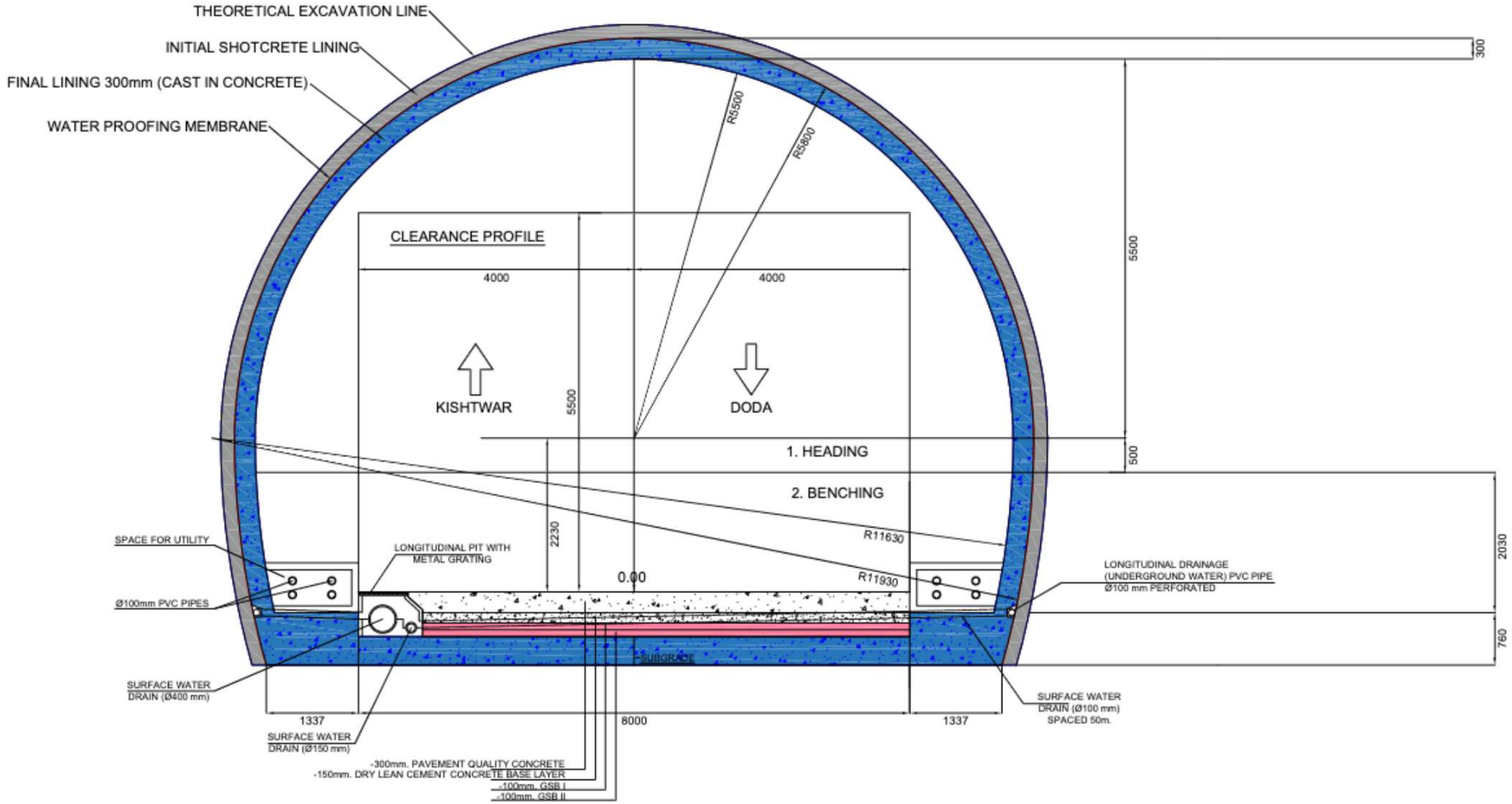


TYPICAL TUNNEL LINING SECTION

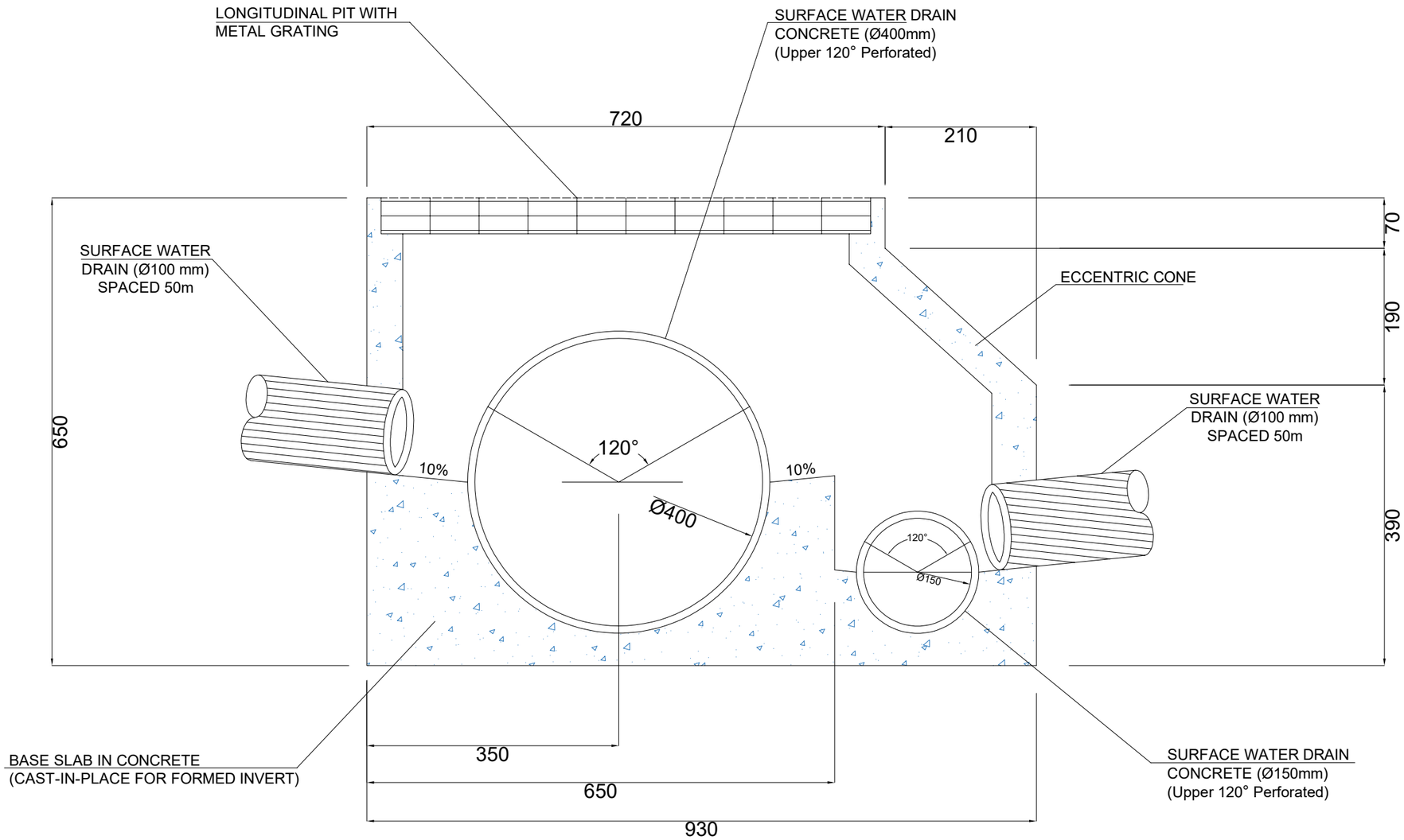
DEMENSION IN MM

CLIENT	PROJECT	EPC CONSULTANT	DESIGN CONSULTANT					
National Highways and Infrastructure Development Corporation **PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001**	Construction Of Bi Directional tunnel at km 83 of length 495m Including approaches road of 664 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244	Belgh Constructlon Company Pvt.Ltd **Plot no 4, Wave mall,Bypass road, Narwal Jammu** **email. info@bccgroupin**	Space Engineers Consortium Pvt.Ltd In associated wlth Equipo De Prospecciones ,S.A					

REVISION	DATE	DESCRIPTION
R1	02-02-22	FINAL DESIGN
R0	22-06-21	FINAL DESIGN

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : 1:50

TITLE: TUNNEL DRAINAGE SYSTEM TYPICAL CROSS SECTION
DRG NO.: KDBT/DRE**IN/IN**D/R1
REVISION: R1



DETAIL "A"

DIMENSIONS IN mm

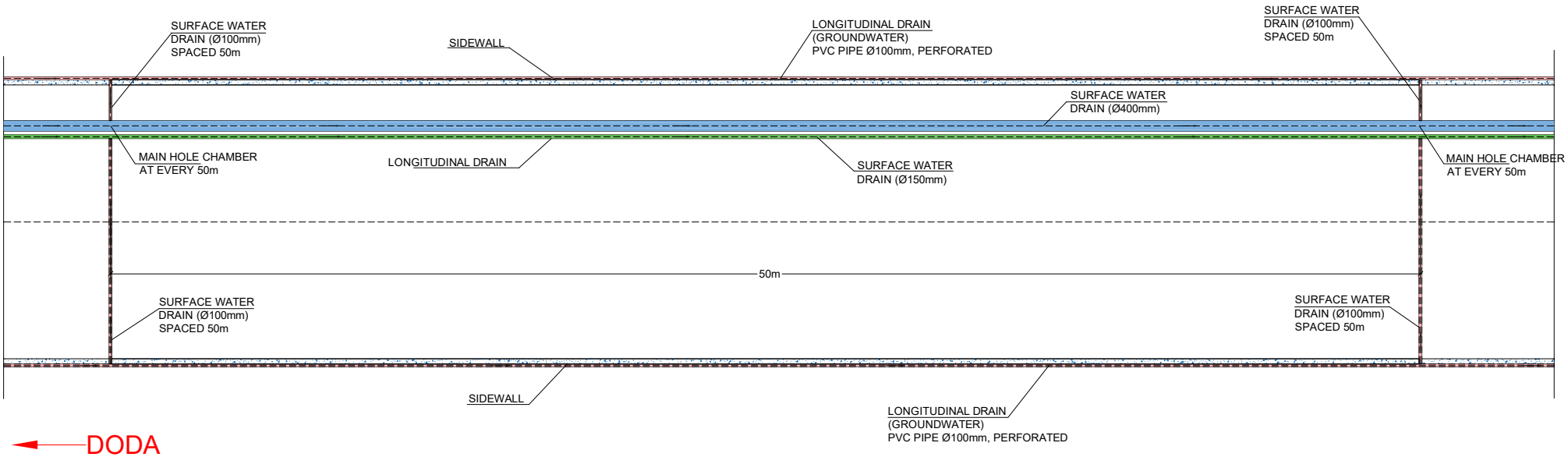
CLIENT	PROJECT	EPC CONSULTANT	DESIGN CONSULTANT
National Highways and Infrastructure Development Corporation PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001	Construction Of Bi Directional tunnel at km 83 of length 495m Including approaches road of 664 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244	Belgh Construction Company Pvt.Ltd Plot no 4, Wave mall,Bypass road, Narwal Jammu email. info@bccgroupin	SECL Space Engineers Consortium Pvt.Ltd In associated with Equipo De Prospecciones ,S.A

REVISION	DATE	DESCRIPTION
R1	02-02-22	FINAL DESIGN
R0	22-06-21	FINAL DESIGN

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : 1:50

TITLE: TUNNEL DRAINAGE SYSTEM TYPICAL CROSS SECTION
DRG NO.: KDBT/DREIN/IND/R1
REVISION: R1

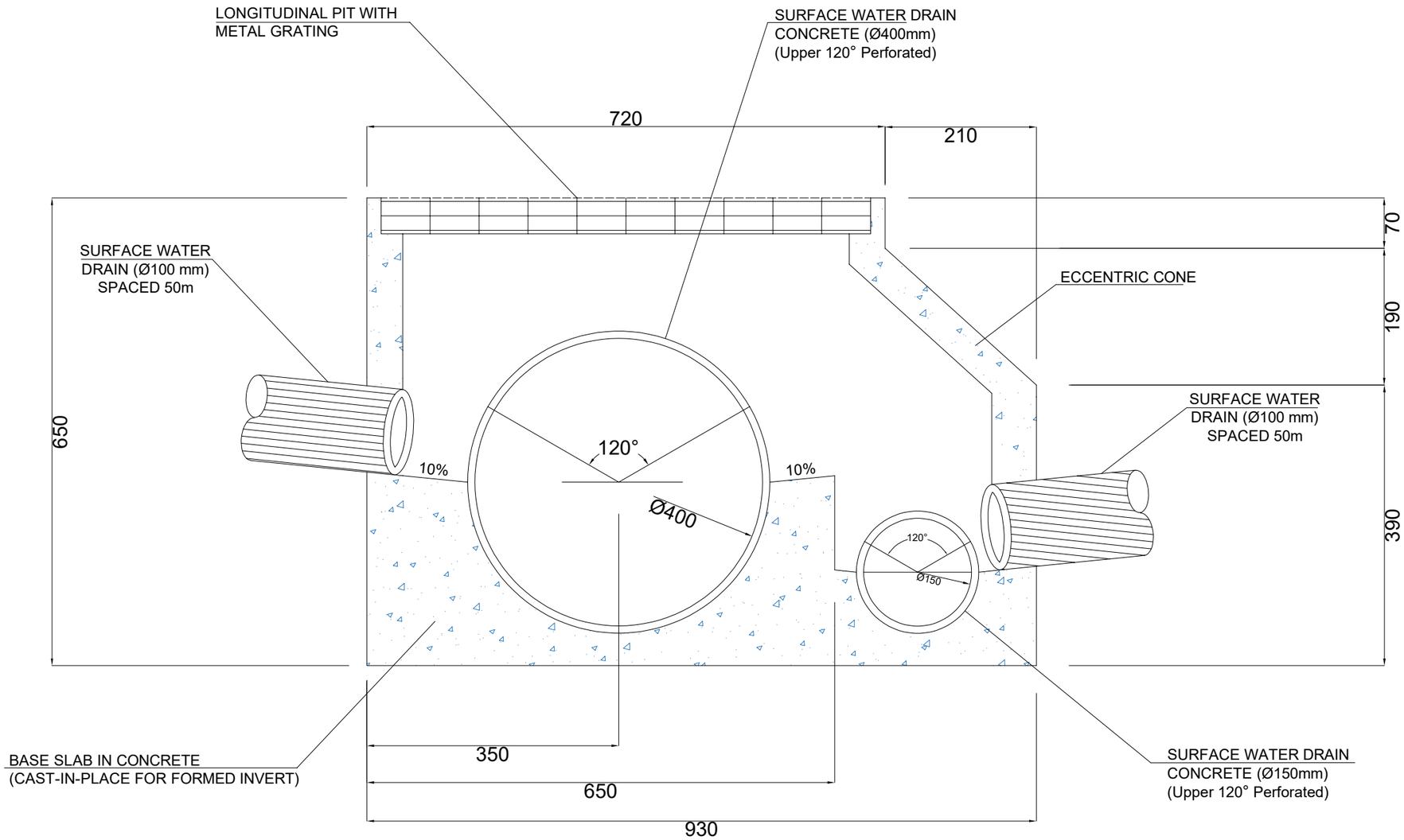
KISHTWAR



DODA

DETAIL PLAN

CLIENT: National Highways and Infrastructure Development Corporation, PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001	PROJECT: Construction Of Bi Directional tunnel at km 83 of length 495m Including approaches road of 664 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244	EPC CONSULTANT: Belgh Construction Company Pvt.Ltd, Plot no 4, Wave mall,Bypass road, Narwal Jammu, email. info@bccgroupin	DESIGN CONSULTANT: Space Engineers Consortium Pvt.Ltd In associated with Equipo De Prospecciones ,S.A	R1 / R0 — 02-02-22 / 22-06-21 — FINAL DESIGN / FINAL DESIGN	DRAWN BY : CARMEN PEREZ SERRANO DESIGNED BY : DIANA CASTANEDO DE LUCAS CHECKED BY : PROF.FCO.CASTENEDO NAVARRO RECOMMENDED BY : DIANA CASTANEDO LUCAS APPROVED BY : PROF.FCO.CASTENEDO NAVARRO SCALE : 1:50	TITLE: TUNNEL DRAINAGE SYSTEM TYPICAL CROSS SECTION DRG NO.: KDBT/DRE/N/IN/D/R1 REVISION: R1



DETAIL "A"

DIMENSIONS IN mm

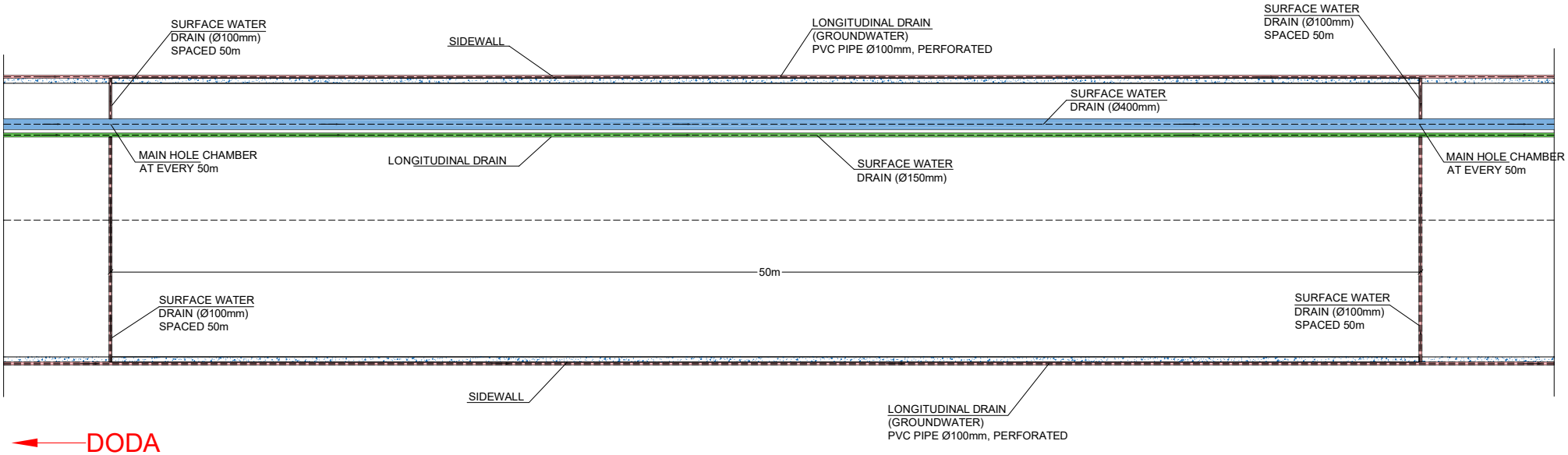
CLIENT	PROJECT	EPC CONSULTANT	DESIGN CONSULTANT
National Highways and Infrastructure Development Corporation **PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001**	Construction Of Bi Directional tunnel at km 83 of length 495m Including approaches road of 664 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244	Belgh Construction Company Pvt.Ltd **Plot no 4, Wave mall,Bypass road, Narwal Jammu** **email. info@bccgroupin**	Space Engineers Consortium Pvt.Ltd In associated with Equipo De Prospecciones ,S.A

REVISION	DATE	DESCRIPTION
R1	02-02-22	FINAL DESIGN
R0	22-06-21	FINAL DESIGN

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : 1:50

TITLE: TUNNEL DRAINAGE SYSTEM TYPICAL CROSS SECTION
DRG NO.: KDBT/DREIN/IND/R1
REVISION: R1

KISHTWAR



DODA

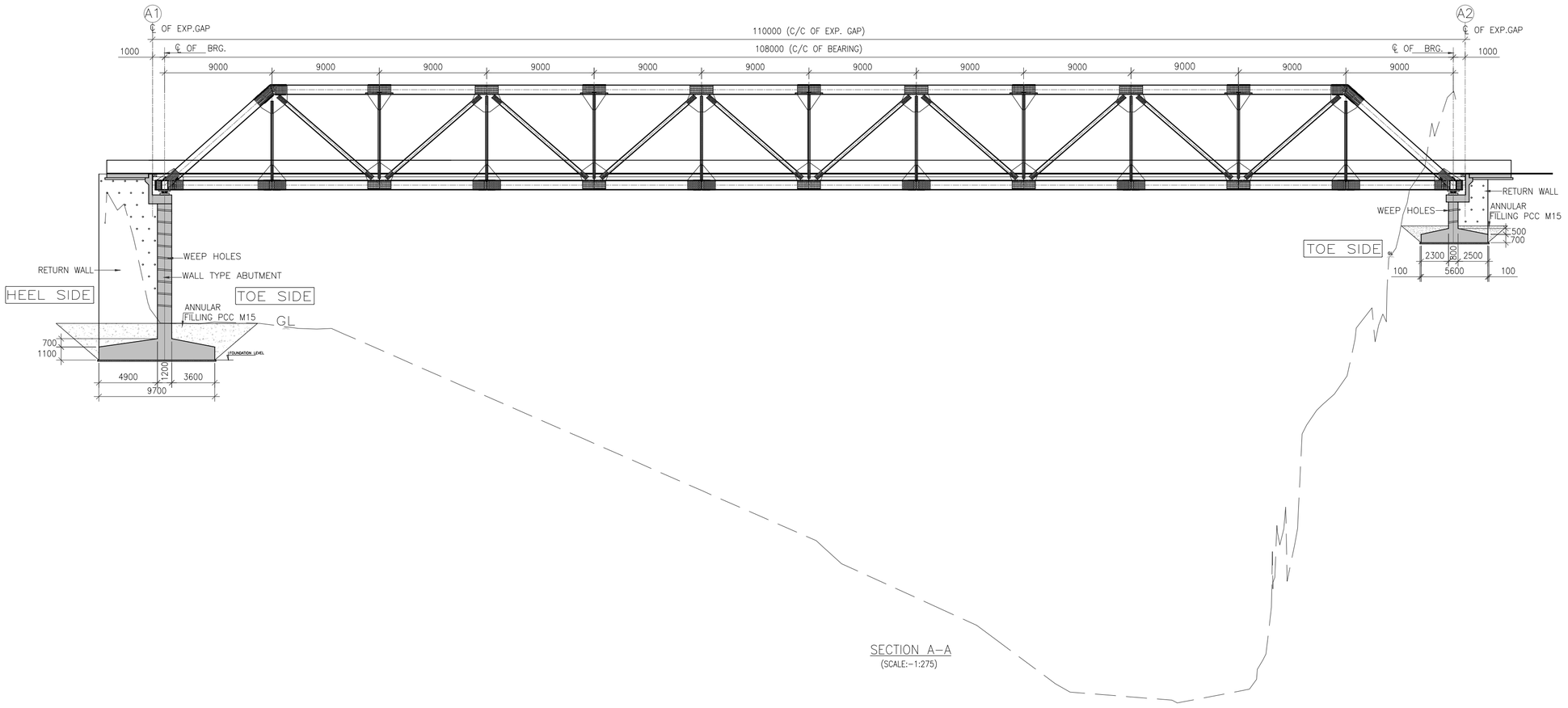
DETAIL PLAN

CLIENT: National Highways and Infrastructure Development Corporation, PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001	PROJECT: Construction Of Bi Directional tunnel at km 83 of length 495m Including approaches road of 664 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244	EPC CONSULTANT: Belgh Construction Company Pvt.Ltd, Plot no 4, Wave mall,Bypass road, Narwal Jammu, email. info@bccgroupin	DESIGN CONSULTANT: Space Engineers Consortium Pvt.Ltd In associated with Equipo De Prospecciones ,S.A	R1 / R0 — 02-02-22 / 22-06-21 — FINAL DESIGN / FINAL DESIGN	DRAWN BY: CARMEN PEREZ SERRANO; DESIGNED BY: DIANA CASTANEDO DE LUCAS; CHECKED BY: PROF.FCO.CASTENEDO NAVARRO; RECOMMENDED BY: DIANA CASTANEDO LUCAS; APPROVED BY: PROF.FCO.CASTENEDO NAVARRO; SCALE: 1:50

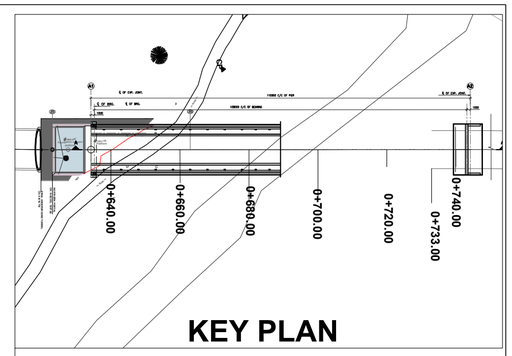
TITLE: TUNNEL DRAINAGE SYSTEM TYPICAL CROSS SECTION

DRG NO.: KDBT/DRE/N/IND/R1

REVISION: R1



SECTION A–A
(SCALE:–1:275)

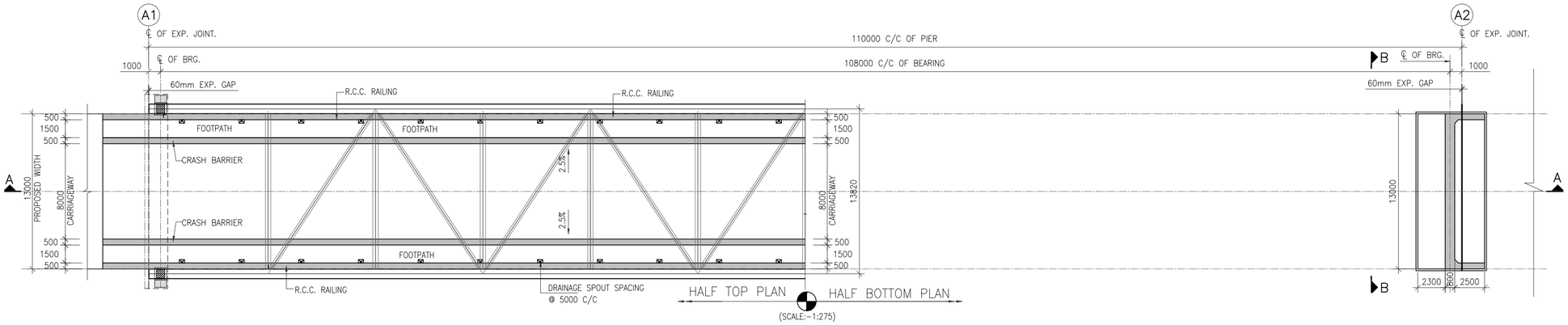


KEY PLAN

NOTES:-

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
3. DURING WELDING, POSITION OF MEMBERS AND ASSEMBLY SHOULD BE SUCH THAT OVERHEAD WELDING SHALL BE AVOIDED/MINIMIZED.
4. ALL THE MEMBERS MEETING AT A JOINTS SHOULD BE WELDED AROUND.
5. ALL WELDING ELECTRODES FOR 'GMAW' PROCESS SHALL CONFORM TO AWS A 505.
6. ALL BARE ELECTRODES FOR 'GMAW' PROCESS SHALL CONFORM TO AWS A SUBMERGED ARC WELDING (SAW) SHALL BE AS PER AWS A 5.23.
7. ALL WELDING TO BE DONE IN CONFORMITY WITH IS:9595 & OR AWS D 1.1/D 1.5 & OTHER RELEVANT SPECIFICATION.
8. BREAKUP OF DIMENSIONS SHOULD TALLY WITH OVERALL DIMENSION FOR ALL THE MEMBERS.
9. STRIP SEAL EXPANSION JOINTS SHALL BE PROVIDED ON EXPANSION END.
10. BEARINGS SHALL BE POT/PTFE BEARINGS.
11. GRADE OF DECK SLAB IS M–40.
12. THE DESIGN IS IN ACCORDANCE WITH IRC:5–2015, IRC:6–2017, IRC:112–2011 & IRC:24–2010.
13. HIGH STRENGTH FRICTION GRIP BOLT (HSFG) OF GRADE (10.9) MAY BE USED IN CONFORMITY WITH IS:4000– 1992. SLIP FACTOR SHOULD BE TAKEN 0.35.
14. FOR LIFTING OF SPAN IN FUTER, JACKS WELL BE LOCATED UNDER END CROSS GIRDERS AT THE LOCATION SHOWN.
15. WHEN THE SPAN IS LIFTED ON JACKS LIVE LOAD WILL NOT BE FOLLOWED OVER THE BRIDGE, JACK REQUIRED FOR LIFTING OF SPAN SHALL HAVE MINIMUM CAPACITY OF 250 TON
16. DO NOT PROVIDE ANY PAINT SUCH AS RED OXIDE, PRIMER OR ANY OTHER COATING OVER HSFG BOLT CONNECTION AREA

PROPOSED LVL AT LME	1007.199 — 1007.112
GROUND LEVELS	994.444 — 1004.112
PROPOSED CHAINAGE	0+634 — 0+744



HALF TOP PLAN — HALF BOTTOM PLAN
(SCALE:–1:275)

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY: AIAPL

EPC CONTRACTOR: BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT: HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT: EARLTECHNO CONSULTANTS PVT. LTD.

DESIGN CONSULTANT: FUTURE BUILD COMPANY

PROJECT: CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

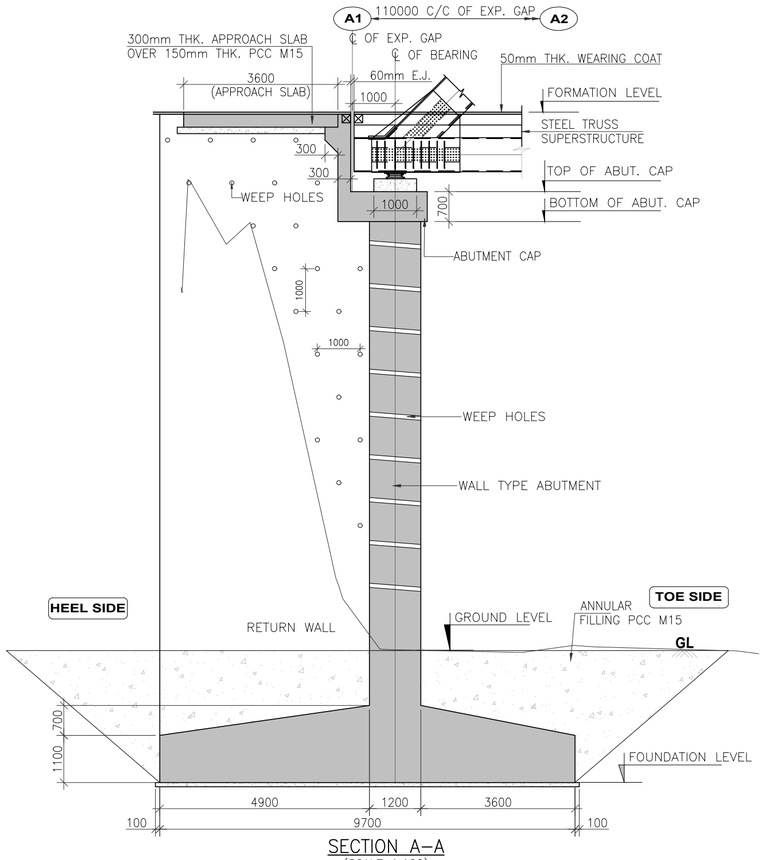
DRAWING TITLE: **GENERAL ARRANGEMENT DRAWING FOR MAJOR BRIDGE @ CH.: 0+689**

SCALE : AS SHOWN | PAPER SIZE : A2

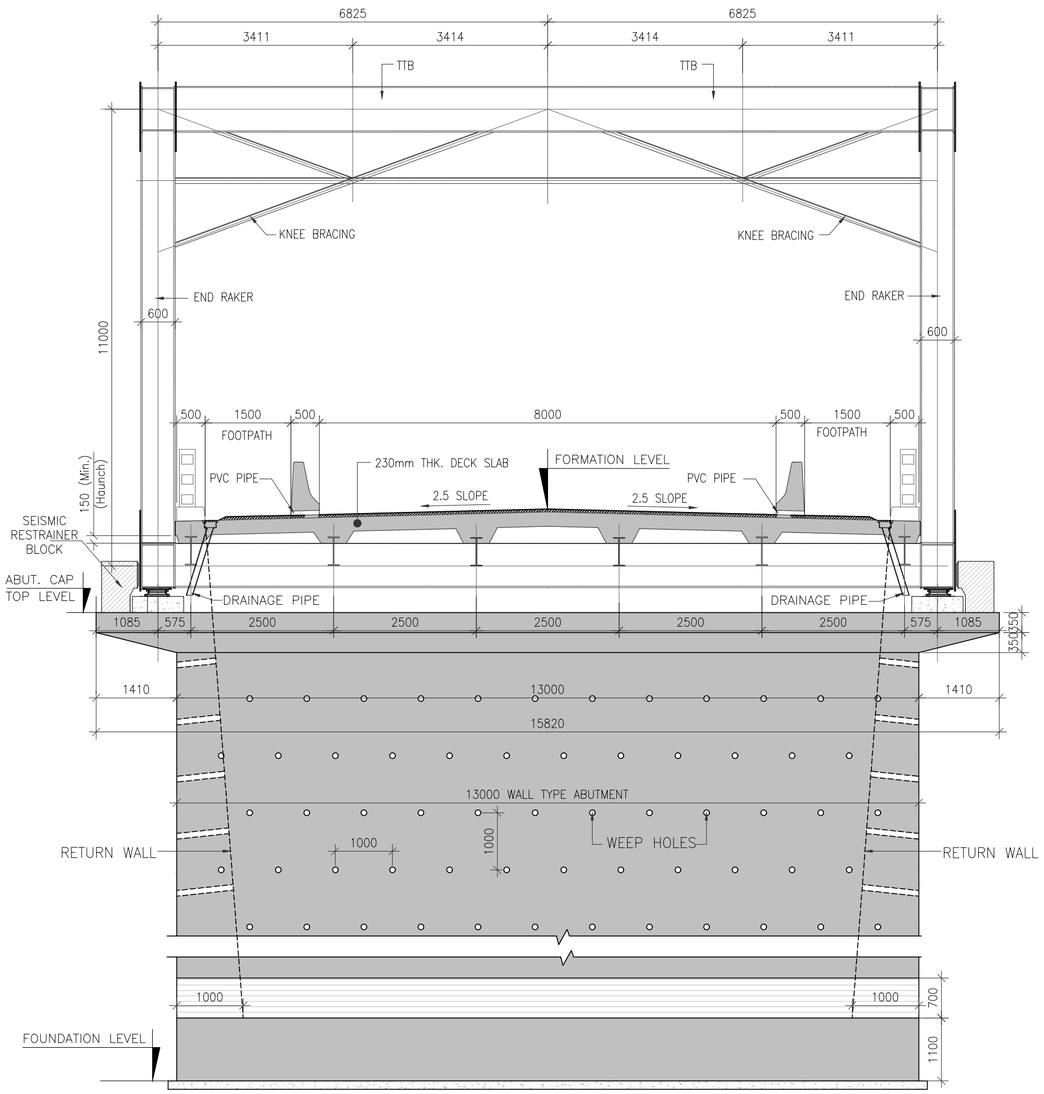
DRG. NO. **STR/DWG/MJB/GAD/101**

DATE : SEPTEMBER. 2022 | **REV: R0**

DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM



SECTION A–A
(SCALE 1:100)



SECTION X–X
(SCALE 1:75)

NOTE'S:–

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS AND CHAINAGES ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED AS PER IRC : 6–2017.
4. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED FOR 3 LANE OF CLASS A, 1 LANE OF 70R + 1 LANE CLASS A AND SV LOADING WHICHEVER GOVERNS AS PER IRC : 6–2017.
5. BACK FILL MATERIALS SHALL CONSISTS OF SELECTED EARTH CONFORMING TO APPENDIX : 6 OF IRC : 78–2014.
6. ALL LEVELS SHOWN HERE VERIFIED WITH APPROVED PLAN AND PROFILE DRAWING BY EXECUTING AGENCY/CONTRACTOR BEFORE START OF WORK.
7. IN CASE OF POCKET OF SOFT UNSUITABLE STRATA IS FOUND BELOW FOUNDING LEVEL, SAME SHALL BE REPLACED WITH SUITABLE GRANULAR MATERIALS.
8. FOR DETAILS OF APPROACHES, DRAINAGE SYSTEM, SLOPE PROTECTION, ETC, REFER SEPARATE DRAWINGS.
9. 100mm DIA PVC PIPE SHALL BE PROVIDED AS PER WEEP HOLES @ 1000 C/C BOTHWAYS. WEEP HOLES SHALL BE PROVIDED AT A SLOPE OF 1:20.
10. FILTER MEDIA BEHIND RETAINING WALL SHALL BE PROVIDED AS PER APPENDIX : 6 OF IRC : 78–2014.
11. THE DESIGN AND DETAILING IS CARRIED OUT WITH FOLLOWING ASSUMTIONS AS PER CLAUSE 4.2 OF IRC : 112–2011.
12. MODERATE EXPOSURE CONDITION IS CONSIDERED FOR DESIGN
13. THE BRIDGE SITE IS LOCATED IN SEISMIC ZONE–IV.
14. THE STRUCTURE IS DESIGNED FOR 100 YEARS OF A LIFE TIME.
15. THE SATURATED DENSITY OF SOIL IS 20 kN/m3 AND THE SUBMERGED DENSITY OF SOIL IS 10 kN/m3.
16. BACK FILLING BEHIND ABUTMENTS SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX :6 OF IRC:78–2000 HAVING PROPERTIES C=0 , ø=33°.

GRADES, MATERIAL TYPES & ETC.:–

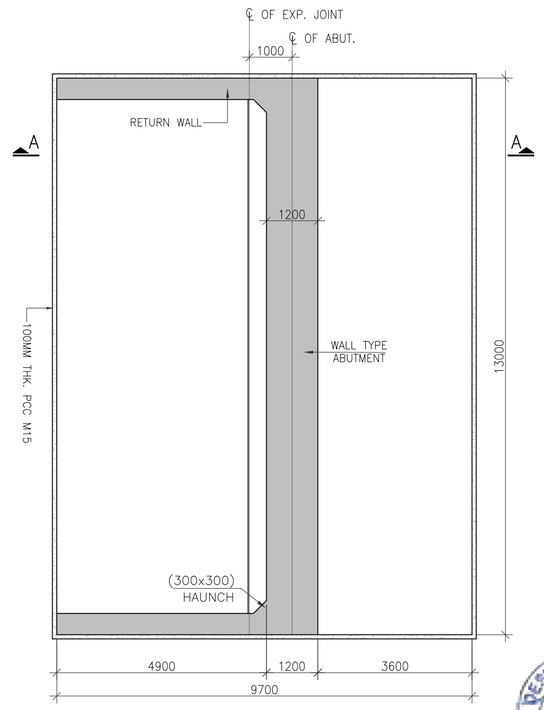
a) RCC CRASH BARRIER M40
b) SUBSTRUCTURE / FOUNDATION.....M35
c) APPROACH SLAB M30
d) ABUTMENT CAP M35
e) PEDESTAL.....M40
f) PCC M15
g) SEISIMIC ZONE.....(IV)
h) B.C WEARING COAT.....50MM THK.
i) STEEL/HYSD BARS (CONFIRM TO IS:1786).....Fe500D.

CLEAR COVER:–

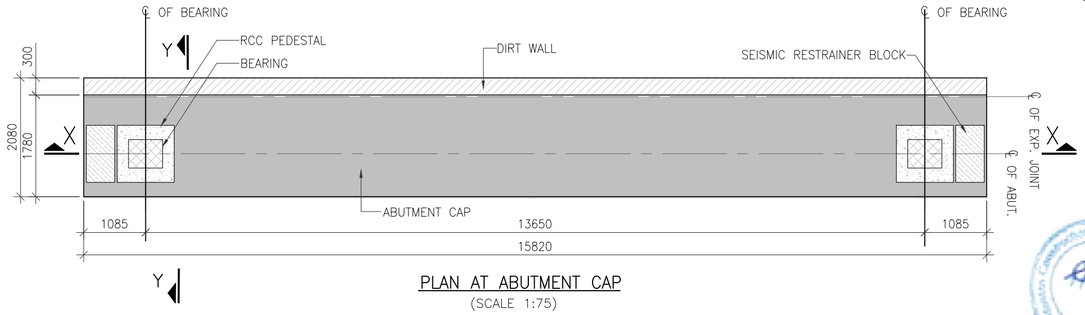
a) RCC CRASH BARRIER 50mm
b) FOUNDATION 75mm
c) RCC ABUTMENT SHAFT (EARTH FACE) 75mm
d) RCC ABUTMENT SHAFT (NON–EARTH FACE).....40mm
e) ABUTMENT CAP.....50mm
f) DIRT WALL 50mm
g) APPROACH SLAB 50mm

SPECIAL NOTES:

01 "SAFE BEARING PRESSURE CONSIDERED IN DESIGN IS 70 T/m² AND THE SAME SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK."
02 "PLATE LOAD TEST SHALL BE DONE AT SITE."

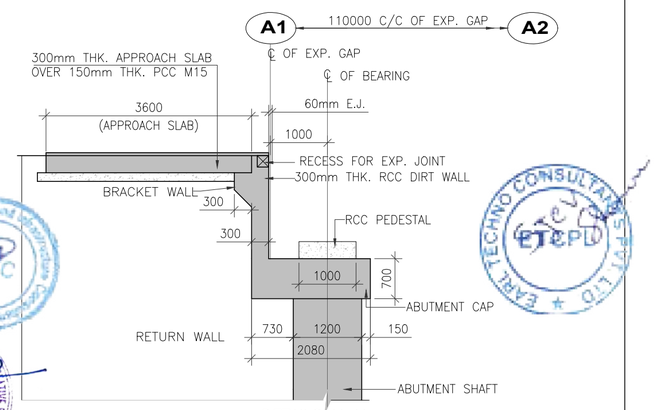


PLAN OF FOUNDATION
(SCALE 1:75)



PLAN AT ABUTMENT CAP
(SCALE 1:75)

ABUTMENT LEVELS						
LOCATION	FINISHED ROAD LEVEL	ABUTMENT CAP TOP LEVEL	ABUTMENT CAP BOTTOM LEVEL	GROUND LEVEL	FOUNDATION TOP LEVEL	FOUNDATION BOTTOM LEVEL
A1	1007.199	1004.984	1004.284	994.444	994.144	992.344



DETAILS Y–Y
(SCALE 1:75)

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY: AIAPL

EPC CONTRACTOR: BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT: HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT: EARLTECHNO CONSULTANTS PVT. LTD

DESIGN CONSULTANT: FUTURE BUILD COMPANY

PROJECT: CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

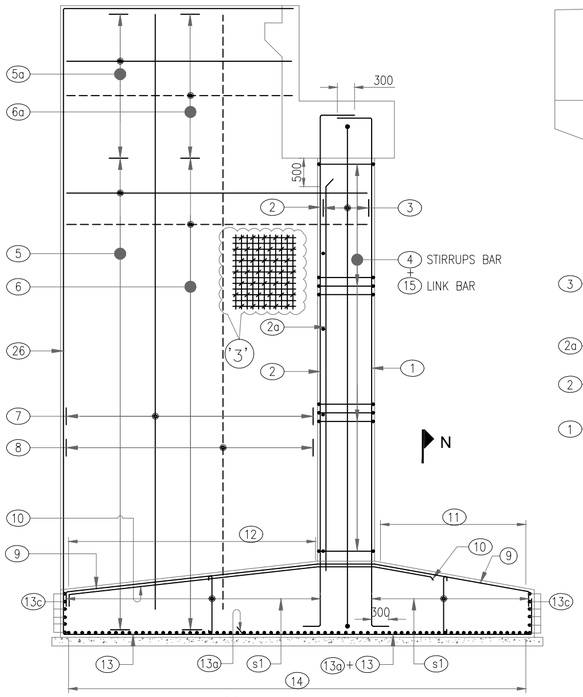
DRAWING TITLE: DIMENSION DETAILS DRAWING OF ABUTMENT (A1) FOR MJB AT CH. 0+689

SCALE : AS SHOWN | PAPER SIZE : A2

DRG. NO. STR/DWG/MJB/DIM./ABUT.-A1/201

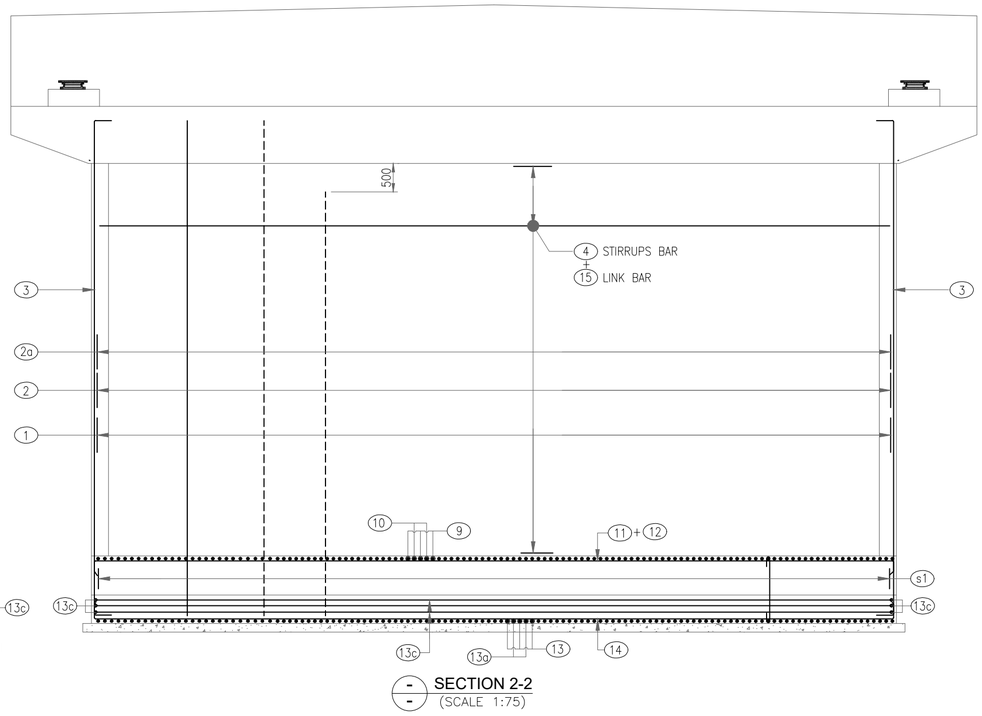
DATE : SEPTEMBER. 2022 | REV: R0

DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM

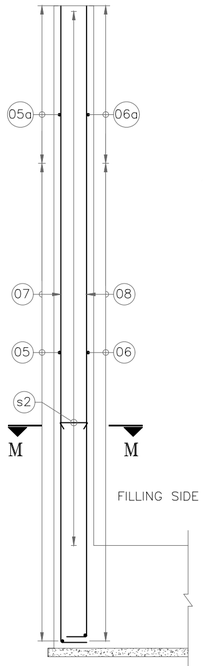


SECTION 1-1
(SCALE 1:75)

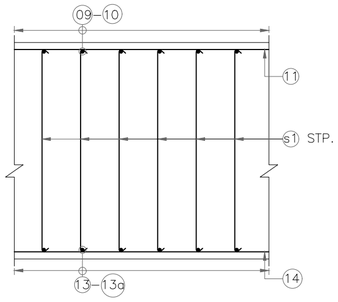
N



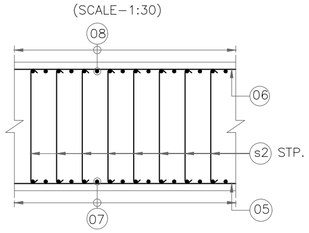
SECTION 2-2
(SCALE 1:75)



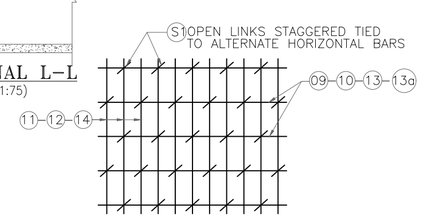
SECTIONAL L-L
(SCALE 1:75)



SECTION N-N
(SCALE-1:30)



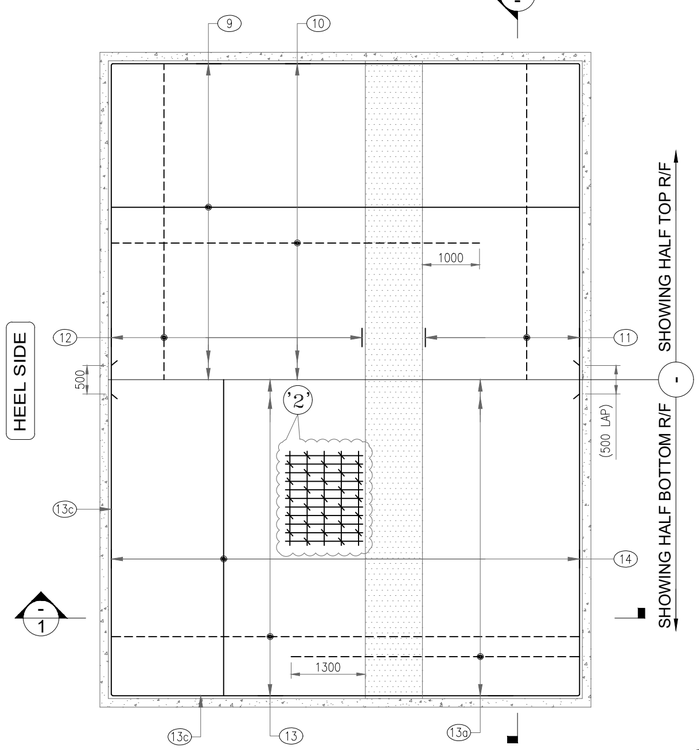
SECTION M-M
(SCALE-1:25)



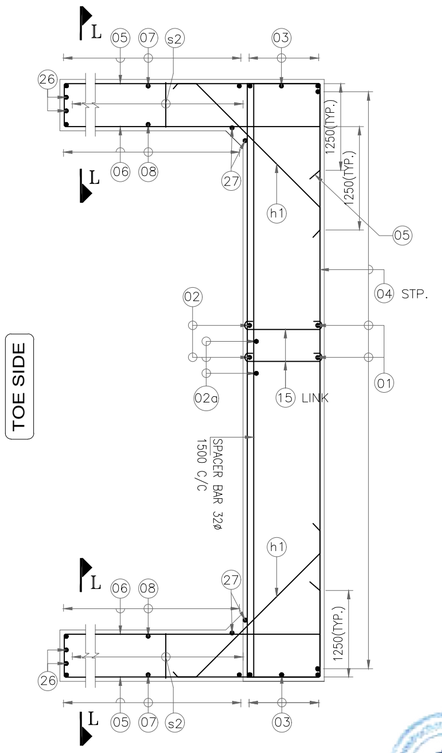
DETAIL '2'
(SCALE-1:20)

REINF.SCHEDULE FOR ABUTMENT-A1

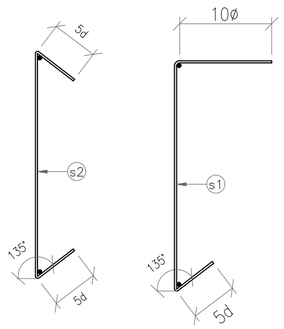
BAR MKD.	SHAPE (NOT TO SCALE)	DIA. (mm)	TOTAL NOS. / SPACING (mm)
01	300 / 300	25	90 C/C
02	300 / 300	32	90 C/C
02a	300 / 300	32	90 C/C
03	300 / 300	20	100 C/C
04	PLAN	20	100 C/C
05		16	200 C/C
05a		16	150 C/C
06		25	150 C/C
06a		20	150 C/C
07		16	200 C/C
08		25	150 C/C
09		25	100 C/C
10		BAR MARK NOT USED	
11		16	150 C/C
12		16	150 C/C
13		25	100 C/C
13a		25	100 C/C
13b	BAR MARK NOT USED		
13c		16	100 C/C
14		20	150 C/C
15		10	200 C/C VERTICALLY
26	300 / 300	12	2 x 5 NOS.
h1	1225	10	100 C/C
s1		10	OPEN LINK 200 C/C
s2		10	OPEN LINK 200 C/C
27	300	12	2 x 2 NOS.



