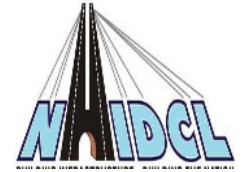




Ministry of Road Transport and Highways
(GOVERNMENT OF INDIA)



NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.

Head Office: 3rd floor, PTI building, 4- Parliament Street, New Delhi-110001

Project office: Building of State Institute of Rural Development & Panchayati Raj Durlang Leitans, Mizoram Aizawl-796025

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte (49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km)).



FINAL DETAILED PROJECT REPORT (VOLUME VIII – PROJECT DRAWINGS) (Silchar-Jiribam Tunnel) From Km 24+910 to D. Km 25+680

NOVEMBER 2024

Transys Consulting Pvt. Ltd.

Head Office : 12th Floor, JMD Regent square, M.G. Road, Gurugram-122002, Haryana,

Email ID: sanjeev@transysconsulting.co.in

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Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III) (Silchar-Vairengte(49.9 km), Vairengte-Sairang (111 km), Silchar-Jiribam (55 km))

Section: Silchar to Jiribam, Package: SJ-2 (Silchar Jiribam Tunnel from D. Km 24+910 to D. Km 25+680)

FINAL DETAILED PROJECT REPORT – R2

VOLUME : I	MAIN REPORT (Silchar Jiribam Tunnel)	
VOLUME : II	DESIGN REPORT (Silchar Jiribam Tunnel)	
VOLUME : III	MATERIAL REPORT (Highway+ Tunnel)	
VOLUME : IV	ENVIRONMENTAL ASSESSMENT REPORT INCLUDING ENVIRONMENTAL MANAGEMENT PLAN (EMP) AND RESETTLEMENT ACTION PLAN (RAP) (Highway +Tunnel)	
VOLUME : V	TECHNICAL SPECIFICATION (Silchar Jiribam Tunnel) TECHNICAL SCHEDULE (Highway +Tunnel	
VOLUME : VI	RATE ANALYSIS(Silchar Jiribam Tunnel)	
VOLUME : VII AND VIII	COST ESTIMATE & BILL OF QUANTITIES (Silchar Jiribam Tunnel)	
VOLUME : IX	PROJECT DRAWINGS (Silchar Jiribam Tunnel)	√

Vol-IX

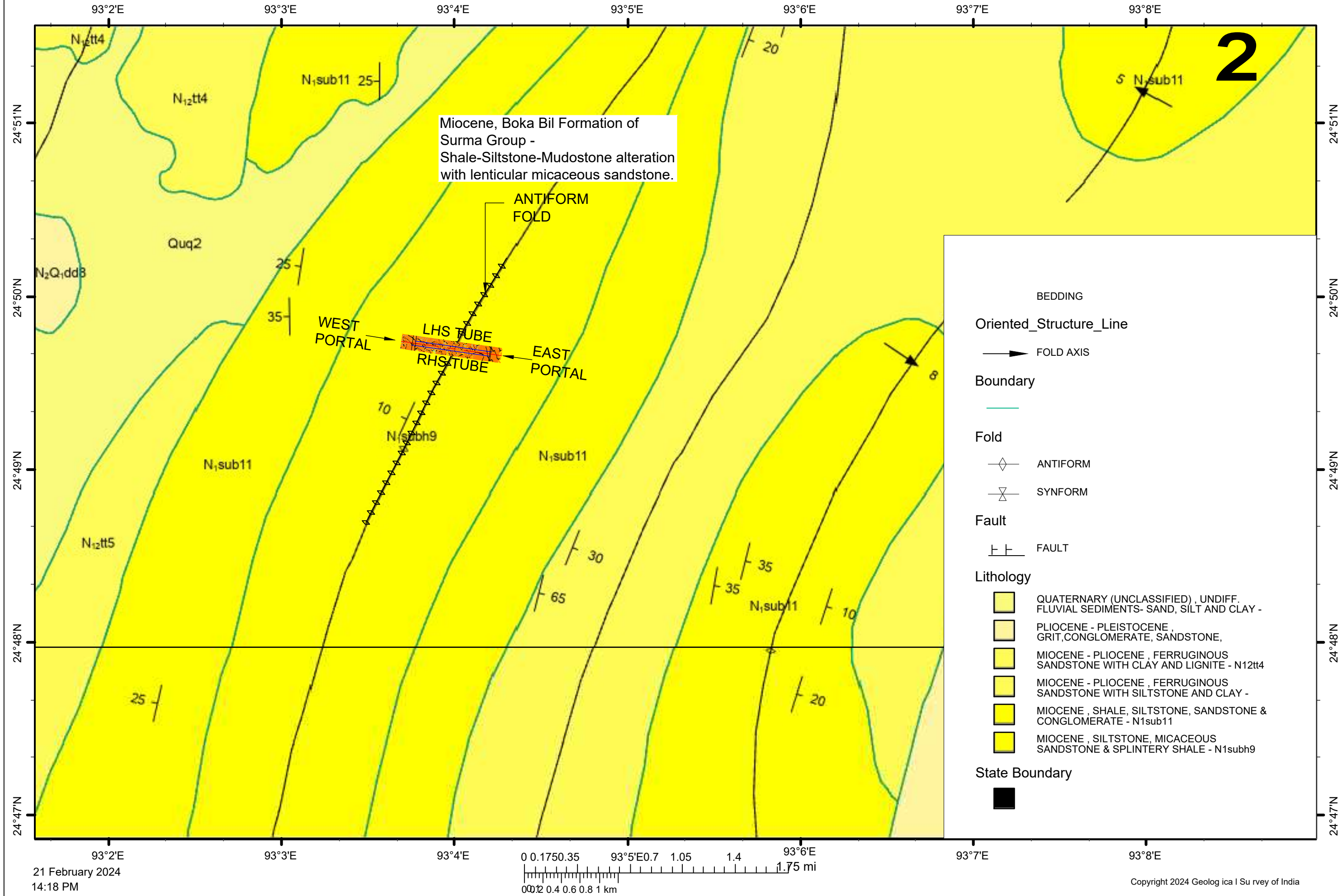
Project Drawings

SILCHAR-JIRIBAM TUNNEL GEOLOGY DRAWING

SILCHAR-JIRIBAM SECTION OF NH-37 (PACKAGE: S-J-2 (PNP_TUNNEL-DPR), D. KM 24+000 TO D. KM 27+000

<u>S. No.</u>	<u>Name of Drawing</u>	<u>Drawing Number</u>	<u>No. of Drawing</u>	<u>Revision No</u>
1	REGIONAL GEOLOGICAL MAP SILCHAR TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-001	SHEET 1 OF 15	R2
2	GEOLOGICAL PLAN OF SILCHAR-JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-002	SHEET 2 OF 15	R2
3	GEOLOGICAL PLAN OF SILCHAR-JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-003	SHEET 3 OF 15	R2
4	(LHS) GEOLOGICAL L-SECTION SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-004	SHEET 4 OF 15	R2
5	(RHS) GEOLOGICAL L-SECTION SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-005	SHEET 5 OF 15	R2
6	(LHS) WEST PORTAL GEOLOGICAL L-SECTION	Transys-NH37-TUNNEL-DPR_GEO-006	SHEET 6 OF 15	R2
7	(LHS) EAST PORTAL GEOLOGICAL L-SECTION	Transys-NH37-TUNNEL-DPR_GEO-007	SHEET 7 OF 15	R2
8	(RHS) WEST PORTAL GEOLOGICAL L-SECTION	Transys-NH37-TUNNEL-DPR_GEO-008	SHEET 8 OF 15	R2
9	(RHS) EAST PORTAL GEOLOGICAL L-SECTION	Transys-NH37-TUNNEL-DPR_GEO-009	SHEET 9 OF 15	R2
10	GEOLOGICAL CROSS SECTION A-A' AT WEST PORTAL SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-010	SHEET 10 OF 15	R2
11	GEOLOGICAL CROSS SECTION B-B' AT EAST & WEST PORTAL SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-011	SHEET 11 OF 15	R2
12	GEOLOGICAL CROSS SECTION C-C' AT EAST & WEST PORTAL SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-012	SHEET 12 OF 15	R2
13	GEOLOGICAL CROSS SECTION D-D' AT EAST PORTAL SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-013	SHEET 13 OF 15	R2
14	PLAN OF EAST PORTAL AREA SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-014	SHEET 14 OF 15	R2
15	PLAN OF WEST PORTAL AREA SILCHAR JIRIBAM TUNNEL-DPR	Transys-NH37-TUNNEL-DPR_GEO-015	SHEET 15 OF 15	R2

Geological Survey of India - Bhukosh Map



Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transsys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transsys_blr@transsysconsulting.co.in

Project:

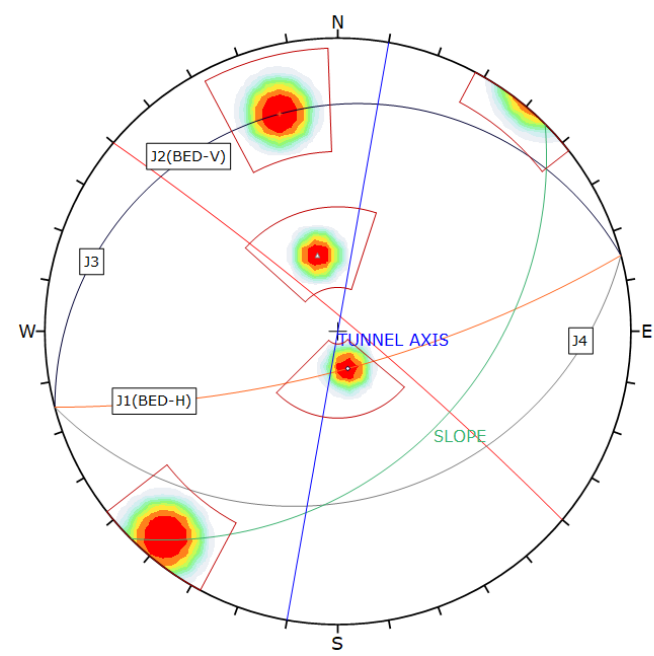
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: REGIONAL GEOLOGICAL MAP SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drig. No	Rev:
A3	1:50	Transsys-NH37-TUNNEL-DPR_GEO-001	R2

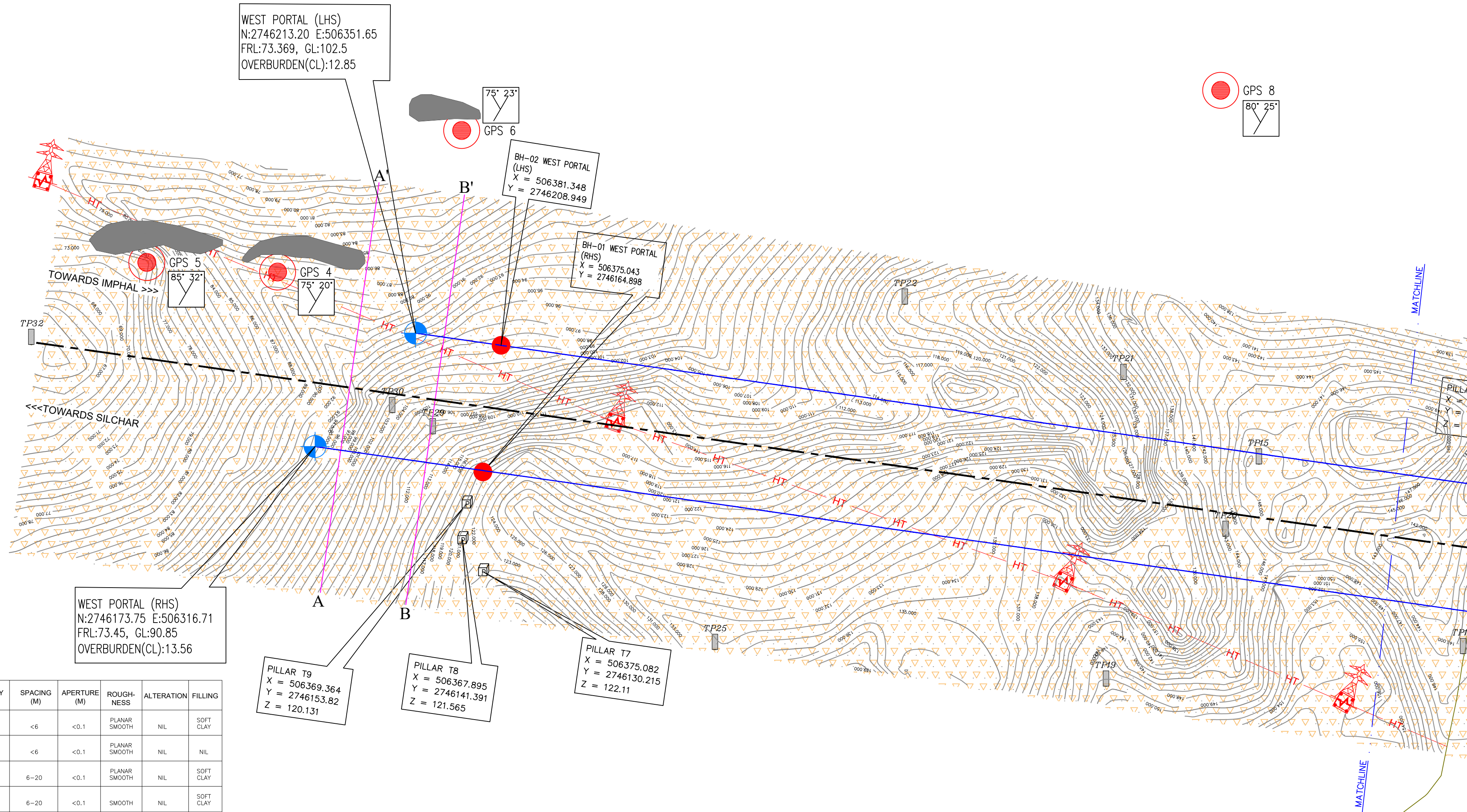
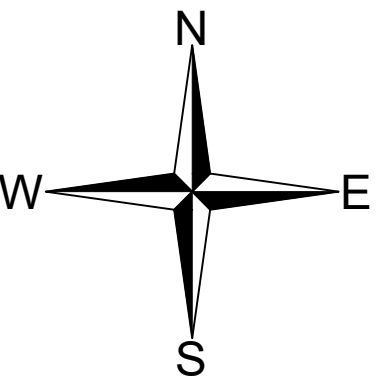


WEST PORTAL-(SILCHAR 770m TUNNEL)		
Symbol	ID	Quantity
1	1	1
2	2	1
3	3	1
4	4	1

Density Concentrations	
Color	Density Concentrations
1.00	1.00
2.00	2.00
3.00	3.00
4.00	4.00
5.00	5.00
6.00	6.00
7.00	7.00
8.00	8.00
9.00	9.00
10.00	10.00
11.00	11.00
12.00	12.00
13.00	13.00
14.00	14.00
15.00	15.00
16.00	16.00
17.00	17.00
18.00	18.00
19.00	19.00
20.00	20.00
21.00	21.00
22.00	22.00
23.00	23.00
24.00	24.00

Contour Data	
Maximum Density	24.00%
Contour Distribution	Factor
Counting Circle Size	1.0%

Plot Mode	
Plot Mode	Pole Vectors
Vector Count	4 (4 Entries)
Hemisphere	Lower
Projection	Equal Angle



SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGH-NESS	ALTERATION	FILLING
J1 (BEDDING)	15°	N345°	10-20	<6	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J2 (BEDDING)	85°	N040°	1-3	<6	<0.1	PLANAR SMOOTH	NIL	NIL
J3	30°	N165°	1-3	6-20	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J4	75°	N165°	1-3	6-20	<0.1	SMOOTH	NIL	SOFT CLAY

DISCONTINUITY PARAMETERS AND STEREO GRAPHIC PROJECTION AT WEST PORTAL.

Rev.	Date	Description

Authority:

**National Highways & Infrastructure Development Corporation Ltd.**
(Ministry of Road Transport & Highways)

Design Consultants:

**Transys Consulting Pvt. Ltd.**
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

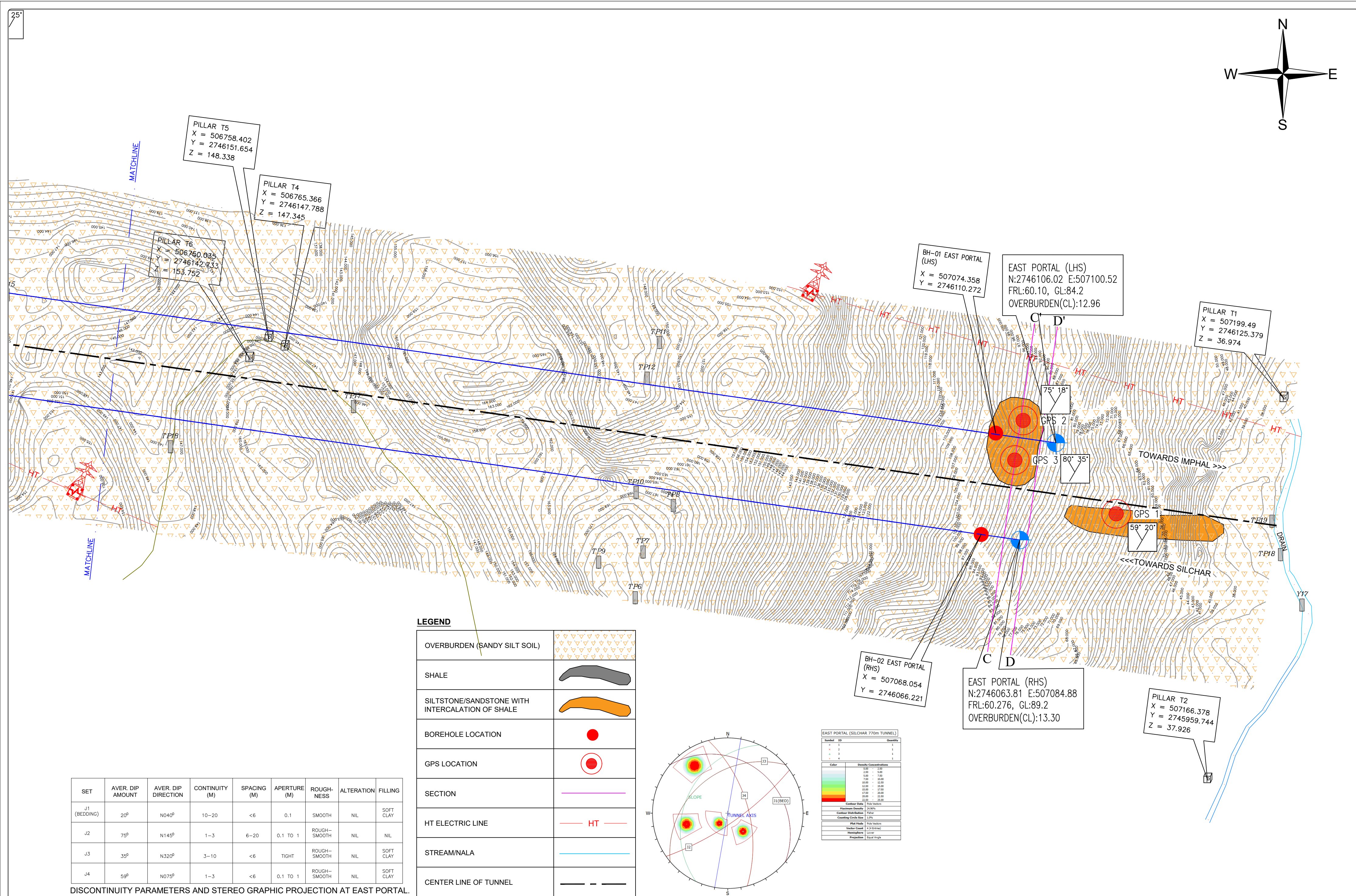
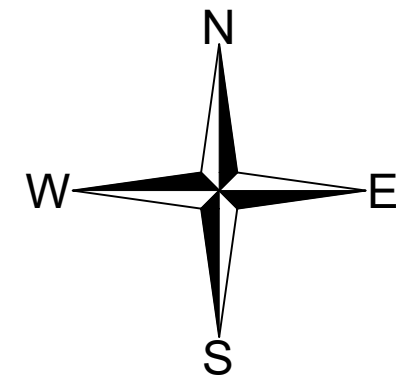
Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT

Title: GEOLOGICAL PLAN OF SILCHAR-JIRIBAM TUNNEL			
Size	Scale	Drp. No	Rev.
A2	1:1000	Transys-NH37-TUNNEL-DPR_GEO-002	R2

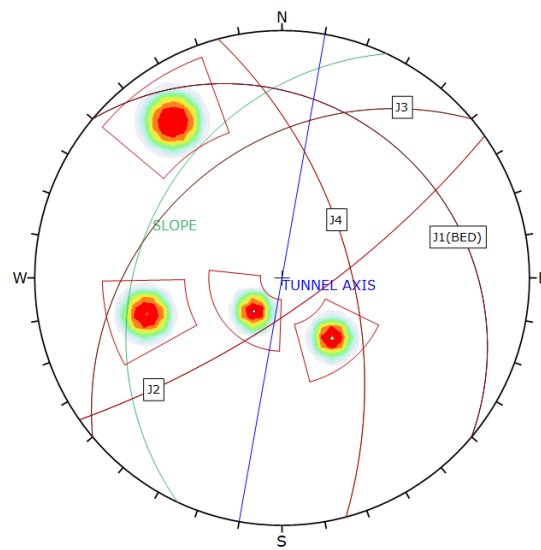


SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGHNESS	ALTERATION	FILLING
J1 (BEDDING)	20°	N040°	10-20	<6	0.1	SMOOTH	NIL	SOFT CLAY
J2	75°	N145°	1-3	6-20	0.1 TO 1	ROUGH-SMOOTH	NIL	NIL
J3	35°	N320°	3-10	<6	TIGHT	ROUGH-SMOOTH	NIL	SOFT CLAY
J4	59°	N075°	1-3	<6	0.1 TO 1	ROUGH-SMOOTH	NIL	SOFT CLAY

DISCONTINUITY PARAMETERS AND STEREO GRAPHIC PROJECTION AT EAST PORTAL.

LEGEND

OVERBURDEN (SANDY SILT SOIL)	
SHALE	
SILTSTONE/SANDSTONE WITH INTERCALATION OF SHALE	
BOREHOLE LOCATION	
GPS LOCATION	
SECTION	
HT ELECTRIC LINE	
STREAM/NALA	
CENTER LINE OF TUNNEL	

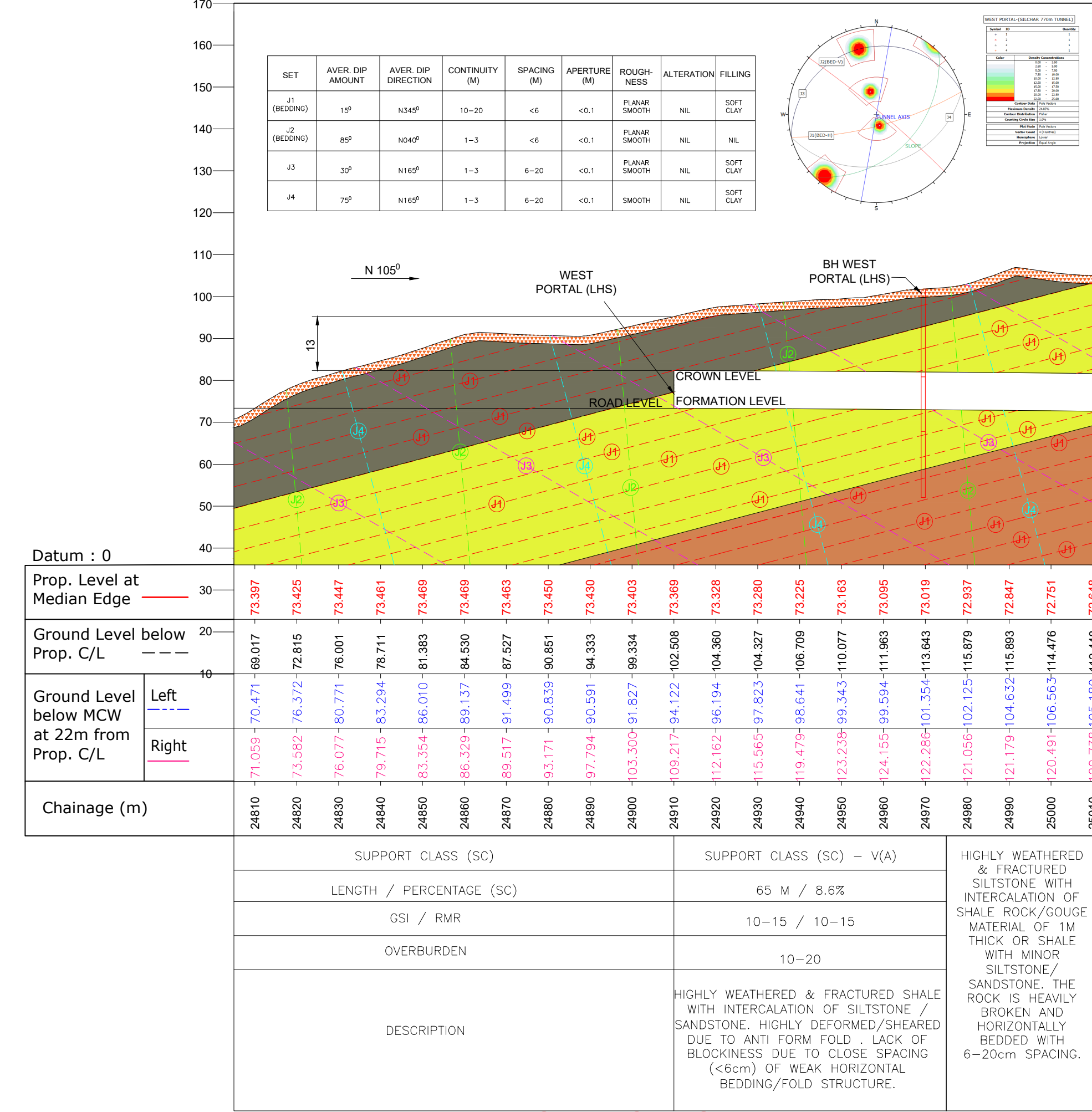


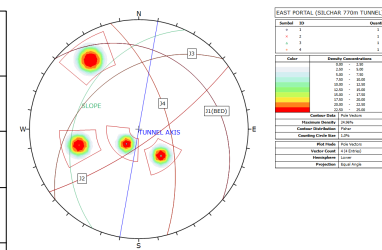
Symbol	ID	Quantity
1	1	1
2	2	1
3	3	1
4	4	1

Color	Density Concentrations
1	1.00 - 1.50
2	1.50 - 2.00
3	2.00 - 2.50
4	2.50 - 3.00
5	3.00 - 3.50
6	3.50 - 4.00
7	4.00 - 4.50
8	4.50 - 5.00
9	5.00 - 5.50
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14	7.50 - 8.00
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28	14.50 - 15.00
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34	17.50 - 18.00
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358	179.50 - 180.00
359	180.00 - 180.50
360	180.50 - 181.00
361	181.00 - 181.50
362	181.50 - 182.00
363	182.00 - 182.50
364	182.50 - 183.00
365	183.00 - 183.50
366	183.50 - 184.00
367	184.00 - 184.50
368	184.50 - 185.00
369	185.00 - 185.50
370	185.50 - 186.00
371	186.00 - 186.50
372	186.50 - 187.00
373	187.00 - 187.50
374	187.50 - 188.00
375	188.00 - 188.50
376	188.5



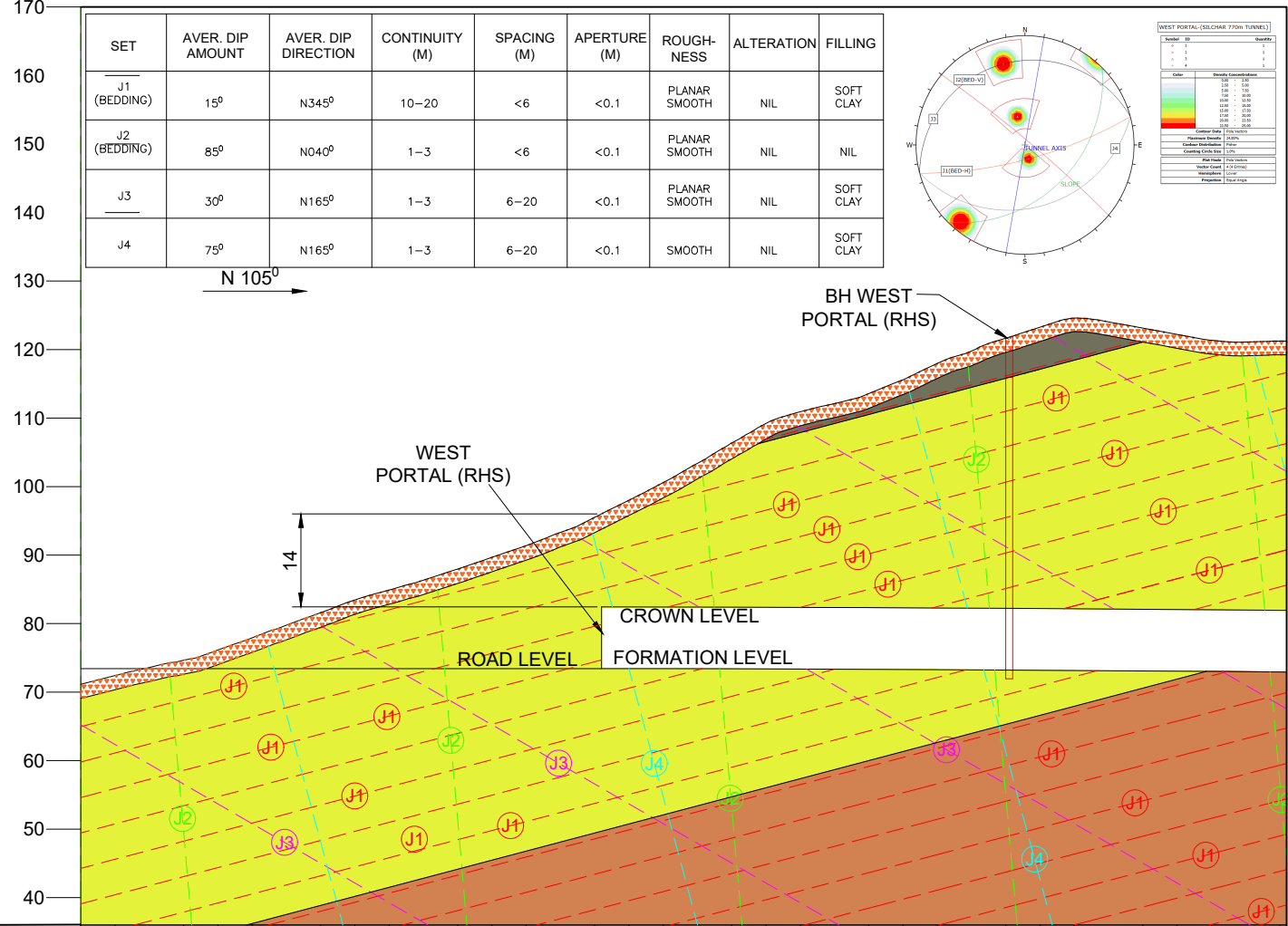
Title: GEOLOGICAL L-SECTION SILCHAR JIRIBAM TUNNEL(RHS)			
Size	Scale	Drg. No	Rev: R2
A0	1:1000	Transys-NH37-TUNNEL-DPR_GEO-005	





Datum : 0		40
Prop. Level at Median Edge 		30
Ground Level below Prop. C/L 		20
Ground Level below MCW at 22m from Prop. C/L	Left 	10
	Right 	
Chainage (m)		
SUPPORT CLASS (SC)		SUPPORT CLASS (SC) – V
LENGTH / PERCENTAGE (SC)		60 M / 7.9%
GSI / RMR		15–20 / 20
OVERBURDEN		20–35
DESCRIPTION		HIGHLY WEATHERED & FRACTURED SILTSTONE WITH INTERCALATION OF SHALE ROCK/GOUGE MATERIAL OF 1M THICK . THE ROCK IS HEAVILY BROKEN AND HORIZONTALLY BEDDED WITH 6–20cm SPACING.

Rev.	Date	Description	Authority: National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)	Design Consultants: Transsys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transsysconsulting.co.in	Project: Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000) Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-II)	DRAWN BY LOKESH DESIGNED BY SREERAJ MELOTH CHECKED BY VIDYA SAGAR APPROVED BY SANJEEV	FINAL DETAILED PROJECT REPORT	Title: LHS EAST PORTAL GEOLOGICAL L-SECTION <table border="1"> <tr> <th>Size</th><th>Scale</th><th>Org. No</th><th>Rev:</th></tr> <tr> <td>A3</td><td>1:1000</td><td>Transsys-NH37-TUNNEL-DPR_GEO-007</td><td>R2</td></tr> </table>	Size	Scale	Org. No	Rev:	A3	1:1000	Transsys-NH37-TUNNEL-DPR_GEO-007	R2
Size	Scale	Org. No	Rev:													
A3	1:1000	Transsys-NH37-TUNNEL-DPR_GEO-007	R2													



Datum : 0

Prop. Level at Median Edge	30	73.397	73.425	73.447	73.461	73.469	73.469	73.463	73.450	73.430	73.403	73.369	73.328	73.280	73.225	73.163	73.095	73.019	72.937
Ground Level below Prop. C/L	20	69.017	72.815	76.001	78.711	81.383	84.530	87.527	90.851	94.333	99.334	102.508	104.360	104.327	106.709	110.077	111.963	113.643	115.879
Ground Level below MCW at 22m from Prop. C/L	Left	70.471	76.372	80.771	83.294	86.010	89.137	91.499	90.839	90.591	91.827	94.122	96.194	97.823	98.641	99.343	99.594	101.354	102.125
	Right	71.059	73.582	76.077	79.715	83.354	86.329	89.517	93.171	97.794	103.300	109.217	112.162	115.565	119.479	123.238	124.155	122.286	121.056
Chainage (m)		24810	24820	24830	24840	24850	24860	24870	24880	24890	24900	24910	24920	24930	24940	24950	24960	24970	24980

SUPPORT CLASS (SC)	SUPPORT CLASS (SC) - V(A)	SUPPORT CLASS (SC) - V	
LENGTH / PERCENTAGE (SC)	14 M/1.8%	35 M / 4.5%	
GSI / RMR	10-15 / 10-15	15-20 / 20	
OVERBURDEN	10-20	20-35	
DESCRIPTION	HIGHLY WEATHERED & FRACTURED SHALE WITH INTERCALATION OF SILTSTONE / SANDSTONE. HIGHLY DEFORMED/SHEARED DUE TO ANTI FORM FOLD LACK OF BLOCKINESS DUE TO CLOSE SPACING (<6m) OF WEAK HORIZONTAL BEDDING/FOLD STRUCTURE.	HIGHLY WEATHERED & FRACTURED SILTSTONE/SANDSTONE WITH INTERCALATION OF SHALE ROCK/GOUGE MATERIAL OF 1M THICK OR SHALE WITH MINOR SILTSTONE/ SANDSTONE. THE ROCK IS HEAVILY BROKEN AND HORIZONTALLY BEDDED WITH 6-20cm SPACING.	

RHS - WEST PORTAL

LEGEND

OVERBURDEN	
SHALE WITH MINOR SILTSTONE/SANDSTONE	
SHALE	
SILTSTONE / SANDSTONE WITH INTERCALATION OF SHALE.	
JOINT SET	

Rev.	Date	Description

Authority:	National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)
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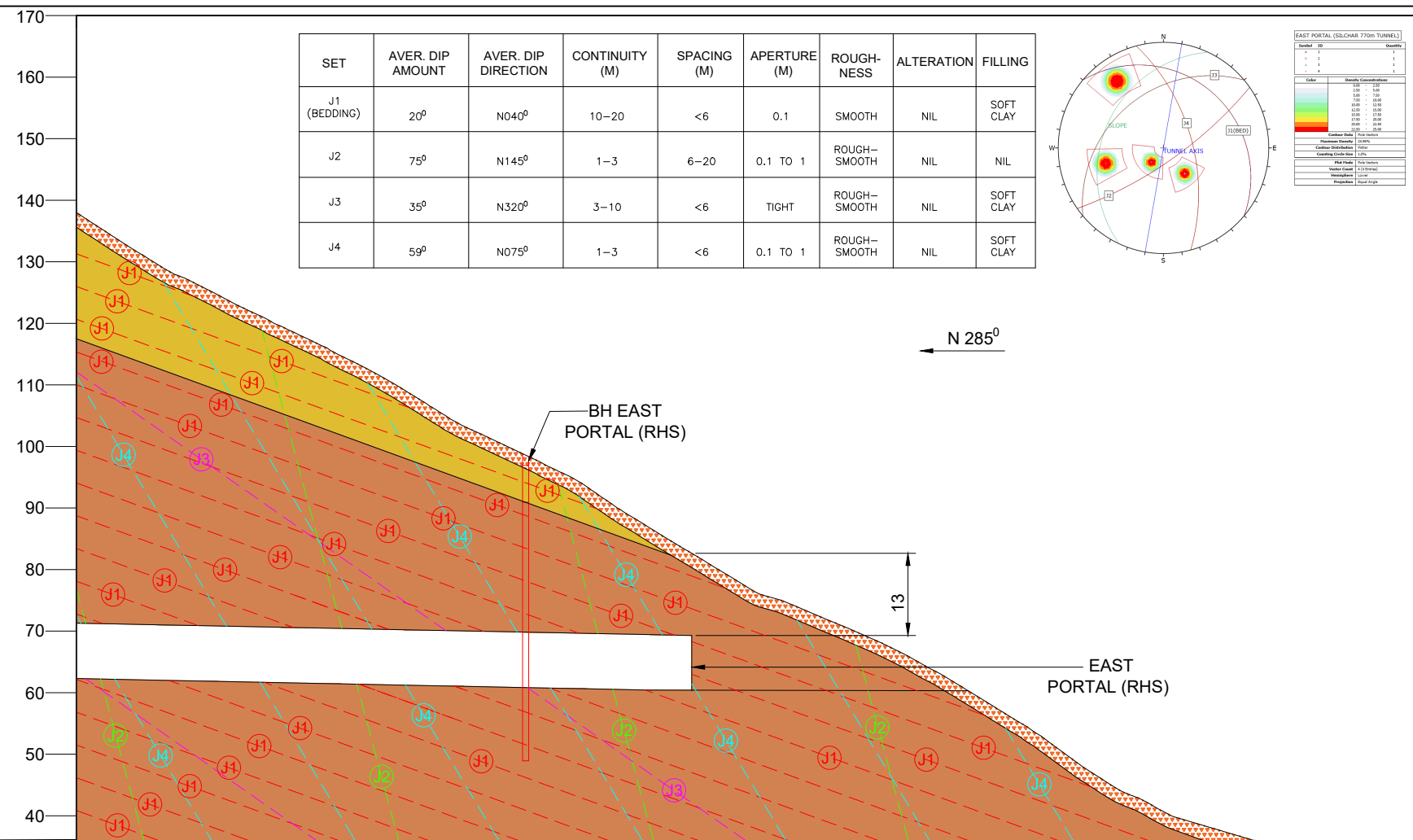
Design Consultants:	Transys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in
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Project:	Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000) Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)
----------	--

DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT
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Title: RHS WEST PORTAL GEOLOGICAL L-SECTION			
Size	Scale	Dwg. No	
	A3	1:1000	
Transys-NH37-TUNNEL-DPR_GEO-008		Rev: R2	



LEGEND

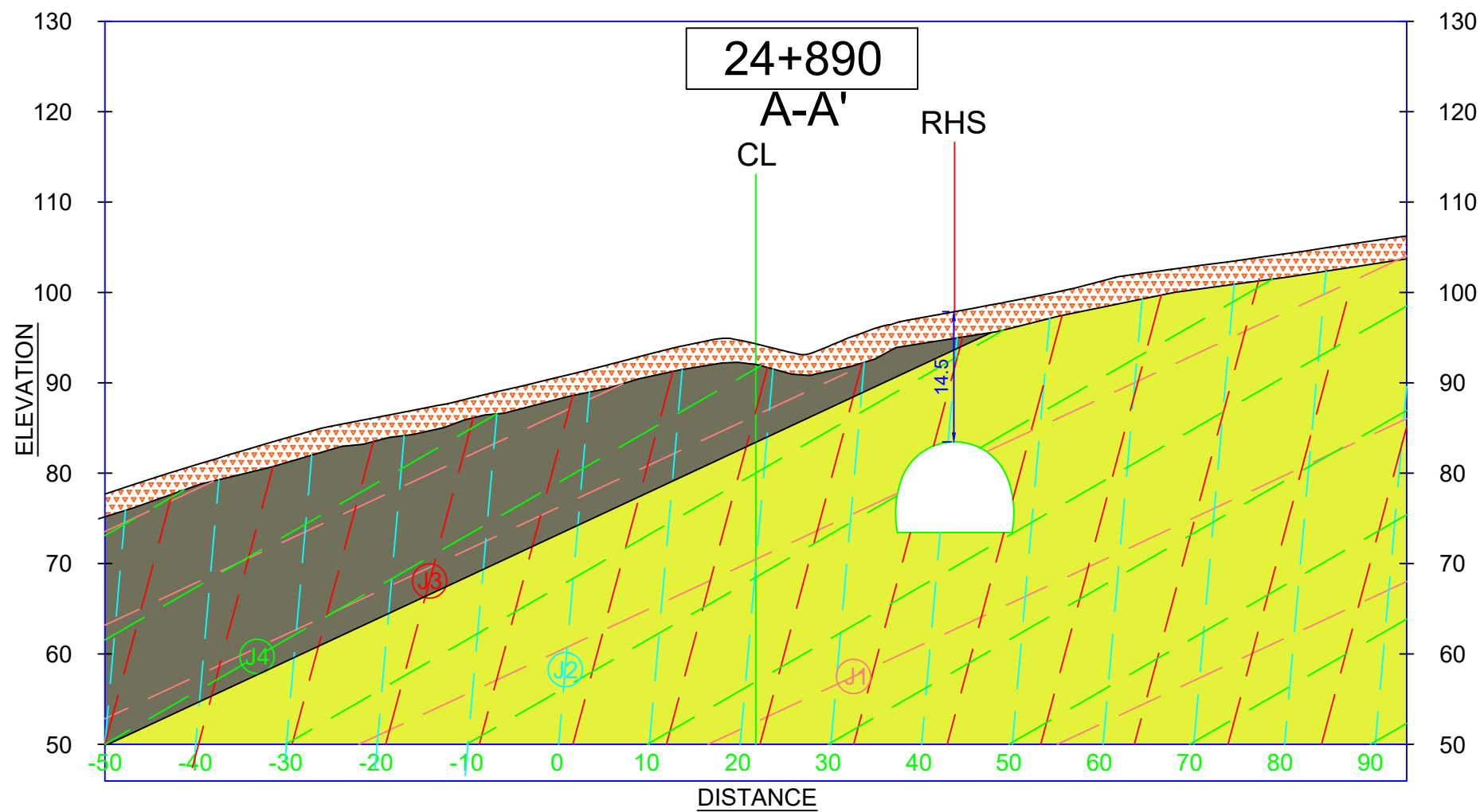
OVERBURDEN	
SILTSTONE / SANDSTONE WITH MINOR INTERCALATION OF SHALE.	
SILTSTONE / SANDSTONE WITH INTERCALATION OF SHALE.	
JOINT SET	

Datum : 0

Prop. Level at Median Edge		30	62.276	62.076	61.876	61.676	61.476	61.276	61.076	60.876	60.676	60.476	60.276	60.076	59.876	59.676	59.476	59.276	59.076	58.876	58.676	58.476	58.276	58.076
Ground Level below Prop. C/L		20	140.669	135.459	130.240	125.098	119.535	114.349	108.458	103.506	98.542	93.206	87.925	82.652	77.258	72.301	67.880	61.900	53.536	43.713	38.242	36.810	37.214	39.201
Ground Level below MCW at 22m from Prop. C/L	Left	10	146.164	137.260	135.631	129.317	121.242	114.855	110.442	106.063	102.541	96.553	89.826	82.945	76.990	70.335	64.209	59.397	53.020	46.527	38.187	37.620	37.075	40.471
	Right		139.273	132.893	126.975	122.201	117.426	112.575	106.446	101.080	96.377	90.543	84.249	77.955	73.399	69.496	64.579	58.698	52.212	45.271	40.016	38.394	37.079	37.001
Chainage (m)			25560	25570	25580	25590	25600	25610	25620	25630	25640	25650	25660	25670	25680	25690	25700	25710	25720	25730	25740	25750	25760	25770
SUPPORT CLASS (SC)								SUPPORT CLASS (SC) – V			SUPPORT CLASS (SC) – V(A)													
LENGTH / PERCENTAGE (SC)								50 M / 6.5%			17 M / 2.2%													
GSI / RMR								15–20 / 20			10–15 / 10–15													
OVERBURDEN								20–35			10–20													
DESCRIPTION								HIGHLY WEATHERED & FRACTURED SILTSTONE WITH INTERCALATION OF SHALE ROCK/GOUGE MATERIAL OF 1M THICK . THE ROCK IS HEAVILY BROKEN AND HORIZONTALLY BEDDED WITH 6–20cm SPACING.			HIGHLY WEATHERED & FRACTURED SILTSTONE WITH INTERCALATION OF SHALE ROCK/GOUGE MATERIAL. HIGHLY DEFORMED/SHEARED DUE TO ANTI FORM FOLD . LACK OF BLOCKINESS DUE TO CLOSE SPACING (<6cm) OF WEAK HORIZONTAL BEDDING/FOLD STRUCTURE.													

RHS - EAST PORTAL

Rev.	Date	Description	Authority: National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)	Design Consultants: Transys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in	Project: Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000) Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)	DRAWN BY: LOKESH DESIGNED BY: SREERAJ MELOTH CHECKED BY: VIDYA SAGAR APPROVED BY: SANJEEV	FINAL DETAILED PROJECT REPORT	Title: RHS EAST PORTAL GEOLOGICAL L-SECTION Size: A3 Scale: 1:1000 Dwg. No: Transys-NH37-TUNNEL-DPR_GEO-009 Rev: R2
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LEGEND

OVERBURDEN	
SHALE	
SHALE WITH MINOR SILTSTONE/SANDSTONE	
JOINT SET	

ROCK TYPE	Shale with minor intercalation of siltstone /sandstone rock.
UCS (MPa)	10-25.
RQD	<10 %.
GROUND WATER CONDITION	Damp to dripping.

SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGH-NESS	ALTERATION	FILLING
J1 (BEDDING)	15°	N345°	10–20	<6	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J2 (BEDDING)	85°	N040°	1–3	<6	<0.1	PLANAR SMOOTH	NIL	NIL
J3	30°	N165°	1–3	6–20	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J4	75°	N165°	1–3	6–20	<0.1	SMOOTH	NIL	SOFT CLAY

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

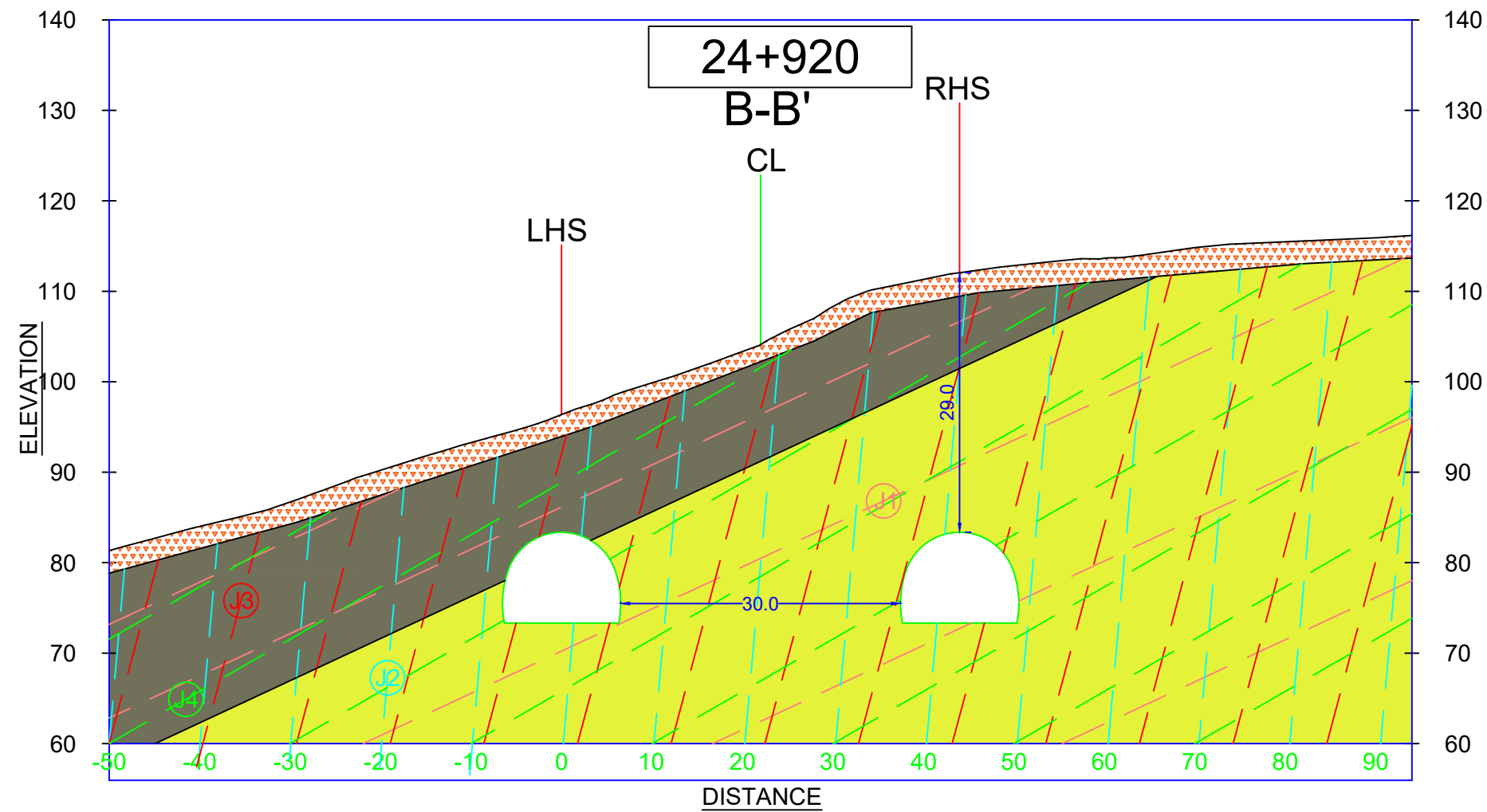
Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: GEOLOGICAL CROSS SECTION A-A' AT WEST PORTAL SILCHAR JIRIBAM TUNNEL			
Size A3	Scale	Dwg. No	Rev:
	1:100	Transys-NH37-TUNNEL-DPR_GEO-010	R2



LEGEND

OVERBURDEN	
SHALE	
SHALE WITH MINOR SILTSTONE/SANDSTONE	
JOINT SET	

ROCK TYPE	Shale with minor intercalation of siltstone /sandstone rock.
UCS (MPa)	10-25.
RQD	<10 %.
GROUND WATER CONDITION	Damp to dripping.

SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGH-NESS	ALTERATION	FILLING
J1 (BEDDING)	15°	N345°	10–20	<6	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J2 (BEDDING)	85°	N040°	1–3	<6	<0.1	PLANAR SMOOTH	NIL	NIL
J3	30°	N165°	1–3	6–20	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J4	75°	N165°	1–3	6–20	<0.1	SMOOTH	NIL	SOFT CLAY

Rev.	Date	Description

Authority:	National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)
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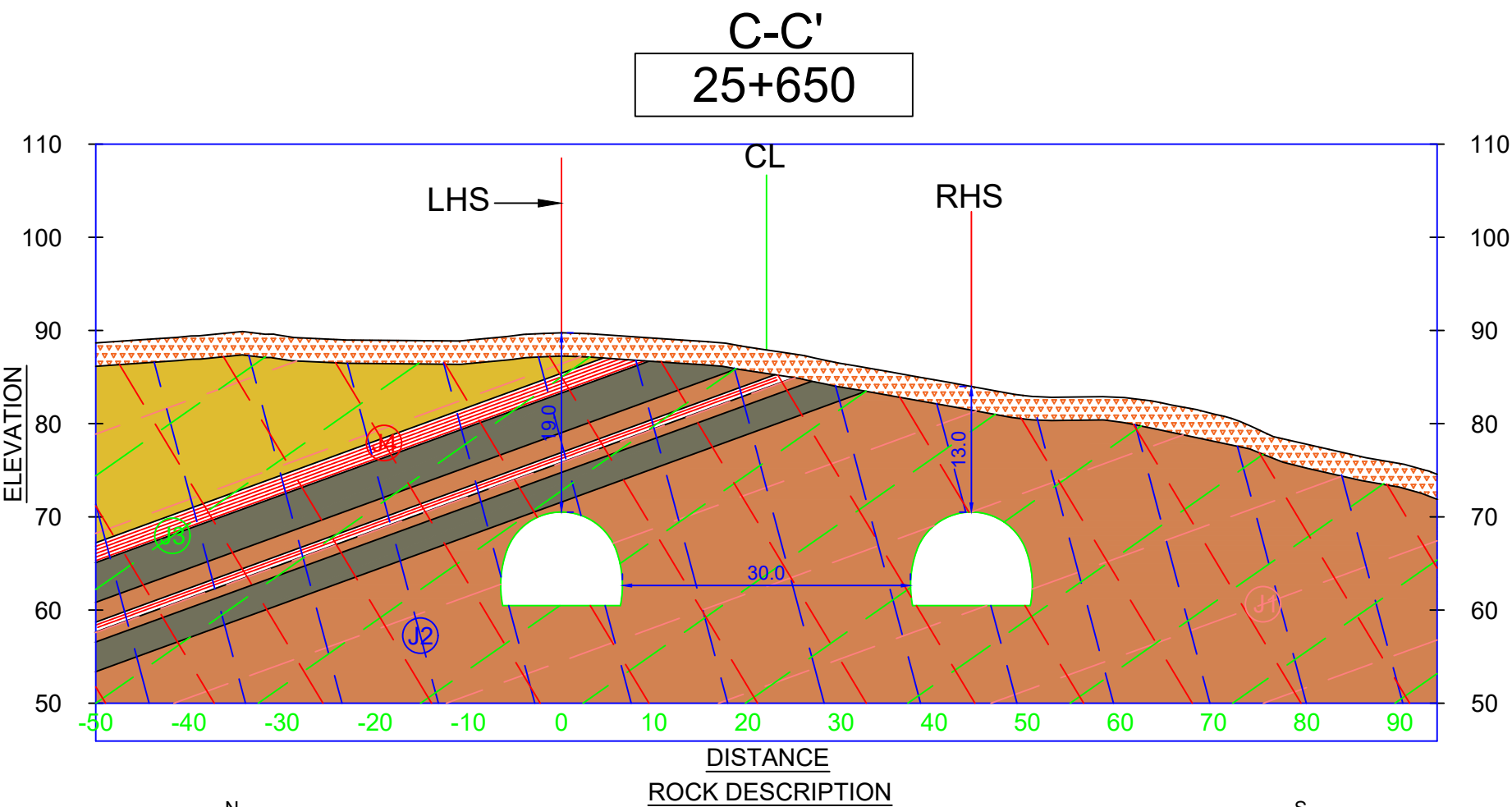
Design Consultants:	Transys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in
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Project:	Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000) Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)
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DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT
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Title: GEOLOGICAL CROSS SECTION B-B' AT WEST PORTAL SILCHAR JIRIBAM TUNNEL			
Size	Scale	Dwg. No	Rev:
A3	1:100	Transys-NH37-TUNNEL-DPR_GEO-011	R2



LEGEND	
OVERBURDEN	
SILTSTONE / SANDSTONE WITH MINOR INTERCALATION OF SHALE.	
SHALE	
SILTSTONE / SANDSTONE WITH INTERCALATION OF SHALE.	
SHALE / GOUGE MATERIAL	
JOINT SET	

SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGH-NESS	ALTERATION	FILLING
J1 (BEDDING)	20 ⁰	N040 ⁰	10–20	<6	0.1	SMOOTH	NIL	SOFT CLAY
J2	75 ⁰	N145 ⁰	1–3	6–20	0.1 TO 1	ROUGH–SMOOTH	NIL	NIL
J3	35 ⁰	N320 ⁰	3–10	<6	TIGHT	ROUGH–SMOOTH	NIL	SOFT CLAY
J4	59 ⁰	N075 ⁰	1–3	<6	0.1 TO 1	ROUGH–SMOOTH	NIL	SOFT CLAY

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

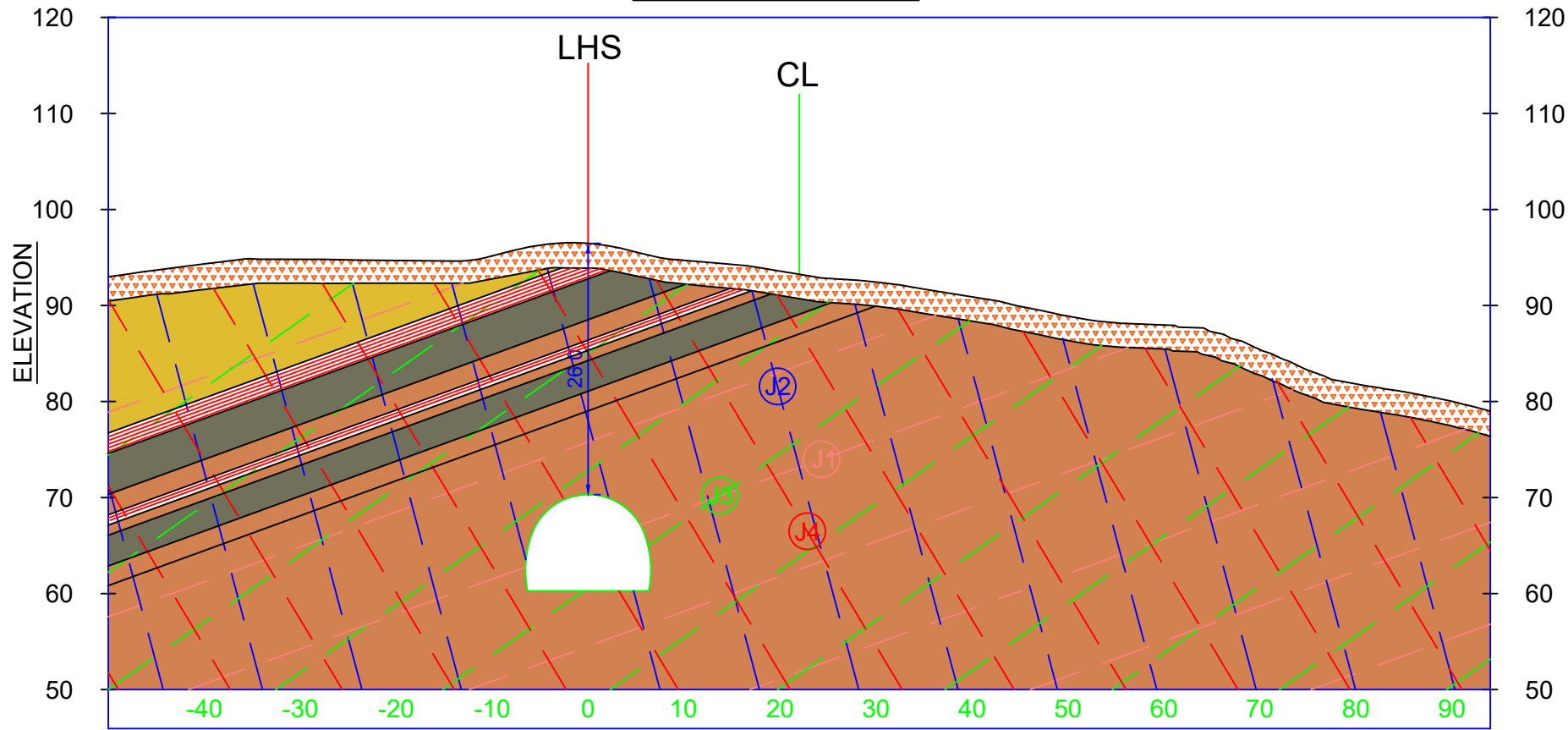
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: GEOLOGICAL CROSS SECTION C-C' AT EAST PORTAL SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drg. No	Rev:
A3	1:100	Transys-NH37-TUNNEL-DPR_GEO-012	R2

25+660



LEGEND

OVERBURDEN	
SILTSTONE / SANDSTONE WITH MINOR INTERCALATION OF SHALE.	
SHALE	
SILTSTONE / SANDSTONE WITH INTERCALATION OF SHALE.	
SHALE / GOUGE MATERIAL	
JOINT SET	

ROCK DESCRIPTION

ROCK TYPE	Siltstone / Sandstone with intercalation of shale rock.
UCS (MPa)	10-20.
RQD	<10 %.
GROUND WATER CONDITION	Damp to dripping.

SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGH-NESS	ALTERATION	FILLING
J1 (BEDDING)	20 ⁰	N040 ⁰	10–20	<6	0.1	SMOOTH	NIL	SOFT CLAY
J2	75 ⁰	N145 ⁰	1–3	6–20	0.1 TO 1	ROUGH–SMOOTH	NIL	NIL
J3	35 ⁰	N320 ⁰	3–10	<6	TIGHT	ROUGH–SMOOTH	NIL	SOFT CLAY
J4	59 ⁰	N075 ⁰	1–3	<6	0.1 TO 1	ROUGH–SMOOTH	NIL	SOFT CLAY

Rev.	Date	Description

Authority:



National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:



Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

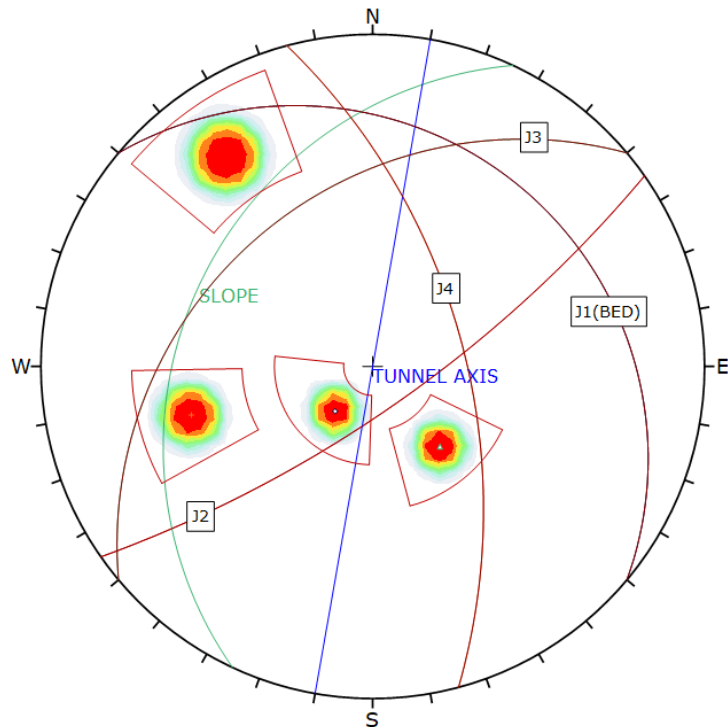
Title: GEOLOGICAL CROSS SECTION D-D' AT WEST PORTAL SILCHAR JIRIBAM TUNNEL			
Size	Scale	Dwg. No	Rev:
A3	1:100	Transys-NH37-TUNNEL-DPR_GEO-013	R2

JOINT SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGH-NESS	ALTERATION	FILLING
J1 (BEDDING)	20°	N040°	10–20	<6	0.1	SMOOTH	NIL	SOFT CLAY
J2	75°	N145°	1–3	6–20	0.1 TO 1	ROUGH–SMOOTH	NIL	NIL
J3	35°	N320°	3–10	<6	TIGHT	ROUGH–SMOOTH	NIL	SOFT CLAY
J4	59°	N075°	1–3	<6	0.1 TO 1	ROUGH–SMOOTH	NIL	SOFT CLAY

DISCONTINUITY PARAMETERS AND STEREO GRAPHIC PROJECTION AT EAST PORTAL.

LEGEND

OVERBURDEN (SANDY SILT SOIL)	
SILTSTONE/SANDSTONE WITH INTERCALATION OF SHALE	
BOREHOLE LOCATION	
GPS LOCATION	
SECTION	
HT ELECTRIC LINE	
STREAM/NALA	
CENTER LINE OF TUNNEL	

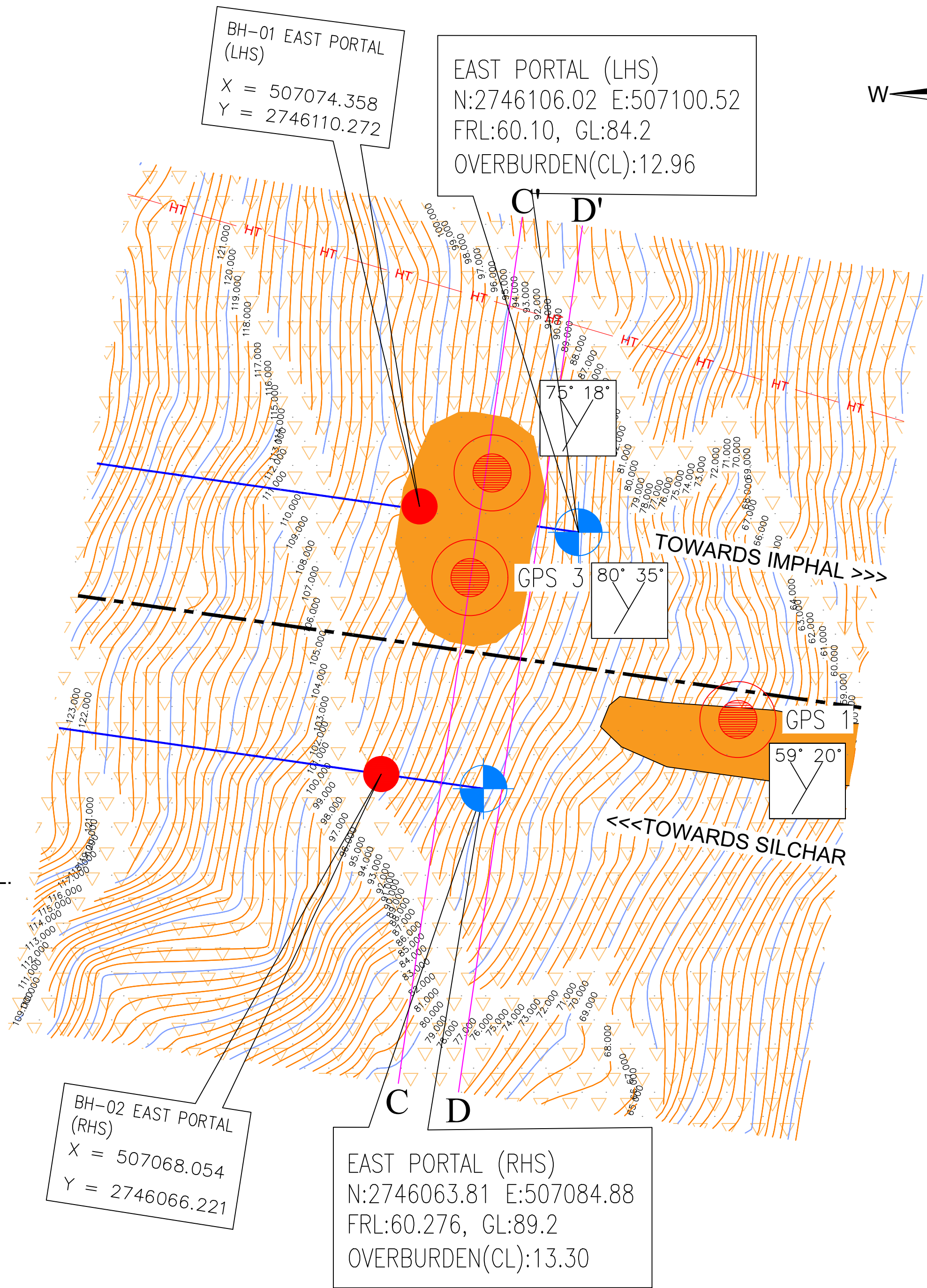


EAST PORTAL (SILCHAR 770m TUNNEL)		
Symbol	ID	Quantity
○	1	1
×	2	1
△	3	1
+	4	1

Color		Density Concentrations
0.00	2.50	
2.50	5.00	
5.00	7.50	
7.50	10.00	
10.00	12.50	
12.50	15.00	
15.00	17.50	
17.50	20.00	
20.00	22.50	
22.50	25.00	

Contour Data	Pole Vectors
Maximum Density	24.36%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Plot Mode	Pole Vectors
Vector Count	4 (4 Entries)
Hemisphere	Lower
Projection	Equal Angle



Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

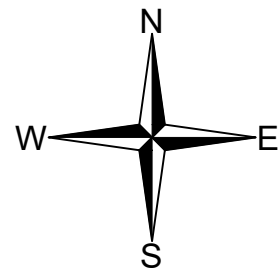
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: PLAN OF EAST PORTAL AREA SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drg. No	
	A2	1:100	Transys-NH37-TUNNEL-DPR_GEO-014
Rev:			R2



WEST PORTAL (LHS)
N:2746213.20 E:506351.65
FRL:73.369, GL:102.5
OVERBURDEN(CL):12.85

75° 23'
GPS 6

BH-02 WEST PORTAL (LHS)
X = 506381.348
Y = 2746208.949

BH-01 WEST PORTAL (RHS)
X = 506375.043
Y = 2746164.898

85° 32'
GPS 5

75° 20'
GPS 4

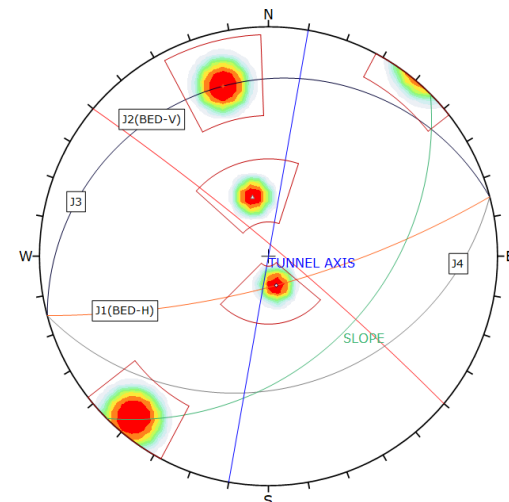
TOWARDS IMPHAL >>>

WEST PORTAL (RHS)
N:2746173.75 E:506316.71
FRL:73.45, GL:90.85
OVERBURDEN(CL):13.56

PILLAR T9
X = 506369.364
Y = 2746153.82
Z = 120.131

PILLAR T8
X = 506367.895
Y = 2746141.391
Z = 121.565

PILLAR T7
X = 506375.082
Y = 2746130.215
Z = 122.11



WEST PORTAL-(SILCHAR 770m TUNNEL)		
Symbol	ID	Quantity
○	1	1
×	2	1
△	3	1
+	4	1

Color	Density Concentrations
0.00	0.00 - 2.50
2.50	2.50 - 5.00
5.00	5.00 - 7.50
7.50	7.50 - 10.00
10.00	10.00 - 12.50
12.50	12.50 - 15.00
15.00	15.00 - 17.50
17.50	17.50 - 20.00
20.00	20.00 - 22.50
22.50	22.50 - 25.00

Contour Data	
Maximum Density	24.85%
Contour Distribution	Figure
Counting Circle Size	1.2%

Plot Note	
Vector Count	4 (4 Entries)
Hemisphere	Lower
Projection	Equal Angle

LEGEND

OVERBURDEN (SANDY SILT SOIL)	
SHALE	
BOREHOLE LOCATION	
GPS LOCATION	
SECTION	
HT ELECTRIC LINE	
STREAM/NALA	
CENTER LINE OF TUNNEL	

SET	AVER. DIP AMOUNT	AVER. DIP DIRECTION	CONTINUITY (M)	SPACING (M)	APERTURE (M)	ROUGH-NESS	ALTERATION	FILLING
J1 (BEDDING)	15°	N345°	10-20	<6	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J2 (BEDDING)	85°	N040°	1-3	<6	<0.1	PLANAR SMOOTH	NIL	NIL
J3	30°	N165°	1-3	6-20	<0.1	PLANAR SMOOTH	NIL	SOFT CLAY
J4	75°	N165°	1-3	6-20	<0.1	SMOOTH	NIL	SOFT CLAY

DISCONTINUITY PARAMETERS AND STEREO GRAPHIC PROJECTION AT WEST PORTAL.

Rev.	Date	Description

Authority:	National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)
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Design Consultants:	Transys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in
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Project:	Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000) Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)
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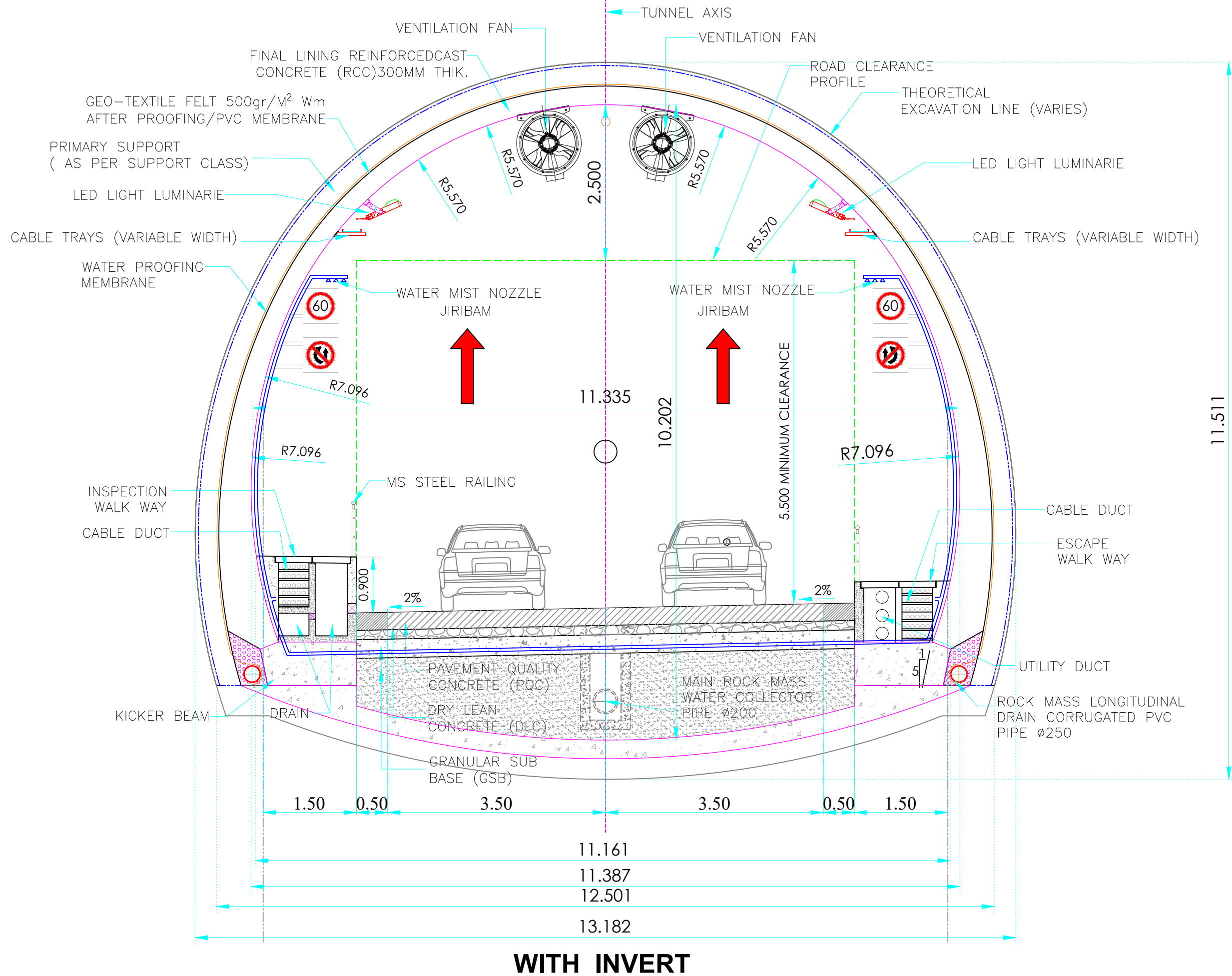
DRAWN BY	LOKESH
DESIGNED BY	SREERAJ MELOTH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT
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Title: PLAN OF WEST PORTAL AREA SILCHAR JIRIBAM TUNNEL			
Size A2	Scale	Dwg. No	Rev:
	1:100	Transys-NH37-TUNNEL-DPR_GEO-015	R2

SILCHAR-JIRIBAM TUNNEL CIVIL DRAWING

SILCHAR-JIRIBAM SECTION OF NH-37 (PACKAGE: S-J-2 (PNP_TUNNEL-DPR), D. KM 24+000 TO D. KM 27+000				
<u>S. No.</u>	<u>Name of Drawing</u>	<u>Drawing Number</u>	<u>NO. OF DRAWING</u>	<u>Revision No</u>
1	GAD TUNNEL & CROSS PASSAGE	Transsys-NH37-TUNNEL-DPR-CIVIL-001	5	R2
2	LAYOUT PLAN (Tunnel East & West portal)	Transsys-NH37-TUNNEL-DPR-CIVIL-002	3	R2
3	(SECTION A-A) L-SECTION OF WEST PORTAL LHS	Transsys-NH37-TUNNEL-DPR-CIVIL-003	1	R2
4	(SECTION B-B) L-SECTION OF EAST PORTAL LHS	Transsys-NH37-TUNNEL-DPR-CIVIL-004	1	R2
5	(SECTION C-C) L-SECTION OF WEST PORTAL RHS	Transsys-NH37-TUNNEL-DPR-CIVIL-005	1	R2
6	(SECTION D-D) L-SECTION OF EAST PORTAL RHS	Transsys-NH37-TUNNEL-DPR-CIVIL-006	1	R2
7	(SECTION 1-1) CROSS SECTION OF WEST PORTAL CH 24860	Transsys-NH37-TUNNEL-DPR-CIVIL-007	1	R2
8	(SECTION 2-2) CROSS SECTION OF WEST PORTAL CH 24881	Transsys-NH37-TUNNEL-DPR-CIVIL-008	1	R2
9	(SECTION 3-3) CROSS SECTION OF WEST PORTAL CH 24910	Transsys-NH37-TUNNEL-DPR-CIVIL-009	1	R2
10	(SECTION 4-4) CROSS SECTION OF EAST PORTAL CH 25657	Transsys-NH37-TUNNEL-DPR-CIVIL-010	1	R2
11	(SECTION 5-5) CROSS SECTION OF EAST PORTAL CH 25666.5	Transsys-NH37-TUNNEL-DPR-CIVIL-011	1	R2
12	(SECTION 6-6) CROSS SECTION OF EAST PORTAL CH 25687.5	Transsys-NH37-TUNNEL-DPR-CIVIL-012	1	R2
13	TUNNEL-DPR EXCAVATION & SUPPORT CLASS FOR SC-03 SILCHAR JIRIBAM TUNNEL-DPR	Transsys-NH37-TUNNEL-DPR-CIVIL-013	1	R2
14	TUNNEL-DPR EXCAVATION & SUPPORT CLASS FOR SC-04 SILCHAR JIRIBAM TUNNEL-DPR	Transsys-NH37-TUNNEL-DPR-CIVIL-014	1	R2
15	TUNNEL-DPR EXCAVATION & SUPPORT CLASS FOR SC-05 SILCHAR JIRIBAM TUNNEL-DPR	Transsys-NH37-TUNNEL-DPR-CIVIL-015	1	R2
16	TUNNEL-DPR EXCAVATION & SUPPORT CLASS FOR SC-05(A) SILCHAR JIRIBAM TUNNEL-DPR	Transsys-NH37-TUNNEL-DPR-CIVIL-016	1	R2
17	TUNNEL CROSS PASSAGE EXCAVATION & SUPPORT CLASS FOR SC-05 SILCHAR JIRIBAM TUNNEL-DPR	Transsys-NH37-TUNNEL-DPR-CIVIL-017	1	R2
18	PIPE ROOFING, PRESSURE RELIEF HOLES, AND ROCK BOLT DETAILS	Transsys-NH37-TUNNEL-DPR-CIVIL-018	1	R2
19	TYPICAL CROSS SECTION ISMB 250 (M-30 CONCRETE)	Transsys-NH37-TUNNEL-DPR-CIVIL-019	1	R2
20	SECONDARY LINING REINFORCEMENT DETAILS	Transsys-NH37-TUNNEL-DPR-CIVIL-020	3	R2
21	STANDARD TUNNEL MONITORING DETAILS	Transsys-NH37-TUNNEL-DPR-CIVIL-021	1	R2
22	TYPICAL SECTION MONITORING DETAIL FOR PORTAL SLOPE	Transsys-NH37-TUNNEL-DPR-CIVIL-022	1	R2
23	RIGID PAVEMENT	Transsys-NH37-TUNNEL-DPR-CIVIL-023	2	R2
24	SIGNAGE PLAN	Transsys-NH37-TUNNEL-DPR-CIVIL-024	1	R2



Rev.	Date	Description

Authority:  National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)

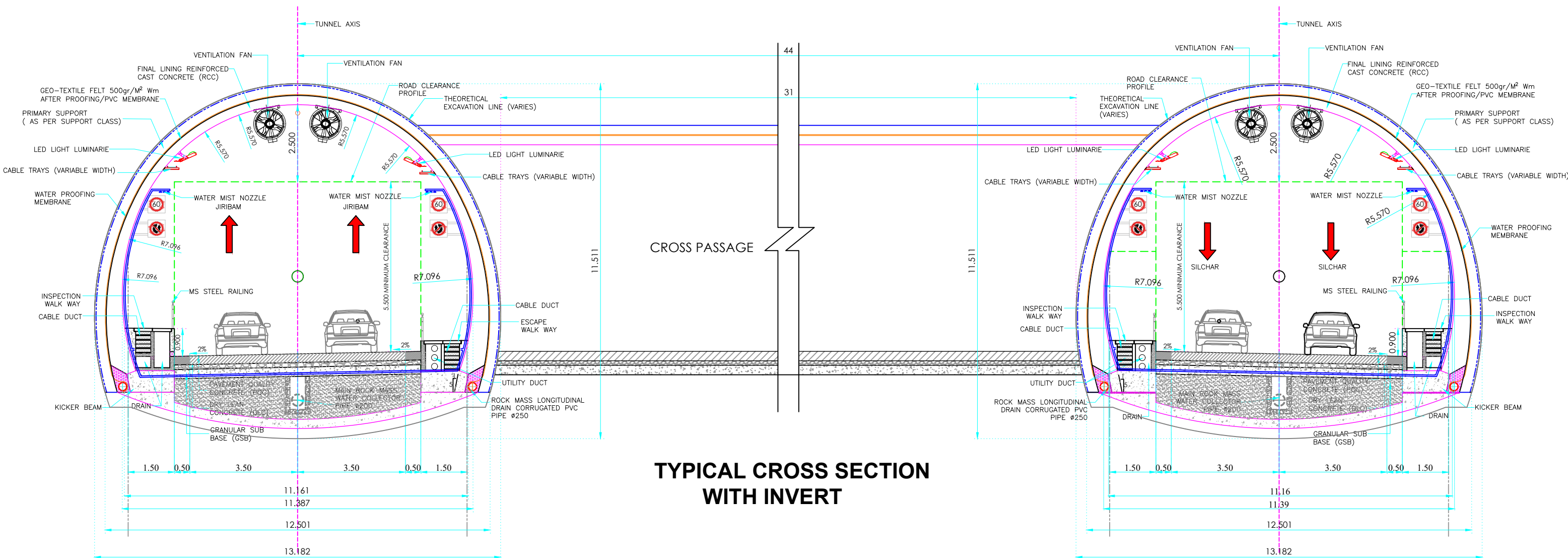
Design Consultants:  Transys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project: Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000) Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)
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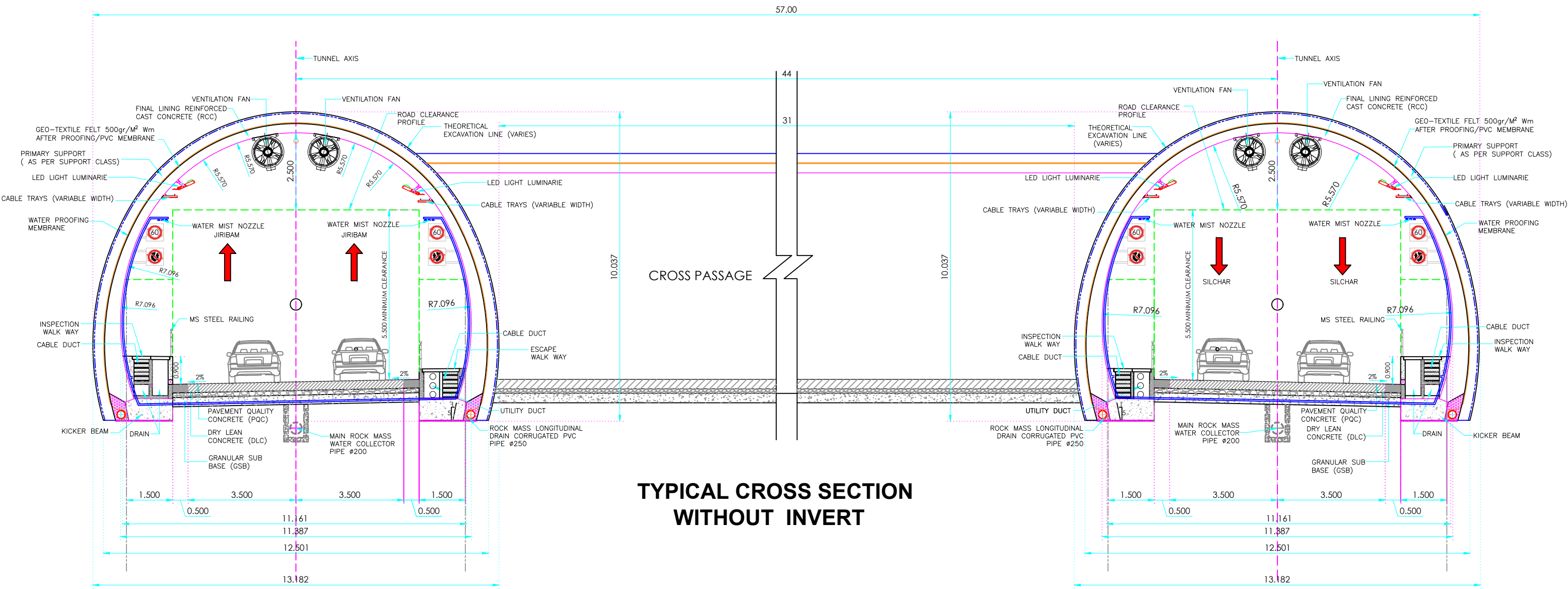
DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT
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Title: TYPICAL CROSS SECTION WITH INVERT			SHEET NO. (1 of 5)
Size	Scale	Dwg. No	Rev:
A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-001	R2



TYPICAL CROSS-SECTION - TUNNEL



TYPICAL CROSS-SECTION - TUNNEL

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
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001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transysblr@transysconsulting.co.in

Project:

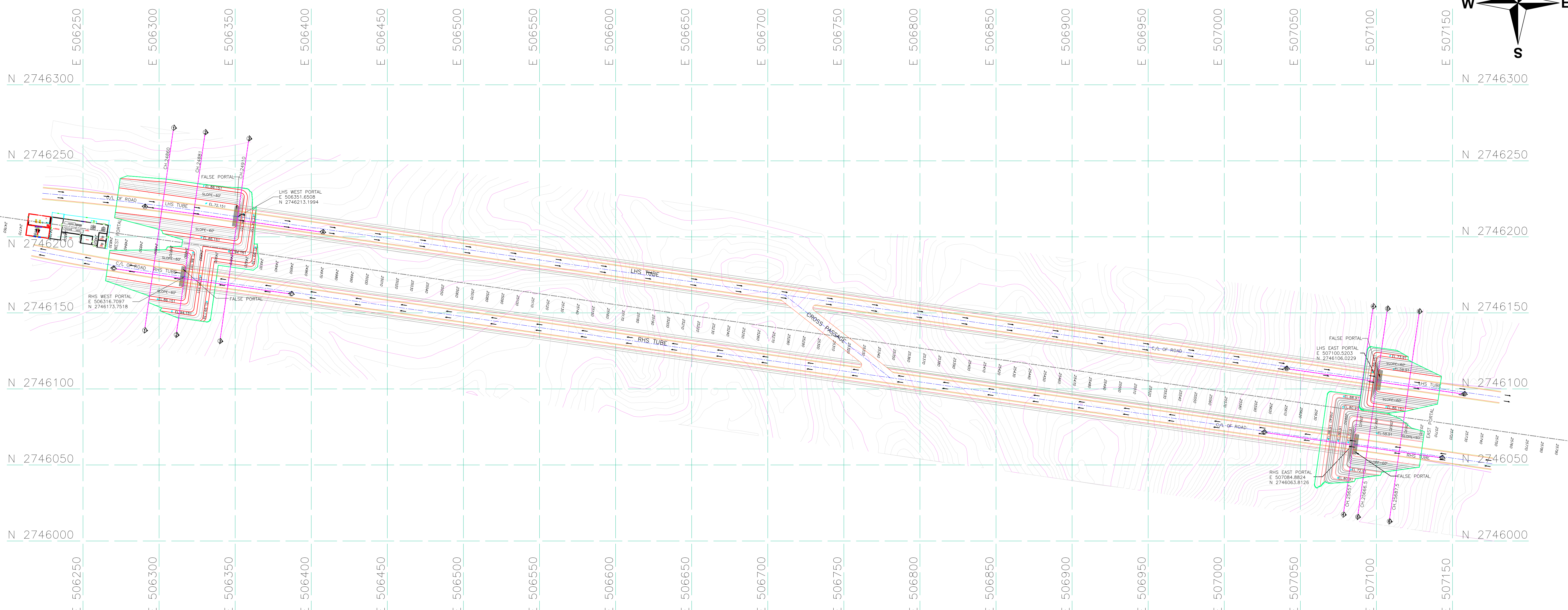
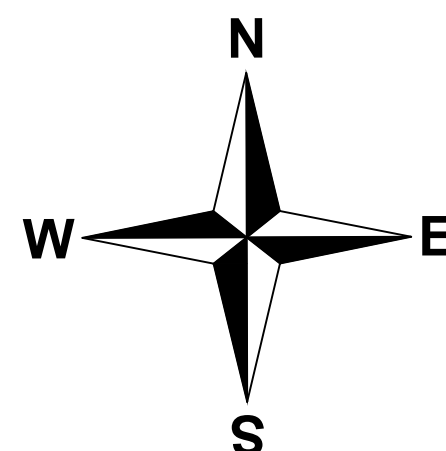
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

TYPICAL CROSS SECTION WITHOUT INVERT				SHEET NO. (4 of 5)
Title:	Size	Scale	Dwg. No	Rev:
	A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-001	



SILCHAR-JIRIBAM TUNNEL PLAN

LEGEND

SECTION LINE	
MAJOR CONTOUR	
MINOR CONTOUR	
ROAD CENTERLINE	
ROAD	
EDGE STRIP	
TUNNEL INTERNAL LINE	
TUNNELS CENTERLINE	
TUNNEL EXCAVATION LINE	
PAVED SHOULDER	
PORTAL OUTER LINE	
UTILITY BUILDING	
TUNNEL PORTAL	

Rev.	Date	Description

Authority:

**National Highways & Infrastructure Development Corporation Ltd.**
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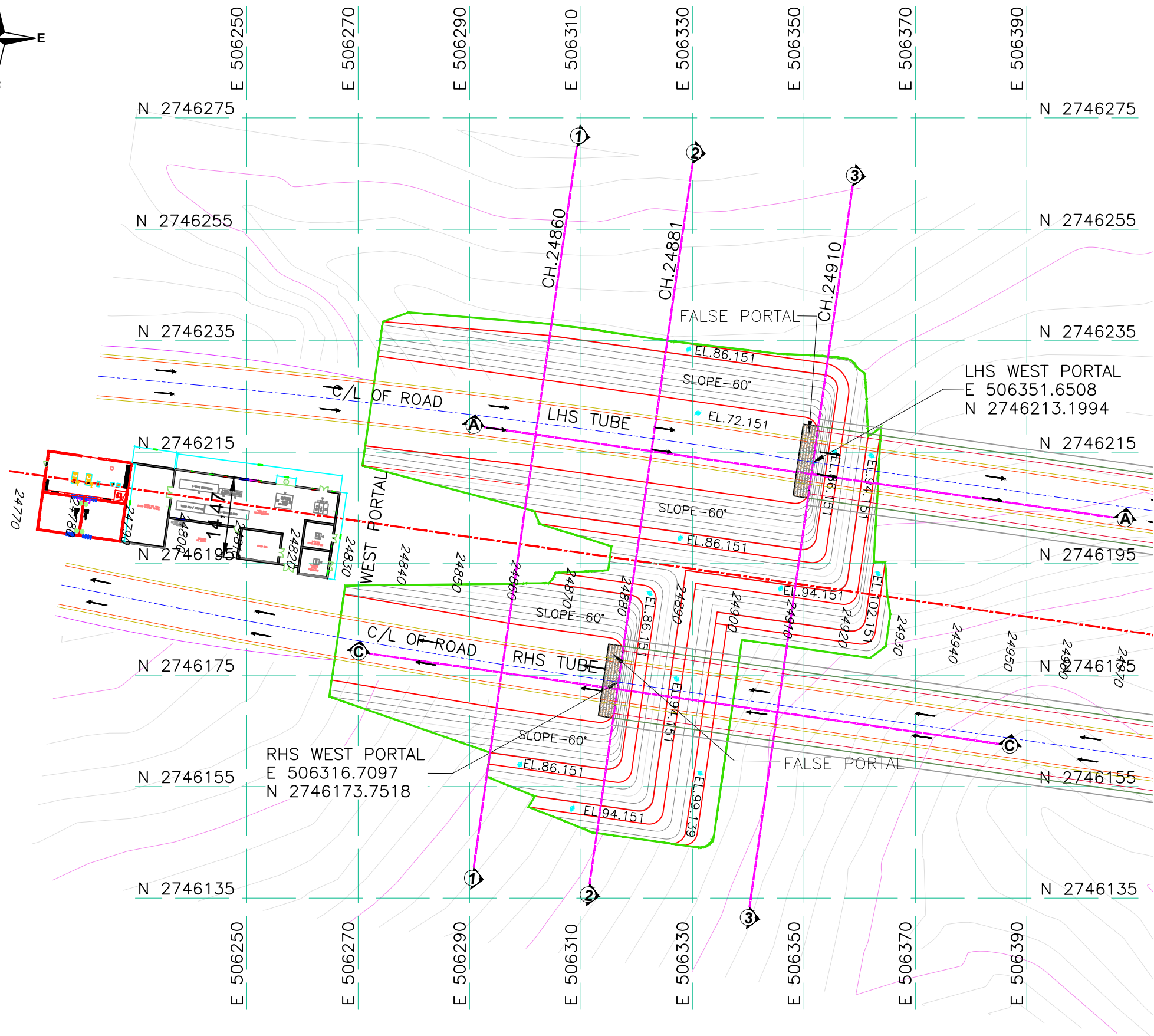
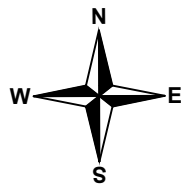
Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP_TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: LAYOUT PLAN OF SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drw. No	Rev:
A1	1:800	Transys-NH37-TUNNEL-DPR-CIVIL-002 SHEET NO. (1 of 3)	R2



PLAN OF WEST PORTAL

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. OPEN EXCAVATION OF PORTAL AREA SHALL BE DONE IN MULTIPLE STAGES FROM TOP TO DOWN WITH INSTALLTION OF SUPPORT SYSTEM.
4. THE SUPPORT MUST BE INSTALLED IMMEDIATELY AFTER EXCAVATION AND BEFORE STARTING NEXT ROUND OF EXCAVATION.
5. THE SUPPORT SCHEME IS ARRIVED BASED ON THE GEOLOGICAL AND GEO-TECHNICAL INVESTIGATION CONDUCTED AT SITE. IF ANY GEOLOGICAL VARITIONS OCCUR DURING EXCAVATION OF THE FACE, THE SUPPORT SCHEME SHALL BE REDESIGNED TO MEET THE SITE REQUIREMENT.
6. ALL THE WORK SHALL BE CARRIED OUT AS PER THE RELEVANT TENDER SPECIFICATIONS AND CODES.
7. ALL THE MATERIAL USED FOR CONSTRUCTION SHALL BE TESTED AS PER RELEVENT IS CODES.
8. THE SUPPORT SYSTEM INDICATED IS EXCLUSIVELY FOR THE PORTAL AREA IRRESPECTIVE OF ROCK CLASSIFICATION. FOR MAIN TUNNEL SUPPORT REFER SEPARATE DRAWINGS.
9. IN CASE OF GEOTECHNICAL CONDITON ARE WORSE THAN EXPECTED OR UNACCEPTABLE DISPLACEMENTS OR INSTABILITY SIGNS ARE DETECTED, ADDITIONAL SUPPORT MAY BE INSTALLED IN CONSULTATION WITH SITE GEOLOGIST AND DESIGNER.
10. IN CASE OF LEAKAGES OR INFILTRATIONS ARE DETECTED IN THE SURFACE OF THE SHOTCRETE ONCE THE DRAIN PIPES ARE INSTALLED, ADDITIONAL DRAIN PIPE SHALL BE INSTALLED TO RELEASE THE PRESSURE FROM THE SHOTCRETE LAYER IN THOSE ZONES.

