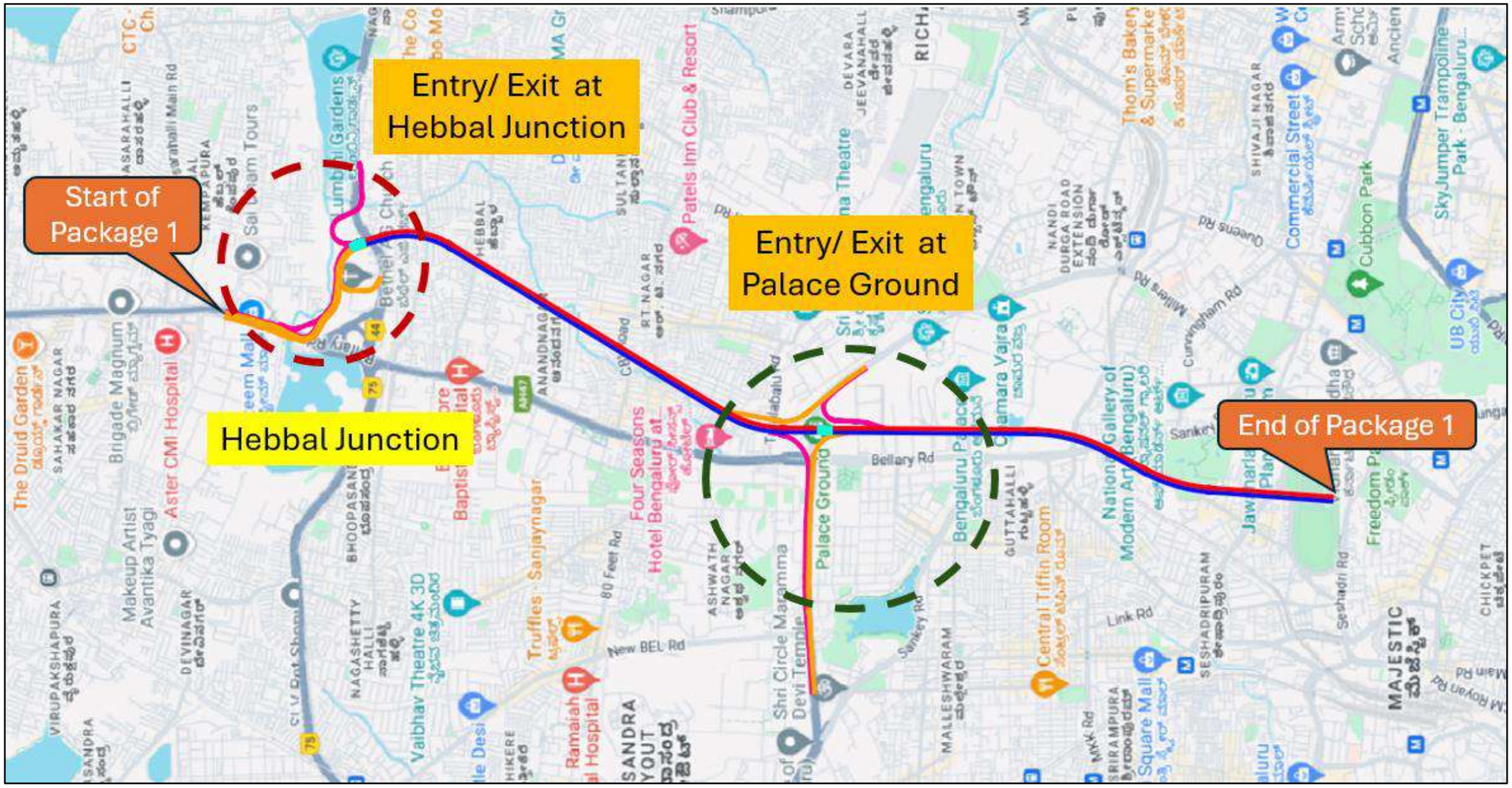
GOVERNMENT OF KARNATAKA

CONSULTANCY SERVICES FOR PREPARATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION



VOLUME-4-TENDER DRAWINGS PACKAGE-1

TUNNEL TUBE -I

Hebbal Esteem mall junction

Silk Road

Legend

Topographic Survey

Asphalt Edge		Flag Pole			Median		
Building		Foot Path			Palm Tree		
Bus Stop		Gate			Parking		
Bollard		Handrail			Pole		
Concrete		High Mast Light			Power Pole		
Closed Drain		Light Pole			Post		
Curb Top & Bottom		Lamp Post			Retaining Wall Top & Bottom		
Electrical Box	EB	Manhole	MH		Road Centreline		
Fence					Road Median		
Road Sign	SB	Sink			Transformer		
Roof Extension		Sky Walk Bridge			Tree		
Safety Barrier		Sports Field			Tunnel		
Security Room		Stairs			Tree Line		
Shed		Telecommunication Tower			Wall		
Shelter		Telephone Box	TPB		Water Body		
Side Walk		Temporary Barrier			Water Tank		
Sign Board	SB	Track			Zebra Crossing		
Single Post		Traffic Signal	TS				

Legend

Plan			L Profile	
Proposed Tunnel Tube-I			Proposed Road Levels	
Proposed Tunnel Tube-II			Existing Levels	
Proposed Shaft			Proposed NATM	
Proposed Vehicular Cross Passage			Proposed Cut & Cover	
Proposed NATM (Entry Ramp)			Proposed Shaft	
Proposed NATM (Exit Ramp)			G - Gradient %	
Proposed Cut & Cover (Entry Ramp)			Lv - Length of Vertical Curve	
Proposed Cut & Cover (Exit Ramp)			L - Length of Grade(m)	
Proposed Open Cut (Exit Ramp)			K - Ratio Between vertical curve Length & Change of Gradient {Lc/(G2-G1)}	
Proposed Open Cut (Entry Ramp)			e - Superelevation (%)	
Proposed Rights of Way	PROW PROW PROW		D - Straight Length of Horizontal Alignment	
Existing Rights of Way			Lc - Length of Circular Curve	
Airport Metro Line				
Metro Line (Phase-1)				
Metro Line (Phase-2)				
Metro Line (Phase-3A)				
R - Radius of Curve				
Dc - Degree of Curvature				
Lc - Length of Circular Curve				
Ts - Tangent Length				
Es - Apex Distance				
LS - Length of Spiral Curve				
∆ - Deflection Angle				
DS - Design Speed Km/Hr				
PC - Point of Curvature				
PT - Point of Tangent				
HIP - Horizontal Intersection Point				

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GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
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CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

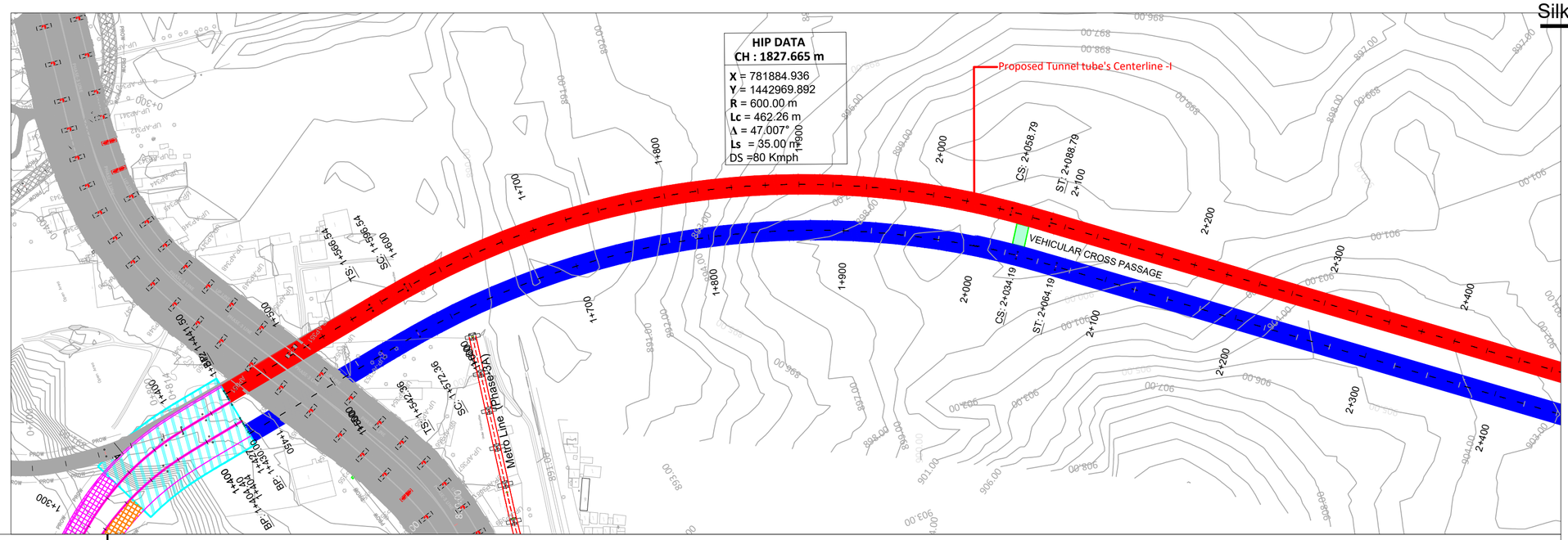
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Approved:	HRY	

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Drawing Title	PLAN & PROFILE (LEGEND)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ Legend /R0

Hebbal Esteem mall junction

Silk Road



Proposed Levels	863.334 863.124 862.507 861.891 861.274 860.657 860.040 859.423 858.806 858.189 857.573 856.956 856.339 855.722 855.105 854.488 853.872 853.255 852.645 852.099 851.631 851.240 850.927 850.691 850.532 850.450 850.446 850.520 850.670 850.898 851.197 851.509 851.820 852.131 852.443 852.754 853.066 853.377 853.689 854.000 854.312 854.623 854.935 855.246
Existing Levels	888.733 888.305 888.790 888.406 889.656 889.804 890.069 889.961 889.961 889.352 890.273 888.728 888.698 889.635 890.255 891.088 892.424 893.886 895.139 895.805 896.522 897.744 898.993 899.718 899.956 899.281 898.576 898.450 899.123 899.275 899.366 899.718 900.676 901.898 903.322 904.495 904.785 904.224 904.102 903.978 903.668 903.160 902.711 901.981
Level Difference	-25.399 -25.181 -26.283 -26.515 -28.383 -29.147 -30.028 -30.538 -31.154 -31.163 -32.700 -31.772 -32.359 -33.912 -35.150 -36.599 -38.552 -40.632 -42.494 -43.706 -44.891 -46.503 -48.067 -49.027 -49.424 -48.831 -48.129 -47.930 -48.453 -48.377 -48.169 -48.210 -48.856 -49.767 -50.879 -51.741 -51.720 -50.847 -50.413 -49.978 -49.356 -48.537 -47.776 -46.734
Horizontal	L =125.036 L: 30.000 R: 600.000 L: 462.258 L: 30.000
Vertical	G =-2.467% L =422.961 R =8079.070 K =80.791 L =300.000
Chainage	1441.500 1450.000 1475.000 1500.000 1525.000 1550.000 1575.000 1600.000 1625.000 1650.000 1675.000 1700.000 1725.000 1750.000 1775.000 1800.000 1825.000 1850.000 1875.000 1900.000 1925.000 1950.000 1975.000 2000.000 2025.000 2050.000 2075.000 2100.000 2125.000 2150.000 2175.000 2200.000 2225.000 2250.000 2275.000 2300.000 2325.000 2350.000 2375.000 2400.000 2425.000 2450.000 2475.000 2500.000

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GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:

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NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
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(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

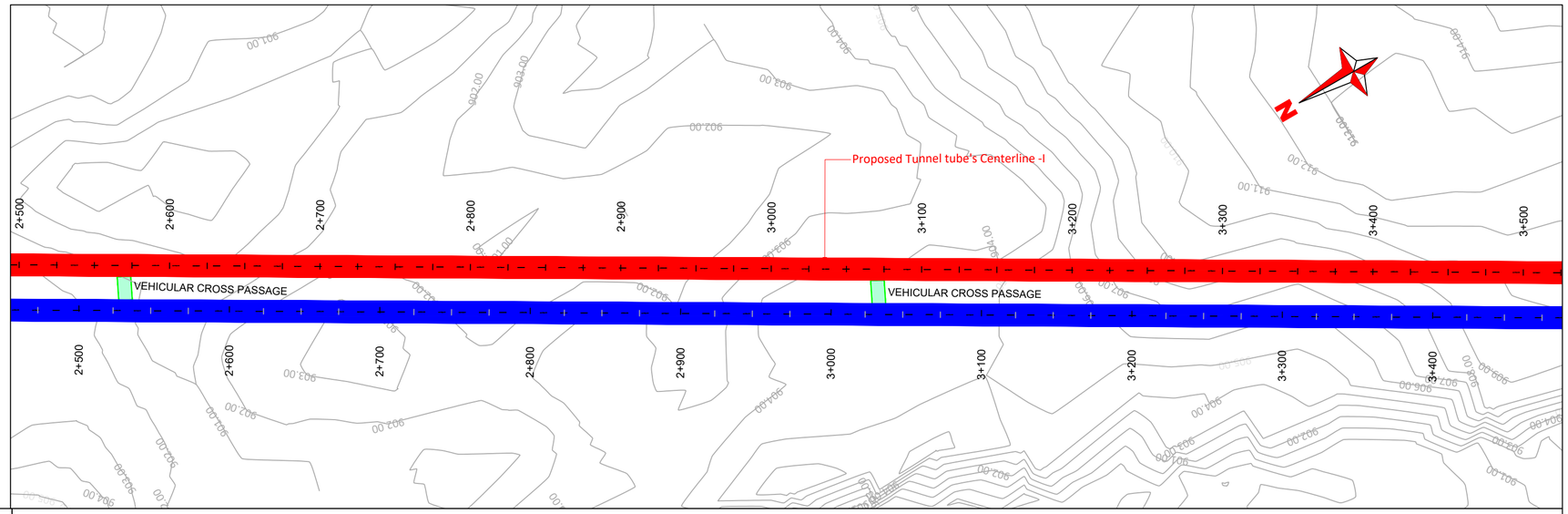
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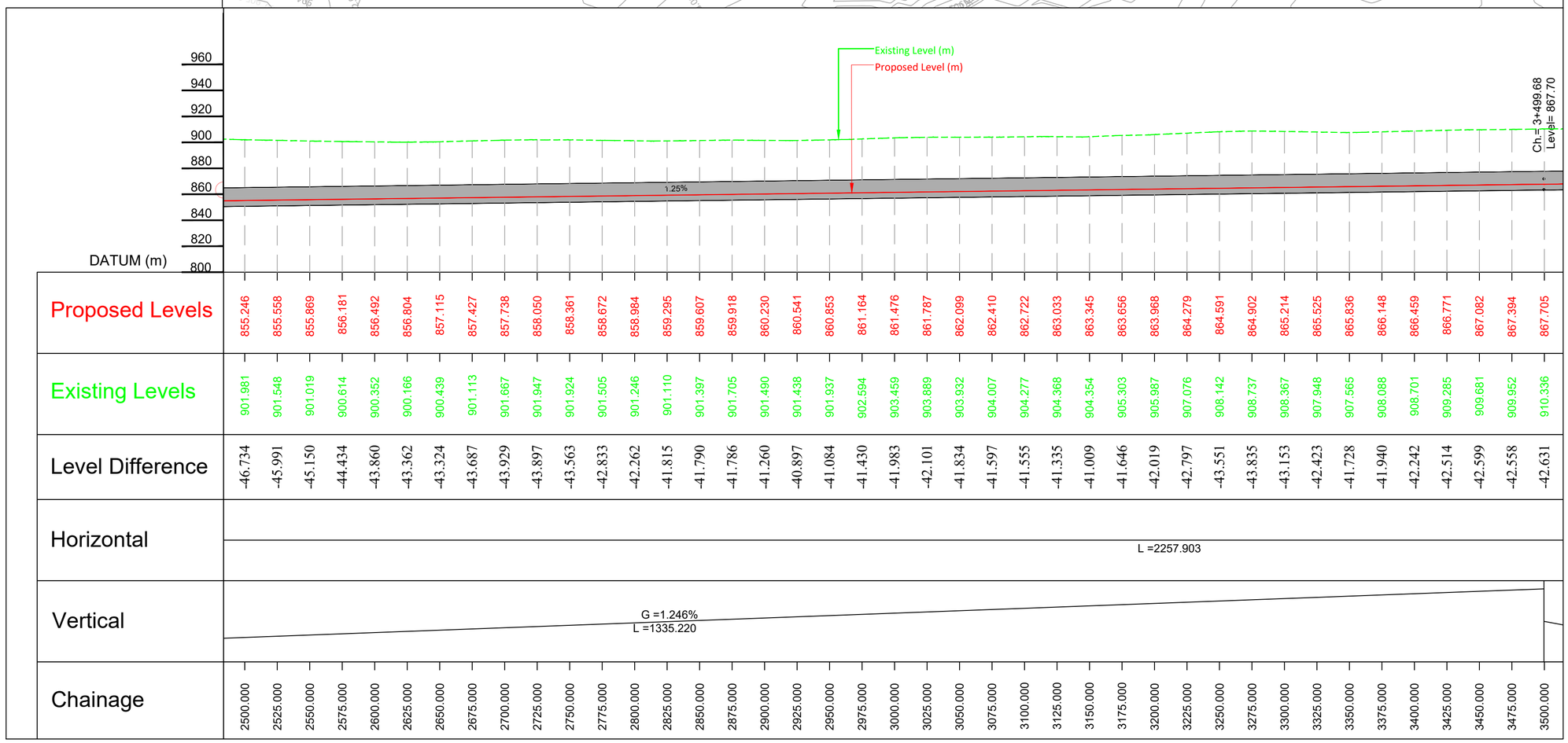
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Drawing Title	PLAN & PROFILE (TUNNEL TUBE - I) (Km.1+441 to Km.2+500)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 01/R0

Hebbal Esteem mall junction

Silk Road





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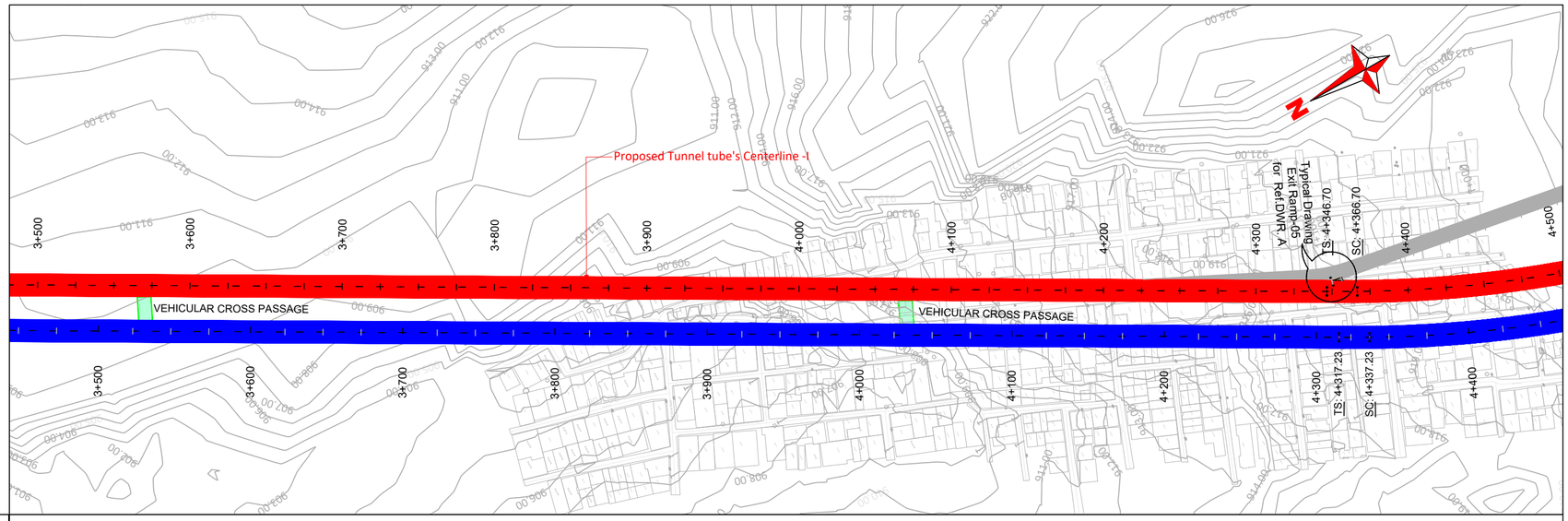
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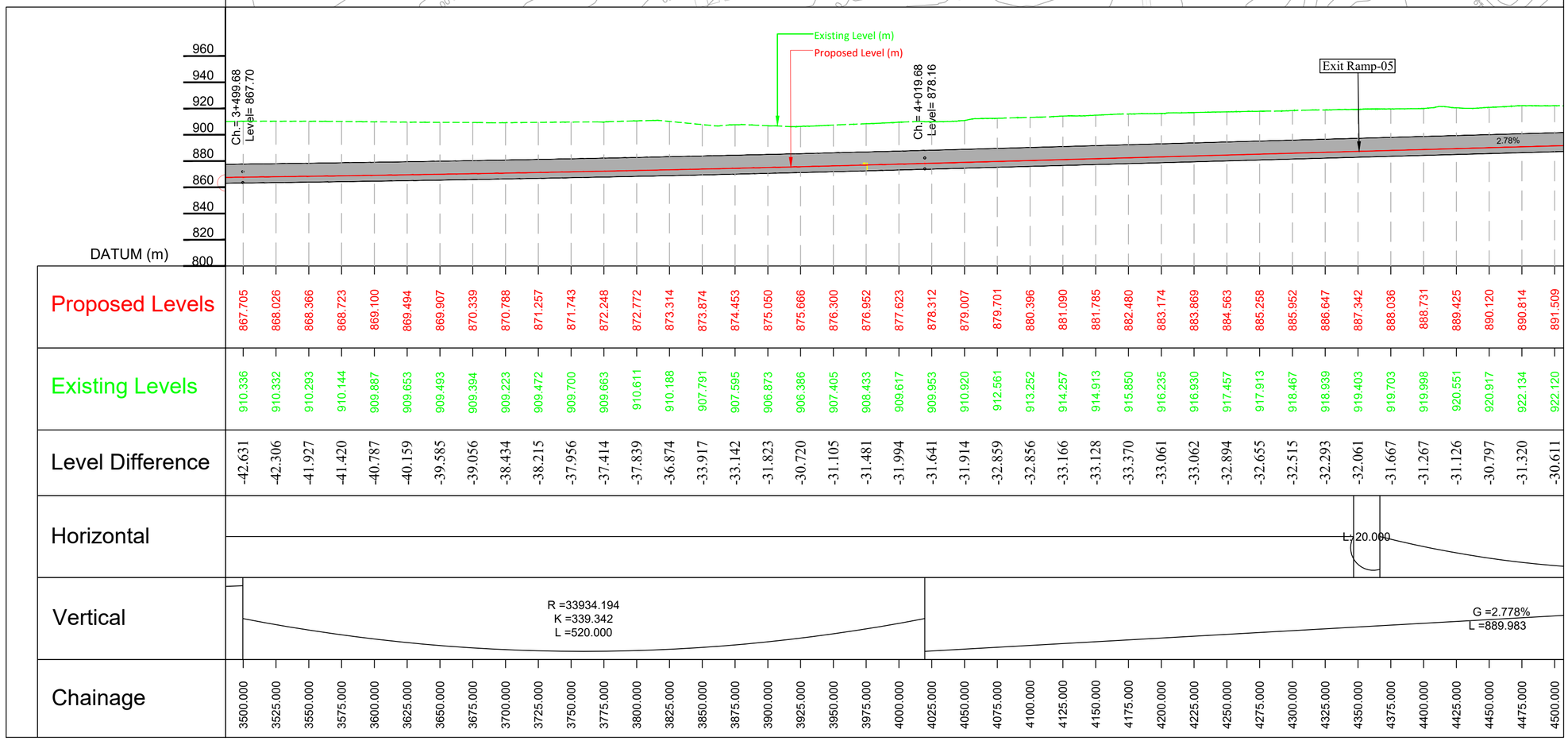
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Drawing Title	PLAN & PROFILE (TUNNEL TUBE - I) (Km.2+500 to Km.3+500)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 02/R0

Hebbal Esteem mall junction

Silk Road





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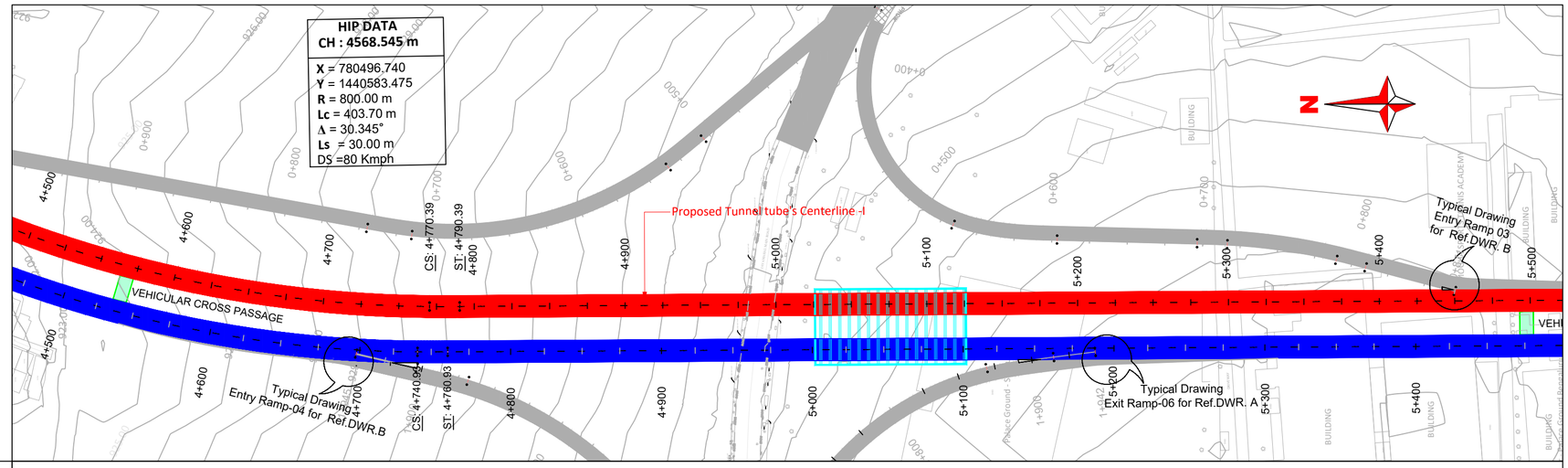
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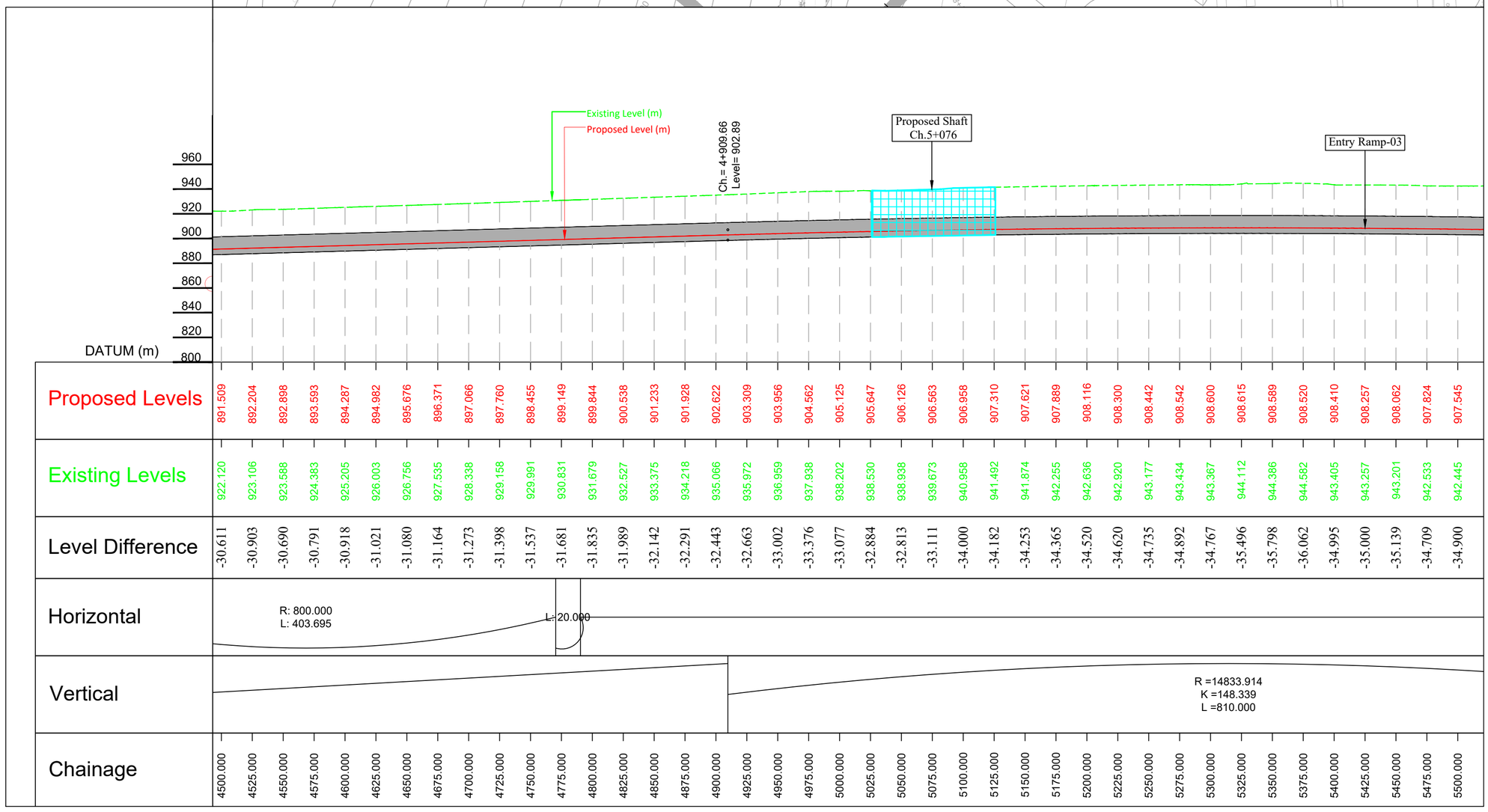
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Drawing Title	PLAN & PROFILE (TUNNEL TUBE - I) (Km.3+500 to Km.4+500)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 03/R0

Hebbal Esteem mall junction

Silk Road

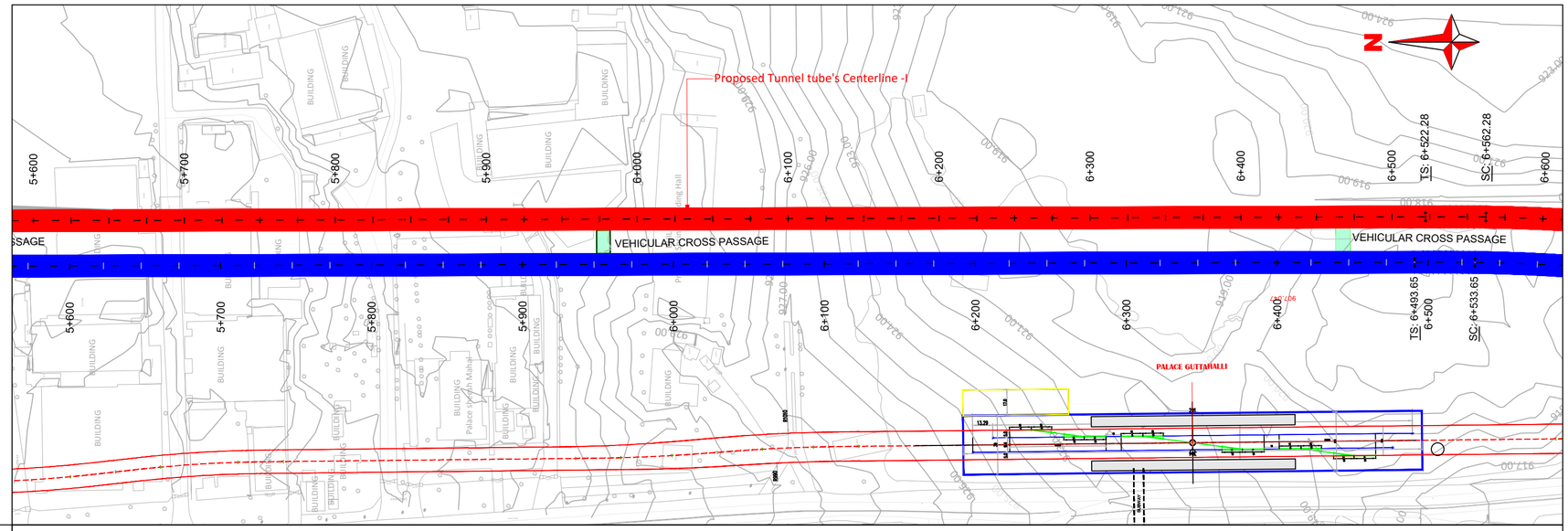


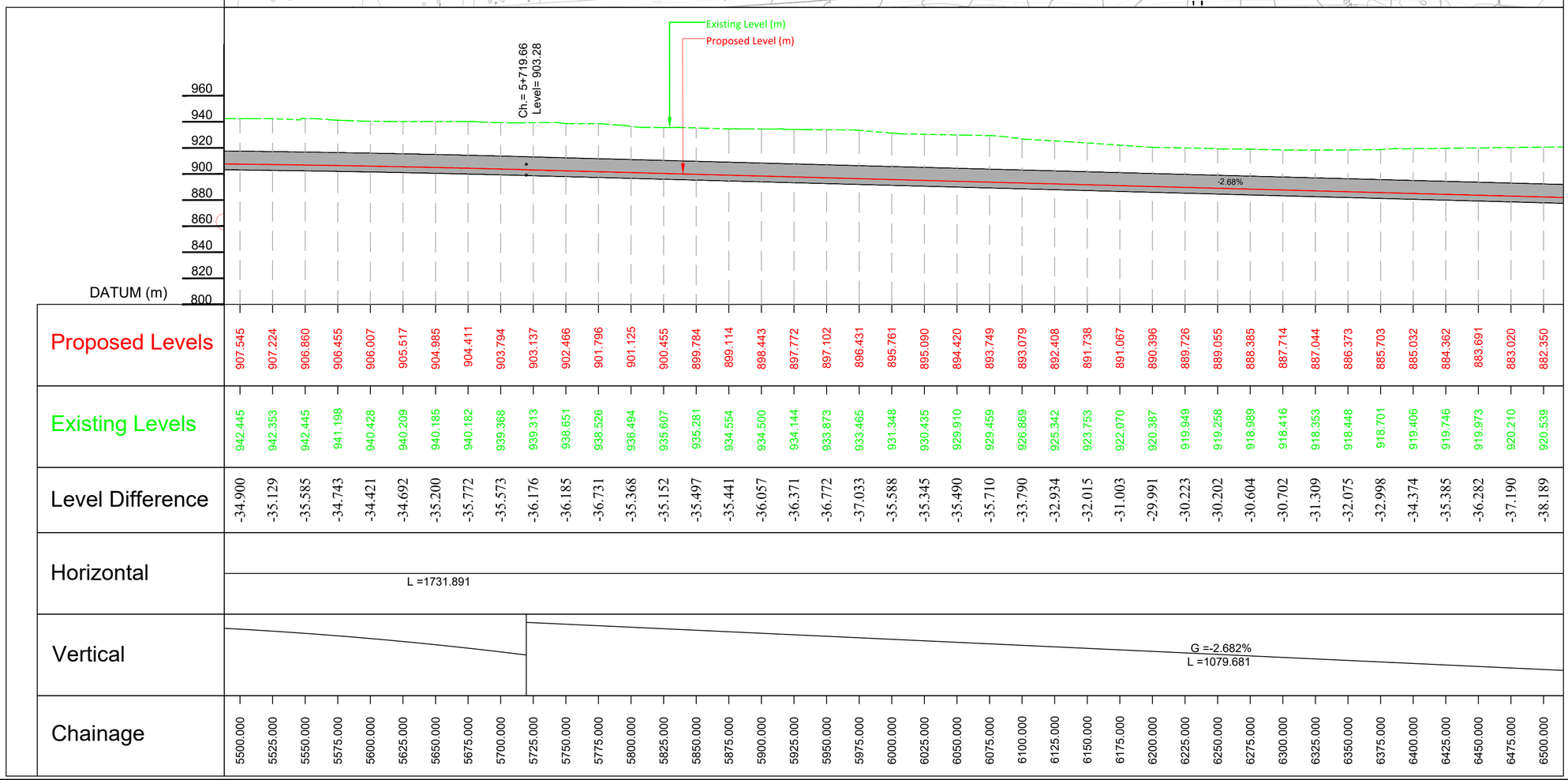


| Proposed Levels | | |

Hebbal Esteem mall junction

Silk Road

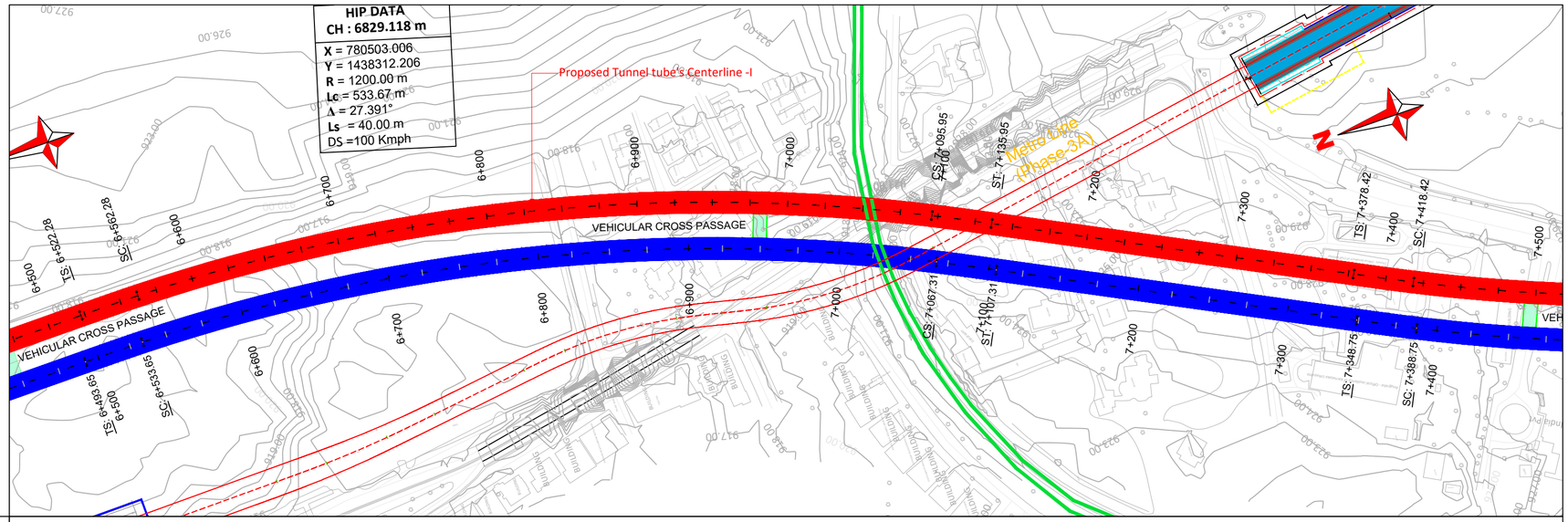


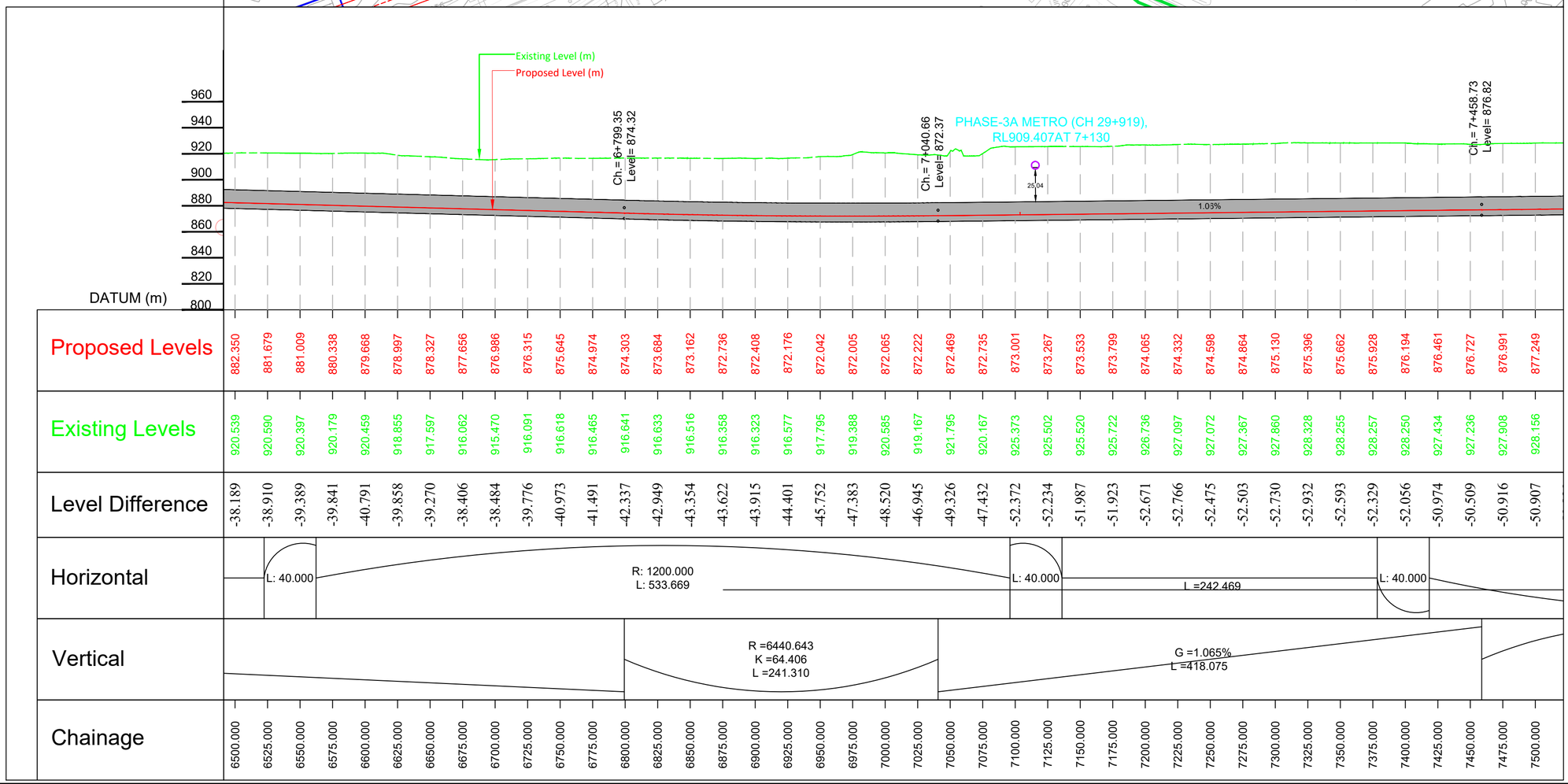


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Hebbal Esteem mall junction

Silk Road





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FINAL DETAILED PROJECT REPORT

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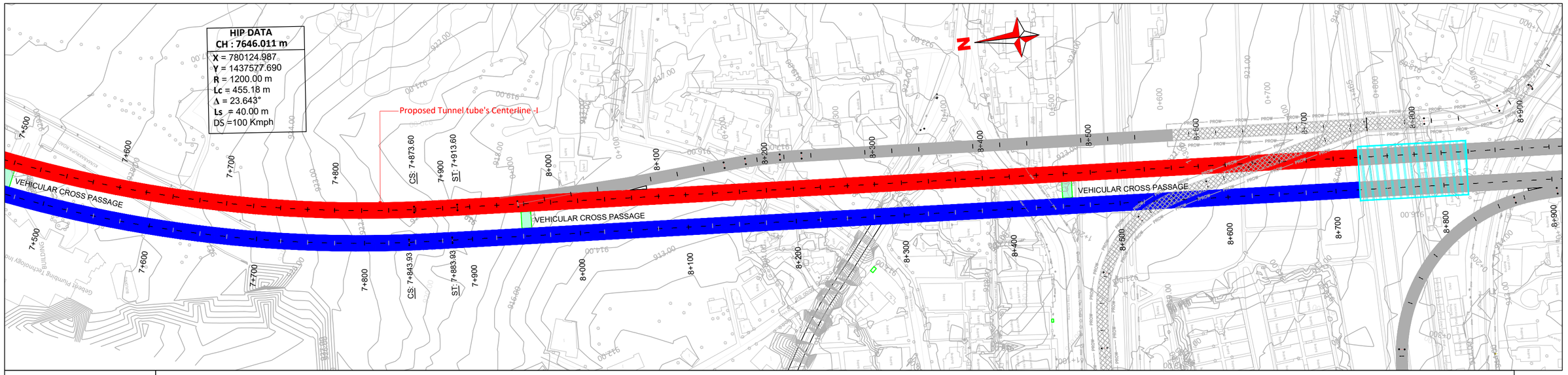
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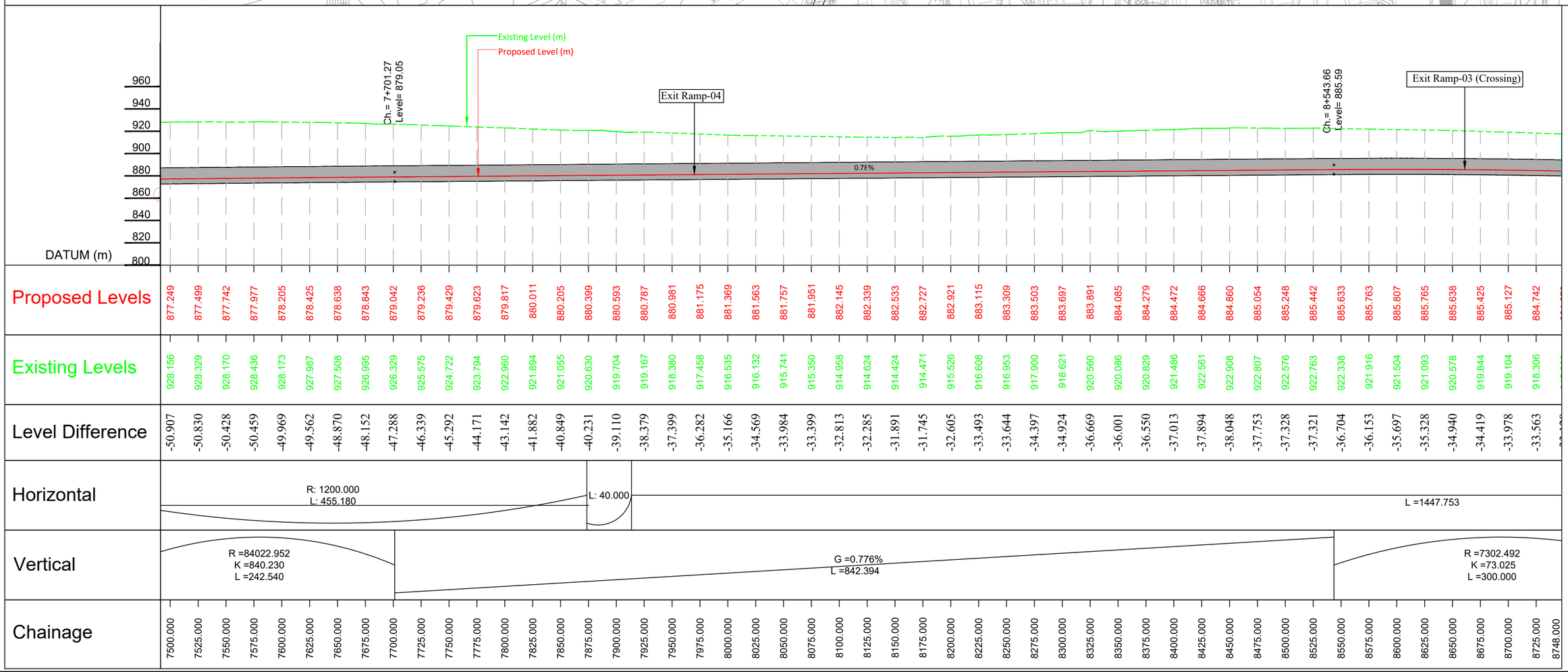
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Drawing No.: RC/1640/HO/HBT/TU/DWG/P&P/ 06/R0

Hebbal Esteem mall junction

Silk Road





| | | |

TUNNEL TUBE -II

Hebbal Esteem mall junction

Silk Road

Legend

Topographic Survey

Asphalt Edge		Flag Pole		Median	
Building		Foot Path		Palm Tree	
Bus Stop		Gate		Parking	
Bollard		Handrail		Pole	
Concrete		High Mast Light		Power Pole	
Closed Drain		Light Pole		Post	
Curb Top & Bottom		Lamp Post		Retaining Wall Top & Bottom	
Electrical Box	EB	Manhole	MH	Road Centreline	
Fence				Road Median	
Road Sign	SB	Sink		Transformer	
Roof Extension		Sky Walk Bridge		Tree	
Safety Barrier		Sports Field		Tunnel	
Security Room		Stairs		Tree Line	
Shed		Telecommunication Tower		Wall	
Shelter		Telephone Box	TPB	Water Body	
Side Walk		Temporary Barrier		Water Tank	
Sign Board	SB	Track		Zebra Crossing	
Single Post		Traffic Signal	TS		

Legend

Plan		L Profile	
Proposed Tunnel Tube-I		Proposed Road Levels	
Proposed Tunnel Tube-II		Existing Levels	
Proposed Shaft		Proposed NATM	
Proposed Vehicular Cross Passage		Proposed Cut & Cover	
Proposed NATM (Entry Ramp)		Proposed Shaft	
Proposed NATM (Exit Ramp)		G - Gradient %	
Proposed Cut & Cover (Entry Ramp)		Lv - Length of Vertical Curve	
Proposed Cut & Cover (Exit Ramp)		L - Length of Grade(m)	
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Proposed Rights of Way	PROW PROW PROW	D - Straight Length of Horizontal Alignment	
Existing Rights of Way		Lc - Length of Circular Curve	
Airport Metro Line			
Metro Line (Phase-1)			
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Dc - Degree of Curvature			
Lc - Length of Circular Curve			
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LS - Length of Spiral Curve			
∆ - Deflection Angle			
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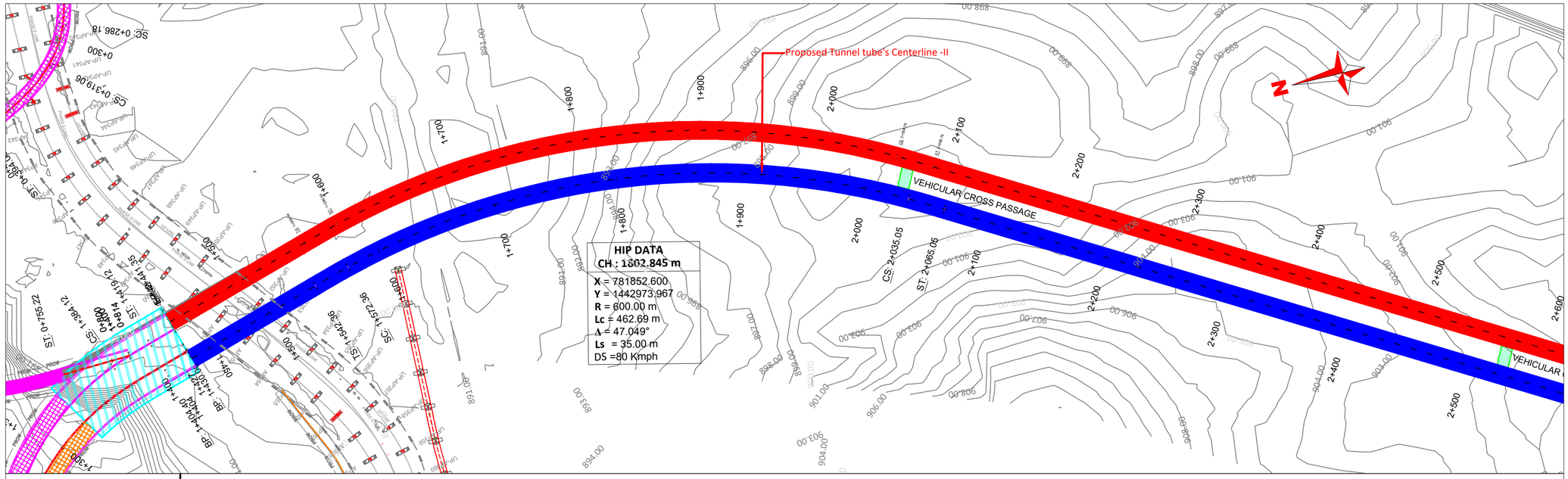
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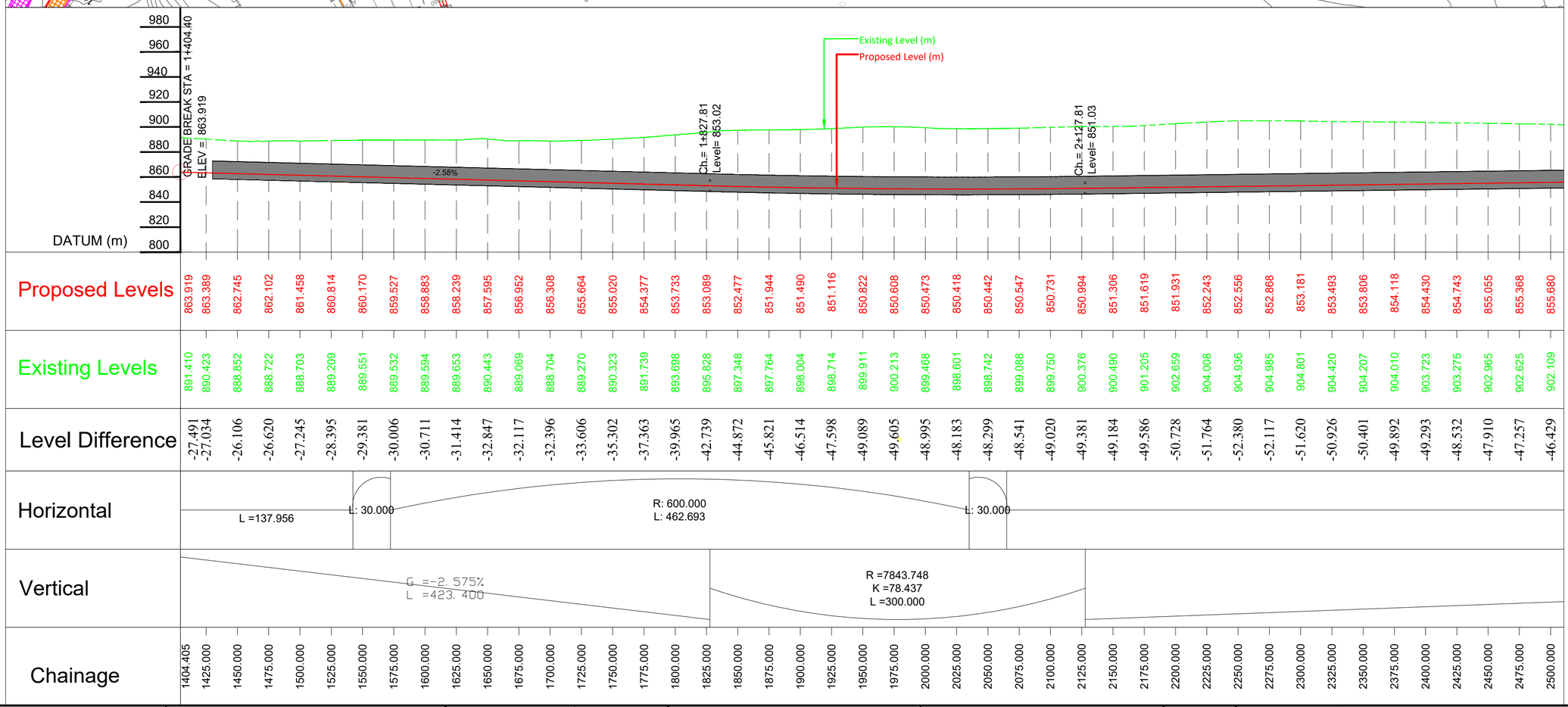
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Drawing Title	PLAN & PROFILE (LEGEND)
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Hebbal Esteem mall junction

