



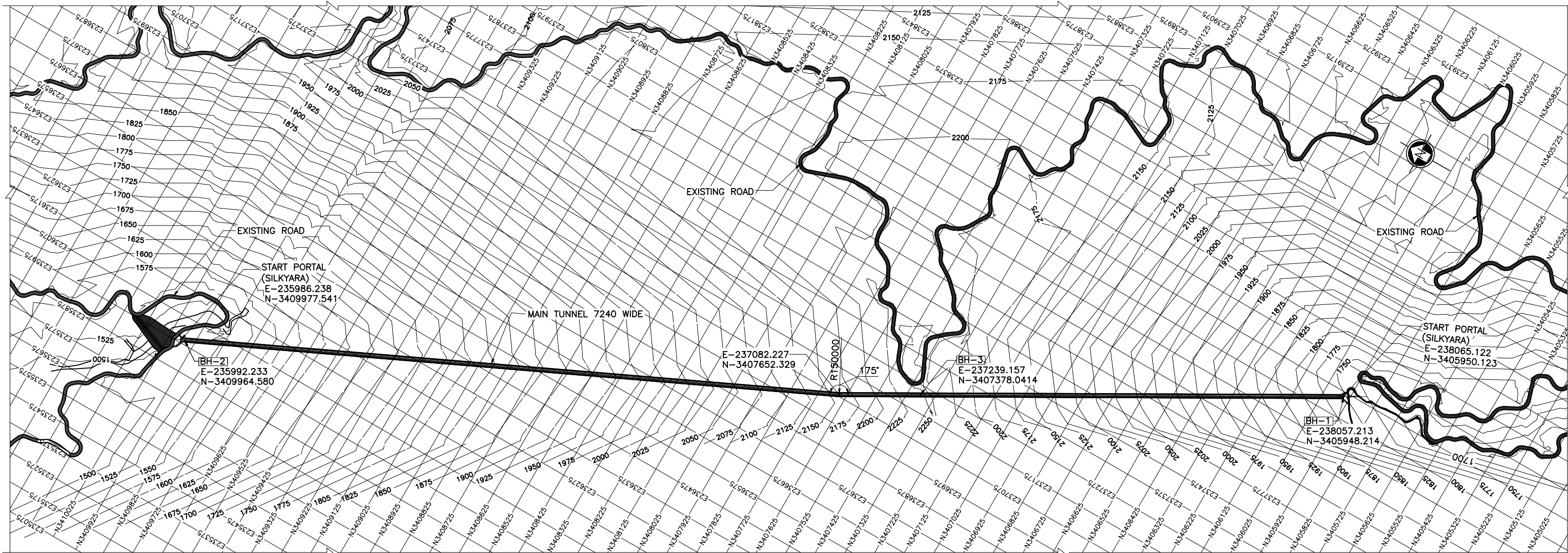
National Highways & Infrastructure Development Corporation Limited
(A Government of India Undertaking)

**“CONSTRUCTION, OPERATION AND MAINTENANCE OF 2-LANE BI-DIRECTIONAL SILKYARA BEND – BARKOT
TUNNEL WITH ESCAPE PASSAGE INCLUDING APPROACHES ON DHARASU-YAMUNOTRI SECTION BETWEEN
CH. 25.400 KM AND CH. 51.000 KM FALLING ALONG NH-134 (OLD NH-94) IN THE STATE OF UTTARAKHAND”**

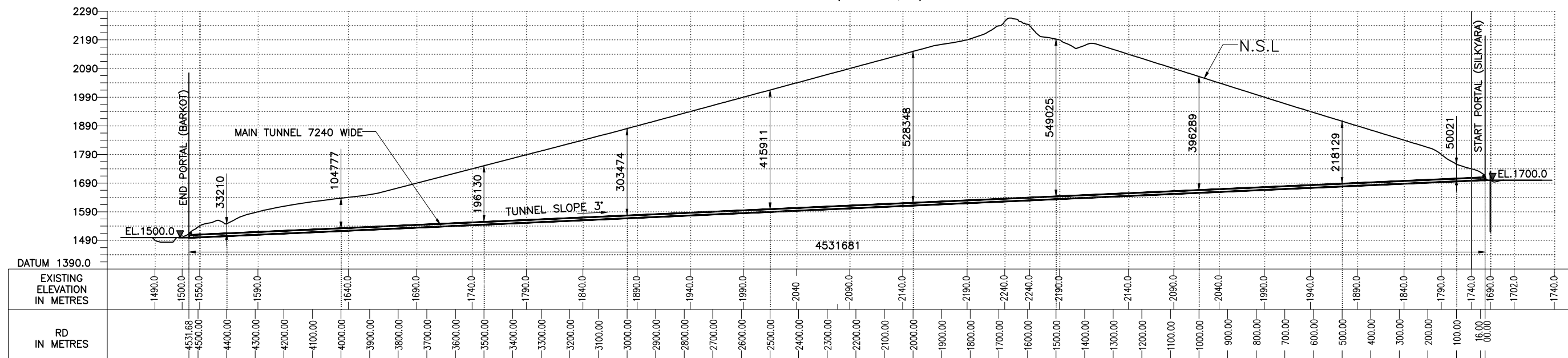
On Engineering, Procurement & Construction (EPC) Mode

Appendix –BI (CIVIL & EM DRAWINGS)

January, 2018



ROAD TUNNEL LAYOUT PLAN
(SCALE 1:15,000)



ROAD TUNNEL LONGITUDINAL SECTION
(SCALE 1:15,000)

SCALE: - 1:15,000
0 150 300 450 600 750m

Project Title

Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”

CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title:

ROAD TUNNEL
LAYOUT PLAN & L-SECTION

Drawing No. :- MC-ROADS/MISC/01

Sheet :

Scale :- NTS

Drm

Dgn.

Appd

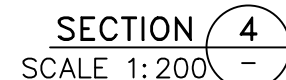
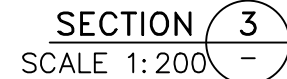
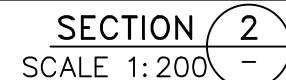
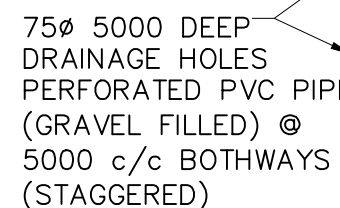
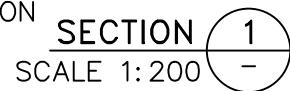
Date

M.R.

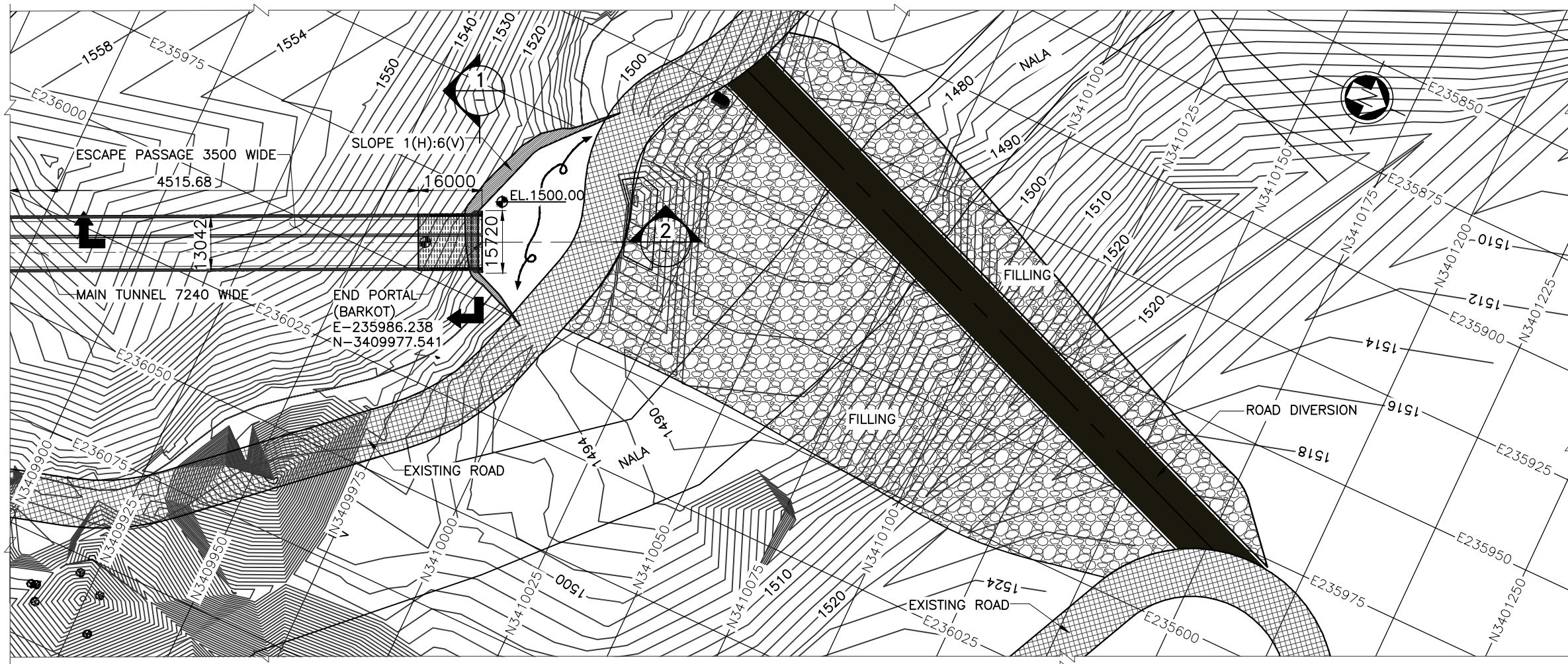
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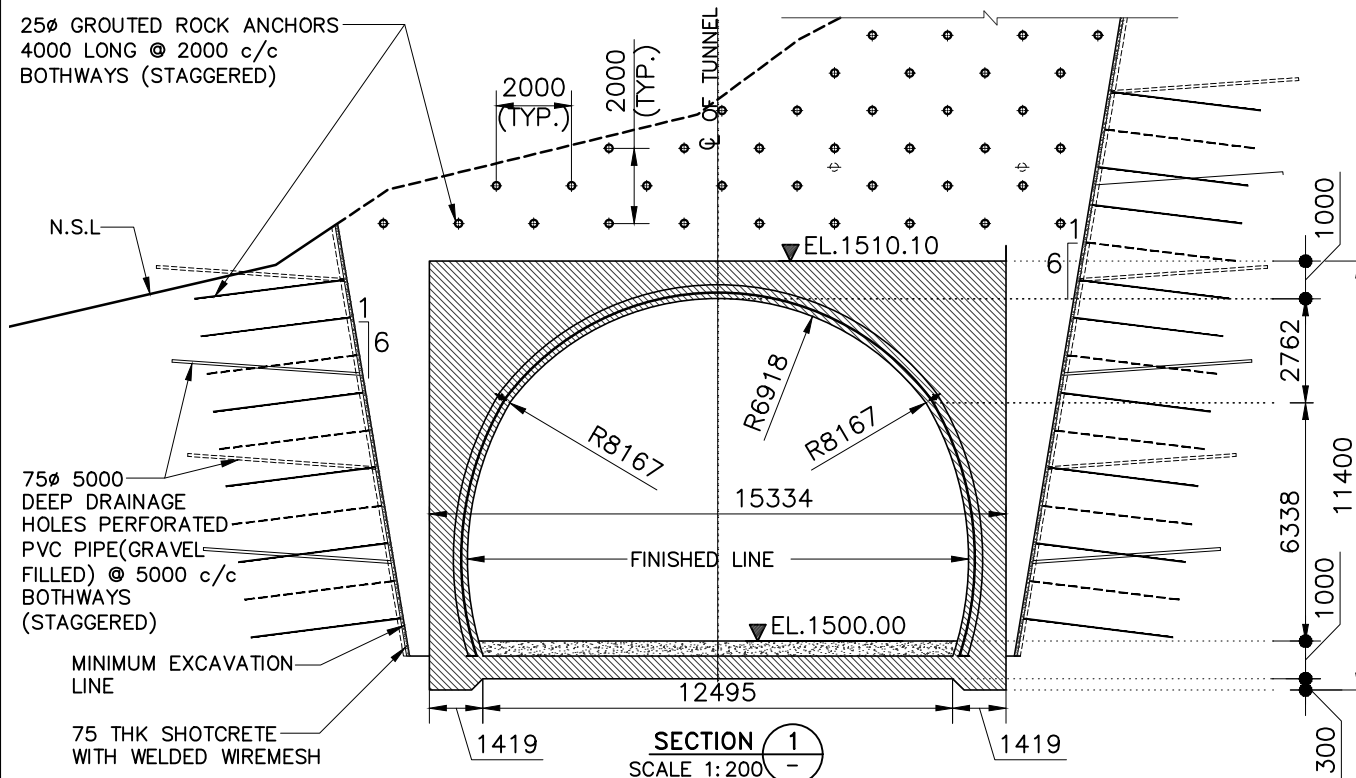
MARCH-2017



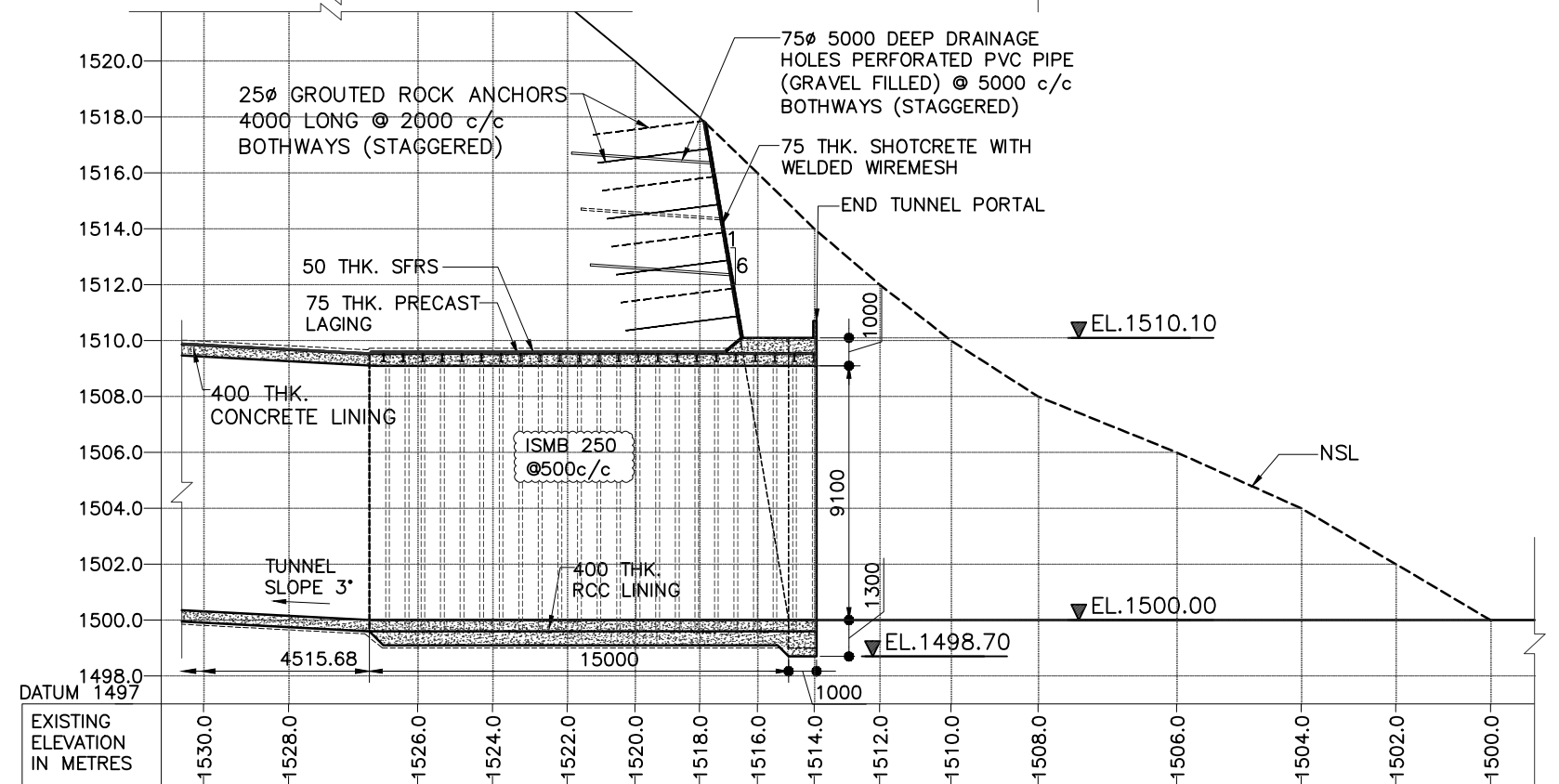
AKS



END PORTAL LAYOUT PLAN
(SCALE 1:1250)



SECTION 1
SCALE 1:200



SECTION 2
SCALE 1:200

Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”

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MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: END PORTAL(BARKOT)
EXCAVATION PLAN AND SECTION

Drawing No. :- MC-ROADS/MISC/ 04

Sheet :

Scale :- NTS

Drm

Dgn.

