



Construction of **Z-Morh Tunnel** including approaches on (Srinagar-Sonmarg-Gumri Road) with parallel escape tunnel on BOT (Annuity) basis, in DBFOT pattern in the state of Jammu and Kashmir.

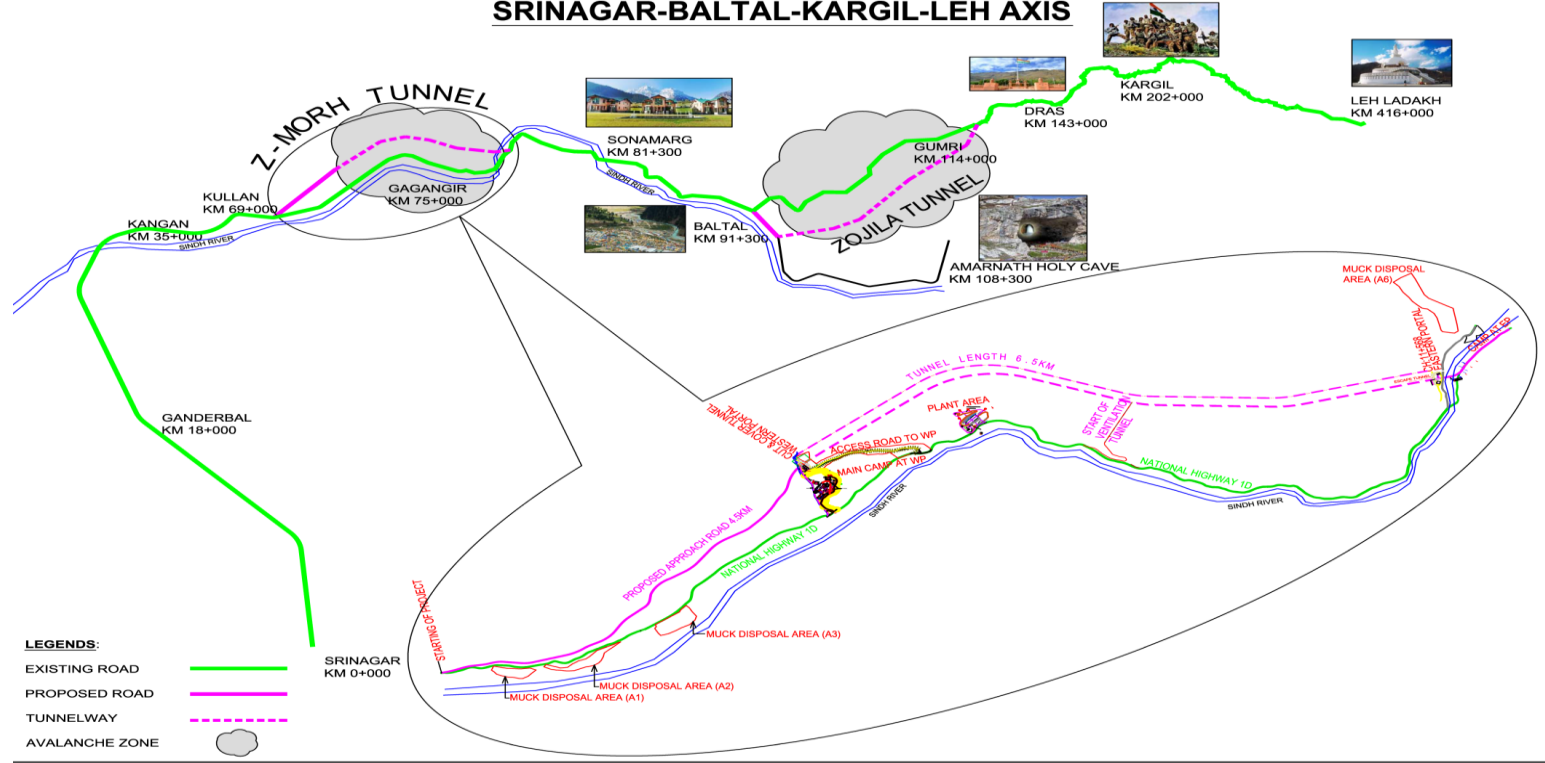
NHIDCL 4th INCEPTION DAY

NEW DELHI 18/07/2018



TUNNEL UBICATION

SRINAGAR-BALTAL-KARGIL-LEH AXIS





INTRODUCTION

- The project is located around 70 Km North-East of Srinagar City on NH-1 in Sringar-Leh route
- The total length of the Project is around 11.6Km
- The project includes following components :
 - Around 4.8 km approach 2 lane road from Village Rizan to Western Portal of Tunnel including one 240 m (6 span viaduct) and 0.5 Km road in eastern with a 70 m bridge.
 - A 3rd lane in western access road is under study due to required gradient (7%)
 - 6402 m of two lane road tunnel + 6402 m egress tunnel
 - 590 m of auxiliary ventilation tunnel + 42 high section cavern
 - All tunnels are excavated using NATM
 - Ventilation system is transverse in normal operation divided in 4 sectors
 - In case of fire, longitudinal fans and sector unification will provide smoke control and extraction in evacuation process