Silk Road

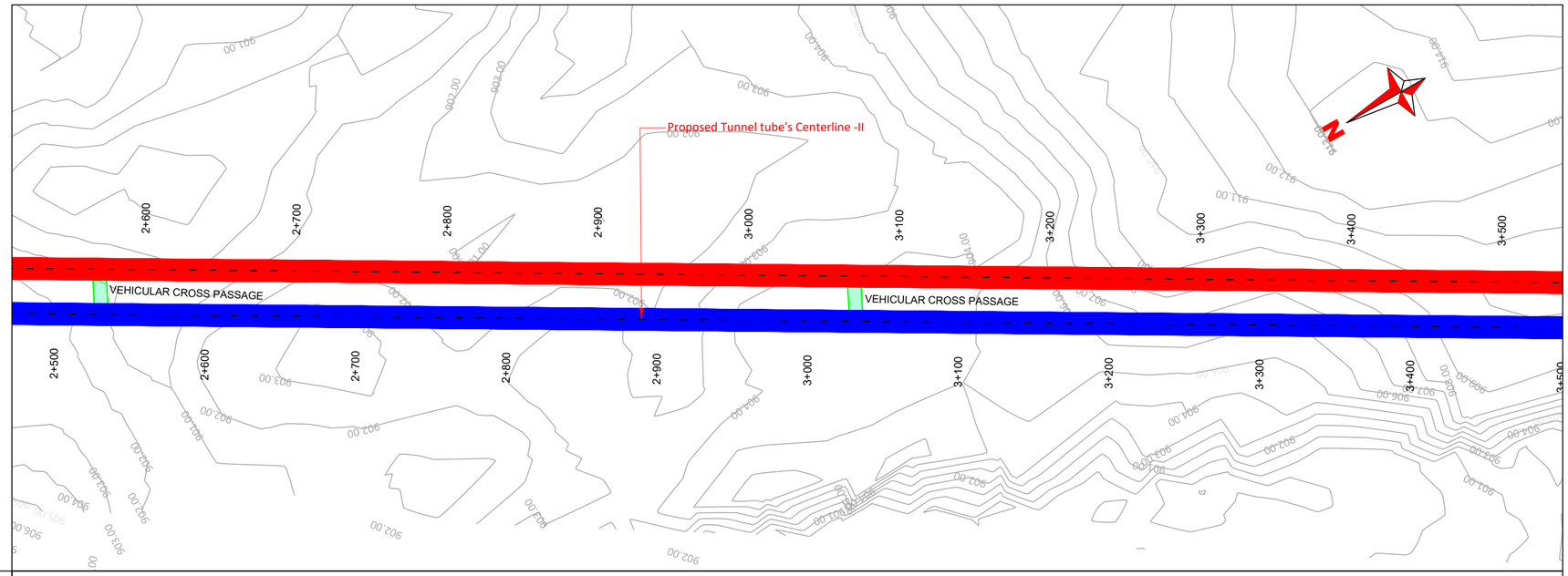


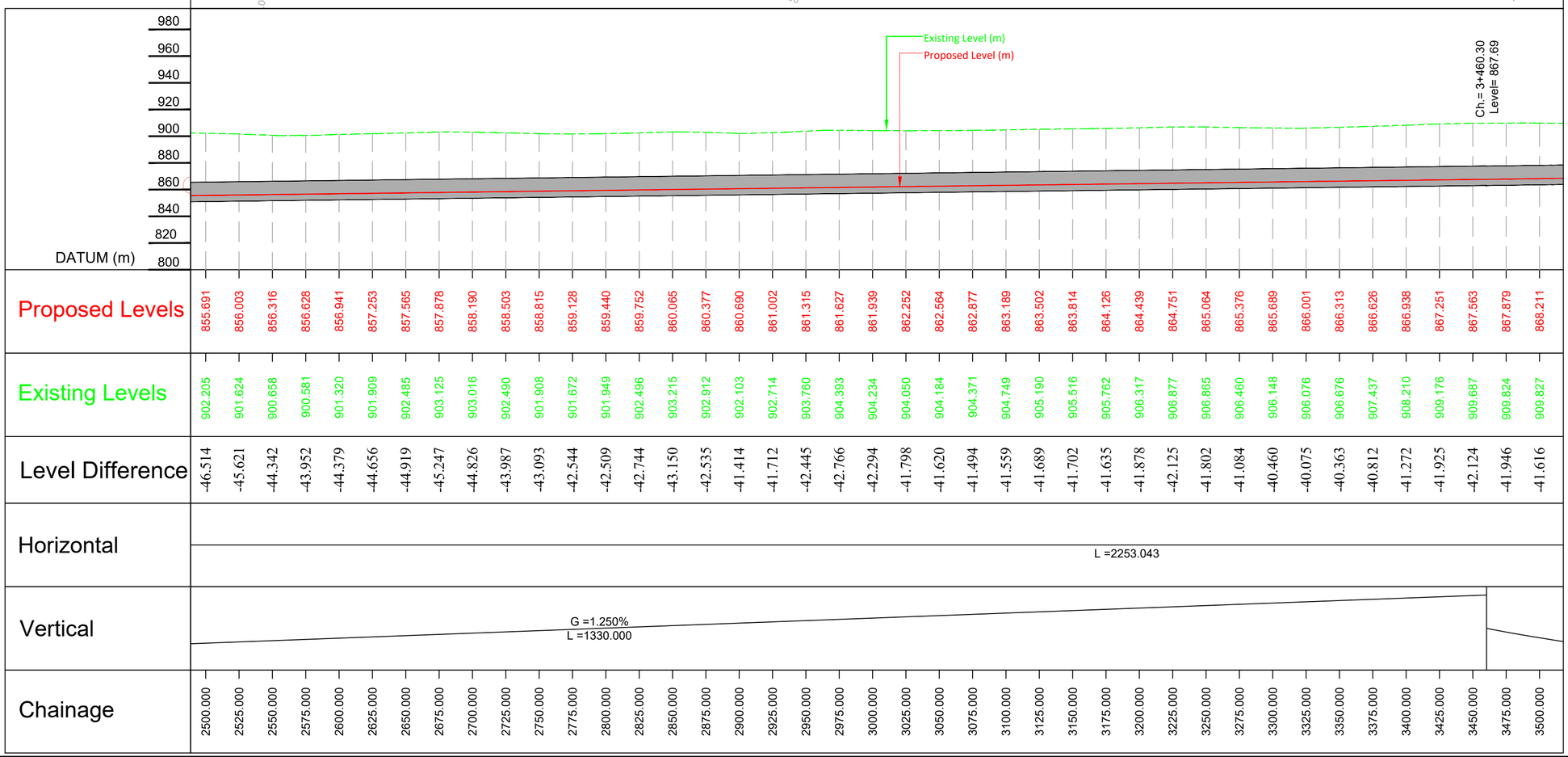


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Hebbal Esteem mall junction

Silk Road

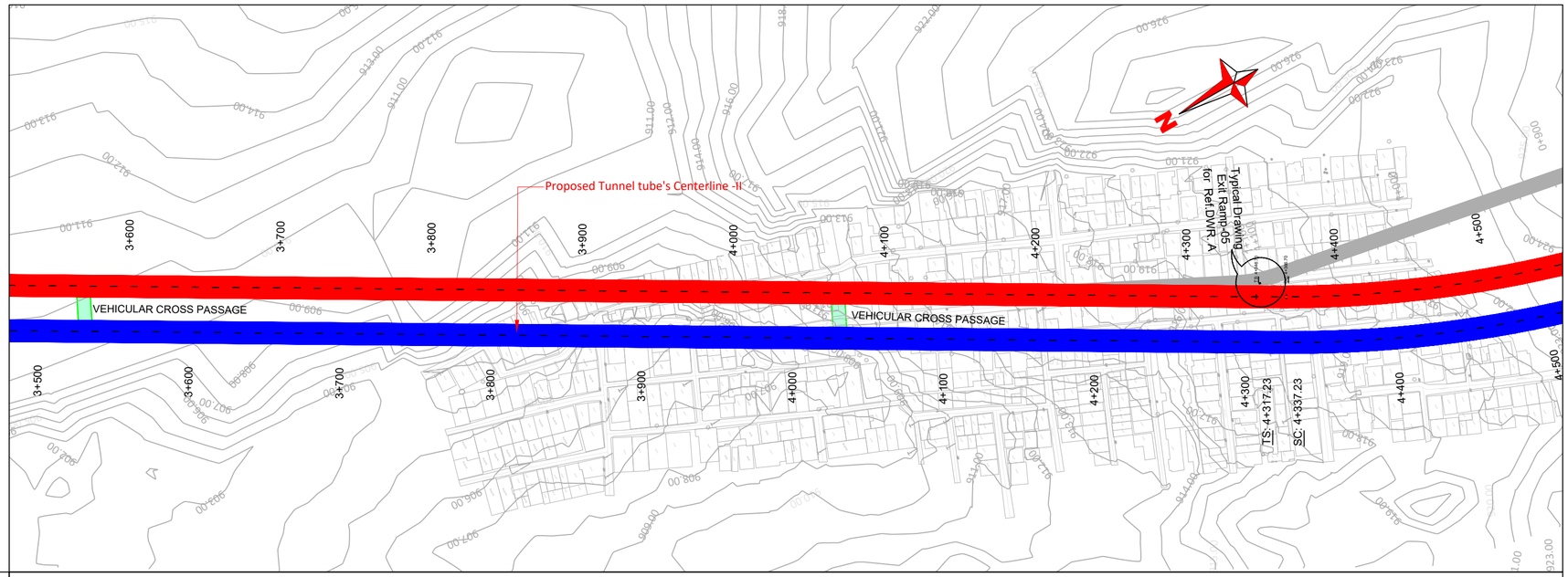


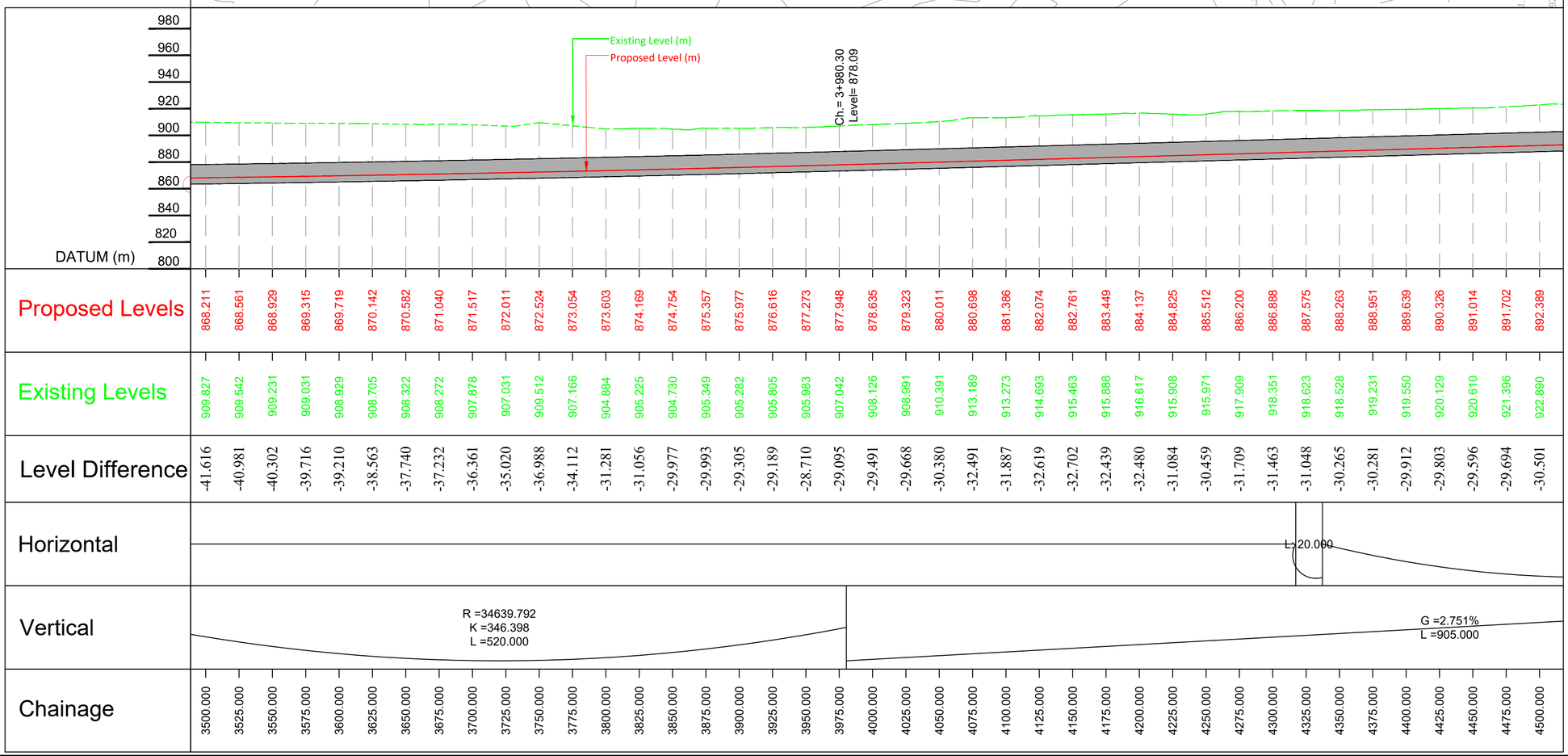


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Hebbal Esteem mall junction

Silk Road





Proposed Levels	Existing Levels	Level Difference	Chainage
868.211	909.827	-41.616	3500.000
868.561	909.542	-40.981	3525.000
868.929	909.231	-40.302	3550.000
869.315	909.031	-39.716	3575.000
869.719	908.929	-39.210	3600.000
870.142	908.705	-38.563	3625.000
870.582	908.322	-37.740	3650.000
871.040	908.272	-37.232	3675.000
871.517	907.878	-36.361	3700.000
872.011	907.031	-35.020	3725.000
872.524	909.512	-36.988	3750.000
873.054	907.166	-34.112	3775.000
873.603	904.884	-31.281	3800.000
874.169	905.225	-31.056	3825.000
874.754	904.730	-29.977	3850.000
875.357	905.349	-29.993	3875.000
875.977	905.282	-29.305	3900.000
876.616	905.805	-29.189	3925.000
877.273	905.983	-28.710	3950.000
877.948	907.042	-29.095	3975.000
878.635	908.126	-29.491	4000.000
879.323	908.991	-29.668	4025.000
880.011	910.391	-30.380	4050.000
880.698	913.189	-32.491	4075.000
881.386	913.273	-31.887	4100.000
882.074	914.693	-32.619	4125.000
882.761	915.463	-32.702	4150.000
883.449	915.888	-32.439	4175.000
884.137	916.617	-32.480	4200.000
884.825	915.908	-31.084	4225.000
885.512	915.971	-30.459	4250.000
886.200	917.909	-31.709	4275.000
886.888	918.351	-31.463	4300.000
887.575	918.623	-31.048	4325.000
888.263	918.528	-30.265	4350.000
888.951	919.231	-30.281	4375.000
889.639	919.550	-29.912	4400.000
890.326	920.129	-29.803	4425.000
891.014	920.610	-29.596	4450.000
891.702	921.396	-29.694	4475.000
892.389	922.890	-30.501	4500.000

Horizontal: L=20.000

Vertical: R =34639.792, K =346.398, L =520.000; G =2.751%, L =905.000

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
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EIC- BBMP	

CONSULTANT:

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NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

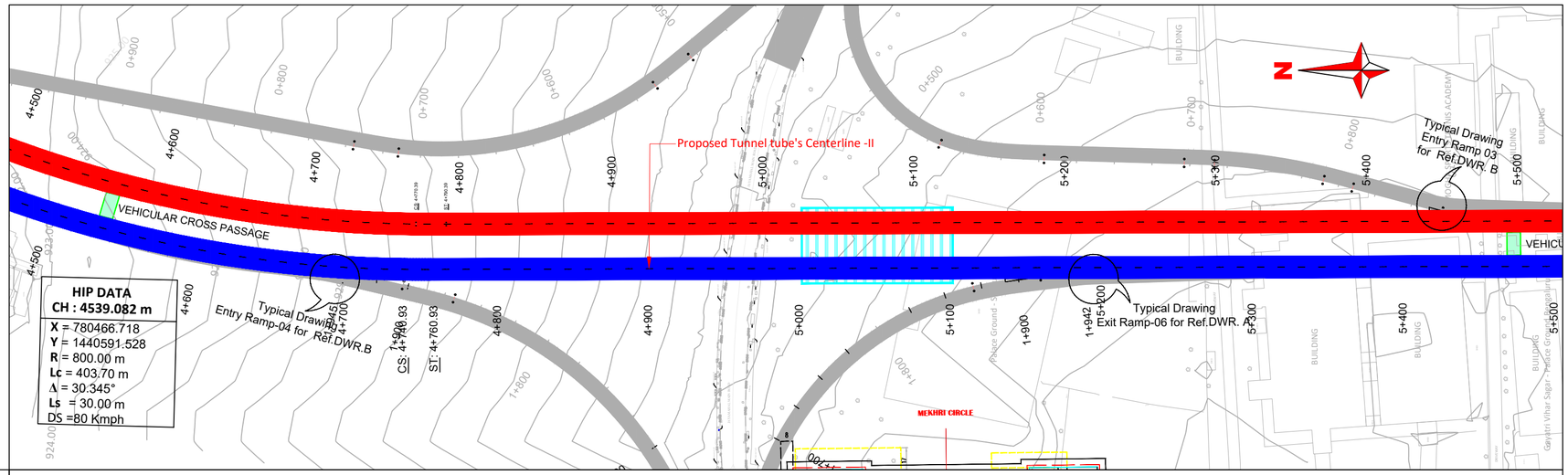
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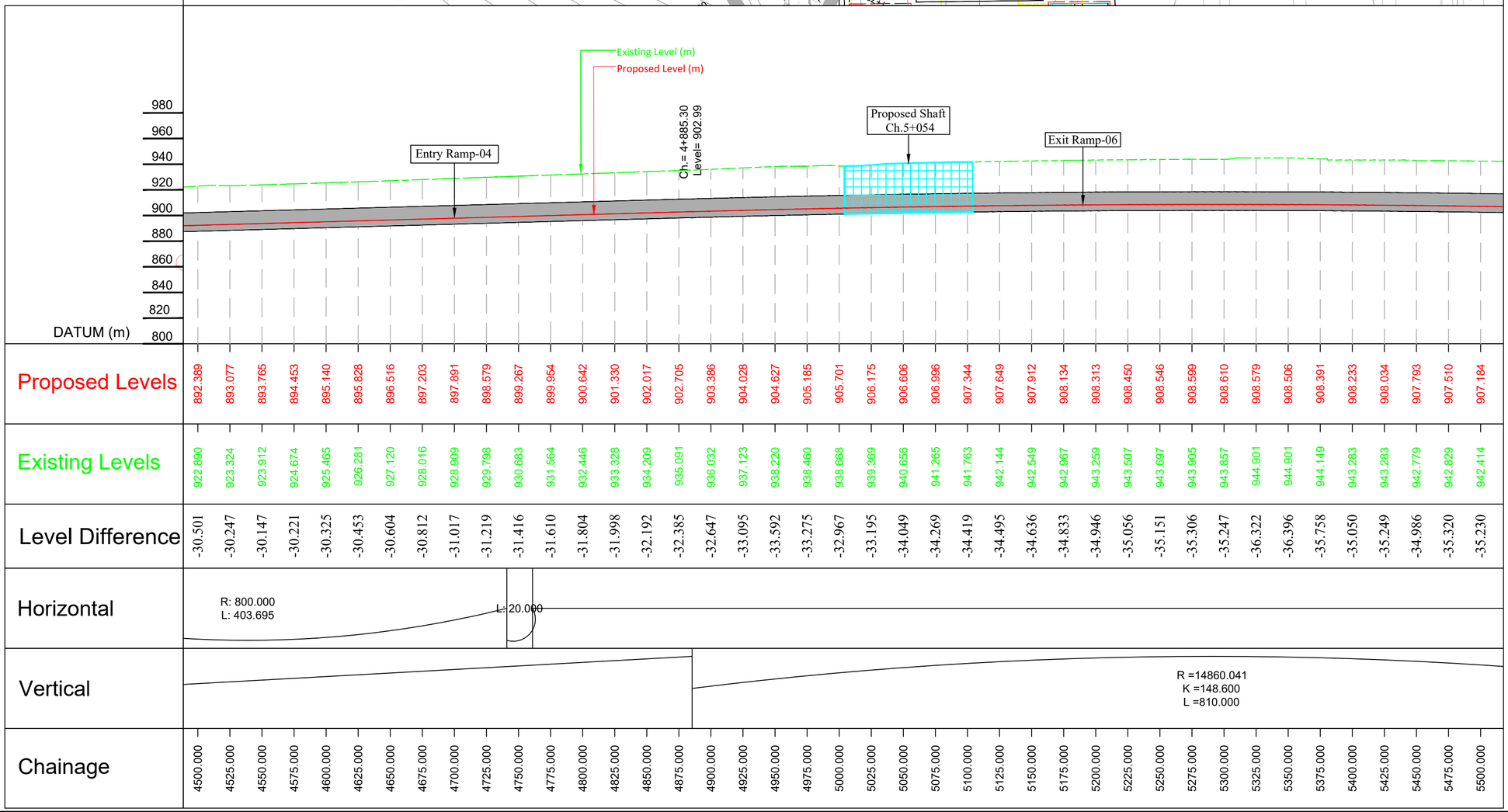
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Drawing Title	PLAN & PROFILE (TUNNEL TUBE - II) (Km.3+500 to Km.4+500)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/03/R0

Hebbal Esteem mall junction

Silk Road





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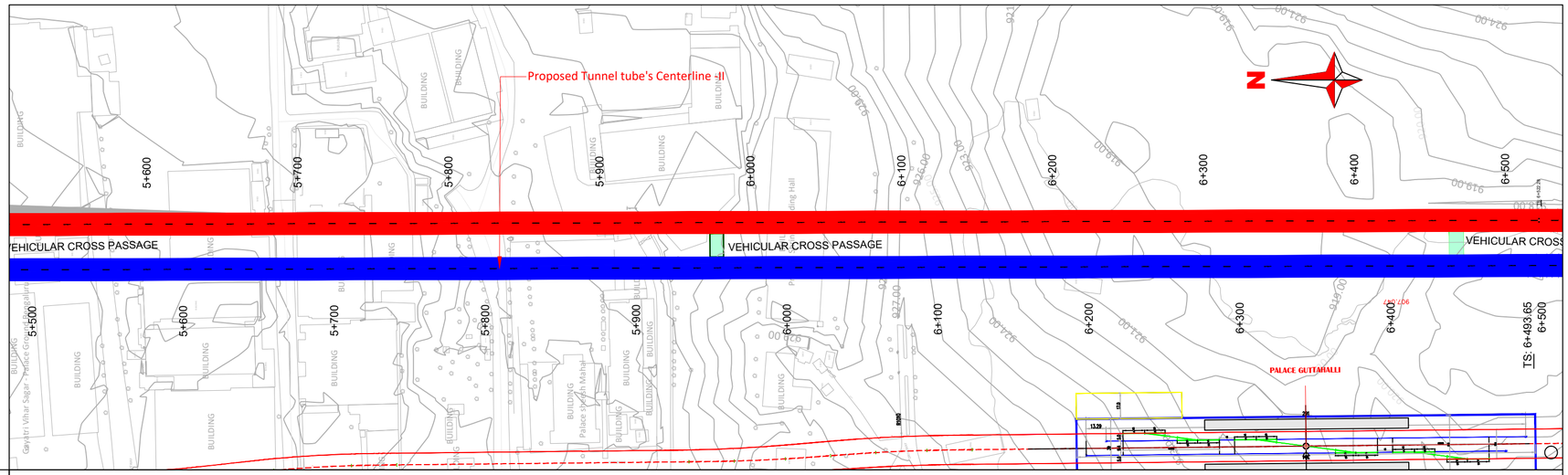
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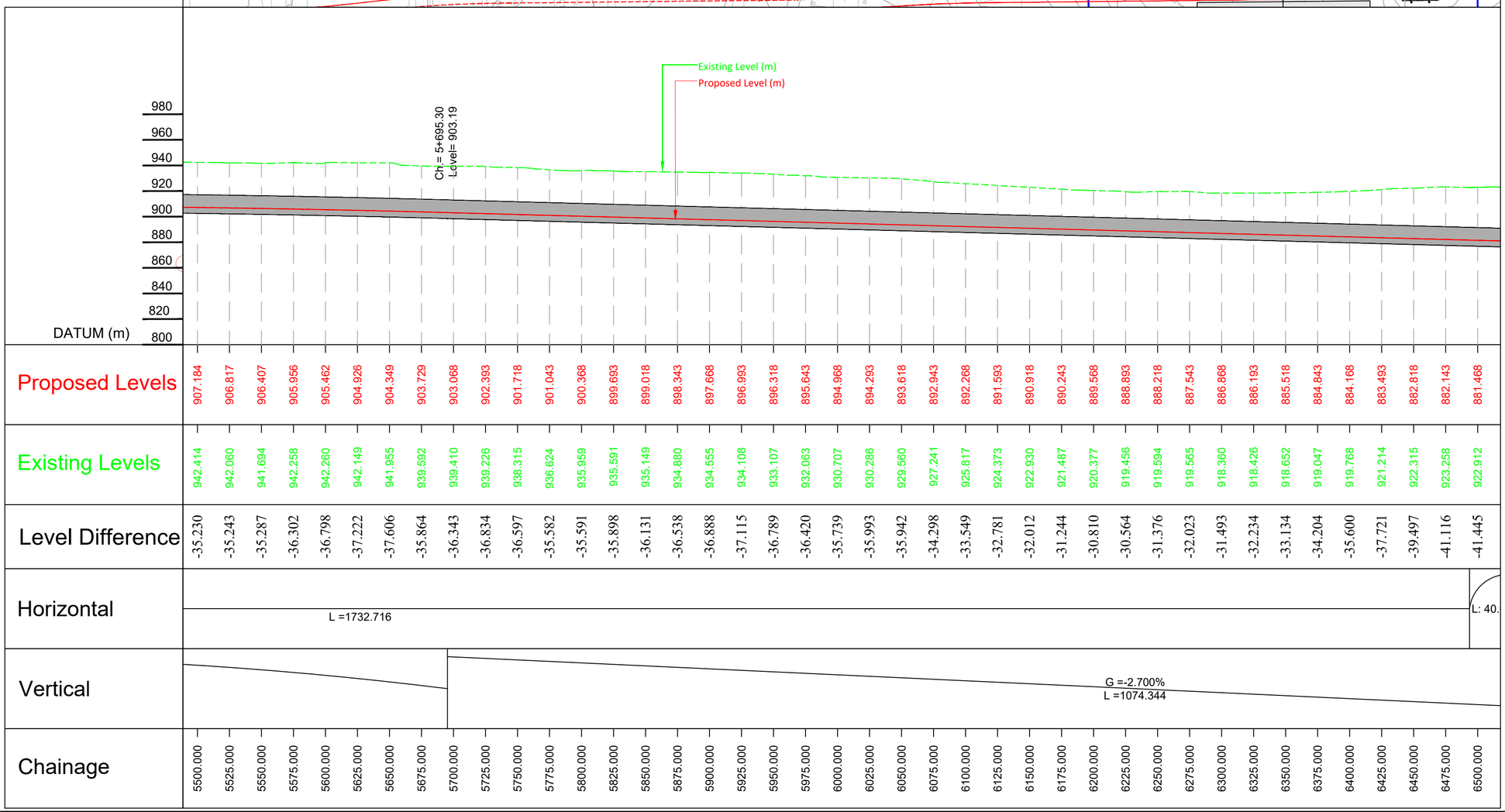
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Drawing Title	PLAN & PROFILE (TUNNEL TUBE - II) (Km.4+500 to Km.5+500)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/04/R0

Hebbal Esteem mall junction

Silk Road





Chainage	Proposed Levels	Existing Levels	Level Difference
5500.000	907.184	942.414	-35.230
5525.000	906.817	942.060	-35.243
5550.000	906.407	941.694	-35.287
5575.000	905.956	942.258	-36.302
5600.000	905.462	942.260	-36.798
5625.000	904.926	942.149	-37.222
5650.000	904.349	941.955	-37.606
5675.000	903.729	939.592	-35.864
5700.000	903.068	939.410	-36.343
5725.000	902.393	939.226	-36.834
5750.000	901.718	938.315	-36.597
5775.000	901.043	936.624	-35.582
5800.000	900.368	935.959	-35.591
5825.000	899.693	935.591	-35.898
5850.000	899.018	935.149	-36.131
5875.000	898.343	934.880	-36.538
5900.000	897.668	934.555	-36.888
5925.000	896.993	934.108	-37.115
5950.000	896.318	933.107	-36.789
5975.000	895.643	932.063	-36.420
6000.000	894.968	930.707	-35.739
6025.000	894.293	930.286	-35.993
6050.000	893.618	929.560	-35.942
6075.000	892.943	927.241	-34.298
6100.000	892.268	925.817	-33.549
6125.000	891.593	924.373	-32.781
6150.000	890.918	922.930	-32.012
6175.000	890.243	921.487	-31.244
6200.000	889.568	920.377	-30.810
6225.000	888.893	919.456	-30.564
6250.000	888.218	919.594	-31.376
6275.000	887.543	919.565	-32.023
6300.000	886.868	918.360	-31.493
6325.000	886.193	918.426	-32.234
6350.000	885.518	918.652	-33.134
6375.000	884.843	919.047	-34.204
6400.000	884.168	919.768	-35.600
6425.000	883.493	921.214	-37.721
6450.000	882.818	922.315	-39.497
6475.000	882.143	923.258	-41.116
6500.000	881.468	922.912	-41.445

Horizontal: L =1732.716 ; L: 40.

Vertical: G =-2.700% ; L =1074.344

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GEOCONSULT INDIA PRIVATE LIMITED
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(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

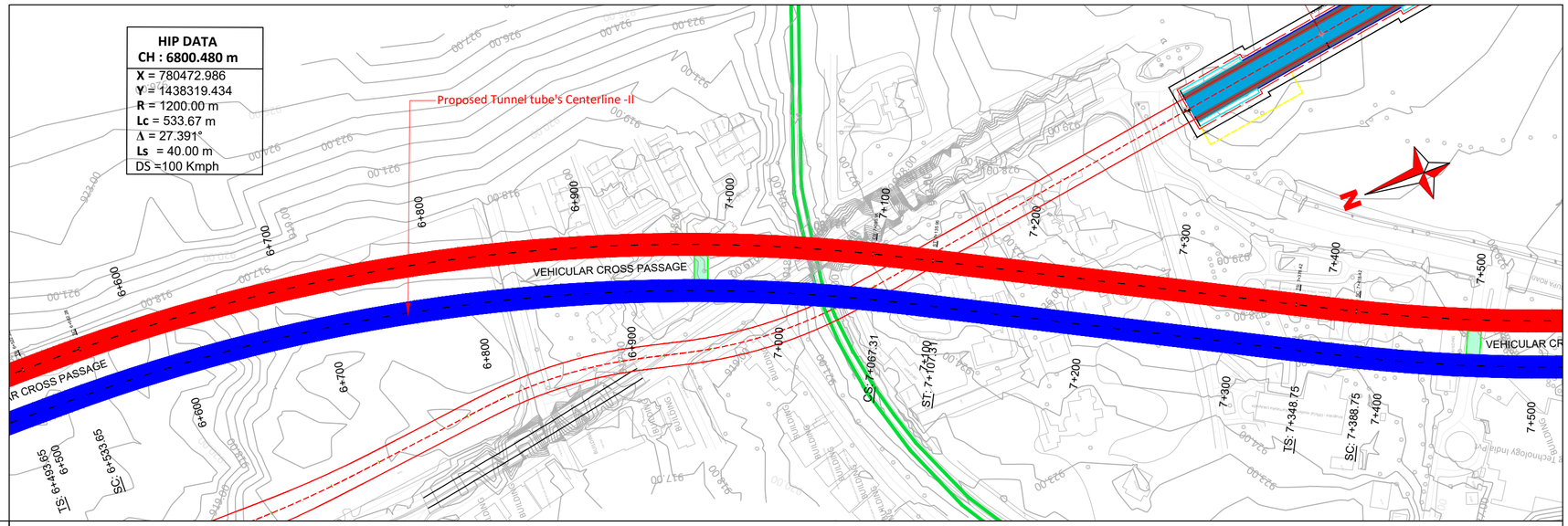
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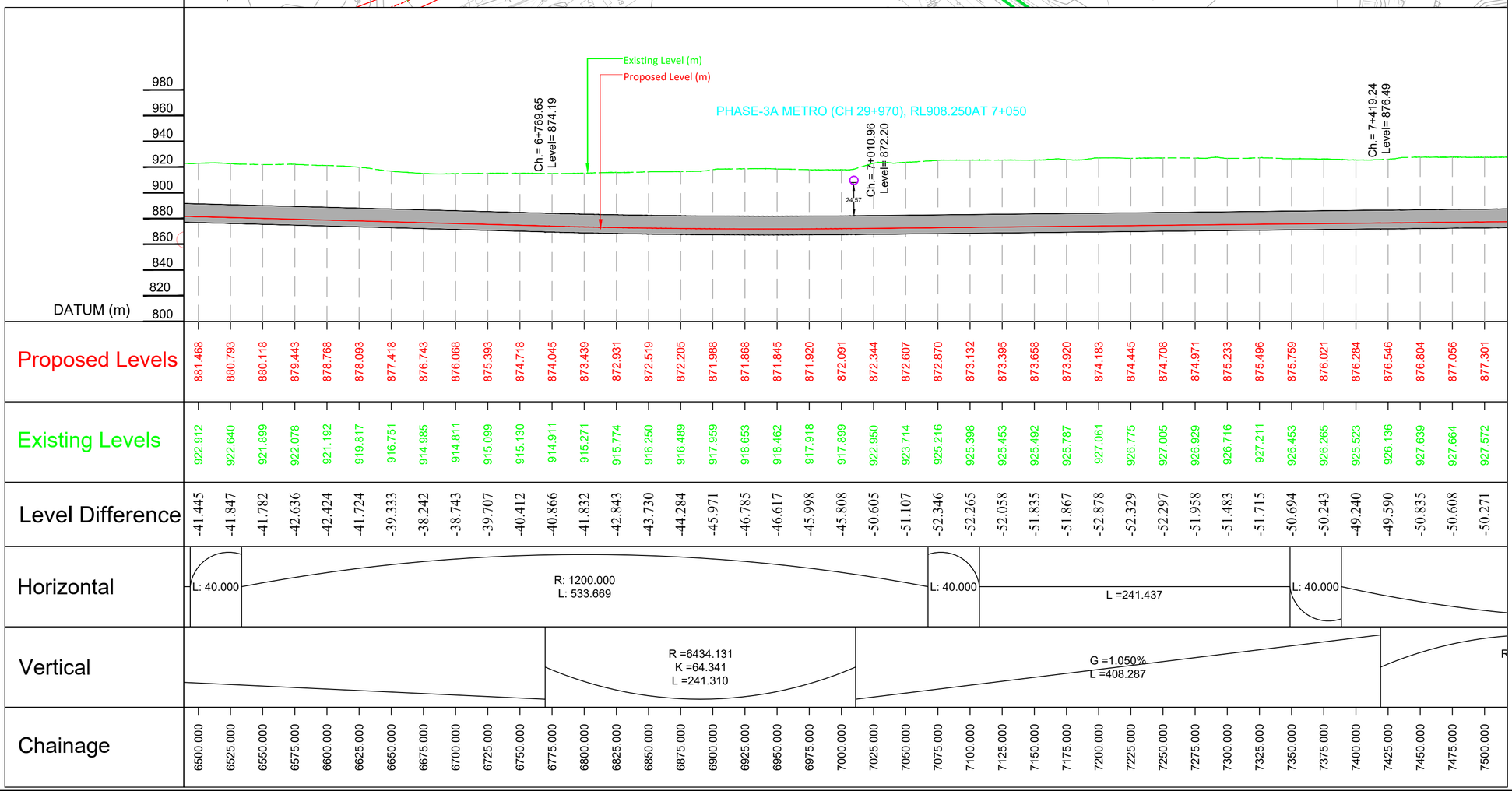
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Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (TUNNEL TUBE - II) (Km.5+500 to Km.6+500)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/05/R0

Hebbal Esteem mall junction

Silk Road





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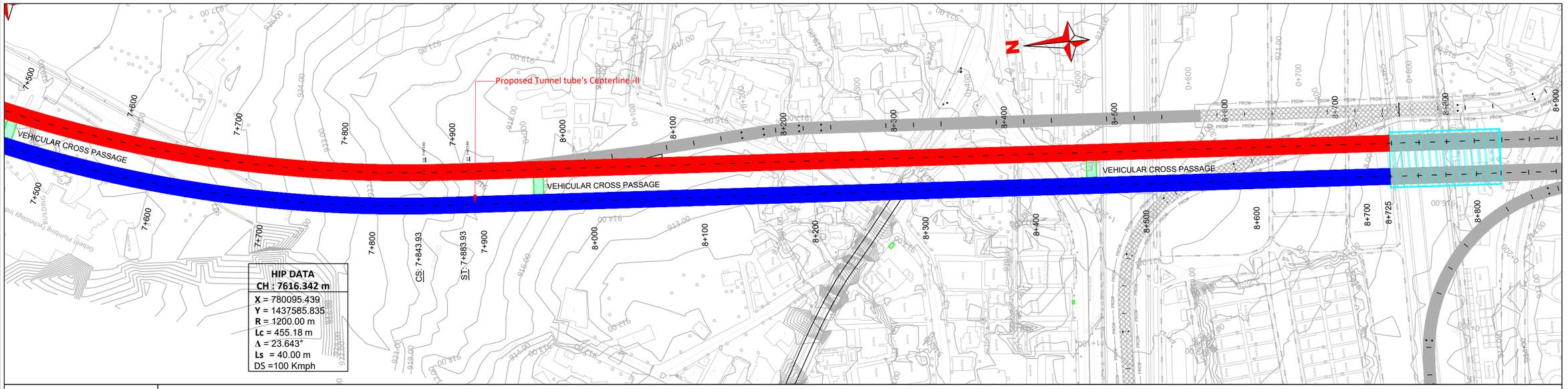
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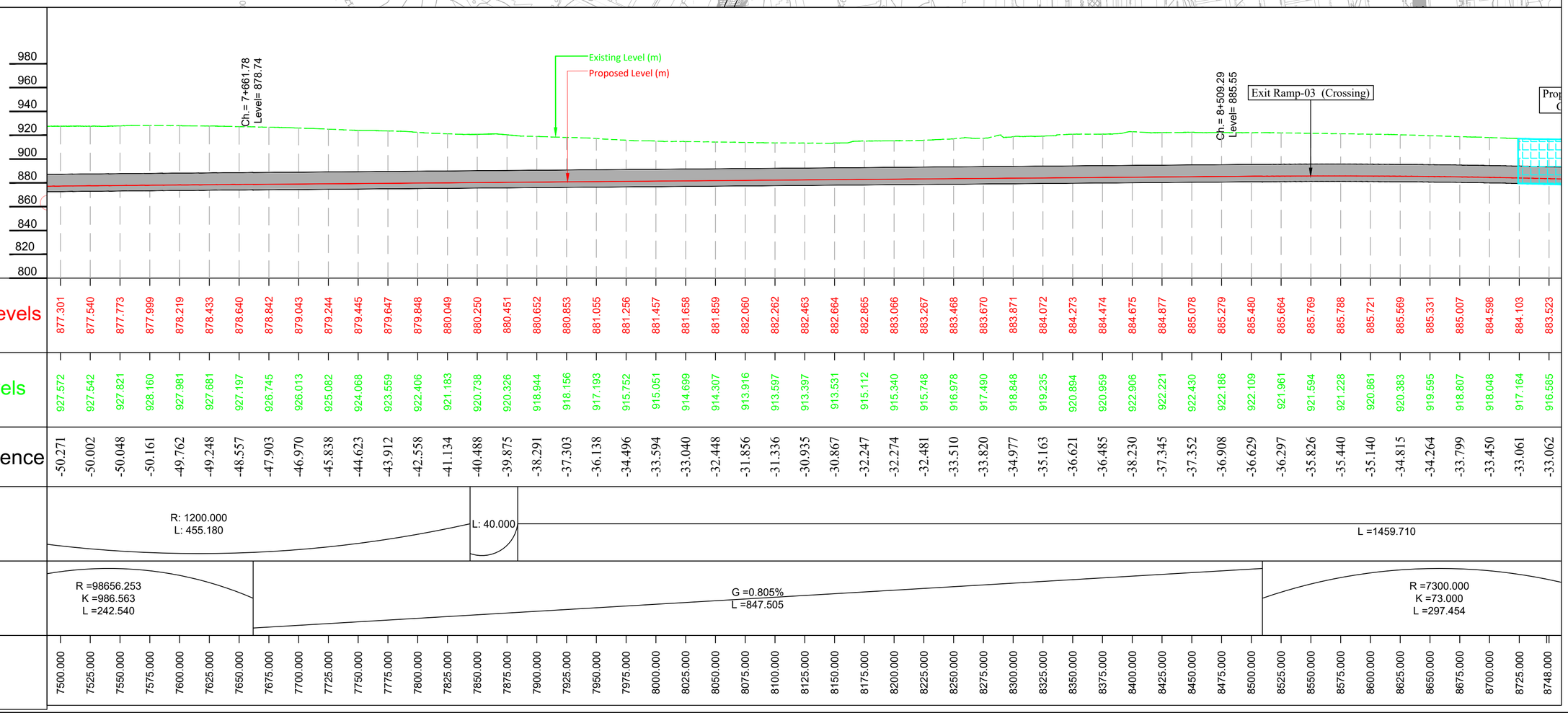
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Drawing Title	PLAN & PROFILE (TUNNEL TUBE - II) (Km.6+500 to Km.7+500)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/06/R0

Hebbal Esteem mall junction

Silk Road





| | | |

PLAN & PROFILE

PACKAGE -1 (ENTRY & EXIT RAMP)

Hebbal Esteem mall junction

Silk Road

Legend

Topographic Survey

Asphalt Edge		Flag Pole		Median	
Building		Foot Path		Palm Tree	
Bus Stop		Gate		Parking	
Bollard		Handrail		Pole	
Concrete		High Mast Light		Power Pole	
Closed Drain		Light Pole		Post	
Curb Top & Bottom		Lamp Post		Retaining Wall Top & Bottom	
Electrical Box	EB	Manhole	MH	Road Centreline	
Fence				Road Median	
Road Sign	SB	Sink		Transformer	
Roof Extension		Sky Walk Bridge		Tree	
Safety Barrier		Sports Field		Tunnel	
Security Room		Stairs		Tree Line	
Shed		Telecommunication Tower		Wall	
Shelter		Telephone Box	TPB	Water Body	
Side Walk		Temporary Barrier		Water Tank	
Sign Board	SB	Track		Zebra Crossing	
Single Post		Traffic Signal	TS		

Legend

Plan		L Profile	
Proposed Tunnel Tube-I		Proposed Road Levels	
Proposed Tunnel Tube-II		Existing Levels	
Proposed Shaft		Proposed NATM	
Proposed Vehicular Cross Passage		Proposed Cut & Cover	
Proposed NATM (Entry Ramp)		Proposed Shaft	
Proposed NATM (Exit Ramp)		G - Gradient %	
Proposed Cut & Cover (Entry Ramp)		Lv - Length of Vertical Curve	
Proposed Cut & Cover (Exit Ramp)		L - Length of Grade(m)	
Proposed Open Cut (Exit Ramp)		K - Ratio Between vertical curve Length & Change of Gradient {Lc/(G2-G1)}	
Proposed Open Cut (Entry Ramp)		e - Superelevation (%)	
Proposed Rights of Way	PROW	D - Straight Length of Horizontal Alignment	
Existing Rights of Way		Lc - Length of Circular Curve	
Airport Metro Line			
Metro Line (Phase-1)			
Metro Line (Phase-2)			
Metro Line (Phase-3A)			
R - Radius of Curve			
Dc - Degree of Curvature			
Lc - Length of Circular Curve			
Ts - Tangent Length			
Es - Apex Distance			
LS - Length of Spiral Curve			
Δ - Deflection Angle			
DS - Design Speed Km/Hr			
PC - Point of Curvature			
PT - Point of Tangent			
HIP - Horizontal Intersection Point			

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FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

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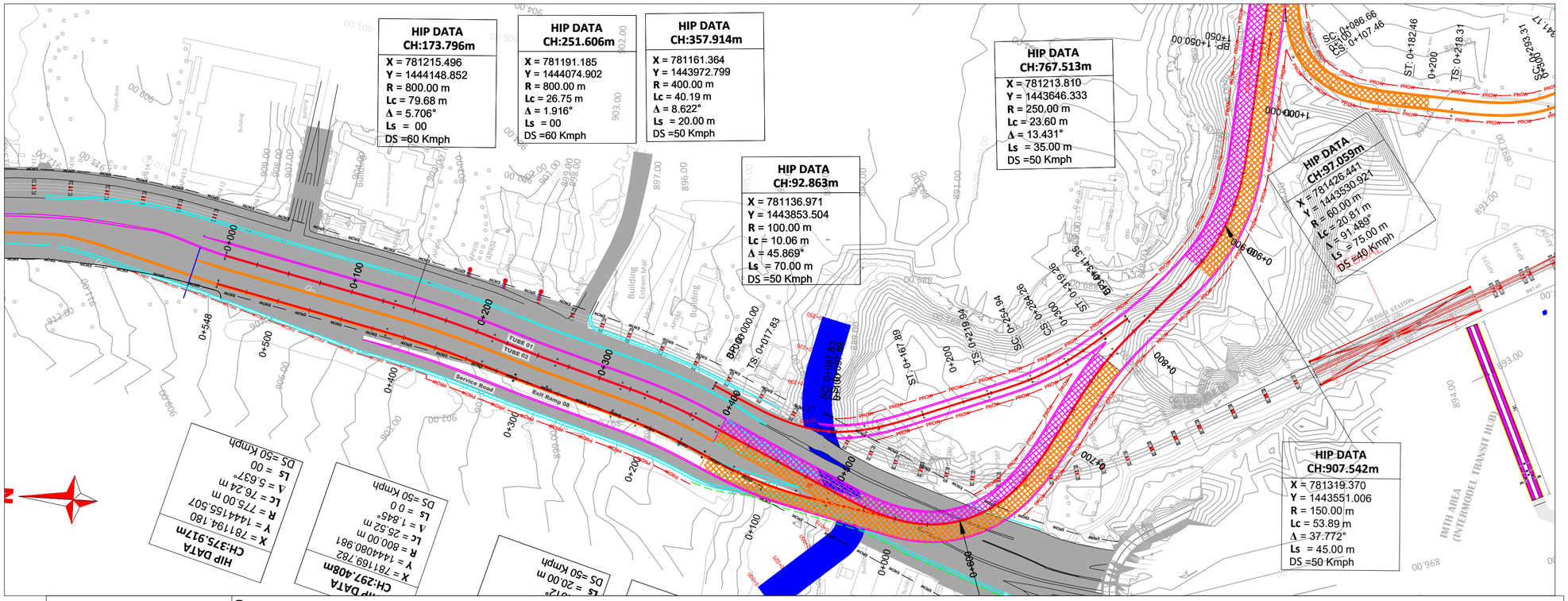
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Drawing Title	PLAN & PROFILE (LEGEND)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/Legend /R0

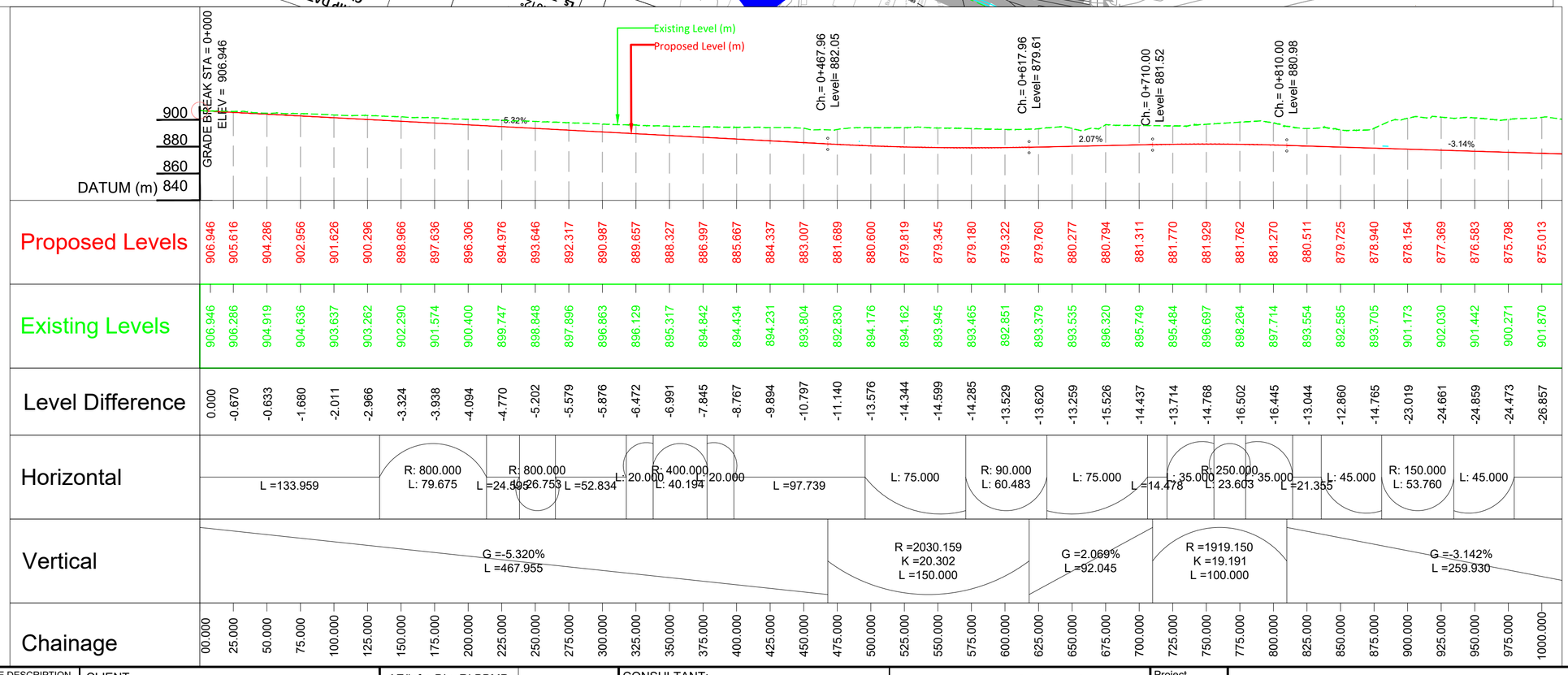
PLAN & PROFILE

TUBE -I & II

Hebbal Esteem mall junction

Silk Road

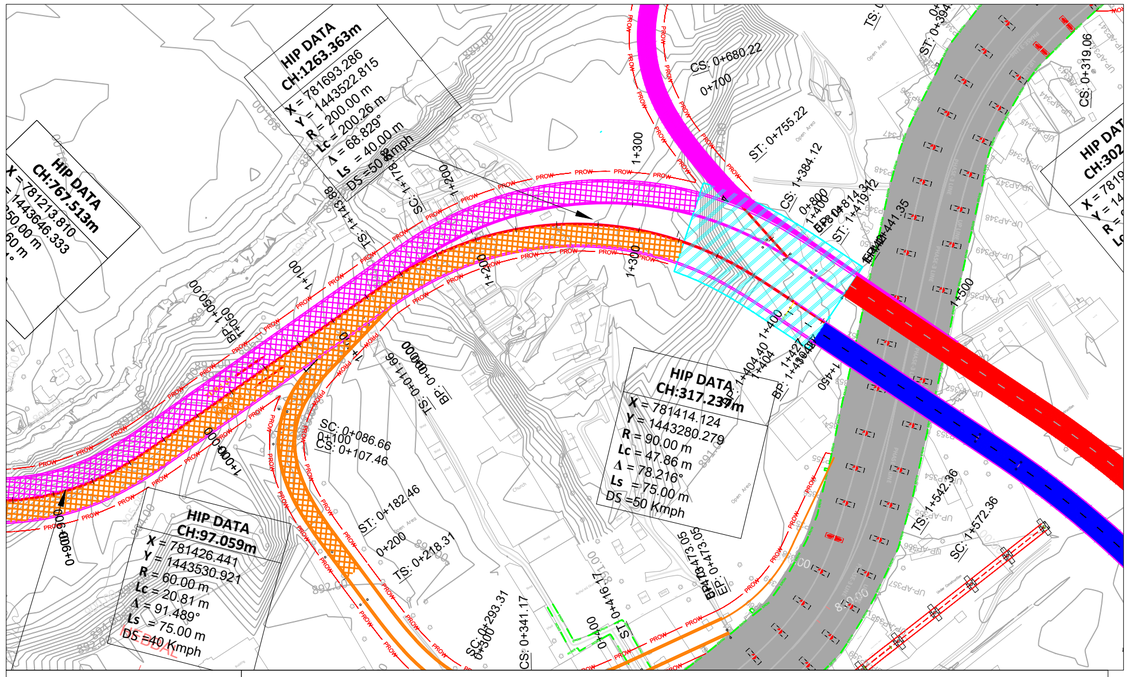


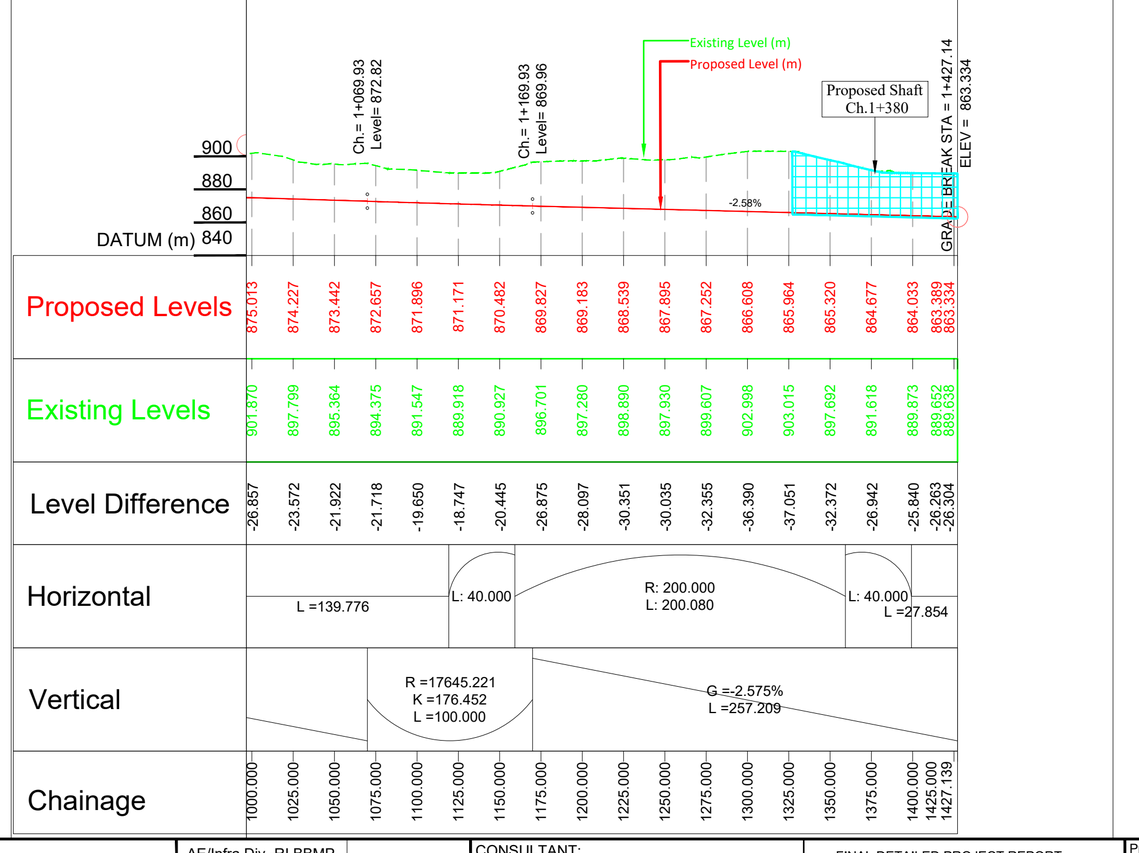


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Hebbal Esteem mall junction

Silk Road





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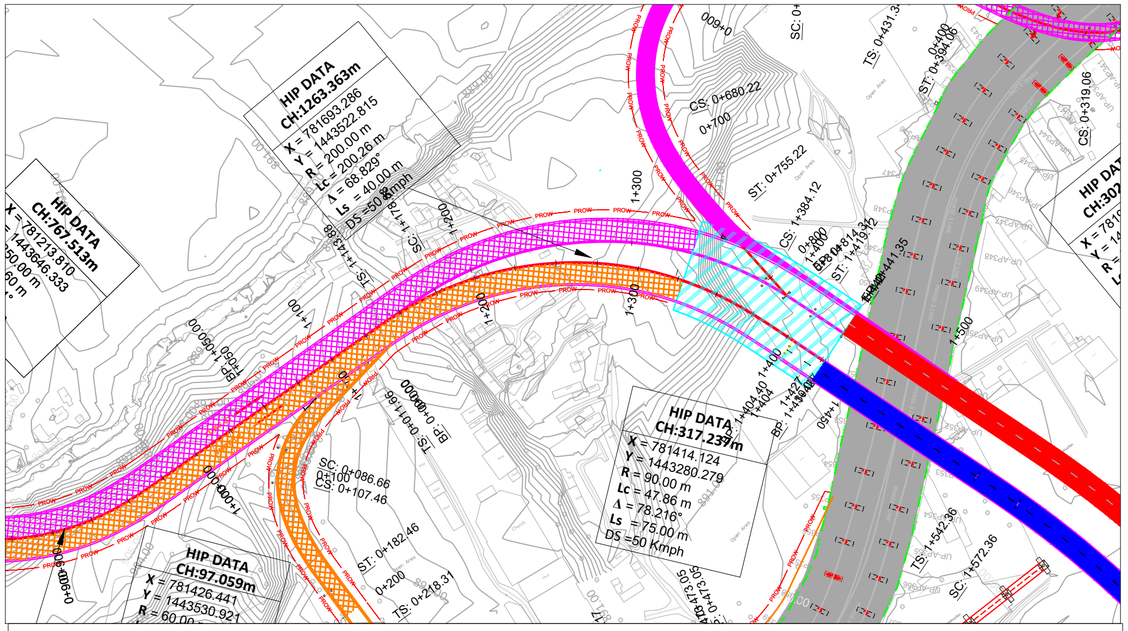
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Drawing Title	PLAN & PROFILE (Tube-1 and Tube-2) (Km.1+000 to Km.1+427)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 01A/R0