Appd

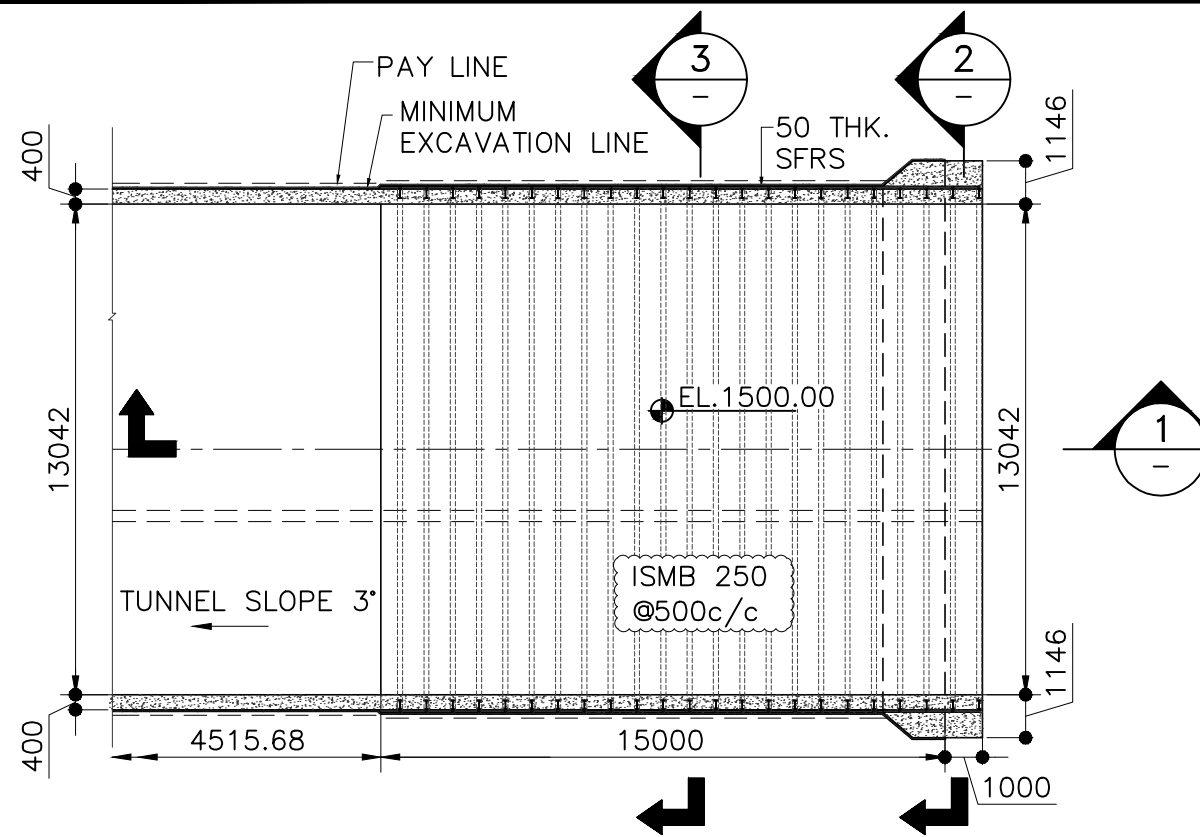
Date

M.R.

M.K.S.

A.K.S.

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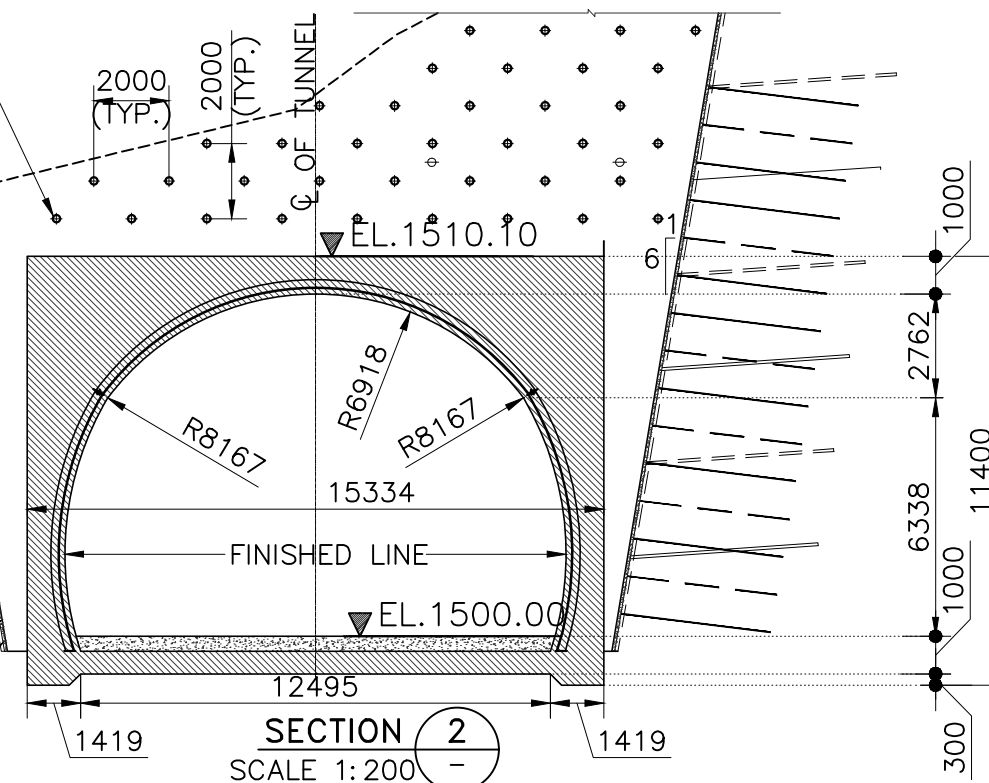


SECTIONAL PLAN
SCALE 1:150

25Ø GROUTED ROCK ANCHORS
4000 LONG @ 2000 c/c
BOTHWAYS (STAGGERED)

75Ø 5000 DEEP
DRAINAGE HOLES
PERFORATED PVC PIPE
(GRAVEL FILLED) @
5000 c/c BOTHWAYS
(STAGGERED)

MINIMUM EXCAVATION
LINE
75 THK SHOTCRETE
WITH WELDED WIREMESH



SECTION 2
SCALE 1:200

25Ø GROUTED ROCK ANCHORS
4000 LONG @ 2000 c/c
BOTHWAYS (STAGGERED)

75Ø 5000 DEEP DRAINAGE
HOLES PERFORATED PVC PIPE
(GRAVEL FILLED) @ 5000 c/c
BOTHWAYS (STAGGERED)

75 THK. SHOTCRETE WITH
WELDED WIREMESH

END TUNNEL PORTAL

NSL

EL.1510.10

50 THK. SFRS
75 THK. PRECAST
LAGING

400 THK.
CONCRETE LINING

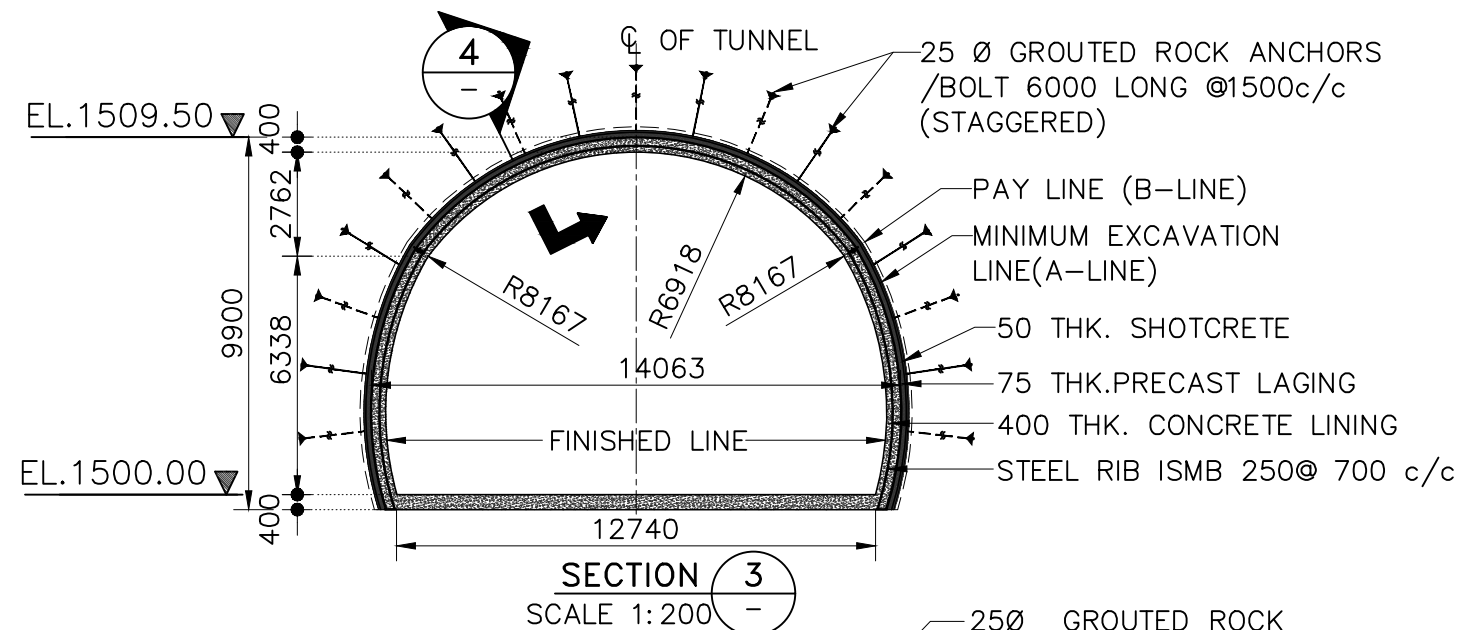
ISMB 250
@500c/c

400 THK.
RCC LINING

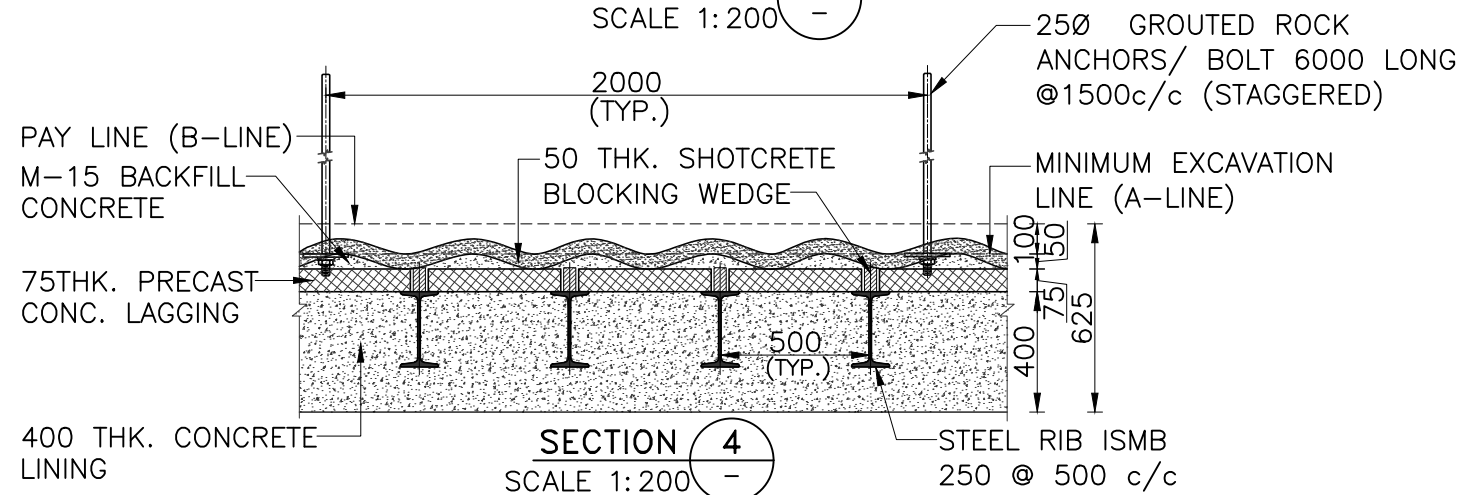
TUNNEL
SLOPE 3°

MINIMUM EXCAVATION
LINE
PAY LINE

SECTION 1
SCALE 1:200



SECTION 3
SCALE 1:200



SECTION 4
SCALE 1:200

Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode"

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MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: END PORTAL(BARKOT)
PLAN AND SECTION DETAILS

Drawing No. :- MC-ROADS/MISC/05

Sheet :

Scale :- NTS

Drm

Dgn.