LEGEND

SECTION LINE	
MAJOR CONTOUR	
MINOR CONTOUR	
ROAD CENTERLINE	
ROAD	
EDGE STRIP	
TUNNEL INTERNAL LINE	
TUNNELS CENTERLINE	
TUNNEL EXCAVATION LINE	
PAVED SHOULDER	
PORTAL OUTER LINE	
UTILITY BUILDING	
TUNNEL PORTAL	

Rev.	Date	Description

Authority:



**National Highways & Infrastructure
Development Corporation Ltd.**
(Ministry of Road Transport & Highways)

Design Consultants:



Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum
Road, Bengaluru-560001; Tel: 080-41461995;
email: transys_blr@transysconsulting.co.in

Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors,
Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India
under Bharatmala Pariyojna (Lot-1) (Package-III)

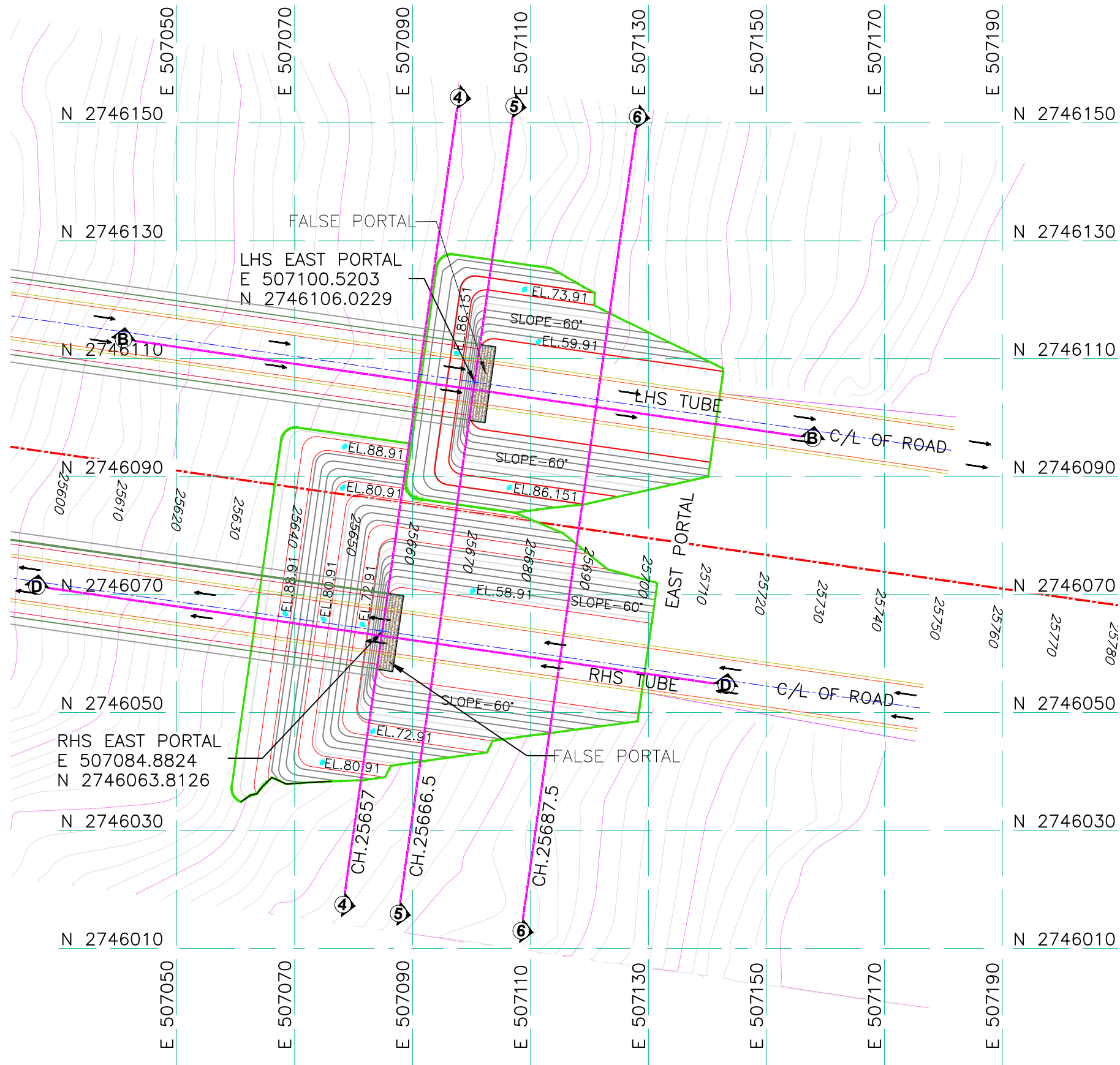
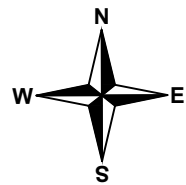
DRAWN BY	LOKESH
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: **LAYOUT PLAN OF WEST PORTAL**

Size	Scale	Dwg. No	Rev:
A3	1:100	Transys-NH37-TUNNEL-DPR-CIVIL-002	R2

SHEET NO. (2 of 3)



PLAN OF EAST PORTAL

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
 2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 3. OPEN EXCAVATION OF PORTAL AREA SHALL BE DONE IN MULTIPLE STAGES FROM TOP TO DOWN WITH INSTALLATION OF SUPPORT SYSTEM.
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 7. ALL THE MATERIAL USED FOR CONSTRUCTION SHALL BE TESTED AS PER RELEVANT IS CODES.
 8. THE SUPPORT SYSTEM INDICATED IS EXCLUSIVELY FOR THE PORTAL AREA IRRESPECTIVE OF ROCK CLASSIFICATION. FOR MAIN TUNNEL SUPPORT REFER SEPARATE DRAWINGS.
 9. IN CASE OF GEOTECHNICAL CONDITION ARE WORSE THAN EXPECTED OR UNACCEPTABLE DISPLACEMENTS OR INSTABILITY SIGNS ARE DETECTED, ADDITIONAL SUPPORT MAY BE INSTALLED IN CONSULTATION WITH SITE GEOLOGIST AND DESIGNER.
 10. IN CASE OF LEAKAGES OR INFILTRATIONS ARE DETECTED IN THE SURFACE OF THE SHOTCRETE ONCE THE DRAIN PIPES ARE INSTALLED, ADDITIONAL DRAIN PIPE SHALL BE INSTALLED TO RELEASE THE PRESSURE FROM THE SHOTCRETE LAYER IN THOSE ZONES.

LEGEND

SECTION LINE	
MAJOR CONTOUR	
MINOR CONTOUR	
ROAD CENTERLINE	
ROAD	
EDGE STRIP	
TUNNEL INTERNAL LINE	
TUNNELS CENTERLINE	
TUNNEL EXCAVATION LINE	
PAVED SHOULDER	
PORTAL OUTER LINE	
UTILITY BUILDING	
TUNNEL PORTAL	

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

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Project:
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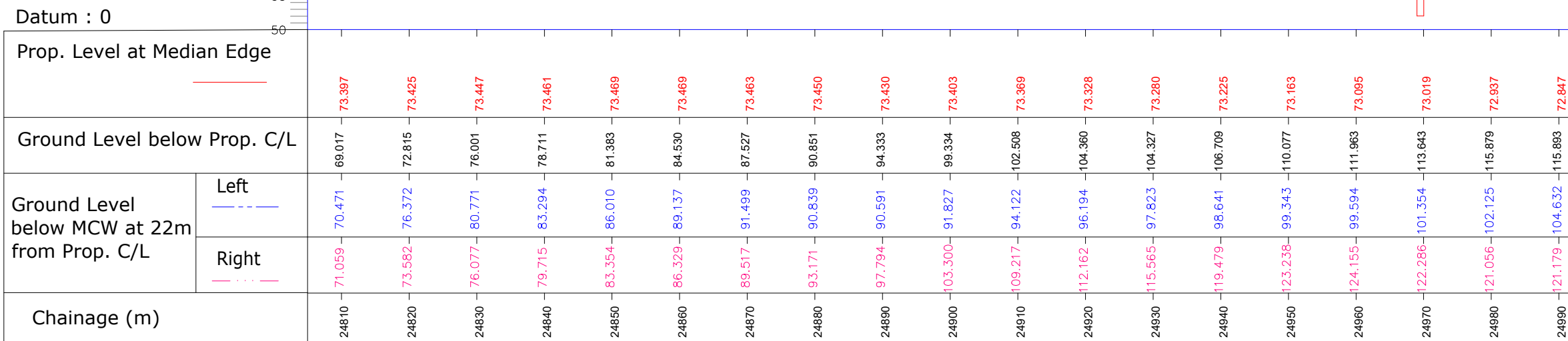
DRAWN BY	LOKESH
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**FINAL
DETAILED
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REPORT**

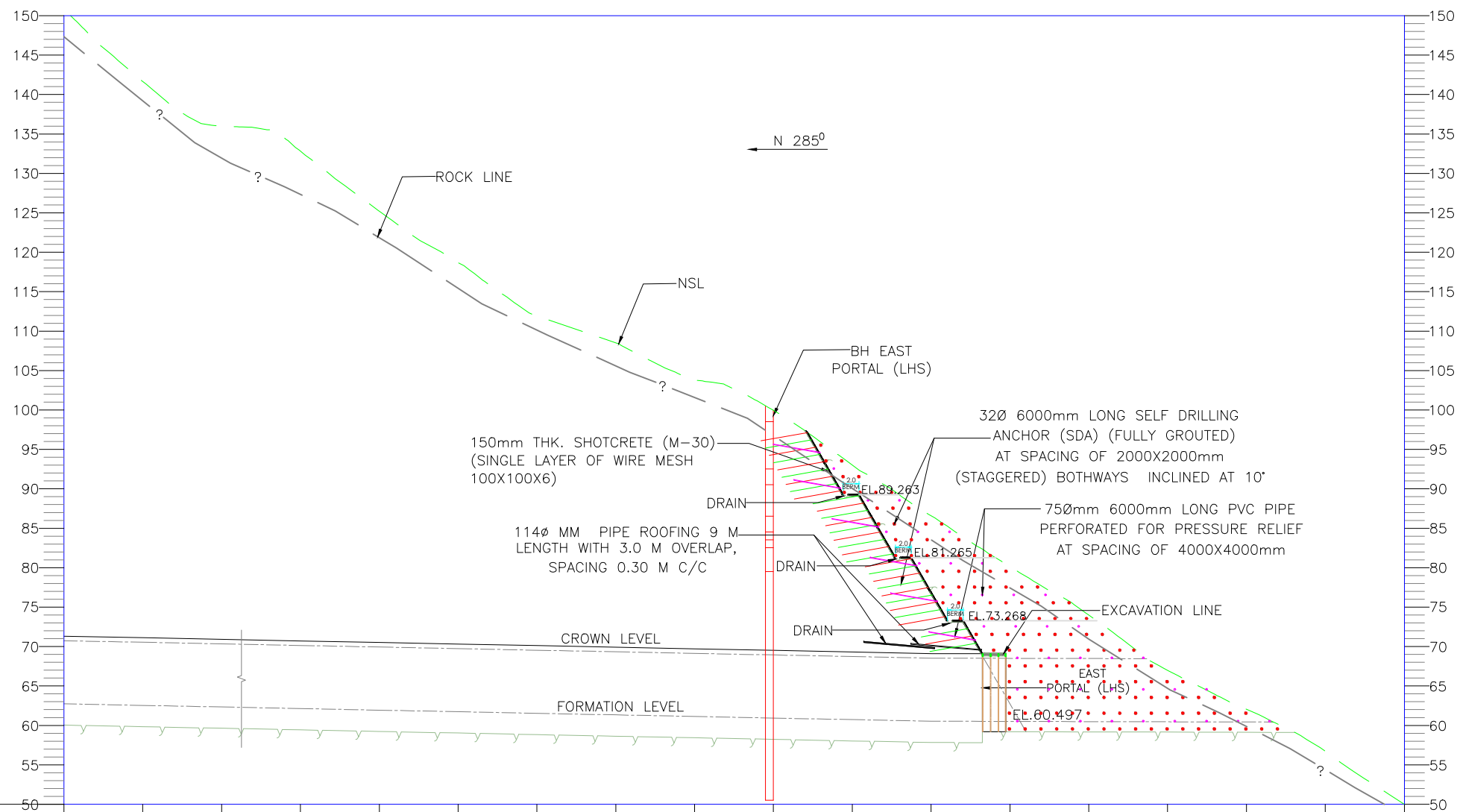
Title: **LAYOUT PLAN OF EAST PORTAL**

Size	Scale	Dwg. No	Rev:
A3	1:100	Transys-NH37-TUNNEL-DPR-CIVIL-002	R2

SHEET NO. (3 of 3)



FINAL DETAILED PROJECT REPORT	Title: (SECTION A-A) L- SECTION OF LHS WEST PORTAL			
	<i>Size</i>	<i>Scale</i>	<i>Drwg. No</i>	<i>Rev:</i>
	A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-003	R2



Datum : 0

Prop. Level at Median Edge		62.276	62.076	61.876	61.676	61.476	61.276	61.076	60.876	60.676	60.476	60.276	60.076	59.876	59.676	59.476	59.276
Ground Level below Prop. C/L		140.669	135.459	130.240	125.098	119.535	114.349	108.458	103.506	98.542	93.206	87.925	82.652	77.258	72.301	67.880	61.900
Ground Level below MCW at 22m from Prop. C/L	Left	146.164	137.260	135.631	129.317	121.242	114.855	110.442	106.063	102.541	96.553	89.826	82.945	76.990	70.335	64.209	59.397
	Right	139.273	132.893	126.975	122.201	117.426	112.575	106.446	101.080	96.377	90.543	84.249	77.955	73.399	69.496	64.579	58.698
Chainage (m)		25560	25570	25580	25590	25600	25610	25620	25630	25640	25650	25660	25670	25680	25690	25700	25710

L-SECTION (B - B) EAST PORTAL (LHS)

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
 2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 3. OPEN EXCAVATION OF PORTAL AREA SHALL BE DONE IN MULTIPLE STAGES FROM TOP TO DOWN WITH INSTALLTION OF SUPPORT SYSTEM.
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- SPRAYED CONCRETE**
1. SPRAYED CONCRETE SHALL BE OF M30 GRADE CONCRETE.
 2. SPRAYED CONCRETE MATERIAL, ADMIXTURES, PRODUCTION, METHODS OF APPLICATION, TEMPERATURE CONTROL AND TESTING SHALL CONFIRM TO RELEVANT TECHNICAL SPECIFICATIONS AND INDIAN STANDARD IS:269, IS:383, IS:456, IS:1489, IS:2645, IS:9012, IS:9013 OR TO THE EQUIVALENT INTERNATIONAL STANDARDS IF NOT COVERED BY THESE STANDARDS.
 3. THE COMPRESSIVE STRENGTH AFTER 7 DAYS SHALL BE 70% OF THE SPECIFIED STRENGTH AT 28 DAYS. THE STRENGTH AND WORKABILITY PRQUIREMENTS SHALL BE ESTABLISHED BY APPROPRIATE CONCRETE MIX DESIGN AND LABORATORY FIELD TESTS.
 4. ALL SPRAYED CONCRETE WORK SHALL BE PROPERLY CURED SO THAT ITS POTENTIAL STRENGTH AND DURABILITY CAN BE FULLY DEVELOPED.

- ROCK BOLT**
1. THE ROCK BOLTS OF 32mm Ø WITH PLATE 150X150X10mm SHOULD CONFIRM TO IS:1786, IS:1367 & IS:1363.
 2. THE MINIMUM YIELD STRENGTH OF THE ROCK BOLT SHALL BE 23T.
 3. ROCK BOLTS SHALL BE MADE OF HYSD BARS HAVING CHARACTERISTIC YIELD STRENGTH NOT LESS THAN 500 N/mm².
 4. THE HYSD BAR SHALL BE CHAMFERED AT ONE END AND OTHER END SHALL BE THREADED WITH COARSE THREAD OVER A LENGTH OF 100mm.
 5. ROCK BOLTS SHOULD BE TESTED FOR PULL OUT OF STRENGTH AS PER IS:11309.
 6. ALL ROCK BOLTS SHALL BE FULLY GROUTED WITH CEMENT MIX 1:1.

- DRAINAGE HOLES**
1. PRESSURE RELIF HOLES OF 75mm DIA. 6000mm LONG, SHOULD BE PROVIDED ON CUT SLOPE OF PORTAL.
 2. THE WATER SHALL BE TRAINED AND CHANNALIZED TO THE SIDE DRAIN.

- CONCRETE**
1. ALL CONCRETE WORKS SHALL BE EXECUTED AS PER IS:456 WITH THE LATEST CORRECTSION
 2. GRADE OF CONCRETE FOR DIFFERENT ITEMS
SPRAYED CONCRETE M30
DRAIN WALL M20
SHOTCRETE M30
 3. CONSTRUCTION JOINTS SHALL BE PROPERLY CLEANED BEFORE PLACING OF FRESH CONCRETE.
 4. CONCRETE SHALL NE KEPTH MOIST FOR AT LEAST 21 DAYS.

- STEEL SUPPORTS**
1. RIBS SHALL BE CONFORMING TO IS2062-2006.
 2. QUALITY CONTROL AND SAFETY PARAMETERS ARE TO BE ENSURED DURING PROGRESS OF THE WORKS.
 3. REFER TECHNICAL SPECIFICATION FOR OTHER DETAILS.
 4. THE RIB SHALL BE ERECTED PERPENDICULAR TO THE TUNNEL AXIS.
 5. THE RIB SHALL BE EMBEDDED IN CONCRETE AS SHOWN IN DRAWING. PLEASE REFER SEPARATE DRAWING FOR CONCRETE & REINFORCEMENT DETAILS.
 6. RIB SHALL BE INSTALLED TO CONFORM THE EXCAVATED SHAPE.
 7. SURFACE TO BE WELDED SHALL BE DRY, FUSION FACE AND SURROUNDING SURFACE SHALL BE FREE FROM HEAVY SCALE, MOISTURE OIL, PAINT OR ANY OTHER SUBSTANCE WHICH MIGHT AFFECT THE QUALITY OF WELD.

- WIRE MESH**
1. THE WIRE MESH (100X100X6) SHALL BE OF MILD STEEL CONFIRM TO IS:4948 .
 2. THE OVERLAPPED MESHES SHALL BE FIXED WITH A WIRE AT 450 MM INTERVAL

- WATER PROOFING MEMBRANE**
1. THE THICKNESS INCLUDING SINGLE LAYER SHALL BE AS PER BS EN 1849-2 IS MIN 2-3mm.
 2. THE TENSILE STRENGTH IN LONGITUDINAL AND TRANSVERSE DIRECTION AS PER BS EN ISO 527-1 & 3 IS >=15MPa.

- LEGEND:**
- ☒ ROCK BOLT (FULLY GROUTED)
 - PVC PIPE PERFORATED FOR PRESSURE RELIEF

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

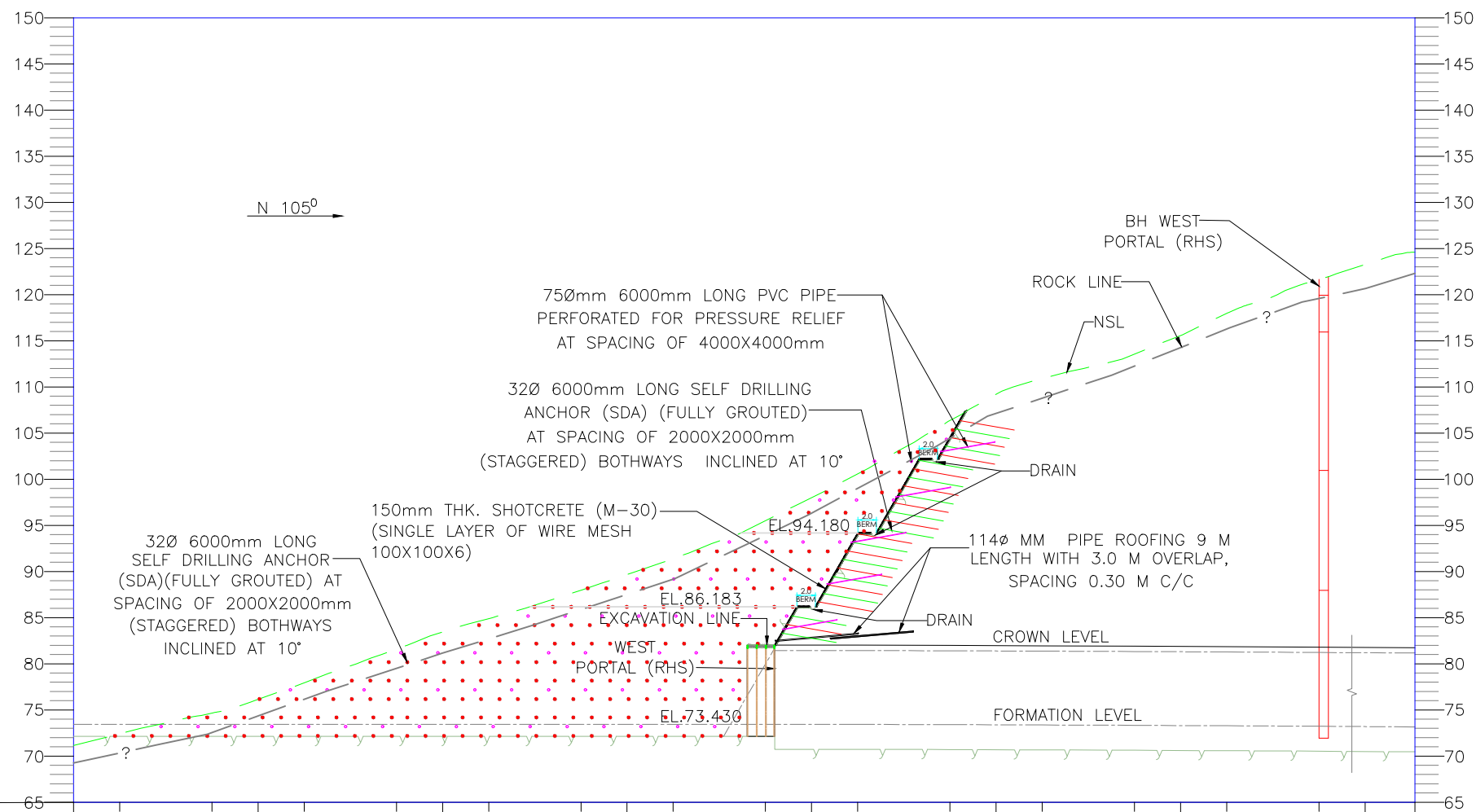
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: (SECTION B-B) L- SECTION OF LHS EAST PORTAL			
Size A3	Scale	Drw. No	Rev: R2
	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-004	



Datum : 0

Prop. Level at Median Edge		73.397	73.425	73.447	73.461	73.469	73.469	73.463	73.450	73.430	73.403	73.369	73.328	73.280	73.225
Ground Level below Prop. C/L		69.017	72.815	76.001	78.711	81.383	84.530	87.527	90.851	94.333	99.334	102.508	104.360	104.327	106.709
Ground Level below MCW at 22m from Prop. C/L	Left	70.471	76.372	80.771	83.294	86.010	89.137	91.499	90.839	90.591	91.827	94.122	96.194	97.823	98.641
	Right	71.059	73.582	76.077	79.715	83.354	86.329	89.517	93.171	97.794	103.300	109.217	112.162	115.565	119.479
Chainage (m)		24810	24820	24830	24840	24850	24860	24870	24880	24890	24900	24910	24920	24930	24940

L-SECTION (C - C) WEST PORTAL (RHS)

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
- DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
- OPEN EXCAVATION OF PORTAL AREA SHALL BE DONE IN MULTIPLE STAGES FROM TOP TO DOWN WITH INSTALLTION OF SUPPORT SYSTEM.
- THE SUPPORT MUST BE INSTALLED IMMEDIATELY AFTER EXCAVATION AND BEFORE STARTING NEXT ROUND OF EXCAVATION.
- THE SUPPORT SCHEME IS ARRIVED BASED ON THE GEOLOGICAL AND GEO-TECHNICAL INVESTIGATION CONDUCTED AT SITE. IF ANY GEOLOGICAL VARIATIONS OCCUR DURING EXCAVATION OF THE FACE, THE SUPPORT SCHEME SHALL BE REDESIGNED TO MEET THE SITE REQUIREMENT.
- ALL THE WORK SHALL BE CARRIED OUT AS PER THE RELEVANT TENDER SPECIFICATIONS AND CODES.
- ALL THE MATERIAL USED FOR CONSTRUCTION SHALL BE TESTED AS PER RELEVANT IS CODES.
- THE SUPPORT SYSTEM INDICATED IS EXCLUSIVELY FOR THE PORTAL AREA IRRESPECTIVE OF ROCK CLASSIFICATION. FOR MAIN TUNNEL SUPPORT REFER SEPARATE DRAWINGS.
- IN CASE OF GEOTECHNICAL CONDITON ARE WORSE THAN EXPECTED OR UNACCEPTABLE DISPLACEMENTS OR INSTABILITY SIGNS ARE DETECTED, ADDITIONAL SUPPORT MAY BE INSTALLED IN CONSULTATION WITH SITE GEOLOGIST AND DESIGNER.
- IN CASE OF LEAKAGES OR INFILTRATIONS ARE DETECTED IN THE SURFACE OF THE SHOTCRETE ONCE THE DRAIN PIPES ARE INSTALLED, ADDITIONAL DRAIN PIPE SHALL BE INSTALLED TO RELEASE THE PRESSURE FROM THE SHOTCRETE LAYER IN THOSE ZONES.

SPRAYED CONCRETE

- SPRAYED CONCRETE SHALL BE OF M30 GRADE CONCRETE.
- SPRAYED CONCRETE MATERIAL, ADMIXTURES, PRODUCTION, METHODS OF APPLICATION, TEMPERATURE CONTROL AND TESTING SHALL CONFIRM TO RELEVANT TECHNICAL SPECIFICATIONS AND INDIAN STANDARD IS:269, IS:383, IS:456, IS:1489, IS:2645, IS:9012, IS:9013 OR TO THE EQUIVALENT INTERNATIONAL STANDARDS IF NOT COVERED BY THESE STANDARDS.
- THE COMPRESSIVE STRENGTH AFTER 7 DAYS SHALL BE 70% OF THE SPECIFIED STRENGTH AT 28 DAYS. THE STRENGTH AND WORKABILITY PRQUIREMENTS SHALL BE ESTABLISHED BY APPROPRIATE CONCRETE MIX DESIGN AND LABORATORY FIELD TESTS.
- ALL SPRAYED CONCRETE WORK SHALL BE PROPERLY CURED SO THAT ITS POTENTIAL STRENGTH AND DURABILITY CAN BE FULLY DEVELOPED.

ROCK BOLT

- THE ROCK BOLTS OF 32mm Ø WITH PLATE 150X150X10mm SHOULD CONFIRM TO IS:1786, IS:1367 & IS:1363.
- THE MINIMUM YIELD STRENGTH OF THE ROCK BOLT SHALL BE 23T.
- ROCK BOLTS SHALL BE MADE OF HYSD BARS HAVING CHARACTERISTIC YIELD STRENGTH NOT LESS THAN 500 N/mm².
- THE HYSD BAR SHALL BE CHAMFERED AT ONE END AND OTHER END SHALL BE THREADED WITH COARSE THREAD OVER A LENGTH OF 100mm.
- ROCK BOLTS SHOULD BE TESTED FOR PULL OUT OF STRENGTH AS PER IS:11309.
- ALL ROCK BOLTS SHALL BE FULLY GROUTED WITH CEMENT MIX 1:1.

DRAINAGE HOLES

- PRESSURE RELIF HOLES OF 75mm DIA. 6000mm LONG, SHOULD BE PROVIDED ON CUT SLOPE OF PORTAL.
- THE WATER SHALL BE TRAINED AND CHANNALIZED TO THE SIDE DRAIN.

CONCRETE

- ALL CONCRETE WORKS SHALL BE EXECUTED AS PER IS:456 WITH THE LATEST CORRECTSION
- GRADE OF CONCRETE FOR DIFFERENT ITEMS
SPRAYED CONCRETE M30
DRAIN WALL M20
SHOTCRETE M30
- CONSTRUCTION JOINTS SHALL BE PROPERLY CLEANED BEFORE PLACING OF FRESH CONCRETE.
- CONCRETE SHALL NE KEPTH MOIST FOR AT LEAST 21 DAYS.

STEEL SUPPORTS

- RIBS SHALL BE CONFORMING TO IS2062-2006.
- QUALITY CONTROL AND SAFETY PARAMETERS ARE TO BE ENSURED DURING PROGRESS OF THE WORKS.
- REFER TECHNICAL SPECIFICATION FOR OTHER DETAILS.
- THE RIB SHALL BE ERCTED PERPENDICULAR TO THE TUNNEL AXIS.
- THE RIB SHALL BE EMBEDDED IN CONCRETE AS SHOWN IN DRAWING. PLEASE REFER SEPARATE DRAWING FOR CONCRETE & REINFORCEMENT DETAILS.
- RIB SHALL BE INSTALLED TO CONFORM THE EXCAVATED SHAPE.
- SURFACE TO BE WELDED SHALL BE DRY, FUSION FACE AND SURROUNDING SURFACE SHALL BE FREE FROM HEAVY SCALE, MOISTURE OIL, PAINT OR ANY OTHER SUBSTANCE WHICH MIGHT AFFECT THE QUALITY OF WELD.

WIRE MESH

- THE WIRE MESH (100X100X6) SHALL BE OF MILD STEEL CONFIRM TO IS:4948 .
- THE OVERLAPPED MESHES SHALL BE FIXED WITH A WIRE AT 450 MM INTERVAL

WATER PROOFING MEMBRANE

- THE THICKNESS INCLUDING SINGLE LAYER SHALL BE AS PER BS EN 1849-2 IS MIN 2-3mm.
- THE TENSILE STRENGTH IN LONGITUDINAL AND TRANSVERSE DIRECTION AS PER BS EN ISO 527-1 & 3 IS >=15MPa.

LEGEND:

- ☒ ROCK BOLT (FULLY GROUTED)
☐ PVC PIPE PERFORATED
FOR PRESSURE RELIEF

Rev.	Date	Description

Authority:	
	
National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)	

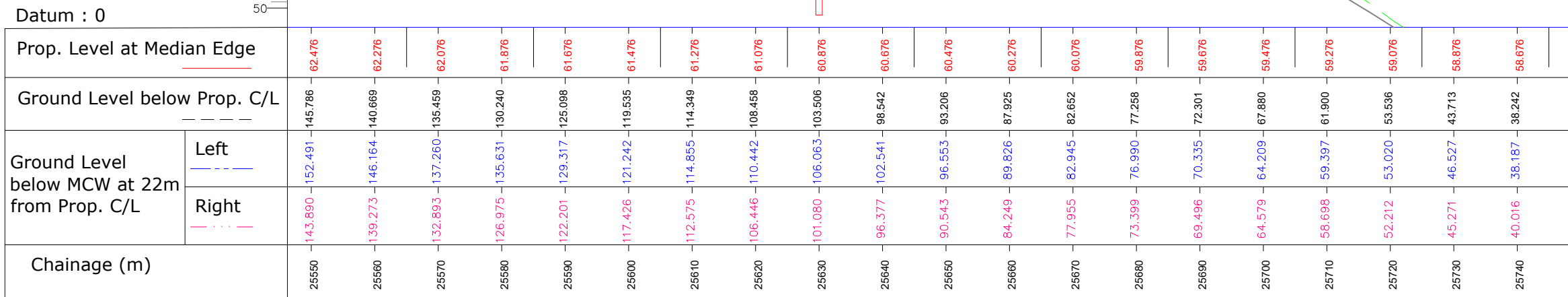
Design Consultants:	
	
Transys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in	

Project:	
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)	
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)	

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

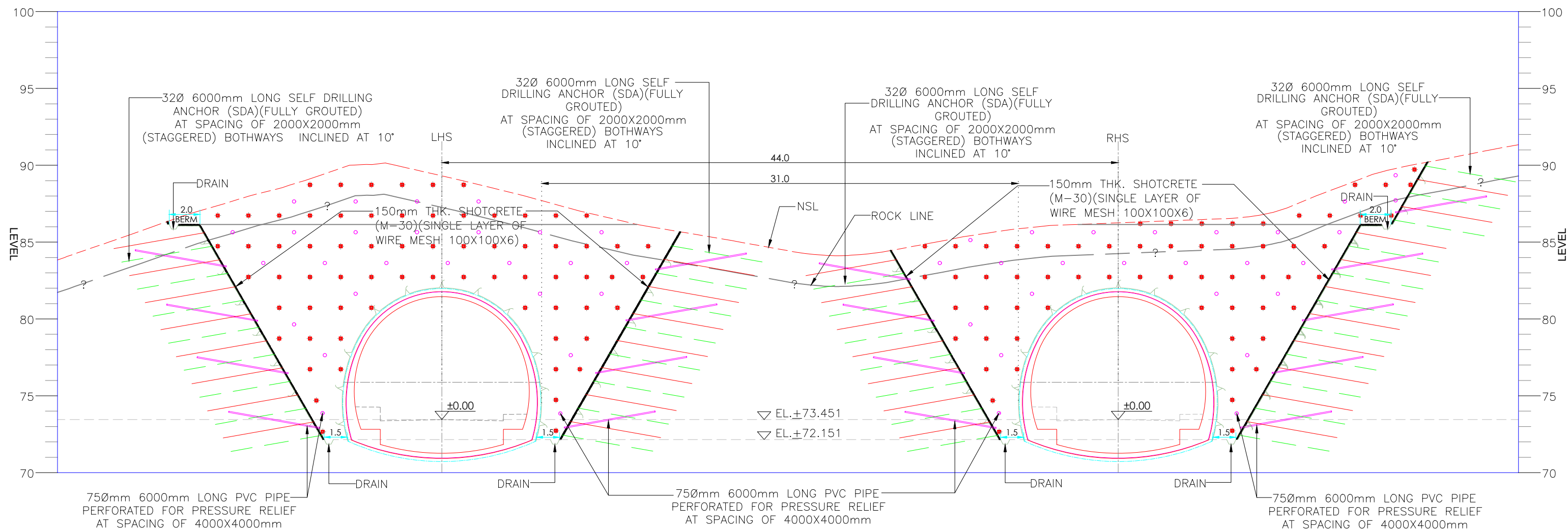
FINAL DETAILED PROJECT REPORT	
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Title: (SECTION C-C) L- SECTION OF RHS WEST PORTAL			
Size A3	Scale NTS	Drw. No Transys-NH37-TUNNEL-DPR-CIVIL-005	Rev: R2



FINAL DETAILED PROJECT REPORT	<i>Title:</i> (SECTION D-D) L- SECTION OF RHS EAST PORTAL			
	<i>Size</i> A3	<i>Scale</i> NTS	<i>Drg. No</i> Transsys-NH37-TUNNEL-DPR-CIVIL-006	<i>Rev:</i> R2

- NOTES:**
1. ALL DIMENSIONS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
 2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.



(SECTION 1-1)
CROSS SECTION
OF WEST PORTAL
(CH.24860)

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transsys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transsys_blr@transsysconsulting.co.in

Project:

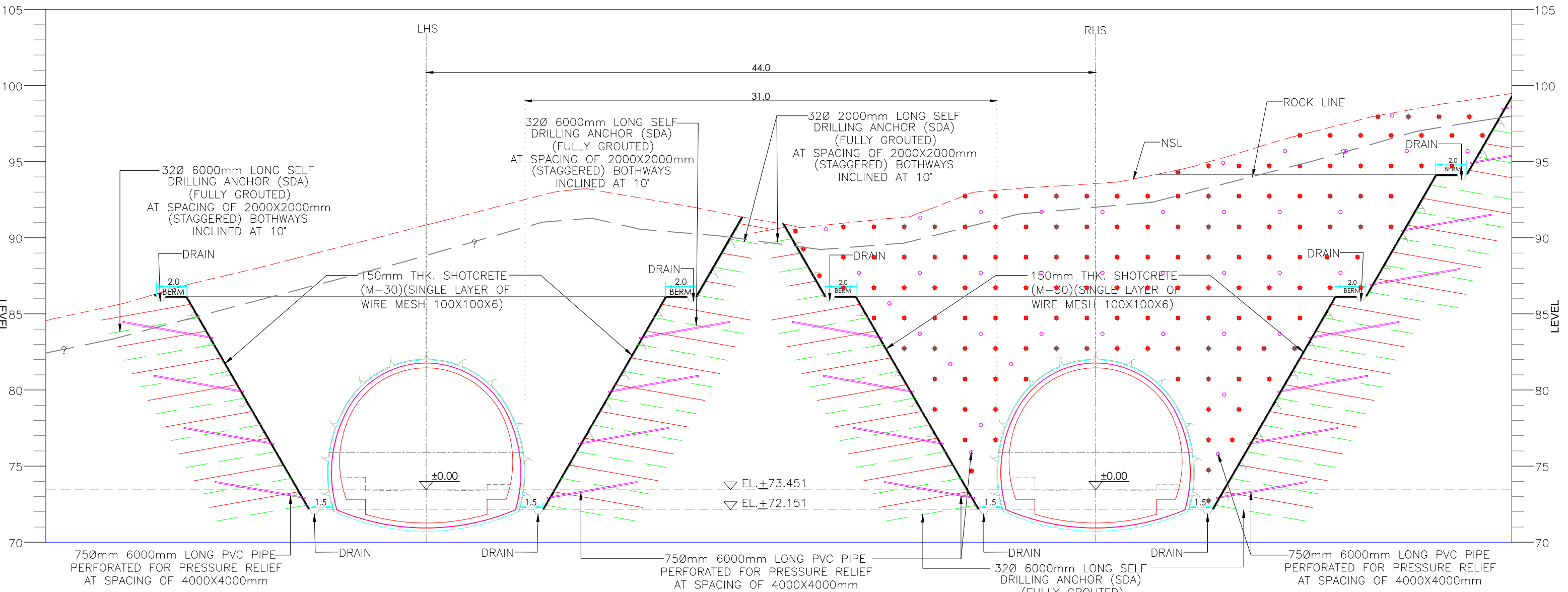
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-II)

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT

Title: (SECTION 1-1) CROSS SECTION OF WEST PORTALS			
Size	Scale	Drw. No	Rev:
A3	NTS	Transsys-NH37-TUNNEL-DPR-CIVIL-007	R2

- NOTES:
1. ALL DIMENSIONS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
 2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.



(SECTION 2-2)
CROSS SECTION
OF WEST PORTAL(CH.24881)

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transsys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transsys_blr@transsysconsulting.co.in

Project:

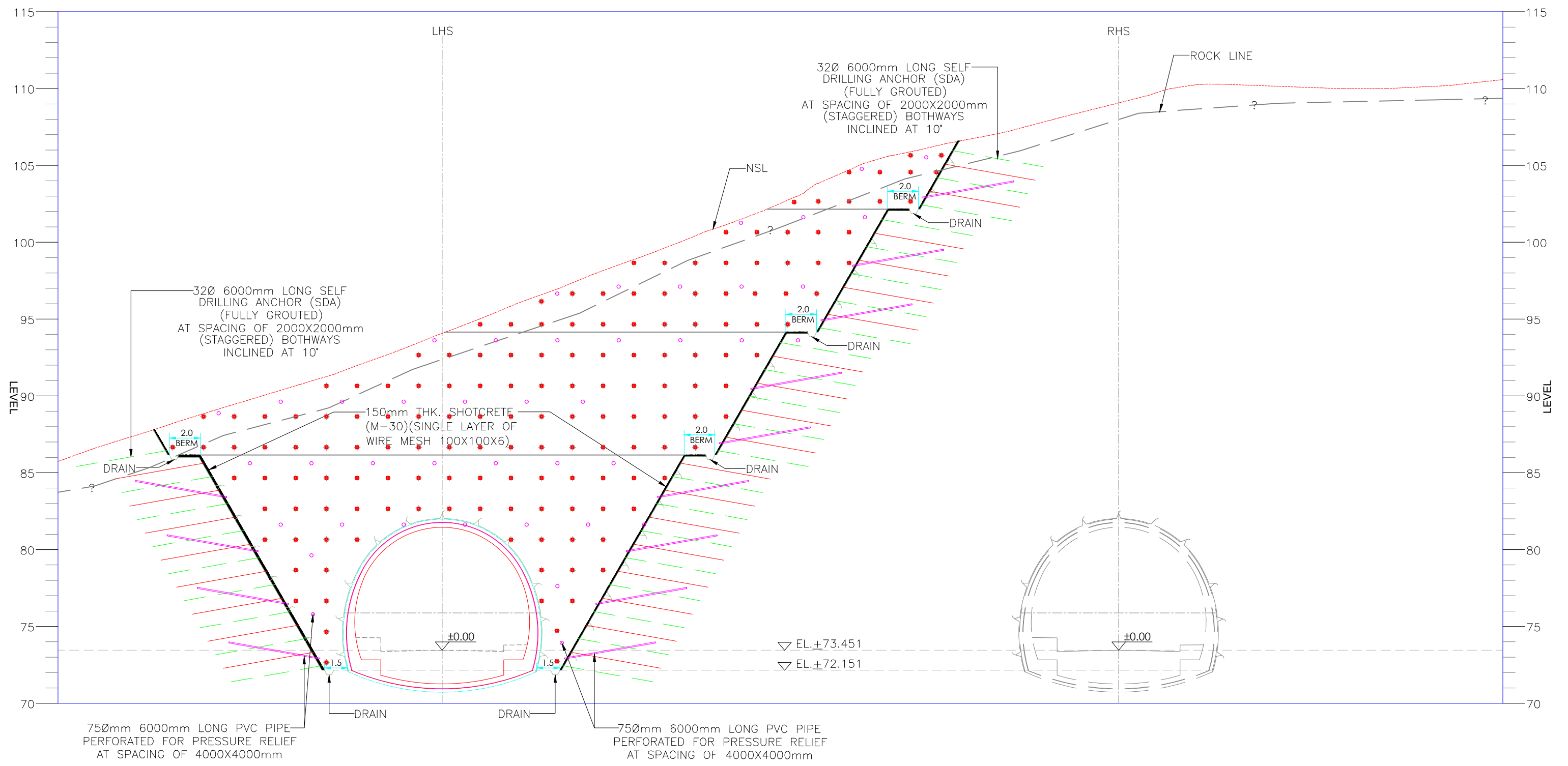
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: (SECTION 2-2) CROSS SECTION OF WEST PORTALS			
Size	Scale	Drw. No	Rev:
A3	NTS	Transsys-NH37-TUNNEL-DPR-CIVIL-008	R2

- NOTES:
1. ALL DIMENSIONS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
 2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.



(SECTION 3-3)
CROSS SECTION
OF WEST PORTAL
(CH.24910)

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transsys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transsys_blr@transsysconsulting.co.in

Project:

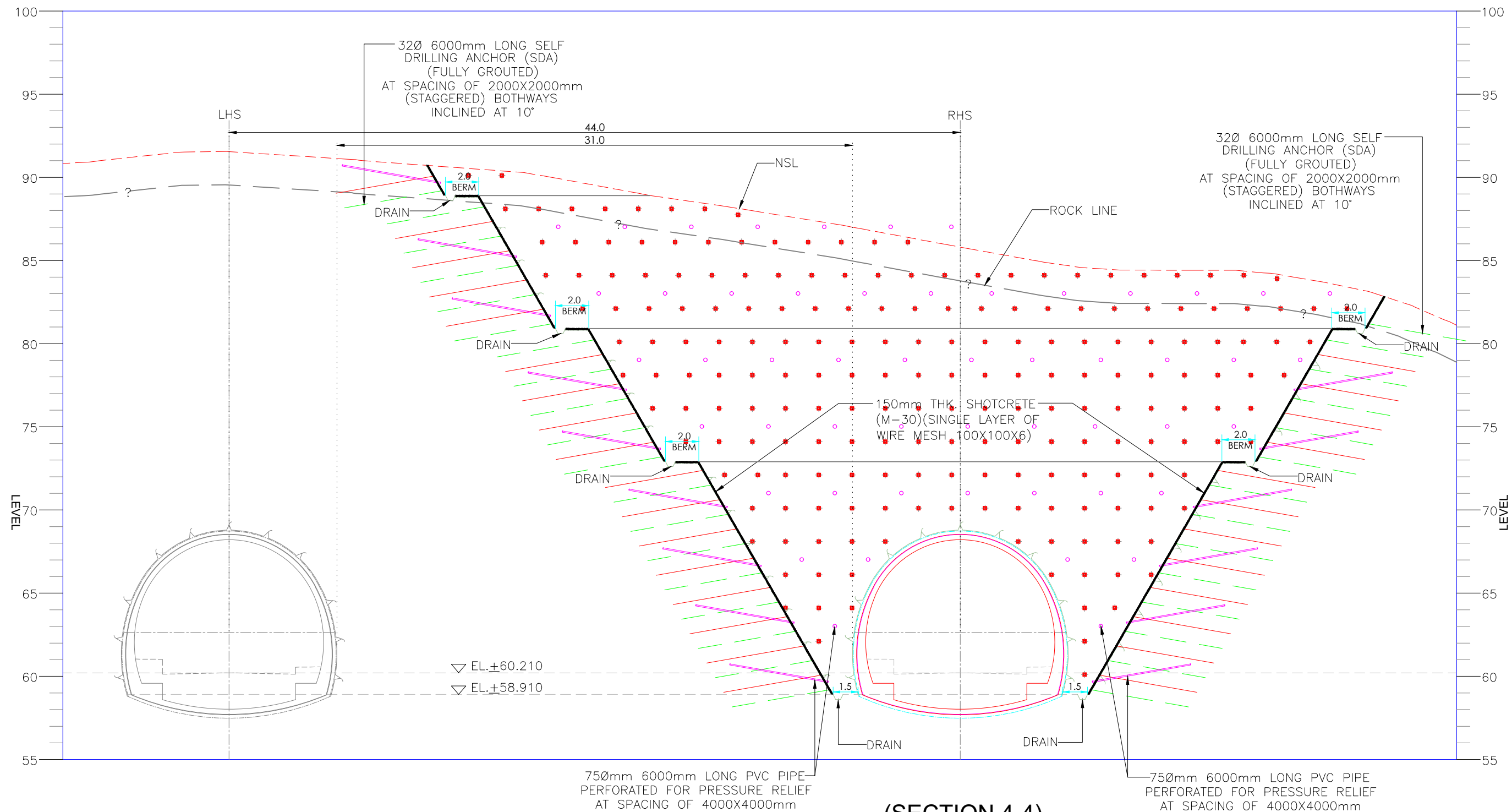
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-II)

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: (SECTION 3-3) CROSS SECTION OF WEST PORTALS			
Size	Scale	Dwg. No	Rev:
A3	NTS	Transsys-NH37-TUNNEL-DPR-CIVIL-009	R2

- NOTES:
1. ALL DIMENSIONS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
 2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.



(SECTION 4-4)
CROSS SECTION
OF EAST PORTAL
(CH.25657)

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

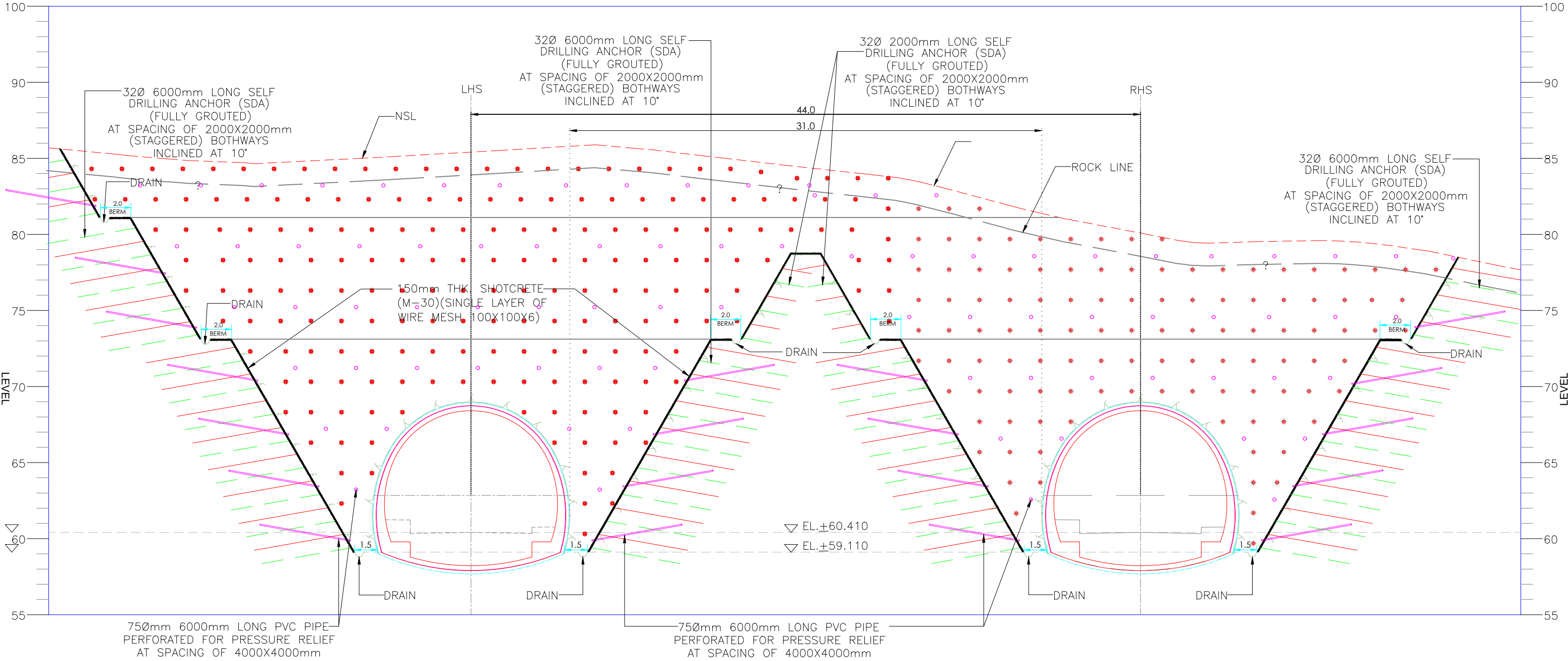
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY: SHUDHANSHU
DESIGNED BY: RAJU
CHECKED BY: VIDYA SAGAR
APPROVED BY: SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: (SECTION 4-4) CROSS SECTION OF EAST PORTALS			
Size	Scale	Drp. No	Rev:
A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-010	R2

- NOTES:
1. ALL DIMENSIONS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
 2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.



(SECTION 5-5)
CROSS SECTION
OF EAST PORTAL
(CH.25666.5)

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
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Project:

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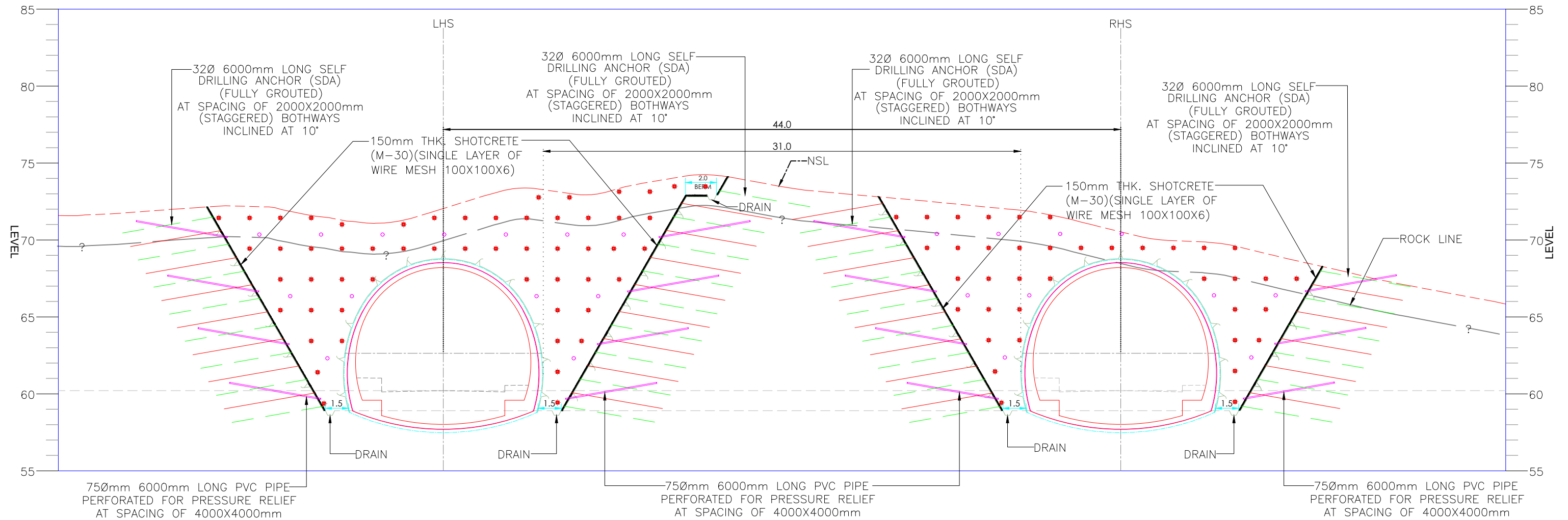
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DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: (SECTION 5-5) CROSS SECTION OF EAST PORTALS			
Size	Scale	Drw. No	Rev:
A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-011	R2

NOTES:

1. ALL DIMENSIONS AND LEVELS IN METERS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHALL NOT BE SCALED AND ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.