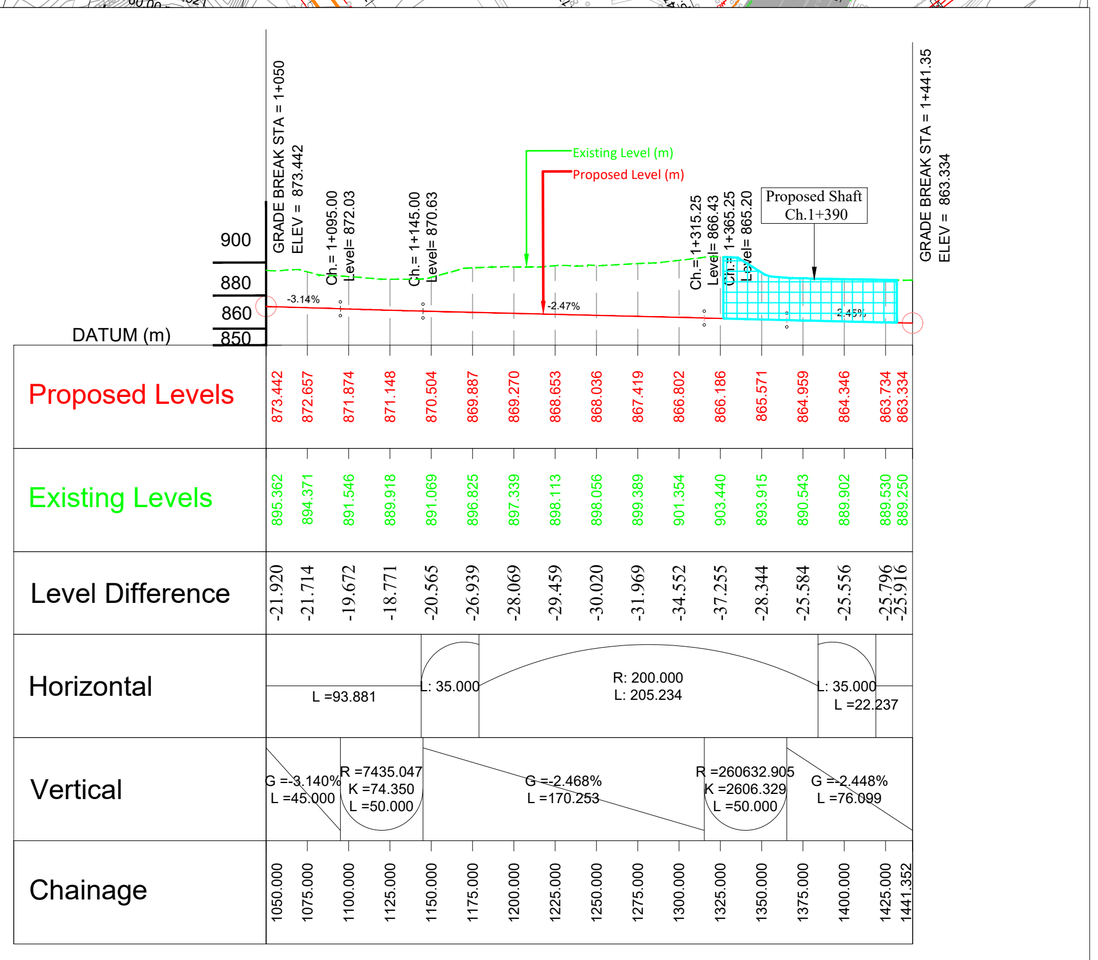
PLAN & PROFILE

(HEBBAL TUBE -I)

Hebbal Esteem mall junction

Silk Road





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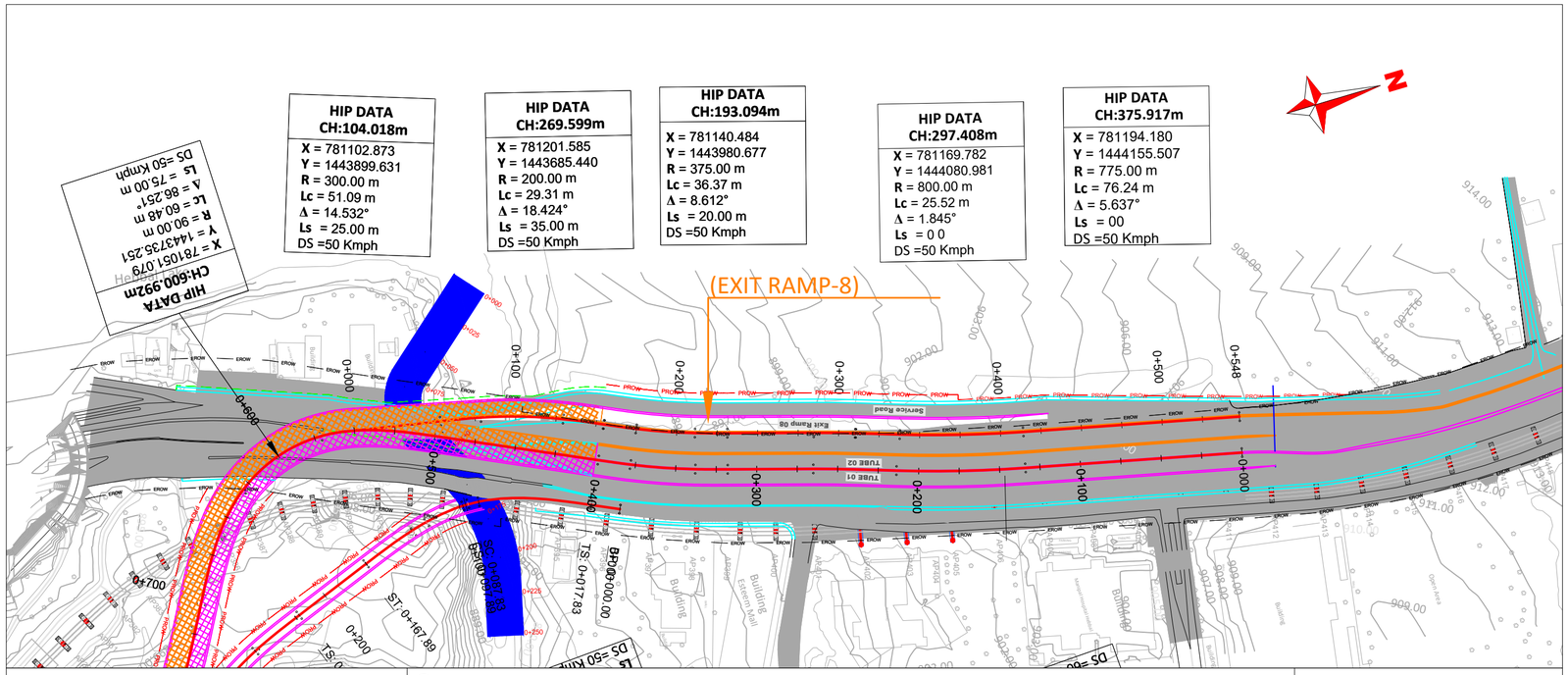
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Drawing Title	PLAN & PROFILE (HEBBAL TUBE 1) (Km.1+050 to Km.1+441)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 01A/R0

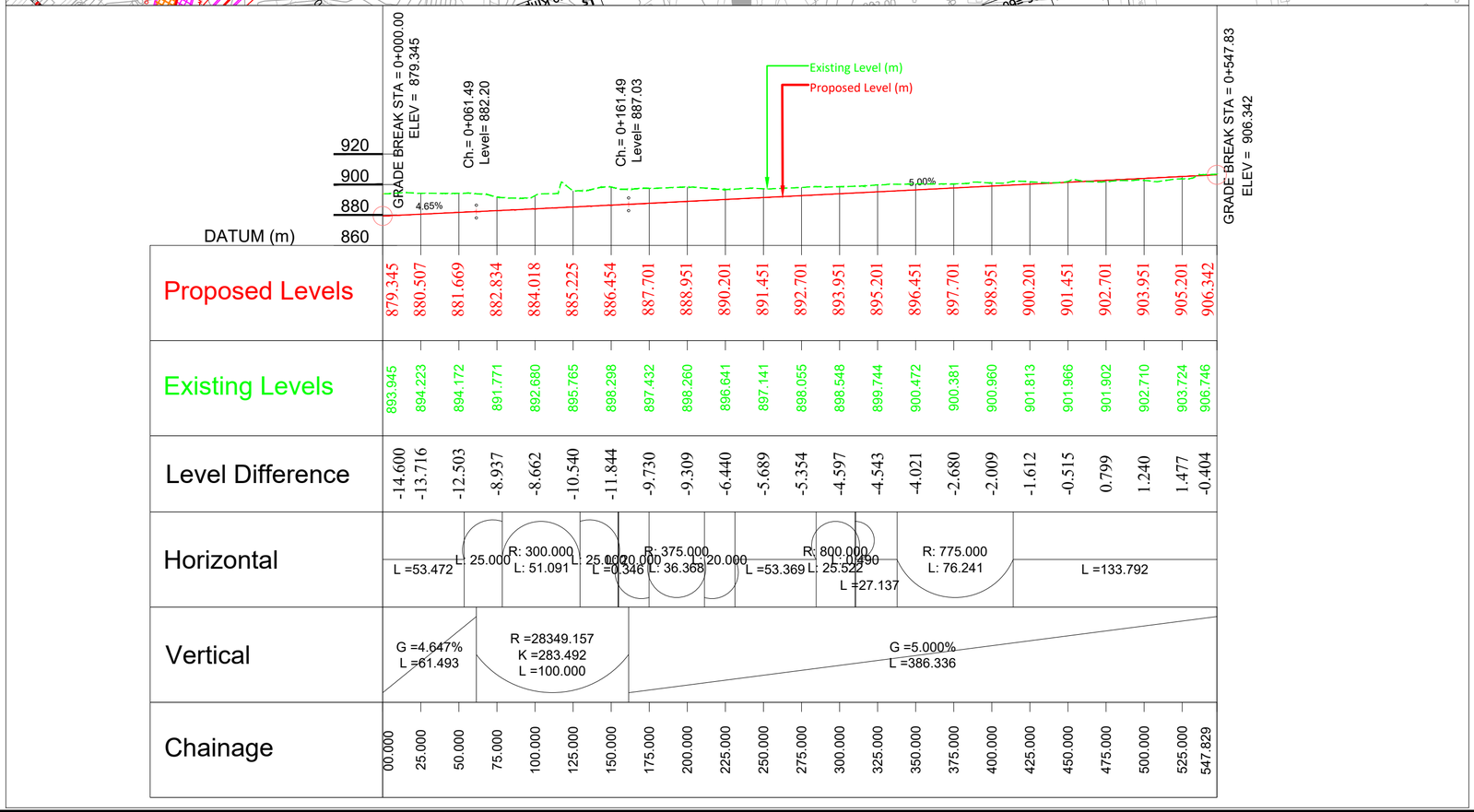
PLAN & PROFILE

(EXIT RAMP -8)

Hebbal Esteem mall junction

Silk Road





REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

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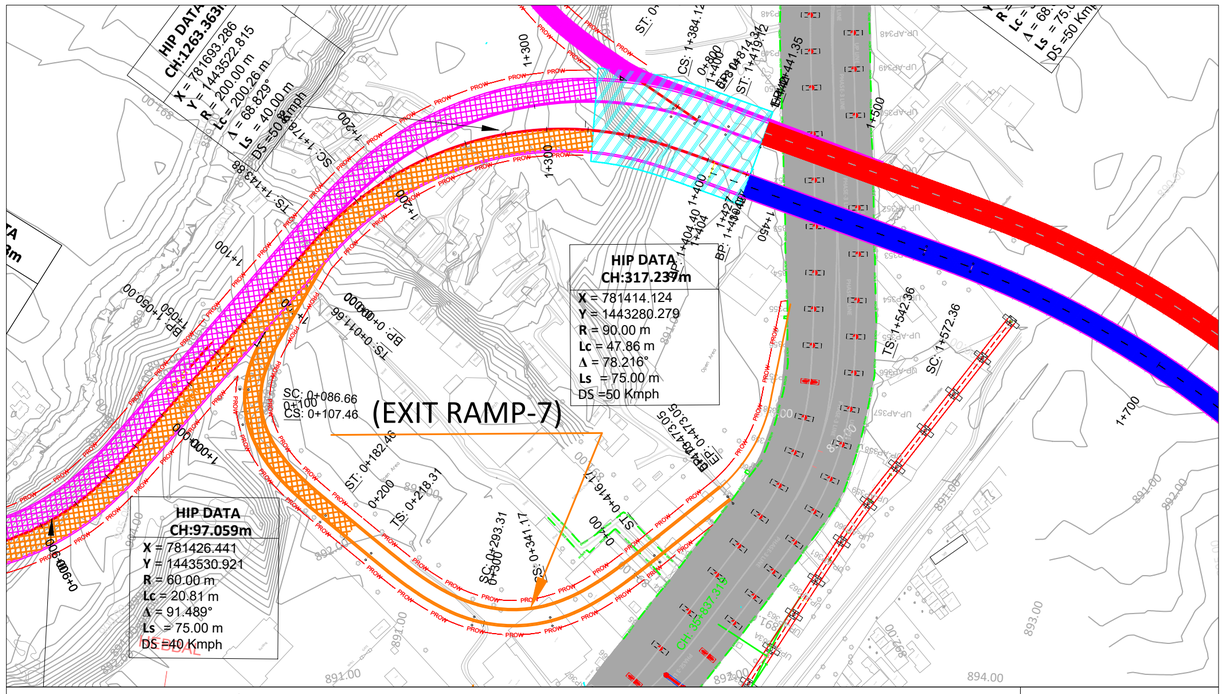
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (EXIT RAMP-8) (Km.0+000 to Km.0+548)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 01/R0

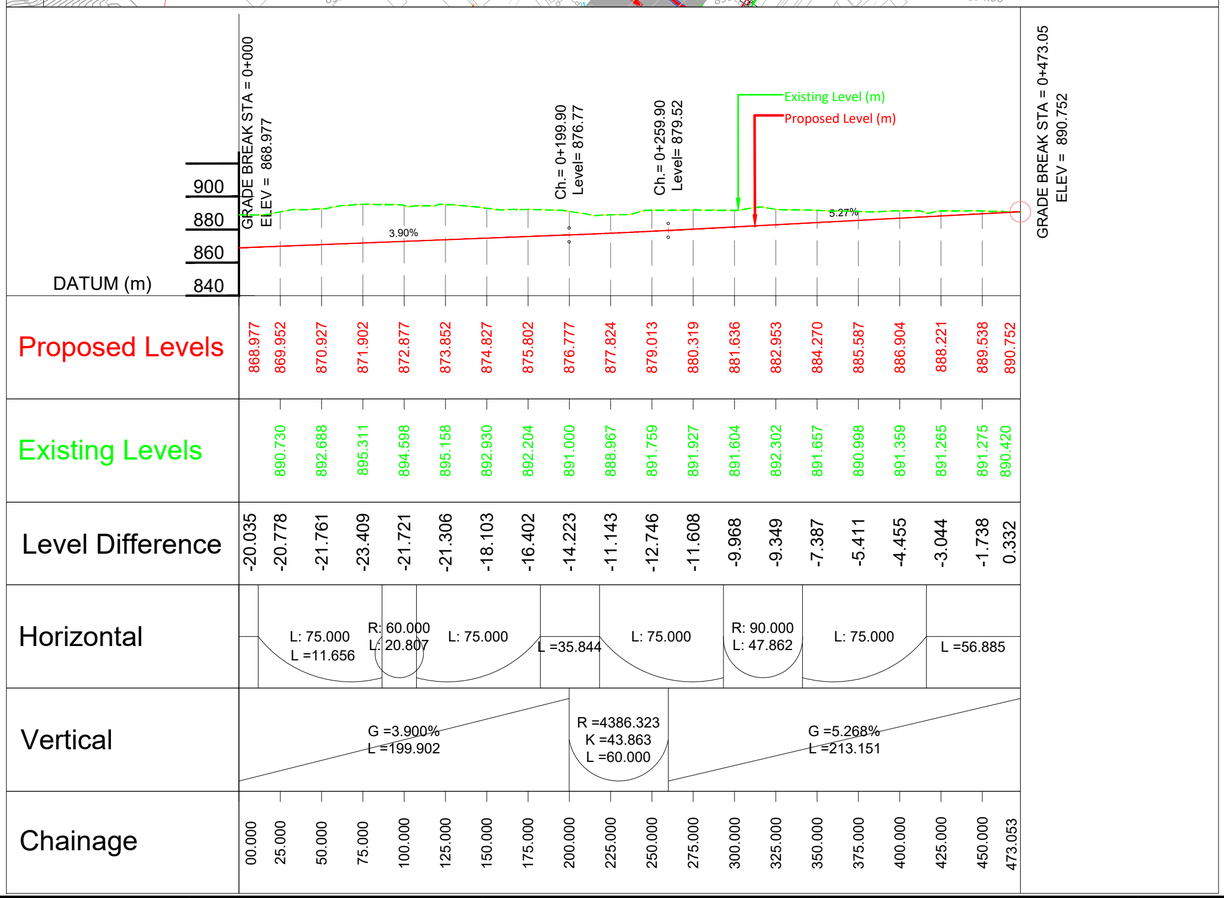
PLAN & PROFILE

(EXIT RAMP - 7)

Hebbal Esteem mall junction

Silk Road





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CONSULTANT:

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GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

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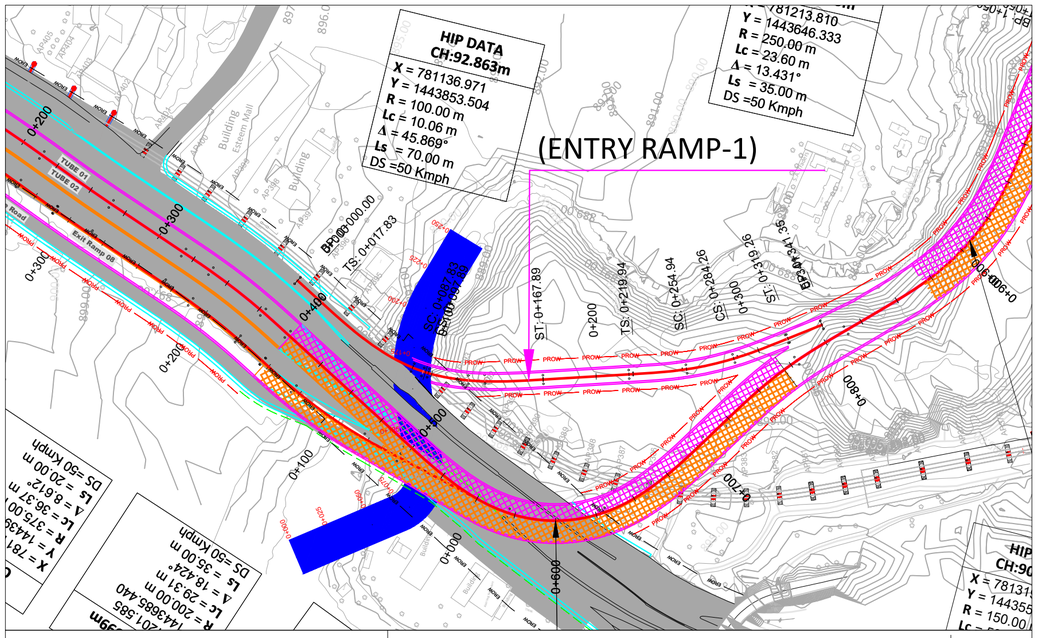
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (EXIT RAMP-7) (Km.0+000 to Km.0+473)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 01/R0

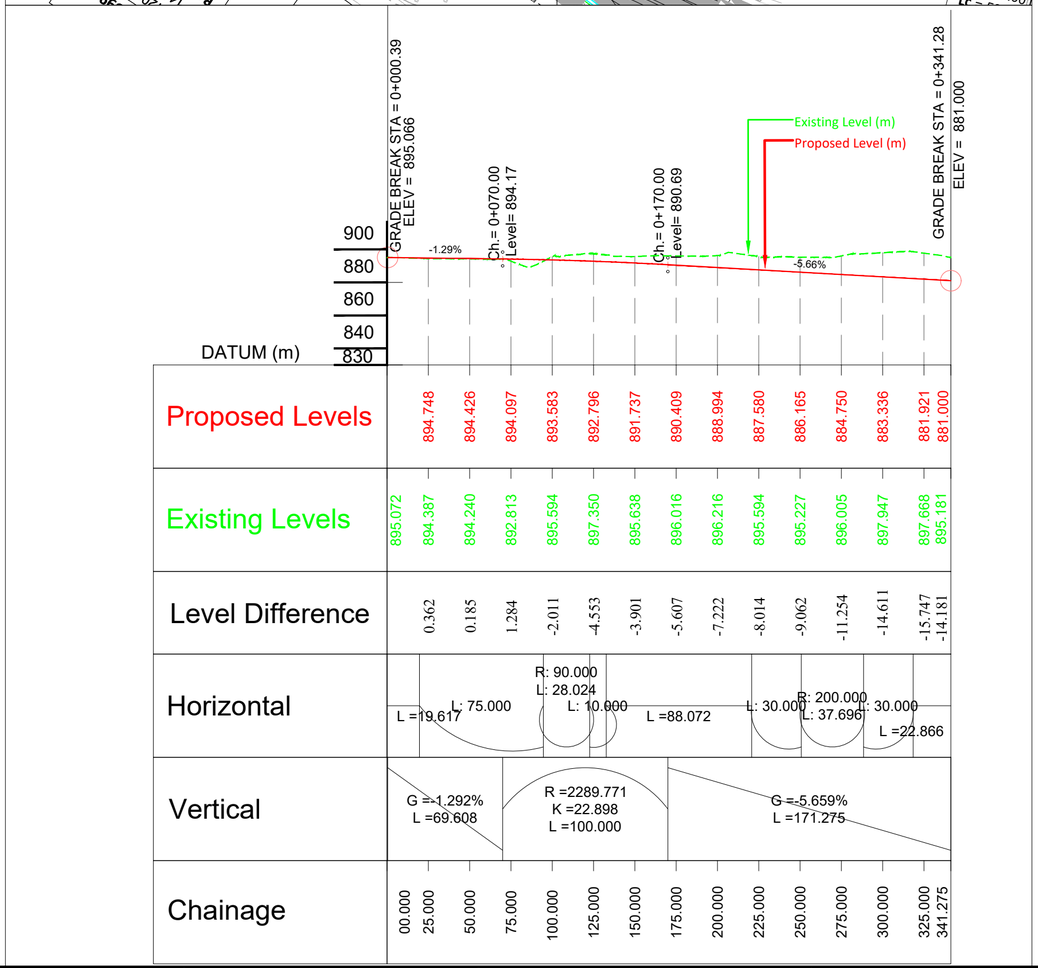
PLAN & PROFILE

(ENTRY RAMP - 1)

Hebbal Esteem mall junction

Silk Road





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04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

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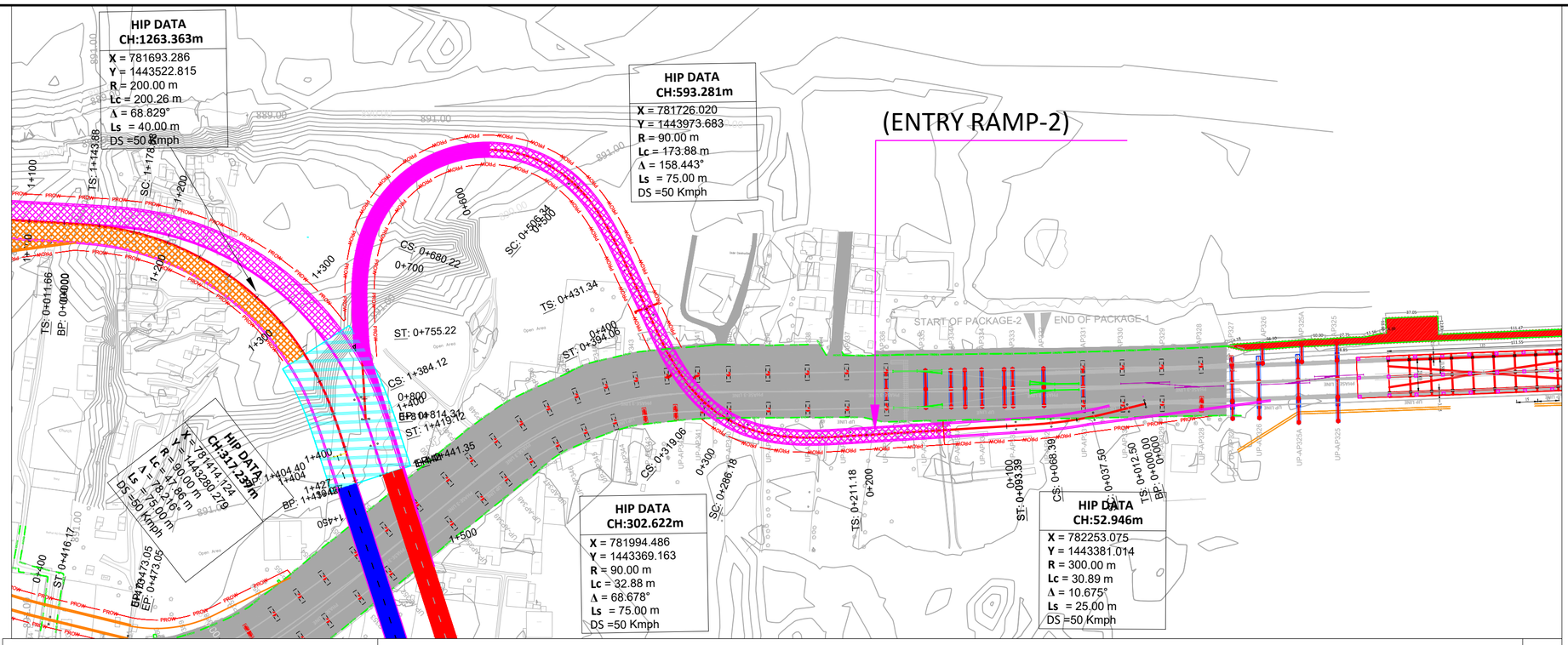
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (ENTRY RAMP-1) (Km.0+000 to Km.0+341)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 01/R0

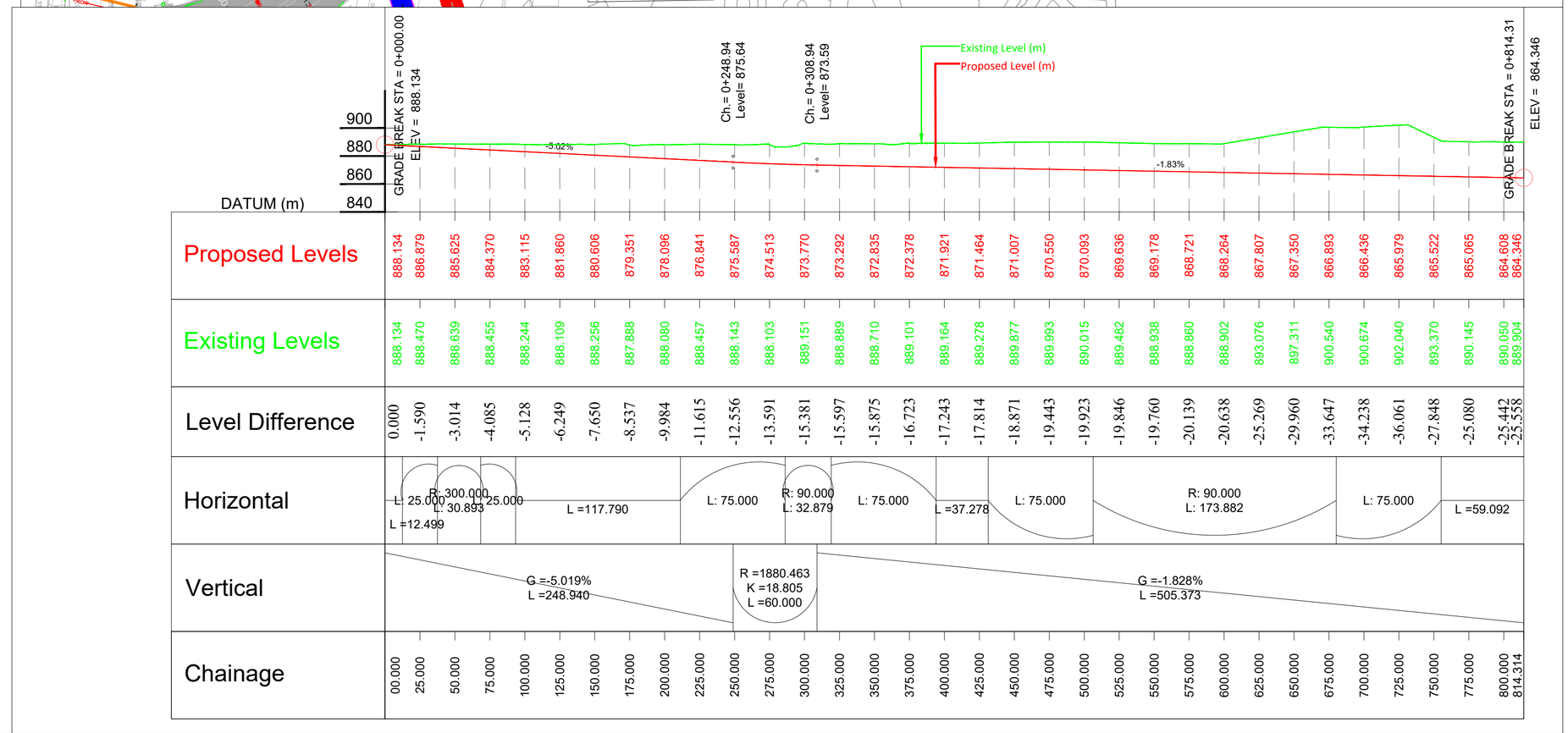
PLAN & PROFILE

(ENTRY RAMP - 2)

Hebbal Esteem mall junction

Silk Road





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CONSULTANT:

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04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

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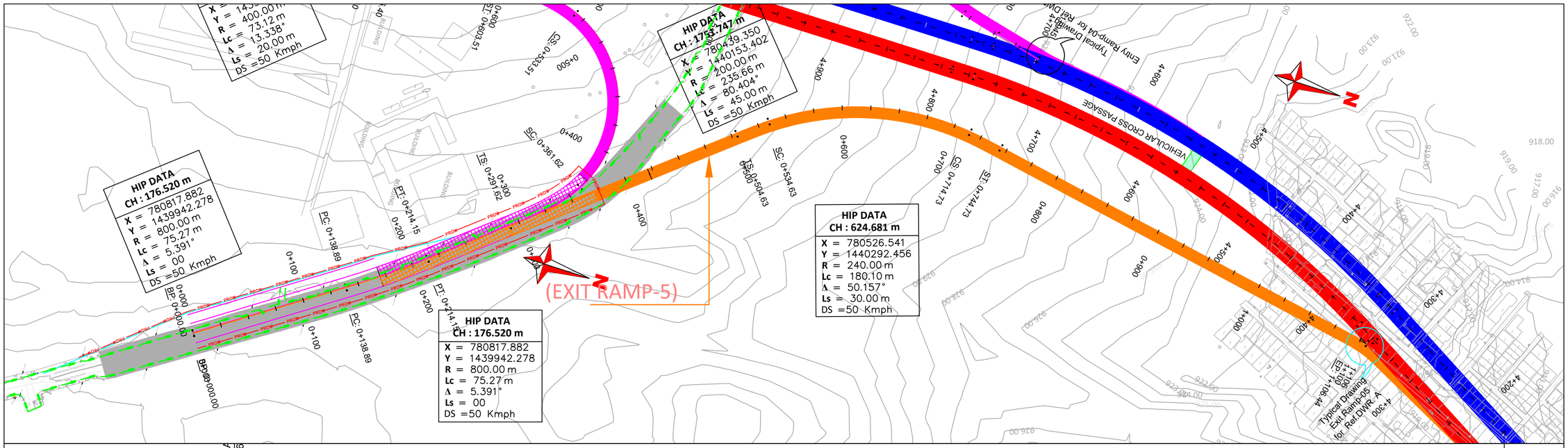
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (ENTRY RAMP-2) (Km.0+000 to Km.000+814)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/ 01/R0

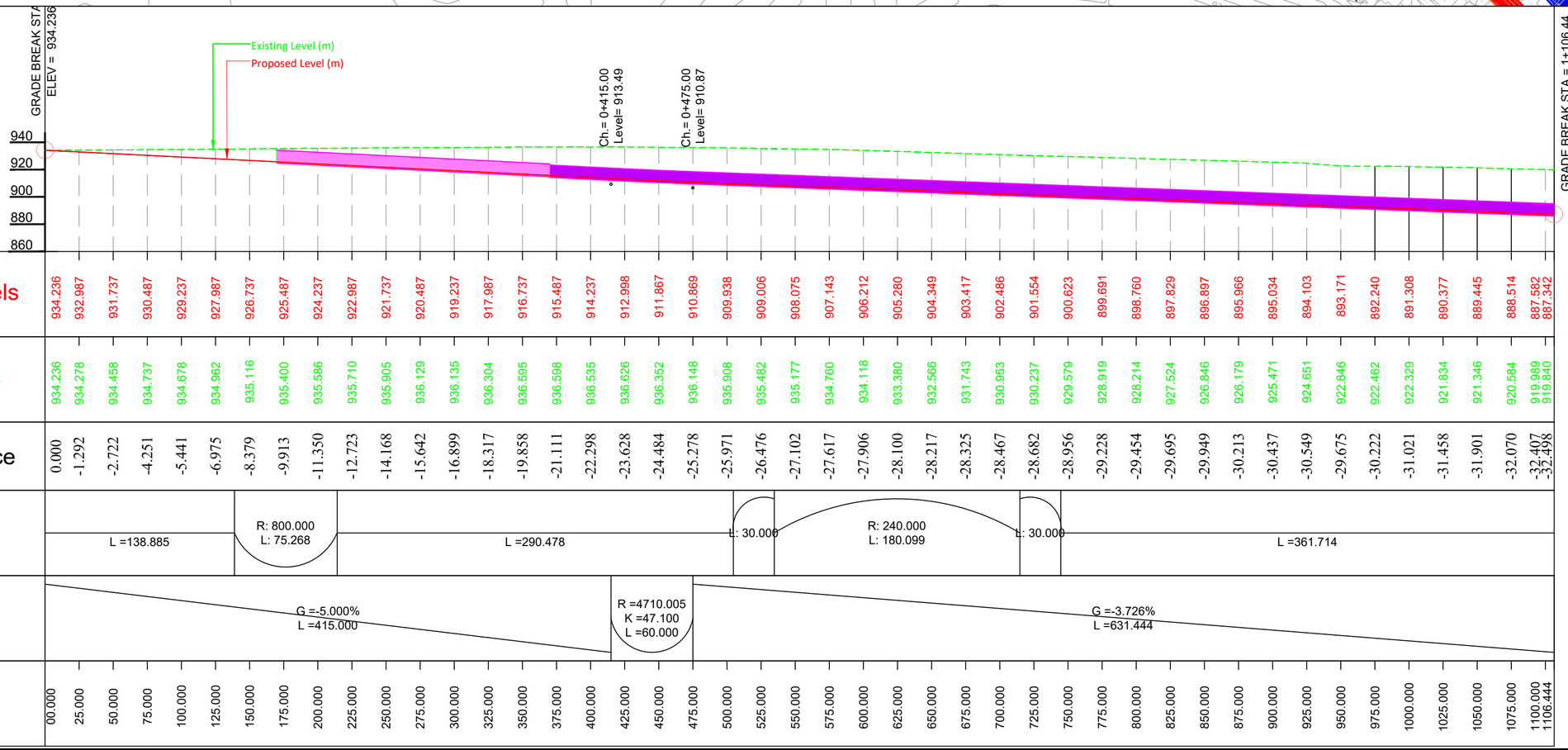
PLAN & PROFILE

(EXIT RAMP - 5)

Hebbal Esteem mall junction

Silk Road





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CONSULTANT:

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FINAL DETAILED PROJECT REPORT

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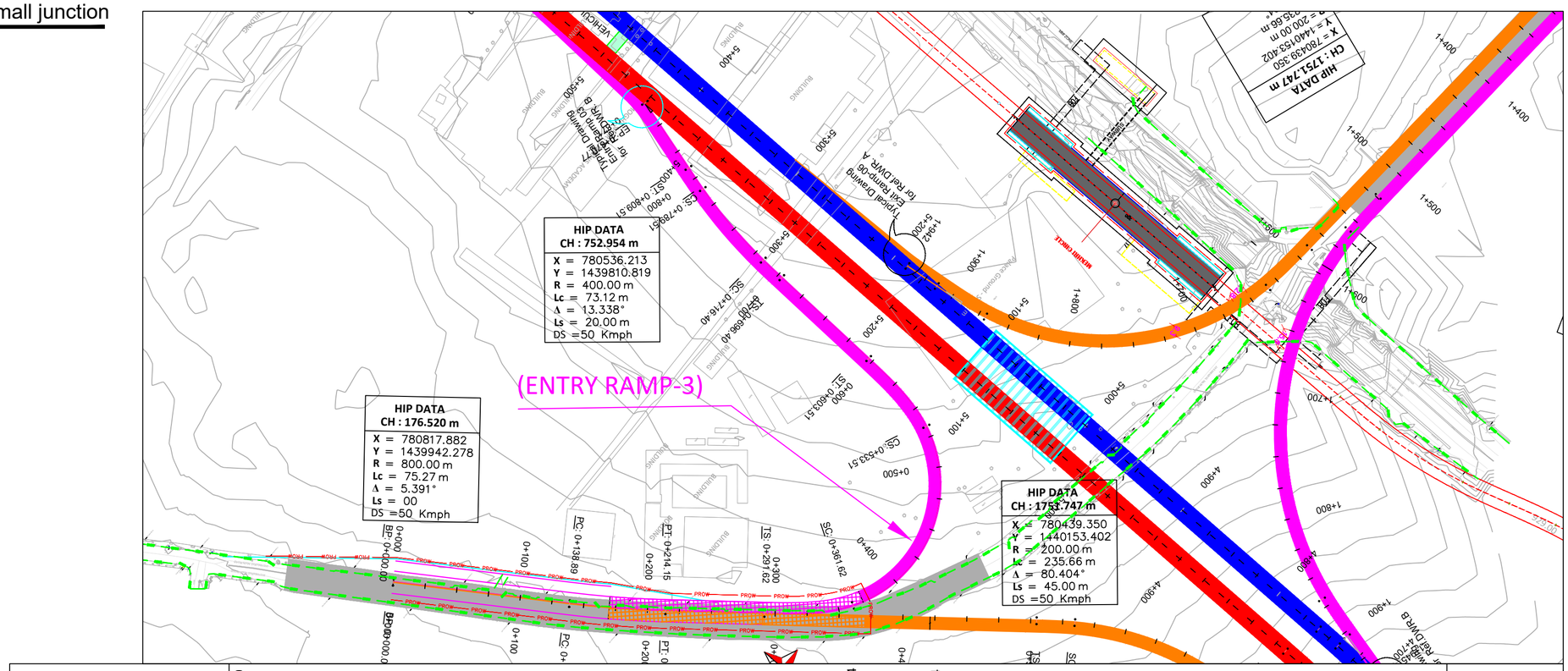
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (EXIT RAMP-5) (Km.0+000 to Km.1+106)
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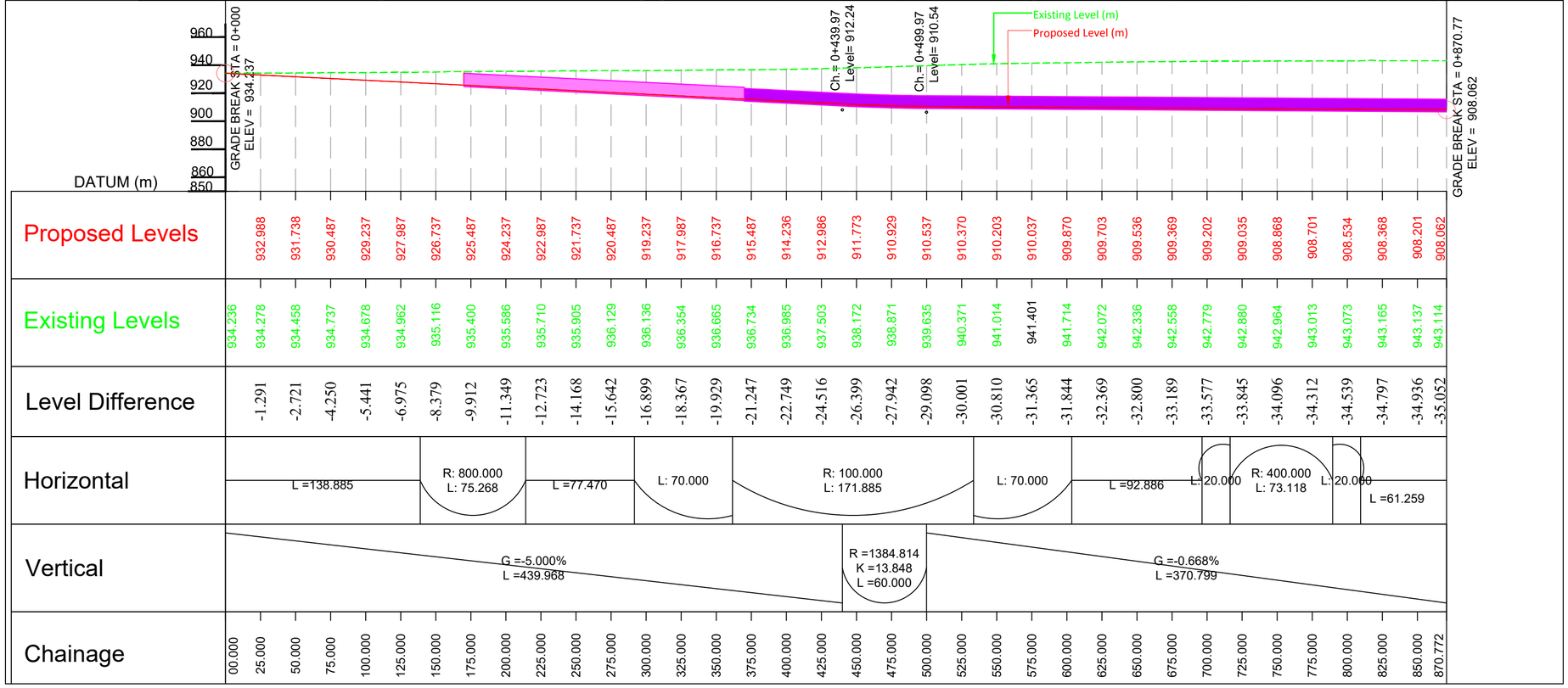
PLAN & PROFILE

(ENTRY RAMP - 3)

Hebbal Esteem mall junction

Silk Road





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CONSULTANT:

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04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

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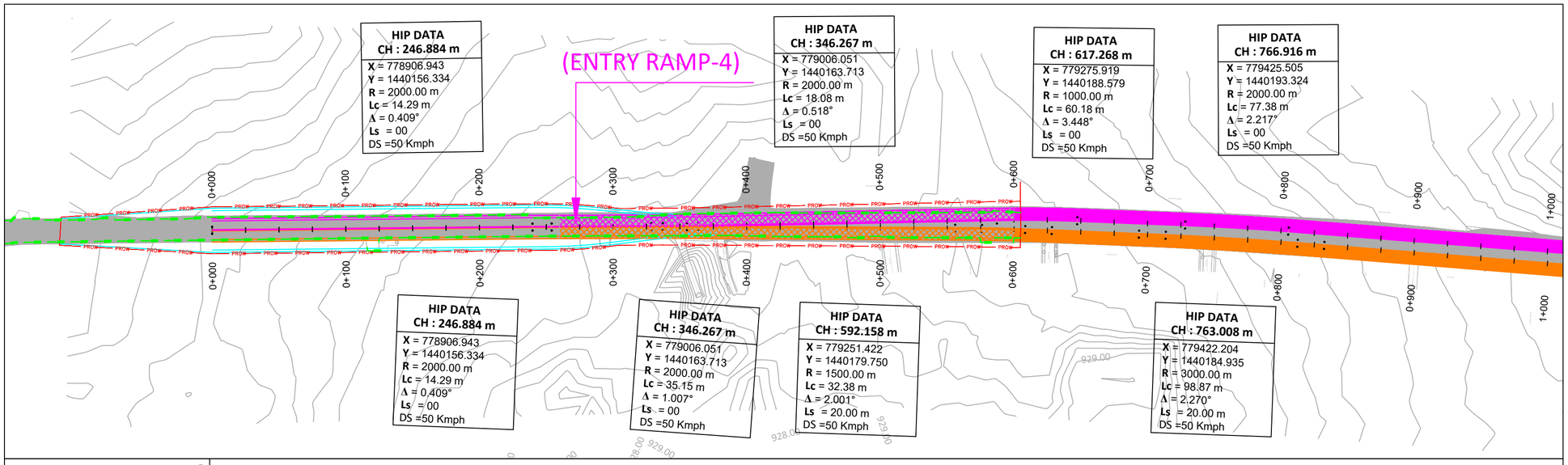
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (ENTRY RAMP-3) (Km.0+000 to Km.000+870)
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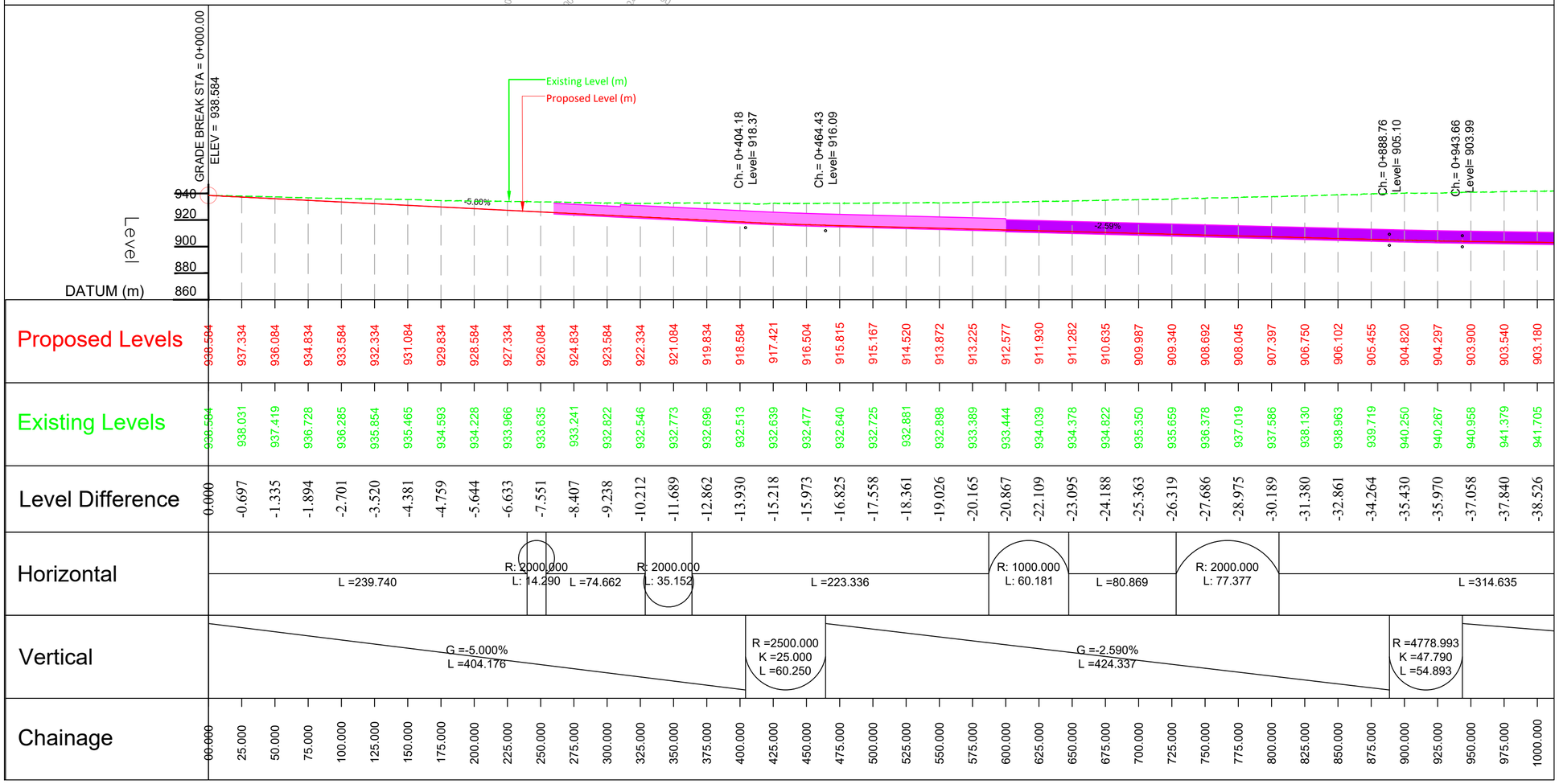
PLAN & PROFILE

(ENTRY RAMP - 4)

Hebbal Esteem mall junction

Silk Road





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EE/Infra Div.-RI,BBMP	
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CONSULTANT:

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1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
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04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

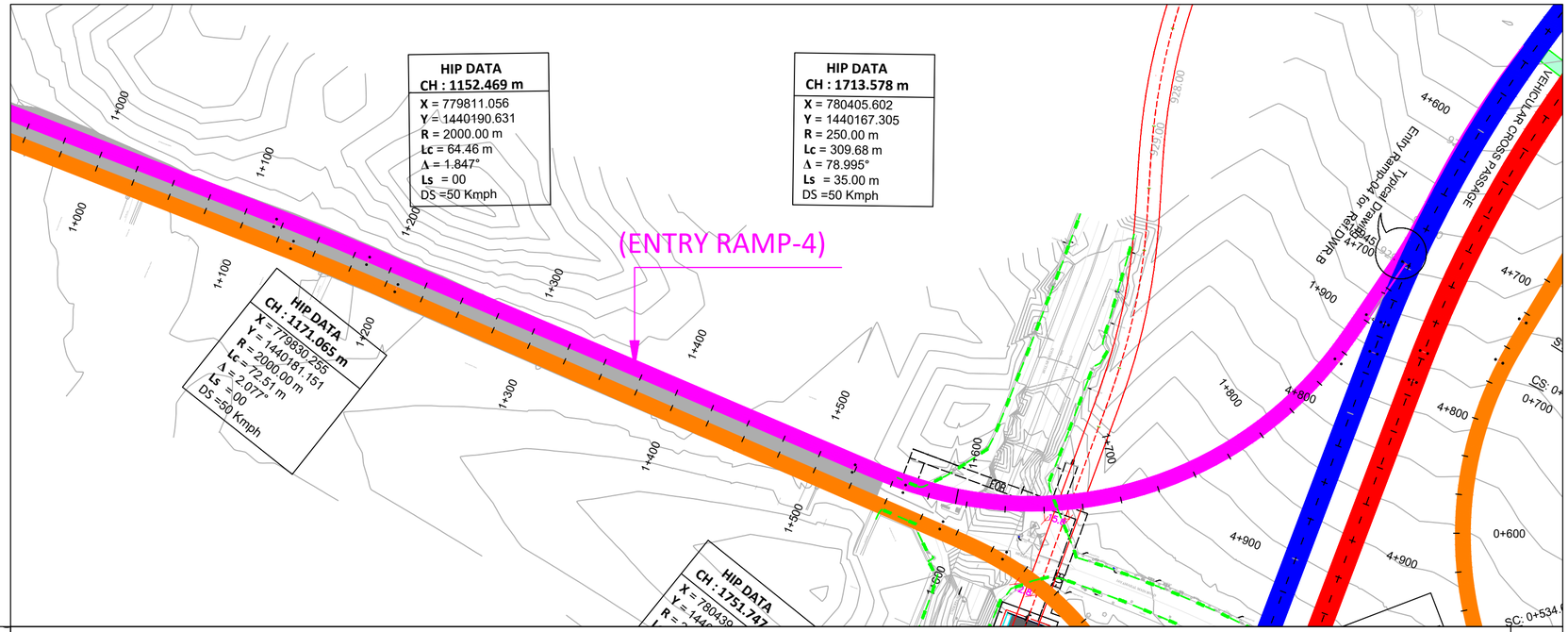
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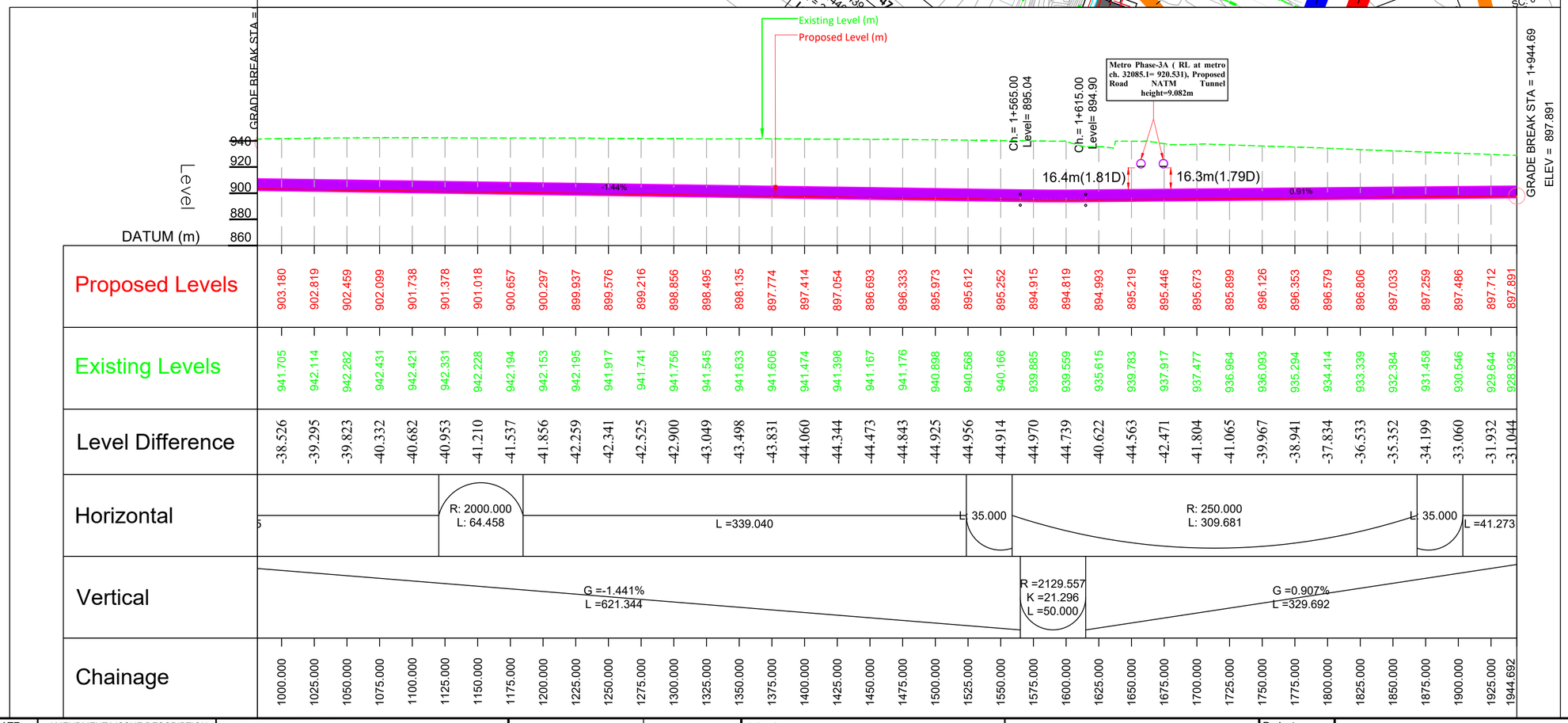
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Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (ENTRY RAMP-4) (Km.0+000 to Km.1+000)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/01/R0

Hebbal Esteem mall junction

Silk Road





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FINAL DETAILED PROJECT REPORT

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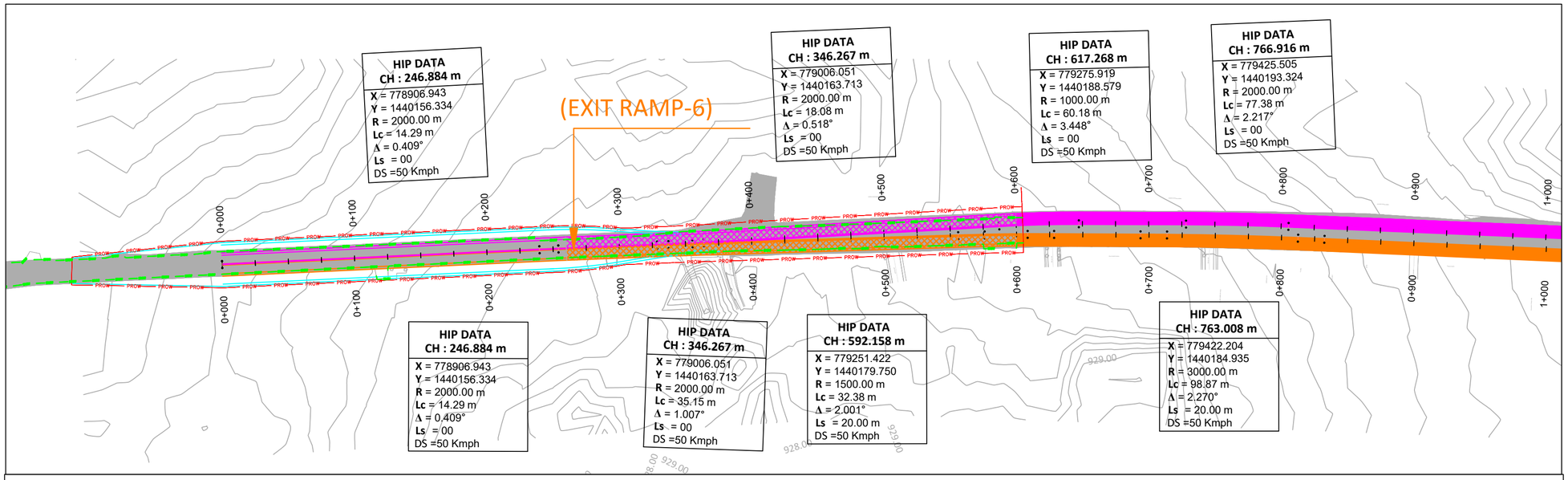
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (ENTRY RAMP-4) (Km.0+000 to Km.1+945)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/01A/R0