Appd

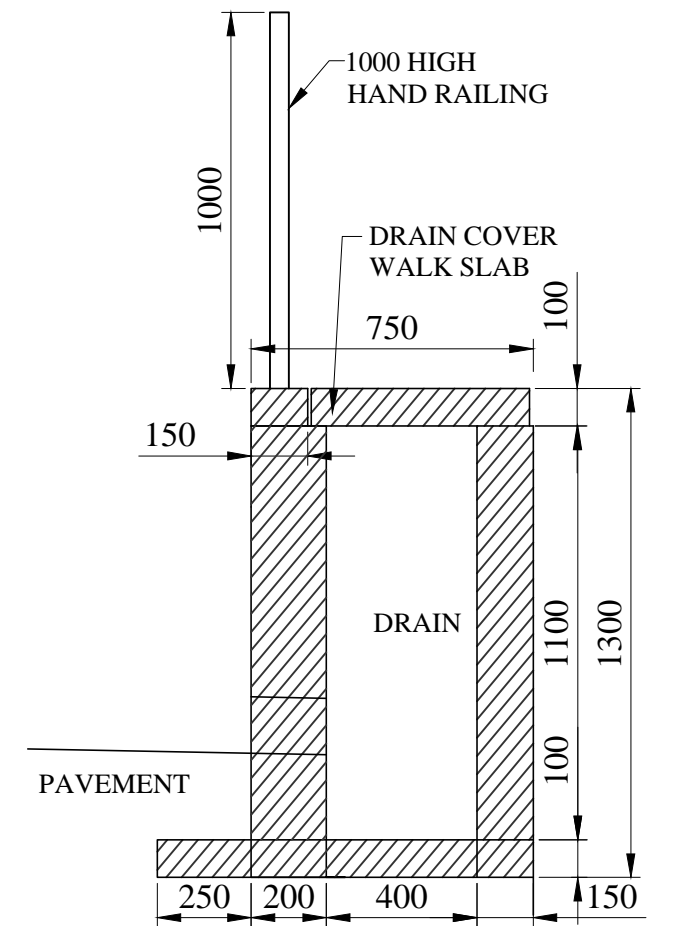
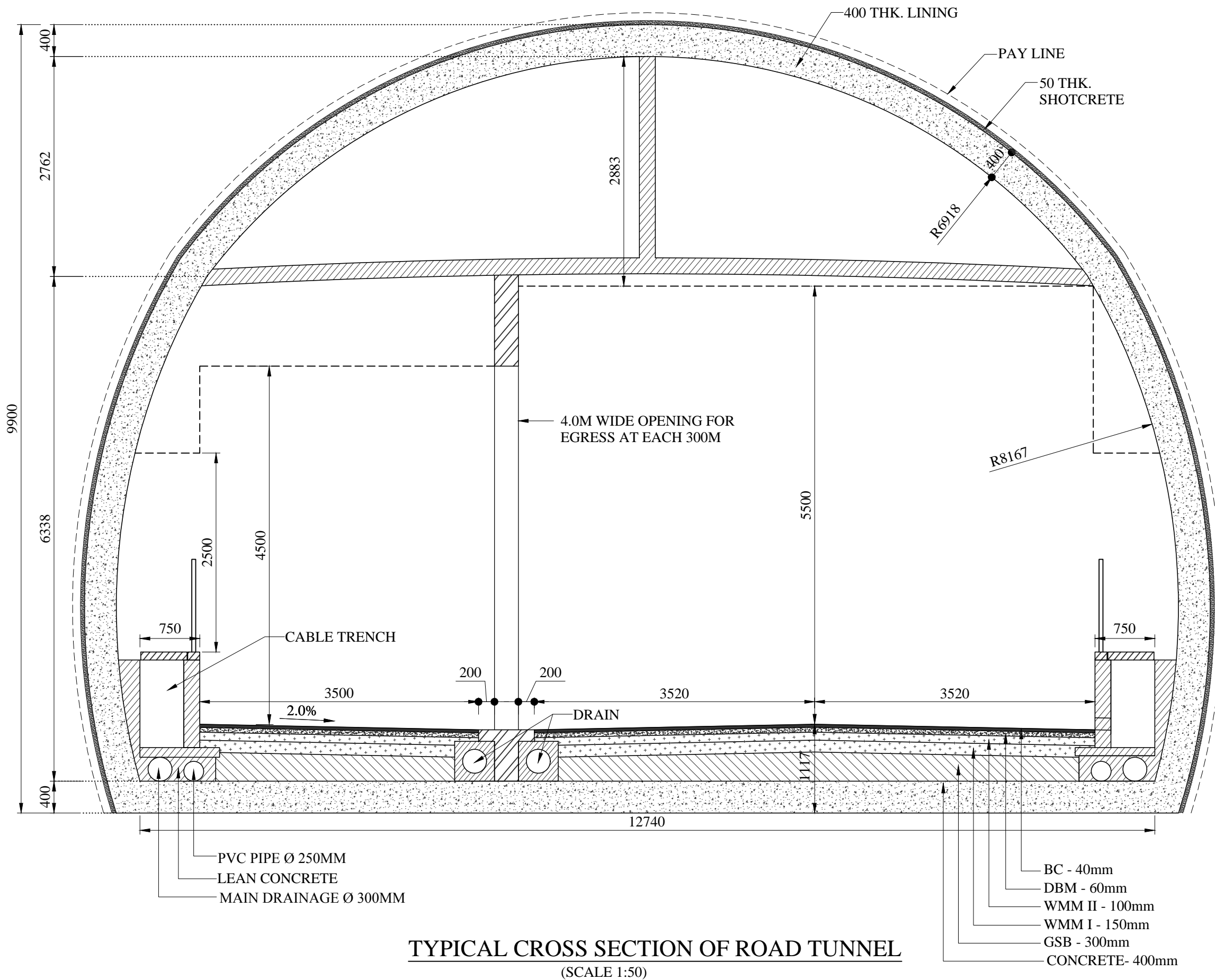
Date

M.R.

M.K.S.

A.K.S.

MARCH-2017



Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”

CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: TYPICAL CROSS SECTION OF ROAD TUNNEL

Drawing No. :- MC-ROADS/MISC/07

Sheet :

Scale :- 1:50

Drm

Dgn.

Appd

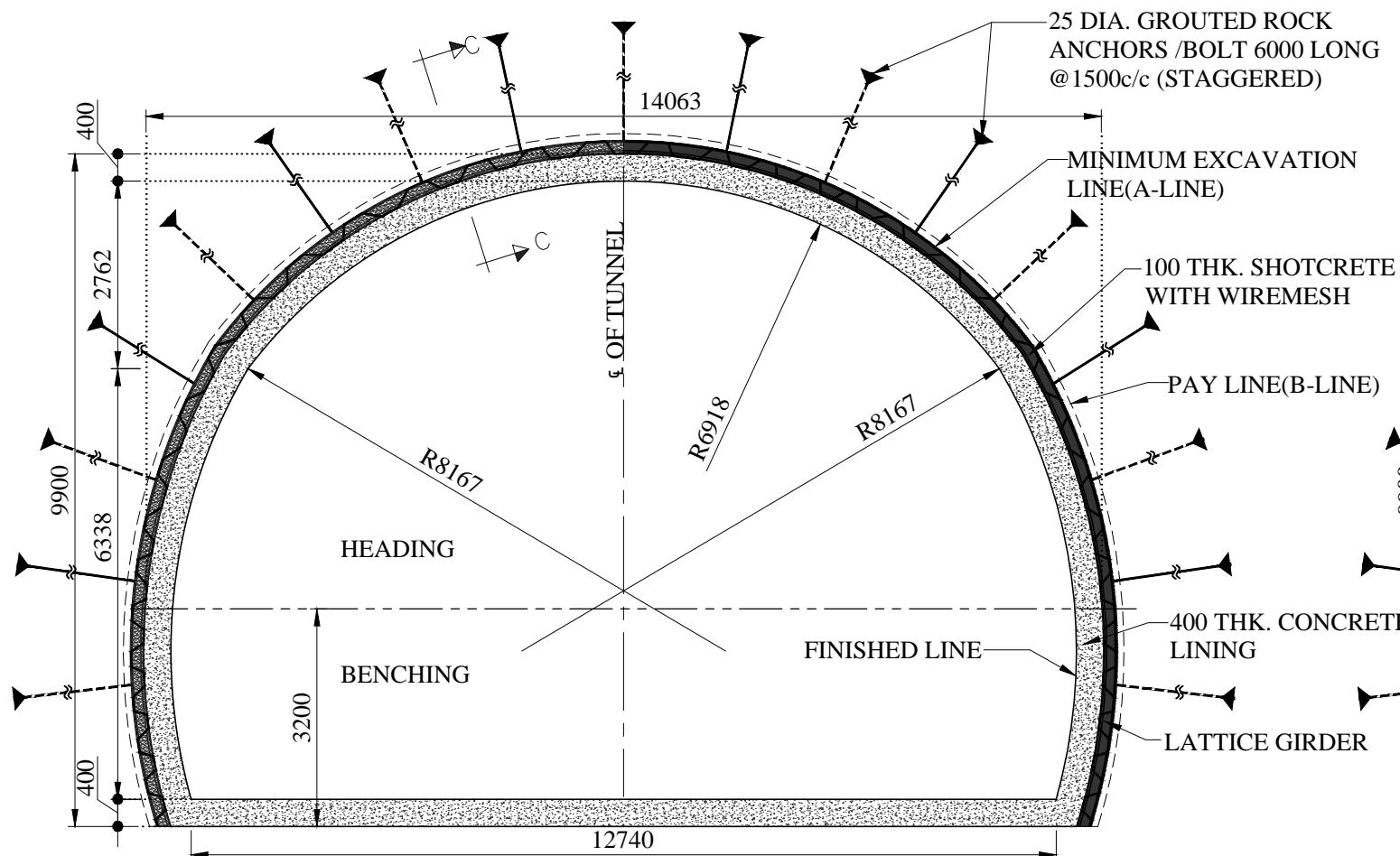
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M.R.

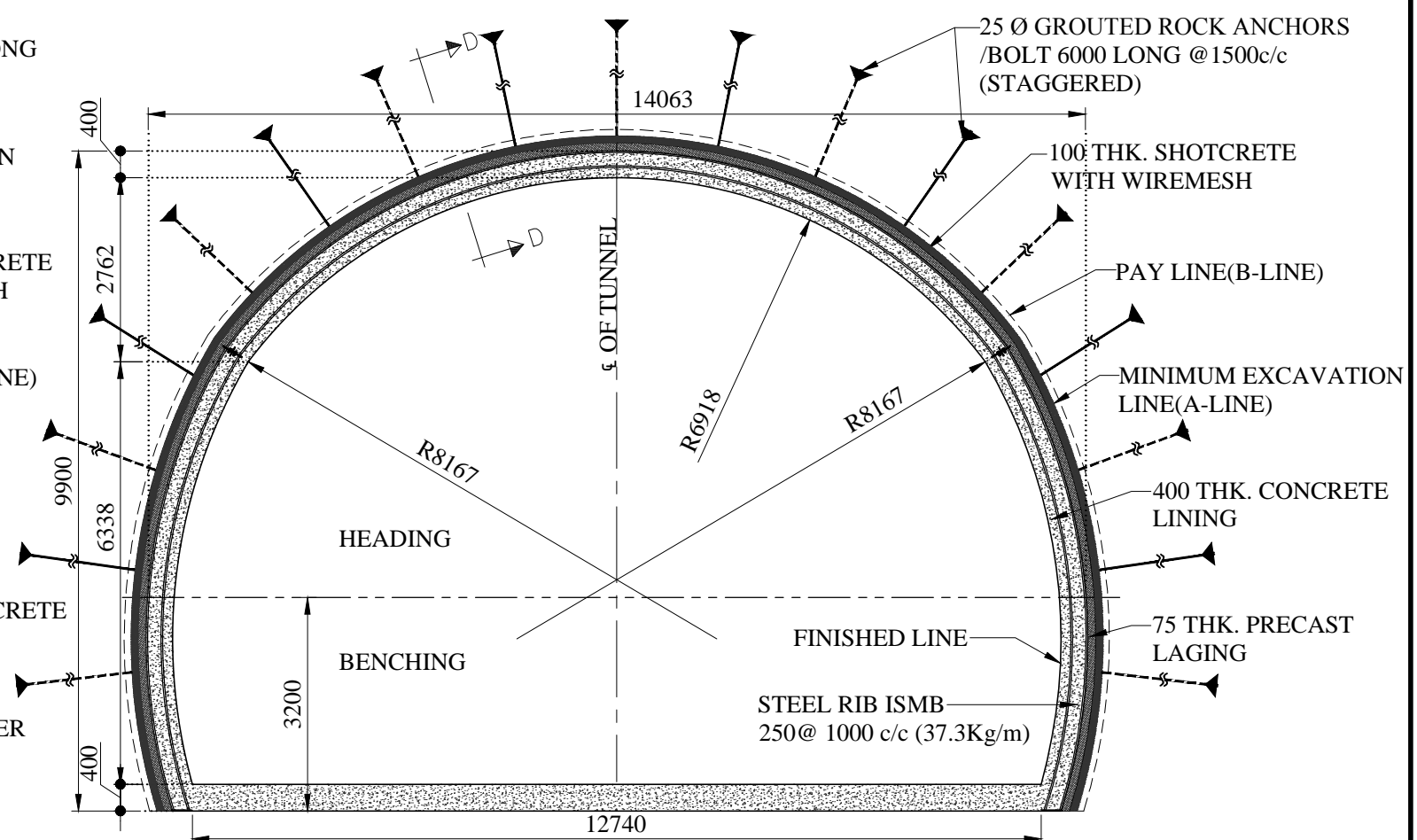
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A.K.S.

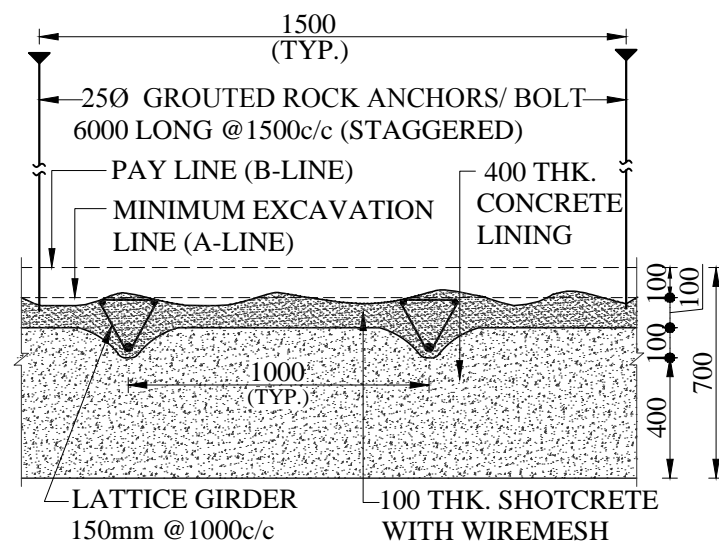
MARCH-2017



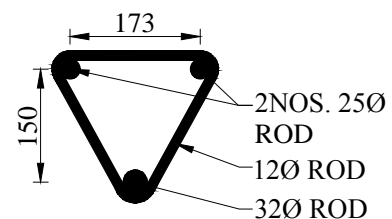
CLASS -D (PROVIDED LATTICE GIRDER) (SCALE 1:100)



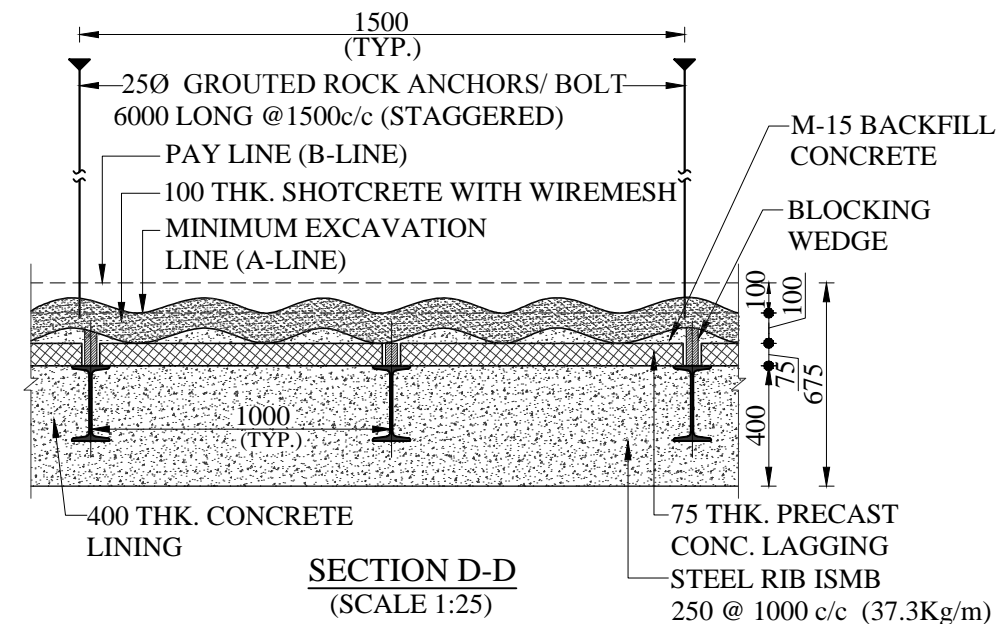
CLASS -D (PROVIDED STEEL RIB) (SCALE 1:100)



SECTION C-C
(SCALE 1:25)



DETAILS OF LATTICE GIRDER
(SCALE 1:10)



SECTION D-D
(SCALE 1:25)

Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode"

CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: ROAD TUNNEL
ROCK SUPPORT DETAIL

Drawing No. :- MC-ROADS/MISC/09

Sheet :

Scale :- NTS

Drm

Dgn.