PROJECT BRIEF

Project Title		Construction Operation and Maintenance of Z-Morh Tunnel including approaches on National Highway No.1 (Srinagar Sonmarg Gumri Road) in the State of J&K on Design, Build Finance, Operate & Transfer (DBFOT) Annuity Basis			
Owner	:	National Highways & Infrastructure Development Corporation Limited. (NHIDCL)	Development Contract Type	:	Lump Sum Turn Key
Concessionaire	:	Srinagar Sonamarg Tunnel way limited (SSTL)	Construction Contract Type	:	Item rate
IE	:	EPTISA.	Development Cost	:	₹ 2473 Cr.
Project Developer	:	IL&FS Transportation Networks Limited (ITNL)	Total Capital Cost	:	₹ 3289 Cr
Contractor	:	APCO – TITAN JV	Concession Period	:	20 years
Design	:	ITNL Design Cell & Grusamar	Construction Period	:	1825 days
Appointed Date (Actual)	:	May 01, 2015	Schedule Project Completion Date (SPCD)	:	Initial: April 30, 2020 EOT 8 months December 2020
Time Elapsed (%)	:	55%	Semi Annuity	:	₹. 234.70 Cr



PROJECT DETAILS

Project Title

Construction Operation and Maintenance of Z-Morh Tunnel including approaches on National Highway No.1 (Srinagar Sonmarg Gumri Road) in the State of J&K on Design, Build Finance, Operate & Transfer (DBFOT) Annuity Basis

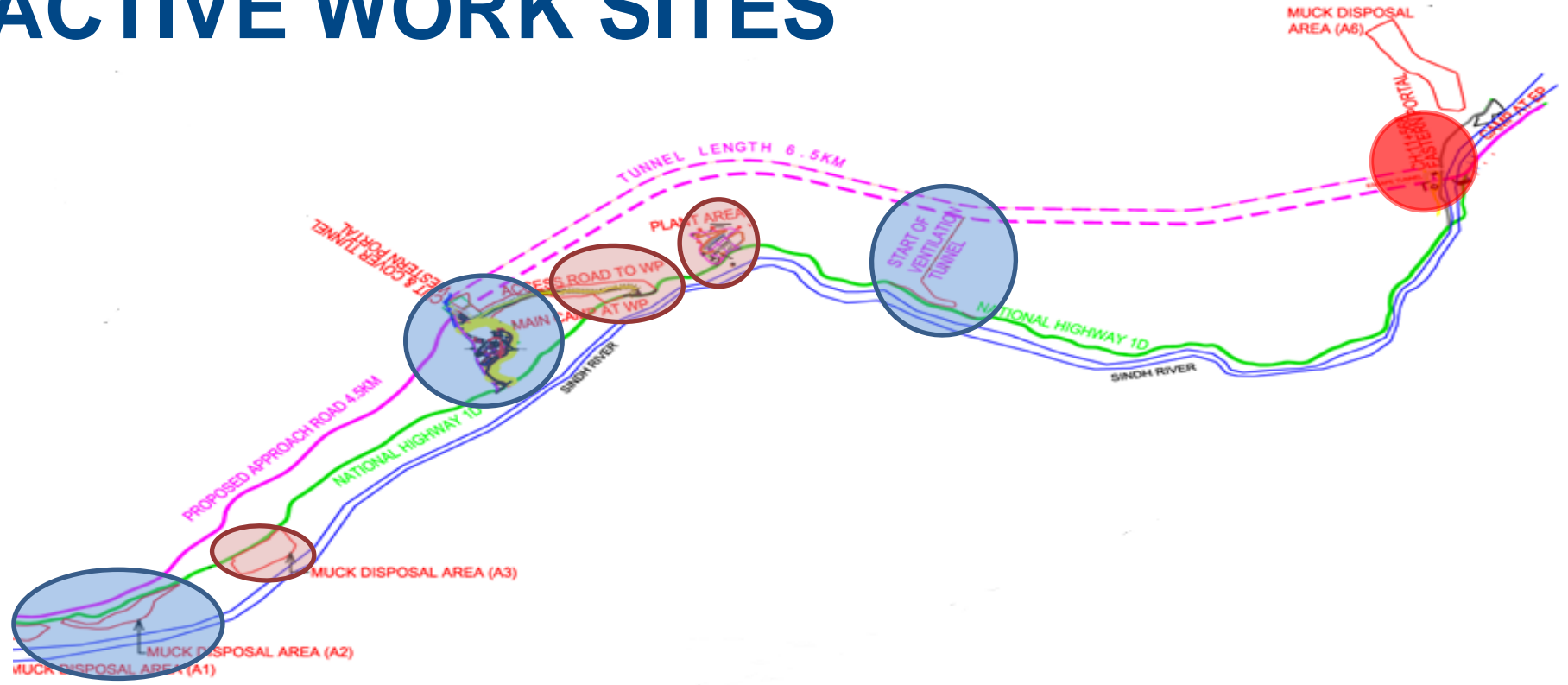
Main Tunnel	: 6.4 km	Escape Tunnel	: 6.4 km
Ventilation Tunnel	: 575 m	Ventilation Cavern	: 01 (42 m Length)
Cross Passage	: 25	Rigid Pavement	: 12.00 km (Both tunnel)
Flexible Pavement	: 5.60 Km	Rotary Junction	: 01
Minor Bridge	: 1 (30 m Span)	Tunnel Control Centre (Building)	: 02
Major Bridge	: 2 (70 m 1 span & 240m 6 spans)	Box culverts	: 23
Lay bays	: 08	Fire fighting System	: With 50 niches on both sides
Vehicular Emergency Exit	: 08	Ventilation Building	: 02+Intermediate
Pedestrian Cross Passage Exit	: 17	Sub Station for Power from J&K Electricity Board	: 02