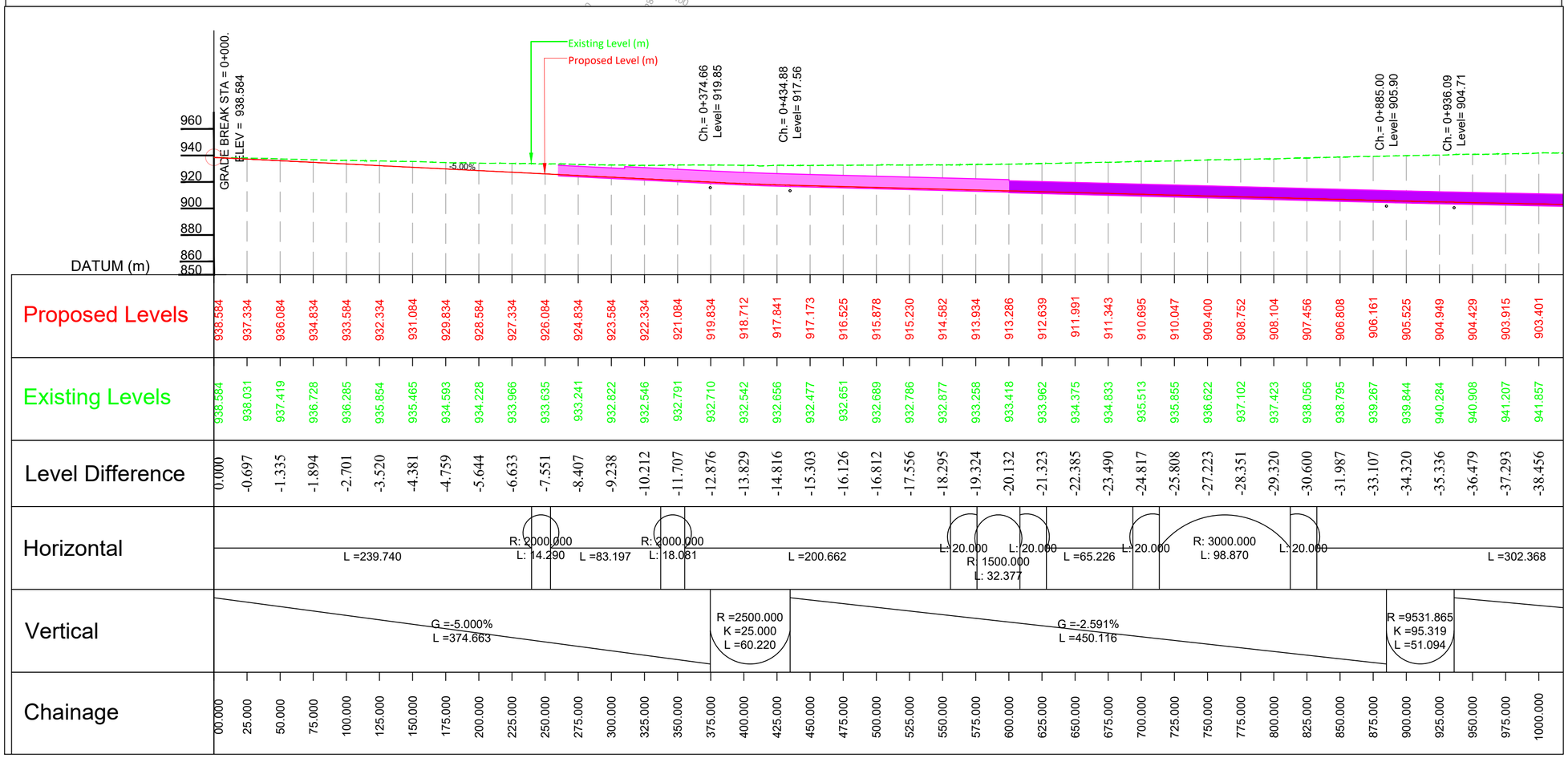
PLAN & PROFILE

(EXIT RAMP – 6)

Hebbal Esteem mall junction

Silk Road





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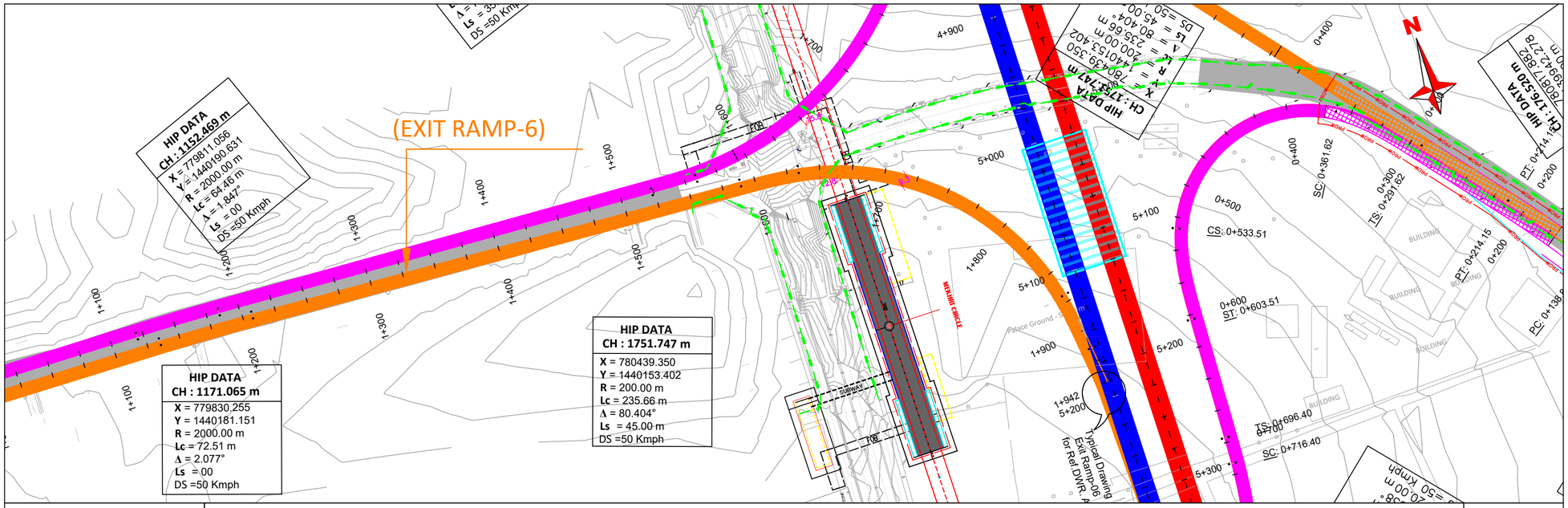
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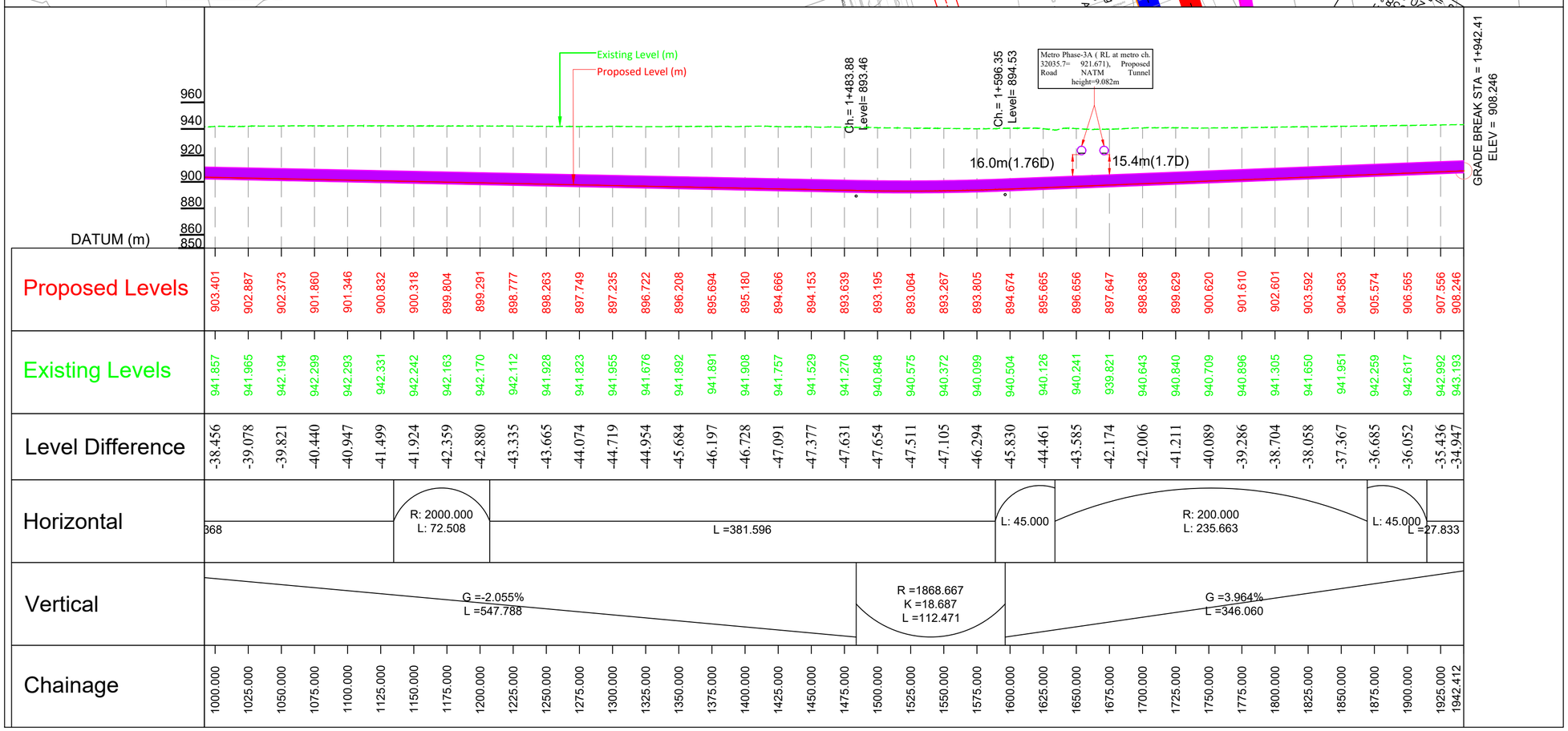
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Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	PLAN & PROFILE (EXIT RAMP-6) (Km.0+000 to Km.1+000)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/01A/R0

Hebbal Esteem mall junction

Silk Road





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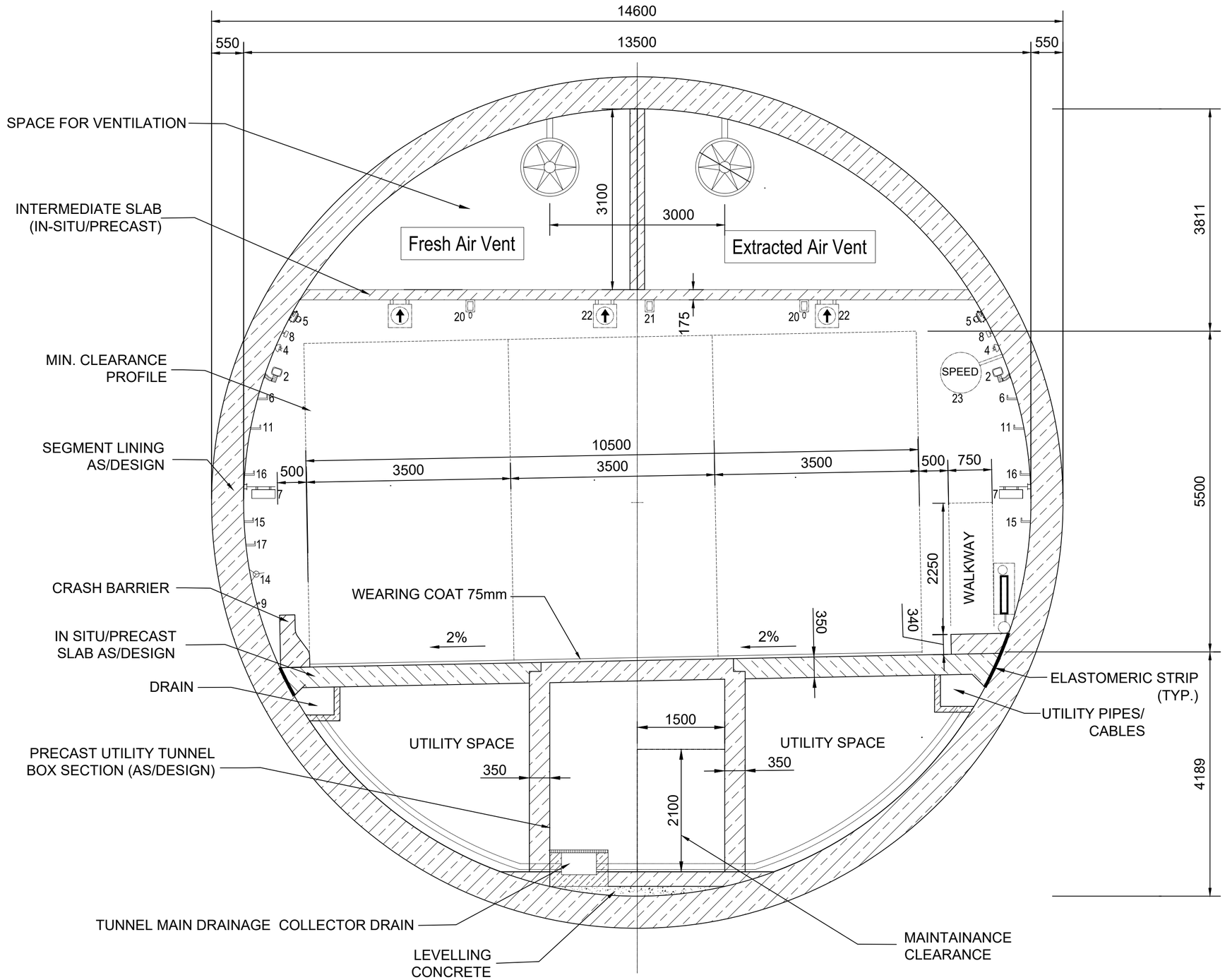
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Drawing Title	PLAN & PROFILE (EXIT RAMP-6) (Km.0+000 to Km.1+942)
Drawing No.	RC/1640/HO/HBT/TU/DWG/P&P/01A/R0

Appendix-B-I

TYPICAL CROSS SECTION

PACKAGE -1



TYPICAL CROSS SECTION-01
MAIN TBM TUNNEL (3 LANES)
SCALE 1:50

LIST OF EQUIPMENT:	
L.No.	Description
1.	LINEAR HEAT DETECTION CABLE
2.	CCTV CAMERA
3.	JET FAN
4.	LIGHT
5.	VENTILATION SENSORS
6.	150MM.CABLE TRAY (LIGHTING,CCTV,SPEAKER & SENSORS)
7.	ILLUMINATED/NON ILLUMINATED EMERGENCY SIGN
8.	SPEAKER (PA)
9.	HANDRAIL
10.	RADIO (LEAKY FEEDER)
11.	150MM. CABLE TRAY (OFC)
12	FIRE FIGHTING PIPE (150/125 NB)
14	MAINTENANCE POWER SOCKET (THREE PHASE & SINGLE PHASE)
15.	150MM. CABLE TRAY (UPS CABLES)
16.	150MM. CABLE TRAY (JET FANS DB TO JET FANS CABLES)
17.	150MM. CABLE TRAY (MAINTENANCE POWER SOCKET CABLES)
18.	250MM. CABLE TRAY (33KV.CABLES)
19.	250MM. CABLE TRAY (11KV.CABLES)
20.	SPRINKLER
21.	FIRE ALARM
22.	TRAFFIC LIGHT
22.	TRAFFIC SIGN BOARD

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTORS DETAILED DESIGN. DETAILED DESIGN OF SEGMENTAL LINING SHALL BE DONE BY CONTRACTOR.
3. SIZING AND DETAILS OF CRASH BARRIER, DRAINAGE , UTILITY PIPE TRENCH ETC . MAY CHANGE AS PER CONTRACTORS DETAILED DESIGN.
4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN.
5. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.
6. ELASTOMERIC STRIPS TO BE INSTALLED AT THE JOINT OF PAVEMENT SLAB WITH TUNNELING SEGMENTAL LINING.

MATERIALS:-
GRADE OF CONCRETE - M60

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT
GOVERNMENT OF KARNATAKA
Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:
RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)
GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

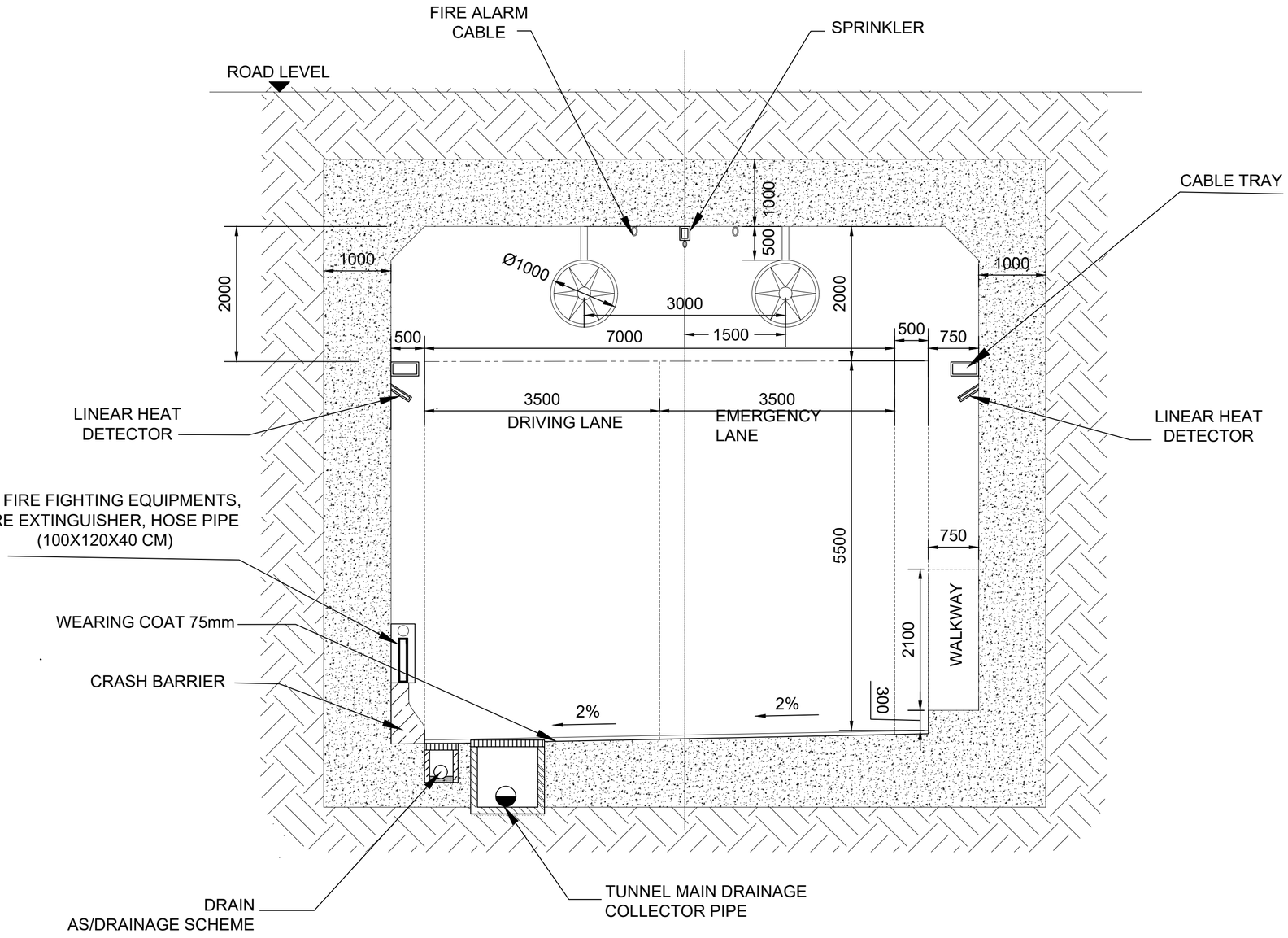
FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A2

Project: Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.

Drawing Title: TYPICAL CROSS SECTION-1 (TBM TUNNEL)
Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/01/R0



TYPICAL CROSS SECTION-03

CUT AND COVER SECTION FOR ENTRY/EXIT (2 LANE)

SCALE 1:50

NOTES:

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4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN.
5. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

MATERIALS:
GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

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EIC- BBMP	

CONSULTANT:
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FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

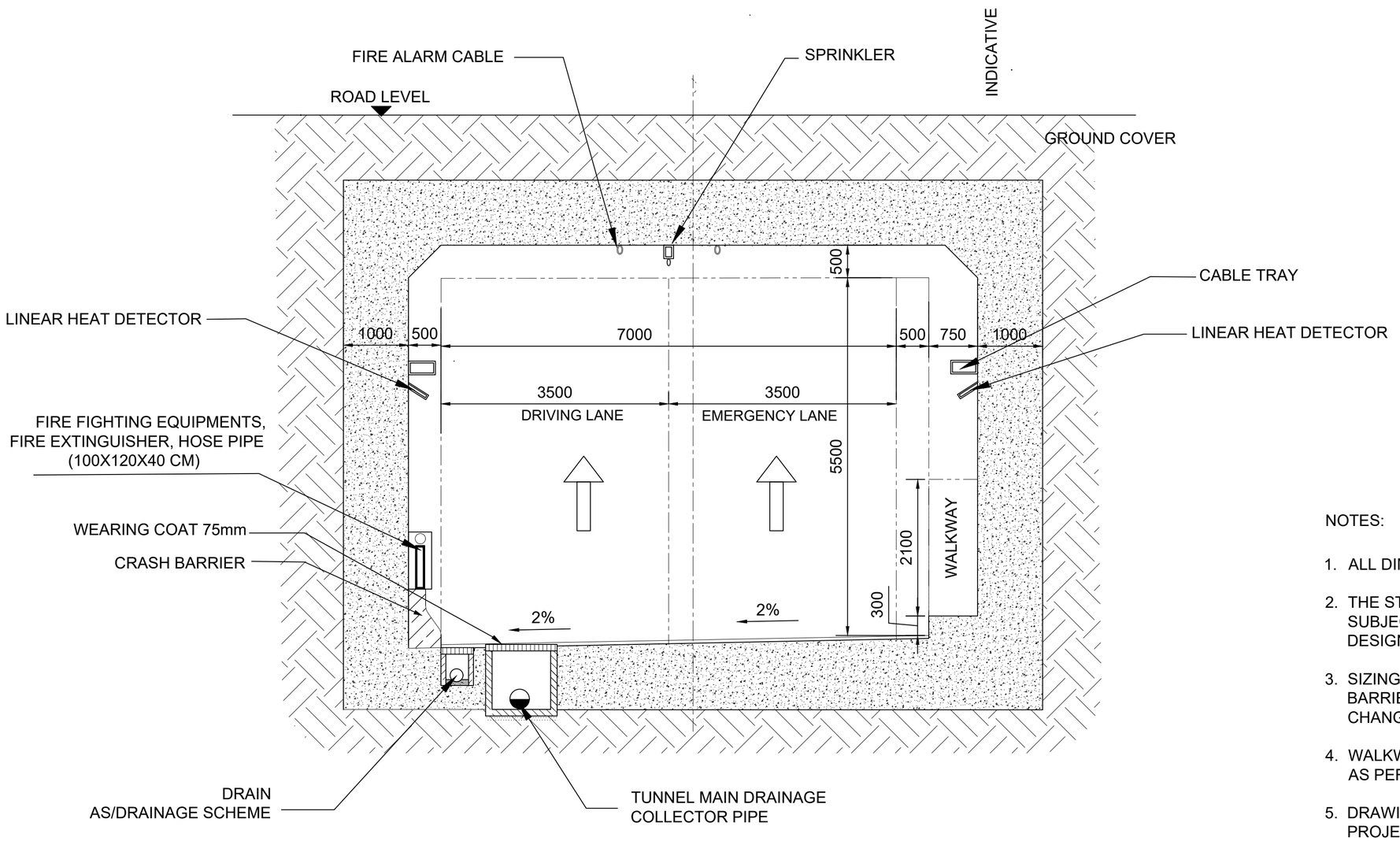
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Drawing Title: TYPICAL CROSS SECTION-03

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/02/R0



TYPICAL CROSS SECTION-03A
CUT AND COVER TYPICAL SECTION - 2 LANE

REGULAR CROSS SECTION
SCALE 1:50

NOTES:

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3. SIZING AND DETAILS OF TYPICAL DETAILS OF CRASH BARRIER , UTILITY PIPE TRENCH , MAIN DRAINAGE ETC. MAY CHANGE AS PER CONTRACTOR'S DETAILED DESIGN.
4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN .
5. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.
6. CROSS SECTION TO BE READ IN CONJUNCTION WITH TCS-3A.

MATERIALS:
GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

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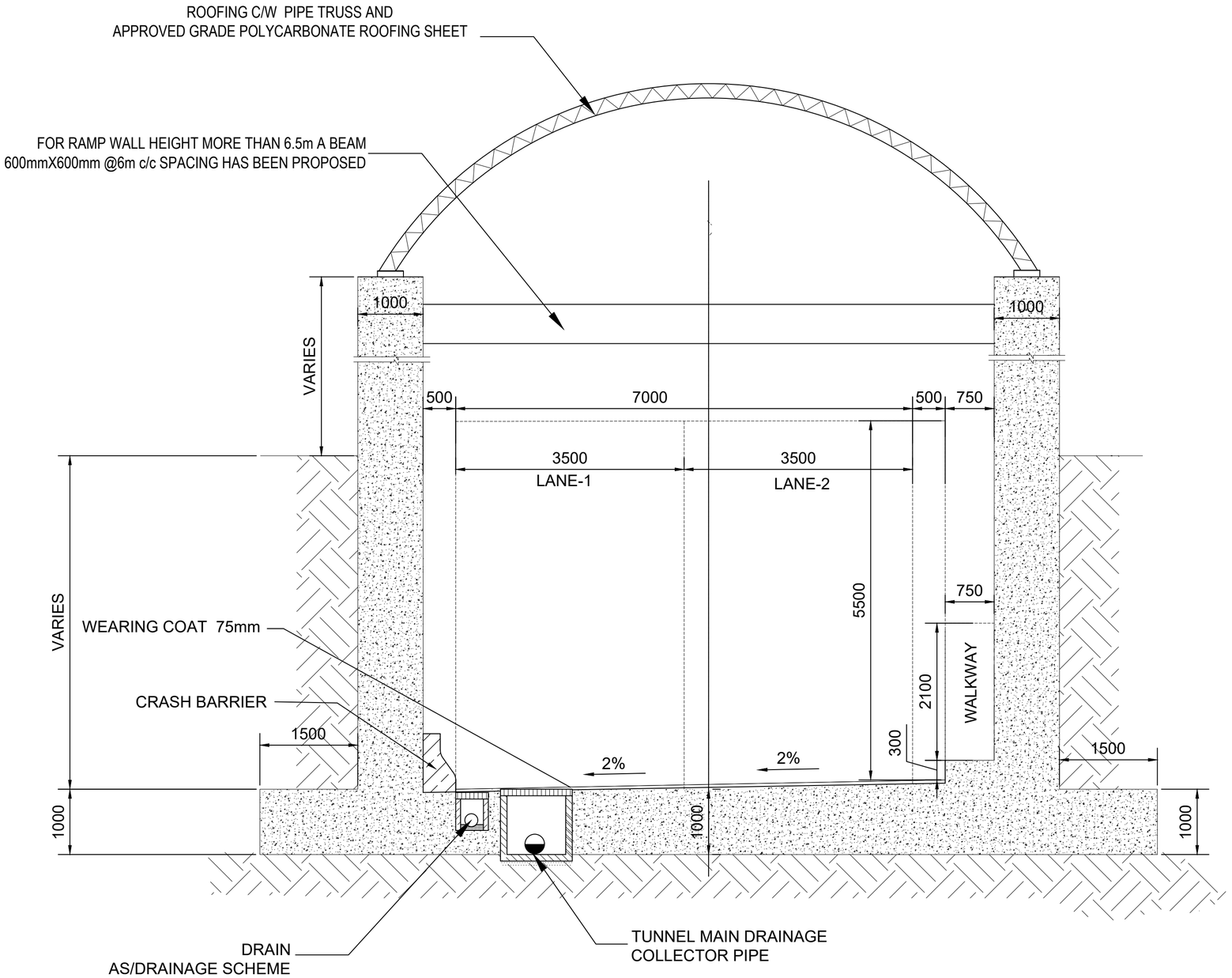
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Drawing Title: TYPICAL CROSS SECTION-3A

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/03/R0



TYPICAL CROSS SECTION-04
OPEN RAMP SECTION FOR ENTRY/EXIT (2 LANE)

SCALE 1:50

NOTES:

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FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

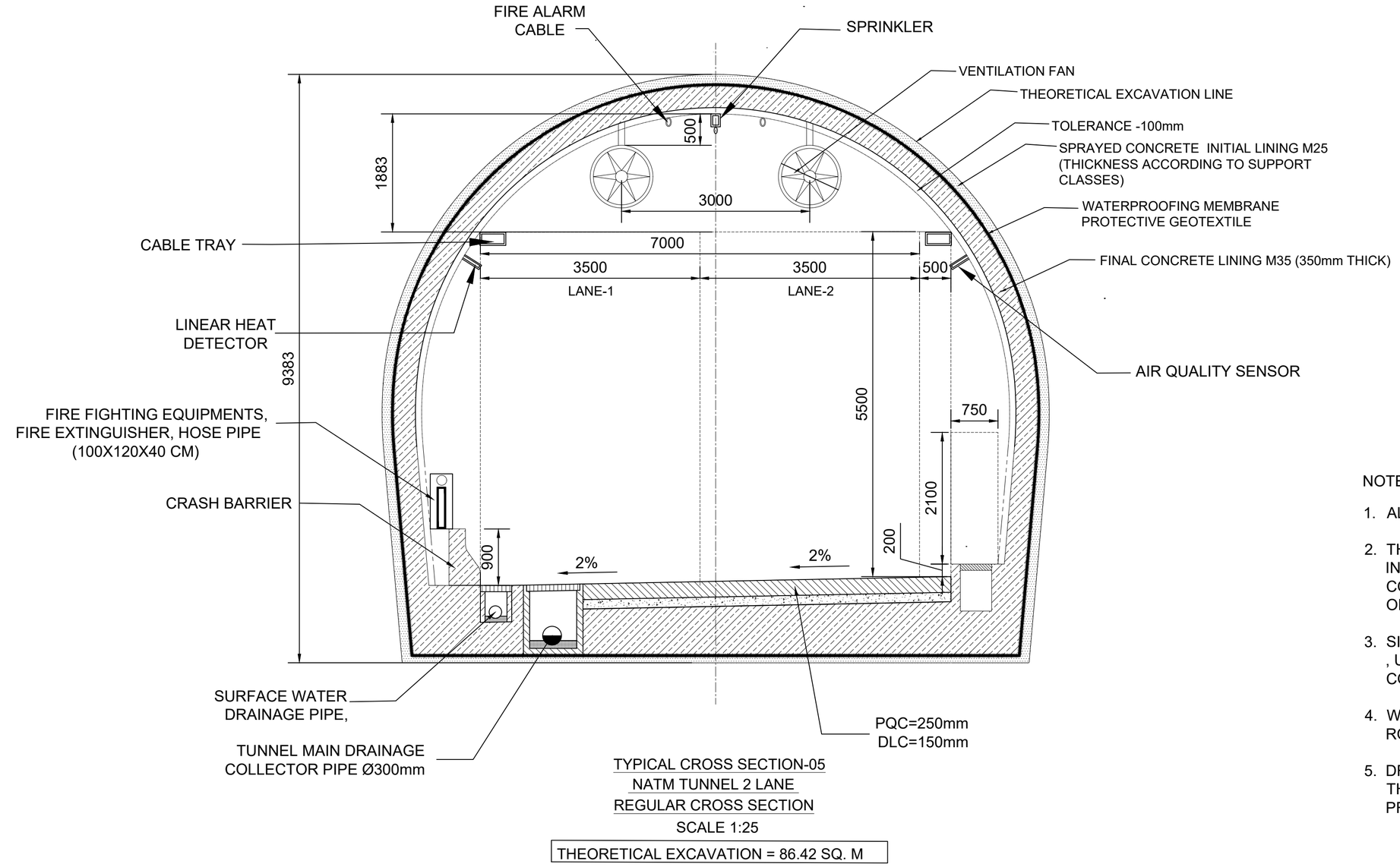
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Drawing Title: TYPICAL CROSS SECTION-04

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/ 04/R0



TYPICAL CROSS SECTION-05
NATM TUNNEL 2 LANE
REGULAR CROSS SECTION
SCALE 1:25

THEORETICAL EXCAVATION = 86.42 SQ. M

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MATERIALS:

GRADE OF CONCRETE - M35

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
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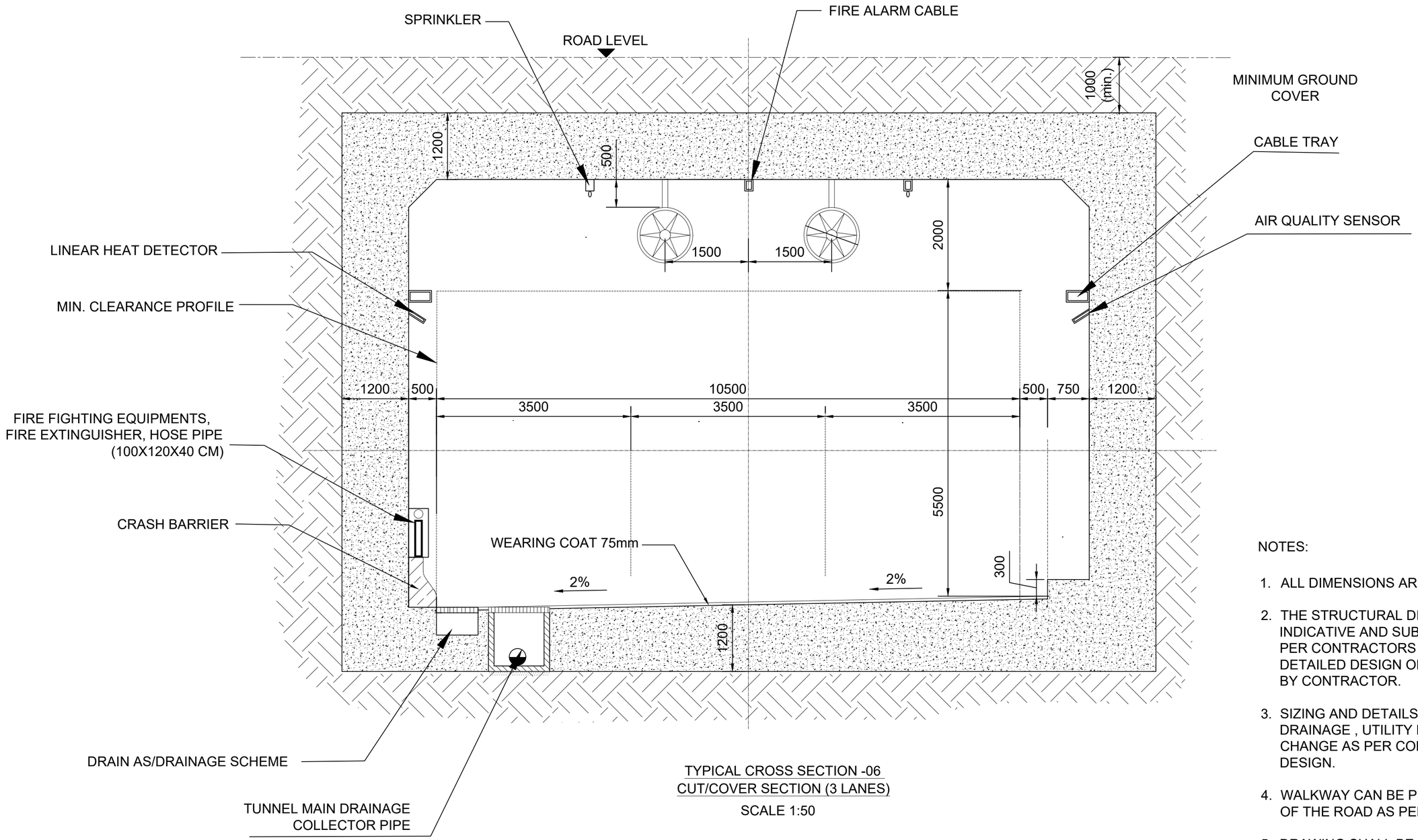
CONSULTANT:
RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)
GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
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Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	TYPICAL CROSS SECTION-05
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 05/R0



TYPICAL CROSS SECTION -06
CUT/COVER SECTION (3 LANES)
SCALE 1:50

NOTES:

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MATERIALS

GRADE OF CONCRETE - M35
GRADE OF STEEL Fe550D

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
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CLIENT
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Bruhat Bangalore Mahanagara Palike

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EIC- BBMP	

CONSULTANT:
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1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0,000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

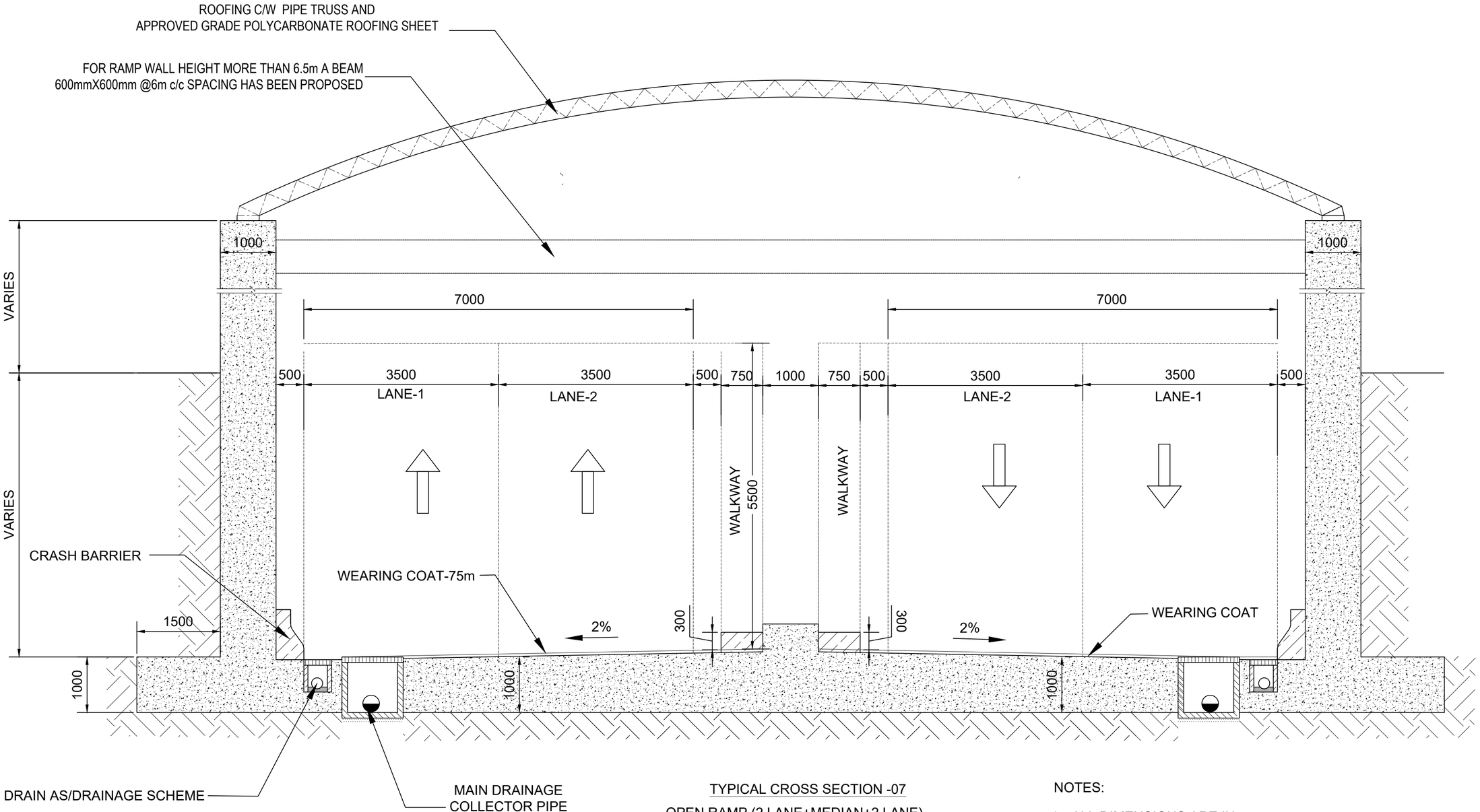
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Project: Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.

Drawing Title: TYPICAL CROSS SECTION-06

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/ 06/R0



TYPICAL CROSS SECTION -07

OPEN RAMP (2 LANE+MEDIAN+2 LANE)

SCALE 1:50

MATERIALS:-

GRADE OF CONCRETE - M35
GRADE OF STEEL Fe550D

NOTES:

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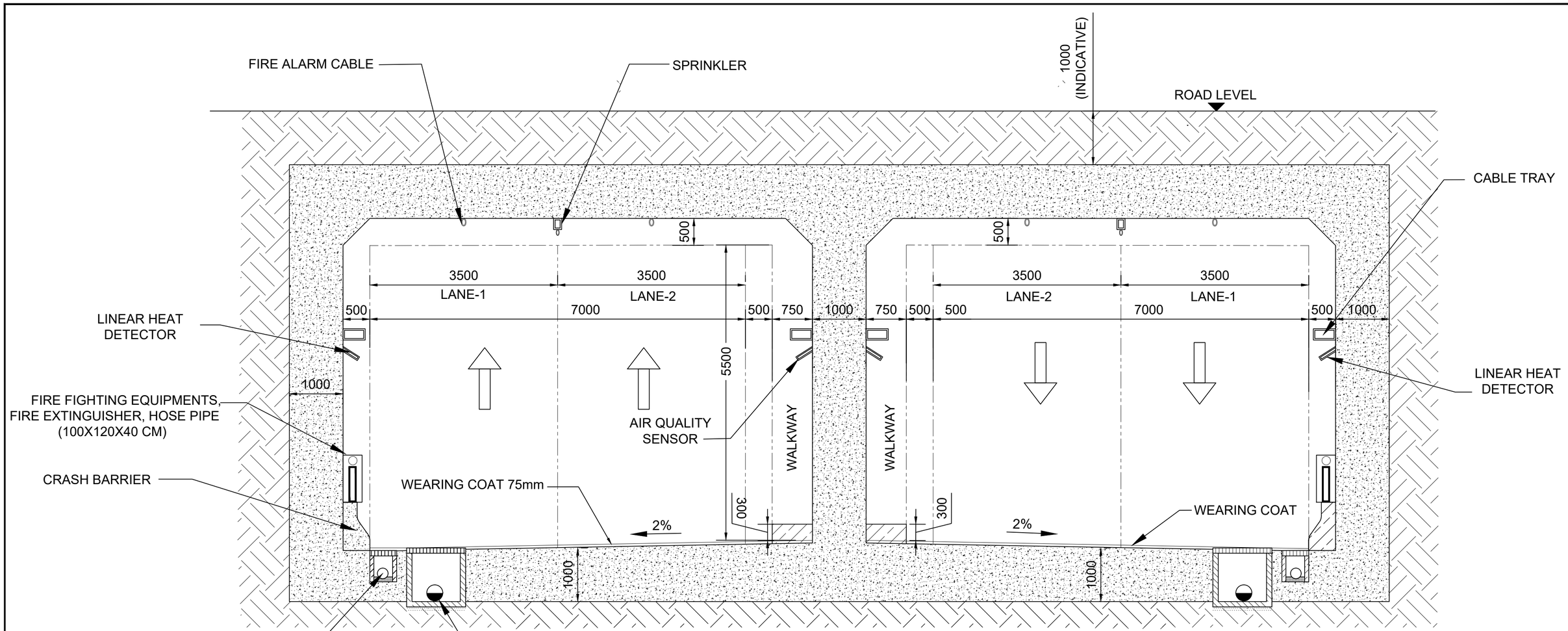
CONSULTANT:
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FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

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Drawing Title	TYPICAL CROSS SECTION-07
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 07/R0



TYPICAL CROSS SECTION -08

CUT AND COVER SECTION
(2 LANE+MEDIAN WALL+2 LANE)

MATERIALS:
GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

NOTES:-

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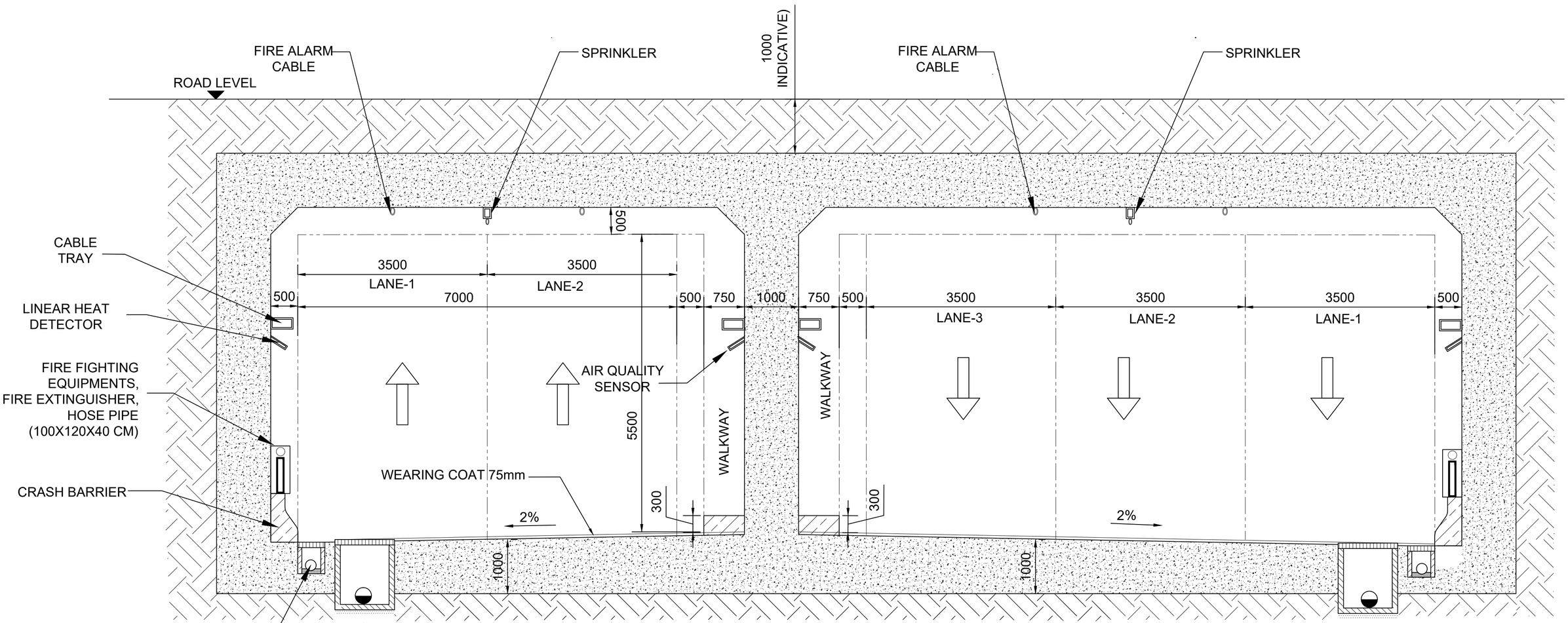
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Drawing Title	TYPICAL CROSS SECTION-08
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 08/R0



TYPICAL CROSS SECTION -09
CUT AND COVER SECTION
2 LANE+MEDIAN WALL+3LANE

SCALE 1:50

MATERIALS:-

GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

NOTES:

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CONSULTANT:
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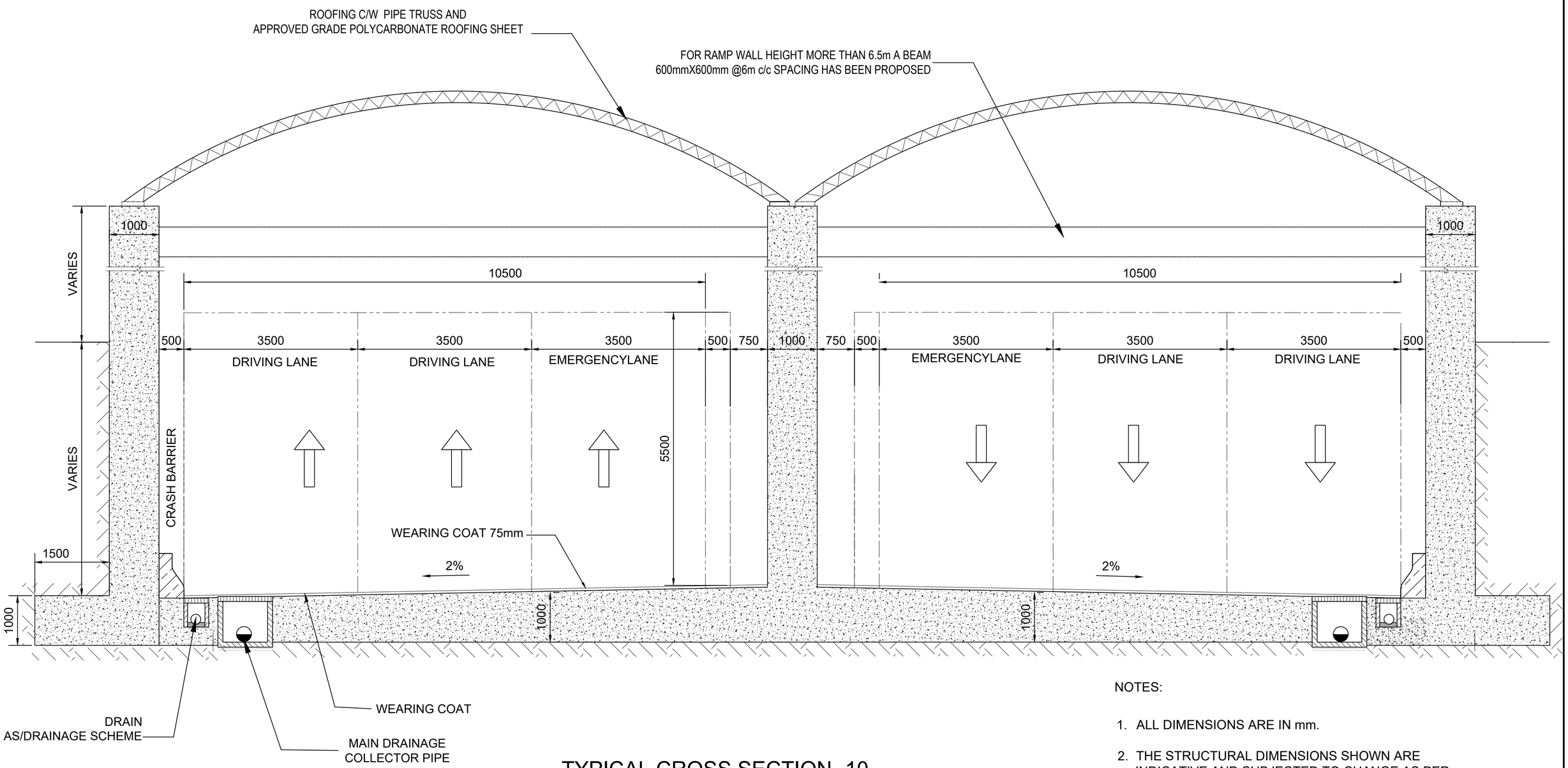
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Drawing Title: TYPICAL CROSS SECTION-09

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/ 09/R0



TYPICAL CROSS SECTION -10
OPEN RAMP SECTION
3LANE+MEDIAN WALL+3LANE
SCALE 1:50

MATERIALS: -
GRADE OF CONCRETE -M35 , STEEL GRADE Fe550D

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NEW DELHI - 110001 (INDIA)
GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

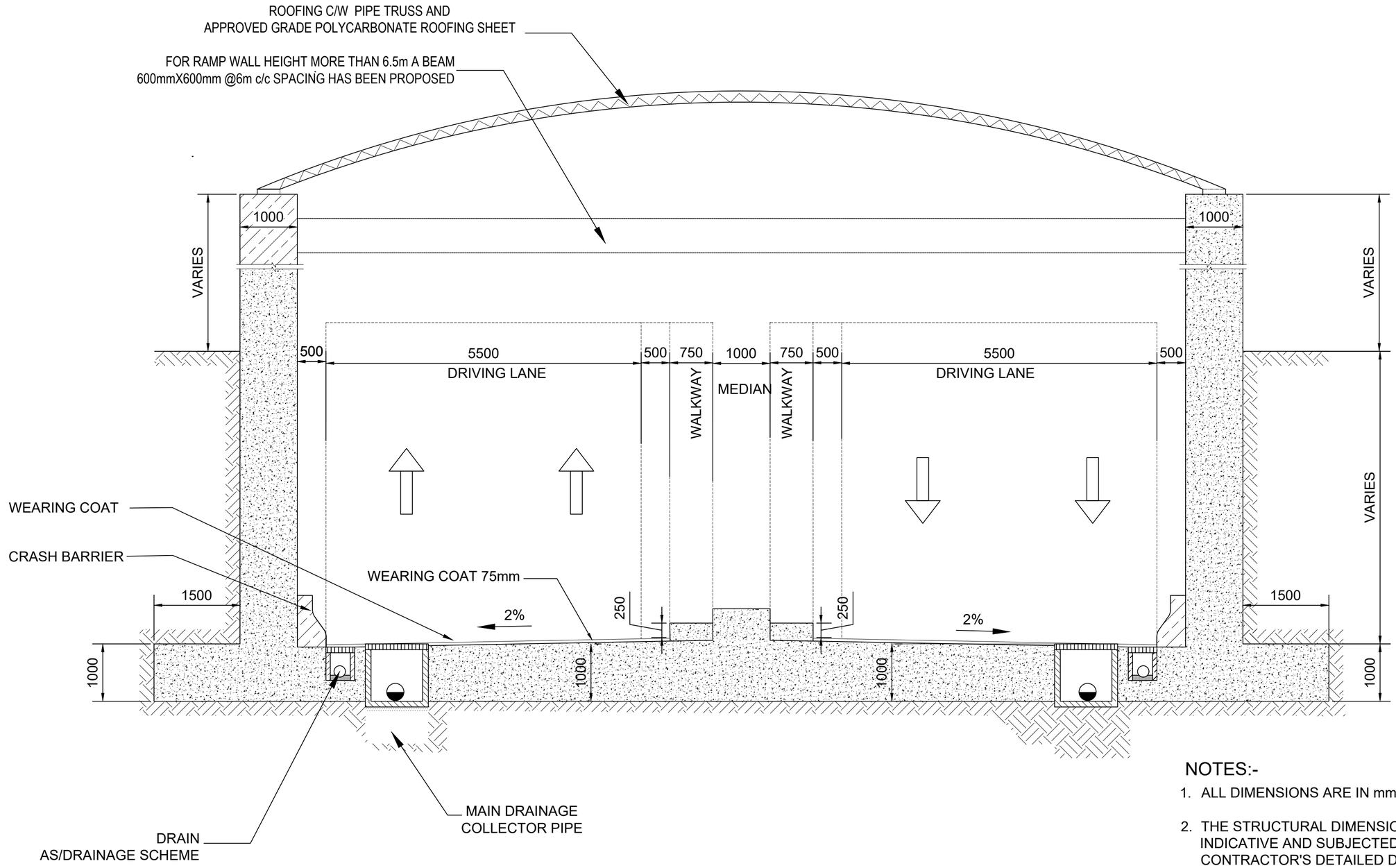
Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A2

Project: Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.