Appd

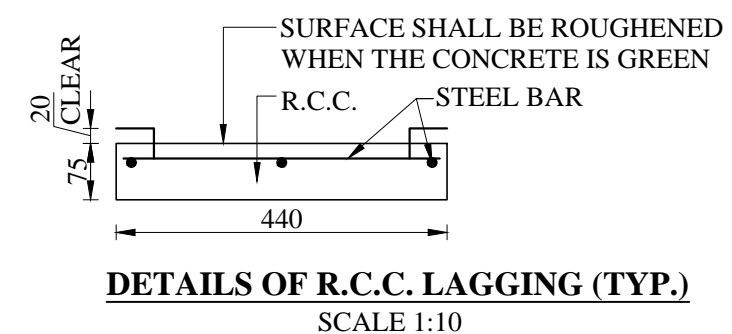
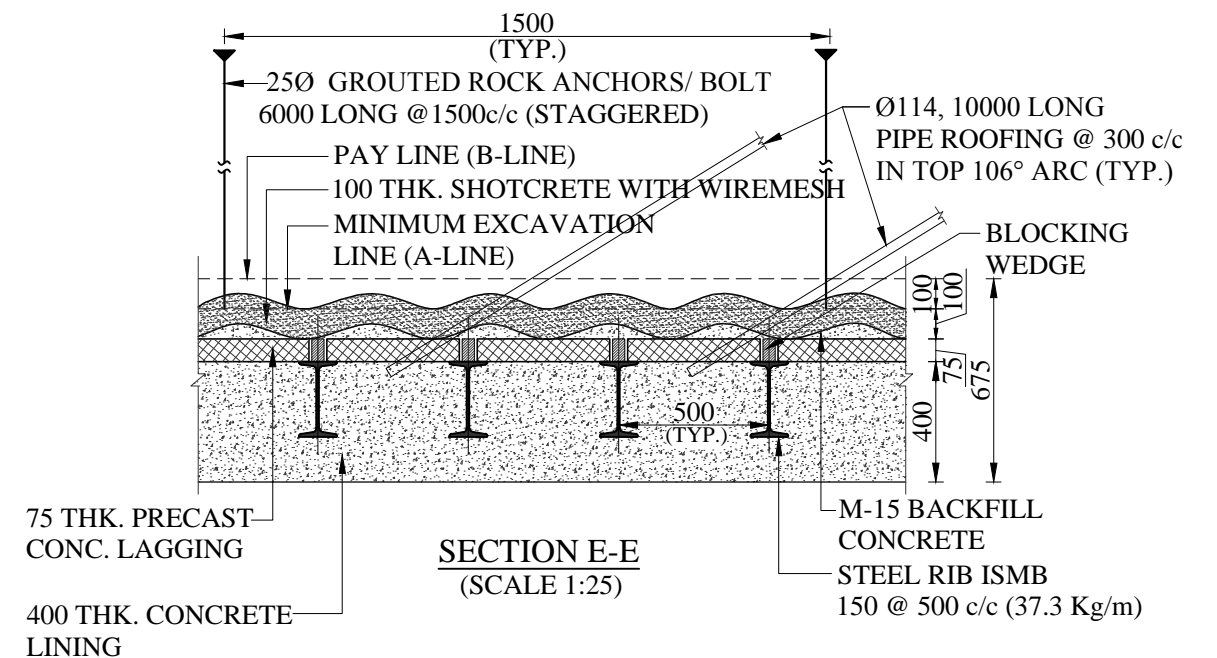
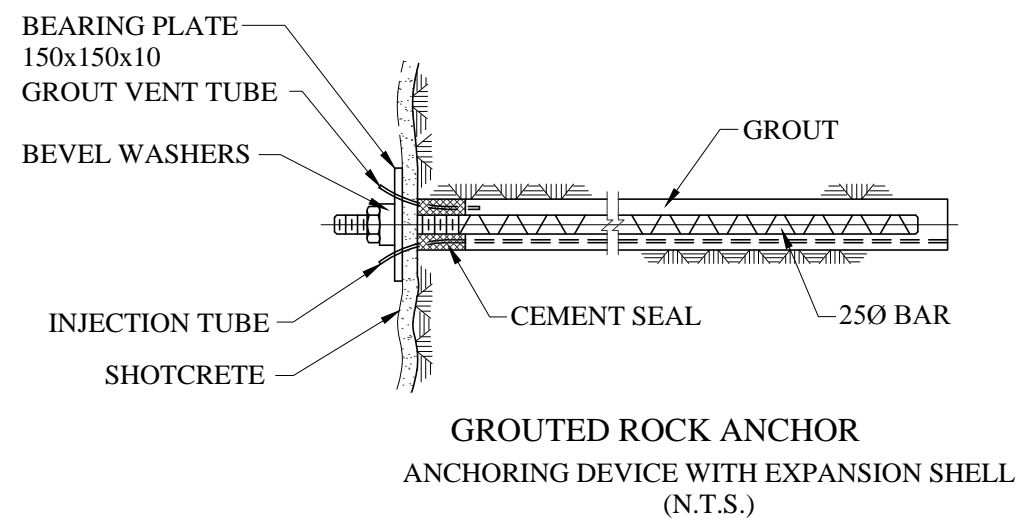
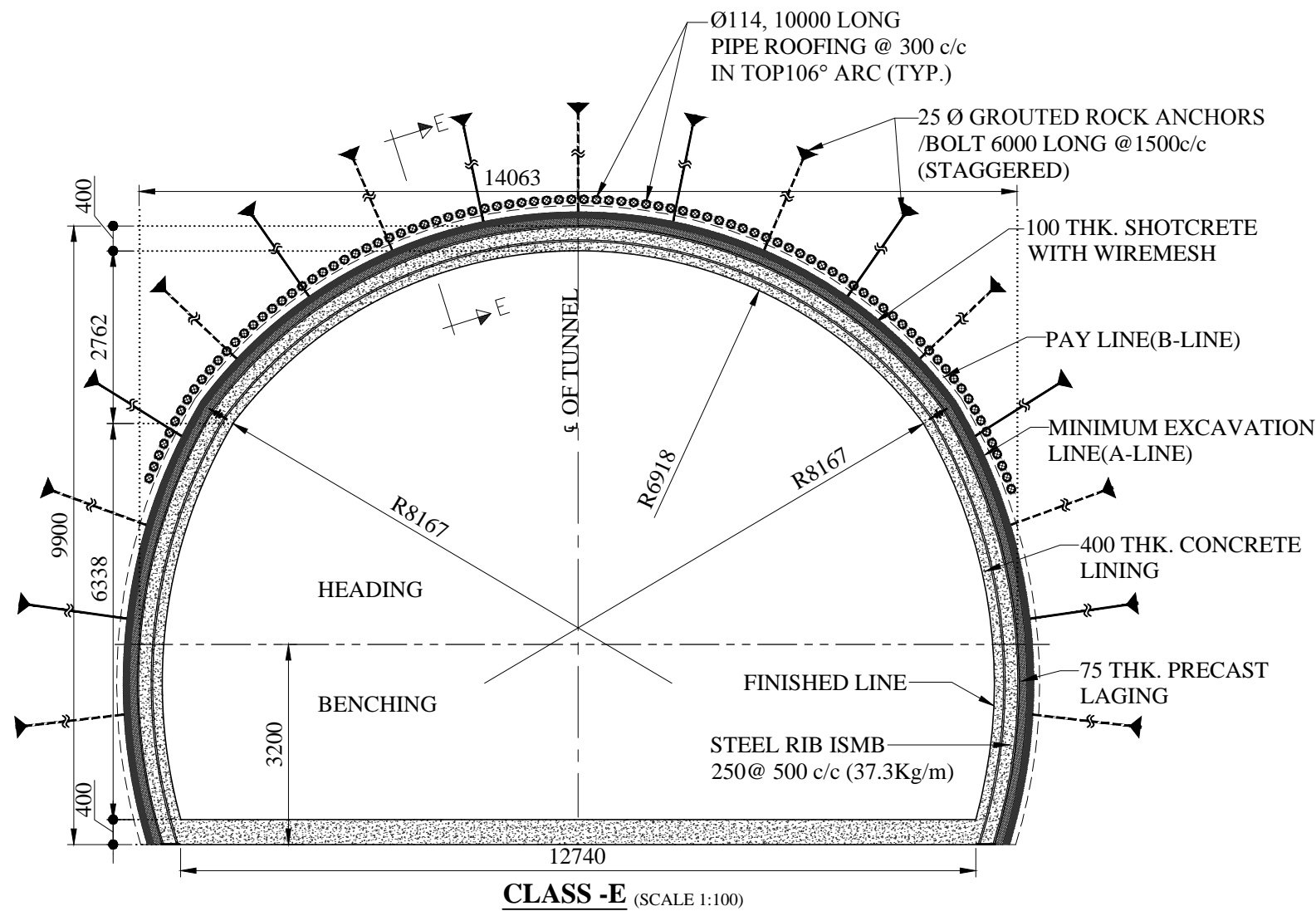
Date

M.R.

M.K.S.

A.K.S.

MARCH-2017



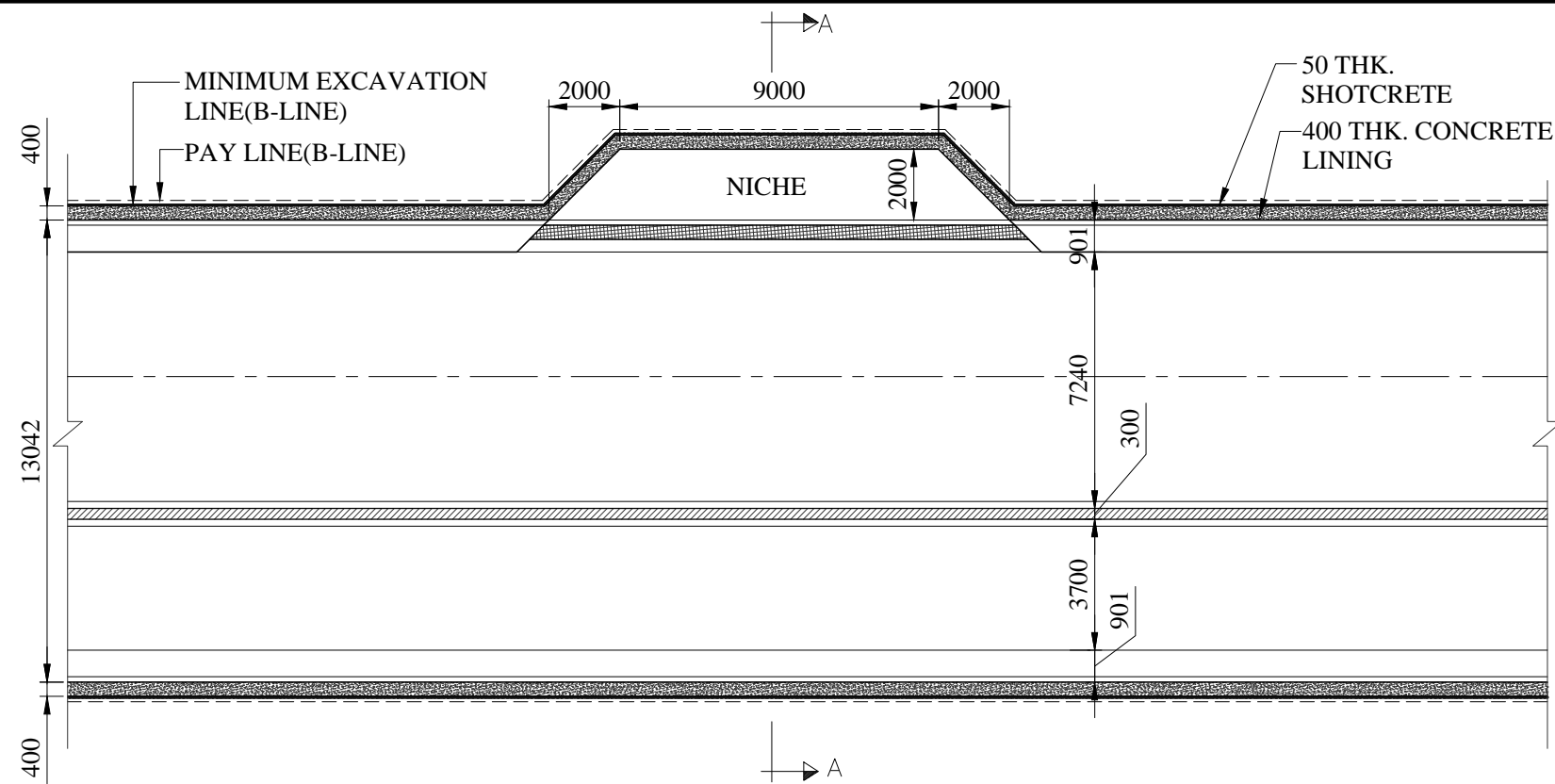
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CLIENT