PROJECT SITE

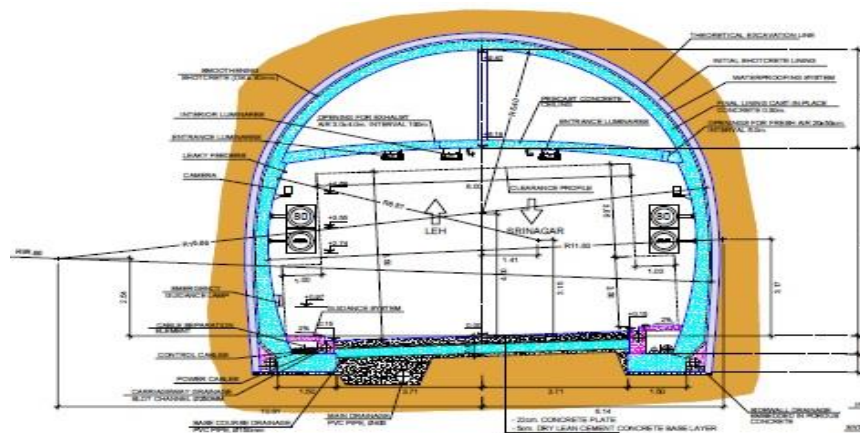


ACTIVE WORK SITES

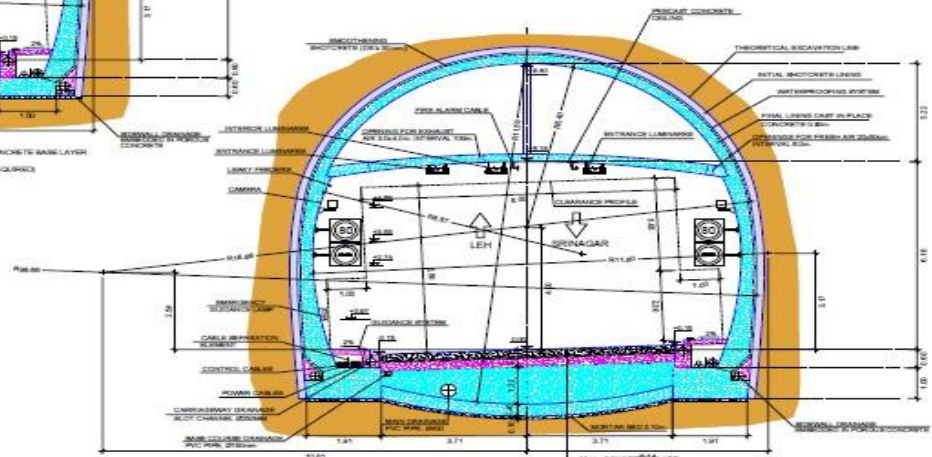




TUNNEL SECTIONS



CROSS SECTION WITHOUT INVERT
SCALE=1/50



CROSS SECTION WITH INVERT ARCH
SCALE=1/50

ACTIVE SITES & WORKS IN PROGRESS

1. WESTERN PORTAL

- Excavation in Main Tunnel: 1 face
- Excavation in Egress tunnel: 1 face

2. VENTILATION PORTAL

- Excavation in Main Tunnel: 2 faces
- Excavation in Egress tunnel: 2 faces
- Ventilation tunnel and Ventilation Cavern excavation completed

3. EASTERN PORTAL

- Excavation in Main Tunnel: 1 face
- Excavation in Egress tunnel: 1 face

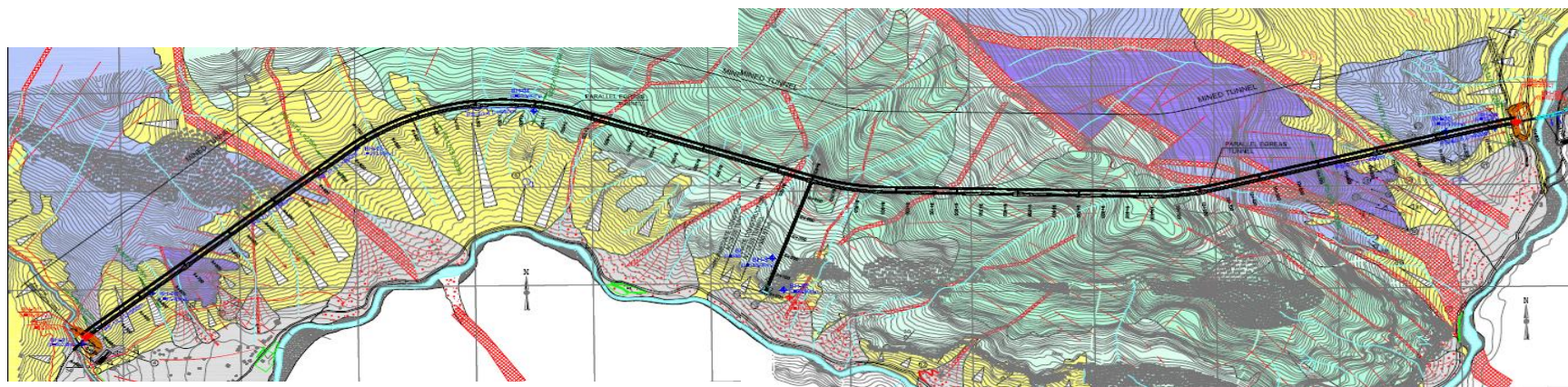


ACTIVE SITES & WORKS IN PROGRESS

1. ACCESS ROAD CH 0+000 to 1+000 and 4+000 to 4+500
 - Earth works
 - Retaining walls
2. ACCESS ROAD CH 4+000 to 4+500
 - Earth works
 - Retaining walls
 - Minor bridge abutments
3. ACCESS ROAD CH 11+181
 - MJB 11+181 2 Abutments foundations completed & Vertical walls
4. AUXILIARY EQUIPMENT
 - Access road to Western Portal slopes
 - Muck disposal area.
 - Camp area
 - Fabrication&storage sites