Drawing Title: TYPICAL CROSS SECTION-10

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/ 10/R0



TYPICAL CROSS SECTION -11

RAMP SECTION (TYPE - RPBD3) BIDIRECTIONAL - 1.5 LANE+MEDIAN+1.5 LANE (3 LANE) REGULAR CROSS SECTION

SCALE 1:50

MATERIALS: -
GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

NOTES:-

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTOR'S DETAILED DESIGN.
3. SIZING AND DETAILS OF TYPICAL DETAILS OF CRASH BARRIER , UTILITY PIPE TRENCH , MAIN DRAINAGE ETC. MAY CHANGE AS PER CONTRACTOR'S DETAILED DESIGN.
4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN .
5. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT
GOVERNMENT OF KARNATAKA
Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

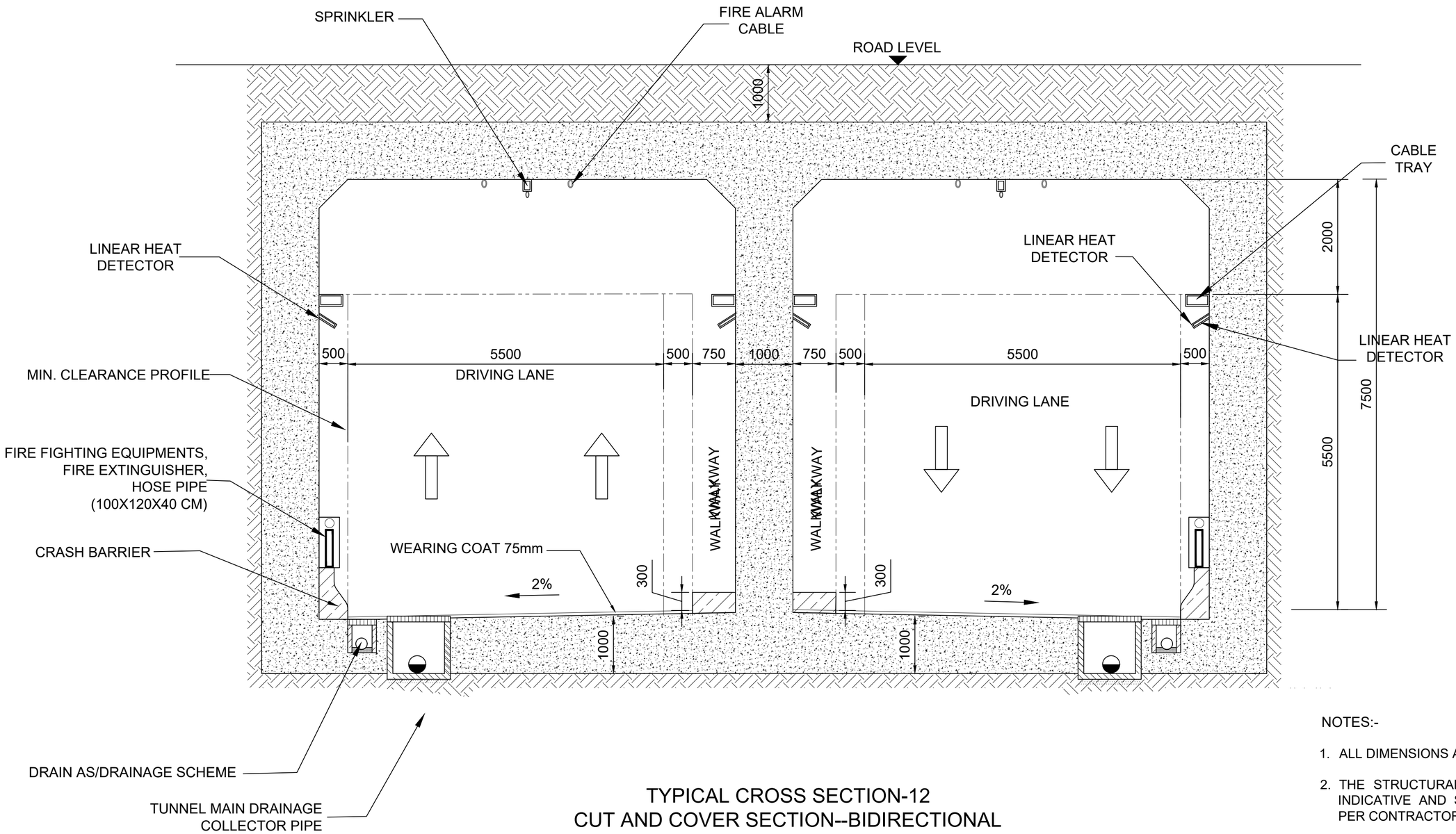
CONSULTANT:
RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)
GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A2

Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	TYPICAL CROSS SECTION-11
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 11/R0



TYPICAL CROSS SECTION-12
CUT AND COVER SECTION--BIDIRECTIONAL
3 LANE (1.5 LANE+ MEDIAN WALL+1.5 LANE)
SCALE 1:50

MATERIALS: -

GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

NOTES:-

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CONSULTANT:
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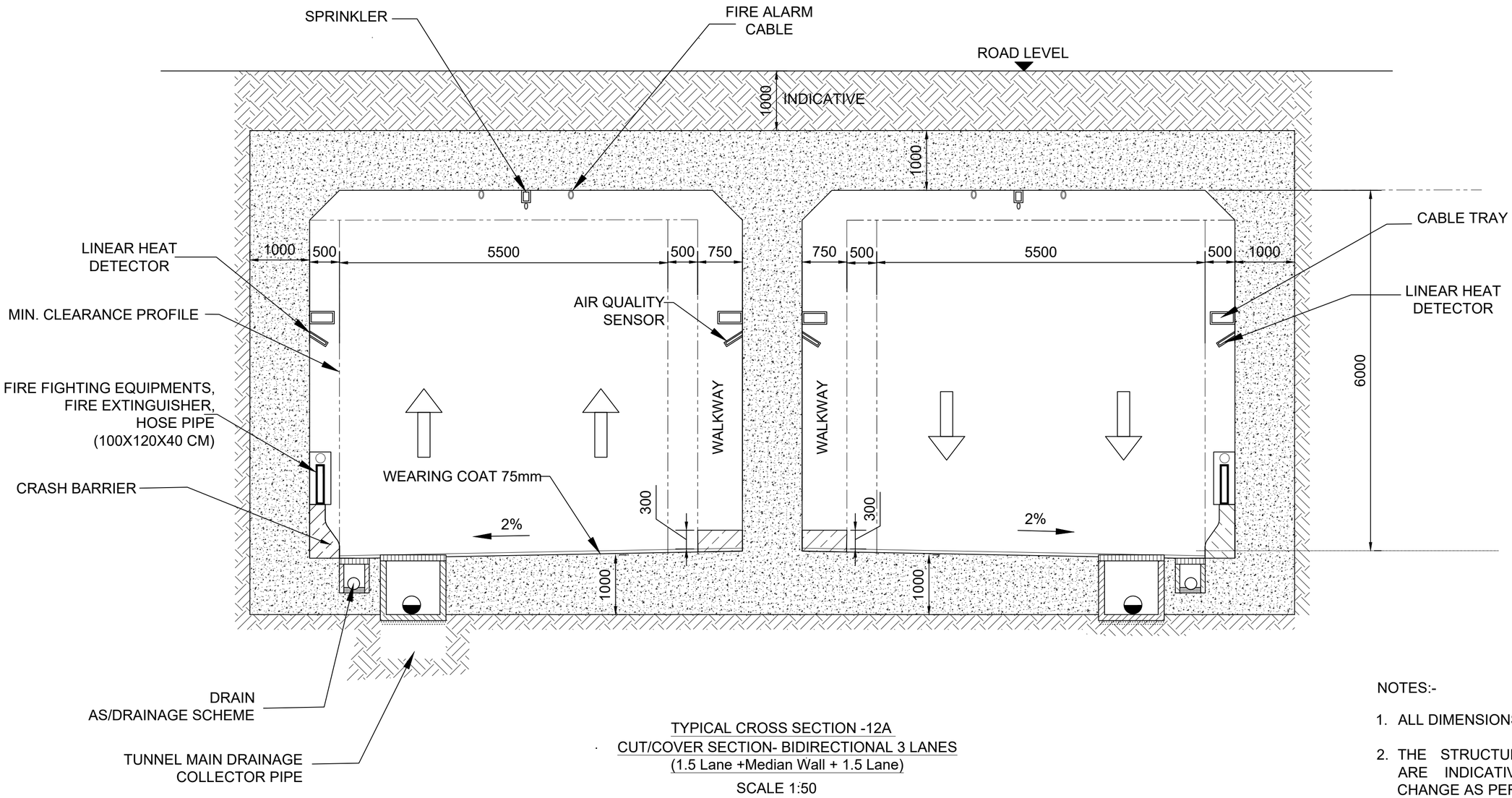
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Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A2

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Drawing Title: TYPICAL CROSS SECTION-12

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/ 12/R0



TYPICAL CROSS SECTION -12A
CUT/COVER SECTION- BIDIRECTIONAL 3 LANES
(1.5 Lane +Median Wall + 1.5 Lane)

SCALE 1:50

NOTES:-

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4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN .
5. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

MATERIALS: -

GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
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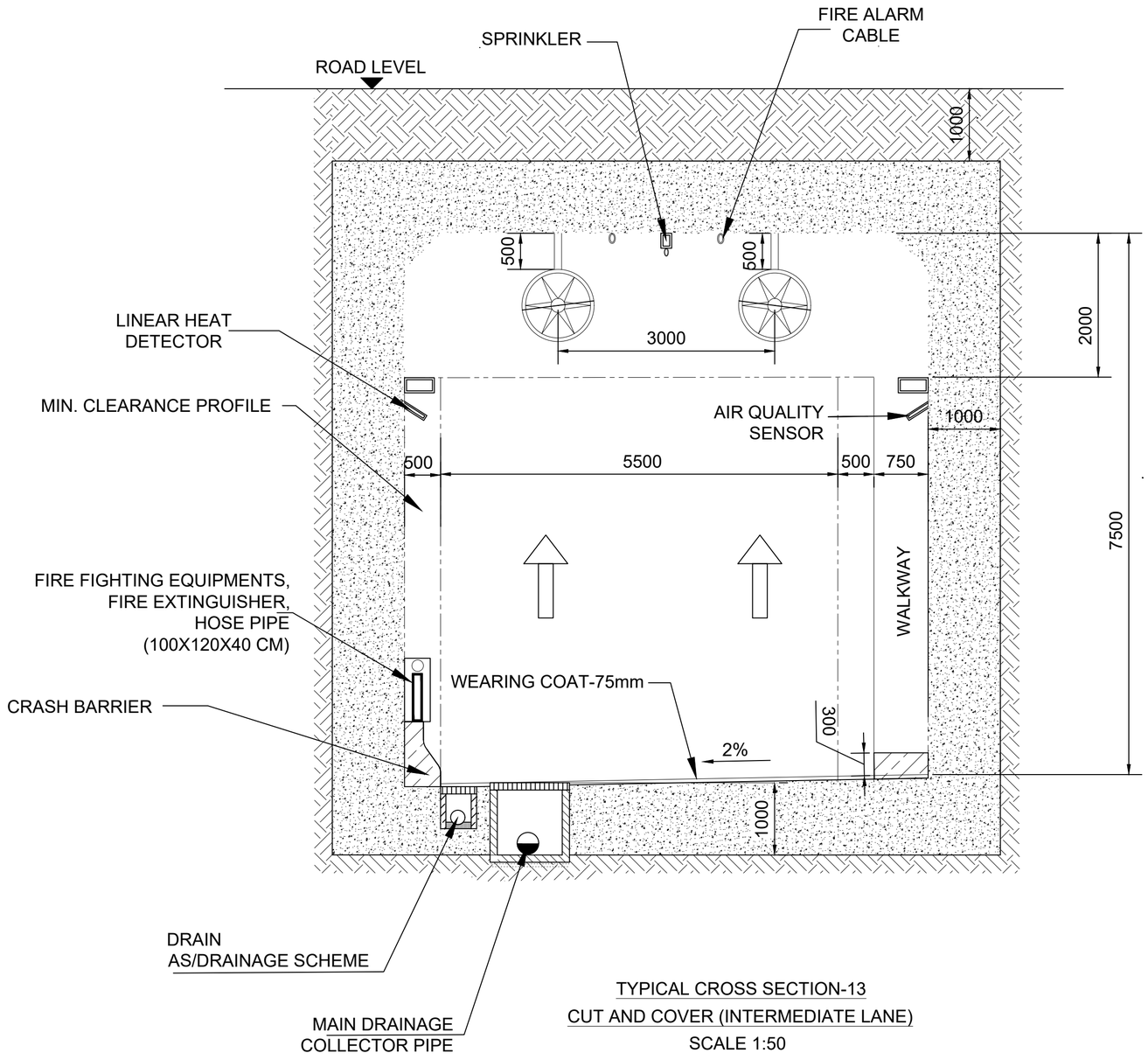
Designed:	RR	
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Sheet size: A2

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Drawing Title: TYPICAL CROSS SECTION-12A

Drawing No.: RC/1640/HO/HBT/TU/DWG/TCS/ 12A/R0



TYPICAL CROSS SECTION-13

CUT AND COVER (INTERMEDIATE LANE)

SCALE 1:50

MATERIALS: -

GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

NOTES:

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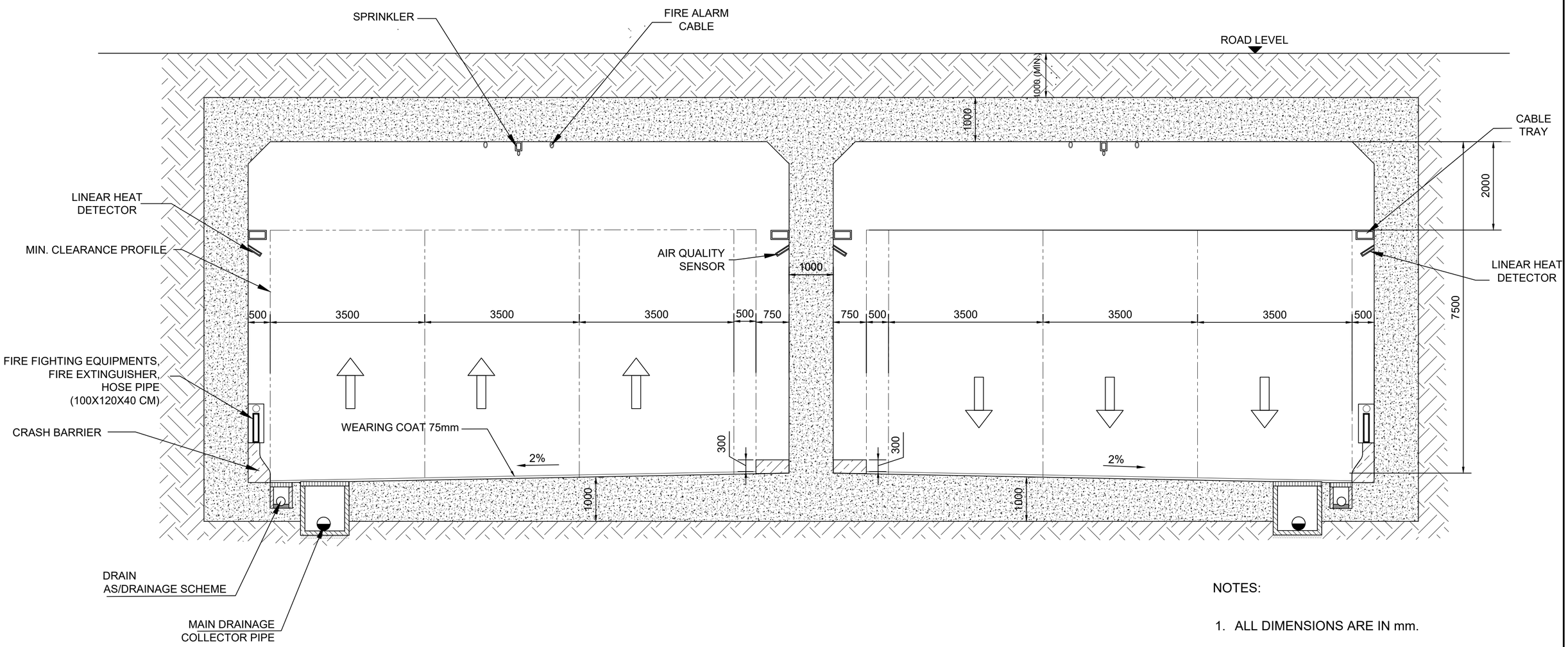
CONSULTANT:
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1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)
GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A2

Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	TYPICAL CROSS SECTION-13
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/13/R0



TYPICAL CROSS SECTION-14
CUT AND COVER (3 LANE+MEDIAN WALL+ 3 LANE)
SCALE 1:50

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTOR'S DETAILED DESIGN.
3. SIZING AND DETAILS OF TYPICAL DETAILS OF CRASH BARRIER , UTILITY PIPE TRENCH , MAIN DRAINAGE ETC. MAY CHANGE AS PER CONTRACTOR'S DETAILED DESIGN.
4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN .
5. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

MATERIALS: -

GRADE OF CONCRETE -M35 ,
STEEL GRADE Fe550D

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
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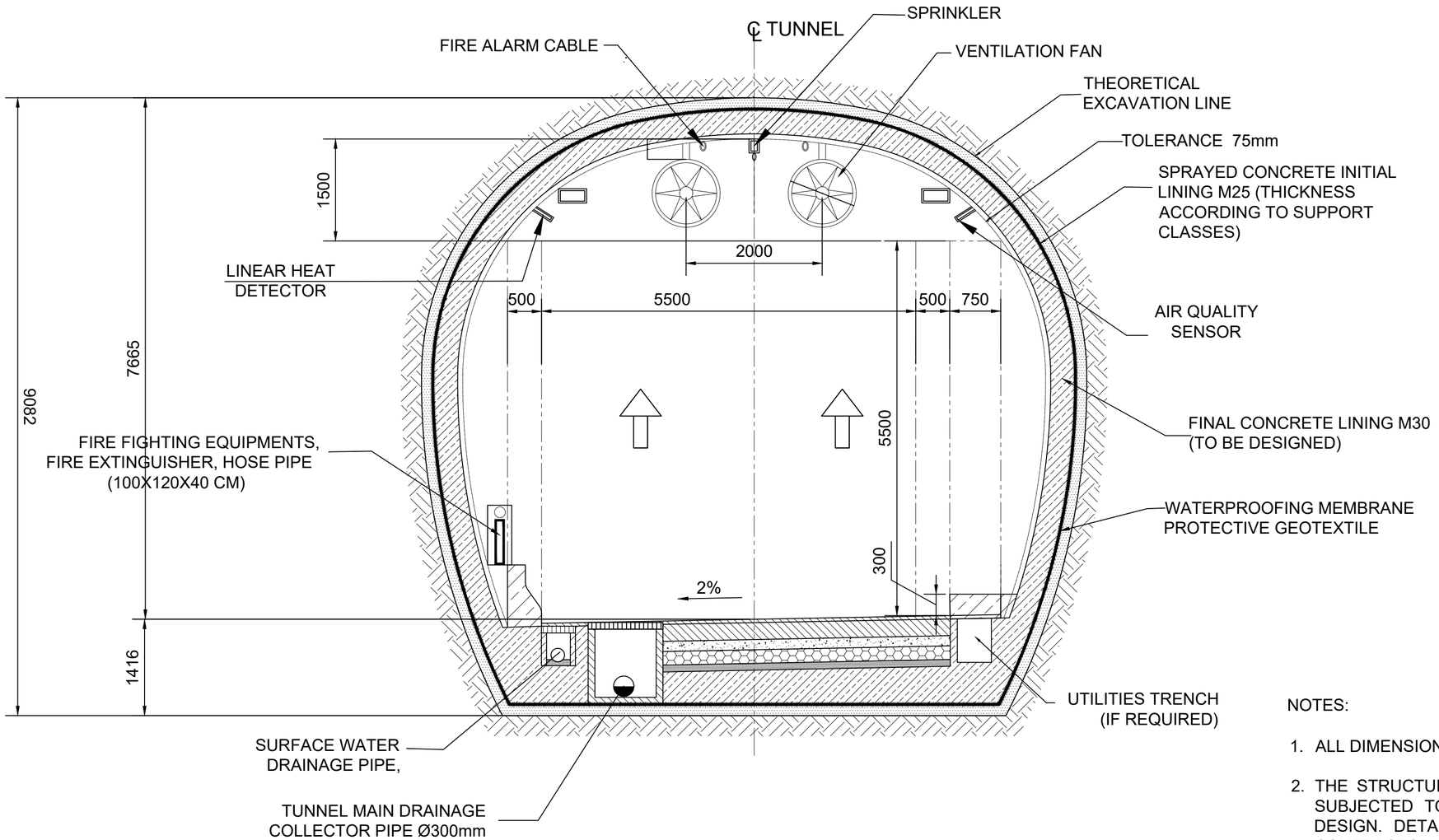
CONSULTANT:
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FINAL DETAILED PROJECT REPORT
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Drawn:	SS	
Checked:	AT	
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Sheet size: A2

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Drawing Title	TYPICAL CROSS SECTION-14
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 14/R0



TYPICAL CROSS SECTION -15
NATM TUNNEL (INTERMEDIATE LANE)
SCALE 1:50

THEORETICAL EXCAVATION = 77.4 SQ. M

MATERIALS: GRADE OF CONCRETE -M35 , STEEL GRADE Fe550D

NOTES:

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2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTOR'S DETAILED DESIGN. DETAILED DESIGN OF LINING SHALL BE DONE BY CONTRACTOR.
3. SIZING AND DETAILS OF TYPICAL DETAILS OF CRASH BARRIER , UTILITY PIPE TRENCH , MAIN DRAINAGE ETC. ARE NOT SHOWN AND SAME SHALL BE MADE BY CONTRACTOR AS PER DETAILED DESIGN.
4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN .
5. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

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GOVERNMENT OF KARNATAKA
Bruhat Bangalore Mahanagara Palike

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EIC- BBMP	

CONSULTANT:
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NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
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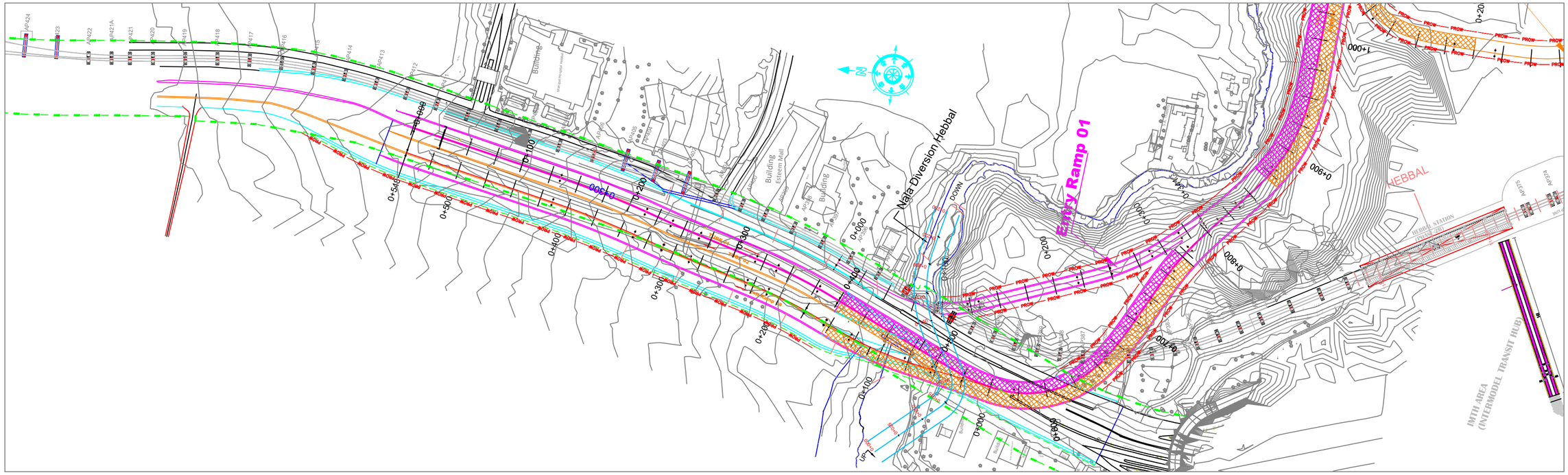
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Sheet size: A2

Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	TYPICAL CROSS SECTION-15
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/15/R0

GAD OF STRUCTURES

Hebbal Esteem mall junction

Silk Road



KEY PLAN

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	May.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

GOVERNMENT OF KARANATAKA
Bruhat Bangalore Mahanagara Palike

CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA
CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur
Metro Station Sector 28, Gurugram
Haryana INDIA

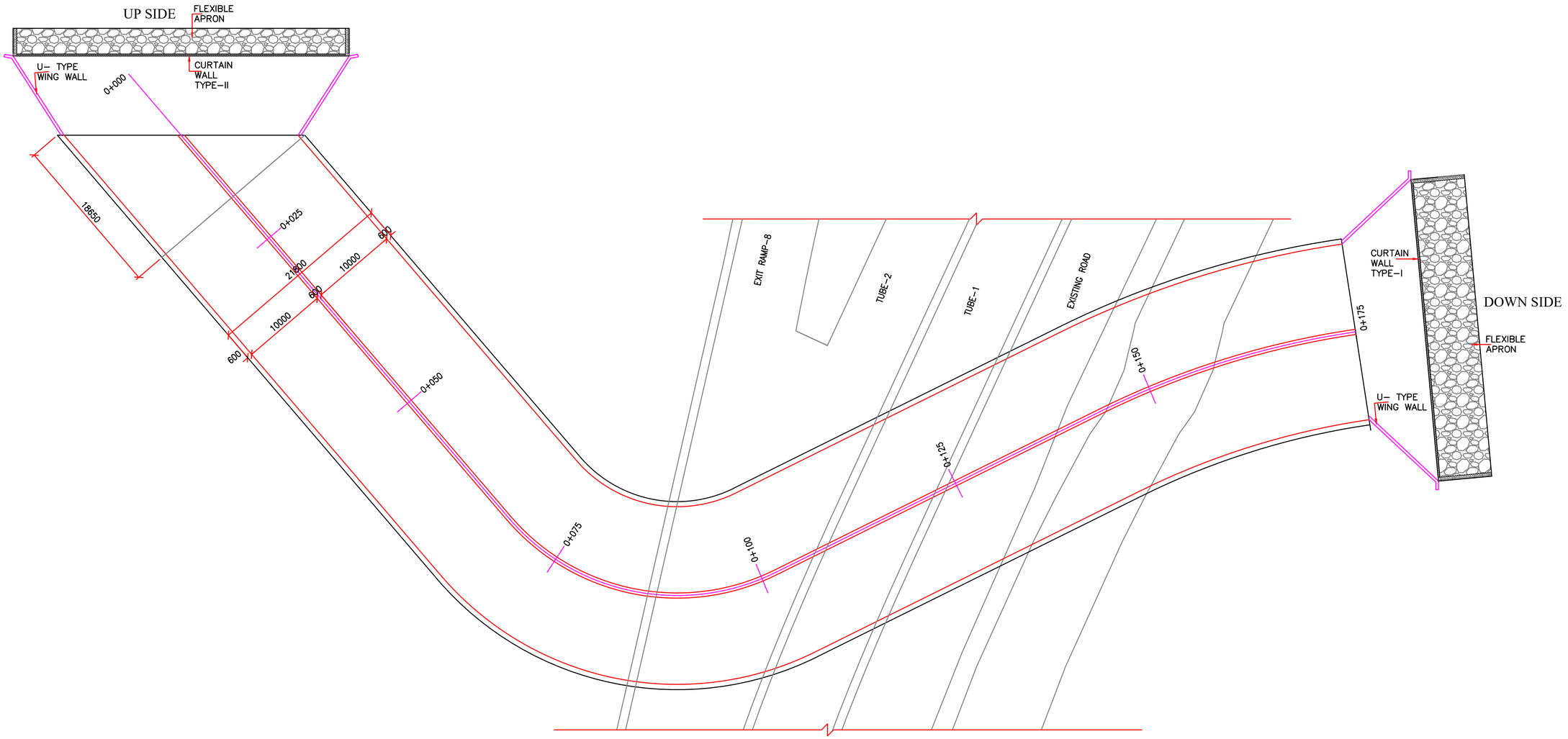
DETAILED PROJECT REPORT-**Package:- 1**

Eastern Tube of North South Corridor connecting Hebbal to Silk Board.

Designed:	Uttam
Drawn:	SB
Checked:	RRS
Approved:	PKK

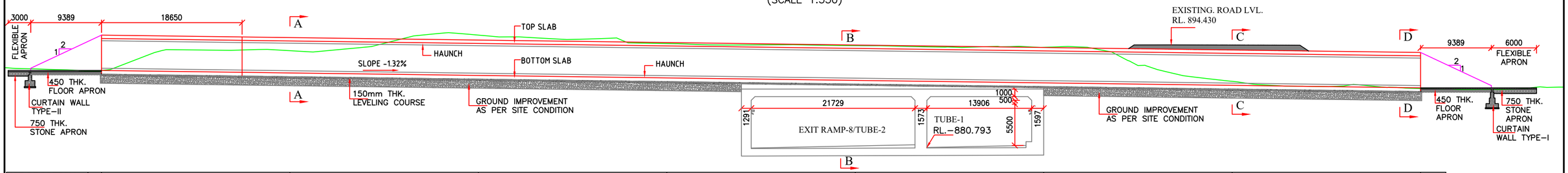
Scale:- AS SHOWN

Project	Construction of Eastern Side Underground Vehicular Tunnel (3-lane Configuration) from Hebbal near Esteem Mall junction (Km. 1+440) to Silk Board Junction (Km 16+000) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000 to Km 1+440) and ORR, entry and exit ramps from Jaymahal road , entry ramp to eastern and western tube from KG road and exit ramp on Siddapura Road near Wilson garden.
Drawing Title	KEY PLAN OF NALA DIVERSION HEBBAL
Drawing No.	RC/1640/HO/HBT/TU/DWG/01/R0 (SHEET 1 OF 3)



PLAN OF NALA

(SCALE 1:350)



TOP OF BOTTOM SLAB OF RCC BOX	891.029	890.699	890.369	890.040	889.710	889.380	889.050	888.720
EXISTING LEVELS	891.371	890.699	893.327	895.402	894.276	894.000	893.772	889.252
CHAINAGE (KM.)	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175

LONGITUDINAL ELEVATION OF NALA

(SCALE 1:350)

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
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Bruhat Bangalore Mahanagara Palike

CONSULTANT:

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CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

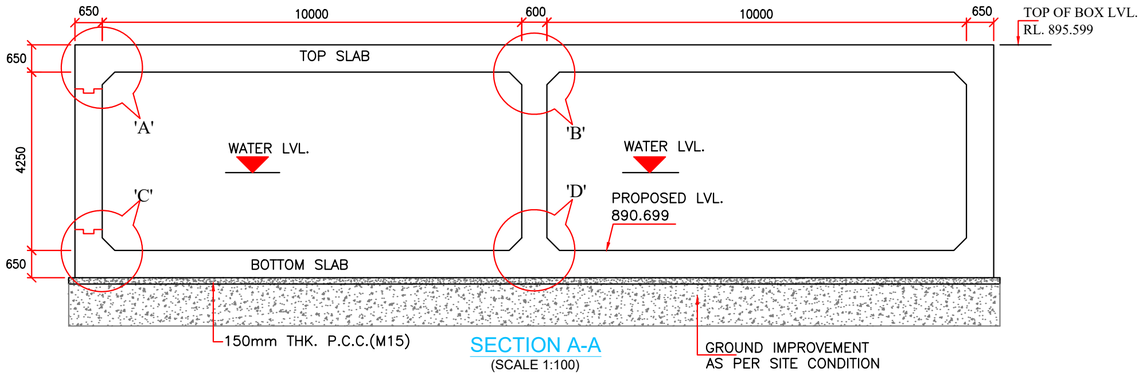
GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur
Metro Station Sector 28, Gurugram
Haryana INDIA

DETAILED PROJECT REPORT-**Package:- 1**

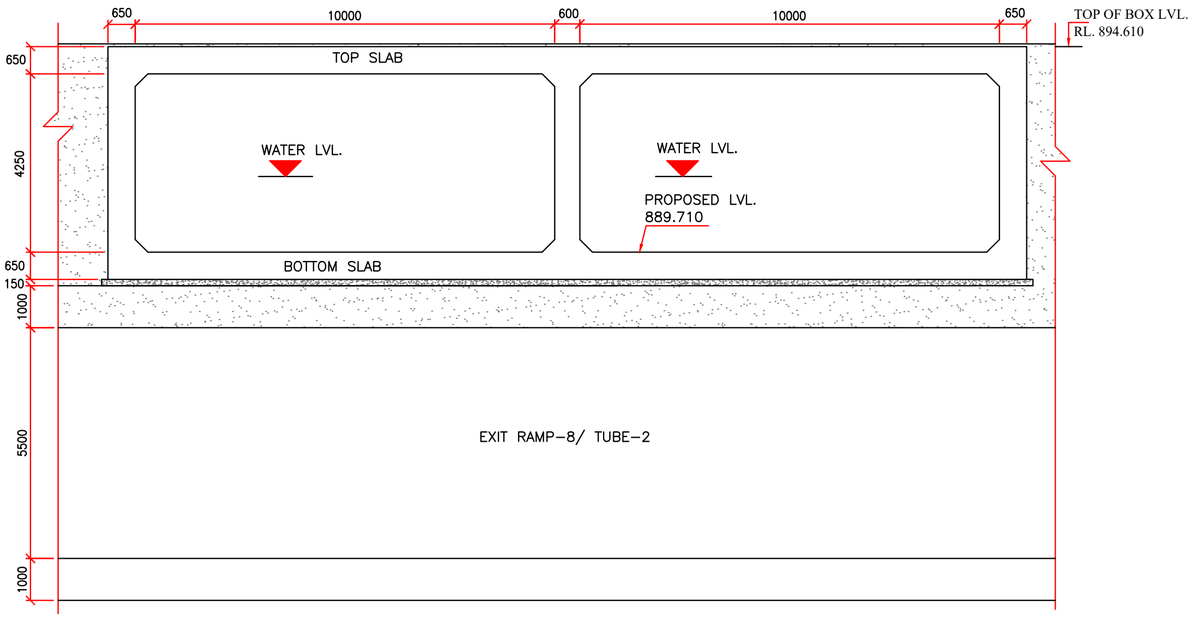
Eastern Tube of North South Corridor connecting Hebbal to Silk Board.

Designed:	Uttam	Scale:-	AS SHOWN
Drawn:	SB		
Checked:	RRS		
Approved:	PKK		

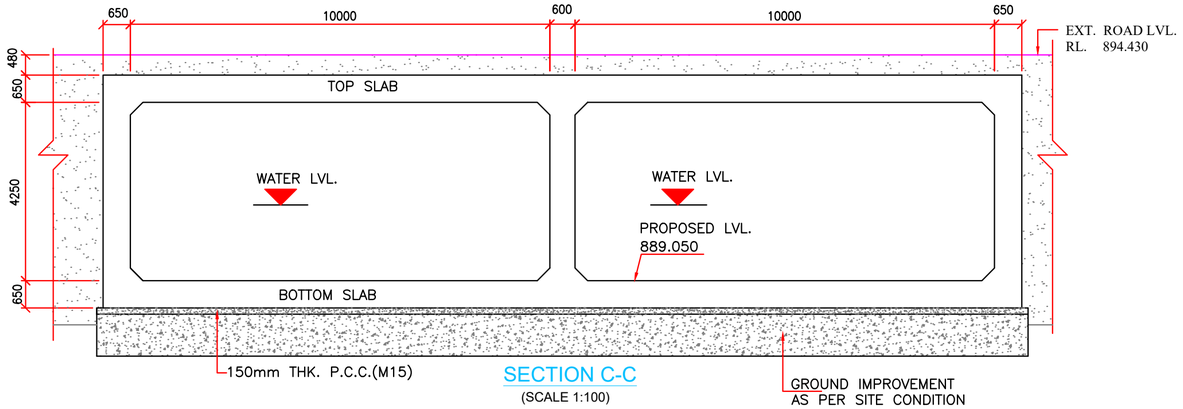
Project	Construction of Eastern Side Underground Vehicular Tunnel (3-lane Configuration) from Hebbal near Esteem Mall junction (Km. 1+440) to Silk Board Junction (Km 16+000) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000 to Km 1+440) and ORR, entry and exit ramps from Jaymahal road , entry ramp to eastern and western tube from KG road and exit ramp on Siddapura Road near Wilson garden.
Drawing Title	GENERAL ARRANGEMENT DRAWING FOR NALA DIVERSION HEBBAL
Drawing No.	RC/1640/HO/HBT/TU/DWG/01/R0 (SHEET 2 OF 3)



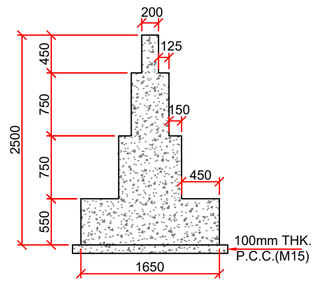
SECTION A-A
(SCALE 1:100)



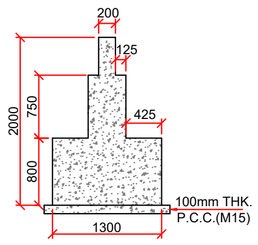
SECTION B-B
(SCALE 1:100)



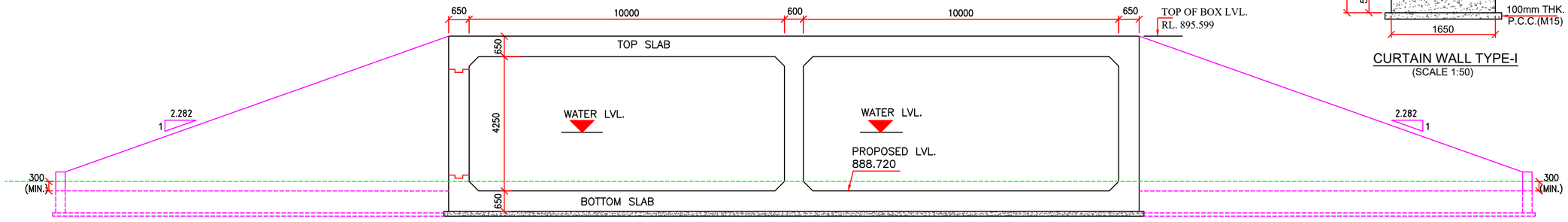
SECTION C-C
(SCALE 1:100)



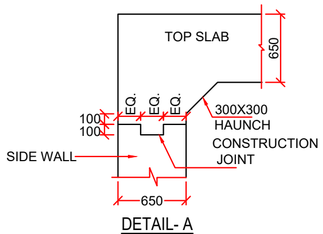
CURTAIN WALL TYPE-I
(SCALE 1:50)



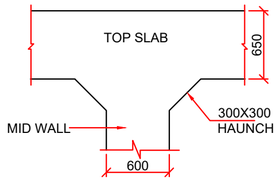
CURTAIN WALL TYPE-II
(SCALE 1:50)



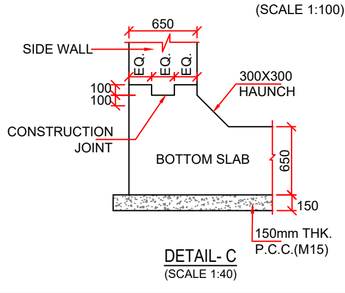
SECTION D-D
(SCALE 1:100)



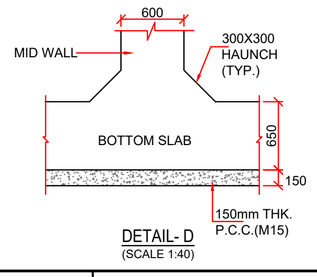
DETAIL- A
(SCALE 1:40)



DETAIL- B
(SCALE 1:40)



DETAIL- C
(SCALE 1:40)



DETAIL- D
(SCALE 1:40)

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS FOLLOWS :–
   i) BOX STRUCTURE – M40
   ii) LEVELING COURSE (UNDER FOUNDATION) – M15
3. THE REINFORCING BARS SHALL BE OF THERMO MECHANICALLY TREATED STEEL (TMT) (GRADE DESIGNATION FE–500D) CONFORMING TO IS:1786 STANDARDS.
4. CLEAR COVER TO OUTER MOST STEEL SHOULD BE 75mm.
5. MINIMUM CONCRETE COVER, GRADE OF CONCRETE, MINIMUM CEMENT CONTENT AND MAXIMUM W/C RATIO SHALL BE AS PER MODERATE CONDITION OF EXPOSURE AS PER PROVISION OF IRC:112–2020.
6. WATER TO BE USED IN CONCRETING, GROUTING & CURING SHALL CONFORM TO 18.4.5 IRC:112–2020.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	May.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

GOVERNMENT OF KARANATAKA
Bruhat Bangalore Mahanagara Palike

CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA
CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur
Metro Station Sector 28, Gurugram
Haryana INDIA

DETAILED PROJECT REPORT-**Package:- 1**
Eastern Tube of North South Corridor connecting Hebbal to Silk Board.

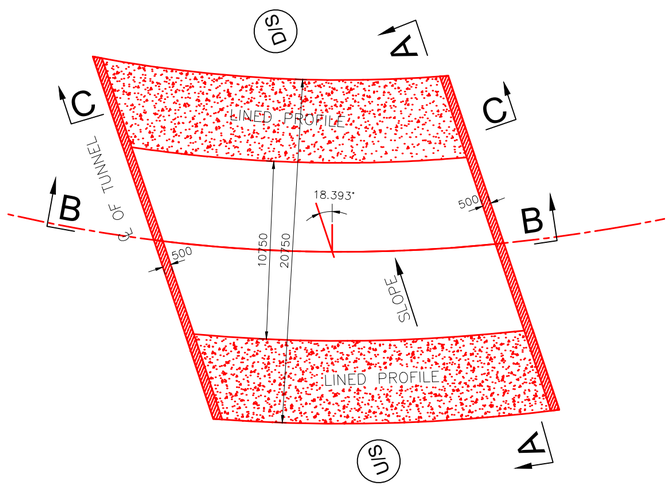
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Drawn:	SB
Checked:	RRS
Approved:	PKK

Scale:- AS SHOWN

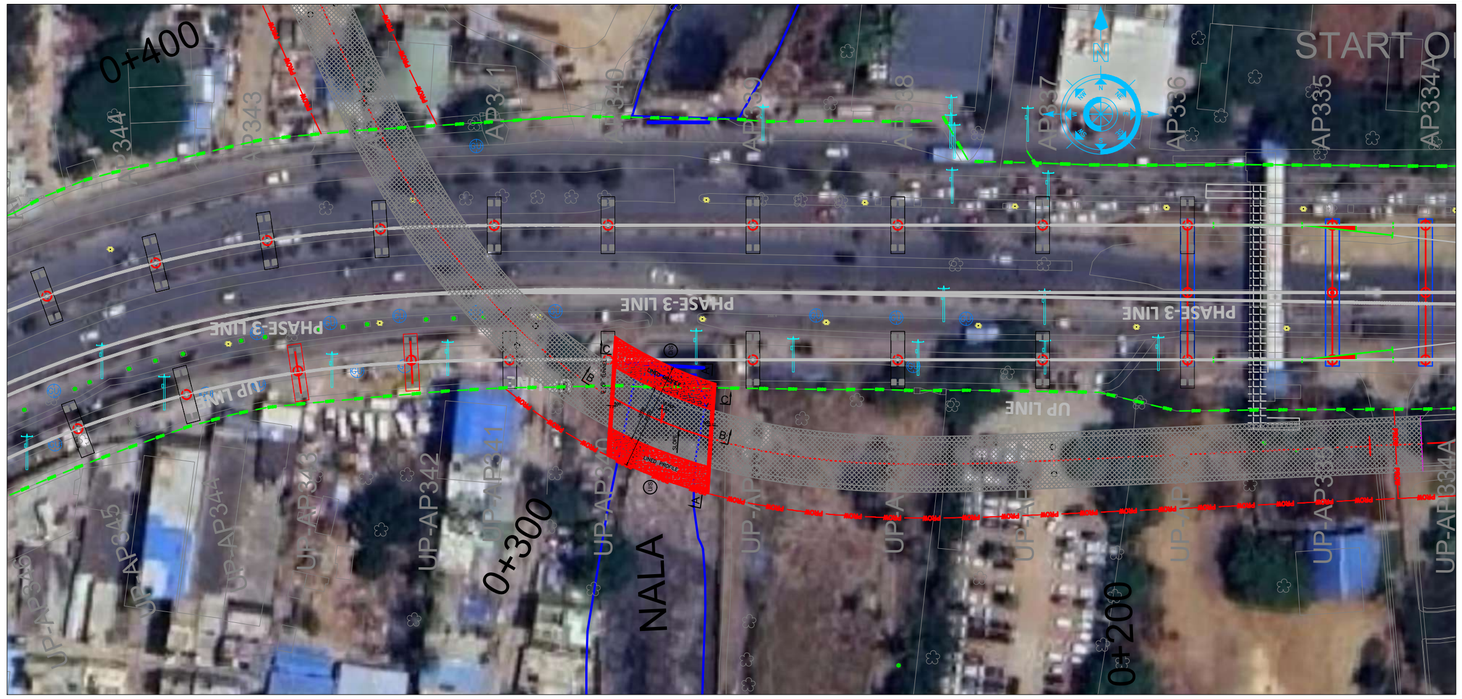
Project	Construction of Eastern Side Underground Vehicular Tunnel (3-lane Configuration) from Hebbal near Esteem Mall junction (Km. 1+440) to Silk Board Junction (Km 16+000) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000 to Km 1+440) and ORR, entry and exit ramps from Jaymahal road , entry ramp to eastern and western tube from KG road and exit ramp on Siddapura Road near Wilson garden.
Drawing Title	GENERAL ARRANGEMENT DRAWING FOR NALA DIVERSION HEBBAL
Drawing No.	RC/1640/HO/HBT/TU/DWG/ 01/R0 (SHEET 3 OF 3)

Hebbal Esteem mall junction

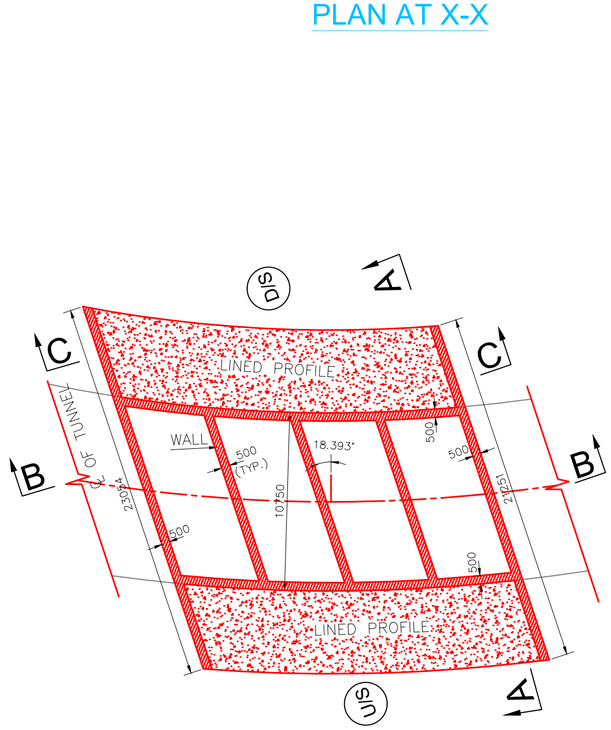
Silk Road



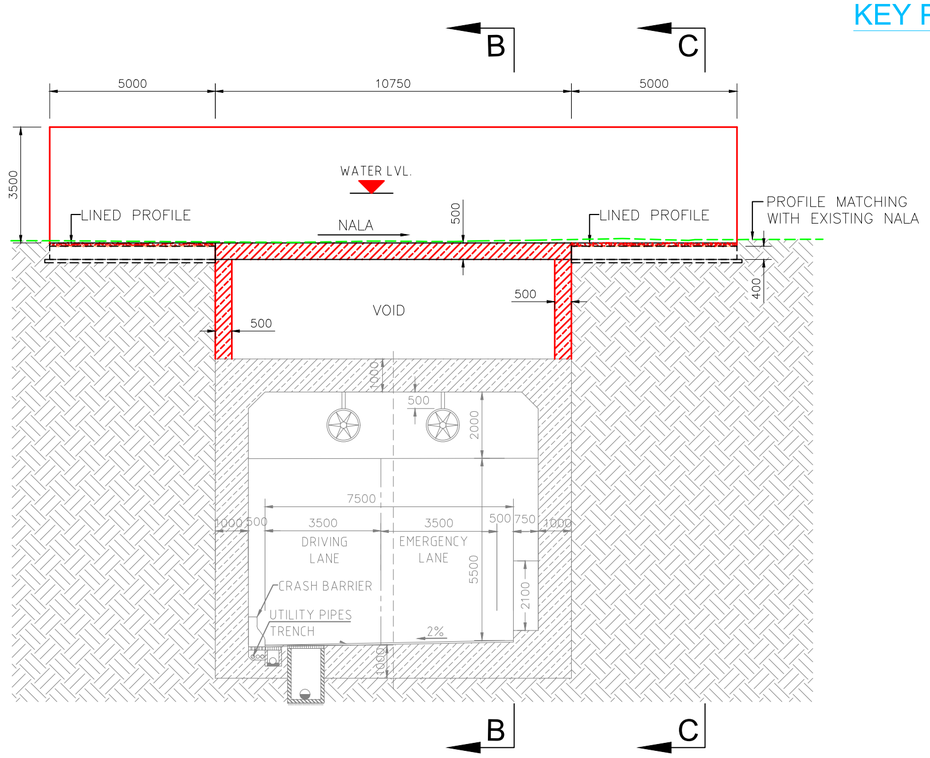
PLAN AT X-X



KEY PLAN



PLAN AT Y-Y



SECTION A-A

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETER AND LEVELS IN METERS UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.
2. TUNNEL SHALL BE DESIGNED FOR LIVE LOAD OF ONE LANE OF IRC CLASS 70R OR TWO LANES OF IRC CLASS A LOADING WHICHEVER GOVERNS.
3. THE REINFORCING BARS SHALL BE OF THERMO MECHANICALLY TREATED STEEL (TMT) (GRADE DESIGNATION FE–500D) CONFORMING TO IS:1786 STANDARDS.
4. CLEAR COVER TO OUTER MOST STEEL SHALL BE 50mm. EXCEPT IN BOTTOM SLAB OF BOX, TOP OF TOP SLAB AND EARTH FACE OF VERTICAL WALL WHERE IT SHOULD BE 75mm.
5. 50mm THK. STONE MASTIC ASPHALT LAYER (WEARING COAT) OVER 6MM WATER PROOFING MEMBRANE SHALL BE LAID IN CONFORMITY WITH SECTION 500 OF MORTH SPECIFICATION.
6. MINIMUM CONCRETE COVER, GRADE OF CONCRETE, MINIMUM CEMENT CONTENT AND MAXIMUM W/C RATIO SHALL BE AS PER MODERATE CONDITION OF EXPOSURE AS PER PROVISION OF IRC:112–2011.
7. WATER TO BE USED IN CONCRETING, GROUTING & CURING SHALL CONFORM TO 18.4.5 IRC:112–2011.
8. NALA SHOULD BE LINED AS INDICATED IN THE DRAWING; THE REST OF THE PORTION CAN REMAIN AS LINED OR IN THE EXISTING PROFILE.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

GOVERNMENT OF KARANATAKA
Bruhat Bangalore Mahanagara Palike

CONSULTANT:

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CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur
Metro Station Sector 28, Gurugram
Haryana INDIA

DETAILED PROJECT REPORT-**Package:- 1**

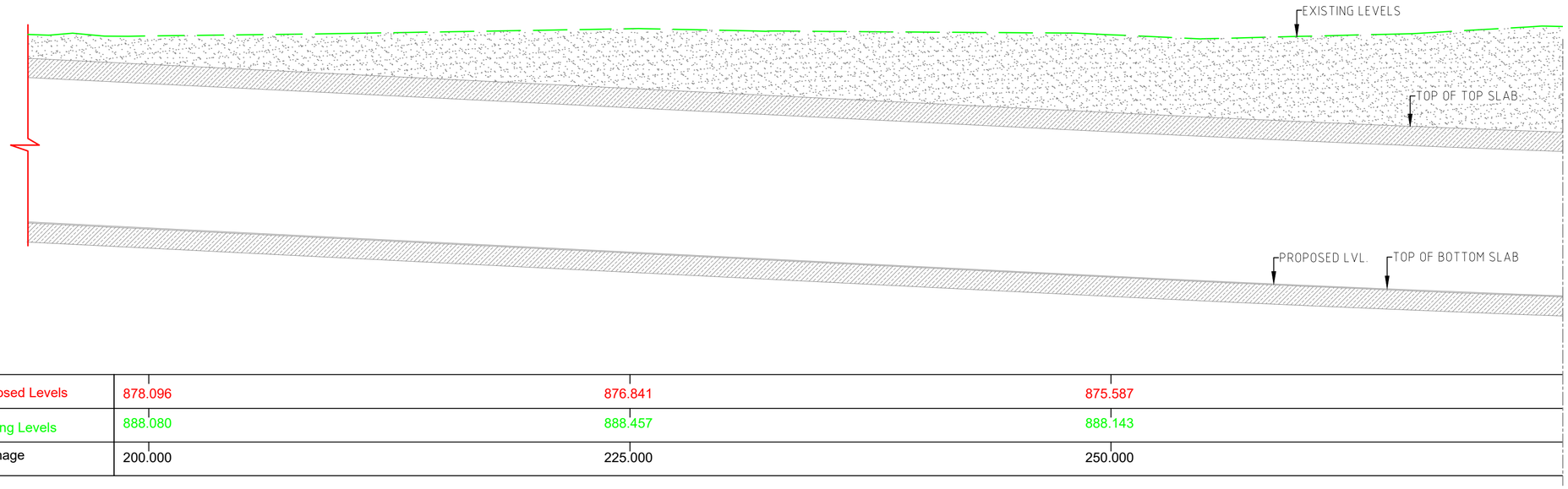
Eastern Tube of North South Corridor connecting Hebbal to Silk Board.

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Drawn:	AK	V=:-1:250
Checked:	PKK	
Approved:	HRY	Sheet size: A2

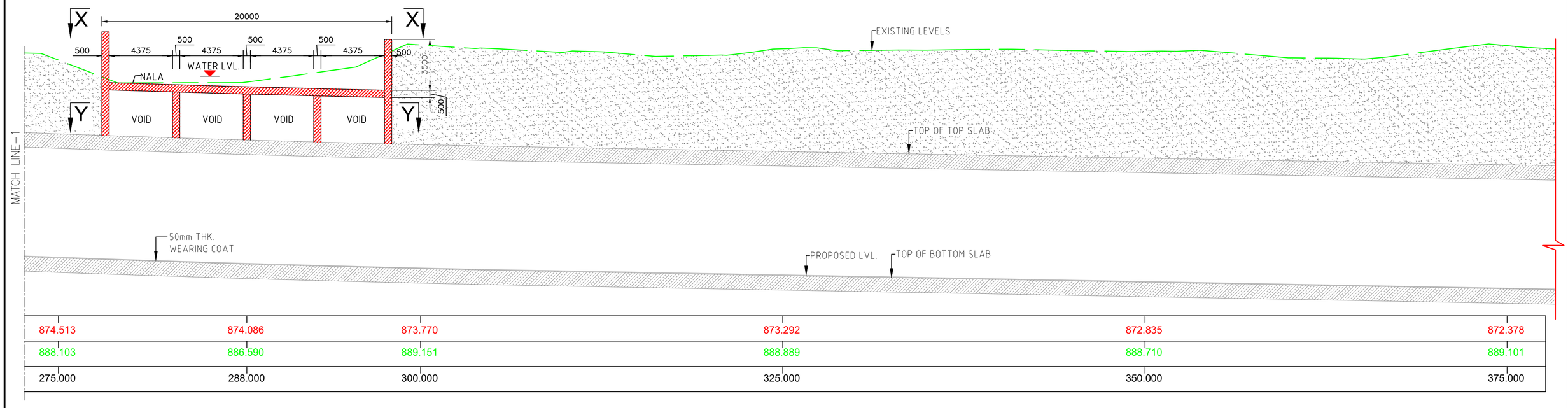
Project	Construction of Eastern Side Underground Vehicular Tunnel (3-lane Configuration) from Hebbal near Esteem Mall junction (Km. 1+440) to Silk Board Junction (Km 16+000) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000 to Km 1+440) and ORR, entry and exit ramps from Jaymahal road , entry ramp to eastern and western tube from KG road and exit ramp on Siddapura Road near Wilson garden.
Drawing Title	GENERAL ARRANGEMENT DRAWING FOR NALA ARRANGEMENT AT CH:-0+288 FOR ENTRY RAMP-2
Drawing No.	RC/1640/HO/HBT/TU/DWG/02/R0 (SHEET 1 OF 2)

Hebbal Esteem mall junction

Silk Road

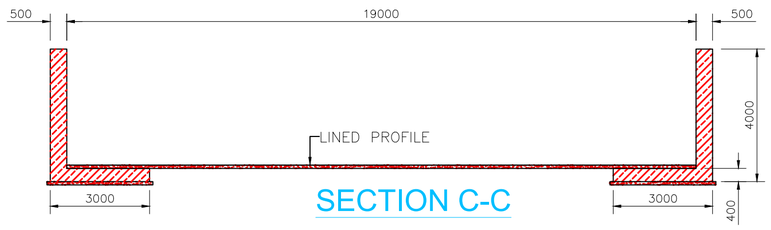


Proposed Levels	878.096	876.841	875.587
Existing Levels	888.080	888.457	888.143
Chainage	200.000	225.000	250.000



874.513	874.086	873.770	873.292	872.835	872.378
888.103	886.590	889.151	888.889	888.710	889.101
275.000	288.000	300.000	325.000	350.000	375.000

SECTION B-B



SECTION C-C

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

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Bruhat Bangalore Mahanagara Palike

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CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur
Metro Station Sector 28, Gurugram
Haryana INDIA

DETAILED PROJECT REPORT-**Package:- 1**

Eastern Tube of North South Corridor connecting Hebbal to Silk Board.