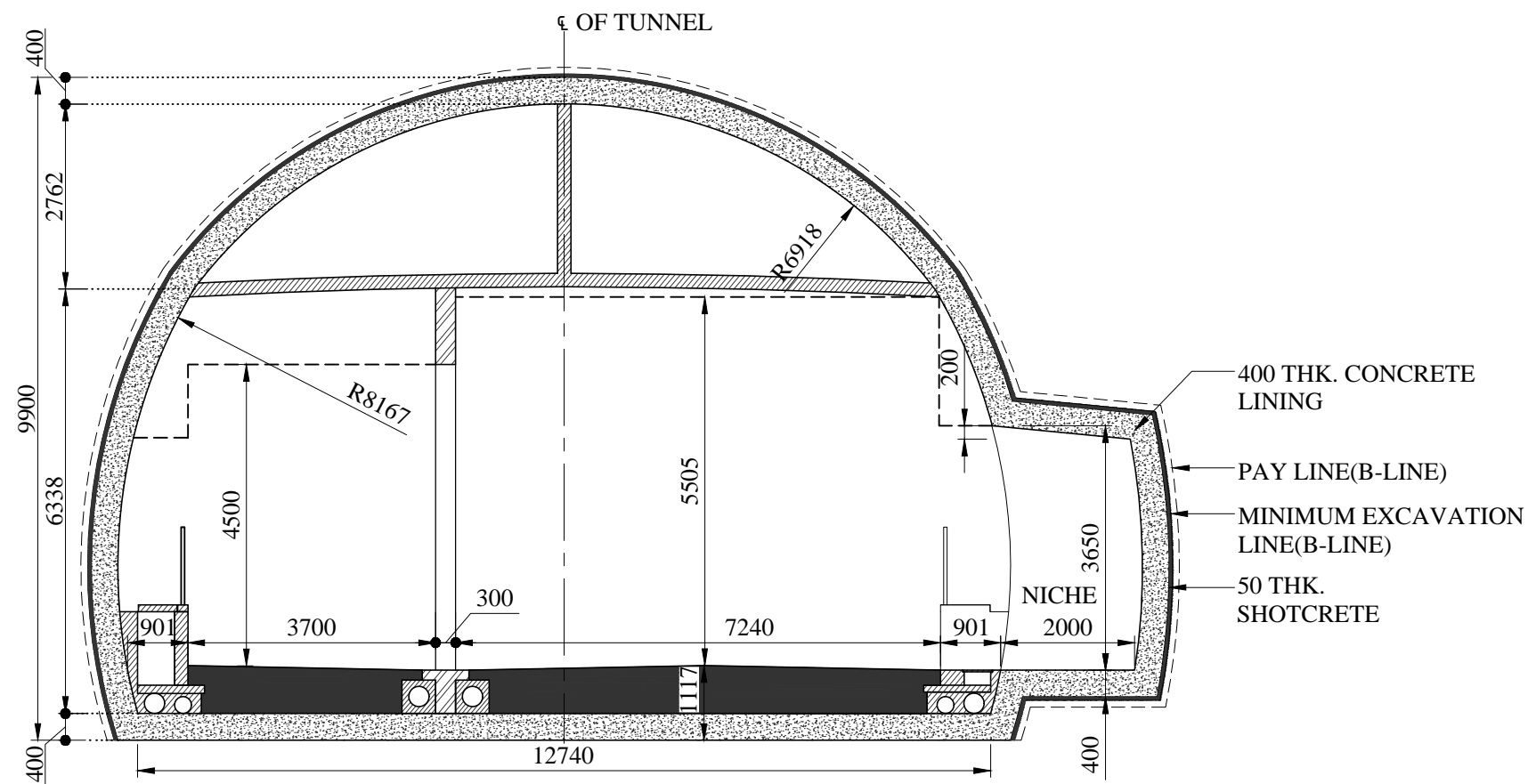


MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: ROAD TUNNEL ROCK SUPPORT DETAIL			
Drawing No. :- MC-ROADS/MISC/10			Sheet :
Scale :- NTS			
Drm	Dgn.	Appd	Date
M.R.	M.K.S.	A.K.S.	MARCH-2017



TYP. PLAN AT NICHE LOCATION FOR VEHICLE CROSSING
(SCALE 1:100)



SECTION A-A
(SCALE 1:25)

Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode"

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MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: **ROAD TUNNEL TYP. PLAN AT NICHE LOCATION FOR VEHICLE CROSSING**

Drawing No. :- MC-ROADS/MISC/11

Sheet :

Scale :- NTS

Drm

Dgn.

Appd

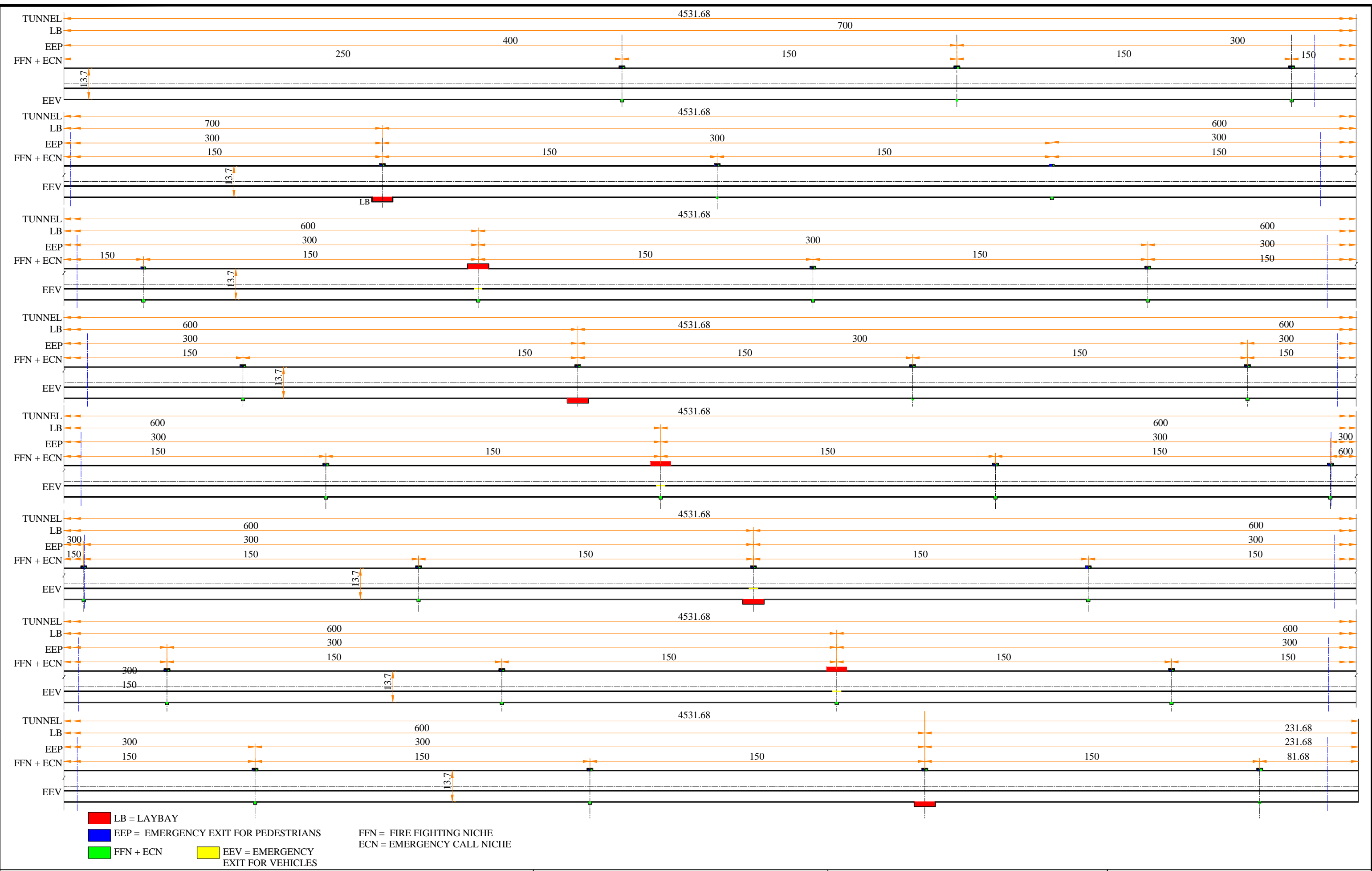
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M.R.

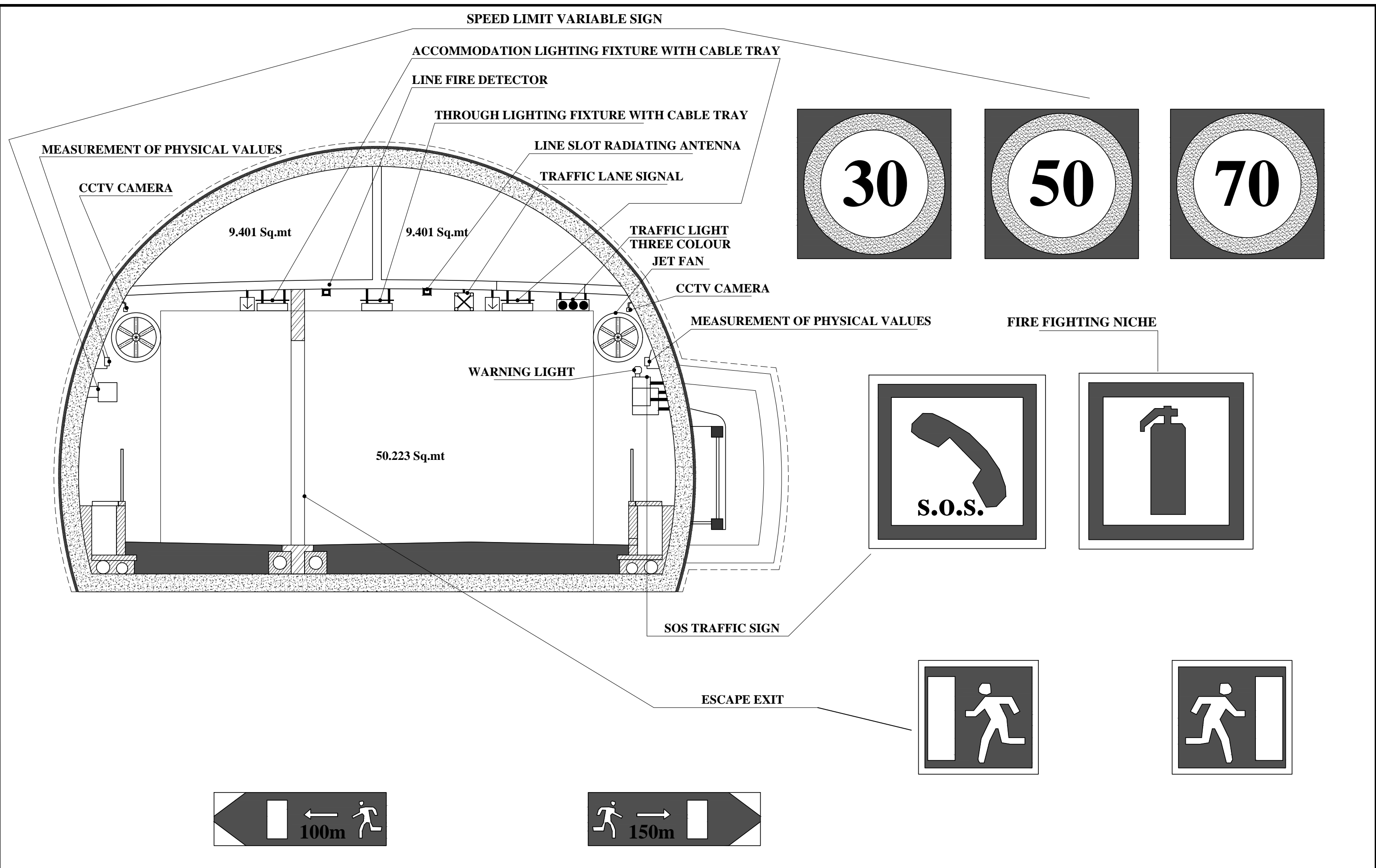
M.K.S.

A.K.S.

MARCH-2017



Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”	<u>CLIENT</u>				Drawing Title: LAYBAY PLAN		
	MINISTRY OF ROAD TRANSPORT & HIGHWAYS				Drawing No. :- MC-ROADS/MISC/06		
			Scale :- NTS				
			Drn	Dgn.	Appd	Date	
			M.R.	M.K.S.	A.K.S.	MARCH-2017	



Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode"

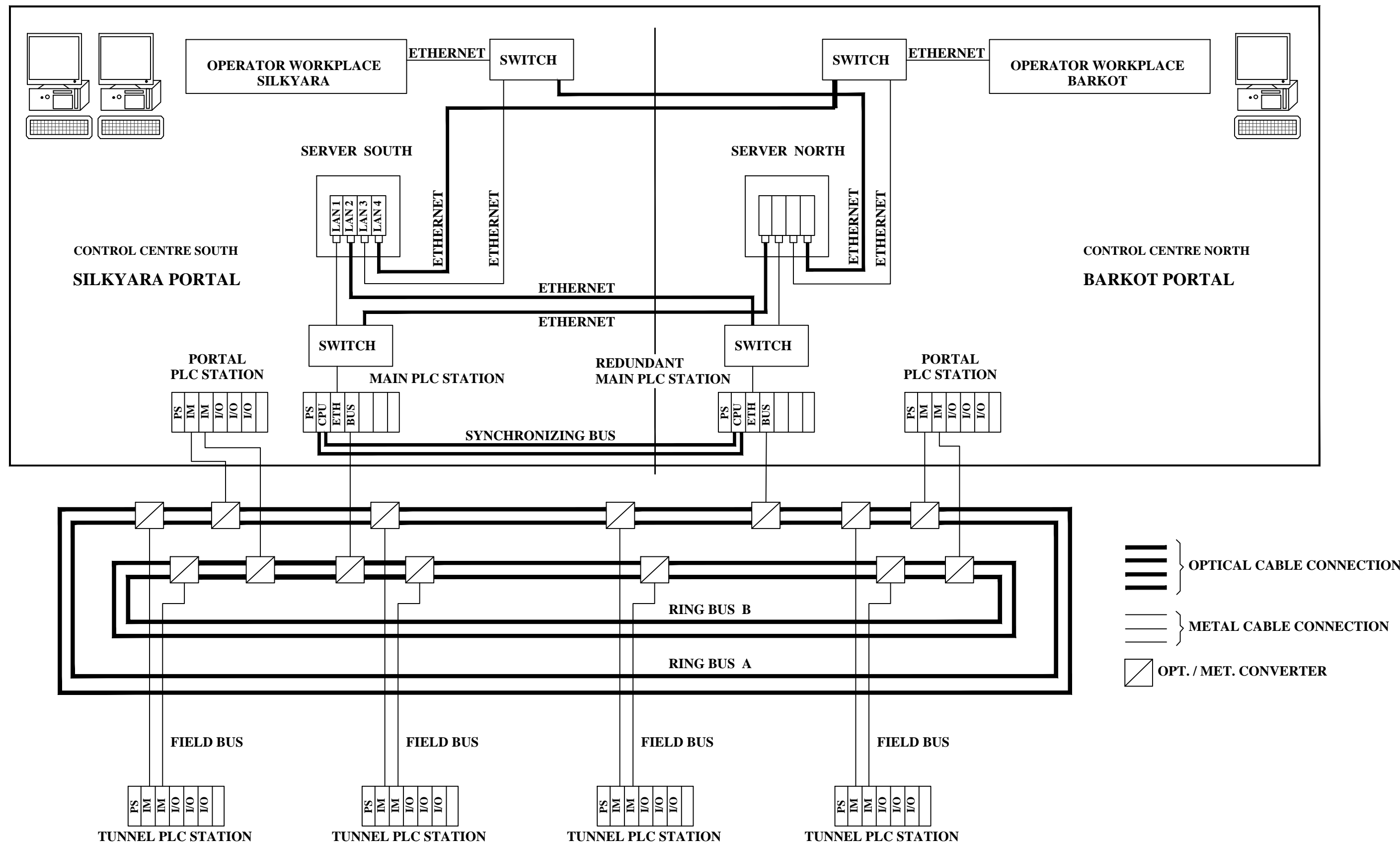
CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: TUNNEL TUBE CROSS SECTION COORDINATION			
Drawing No. :- MC-ROADS/MISC/12			Sheet :
Scale :- NTS			Date
Drm	Dgn.	Appd	MARCH-2017
M.R.	M.K.S.	A.K.S.	