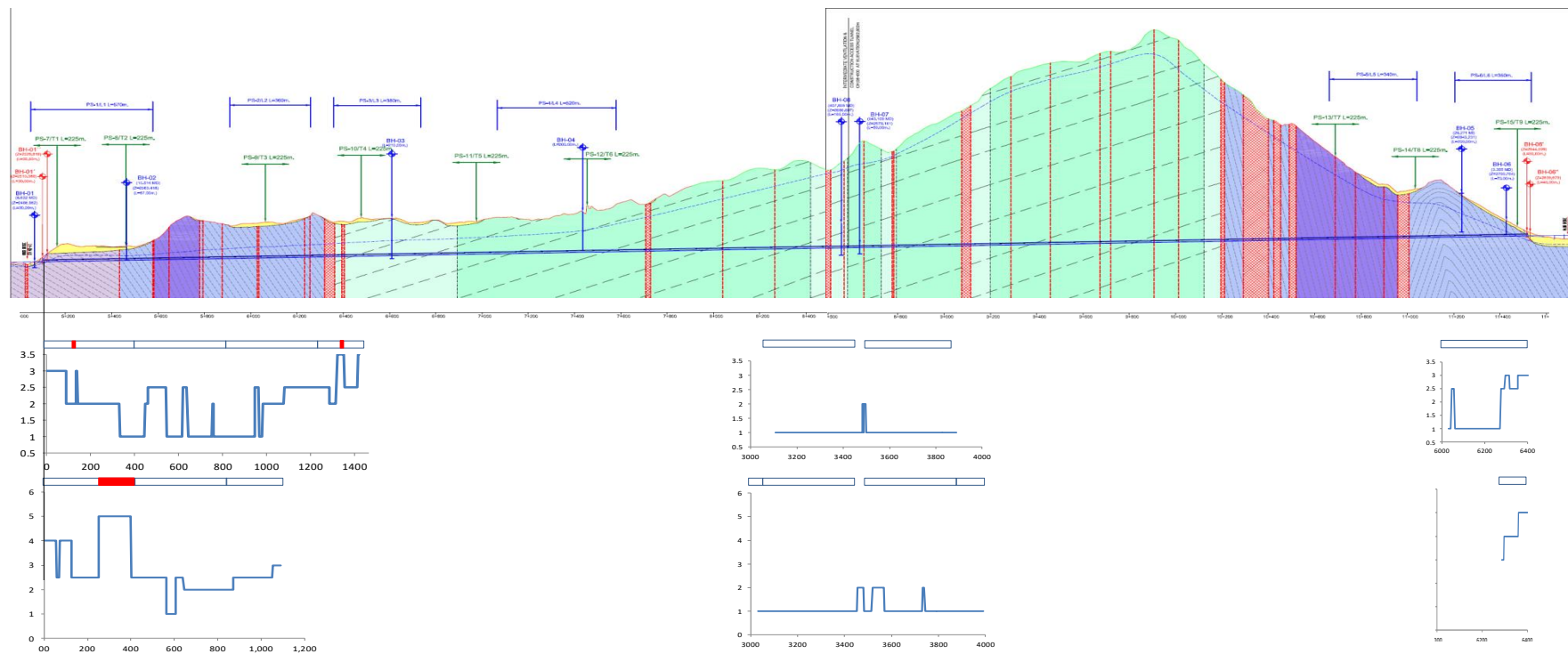
GEOLOGICAL PLANT



GEOLOGICAL PLANT LEGEND			
<p>QUATERNARY</p> <ul style="list-style-type: none"> - RIVER SEDIMENT. - COLLUVIAL. - ALLUVIAL FAN. <ul style="list-style-type: none"> - MEDIUM GRAIN SIZE. - MEDIUM GRAIN SIZE + BLOCKS. 	<p>PERMIAN - CARBONIFEROUS</p> <ul style="list-style-type: none"> - ZOJILA FM. SLATE AND MICA SCHIST. - ZOJILA FM. CALCAREOUS - SCHIST. - ZOJILA FM. QUARTZITIC - SCHIST. - PANJAL TRAP FM. METABASITES MASSIVE. - PANJAL TRAP FM. METABASITES FRACTURED. 	<p>CONVENTIONAL SYMBOLS</p> <ul style="list-style-type: none"> - FAULTS. - SHEAR ZONE. - CONTACT BETWEEN FORMATIONS. - STRIKE AND DIP OF FOLIATION. - STRIKE AND DIP OF JOINT. - FAULTS. - SHEAR ZONE. - CONTACT BETWEEN FORMATIONS. 	<p>GEOLOGICAL INVESTIGATION 2013</p> <ul style="list-style-type: none"> - BORE HOLE DH-01 (L=100.00m) - SEISMIC PROFILE PS-2/L2 L=360m. PS-10/T4 L=225m. - MOVEMENTS OF HILLSIDE. - WATER UPWELLING.