Designed:	SB
Drawn:	AK
Checked:	PKK
Approved:	HRY

Scale :- H=:-1:2500
V=:-1:250
Sheet size: A2

Project	Construction of Eastern Side Underground Vehicular Tunnel (3-lane Configuration) from Hebbal near Esteem Mall junction (Km. 1+440) to Silk Board Junction (Km 16+000) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000 to Km 1+440) and ORR, entry and exit ramps from Jaymahal road , entry ramp to eastern and western tube from KG road and exit ramp on Siddapura Road near Wilson garden.
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Drawing No.	RC/1640/HO/HBT/TU/DWG/02/R0 (SHEET 2 OF 2)

TRAFFIC SIGNAGE PLAN

Hebbal Esteem mall junction

Silk Road

Legend

Topographic Survey

Asphalt Edge		Flag Pole		Median	
Building		Foot Path		Palm Tree	
Bus Stop		Gate		Parking	
Bollard		Handrail		Pole	
Concrete		High Mast Light		Power Pole	
Closed Drain		Light Pole		Post	
Curb Top & Bottom		Lamp Post		Retaining Wall Top & Bottom	
Electrical Box	EB	Manhole	MH	Road Centreline	
Fence				Road Median	
Road Sign	SB	Sink		Transformer	
Roof Extension		Sky Walk Bridge		Tree	
Safety Barrier		Sports Field		Tunnel	
Security Room		Stairs		Tree Line	
Shed		Telecommunication Tower		Wall	
Shelter		Telephone Box	TPB	Water Body	
Side Walk		Temporary Barrier		Water Tank	
Sign Board	SB	Track		Zebra Crossing	
Single Post		Traffic Signal	TS		

Legend

Plan		L Profile	
Proposed Tunnel LHS		Proposed Road Levels	
Proposed Tunnel LHS		Existing Levels	
Proposed Shaft		Proposed NATM	
Proposed Vehicular Cross Passage		Proposed Cut & Cover	
Proposed NATM (Entry Ramp)		G - Gradient %	
Proposed NATM (Exit Ramp)		Lv - Length of Vertical Curve	
Proposed Cut & Cover (Entry Ramp)		L - Length of Grade(m)	
Proposed Cut & Cover (Exit Ramp)		K - Ratio Between vertical curve Length & Change of Gradient {Lc/(G2-G1)}	
Proposed Open Cut (Exit Ramp)		e - Superelevation (%)	
Proposed Open Cut (Entry Ramp)		D - Straight Length of Horizontal Alignment	
Proposed Rights of Way		Lc - Length of Circular Curve	
Existing Rights of Way			
Airport Metro Line			
Metro Line (Phase-1)			
Metro Line (Phase-2)			
Metro Line (Phase-3A)			

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EE/Infra Div.-RI,BBMP	
EIC- BBMP	

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NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	Scale :- H=:-1:2500
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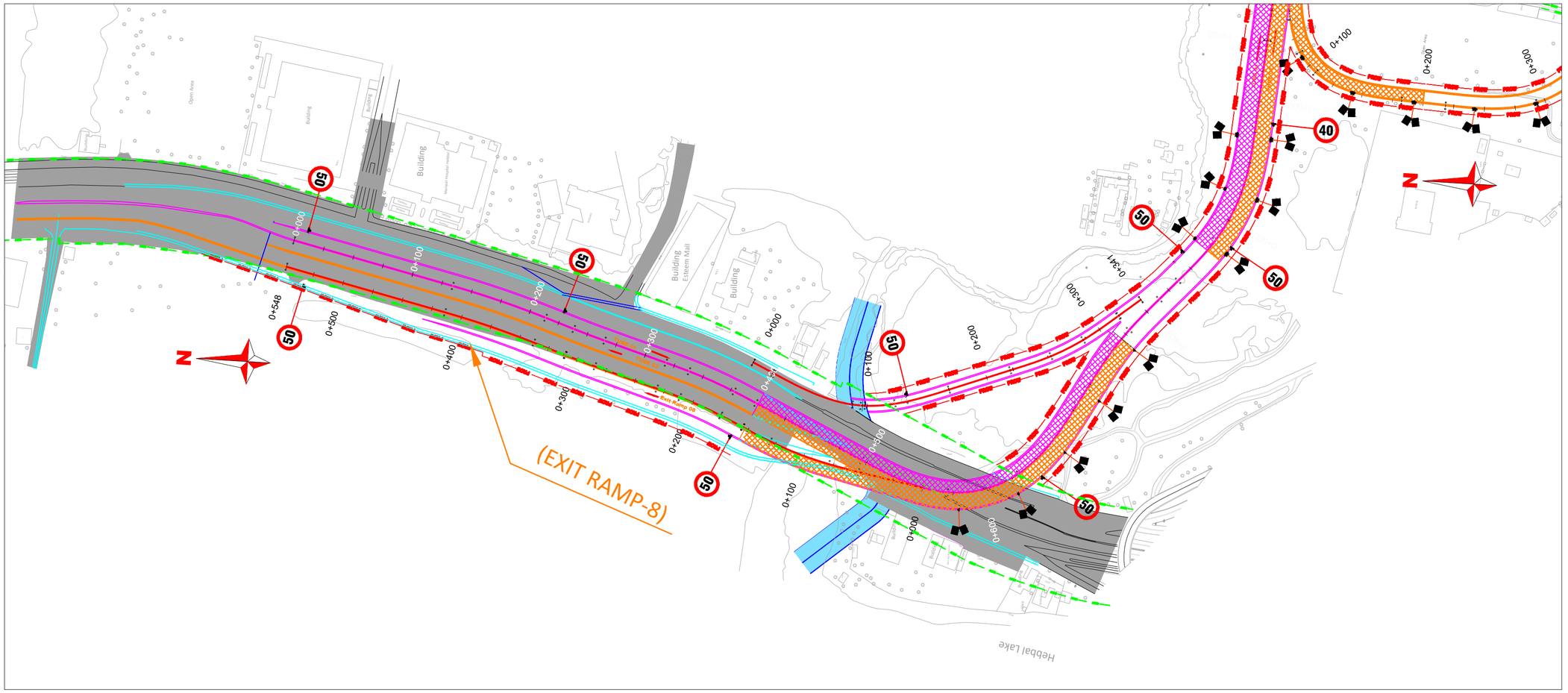
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TRAFFIC PLAN (LEGEND)

RC/1640/HO/HBT/TU/DWG/TF/R0

Hebbal Esteem mall junction

Silk Road



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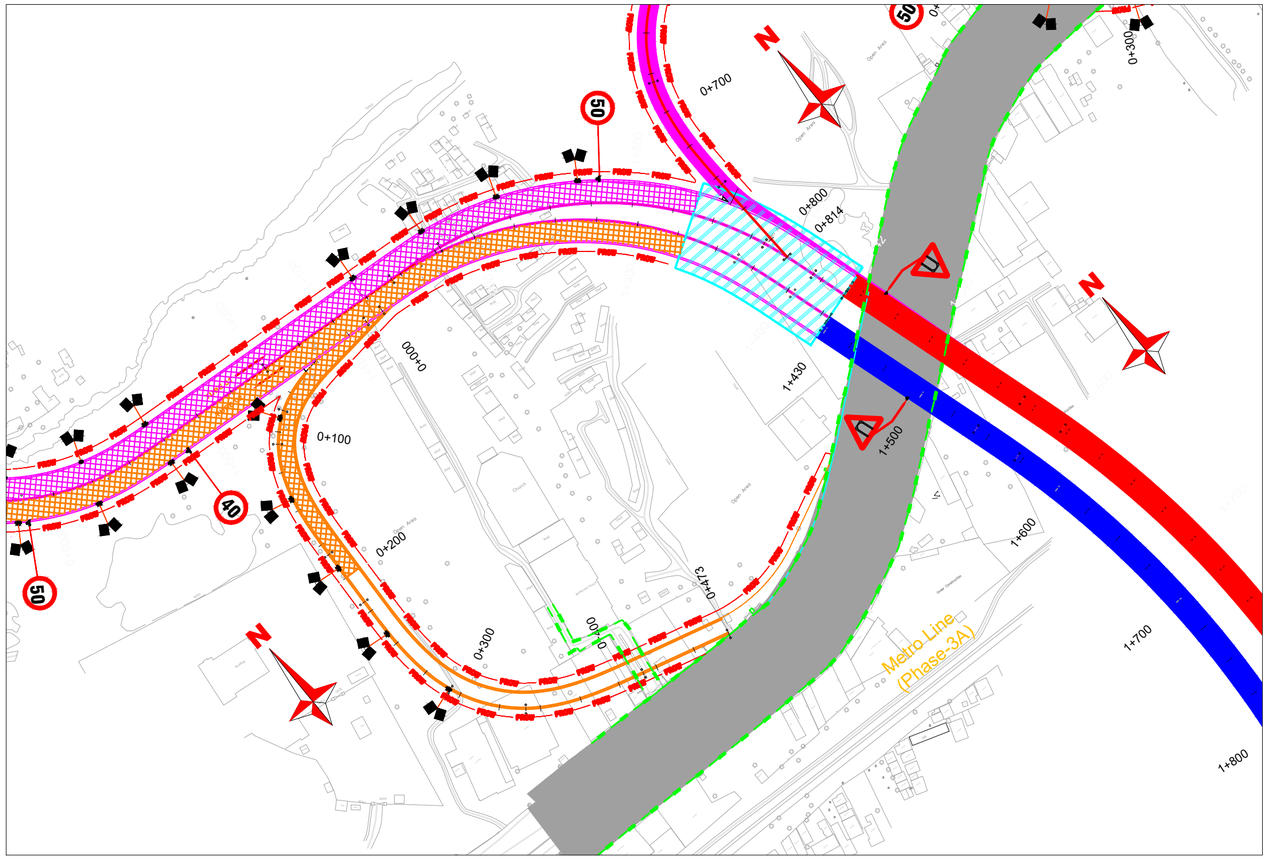
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TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP01/R0

Hebbal Esteem mall junction

Silk Road



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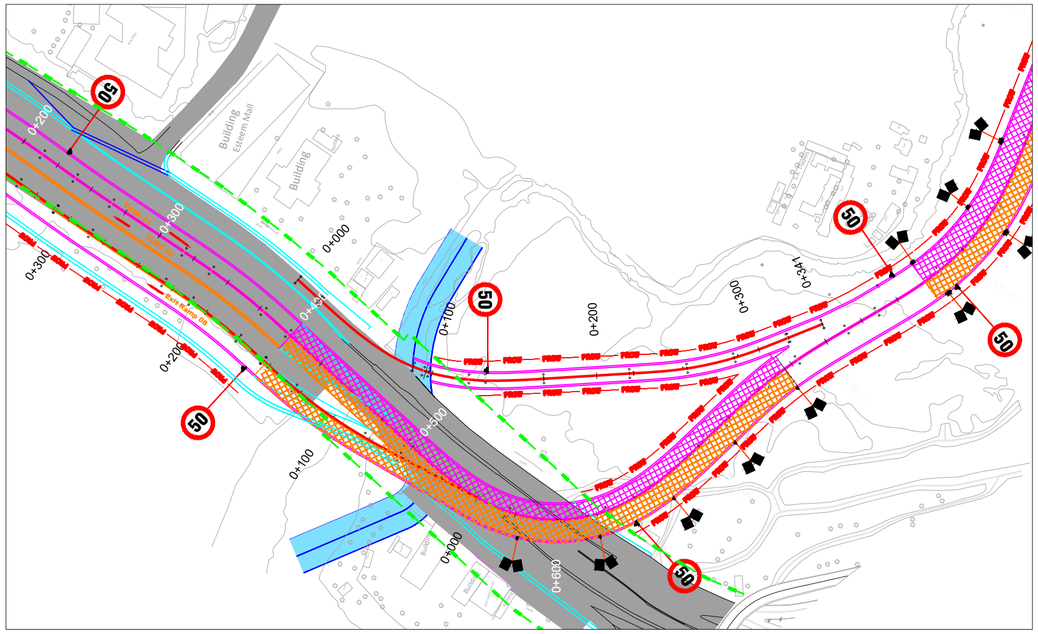
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TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01A/R0

Hebbal Esteem mall junction

Silk Road



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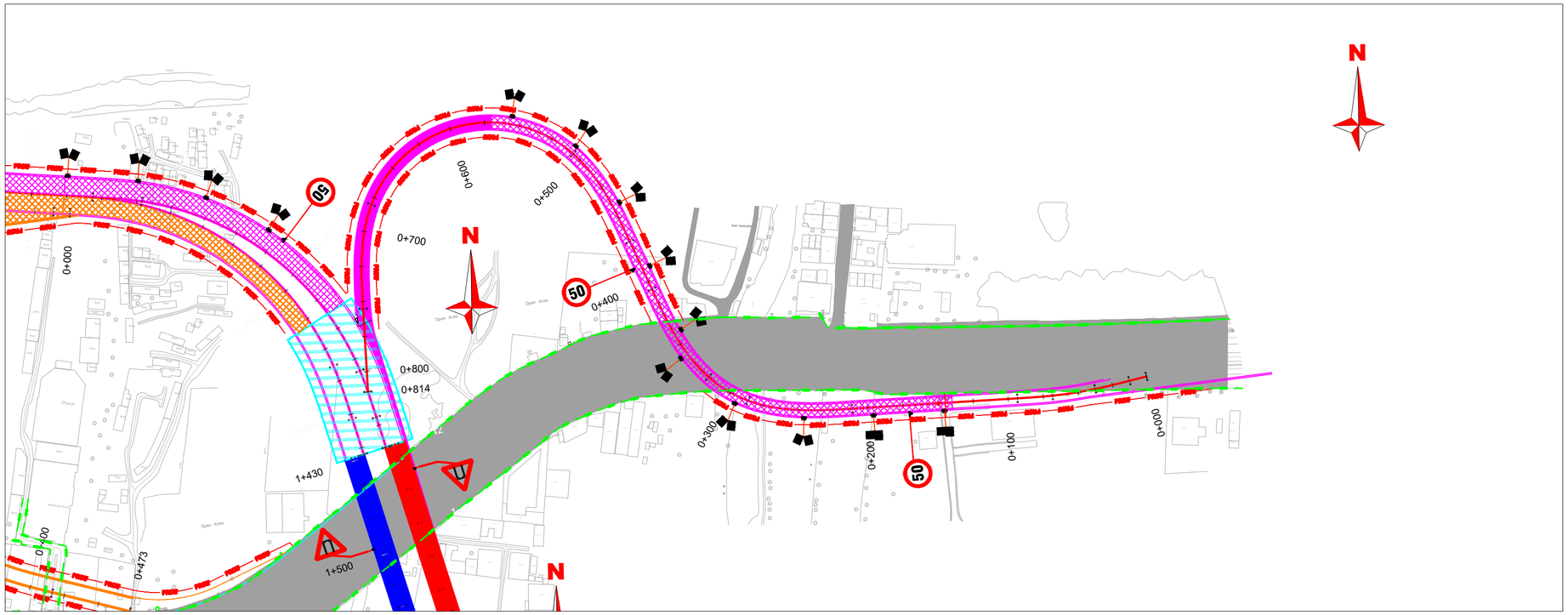
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TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01/R0

Hebbal Esteem mall junction

Silk Road



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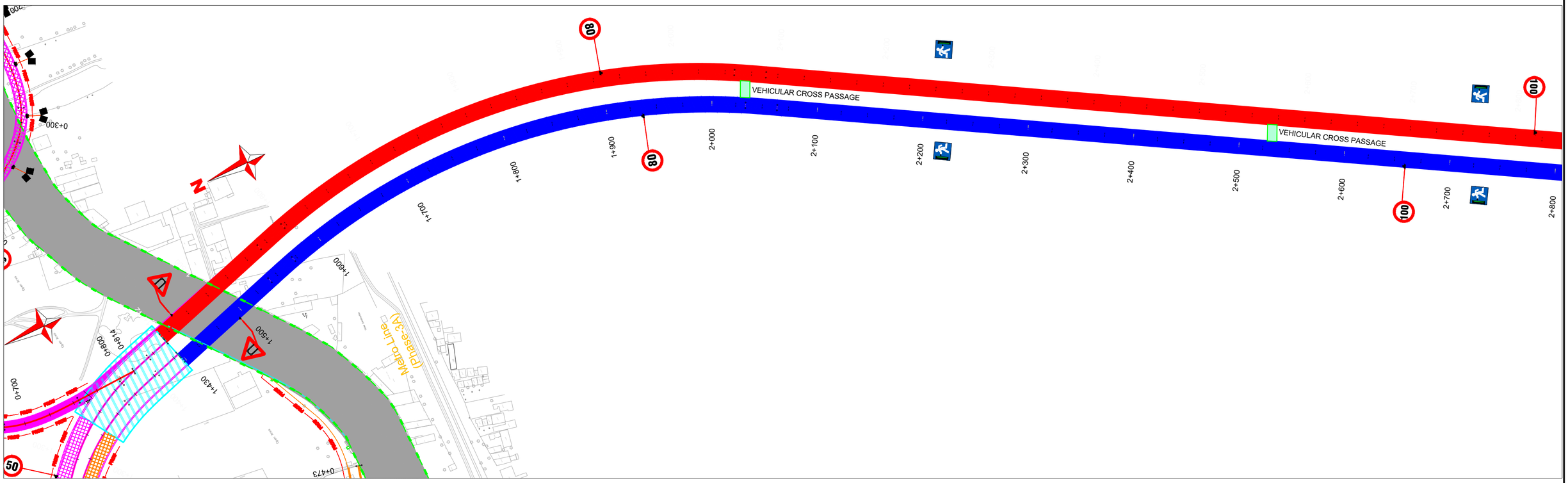
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TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01/R0

Hebbal Esteem mall junction

Silk Road



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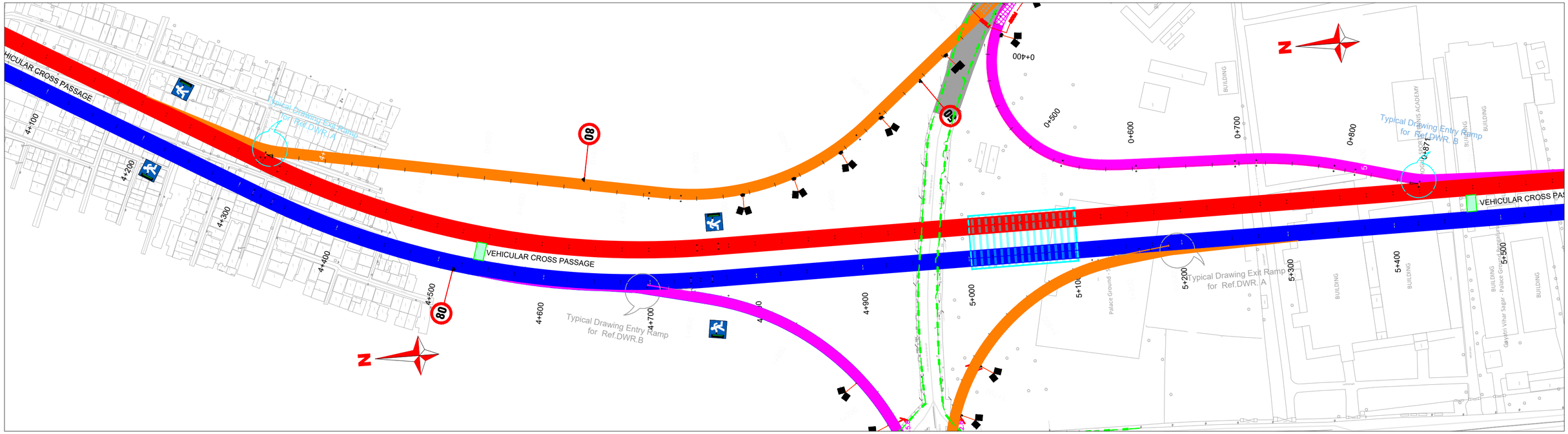
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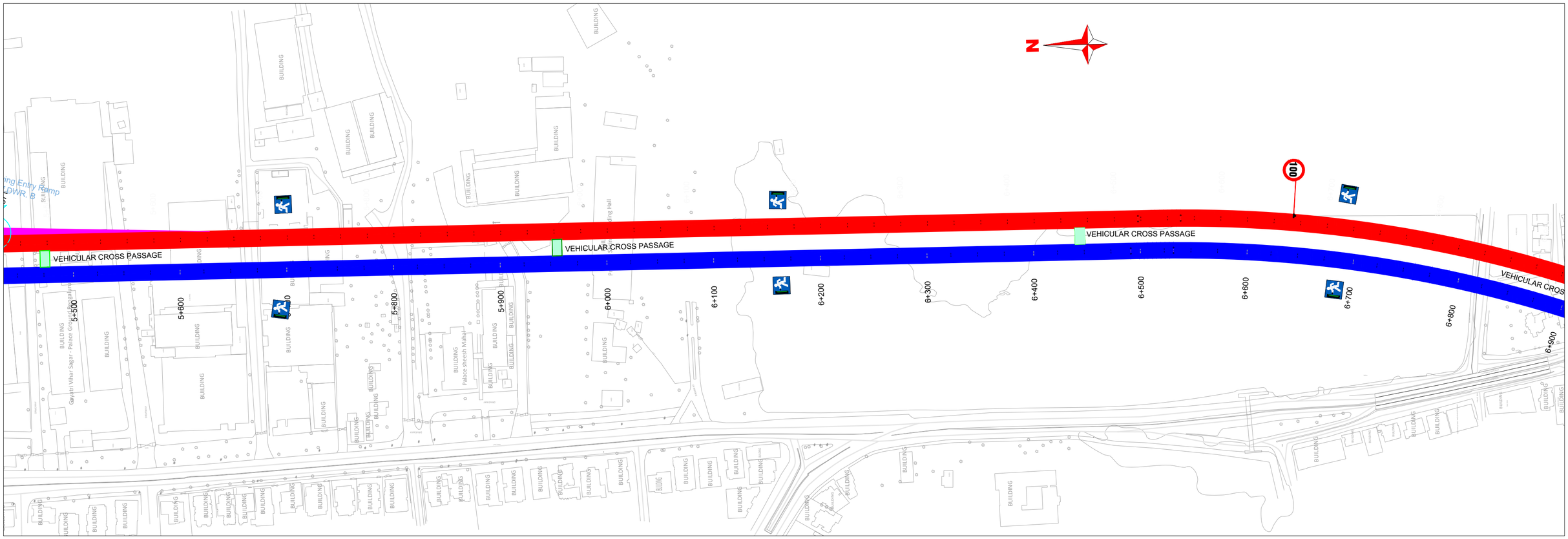
TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01/R0

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Drawn:	NL
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Approved:	HRY

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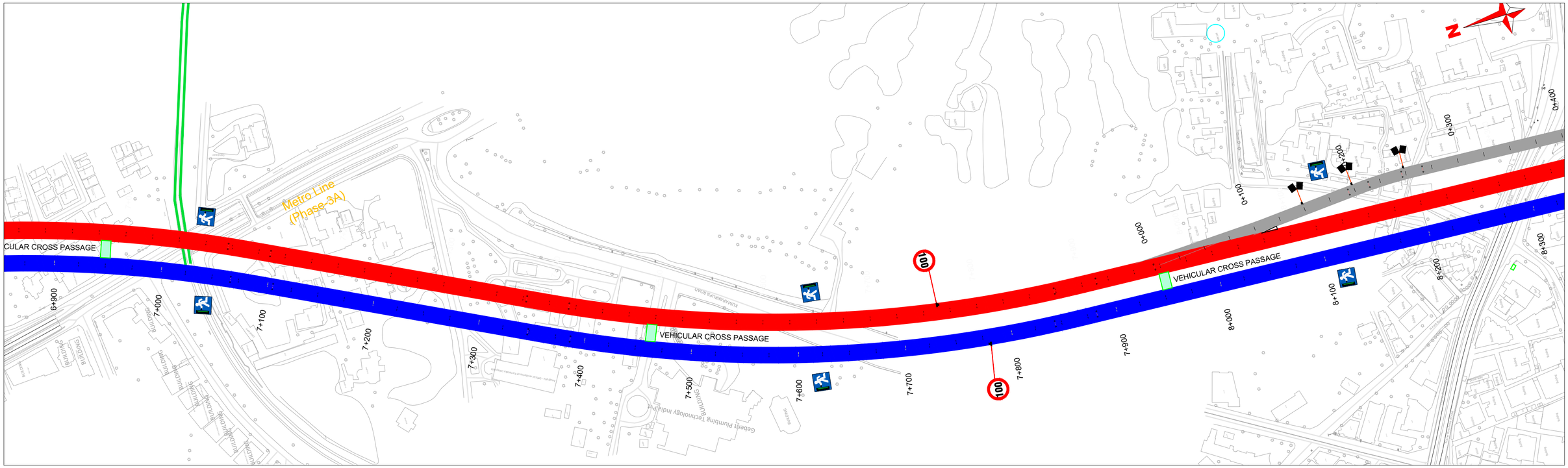
Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.

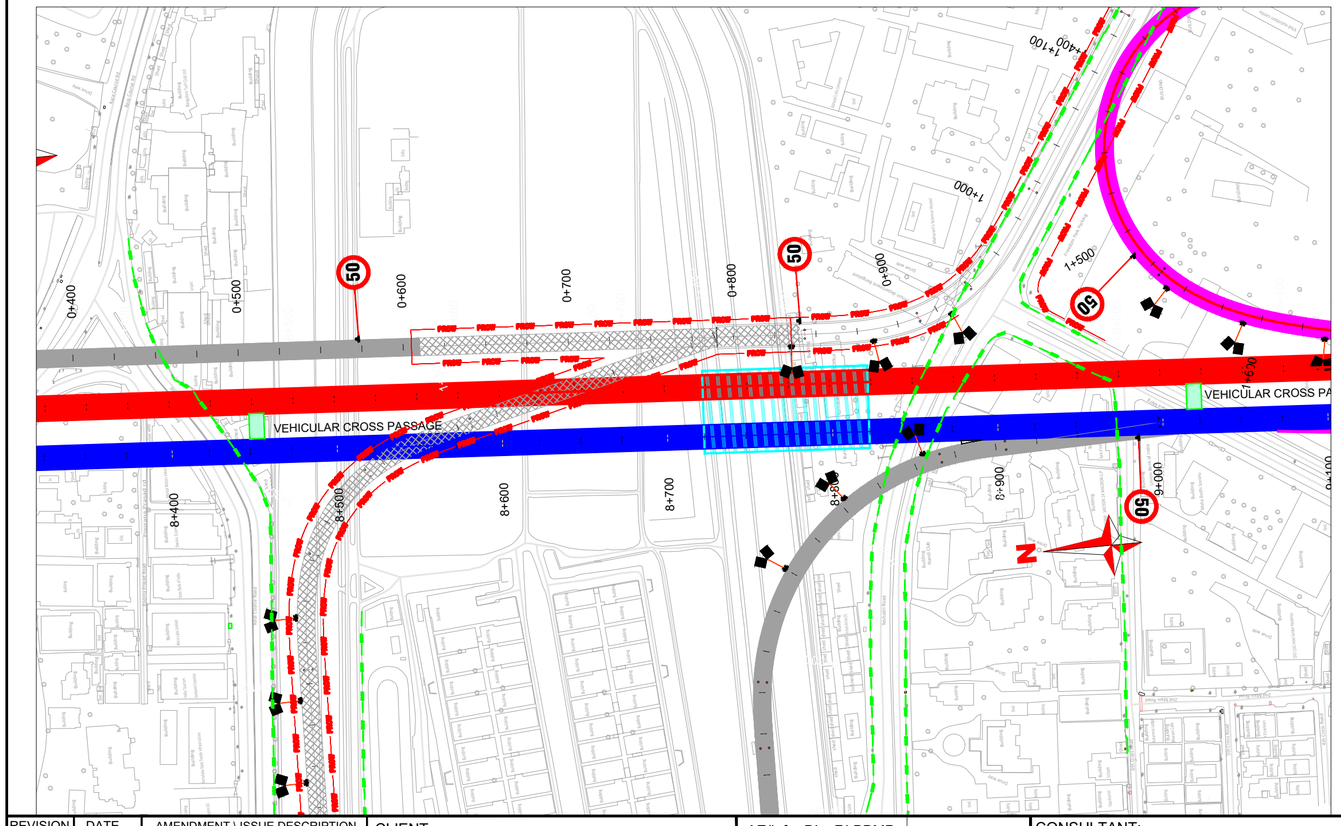
TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01/R0

Hebbal Esteem mall junction

Silk Road





REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	

CLIENT

GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	Scale :- H=:-1:2500
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Checked:	AT	
Approved:	HRY	Sheet size: A2

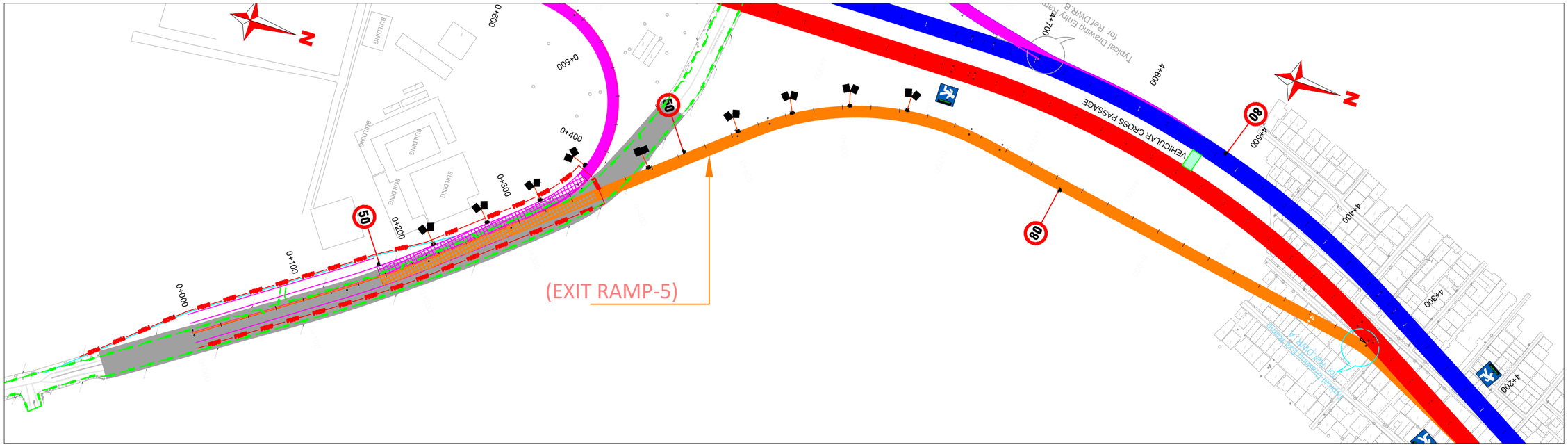
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TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01/R0

Hebbal Esteem mall junction

Silk Road



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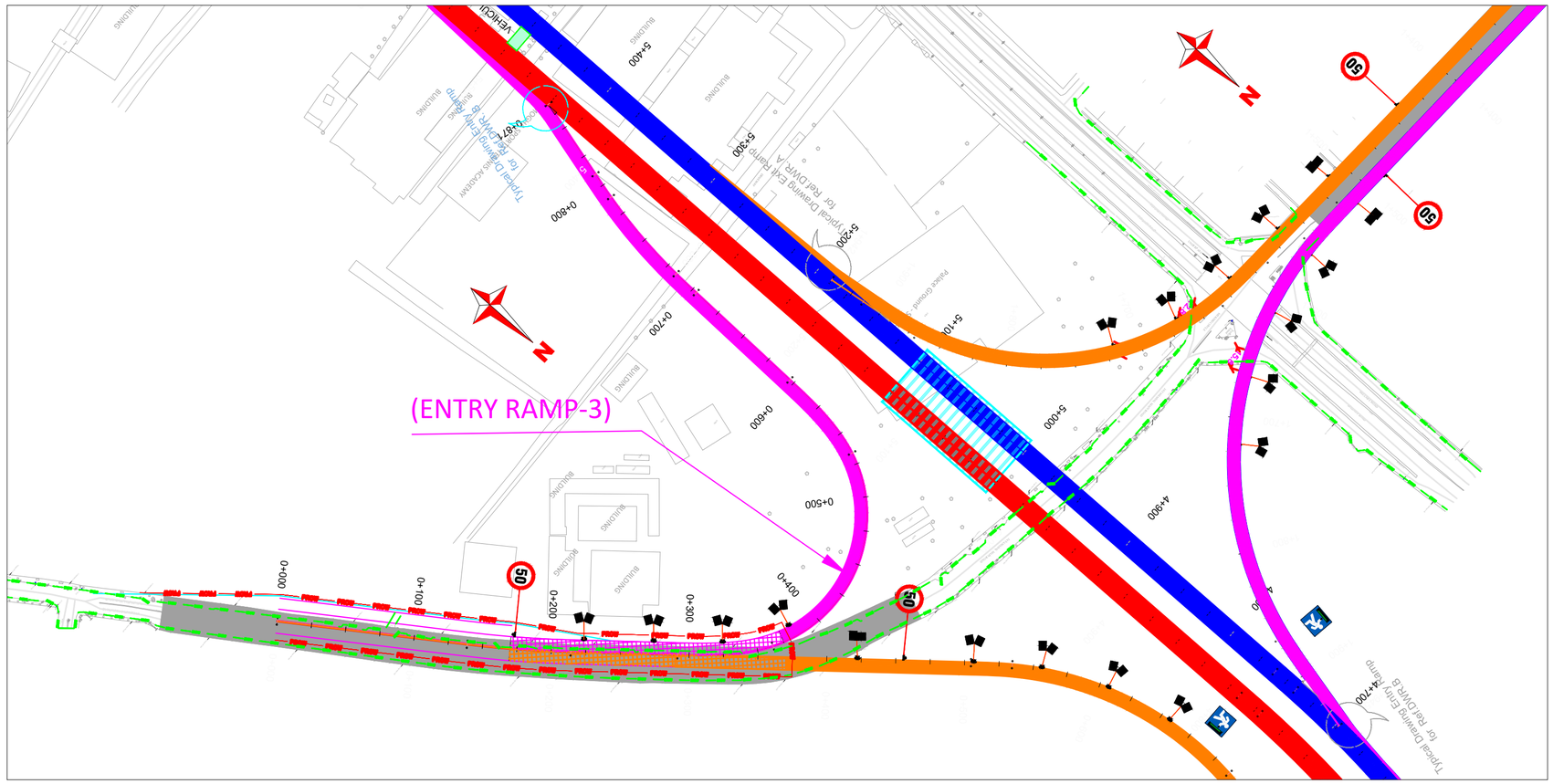
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TRAFFIC PLAN

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Hebbal Esteem mall junction

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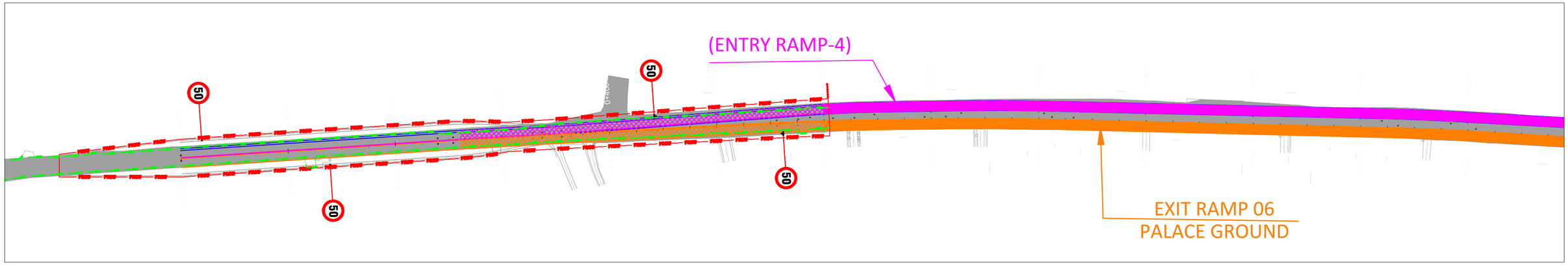
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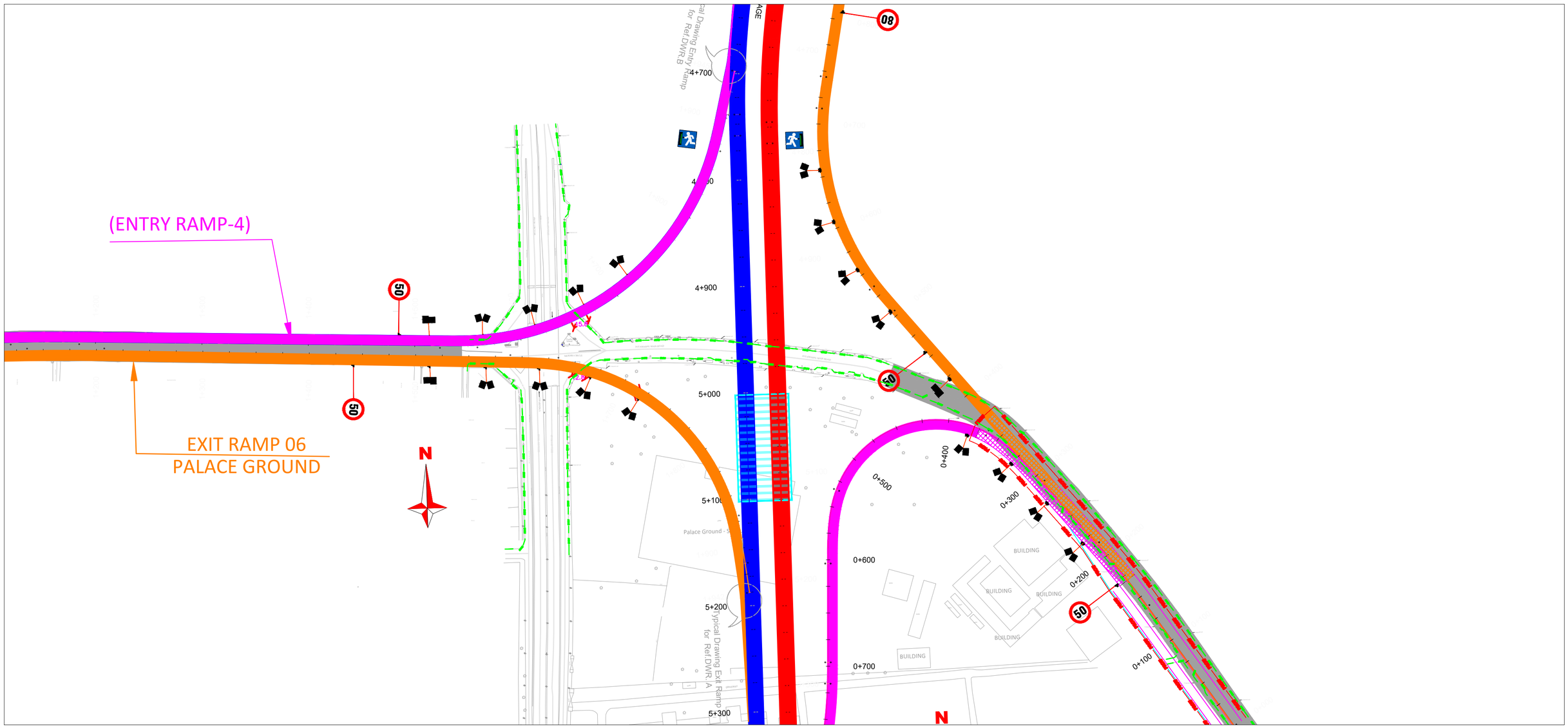
TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01/R0

Hebbal Esteem mall junction

Silk Road





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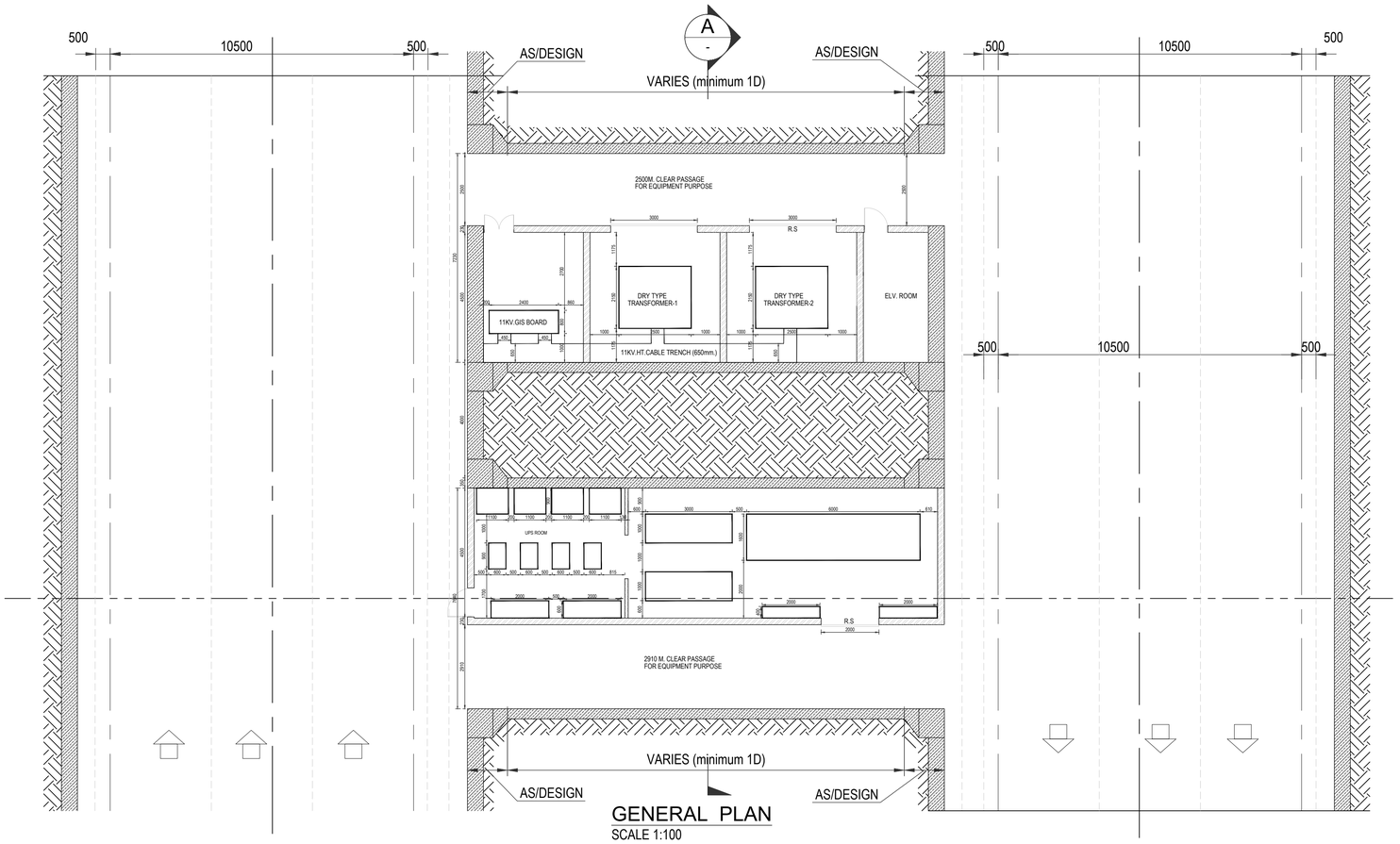
TRAFFIC PLAN

RC/1640/HO/HBT/TU/DWG/TP 01/R0

TUNNEL DRAWING

GENERAL ARRANGEMENT DRAWING

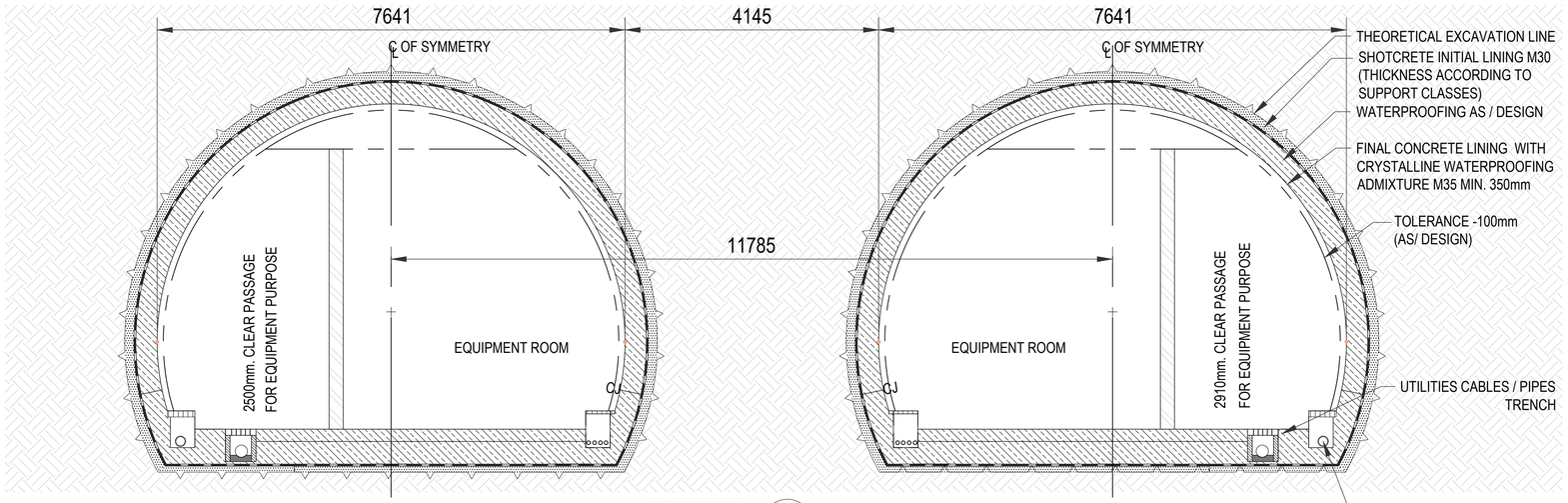
Original Drawing Size A1



GENERAL PLAN
SCALE 1:100

LOCATION DETAILS FOR CP-E :-

SUBSTATION IN CP -E	SUBSTATION NUMBER	PROPOSED CHAINAGE
CPE-1	S/SN-1	2331.5
CPE-2	S/SN-2	4110.5
CPE-3	S/SN-3	6006.25
CPE-4	S/SN-4	7818.75
CPE-5	S/SN-5	9775
CPE-6	S/SN-6	11675
CPE-7	S/SN-16	11725
CPE-8	S/SN-7	13541
CPE-9	S/SN-8	15114



SECTION A
SCALE 1:50

TYPICAL CROSS SECTION AT CROSS PASSAGE

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTORS DETAILED DESIGN. DETAILED DESIGN SHALL BE DONE BY CONTRACTOR.
3. SIZING AND DETAILS OF MEP EQUIPMENTS MAY CHANGE AS PER CONTRACTORS DETAILED DESIGN.
4. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.
5. NUMBERS AND CHAINAGE OF CP-E ARE INDICATIVE AND TO BE DECIDED BASED ON DETAILED DESIGN OF CONTRACTOR.

SCALE 1 : 50 (1m 0 1m 5m)

SCALE 1 : 100 (5m 0 5m 10m)

FOR DPR SUBMISSION

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
A	31.01.25	FORMAL SUBMISSION

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Haryana INDIA

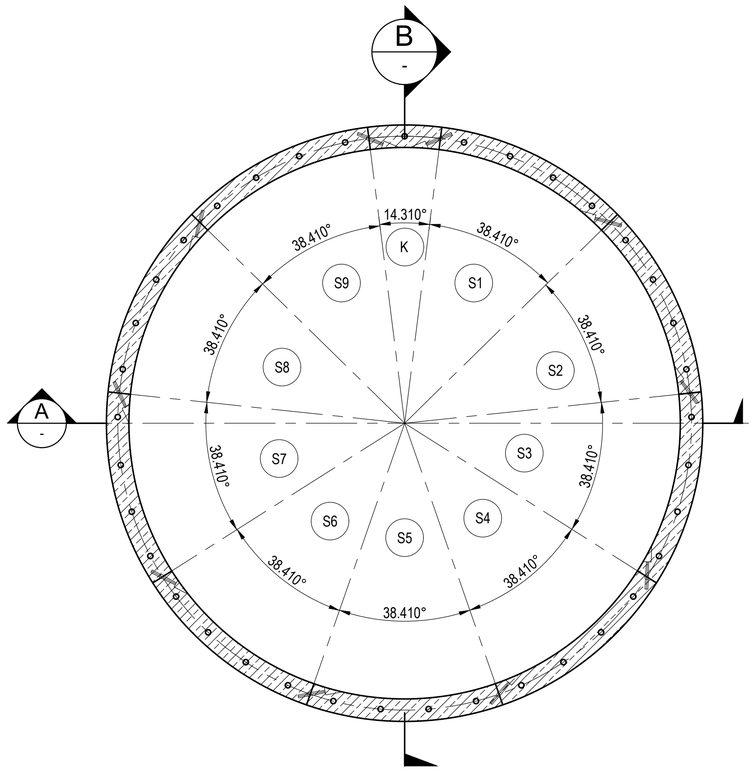
Fluidyn India
#15, 4th Floor, Outer Ring Road
JP Nagar 6th Phase Bengaluru,
Karnataka 560078 India

DRAFT PROJECT REPORT

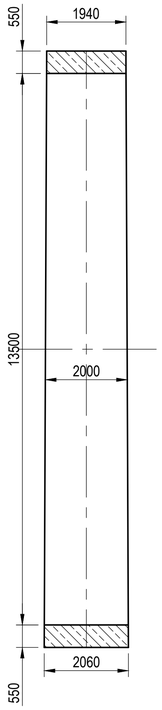
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Checked:	SDh	
Approved:	PSj	Sheet size: A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	GENERAL ARRANGEMENT DRAWING FOR ELECTRICAL CROSS PASSAGE
Drawing No.	RC/1640/HO/HBT/TU/DWG/CP/RCS/304/A

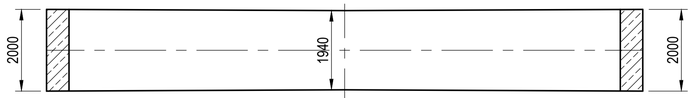
Original Drawing Size A1



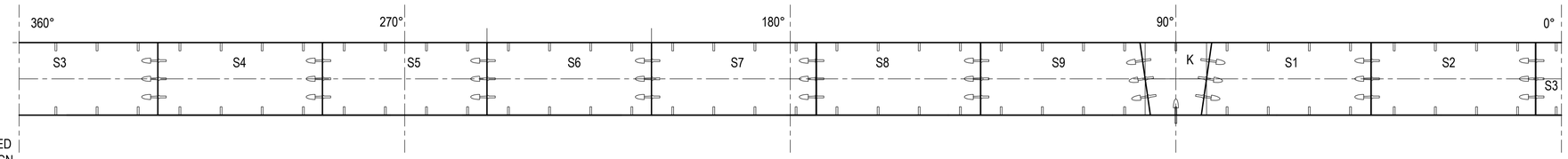
TYPICAL SEGMENTS ARRANGEMENT
SCALE 1:75



SECTION B
SCALE 1:75



SECTION A
SCALE 1:75



DEVELOPED VIEW OF RING LAYOUT ON INTRADOS OF ALL SEGMENTS
SCALE 1:75

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTORS DETAILED DESIGN. DETAILED DESIGN OF SEGMENTAL LINING SHALL BE DONE BY CONTRACTOR.
3. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.
4. DESIGN SHALL FULLFILL THE EMPLOYER REQUIREMENT OF FUNCTION AND DURABILITY.

MATERIALS:

CONCRETE : M60
STEEL REINFORCEMENT Fe550D

SCALE 1 : 75
2.5m 0 2.5m 5.0m 7.5m

FOR DPR SUBMISSION

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	10.09.24	PRELIMINARY
A	30.01.25	FORMAL SUBMISSION

CLIENT
GOVERNMENT OF KARNATAKA
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Bruhat Bangalore Mahanagara Palike

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Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

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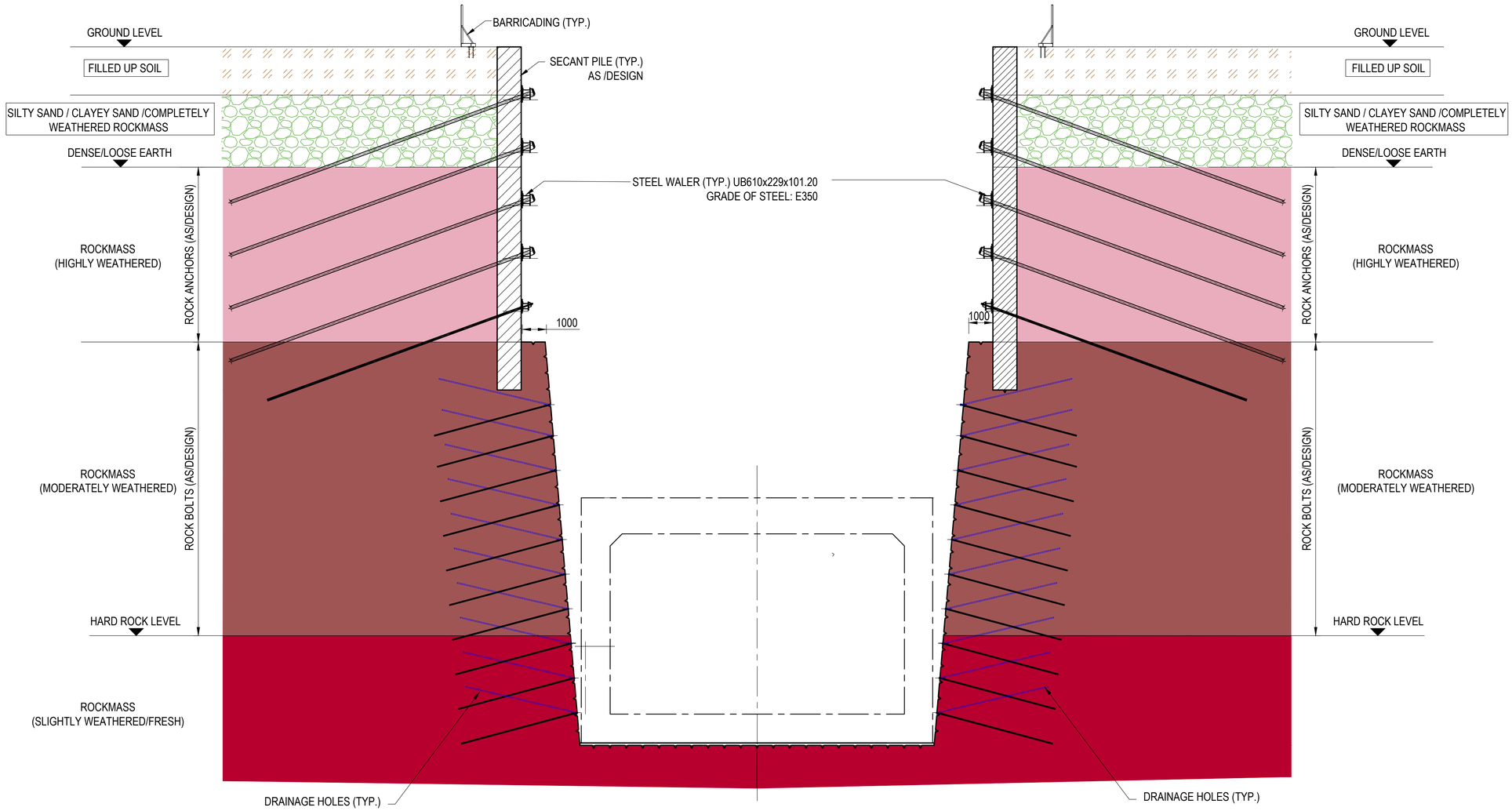
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Checked:	CSa	
Approved:	PSi	Sheet size: A1

Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

Drawing Title: BORED TUNNEL , GENERAL ARRANGEMENT OF PRECAST SEGMENTS

Drawing No.: RC/1640/HO/HBT/TU/DWG/BT/RCS/304/A

Original Drawing Size A1



TYPICAL CROSS SECTION AT CUT/COVER AND RAMP SECTION WITH SECANT PILES , ROCK ANCHORS, ROCK BOLTS AND WALER

SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN mm.
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3. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

SCALE 1 : 100

5m 0 5m 10m

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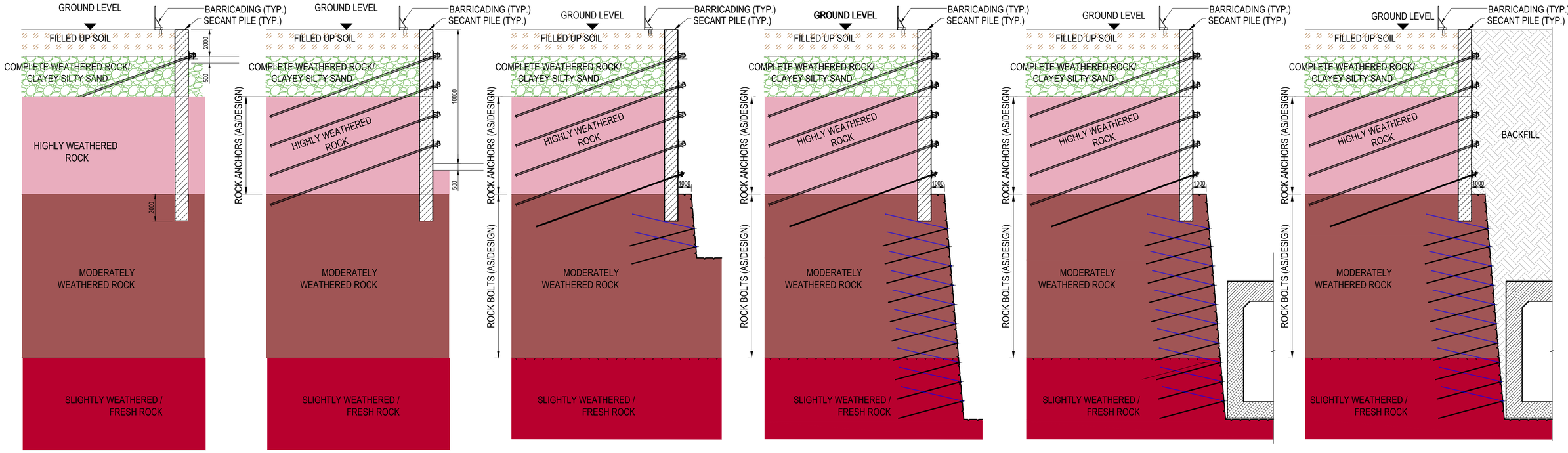
Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

DRAFT PROJECT REPORT

Designed:	CSA/NGO	Scale :- 1:100
Drawn:	RMe	
Checked:		
Approved:	PSj	Sheet size: A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	CUT AND COVER/ RAMP SECTION , TEMPORARY WORKS WITH SECANT PILES AND ROCK SLOPE
Drawing No.	RC/1640/HO/HBT/TU/DWG/CC/SUP/504/A

Original Drawing Size A1



STAGE-1:

1. REINSTATE THE GROUND LEVEL AND BARRICADE ALONG THE EXCAVATION PERIMETER.
2. INSTALL SECANT PILES AS PER SECANT PILE INSTALLATION SEQUENCE.
3. MAXIMUM SURCHARGE SHALL BE LIMITED TO 20 kPa.
4. EXCAVATE 2.5m ON PASSIVE SIDE.
5. INSTALL ROCK ANCHORS & WALER AT 500 MM ABOVE EXCAVATED FACE.
6. PRE STRESS ROCK ANCHORS WHEN GROUT ATTAINS STRENGTH OF AT LEAST 7 DAYS.
7. MAXIMUM SURCHARGE CAN NOW BE UP TO 50 kPa.

STAGE-2:

1. EXCAVATE FURTHER TILL FINAL ROCK ANCHOR LEVEL ROCK LEVEL AND INSTALL ROCK ANCHORS SEQUENTIALLY.
2. INSTALL ROCK ANCHOR & WALER ABOVE 1m FROM EXCAVATION LEVEL.
3. PRE STRESS ROCK ANCHORS WHEN GROUT ATTAINS STRENGTH OF AT LEAST 7 DAYS.