C



Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”

CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: SCHEMATIC DIAGRAM OF THE INTEGRATED TUNNEL CONTROL SYSTEM

Drawing No. :- MC-ROADS/MISC/16

Sheet :

Scale :- NTS

Drm

Dgn.

Appd

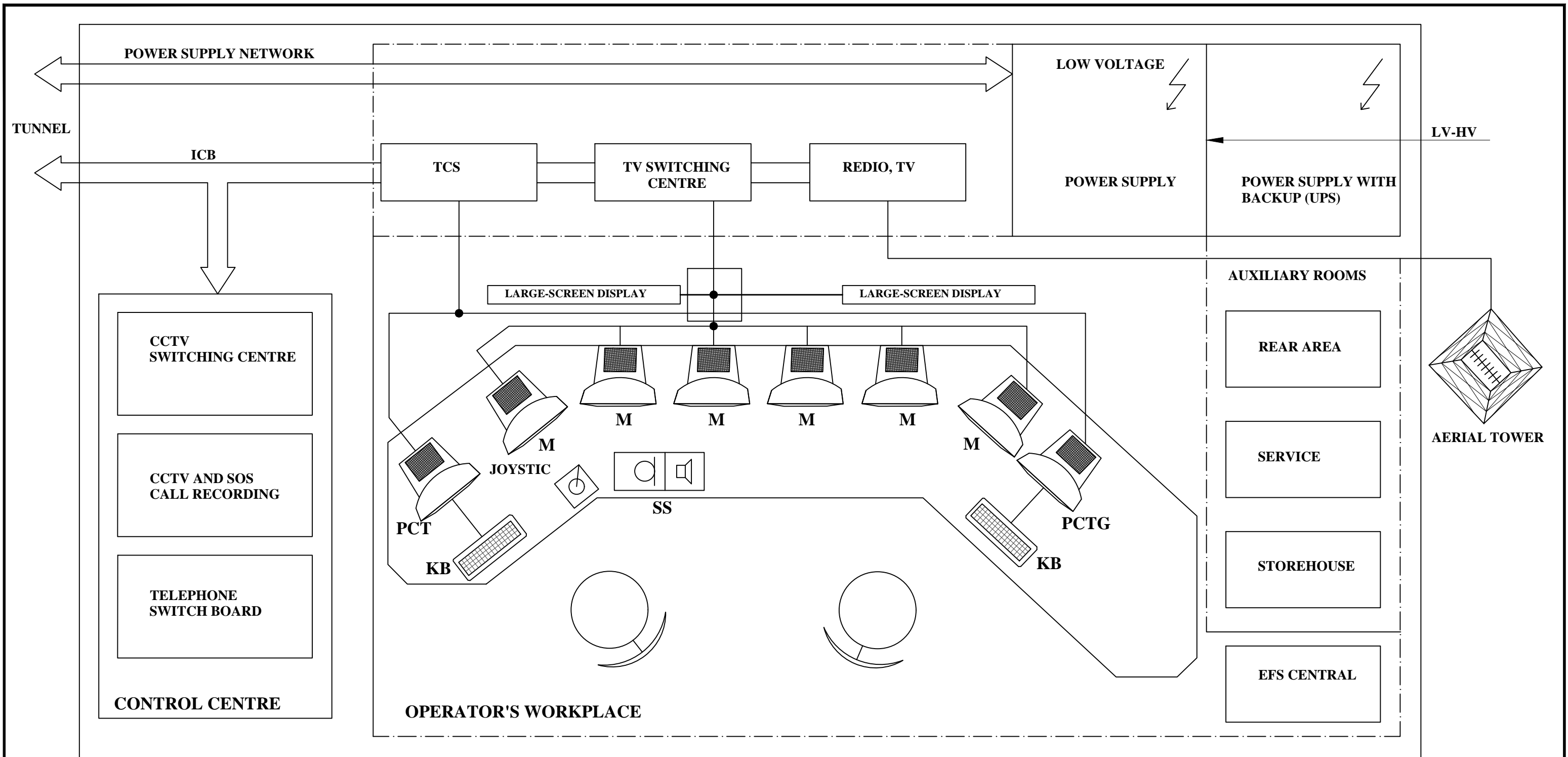
Date

M.R.

M.K.S.

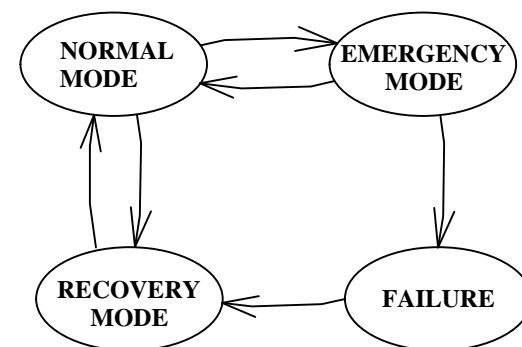
A.K.S.

MARCH-2017



ICB - INDUSTRIAL CONTROL BUS
TCS - TUNNEL CONTROL SYSTEM
EFS - ELECTRIC FIRE SIGNALING
M - CCTV MONITOR
KB - KEYBOARD
PCT - TERMINAL FOR TECHNOGY
SS - SPEAKER/ MICROPHONE SET

BASE TUNNEL OPERATION MODES



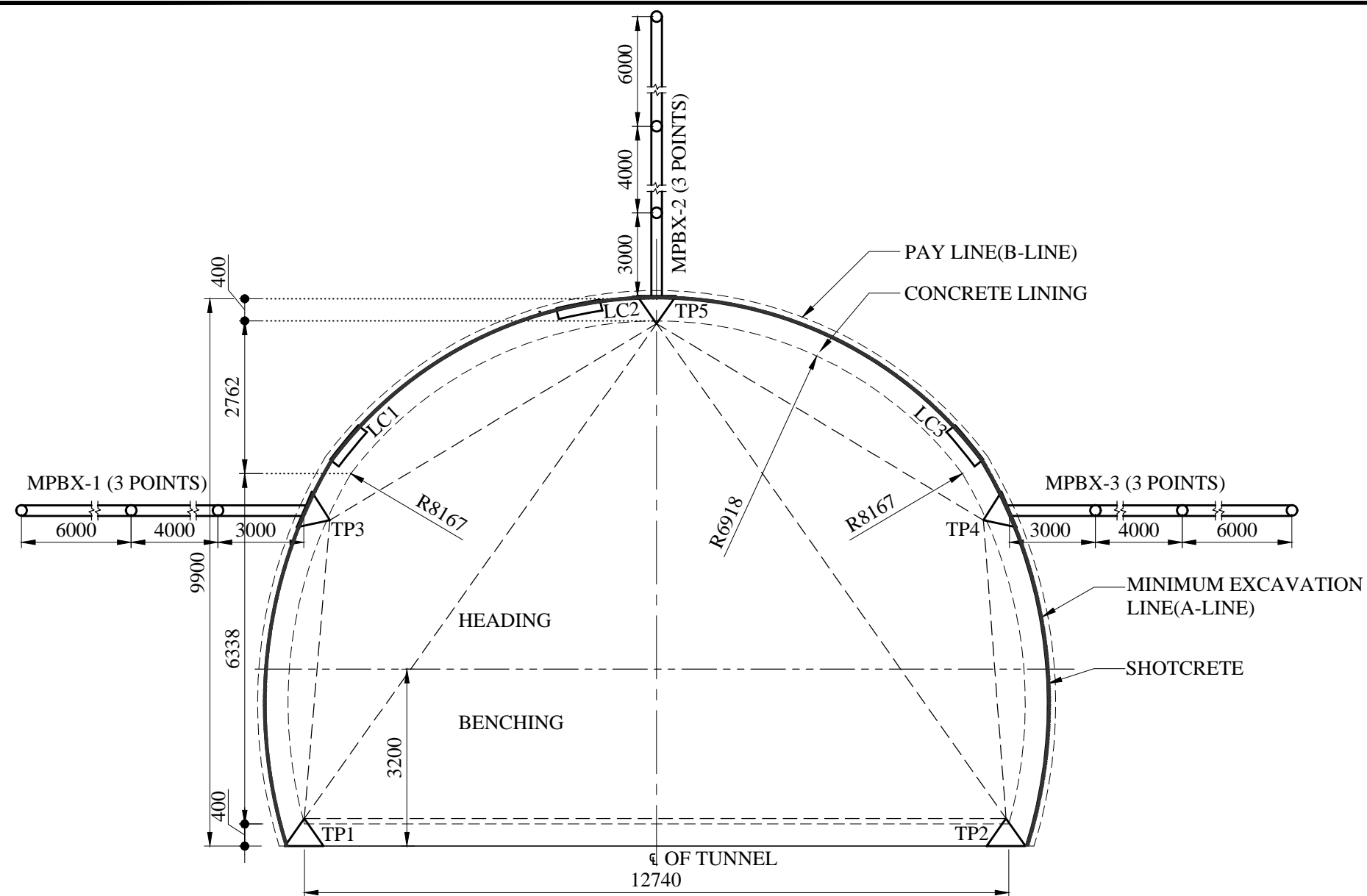
Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel
 With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch.
 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”

CLIENT

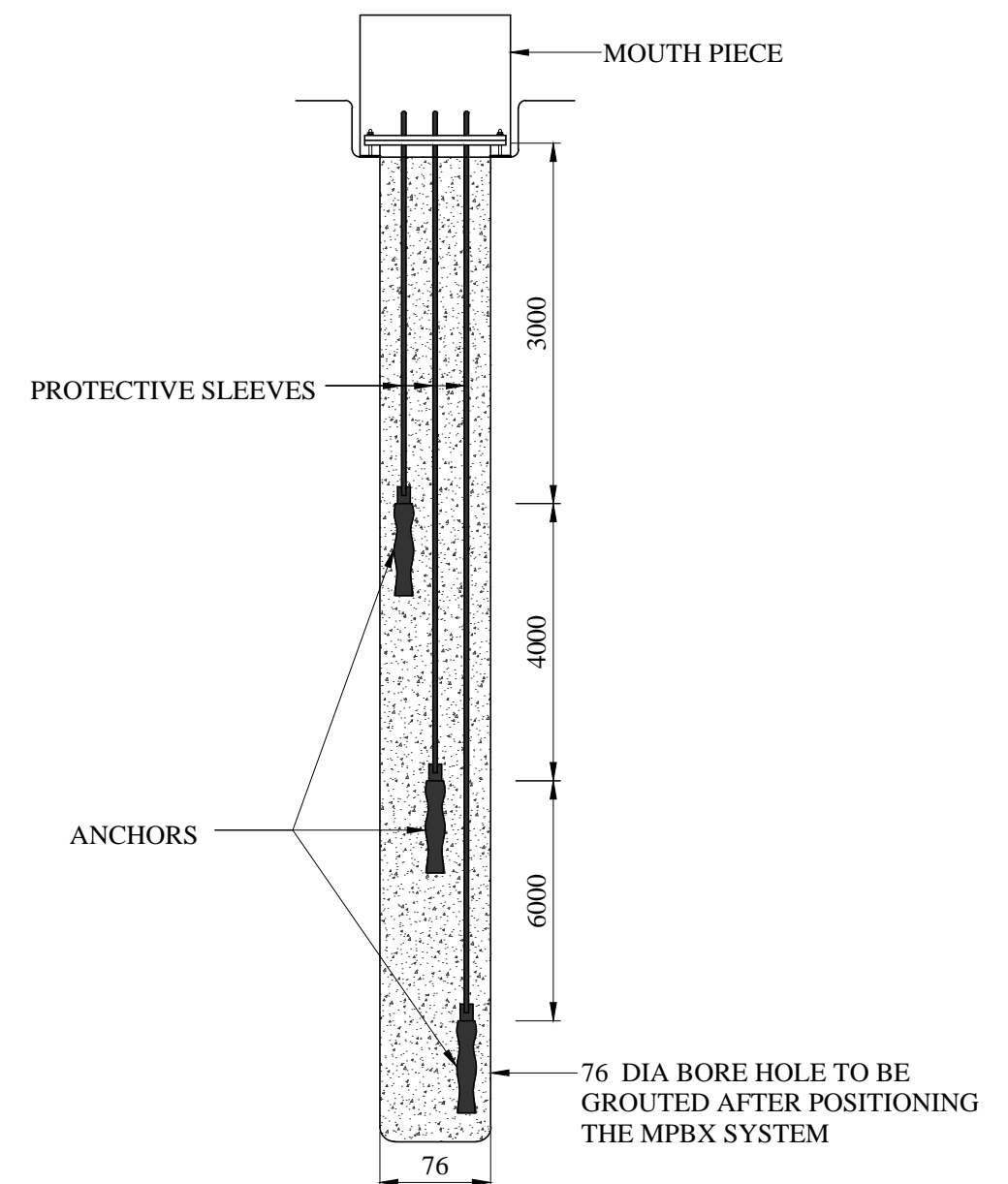


MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: SCHEMATIC DIAGRAM OF THE MAIN CONTROL CENTRE			
Drawing No. :- MC-ROADS/MISC/17			Sheet :
Scale :- NTS			Date
Drm	Dgn.	Appd	MARCH-2017
M.R.	M.K.S.	A.K.S.	