(SECTION 6-6)
CROSS SECTION
OF EAST PORTAL
(CH.25687.5)

Rev.	Date	Description

Authority:
**National Highways & Infrastructure Development Corporation Ltd.**
(Ministry of Road Transport & Highways)

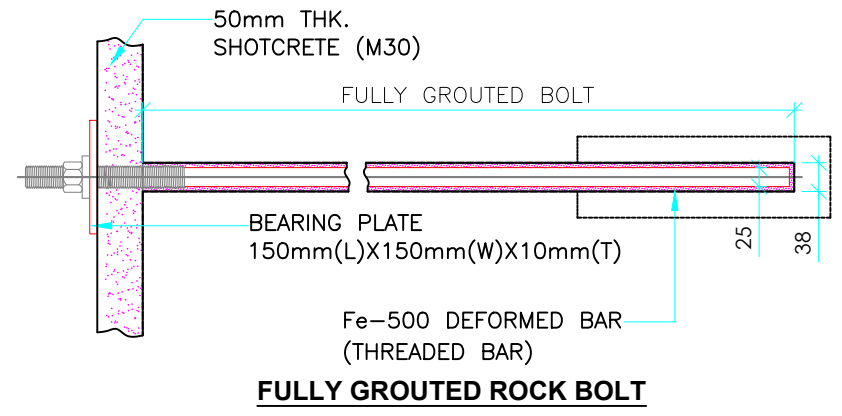
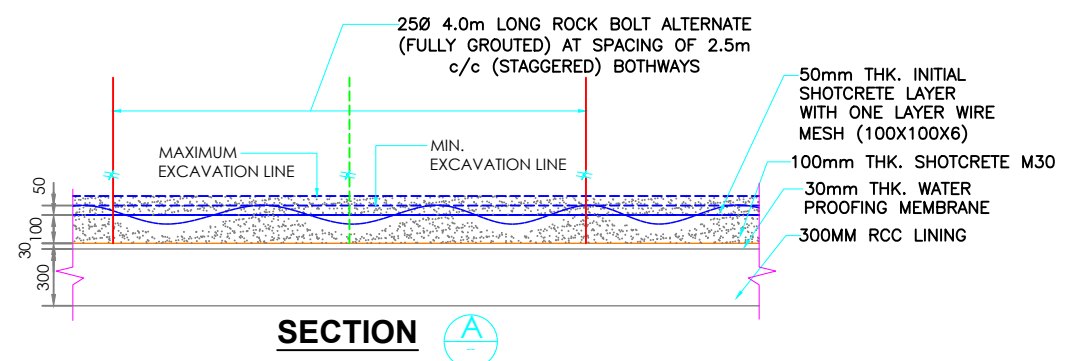
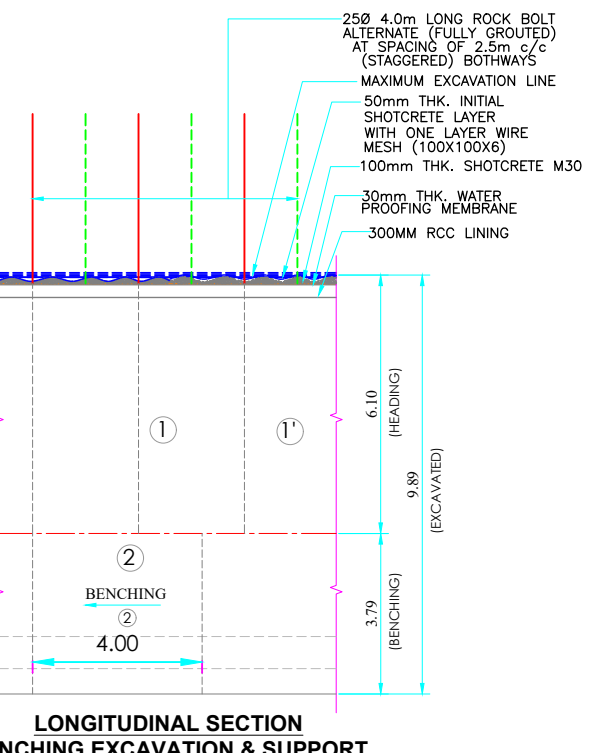
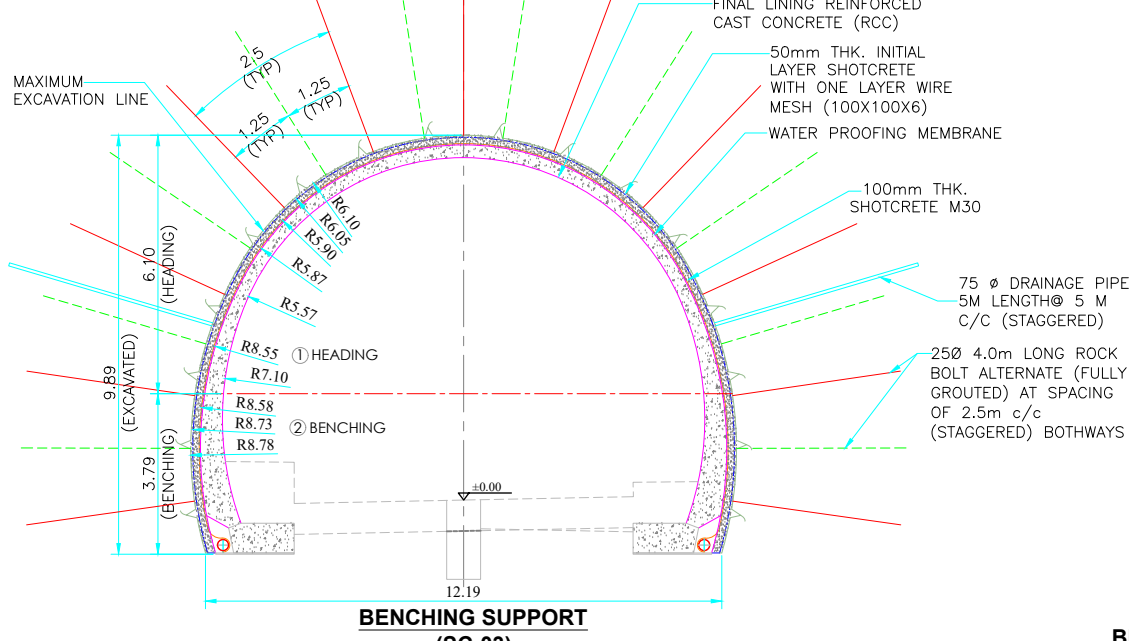
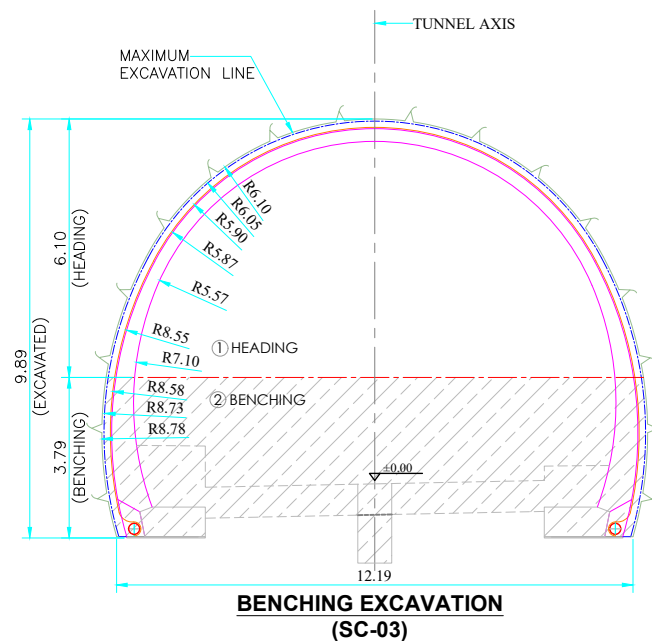
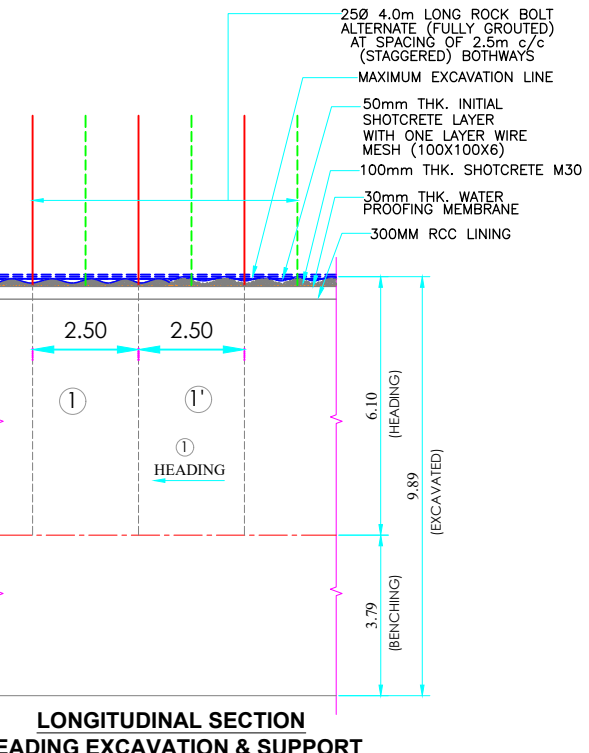
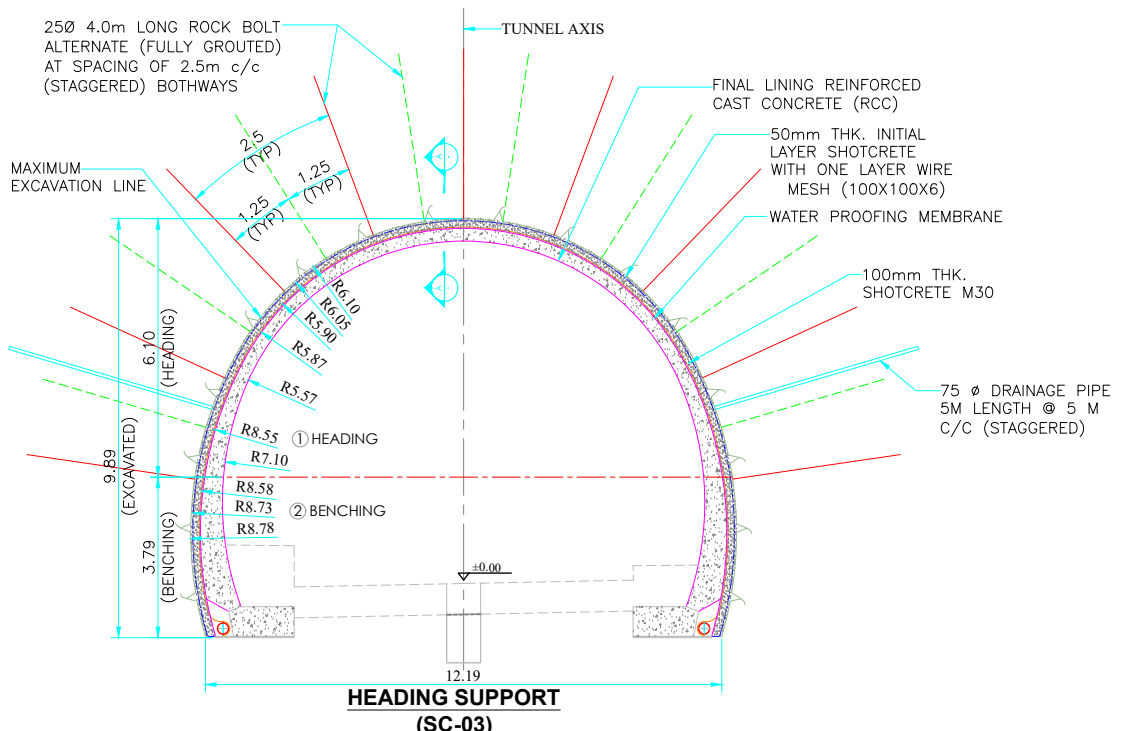
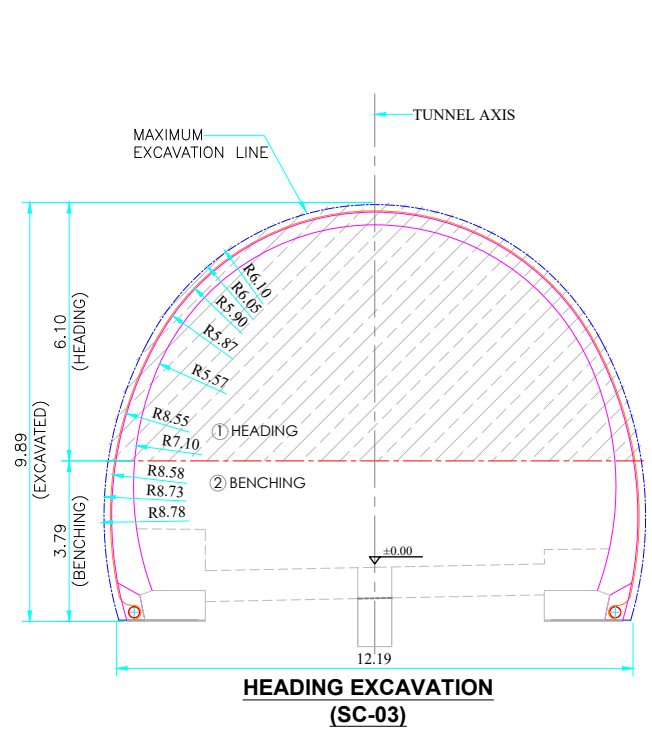
Design Consultants:
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Project:
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: (SECTION 6-6) CROSS SECTION OF EAST PORTALS			
Size	Scale	Drp. No	Rev:
A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-012	R2



PRIMARY SUPPORT:				
ROCK CLASS	SHOTCRETE (M30)	ROCK BOLT DIA (mm)	ROCK BOLT LENGTH (m)	ROCK BOLT SPACING (m)
SC-03	150 mm	25	4.0	2.5

- LEGEND:**
- ① SEQUENCE FOR HEADING EXCAVATION
 - ② SEQUENCE FOR BENCHING EXCAVATION
 - EXCAVATION LINE
 - CENTRE LINE

- NOTES:**
- ALL DIMENSIONS ARE IN METERS, UNLESS STATED OTHERWISE.
 - NO MEASUREMENTS SHALL BE TAKEN FROM THE DRAWINGS UNLESS STATED OTHERWISE.
 - THE DESIGN IS BASED ON TOPOGRAPHICAL DATA AND GEOLOGICAL INPUT. IF ANY DISCREPANCY IS OBSERVED IN DATA DURING EXCAVATION, IT SHALL BE IMMEDIATELY INFORMED TO THE ENGINEER - IN - CHARGE.
 - SUPPORT SYSTEM MAY VARY AS PER SITE CONDITIONS AND RECOMMENDATION OF SITE.

- CONSTRUCTION GUIDELINES:**
- THE TUNNEL SHALL BE EXCAVATED IN HEADING, BENCHING, AND INVERT (IF ANY) SPECIFIED IN THE DRAWING.
 - THE FOLLOWING STEPS FOR EXCAVATION SHALL BE ADOPTED
STEP 1 HEADING EXCAVATION
STEP 2 HEADING SHOTCRETE FIRST LAYER 50mm.
STEP 3 HEADING ROCK BOLTING & WIREMESH.
STEP 4 HEADING SHOTCRETE IN SECOND & THIRD LAYER WITH EACH 50MM THK. (100mm. THK.)
STEP 5 BENCHING EXCAVATION.
STEP 6 BENCHING SHOTCRETE FIRST LAYER 50mm.
STEP 7 BENCHING ROCK BOLTING & WIREMESH.
STEP 8 BENCHING SHOTCRETE IN SECOND & THIRD LAYER WITH EACH 50MM THK. (100mm. THK.)
STEP 9 WATER PROOFING MEMBRANE FIXING
STEP 10 SECONDARY LINING CONCRETING
 - GALVANIZED OR PROTECTIVE COATING FOR ROCK BOLTS SHALL BE USED BEFORE INSTALLATION.
 - WATER PROOFING SYSTEM SHALL BE INSTALLED AS PER STANDARD SPECIFICATIONS.
 - SECONDARY LINING SHALL BE PLACED AFTER INSTALLATION OF WATER PROOFING SYSTEM .

- DEVIATIONS:**
- THE ENGINEER- IN - CHARGE SHALL BE INFORMED IMMEDIATELY IF ENCOUNTERED ROCK MASS CONDITION DURING EXCAVATION IS DIFFERENT FROM THE GIVEN IN THE GEOLOGICAL DRAWINGS.

- ADDITIONAL GUIDELINES:**
- IN CASE OF THE PRESENCE OF SHEAR ZONE OR HIGHLY FRACTURED ROCK MASS PRE GROUTING MAY BE CARRIED OUT STARTING FROM THE FACE. THE DEPTH OF GROUT HOLES SHOULD BE KEPT 6 TO 9m FROM THE FACE WITH 45mm DIA.
 - ENGINEER- IN - CHARGE SHOULD BE IMMEDIATELY INFORMED IN CASE OF ANY WEDGE OR SLIDE FAILURE ENCOUNTERED DURING EXCAVATION.

- TECHNICAL NOTES:**
- ALL ROCK BOLTS SHALL BE CONFIRM IS : 1786 AND SHOULD BE MADE OF Fe-500.
 - FACE PLATE SIZE OF 150mm x150mm x10mm SHALL BE USED FOR FACE PLATE FOR ROCK BOLTS.
 - THE ROCK BOLT SHALL BE FULLY GROUTED WITH CEMENT OR RESIN.
 - THE MINIMUM YIELD STRENGTH OF THE ROCK BOLT SHALL BE 20T.
 - NECESSARY PULL OUT TEST FOR ROCK BOLTS SHALL BE CONDUCTED TO ASSESS THE ROCK BOLTS AND GROUT PARAMETERS AS PER IS 11309.
 - THE MINIMUM COMPRESSIVE STRENGTH FOR SHOTCRETE SHALL BE 30 MPa.
 - SHOTCRETE WITH ONE LAYER OF WIRE MESH(100x100x6) WITH SAME M30 GRADE.
 - THE WIRE MESH FABRIC SHALL BE OF MILD STEEL CONFIRM TO IS:4948 HAVING YIELD STRENGTH NOT LESS THAN 275 N/SQ MM.
 - LOCAL WEDGES SHALL BE STABILIZED BY ADDITIONAL ROCK BOLTING WITH SAME SPECIFICATION.

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

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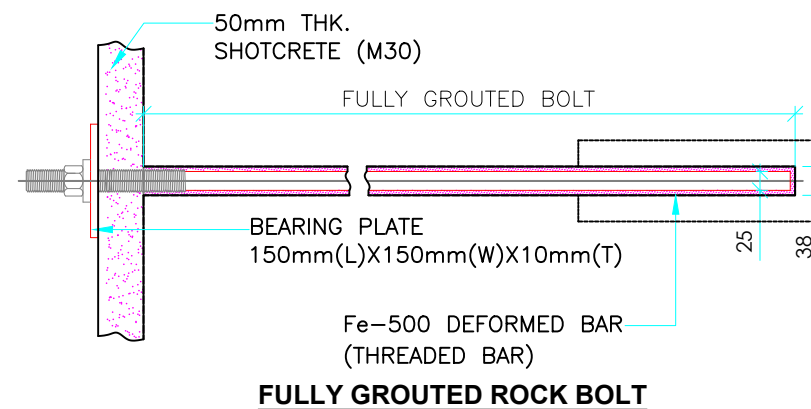
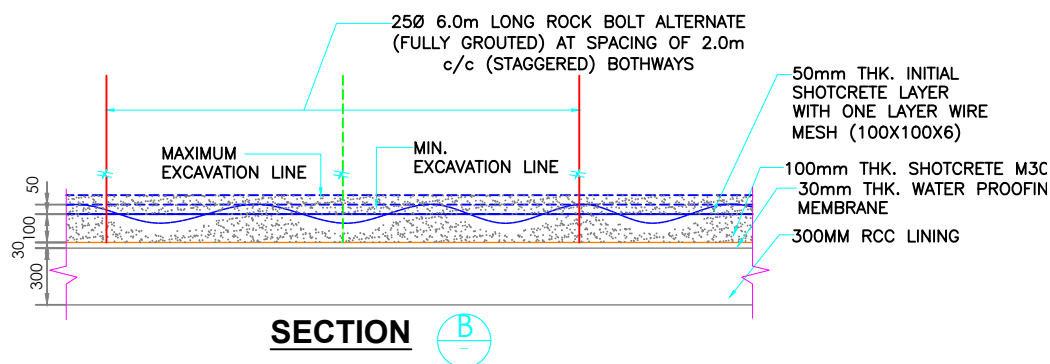
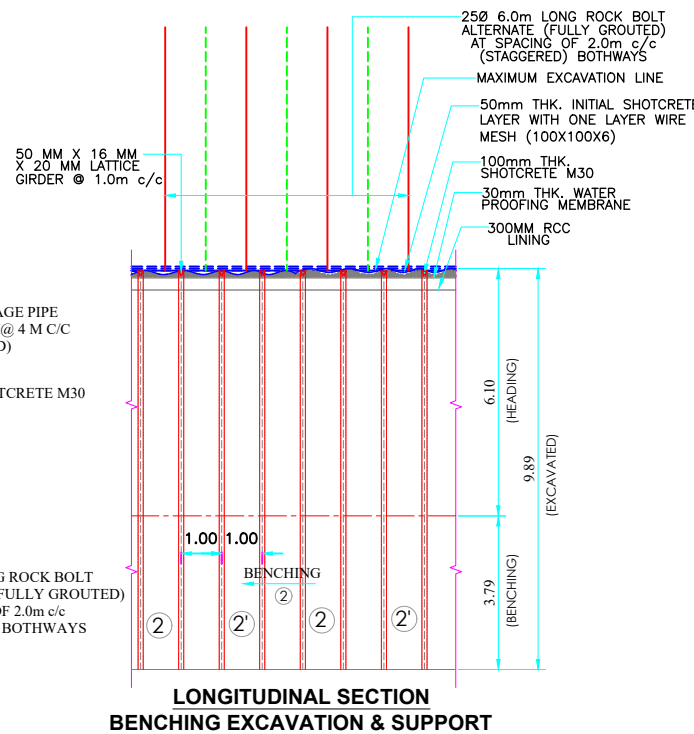
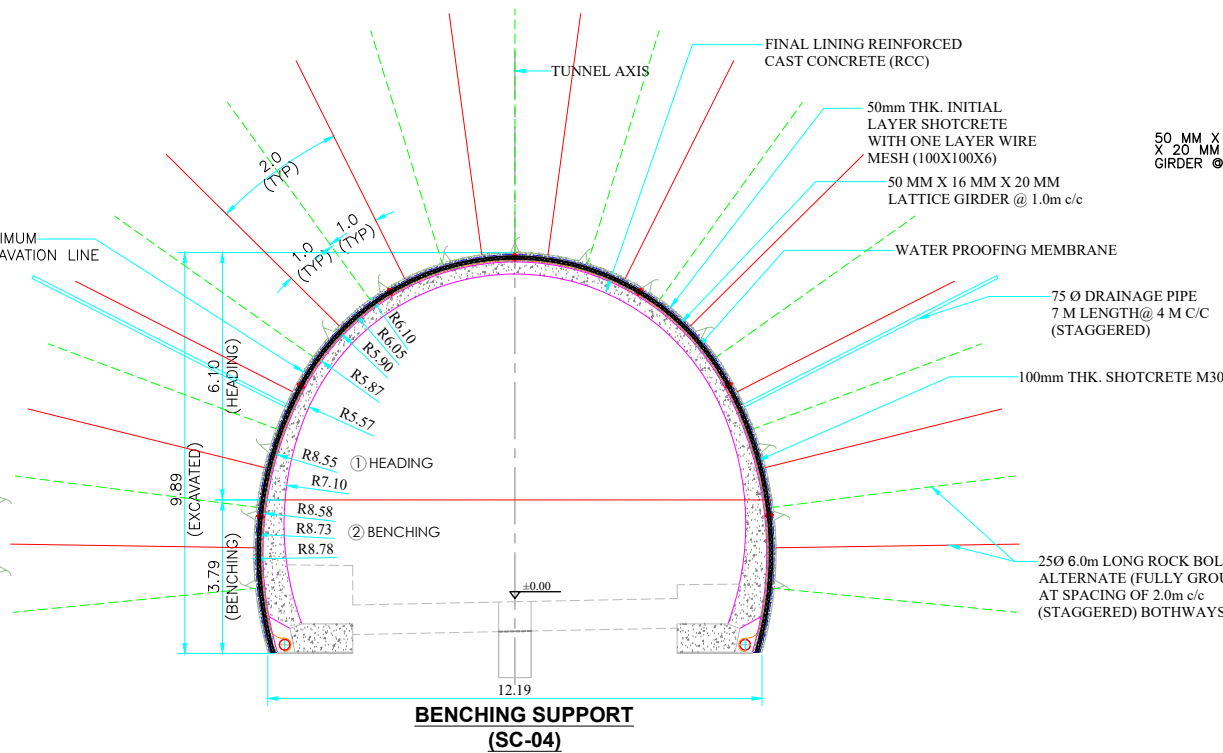
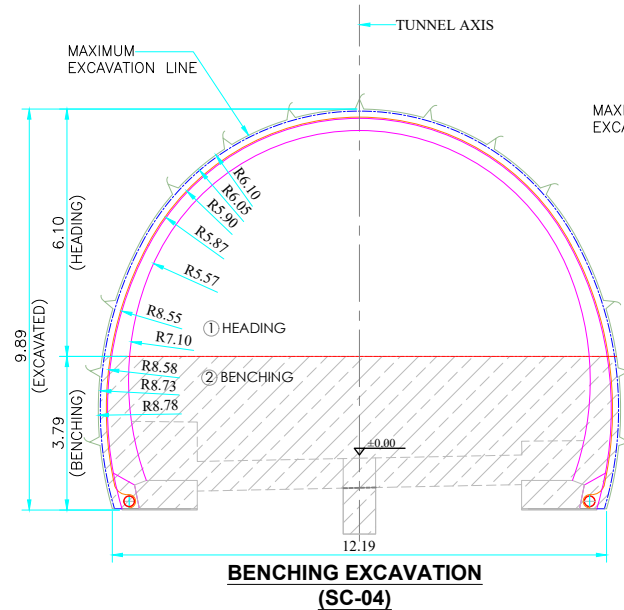
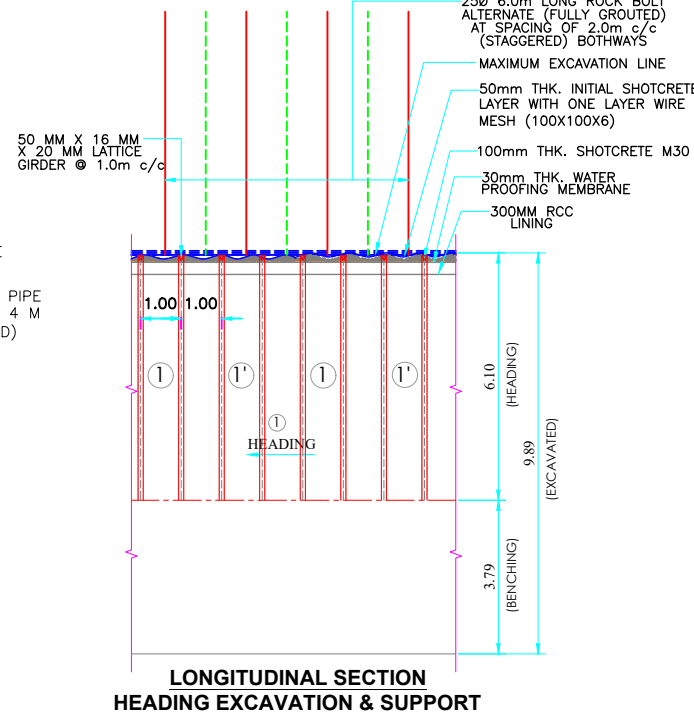
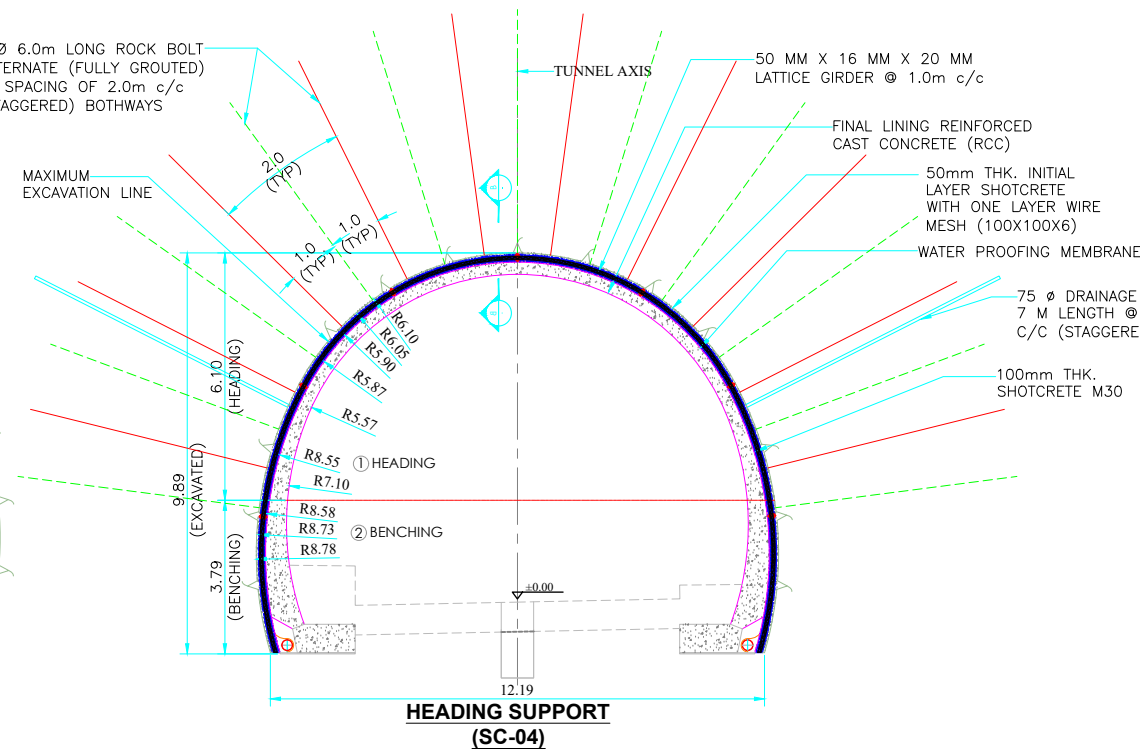
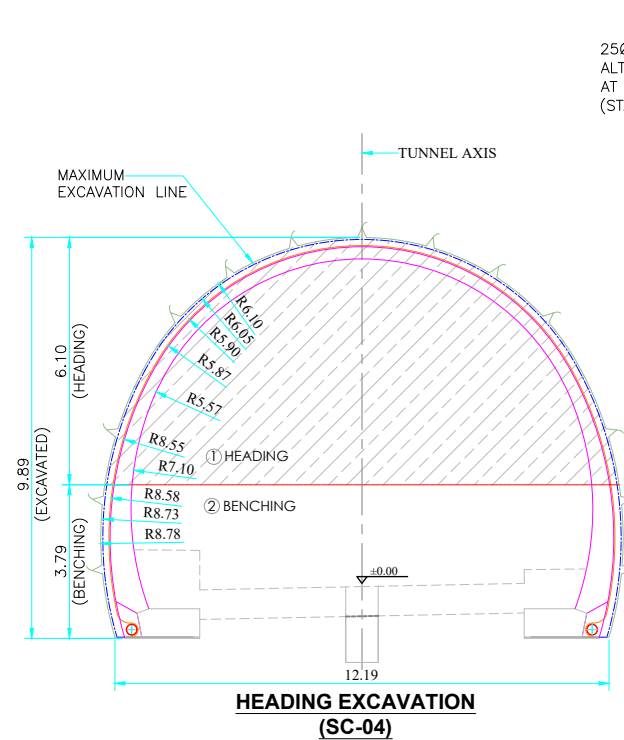
Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT

Title: TUNNEL EXCAVATION & SUPPORT CLASS FOR SC-03 SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drg. No	
	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-013	
Rev: R2			



PRIMARY SUPPORT:

ROCK CLASS	SHOTCRETE (M30)	ROCK BOLT DIA (mm)	ROCK BOLT LENGTH (m)	ROCK BOLT SPACING (m)
SC-04	150 mm	25	6.0	2.0

LEGEND:

- ① SEQUENCE FOR HEADING EXCAVATION
- ② SEQUENCE FOR BENCHING EXCAVATION
- EXCAVATION LINE
- CENTRE LINE

NOTES:

- ALL DIMENSIONS ARE IN METERS, UNLESS STATED OTHERWISE.
- NO MEASUREMENTS SHALL BE TAKEN FROM THE DRAWINGS UNLESS STATED OTHERWISE.
- THE DESIGN IS BASED ON TOPOGRAPHICAL DATA AND GEOLOGICAL INPUT. IF ANY DISCREPANCY IS OBSERVED IN DATA DURING EXCAVATION, IT SHALL BE IMMEDIATELY INFORMED TO THE ENGINEER - IN - CHARGE.
- SUPPORT SYSTEM MAY VARY AS PER SITE CONDITIONS AND RECOMMENDATION OF SITE.

CONSTRUCTION GUIDELINES:

- THE TUNNEL SHALL BE EXCAVATED IN HEADING, BENCHING, AND INVERT (IF ANY) SPECIFIED IN THE DRAWING.
- THE FOLLOWING STEPS FOR EXCAVATION SHALL BE ADOPTED
 - STEP 1 HEADING EXCAVATION
 - STEP 2 HEADING SHOTCRETE FIRST LAYER 50mm.
 - STEP 3 HEADING ROCK BOLTING & WIREMESH.
 - STEP 4 HEADING ERECTION OF LATTICE GIRDER AND SHOTCRETING AS SECOND & THIRD LAYER WITH EACH 50MM THK. (100mm. THK.)
 - STEP 5 BENCHING EXCAVATION.
 - STEP 6 BENCHING SHOTCRETE FIRST LAYER 50mm.
 - STEP 7 BENCHING ROCK BOLTING & WIREMESH.
 - STEP 8 BENCHING ERECTION OF LATTICE GIRDER AND SHOTCRETING SECOND & THIRD LAYER WITH EACH 50MM THK. (100mm. THK.)
 - STEP 9 WATER PROOFING MEMBRANE FIXING
 - STEP 10 SECONDARY LINING CONCRETING
- GALVANIZED OR PROTECTIVE COATING FOR ROCK BOLTS SHALL BE USED BEFORE INSTALLATION.
- WATER PROOFING SYSTEM SHALL BE INSTALLED AS PER STANDARD SPECIFICATIONS.
- SECONDARY LINING SHALL BE PLACED AFTER INSTALLATION OF WATER PROOFING SYSTEM.

DEVIATIONS:

- THE ENGINEER - IN - CHARGE SHALL BE INFORMED IMMEDIATELY IF ENCOUNTERED ROCK MASS CONDITION DURING EXCAVATION IS DIFFERENT FROM THE GIVEN IN THE GEOLOGICAL DRAWINGS.

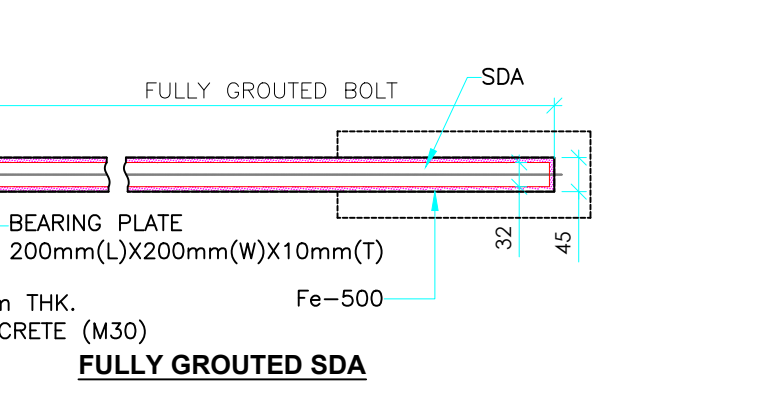
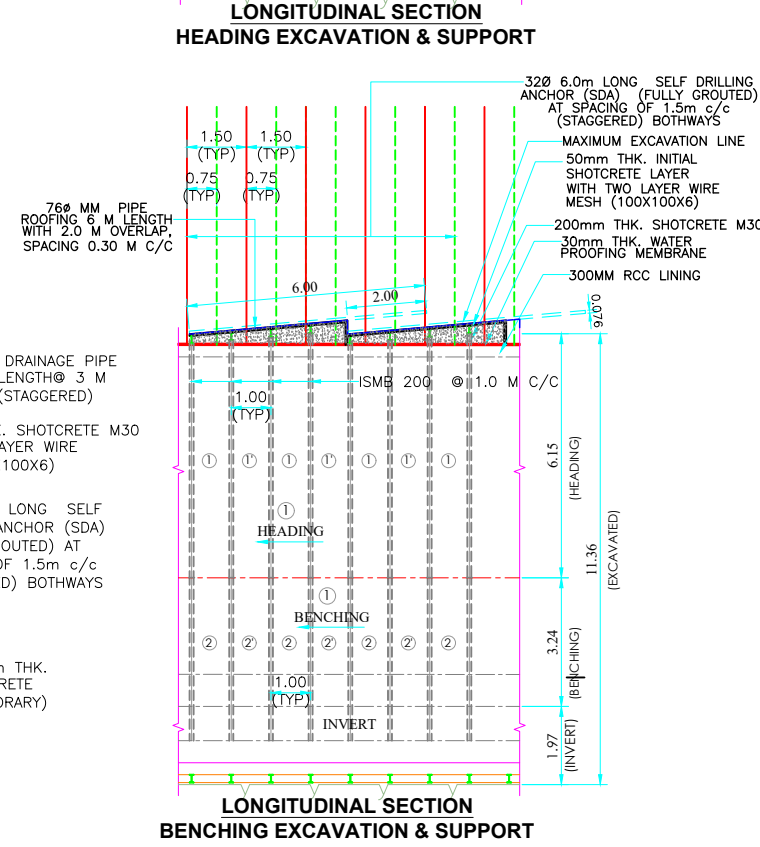
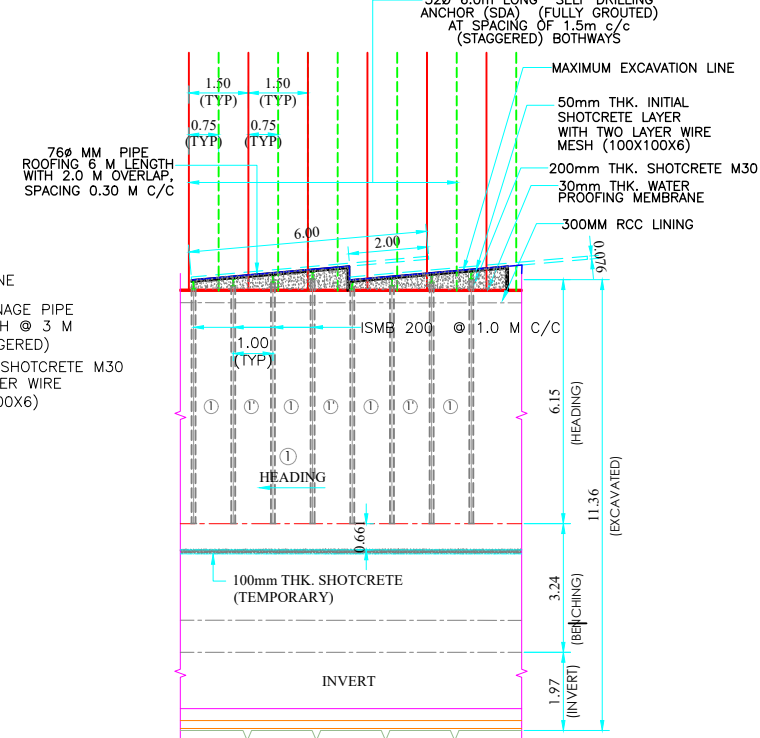
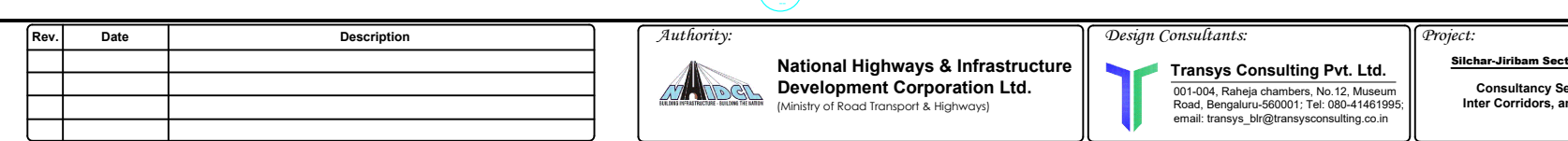
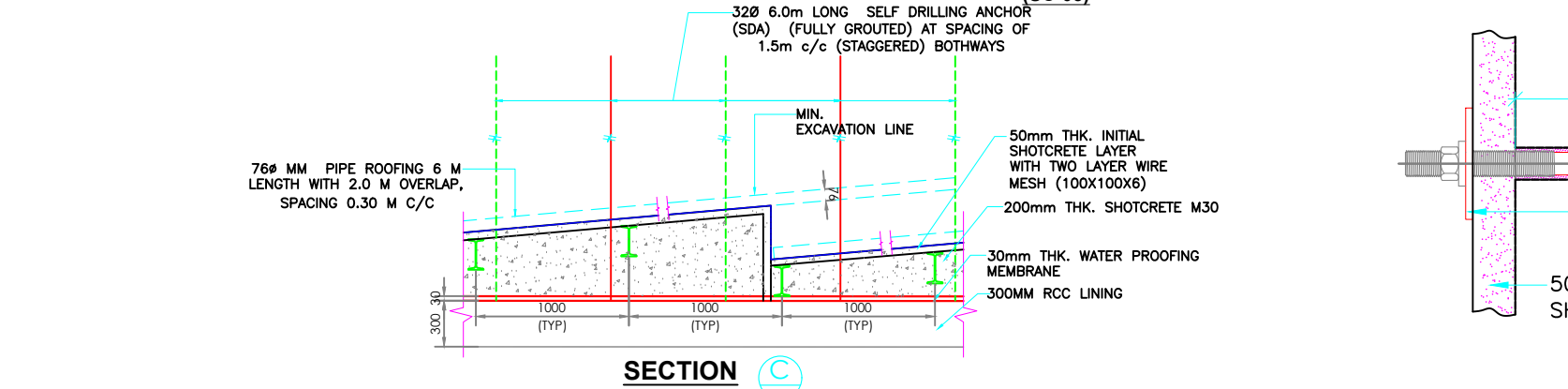
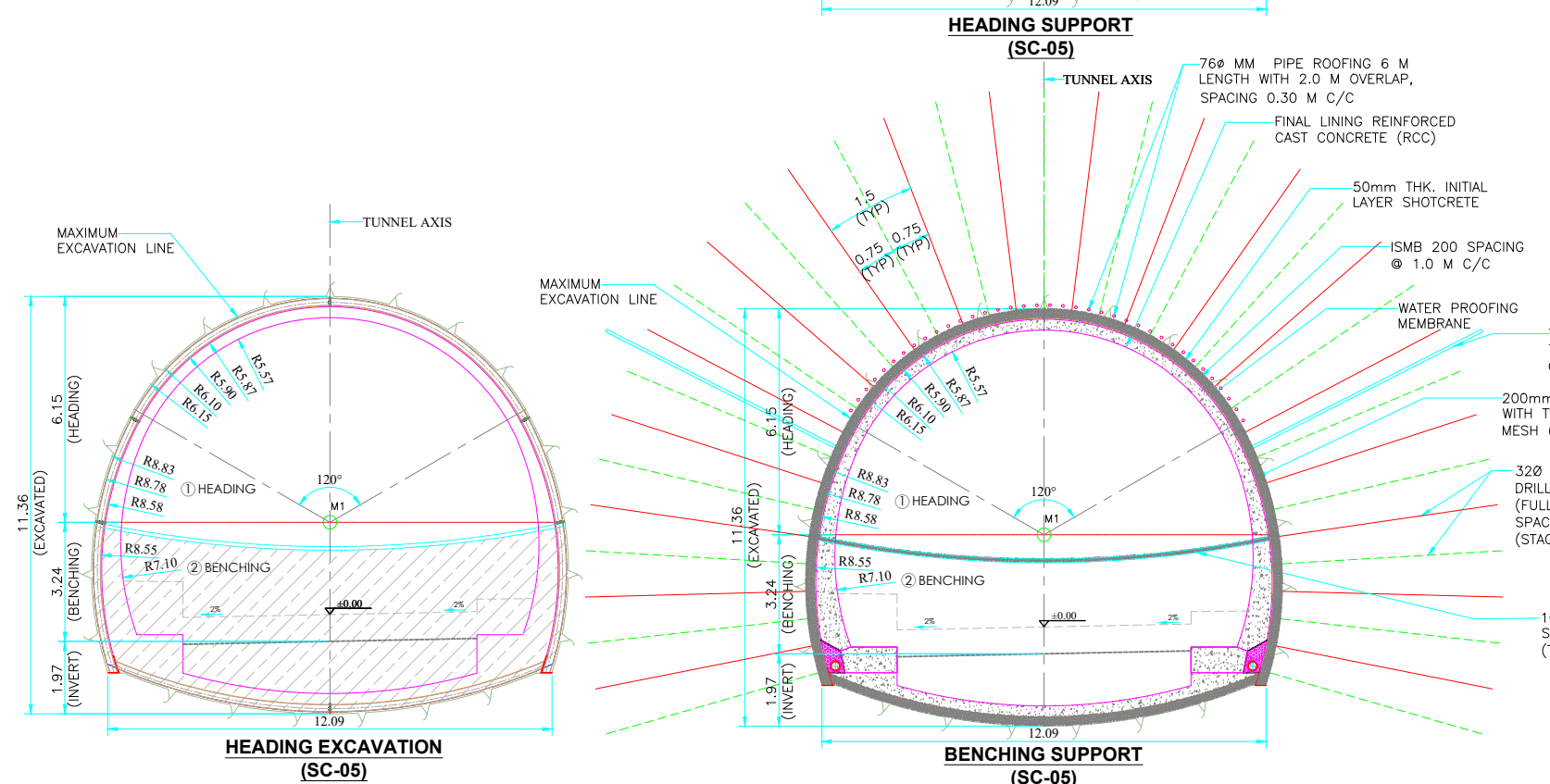
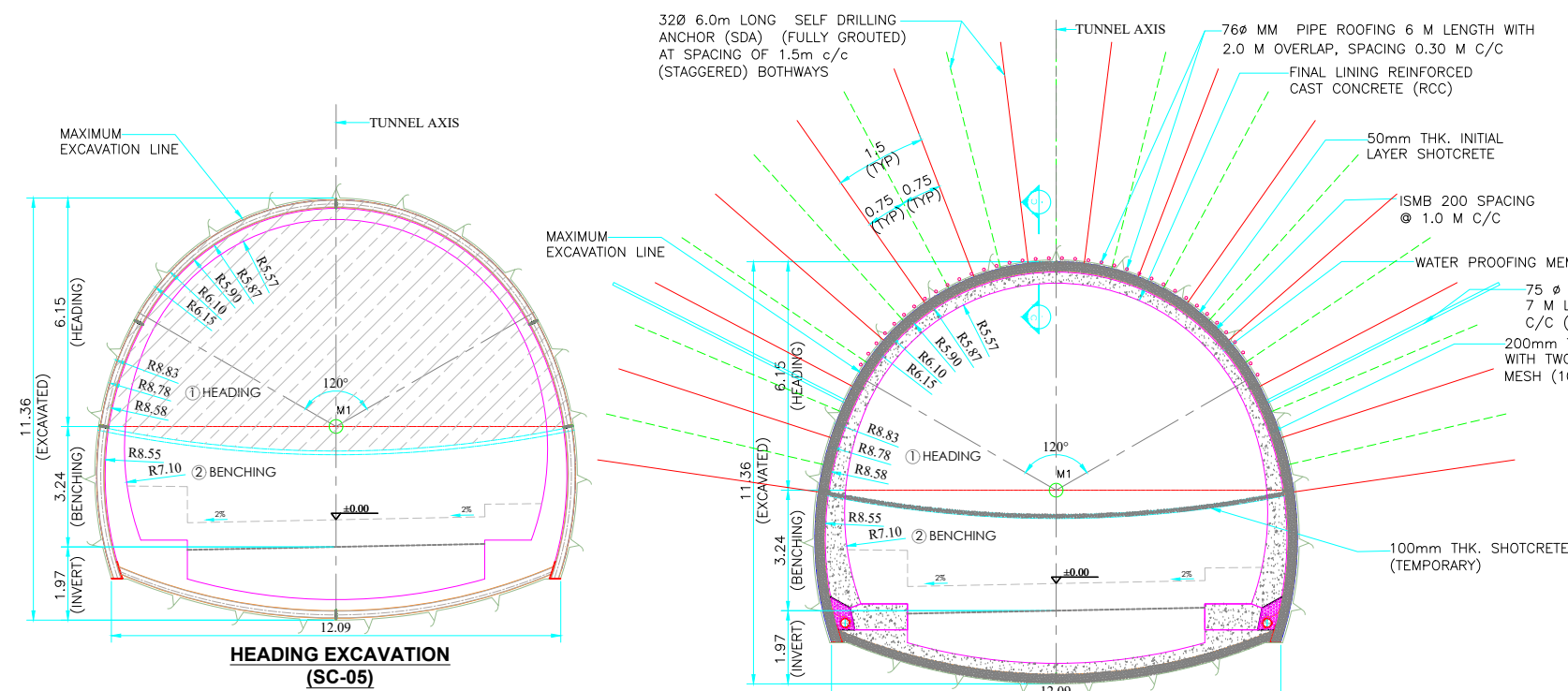
ADDITIONAL GUIDELINES:

- IN CASE OF THE PRESENCE OF SHEAR ZONE OR HIGHLY FRACTURED ROCK MASS PRE GROUTING MAY BE CARRIED OUT STARTING FROM THE FACE. THE DEPTH OF GROUT HOLES SHOULD BE KEPT 6 TO 9m FROM THE FACE WITH 45mm DIA.
- ENGINEER - IN - CHARGE SHOULD BE IMMEDIATELY INFORMED IN CASE OF ANY WEDGE OR SLIDE FAILURE ENCOUNTERED DURING EXCAVATION.