STAGE-3:

1. EXCAVATE FURTHER OR UPTO GRADE III LEVEL WHICHEVER IS LESS.
2. INSTALL PASSIVE ROCK BOLT & WALER ABOVE 1m FROM EXCAVATION LEVEL.

STAGE-4:

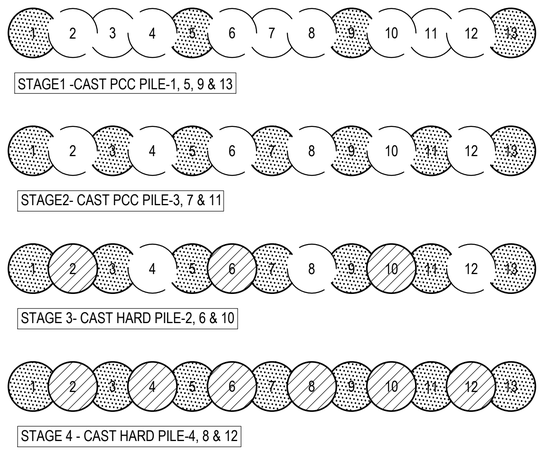
1. EXCAVATE TILL FINAL EXCAVATION LEVEL BY LEAVING MIN. 1000mm STRIP OF ROCK FROM SECANT PILE FACE AFTER REACHING GRADE III LEVEL.
2. ROCK BOLTS AND SHOTCRETING SHALL BE DONE TO STABILIZE ROCK CUT FACE

STAGE-5:

1. CONSTRUCT PERMANENT STRUCTURE BY BOTTOM-UP METHODOLOGY.

STAGE-6:

1. BACKFILL AND REMOVE THE WALER AND ROCK ANCHOR SEQUENTIALLY TILL FINAL REINSTATEMENT OF GROUND LEVEL.
2. HACK SECANT PILE UPTO 2m FROM G.L.



SECANT PILE INSTALLATION SEQUENCE

CONSTRUCTION SEQUENCE

A. PREPARE THE GROUND.

B. START BORING OPERATION FOR PCC PILE AND STABILISE SOIL WITH BENTONITE OR USING CASING WHILE BORING. INSTALL PCC PILE.

C. REPEAT THE PROCESS AND INSTALL PCC PILE AS PER THE INSTALLING SEQUENCE.

D. START BORING OF HARD PILE WITH CASING TO CUT THROUGH PCC PILE TO THE EMBEDMENT DEPTH BELOW THE PRESCRIBED ROCK LEVEL.

E. LOWER REINFORCEMENT CAGE AND CONCRETE.

NOTES:

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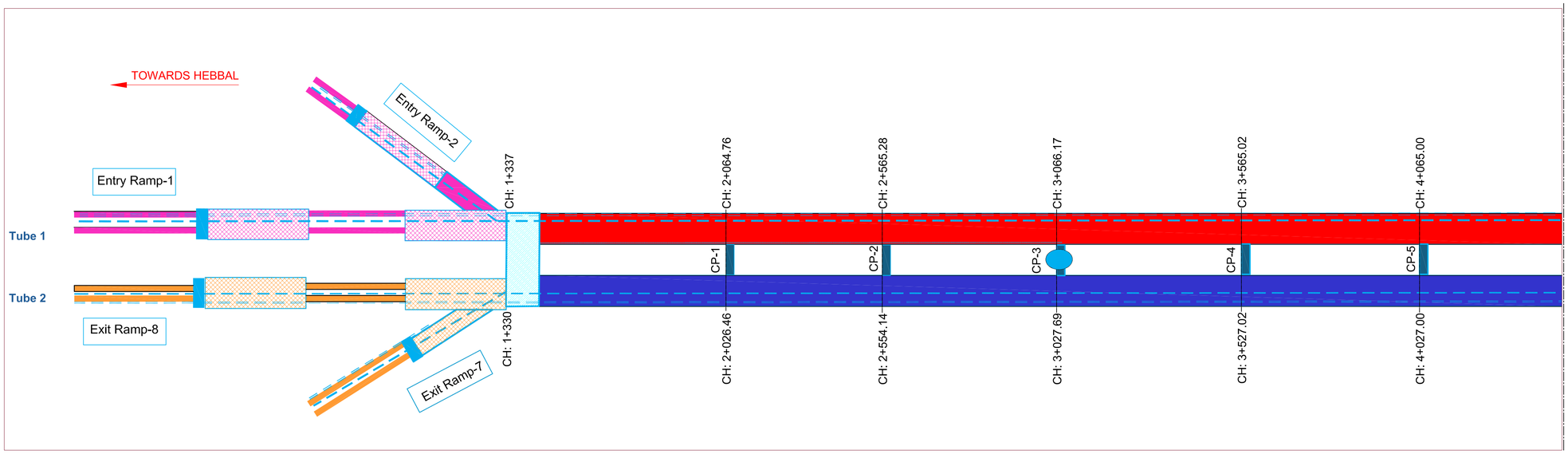
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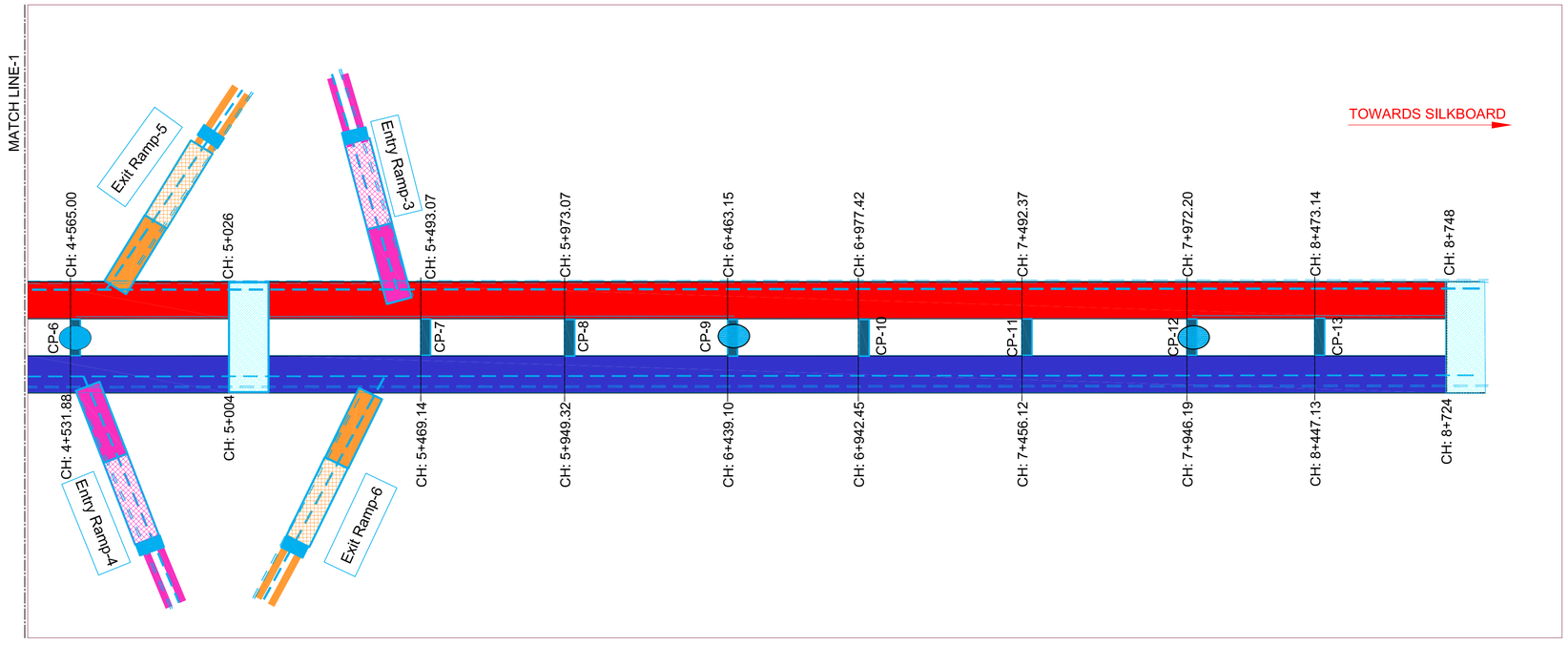
Drawing Title: CUT AND COVER/ RAMP SECTION, TYPICAL CONSTRUCTION SEQUENCE AND PILE INSTALLATION SEQUENCE

Drawing No.: RC/1640/HO/HBT/TU/DWG/CC/SUP/505/A

Original Drawing Size A1

Appendix-B-III





LEGEND:

- TUBE-1
- TUBE-2
- SHAFT
- NATM ENTRY
- NATM EXIT
- C&C ENTRY
- C&C EXIT
- RAMP ENTRY
- RAMP EXIT
- RAMP SUMP
- CP SUMP
- CROSS PASSAGE
- SURFACE DRAINAGE
- CENTRAL DRAINAGE
- SUMP DISCHARGE

TUNNEL DRAINAGE SCHEME - PACKAGE 1

NOTE:

1. THE DRAWING IS INDICATIVE TO SHOW THE OVERALL DRAINAGE LAYOUT OF THE PACKAGE.
2. ALIGNMENT DRAWINGS SHALL SUPERSEDE THE DETAILS IN CASE OF ANY DISCREPANCY OF CHAINAGE/ LENGTH OR LOCATIONS ETC.
3. DRAWING IS NOT TO SCALE.

FOR DPR SUBMISSION

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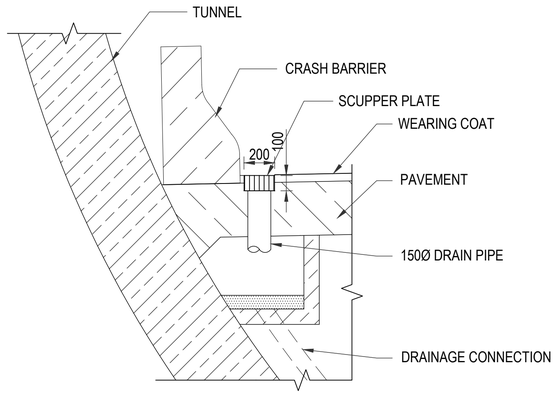
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#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

DRAFT PROJECT REPORT

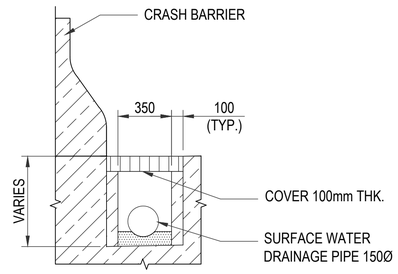
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Drawn:	ZHu	
Checked:	PSi	
Approved:	PSi	Sheet size: A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	**TUNNEL DRAINAGE SCHEME PACKAGE-1 (HEBBAL TO RACE COURSE)**
Drawing No.	RC/1640/HO/HBT/TU/DWG/GEN-ALG-111

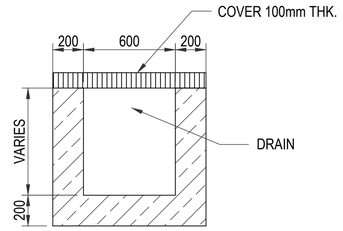
Original Drawing Size A1



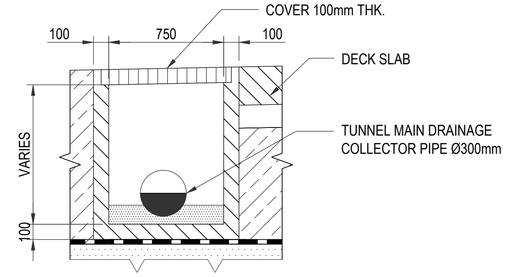
TYPICAL DETAILS OF
PAVEMENT DRAINAGE SPOUT
SCALE - NTS



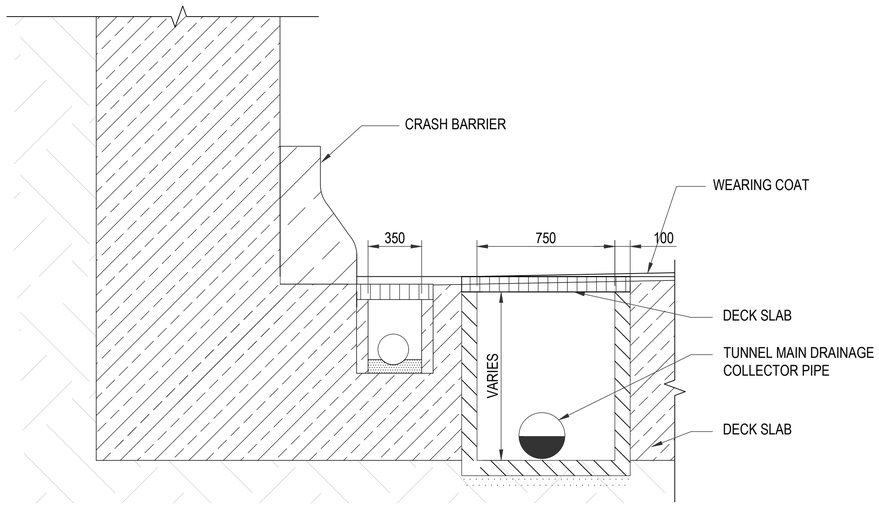
TYPICAL DETAILS OF SURFACE
DRAIN MAMHOLE (NATM AND C&C)
SCALE - NTS



TYPICAL DETAILS OF TUNNEL
CENTRAL COVERED DRAIN
SCALE - NTS



TYPICAL DETAILS OF TUNNEL
MAIN DRAIN MANHOLE (NATM)
SCALE - NTS



TYPICAL DETAILS OF MANHOLE IN CUT & COVER
TUNNEL AND RAMP
SCALE - NTS

NOTES:

1. DRAWING IS NOT TO SCALE. DIMENSIONS ARE NOT BE MEASURED.
2. THE DRAINAGE DETAILS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTORS DETAILED DESIGN. CONTRACTOR SHALL REFER THE STANDARD REQUIREMENT OF SPOUT AND MANHOLES AS PER IRC STANDARD.
3. FOR RCS AND OTHER DESIGN DETAILS REFER SEPARATE DRAWINGS.
4. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

SCALE 1 : 20
1m 0 1m 2m

FOR DPR SUBMISSION

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
A	31.01.25	FORMAL SUBMISSION

CLIENT
GOVERNMENT OF KARNATAKA
GOVERNMENT OF KARANATAKA
Bruhat Bangalore Mahanagara Palike

CONSULTANT:
RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA
CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near
Sikanderpur Metro Station Sector 28, Gurugram
Haryana INDIA

Fluidyn India
#15, 4th Floor, Outer Ring Road
JP Nagar 6th Phase Bengaluru,
Karnataka 560078 India

DRAFT PROJECT REPORT

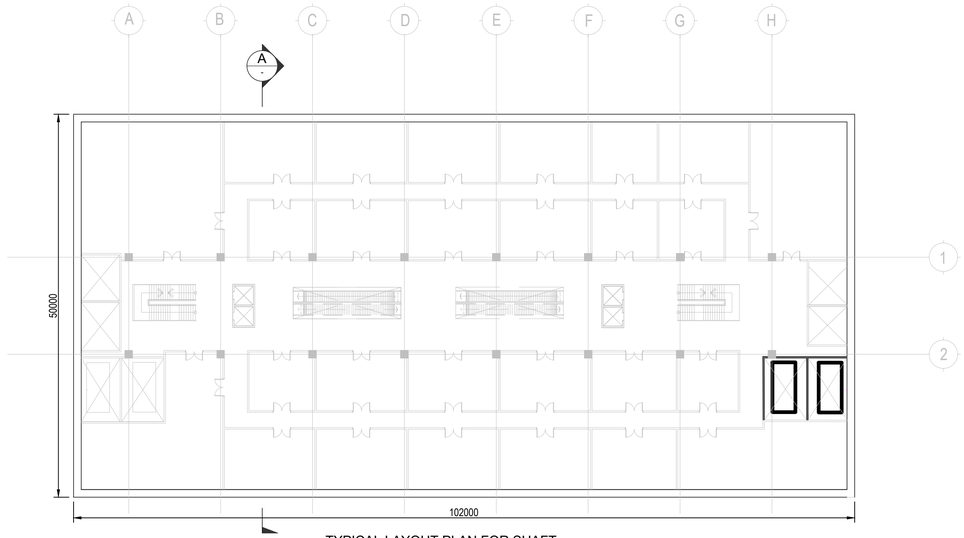
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Drawn:	MGs	
Checked:	SDh	
Approved:	PSi	Sheet size: A1

Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

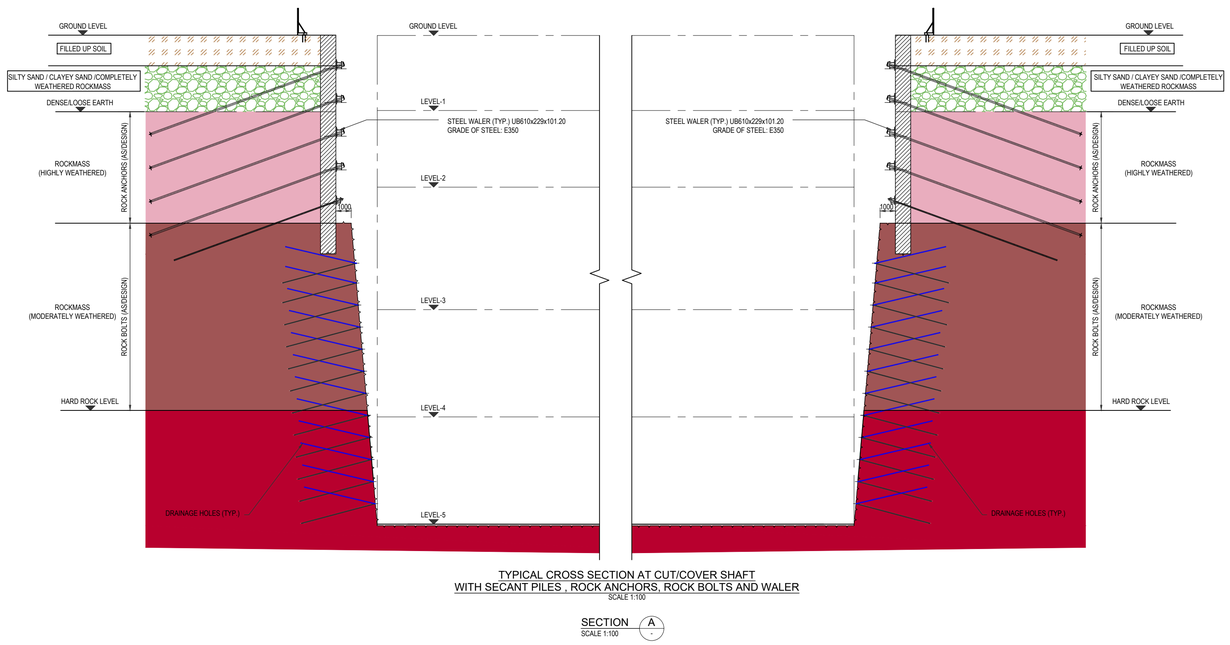
Drawing Title: TYPICAL DETAILS OF DRAINS

Drawing No.: RC/1640/HO/HBT/TU/DWG/GEN/ALG/113/A

Original Drawing Size A1



TYPICAL LAYOUT PLAN FOR SHAFT
SCALE 1:100



TYPICAL CROSS SECTION AT CUT/COVER SHAFT
WITH SECANT PILES , ROCK ANCHORS, ROCK BOLTS AND WALER
SCALE 1:100

SECTION A
SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND MAY CHANGE AFTER DETAILED DESIGN.
3. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

SCALE 1 : 100
5m 0 5m 10m

FOR DPR SUBMISSION

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
A	30.01.25	FORMAL SUBMISSION

CLIENT
GOVERNMENT OF KARNATAKA
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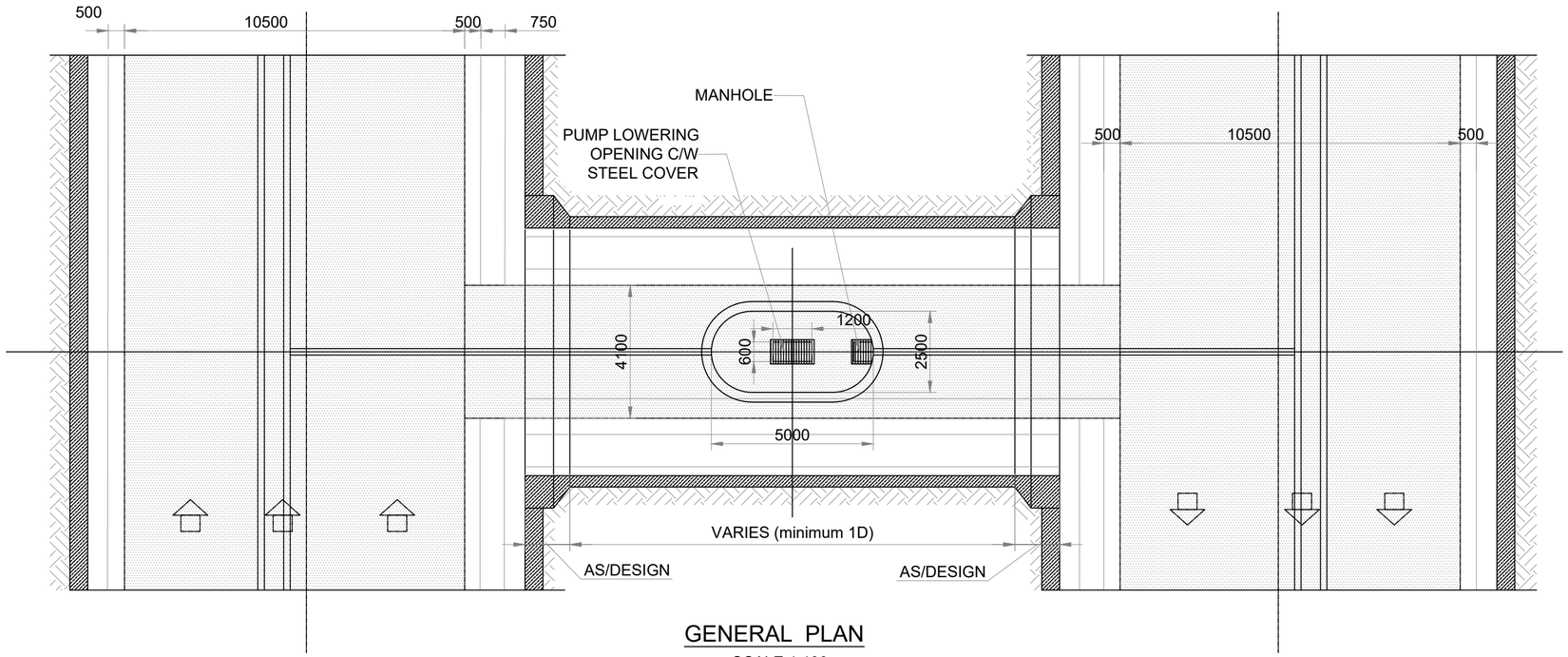
Fluidyn India
#15, 4th Floor, Outer Ring Road
JP Nagar 6th Phase Bengaluru,
Karnataka 560078 India

DRAFT PROJECT REPORT

Designed:	SDh
Drawn:	MGs
Checked:	SDh
Approved:	PSi

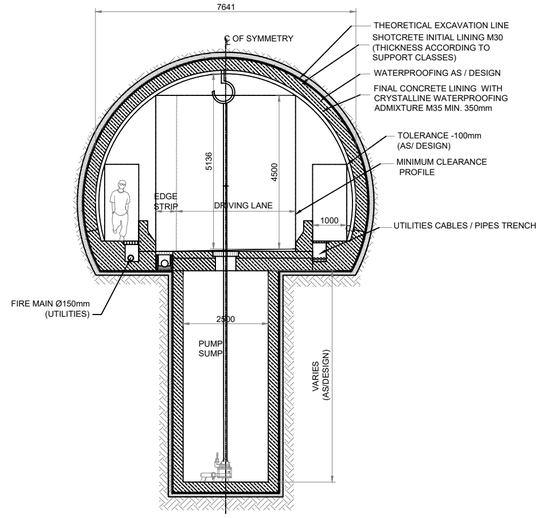
Scale :- 1:100
Sheet size: A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	CUT AND COVER SHAFT SECTION , TEMPORARY WORKS WITH SECANT PILES AND ROCK SLOPE
Drawing No.	RC/1640/HO/HBT/TU/DWG/CC/SUP/506/A



GENERAL PLAN

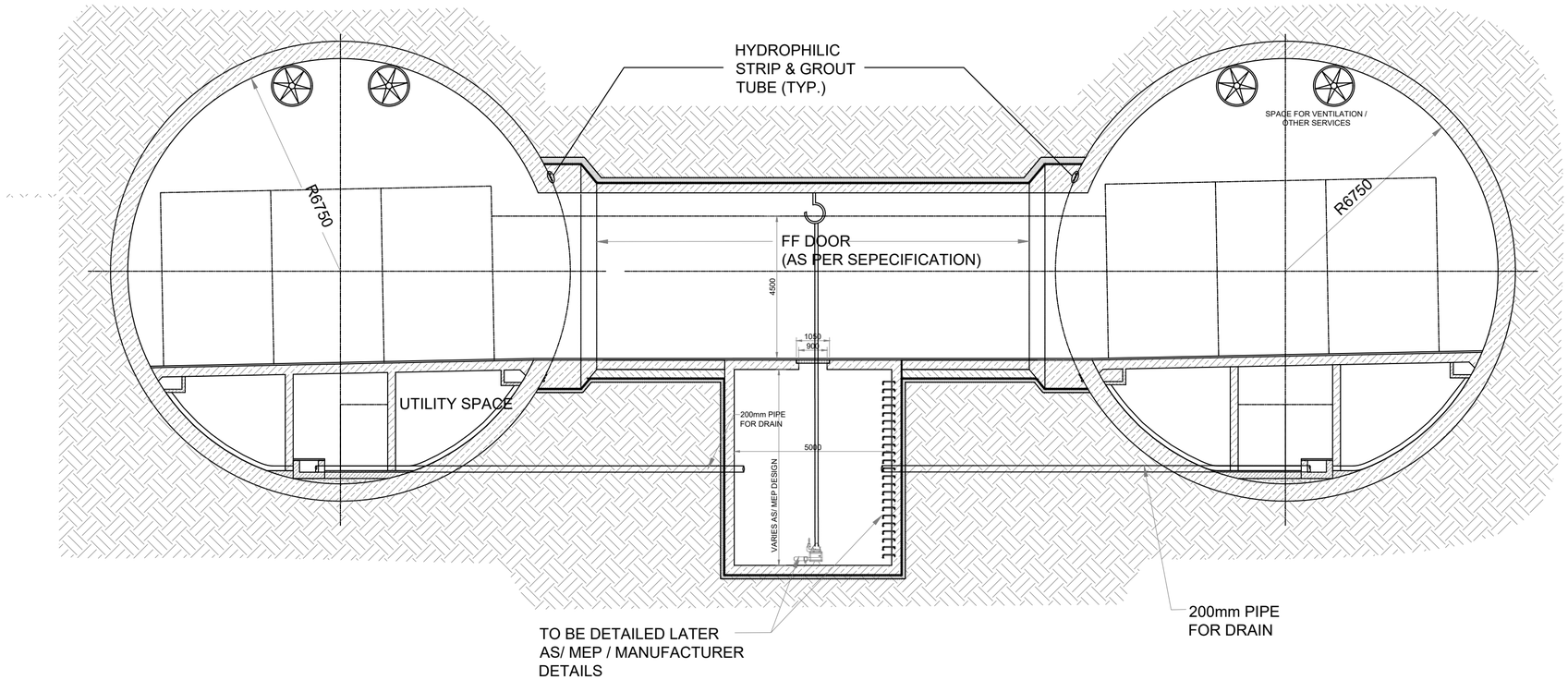
SCALE 1:100



TYPICAL CROSS SECTION WITH SUMP

SCALE 1:50

(FOR REGULAR CROSS SECTION - REFER DRG, No. I40172-NT-RCS-402)



AT CROSS PASSAGE WITH SUMP

SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTORS DETAILED DESIGN. DETAILED DESIGN OF SEGMENTAL LINING SHALL BE DONE BY CONTRACTOR.
3. SIZING AND DETAILS OF CRASH BARRIER, DRAINAGE , UTILITY PIPE TRENCH ETC . MAY CHANGE AS PER CONTRACTORS DETAILED DESIGN.
4. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.
5. ALL CPS TO BE INSTALLED WITH FIRE-FIGHTING DOOR AS PER SPECIFICATIONS.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

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NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

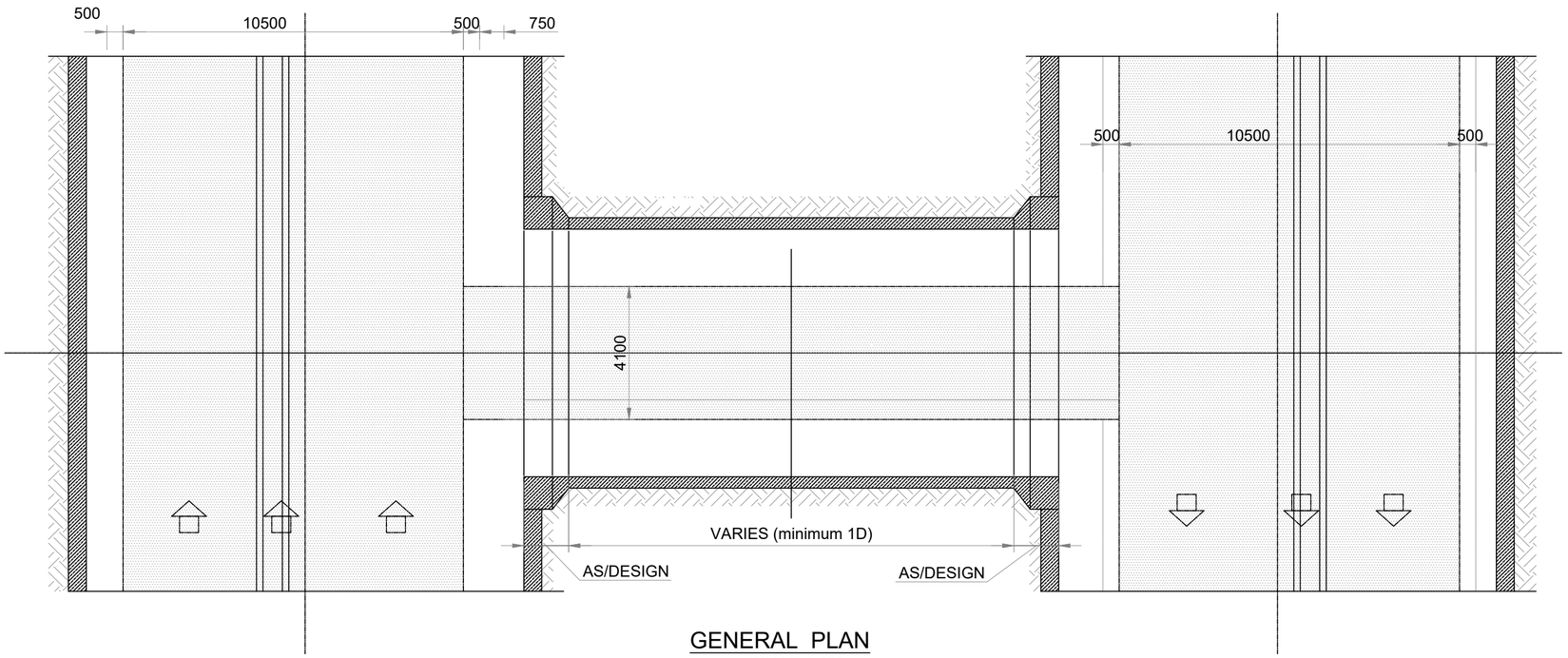
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

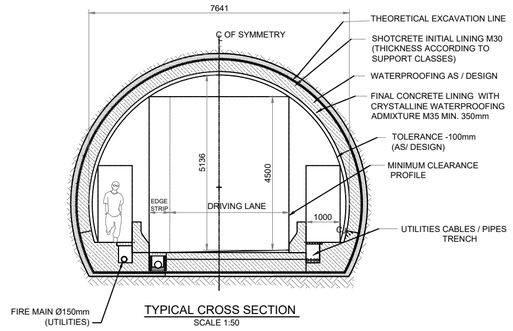
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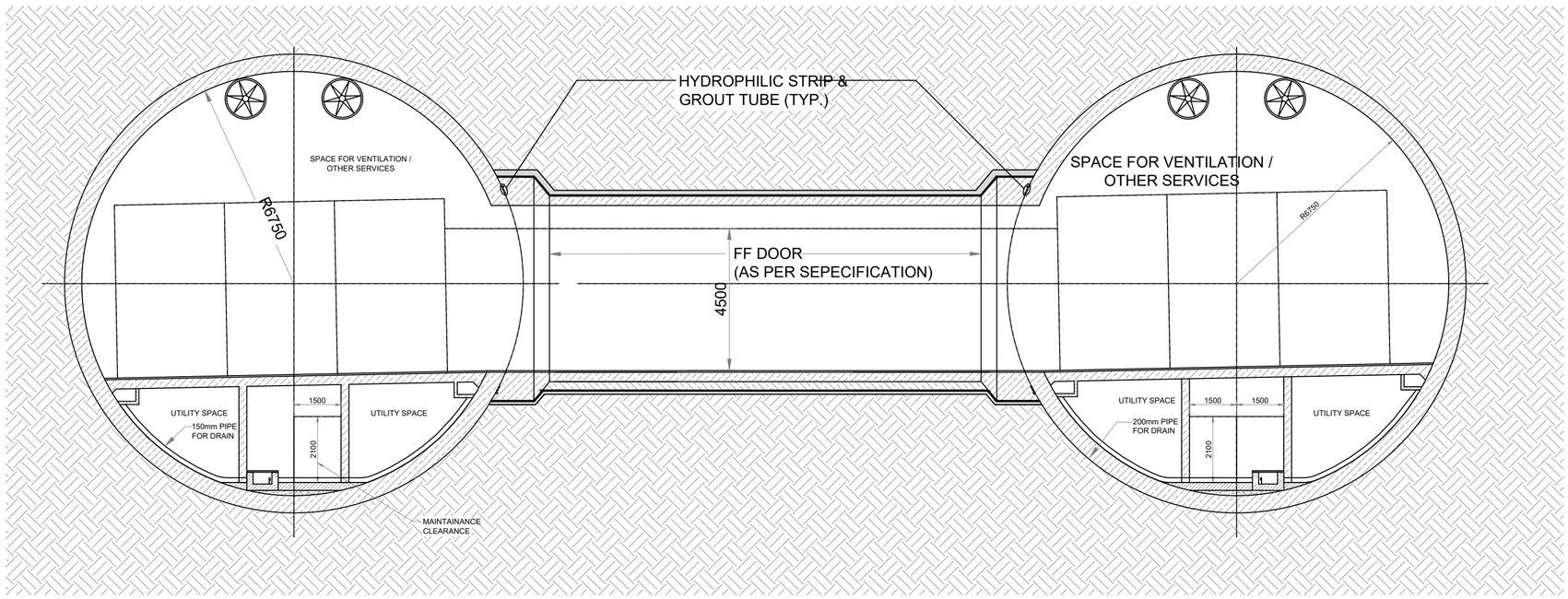
Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	TYPICAL TUNNEL CROSS SECTION AT CROSS PASSAGE WITH SUMP
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 16/R0



GENERAL PLAN
SCALE 1:100



TYPICAL CROSS SECTION
SCALE 1:50



AT CROSS PASSAGE WITH SUMP
SCALE 1:100

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTORS DETAILED DESIGN. DETAILED DESIGN OF SEGMENTAL LINING SHALL BE DONE BY CONTRACTOR.
3. SIZING AND DETAILS OF CRASH BARRIER, DRAINAGE , UTILITY PIPE TRENCH ETC . MAY CHANGE AS PER CONTRACTORS DETAILED DESIGN.
4. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.
5. ALL CPS TO BE INSTALLED WITH FIRE-FIGHTING DOOR AS PER SPECIFICATIONS.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT
GOVERNMENT OF KARNATAKA
Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:
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NEW DELHI - 110001 (INDIA)

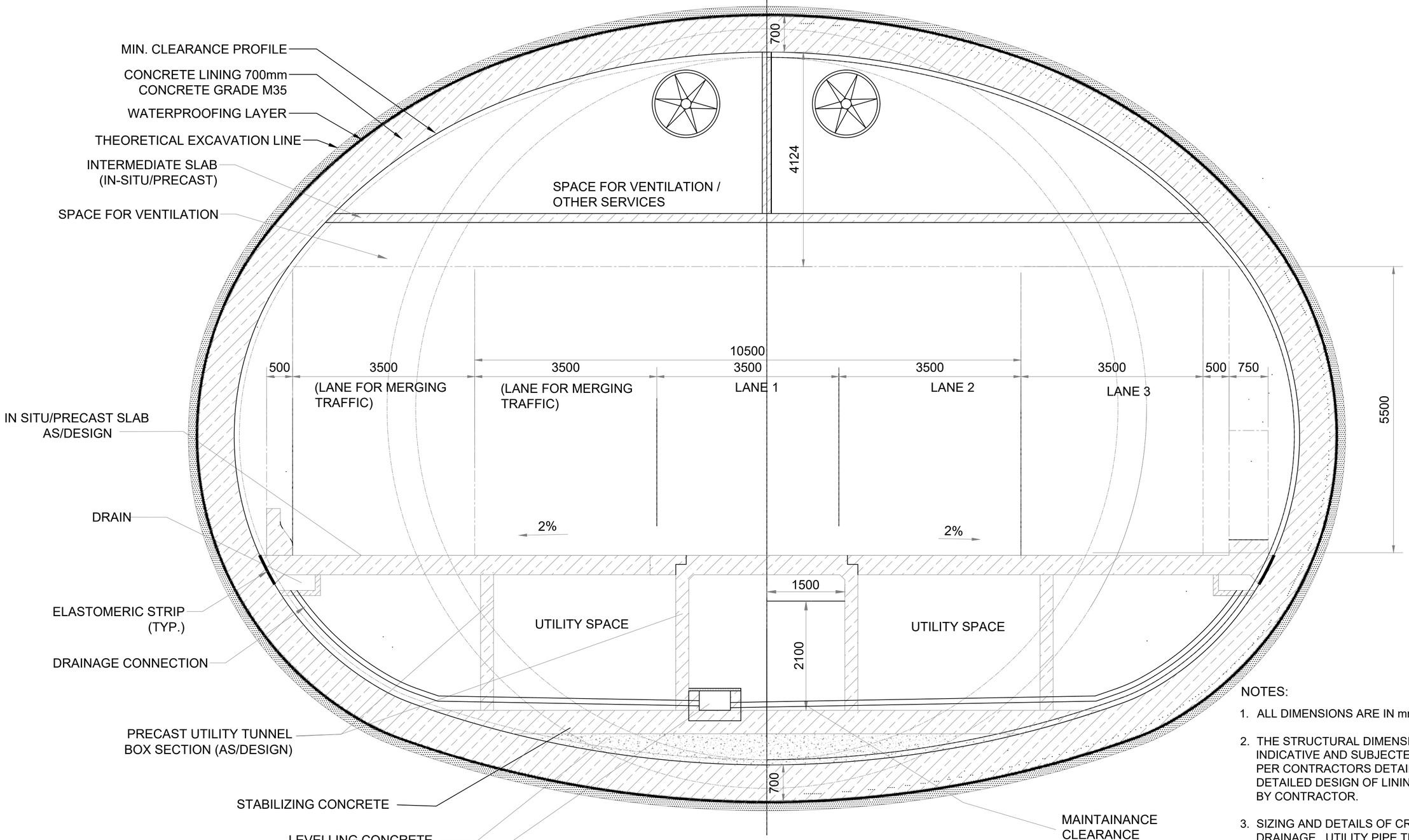
GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A2

Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	TYPICAL TUNNEL CROSS SECTION AT CROSS PASSAGE WITH SUMP
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 16A/R0



INTERSECTION OF MAIN TUNNEL WITH ENTRY/EXIT

SCALE 1:50

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. THE STRUCTURAL DIMENSIONS SHOWN ARE INDICATIVE AND SUBJECTED TO CHANGE AS PER CONTRACTORS DETAILED DESIGN. DETAILED DESIGN OF LINING SHALL BE DONE BY CONTRACTOR.
3. SIZING AND DETAILS OF CRASH BARRIER, DRAINAGE , UTILITY PIPE TRENCH WALKWAY ETC . MAY CHANGE AS PER CONTRACTORS DETAILED DESIGN.
4. WALKWAY CAN BE PLANNED ON EITHER SIDE OF THE ROAD AS PER DETAILED DESIGN.
5. DRAWING SHALL BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT PROVISIONS.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

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GOVERNMENT OF KARNATAKA
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GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A2

Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	TYPICAL CROSS SECTION AT INTERSECTION OF MAIN TUNNEL WITH ENTRY/EXIT
Drawing No.	RC/1640/HO/HBT/TU/DWG/TCS/ 17/R0

SUPPORT DESIGN AND MONITORING

1. INSTRUMENTATION AND IT'S MONITORING TO ALL ADJACENT EXISTING BUILDING STRUCTURES (EBS), UTILITIES, SERVICES, PAVEMENT, ROAD FURNITURE SHALL BE START AT LEAST 15 DAYS BEFORE EXCAVATION WORK TO ESTABLISH STABLE BASE LINE TRENDS IN READING.

2. ALL INSTRUMENTATION TO BE MAINTAINED THROUGHOUT CONSTRUCTION PERIOD AND IMMEDIATELY REPLACED /REINSTATED IF DAMAGED/DEFECTIVE OR COVERED PERMANENTLY, DEEMED CRITICAL TO THE WORKS

3. THE FREQUENCY OF MONITORING WILL BE VARIED DEPENDING ON THE TYPE OF INSTRUMENT AND THE RELATIONSHIP BETWEEN THE INSTRUMENT AND AREAS OF CURRENT ACTIVITY.

4. VIBRATION MONITORING WITH INITIAL CALIBRATION WILL BE CARRIED OUT ON SELECTED STRUCTURES WHERE THE CONSTRUCTION ACTIVITY IS LIKELY TO RESULT IN VIBRATIONS. THE VIBRATION MONITORING REQUIREMENT WILL BE ESTABLISHED DURING INITIAL STAGES OF THE SPECIFIC CONSTRUCTION ACTIVITIES, WHICH MAY CAUSE VIBRATION TO EXCEED THE ACCEPTABLE LIMITS.

(a) THE VIBRATION WILL BE MONITORED FOR BUILDING NEAR TO CUT AND COVER STATION DURING DIAPHRAGM WALL OPERATION/PILING OPERATION /EXCAVATION ACTIVITY.

(b) THE VIBRATION WILL BE MONITORED FOR THE MODERATE / SEVERE / VERY SEVERE BUILDINGS OR BUILDINGS HIGHER THAN B+G+2 OR G+3 AND WITHIN 5mm CONTOUR OR LOCATED DIRECTLY ABOVE THE TBM TUNNEL.

(c) THE VIBRATION WILL BE MONITORED MIXED FACE CONDITION IS ENCOUNTERED DURING TBM TUNNELING.

5. VIBRATION MONITORING SHALL BE CARRIED OUT BY PLACING SENSORS ON THE GROUND FLOOR AND THE HIGHEST FLOOR OF THE BUILDING. IN ADDITION, IF A BUILDING HAS MORE THAN 4 FLOORS, VIBRATION SENSORS SHALL BE INSTALLED ON EVERY FOURTH FLOOR. VIBRATION MONITORING INSTRUMENTS SHALL MEET THE REQUIREMENTS SPECIFIED IN BS 5228-2 2009.

6. SUFFICIENT NUMBER OF DEEP LEVELING DATUM SHOULD BE INSTALLED BEFORE THE START OF ANY MONITORING WORKS. THE LOCATION OF THE DEEP LEVELING DATUM SHOULD BE OUTSIDE THE ZONE OF INFLUENCE OF THE WORKS AND MUST BE ACCEPTED BY THE DESIGNER.

7. PRIOR TO THE START OF ANY EXCAVATION WORKS ON SITE, A SATISFACTORY SET OF BASE READINGS COMPRISING THE MEAN OF AT LEAST THREE SEPARATE INDEPENDENT SURVEYS WILL BE OBTAINED FOR ALL MONITORING POINTS. EACH SURVEY SHALL BE TIED TO THE REFERENCE DEEP LEVELING DATUM.

8. AT LEAST 15% OF ALL STRUTS WILL BE MONITORED FOR LOAD USING STRAIN GAUGES. LOAD CELL SHALL BE APPLICABLE WHEREVER THERE IS A PRELOADING ON THE STRUTS. WHERE STRAIN GAUGES ARE USED, A MINIMUM OF TWO STRAIN GAUGES COUPLED WITH TEMPERATURE SENSOR WILL BE INSTALLED AT EACH MONITORING LOCATION.
AT LEAST 5% OF GROUND ANCHORS WILL BE MONITORED FOR LOAD USING LOAD CELL.
THE STRUT AND ANCHOR MONITORING LOCATION SHOULD BE SELECTED SO THAT:
   - STRUTS/ANCHOR OF ALL LEVELS AT THE SELECTED LOCATIONS IS MONITORED,
   - THE STRUT/ANCHOR MONITORING LOCATION COINCIDES APPROXIMATELY WITH MONITORING ARRAY.

9. MAJOR UTILITIES LIKE WATER PIPELINE OF MORE THAN 600MM DIAMETER OR SEWER LINE IN THE MONITORING ZONE WHETHER SUPPORTED OR NOT, WILL BE MONITORED USING SURFACE SETTLEMENT POINT PLACED ON OR IMMEDIATELY ABOVE THE UTILITY AT INTERVALS NOT MORE THAN 25M.

10. BUILDING SETTLEMENT POINT WILL BE PROVIDED ON HERITAGE STRUCTURES/HISTORIC BUILDINGS AT GROUND LEVEL AND EXTEND THROUGHOUT THE AREA WHERE PREDICTED MOVEMENTS ARE EXPECTED TO EXCEED 5 MILLIMETRES. SPECIAL ATTENTION NEEDS TO GIVE FOR EXISTING WELLS ON THE TUNNEL ALIGNMENT.

11. SURFACE SETTLEMENT POINT/PRECISE LEVELING STUDS (ROAD NAILS) WILL BE INSTALLED IN HIGHWAY AND PAVEMENT AREAS IN ARRAY AT 90 DEGREES TO THE TUNNEL ALIGNMENT, THESE ARRAYS WILL EXTEND TO THE OUTER EDGES OF THE 5 MILLIMETRES PREDICTED SETTLEMENT CONTOURS LINES. SUITABLE MONITORING POINTS WHICH CANNOT BE READILY DISTURBED WILL BE INSTALLED OVER OPEN/PARK AREAS. THE LOCATION AND TYPE OF SUCH MONITORING POINTS WILL BE AGREED WITH THE EMPLOYERS'S REPRESENTATIVE.

12. THE ARRAY CAN BE SUITABLY MODIFIED OR MORE INSTRUMENTS CAN BE INCLUDED AS PER SITE CONDITIONS NEAR THE STATION AND BORED TUNNEL SECTIONS, IF REQUIRED.

13. THE MINIMUM MONITORING ZONE FOR THE BUILDINGS WILL EXTEND TO THE OUTER EDGES OF THE 5MM PREDICTED CONTOUR LINE.

14. PRECISE TOTAL STATION WITH 1" ANGULAR ACCURACY AND 1MM + 1.5PPM DISTANCE ACCURACY SHALL BE USED TO SURVEY 3D MONITORING TARGETS.THESE TARGETS SHALL BE MONITORED REGULARLY TO CHECK STABILITY.

15. PRECISE LEVELING EQUIPMENT COMPRISING AUTOMATIC DIGITAL LEVELS AND INVAR STAFF SHALL BE USED TO SURVEY THE DEEP LEVELING DATUM. THESE DEEP LEVELING DATUM SHALL BE MONITORED REGULARLY TO CHECK THEIR STABILITY.

16. ALL THE DATA FROM MONITORING INSTRUMENTS SHALL BE PROCESSED WITHIN 24HOURS AND MADE AVAILABLE TO THE RELEVANT AUTHORITY AND / OR THE EMPLOYER'S REPRESENTATIVE.

17. ALL INSTRUMENT SHALL BE CONNECTED TO DATA LOGGING EQUIPMENT WHERE POSSIBLE SO THAT MEASUREMENTS CAN BE TAKEN ON A CONTINUOUS 24 HOURS BASIS. DATA SHALL BE ACCESSIBLE VIA COMPUTER IN THE ENGINEERS SITE OFFICE. AN ALARM SYSTEM SHALL BE INCORPORATED IN TO THE COMPUTER NETWORK, WITH THE ALARM BEING ACTIVATED IF GAUGE READING EXCEED ANY OF AGREED ALERT,ACTION AND ALARM LEVELS.

18. THE FREQUENCY OF MONITORING WILL BE REVISED DEPENDING ON THE CONSTRUCTION ACTIVITY AND THE PACE OF WORK.
THE FOLLOWING GUIDELINES WILL BE USED WHEN DECIDING ON THE FREQUENCY OF MONITORING:
   - MONITORING WILL BE REPEATED ON THE SAME DAY IF READINGS WERE CONSIDERED INCONSISTENT BY THE RELEVANT AUTHORITY.
   - IF THE READINGS SHOW SIGNIFICANT CHANGE, THE FREQUENCY OF MONITORING WILL BE INCREASED.
   - IF THERE IS AN UNDESIRABLE OCCURRENCE SUCH AS EXCESSIVE GROUND LOSS FOR BORED TUNNELS OR BASE HEAVE OR BASE BLOW OUT OR HIGH SEEPAGE IS DETECTED. THE FREQUENCY OF MONITORING WILL BE INCREASED.

19. MONITORING SHALL BEGIN PRIOR TO COMMENCEMENT OF WORK TO ENABLE INSTRUMENT BASE LINE VALUES TO BE DETERMINED ACCURATELY, AND SHALL CONTINUE UNTIL ALL MOVEMENTS AND DISTORTIONS TO THE GROUND AND EBS, AND CHANGES TO THE GROUNDWATER TABLE THAT MIGHT BE ATTRIBUTED TO THE WORKS, AS SHOWN BY THE MONITORING, HAVE EFFECTIVELY CEASED FOR A PERIOD OF THREE MONTHS.

20. DURING THE DETAIL DESIGN PHASE, IDENTIFYING OF STRUCTURES/SENSORS FOR REAL TIME MONITORING SHALL BE DONE BY CONTRACTOR WITH THE APPROVAL OF ENGINEER.

21. ALL INSTRUMENTATION AND MONITORING WORKS SHALL BE IN RIGOROUS ADHERENCE TO ACCEPTED FIELD WORKS PROCEDURES.

22. ALL EBS UNLESS NOTED OTHERWISE IF ANY PART OF A EBS FALLS WITH THE MONITORING ZONE THAT EBS SHALL BE MONITORED WITH.
-BUILDING SETTLEMENT POINTS, ONE EACH AT THE CORNERS OF THE EBS. TYPE OF POINTS TO BE INSTALLED
-ON THE STRUCTURES SHALL BE ACCEPTABLE TO THE RELEVANT AUTHORITY.
-3D OPTICAL TARGET IN COLUMNS
-TILT METRES
-CRACKMETRES TO MEASURE EXISTING OR NEW CRACKS

23. ALL EXISTING PEDESTRIAN BRIDGES (UNLESS NOTED OTHERWISE) / FOOT OVER BRIDGE PILLARS IN THE MONITORING ZONE SHALL BE MONITORED WITH:
- MOVEMENT MONITORING POINTS, TYPE OF POINTS TO BE INSTALLED ON THE STRUCTURES MUST BE ACCEPTABLE TO THE
- RELEVANT AUTHORITY
- 3D OPTICAL TARGET/TILT METER ON THE STRUCTURES.

24. ALL PRECISE LEVELING DATA SHALL BE CRITICALLY ANALYZED TO ELIMINATE SUPPLY OF INCORRECT, CONFUSED OR CONFLICTING INFORMATION.

25. PILE TOP/ DIAPHRAGM WALL TOP MOVEMENT SHALL BE MONITORED DURING EVERY EXCAVATION AND REFERENCE POINT SHALL BE NOTED BEFORE STARTING OF DEEP EXCAVATION.

26. ADDITIONAL DUMMY MS PIPE OF 150MM DIA SHALL BE EMBEDDED INSIDE CONCRETE AT EACH INCLINOMETER LOCATION, WHEN INSTALLING INSIDE THE D-WALL, IN CASE THE MAIN PIPE GET BLOCKED. PIPE SHOULD BE SEALED AT BOTH ENDS TO PREVENT CONCRETE ENTERING INSIDE.

27. CONTRACTOR SHALL :
- ADJUST INSTRUMENTATION MOUNTING DEVICES TO SUIT ACTUAL FIELD CONDITION WITH APPROVAL OF EMPLOYER/ENGINEER.
- VERIFY THE LOCATIONS OF THE EXISTING STRUCTURES PRIOR TO INSTALLATION OF INSTRUMENTS.
- HERITAGE AND SENSITIVE STRUCTURE TO BE MONITORED ON REAL TIME BASIS IF FOUND CRITICAL AS PER BUILDING DAMAGE ASSESSMENT CRITERIA.

CUT & COVER:

28. DURING SHAFT CONSTRUCTION, MONITORING METHOD OF EXISTING INDIAN RAILWAY LINE OR METRO LINE CROSSING SHALL BE USED WITH PRIOR APPROVAL OF CONCERNED AUTHORITY, WELL IN ADVANCE. INSTRUMENTS WITHIN OUTER EDGE OF 5mm SETTLEMENT CONTOUR LINE SHALL BE MONITORED DAILY UNTIL ONE WEEK. AFTER PERMANENT STRUCTURE IS CAST. WEEKLY MONITORING SHALL BE CARRIED OUT UNTIL 3 WEEKS CONSECUTIVE READINGS SHOW NO CHANGE.

BORED TUNNEL:

29. THE MONITORING FREQUENCY SHALL BE DOUBLED DURING THE TBM INITIAL DRIVE. THE INITIAL DRIVE DISTANCE IS FIRST 150 METERS OF TUNNELING.

30. THE FREQUENCY OF SURFACE MONITORING FOR THE BORED TUNNELS SHALL BE VARIED WITH RESPECT TO THE LOCATION OF THE TBM. THE FOLLOWING INDICATIVE FREQUENCY REPRESENTS THE MINIMUM REQUIRED.
   - FOUR TIMES A DAY MONITORING 25m CIRCLE OF TBM CUTTER HEAD, WHEN TBM PASSING BENEATH EBS SUBJECT TO PERMISSION FROM LOCAL AUTHORITY.
   - TWICE A DAY MONITORING WITHIN 100 METERS BEHIND THE TBM AND 50 METERS IN FRONT OF CUTTER HEAD
   - ONCE A DAY BETWEEN 100 TO 300 METERS BEHIND THE TBM.
   - TWICE A WEEK BETWEEN 300 TO 500 METERS BEHIND THE TBM.
   - WEEKLY MONITORING 500 METERS BEHIND THE TBM.

31. WHERE THE TBM TUNNEL WILL PASS BENEATH EBS, THE MONITORING OF THOSE EBS AND OTHER INSTRUMENTS IN THESE AREAS WILL BE CARRIED OUT ON 6 -HOURLY BASIS WHEN TBM CUTTER HEAD IS WITHIN 25 METRES OF THOSE EBS.

32. THE FREQUENCY OF MONITORING SHALL BE REVISED DEPENDING ON THE CONSTRUCTION ACTIVITY AND THE PACE OF WORK.
THE FOLLOWING GUIDELINES SHALL BE USED WHEN DECIDING ON THE FREQUENCY OF MONITORING:
   - MONITORING SHALL BE REPEATED ON THE SAME DAY IF READINGS WERE CONSIDERED INCONSISTENT BY THE RELEVANT AUTHORITY.
   - IF THE READINGS SHOW SIGNIFICANT CHANGE, THE FREQUENCY OF MONITORING SHALL BE INCREASED.
   - IF THERE IS AN UNDESIRABLE OCCURRENCE SUCH AS EXCESSIVE GROUND LOSS FOR BORED TUNNELS OR BASE HEAVE OR BASE BLOW OUT IS DETECTED. THE FREQUENCY OF MONITORING SHALL BE INCREASED.

33. IN NO CASE SHALL THE MONITORING BE STOPPED UNTIL AT LEAST 3 MONTHS AFTER THE WORKS HAVE BEEN COMPLETED OR TILL 3 CONSECUTIVE READING SHOW NO CHANGE WHICHEVER IS LONGER. DECISION OF ANY MONITORING SHALL BE AGREED WITH THE ENGINEER.

NATM TUNNEL:

34. 3D TARGETS, WITH THE HELP OF PRECISE TOTAL STATION (REF NOTE 14) AND OFFICE SOFTWARE, GIVES REALISTIC ASSESSMENT OF THE DISPLACEMENT BEHAVIOR IN 3D OF TUNNEL SURFACE.

35. MULTIPOINT BOREHOLE EXTENSOMETER SHALL BE USED, WHEN REQUIRED, FOR DETERMINATION OF GROUND MOVEMENTS OUTSIDE OF THE EXCAVATED STRUCTURE.

36. RADIAL PRESSURE CELLS SHALL BE USED FOR MEASURING THE DEVELOPMENT OF GROUND PRESSURE ACTING ON THE TUNNEL LINING. LARGE SIZE (300mmX300mm) PRESSURE CELL SHALL BE USED FOR BETTER RESULT. READING SHALL BE TAKEN IN A REMOTE CONTROLLED MANNER WITH ELECTRICAL TRANSDUCERS.