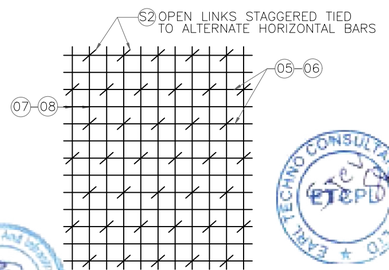
R/F PLAN OF ABUTMENT FOUNDATION
(SCALE 1:75)



R/F DETAILS OF ABUTMENT SHAFT
(SCALE 1:75)



DETAIL OF OPEN LINK
(SCALE-N.T.S.)



DETAIL '3'
(SCALE-1:20)

NOTE'S:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS AND CHAINAGES ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED AS PER IRC : 6-2017.
4. ADEQUATE LINKS SPACER BARS ETC SHALL BE PROVIDED FOR PROPER POSITIONING OF REINFORCEMENT.
5. LAP JOINT SHALL BE PROVIDED IN STAGGERED MANNER & NOT MORE THAN 50% BAR SHALL BE LAPPED AT ANY SECTION.
6. BOND LENGTH SHALL BE 50 TIMES DIA OF BAR & LAP LENGTH SHALL BE 73 TIMES DIA OF BAR.
7. ABUT. CAP TOP LEVEL AND PEDESTAL HEIGHT MAY BE VARIES AFTER DESIGN OF BEARING SIZE.

GRADES, MATERIAL TYPES & ETC.:-

a) RCC CRASH BARRIER M40
b) SUBSTRUCTURE / FOUNDATION.....M35
c) APPROACH SLAB M30
d) ABUTMENT CAP M35
e) PEDESTAL.....M40
f) PCC M15
g) SEISIMIC ZONE.....(IV)
h) B.C WEARING COAT.....50MM THK.
i) STEEL/HYSD BARS (CONFIRM TO IS:1786).....Fe500D.

CLEAR COVER:-

a) RCC CRASH BARRIER 50mm
b) FOUNDATION 75mm
c) RCC ABUTMENT SHAFT (EARTH FACE) 75mm
d) RCC ABUTMENT SHAFT (NON-EARTH FACE).....40mm
e) ABUTMENT CAP.....50mm
f) DIRT WALL 50mm
g) APPROACH SLAB 50mm

SPECIAL NOTES:

01 "SAFE BEARING PRESSURE CONSIDERED IN DESIGN IS 70 T/m² AND THE SAME SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK."
02 "PLATE LOAD TEST SHALL BE DONE AT SITE."

Authorised Signatory

LEGEND:
TOP REINF. ———
BOTTOM REINF. - - - - - -

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
AUTHORITY: AIAPL
EPC CONTRACTOR: BEIGH CONSTRUCTION COMPANY PVT. LTD.
PROOF CONSULTANT: HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS
SAFETY CONSULTANT: EARLTECHNO CONSULTANTS PVT. LTD
DESIGN CONSULTANT: FUTURE BUILD COMPANY

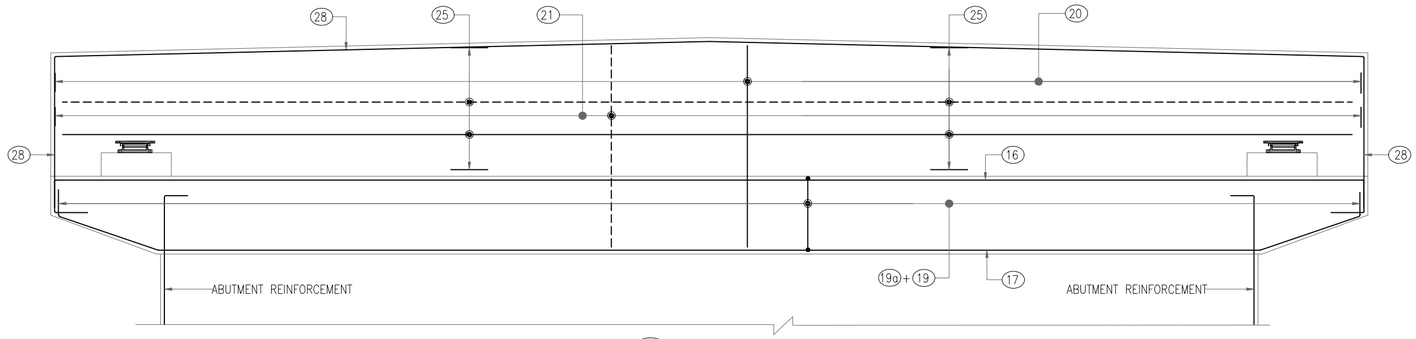
PROJECT: CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

DRAWING TITLE: REINFORCEMENT DETAILS OF ABUTMENT A-1 OF PROPOSED MAJOR BRIDGE AT CH : 0+689 (SHEET 01 OF 02)

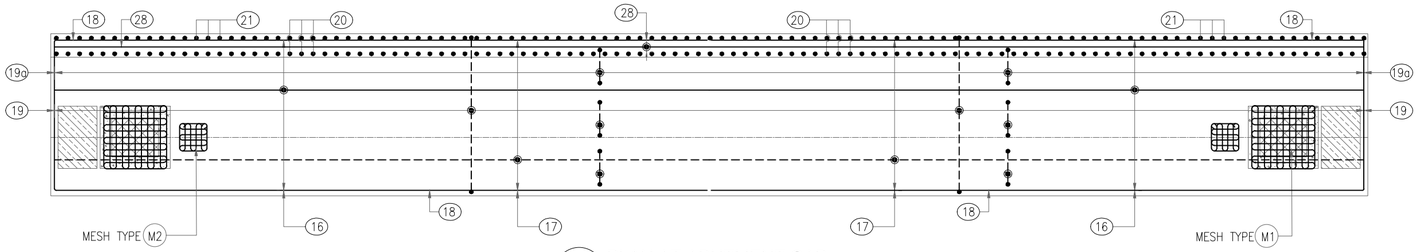
SCALE : AS SHOWN | PAPER SIZE : A2

DRG. NO. STR/DWG/MJB/REINF./ABUT.-A1/202
DATE : SEPTEMBER. 2022 | REV: R0

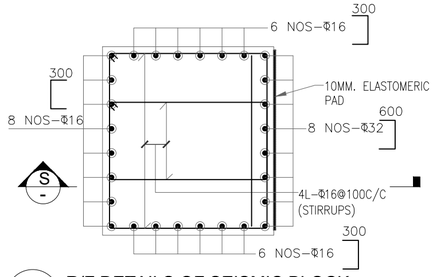
DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM



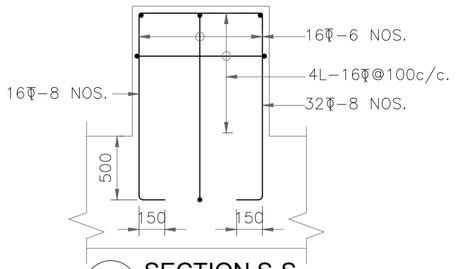
SECTION 2-2
(SCALE 1:50)



PLAN AT ABUTMENT CAP
(SCALE 1:75)



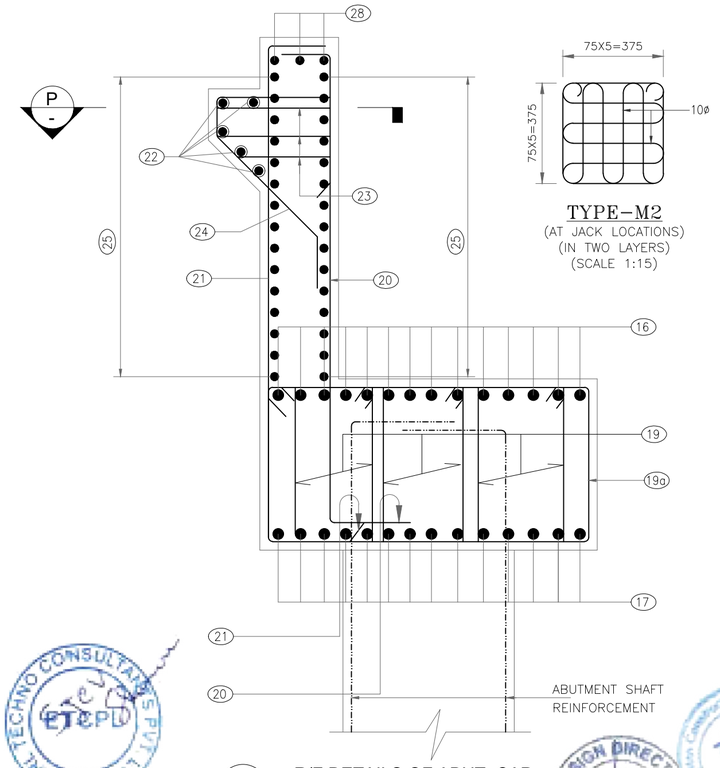
R/F DETAILS OF SEISMIC BLOCK
(SCALE 1:25)



SECTION S-S
(SCALE 1:30)

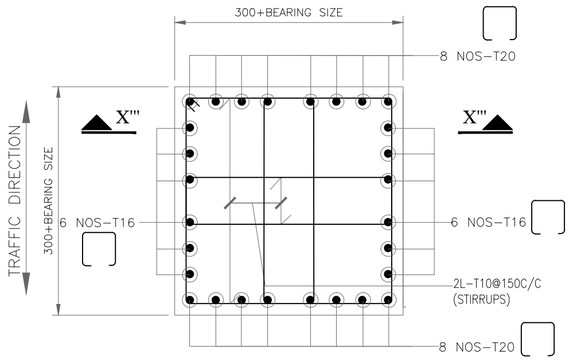
REINF.SCHEDULE FOR ABUTMENT-A1

BAR MKD.	SHAPE (NOT TO SCALE)	DIA. (mm)	TOTAL NOS. / SPACING (mm)
16	400 / 400	16	120 C/C
17	400 / 400	16	120 C/C
18	NOT IN USE		
19		12	150 C/C
19a		12	150 C/C
20	300 / 300	12	120 C/C
21	150 / 500	12	120 C/C
22		10	6 NOS.
23		10	400 C/C 2 LEGGED 3 NOS.(HORI.)
24	600	12	100 C/C
25	150 / 150	10	150 C/C
28	300 / 300	16	3 NOS.

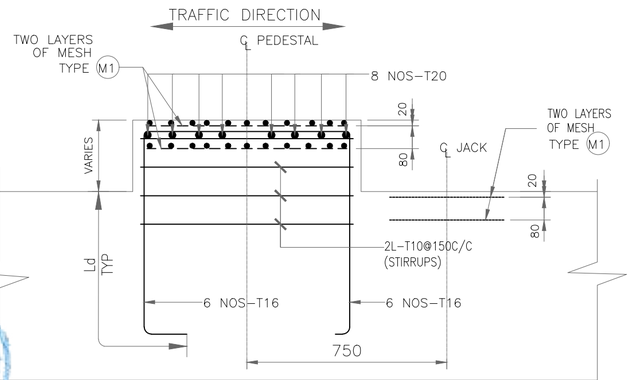


R/F DETAILS OF ABUT. CAP
(SCALE 1:40)

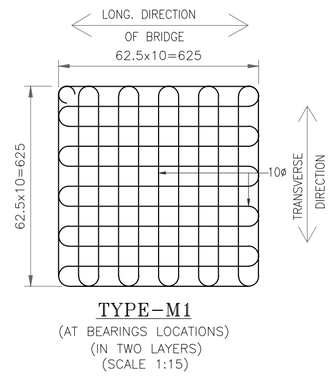
TYPE-M2
(AT JACK LOCATIONS)
(IN TWO LAYERS)
(SCALE 1:15)



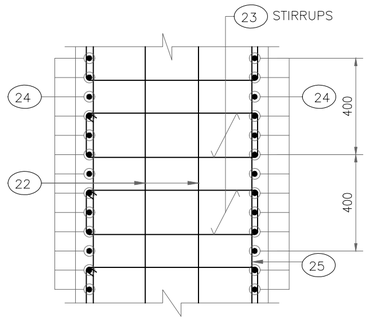
PLAN OF BEARING PEDESTAL
(SCALE-1:15)



SECTION AT X'''- X'''
(SCALE-1:15)



TYPE-M1
(AT BEARINGS LOCATIONS)
(IN TWO LAYERS)
(SCALE 1:15)



SECTION P-P
(SCALE 1:25)

NOTE'S:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS AND CHAINAGES ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED AS PER IRC : 6-2017.
4. ADEQUATE LINKS SPACER BARS ETC SHALL BE PROVIDED FOR PROPER POSITIONING OF REINFORCEMENT.
5. LAP JOINT SHALL BE PROVIDED IN STAGGERED MANNER & NOT MORE THAN 50% BAR SHALL BE LAPPED AT ANY SECTION.
6. BOND LENGTH SHALL BE 50 TIMES DIA OF BAR & LAP LENGTH SHALL BE 73 TIMES DIA OF BAR.
7. ABUT. CAP TOP LEVEL AND PEDESTAL HEIGHT MAY BE VARIES AFTER DESIGN OF BEARING SIZE.

GRADES, MATERIAL TYPES & ETC.:-

a) RCC CRASH BARRIER M40
b) SUBSTRUCTURE / FOUNDATION.....M35
c) APPROACH SLAB M30
d) ABUTMENT CAP M35
e) PEDESTAL.....M40
f) PCC M15
g) SEISIMIC ZONE.....(IV)
h) B.C WEARING COAT.....50MM THK.
i) STEEL/HYSD BARS (CONFIRM TO IS:1786).....Fe500D.

CLEAR COVER:-

a) RCC CRASH BARRIER 50mm
b) FOUNDATION 75mm
c) RCC ABUTMENT SHAFT (EARTH FACE) 75mm
d) RCC ABUTMENT SHAFT (NON-EARTH FACE).....40mm
e) ABUTMENT CAP.....50mm
f) DIRT WALL 50mm
g) APPROACH SLAB 50mm

SPECIAL NOTES:

01 "SAFE BEARING PRESSURE CONSIDERED IN DESIGN IS 70 T/m² AND THE SAME SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK."
02 "PLATE LOAD TEST SHALL BE DONE AT SITE."

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY: AIAPL

EPC CONTRACTOR: BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT: HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT: EARLTECHNO CONSULTANTS PVT. LTD

DESIGN CONSULTANT: FUTURE BUILD COMPANY

PROJECT: CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

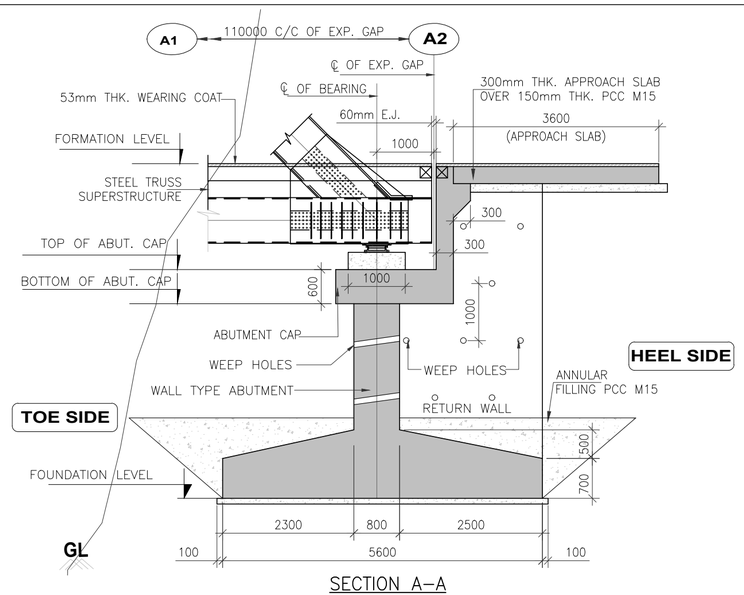
DRAWING TITLE: REINFORCEMENT DETAILS OF ABUTMENT A-1 OF PROPOSED MAJOR BRIDGE AT CH :0+689 (SHEET 02 OF 02)

DRG. NO. STR/DWG/MJB/REINF./ABUT.-A1/202

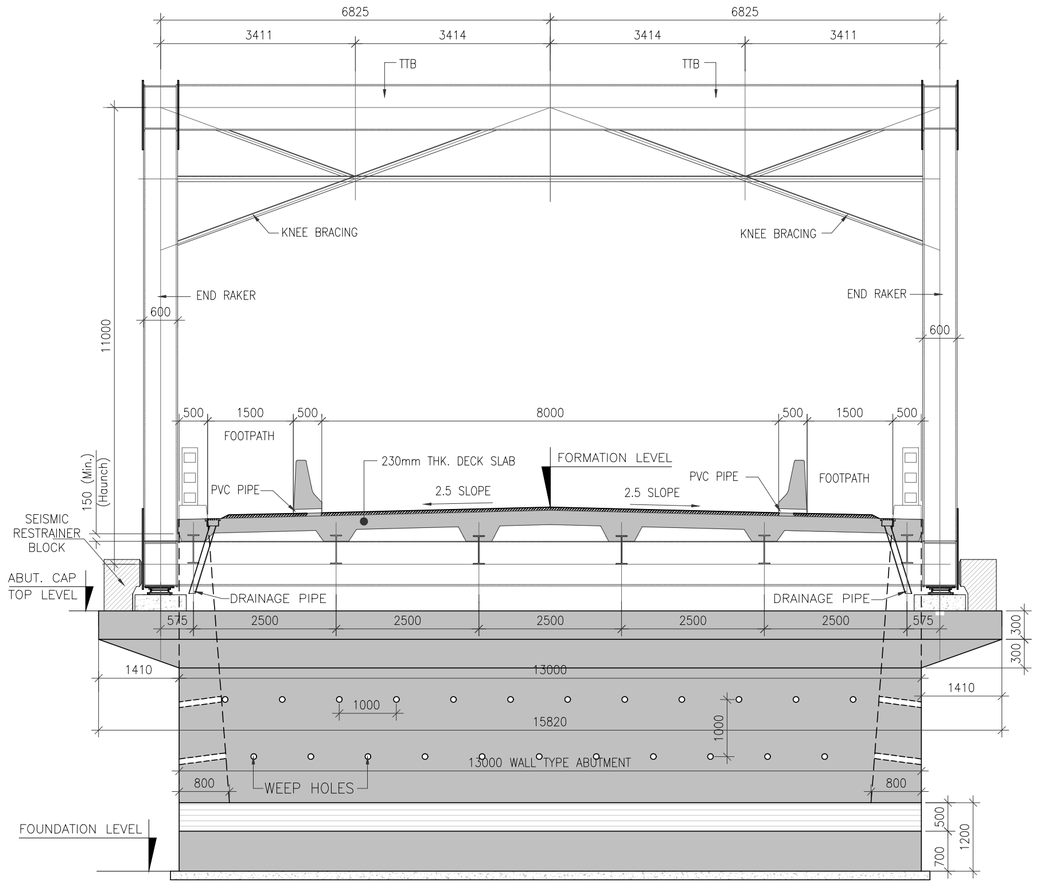
DATE : SEPTEMBER. 2022 | REV: R0

SCALE : AS SHOWN	PAPER SIZE : A2

DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM

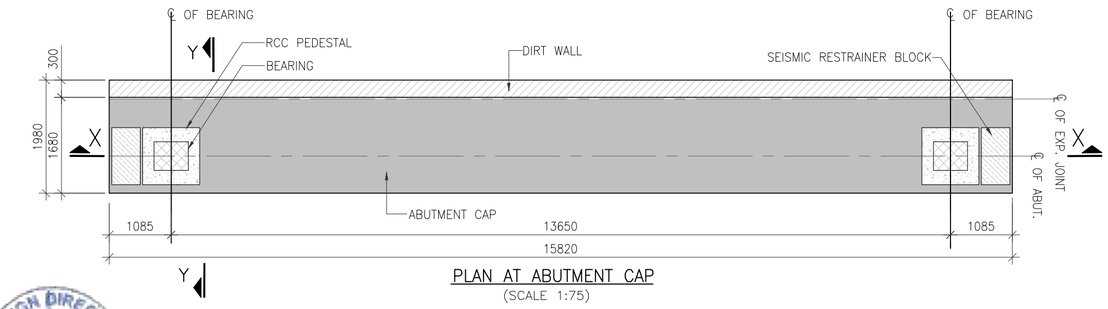


SECTION A–A
(SCALE 1:100)



SECTION X–X
(SCALE 1:75)

PLAN OF FOUNDATION
(SCALE 1:75)



PLAN AT ABUTMENT CAP
(SCALE 1:75)

NOTE'S:–

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS AND CHAINAGES ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED AS PER IRC : 6–2017.
4. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED FOR 3 LANE OF CLASS A, 1 LANE OF 70R + 1 LANE CLASS A AND SV LOADING WHICHEVER GOVERNS AS PER IRC : 6–2017.
5. BACK FILL MATERIALS SHALL CONSISTS OF SELECTED EARTH CONFORMING TO APPENDIX : 6 OF IRC : 78–2014.
6. ALL LEVELS SHOWN HERE VERIFIED WITH APPROVED PLAN AND PROFILE DRAWING BY EXECUTING AGENCY/CONTRACTOR BEFORE START OF WORK.
7. IN CASE OF POCKET OF SOFT UNSUITABLE STRATA IS FOUND BELOW FOUNDING LEVEL, SAME SHALL BE REPLACED WITH SUITABLE GRANULAR MATERIALS.
8. FOR DETAILS OF APPROACHES, DRAINAGE SYSTEM, SLOPE PROTECTION, ETC, REFER SEPARATE DRAWINGS.
9. 100mm DIA PVC PIPE SHALL BE PROVIDED AS PER WEEP HOLES @ 1000 C/C BOTHWAYS. WEEP HOLES SHALL BE PROVIDED AT A SLOPE OF 1:20.
10. FILTER MEDIA BEHIND RETAINING WALL SHALL BE PROVIDED AS PER APPENDIX : 6 OF IRC : 78–2014.
11. THE DESIGN AND DETAILING IS CARRIED OUT WITH FOLLOWING ASSUMTIONS AS PER CLAUSE 4.2 OF IRC : 112–2011.
12. MODERATE EXPOSURE CONDITION IS CONSIDERED FOR DESIGN
13. THE BRIDGE SITE IS LOCATED IN SEISMIC ZONE–IV.
14. THE STRUCTURE IS DESIGNED FOR 100 YEARS OF A LIFE TIME.
15. THE SATURATED DENSITY OF SOIL IS 20 kN/m3 AND THE SUBMERGED DENSITY OF SOIL IS 10 kN/m3.
16. BACK FILLING BEHIND ABUTMENTS SHALL CONSIST OF SELECTED EARTH CONFORMING TO APPENDIX :6 OF IRC:78–2000 HAVING PROPERTIES C=0 , ø=33°.

GRADES, MATERIAL TYPES & ETC.:–

a) RCC CRASH BARRIER M40
b) SUBSTRUCTURE / FOUNDATION.....M35
c) APPROACH SLAB M30
d) ABUTMENT CAP M35
e) PEDESTAL.....M40
f) PCC M15
g) SEISIMIC ZONE.....(IV)
h) B.C WEARING COAT.....50MM THK.
i) STEEL/HYSD BARS (CONFIRM TO IS:1786).....Fe500D.

CLEAR COVER:–

a) RCC CRASH BARRIER 50mm
b) FOUNDATION 75mm
c) RCC ABUTMENT SHAFT (EARTH FACE) 75mm
d) RCC ABUTMENT SHAFT (NON–EARTH FACE).....40mm
e) ABUTMENT CAP.....50mm
f) DIRT WALL 50mm
g) APPROACH SLAB 50mm

SPECIAL NOTES:

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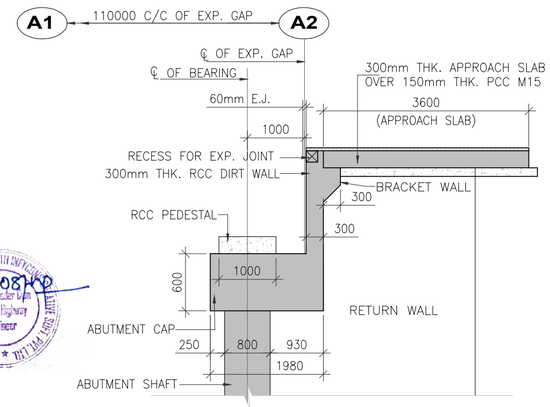
02 "PLATE LOAD TEST SHALL BE DONE AT SITE."



DETAILS Y–Y
(SCALE 1:75)

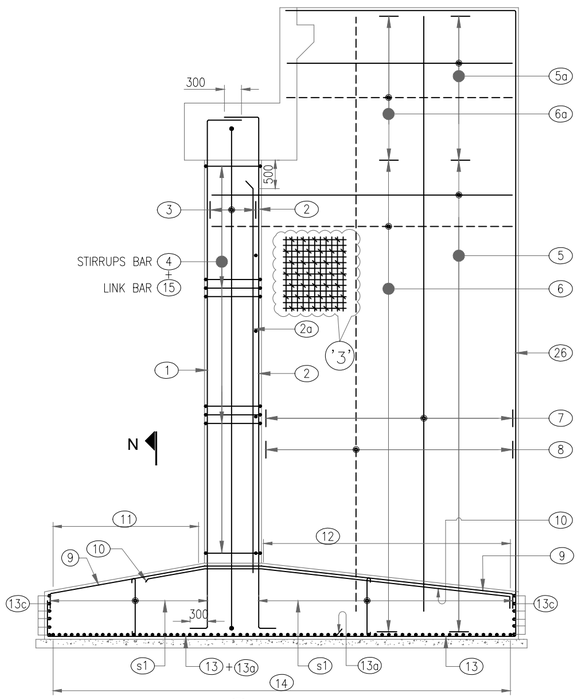
ABUTMENT LEVELS

LOCATION	FINISHED ROAD LEVEL	ABUTMENT CAP TOP LEVEL	ABUTMENT CAP BOTTOM LEVEL	GROUND LEVEL	FOUNDATION TOP LEVEL	FOUNDATION BOTTOM LEVEL
A2	1007.112	1004.897	1004.297	1004.112	1003.212	1002.012

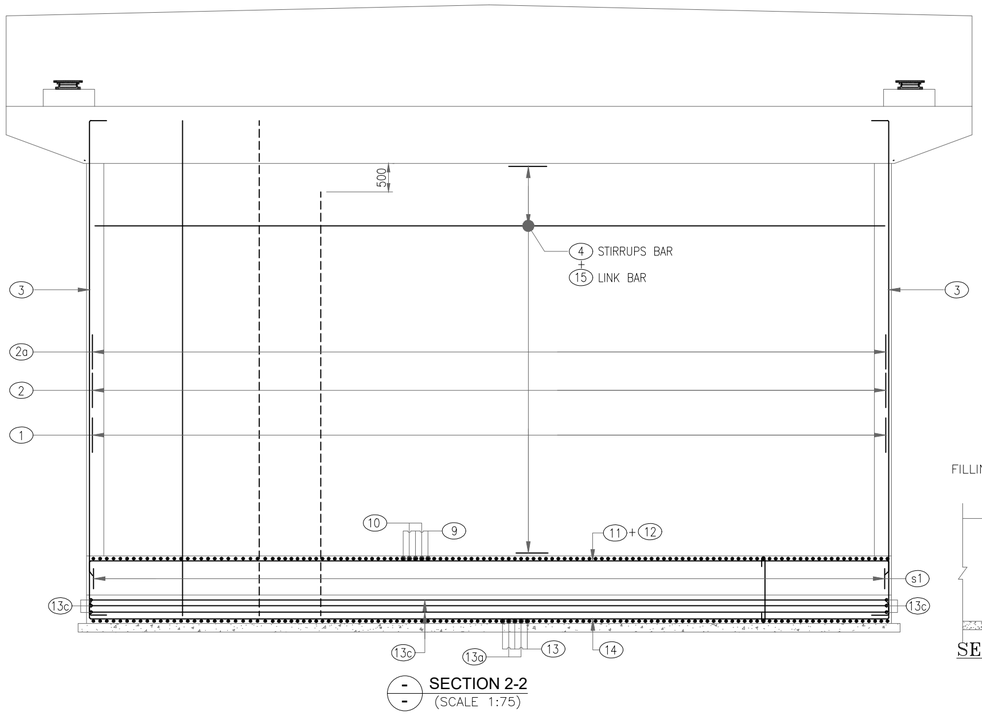
REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
AUTHORITY : AIAPL
EPC CONTRACTOR : BEIGH CONSTRUCTION COMPANY PVT. LTD.
PROOF CONSULTANT : HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS
SAFETY CONSULTANT : EARLTECHNO CONSULTANTS PVT. LTD
DESIGN CONSULTANT : FUTURE BUILD COMPANY
PROJECT : CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.
DRAWING TITLE : DIMENSION DETAILS DRAWING OF ABUTMENT (A2) FOR MJB AT CH. 0+689
SCALE : AS SHOWN
PAPER SIZE : A2
DRG. NO. STR/DWG/MJB/DIM./ABUT.-A2/203
DATE : SEPTEMBER. 2022
REV: R0

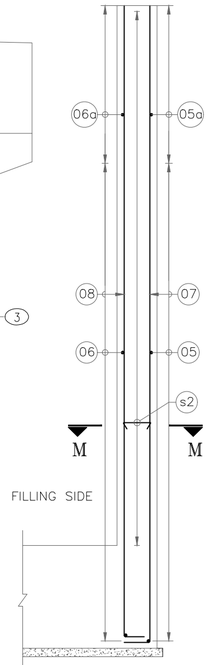
DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM



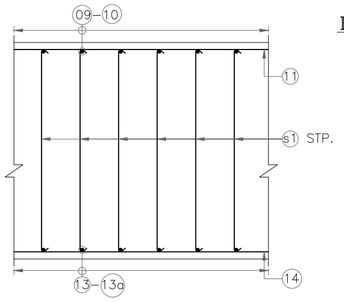
SECTION 1-1
(SCALE 1:75)



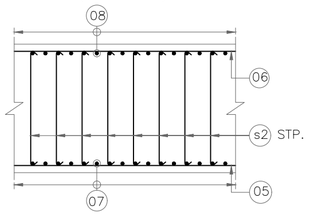
SECTION 2-2
(SCALE 1:75)



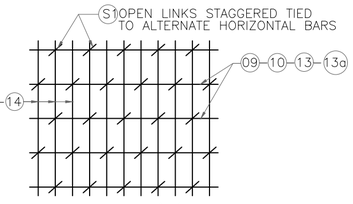
SECTIONAL L-L
(SCALE 1:75)



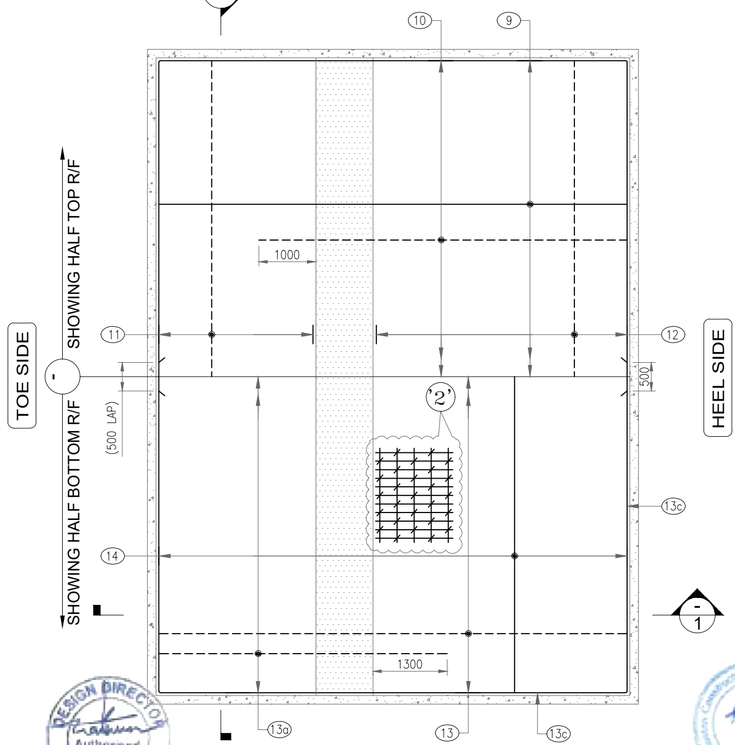
SECTION N-N
(SCALE-1:30)



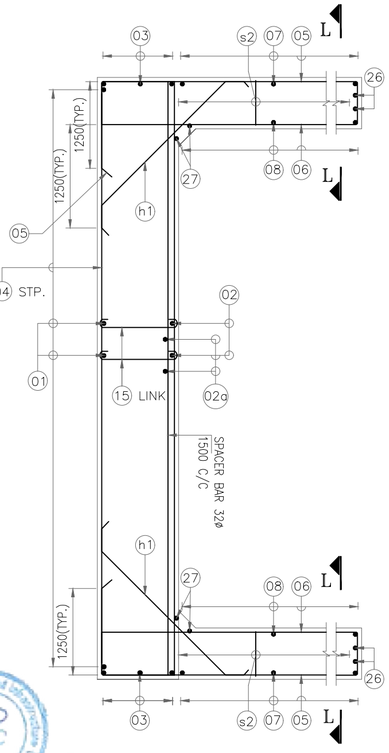
SECTION M-M
(SCALE-1:25)



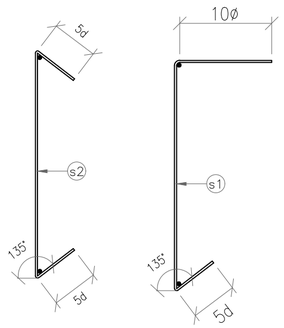
DETAIL '2'
(SCALE-1:20)



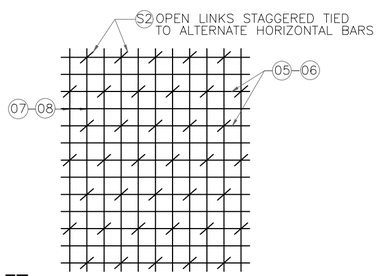
R/F PLAN OF ABUTMENT FOUNDATION
(SCALE 1:75)



R/F DETAILS OF ABUTMENT SHAFT
(SCALE 1:75)



DETAIL OF OPEN LINK
(SCALE-N.T.S.)



DETAIL '3'
(SCALE-1:20)

NOTE'S:-

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3. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED AS PER IRC : 6-2017.
4. ADEQUATE LINKS SPACER BARS ETC SHALL BE PROVIDED FOR PROPER POSITIONING OF REINFORCEMENT.
5. LAP JOINT SHALL BE PROVIDED IN STAGGERED MANNER & NOT MORE THAN 50% BAR SHALL BE LAPPED AT ANY SECTION.
6. BOND LENGTH SHALL BE 50 TIMES DIA OF BAR & LAP LENGTH SHALL BE 73 TIMES DIA OF BAR.
7. ABUT, CAP TOP LEVEL AND PEDESTAL HEIGHT MAY BE VARIES AFTER DESIGN OF BEARING SIZE.

GRADES, MATERIAL TYPES & ETC.:-

a) RCC CRASH BARRIER M40
b) SUBSTRUCTURE / FOUNDATION.....M35
c) APPROACH SLAB M30
d) ABUTMENT CAP M35
e) PEDESTAL.....M40
f) PCC M15
g) SEISIMIC ZONE.....(IV)
h) B.C WEARING COAT.....50MM THK.
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CLEAR COVER:-

a) RCC CRASH BARRIER 50mm
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e) ABUTMENT CAP.....50mm
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SPECIAL NOTES:

01 "SAFE BEARING PRESSURE CONSIDERED IN DESIGN IS 65 T/m² AND THE SAME SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK."
02 "PLATE LOAD TEST SHALL BE DONE AT SITE."

REINF.SCHEDULE FOR ABUTMENT-A2

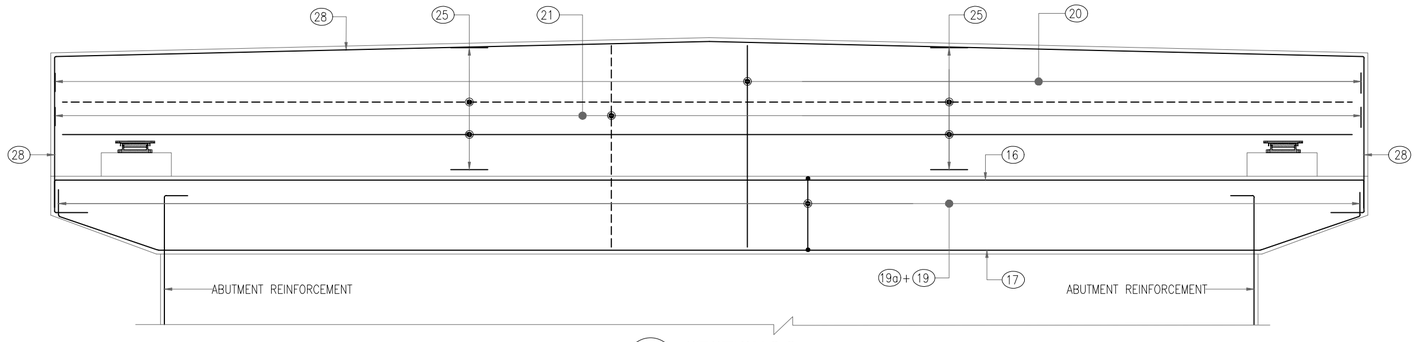
BAR MKD.	SHAPE (NOT TO SCALE)	DIA. (mm)	TOTAL NOS. / SPACING (mm)
01	300 / 300	16	160 C/C
02	300 / 300	20	160 C/C
02a	BAR MARK NOT USED		
03	300 / 300	12	150 C/C
04	PLAN	12	150 C/C
05		12	150 C/C
05a		12	150 C/C
06		20	150 C/C
06a		16	150 C/C
07		12	150 C/C
08		20	150 C/C
09		20	100 C/C
10		BAR MARK NOT USED	
11		16	200 C/C
12		16	200 C/C
13		25	100 C/C
13a		16	100 C/C
13b	BAR MARK NOT USED		
13c		16	100 C/C
14		20	200 C/C
15		10	200 C/C VERTICALLY
26	300 / 300	12	2 x 5 NOS.
h1	1225	10	100 C/C
s1		10	OPEN LINK 200 C/C
s2		10	OPEN LINK 200 C/C
27	300	12	2 x 2 NOS.

LEGEND:
TOP REINF. ———
BOTTOM REINF. - - - - - -

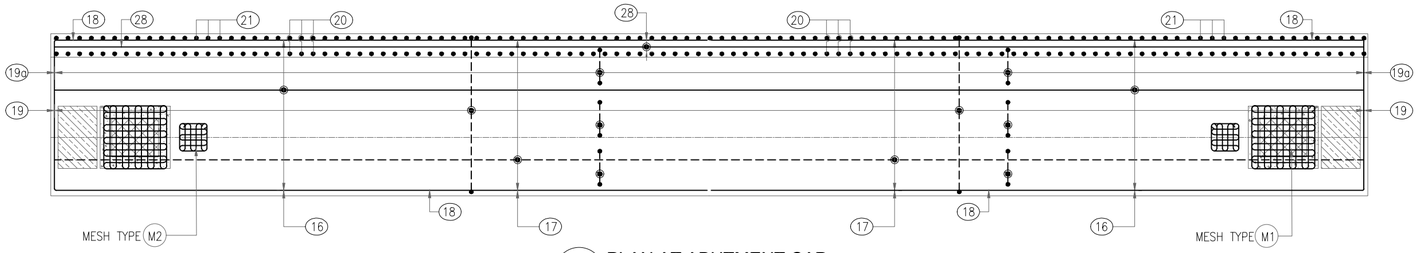
REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
AUTHORITY : AIAPL
EPC CONTRACTOR : BEIGH CONSTRUCTION CO. PVT. LTD. — BEIGH CONSTRUCTION COMPANY PVT. LTD.
PROOF CONSULTANT : HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS
SAFETY CONSULTANT : EARL TECHNO CONSULTANTS PVT. LTD. — EARLTECHNO CONSULTANTS PVT. LTD
DESIGN CONSULTANT : future build company — FUTURE BUILD COMPANY
PROJECT : CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.
DRAWING TITLE : REINFORCEMENT DETAILS OF ABUTMENT A2 OF PROPOSED MAJOR BRIDGE AT CH : 0+689 (SHEET 01 OF 02)
DRG. NO. STR/DWG/MJB/REINF./ABUT.-A2/204
DATE : SEPTEMBER. 2022 — REV: R0
SCALE : AS SHOWN — PAPER SIZE : A2

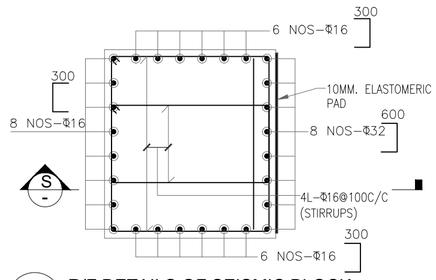
DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM



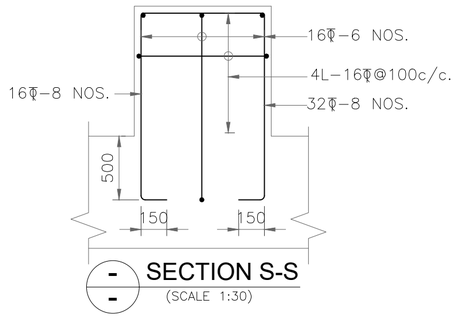
SECTION 2-2
(SCALE 1:50)



PLAN AT ABUTMENT CAP
(SCALE 1:75)



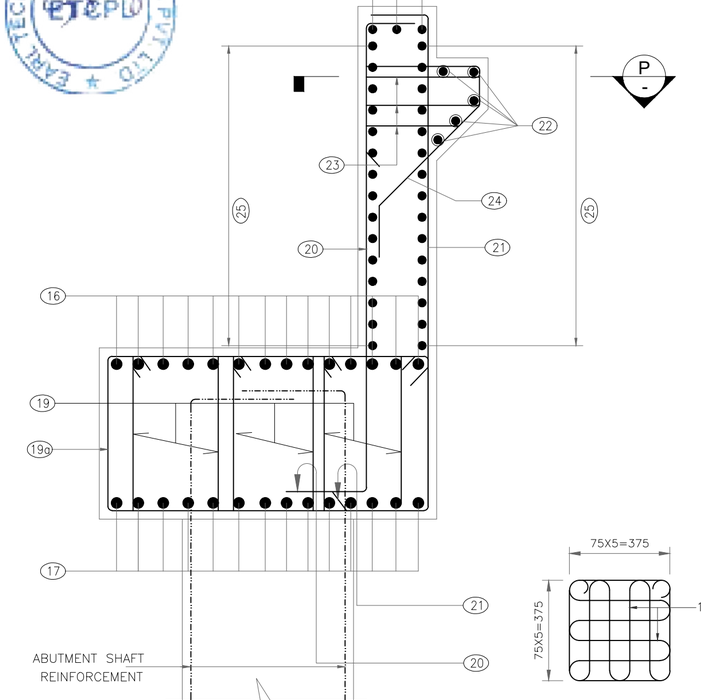
R/F DETAILS OF SEISMIC BLOCK
(SCALE 1:25)



SECTION S-S
(SCALE 1:30)

REINF.SCHEDULE FOR ABUTMENT-A2

BAR MKD.	SHAPE (NOT TO SCALE)	DIA. (mm)	TOTAL NOS. / SPACING (mm)
16	400 / 400	16	150 C/C
17	400 / 400	16	150 C/C
18	NOT IN USE		
19		12	200 C/C
19a		12	200 C/C
20	300 / 300	12	150 C/C
21	150 / 500	12	150 C/C
22		10	6 NOS.
23		10	400 C/C 2 LEGGED 3 NOS.(HORI.)
24	600	12	150 C/C
25	150 / 150	10	150 C/C
28	300 / 300	16	3 NOS.