TECHNICAL NOTES:

- ALL ROCK BOLTS SHALL BE CONFIRM IS : 1786 AND SHOULD BE MADE OF Fe-500.
- FACE PLATE SIZE OF 150mm x 150mm x 10mm SHALL BE USED FOR FACE PLATE FOR ROCK BOLTS.
- THE ROCK BOLT SHALL BE FULLY GROUTED WITH CEMENT OR RESIN.
- THE MINIMUM YIELD STRENGTH OF THE ROCK BOLT SHALL BE 20T.
- NECESSARY PULL OUT TEST FOR ROCK BOLTS SHALL BE CONDUCTED TO ASSESS THE ROCK BOLTS AND GROUT PARAMETERS AS PER IS 11309.
- THE MINIMUM COMPRESSIVE STRENGTH FOR SHOTCRETE SHALL BE 30 MPa.
- SHOTCRETE WITH ONE LAYER OF WIRE MESH (100x100x6) WITH SAME M30 GRADE.
- THE WIRE MESH FABRIC SHALL BE OF MILD STEEL CONFIRM TO IS:4948 HAVING YIELD STRENGTH NOT LESS THAN 275 N/SQ MM.
- LOCAL WEDGES SHALL BE STABILIZED BY ADDITIONAL ROCK BOLTING WITH SAME SPECIFICATION.

Rev.	Date	Description



PRIMARY SUPPORT:

ROCK CLASS	SHOTCRETE (M30)	SDA DIA (mm)	SDA LENGTH (m)	SDA SPACING (m)
SC-05	250 mm	32	6.0	1.5

LEGEND:

① SEQUENCE FOR HEADING EXCAVATION

② SEQUENCE FOR BENCHING EXCAVATION

— EXCAVATION LINE

— CENTRE LINE

NOTES:

- ALL DIMENSIONS ARE IN METERS, UNLESS STATED OTHERWISE.
- NO MEASUREMENTS SHALL BE TAKEN FROM THE DRAWINGS UNLESS STATED OTHERWISE.
- THE DESIGN IS BASED ON TOPOGRAPHICAL DATA AND GEOLOGICAL INPUT. IF ANY DISCREPANCY IS OBSERVED IN DATA DURING EXCAVATION, IT SHALL BE IMMEDIATELY INFORMED TO THE ENGINEER - IN - CHARGE.
- SUPPORT SYSTEM MAY VARY AS PER SITE CONDITIONS AND RECOMMENDATION OF SITE.

CONSTRUCTION GUIDELINES:

- THE TUNNEL SHALL BE EXCAVATED IN HEADING, BENCHING, AND INVERT (IF ANY) SPECIFIED IN THE DRAWING.
- THE FOLLOWING STEPS FOR EXCAVATION SHALL BE ADOPTED
 - PIPE ROOFING
 - HEADING EXCAVATION
 - HEADING SHOTCRETE FIRST LAYER 50mm.
 - HEADING 32MM DIA SDA .
 - HEADING ERECTION OF ISMB 200 AND SHOTCRETING AS SECOND & THIRD LAYER WITH EACH 100MM THK. (200mm. THK.)
 - BENCHING EXCAVATION.
 - BENCHING SHOTCRETE FIRST LAYER 50mm.
 - BENCHING 32MM DIA SDA .
 - BENCHING ERECTION OF ISMB 200 AND SHOTCRETING SECOND & THIRD LAYER WITH EACH 100MM THK. (200mm. THK.)
 - WATER PROOFING MEMBRANE FIXING
 - SECONDARY LINING CONCRETING
- GALVANIZED OR PROTECTIVE COATING FOR ROCK BOLTS SHALL BE USED BEFORE INSTALLATION.
- WATER PROOFING SYSTEM SHALL BE INSTALLED AS PER STANDARD SPECIFICATIONS.
- SECONDARY LINING SHALL BE PLACED AFTER INSTALLATION OF WATER PROOFING SYSTEM .

DEVIATIONS:

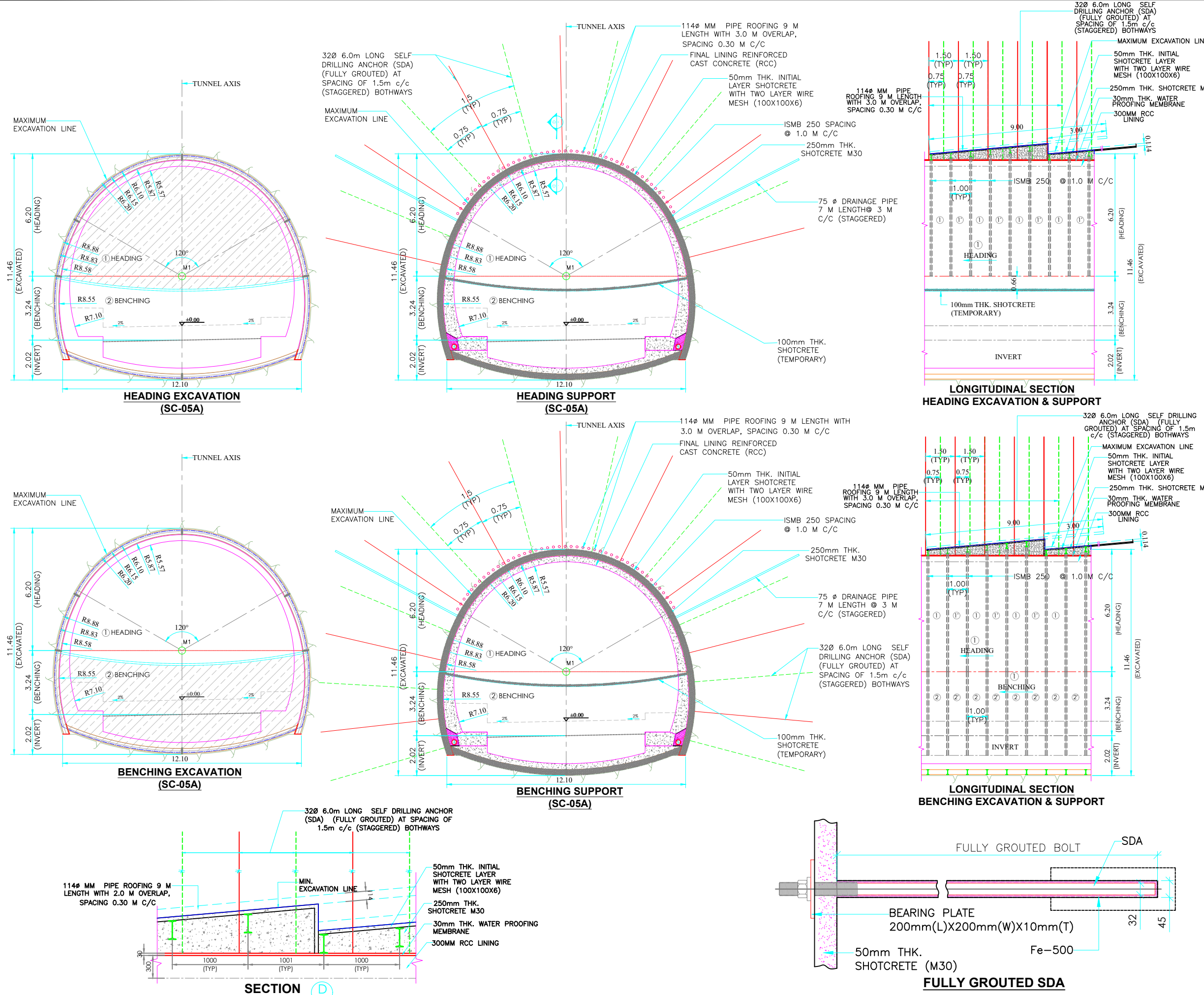
- THE ENGINEER- IN - CHARGE SHALL BE INFORMED IMMEDIATELY IF ENCOUNTERED ROCK MASS CONDITION DURING EXCAVATION IS DIFFERENT FROM THE GIVEN IN THE GEOLOGICAL DRAWINGS.

ADDITIONAL GUIDELINES:

- IN CASE OF THE PRESENCE OF SHEAR ZONE OR HIGHLY FRACTURED ROCK MASS PRE GROUTING MAY BE CARRIED OUT STARTING FROM THE FACE. THE DEPTH OF GROUT HOLES SHOULD BE KEPT 6 TO 9m FROM THE FACE WITH 45mm DIA.
- ENGINEER- IN - CHARGE SHOULD BE IMMEDIATELY INFORMED IN CASE OF ANY WEDGE OR SLIDE FAILURE ENCOUNTERED DURING EXCAVATION.

TECHNICAL NOTES:

- ALL SDA SHALL BE CONFIRM IS : 1786 AND SHOULD BE MADE OF Fe-500.
- FACE PLATE SIZE OF 200mm x200mm x10mm SHALL BE USED FOR FACE PLATE FOR SDA.
- THE SDA SHALL BE FULLY GROUTED WITH CEMENT OR RESIN.
- THE MINIMUM YIELD STRENGTH OF THE 32MM DIA SDA SHALL BE 23T.
- NECESSARY PULL OUT TEST FOR SDA SHALL BE CONDUCTED TO ASSESS THE SDA AND GROUT PARAMETERS AS PER IS 11309.
- THE MINIMUM COMPRESSIVE STRENGTH FOR SHOTCRETE SHALL BE 30 MPa.
- SHOTCRETE WITH TWO LAYER OF WIRE MESH(100x100x6) WITH SAME M30 GRADE .
- THE WIRE MESH FABRIC SHALL BE OF MILD STEEL CONFIRM TO IS:4948 HAVING YIELD STRENGTH NOT LESS THAN 275 N/SQ MM.
- LOCAL WEDGES SHALL BE STABILIZED BY ADDITIONAL ROCK BOLTING WITH SAME SPECIFICATION.



PRIMARY SUPPORT:

ROCK CLASS	SHOTCRETE (M30)	SDA DIA (mm)	DDA LENGTH (m)	SDA SPACING (m)
SC-05A	300 mm	32	6.0	1.5

LEGEND:

① SEQUENCE FOR HEADING EXCAVATION

② SEQUENCE FOR BENCHING EXCAVATION

--- EXCAVATION LINE

--- CENTRE LINE

NOTES:

1. ALL DIMENSIONS ARE IN METERS, UNLESS STATED OTHERWISE.

2. NO MEASUREMENTS SHALL BE TAKEN FROM THE DRAWINGS UNLESS STATED OTHERWISE.

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4. SUPPORT SYSTEM MAY VARY AS PER SITE CONDITIONS AND RECOMMENDATION OF SITE.

CONSTRUCTION GUIDELINES:

1. THE TUNNEL SHALL BE EXCAVATED IN HEADING, BENCHING, AND INVERT (IF ANY) SPECIFIED IN THE DRAWING.

2. THE FOLLOWING STEPS FOR EXCAVATION SHALL BE ADOPTED

STEP 1 PIPE ROOFING

STEP 2 HEADING EXCAVATION

STEP 3 HEADING SHOTCRETE FIRST LAYER 50mm.

STEP 4 HEADING ROCK BOLTING & WIREMESH.

STEP 5 HEADING ERECTION OF ISMB 250 AND SHOTCRETING AS SECOND & THIRD LAYER WITH EACH 125MM THK. (250mm. THK.)

STEP 6 BENCHING EXCAVATION.

STEP 7 BENCHING SHOTCRETE FIRST LAYER 50mm.

STEP 8 BENCHING ROCK BOLTING & WIREMESH.

STEP 9 BENCHING ERECTION OF ISMB 250 AND SHOTCRETING SECOND & THIRD LAYER WITH EACH 125MM THK. (250mm. THK.)

STEP 10 WATER PROOFING MEMBRANE FIXING

STEP 11 SECONDARY LINING CONCRETING

3. GALVANIZED OR PROTECTIVE COATING FOR ROCK BOLTS SHALL BE USED BEFORE INSTALLATION.

4. WATER PROOFING SYSTEM SHALL BE INSTALLED AS PER STANDARD SPECIFICATIONS.

5. SECONDARY LINING SHALL BE PLACED AFTER INSTALLATION OF WATER PROOFING SYSTEM .

DEVIATIONS:

1. THE ENGINEER- IN - CHARGE SHALL BE INFORMED IMMEDIATELY IF ENCOUNTERED ROCK MASS CONDITION DURING EXCAVATION IS DIFFERENT FROM THE GIVEN IN THE GEOLOGICAL DRAWINGS.

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2. ENGINEER- IN - CHARGE SHOULD BE IMMEDIATELY INFORMED IN CASE OF ANY WEDGE OR SLIDE FAILURE ENCOUNTERED DURING EXCAVATION.

TECHNICAL NOTES:

1. ALL SDA SHALL BE CONFIRM : 1786 AND SHOULD BE MADE OF Fe-500.

2. FACE PLATE SIZE OF 200mm x200mm x10mm SHALL BE USED FOR FACE PLATE FOR SDA.

3. THE SDA SHALL BE FULLY GROUTED WITH CEMENT OR RESIN.

4. THE MINIMUM YIELD STRENGTH OF THE 32MM DIA SDA SHALL BE 23T.

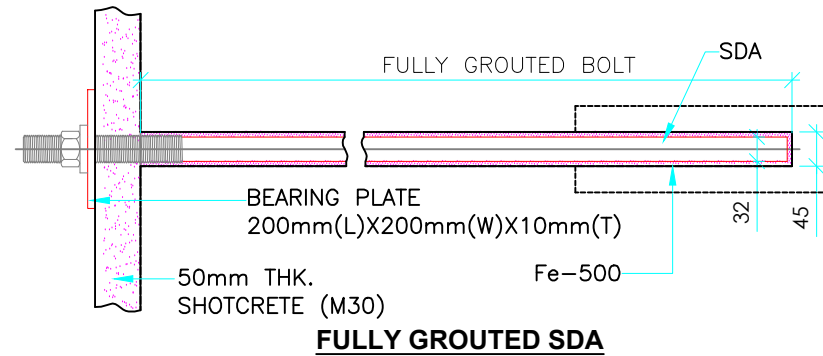
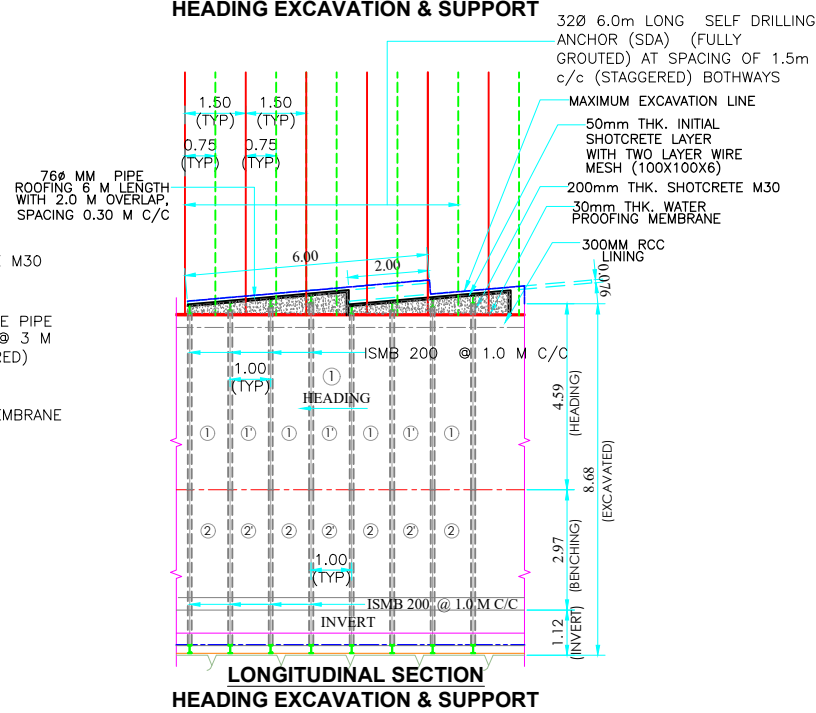
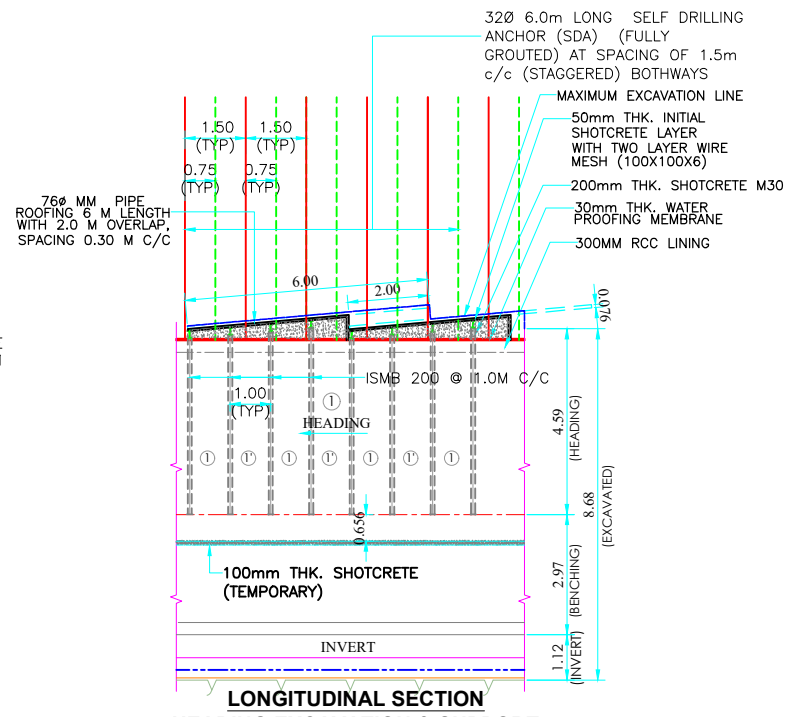
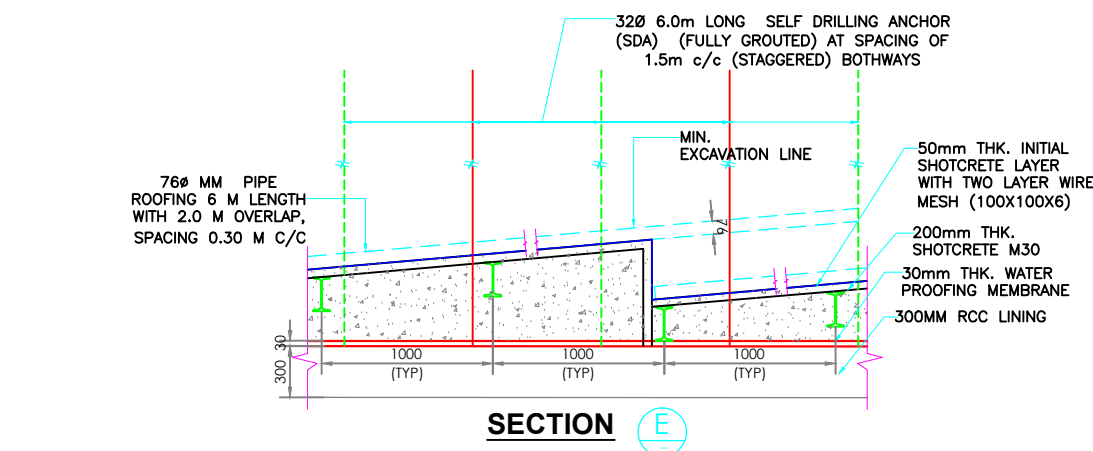
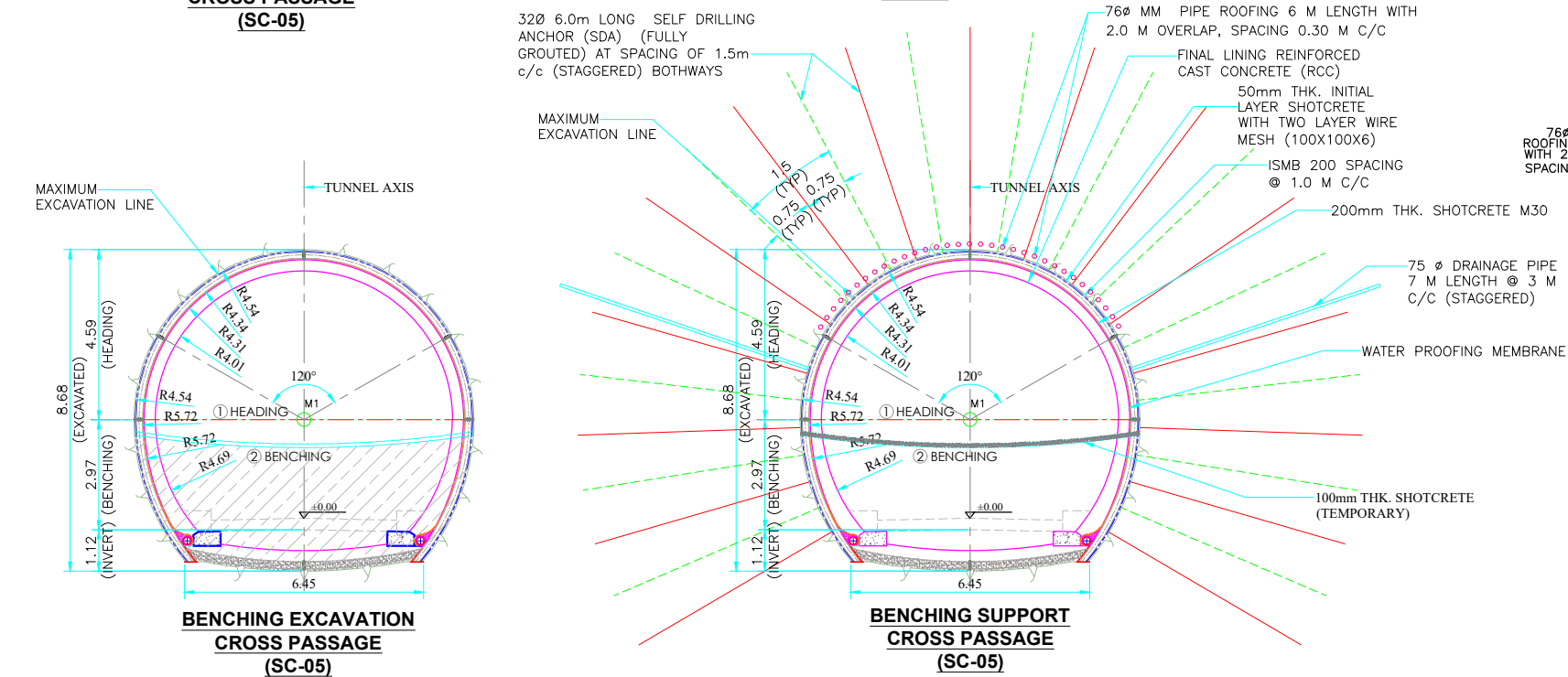
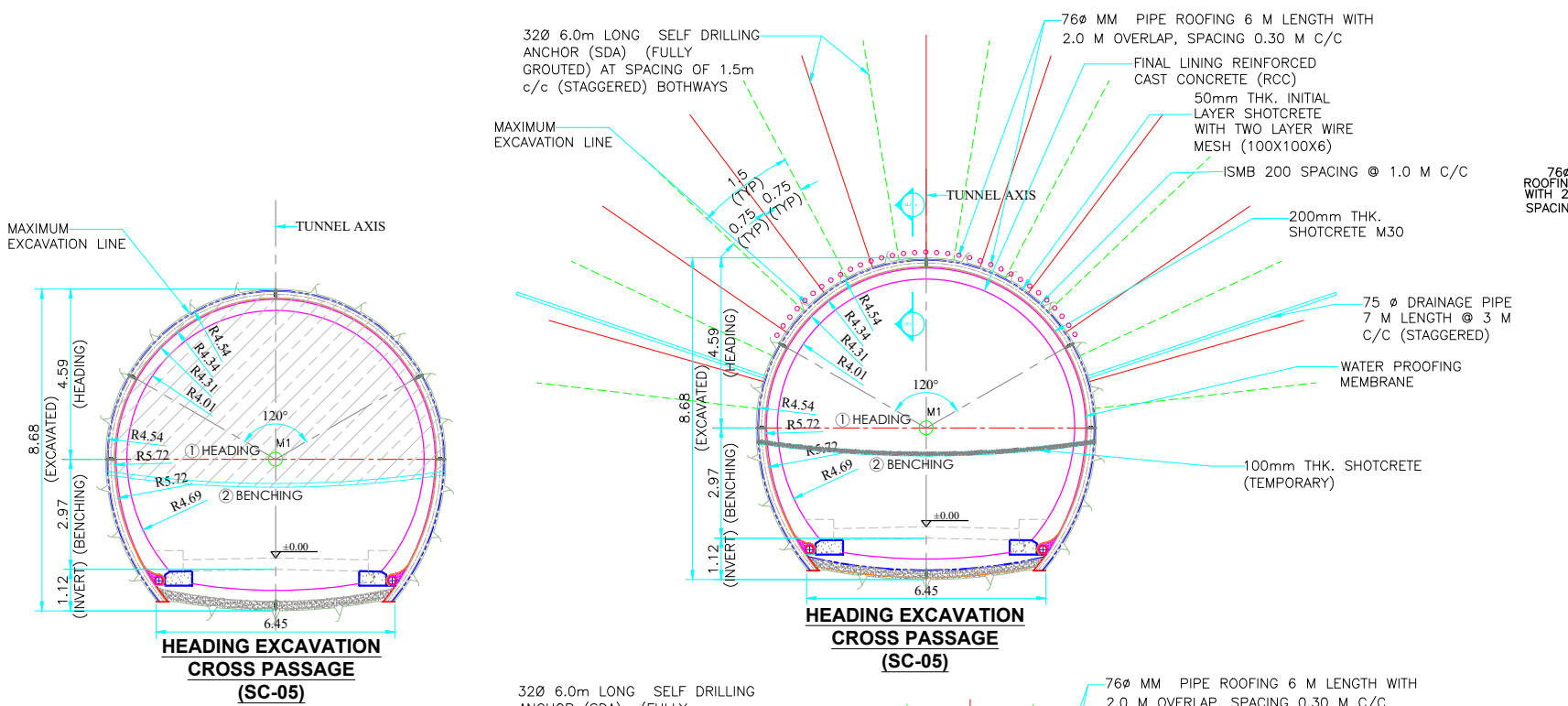
5. NECESSARY PULL OUT TEST FOR SDA SHALL BE CONDUCTED TO ASSESS THE SDA AND GROUT PARAMETERS AS PER IS 11309.

6. THE MINIMUM COMPRESSIVE STRENGTH FOR SHOTCRETE SHALL BE 30 MPa.

7. SHOTCRETE WITH TWO LAYER OF WIRE MESH(100x100x6) WITH SAME M30 GRADE .

8. THE WIRE MESH FABRIC SHALL BE OF MILD STEEL CONFIRM TO IS:4948 HAVING YIELD STRENGTH NOT LESS THAN 275 N/SQ MM.

9. LOCAL WEDGES SHALL BE STABILIZED BY ADDITIONAL ROCK BOLTING WITH SAME SPECIFICATION.



PRIMARY SUPPORT:

ROCK CLASS	SHOTCRETE (M30)	ROCK BOLT DIA (mm)	ROCK BOLT LENGTH (m)	ROCK BOLT SPACING (m)
POOR	200 mm	25	6.0	1.5

LEGEND:

- SEQUENCE FOR HEADING EXCAVATION
 - SEQUENCE FOR BENCHING EXCAVATION
- EXCAVATION LINE
CENTRE LINE

NOTES:

- ALL DIMENSIONS ARE IN METERS, UNLESS STATED OTHERWISE.
- NO MEASUREMENTS SHALL BE TAKEN FROM THE DRAWINGS UNLESS STATED OTHERWISE.
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- SUPPORT SYSTEM MAY VARY AS PER SITE CONDITIONS AND RECOMMENDATION OF SITE.

CONSTRUCTION GUIDELINES:

- THE TUNNEL SHALL BE EXCAVATED IN HEADING, BENCHING, AND INVERT (IF ANY) SPECIFIED IN THE DRAWING.
- THE FOLLOWING STEPS FOR EXCAVATION SHALL BE ADOPTED
 - PIPE ROOFING
 - HEADING EXCAVATION
 - HEADING SHOTCRETE FIRST LAYER 50mm.
 - HEADING ROCK BOLTING & WIREMESH.
 - HEADING ERECTION OF ISMB 200 AND SHOTCRETING AS SECOND & THIRD LAYER WITH EACH 100MM THK. (200mm. THK.)
 - BENCHING EXCAVATION.
 - BENCHING SHOTCRETE FIRST LAYER 50mm.
 - BENCHING ROCK BOLTING & WIREMESH.
 - BENCHING ERECTION OF ISMB 200 AND SHOTCRETING SECOND & THIRD LAYER WITH EACH 100MM THK. (200mm. THK.)
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DEVIATIONS:

- THE ENGINEER- IN - CHARGE SHALL BE INFORMED IMMEDIATELY IF ENCOUNTERED ROCK MASS CONDITION DURING EXCAVATION IS DIFFERENT FROM THE GIVEN IN THE GEOLOGICAL DRAWINGS.

ADDITIONAL GUIDELINES:

- IN CASE OF THE PRESENCE OF SHEAR ZONE OR HIGHLY FRACTURED ROCK MASS PRE GROUTING MAY BE CARRIED OUT STARTING FROM THE FACE. THE DEPTH OF GROUT HOLES SHOULD BE KEPT 6 TO 9m FROM THE FACE WITH 45mm DIA.
- ENGINEER- IN - CHARGE SHOULD BE IMMEDIATELY INFORMED IN CASE OF ANY WEDGE OR SLIDE FAILURE ENCOUNTERED DURING EXCAVATION.

TECHNICAL NOTES:

- ALL ROCK BOLTS SHALL BE CONFIRM IS : 1786 AND SHOULD BE MADE OF Fe-500.
- FACE PLATE SIZE OF 150mm x150mm x10mm SHALL BE USED FOR FACE PLATE FOR ROCK BOLTS.
- THE ROCK BOLT SHALL BE FULLY GROUTED WITH CEMENT OR RESIN.
- THE MINIMUM YIELD STRENGTH OF THE 32mm DIA SDA SHALL BE 23T.
- NECESSARY PULL OUT TEST FOR ROCK BOLTS SHALL BE CONDUCTED TO ASSESS THE ROCK BOLTS AND GROUT PARAMETERS AS PER IS 11309.
- THE MINIMUM COMPRESSIVE STRENGTH FOR SHOTCRETE SHALL BE 30 MPa.
- SHOTCRETE WITH TWO LAYER OF WIRE MESH (100x100x6) WITH SAME M30 GRADE.
- THE WIRE MESH FABRIC SHALL BE OF MILD STEEL CONFIRM TO IS:4948 HAVING YIELD STRENGTH NOT LESS THAN 275 N/SQ MM.
- LOCAL WEDGES SHALL BE STABILIZED BY ADDITIONAL ROCK BOLTING WITH SAME SPECIFICATION.

Rev.	Date	Description

Authority:	National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)
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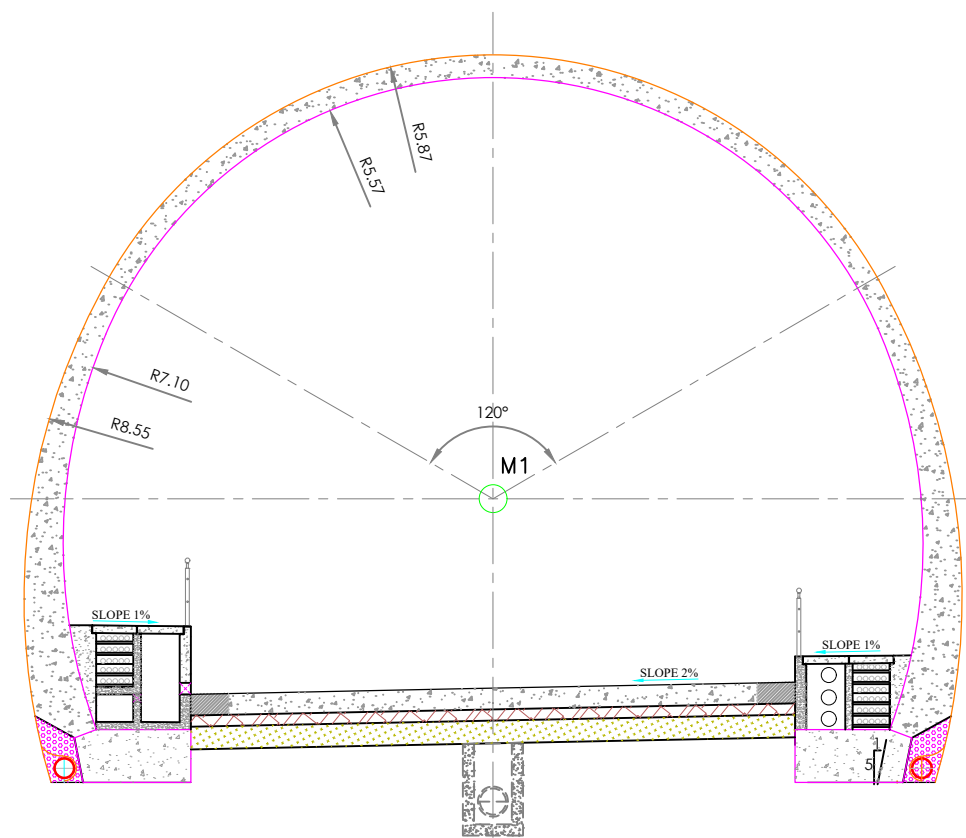
Design Consultants:	Transsys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transsys_blr@transsysconsulting.co.in
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Project:	Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000) Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-II)
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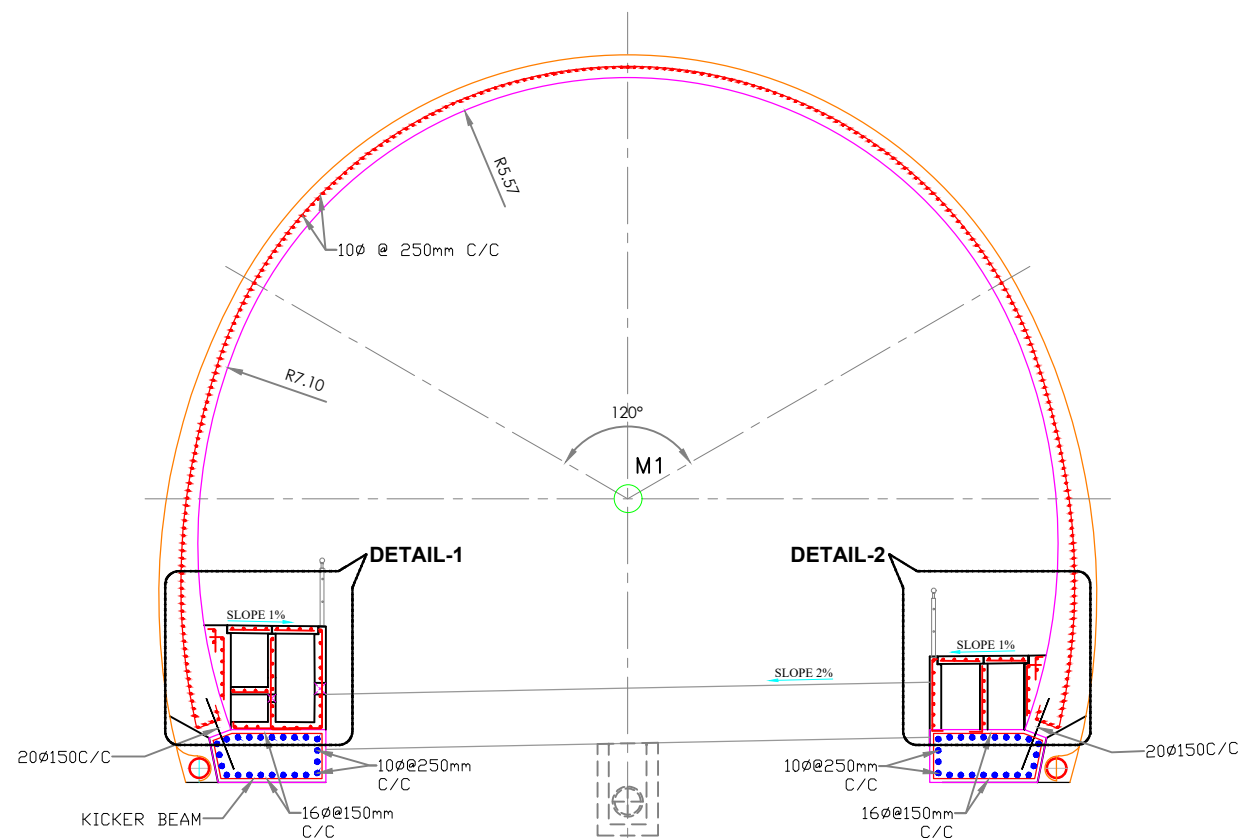
DRAWN BY	SHUDHANSHU
DESIGNED BY	RAJU
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT
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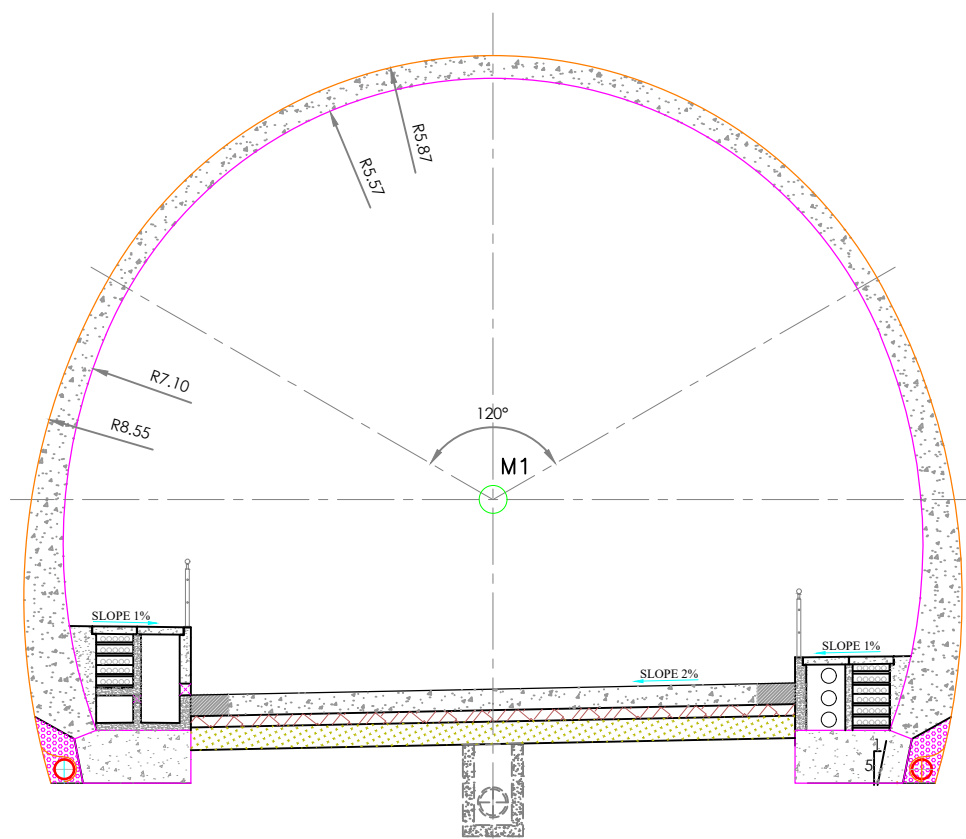
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Size	Scale	Dr. No	Rev:
A3	NTS	Transsys-NH37-TUNNEL-DPR-CIVIL-017	R2



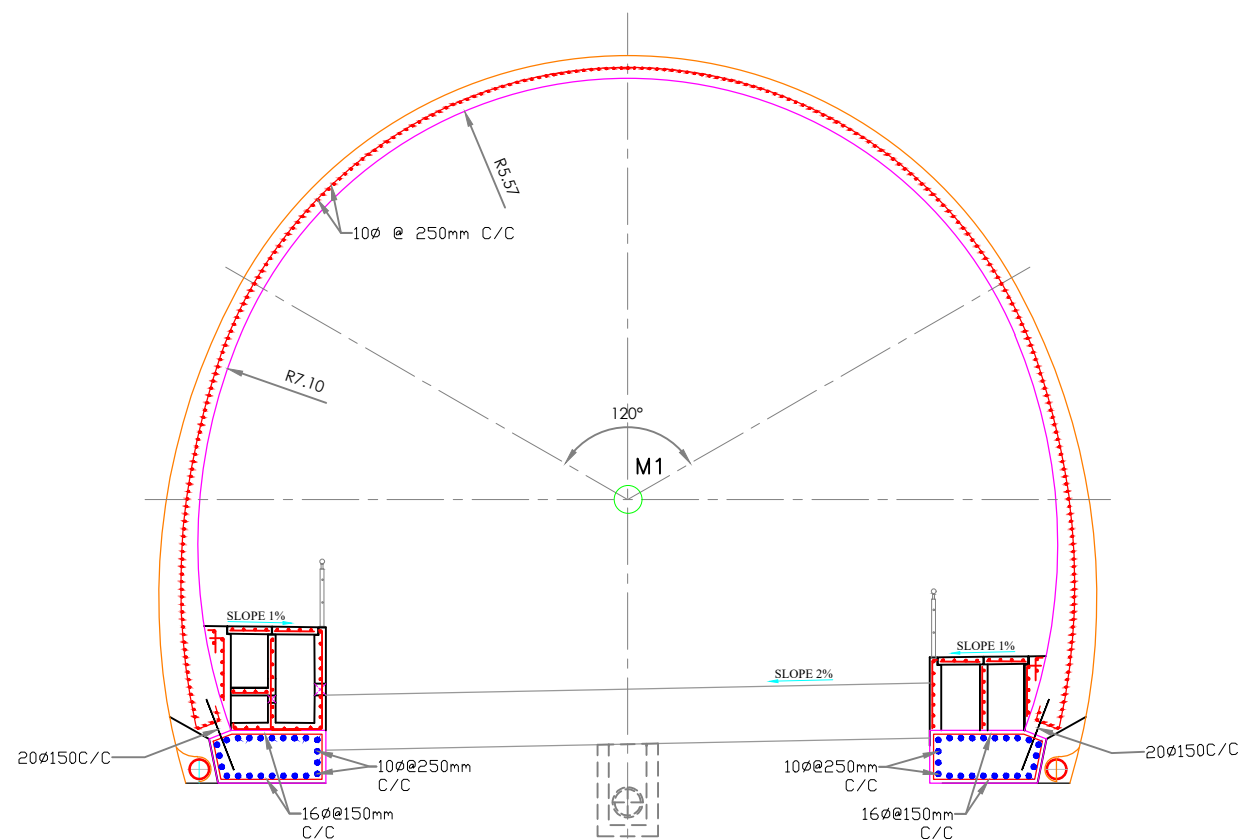
SECONDARY LINING CONCRETE DETAILS
(SC-03)



SECONDARY LINING REINFORCEMENT DETAILS
(SC-03)



SECONDARY LINING CONCRETE DETAILS
(SC-04)



SECONDARY LINING REINFORCEMENT DETAILS
(SC-04)

NOTES:-

1. ALL DIMENSIONS AND LVLS ARE IN MM, UNLESS NOTED OTHERWISE. (U.N.O.) DO NOT SCALE ANY DRG. FOLLOW WRITTEN DIMENSIONS ONLY.
2. THIS DRG. SHOULD BE READ IN CONJUNCTION WITH RELEVANT ARCH. AND SERVICE DRGS. ANY DISCREPANCY SHOULD BE BROUGHT TO THE NOTICE OF CONSULTANT IMMEDIATELY.
3. CONTRACTOR TO VERIFY ALL DIM BEFORE COMMENCEMENT OF WORK.
4. GRADE OF CONCRETE
FOR SECONDARY LINING & KICKER BEAM = M:35
FOR DRAIN = M:25
5. GRADE OF REINFORCEMENT = Fe 500 (HYSD)
(OF TESTED & APPROVED QUALITY)
6. COVER TO THE MAIN REINFORCEMENT SHALL BE AS FOLLOW :-
IN SECONDARY LINING BOTTOM TOP SIDE
40 40 40MM
7. DEVELOPMENT LENGTH FOR REINFORCEMENT (FOR Fe500) TOR STEEL.
8. IN CASE OF WELDING LAP JOINT PROVIDE CURTAILMENT
OF DOWEL VERTICAL BARS ALTERNATIVELY
ABOVE THE KICKER BEAM @100 , 200 MM RESPECTIVELY.
9. OVERLAPPING OF LINING REINFORCEMENT MUST FOLLOW IS:456 2000.