TYPICAL CROSS SECTION OF ROAD TUNNEL
(SCALE 1:100)



**TYPICAL SECTION SHOWING BORE HOLE 3 POINTS
EXTENSOMETER INSTALLATION**
(NOTE TO SCALE)

INSTRUMENTATION FOR ROAD TUNNEL

S. NO.	PARTICULAR OF INSTRUMENTS	NOTATION	QTY.
1.	MULTIPOINT BORE HOLE EXTENSOMETER 3 POINTS-(3+4+6=13m)		300
2.	LOAD CELL (LC)		270
3.	CONVERGENCE / TARGET POINT (TP)		450

Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”

CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: ROAD TUNNEL
INSTRUMENTATION DETAILS

Drawing No. :- MC-ROADS/MISC/19

Sheet :

Scale :- NTS

Drm

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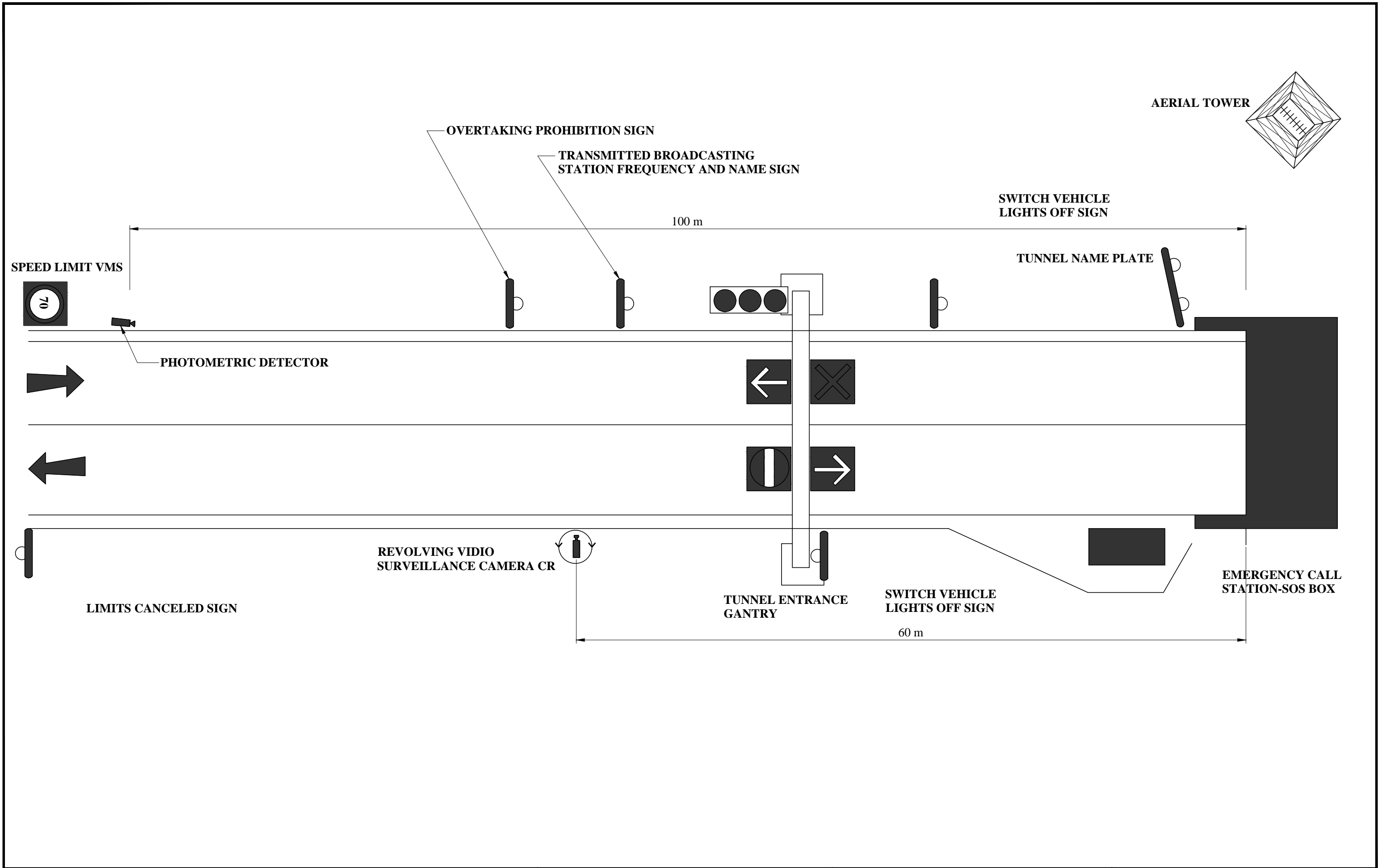
Date

M.R.

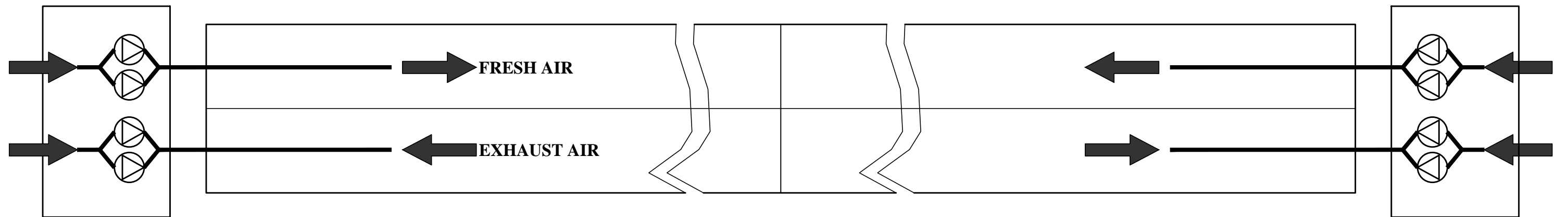
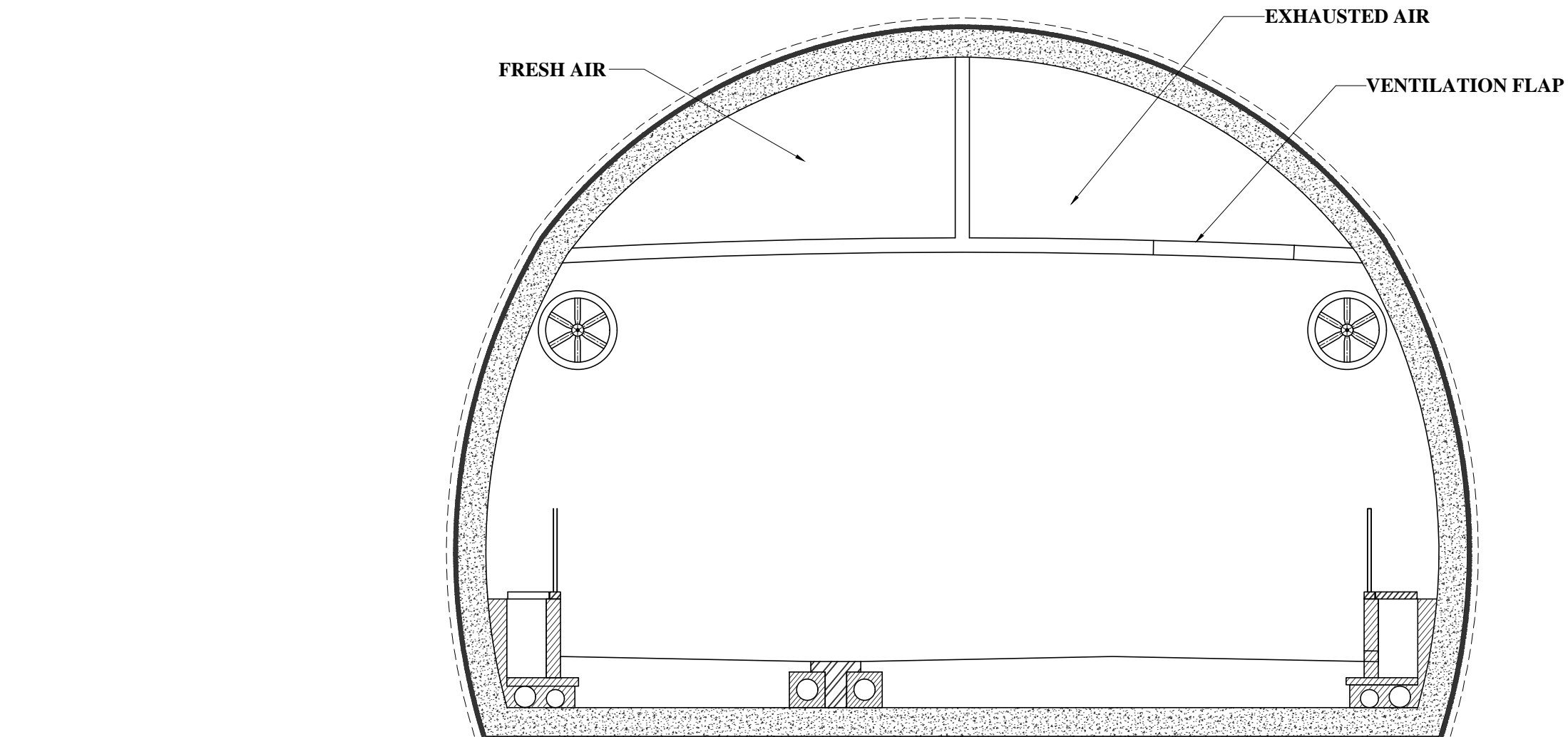
M.K.S.

A.K.S.

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F Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”	<u>CLIENT</u>		Drawing Title: SCHEMATIC LAY-OUT OF TECHNICAL EQUIPMENT IN FRONT OF THE TUNNEL				
	 MINISTRY OF ROAD TRANSPORT & HIGHWAYS		Drawing No. :- MC-ROADS/MISC/18			Sheet :	
			Scale :- NTS				
			Drm	Dgn.		Appd	Date
			M.R.	M.K.S.		A.K.S.	



Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”

CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: SCHEMATIC DIAGRAM OF THE MAIN VENTILATION SYSTEM

Drawing No. :- MC-ROADS/MISC/14

Sheet :

Scale :- NTS

Drm

Dgn.

Appd

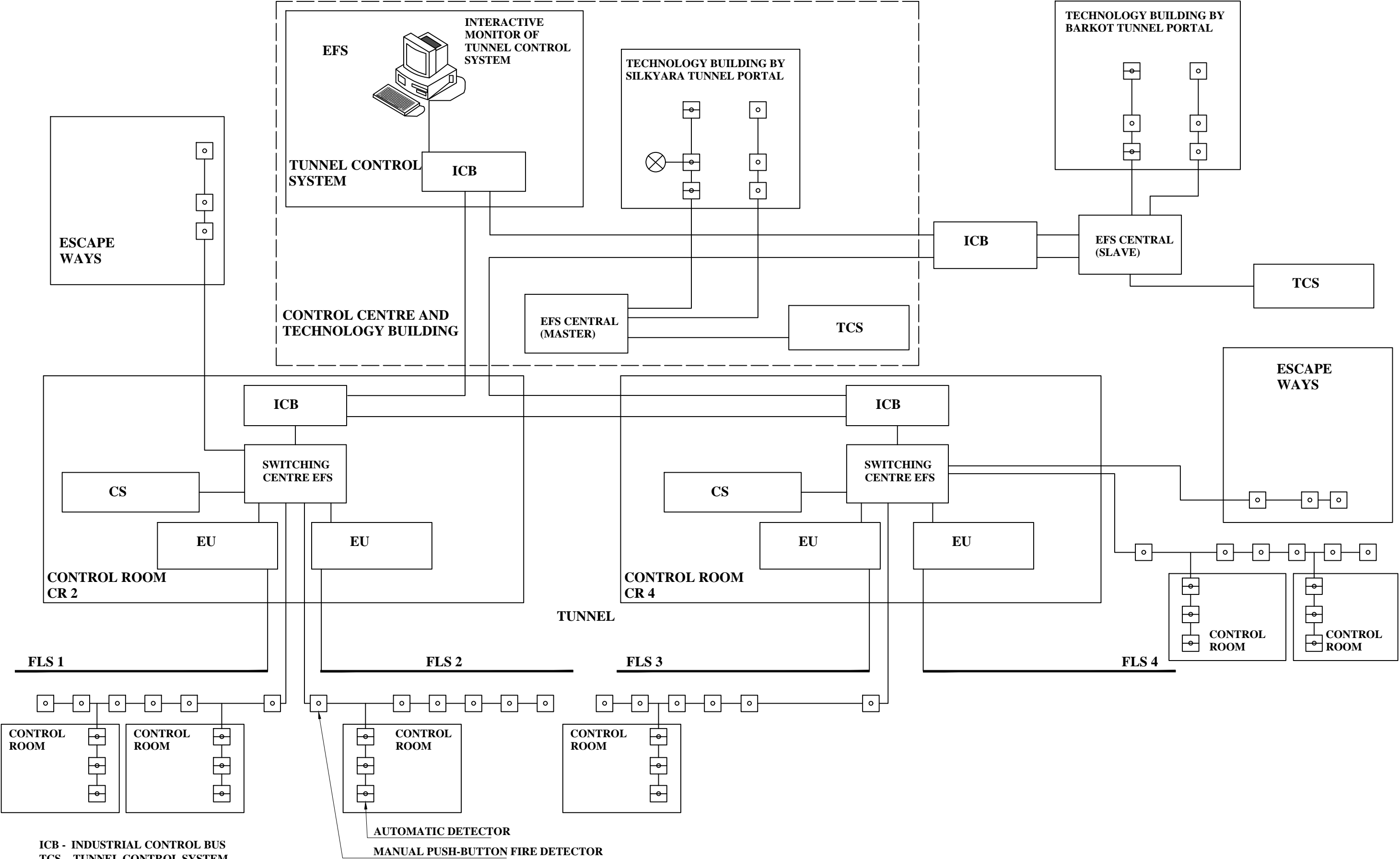
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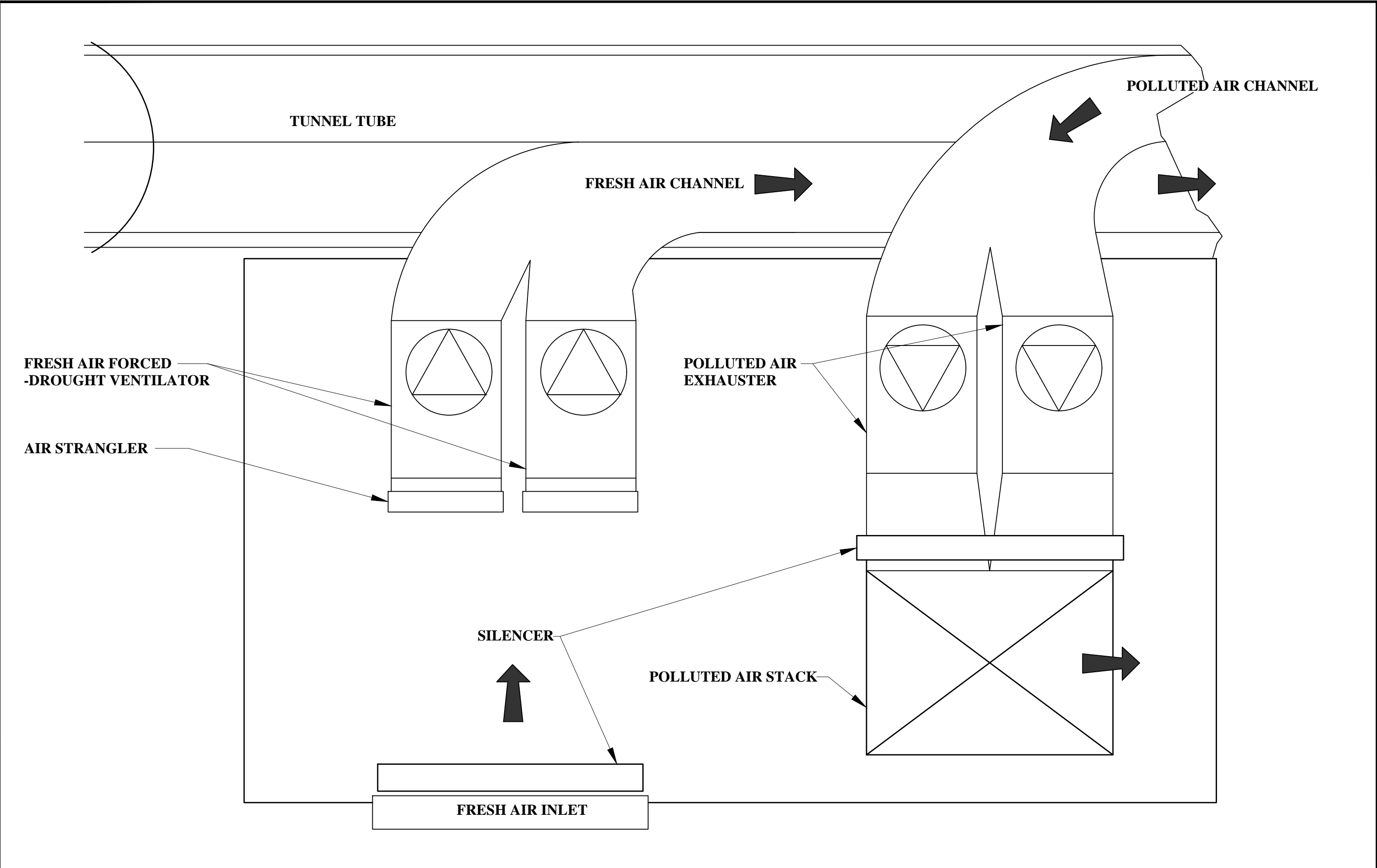
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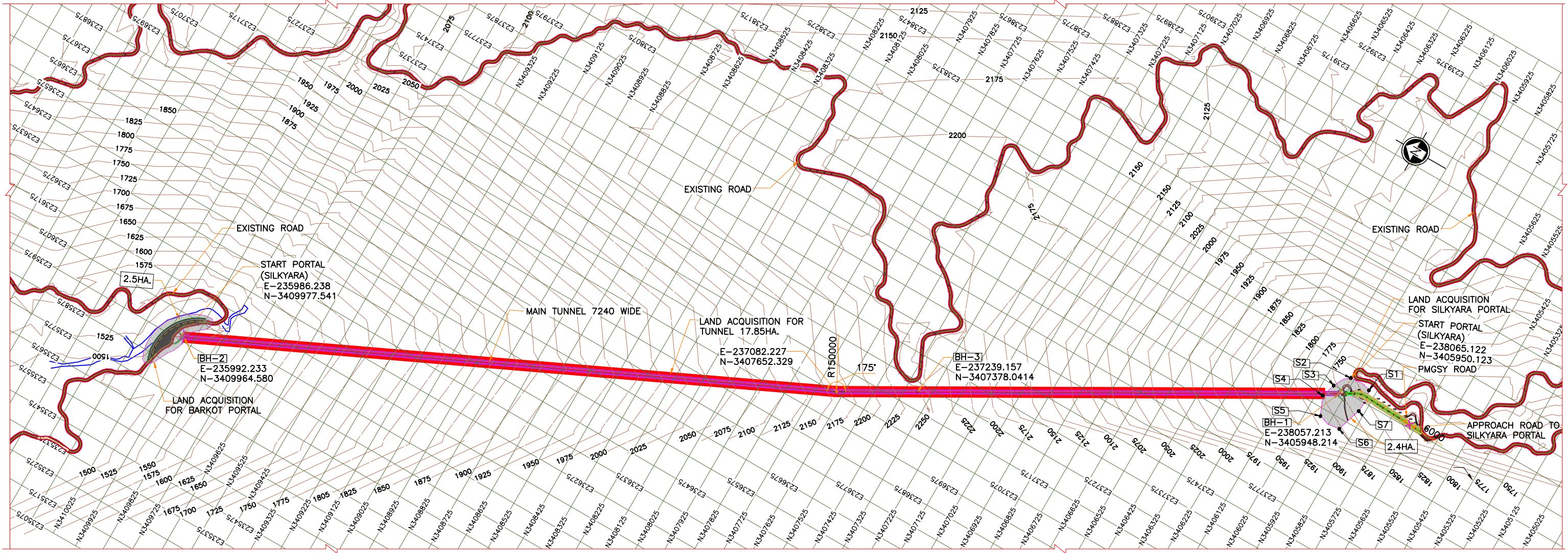
A.K.S.