R/F DETAILS OF ABUT. CAP
(SCALE 1:40)

TYPE-M2
(AT JACK LOCATIONS)
(IN TWO LAYERS)
(SCALE 1:15)

PLAN OF BEARING PEDESTAL
(SCALE-1:15)

SECTION AT X'''- X'''
(SCALE-1:15)

TYPE-M1
(AT BEARINGS LOCATIONS)
(IN TWO LAYERS)
(SCALE 1:15)

SECTION P-P
(SCALE 1:25)

NOTE'S:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, LEVELS ARE IN METERS AND CHAINAGES ARE IN KILOMETERS UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. THE CARRIAGEWAY OF PROPOSED BRIDGE IS DESIGNED AS PER IRC : 6-2017.
4. ADEQUATE LINKS SPACER BARS ETC SHALL BE PROVIDED FOR PROPER POSITIONING OF REINFORCEMENT.
5. LAP JOINT SHALL BE PROVIDED IN STAGGERED MANNER & NOT MORE THAN 50% BAR SHALL BE LAPPED AT ANY SECTION.
6. BOND LENGTH SHALL BE 50 TIMES DIA OF BAR & LAP LENGTH SHALL BE 73 TIMES DIA OF BAR.
7. ABUT. CAP TOP LEVEL AND PEDESTAL HEIGHT MAY BE VARIES AFTER DESIGN OF BEARING SIZE.

GRADES, MATERIAL TYPES & ETC.:-

a) RCC CRASH BARRIER M40
b) SUBSTRUCTURE / FOUNDATION.....M35
c) APPROACH SLAB M30
d) ABUTMENT CAP M35
e) PEDESTAL.....M40
f) PCC M15
g) SEISIMIC ZONE.....(IV)
h) B.C WEARING COAT.....50MM THK.
i) STEEL/HYSD BARS (CONFIRM TO IS:1786).....Fe500D.

CLEAR COVER:-

a) RCC CRASH BARRIER 50mm
b) FOUNDATION 75mm
c) RCC ABUTMENT SHAFT (EARTH FACE) 75mm
d) RCC ABUTMENT SHAFT (NON-EARTH FACE).....40mm
e) ABUTMENT CAP.....50mm
f) DIRT WALL 50mm
g) APPROACH SLAB 50mm

SPECIAL NOTES:

01 "SAFE BEARING PRESSURE CONSIDERED IN DESIGN IS 70 T/m² AND THE SAME SHALL BE VERIFIED AT SITE BEFORE EXECUTION OF WORK."
02 "PLATE LOAD TEST SHALL BE DONE AT SITE."

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY: AIAPL

E.P.C CONTRACTOR: BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT: HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT: EARLTECHNO CONSULTANTS PVT. LTD

DESIGN CONSULTANT: FUTURE BUILD COMPANY

PROJECT: CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

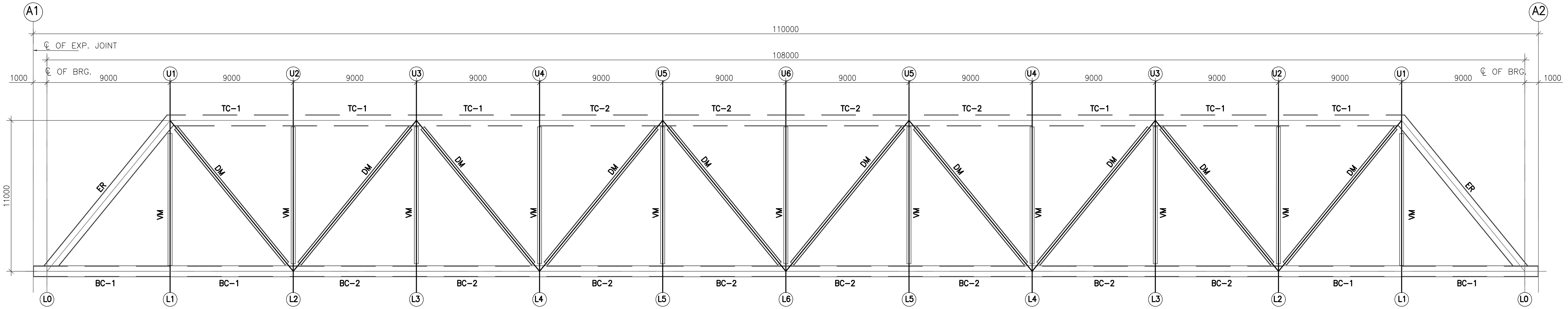
DRAWING TITLE: REINFORCEMENT DETAILS OF ABUTMENT A2 OF PROPOSED MAJOR BRIDGE AT CH :0+689 (SHEET 02 OF 02)

DRG. NO. STR/DWG/MJB/REINF./ABUT.-A2/204

DATE : SEPTEMBER. 2022 | REV: R0

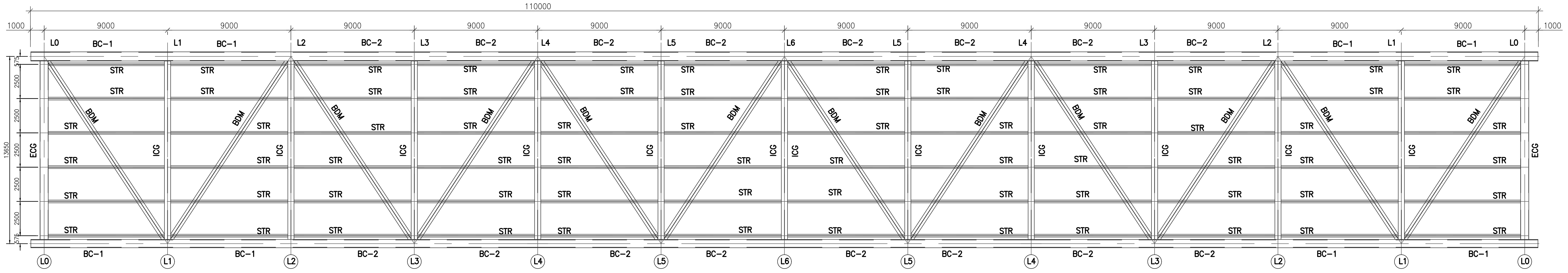
DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM

SCALE : AS SHOWN | PAPER SIZE : A2



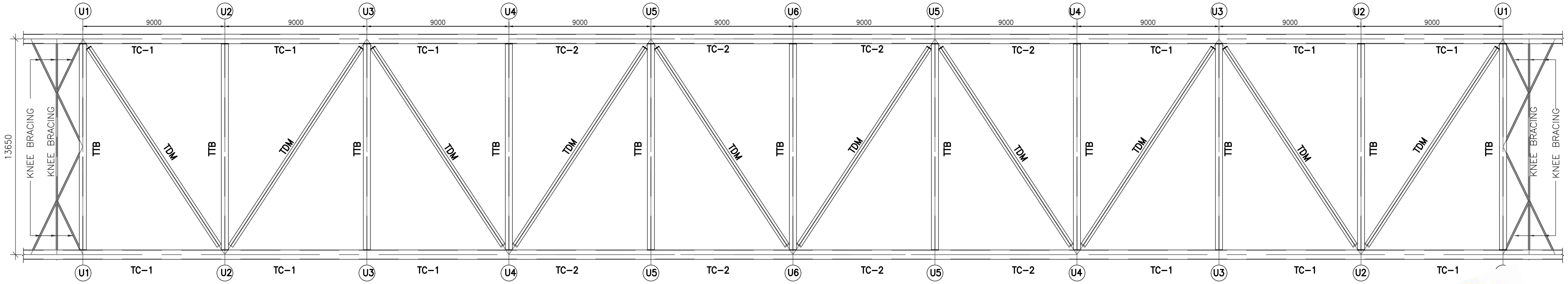
ELEVATION

(SCALE 1:200)



BOTTOM PLAN

(SCALE 1:200)



TOP PLAN

(SCALE 1:150)

LIST OF ABBREVATIONS:-

S.No.		
1	TC–1,2	TOP CHORD
2	BC–1,2,	BOTTOM CHORD
3	ER	END RAKER
4	TDM	TOP DIAGONAL MEMBER
5	BDM	BOTTOM DIAGONAL MEMBER
6	DM	DIAGONAL BRACING
7	STR	STRINGERS
8	ICG	INNER CROSS GIRDER
9	ECG	END CROSS GIRDER
10	VM	VERTICAL MEMBER
11	TTB	TOP TIE BRACING

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY : AIAPL

EPC CONTRACTOR : BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT : HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT : EARLTECHNO CONSULTANTS PVT. LTD

DESIGN CONSULTANT : FUTURE BUILD COMPANY

PROJECT : CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

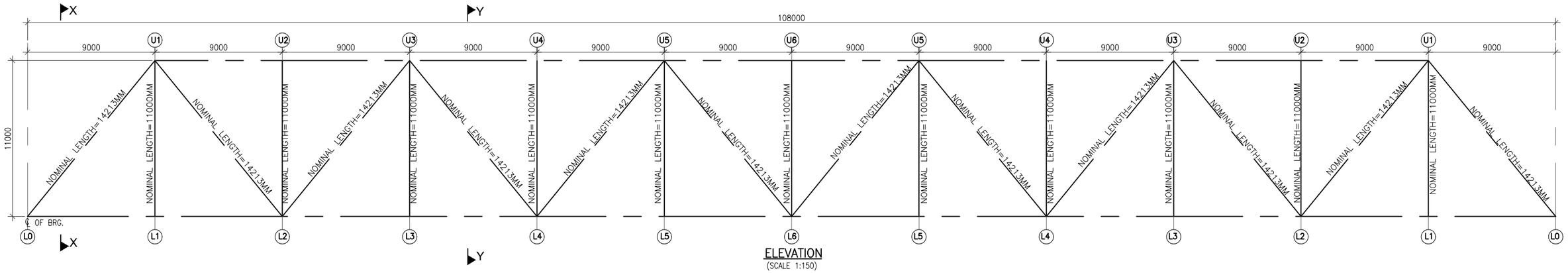
DRAWING TITLE : GENERAL ARRANGEMENT DRAWING OF SUPERSTRUCTURE FOR MJB AT CH 0+689(SPAN 1x110.0M) (SHEET-01 OF 4)

SCALE : AS SHOWN | PAPER SIZE : A2

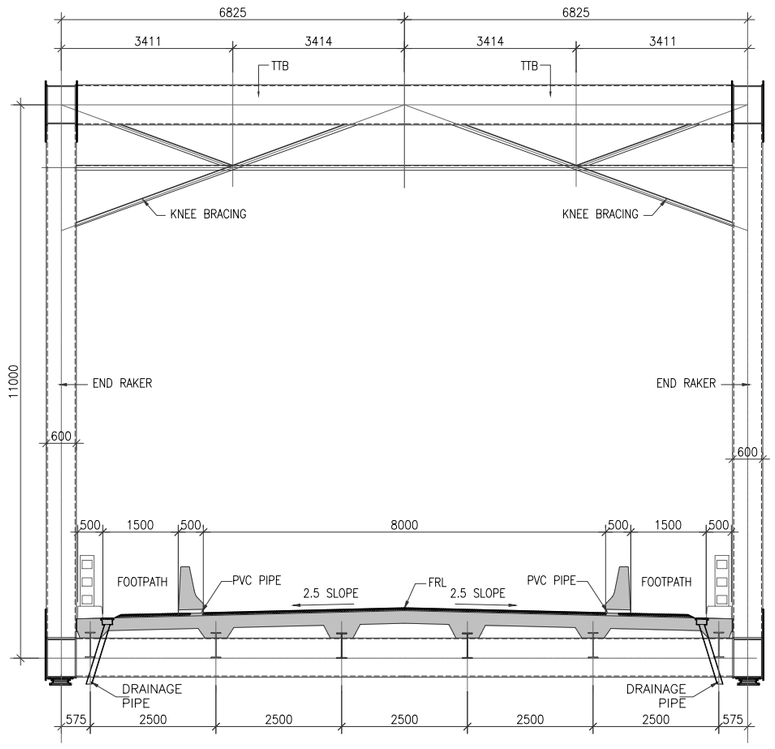
DRG. NO.STR/DWG/MJB/SUPER-STRUCTURE-301

DATE : SEPTEMBER. 2022 | REV: R0

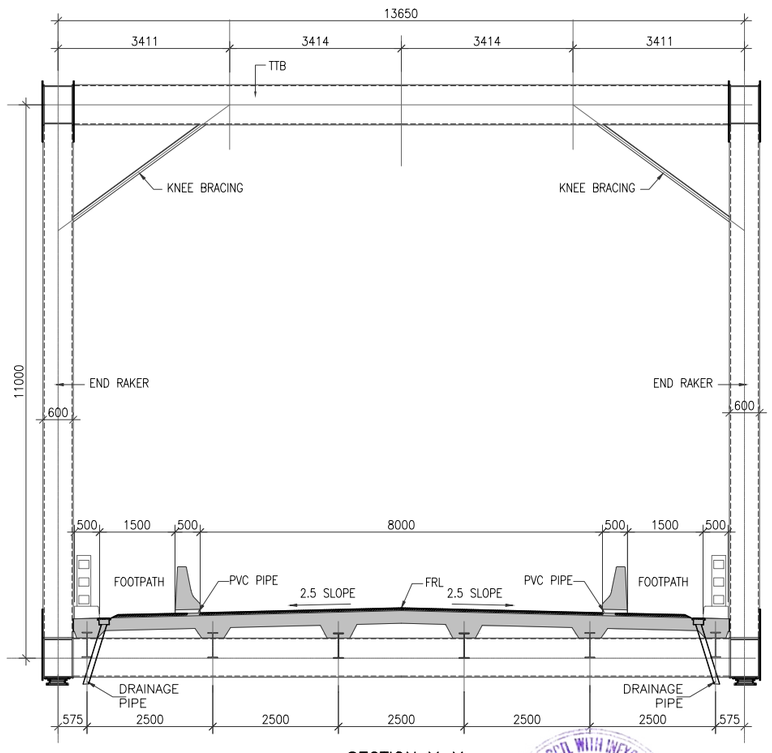
DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM



ELEVATION
(SCALE 1:150)



SECTION X–X
(SCALE 1:85)



SECTION Y–Y
(SCALE 1:85)

NOTES:-

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO
3. DURING WELDING POSITION OF MEMBERS AND ASEMBLY SHOULD BE SUCH THAT OVERHEAD WELDING SHALL BE AVOIDED/MINIMISED.
4. ALL THE MEMBERS MEETING AT A JOINTS SHOULD BE WELDED ALROUND.
5. ALL WELDING ELECTRODES FOR 'SMAW' PROCESS SHALL CONFORM TO AWS A 505.
6. ALL BARE ELECTRODES FOR 'GMAW' PROCESS SHALL CONFORM TO AWS A SUBMERGED ARC WELDING)SAW) SHALL BE AS PER AWS A 5.23.
7. ALL WELDING TO BE DONE IN CONFORMITY WITH IS:9595 & OR AWS D 1.1/D 1.5 & OTHER RELEVANT SPECIFICATION.
8. BREAKUP OF DIMENSIONS SHOULD TALLY WITH OVERALL DIMENSION FOR ALL THE MEMBERS.
9. STRIP SEAL EXPANSION JOINTS SHALL BE PROVIDED ON EXPANSION END.
10. BEARINGS SHALL BE POT/PTFE BEARINGS.
11. GRADE OF DECK SLAB IS M–40.
12. THE DESIGN IS IN ACCORDANCE WITH IRC:5–1998, IRC:6–2014, IRC:112–2011 IRC:22–2008 &IRC:24–2010.
13. HIGH STRENGTH FRICTION GRIP BOLT (HSFG) OF GRADE (10.9) MAY BE USED IN CONFIRMITY WITH IS:4000– 1992. SLIP FACTOR SHOULD BE TAKEN 0.35.
14. FOR LIFTING OF SPAN IN FUTER, JACKS WELL BE LOCTED UNDER END CROSS GRIDERS AT THE LOCATION SHOWN.
15. WHEN THE SPAN IS LIFTED ON JACKS LIVE LOAD WILL NOT BE FLLOWED OVER THE BRIDGE, JACK REQUIRED FOR LIFTING OF SPAN SHALL HAVE MINIMUM CAPACITY OF 250 TON
16. DO NOT PROVIDE ANY PAINT SUCH AS RED OXIDE, PRIMER OR ANY OTHER COATING OVER HSFG BOLT CONNECTION AREA

DESIGN DIRECTOR
Authorised Signatory

EARL TECHNO CONSULTANTS PVT. LTD.

Hindustan Construction And Infrastructure Consultants

Team Leader I/c
Senior Highway Engineer

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY : AIAPL

EPC CONTRACTOR : BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT : HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT : EARLTECHNO CONSULTANTS PVT. LTD

DESIGN CONSULTANT : FUTURE BUILD COMPANY

PROJECT : CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

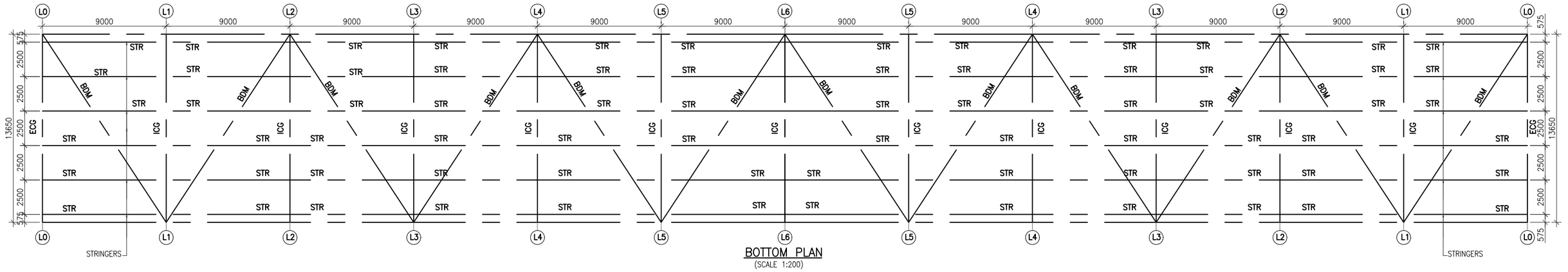
DRAWING TITLE : GENERAL ARRANGEMENT DRAWING OF SUPER STRUCTURE FOR MJB AT CH -0+689 (SPAN 1x110.0M) (SHEET-02 OF 04)

SCALE : AS SHOWN | PAPER SIZE : A2

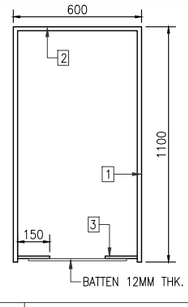
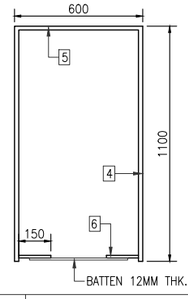
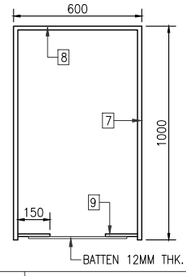
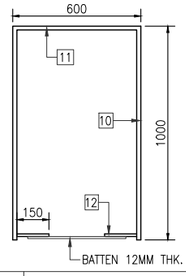
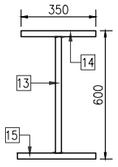
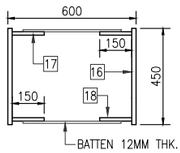
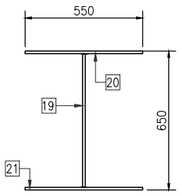
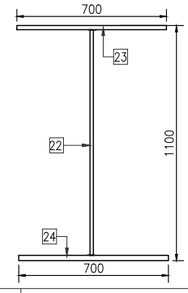
DRG. NO.STR/DWG/MJB/SUPER-STRUCTURE-301

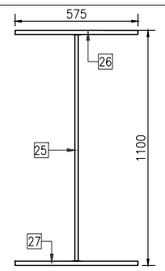
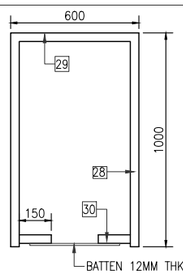
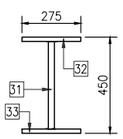
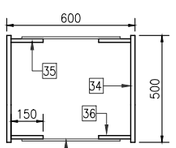
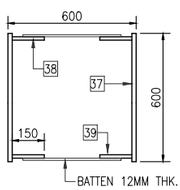
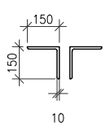
DATE : SEPTEMBER. 2022 | REV: R0

DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM



BOTTOM PLAN
(SCALE 1:200)

S.NO.	01.	02.	03.	04.	05.	06.	07.	08.
MEMBER MRK.	BOTTOM CHORD (BC–1) L0–L1,L1–L2	BOTTOM CHORD (BC–2) L2–L3,L3–L4,L4–L5,L5–L6	TOP CHORD (TC–1) U1–U2 L2–L3 U3–U4	TOP CHORD (TC–2) U4–U5 U5–U6	VERTICAL MEMBER (VM)	TOP DIAGONAL MEMBER (TDM)	STRINGERS (STR)	INNER CROSS GIRDER (ICG)
SHAPE								
WEB	① 20	④ 22	⑦ 20	⑩ 20	⑬ 20	⑯ 18	⑲ 28	㉒ 28
TOP FLANGE	② 18	⑤ 20	⑧ 18	⑪ 18	⑭ 12	⑰ 12	⑳ 20	㉓ 28
BOTTOM FLANGE	③ 12	⑥ 12	⑨ 12	⑫ 12	⑮ 12	⑱ 12	㉑ 20	㉔ 28

S.NO.	09.	10.	11.	12.	13.	14.
MEMBER MRK.	END CROSS GIRDER (ECG)	END RAKER (ER)	TOP TIE BRACING (TTB)	BOTTOM DIAGONAL MEMBER (BDM)	DIAGONAL MEMBER (DM)	KNEE BRACING
SHAPE						
WEB	㉕ 32	㉘ 20	㉛ 18	㉞ 16	㊲ 22	ISA 100X150X10
TOP FLANGE	㉖ 32	㉙ 22	㉜ 12	㉟ 12	㊳ 22	
BOTTOM FLANGE	㉗ 32	㉚ 22	㉝ 12	㊱ 12	㊴ 22	

LIST OF ABBREVATIONS–:

S.No.		
1	TC–1,2	TOP CHORD
2	BC–1,2,	BOTTOM CHORD
3	ER	END RAKER
4	TDM	TOP DIAGONAL MEMBER
5	BDM	BOTTOM DIAGONAL MEMBER
6	DM	DIAGONAL BRACING
7	STR	STRINGERS
8	ICG	INNER CROSS GIRDER
9	ECG	END CROSS GIRDER
10	VM	VERTICAL MEMBER
11	TTB	TOP TIE BRACING

NOTES:-

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRES UNLESS OTHERWISE MENTIONED.
2. DIMENSIONS ARE NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOW.
3. FOR ERECTION / LAUNCHING SCHEME SEE SEPARATE DRAWING.
4. ALL BUTT WELDED ARE TO BE EXAMINED RADIOGRAPHICALLY OR ANY EQUALLY EFFECTIVE NON DESTRUCTIVE TEST METHOD.
5. ALL WELDS TO BE MADE BY APPROVED WELDING PROCEDURES.
6. FABRICATION SHALL BE DONE AS PER IRC: 24–2010.
7. FILLET WELDS ARE OF LEG SIZE 6MM MINIMUM AND AS PER IS:CODE 9595–1996.
8. ALL OBTUSE ANGLE CUTTING SHOULD BE DONE IN PROPER SHAPE & WITHOUT DAMAGE.
9. OVERHANGING MEMBER TO BE SUITABLY SUPPORTED TO AVOID DISTORTION DURING TRANSPORTATION.
10. ALL WELDS SHALL BE IN ONE GO (CONTINUOUS) UNLESS SPECIFIED OTHERWISE.
11. FOR DESIGN OF BRIDGE SEISMIC ZONE–IV IS CONSIDERED.
12. ALL STRUCTURAL STEEL PLT SHALL BE E350 CONFORMING TO IS 2062–2006.
13. FOR FABRICATION, WORKMANSHIP, INSPECTION & TESTING PROTECTION AGAINST CORROSION ETC, RELEVANT PROVISION OF IRC 24–2010 SHALL BE FOLLOWED.
14. CONSTRUCTION STAGE SCHEME SHALL BE PROVIDED BY CONTRACTOR AND CONSTRUCTION SHALL BE VERIFIED BY DDC BEFORE FABRICATION.
15. CONGESTION FACTOR IS NOT CONSIDERED.

WELDING NOTES:-

1. WELDING ELECTRODES SHALL CONFIRM IS 814 OR IS 1395
2. ALL WELDING ELECTRODES OR 'SMAW' PROCESS SHALL CONFORM A 5.5 FOR HT & AWS A 5.1 FOR MS.
3. METAL ARC WELDING SHALL CONFORM TO IS:9595 & 816/ AWS D 1.1/1.5.
4. FOR SCHEME & SYMBOLS OF WELDING REFER IS:813–1986.
5. ALL WELDING TO BE DONE IN CONFIRMITY WITH IS:9595 & OR AWS D 1.1/D1.5& OTHER RELEVANT SPECIFICATION.

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY: AIAPL

EPC CONTRACTOR: BEIGH CONSTRUCTION CO. PVT. LTD. — BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT: HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT: EARL TECHNO CONSULTANTS PVT. LTD. — EARLTECHNO CONSULTANTS PVT. LTD

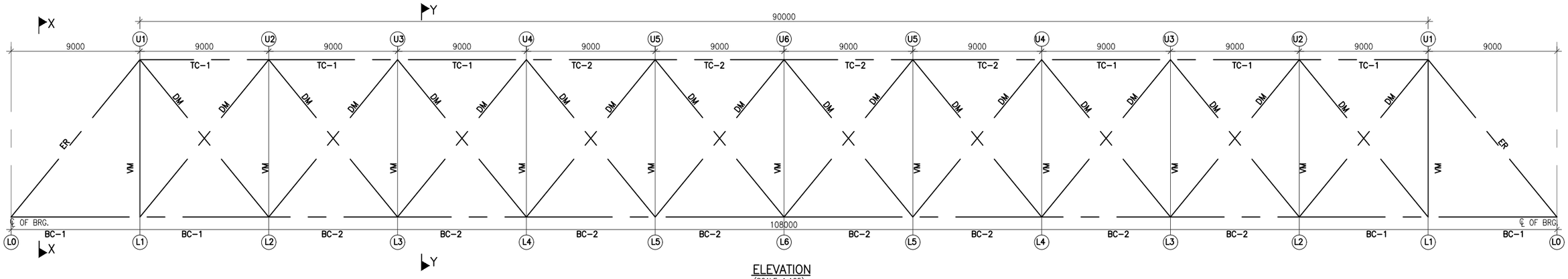
DESIGN CONSULTANT: future build company — FUTURE BUILD COMPANY

PROJECT: CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

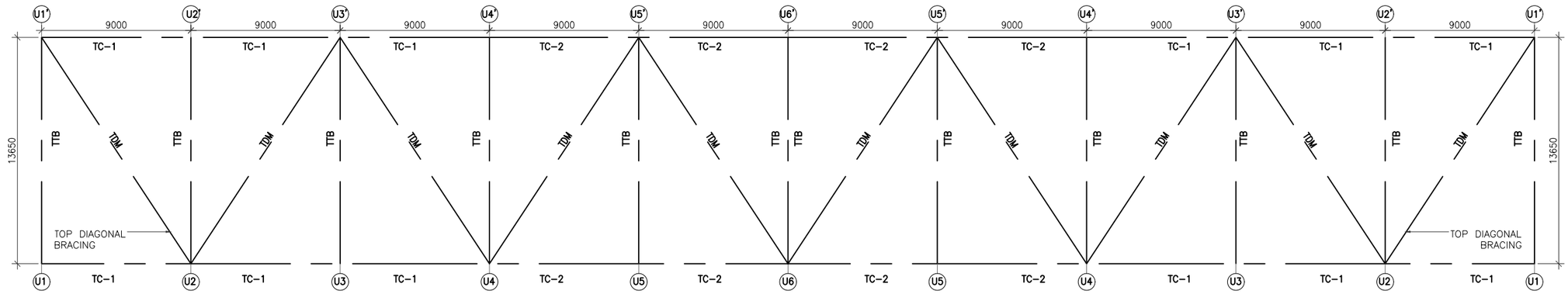
DRAWING TITLE: GENERAL ARRANGEMENT DRAWING OF SUPER STRUCTURE FOR MJB AT CH -0+689 (SPAN 1x110.0M) (SHEET-03 OF 04)

SCALE : AS SHOWN | PAPER SIZE : A2

DRG. NO.	STR/DWG/MJB/SUPER-STRUCTURE-301	
DATE : SEPTEMBER. 2022		REV: R0
DESIGNED GS	DRAWN SP	CHECKED AS	APPROVED SM



ELEVATION
(SCALE 1:125)



TOP PLAN
(SCALE 1:125)

R0	SEP-2022	SUBMISSION OF MJB				
REV	DATE	DESCRIPTION	A	B	C	D

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY : AIAPL

EPC CONTRACTOR : BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT : HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT : EARLTECHNO CONSULTANTS PVT. LTD

DESIGN CONSULTANT : FUTURE BUILD COMPANY

PROJECT : CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

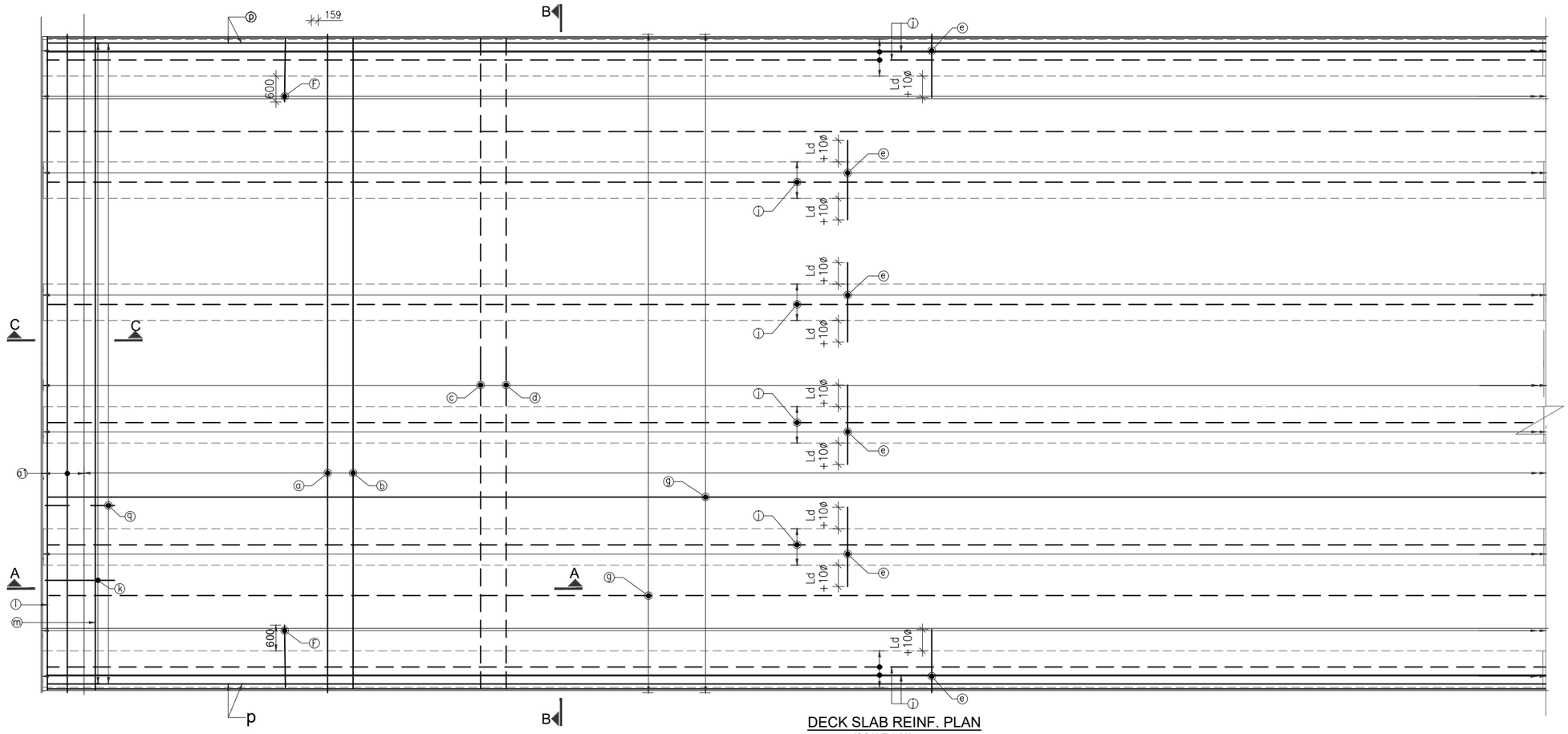
DRAWING TITLE : GENERAL ARRANGEMENT DRAWING OF SUPER STRUCTURE FOR MJB AT CH -0+689 (SPAN 1x110.0M) (SHEET-04 OF 04)

SCALE : AS SHOWN | PAPER SIZE : A2

DRG. NO. STR/DWG/MJB/SUPER-STRUCTURE-301

DATE : SEPTEMBER. 2022 | REV: R0

DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM



DECK SLAB REINF. PLAN
(SCALE 1:80)

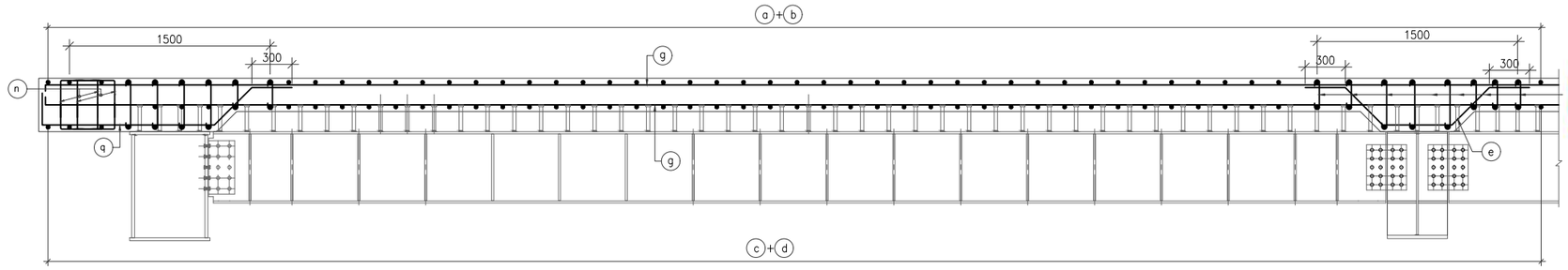
OUTER GIRDER SCHEDULE

BAR MARK	DIA OF BAR (mm)	SPACING OF BAR (mm)	BENDING SHAPE DIMENSIONS SHOWN ARE OVER OUTER EDGES
a	12	260	
a1	16	130	
b	12	260	
c	12	260	
d	12	260	
e	12	130	
f	16	260	
g	10	300	
h	10	200 ACROSS SPAN 200 ALONG SPAN	
j	10	200	
k	12	120	
l	16	2 NOS.	
m	16	3 NOS.	
n	4L-10@ 150C/C		
p	16	4X2 NOS.	
q	12	300	

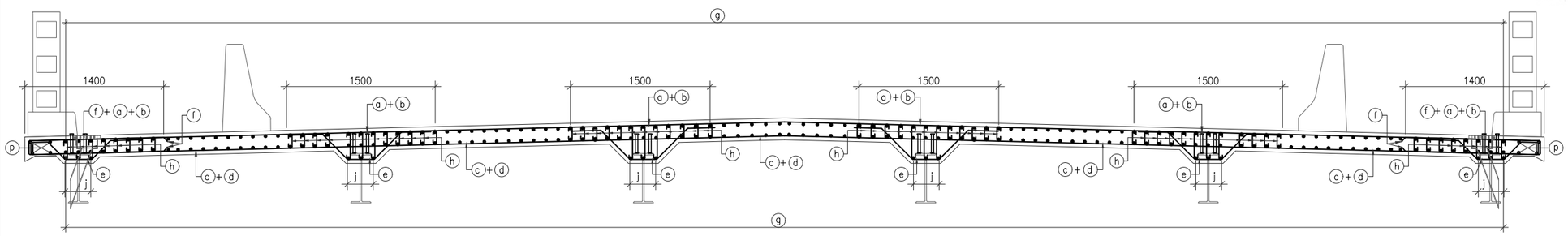
Legend:

BOTTOM REINF. - - - - - -

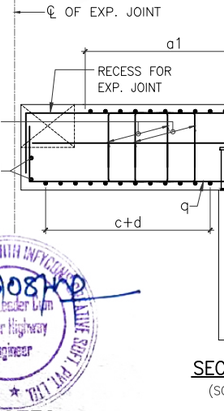
TOP REINF. ———



SECTION A-A
(SCALE 1:30)



SECTION B-B
(SCALE 1:30)



SECTION C-C
(SCALE 1:20)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. CLEAR COVER TO ANY REINFORCEMENT SHALL BE 40MM.
4. GRADE OF CONCRETE SHALL BE OF M40.
5. REINFORCEMENT STEEL SHALL BE HYSD BARS (GRADE DESIGNATION FE: 500D) CONFORMING TO IS :1786.
6. BARS SHALL BE LAPPED IN SUCH A WAY THAT NOT MORE THAN 50% OF THE BARS ARE LAPPED AT ANY SECTION. MINIMUM LAP LENGTH FOR REINFORCEMENT SHALL BE '48XD'. WHERA 'D' DIAMETER OF SMALLER BAR.
7. GRADE OF SHEAR STUD = 6.8 AS PER IS 1367.
8. LAP JOINT SHALL BE PROVIDED IN STAGGERED MANNER & NOT MORE THAN 50% BAR SHALL BE LAPPED AT ANY SECTION.
9. DEVELOPMENT LENGTH (ibnet)
   ibnet = (α =1.0)
   ib = kø
   k = 1.43X36 FOR M35
   K = 1.43X34 FOR M40

REV	DATE	DESCRIPTION	A	B	C	D
R0	SEP-2022	SUBMISSION OF MJB				

CLIENT: NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

AUTHORITY: AIAPL

EPC CONTRACTOR: BEIGH CONSTRUCTION CO. PVT. LTD. — BEIGH CONSTRUCTION COMPANY PVT. LTD.

PROOF CONSULTANT: HCC — HINDUSTAN CONSTRUCTION & INFRASTRUCTURE CONSULTANTS

SAFETY CONSULTANT: EARL TECHNO CONSULTANTS PVT. LTD. — EARLTECHNO CONSULTANTS PVT. LTD

DESIGN CONSULTANT: FUTURE BUILD COMPANY

PROJECT: CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT KM 83RD OF LENGTH 495M INCLUDING APPROACH ROAD OF 664M AND MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN UT OF JAMMU AND KASHMIR ON EPC MODE.

DRAWING TITLE: GENERAL ARRANGEMENT OF 110.0M STEEL TRUSS DECK SLAB DETAIL FOR MAJOR BRIDGE AT DESIGN CH:-0+689

DRG. NO. STR/DWG/MJB/DECK SLAB-302

DATE : SEPTEMBER. 2022 — REV: R0

DESIGNED	DRAWN	CHECKED	APPROVED
GS	SP	AS	SM

SCALE : AS SHOWN — PAPER SIZE : A2

NATIONAL HIGHWAYS AND INFRASTRUCTURE DEVELOPMENT CORPORATION

Building, 4 Parliament Street, Sansad Marg Area, New Delhi- 110001

EPC Contractor

Beigh Construction Company Pvt. Ltd
Plot No : 4, Wave Mall, Bypass Road,
Narwal Jammu

Construction of Bi Directional Tunnel at " KM 83" of length 495m including Approach Roads of 664 m and a Major Bridge of 110m from Km 82 + 675 to Km 82+ 925 on NH-244 in Jammu & Kashmir on EPC Mode

PAVEMENT DESIGN

21-12-2020

S.A.

Central, oficinas y laboratorio: Pasaje Bisbal,
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(+91)194-2310344, space@seclindia.com

IRC:58-2015 Guidlines of		
Plain jointed Rigid Pavements for Highways		
Design of Slab thicness for pavement		
Criteria : Concrete pavement bounded with Dry lean concrete		
Specification: Two Lane Two Way(2L2W)-Lane width : 3.5 m : Spacing of Contraction Joint : 4.5m		
Design Parameters	**Value adopted with units**	**Refrence**
A. Modulus subgrade Reaction		
CBR (Compacted Subgrade)	15%	Site Data
Modulus of subgrade-(strength of subgrade)	62MPa/m	Table-2(IRC:58-2015)
Thicknness of granular base (I&II)	200mm	Contract Document
DLC sub base thickness (adopted) (M-6.5 to M7.5) min strength 7N/mm after 7 days	150mm	Contract Document
Effective Modulus of subgrade (subgrade+GSB+DLC) -Interploation	293MPa/m	Table-4(IRC:58-2015)
B. Selection of Flexural Strength		
28 days compressive strength of Cement concrete for PQC	> 40 Mpa (Target strength after 90days 48MPa) Ft= Fck+1.65*5	IS:10262 (2009) &IS :456200
28 days flexural strength of Cement concrete for PQC	4.4 to 4.5 Mpa (4.84 Mpa after 90days)	IS:10262 (2009) &IS :456200
C. Design Trafic criteria:		
Design Period	30 years	IRC:58-2015/ Contract document
Design Traffic	20msa	Contract Document
Hence, design number of axle load repetitions for bottom-up cracking analysis = 20000000		
D. Cumulative Fatigue Damage (CFD) analysis for Bottom-Up Cracking (BUC)and Top-Down Cracking (TDC) and Selection of Slab Thickness		
Effective modulus of subgrade reaction of foundation, k	62MPa/m	
Elastic Modulus of concrete, E	28000 Mpa	
Poisson's ratio of concrete, μ	0.15	
Unit weight of concrete, γ	25 kN/m3	
Design flexural strength of concrete	4.8 Mpa	
Max. day-time Temperature Differential in slab (for bottom-up cracking)	15.8 Degree C	Table-1(IRC:58-2015) for thickness range of 300mm-400mm (location : J&K)
Night-time Temperature Differential in slab (for top-down cracking) =day-time diff/	12.9 Degree C	
Lateral placement factor (0.25 for 2 lane 2 way)	0.25	
Factor for selcetion of traffic for BUC analysis (for six hours period during day)	0.25	
Other Details		
Shoulders : Tied concrete shoulders	Yes (paved shoulders)	

CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT "KM 83" OF LENGTH 495m APPROACHES ROAD OF 664M AND A MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN Jammu& Kashmir ON EPC MODE

Flextural strength of Concrete, Mpa	4.4145	Spacing of Contraction Joints, m	4.0
Effective modulus of subgrade reaction of DLC subbase, MN/m3	293	Width of slab, m	3.5
Elastic Modulus of Concrete, MPa	2.943E+04	No of lanes in both directions	2
Poisson's ratio	0.15	Type of carriageway	Divided
Coefficient of thermal expansion of concrete, / 0C	1.00E-05	Trial Thickness of PQC, mm	**290**
Tyre pressure, kPa	800	Radius of relative stiffness, m	0.676
Growth rate of traffic	7.5%	Growth Factor	103.40
Design Life, Years	30	Lane Distribution Factor	0.75
Proportion of trucks plying along edge	0.34	Directional Distribution Factor	0.54

Axle Load, t	LF*Axle Load, t	No. of Axles	stress, kg/cm2	Expected No.	Stress Ratio	Allowable No.	Damage Ratio
Single Axle With Single Wheel							
16	19	0	16.7	0	0.37	Unlimited	0.0
14	17	8	15.0	42891	0.33	Unlimited	0.0
12	14	21	13.4	111162	0.30	Unlimited	0.0
10	12	71	11.6	370668	0.26	Unlimited	0.0
8	10	501	9.8	2604818	0.22	Unlimited	0.0
6	7	1536	7.8	7982281	0.17	Unlimited	0.0
4	5	2093	5.7	10879141	0.13	Unlimited	0.0
2	2	274	3.3	1426296	0.07	Unlimited	0.0
Single Axle with Dual Wheels							
24	28.8	2	24.73	12690	0.55	126167	0.101
22	26.4	2	23.26	12690	0.52	367648	0.035
20	24	158	21.72	819029	0.48	2004954	0.409
18	21.6	43	20.17	221403	0.45	90733912	0.002
16	19.2	184	18.45	956728	0.41	Unlimited	0
14	16.8	552		2869137	0.00	Unlimited	0
12	14.4	890		4627569	0.00	Unlimited	0
10	12	437		2273248	0.00	Unlimited	0
Tandem Axle							
40	48	8	16.76	42891	0.37	Unlimited	0
36	43.2	86	15.53	446756	0.35	Unlimited	0
32	38.4	88	14.23	458984	0.32	Unlimited	0
28	33.6	237		1231501	0.00	Unlimited	0
24	28.8	638		3317578	0.00	Unlimited	0
20	24	745		3870601	0.00	Unlimited	0
16	19.2	291		1514834	0.00	Unlimited	0
Tridem Axle							
48	57.6	15	21.54	78871	0.48	2646545	0.030
44	52.8	207	20.06	1073331	0.45	151766641	0.007
40	48	45	18.55	235089	0.41	Unlimited	0.000
							0.58

Since summation CFD is less than 1, i.e 0.58, Hence safe n ok

I. Thickness Design:

Considering pavement option as Concrete bound pavement bounded to Dry lean concrete layer (DLC), 7days 9-10 MPa strength, DLC is imperative for the said case of Rigid pavement.Cement content in Dry lean concrete must not be less than 170 kg/cum. Separation membrane is recommended to be placed between the base and the concrete slab (PQC) to make the interface condition smooth. A de-bonding interlayer ofpolythene sheet white or transparent or any other colour having a minimum thickness of 125 micron isrecommended as per the current practice in India. Granular sub base of 200mm thickness above sub grade is recommended.