MIX OF CONC.	BAR IN TENSION & BENDING	BAR IN COMPRESSION
M 35	46 X d	46 X d

(SHEET 1 OF 3)

Rev.	Date	Description

Authority:
**National Highways & Infrastructure
Development Corporation Ltd.**
(Ministry of Road Transport & Highways)

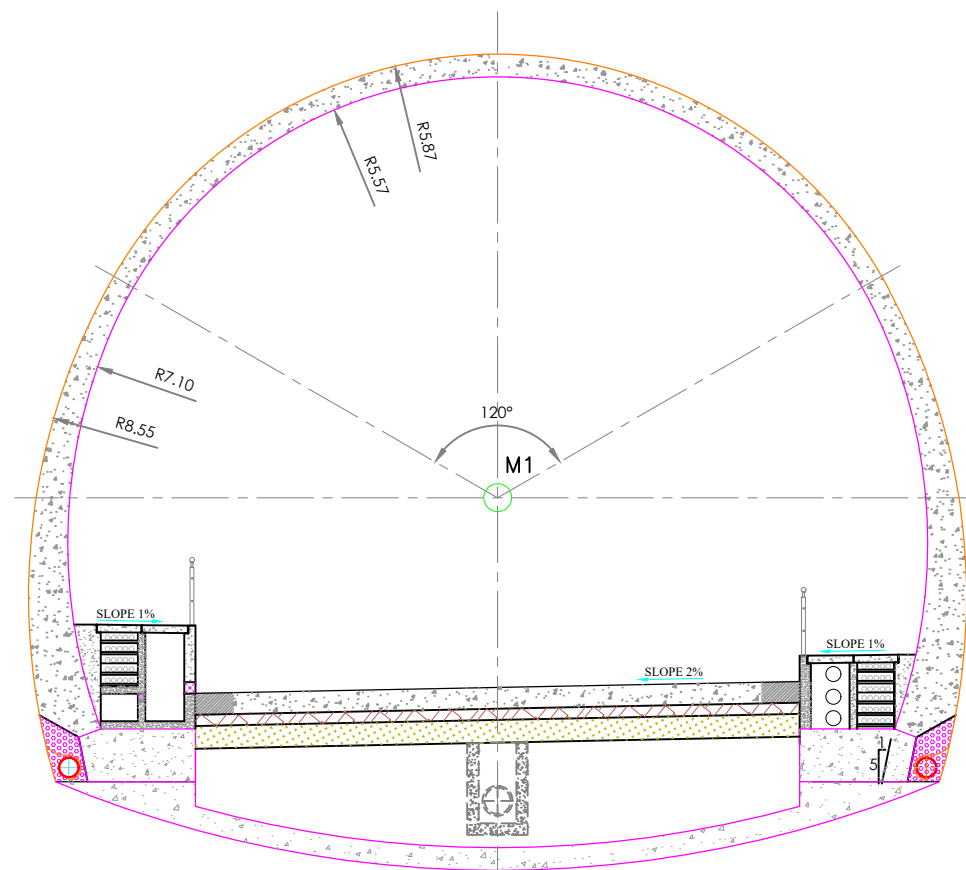
Design Consultants:
**Transys Consulting Pvt. Ltd.**
001-004, Raheja chambers, No.12, Museum
Road, Bengaluru-560001; Tel: 080-41461995;
email: transys_blr@transysconsulting.co.in

Project:
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors,
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under Bharatmala Pariyojna (Lot-1) (Package-III)

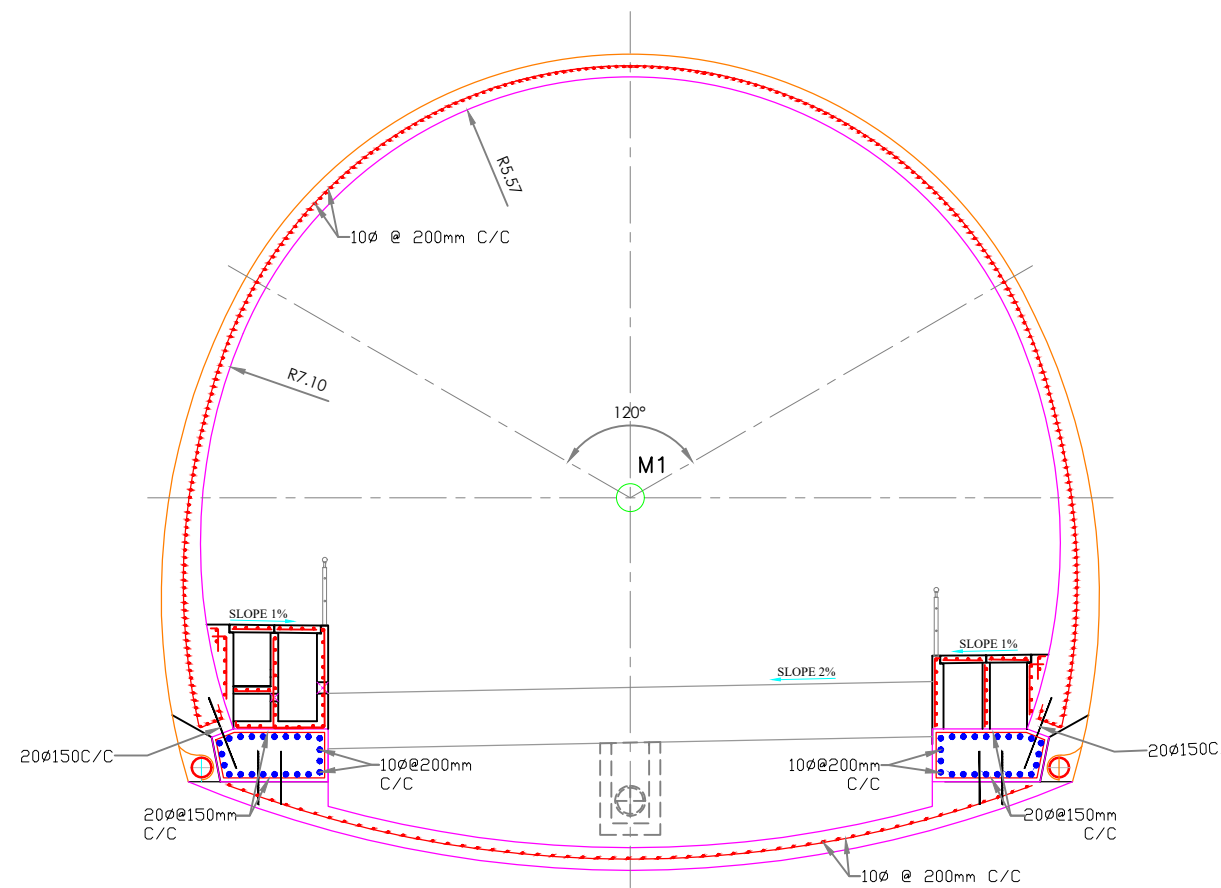
DRAWN BY	SHUDHANSHU
DESIGNED BY	HARI
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

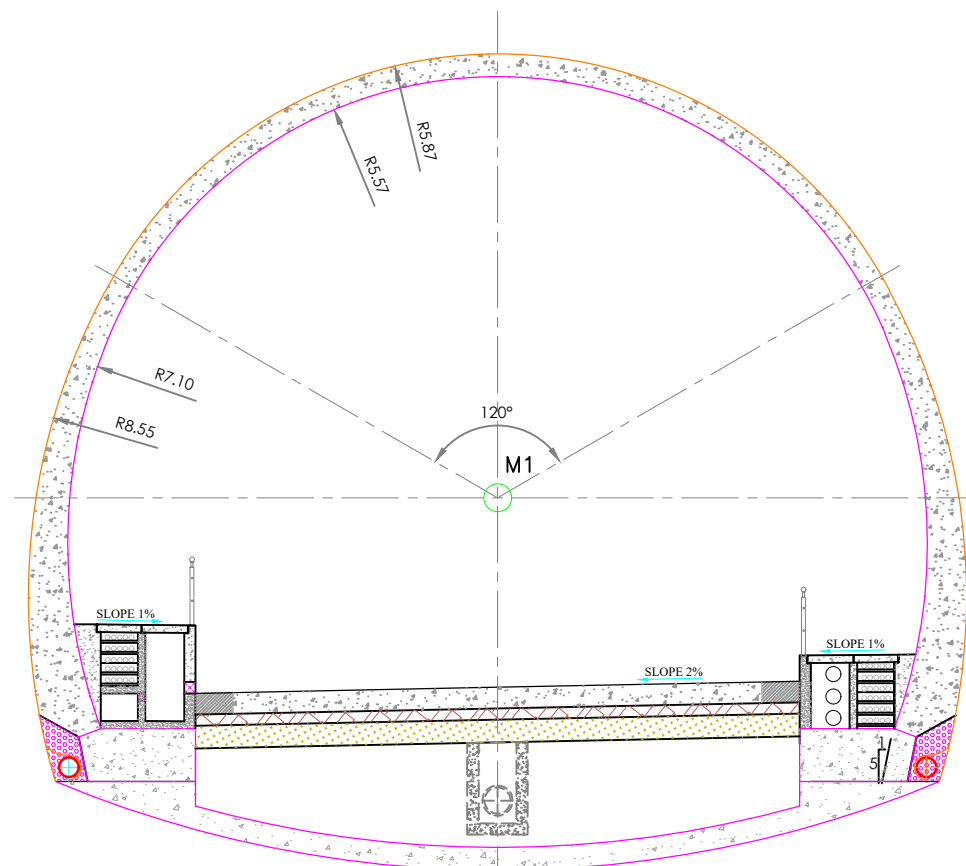
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Size	Scale	Drw. No	Rev.
A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-020	R2



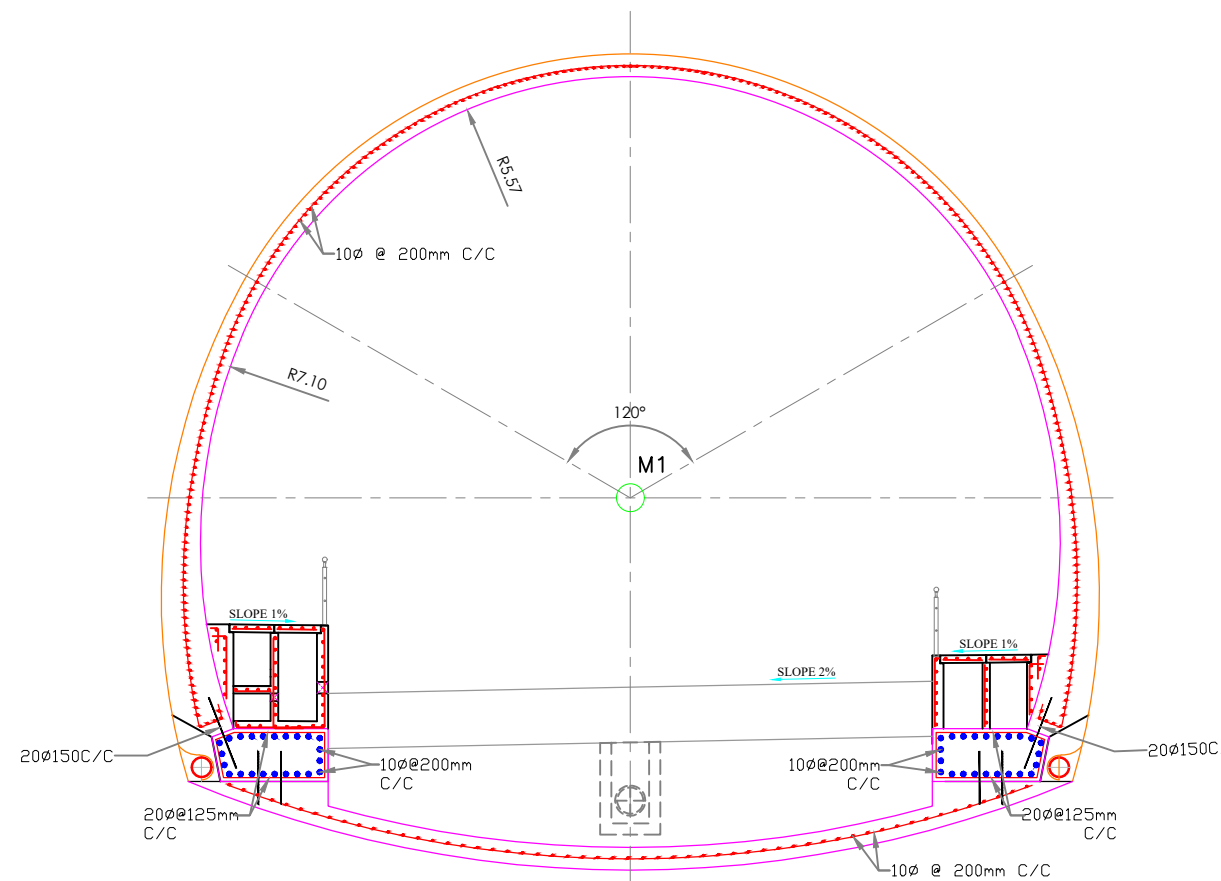
**SECONDARY LINING CONCRETE DETAILS
(SC-05)**



**SECONDARY LINING REINFORCEMENT DETAILS
(SC-05)**



**SECONDARY LINING CONCRETE DETAILS
(SC-05A)**



**SECONDARY LINING REINFORCEMENT DETAILS
(SC-05A)**

NOTES:-

- ALL DIMENSIONS AND LVLS ARE IN MM, UNLESS NOTED OTHERWISE. (U.N.O.) DO NOT SCALE ANY DRG. FOLLOW WRITTEN DIMENSIONS ONLY.
- THIS DRG. SHOULD BE READ IN CONJUNCTION WITH RELEVANT ARCH. AND SERVICE DRGS. ANY DISCREPANCY SHOULD BE BROUGHT TO THE NOTICE OF CONSULTANT IMMEDIATELY.
- CONTRACTOR TO VERIFY ALL DIM BEFORE COMMENCEMENT OF WORK.
- GRADE OF CONCRETE
FOR SECONDARY LINING & KICKER BEAM = M:35
FOR DRAIN = M:25
- GRADE OF REINFORCEMENT = Fe 500 (HYSD)
(OF TESTED & APPROVED QUALITY)
- COVER TO THE MAIN REINFORCEMENT SHALL BE AS FOLLOW :-
IN SECONDARY LINING BOTTOM TOP SIDE
40 40 40MM
- DEVELOPMENT LENGTH FOR REINFORCEMENT (FOR Fe500) TOR STEEL.
- IN CASE OF WELDING LAP JOINT PROVIDE CURTAILMENT
OF DOWEL VERTICAL BARS ALTERNATIVELY
ABOVE THE KICKER BEAM @100 , 200 MM RESPECTIVELY.
- OVERLAPPING OF LINING REINFORCEMENT MUST FOLLOW IS:456 2000.

MIX OF CONC.	BAR IN TENSION & BENDING	BAR IN COMPRESSION
M 35	46 X d	46 X d

(SHEET 2 OF 3)

Rev.	Date	Description

Authority:
National Highways & Infrastructure
Development Corporation Ltd.
(Ministry of Road Transport & Highways)

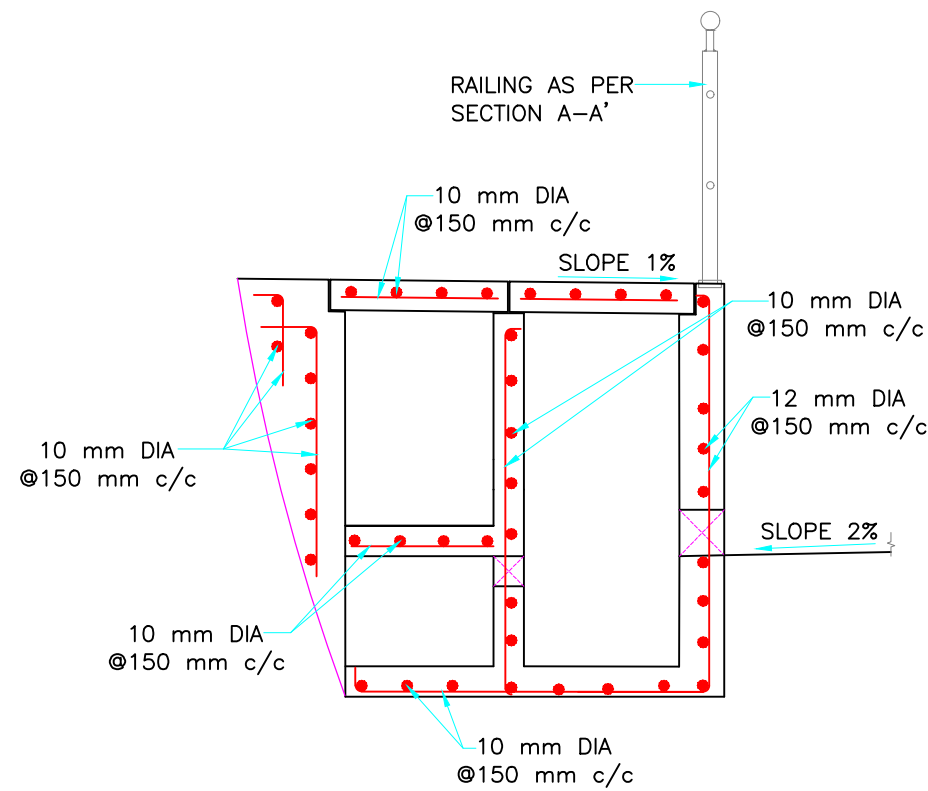
Design Consultants:
Transsys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum
Road, Bengaluru-560001; Tel: 080-41461995;
email: transsys_blr@transsysconsulting.co.in

Project:
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors,
Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India
under Bharatmala Pariyojna (Lot-1) (Package-III)

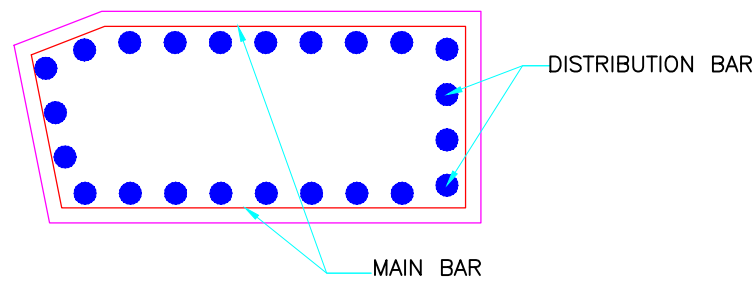
DRAWN BY: SHUDHANSHU
DESIGNED BY: HARI
CHECKED BY: VIDYA SAGAR
APPROVED BY: SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

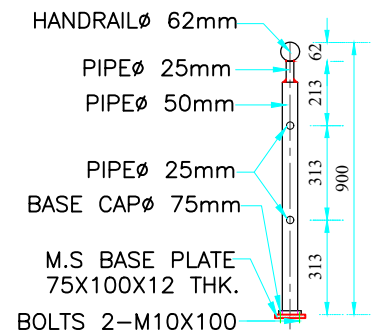
Title: SECONDARY LINING REINFORCEMENT DETAILS (SC-05 & SC05A)			
Size	Scale	Dwg. No	Rev:
A3	N/T	Transsys-NH37-TUNNEL-DPR-CIVIL-020	R2



DETAIL-1 (DRAIN REINFORCEMENT)

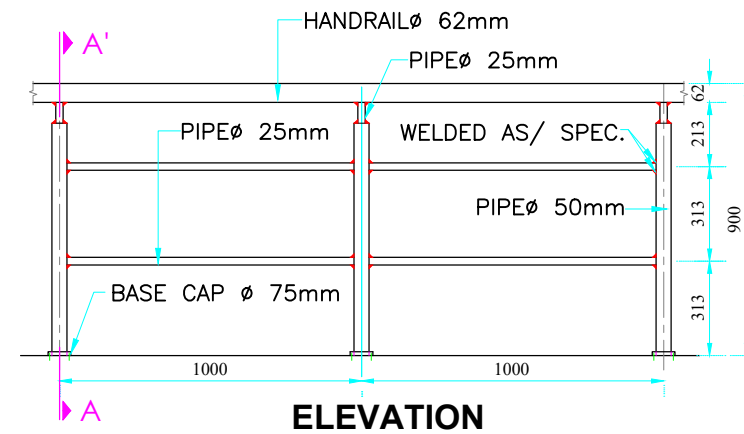
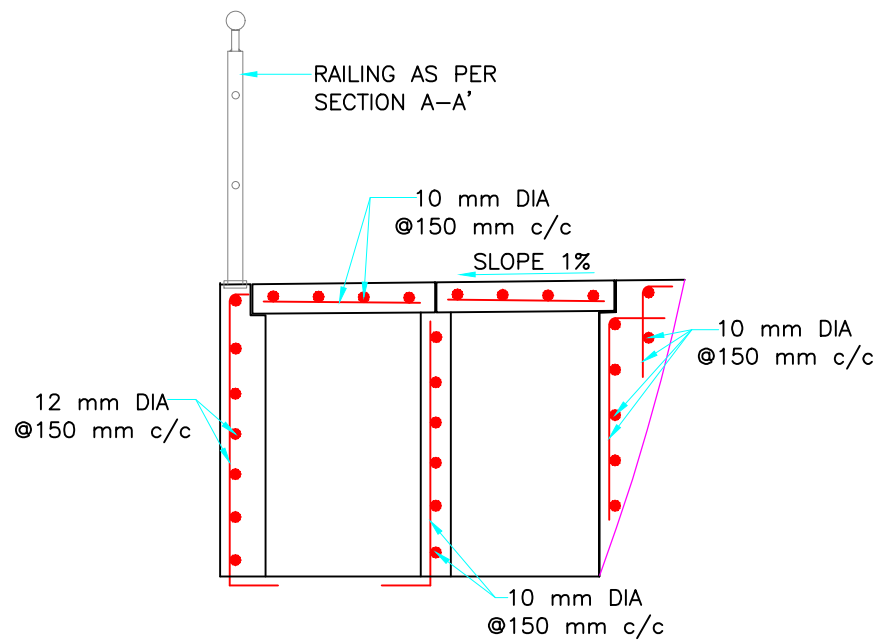


DETAIL OF KICKER BEAM REINFORCEMENT

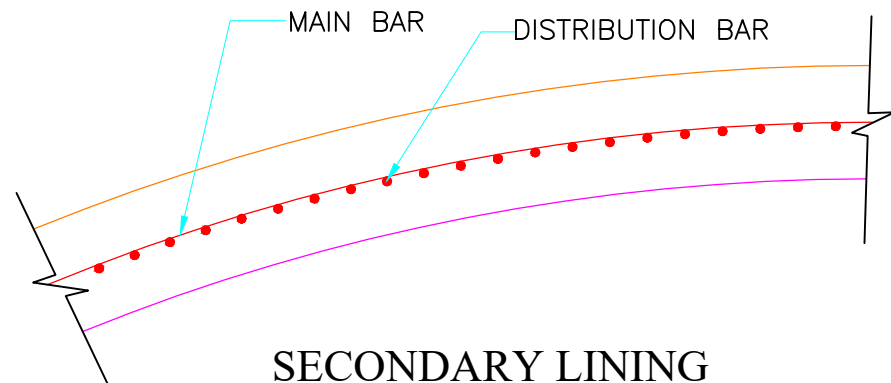


SECTION A-A'

DETAIL-2 (UTILITY DUCT REINFORCEMENT)



ELEVATION



SECONDARY LINING REINFORCEMENT DETAILS

NOTES:-

- ALL DIMENSIONS AND LVLS ARE IN MM, UNLESS NOTED OTHERWISE. (U.N.O.) DO NOT SCALE ANY DRG. FOLLOW WRITTEN DIMENSIONS ONLY.
- THIS DRG. SHOULD BE READ IN CONJUNCTION WITH RELEVANT ARCH. AND SERVICE DRGS. ANY DISCREPANCY SHOULD BE BROUGHT TO THE NOTICE OF CONSULTANT IMMEDIATELY.
- CONTRACTOR TO VERIFY ALL DIM BEFORE COMMENCEMENT OF WORK.
- GRADE OF CONCRETE
FOR SECONDARY LINING & KICKER BEAM = M:35
FOR DRAIN = M:25
- GRADE OF REINFORCEMENT = Fe 500 (HYSD)
(OF TESTED & APPROVED QUALITY)
- COVER TO THE MAIN REINFORCEMENT SHALL BE AS FOLLOW :-
IN SECONDARY LINING BOTTOM TOP SIDE
40 40 40MM
- DEVELOPMENT LENGTH FOR REINFORCEMENT (FOR Fe500) TOR STEEL.
- IN CASE OF WELDING LAP JOINT PROVIDE CURTAILMENT OF DOWEL VERTICAL BARS ALTERNATIVELY ABOVE THE KICKER BEAM @100, 200 MM RESPECTIVELY.
- OVERLAPPING OF LINING REINFORCEMENT MUST FOLLOW IS:456 2000.

MIX OF CONC.	BAR IN TENSION & BENDING	BAR IN COMPRESSION
M 35	46 X d	46 X d

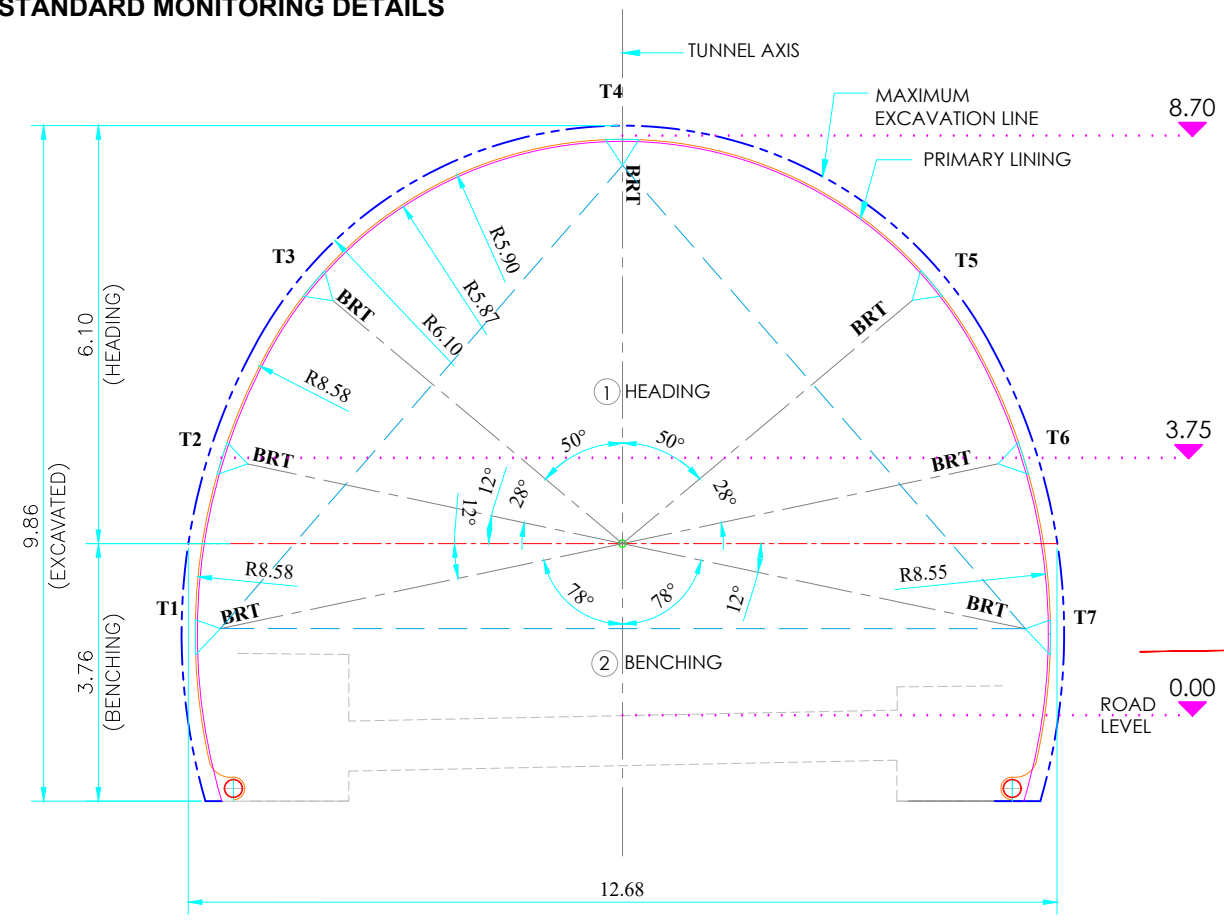
SECONDARY LINING REINFORCEMENT DETAIL		
SC	MAIN BAR	DISTRIBUTION BAR
SC-03	10Ø@250mm C/C	10Ø@250mm C/C
SC-04	10Ø@250mm C/C	10Ø@250mm C/C
SC-05	10Ø@200mm C/C	10Ø@200mm C/C
SC-05A	10Ø@200mm C/C	10Ø@200mm C/C

KICKER BEAM REINFORCEMENT DETAIL		
SC	MAIN BAR	DISTRIBUTION BAR
SC-03	16Ø@150mm C/C	10Ø@250mm C/C
SC-04	16Ø@150mm C/C	10Ø@250mm C/C
SC-05	20Ø@150mm C/C	10Ø@200mm C/C
SC-05A	20Ø@125mm C/C	10Ø@200mm C/C

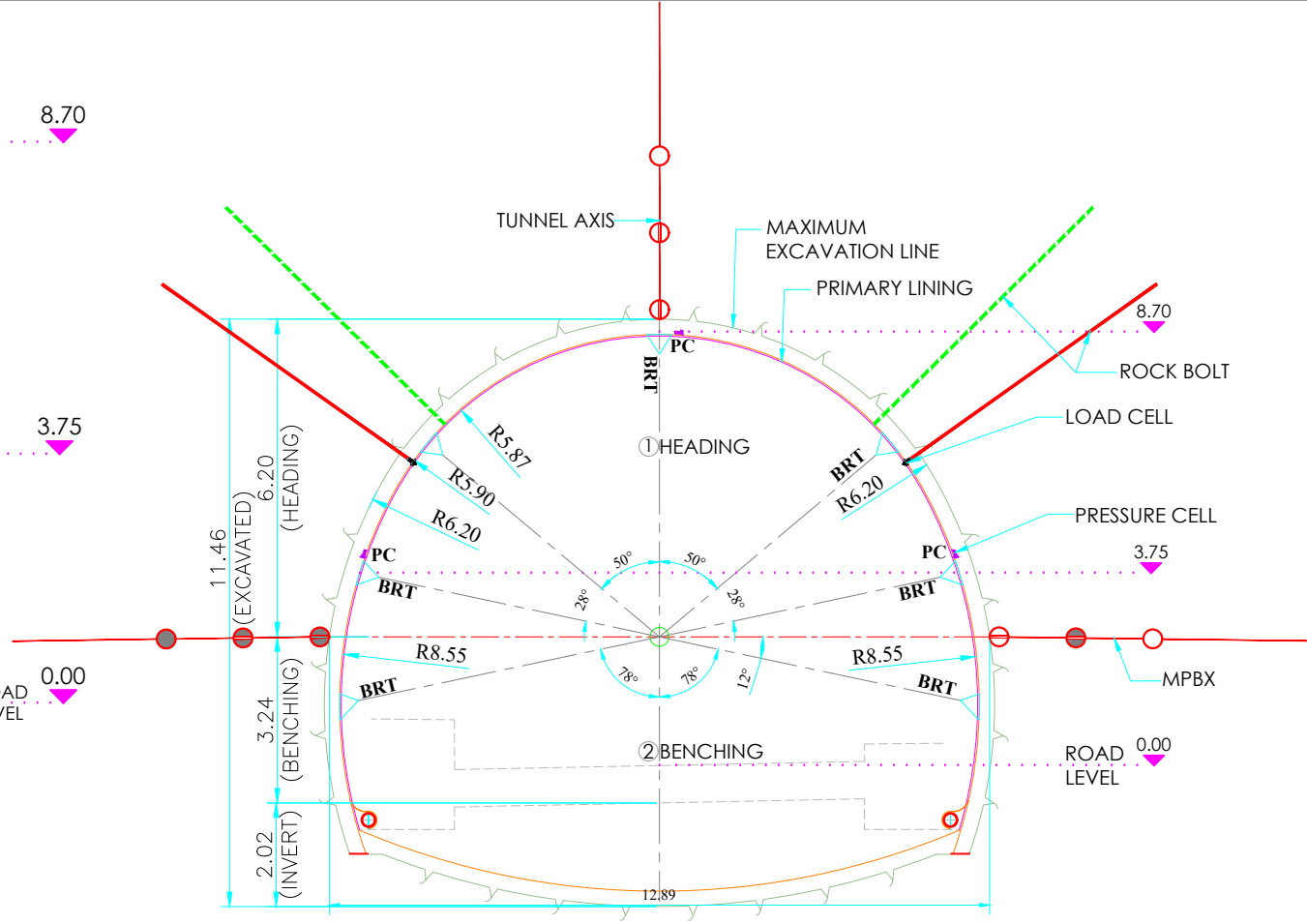
Rev.	Date	Description

Authority:					
		National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)			

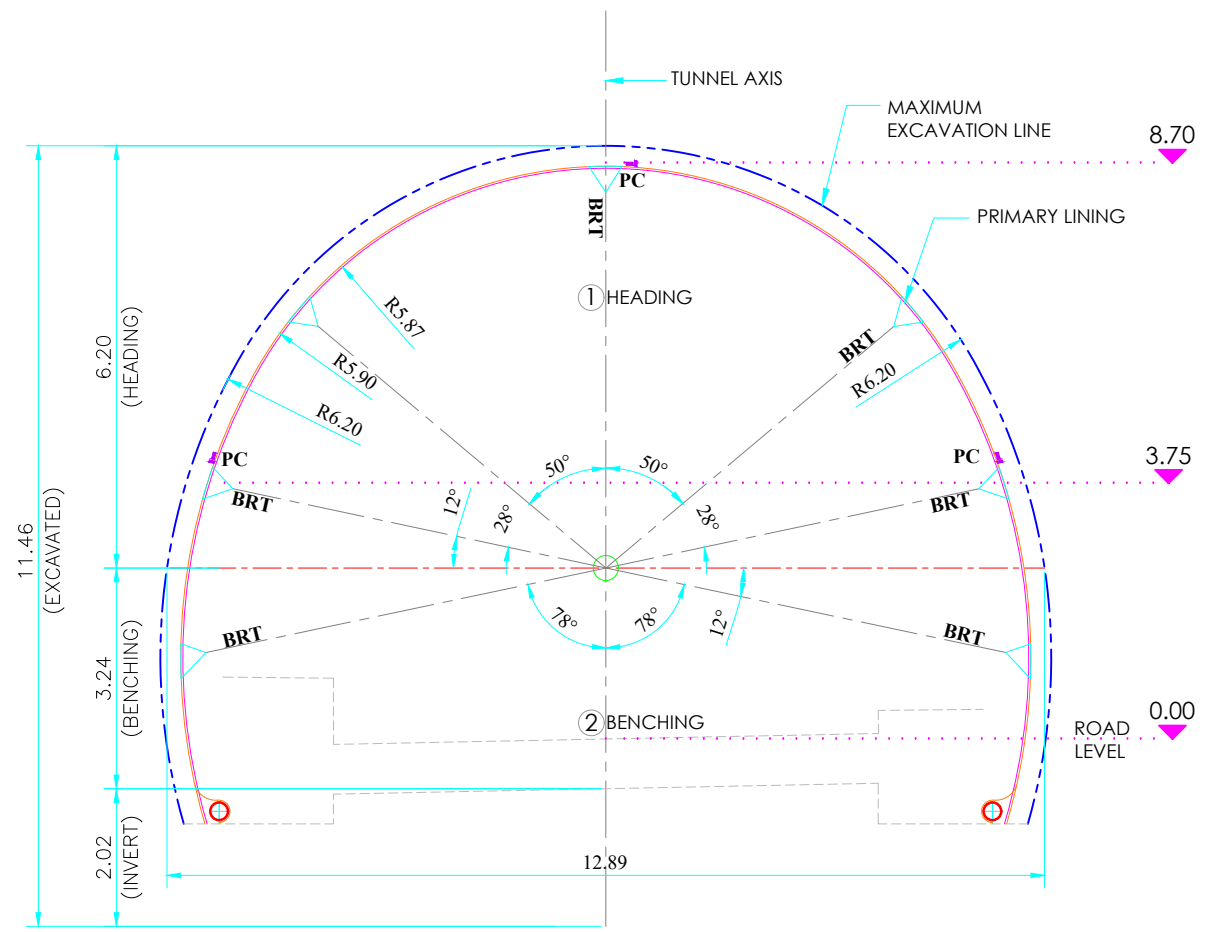
STANDARD MONITORING DETAILS



STANDARD MONITORING SYSTEM
01 SECTION



STANDARD MONITORING
SECTION-03



STANDARD MONITORING
SECTION-02

SUPPORT CLASS	THEORETICAL DISPLACMANT (mm)	ATTENTION LEVEL (mm)	ACTION LEVEL (mm)	ALARM LEVEL (mm)
SC- 03	20	15	20	22
SC- 04	35	26.25	35	38.5
SC- 05	40	33.75	45	49.5
SC- 5A	50	41.25	55	60.5

SUPPORT CLASS	STANDARD MONITORING SECTION-01	STANDARD MONITORING SECTION-02	STANDARD MONITORING SECTION-03
SC- 03	35M	—	—
SC- 04	—	35M	—
SC- 05	—	—	20M
SC- 5A	—	—	ONE AT EACH PORTAL & 10M SPACING FROM PORTAL
CROSS PASSAGE	—	—	3 LOCATION (START,CENTER & END)

- NOTES:**
1. ALL DIMENSIONS ARE IN METERS.
 2. NO DIMENSION SHALL BE MEASURED FROM THE DRAWING.
 3. THE SUPPORT AND MONITORING EQUIPMENTS MUST BE INSTALLED IMMACULATLY AFTER EXCAVATION AND STARING NEXT ROUND EXCAVATION.
 4. ROCK CLASS AND SUPPORT MEASURE TO BE ADJUSTED AND DECIDED BY THE COMPETENT GEOLOGIST IN CONSULTATION WITH DESIGN CONSULTANT ACCORDING TO ENCOUNTERED GEOLOGICAL CONDITION MONITORED DEFORMATION.
 5. ALLOW THE OBSERVATION OF PORTAL EXCAVATION PHASE THE INSTRUMENTATION SHOULD BE INSTALLED AS SOON AS POSSIBLE DURING THE EXCAVATION WORK
 6. DURING CONSTRUCTION BASED ON THE EXPERIENCE AND CONDITION FOUND, THE DEFORMATION VALUES MY BE RE-EVALUATED BY THE DESIGNER THE GEOTECHNIAL SUPERVISION TEAM AND BY THE CONTRACTOR
 7. IN ADDITION TO MONITORING CONSIDERED TO BE OF SUPREME IMPORTANCE TO CARRY OUT VISUAL INSPECTIONS OF STRUCTURE WITH THE INTENT TO DETECT ANY MALFUNCTION OF THE INSTALLED MONITORING SYSTEM
 8. THE GIVEN READINGS ,FREQUENCY ASSUMES A SITUATION OF NORMAL OPERATION CONDITION THE OCCURRENCE OF UNUSUAL SITUATION EITHER ASSOCIATED WITH OUTWARD ACTION OR TO THE WORK BEHAVIOR CAN LEAD TO A CHANGE IN THE READING FREQUENCY ON A TEMPORARY OR DEFINITIVE BASIS DEPENDING ON THE OBSERVED SITUATION
 9. THE NUMBERS, LOCATION AN FREQUENCY OF INSTRUMENTATION ARE SUBJECT TO CHANGE ACCORDING TO THE ENGINEER'S INSTRUCTION ON SITE
 10. THE FREQUENCY ON MONITORING SHOULD BE INCREASED SUITABLY AFTER THE BRANCH OF ATTENTION LEVEL
 11. TRIGGER LEVEL(1E ATTENTION ,ACTION & ALARM LEVEL)SHOULD ALSO BE CHECKED BASED ON DISPLACEMENT VELOCITY CONSIDERATION
 12. SAME NUMBERS AND LOCATIONS OF ENVISAGED FOR TOP HEADING AND BEACHING & HEADING AND INVERT EXCAVATION

LEGENDS

	PRESSURE CELL
	BI REFLEX TARGET
	MPBX
	LOAD CALL

FREQUENCY OF MONITORING

TIME AFTER EXCAVATION	FREQUENCY
WEEK-1	ONCE PER DAY
WEEK-1	THRICE A WEEK
WEEK-3 & 4	ONCE A WEEK
WEEK-4	ONCE A MONTH

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY: PRASANG
DESIGNED BY: GOWTHAM
CHECKED BY: VIDYA SAGAR
APPROVED BY: SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

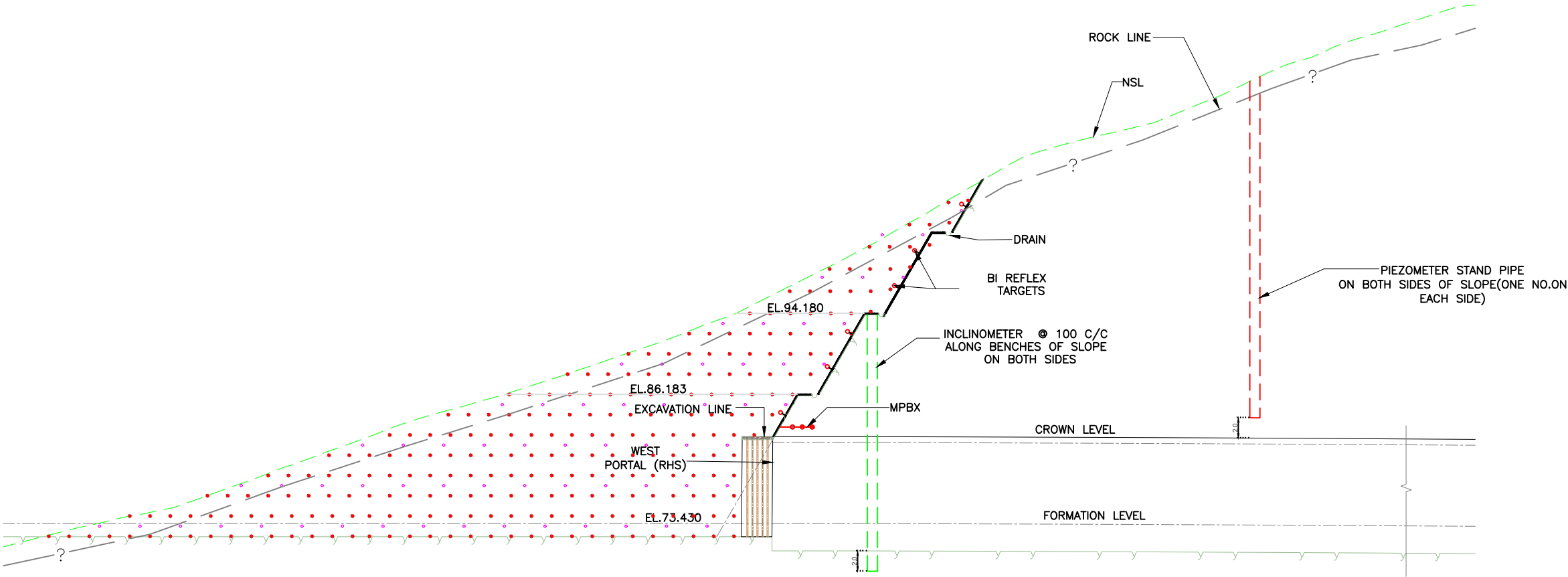
Title: STANDARD MONITORING DETAILS SILCHAR JIRIBAM TUNNEL

Size	Scale	Drw. No	Rev:
A3	N.T.S	Transys-NH37-TUNNEL-DPR-CIVIL-021	R2

- NOTES:**
1. ALL DIMENSIONS ARE IN METERS,AND LEVELS ARE IN METERS OTHERWISE SPECIFIED.
 2. DIMENSION ,LEVELS & COORDINATES SHALL BE CHECKED ON SITE PRIOR TO EXECUTION OF THE WORKS .
 3. THE INSTRUMENTATION PLAN PROVIDE IS TYPICAL & SHALL BE ADJUSTED AS PER THE SITE CONDITIONS AND GROUND BEHAVIOR
 4. THE DECISION ABOUT NUMBER & TYPE OF INSTRUMENTS SHALL BE DECIDED ON THE SITE .

LEGENDS

	BI REFLEX TARGET
	MULTI-POINT BOREHOLE EXTENSOMETER ANCHOR DEPTH - 3,6 & 10M
	PIEZOMETER STAND PIPE
	INCLINOMETER



TYPICAL SECTION MONITORING DETAILS FOR PORTAL SLOPES

Rev.	Date	Description

Authority:

 **National Highways & Infrastructure Development Corporation Ltd.**
(Ministry of Road Transport & Highways)

Design Consultants:

 **Transys Consulting Pvt. Ltd.**
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)

Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

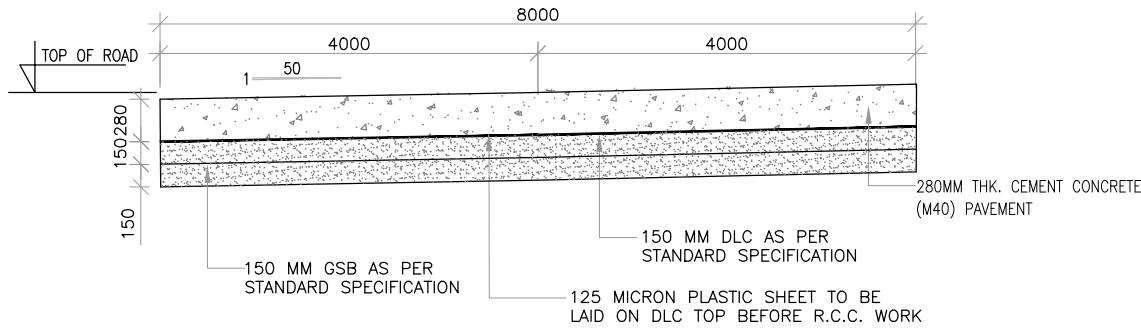
DRAWN BY	PRASANG
DESIGNED BY	GOWTHAM
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

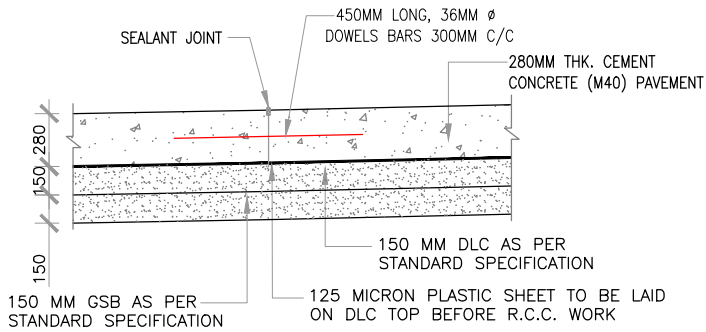
Title: TYPICAL SECTION MONITORING DETAIL FOR PORTAL SLOPES			
Size	Scale	Dwg. No	Rev:
A3	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-022	R2

NOTES:-

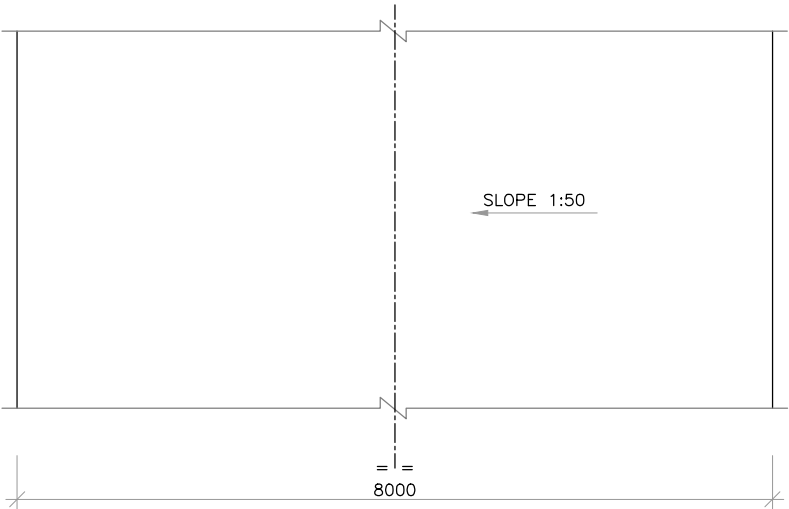
1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHER WISE
2. EXPANSION JOINT SHALL BE PROVIDED AT EVERY 20M. ALONG ROAD LENGTH.
3. CONSTRUCTION JOINT SHALL BE PROVIDED AT EVERY 3.5 M ALONG ROAD LENGTH.
4. CEMENT CONCRETE FOR PQC SHALL BE OF M40 GRADE AS PER IS:456 (LATEST EDITION)
5. STEEL USED IN PAVEMENT CONCRETE SHALL BE OF GRADE Fe- 500 AS PER LATEST EDITION OF IS: 1786
6. SMOOTH SURFACE SHALL BE ACHIEVED BY USE OF PROPER SHUTTERING.
7. VIBRATOR & CONC. MIXER BE USED TO ENSURE THROUGH MIXING & COMPACTION OF CONCRETE.
8. CEMENT CONCRETE FOR DLC SHALL BE OF M15 GRADE AS PER IS:456.



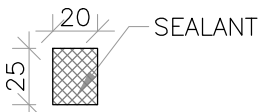
CROSS SECTION OF 8.0M WIDE ROAD
(CARRIAGEWAY + EDGE STRIP)



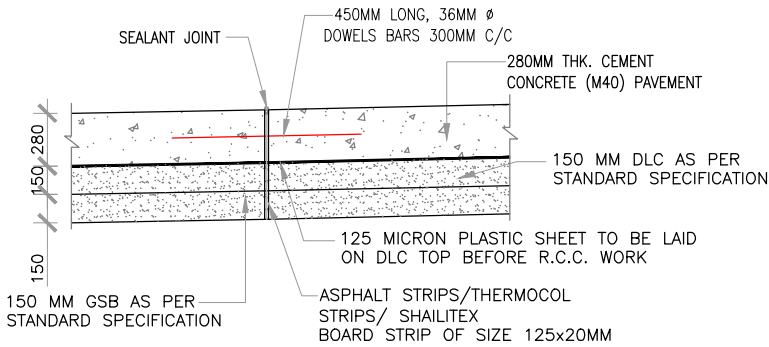
CONSTRUCTION JOINT DETAIL (TYP.)