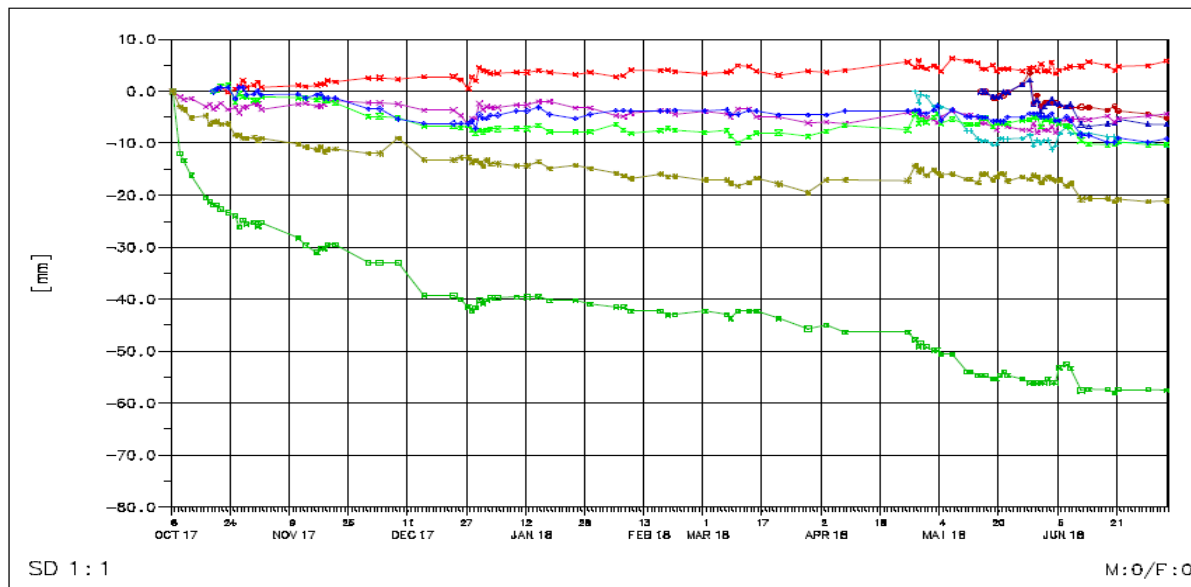
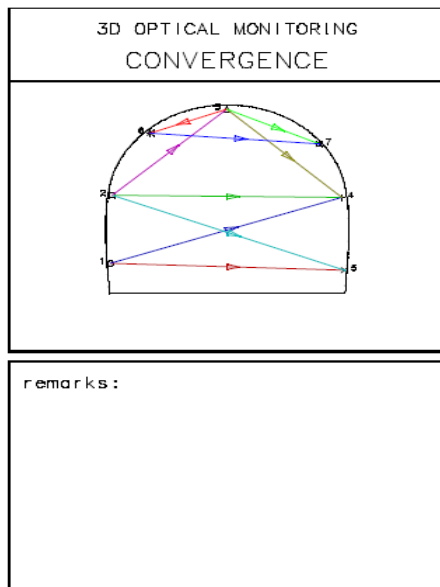
GEOLOGICAL PROFILE COMPARISON





DETAIL OF MONITORING IN F1-MT

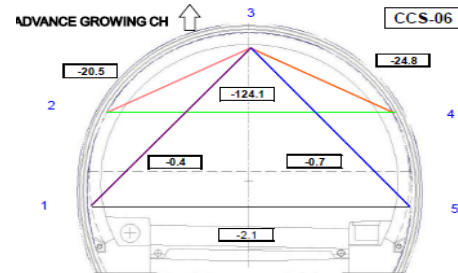
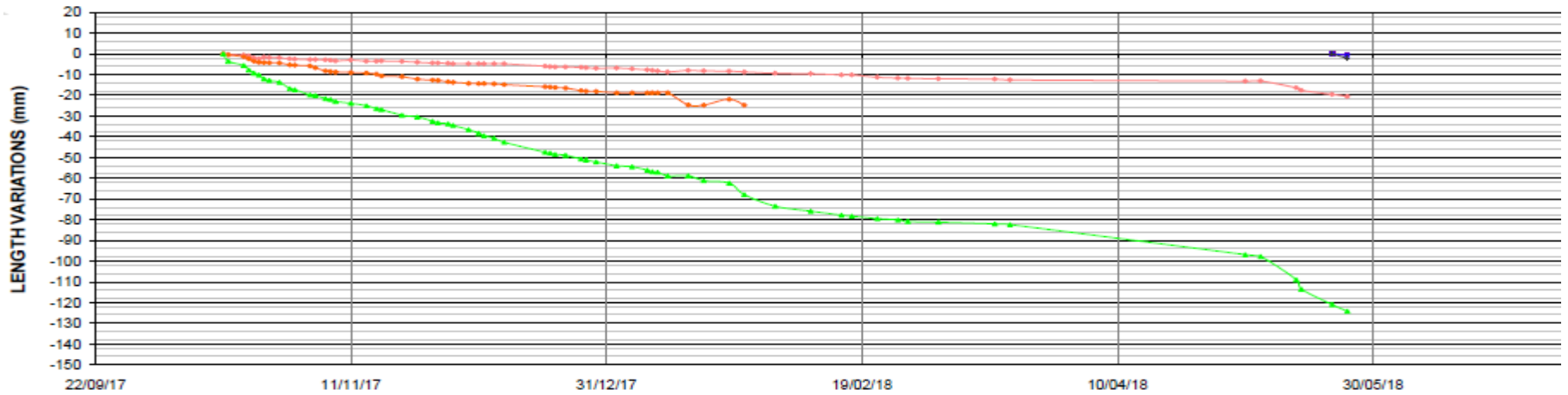
SSTL-APCO DATA