Assuming that doweled transverse joints and tied concrete shoulders will be provided, the thickness of slab required for the given traffic conditions and other design data = 0.30m

E(Concrete)=30000MPa E(DLC)= 13600 MPa ; Poisson's ratio(con)= 0.15; Poisson's Ration (sub)= 0.20

Provide DLC thickness of 0.15m (DLC of 9-10 MPa strength at 7days is considered)

Depth of neutral axis (computed using equation11 of IRC:58-2015) d= 0.19m

$$d = \frac{0.5(h_1^2)+\left(\frac{E_2}{E_1}\right)h_2(h_1+0.5h_2)}{h_1+\left(\frac{E_2}{E_1}\right)h_2} \qquad \text{... 11}$$

Flexural Stiffness of slab proposed to be placed over DLC (Equation 12 of IRC:58-2015)= 83.78MN.m

$$\text{Flexural stiffness (1, PQC)} = \frac{E_1\left(\left(\frac{h_1^3}{12}\right)+h_1(d-0.5h_1)^2\right)}{1-\mu_1^2} \qquad \text{... 12}$$

Flexural Stiffness of DLC (Equation 13 of IRC:58-2015) =34.77 MN.m

$$\text{Flexural Modulus (2, DLC)} = \frac{E_2\left[\frac{\left(\frac{E_2}{E_1}\right)h_2^3}{12}+\left(\frac{E_2}{E_1}\right)h_2\left(h_1+\frac{h_2}{2}-d\right)^2\right]}{(1-\mu_2^2)} \quad \text{... (13)}$$

Combined stiffness of Slab and DLC = 118.55 MN.m
Stiffness of design slab of 0.3m thickness (Equation 10 of IRC:58-2015) =69.05MN.m

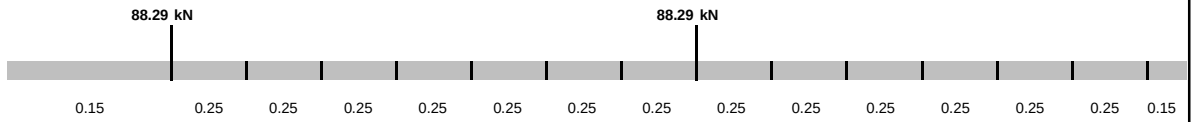
$$\frac{EI}{1-\mu^2} = \frac{Eh^3}{12(1-\mu^2)} \quad \text{... (10)}$$

Combined stiffness is more than Design Stiffness requirement. Hence Ok :
Conclusion: Adopt 300mm thickness of PQC with 150 mm DLC and 200mm GSB

II. Design of Dowel bars:

Slab thickness : 300mm
Joint width = 20mm
Radius of Relative stiffness = 1035.3 mm
E for dowel bar = 2 x 10^5MPa
Modulus of dowel support, k_{mds}= 415000 MPa/m

Diameter of Dowel	32	mm
Length of Dowel	500	mm
Moment of Inertia	5.14719E-08	m4
Modulus of Dowel Support	400000	Mpa
Modulus of Elasticity of Dowel Stee	200000	Mpa

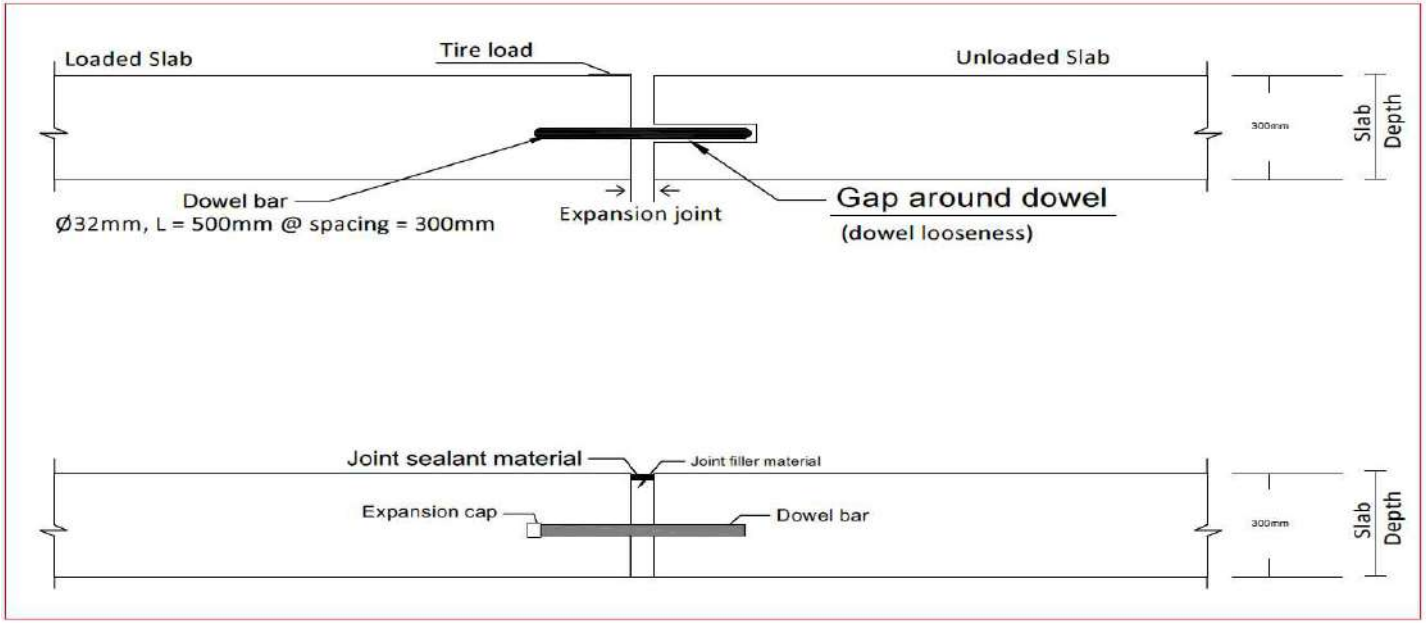


Load by each Dowel	1	0.712644	0.425287	0.137931	0	0	
Max load by one dowel	15.52	kN					
Permissible bearing stress	29.23	Mpa					
Relative Stiffness of Dowel	23.61	m-1					
Bearing Stress in Dowel	28.31	Mpa					

$$F_b = (101.6 - b_d)\, f_{ck}/95.25$$

Since Bearing stress in dowel bar is less than permissible bearing stress in concrete computed using e.15 IRC:58-2015.

Dowel bars of dia 32 mm, with length 500 mm and spacing 300mm is recommended for the current rigid pavement.



III. **Check for Corner stresses**:

Corner stresses have been computed The maximum stress (bending tension) σc and deflection δ c due to the load at corner of a rigid slab is given by Westergaard as:

$$\sigma_c = \frac{3P}{h^2}\left[1-\left(\frac{a\sqrt{2}}{\ell}\right)^{0.6}\right]$$

$$\delta_c = \frac{P}{k\ell^2}\left[1.1-0.88\left(\frac{a\sqrt{2}}{\ell}\right)\right]$$

Where:
k = modulus of subgrade reaction
ℓ = radius of relative stiffness
a = load contact radius
P = load

The above equation for sc as modified by Kelly is being used byIRC for computing the wheel load stress at corner

$$\sigma_c = \frac{3P}{h^2}\left[1-\left(\frac{a\sqrt{2}}{l}\right)^{1.2}\right]$$

And is worked out as : Computed using Excel program

:

Check for Corner Stress	
Axle Load, t	24
Wheel Load, t	12
Radius of contact, cm	30.59
Corner Stress, kg/cm2	17.30

Since , Corner stress is less than Flexural strength of concrete and the pavement thickness of 300mm assumed is **Safe**

IV. Design of Tie Bars

Area of steel required per metre length of joint has been computed using the following equation:

$$A_s = \frac{bfw}{s_{st}} \quad \text{... (16)}$$

In which,

A_s = area of steel in mm^2, required per m length of joint

b = lane width in metres

f = coefficient of friction between pavement and the subbase/base (usually taken as 1.5)

W = weight of slab in kN/m^2 and

S_{st} = allowable working stress of steel in MPa

As per the provisions of IRC:58-2015, The length of any tie bar should be at least twice that required to develop a bondstrength equal to the working stress of the steel. The formula for estimating the length of tiebar is given as equation 17.

$$L = \frac{2 S_{st} A_{cs}}{B^* P_{ptb}} \quad \ldots (17)$$

In which:

L	=	length of tie bar (mm)
S_{st}	=	allowable working stress in steel (MPa)
A_{cs}	=	cross-sectional area of one tie bar (mm^2)
P_{ptb}	=	perimeter of tie bar (mm), and
B*	=	permissible bond stress of concrete (i) for deformed tie bars = 2.46 MPa, (ii) for plain tie bars – 1.75 MPa.

(i).Slab thickness =0.30 m
(ii).Lane width (b) = 3.5 m
(iiii).Coefficient of Friction (f) =1.5
(iv).Density of concrete(KN/m^3)= 24
(v). Allowable Tensile stress in deformed bar, Sst (MPa)= 200 (IRC:15-2011)
(vi).Allowable bond stress in deformed bar(B*) =2.46
(vii).Dia of tie bar = 12 mm
(viii). Area of Tie bar= 113.1 mm^2

Spacing and Length of Deformed bars:Using Excel developed programme using above equations and parameters

Tie bar design		Deformed bars
Area of tie bar steel, cm2	3.024	1.89
Area of 12 mm tie bar	1.131	1.131
Perimeter of tie bar	3.770	3.770
Spacing, cm	37.400	59.840
Length of tie bar, cm	57.857	63.780

Design Conclusion:

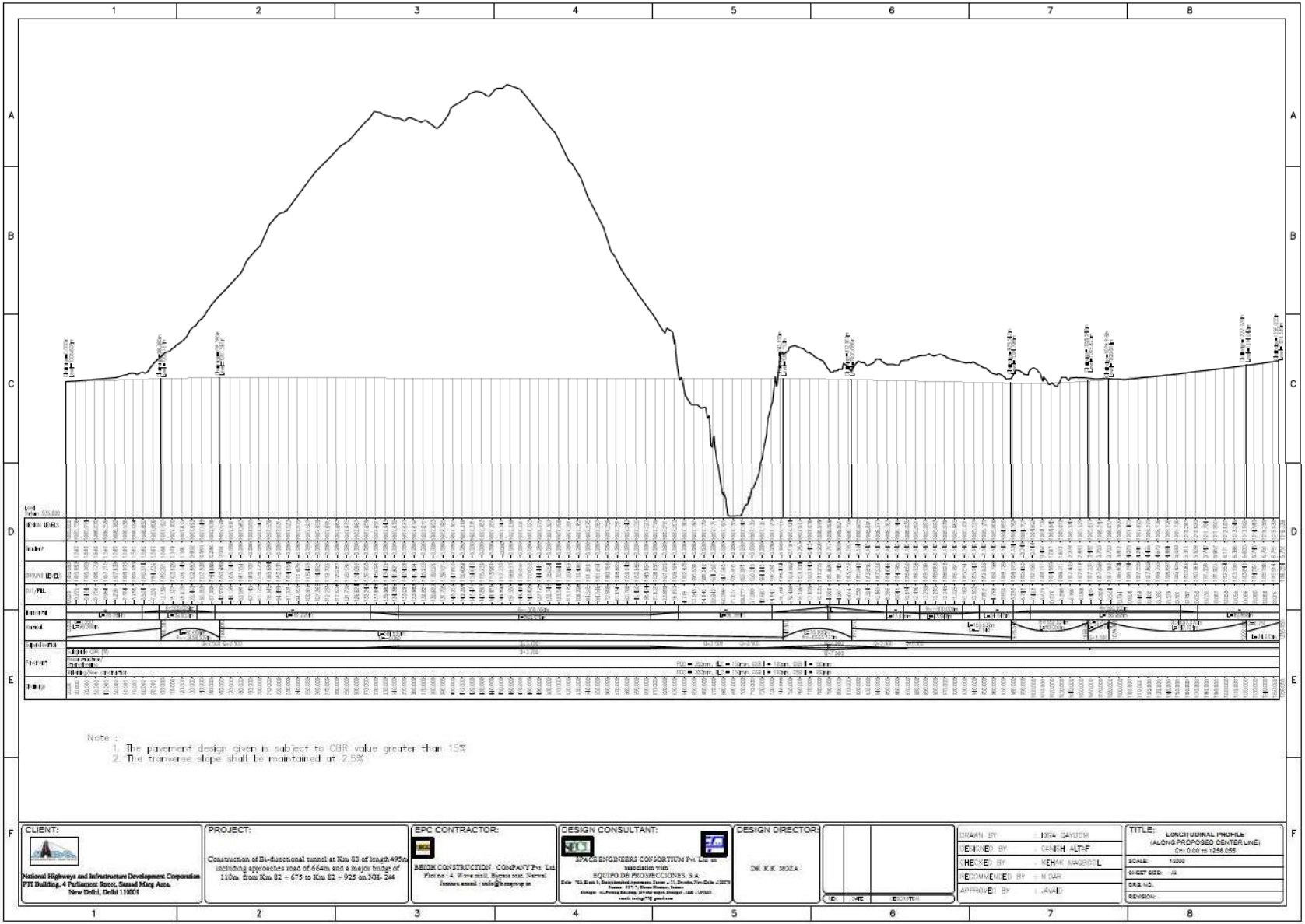
I. Provide pavement thickness of 300mm Pavement Quality Concrete (PQC) having 28-days Flexural and Compressive Strengths 4.5 MPa and 40 MPa respectively over 150 mm Dry Lean Concrete Subbase with a minimum 7-Day Compressive Strength of 7 MPa with 32 mm diameter Dowel bars of length 500 mm at a spacing of 300mm and deformed Tiebars of 12 mm diameter, 640 mm length at a spacing of 600 mm (c/c).

II. Provide a drainage layer (GSB) of 200 mm thickness with a drainage coefficient of min. 350 m per day.

Roadside Drainage

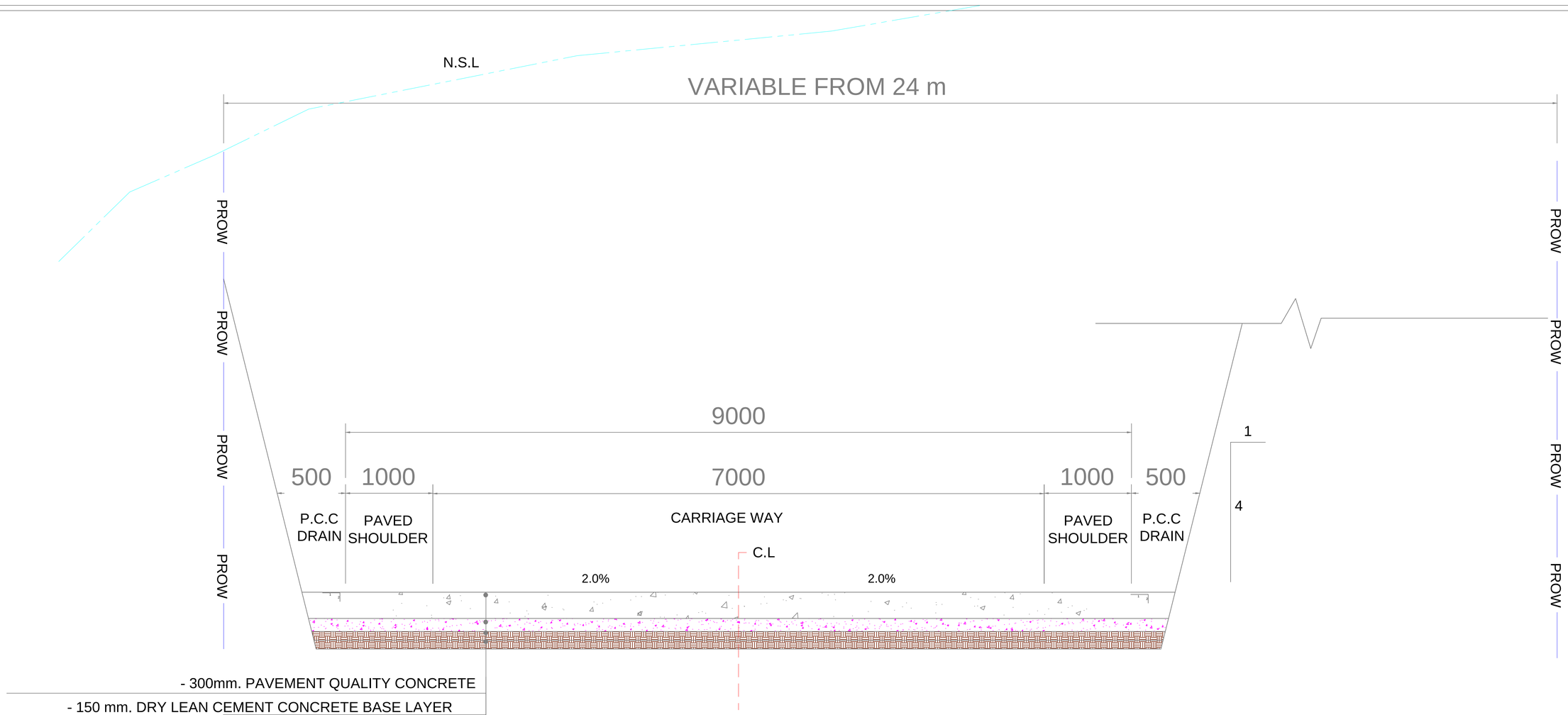
S. No	DESIGN CHAINAGE		LENGTH	DRAIN	TCS TYPE
	From	To			
01	0+000	0+065	65	Both Sides	TCS-1
02	0+065	0+128	63	Both Sides	TCS-1
03	0+733	0+745	12	One Side	TCS-3
04	0+745	0+780	35	Both Sides	TCS-1
05	0+780	0+845	65	One Side	TCS-2
06	0+845	0+880	35	One Side	TCS-3
07	0+880	0+935	55	One Side	TCS-3
08	0+935	0+975	40	One Side	TCS-3
09	0+975	1+015	40	One Side	TCS-2
10	1+015	1+080	65	One Side	TCS-3
11	1+080	1+155	75	One Side	TCS-2
12	1+155	1+215	60	One Side	TCS-1
13	1+215	1+240	25	Both Sides	TCS-2
14	1+240	1+269	29	One Side	TCS-3

III.

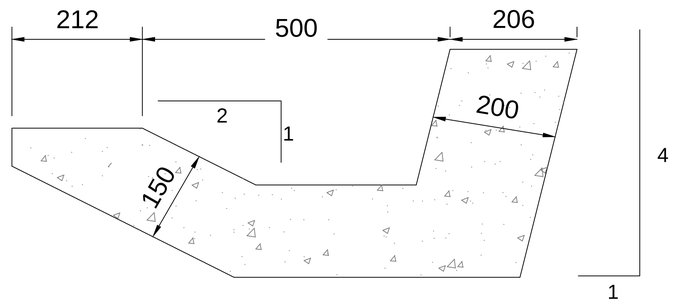

Note :
1. The pavement design given is subject to CBR value greater than 15%
2. The tranverse slope shall be maintained at 2.5%
CLIENT:
National Highways and Infrastructure Development Corporation
PIT Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001
PROJECT:
Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244
EPC CONTRACTOR:
BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
DESIGN CONSULTANT:
SPACE ENGINEERS CONSORTIUM Pvt Ltd in association with
EQUIPO DE PROSPECCIONES, S.A.
DESIGN DIRECTOR:
DR. K.K. MOZA
DRAWN BY
DESIGNED BY
CHECKED BY
RECOMMENDED BY
APPROVED BY
TITLE:
LONGITUDINAL PROFILE
(ALONG PROPOSED CENTER LINE)
Ch: 0.00 to 1256.055
SCALE:
SHEET SIZE:
DRG NO.:
REVISION:

Pavement Quality Concrete (PQC)300 mm
Dry lean concrete (DLC)150mm
GSB -I - 100 mm
GSB -II - 100 mm
Sub grade

CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT "KM 83" OF LENGTH 495m APPROACHES ROAD OF 664M AND A MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN Jammu& Kashmir ON EPC MODE



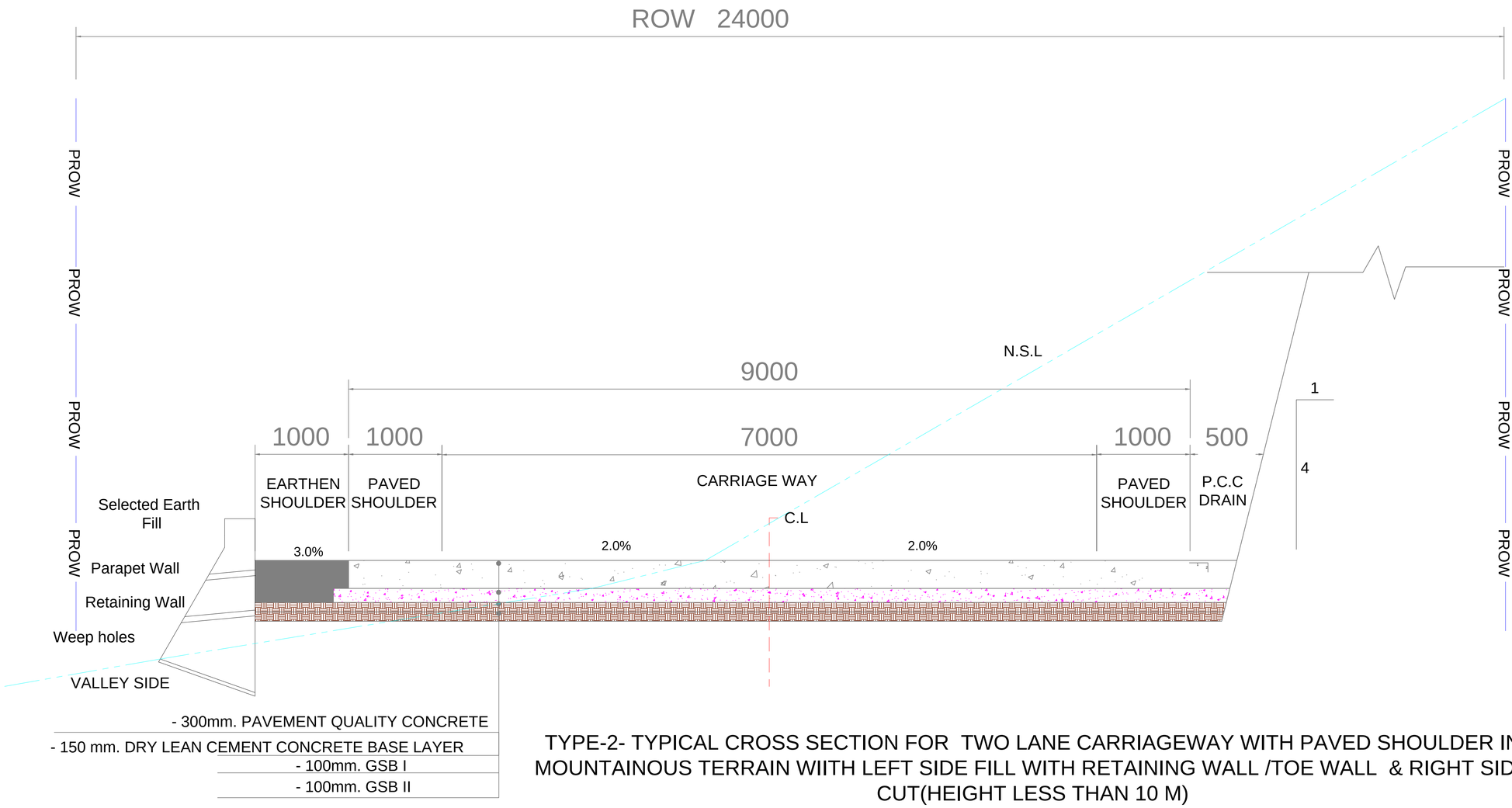
TYPE-1- TYPICAL CROSS SECTION FOR TWO LANE CARRIAGEWAY
WITH PAVED SHOULDER IN MOUNTAINOUS TERRAIN
WITH BOTH SIDE CUT



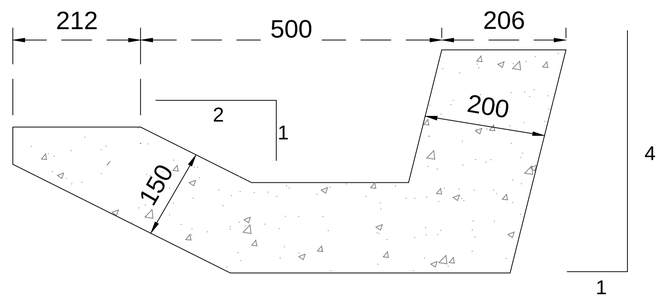
DETAILS 1

NOTE:
1.All dimensions are in mm unless otherwise mentioned.

CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT "KM 83" OF LENGTH 495m APPROACHES ROAD OF 664M AND A MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN Jammu& Kashmir ON EPC MODE



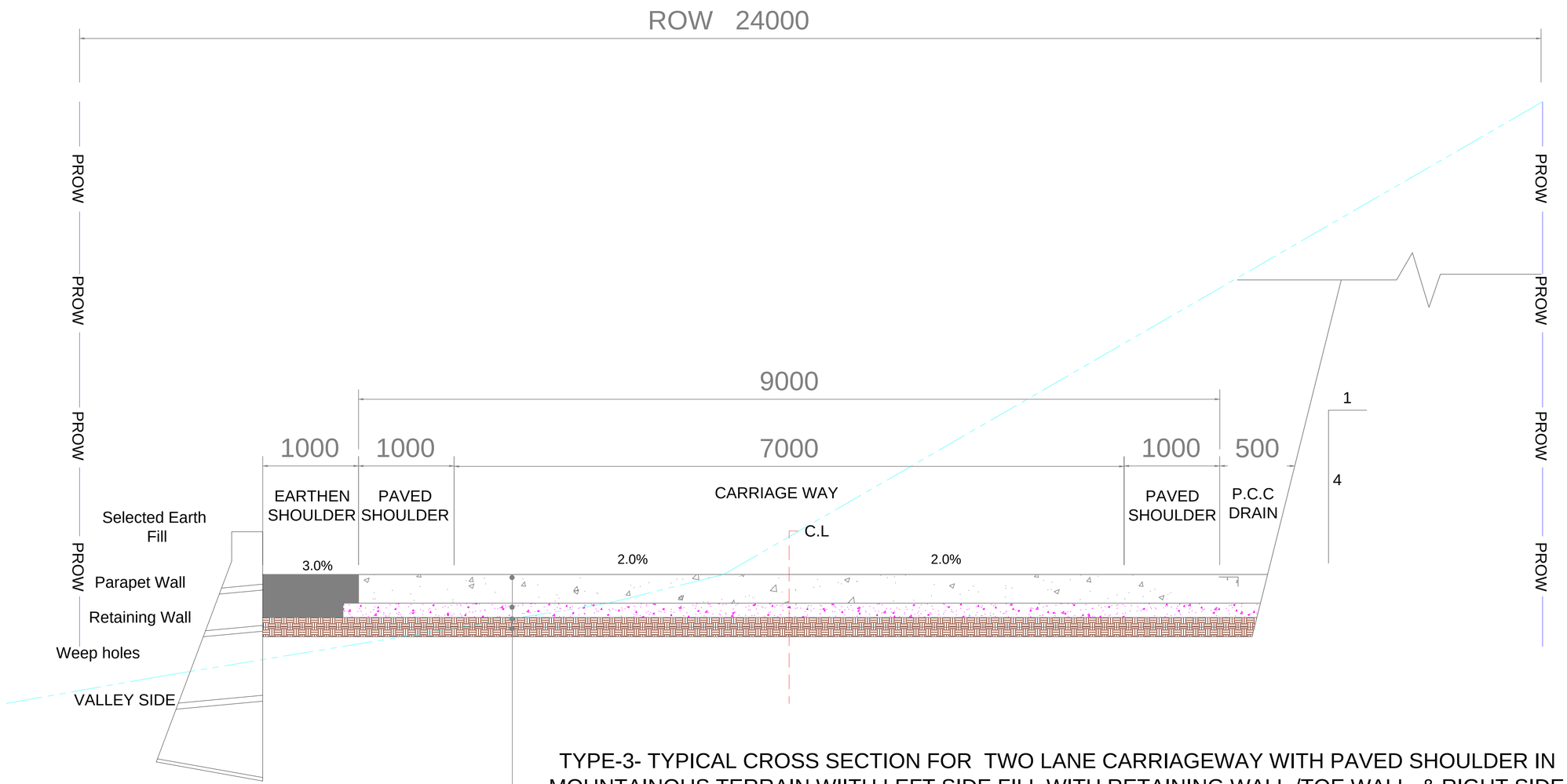
TYPE-2- TYPICAL CROSS SECTION FOR TWO LANE CARRIAGEWAY WITH PAVED SHOULDER IN MOUNTAINOUS TERRAIN WIITH LEFT SIDE FILL WITH RETAINING WALL /TOE WALL & RIGHT SIDE CUT(HEIGHT LESS THAN 10 M)



DETAILS 1

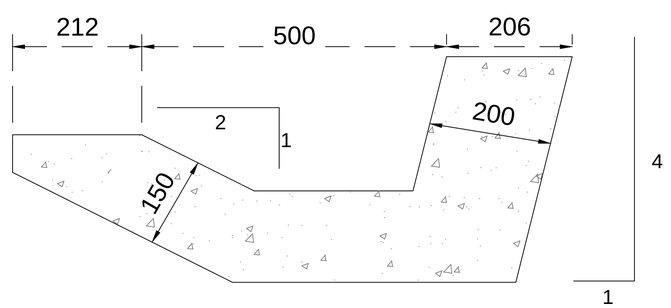
NOTE:
1.All dimensions are in mm unless otherwise mentioned.

CONSTRUCTION OF BI-DIRECTIONAL TUNNEL AT "KM 83" OF LENGTH 495m APPROACHES ROAD OF 664M AND A MAJOR BRIDGE OF 110M FROM KM 82+675 TO KM 82+925 ON NH-244 IN Jammu& Kashmir ON EPC MODE



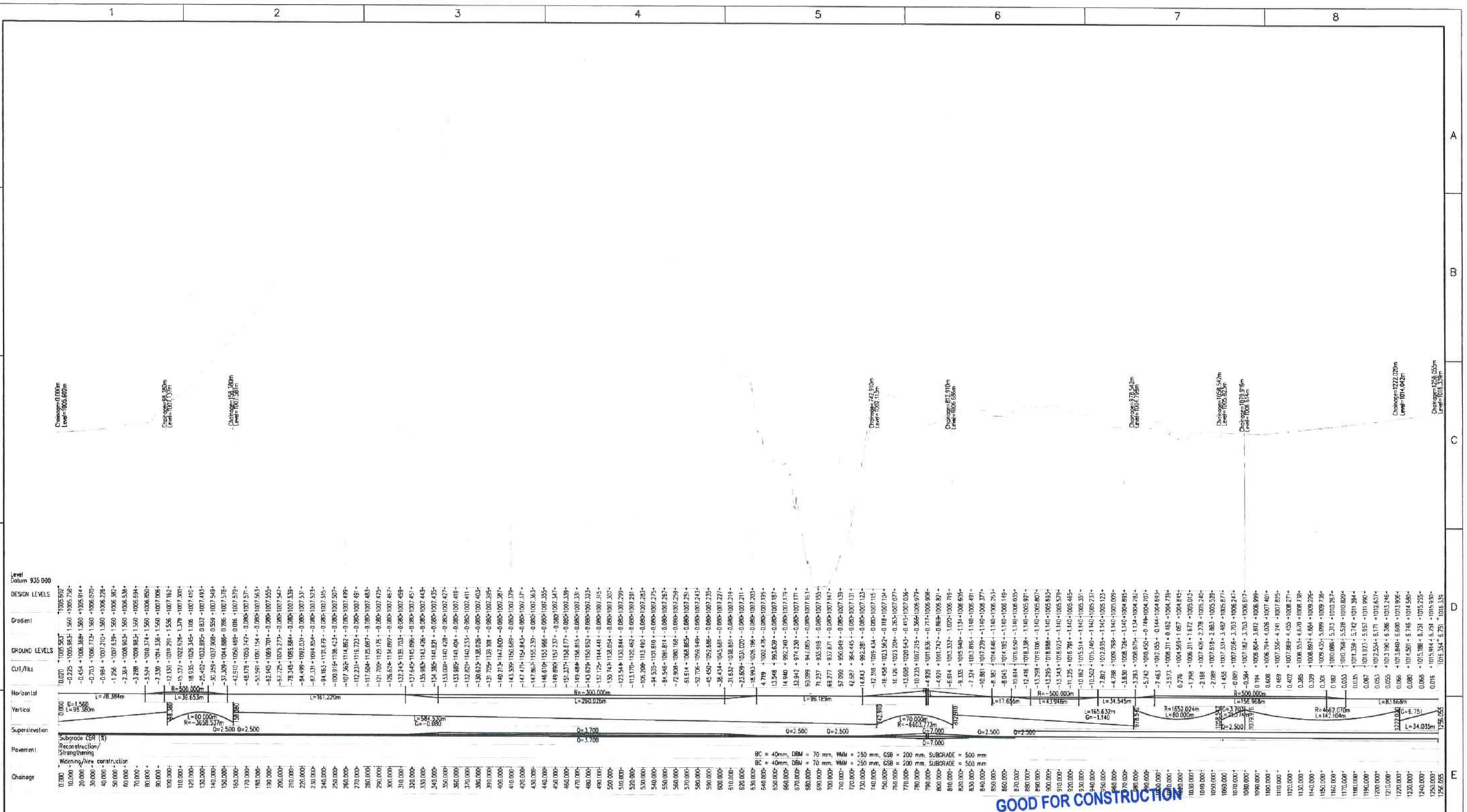
- 300mm. PAVEMENT QUALITY CONCRETE
- 150 mm. DRY LEAN CEMENT CONCRETE BASE LAYER
- 100mm. GSB I
- 100mm. GSB II

TYPE-3- TYPICAL CROSS SECTION FOR TWO LANE CARRIAGEWAY WITH PAVED SHOULDER IN MOUNTAINOUS TERRAIN WIITH LEFT SIDE FILL WITH RETAINING WALL /TOE WALL & RIGHT SIDE CUT(HEIGHT MORE THAN 10 M)



DETAILS 1

NOTE:
1.All dimensions are in mm unless otherwise mentioned.



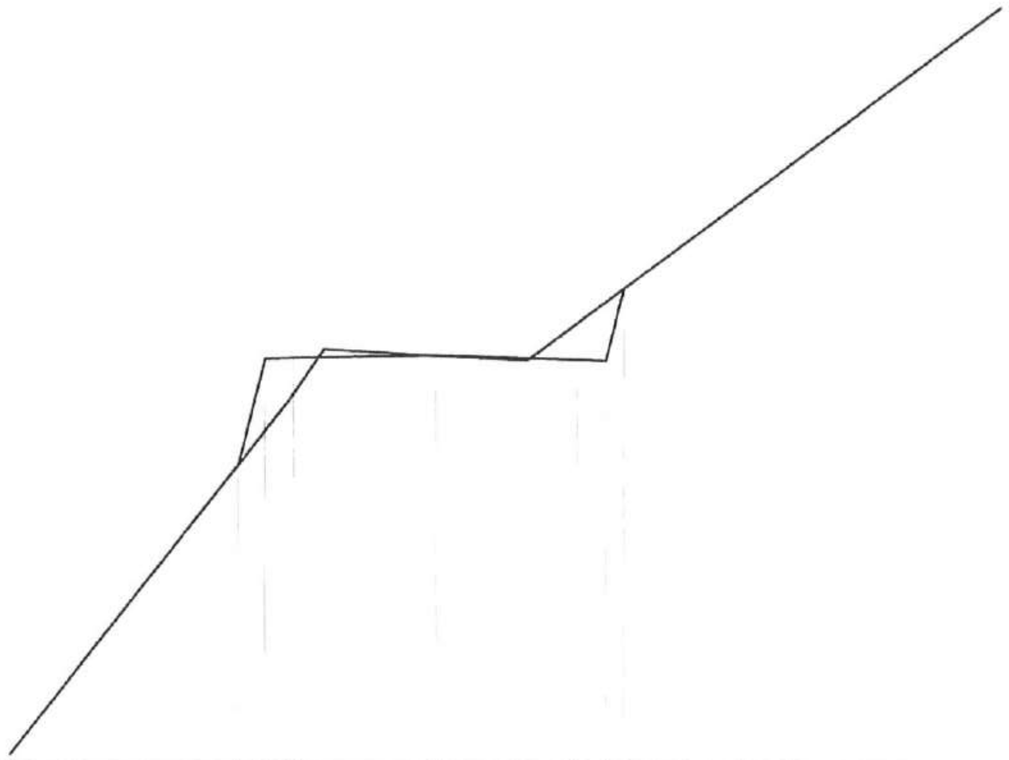
Note : 1. The pavement design given is subject to CBR value greater than 15%
2. The Tranverse slope shall be maintained at 2.5%

Subterra Engineers Pvt. Ltd. New Delhi

CLIENT: National Highways and Infrastructure Development Corporation, PTI Building, 4 Parliament Street, Sansad Marg Area, New Delhi, Delhi 110001	PROJECT: Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244	EPC CONRACTOR: BEIGH CONSTRUCTION COMPANY Pvt. Ltd. Plot no : 4, Wave mall, Bypass road, Narwal Jammu email : info@beegroup.in	DESIGN CONSULTANT: SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with EQUIPO DE PROSPECCIONES, S.A	DESIGN DIRECTOR: DR. K. M. MOZA	REV. / DATE / DESCRIPTION	DRAWN BY : IQRA QAYOOM DESIGNED BY : DANISH ALTAF CHECKED BY : MEHAK MAQBOOL RECOMMENDED BY : M.DAR APPROVED BY : JAVAID

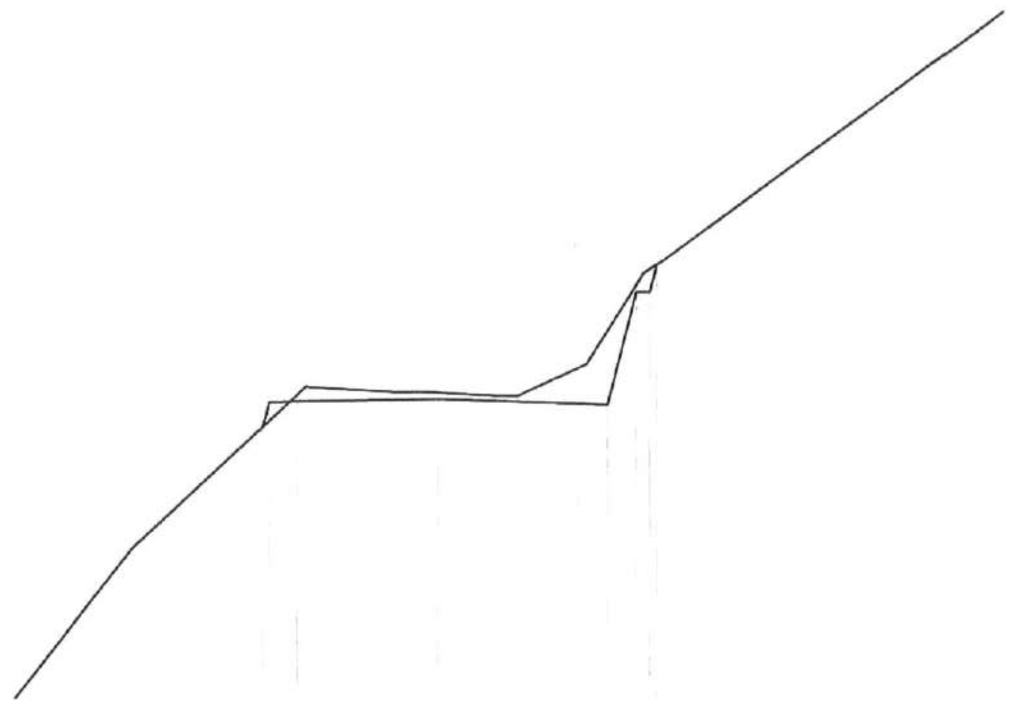
TITLE: **LONGITUDINAL PROFILE** (ALONG PROPOSED CENTER LINE) Ch. 0.00 to 1256.055

SCALE: 1:3000
SHEET SIZE: A3
DRG NO:
REVISION:



Design LEVELS	1001.695, 1005.447, 1005.477, 1005.602, 1005.477, 1005.447, 1007.975
Design OFFSET	-6.938, -6.000, -5.000, 0.000, 5.000, 6.000, 6.632
Design WIDTH	0.938, 1.000, 5.000, 5.000, 1.000, 0.632
Existing Ground LEVELS	991.312, 1003.911, 1005.783, 1005.603, 1005.576, 1005.440, 1017.976
Existing Ground OFFSET	-15.000, -5.217, -3.937, -0.296, 0.104, 3.243, 20.000

Chainage = 0.000



Design LEVELS	1004.729, 1005.603, 1005.633, 1005.758, 1005.633, 1005.603, 1009.603, 1009.604, 1010.564
Design OFFSET	-6.219, -6.000, -5.000, 0.000, 5.000, 6.000, 7.000, 7.500, 7.740
Design WIDTH	0.219, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500
Existing Ground LEVELS	994.991, 1000.353, 1006.181, 1006.147, 1005.997, 1006.007, 1005.897, 1005.897, 1007.034, 1010.266, 1010.704, 1019.548
Existing Ground OFFSET	-15.000, -10.836, -4.685, -4.549, -1.558, -0.577, 2.035, 2.826, 5.245, 7.270, 7.961, 20.000

Chainage = 10.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

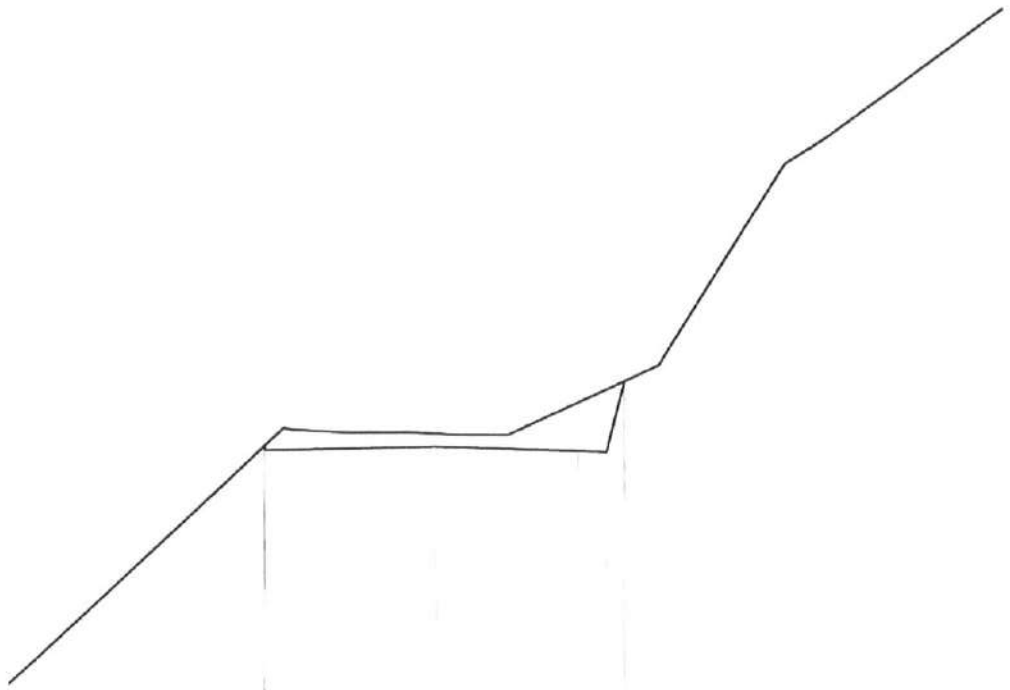
DR. K.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	JAVAID

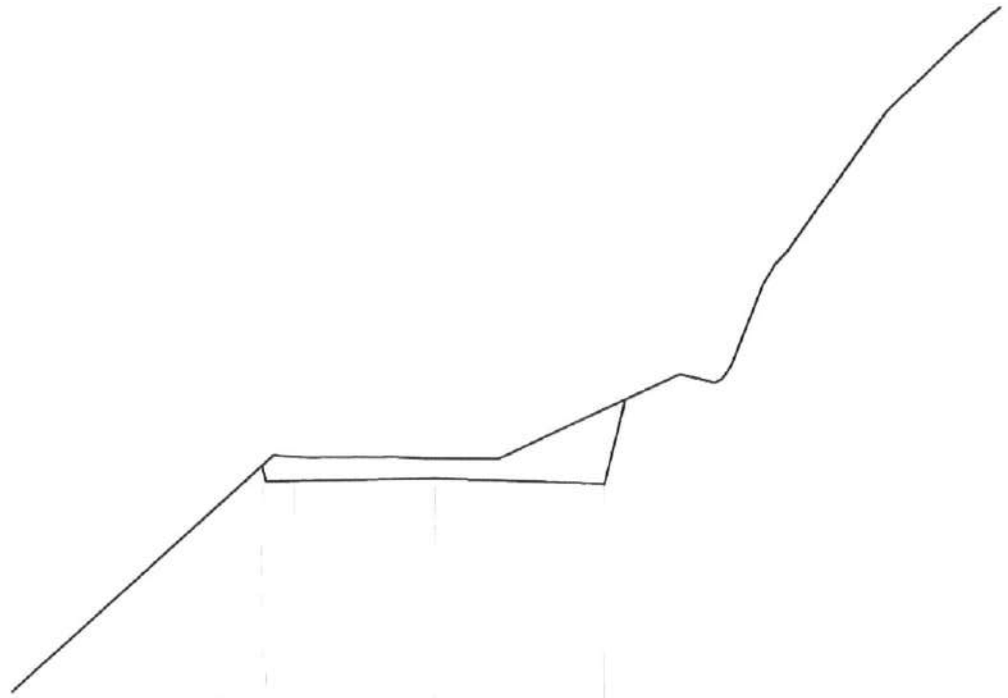
TITLE: **Cross Section Details Ch: 0 & 10**

SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Design LEVELS	1005.908, 1005.759, 1005.789, 1005.914, 1005.789, 1005.759, 1008.266
Design OFFSET	-6.037, -6.000, -5.000, 0.000, 5.000, 6.000, 6.627
Design WIDTH	0.037, 1.000, 5.000, 5.000, 1.000, 0.627
Existing Ground LEVELS	997.416, 1006.560, 1006.486, 1006.387, 1006.409, 1006.335, 1006.334, 1008.837, 1015.945, 1016.909, 1021.453
Existing Ground OFFSET	-15.000, -5.349, -5.055, -3.085, -0.972, 0.780, 2.519, 7.841, 12.295, 13.815, 20.000

Chainage = 20.000



Design LEVELS	1006.476, 1005.915, 1005.945, 1006.070, 1005.945, 1005.915, 1008.904
Design OFFSET	-6.140, -6.000, -5.000, 0.000, 5.000, 6.000, 6.747
Design WIDTH	0.140, 1.000, 5.000, 5.000, 1.000, 0.747
Existing Ground LEVELS	993.575, 1006.864, 1006.825, 1005.778, 1006.811, 1006.773, 1006.772, 1009.809, 1009.619, [illegible], [illegible], 1010.113, 1012.764, [illegible], [illegible], [illegible], 1014.168, 1019.137, 1019.718, 1021.415, 1022.758
Existing Ground OFFSET	-15.000, -5.716, -5.560, -4.612, -1.367, -0.475, 2.213, 8.671, 9.545, [illegible], [illegible], 10.160, 10.495, 11.386, 11.613, 12.054, 12.475, 15.999, 16.607, 18.415, 20.000

Chainage = 30.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

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Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR

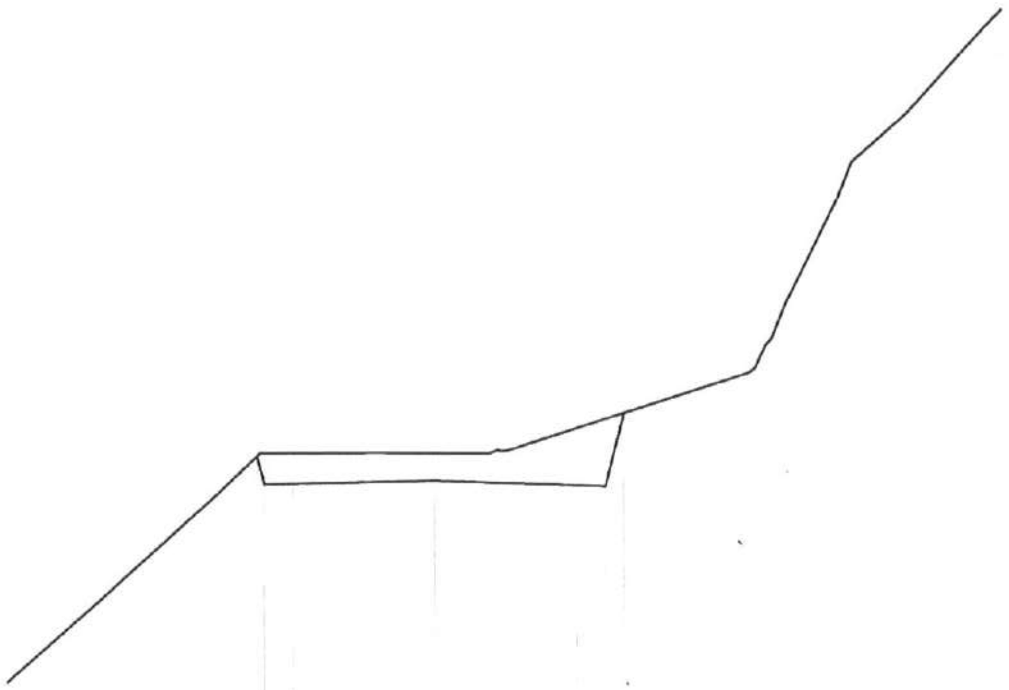
DR. K. K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	JAVAID

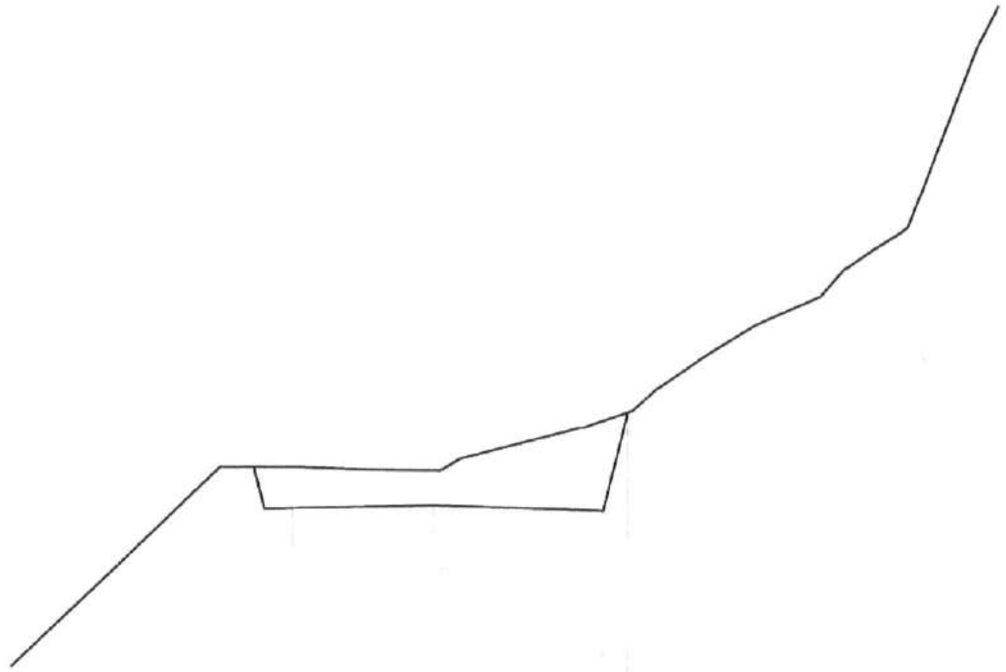
TITLE: **Cross Section Details Ch: 20 & 30**

SCALE	1 2500
SHEET SIZE	A3
DRG NO	
REVISION	



Design LEVELS	1007.066 1006.071 1006.101 1006.226 1006.101 1006.071 1008.662
Design OFFSET	-6.249 -6.000 -5.000 0.000 5.000 6.000 6.648
Design WIDTH	0.249 1.000 5.000 5.000 1.000 0.648
Existing Ground LEVELS	998.981 1005.378 1007.177 1007.197 1007.213 1007.217 1007.209 1007.292 1007.333 1010.122 1010.724 1011.060 1011.316 1012.556 1016.354 1017.565 1019.258 1022.423 1022.556 1022.971
Existing Ground OFFSET	-15.000 -8.004 -6.133 -3.268 -1.763 -1.730 1.907 2.369 2.612 11.080 11.273 11.617 11.864 12.345 14.207 14.679 16.605 19.467 19.688 20.000

Chainage = 40.000



Design LEVELS	1007.705 1006.227 1006.257 1006.382 1006.257 1006.227 1009.716
Design OFFSET	-6.369 -6.000 -5.000 0.000 5.000 6.000 6.872
Design WIDTH	0.369 1.000 5.000 5.000 1.000 0.872
Existing Ground LEVELS	1000.561 1007.696 1007.716 1007.672 1007.640 1007.639 1008.040 1009.114 1009.169 1009.273 1009.779 1010.535 1011.788 1012.821 1013.836 1014.784 1016.157 1016.579 1017.614 1022.609 1024.084
Existing Ground OFFSET	-15.000 -7.578 -4.794 -3.328 -2.117 0.281 0.943 4.970 5.283 5.604 7.052 7.890 9.693 11.343 13.652 14.526 16.577 16.871 17.305 19.243 20.000

Chainage = 50.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bcegroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES S.A.