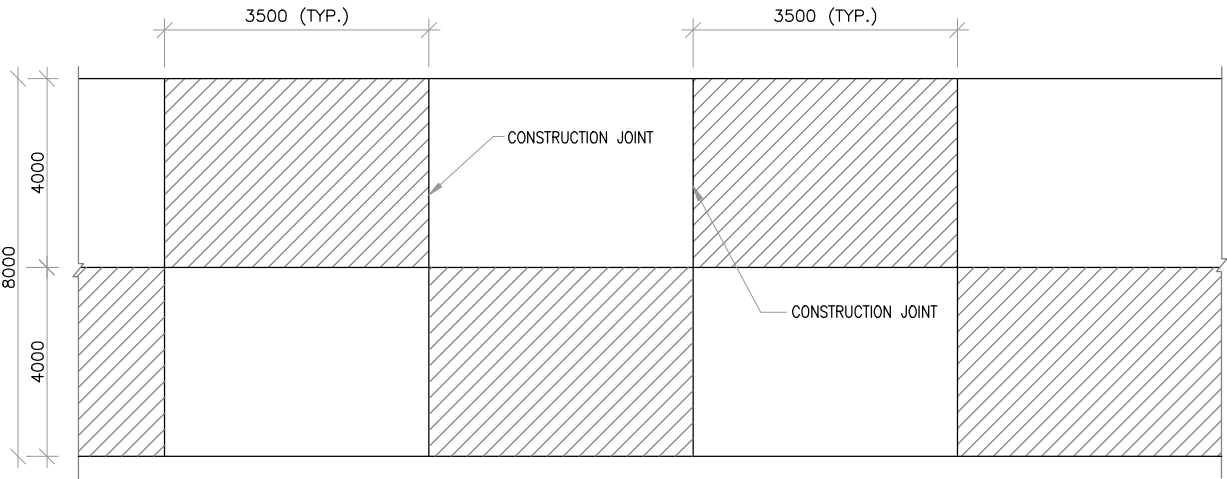
TYPICAL TOP VIEW OF ROAD



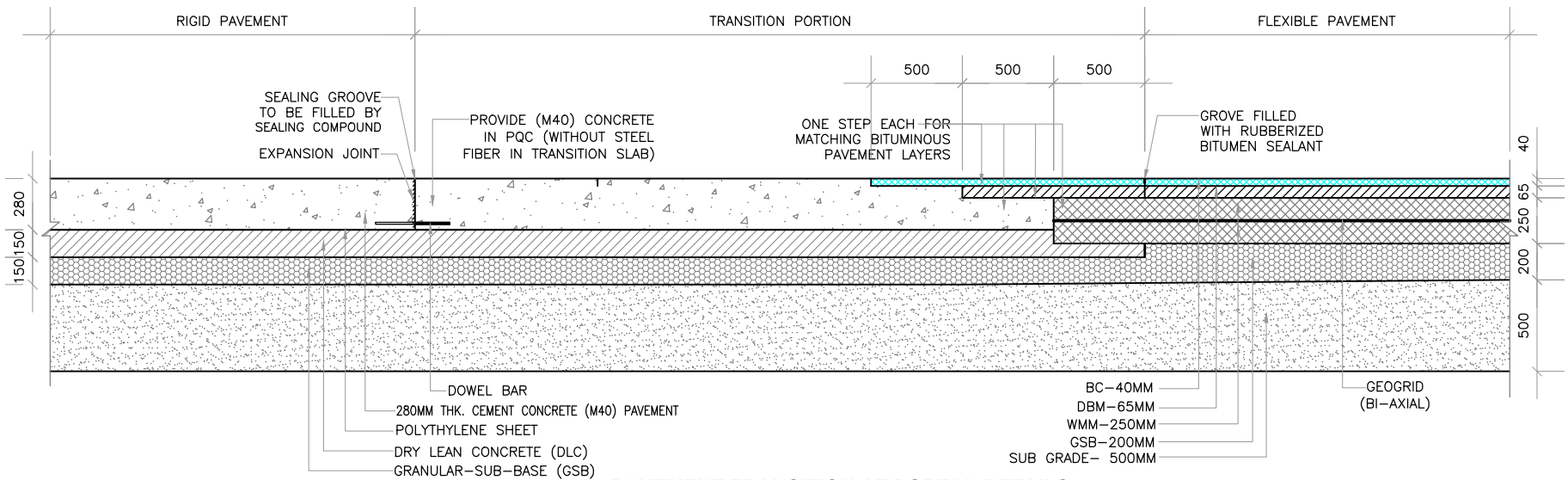
SEALANT DETAILS OF
JOINT GROOVE



TYP. DETAIL OF EXPANSION JOINT



CONCRETE PLACING PATTERN



PAVEMENT TRANSITION AT PORTAL DETAILS

(SHEET 1 OF 2)

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:

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Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-II)

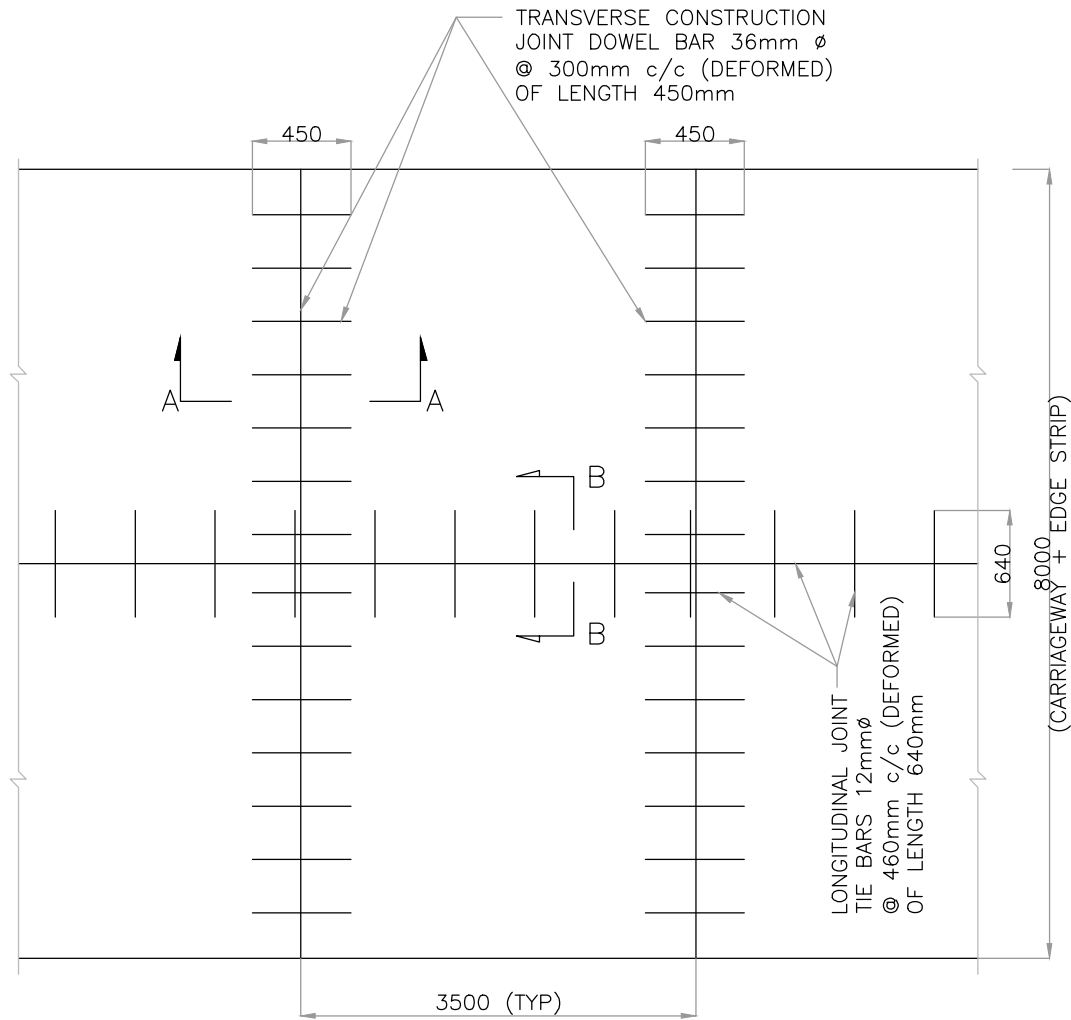
DRAWN BY	SHUDHANSHU
DESIGNED BY	HARI
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
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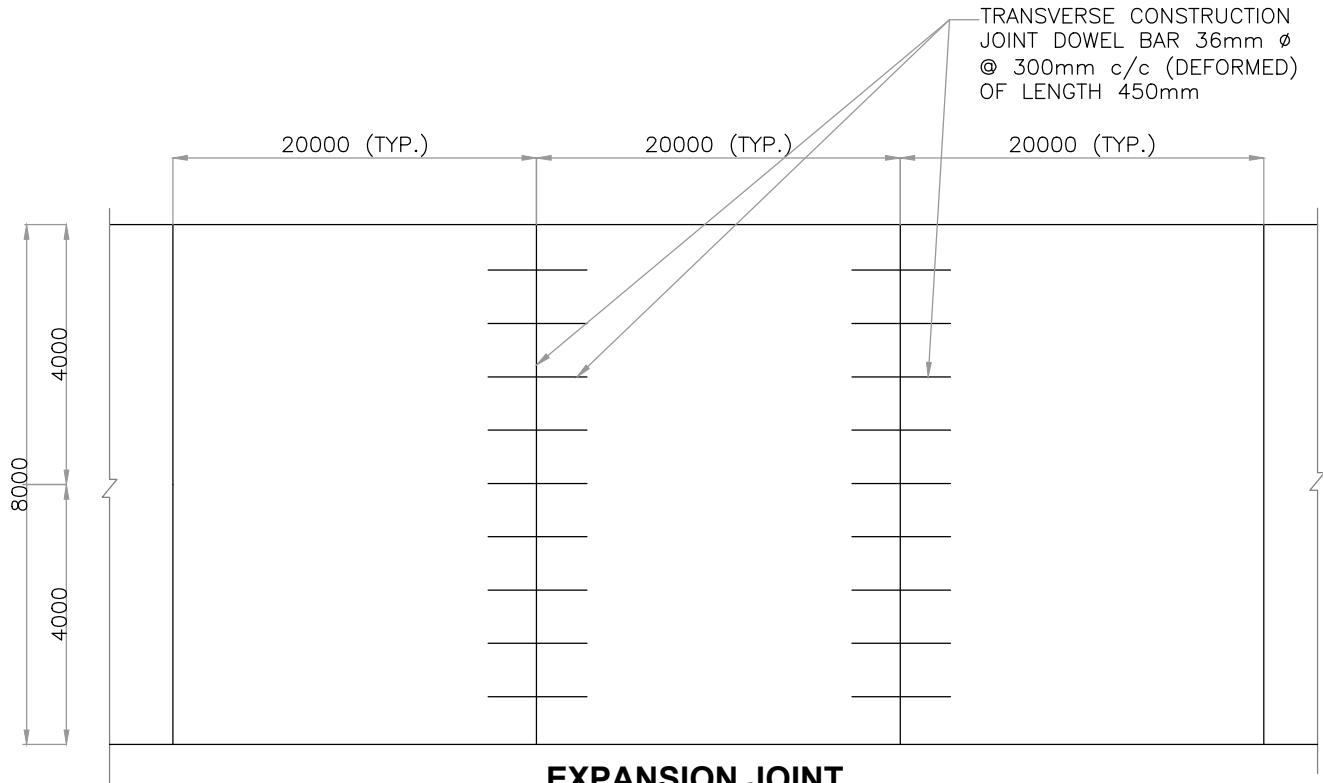
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Size A3	Scale	Drw. No	Rev: R2
	NTS	Transys-NH37-TUNNEL-DPR-CIVIL-023	

NOTES:-

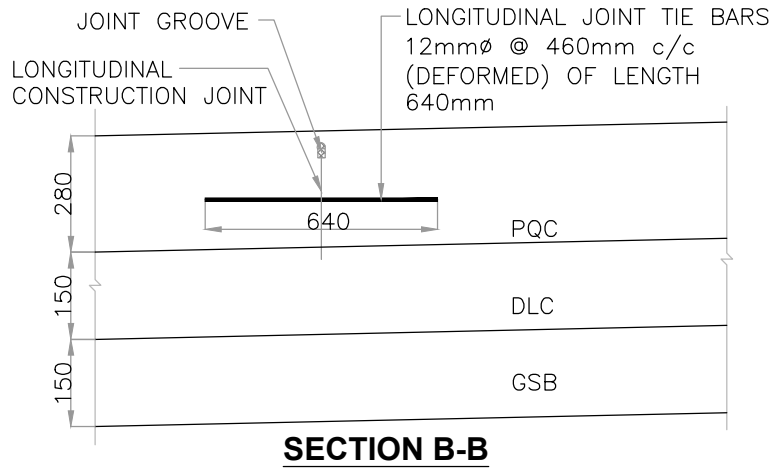
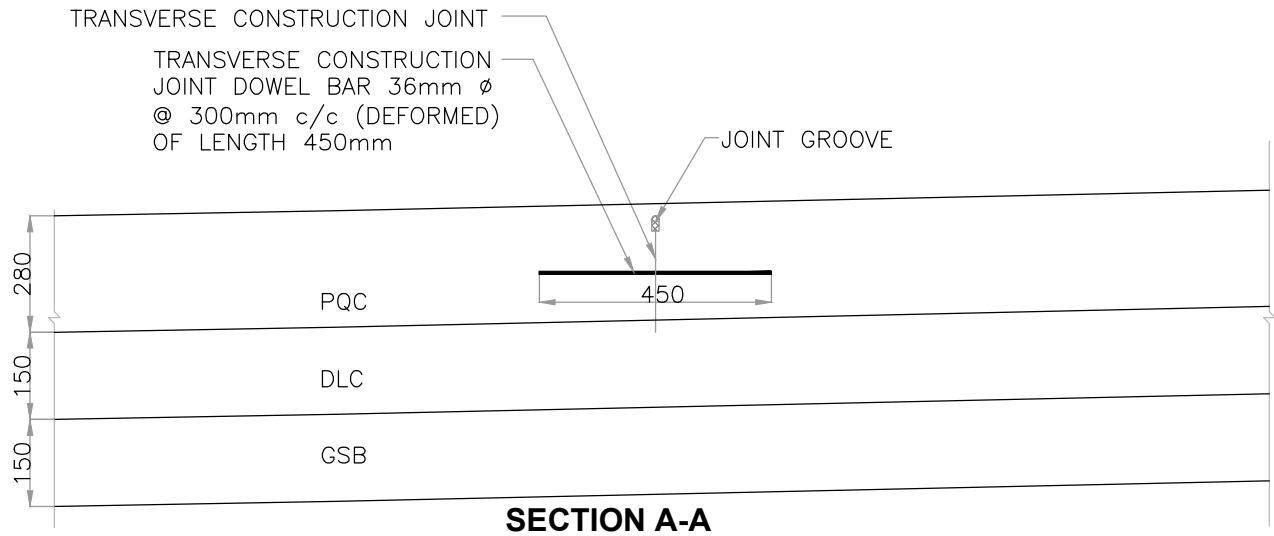
1. ALL DIMENSIONS ARE IN MILLIMETER AND ELEVATIONS IN METER, UNLESS OTHERWISE SPECIFIED.
2. 300MM CONCRETE THICKNESS SHOULD BE MAINTAINED THROUGH OUT THE TUNNEL .
3. STEEL USED IN PAVEMENT SHALL BE OF GRADE Fe-500 AS PER LATEST EDITION OF IS:1786.



CONSTRUCTION JOINT
RIGID PAVEMENT JOINT PLAN



EXPANSION JOINT
RIGID PAVEMENT JOINT PLAN



(SHEET 2 OF 2)

Rev.	Date	Description

Authority:	National Highways & Infrastructure Development Corporation Ltd. (Ministry of Road Transport & Highways)

Design Consultants:	Transsys Consulting Pvt. Ltd. 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transsys_blr@transsysconsulting.co.in

Project:	Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
	Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

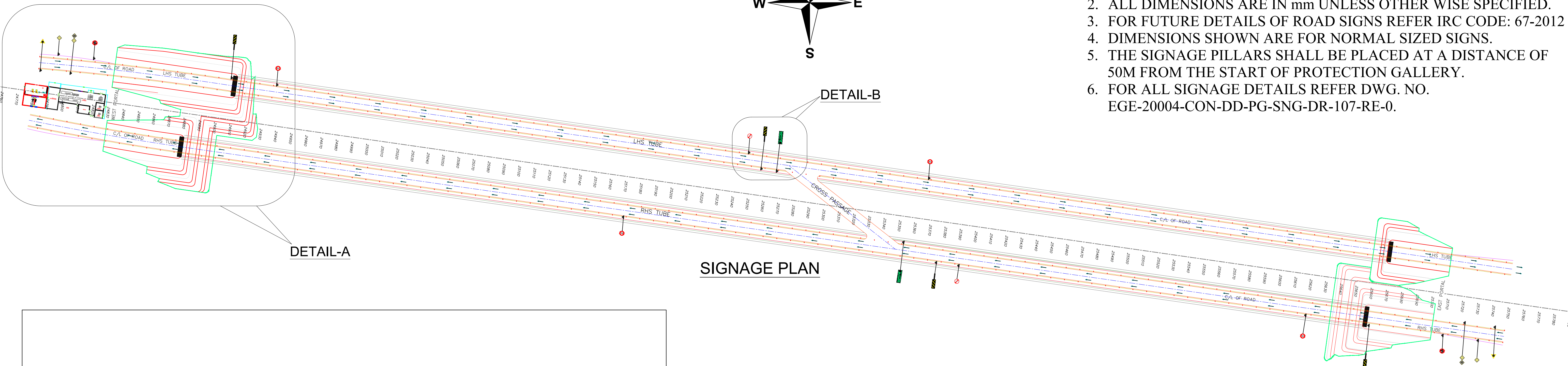
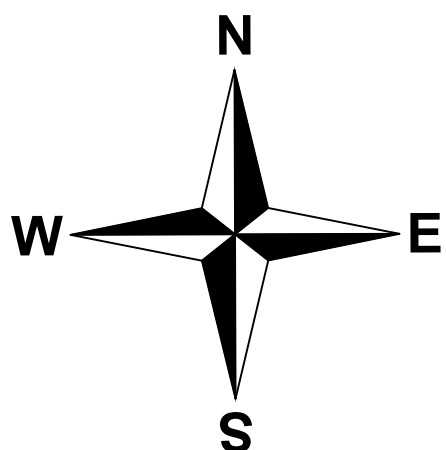
DRAWN BY	SHUDHANSHU
DESIGNED BY	HARI
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT
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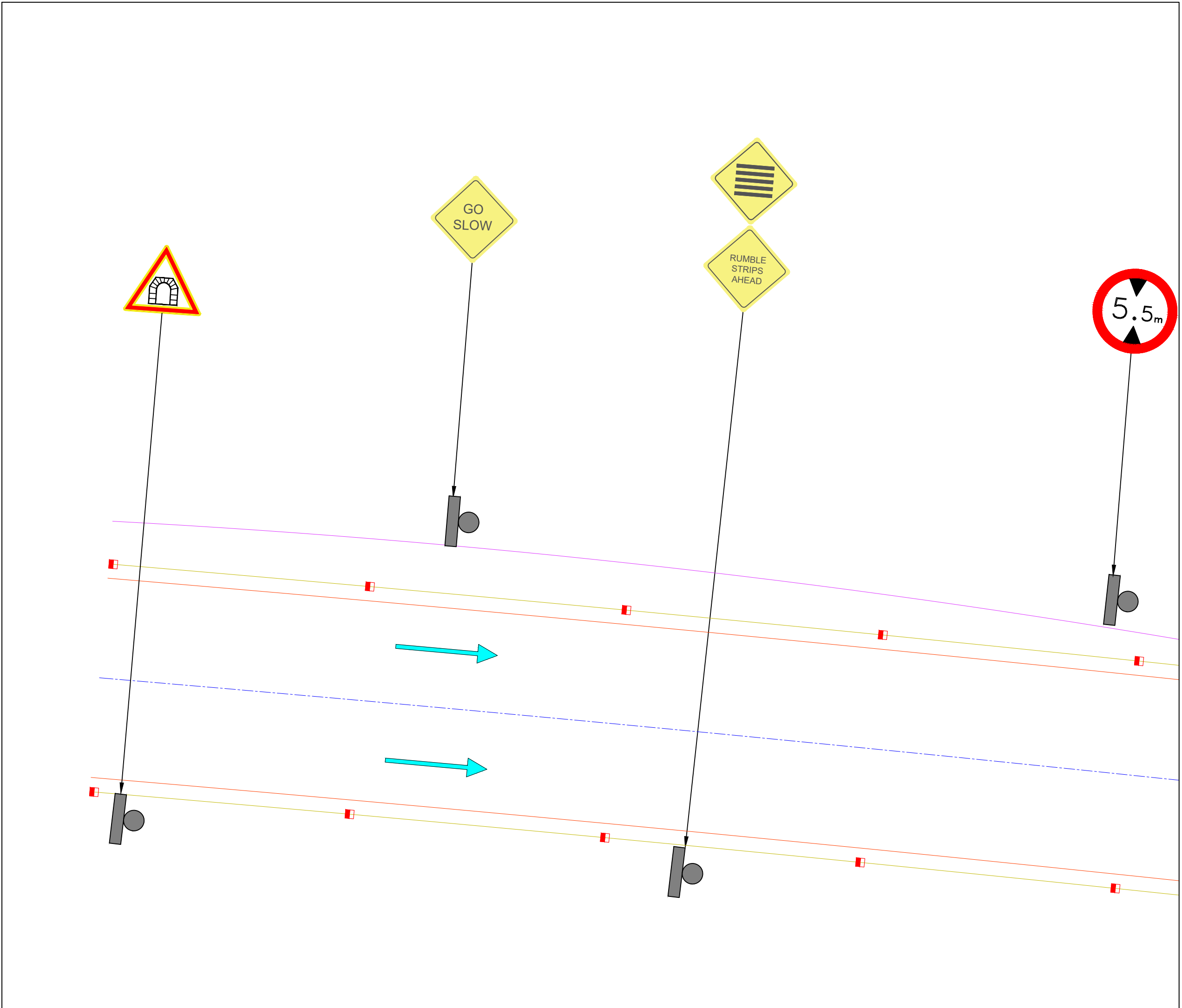
Title: TUNNEL - CONNECTION DETAILS OF PAVEMENT QUALITY CONCRETE (PQC)			
Size	Scale	Dwg. No	Rev.
A3	NTS	Transsys-NH37-TUNNEL-DPR-CIVIL-023	R2

NOTES:-

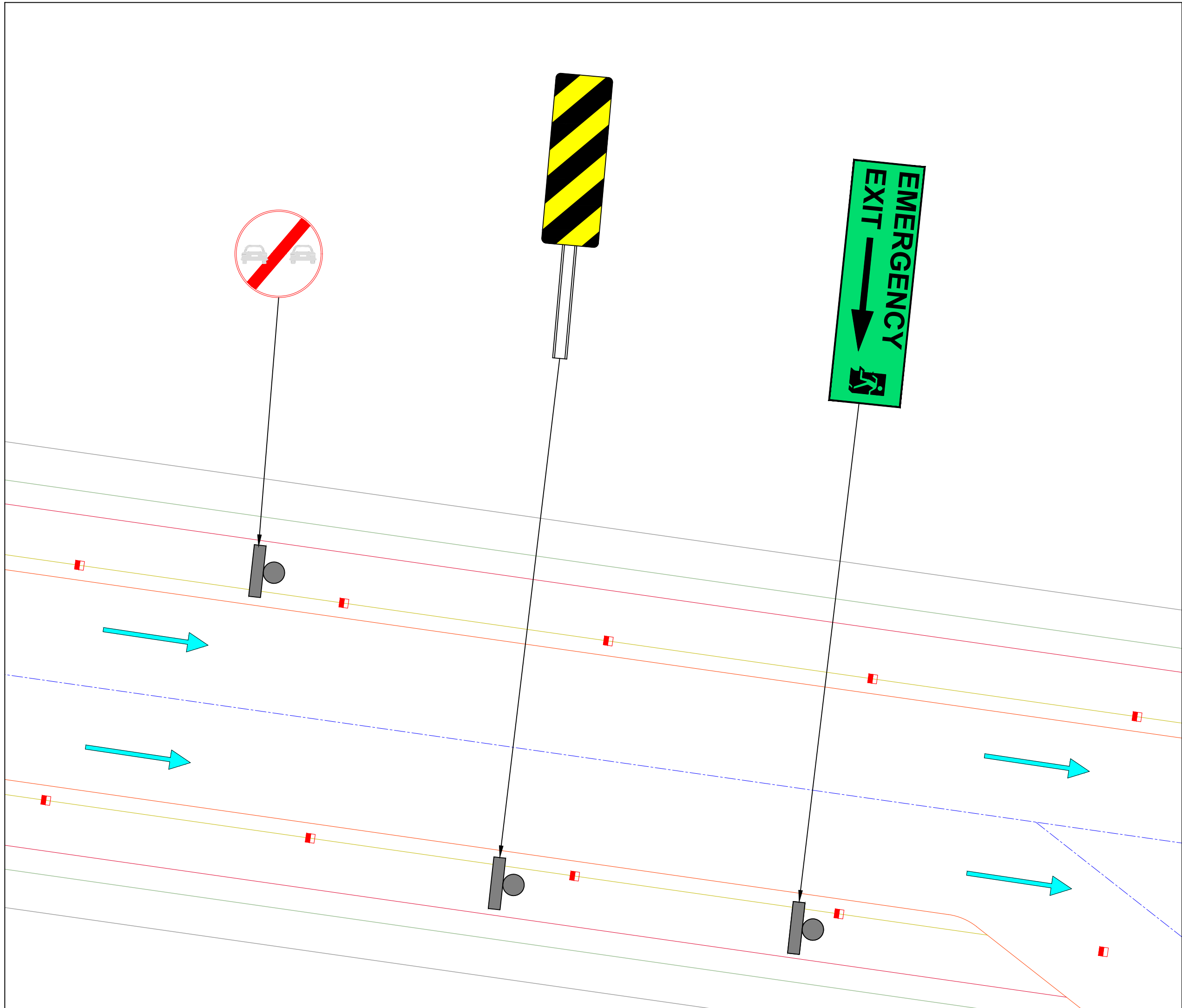
1. DRAWING IS NOT TO SCALE.
2. ALL DIMENSIONS ARE IN mm UNLESS OTHER WISE SPECIFIED.
3. FOR FUTURE DETAILS OF ROAD SIGNS REFER IRC CODE: 67-2012 .
4. DIMENSIONS SHOWN ARE FOR NORMAL SIZED SIGNS.
5. THE SIGNAGE PILLARS SHALL BE PLACED AT A DISTANCE OF 50M FROM THE START OF PROTECTION GALLERY.
6. FOR ALL SIGNAGE DETAILS REFER DWG. NO. EGE-20004-CON-DD-PG-SNG-DR-107-RE-0.



SIGNAGE PLAN



DETAIL-A



DETAIL-B

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transysblr@transysconsulting.co.in

Project:

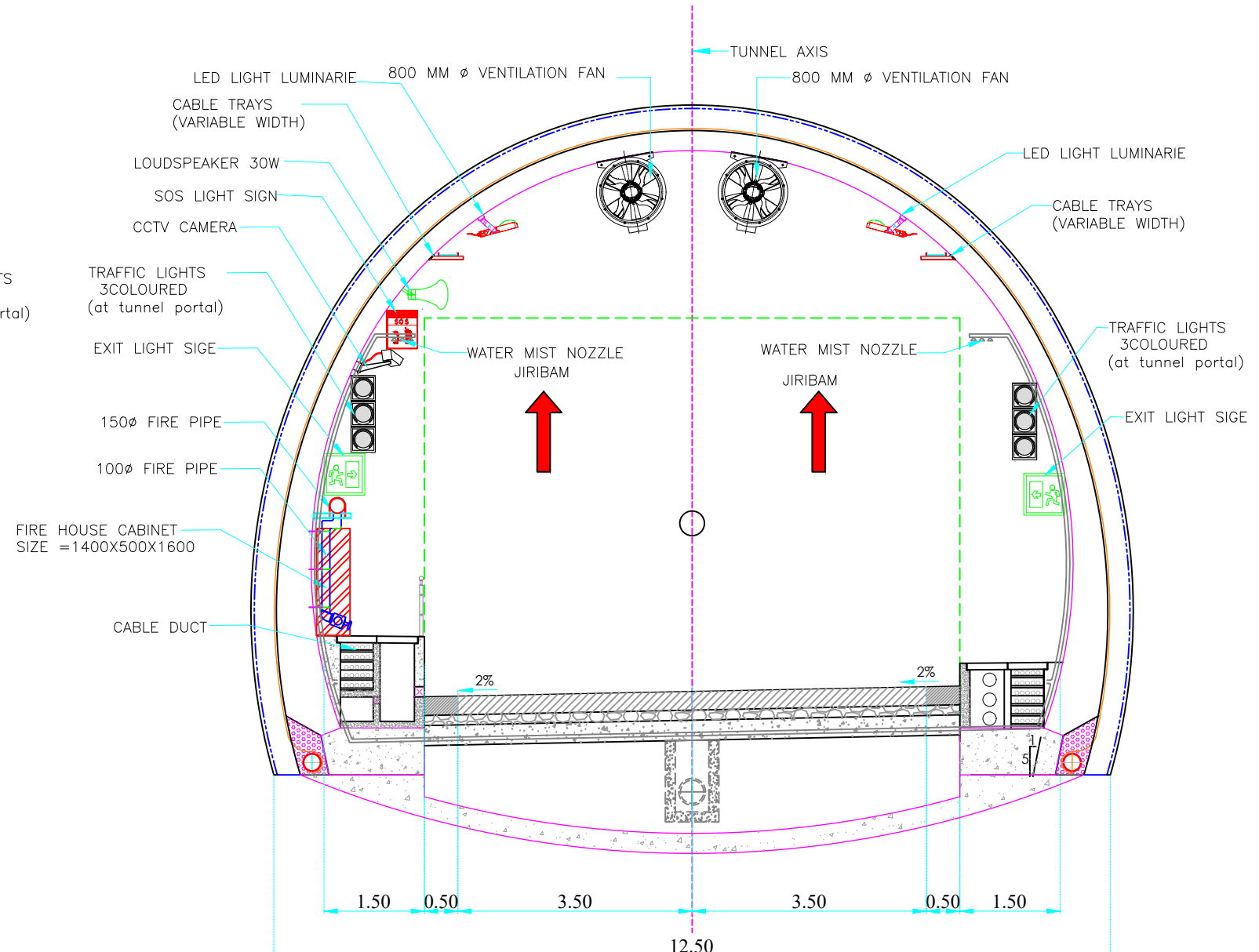
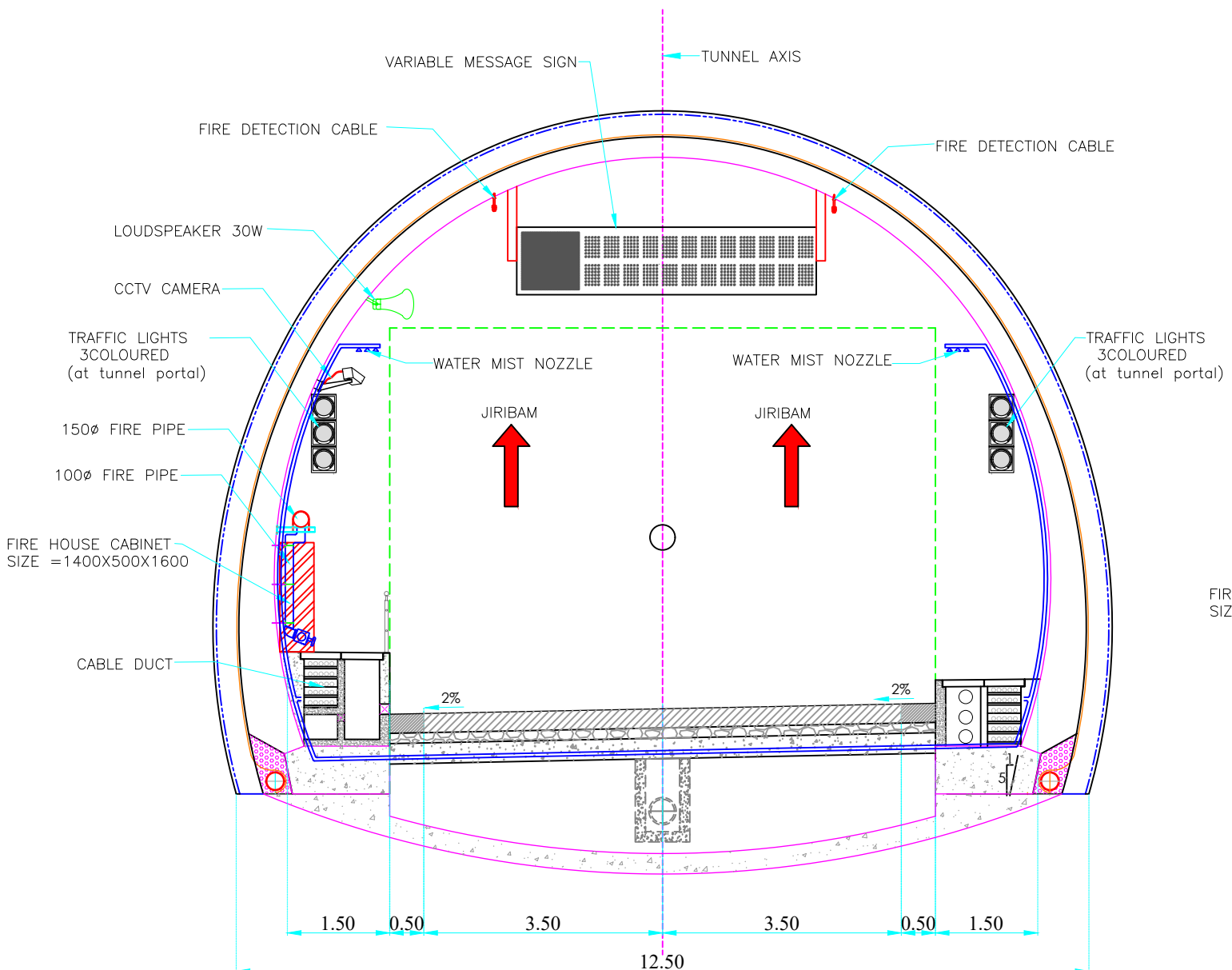
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	LOKESH
DESIGNED BY	VARUN
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: SIGNAGE PLAN OF SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drg. No	
A1	1:800	Transys-NH37-TUNNEL-DPR-CIVIL-024	
Rev:			R2

SILCHAR-JIRIBAM TUNNEL E&M DRAWING



WITH INVERT

TUNNEL GAD WITH E&M COMPONENT

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
(Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

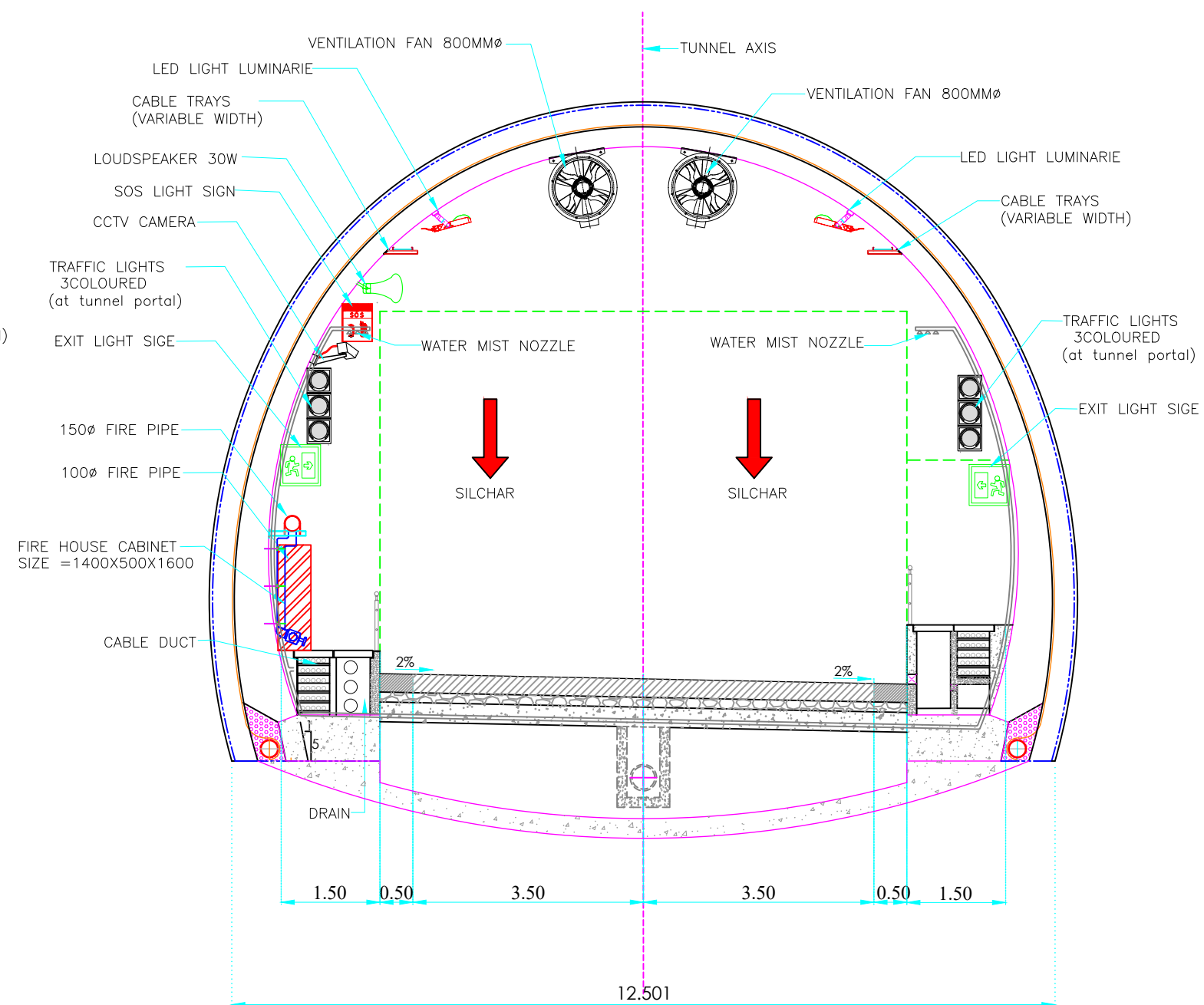
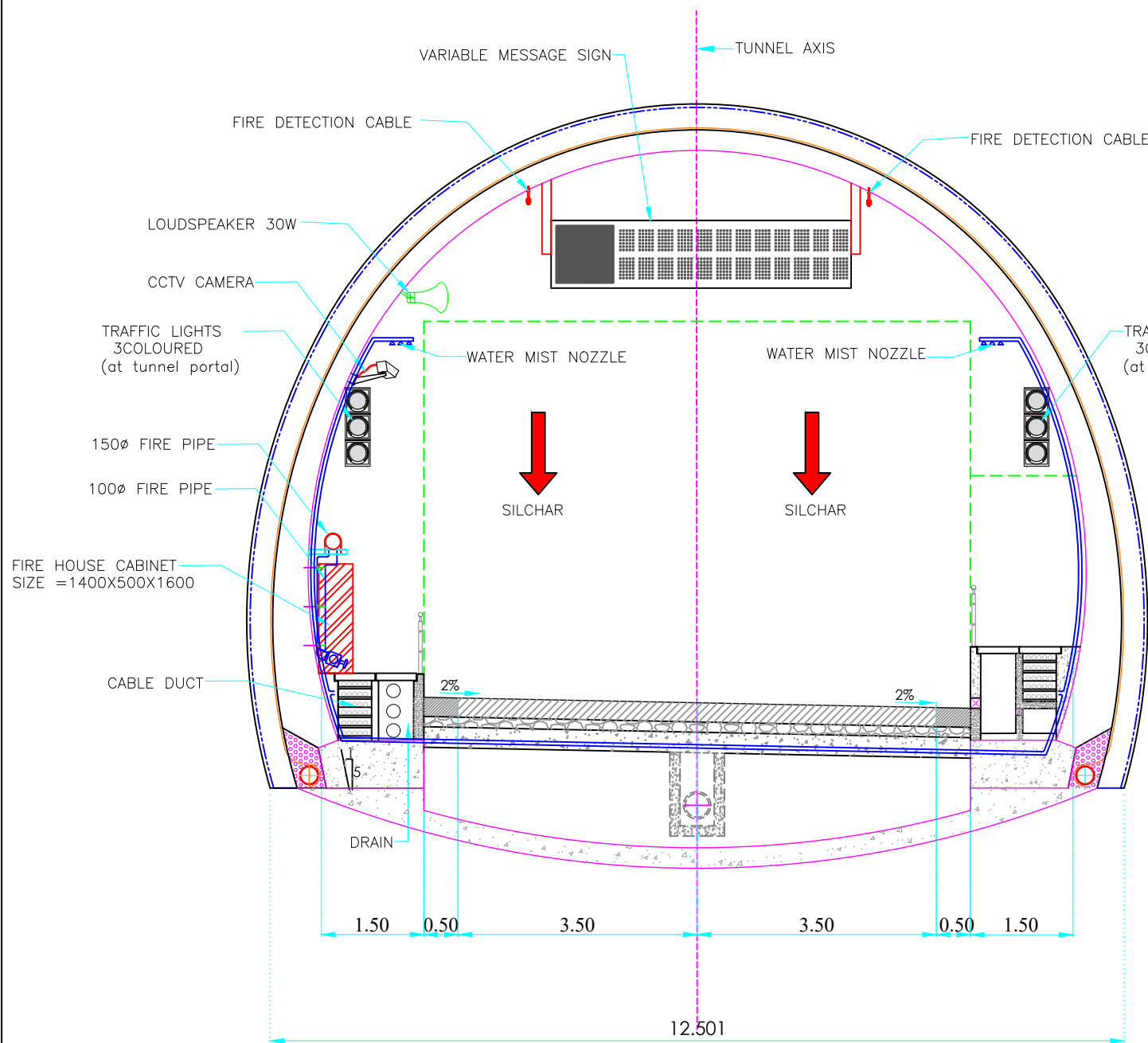
Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	PRASANG
DESIGNED BY	SUBHASH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT

Title: TUNNEL GAD WITH E&N COMPONENT		SHEET NO. (1 of 2)	
Size	Scale	Dwg. No	Rev:
A3		Transys-NH37-TUNNEL-DPR-E&M-01	R2



TUNNEL GAD WITH E&M COMPONENT

Rev.	Date	Description

Authority:

National Highways & Infrastructure Development Corporation Ltd.
 (Ministry of Road Transport & Highways)

Design Consultants:

Transys Consulting Pvt. Ltd.
 001-004, Raheja chambers, No.12, Museum Road, Bengaluru-560001; Tel: 080-41461995; email: transys_blr@transysconsulting.co.in

Project:
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP TUNNEL), D. Km 24+000 to D. Km 27+000)
 Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	PRASANG
DESIGNED BY	SUBHASH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

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DETAILED
PROJECT
REPORT**

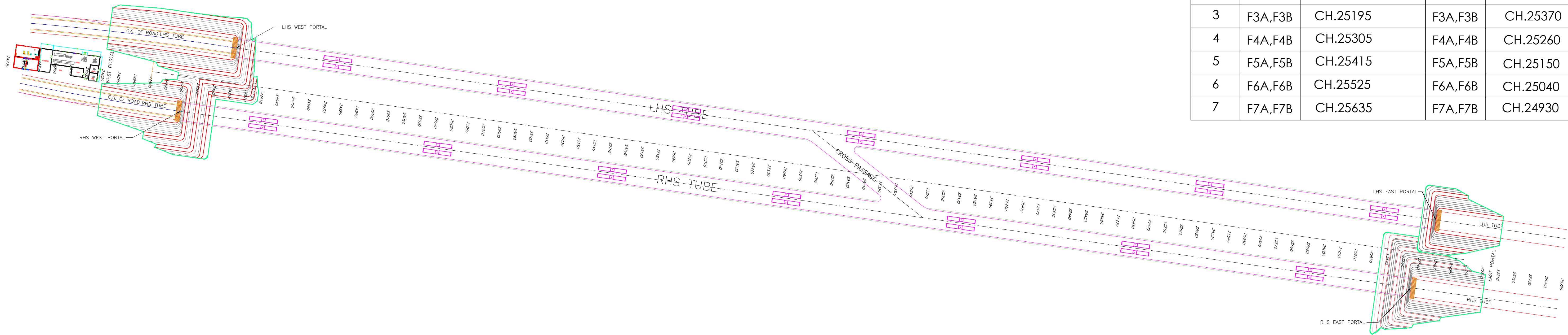
Title: TUNNEL GAD WITH E&M COMPONENT		SHEET NO. (2 of 2)	
Size	Scale	Drw. No	Rev:
A3		Transys-NH37-TUNNEL-DPR-E&M-01	R2

**SILCHAR-JIRIBAM SECTION OF NH-37 (PACKAGE: S-J-2 (PNP_TUNNEL-DPR), D. KM 24+000 TO D.
KM 27+000**

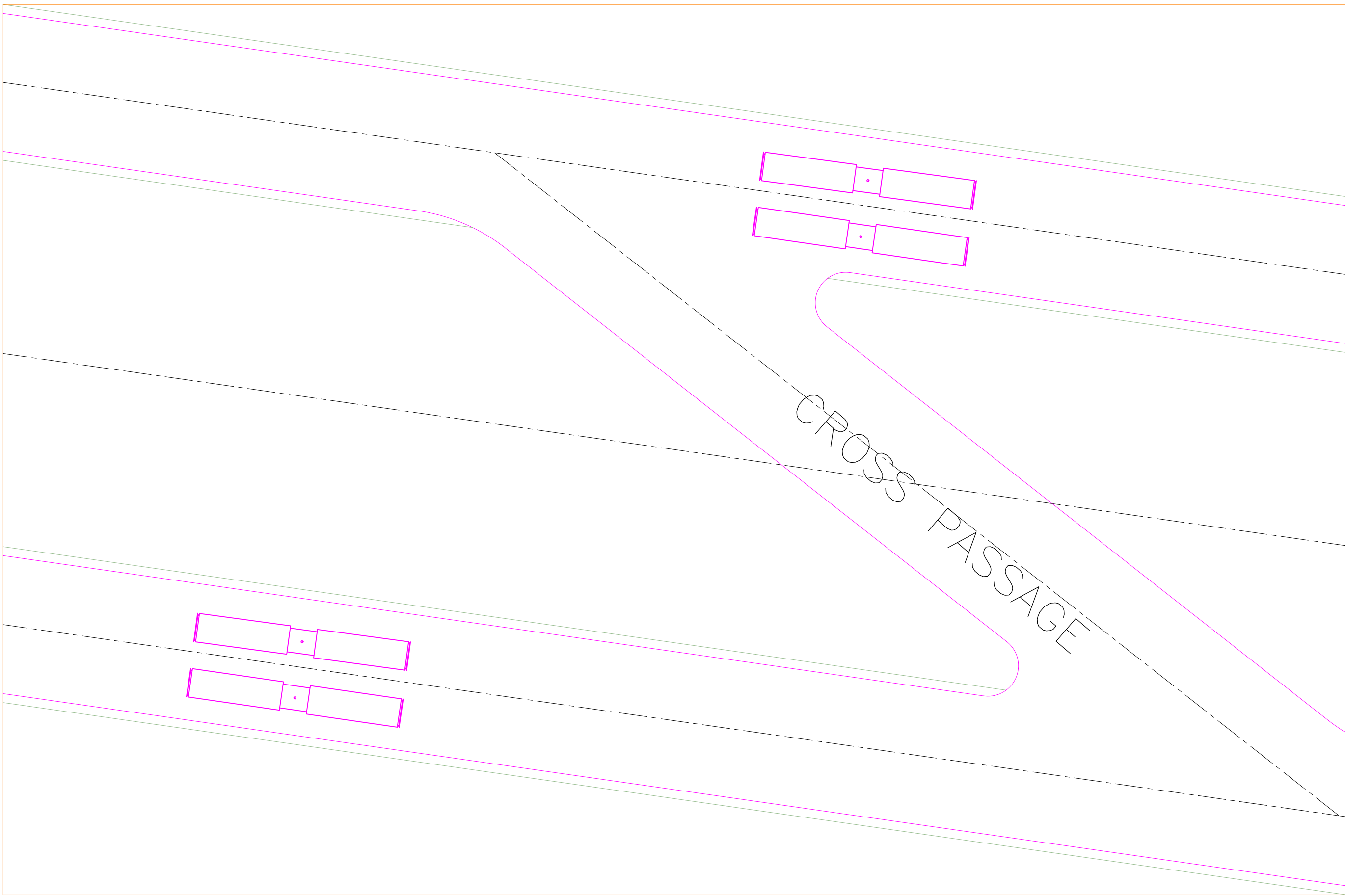
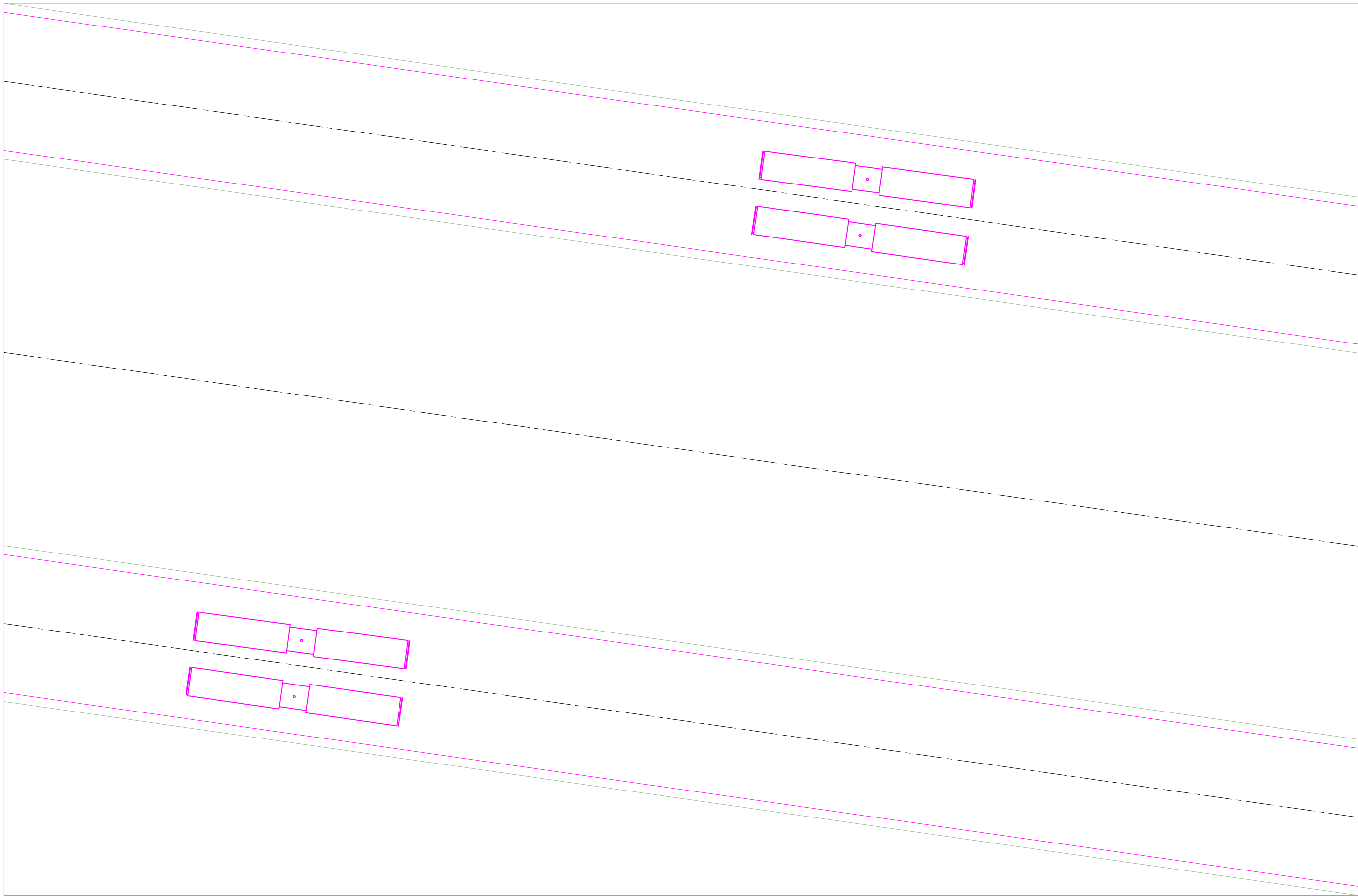
<u>S. No.</u>	<u>Name of Drawing</u>	<u>Drawing Number</u>	<u>No. OF DRAWING</u>	<u>Revision No</u>
1	TUNNEL GAD WITH E&M COPONENT	Transys-NH37-TUNNEL-DPR-E&M-01	2	R2
2	VENTILATION SYSTEM LAYOUT	Transys-NH37-TUNNEL-DPR-E&M-02	1	R2
3	Tunnel lighting layout	Transys-NH37-TUNNEL-DPR-E&M-03	1	R2
4	SINGLE LINE DRAWING	Transys-NH37-TUNNEL-DPR-E&M-04	1	R2
5	FIRE FIGHTING PUMPING HOUSE	Transys-NH37-TUNNEL-DPR-E&M-05	1	R2
6	HYDRANT SYSTEM LAYOUT	Transys-NH37-TUNNEL-DPR-E&M-06	1	R2
7	PUBLIC ADDRESSING SYSTEM	Transys-NH37-TUNNEL-DPR-E&M-07	1	R2
8	COMMUNICATION AND CONTROL NETWORK	Transys-NH37-TUNNEL-DPR-E&M-08	1	R2
9	TRAFFIC MANAGEMENT & SIGNAGE SYSTEM	Transys-NH37-TUNNEL-DPR-E&M-09	1	R2

VENTILATION FAN

NO.	NO.	TUBE-1 CHANNAGE	NO.	TUBE-2 CHANNAGE
1	F1A,F1B	CH.24975	F1A,F1B	CH.25590
2	F2A,F2B	CH.25085	F2A,F2B	CH.25480
3	F3A,F3B	CH.25195	F3A,F3B	CH.25370
4	F4A,F4B	CH.25305	F4A,F4B	CH.25260
5	F5A,F5B	CH.25415	F5A,F5B	CH.25150
6	F6A,F6B	CH.25525	F6A,F6B	CH.25040
7	F7A,F7B	CH.25635	F7A,F7B	CH.24930



LAYOUT PLAN



Rev.	Date	Description

Authority:



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(Ministry of Road Transport & Highways)

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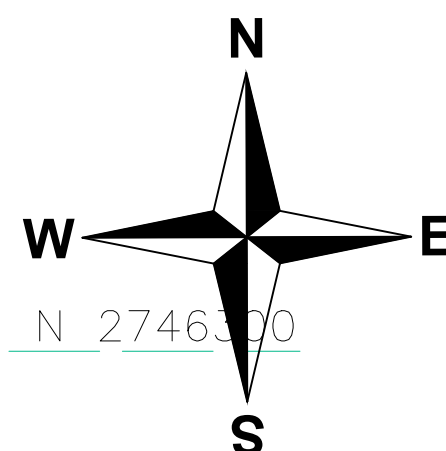
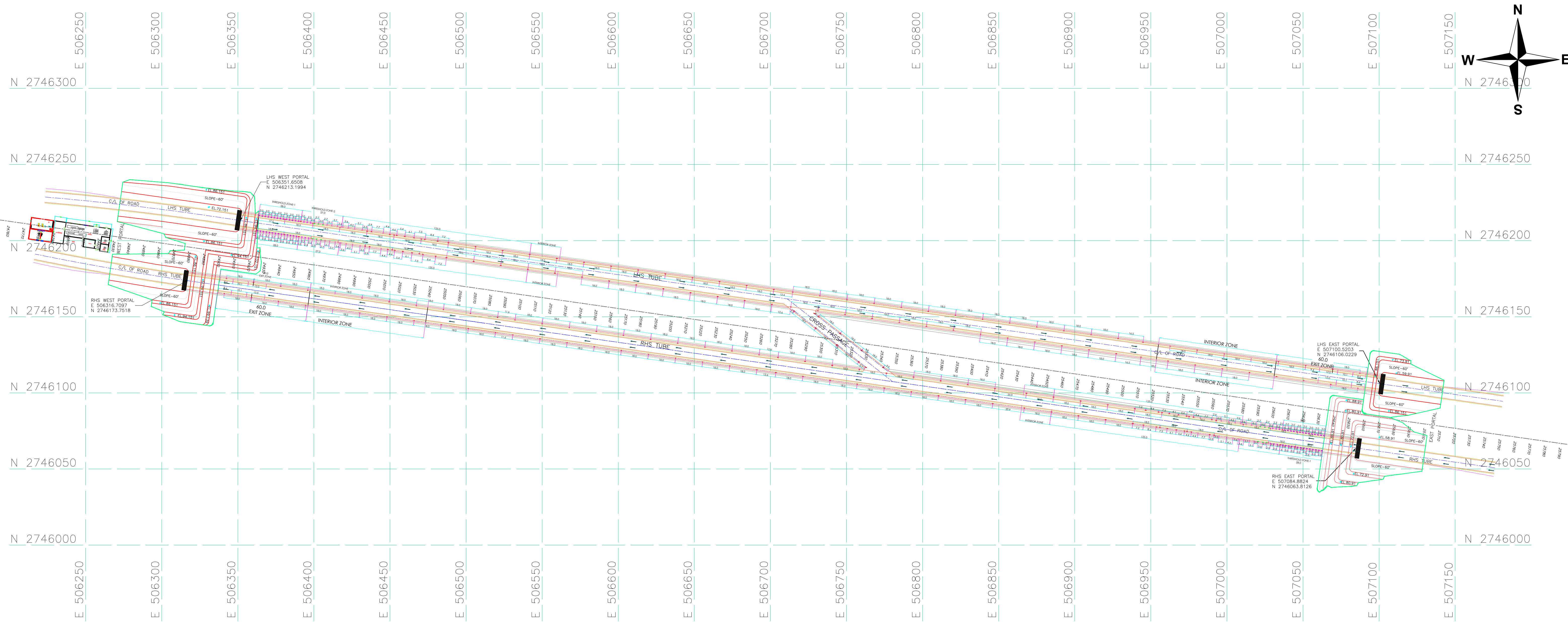
Project:

Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP_TUNNEL), D. Km 24+000 to D. Km 27+000)
Consultancy Services for preparation of DPR for development of Economic Corridors, Inter Corridors, and Feeder Routes to improve the efficiency of freight movement in India under Bharatmala Pariyojna (Lot-1) (Package-III)

DRAWN BY	SHUDHANSHU
DESIGNED BY	SUBHASH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
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Title: TUNNEL VENTILATION SYSTEM LAYOUT SILCHAR JIRIBAM TUNNEL			
Size	Scale	Dwg. No	Rev:
A1	1:3000	Transys-NH37-TUNNEL-DPR-E&M-002	R2



TUNNEL LIGHTING SYSTEMATIC (GA)

LEGEND.:-

S. No.	SYMBOL	DESCRIPTION
01		TUNNEL LIGHT 300 WATT LED
02		TUNNEL LIGHT 240 WATT LED
03		TUNNEL LIGHT 180 WATT LED
04		TUNNEL LIGHT 80 WATT LED (ENTRANCE)
05		TUNNEL LIGHT 80 WATT LED (INTERIOR)
06		ROAD CENTERLINE
07		TUNNELS CENTERLINE
08		ROAD
09		EDGE STRIP
10		UTILITY BUILDING
11		TUNNEL PORTAL

INTERLOCKING SCHEME

DESCRIPTION	BREAKER	Breaker-1 (DG-1)	Breaker-2 (T/F)	Breaker-3 (DG-2)	BUS COUPLER
When Main supply is from Transformer		OFF	ON	OFF	ON
When main supply is off , then DG-1 & DG-2 will be ON.		ON	OFF	ON	OFF

LEGENDS	
SYMBOLS	DESCRIPTION
	DG SET
	11 KV VCB (VACCUM CIRCUIT BREAKER)
	ACB (AIR CIRCUIT BREAKER)
	HRC FUSES
	MOULDED CASE CIRCUIT BREAKER (M.C.C.B.)
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	AMMETER
	VOLTMETER
	AMMETER SELECTOR SWITCH
	VOLTMETER SELECTOR SWITCH
	INDICATING LAMP
	ENERGY ANALYSER WITH MDI
	POWER FACTOR METER
	FREQUENCY METER
	ELECTRICAL / MECHANICAL INTERLOCK
	ANTI PUMPING RELAY
	CAPACITOR
	M.C.B. (MINIATURE CIRCUIT BREAKER)
	ISOLATOR
	PUSH BUTTON
	SELECTOR SWITCH
	TRIP / NORMAL / CLOSE SWITCH WITH LOST MOTION DEVICE
	ANUNCIATION WINDOW WITH
	ELECTRICAL INTERLOCK
	BATTERY CHARGER
	TEMPERATURE SCANNER
	IDMT EARTH FAULT RELAY
	VOLTAGE RESTRAINED OVER CURRENT RELAY
	MASTER TRIP RELAY
	OVER VOLTAGE RELAY
	TRIP CIRCUIT SUPERVISION RELAY
	RESTRICTRD EARTH FAULT RELAY
	INST. O/C RELAY
	IDMT RELAY
	IDMT & INSTANTANEOUS RELAY
	UNDER VOLTAGE RELAY WITH TIMER
	TIMER
	REVERSE POWER RELAY
	POWER CONTACTOR
	SURGE PROTECTION DEVICE (SPD)

ELECTRICAL CONTROL PANEL - IN SCOPE OF DG VENDOR

ELECTRICAL CONTROL FOR INTERLOCKING & AUTO LOAD MANAGEMENT SHALL BE AUTO LOAD SHARING IN COORDINATION WITH DG CONTROLLER FOR SYNCHRONIZATION, SELECTION OF MASTER D.G. SET.