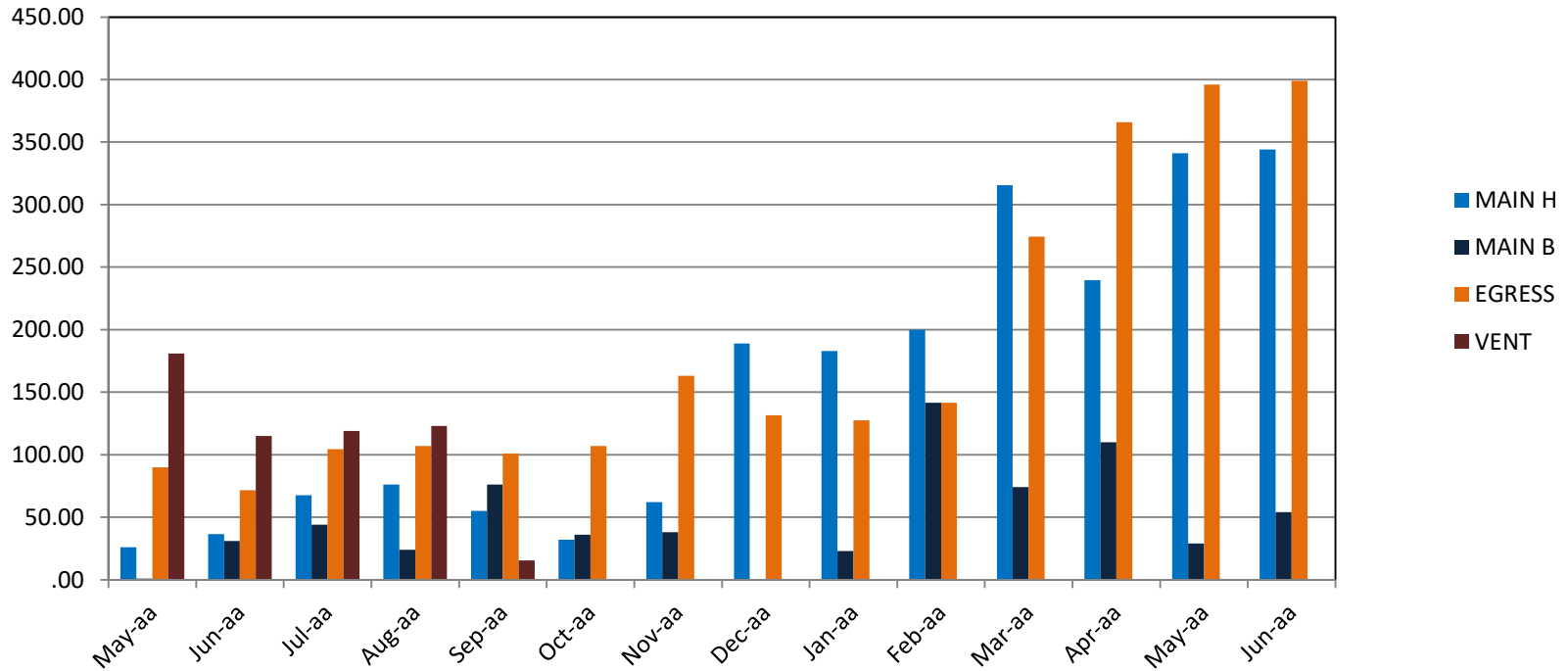
DETAIL OF MONITORING IN F1-MT

IE DATA



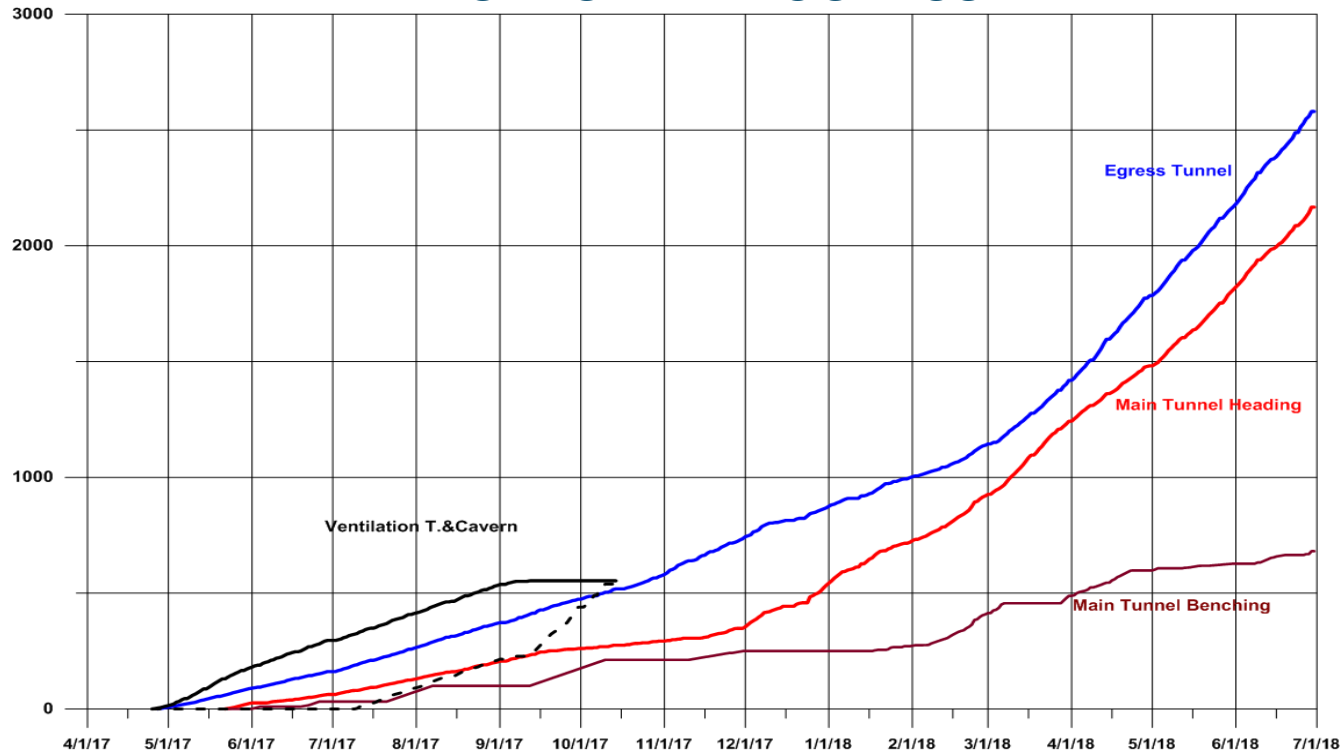
TUNNEL EXCAVATION PROGRESS

MONTHLY PROGRESS



TUNNEL EXCAVATION PROGRESS

AGREGATE PROGRESS





TUNNEL EXCAVATION PROGRESS

MAIN TUNNEL

	START DATE	END DATE	DAYS			SECTION				LENGTH		RATIOS	
			T	H	B	DB HEADING		DB BENCHING		LH	LB	CYCLE	WR
FACE1	22/05/2017	26/04/2017	420	232	91	0.0	556.5	0.0	270.0	556.5	270.0	63.97%	55.24%
FACE2	06/12/2017		222	65		6411.9	6297.9	6411.9	6411.9	114.0	0.0	85.71%	29.28%
FACE3	01/12/2017		227	134	24	3452.4	3964.4	3452.4	3575.4	512.0	123.0	44.94%	59.03%
FACE4	24/12/2017		204	129	29	3482.4	3031.9	3482.4	3398.9	450.5	83.5	40.54%	77.45%
FACE5	17/11/2017		241	153	38	565.0	1099.0	565.0	770.0	534.0	205.0	51.67%	63.48%
TOTALS										2167.0	681.5		
										33.8%	10.6%		

EGRESS TUNNEL

	START DATE	END DATE	DAYS			SECTION				LENGTH		RATIOS	
			T	H	B	DB HEADING		DB BENCHING		LH	LB	CYCLE	WR
FACE1	17/04/2017		455	365		0.0	1417.5			1417.5		70.38%	80.22%
FACE2	03/11/2017		255	97		6402.0	6024.0			378.0		68.42%	38.04%