DESIGN DIRECTOR:

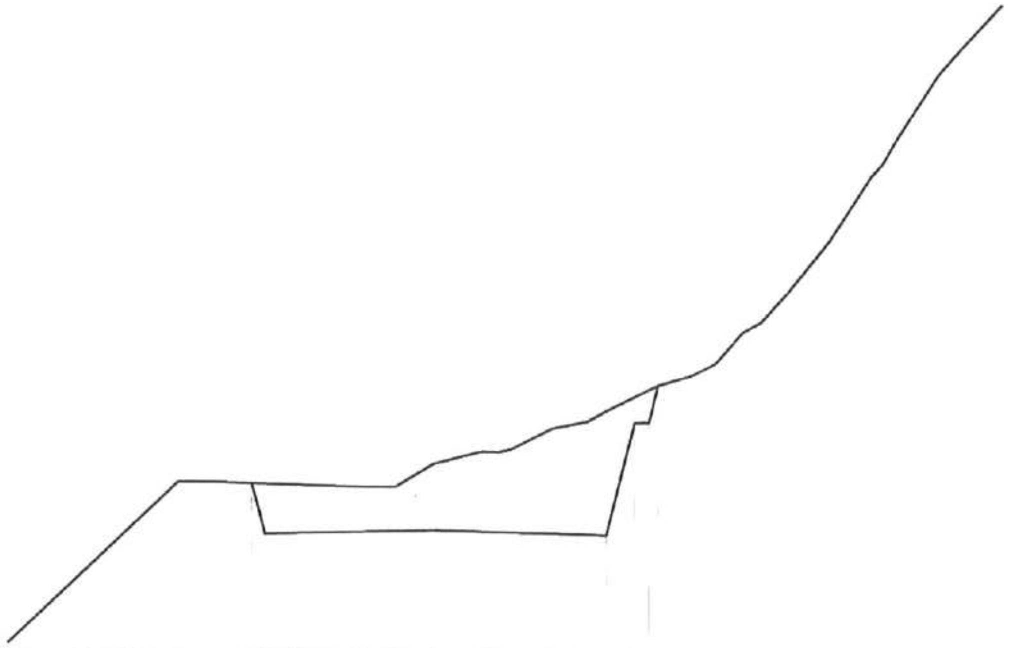
K MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	JAVAID

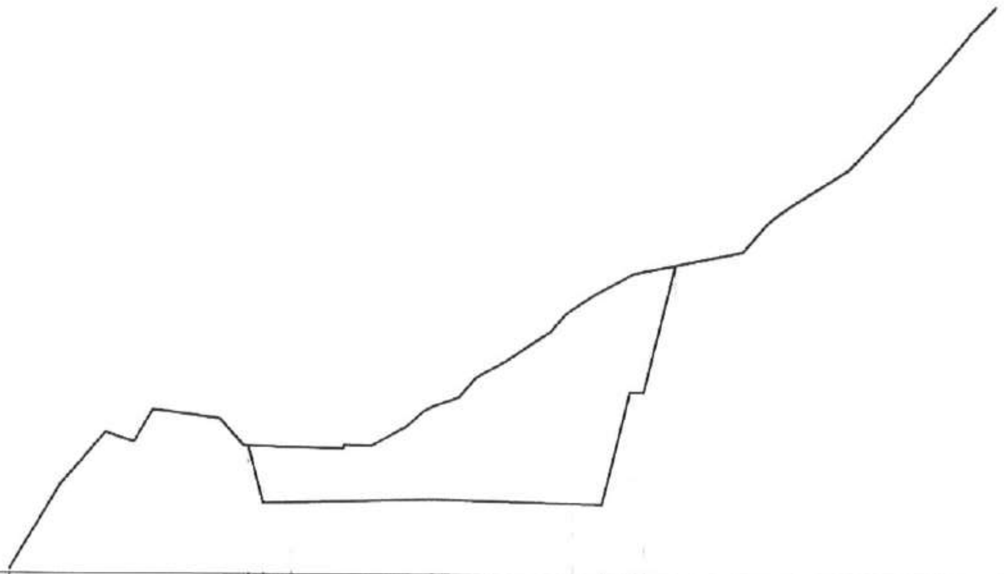
TITLE: **Cross Section Details Ch: 40 & 50**

SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Design LEVELS	1008.178, 1006.383, 1006.413, 1006.538, 1006.413, 1006.383, 1010.383, 1010.384, 1011.699
Design OFFSET	-6.449, -6.000, -5.000, 0.000, 5.000, 6.000, 7.000, 7.500, 7.829
Design WIDTH	0.449, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500
Existing Ground LEVELS	1002.470, 1008.215, 1008.223, 1008.133, 1008.068, 1008.068, 1008.889, 1009.188, 1009.343, 1009.325, 1009.429, 1010.165, 1010.421, 1010.717, 1011.698, 1012.042, 1012.480, 1013.570, 1013.944, 1014.855, 1015.016, 1016.788, 1019.079, 1019.544, 1020.228, 1021.059, 1022.681, 1023.367, 1025.165
Existing Ground OFFSET	-15.000, -9.024, -7.930, -4.939, -2.471, -1.403, -0.051, 1.069, 1.672, 2.274, 2.684, 4.119, 5.370, 5.875, 7.826, 8.984, 9.861, 10.801, 11.485, 12.402, 12.466, 13.900, 15.380, 15.805, 16.185, 16.708, 17.756, 18.339, 20.000

Chainage = 60.000



Design LEVELS	1008.582, 1006.539, 1006.569, 1006.694, 1006.569, 1006.539, 1010.539, 1010.540, 1015.034
Design OFFSET	-6.511, -6.000, -5.000, 0.000, 5.000, 6.000, 7.000, 7.500, 8.623
Design WIDTH	0.511, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 1.123
Existing Ground LEVELS	1004.163, 1007.193, 1009.033, 1008.770, 1008.698, 1009.854, 1009.536, 1008.589, 1008.572, 1008.492, 1008.618, 1008.590, 1009.164, 1009.457, 1009.839, 1010.002, 1010.319, 1011.046, 1011.584, 1012.685, 1013.316, 1013.988, 1014.727, 1015.526, 1016.521, 1016.730, 1017.143, 1018.434, 1020.849, 1021.016, 1021.499, 1023.291, 1024.187
Existing Ground OFFSET	-15.000, -13.188, -11.584, -10.822, -10.574, -9.914, -7.526, -6.689, -6.249, -3.140, -3.129, -2.149, -1.102, -0.701, -0.284, 0.037, 0.949, 1.585, 2.528, 4.179, 4.753, 5.770, 7.128, 11.024, 11.887, 12.141, 12.722, 14.777, 17.074, 17.156, 17.624, 19.131, 20.000

Chainage = 70.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. ★ New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A.

DESIGN DIRECTOR

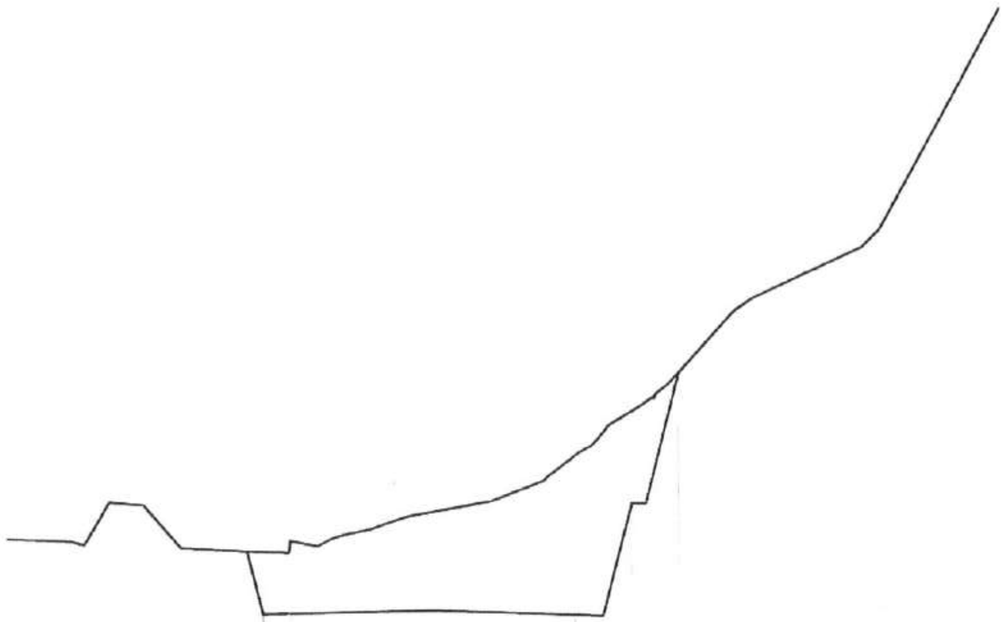
DR. K.K. MOZA

REV.	DATE	DESCRIPTION

DRAWN BY	: IQRA QAYOOM
DESIGNED BY	: DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	JAVAID

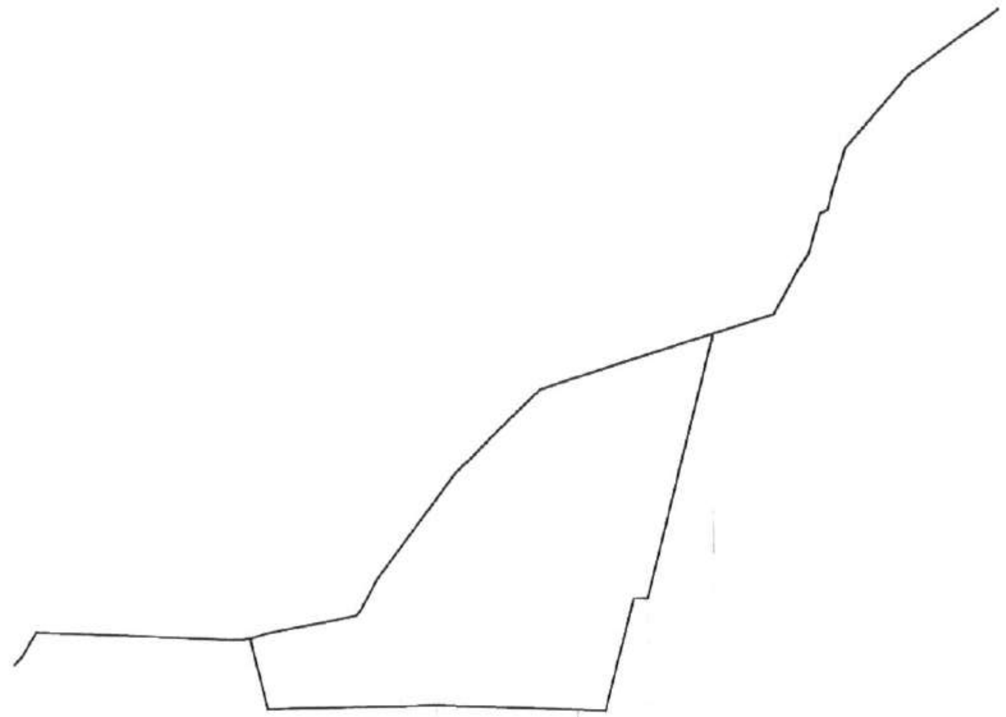
TITLE: **Cross Section Details Ch: 60 & 70**

SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Row	Values
Design LEVELS	1008.936, 1006.695, 1006.725, 1006.850, 1006.725, 1006.695, 1010.695, 1010.696, 1015.337
Design OFFSET	-6.560, -6.000, -5.000, 0.000, 5.000, 6.000, 7.000, 7.500, 8.660
Design WIDTH	0.560, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 1.160
Existing Ground LEVELS	1009.316, 1009.256, 1009.116, 1010.645, 1010.548, 1009.026, 1008.936, [illegible], 1009.318, 1009.126, [illegible], [illegible], 1009.714, [illegible], 1010.214, 1010.686, 1010.742, 1010.764, [illegible], 1011.639, 1012.481, 1012.773, 1013.206, 1013.456, 1014.190, 1014.513, [illegible], [illegible], 1015.237, 1017.538, 1017.982, 1019.802, 1020.415, 1028.204
Existing Ground OFFSET	-15.000, -12.799, -12.317, -11.443, -10.234, -8.890, -6.575, [illegible], [illegible], -4.084, [illegible], [illegible], -3.156, -2.320, -1.248, -0.845, 1.643, [illegible], 2.045, 3.873, 4.044, 5.113, 5.619, 6.004, 6.175, 7.361, 7.792, 7.934, 8.160, 8.571, 10.629, 11.256, 15.149, 15.755, 20.000

Chainage = 80.000



Row	Values
Design LEVELS	1009.362, 1006.851, 1006.881, 1007.006, 1006.881, 1006.851, 1010.851, 1010.852, 1020.226
Design OFFSET	-6.628, -6.000, -5.000, -0.000, 5.000, 6.000, 7.000, 7.500, 9.843
Design WIDTH	0.628, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 2.343
Existing Ground LEVELS	[illegible], 1009.528, 1009.448, 1009.307, [illegible], [illegible], 1009.372, 1009.533, 1009.764, 1010.054, 1010.199, [illegible], [illegible], 1011.587, 1015.332, 1015.784, 1016.506, 1018.064, [illegible], 1018.592, 1020.917, 1022.507, [illegible], [illegible], 1025.186, 1026.757, 1029.336, 1031.597, 1031.681
Existing Ground OFFSET	-15.000, [illegible], [illegible], -14.014, -11.118, -7.332, -7.160, -6.867, -6.565, -6.085, -4.963, -3.503, -2.841, -2.675, -2.084, -2.031, 0.735, 1.230, 1.908, 3.507, 3.688, 4.743, 12.002, 12.865, [illegible], [illegible], 14.073, 14.550, 16.784, 19.902, 20.000

Chainage = 90.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

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Plot no : 4, Wave mall, Bypass road, Narwal
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DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

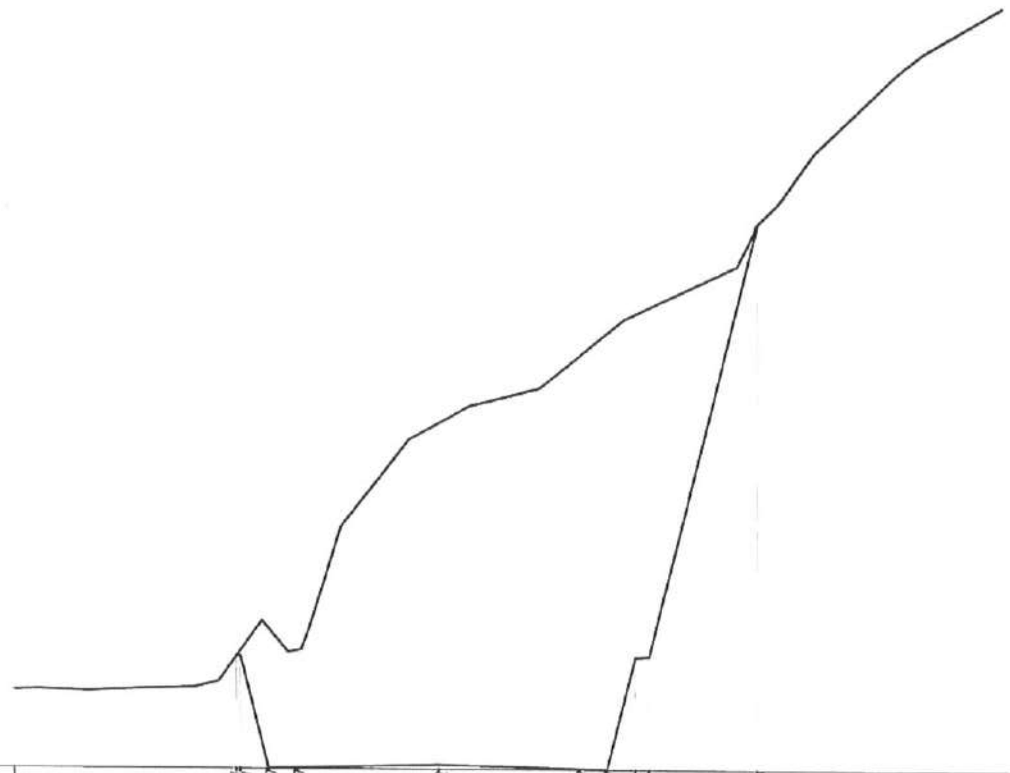
DR. K.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	JAVAID

TITLE: **Cross Section Details Ch: 80 & 90**

SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Design LEVELS	1011.007, 1011.007, 1007.007, 1007.037, 1007.162, 1007.037, 1007.007, 1011.007, 1011.008, 1026.355
Design OFFSET	-7.141, -7.000, -6.000, -5.000, -0.000, 5.000, 6.000, 7.000, 7.500, 11.337
Design WIDTH	0.141, 1.000, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 3.837
Existing Ground LEVELS	1009.772, 1009.787, 1009.766, 1009.728, 1009.831, 1009.876, 1010.103, 1012.261, 1011.140, 1011.248, 1012.057, 1015.607, 1018.393, 1018.697, 1019.887, 1020.507, 1022.946, 1024.837, 1026.058, 1026.302, 1027.083, 1028.830, 1031.582, 1032.384, 1034.005
Existing Ground OFFSET	-15.000, -14.158, -13.403, -12.407, -10.256, -8.654, -7.786, -6.246, -5.318, -4.847, -4.554, -3.451, -1.292, -1.071, 1.074, 3.556, 6.570, 10.594, 11.211, 11.283, 12.082, 13.335, 16.170, 17.209, 20.000

Chainage = 100.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

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DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

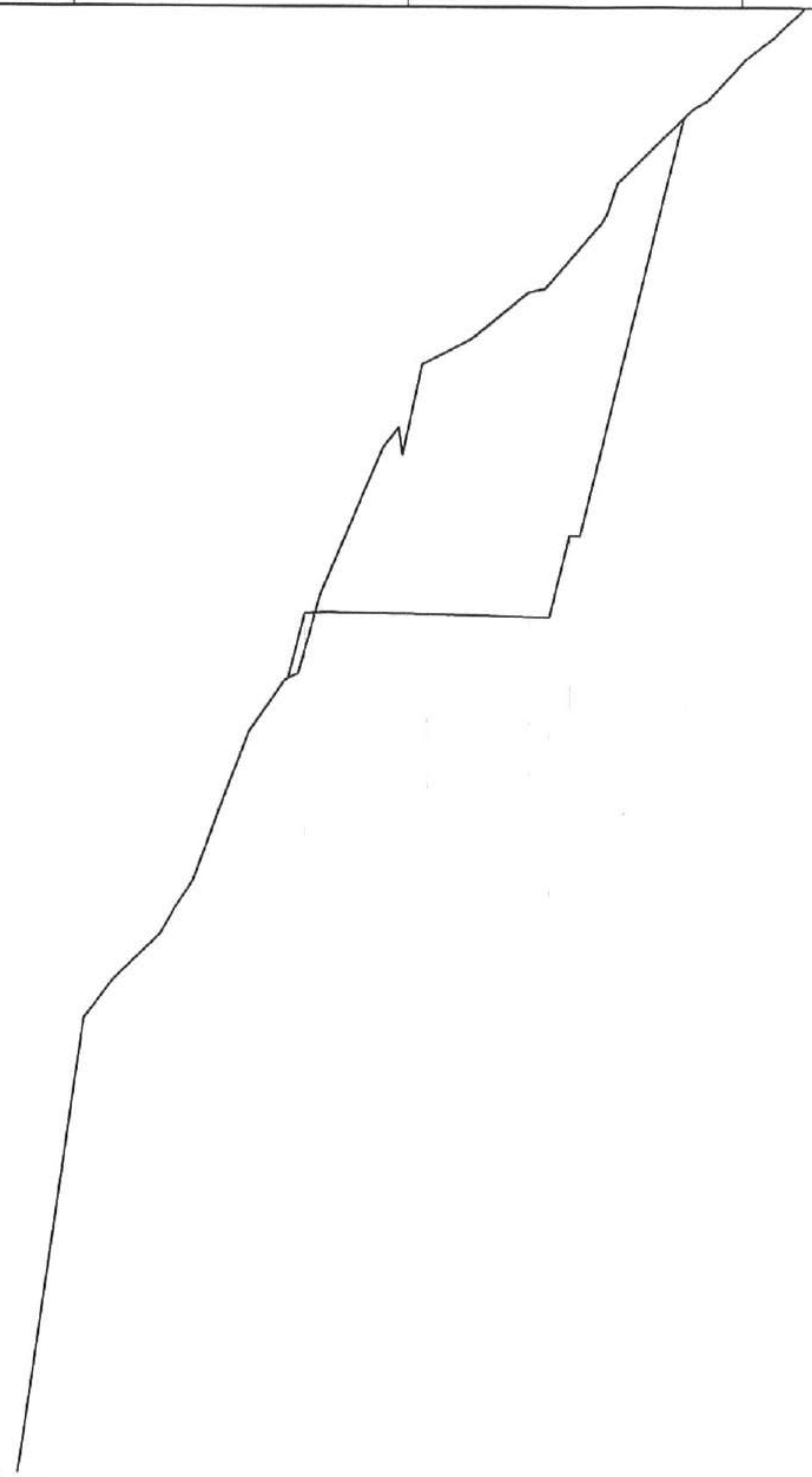
DR. K.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	M.DAR
APPROVED BY	JAVAID

TITLE: **Cross Section Details Ch: 100**

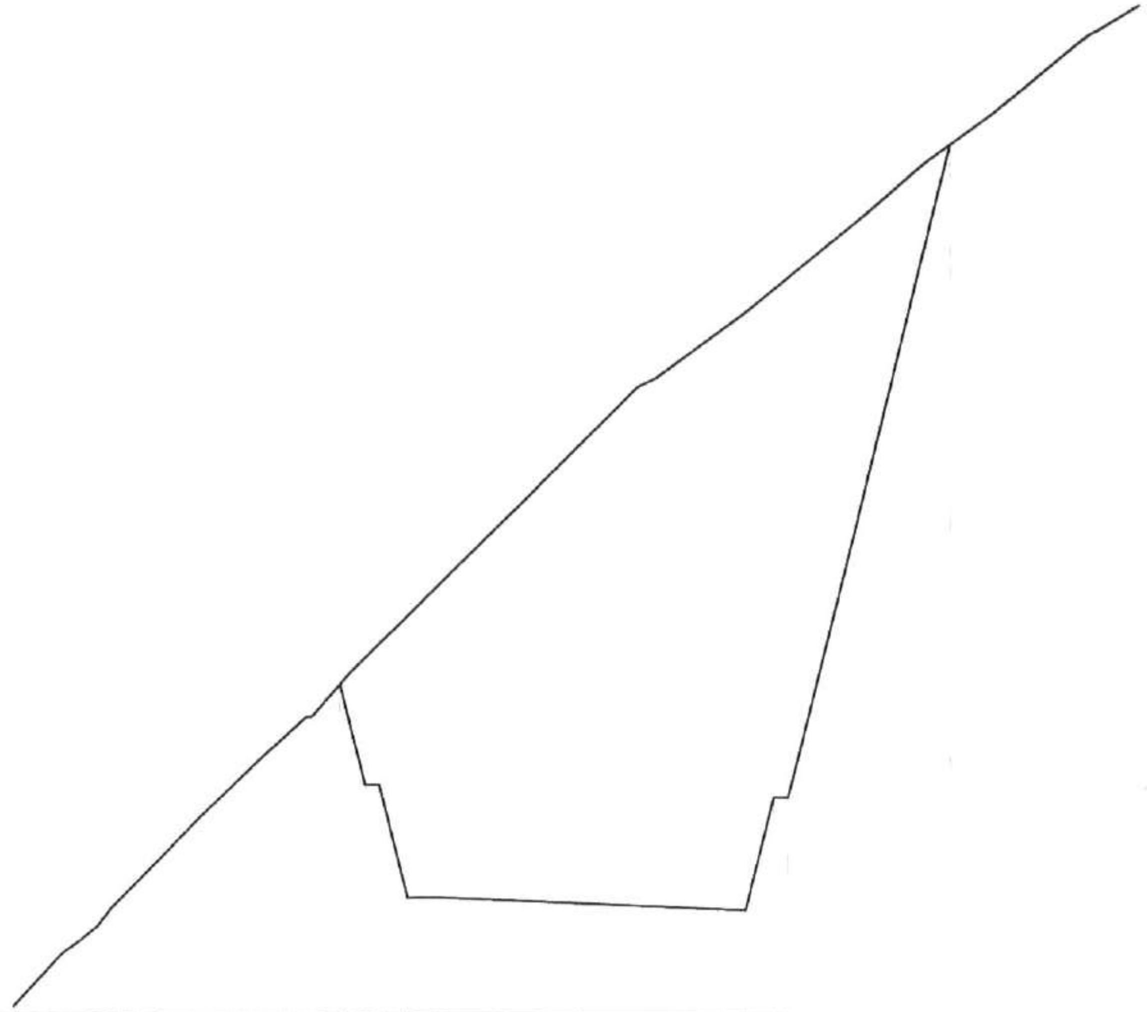
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =964.000

Design LEVELS	1003.931, 1007.149, 1007.174, 1007.115, 1006.990, 1006.965, 1010.965, 1010.966, 1031.534
Design WIDTH	0.805, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 5.142
Existing Ground LEVELS	964.785, 966.405, 987.144, 987.771, 989.050, 991.285, 992.640, 993.632, 997.449, 1001.302, 1003.870, 1004.166, 1008.113, 1015.286, [illegible], [illegible], 1019.317, 1020.567, 1022.866, 1023.059, [illegible], [illegible], 1028.267, 1031.968, 1032.367, 1034.397, [illegible], [illegible], 1036.753, 1038.558
Existing Ground OFFSET	-20.000, -19.744, -16.791, -16.504, -15.578, -13.087, -12.320, -11.473, -10.178, -8.715, -6.931, -6.519, -5.210, -2.122, [illegible], [illegible], -0.224, 2.167, 5.006, 5.847, 8.640, [illegible], [illegible], 9.382, 13.075, 13.800, 15.648, 17.173, 17.413, 18.574, 20.000

Chainage = 740.000



Level Datum =1003.000

Design LEVELS	1014.808, 1011.232, 1011.231, 1007.231, 1007.256, 1007.077, 1006.899, 1006.874, 1010.874, 1010.875, 1033.978
Design WIDTH	0.694, 0.500, 1.000, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 5.776
Existing Ground LEVELS	1003.278, 1005.150, 1005.555, 1006.150, 1006.789, 1009.953, 1012.131, 1013.636, 1013.665, 1015.263, 1025.376, 1025.715, 1028.008, 1031.460, 1033.360, 1035.119, 1037.917, 1038.960
Existing Ground OFFSET	-20.000, -18.303, -17.766, -17.031, -16.526, -13.449, -11.244, -9.600, -9.584, -8.001, 2.188, 2.863, 5.977, 10.216, 12.437, 14.825, 18.259, 20.000

Chainage = 760.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

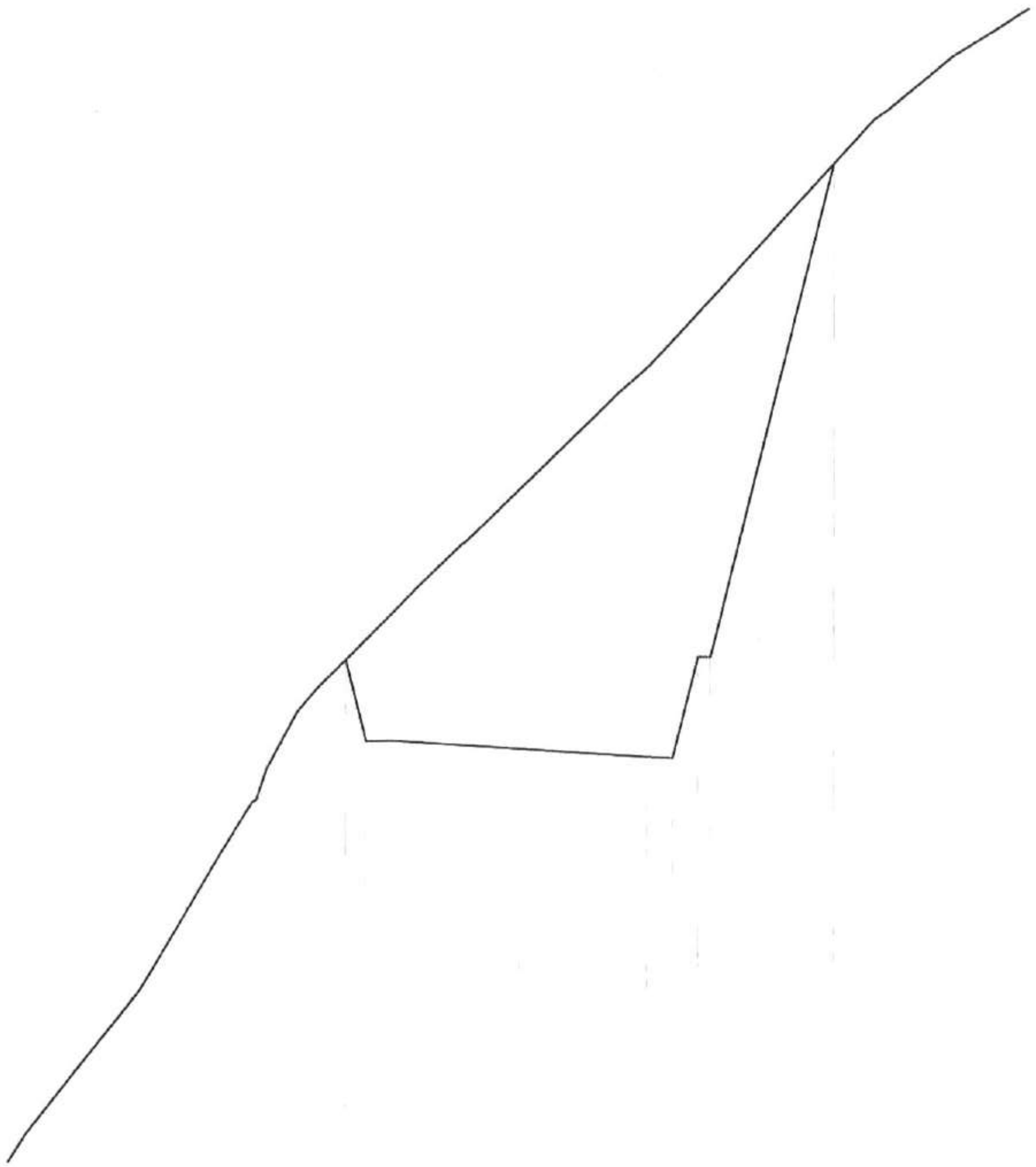
DESIGN DIRECTOR:

DR. K.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

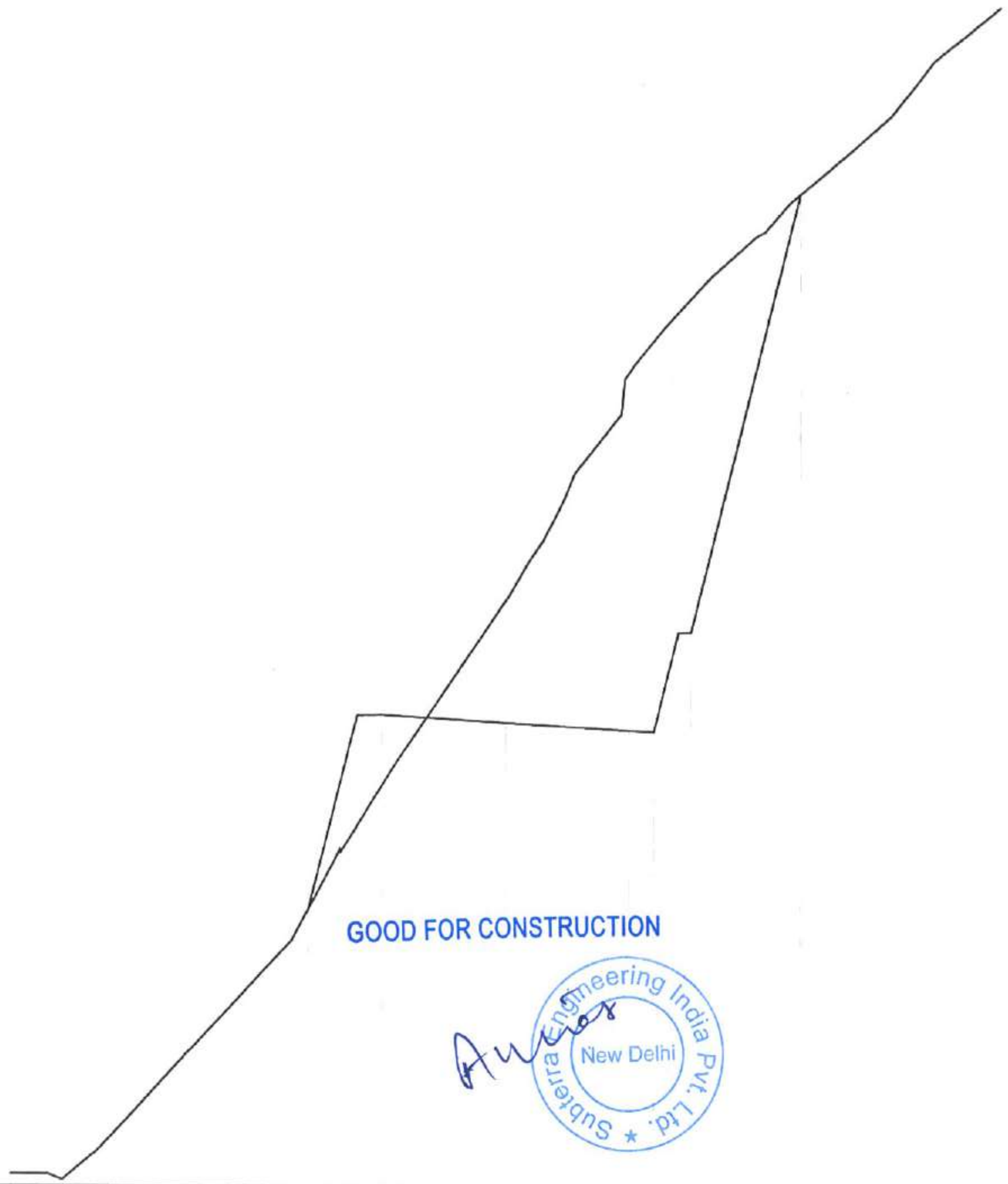
TITLE:	Cross Section Details Ch: 740 & 760
SCALE:	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =990.000

Design LEVELS	1010.451, 1007.252, 1007.277, 1006.979, 1006.681, 1006.656, 1010.656, 1010.657, 1030.091
Design WIDTH	0.802, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 4.859
Existing Ground LEVELS	990.484, 991.561, 997.211, 997.432, 997.991, 1002.753, 1004.783, 1004.873, 1006.085, 1006.094, 1008.378, 1009.389, 1011.006, 1013.778, 1015.074, 1015.061, 1015.745, 1021.053, 1022.083, 1025.229, 1031.876, 1032.226, 1034.356, 1036.278
Existing Ground OFFSET	-20.000, -19.339, -14.930, -14.781, -14.445, -11.714, -10.476, -10.310, -9.926, -9.924, -8.717, -7.864, -6.262, -3.561, -2.226, -2.206, -1.493, 3.902, 5.066, 7.977, 13.966, 14.482, 17.016, 20.000

Chainage = 780.000



Level Datum =988.000

Design LEVELS	999.226, 1007.068, 1007.113, 1006.821, 1006.528, 1006.503, 1010.503, 1010.504, 1028.116
Design WIDTH	1.966, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 4.403
Existing Ground LEVELS	988.481, 988.474, 988.250, 989.272, 989.384, 993.227, 993.568, 997.947, 1001.506, 1001.533, 1005.097, 1011.620, 1011.929, 1013.320, 1014.171, 1015.720, 1016.885, 1019.254, 1020.661, 1021.232, 1022.652, 1024.740, 1026.390, 1026.606, 1027.749, 1031.287, 1033.499, 1033.785, 1035.720
Existing Ground OFFSET	-20.000, -18.485, -17.897, -16.587, -16.519, -13.015, -12.692, -8.636, -6.770, -6.679, -4.468, -0.086, 0.132, 0.921, 1.510, 2.315, 2.787, 4.575, 4.814, 5.212, 6.379, 8.299, 10.116, 10.503, 11.471, 15.631, 17.280, 17.630, 20.000

Chainage = 800.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

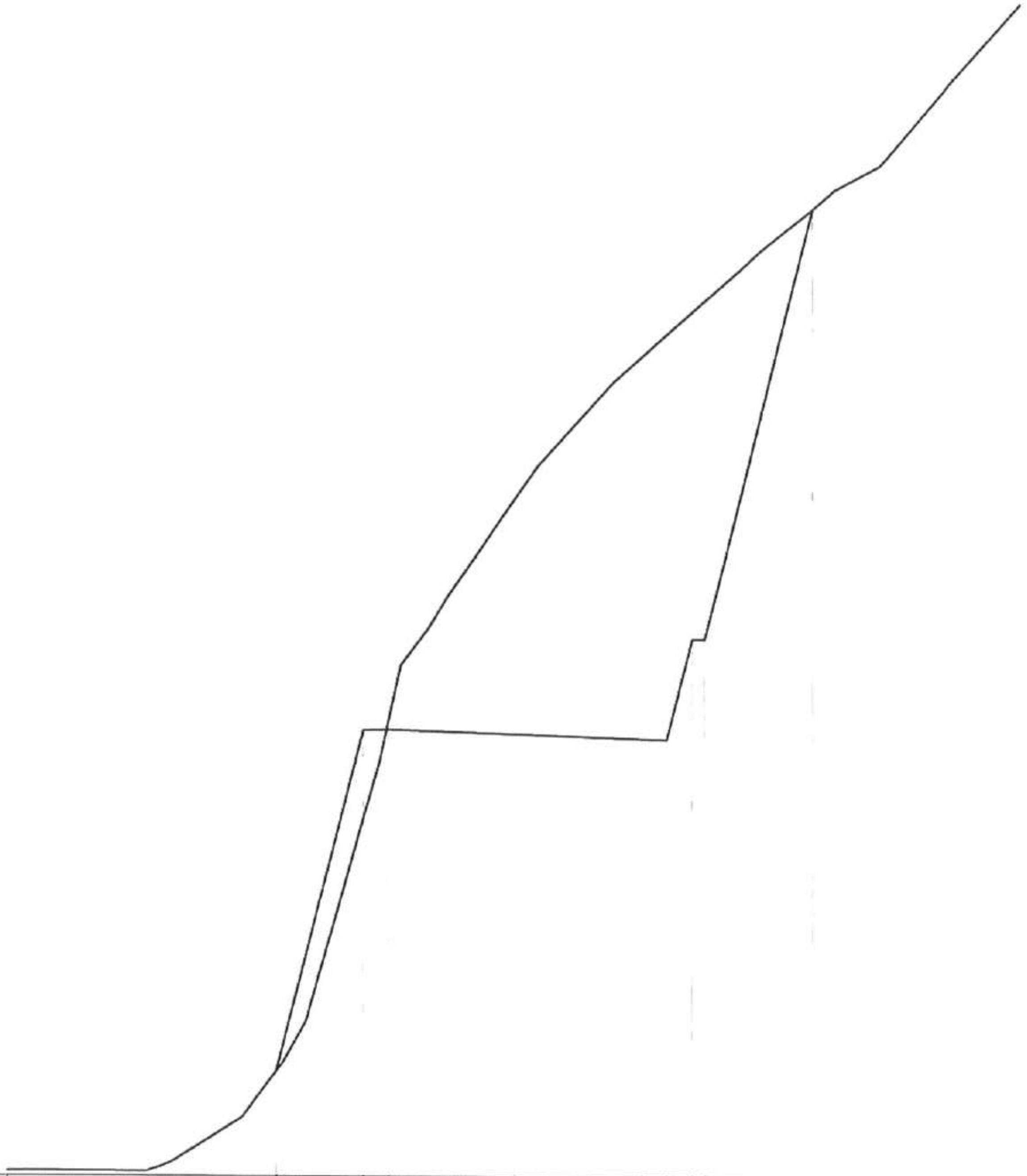
Dr. K.K MOZA

REV.	DATE	DESCRIPTION

DRAWN BY	: IQRA QAYOOM
DESIGNED BY	: DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	: M.DAR

TITLE: **Cross Section Details Ch: 780 & 800**

SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =989.000

Row	Values
Design LEVELS	993.169, 1006.753, 1006.778, 1006.605, 1006.432, 1006.407, 1010.407, 1010.408, 1027.392
Design WIDTH	3.396, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 4.246
Existing Ground LEVELS	989.195, 989.204, 989.181, [illegible], 989.185, 989.315, 989.540, 991.322, 993.538, 995.165, 1005.507, 1009.358, 1010.868, 1012.051, 1017.272, 1018.342, 1020.518, 1022.839, 1025.159, 1025.621, 1027.380, 1028.201, 1029.145, 1032.132, 1032.426, 1035.655
Existing Ground OFFSET	-20.000, -18.881, -14.854, [illegible], -14.509, -14.134, -13.582, -10.759, -9.124, -8.236, -5.359, -4.517, -3.391, -2.679, 0.917, 1.899, 3.862, 6.463, 9.056, 9.544, 11.732, 12.639, 14.419, 16.952, 17.163, 20.000

Chainage = 820.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

Level Datum =990.000

Row	Values
Design LEVELS	1007.685, 1006.406, 1006.431, 1006.377, 1006.252, 1006.227, 1010.227, 1010.228, 1028.826
Design WIDTH	0.320, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 4.650
Existing Ground LEVELS	990.256, 990.197, 990.215, 991.104, 991.464, 991.507, 991.420, 991.418, 994.398, 994.891, 996.678, 998.901, 999.874, 1004.095, 1005.705, 1006.970, 1010.226, 1015.965, 1017.066, 1018.645, 1018.834, 1019.497, 1021.054, 1021.762, 1022.780, 1028.752, 1028.759, 1030.672, 1030.682, 1032.630, 1032.920, 1034.903
Existing Ground OFFSET	-20.000, -18.725, -16.952, -14.623, -13.819, -13.565, -12.949, -12.788, -11.637, -11.364, -10.586, -8.971, -8.654, -7.999, -7.558, -6.765, -4.737, -1.085, -0.128, 1.042, 1.222, 1.897, 3.582, 4.577, 5.489, 12.053, 12.060, 14.585, 14.610, 16.993, 17.629, 20.000