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Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”	CLIENT			Drawing Title: THE SCHEMATIC LAY-OUT OF THE PORTAL VENTILATION MACHINE ROOM		5		
	MINISTRY OF ROAD TRANSPORT & HIGHWAYS			Drawing No. :- MC-ROADS/MISC/			Sheet :	
				Scale :- NTS				
				Drn	Dgn.		Appd	Date
				M.R.	M.K.S.		A.K.S.	MARCH-2017

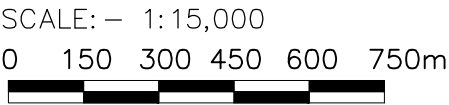


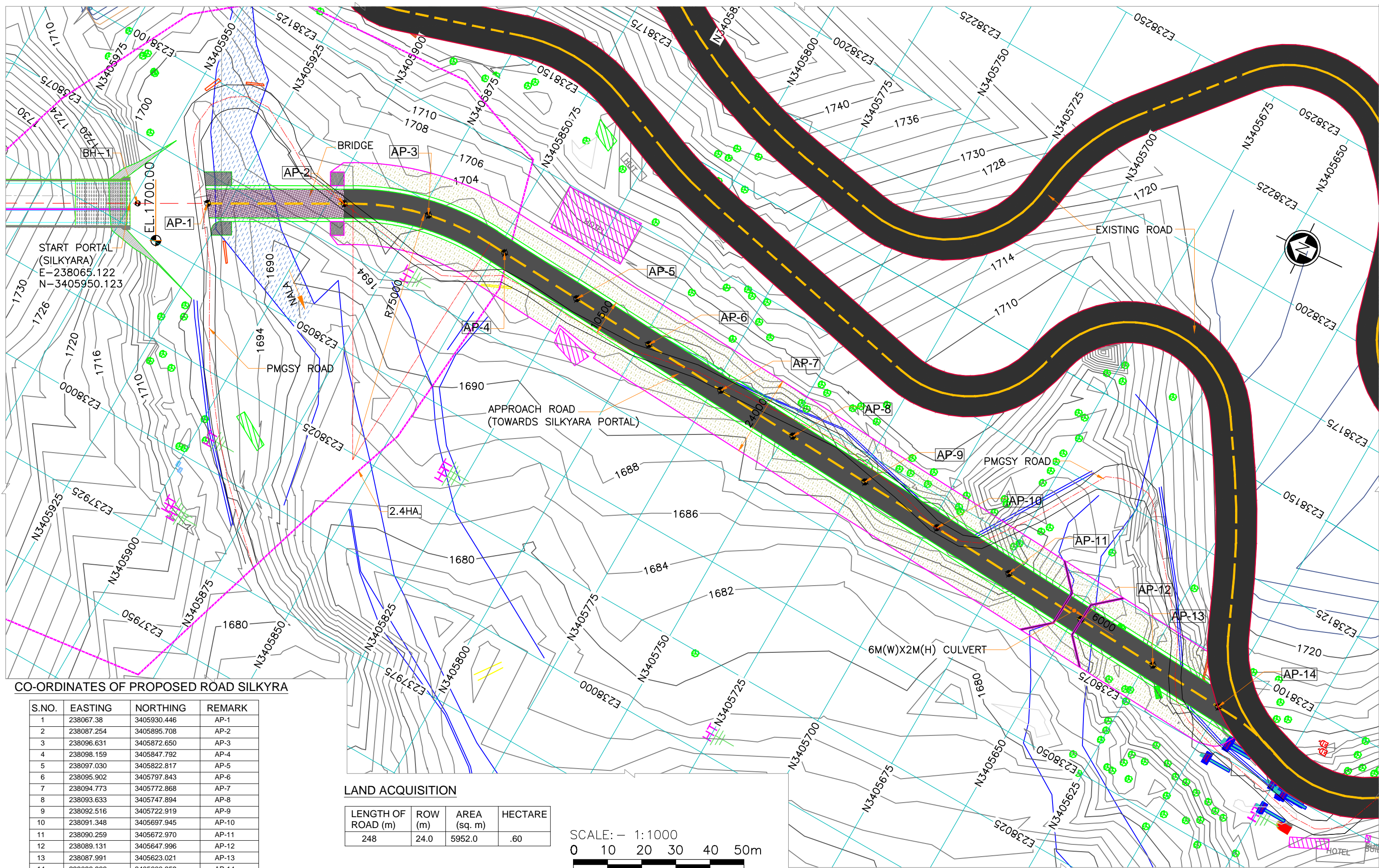
LAND ACQUISITION PLAN
(SCALE 1:15,000)

CO-ORDINATES OF SILKYRA FOREST LAND BOUNDARY

S.NO	DESCRIPTION	AREA IN HECTARES
1	FOR TUNNEL 4.462KM	17.85
2	FOR SILKYARA PORTAL	2.40
3	FOR BARKOT PORTAL	2.50
4	PRIVATE LAND ACQUISITION FOR APPROACH ROAD (LENGTH 248m ROW 24)	0.60
TOTAL FOREST LAND ACQUISITION		22.75
TOTAL FOREST DIVERSION		4.90

S.NO.	EASTING	NORTHING	REMARK
1	238125.991	3405854.116	S1
2	238131.857	3405939.172	S2
3	238072.986	3405982.672	S3
4	238017.750	3406000.054	S4
5	237944.154	3405967.992	S5
6	237937.650	3405879.354	S6
7	238036.033	3405848.160	S7



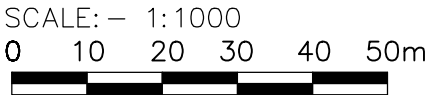


CO-ORDINATES OF PROPOSED ROAD SILKYRA

S.NO.	EASTING	NORTHING	REMARK
1	238067.38	3405930.446	AP-1
2	238087.254	3405895.708	AP-2
3	238096.631	3405872.650	AP-3
4	238098.159	3405847.792	AP-4
5	238097.030	3405822.817	AP-5
6	238095.902	3405797.843	AP-6
7	238094.773	3405772.868	AP-7
8	238093.633	3405747.894	AP-8
9	238092.516	3405722.919	AP-9
10	238091.348	3405697.945	AP-10
11	238090.259	3405672.970	AP-11
12	238089.131	3405647.996	AP-12
13	238087.991	3405623.021	AP-13
14	238086.966	3405600.359	AP-14

LAND ACQUISITION

LENGTH OF ROAD (m)	ROW (m)	AREA (sq. m)	HECTARE
248	24.0	5952.0	.60



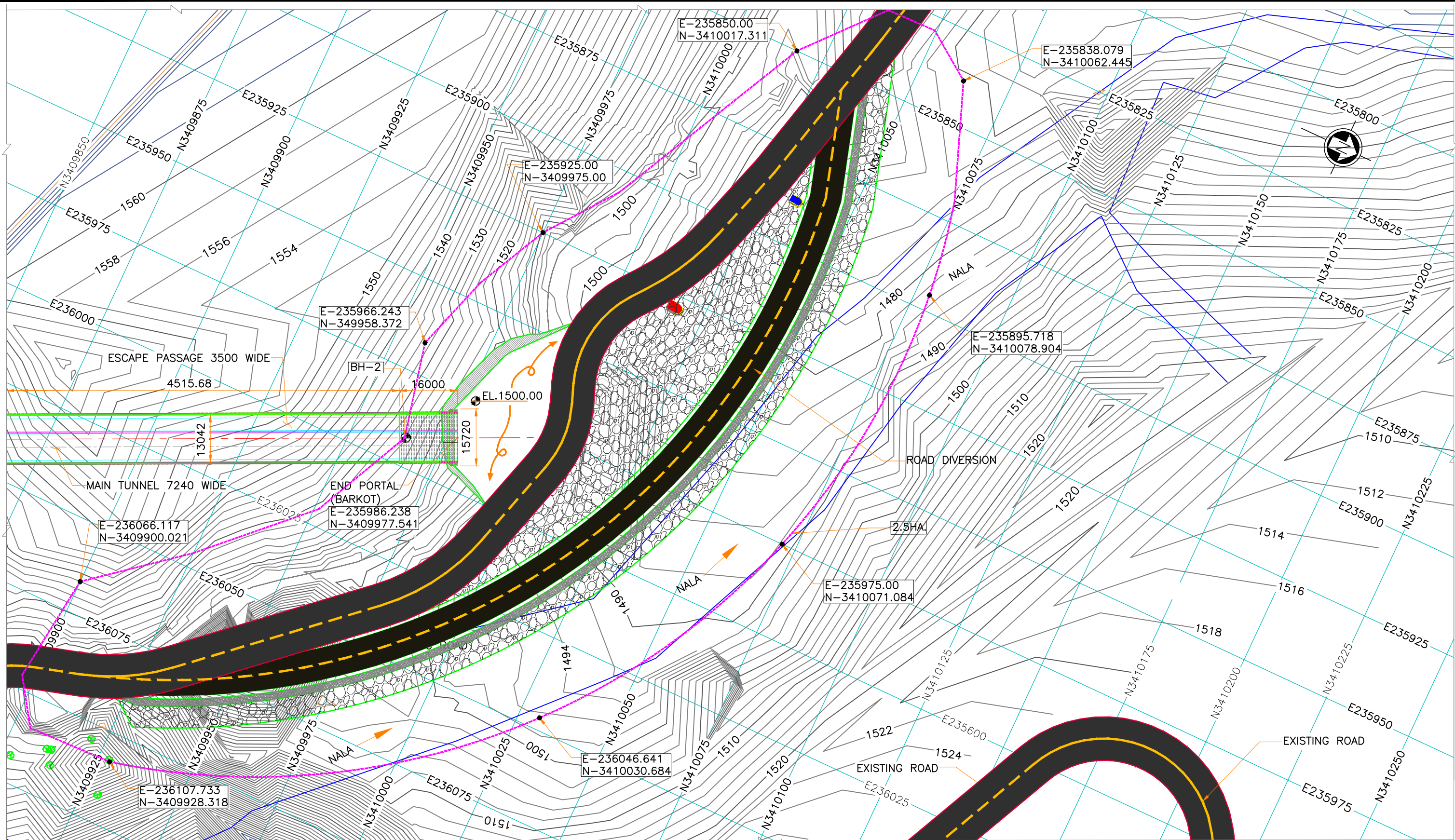
Project Title

Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyra Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode”



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: START PORTAL(SILKYRA) LAND ACQUISITION			
Drawing No. :- MC-ROADS/MISC/02-1			Sheet :
Scale :- NTS			
Drm	Dgn.	Appd	Date
M.R.	M.K.S.	A.K.S.	MARCH-2017



LAND ACQUISITION

DESCRIPTION	AREA (sq. m)	HECTARE
FOREST LAND DIVERSION AT BARKOT PORTAL	25000.00	2.5

END PORTAL LAYOUT PLAN
(SCALE 1:1250)

SCALE: - 1:1000
0 10 20 30 40 50m

Project Title :Construction, Operation and Maintenance of 2-Lane Bi-Directional Silkyara Bend – Barkot Tunnel With Escape Passage Including Approaches On Dharasu-Yamunotri Section Between Ch. 25.400 Km And Ch. 51.000 Km Falling Along NH-134 (OLD NH-94)in the State Of Uttarakhand on EPC mode"

CLIENT



MINISTRY OF ROAD TRANSPORT & HIGHWAYS

Drawing Title: END PORTAL(BARKOT) LAND ACQUISITION			
Drawing No. :- MC-ROADS/MISC/ 04-1			Sheet :
Scale :- NTS			
Dwn	Dgn.	Appd	Date
M.R.	M.K.S.	A.K.S.	MARCH-2017