FACE3	15/02/2018		151	112		3501.0	3911.0			410.0		49.25%	74.17%
FACE4	22/02/2018		144	110		3501.0	3126.5			374.5		44.98%	76.38%
TOTALS										2580.0			
										40.3%			

VENTILATION TUNNEL

	START DATE	END DATE	DAYS			SECTION				LENGTH		RATIOS	
			T	H	B	DB HEADING		DB BENCHING		LH	LB	CYCLE	WR
TUNNEL	25/04/2017	14/10/2017	172	118	24	0	553.5	0	553.5	553.5	553.5	47.86%	82.56%
CAVERN	15/10/2017	10/02/2018	118	44	46	553.5	596.5	553.5	596.5	43.0	43.0	68.22%	76.27%
TOTALS										596.5			
										100.0%			



PHYSICAL PROGRESS

#	Description	Unit	Scope	Completed	%age
TUNNEL WORK					
1.	Main tunnel-Heading	Mtr	6400	2167.0	33.8%
	Main Tunnel-Benching	Mtr.	6400	681.5	10.6%
2.	Escape Tunnel	Mtr.	6400	2580.0	40,3%
3.	Ventilation Tunnel and Ventilation Cavern	Mtr.	596	596.0	100%
4.	Cross Passages	Ud	17	4	23.5%
5.	Portals	Uds	3	3	100%
ROAD WORK					
5.	Main Approach Road-Embankment work in Progress WP	Mtr.	4636	1650	35.6%
STRUCTURE WORK					
6.	Major Bridge MJB 11+181				
a.	Foundation	Nos.	2	2	100%
b.	Sub-structure	Nos.	2	1	80%
c.	Super Structure	Nos.	1	-	-