Chainage = 840.000

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

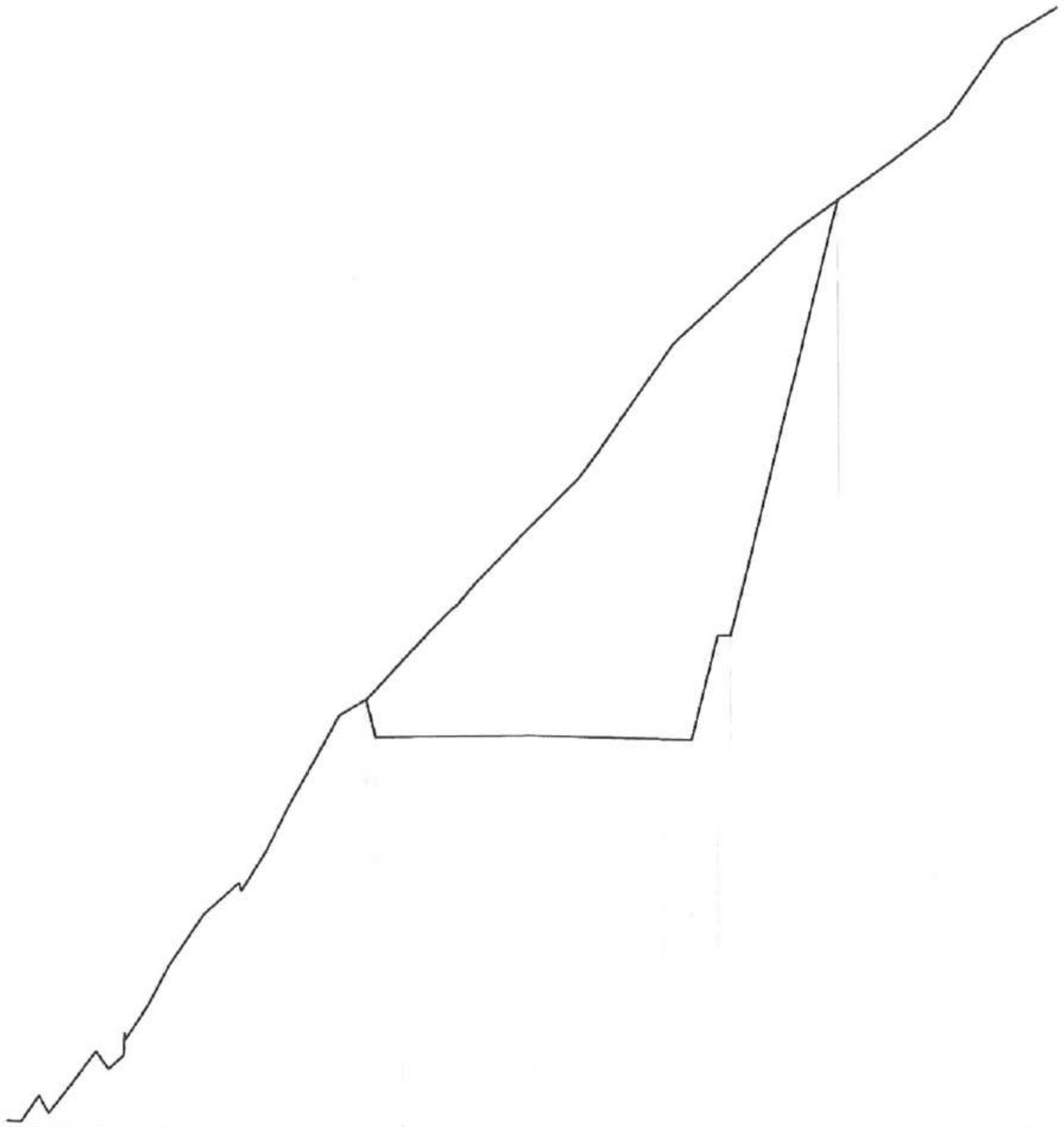
K.K. MOZA

REV.	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 820 & 840**

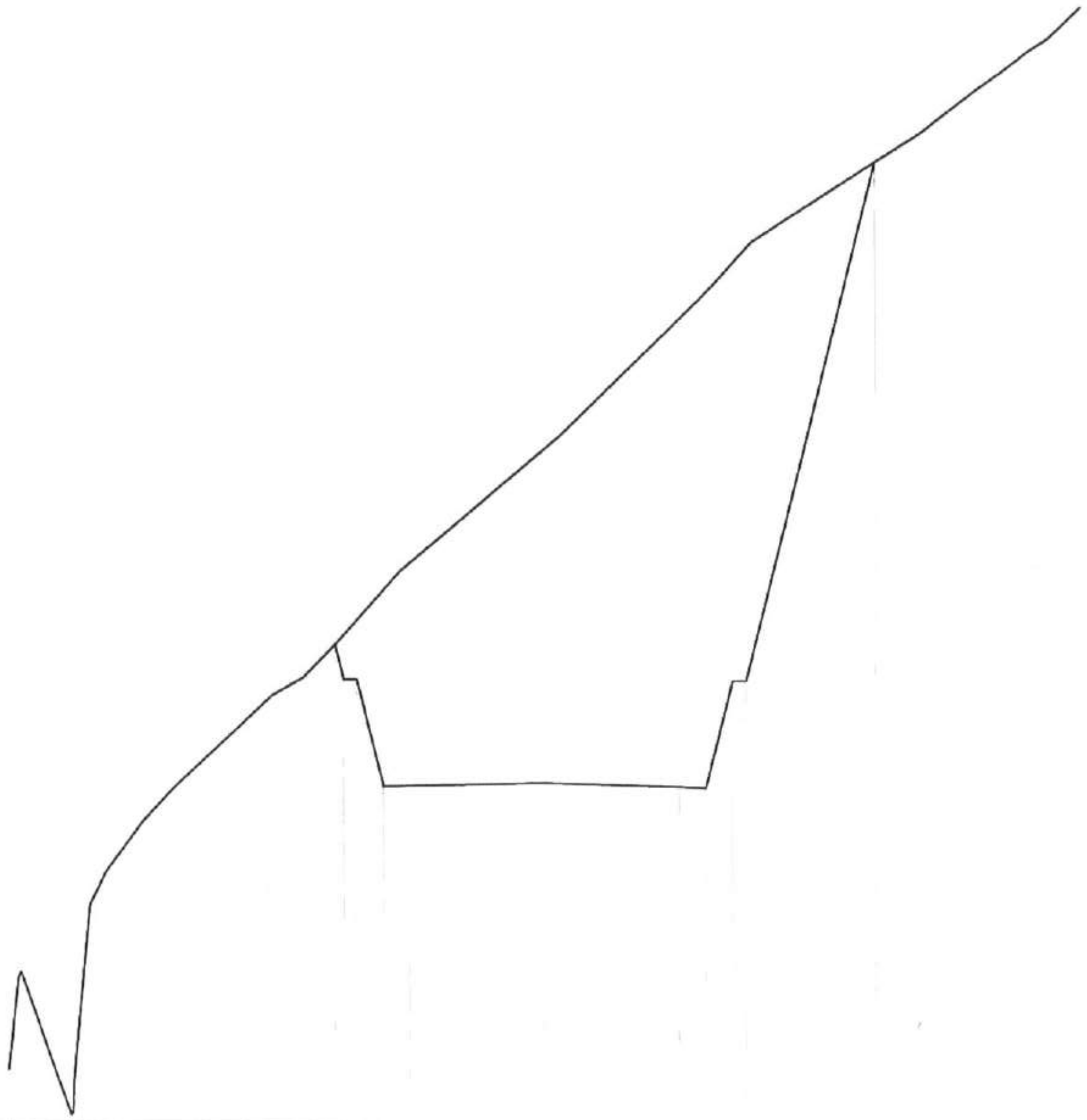
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =991.000

Design LEVELS	1007.498, 1006.058, 1006.083, 1006.149, 1006.024, 1005.999, 1009.999, 1010.000, 1026.572
Design WIDTH	0.360, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 4.143
Existing Ground LEVELS	991.319, 991.296, 992.282, 991.623, 992.732, 994.004, 993.317, 993.847, 994.464, 995.309, 995.858, 997.285, 999.283, 1000.470, 1000.152, 1001.784, 1003.537, 1006.884, 1007.524, 1010.172, 1010.973, 1011.099, 1011.903, 1014.024, 1015.963, 1016.761, 1018.431, 1021.051, 1025.021, 1025.333, 1028.093, 1029.520, 1029.744, 1032.760, 1033.993
Existing Ground OFFSET	-20.000, -19.460, -18.789, -18.433, -17.556, -16.602, -16.136, -15.563, -15.489, -14.913, -14.576, -13.837, -12.477, -11.166, -11.097, -10.090, -9.226, -7.367, -6.318, -3.878, -3.072, -2.887, -2.238, -0.168, 1.748, 2.341, 3.525, 5.351, 9.589, 9.952, 13.720, 15.564, 15.848, 17.970, 20.000

Chainage = 860.000



Level Datum =993.000

Design LEVELS	1011.057, 1009.772, 1009.771, 1005.771, 1005.796, 1005.921, 1005.796, 1005.771, 1009.771, 1009.772, 1029.013
Design WIDTH	0.321, 1.000, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 4.810
Existing Ground LEVELS	995.125, 998.769, 998.739, 993.454, 994.719, 1001.269, 1002.518, 1003.160, 1004.385, 1005.721, 1009.152, 1009.822, 1011.068, 1013.764, 1018.840, 1024.402, 1026.026, 1026.716, 1030.094, 1030.278, 1030.360, 1030.969, 1033.172, 1033.610, 1034.825
Existing Ground OFFSET	-20.000, [illegible], -19.521, -17.587, -17.353, -16.942, -16.346, -15.890, -14.982, -13.764, -10.160, -9.001, -7.811, -5.410, 0.594, 6.251, 7.695, 8.759, [illegible], [illegible], [illegible], 15.166, 18.039, 18.728, 20.000

Chainage = 880.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

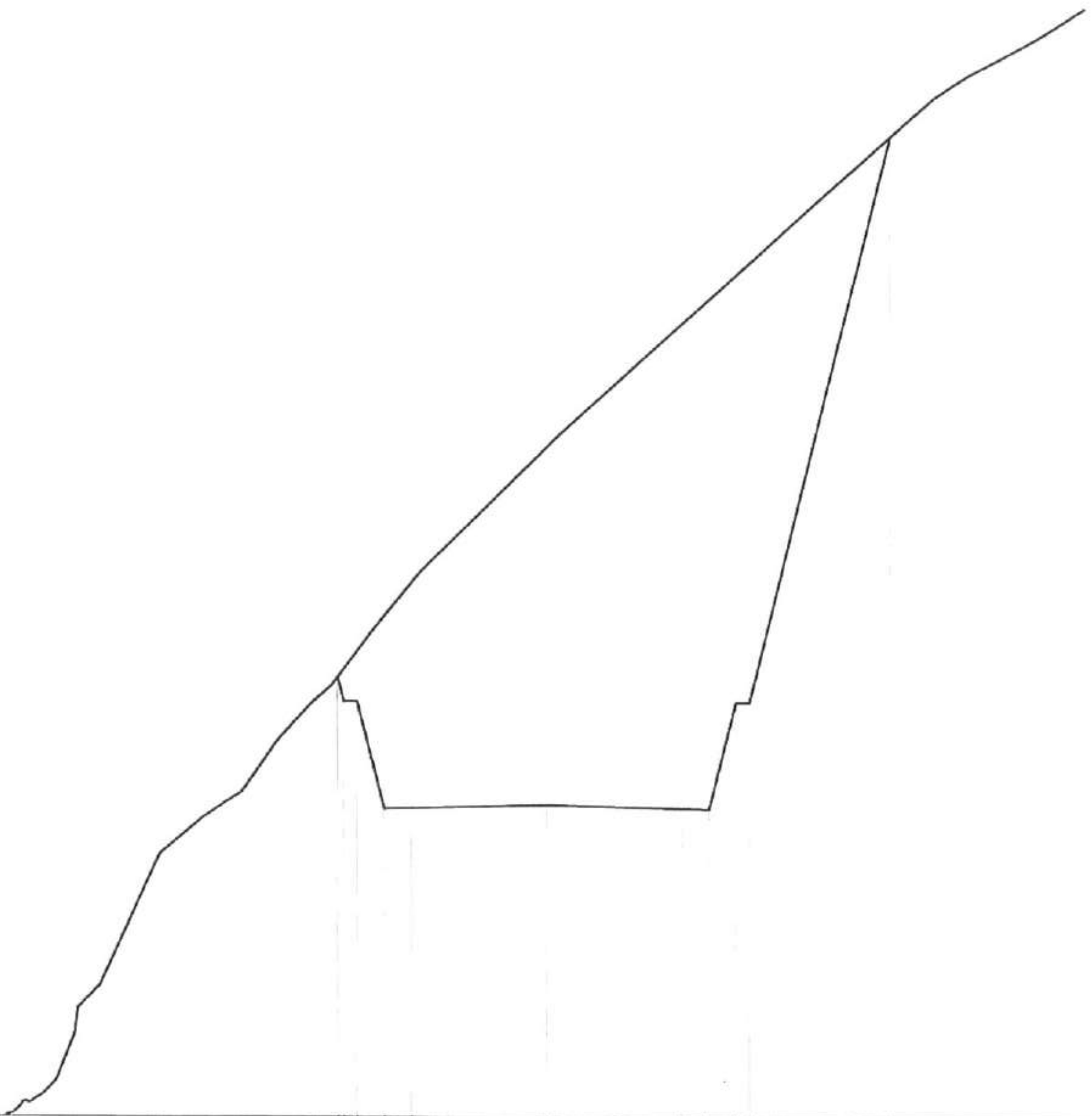
CLIENT:	PROJECT:	EPC CONTRACTOR:	DESIGN CONSULTANT:	DESIGN DIRECTOR
National Highways and Infrastructure Development Corporation PTI Building, 4 Parliament Street, Sansad Marg Area, New Delhi, Delhi 110001	Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244	BEIGH CONSTRUCTION COMPANY Pvt. Ltd. Plot no : 4, Wave mall, Bypass road, Narwal Jammu email : info@bccgroup.in	SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with EQUIPO DE PROSPECCIONES, S.A	R.K. MOZA

REV.	DATE	DESCRIPTION

DRAWN BY	: IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 860 & 880**

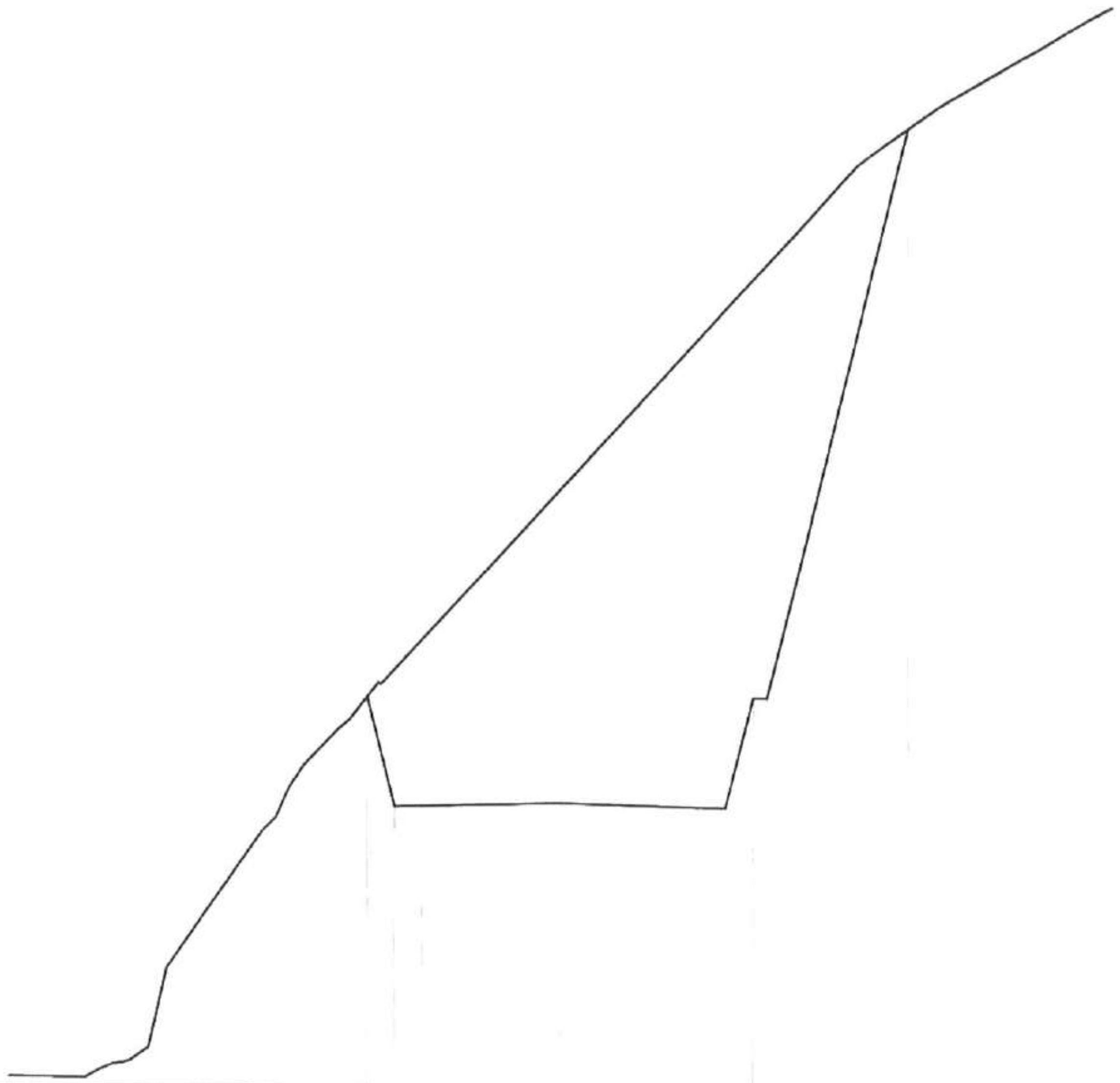
SCALE	1 2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =994.000

Design LEVELS	1010.458, 1009.544, 1009.543, 1005.543, 1005.568, 1005.693, 1005.568, 1005.543, 1009.543, 1009.544, 1030.566
Design WIDTH	0.226, 1.000, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 5.255
Existing Ground LEVELS	[illegible], 998.914, 1003.833, 1005.164, 1005.727, 1006.147, 1008.102, 1009.503, 1010.141, 1012.119, 1014.352, 1019.058, 1019.204, 1020.298, 1030.193, 1032.060, 1032.886, 1034.233, 1035.424
Existing Ground OFFSET	[illegible], -16.538, -14.308, -12.762, -11.947, -11.287, -9.934, -8.683, -7.967, -6.476, -4.701, 0.070, 0.192, 1.385, 12.342, 14.412, 15.655, 18.144, 20.000

Chainage = 900.000



Level Datum =995.000

Design LEVELS	1009.286, 1005.315, 1005.340, 1005.465, 1005.340, 1005.315, 1009.315, 1009.316, 1029.872
Design WIDTH	0.993, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 5.139
Existing Ground LEVELS	995.427, 995.404, 995.394, 995.666, 995.893, 995.972, 996.017, 996.284, 997.096, 999.389, 1004.390, 1004.876, 1005.902, 1006.204, 1006.843, 1008.103, 1008.442, 1009.810, 1009.755, 1026.017, 1028.537, 1029.039, 1030.707, 1034.335
Existing Ground OFFSET	-20.000, -17.900, -17.272, -16.801, -16.290, -15.829, -15.632, -15.247, -14.811, -14.295, -10.807, -10.312, -9.874, -9.587, -9.253, -8.055, -7.635, -6.594, -6.486, 8.505, 10.786, 11.471, 13.808, 20.000

Chainage = 920.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. ★ New Delhi

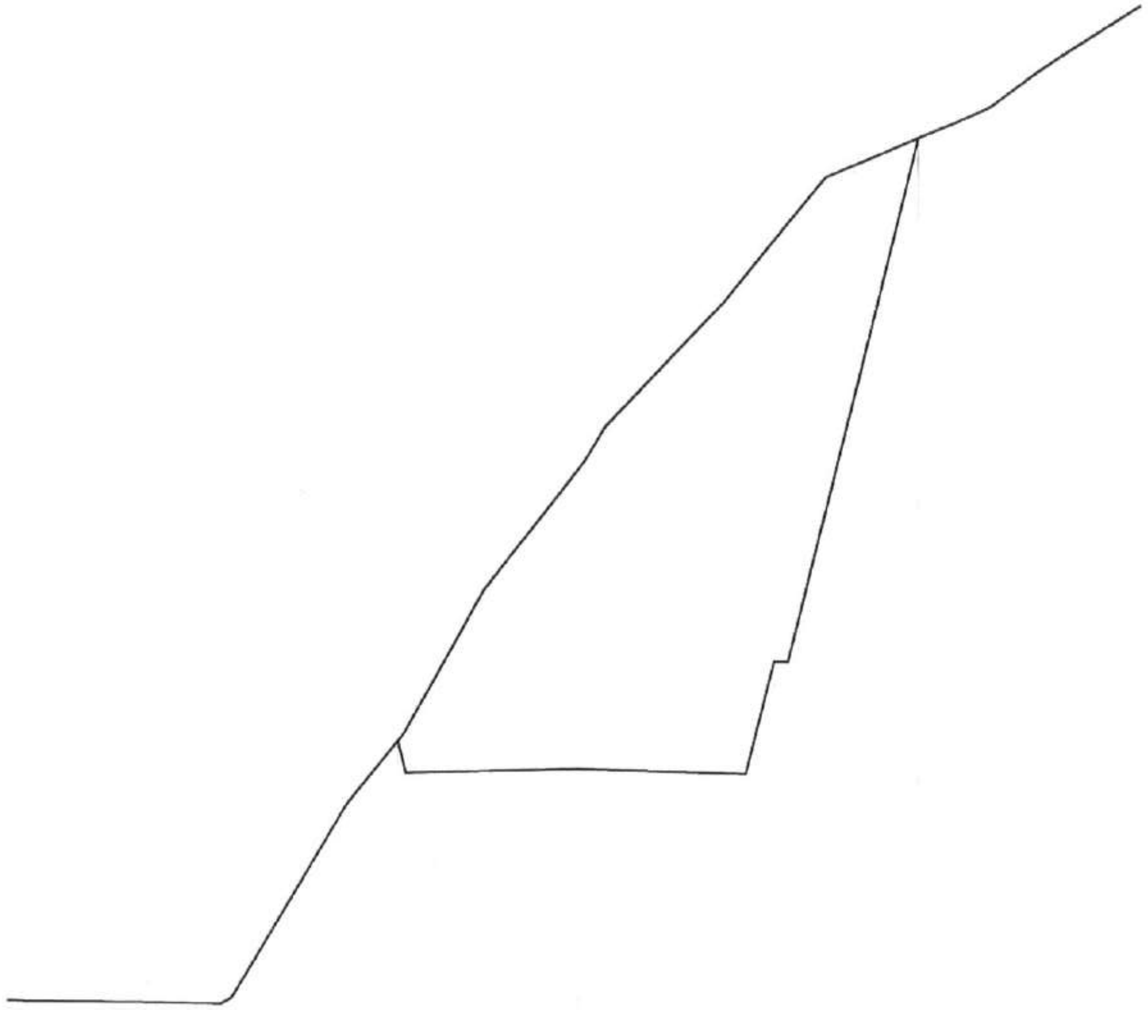
CLIENT:	National Highways and Infrastructure Development Corporation PTI Building, 4 Parliament Street, Sansad Marg Area, New Delhi, Delhi 110001
PROJECT:	Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244
EPC CONTRACTOR:	BEIGH CONSTRUCTION COMPANY Pvt. Ltd. Plot no : 4, Wave mall, Bypass road, Narwal Jammu email : info@bccgroup.in
DESIGN CONSULTANT:	SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with EQUIPO DE PROSPECCIONES, S.A
DESIGN DIRECTOR	R.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE	Cross Section Details Ch: 900 & 920
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	

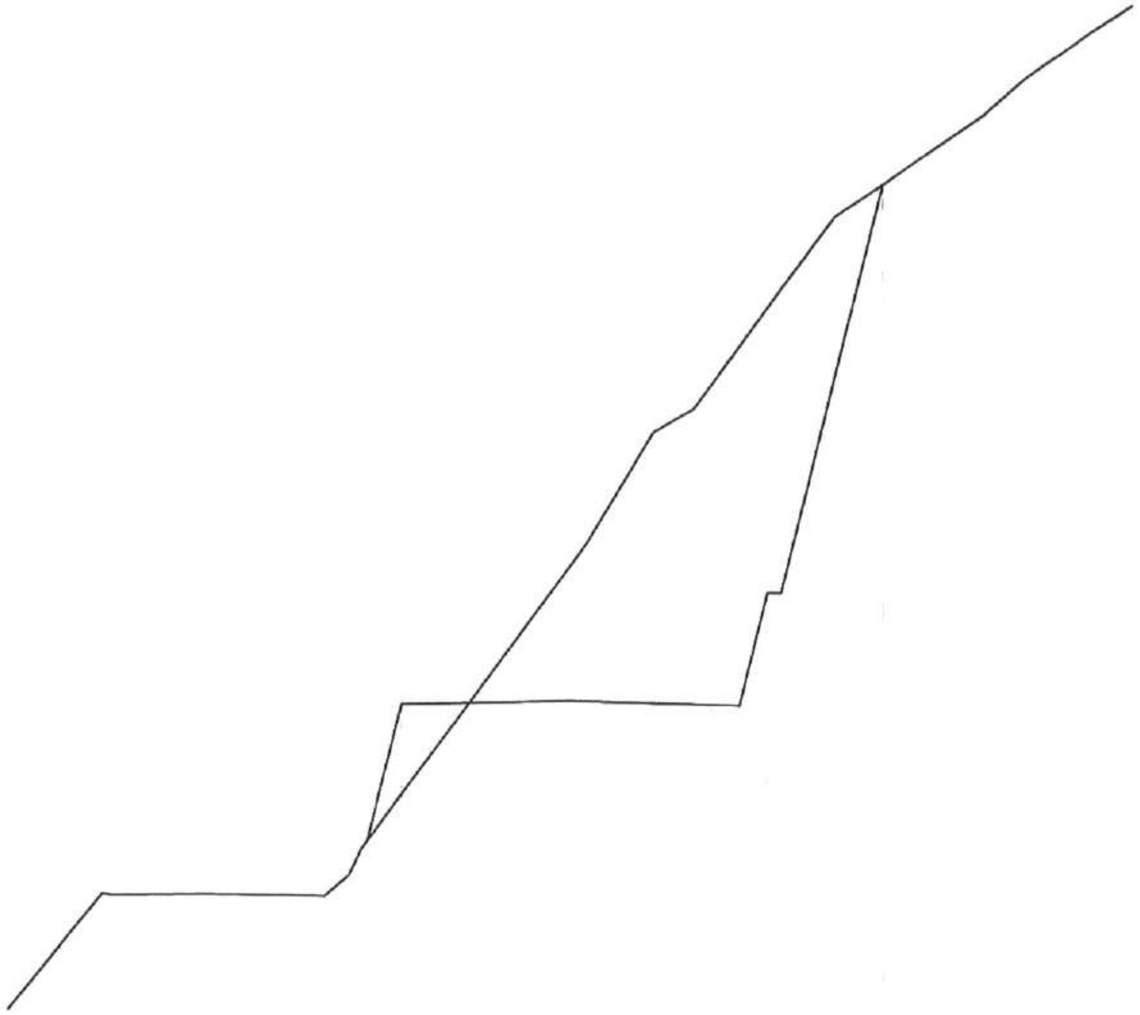
1 | 2 | 3 | 4 | 5 | 6 | 7 | 8



Level Datum =996.000

Design LEVELS	1006.203, 1005.087, 1005.112, 1005.237, 1005.112, 1005.087, 1009.087, 1009.088, 1027.583
Design WIDTH	0.279, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 4.624
Existing Ground LEVELS	996.934, 996.917, 996.908, 996.884, 996.882, 996.842, 997.058, 1003.900, 1006.464, 1011.602, 1016.046, 1016.436, 1017.374, 1018.047, 1021.725, 1026.193, 1028.679, 1029.952, 1032.327
Existing Ground OFFSET	-20.000, -19.665, -19.290, -15.866, -15.630, -12.516, -12.140, -8.091, -6.073, -3.230, 0.239, 0.506, 1.050, 1.687, 5.213, 8.868, 14.690, 16.350, 20.000

Chainage = 940.000



Level Datum =993.000

Design LEVELS	1000.005, 1004.859, 1004.884, 1005.009, 1004.884, 1004.859, 1008.859, 1008.860, 1023.269
Design WIDTH	1.214, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 3.602
Existing Ground LEVELS	993.941, 998.067, 998.021, 998.060, 998.058, 998.033, 998.020, 998.771, 999.720, 1005.084, 1010.557, 1014.520, 1015.346, 1019.700, 1022.128, 1023.292, 1024.318, 1025.698, 1027.027, 1028.547, 1029.640
Existing Ground OFFSET	-20.000, -16.638, -16.310, -12.912, -12.493, -9.091, -8.723, -7.865, -7.423, -3.481, 0.561, 2.954, 4.393, 7.595, 9.430, 11.135, 12.579, 14.631, 16.186, 18.303, 20.000

Chainage = 960.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. ★ New Delhi

CLIENT:
National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:
Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:
BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@beegroup.in

DESIGN CONSULTANT:
SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

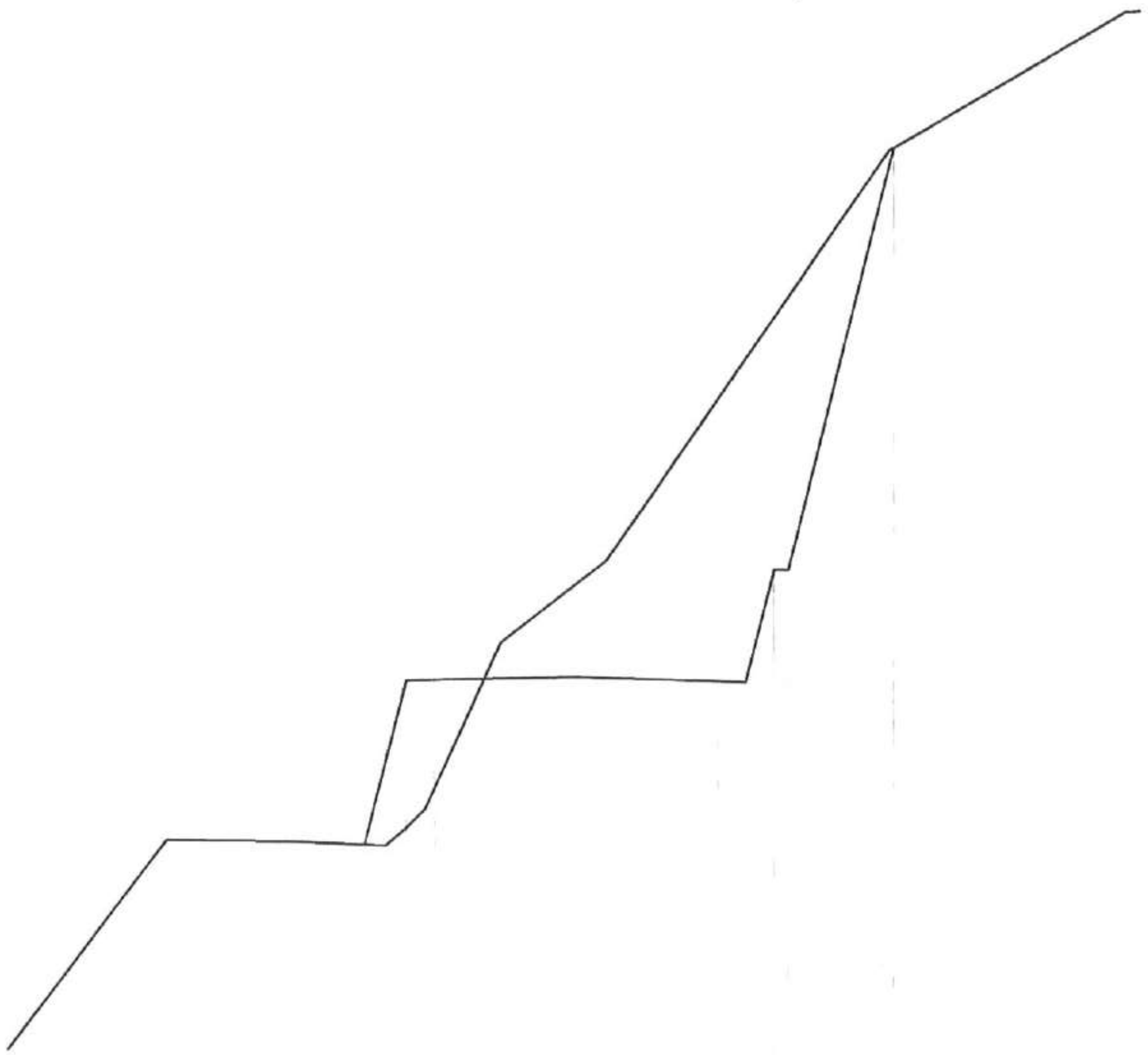
DESIGN DIRECTOR:
DR K.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 940 & 960**

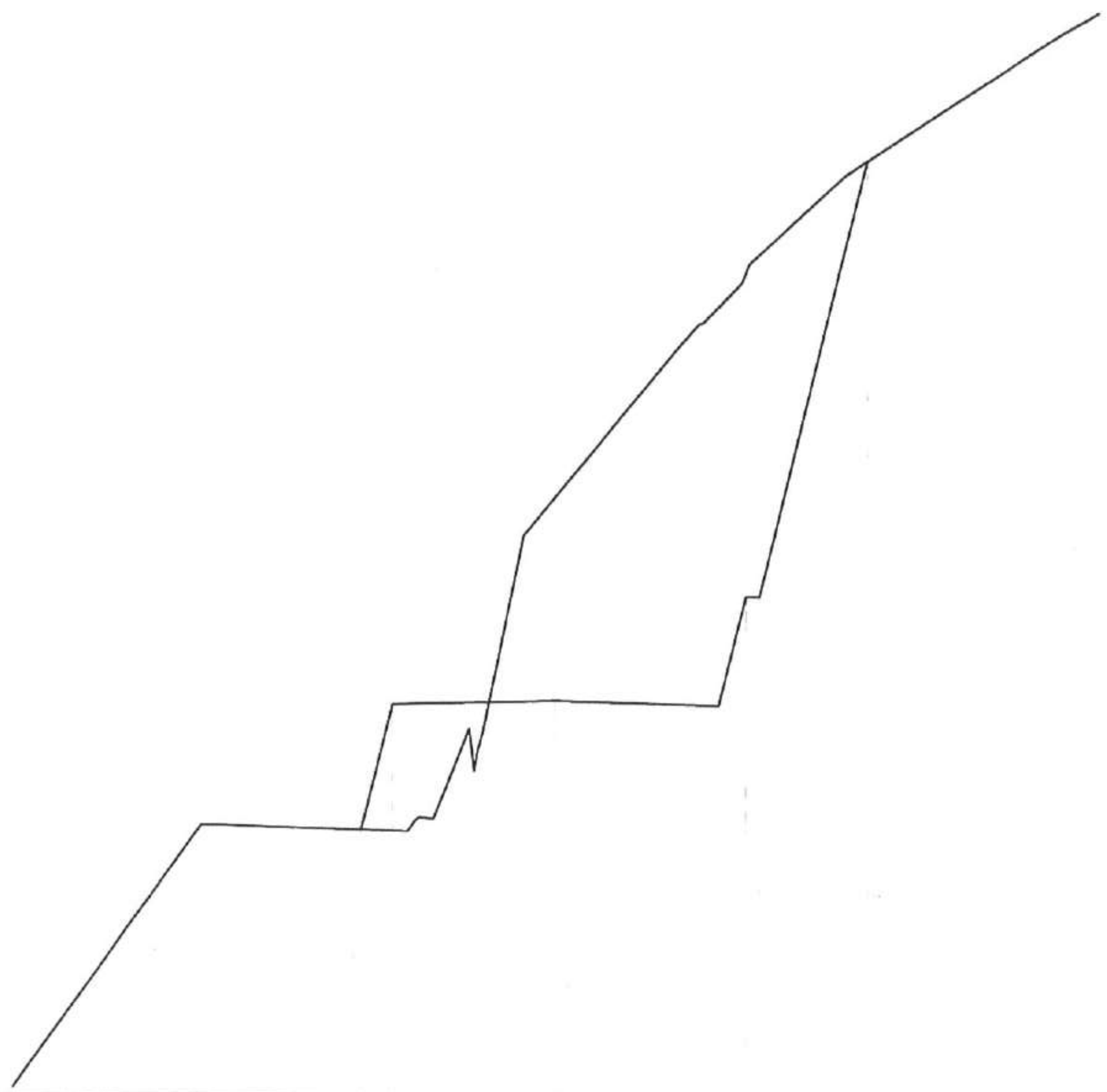
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =991.000

Design LEVELS	998.783, 1004.632, 1004.657, 1004.782, 1004.657, 1004.632, 1008.632, 1008.633, 1023.537
Design WIDTH	1.462, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 3.726
Existing Ground LEVELS	991.414, 998.913, 998.895, 998.898, 998.880, 998.877, 998.756, 999.295, 1000.021, 1005.996, 1008.889, 1023.440, 1028.422, 1028.418, 1028.452
Existing Ground OFFSET	-20.000, -14.430, -14.305, -14.020, -10.517, -10.153, -6.704, -6.089, -5.351, -2.662, 1.043, 11.062, 19.461, 19.614, 20.000

Chainage = 980.000



Level Datum =990.000

Design LEVELS	999.899, 1004.543, 1004.568, 1004.693, 1004.568, 1004.543, 1008.543, 1008.544, 1024.496
Design WIDTH	1.161, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 3.988
Existing Ground LEVELS	990.367, 1000.058, 1000.052, 999.965, 999.862, 999.850, 1000.382, 1000.314, 1003.641, 1002.892, 1003.543, 1010.005, 1010.728, 1017.564, 1018.478, 1018.531, 1020.008, 1020.682, 1023.928, 1024.396, 1026.135, 1028.374, 1029.578, 1029.992
Existing Ground OFFSET	-20.000, -13.046, -12.356, -9.597, -5.809, -5.449, -5.032, -4.510, -3.186, -2.855, -2.677, -1.317, -1.181, 4.471, 5.287, 5.457, 6.880, 7.128, 10.675, 11.337, 13.978, 17.406, 19.301, 20.000

Chainage = 1000.000

GOOD FOR CONSTRUCTION

Subterra Engineering Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd, in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

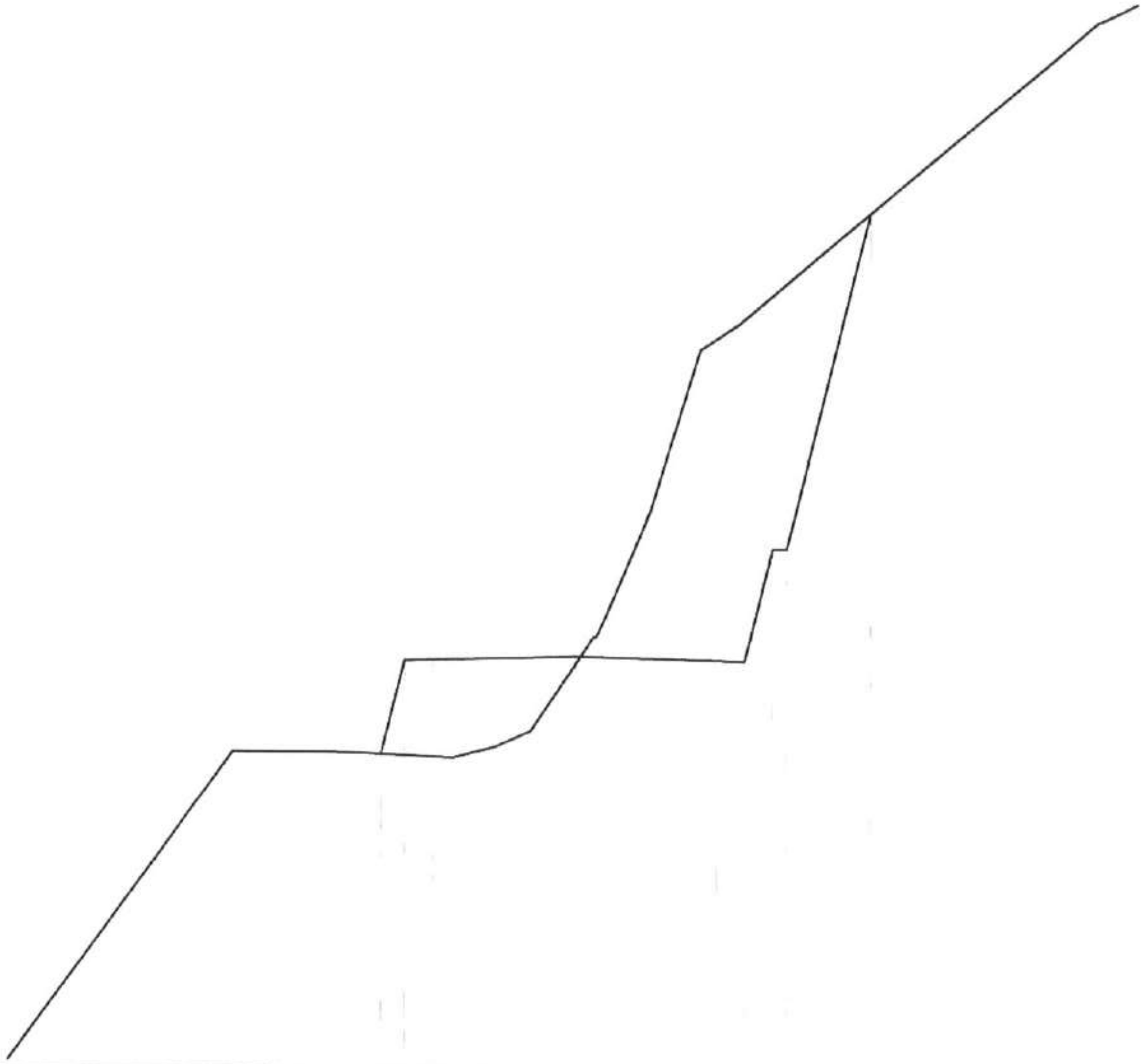
R.K MOZA

REV	DATE	DESCRIPTION

DRAWN BY	: IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	: M.DAR

TITLE: **Cross Section Details Ch: 980 & 1000**

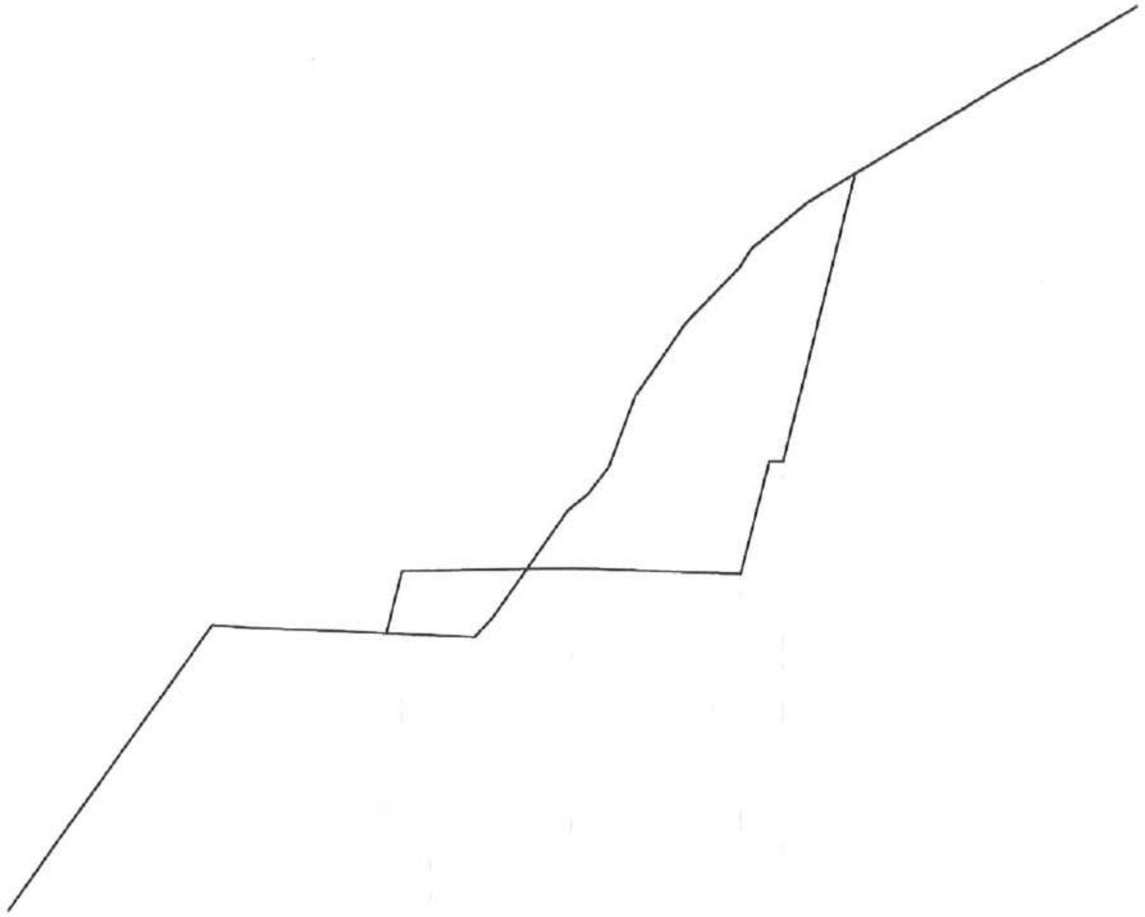
SCALE	1 2500
SHEET SIZE	A3
DRG NO	
REVISION	



el Datum =990.000

sign LEVELS	1001.336, 1004.695, 1004.720, 1004.845, 1004.720, 1004.695, 1008.695, 1008.696, 1020.609
sign WIDTH	0.840, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 2.978
sting Ground LEVELS	990.355, 994.227, 1001.415, 1001.399, 1001.396, 1001.372, 1001.227, 1001.611, 1002.178, 1005.539, 1006.162, 1008.200, 1009.610, 1010.166, 1015.750, 1016.654, 1027.466, 1027.493, 1028.142
sting Ground OFFSET	-20.000, -17.215, -12.076, -11.573, -8.639, -7.666, -4.303, -2.827, -1.575, 0.639, 1.019, 1.884, 2.491, 2.707, 4.441, 5.797, 18.594, 18.716, 20.000

Chainage = 1020.000



Level Datum =992.000

Design LEVELS	1002.864, 1005.090, 1005.115, 1005.240, 1005.115, 1005.090, 1009.090, 1009.091, 1019.271
Design WIDTH	0.557, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 2.545
Existing Ground LEVELS	992.879, 1003.092, 1003.041, 1003.023, 1002.928, 1002.910, 1002.881, 1002.758, 1003.461, 1007.296, 1007.885, 1008.846, 1011.354, 1013.945, 1015.906, 1016.595, 1018.241, 1021.392, 1025.220
Existing Ground OFFSET	-20.000, -12.743, -11.831, -11.654, -8.480, -7.876, -7.075, -3.428, -2.787, -0.135, 0.584, 1.306, 2.240, 4.023, 5.914, 6.356, 8.351, 13.530, 20.000

Chainage = 1040.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

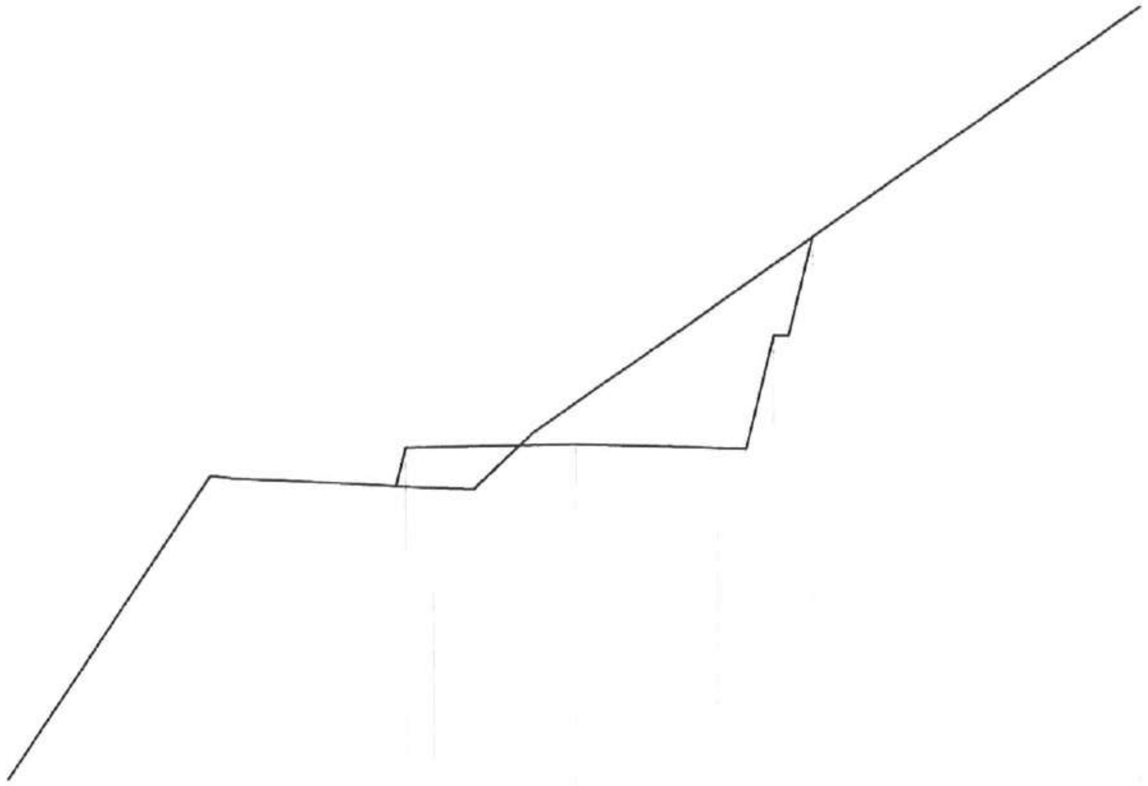
K MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 1020 & 1040**