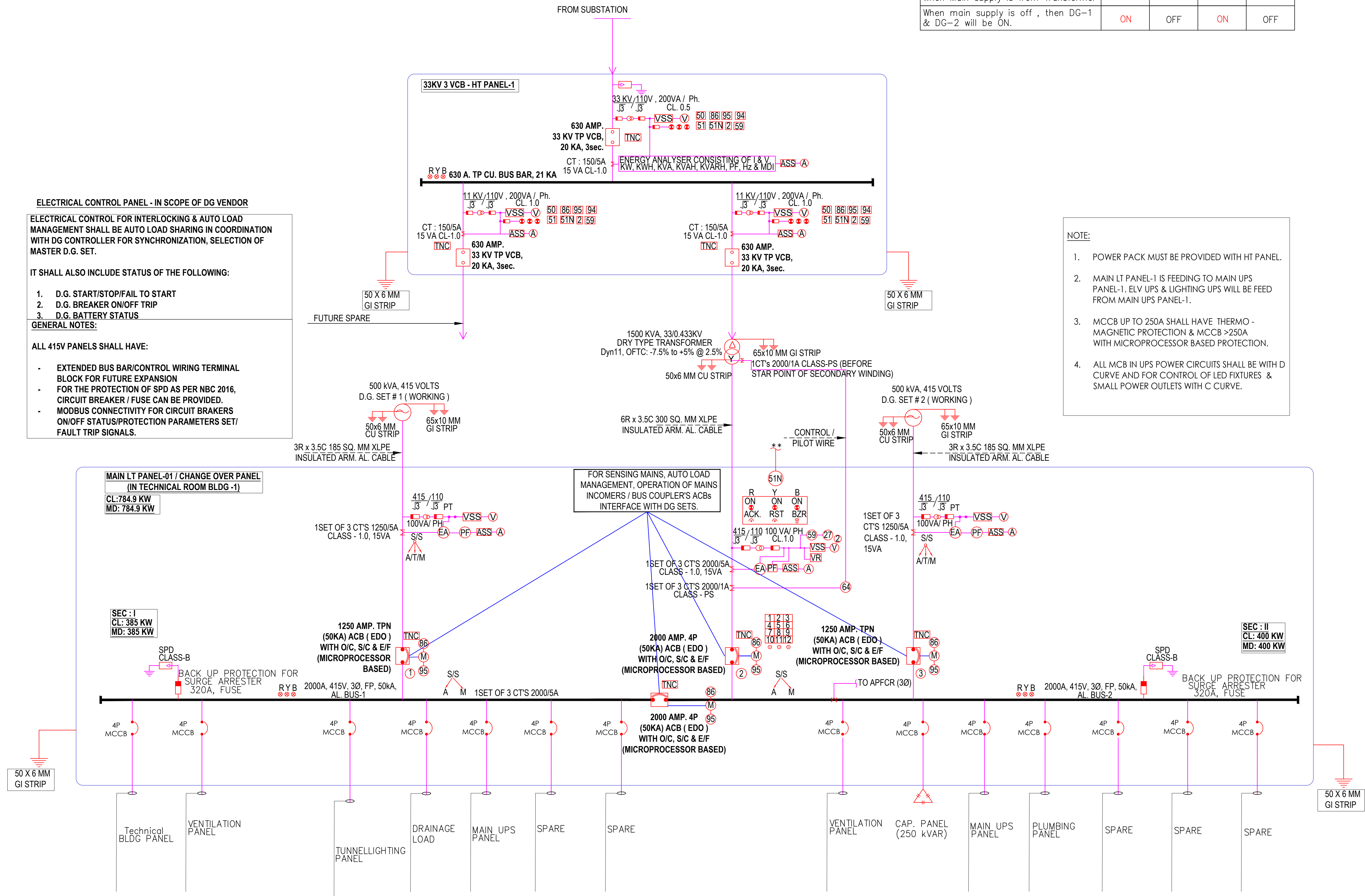
IT SHALL ALSO INCLUDE STATUS OF THE FOLLOWING:

- D.G. START/STOP/FAIL TO START
- D.G. BREAKER ON/OFF TRIP
- D.G. BATTERY STATUS

GENERAL NOTES:

ALL 415V PANELS SHALL HAVE:

- EXTENDED BUS BAR/CONTROL WIRING TERMINAL BLOCK FOR FUTURE EXPANSION
- FOR THE PROTECTION OF SPD AS PER NBC 2016, CIRCUIT BREAKER / FUSE CAN BE PROVIDED.
- MODBUS CONNECTIVITY FOR CIRCUIT BRAKERS ON/OFF STATUS/PROTECTION PARAMETERS SET/ FAULT TRIP SIGNALS.



NOTE:

- POWER PACK MUST BE PROVIDED WITH HT PANEL.
- MAIN LT PANEL-1 IS FEEDING TO MAIN UPS PANEL-1. ELV UPS & LIGHTING UPS WILL BE FEED FROM MAIN UPS PANEL-1.
- MCCB UP TO 250A SHALL HAVE THERMO - MAGNETIC PROTECTION & MCCB >250A WITH MICROPROCESSOR BASED PROTECTION.
- ALL MCB IN UPS POWER CIRCUITS SHALL BE WITH D CURVE AND FOR CONTROL OF LED FIXTURES & SMALL POWER OUTLETS WITH C CURVE.

Rev.	Date	Description

Authority:

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Design Consultants:

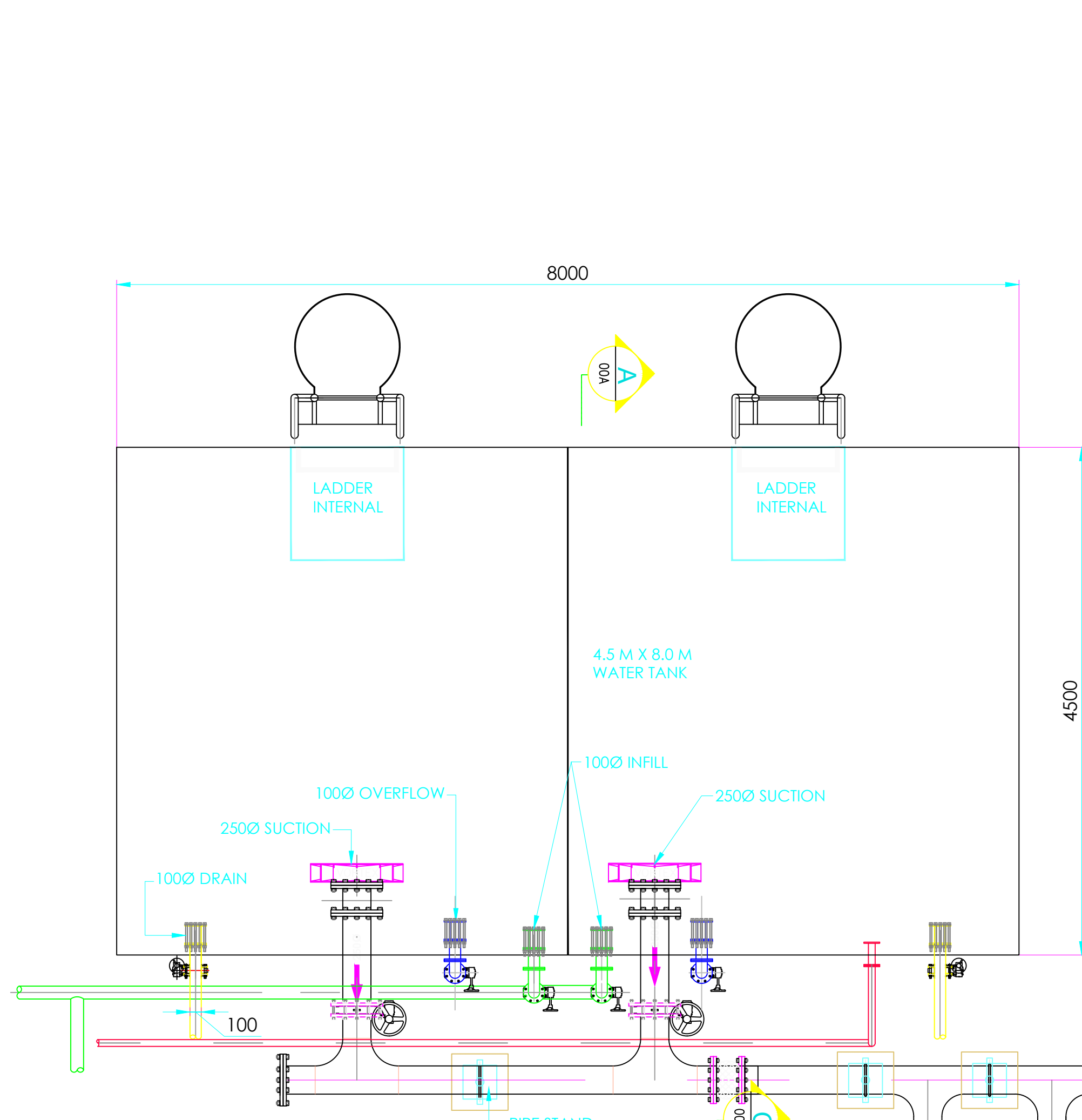
Transys Consulting Pvt. Ltd.
001-004, Raheja chambers, No.12, Museum Road,
Bengaluru-560001; Tel: 080-41461995;
email: transys_dir@transysconsulting.co.in

Project:
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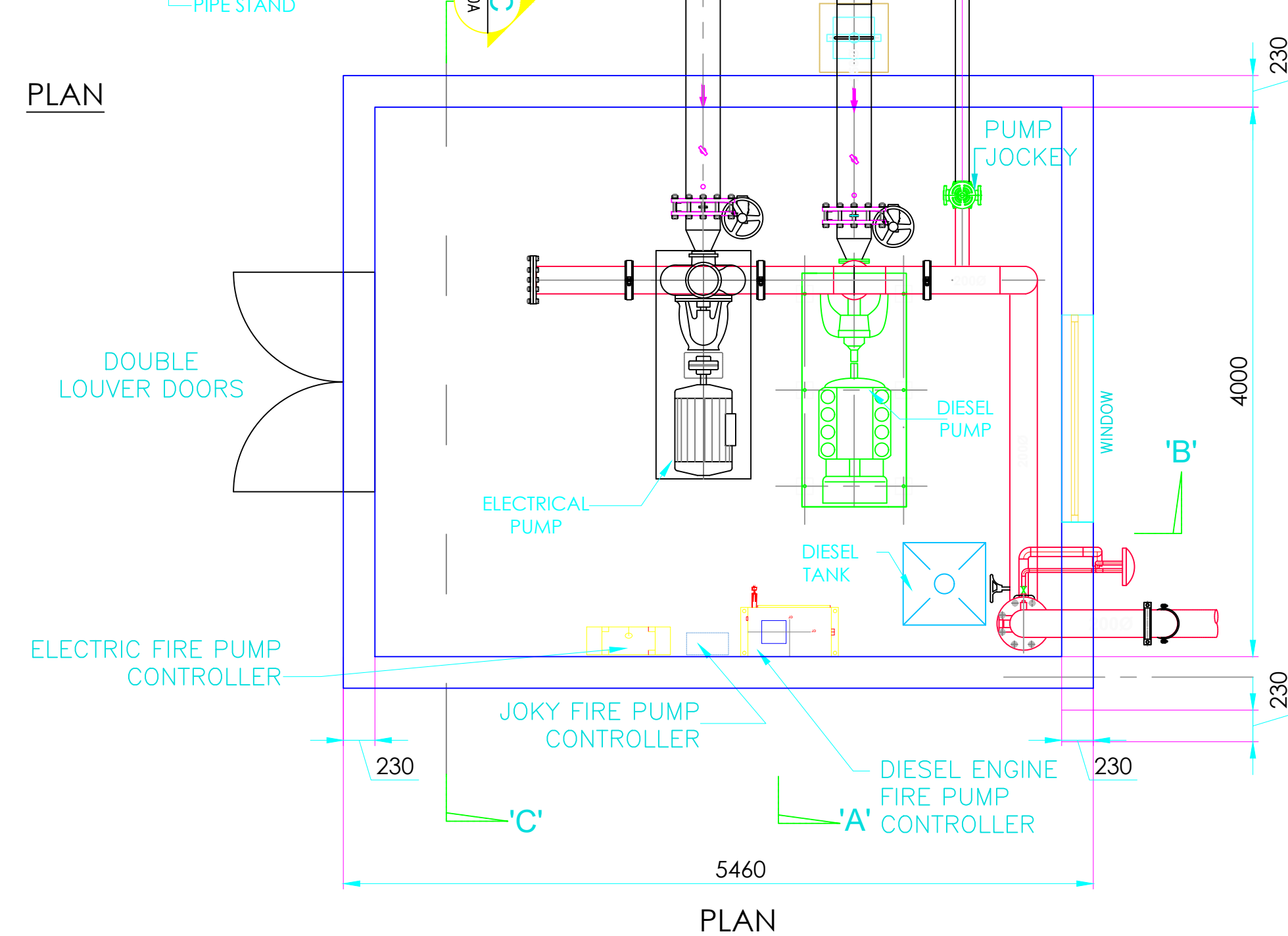
DRAWN BY	SHUDHANSHU
DESIGNED BY	SUBHASH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
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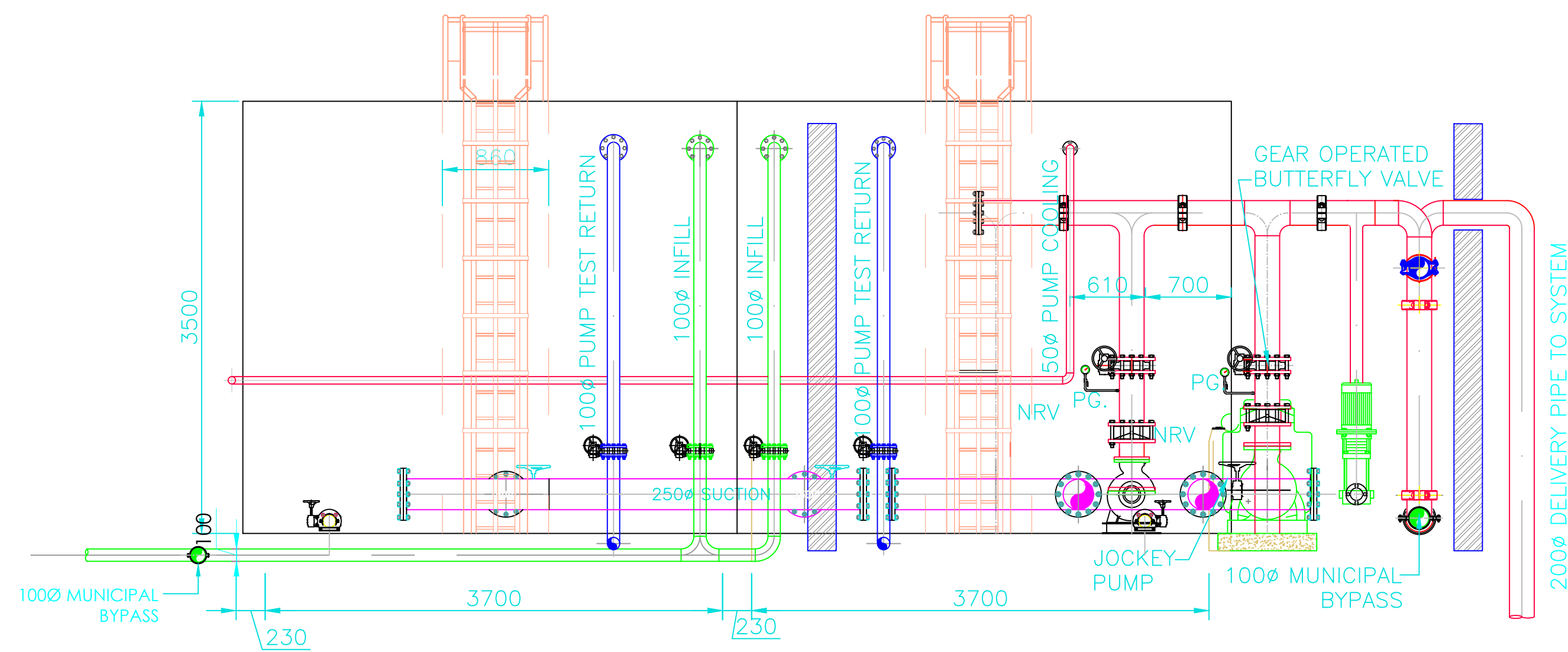
Title: SINGLE LINE DRAWING SILCHAR JIRIBAM TUNNEL		Rev: R2
Size: A1	Scale: 1:2500	
Drg. No: Transys-NH37-TUNNEL-DPR-E&M-004		



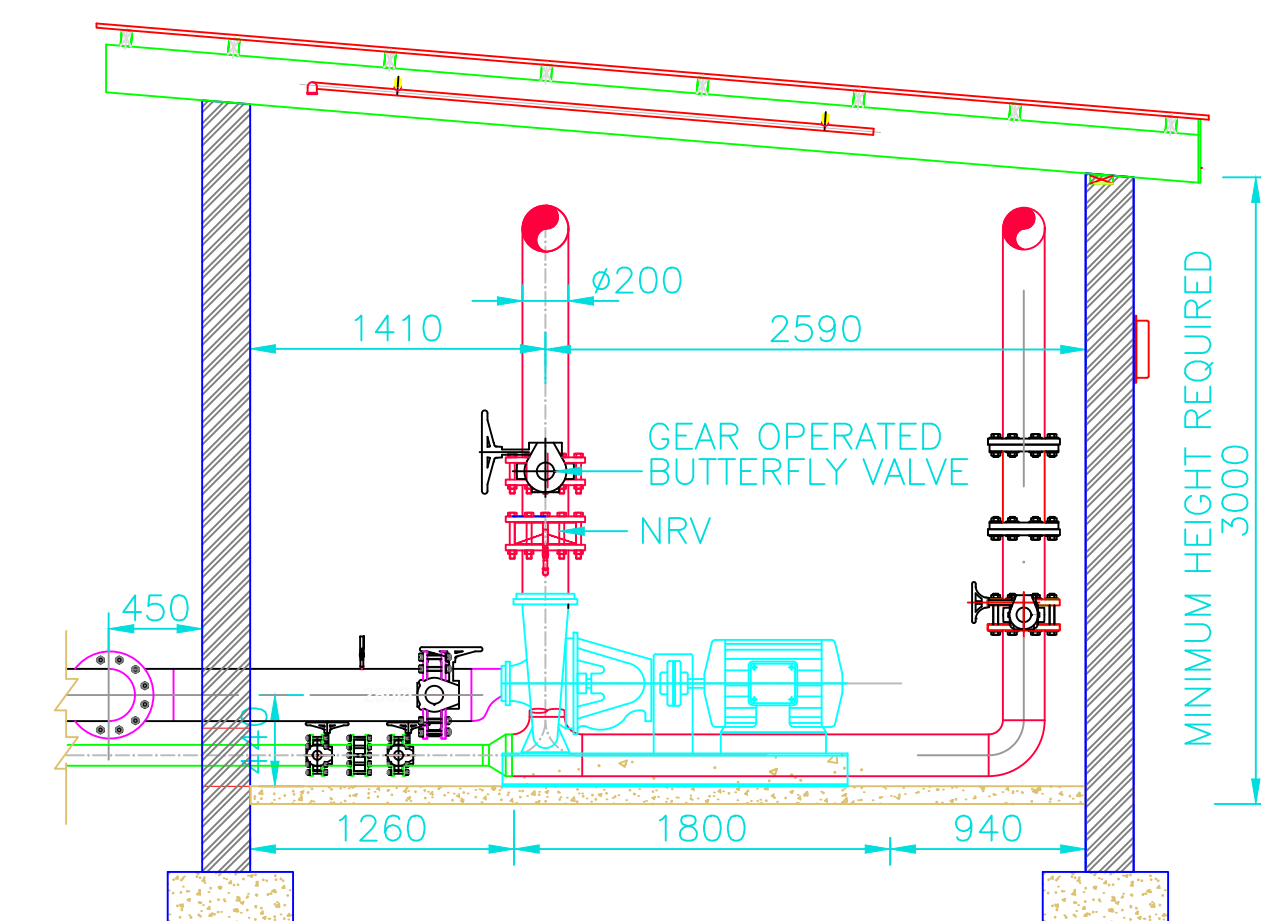
PLAN



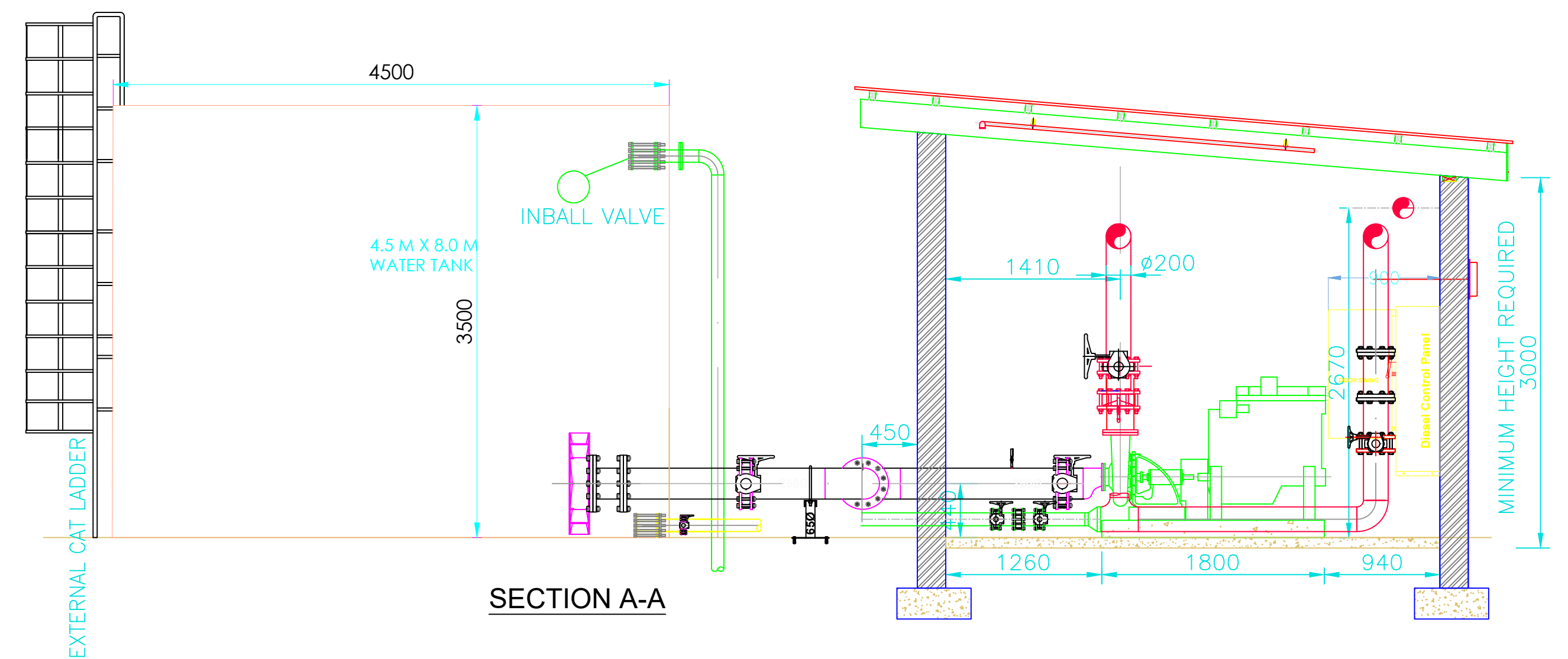
PLAN



SECTION B-B



SECTION C-C



SECTION A-A

Rev.	Date	Description

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Project:

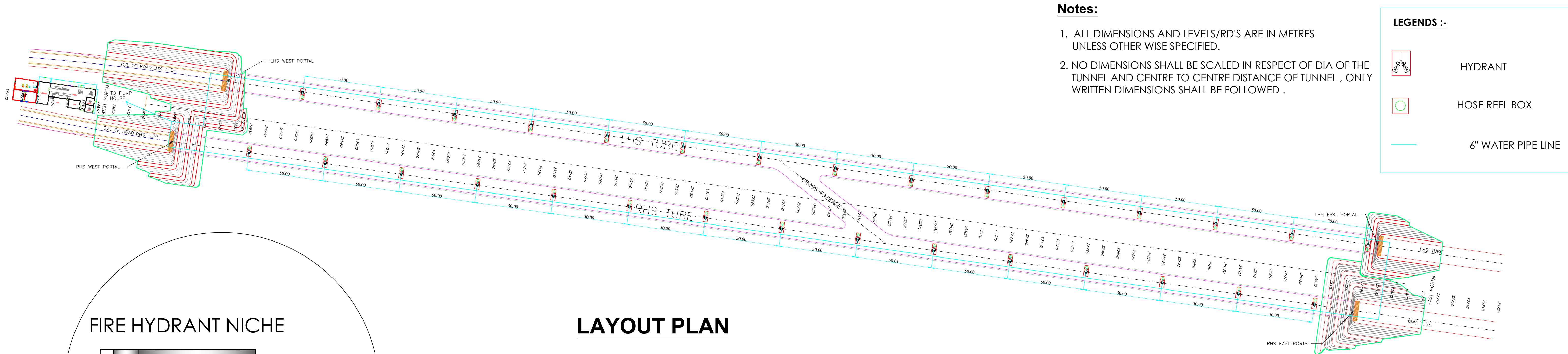
Silchar-Jiribam Section of NH-37 (Package: SJ-2 (PNP_TUNNEL), D. Km 24+000 to D. Km 27+000)

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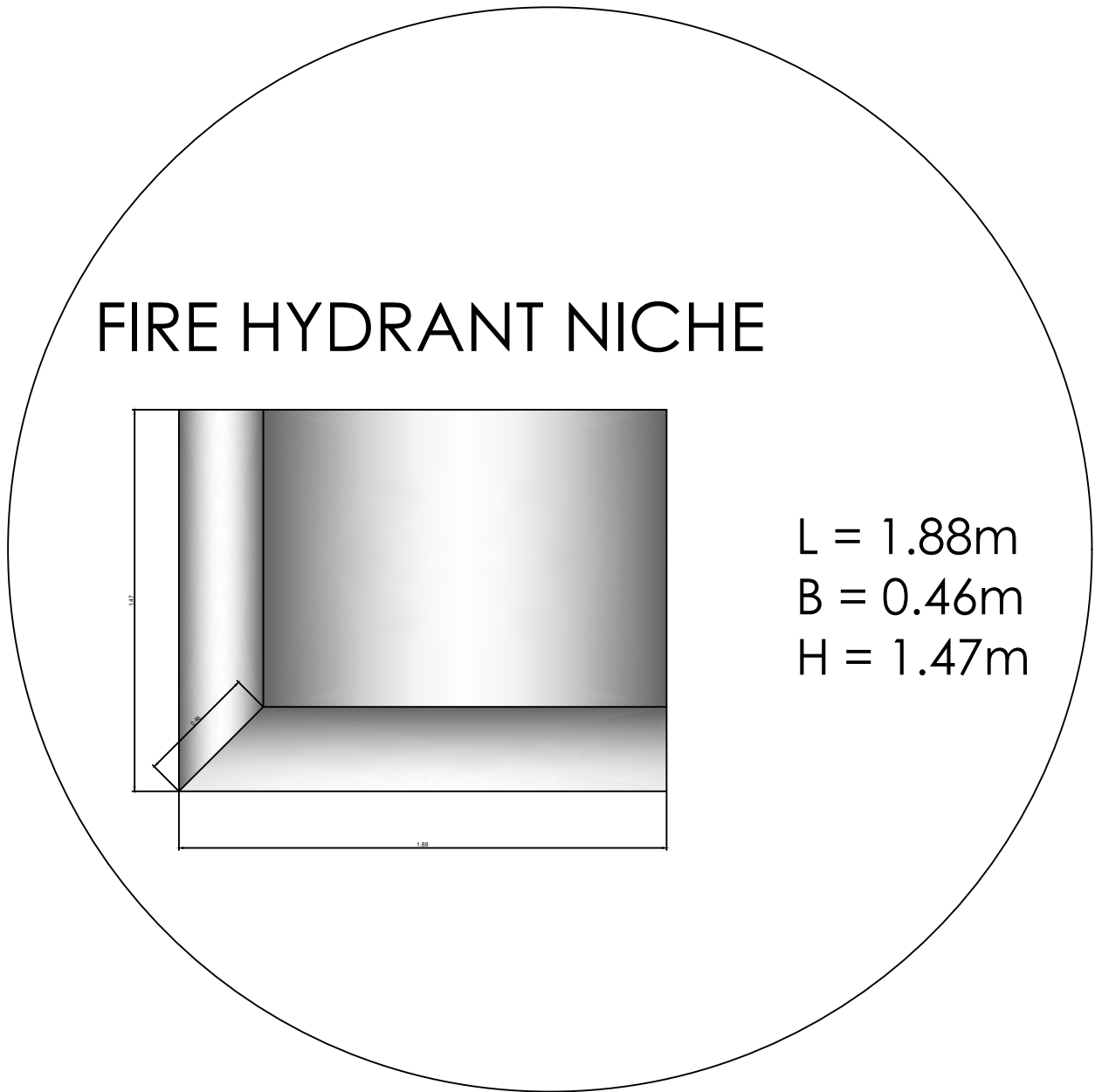
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FINAL DETAILED PROJECT REPORT

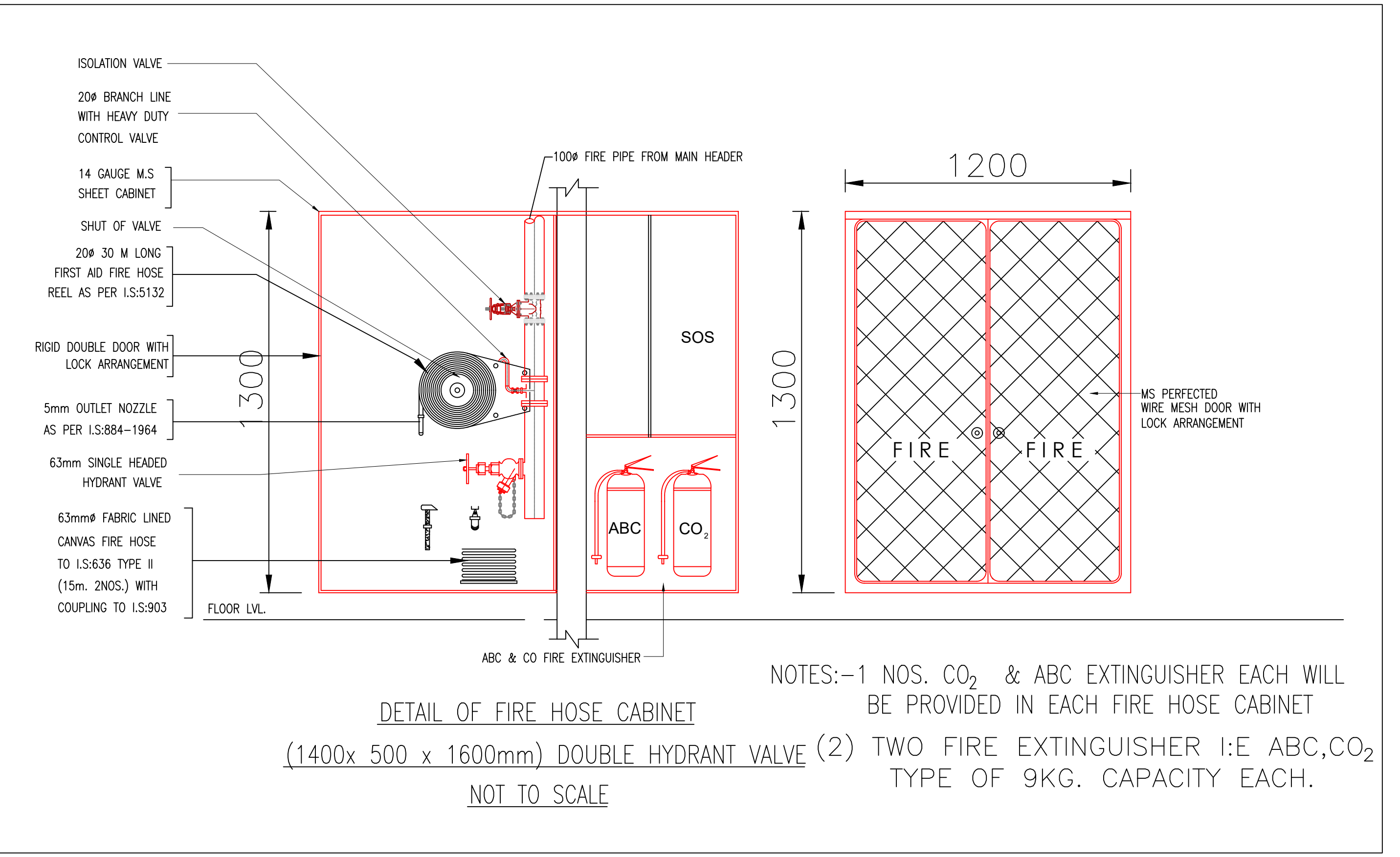
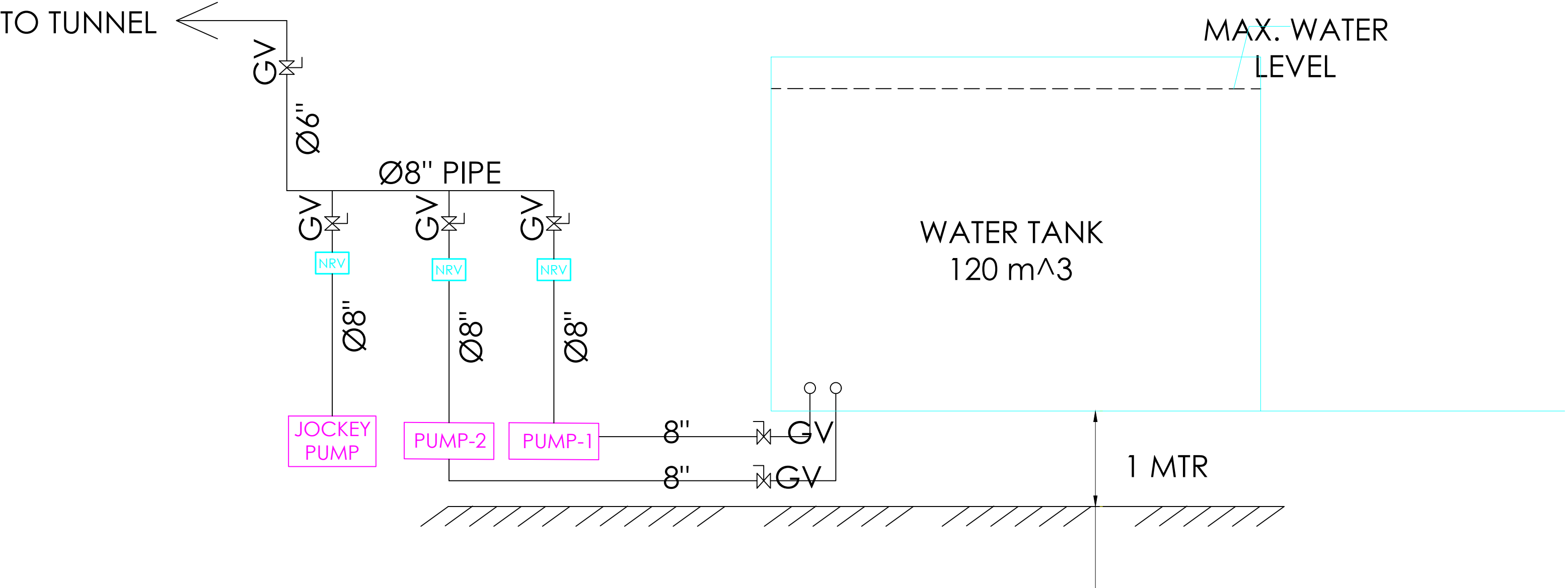
Title: FIRE FIGHTING PUMPING HOUSE GAD SILCHAR JIRIBAM TUNNEL			
Size	Scale	Dwg. No	Rev.
A1	1:3000	Transys-NH37-TUNNEL-DPR-E&M-005	R2



- Notes:**
- 1. ALL DIMENSIONS AND LEVELS/RD'S ARE IN METRES UNLESS OTHER WISE SPECIFIED.
 - 2. NO DIMENSIONS SHALL BE SCALED IN RESPECT OF DIA OF THE TUNNEL AND CENTRE TO CENTRE DISTANCE OF TUNNEL , ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED .
- LEGENDS :-**
- HYDRANT
 - HOSE REEL BOX
 - 6" WATER PIPE LINE



LAYOUT PLAN



FHS CABINET DETAIL

Rev.	Date	Description

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Project:

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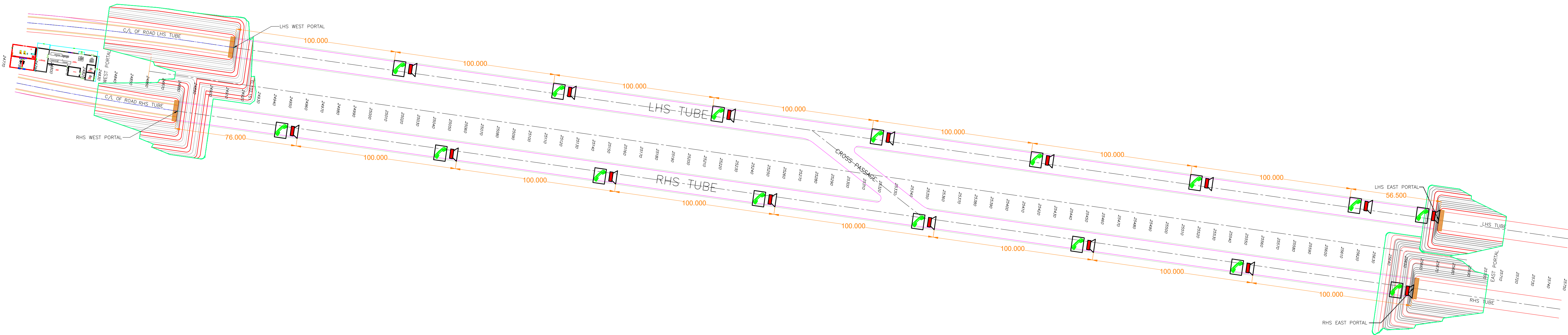
DRAWN BY	SHUDHANSHU
DESIGNED BY	SUBHASH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

FINAL DETAILED PROJECT REPORT

Title: TUNNEL HYDRANT SYSTEM LAYOUT SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drw. No	Rev:
A1	1:3000	Transys-NH37-TUNNEL-DPR-E&M-006	R2

LEGEND

SI.NO.	CONTENT	QUANTITY
1.	 SOS	16
2.	 SPEAKER	16



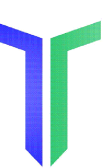
LAYOUT PLAN

Rev.	Date	Description

Authority:

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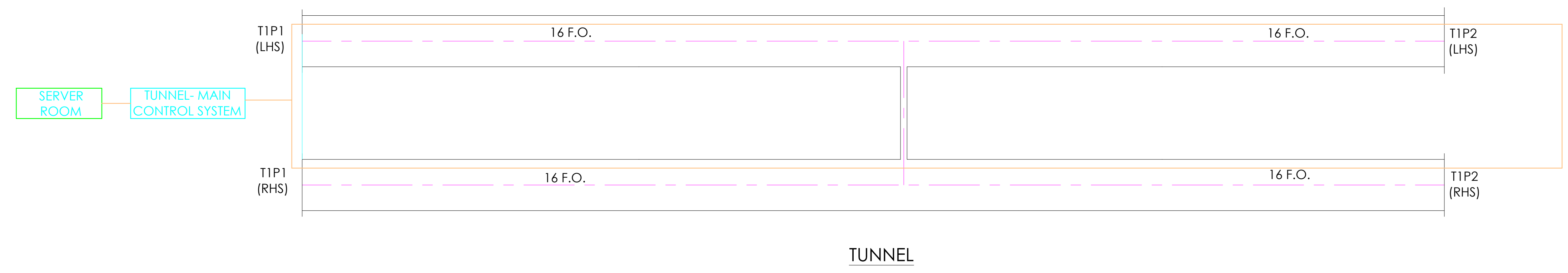
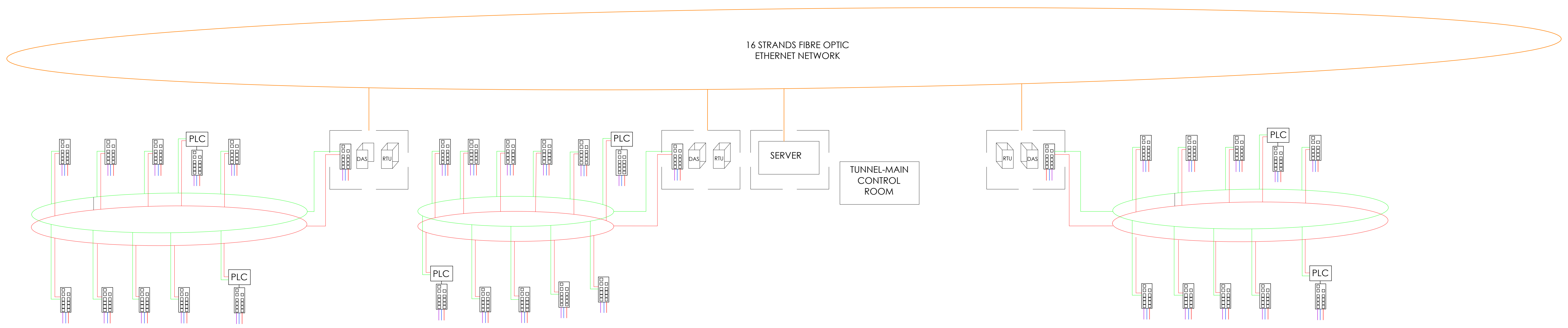
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DESIGNED BY	SUBHASH
CHECKED BY	VIDYA SAGAR
APPROVED BY	SANJEEV

**FINAL
DETAILED
PROJECT
REPORT**

Title: TUNNEL PUBLIC ADDRESSING SYSTEM SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drw. No	Rev:
A1	1:2500	Transys-NH37-TUNNEL-DPR-E&M-007	R2



LEGEND

1ST COMMUNICATIONS LEVEL

MAIN FIBRE OPTIC NETWORK

2ND COMMUNICATIONS LEVEL

MAIN DATA NETWORK

REDUNDANT DATA NETWORK

3RD COMMUNICATIONS LEVEL

VIDEO NETWORK

AUDIO NETWORK

DATA NETWORK

SERVER

REDUNDANT SERVER

PLC

PROGRAMMABLE LOGIC CONTROLLER

DAS

DATA ACQUISITION STATION(D.A.S)
(AUTOMATISM, DIGITAL I/O, ANALOG I)

RTU

REMOTE TERMINAL UNIT (R.T.U)

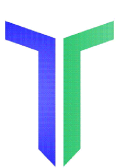
COMMUNICATIONS SWITCH

Rev.	Date	Description

Authority:

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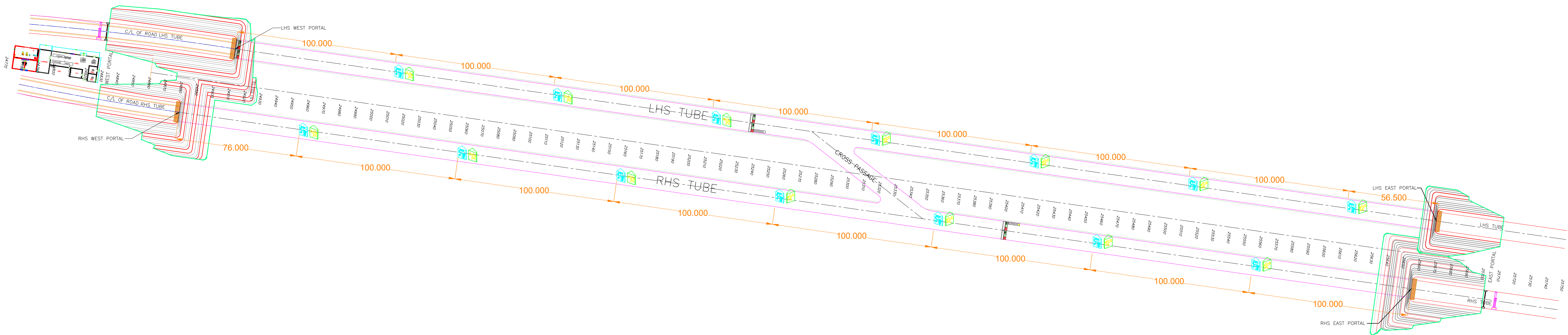
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DESIGNED BY	SUBHASH
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Title: COMMUNICATION AND CONTROL NETWORK SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drg. No	Rev:
A1	1: 2500	Transys-NH37-TUNNEL-DPR-E&M-008	R2

LEGEND

Sl.NO.	CONTENT	QUANTITY
1.	 LIMINOUS LIGHT	14
2.	 EXIT SINAGE LIGHT	14
3.	 DGS DGS SENSOR	2
4.	 LOOP DETECTOR	2
5.	 BARRIER	2
6.	 TRAFFIC SIGNAL LIGHT	6
7.	 VARIABLE MESSAGE DISPLAY	6



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APPROVED BY	SANJEEV

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Title: TRAFFIC MANAGEMENT & SIGNAGE SYSTEM SILCHAR JIRIBAM TUNNEL			
Size	Scale	Drp. No	Rev:
A1	1:2500	Transys-NH37-TUNNEL-DPR-E&M-009	R2