OVERALL PROGRESS 38,04%

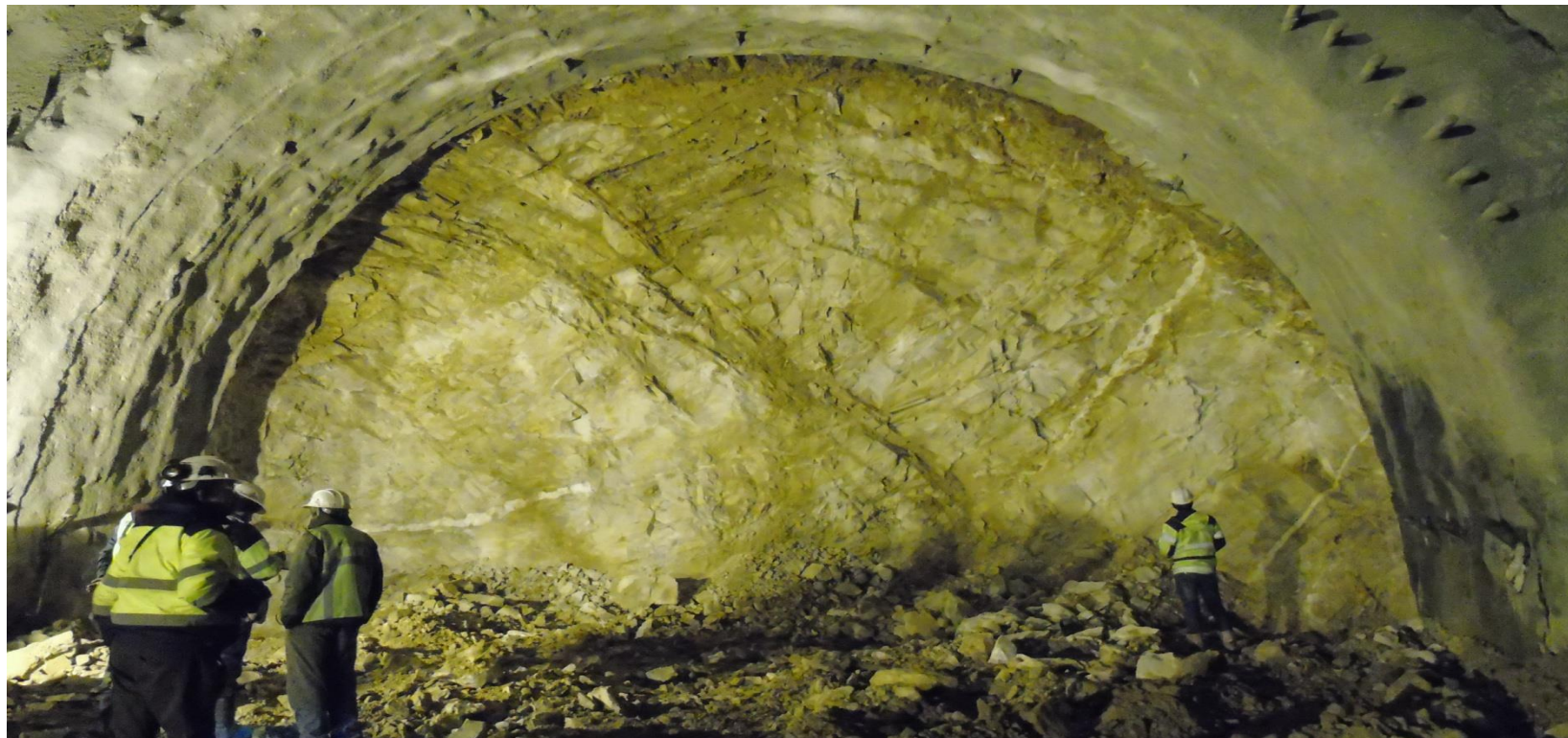


ACCESS ROAD





WP/FACE1





WP/FACE1-5





WP/FACE 5





WP/EGRESS





VENTILATION PORTAL STABILISATION





VENTILATION CAVERN





VT/FACE 3





VT/FACE 4





EAST PORTAK (February 2018)





EAST PORTAL (May 2018)





MAIN TUNNEL EAST FACE (May 2018)





EP ACCESS (February 2018)





IE: MAIN INCIDENTS ZMORH

1. CLOUD BURST IN JULY 2015
2. DISTURBANCES JULY – OCTOBER 2016
3. MINOR INCIDENTS WITH VILAYERS
4. WINTER CONDITIONS
 - EAST PORTAL REMAINS UNNACCESSIBLE IN PERIOD JANUARY TO APRIL
 - DIFFICULT ACCESS TO VENTILATION PORTAL BETWEEN JANUARY TO APRIL
5. UNPREVISTED PRESENCE OF CLAY IN 150 m OF MAIN TUNNEL
6. East portal should be redesigned DUE TO LOCAL geotechnical conditions



IE: SUMMER 2018 OBJECTIVES

1. CONNECT WEST AND VENTILATION PORTAL ACROSS EGRESS TUNNEL
2. CROSS CONTACT WITH WATER ZONES EXPERT IN EASTERN PORTAL
3. IMPOROVE PRODUCTION RATIO IN TUNNELS&ROADS

Improve quality in blasting process.

Improve excavation in winter

Improve access road earth works & slope stabilisation

6. CLOSE DESIGN PROCESS

Complete Final Lining design

Complete E&M design

3rd LANE DESIGN

Complete MB Design



MINISTRY OF ROAD,
TRANSPORT & HIGHWAY



IL&FS

SRINAGAR SONAMARG
TUNNELWAY Ltd

Thank you for
your attention



EQUIPMENTS AVAILABLE

No.	DESCRIPTION	PLANNED	AVAILABLE	PENDING	Remarks
1	Batching Plant with Silo Cement Feeder(200T)	3	2	1	In Transit
2	Crushing Plant	1	1	-	
3	Drill Jumbo – 2 Boom/3 boom	8	7	1	
4	Shotcrete – Meyco Potenza	7	7		
5	Hydraulic Excavator- 25T/30T/35T	11	11	0	
6	Wheel Loader(Side Tilt)	6	3		
7	Wheel Loader- 3.2/4.5 cum	7	2	5	
8	Backhoe Loader	2	2	0	
9	Diesel Generator sets 82.5 to 1010 Kva	17	17	0	
10	HD Trucks – TATA/MAN	40	25	15	
11	Grout Pump MAI NT 400 & NT 700	8	6	-	
12	Manitou	8	6	2	
13	Transit Mixer	16	8	8	
14	ROC / Track Drill	4	4	0	
15	Air Compressor(600cufm+400cufm)	6	6	0	
16	Ventilation Fan	8	7	1	
17	Surface Drilling Hydraulic	1	1	0	



MANPOWER DEPLOYED

SL no	Category	Total Nos
1	Officers	112
2	Workmen	328
3	PRW	316
	TOTAL	756