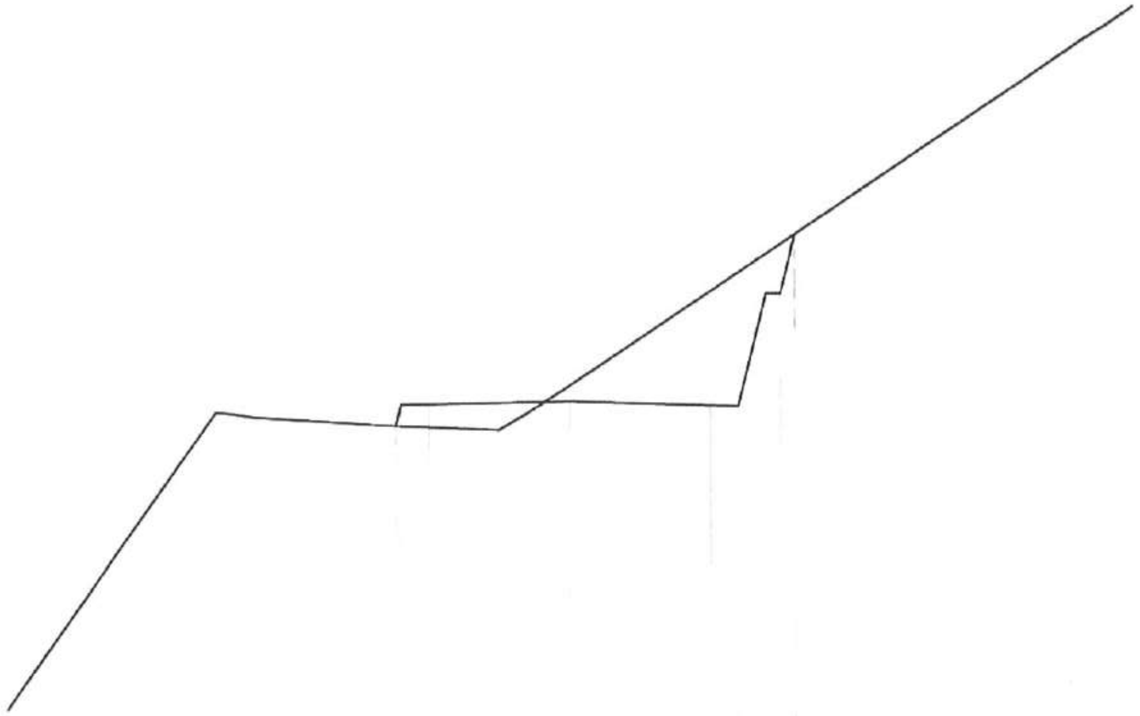
SCALE	1 2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =993.000

Design LEVELS	1004.359, 1005.727, 1005.752, 1005.877, 1005.752, 1005.727, 1009.727, 1009.728, 1013.205
Design WIDTH	0.342, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 0.869
Existing Ground LEVELS	993.878, 1004.687, 1004.688, 1004.610, 1004.554, 1004.440, 1004.338, 1004.245, 1006.283, 1021.367
Existing Ground OFFSET	-20.000, -12.855, -12.669, -12.016, -10.375, -7.851, -5.964, -3.607, -1.493, 20.000

Chainage = 1060.000



Level Datum =995.000

Design LEVELS	1005.715, 1006.467, 1006.492, 1006.617, 1006.492, 1006.467, 1010.467, 1010.468, 1012.562
Design WIDTH	0.188, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 0.523
Existing Ground LEVELS	995.574, 1004.464, 1006.149, 1006.115, 1005.988, 1005.978, 1005.884, 1005.745, 1005.724, 1005.585, 1006.040, 1006.245, 1007.138, 1020.594
Existing Ground OFFSET	-20.000, -13.763, -12.551, -12.024, -11.183, -10.970, -9.325, -6.860, -6.446, -2.523, -1.745, -1.422, -0.065, 20.000

Chainage = 1080.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:
National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:
Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:
BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:
SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

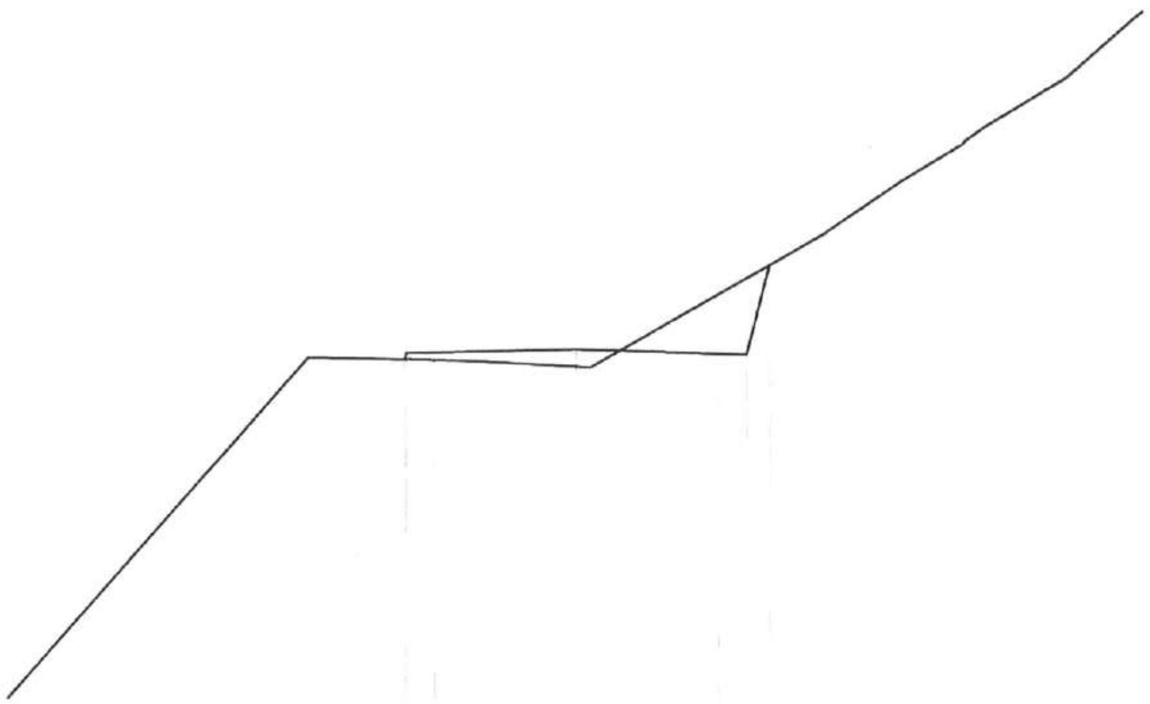
DESIGN DIRECTOR:
K.K MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	: MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 1060 & 1080**

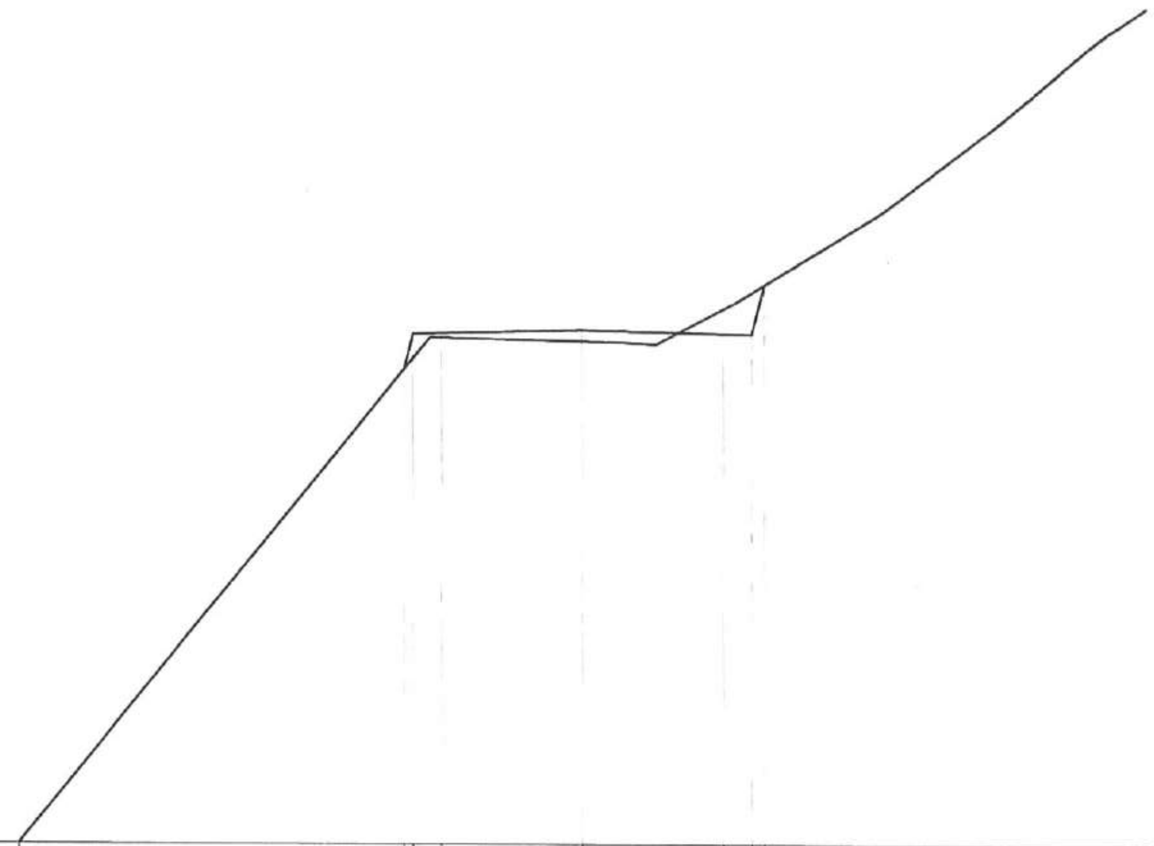
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =994.000

Design LEVELS	1007.014	1007.251	1007.276	1007.401	1007.276	1007.251	1010.412										
Design WIDTH	0.059	1.000	5.000	5.000	1.000	0.790											
Existing Ground LEVELS	994.917	1007.061	1007.061	1007.048	1006.974	1006.974	1006.769	1006.853	1011.483	1011.670	1013.370	1014.706	1014.857	1015.360	1017.053	1019.157	1019.424
Existing Ground OFFSET	-20.000	-9.472	-9.337	-8.097	-3.667	-3.645	0.492	0.651	8.638	8.919	11.416	13.593	13.737	14.418	17.273	19.661	20.000

Chainage = 1100.000



Level Datum =990.000

Design LEVELS	1006.880	1008.121	1008.146	1008.271	1008.146	1008.121	1009.854						
Design WIDTH	0.310	1.000	5.000	5.000	1.000	0.433							
Existing Ground LEVELS	990.019	1007.989	1007.926	1007.891	1007.836	1007.774	1009.266	1012.339	1012.472	1013.836	1015.329	1018.695	1019.607
Existing Ground OFFSET	-20.000	-5.409	-2.541	-0.968	1.410	2.618	5.467	10.518	10.708	12.514	14.508	18.608	20.000

Chainage = 1120.000

GOOD FOR CONSTRUCTION

Subterra Engineering Pvt. Ltd. ★ New Delhi

CLIENT:
National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:
Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:
BEIGH CONSTRUCTION COMPANY Pvt. Ltd,
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:
SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

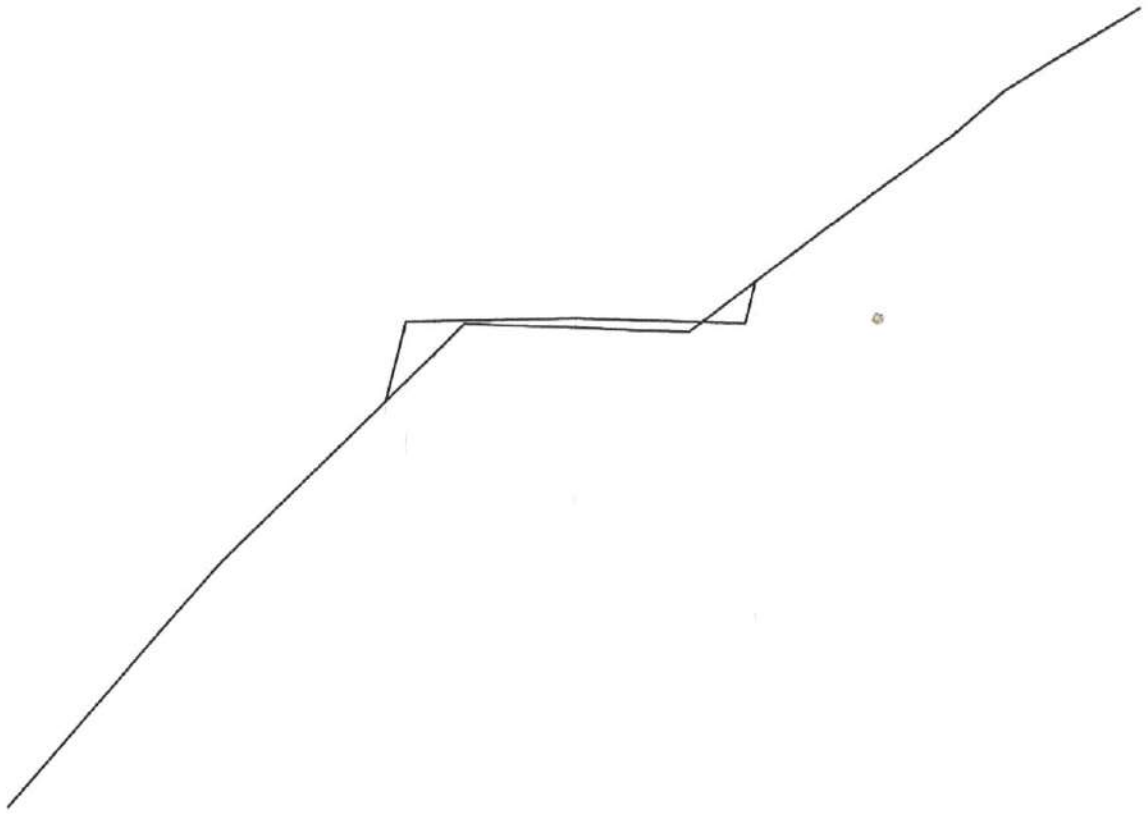
DESIGN DIRECTOR:
R.K. MOZA

REV.	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 1100 & 1120**

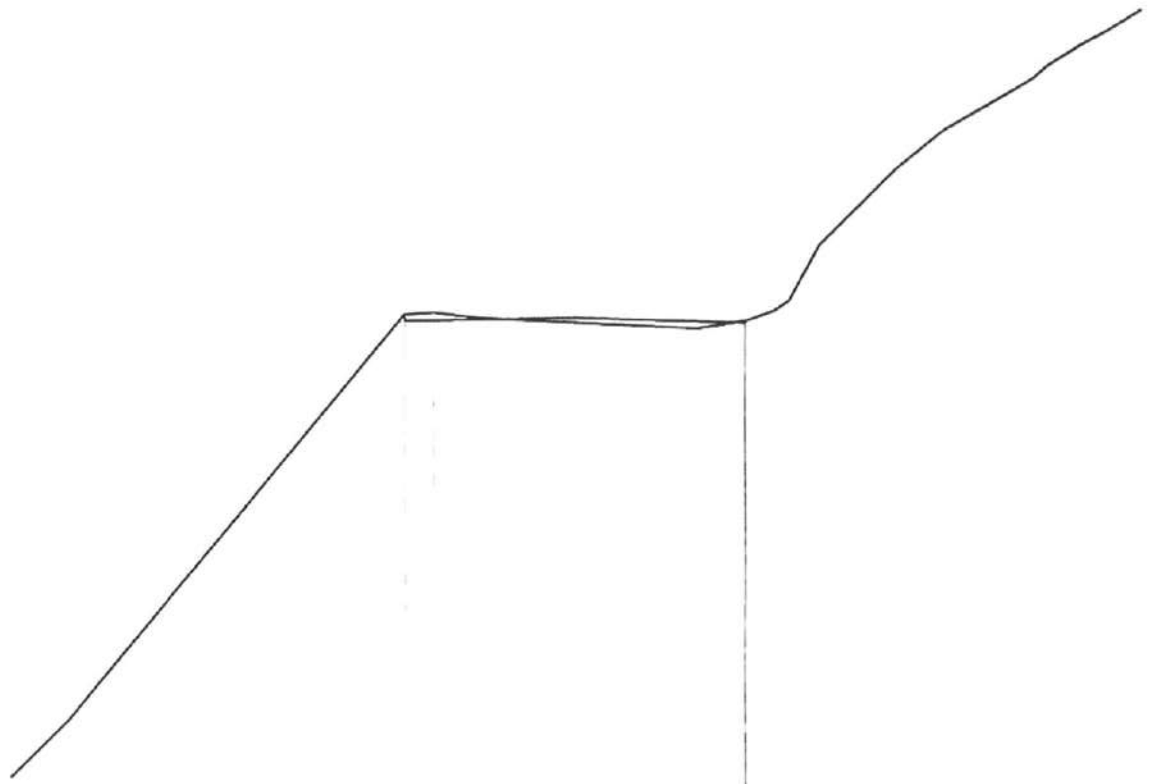
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =991.000

Design LEVELS	1006.259	1009.076	1009.101	1009.226	1009.101	1009.076	1010.553					
Design WIDTH	0.704	1.000	5.000	5.000	1.000	0.369						
Existing Ground LEVELS	991.757	1000.436	1009.017	1008.955	1008.899	1008.817	1008.774	1012.543	1012.631	1015.746	1017.319	1020.255
Existing Ground OFFSET	-20.000	-12.579	-3.923	-2.448	-0.032	2.227	4.014	9.004	9.156	13.396	15.226	20.000

Chainage = 1140.000



Level Datum =993.000

Design LEVELS	1010.328	1010.117	1010.142	1010.267	1010.142	1010.117	1010.193											
Design WIDTH	0.053	1.000	5.000	5.000	1.000	0.019												
Existing Ground LEVELS	993.855	995.847	1010.344	1010.420	1010.259	1010.182	1010.093	1010.027	1009.911	1010.197	1010.541	1010.914	1012.886	1015.591	1016.936	1018.803	1019.268	1021.197
Existing Ground OFFSET	-20.000	-17.989	-6.040	-4.998	-3.679	-2.236	-0.175	1.332	4.319	6.042	7.018	7.571	8.670	11.401	13.081	16.258	16.805	20.000

Chainage = 1160.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

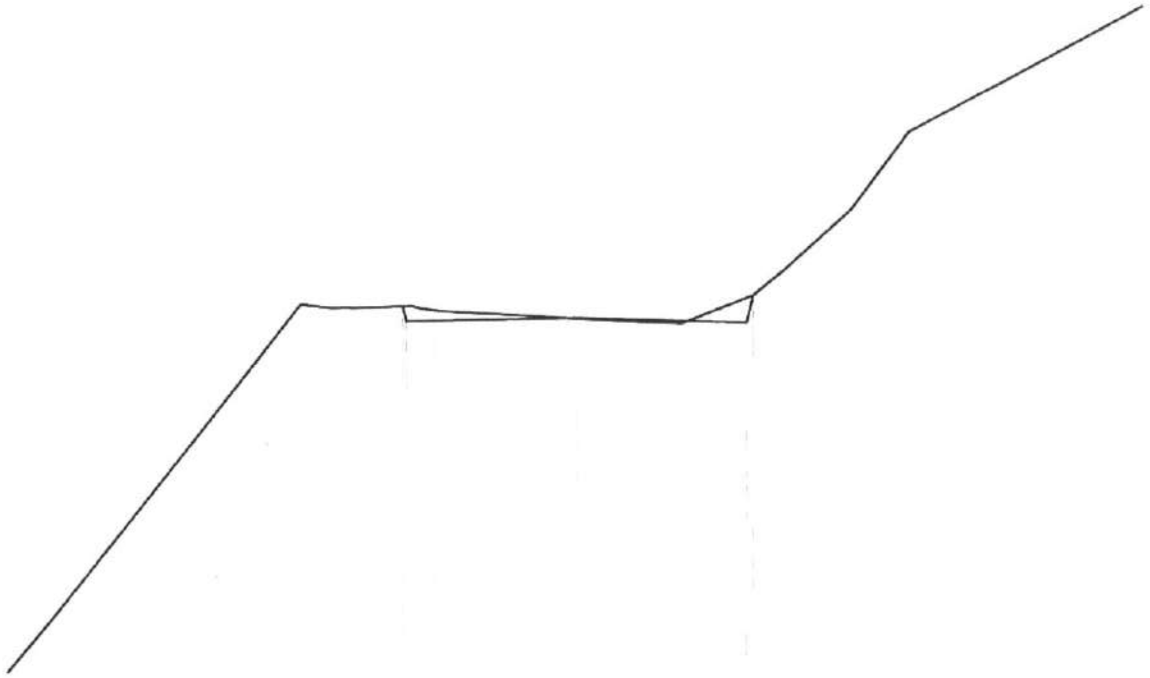
DR. K.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 1140 & 1160**

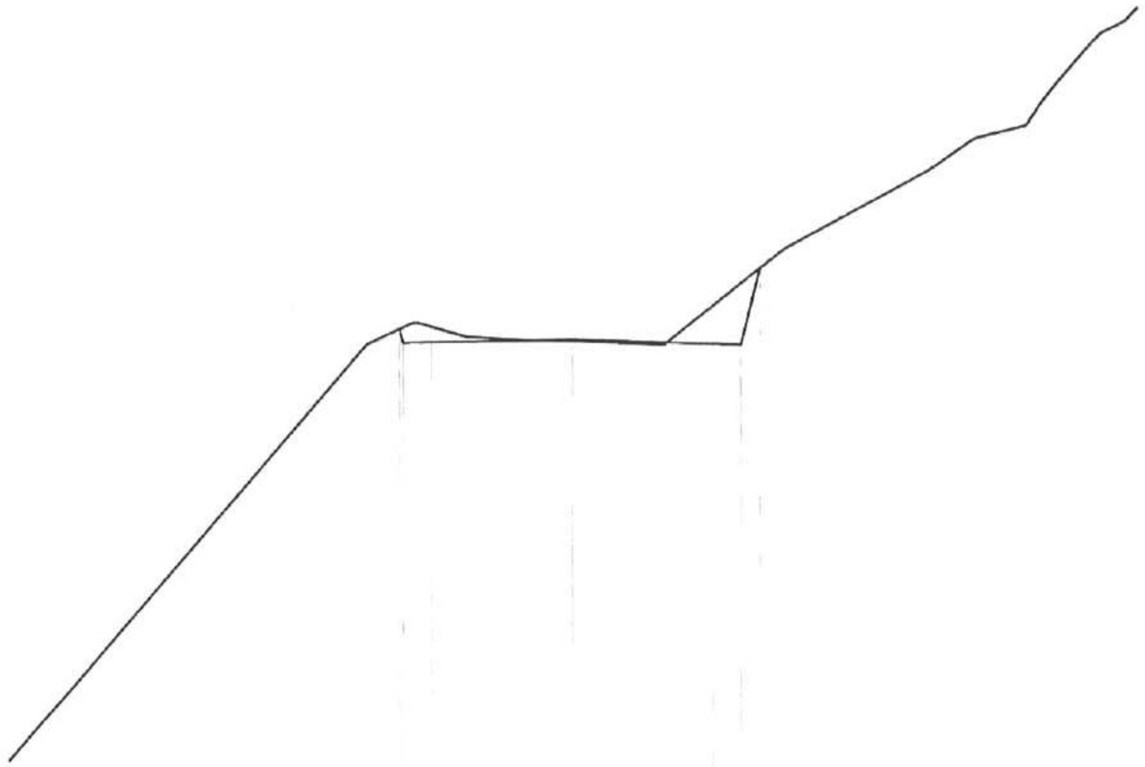
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =998.000

Design LEVELS	1011.775, 1011.244, 1011.269, 1011.394, 1011.269, 1011.244, 1012.228
Design WIDTH	0.133, 1.000, 5.000, 5.000, 1.000, 0.246
Existing Ground LEVELS	998.668, 1000.560, 1011.648, 1011.819, 1011.711, 1011.726, 1011.713, 1011.787, 1011.696, 1011.610, 1011.572, 1011.499, 1011.367, 1011.265, 1011.210, 1012.112, 1012.224, 1013.107, 1015.250, 1018.030, 1020.425, 1022.499
Existing Ground OFFSET	-20.000, -18.455, -9.843, -9.664, -8.688, -7.998, -7.892, -5.806, -5.465, -4.787, -4.018, -2.557, -0.179, 2.104, 3.719, 5.956, 6.242, 7.312, 9.675, 11.725, 16.199, 20.000

Chainage = 1180.000



Level Datum =997.000

Design LEVELS	1012.943, 1012.457, 1012.482, 1012.607, 1012.482, 1012.457, 1015.167
Design WIDTH	0.122, 1.000, 5.000, 5.000, 1.000, 0.678
Existing Ground LEVELS	997.516, 999.496, 1012.389, 1013.163, 1013.174, 1012.676, 1012.569, 1012.568, 1012.486, 1012.438, 1015.869, 1018.639, 1019.784, 1020.258, 1021.008, 1021.781, 1023.523, 1023.922, 1024.407
Existing Ground OFFSET	-20.000, -18.283, -7.279, -5.664, -5.493, -3.761, -1.608, -0.388, 2.003, 3.252, 7.559, 12.609, 14.269, 16.075, 16.582, 17.204, 18.762, 19.519, 20.000

Chainage = 1200.000

GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in
association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

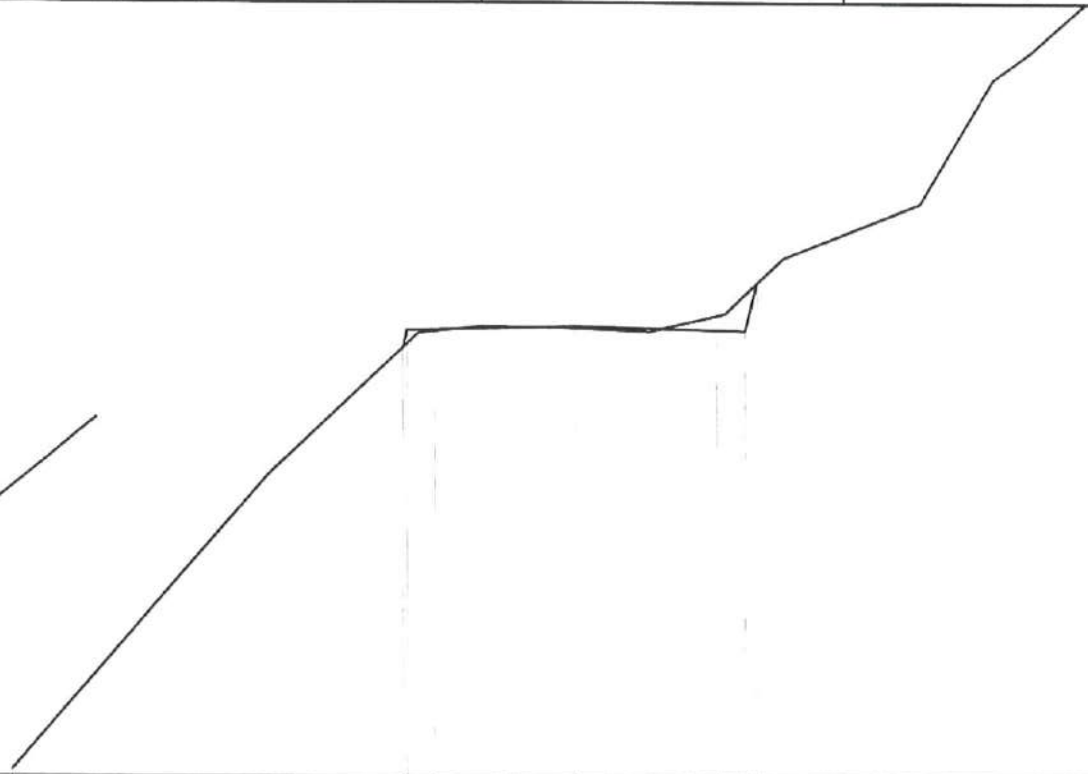
DR. K.K. MOZA

REV	DATE	DESCRIPTION

DRAWN BY	: IQRA QAYOOM
DESIGNED BY	: DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	: M.DAR

TITLE: **Cross Section Details Ch: 1180 & 1200**

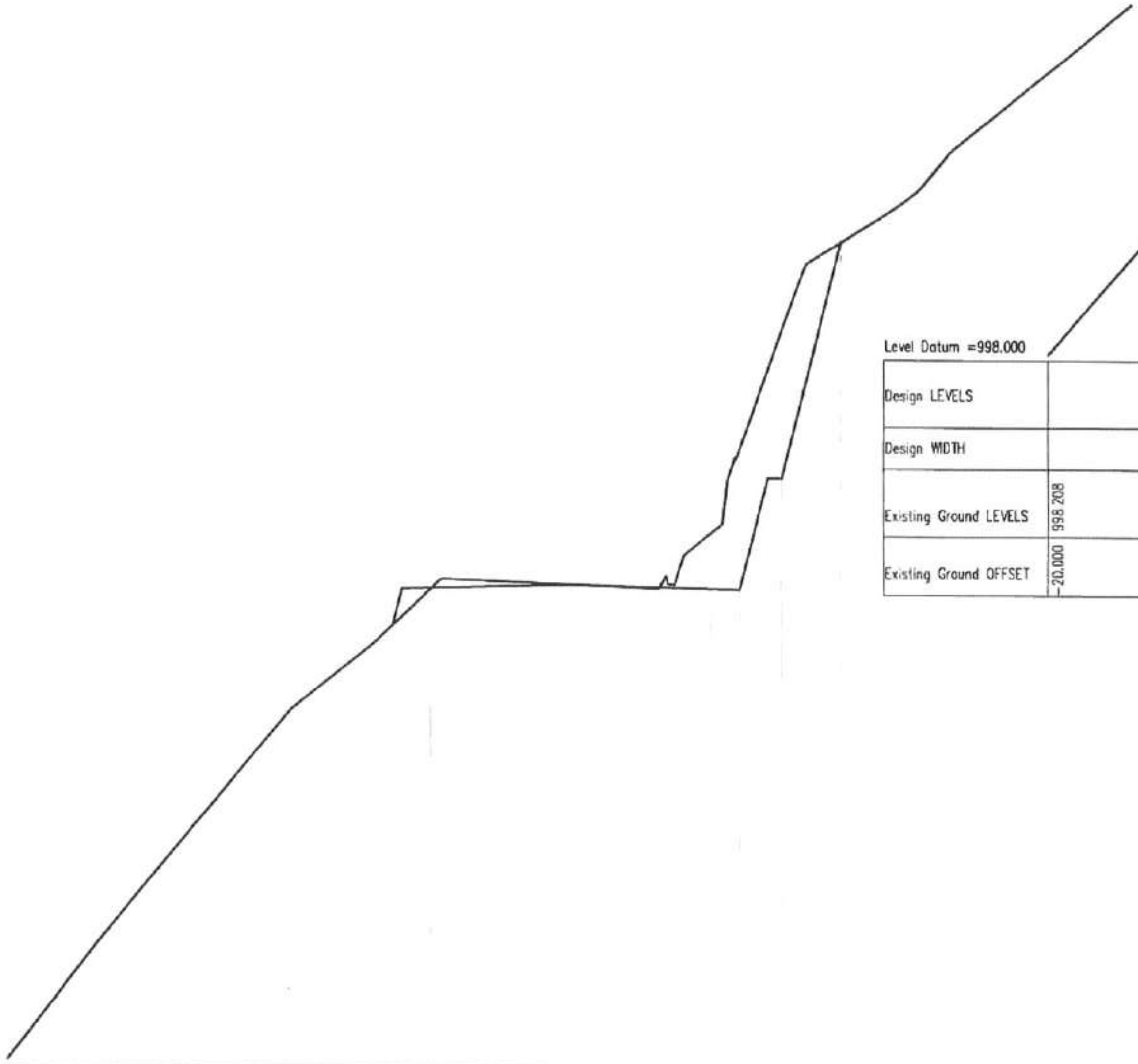
SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	



Level Datum =998.000

Row	Values
Design LEVELS	1013.128, 1013.756, 1013.781, 1013.906, 1013.781, 1013.756, 1015.438
Design WIDTH	0.157, 1.000, 5.000, 5.000, 1.000, 0.421
Existing Ground LEVELS	998.208, 1008.698, 1013.656, 1013.889, 1013.881, 1013.863, 1013.769, 1013.732, 1014.353, 1016.332, 1018.277, 1018.433, 1022.733, 1023.672, 1027.166
Existing Ground OFFSET	-20.000, -10.903, -5.592, -3.443, -1.376, -0.588, 1.784, 2.643, 5.281, 7.360, 12.211, 12.332, 14.842, 16.133, 20.000

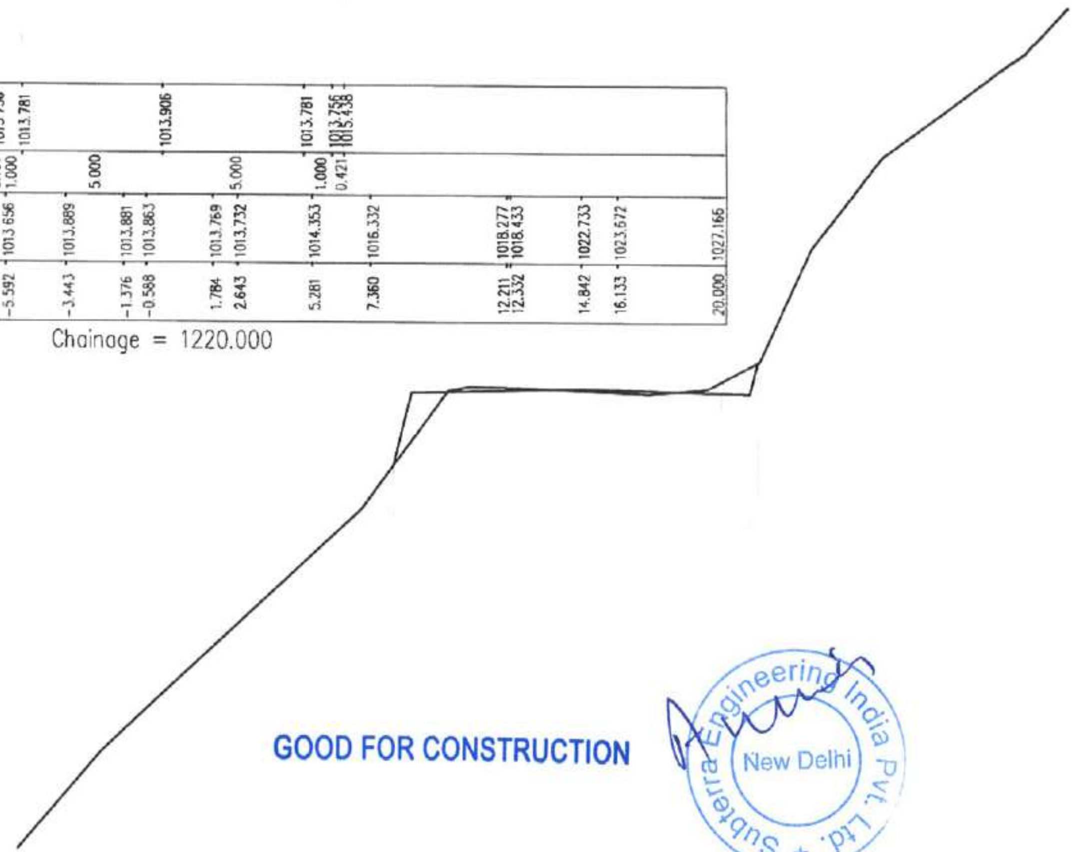
Chainage = 1220.000



Level Datum =999.000

Row	Values
Design LEVELS	1014.869, 1016.189, 1016.214, 1016.339, 1016.214, 1016.189, 1020.189, 1020.190, 1028.624
Design WIDTH	0.330, 1.000, 5.000, 5.000, 1.000, 1.000, 0.500, 2.109
Existing Ground LEVELS	999.332, 1003.806, 1011.843, 1014.269, 1016.508, 1016.538, 1016.354, 1016.214, 1016.374, 1016.355, 1017.408, 1018.538, 1020.127, 1020.844, 1027.185, 1027.872, 1029.867, 1030.443, 1031.835, 1033.508, 1037.085
Existing Ground OFFSET	-20.000, -16.531, -9.944, -6.345, -4.649, -4.505, -0.000, 3.129, 3.451, 3.696, 4.023, 5.387, [illegible], [illegible], 8.105, 8.405, 11.600, 12.351, 13.481, 15.570, 20.000

Chainage = 1256.055



GOOD FOR CONSTRUCTION

Subterra Engineering India Pvt. Ltd. ★ New Delhi

Level Datum =998.000

Row	Values
Design LEVELS	1012.511, 1015.105, 1015.130, 1015.255, 1015.130, 1015.105, 1016.212
Design WIDTH	0.649, 1.000, 5.000, 5.000, 1.000, 0.277
Existing Ground LEVELS	998.900, 1002.383, 1010.978, 1015.185, 1015.316, 1015.267, 1015.223, 1015.189, 1015.081, 1015.261, 1016.250, 1020.298, 1023.533, 1027.237, 1027.612, 1028.463, 1031.799
Existing Ground OFFSET	-20.000, -16.979, -7.772, -4.688, -3.906, -1.838, -0.788, -0.022, 2.437, 4.508, 6.349, 8.203, 10.711, 15.733, 16.090, 16.898, 20.000

Chainage = 1240.000

CLIENT:

National Highways and Infrastructure Development Corporation
PTI Building, 4 Parliament Street, Sansad Marg Area,
New Delhi, Delhi 110001

PROJECT:

Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244

EPC CONTRACTOR:

BEIGH CONSTRUCTION COMPANY Pvt. Ltd.
Plot no : 4, Wave mall, Bypass road, Narwal
Jammu email : info@bccgroup.in

DESIGN CONSULTANT:

SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with
EQUIPO DE PROSPECCIONES, S.A

DESIGN DIRECTOR:

K. MOZA

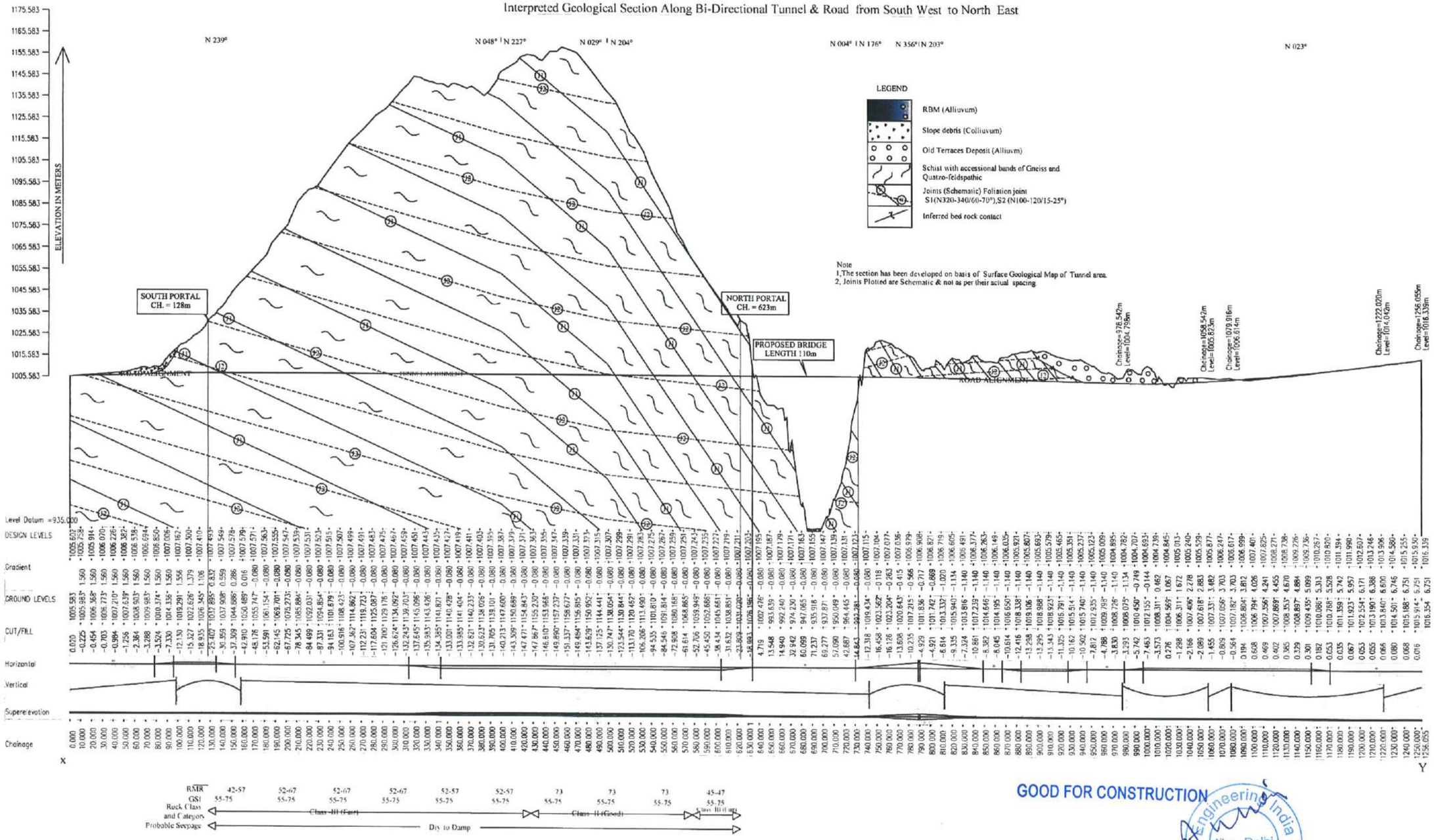
REV	DATE	DESCRIPTION

DRAWN BY	IQRA QAYOOM
DESIGNED BY	DANISH ALTAF
CHECKED BY	MEHAK MAQBOOL
RECOMMENDED BY	: M.DAR
APPROVED BY	M.DAR

TITLE: **Cross Section Details Ch: 1220,1240 & 1256.055**

SCALE	1:2500
SHEET SIZE	A3
DRG NO	
REVISION	

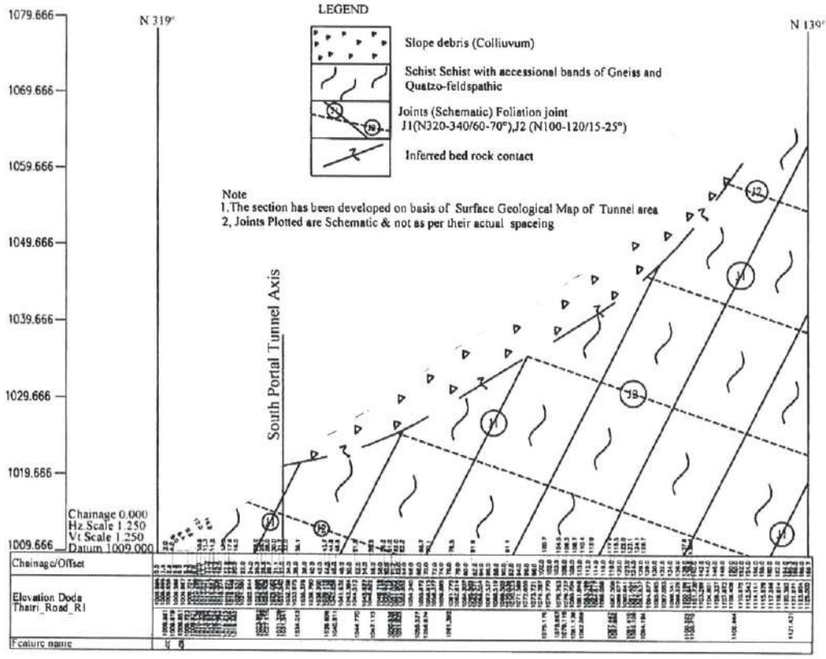
Interpreted Geological Section Along Bi-Directional Tunnel & Road from South West to North East



GOOD FOR CONSTRUCTION

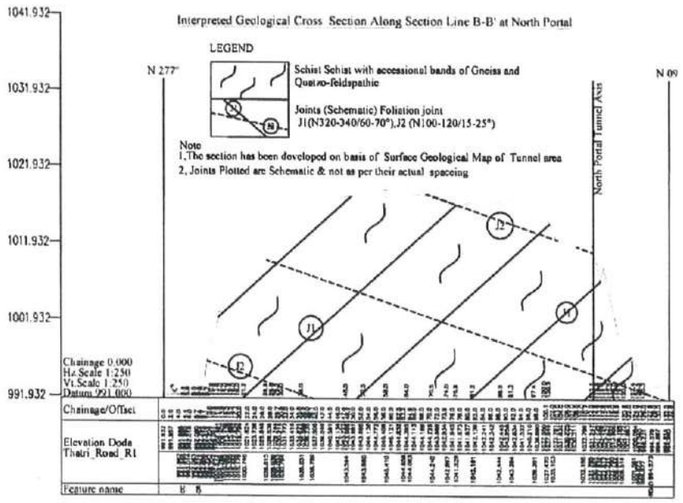
Subterra Engineering India Pvt. Ltd. New Delhi

CLIENT:	National Highways and Infrastructure Development Corporation PTI Building, 4 Parliament Street, Sansad Marg Area, New Delhi, Delhi 110001
PROJECT:	Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244
EPC CONTRACTOR:	BEIGH CONSTRUCTION COMPANY Pvt. Ltd. Plot no : 4, Wave mall, Bypass road, Narwal Jammu email : info@beeghgroup.in
DESIGN CONSULTANT:	SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with EQUIPO DE PROSPECCIONES, S.A.
DESIGN DIRECTOR:	[illegible] MOZA
REV / DATE / DESCRIPTION	
DRAWN BY	AMAAN
DESIGNED BY	FARHATUN NISA
CHECKED BY	JAVAID
RECOMMENDED BY	: FARHATUN NISA
APPROVED BY	JAVAID
TITLE	Interpreted Geological Section Along Bi-Directional Tunnel & Road from South West to North East
SCALE	1:3500
SHEET SIZE	A3
DRG NO	
REVISION	



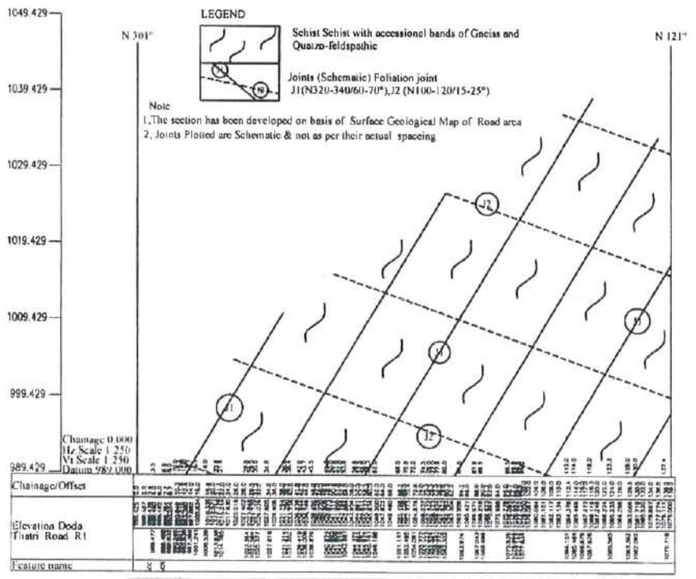
RMR Basic	52-56
GSI	55-75
Rock Class and Category	Class -III (Fair)
Probable Seepage	Dry to Damp

Interpreted Geological Cross Section Along Section Line A-A' at South Portal



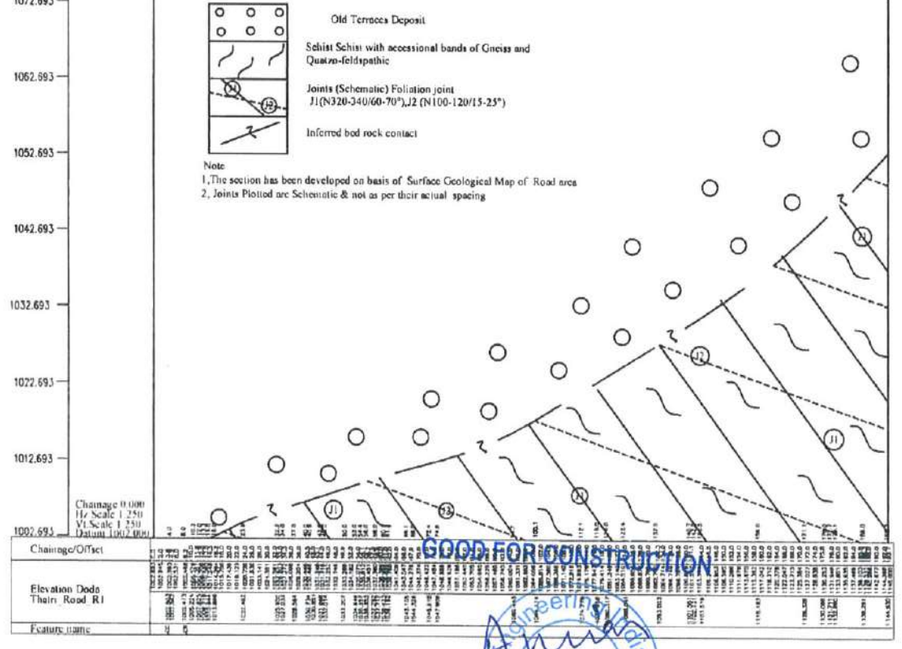
RMR Basic	50-52
GSI	55-75
Rock Class and Category	Class -III (Fair)
Probable Seepage	Dry to Damp

Interpreted Geological Cross Section Along Section Line C-C' at Ch 0+825m



RMR Basic	50-57
GSI	55-75
Rock Class and Category	Class -III (Fair)
Probable Seepage	Dry to Damp

Interpreted Geological Cross Section Along Section Line D-D' at Ch 1+037m



GOOD FOR CONSTRUCTION

CLIENT: National Highways and Infrastructure Development Corporation PTI Building, 4 Parliament Street, Sansad Marg Area, New Delhi, Delhi 110001	PROJECT: Construction of Bi-directional tunnel at Km 83 of length 495m including approaches road of 664m and a major bridge of 110m from Km 82 + 675 to Km 82 + 925 on NH- 244	EPC CONTRACTOR: BEIGH CONSTRUCTION COMPANY Pvt. Ltd. Plot no : 4, Wave mall, Bypass road, Narwal Jammu email : info@bcegroup.in	DESIGN CONSULTANT: SPACE ENGINEERS CONSORTIUM Pvt. Ltd. in association with EQUIPO DE PROSPECCIONES, S.A

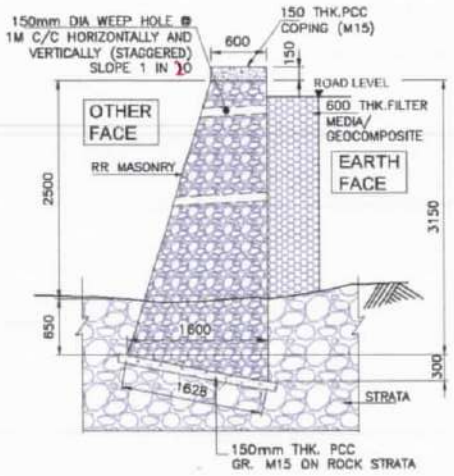
DESIGN DIRECTOR: DR. A.K.MOZA

REV	DATE	DESCRIPTION

DRAWN BY	: AMAAN
DESIGNED BY	: FARHATUN NISA
CHECKED BY	: JAVAID
RECOMMENDED BY	: FARHATUN NISA
APPROVED BY	: JAVAID

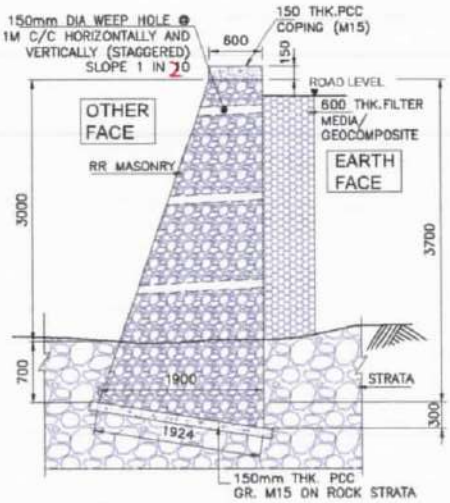
TITLE: Interpreted Geological Cross Section

SCALE	1:500
SHEET SIZE	A3
DRG NO	
REVISION	



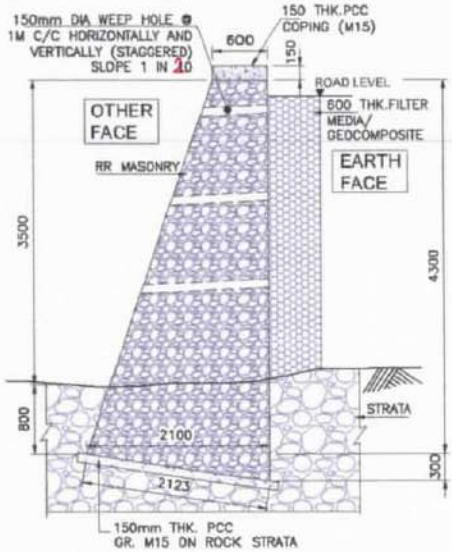
TYPICAL SECTION - 1

FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 2.5M



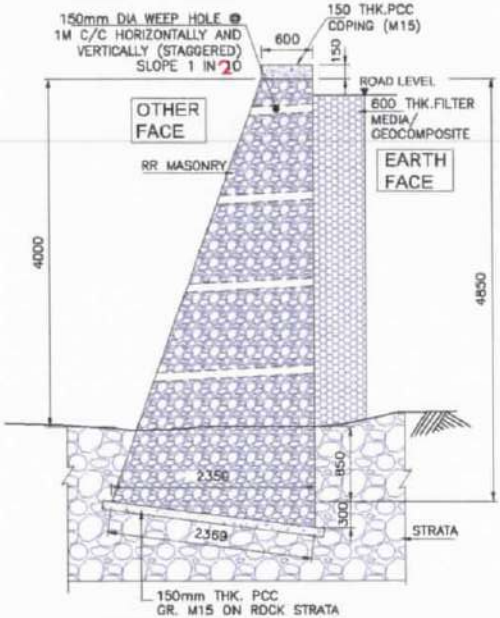
TYPICAL SECTION - 2

FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 3.0M



TYPICAL SECTION - 3

FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 3.5M



TYPICAL SECTION - 4

FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 4.0M

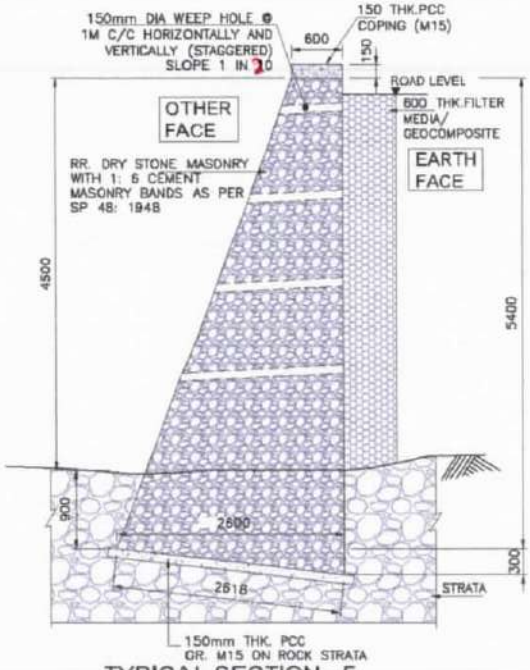
NOTES:-

1. ALL DIMENSION ARE IN MILLIMETERS, LEVELS IN METRES AND CHAINAGES IN KILOMETERS UNLESS OTHERWISE MENTIONED.
2. THE DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT APPROVED HIGHWAY DRAWINGS FOR STRUCTURE ORIENTATION, SKEW ANGLE, FRL & CAMBER/SUPERELEVATION ETC.
3. 150 DIA WEEP HOLES WITH SLOPE 1 IN 20 SHALL BE PROVIDED AT SPACING OF 1000 C/C BOTH HORIZONTALT AND VERTICALLY (STAGGERED) IN FULL HEIGHT OF THE RETAINING WALL WITH BOTTOM MOST ROW 150MM ABOVE G.L.
4. BACK FILLING AND GEO COMPOSITE MEMBRANE BEHIND THE RETAINING WALL SHALL CONFIRMING TO IRC:78-2014 HAVING PROPERTIES Ø = 38 , C = 0. CONTRACTOR WILL ENSURE CAREFUL PLACEMENT OF BACKFILL AND PROPER PACKING. PROPER BONDING OF MASONRY COURSES AS PER SPECIFICATIONS OF IRC:SP: 48-1998.
5. CEMENT MORTAR (1:3) IS TO BE GIVEN FOR COPING.
6. . THE REQUIRED SAFE BEARING CAPACITY IS 20 T/SQM, WHICH SHOULD BE CHECKED AND VERIFIED AT SITE BEFORE EXECUTION OF WORK. IF ANY VARIATION NOTICED, IT SHOULD BE INFORMED TO THE DESIGN CONSULTANT.
7. MINIMUM EDGE AT TOE END SHALL BE MINIMUM 900MM FROM TOE AS PER IS 1904

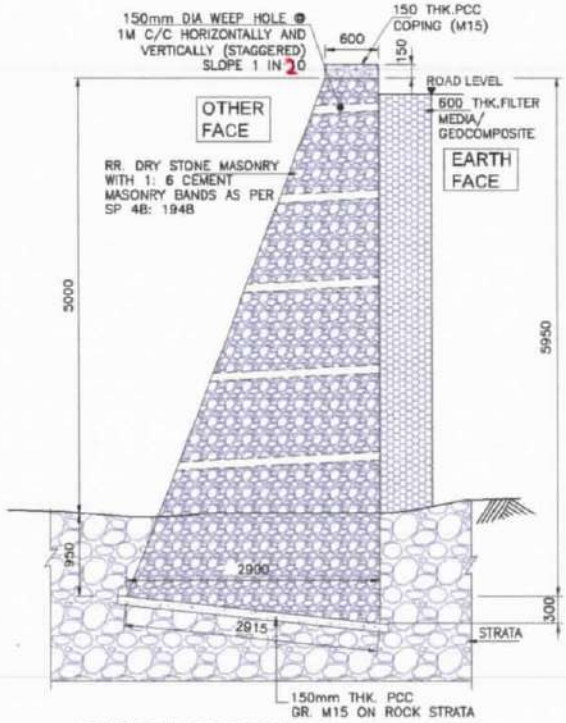
RR. MASONRY SPECIFICATIONS (AS PER IS 1597(1):1992)

1. **SIZE:** THE LENGTH OF STONE SHALL NOT EXCEED THREE TIMES THE HEIGHT ANDBREADTH ON BASE. SHALL NOT BE GREATER THAN THREE FOURTH OF THICKNESS OF WALL NOR LESS THAN 1500mm, THE HEIGHT OF STONE FOR RUBBLE MASONRY MAY BE UP TO 300mm.
2. **MATERIAL:** ALL STONES USED SHALL BE OF STRONG HARD AND DURABLE. ALSO IF SHOULD BE FREE FROM DEFECTS LIKE CAVITIES,CRACKS,FLAWS, SAND HOLES. THE PERCENTAGE OF WATER ABSORPTION NOT EXCEED 5 PERCENT.
3. **CONSTRUCTION OPERATIONS:** THE STONE SHALL BE LAID SO THAT THE PRESSURE IS ALWAYS PERPENDICULAR TO THE NATURAL BED. STONES SHALL BE SUFFICIENTLY WETTED BEFORE LAYING TO PREVENT ABSORPTION OF WATER FROM MORTAR.VERTICAL JOINTS SHALL BE STAGGERED AS FAR AS POSSIBLE, BELL SHAPED BOND STONES AS HEADERS SHALL NOT BE USED. AT ALL ANGULAR JUNCTIONS THE STONES AT EACH ALTERNATE COURSE SHALL BE WELL BONDED INTO RESPECTIVE COURSES OF THE ADJACENT WALL.

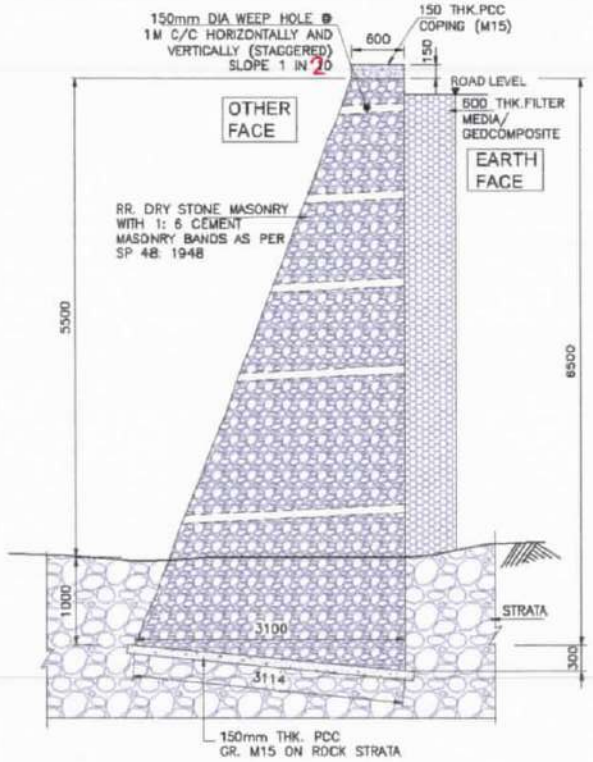
Dwg no.: BCC/NHIDCL/EPC/RRM/01



TYPICAL SECTION - 5
FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 4.5M

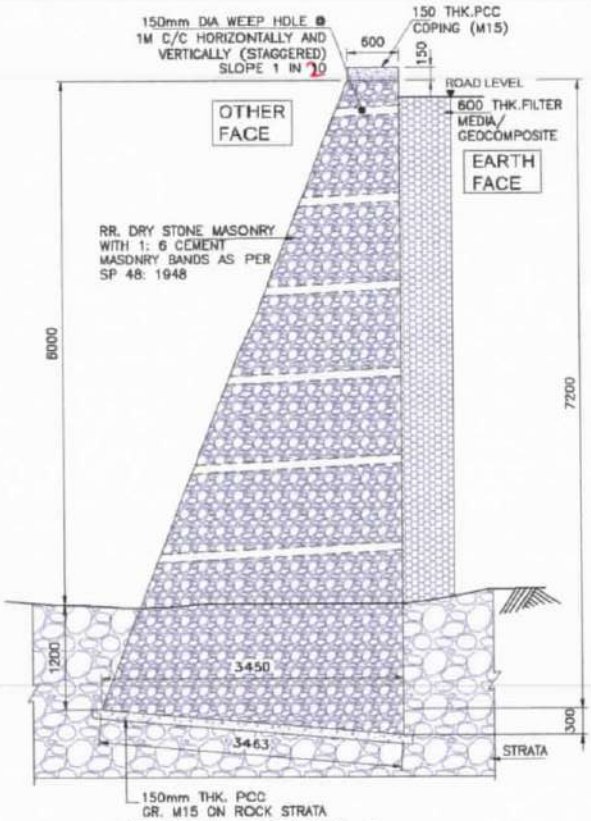


TYPICAL SECTION - 6
FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 5.0M

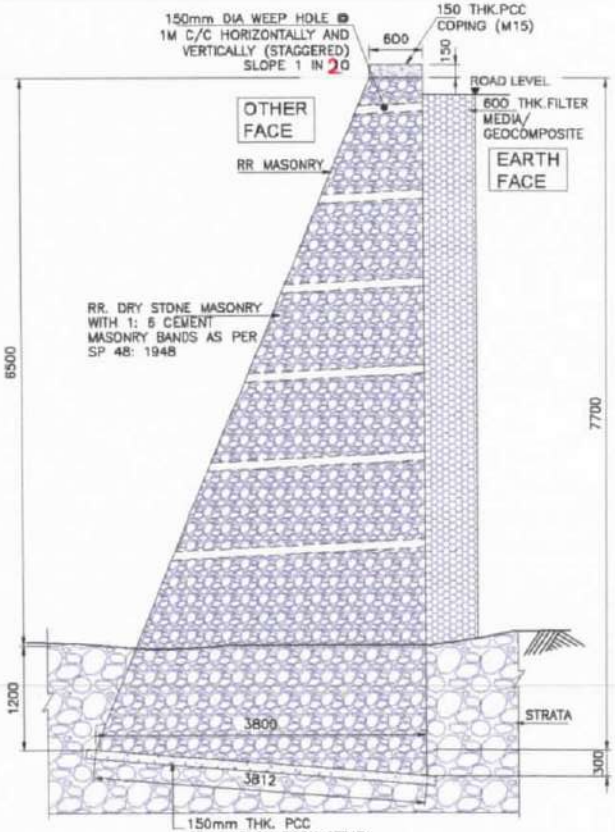


TYPICAL SECTION - 7
FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 5.5M

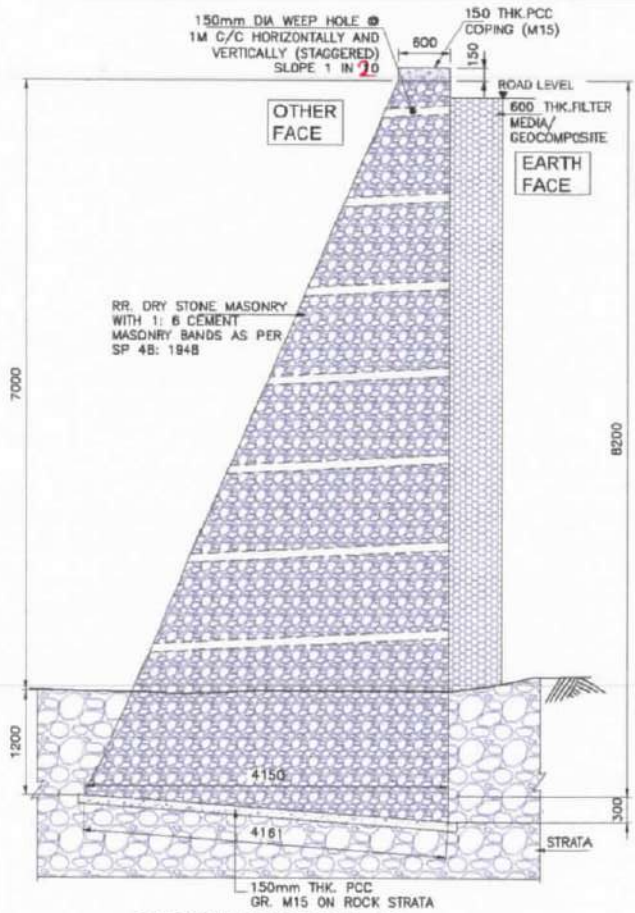
Dwg no.: BCC/NHIDCL/EPC/RRM/01



TYPICAL SECTION - 8
FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 6.5M

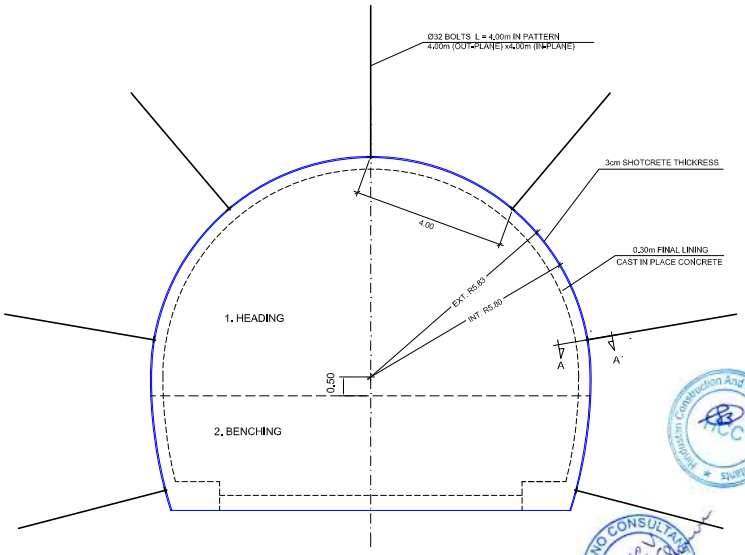


TYPICAL SECTION - 9
FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 6.0M



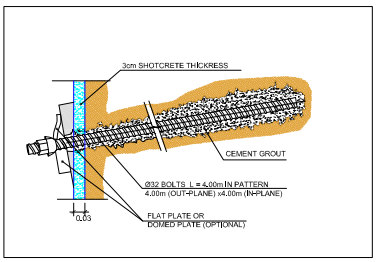
TYPICAL SECTION - 10
FOR RR. DRY MASONRY RETAINING
WALL OF HEIGHT 7.0M

Dwg no.: BCC/NHIDCL/EPC/RRM/01



CROSS SECTION S-I
SCALE=1/100

TABLE OF MATERIALS		
ELEMENT	TYPE	CONTROL LEVEL
SHOTCRETE	M30 GRADE	USUAL
BOLTS	FRICTION BOLT (Minimum Breaking Load 220KN)	USUAL
	BOLTS Ø32 Fe 500D	
POLYPROPYLENE FIBER	SEE NOTE	USUAL
CAST IN PLACE CONCRETE IN FOOTING AND WALLS	M30 GRADE	USUAL
-FIBERS AMOUNT WILL BE ENOUGH WHEN THE ENERGY ABSORPTION EXCEEDS 750 JOULES IN THE PLATE TEST.		



SECTION A-A
SCALE=1/10

NOTE 1:

-PAYMENT LINE OF EXCAVATION DEFINES THE TECHNICAL AND GEOLOGICAL OVERBREAK.

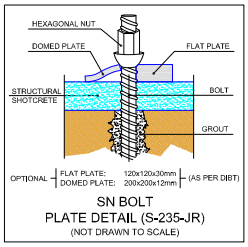
-FILLING OF THE OVERBREAK WILL BE PAID WITH THE PRICE OF m³ OF SHOTCRETE.

NOTE 2:

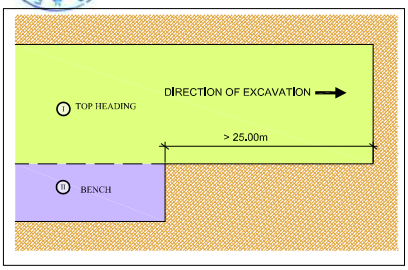
-MAX. TOP-HEADING EXCAVATION ROUND LENGTH: 4,00m.

-MAX. BENCH EXCAVATION ROUND LENGTH: TWICE TO THREE TIMES THE TOP-HEADING.

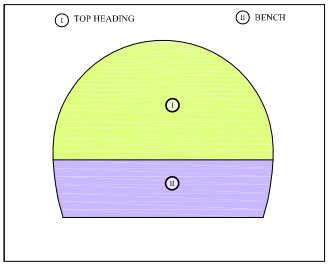
-THE EXCAVATION ROUND MAY BE REDUCED ACCORDING TO AUSCULTATION RESULTS AND SEEING.



SN BOLT
PLATE DETAIL (S-235-JR)
(NOT DRAWN TO SCALE)



SCHEME EXCAVATION OF LONGITUDINAL SECTION



EXCAVATION OF CROSS SECTION S-I

CLIENT
National Highways and Infrastructure Development Corporation
PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001

PROJECT
Construction Of Bi Directional tunnel at km 83 of length 495m including approaches road of 684 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244

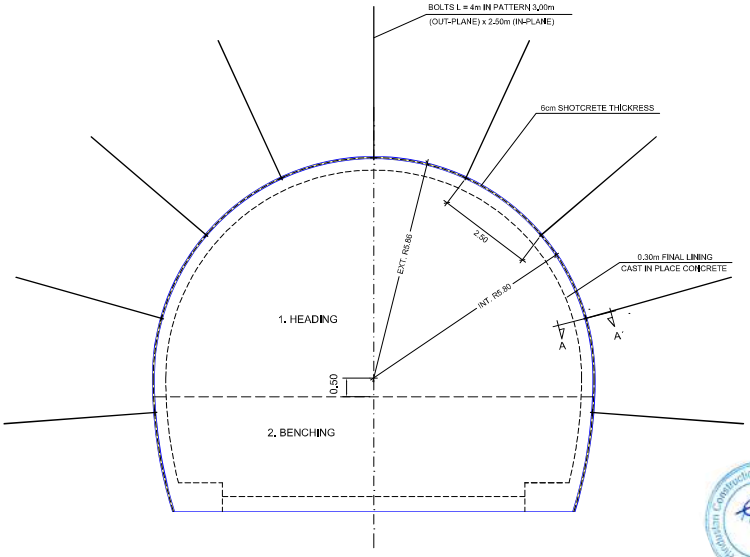
EPC CONSULTANT
Belgh Construction Company Pvt.Ltd
Plot no 4, Wave mall,Bypass road, Narwal ,Jammu
email. info@bccgroupin

DESIGN CONSULTANT
Space Engineers Consortium Pvt.Ltd
In associated with
Equipo De Prospecciones ,S.A

REVISION	DATE	DESCRIPTION
R2	02-02-22	FINAL DESIGN
R1	24-05-21	FINAL DESIGN
R0	27-03-21	FINAL DESIGN

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : INDICATED

TITLE: TYPICAL SECTIONS EXCAVATION AND SUPPORT (CROSS SECTION I)
DWG NO.: KDBT/STES/IND/R2/1/5
REVISION: R2



CROSS SECTION S-II
SCALE=1/100

NOTE 1:

-PAYMENT LINE OF EXCAVATION DEFINES THE TECHNICAL AND GEOLOGICAL OVERBREAK.

-FILLING OF THE OVERBREAK WILL BE PAID WITH THE PRICE OF m³ OF SHOTCRETE.

NOTE 2:

-MAX. TOP-HEADING EXCAVATION ROUND LENGTH: 2,00m.

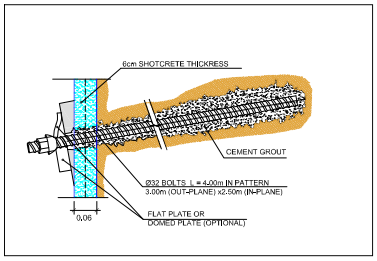
-MAX. BENCH EXCAVATION ROUND LENGTH: TWICE TO THREE TIMES THE TOP-HEADING.

-THE EXCAVATION ROUND MAY BE REDUCED ACCORDING TO AUSCULTATION RESULTS AND SEEING.

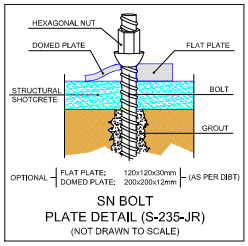
TABLE OF MATERIALS

ELEMENT	TYPE	CONTROL LEVEL
SHOTCRETE	M30 GRADE	USUAL
BOLTS	FRICTION BOLT (Minimum Breaking Load 220KN)	USUAL
	BOLTS Ø32 Fe 500D	
POLYPROPYLENE FIBER	SEE NOTE	USUAL
CAST IN PLACE CONCRETE IN FOOTING AND WALLS	M30 GRADE	USUAL

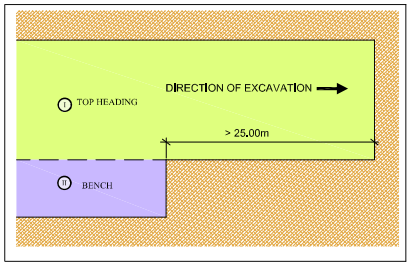
FIBERS AMOUNT WILL BE ENOUGH WHEN THE ENERGY ABSORPTION EXCEEDS 750 JOULES IN THE PLATE TEST.



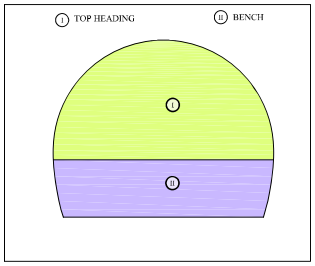
SECTION A-A
SCALE=1/10



SN BOLT
PLATE DETAIL (S-235-JR)
(NOT DRAWN TO SCALE)



SCHEME EXCAVATION OF LONGITUDINAL SECTION



EXCAVATION OF CROSS SECTION S-II

CLIENT
National Highways and Infrastructure Development Corporation
PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001

PROJECT
Construction Of Bi Directional tunnel at km 83 of length 495m including approaches road of 684 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244

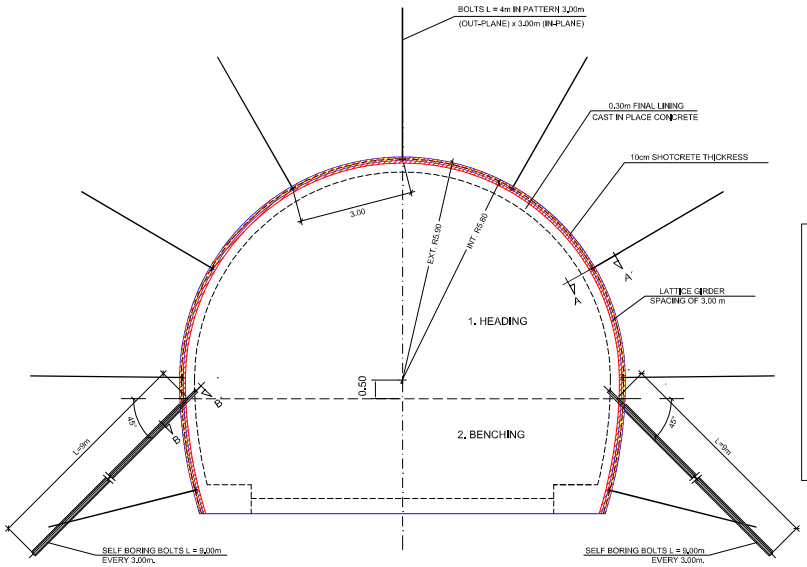
EPC CONSULTANT
Belgh Construction Company Pvt.Ltd
Plot no 4, Wave mall,Bypass road, Narwal ,Jammu
email. info@bccgroupin

DESIGN CONSULTANT
Space Engineers Consortium Pvt.Ltd
In associated with
Equipo De Prospecciones ,S.A

REVISION	DATE	DESCRIPTION
R2	02-02-22	FINAL DESIGN
R1	24-05-21	FINAL DESIGN
R0	27-03-21	FINAL DESIGN

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : INDICATED

TITLE: TYPICAL SECTIONS EXCAVATION AND SUPPORT (CROSS SECTION II)
DWG NO. KDBT/STES/IND/R2/2/5
REVISION R2



CROSS SECTION S-III
SCALE=1/100

NOTE 1:

-PAYMENT LINE OF EXCAVATION DEFINES THE TECHNICAL AND GEOLOGICAL OVERBREAK.

-FILLING OF THE OVERBREAK WILL BE PAID WITH THE PRICE OF m³ OF SHOTCRETE.

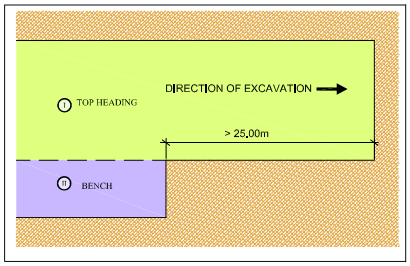
NOTE 2:

-MAX. TOP-HEADING EXCAVATION ROUND LENGTH: 3,00m.

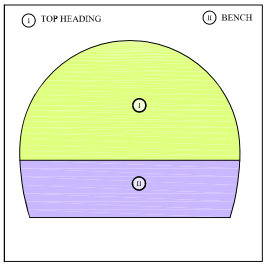
-MAX. BENCH EXCAVATION ROUND LENGTH: TWICE TO THREE TIMES THE TOP-HEADING.

-THE EXCAVATION ROUND MAY BE REDUCED ACCORDING TO AUSCULTATION RESULTS AND SEEING.

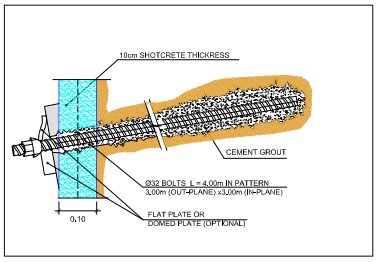
TABLE OF MATERIALS		
ELEMENT	TYPE	CONTROL LEVEL
SHOTCRETE	M30 GRADE	USUAL
BOLTS	FRICTION BOLT (Minimum Breaking Load ≥200kN)	USUAL
	BOLTS Ø32 Fe 500D	
POLYPROPYLENE FIBER	SEE NOTE	USUAL
CAST IN PLACE CONCRETE IN FOOTING AND WALLS	M30 GRADE	USUAL
FIBERS AMOUNT WILL BE ENOUGH WHEN THE ENERGY ABSORPTION EXCEEDS 750 JOULES IN THE PLATE TEST.		



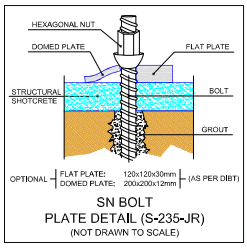
SCHEME EXCAVATION OF LONGITUDINAL SECTION



EXCAVATION OF CROSS SECTION S-III



SECTION A-A
SCALE=1/10

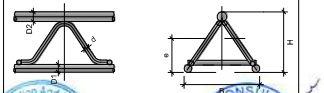


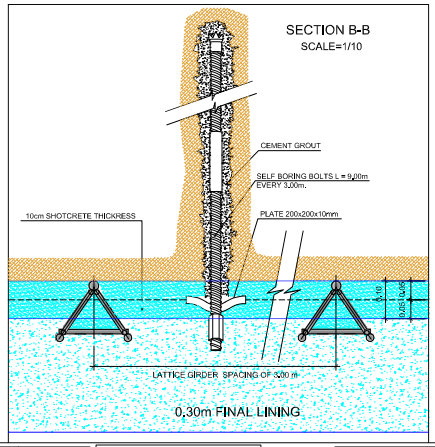
SN BOLT
PLATE DETAIL (S-235-JR)
(NOT DRAWN TO SCALE)

LATTICE GIRDER DETAIL
(dimensions in mm)

TECHNICAL DATA

D1 mm	D2 mm	d mm	B mm	H mm	Q kg/m	e cm
20	25	12	200	160	11,86	8,97



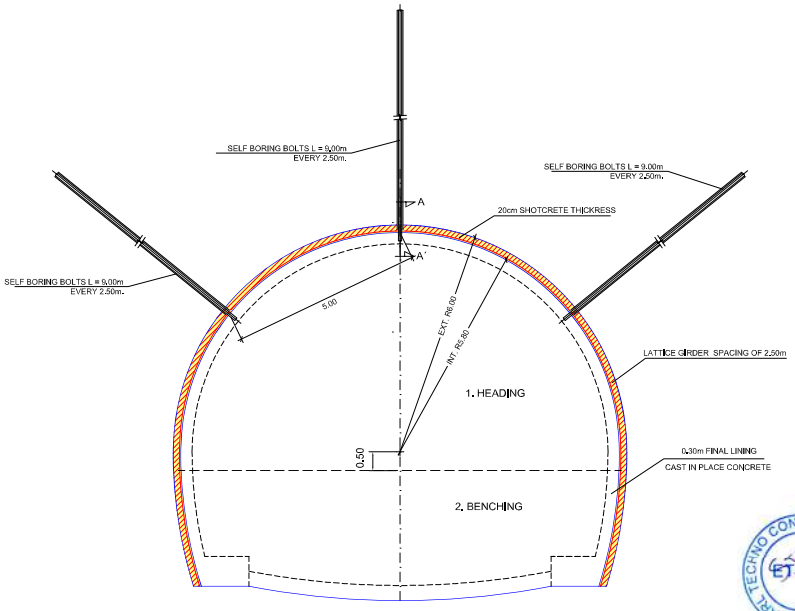


CLIENT	National Highways and Infrastructure Development Corporation **PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001**	
PROJECT	Construction Of Bi Directional tunnel at km 83 of length 495m including approaches road of 684 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH - 244	
EPC CONSULTANT	Belgh Construction Company Pvt.Ltd **Plot no 4, Wave mall,Bypass road, Narwal ,Jammu** **email. info@bccgroupin**	
DESIGN CONSULTANT	Space Engineers Consortium Pvt.Ltd In associated with Equipo De Prospecciones ,S.A	

REVISION	DATE	DESCRIPTION
R2	02-02-22	FINAL DESIGN
R1	24-06-21	FINAL DESIGN
R0	27-03-21	FINAL DESIGN

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : INDICATED

TITLE: TYPICAL SECTIONS EXCAVATION AND SUPPORT (CROSS SECTION III)
DRG NO.: KDBT/STES/IND/R2/3/5
REVISION: R2



CROSS SECTION S-IV
SCALE=1/100

NOTE 1:

-PAYMENT LINE OF EXCAVATION DEFINES THE TECHNICAL AND GEOLOGICAL OVERBREAK.

-FILLING OF THE OVERBREAK WILL BE PAID WITH THE PRICE OF m³ OF SHOTCRETE.

NOTE 2:

-MAX. TOP-HEADING EXCAVATION ROUND LENGTH: 2,50m.

-MAX. BENCH EXCAVATION ROUND LENGTH: TWICE TO THREE TIMES THE TOP-HEADING.

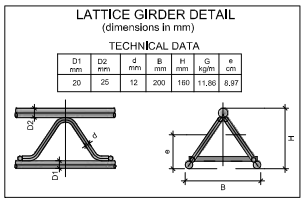
-THE EXCAVATION ROUND MAY BE REDUCED ACCORDING TO AUSCULTATION RESULTS AND SEEING.

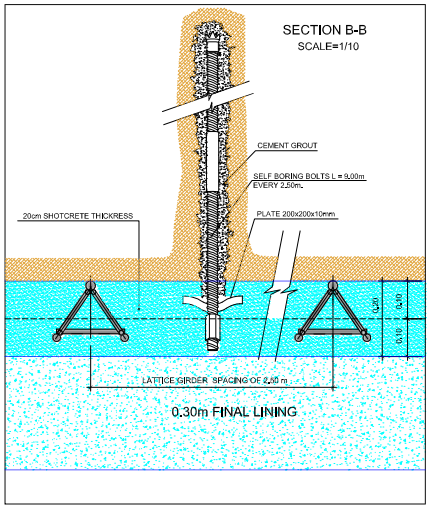
TABLE OF MATERIALS		
ELEMENT	TYPE	CONTROL LEVEL
SHOTCRETE	M30 GRADE	USUAL
BOLTS	FRICTION BOLT (Minimum Breaking Load 220KN)	USUAL
	BOLTS Ø32 Fe 500D	
POLYPROPYLENE FIBER	SEE NOTE	USUAL
CAST IN PLACE CONCRETE IN FOOTING AND WALLS	M30 GRADE	USUAL
FIBERS AMOUNT WILL BE ENOUGH WHEN THE ENERGY ABSORPTION EXCEEDS 750 JOULES IN THE PLATE TEST.		

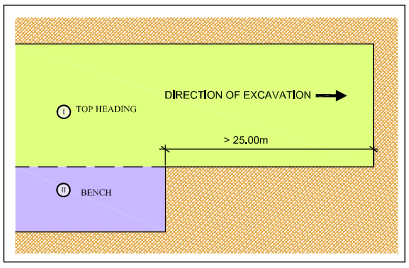
LATTICE GIRDER DETAIL
(dimensions in mm)

TECHNICAL DATA

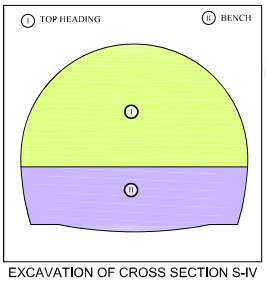
D1 mm	D2 mm	d mm	B mm	H mm	G kg/m	e cm
20	25	12	200	160	11,86	8,97







SCHEME EXCAVATION OF LONGITUDINAL SECTION



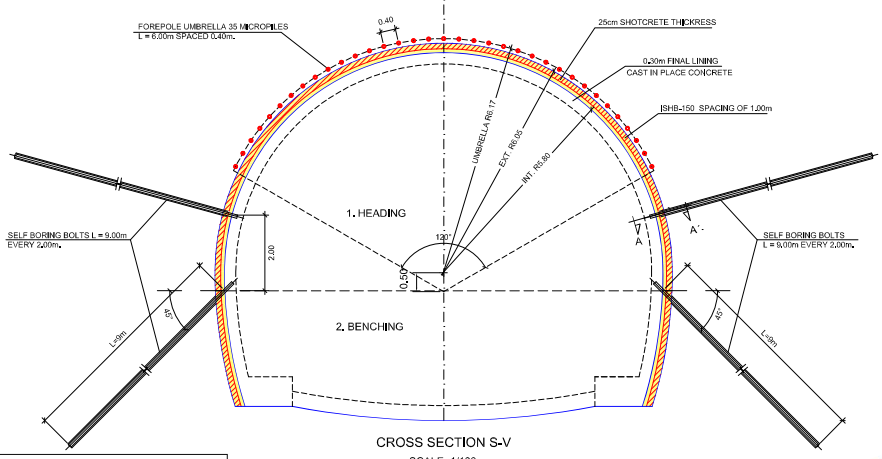
EXCAVATION OF CROSS SECTION S-IV

CLIENT	PROJECT	EPC CONSULTANT
National Highways and Infrastructure Development Corporation **PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi 110001**	Construction Of Bi Directional tunnel at km 83 of length 495m including approaches road of 684 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244	Belgh Construction Company Pvt.Ltd **Plot no 4, Wave mall,Bypass road, Narwal ,Jammu** **email. Info@bccgroupin**

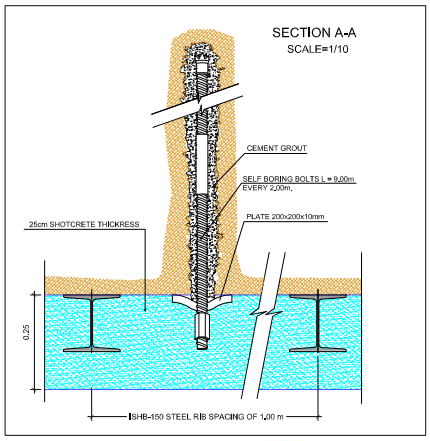
DESIGN CONSULTANT			
Space Engineers Consortium Pvt.Ltd In associated with Equipo De Prospecciones ,S.A			
R2	02-02-22	FINAL DESIGN	
R1	24-05-21	FINAL DESIGN	
R0	27-03-21	FINAL DESIGN	
revision	date	description	

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : INDICATED

TITLE: TYPICAL SECTIONS EXCAVATION AND SUPPORT (CROSS SECTION IV)
DWG NO.: KDBT/STES/IND/R2/4/5
REVISION: R2



CROSS SECTION S-V
SCALE=1/100



NOTE 1:

-PAYMENT LINE OF EXCAVATION DEFINES THE TECHNICAL AND GEOLOGICAL OVERBREAK.

-FILLING OF THE OVERBREAK WILL BE PAID WITH THE PRICE OF m³ OF SHOTCRETE.

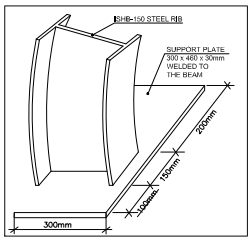
NOTE 2:

-MAX. TOP-HEADING EXCAVATION ROUND LENGTH: 1.00m.

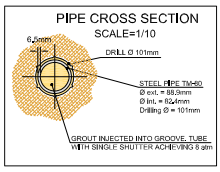
-MAX. BENCH EXCAVATION ROUND LENGTH: TWICE TO THREE TIMES THE TOP-HEADING.

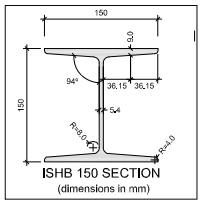
-THE EXCAVATION ROUND MAY BE REDUCED ACCORDING TO AUSCULTATION RESULTS AND SEEING.

TABLE OF MATERIALS		
ELEMENT	TYPE	CONTROL LEVEL
SHOTCRETE	M30 GRADE	USUAL
BOLTS	SELF BORING BOLTS (Minimum Breaking Load ≥200kN)	USUAL
POLYPROPYLENE FIBER	SEE NOTE	USUAL
CAST IN PLACE CONCRETE IN FOOTING AND WALLS	M30 GRADE	USUAL
BEAM RIBS	ISHB-150 S-275-JR	USUAL
INVERT STRUTS STEEL RIB BEAM	ISHB-150	USUAL
FOREPOLE UMBRELLA	Ø ext = 88,9 mm; Øint=80,9mm; Øperf=101 mm; TM-80	USUAL
FIBERS AMOUNT WILL BE ENOUGH WHEN THE ENERGY ABSORPTION EXCEEDS 750 JOULES IN THE PLATE TEST.		

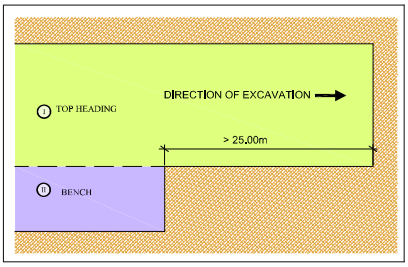


SKETCH OF SUPPORTING PROFILE
OUT OF SCALE

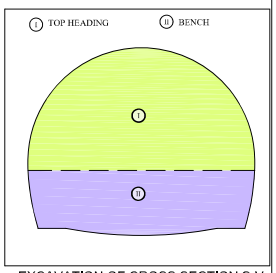




ISHB 150 SECTION
(dimensions in mm)



SCHEME EXCAVATION OF LONGITUDINAL SECTION



EXCAVATION OF CROSS SECTION S-V

CLIENT	PROJECT	EPC CONSULTANT	DESIGN CONSULTANT
National Highways and Infrastructure Development Corporation **PTI Building ,4 Parliament Street,Sansad Marg Area, New Delhi,Delhi-110001**	Construction Of Bi Directional tunnel at km 83 of length 495m including approaches road of 694 m and a major bridge of 110 m from km 82 +675 to km 82 +925 on NH- 244	Belgh Construction Company Pvt.Ltd **Plot no 4, Wave mall,Bypass road, Narwal ,Jammu** **email. info@bccgroupin**	Space Engineers Consortium Pvt.Ltd In associated with Equipo De Prospecciones ,S.A

REVISION	DATE	DESCRIPTION
R2	02-02-22	FINAL DESIGN
R1	24-05-21	FINAL DESIGN
R0	27-03-21	FINAL DESIGN

DRAWN BY : CARMEN PEREZ SERRANO
DESIGNED BY : DIANA CASTANEDO DE LUCAS
CHECKED BY : PROF.FCO.CASTENEDO NAVARRO
RECOMMENDED BY : DIANA CASTANEDO LUCAS
APPROVED BY : PROF.FCO.CASTENEDO NAVARRO
SCALE : INDICATED

TITLE: TYPICAL SECTIONS EXCAVATION AND SUPPORT (CROSS SECTION V)
DWG NO.: KDBT/STES/IND/R2/5/5
REVISION: R2