37. STRAIN METER SHALL BE USED FOR DETERMINATION OF THE STRESS DEVELOPMENT IN THE SPRAYED CONCRETE BY MEASURING STRAINS. THEY SHALL BE INSTALLED IN PAIRS TO ALLOW A DETERMINATION OF SECTIONAL FORCES SUCH AS NORMAL THRUST AND BENDING MOMENTS. STRAIN METERS SHALL BE TEMPERATURE COMPENSATED TO COMPENSATE FOR TEMPERATURE INCREASE OF THE SPRAYED CONCRETE DURING HARDENING PROCESS.

38. FREQUENCY OF MONITORING CAN BE ENVISAGED FOR EACH MONITORING SECTION AS FOLLOWS:
-1st WEEK: DAILY
-2nd WEEK: TWICE A WEEK
-3rd & 4th WEEK: ONCE PER WEEK
-LATER: MONTHLY AND BI-MONTHLY
-WHEN BENCH IS APPROACHING INSTRUMENTATION SECTION INSTALLED DURING TOP HEADING, READING FREQUENCIES SHALL BE INCREASED AGAIN
-ACTUAL FREQUENCY OF READING WILL HOWEVER BE INFLUENCED BY THE CONSTRUCTION STAGE, MONITORING RESULT MAY CHANGE DURING CONSTRUCTION ACCORDING TO OBSERVATION APPROACH.
-MONITORING FREQUENCY MAY INCREASE DEPENDING ON THE ACCESSIBILITY OF SITE.

39. DATA OF THE OPTICAL TARGETS DISPLACEMENT MONITORING SHALL BE PROCESSED ON THE SAME DAY AND PLOTS SHALL BE AVAILABLE AT LATE AFTERNOON FOR ASSESSMENT BY THE ENGINEER.

VIBRATION MONITORING:

MAXIMUM PERMISSIBLE PEAK PARTICLE VELOCITIES AT EXISTING BUILDING STRUCTURES		
S.NO	TYPES OF EBS	MAXIMUM ALLOWABLE PEAK PARTICLE VELOCITIES (IN MM/SEC) AT EBS
1	MOST STRUCTURES IN GOOD CONDITION (NEGLIGIBLE & VERY SLIGHT)	25
2	MOST STRUCTURES IN FAIR CONDITION OCCUPANTS (SLIGHT & MODERATE)	12
3	MOST STRUCTURES IN POOR CONDITION (SEVERE & VERY SEVERE)	5
4	WATER SUPPLY STRUCTURES	5
5	HERITAGE STRUCTURES/BRIDGE STRUCTURES	5

ABOVE LIMITS ARE MAXIMUM PERMISSIBLE, HOWEVER THIS MAY HAVE TO RESTRICTED FURTHER IF REQUIRED TO AVOID DAMAGE TO THE ADJACENT EBS OR CAUSING DISCOMFORT TO THE OCCUPANTS. ALONG THE PROPOSED ALIGNMENT, OTHER LIMITATIONS MAY BE IMPOSED AT ADJECENT EBS, SUCH AS HOSPITALS, SHCOOL BUILDINGS, TELEPHONE-EXCHANGE STRUCTURES, SPECIAL WATER-SUPPLY STRUCTURES AND HERITAGE STRUCTURES ETC. IN ADDITION, WORKING HOURS FOR SUCH EQUIPMENT CAUSING VIBRATIONS MAY HAVE TO RESTRICTED, KEEPING THE CONVENIENCE AND COMFORT OF THE OCCUPANTS IN MIND.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	SEPT 24	DRAFT SUBMISSION

CLIENT

GOVERNMENT OF KARNATAKA

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Bruhat Bangalore Mahanagara Palike

CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA
CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
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Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

DRAFT PROJECT REPORT

Designed:	SKC
Drawn:	ZHu
Checked:	PMu
Approved:	PSi

Scale :- AS SHOWN

Sheet size: A1

Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

Drawing Title: GENERAL NOTES-INSTRUMENTATION AND MONITORING

Drawing No.: RC/1640/HO/HBT/TU/DWG/ MON/GEN/801/R0

REVIEW LEVELS

THERE ARE THREE REVIEW LEVELS AS PER CONTRACT.

1. ALERT LEVEL
2. ACTION LEVEL
3. ALARM LEVEL

THE ALERT LEVEL IS A READING AT A PREDETERMINED LEVEL PRIOR TO THE ACTION LEVEL AND ALARM LEVEL. THE ALERT LEVEL IS 50% OF THE PREDICTED SERVICEABILITY VALUE DEFINED FOR MONITORED EBS / INSTRUMENT

THE ACTION LEVEL IS A READING AT A PREDETERMINED LEVEL AFTER THE ALERT LEVEL AND PRIOR TO ALARM LEVEL. THE ALARM LEVEL IS 80% OF THE PREDICTED SERVICEABILITY VALUE DEFINED FOR MONITORED EBS/ INSTRUMENT.

THE ALARM LEVEL WILL BE SET AT THE 100% OF THE PREDICTED SERVICEABILITY VALUE DEFINED FOR MONITORED EBS / INSTRUMENT.

CHANGES MAY BE PROPOSED TO THE INITIAL VALUES SELECTED BASED ON THE SITE CONDITIONS AND REQUIREMENTS. CHANGES TO ALERT AND ALARM LEVELS WILL BE JUSTIFIED ON THE BASIS OF OBSERVED PERFORMANCE AND WILL BE SUBMITTED FOR THE ACCEPTANCE OF THE EMPLOYER.

ON REACHING AN "ALERT LEVEL" AT ANY LOCATION, A REPORT WILL BE PREPARED AND SUBMITTED TO THE EMPLOYER, REVIEWING ALL TOTAL AND DIFFERENTIAL MOVEMENTS / DISTORTIONS TO DATE. ASSESSMENT OF THE EFFECTS OF THE MOVEMENTS / DISTORTIONS ON THE MONITORING ELEMENTS AND PREDICTING FURTHER MOVEMENTS AND THEIR EFFECT ON MONITORED ELEMENTS BASED ON THE TREND TO DATE.IF THE MOVEMENT TREND INDICATES THAT " ACTION LEVEL " MAY BE REACHED DURING THE COURSE OF THE WORKS, THE REMEDIAL MEASURES TO LIMIT FURTHER MOVEMENTS WILL BE PROPOSED.

ON REACHING AN "ACTION LEVEL " AT ANY LOCATION. AN UPDATED REPORT WILL BE PREPARED AND SUBMITTED TO THE EMPLOYER, REVIEWING THE MOVEMENTS INCLUDING DIFFERENTIAL MOVEMENT AND DISPERSIONS THE REPORT WILL ASSESS THE EFFECTS ON MONITORED ELEMENTS AND PREDICT FURTHER MOVEMENTS AND THEIR SUBSEQUENT EFFECT ON MONITORED ELEMENTS. THE REPORT WILL ALLOW FOR REMEDIAL WORKS THAT HAVE BEEN IMPLEMENTED AND SHOWN TO BE EFFECTIVE. IN ADDITION REVISED "ALERT LEVEL" AND "ACTION LEVEL " VALUES WHICH TAKE INTO ACCOUNT THE IMPLEMENTED REMEDIAL WORKS. THE REPORT DETAILING THE FULL HISTORY OF MOVEMENTS AND REMEDIAL MEASURES ADOPTED IN RELATION TO THE ACTUAL CONSTRUCTION SEQUENCE.

ON REACHING AN "ALARM LEVEL" ALL WORK WILL BE SUSPENDED WITHIN 30 METERS OF THE INSTRUMENT . A REPORT WILL BE PROVIDED TO THE EMPLOYER DETAILING THE FULL HISTORY OF MOVEMENTS AND AN INTERPRETATION OF EVENTS.

MONITORING DIFFERENTIAL SETTLEMENT FOR EBS AND TRIG ACTIONS ACCORDING TO FOLLOWING :-

ANGULAR DISTORTION	ACTION
1 IN 1000	ALERT
1 IN 625	ACTION
1 IN 500	ALARM WORK SUSPENSION AND REASSESSMENT

AAA LEVEL VALUE APPROVAL SHALL BE TAKEN FROM CONCERNED AUTHORITY WHEN CROSSING EXISTING INDIAN RAILWAY LINE OR METRO LINE

PROPOSED MONITORING FREQUENCY FOR DIFFERENT INSTRUMENTS

SL. NO.	TYPE OF INSTRUMENT	SYMBOL	15 DAYS PRIOR TO EXCAVATION	DURING EXCAVATION	COMPLETION OF PERMANENT WORKS	SHALL CONTINUE UNTIL ALL SETTLEMENTS HAS EFFECTIVELY STOPPED FOR A PERIOD OF THREE MONTHS
1	INCLINOMETER	I	WEEKLY	DAILY	WEEKLY	MONTHLY
2	STAND PIPE	SP	WEEKLY	DAILY	WEEKLY	MONTHLY
3	VIBRATING WIRE (VW) PIEZOMETER	SP_{VW}	WEEKLY	DAILY	WEEKLY	MONTHLY
4	SURFACE SETTLEMENT POINT		WEEKLY	DAILY	WEEKLY	MONTHLY
5	BUILDING SETTLEMENT POINT		WEEKLY	DAILY	WEEKLY	MONTHLY
6	3D OPTICAL TARGET	①	WEEKLY	DAILY	WEEKLY	MONTHLY
7	TILT PLATE/METER		WEEKLY	DAILY	WEEKLY	MONTHLY
8	CRACK METER		WEEKLY	DAILY	WEEKLY	MONTHLY
9	EXTENSOMETER MPBX-3POINT	E	WEEKLY (IF FROM OUTSIDE)	DAILY	WEEKLY	MONTHLY
10	LOAD CELL (STRUTS)	LC	WEEKLY	DAILY	WEEKLY	MONTHLY
11	LOAD CELL (ROCKBOLT/ANCHOR)		WEEKLY	DAILY	WEEKLY	MONTHLY
12	STRAIN GAUGE (STRUTS)	SG	-	DAILY	WEEKLY	MONTHLY
13	STRAIN GAUGE (SPRAYED CONCRETE)		-	DAILY	WEEKLY	MONTHLY
14	RADIAL PRESSURE CELL		-	DAILY	WEEKLY	MONTHLY
15	VIBRATION SENSOR	VM	-	DAILY	-	MONTHLY
16	HEAVE STAKE	S°	-	DAILY	WEEKLY	-

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Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

DRAFT PROJECT REPORT

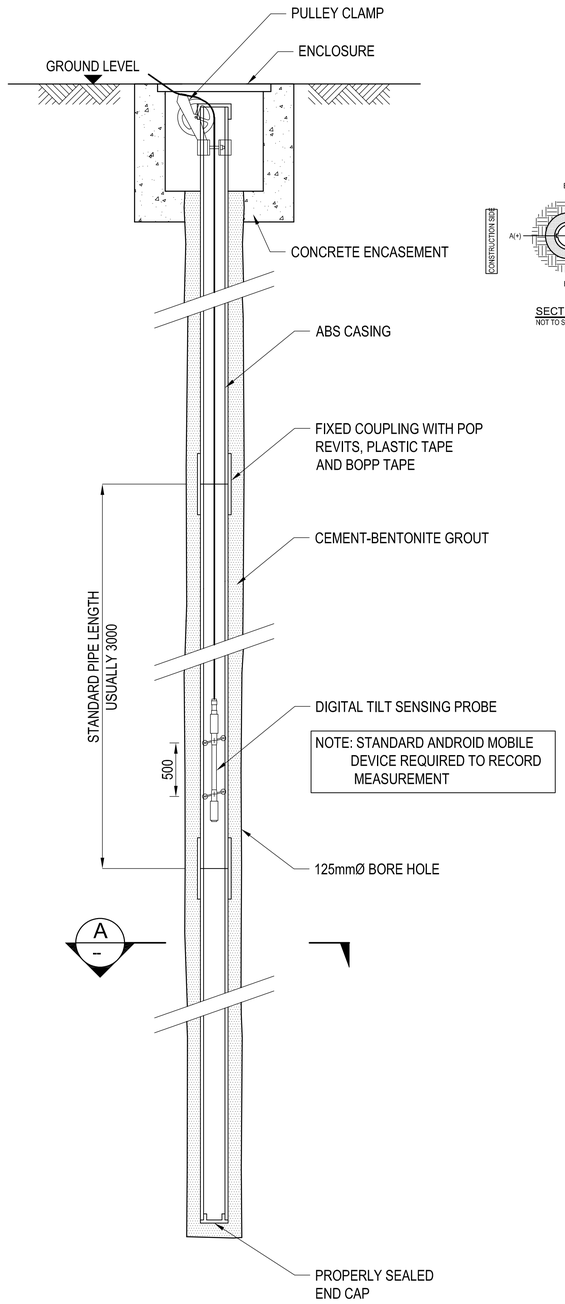
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Drawn:	ZHu		
Checked:	PMu		
Approved:	PSi	Sheet size: A1	

Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

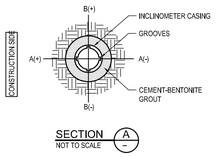
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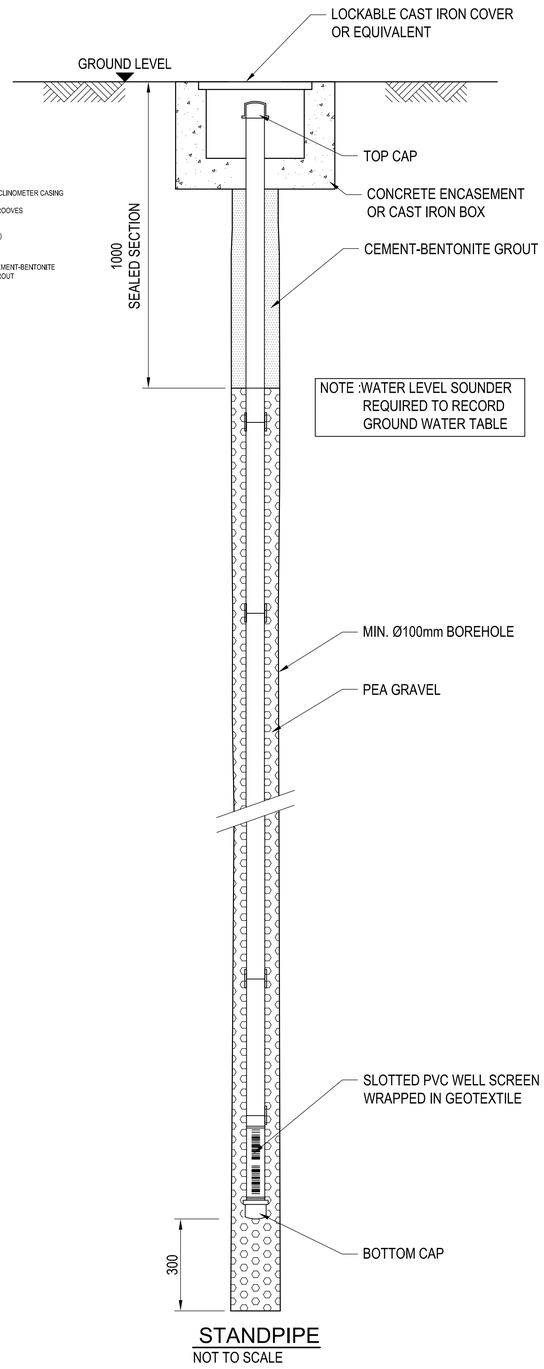
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Original Drawing Size A1

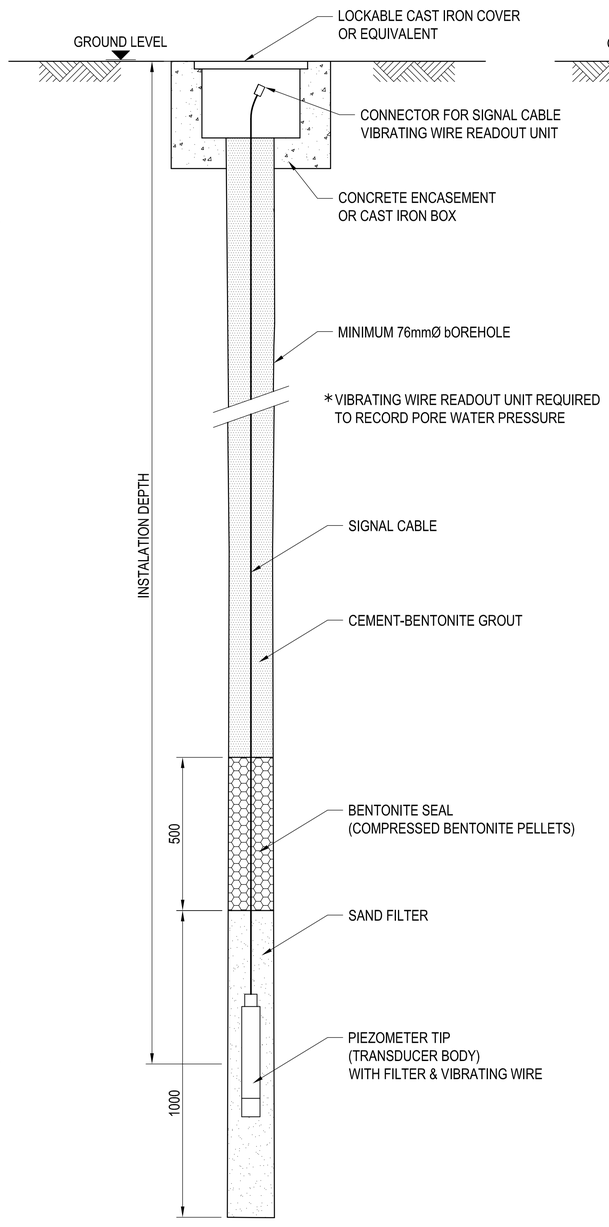


INCLINOMETER
NOT TO SCALE



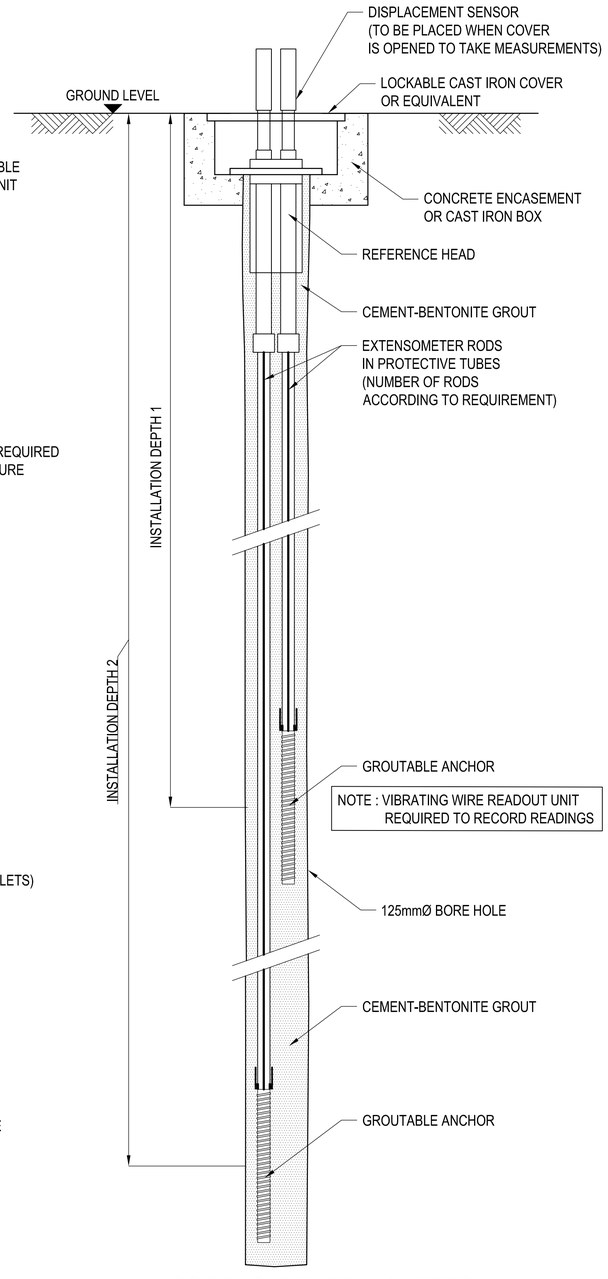


STANDPIPE
NOT TO SCALE



VIBRATING WIRE PIEZOMETER
NOT TO SCALE

SINGLE-LEVEL INSTALLATION
WITH SAND FILTER



BOREHOLE EXTENSOMETER
NOT TO SCALE

WITH GROUTABLE ANCHORS

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

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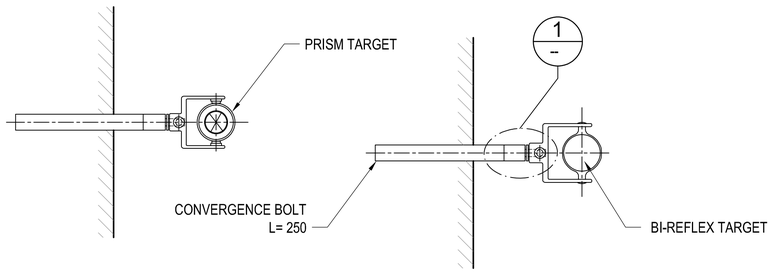
Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

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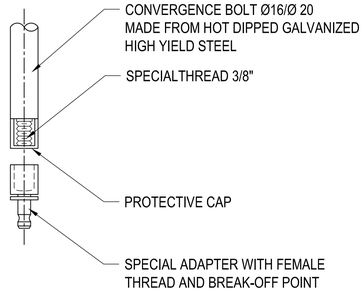
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Approved:	PSi	Sheet size:	A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	GENERAL -INSTRUMENTATION AND MONITORING - TYPICAL DETAILS
Drawing No.	RC/1640/HO/HBT/TU/DWG/MON/GEN/803/R0

Original Drawing Size A1

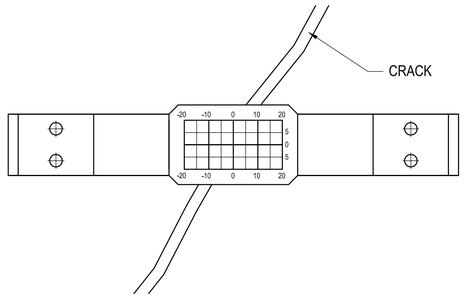


3D OPTICAL MONITORING
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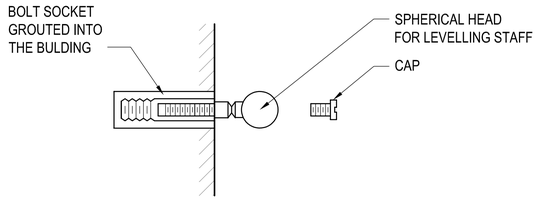


DETAIL 1
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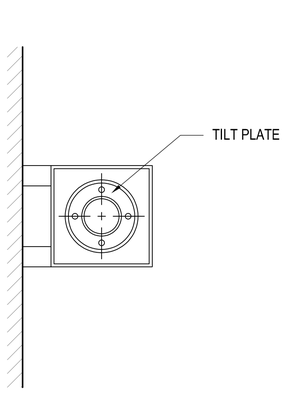
CONVERGENCE BOLT



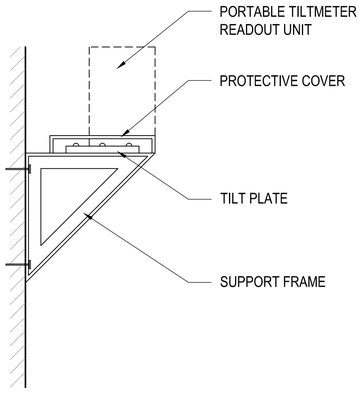
CRACK METER
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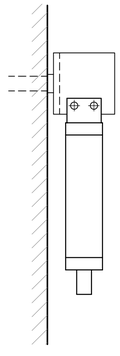
REMOVABLE MEASURING POINT
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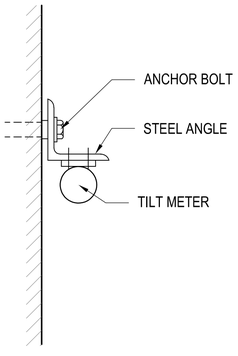
PLAN VIEW



SECTION



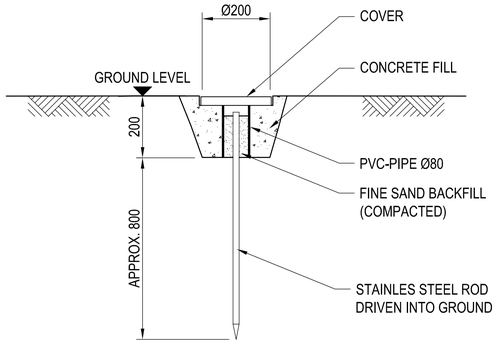
SIDE VIEW



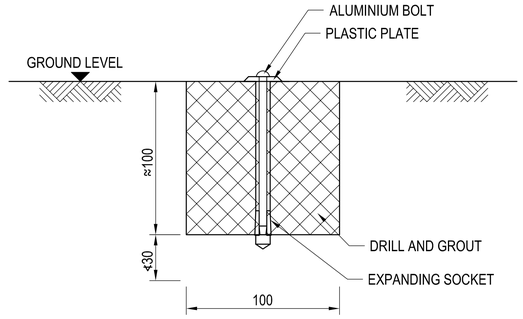
PLAN VIEW

ELECTRONIC TILTMETER
NOT TO SCALE

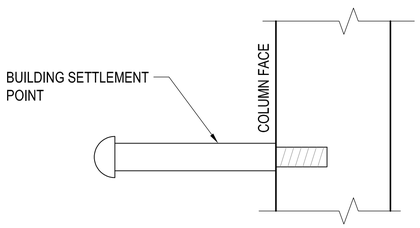
PORTABLE TILTMETER
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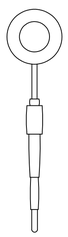
SURFACE SETTLEMENT MARKER
NOT TO SCALE
SHALLOW SUBSURFACE DATUM/SOIL SURFACE



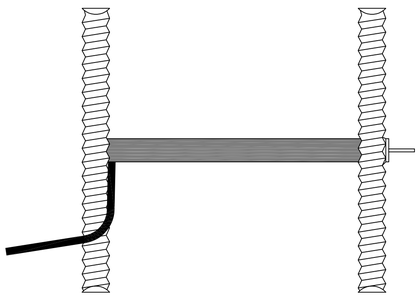
SURFACE SETTLEMENT MARKER
NOT TO SCALE
PAVED/CONCRETE SURFACE



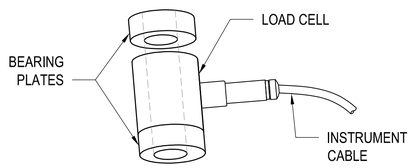
BUILDING SETTLEMENT POINT
NOT TO SCALE



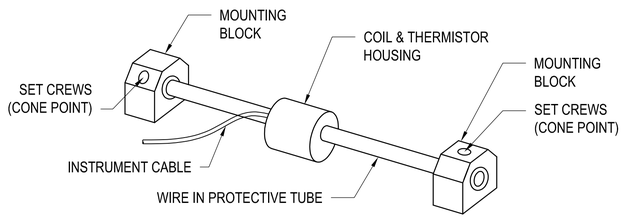
LOAD CELL
NOT TO SCALE



STRAIN GAUGE
NOT TO SCALE



CENTRE HOLE LOAD CELL
NOT TO SCALE



SPOT WELDABLE STRAIN GAUGE (VW) STRUTS
NOT TO SCALE

NOTES:

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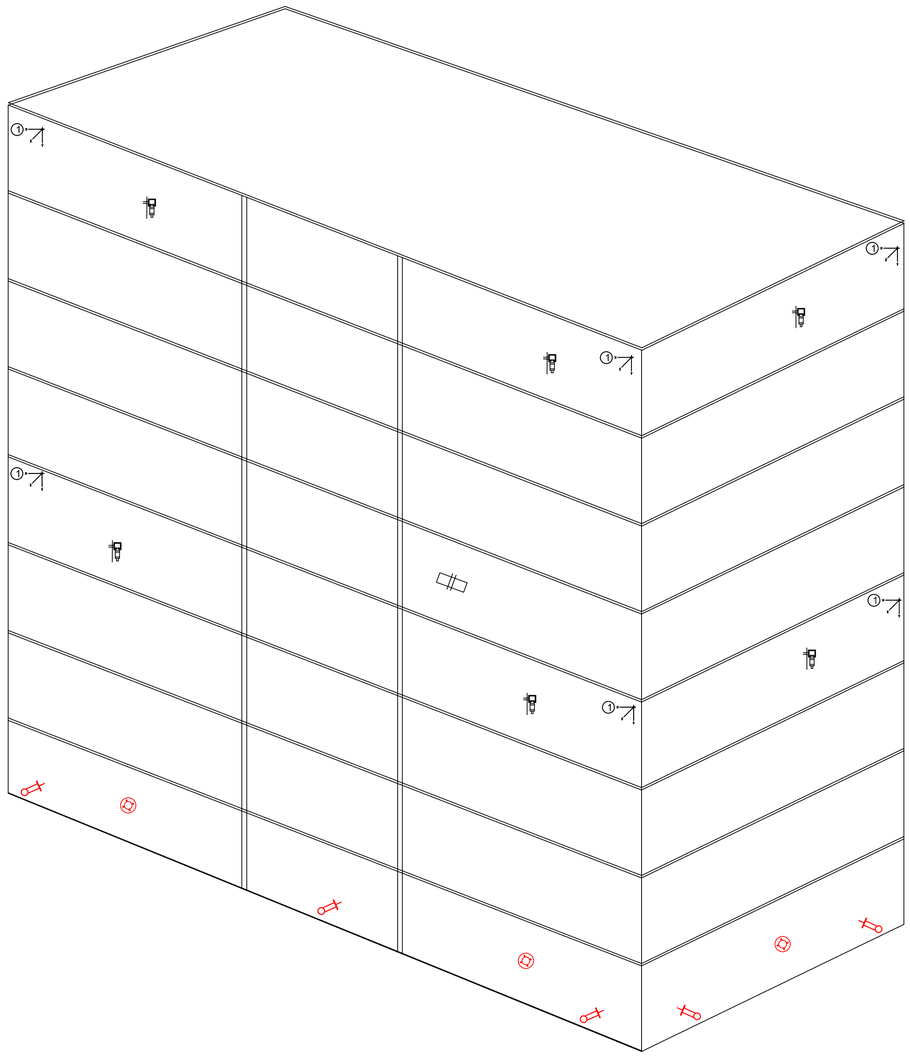
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Scale :- AS SHOWN

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Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	GENERAL -INSTRUMENTATION AND MONITORING - TYPICAL DETAILS
Drawing No.	RC/1640/HO/HBT/TU/DWG/MON/GEN/804/R0

Original Drawing Size A1



MINIMUM NUMBER OF MONITORING INSTRUMENTS FOR EBS (EXISTING BUILDINGS AND STRUCTURES)

MINIMUM NUMBERS OF INSTRUMENTS FOR EBS*						
STRUCTURE TYPE IDENTIFICATION	DESCRIPTION	BUILDING SETTLEMENT POINT	TILT PLATE / METER	CRACK METER	VIBRATION SENSOR	3D OPTICAL TARGET
S3	EBS IS IN POOR / FAIR CONDITION	8	4	AS REQ	AS REQUIRED	6
S4	EBS IS IN GOOD CONDITION	4	2	AS REQ		2

* THE NUMBERS OF INSTRUMENTS INDICATED ON THE ABOVE TABLE IS ONLY INDICATIVE AND THE ACTUAL NUMBER OF INSTRUMENTS SHOULD BE DECIDED BASED ON THE SIZE AND CONDITION OF THE BUILDINGS PRIOR TO EXCAVATION WORK.

LEGEND:

SYMBOL	DESCRIPTION / INSTRUMENTS TYPE
	BUILDING SETTLEMENT POINT
	TILT-PLATES
	TILT METERS
	3D OPTICAL TARGET
	CRACK METER

NOTES:

1. BUILDING FOOTPRINT SHOWN IN THE DRAWING IS TENTATIVE ONLY AND SHALL NOT BE MEASURED. ACTUAL DIMENSION SHALL BE AS PER SITE ASSESMENT.
2. THE TOTAL NO. OF CRACK METERS TO BE INSTALLED AND ITS LOCATION SHALL BE DECIDED AT SITE.
3. BUILDING SETTLEMENT POINT, 3D OPTICAL TARGET AND TILT PLATE/METER ARE TO BE INSTALLED INTO BUILDING STRUCTURAL ELEMENTS.
4. POSITION OF 3D OPTICAL TARGET CAN BE ADJUSTED ACCORDING TO THE PREFERRED LOCATION OF TOTAL STATION.
5. EBS / UTILITY INSTRUMENTS CAN BE INCREASED AS PER MONITORING RESULTS / TREND, AS REQUIRED.

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	SEPT 24	DRAFT SUBMISSION

CLIENT

GOVERNMENT OF KARNATAKA

GOVERNMENT OF KARANATAKA
Bruhat Bangalore Mahanagara Palike

CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA
CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

DRAFT PROJECT REPORT

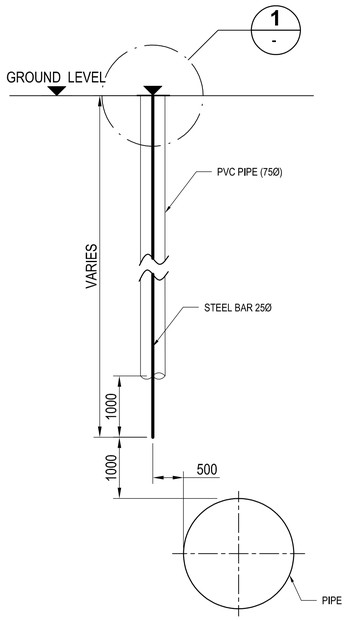
Designed:	SKC
Drawn:	ZHu
Checked:	PMu
Approved:	PSi

Scale :- AS SHOWN

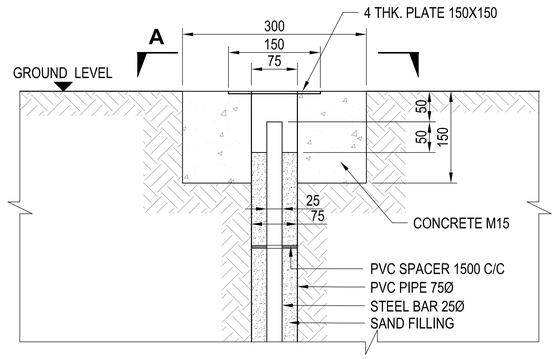
Sheet size: A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	GENERAL -INSTRUMENTATION AND MONITORING - TYPICAL EBS INSTRUMENTATION
Drawing No.	RC/1640/HO/HBT/TU/DWG/ MON/GEN/805/R0

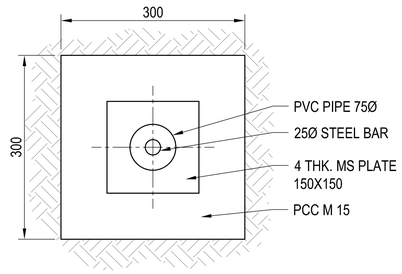
Original Drawing Size A1



TYPICAL SECTIONAL VIEW
SCALE N.T.S.



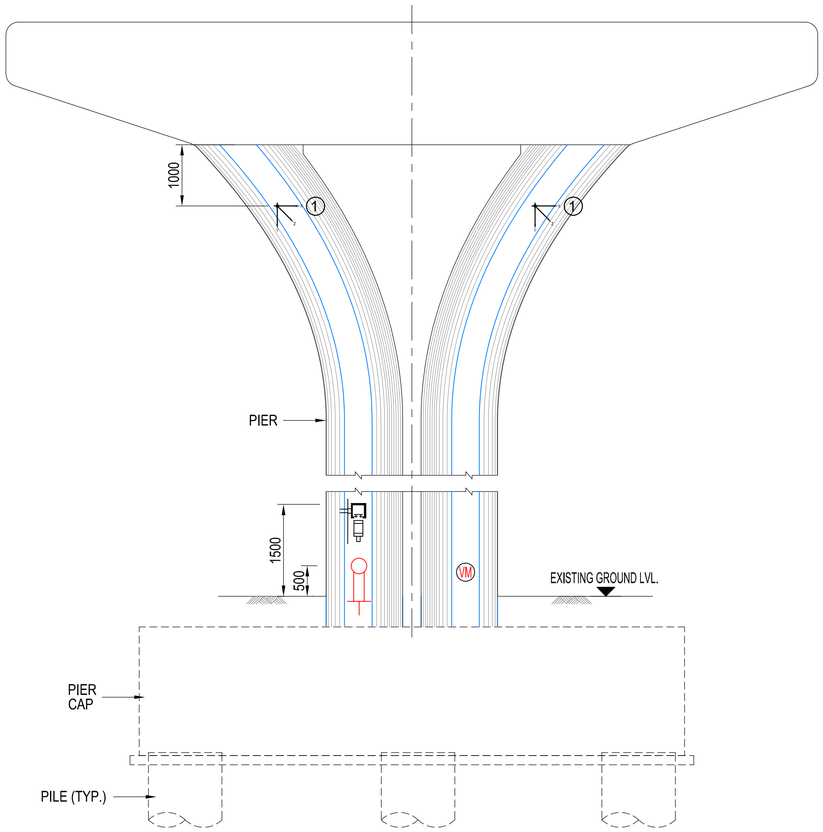
DETAIL 1 / -
SCALE 1:5



VIEW A / -
SCALE 1:5

INSTALLATION SEQUENCE OF UTILITY SETTLEMENT MARKER

1. MARK THE LOCATION AND DEPTH OF UTLITY.
2. DRILL 75Ø BORE HOLES AT MONITORING LOCATION. INSTATLL PVC PIPE CASING.
3. INSTALL 25Ø STEEL BAR DRIVEN 1.00m BELOW THE DRILL HOLE AND USING PVC SPACER @ 1.5m OR LESS BAR TOP SHALL BE ABOUT 50mm BELOW THE SURFACE.
4. BACKFILL THE PIPE WITH SAND.
5. INSTALL PCC BLOCK OF 300mmX300mmX150mm AT TOP.
6. INSTALL 4mm THICK PLATE FOR COVER AROUND THE CASING PIPE.



TYPICAL ARRANGEMENT
SCALE N.T.S

LEGEND:	
SYMBOL	DESCRIPTION / INSTRUMENTS TYPE
	BUILDING SETTLEMENT POINT
	TILT METERS
VM	VIBRATION METER
1	3D OPTICAL TARGET

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS UNTIL SPECIFIED.
2. SEWER LINE UTILITY SETTLEMENT MARKER TO BE INSTALLED CLOSED TO MANHOLE COVER.
3. UTILITY SETTLEMENT MARKER AS SHOWN IN THE DRAWING CAN BE SHIFTED ALONG THE UTILITY TO MATCH WITH SITE CONDITION.
4. EBS / UTILITY INSTRUMENTS CAN BE INCREASED AS PER MONITORING RESULTS / TREND, AS REQUIRED.

SCALE 1 : 5
100mm 0 500mm

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	SEPT 24	DRAFT SUBMISSION

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GOVERNMENT OF KARNATAKA
GOVERNMENT OF KARANATAKA
Bruhat Bangalore Mahanagara Palike

CONSULTANT:
RODIC CONSULTANTS PVT. LTD.
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Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

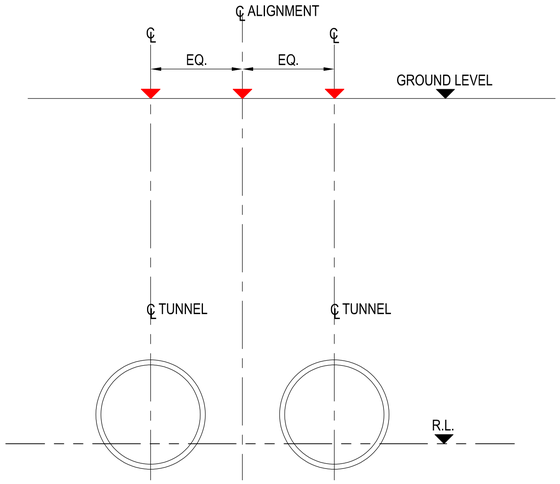
DRAFT PROJECT REPORT

Designed:	SKC
Drawn:	ZHu
Checked:	PMu
Approved:	PSi

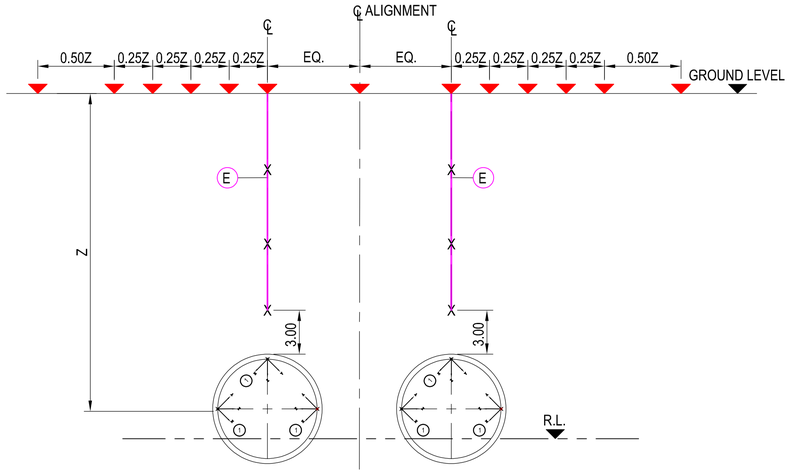
Scale :- AS SHOWN
Sheet size: A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	GENERAL -INSTRUMENTATION AND MONITORING - TYPICAL ARRANGEMENT OF UTILITY AND PIER
Drawing No.	RC/1640/HO/HBT/TU/DWG/ MON/GEN/806/R0

Original Drawing Size A1



MONITORING ARRAY FOR TUNNEL: TYPE - D
SCALE N.T.S



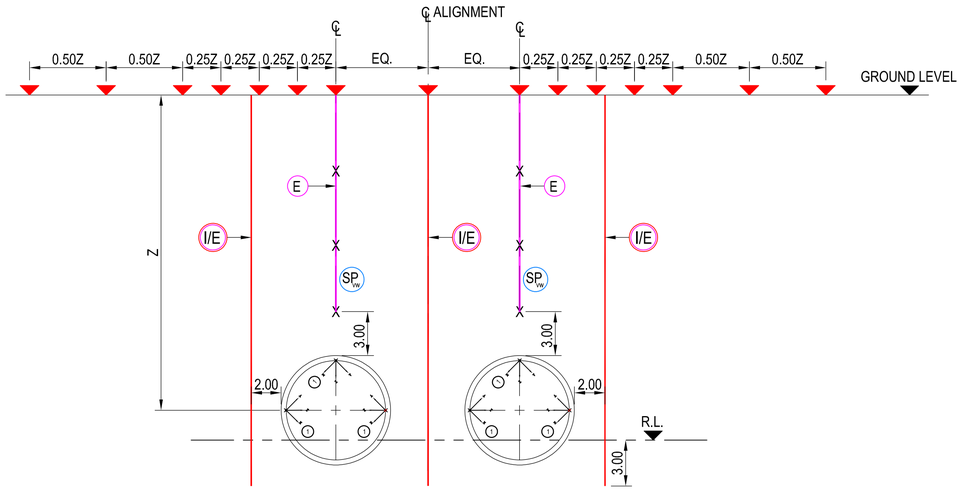
MONITORING ARRAY FOR TUNNEL: TYPE - E
SCALE N.T.S

LEGEND:		
SL.	TYPE OF INSTRUMENT	SYMBOL
1.	DEPTH TO TUNNEL CENTRE AXIS	Z
2.	SURFACE SETTLEMENT POINT	
3.	3D OPTICAL TARGET	
4.	INCLINOMETER / EXTENSOMETER	I/E
5.	EXTENSOMETER MPBX-3POINT	E
6.	VIBRATING WIRE (VW) PIEZOMETER	SP VW

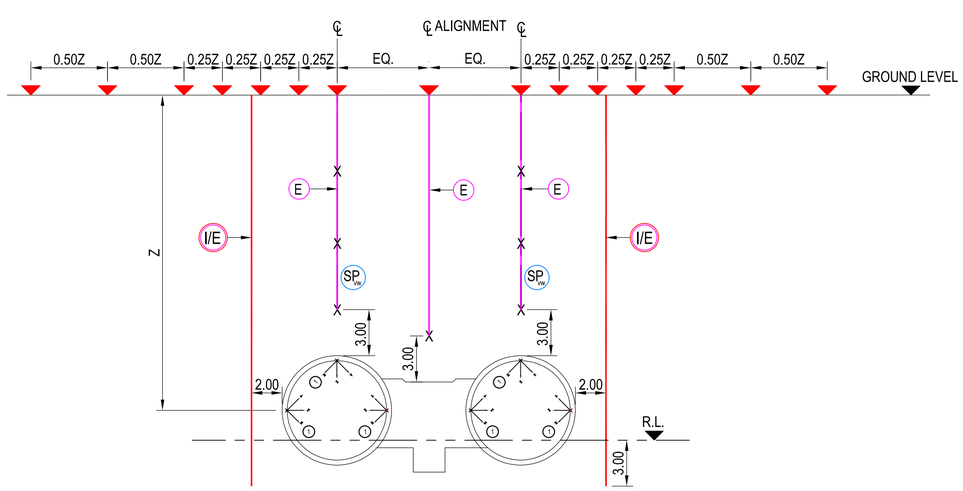
MONITORING AND INSTRUMENTATION SCHEME AT TBM TUNNEL AND CROSS PASSAGES- MINIMUM REQUIREMENT

NOTE:

1. ALL DIMENSIONS ARE IN METRES; UNLESS NOTED OTHERWISE.
2. BORE HOLE FOR EXTENSOMETER SHOULD BE TERMINATED ABOUT 3m ABOVE THE TUNNEL CROWN.
3. `D' ARRAY FOR EVERY 25m.
4. `E' ARRAY FOR EVERY 250m.
5. `F' ARRAY FOR EVERY 1000m.
6. ARRAY `G' CORRESPOND TO CROSS PASSAGE MONITORING.
7. ACTUAL REQUIREMENT OF CERTAIN INSTRUMENTS SUCH AS PEIZOMETER, INCLINOMETER / EXTENSOMETER AND MPBX EXTENSOMETER WILL BE ESTABLISHED DURING INITIAL STAGES OF CONSTRUCTION ACTIVITY.



MONITORING ARRAY FOR TUNNEL: TYPE - F
SCALE N.T.S



MONITORING ARRAY FOR CROSS PASSAGE: TYPE-G
SCALE N.T.S

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	SEPT 24	DRAFT SUBMISSION

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CONSULTANT:

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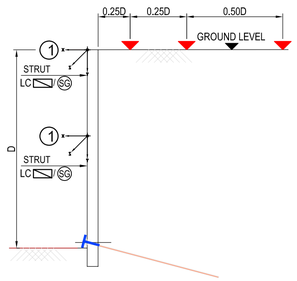
Fluidyn India
#15, 4th Floor, Outer Ring Road JP Nagar 6th Phase Bengaluru, Karnataka 560078 India

DRAFT PROJECT REPORT

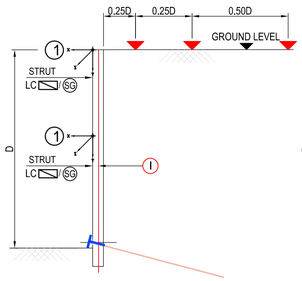
Designed:	SKC	Scale :-	AS SHOWN
Drawn:	ZHu		
Checked:	PMu		
Approved:	PSi	Sheet size:	A1

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	GENERAL -INSTRUMENTATION AND MONITORING - SECTIONS
Drawing No.	RC/1640/HO/HBT/TU/DWG/ MON/GEN/807/R0

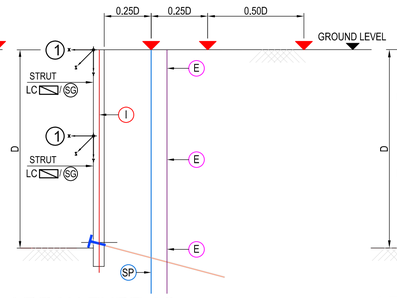
Original Drawing Size A1



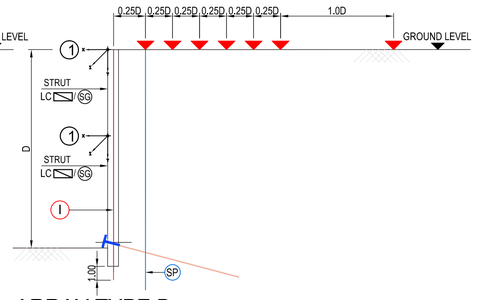
ARRAY TYPE A



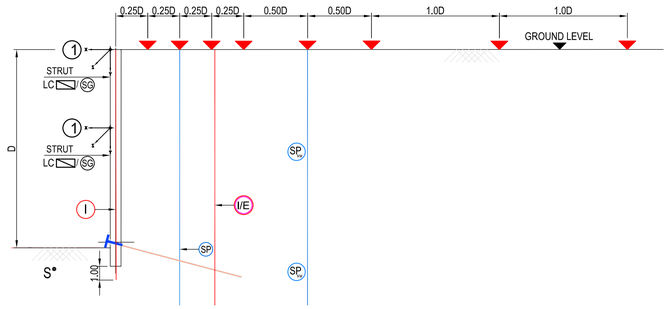
ARRAY TYPE A1



ARRAY TYPE A2



ARRAY TYPE B

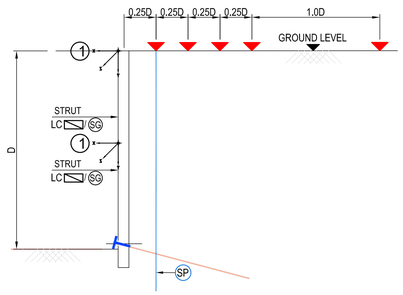


ARRAY TYPE C

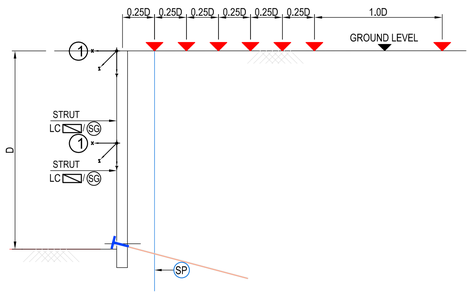
MONITORING & INSTRUMENTATION SCHEME AT CUT AND COVER SECTION - MINIMUM REQUIREMENT (FOR SECANT PILE WALL / DIAPHRAGM WALL)

NOTE:

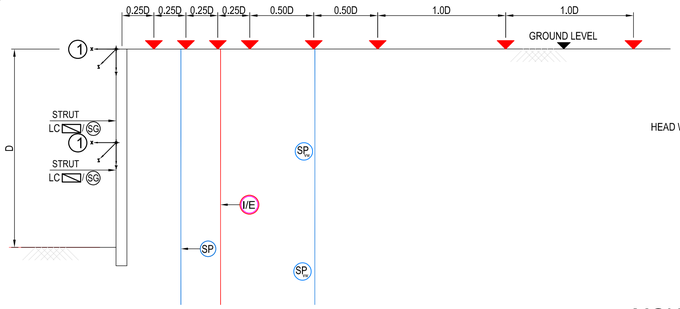
1. ONE OF EACH ARRAY TYPE A OR A1 OR A2 SHALL BE SPACED EVERY 25m OF PERIMETER WALL OF CUT AND COVER SECTION.
2. AN AVERAGE OF ONE TYPE B ARRAY FOR EVERY 100m PERIMETER WALL OF CUT AND COVER SECTION.
3. AN AVERAGE OF ONE TYPE C ARRAY FOR EVERY 300m PERIMETER WALL OF CUT AND COVER SECTION.
4. TYPE 'B' AND TYPE 'C' ARRAY SHALL BE ADOPTED IN AREAS OF PERICULAR CONCERN CONSIDERING NATURE AND SEQUENCE OF CONSTRUCTION AND ADJACENT EBS.
5. STRAIN GAUGE /LOAD CELL FOR STRUS AND LOAD CELL FOR ROCK BOLT/ANCHOR, AS APPLICABLE, ACCORDING TO CONSTRUCTION METHODOLOGY.



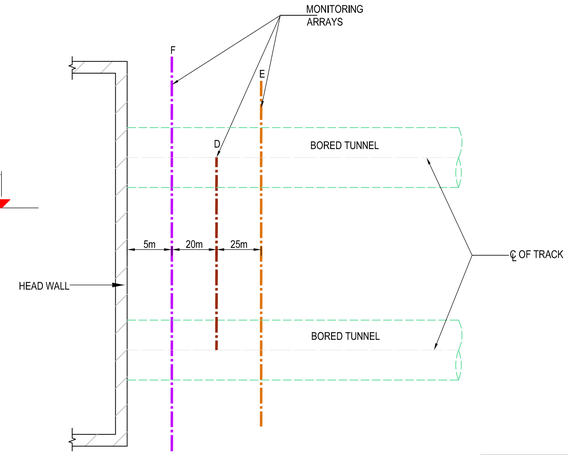
ARRAY TYPE A'



ARRAY TYPE B'



ARRAY TYPE C'

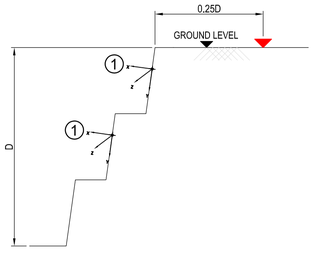


MONITORING ZONE AT EACH TBM LAUNCH SHAFT / HEAD WALL
(REFER DRAWING NO. MON/GEN/807 FOR ARRAY TYPES D, E AND F)

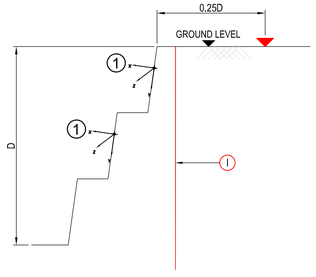
MONITORING & INSTRUMENTATION SCHEME AT CUT AND COVER SECTION - MINIMUM REQUIREMENT (FOR SOLDIER PILE)

NOTE:

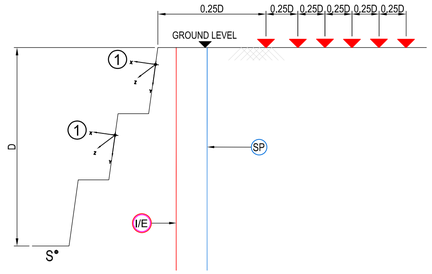
1. ONE OF EACH ARRAY TYPE A' SHALL BE SPACED EVERY 25m OF PERIMETER WALL OF CUT AND COVER SECTION.
2. AN AVERAGE OF ONE TYPE B' ARRAY FOR EVERY 100m PERIMETER WALL OF CUT AND COVER SECTION.
3. AN AVERAGE OF ONE TYPE C' ARRAY FOR EVERY 300m PERIMETER WALL OF CUT AND COVER SECTION.
4. TYPE B' AND TYPE C' ARRAY SHALL BE ADOPTED IN AREAS OF PERICULAR CONCERN CONSIDERING NATURE AND SEQUENCE OF CONSTRUCTION AND ADJACENT EBS.
5. STRAIN GAUGE /LOAD CELL FOR STRUS AND LOAD CELL FOR ROCK BOLT/ANCHOR, AS APPLICABLE, ACCORDING TO CONSTRUCTION METHODOLOGY.



ARRAY TYPE A"



ARRAY TYPE B"



ARRAY TYPE C"

NOTES:

1. ALL DIMENSION ARE IN MILLIMETER; UNLESS OTHERWISE SPECIFIED.
2. OPTICAL TARGET AT TOP OF THE DIAPHRAGM WALL / SECANT PILE / SOLDIER PILE IS PROVIDED FOR REFERENCE POINT READING TO BASE LEVEL EXCAVATION FOR DEFORMATION MONITORING PURPOSE

MONITORING & INSTRUMENTATION SCHEME AT SLOPE - MINIMUM REQUIREMENT

NOTE:

1. ONE OF EACH ARRAY TYPE A" SHALL BE SPACED EVERY 25m OF PERIMETER WALL OF SLOPE.
2. AN AVERAGE OF ONE TYPE B" ARRAY FOR EVERY 100 PERIMETER WALL OF SLOPE.
3. AN AVERAGE OF ONE TYPE C" ARRAY FOR EVERY 300m PERIMETER WALL OF SLOPE.
4. TYPE B" AND TYPE C" ARRAY SHALL BE ADOPTED IN AREAS OF PERICULAR CONCERN CONSIDERING NATURE AND SEQUENCE OF CONSTRUCTION AND ADJACENT EBS.
5. MONITORING OF INSTRUMENTS TO BE DONE WHERE EXCAVATION DEPTH OF SLOPE IS 4m OR DEEPER FROM COMMENCING LEVEL.

LEGEND:

SL.	TYPE OF INSTRUMENT	SYMBOL
1.	DEPTH OF EXCAVATION	D
2.	SURFACE SETTLEMENT POINT	× ▼
3.	3D OPTICAL TARGET	①
4.	INCLINOMETER / EXTENSOMETER	I/E
5.	EXTENSOMETER MPBX-3POINT	E
6.	VIBRATING WIRE (VW) PIEZOMETRE	SP_{VW}
7.	LOAD CELL (STRUTS)	LC
8.	STRAIN GAUGE (STRUTS)	SG
9.	HEAVE STAKE	S°
10.	STAND PIPE	SP
11.	INCLINOMETER	I
12.	LOAD CELL (ROCK BOLT/ANCHOR)	⊣

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	SEPT 24	DRAFT SUBMISSION

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DRAFT PROJECT REPORT

Designed:	SKC
Drawn:	ZHu
Checked:	PMu
Approved:	PSi

Scale :- AS SHOWN

Sheet size: A1

Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

Drawing Title: RAMP AND CUT AND COVER -INSTRUMENTATION AND MONITORING - ARRAYS

Drawing No.: RC/1640/HO/HBT/TU/DWG/ MON/GEN/808/R0

Appendix-B-IV

MECHANICAL ELECTRICAL & PLUMBING ENGINEERING

Original Drawing Size A1

ELECTRICAL & MECHANICAL DRAWINGS

S.Nr.	DRAWING NUMBER	REV.	DRAWING NAME
1		A	COVER PAGE__00
2	BBMP-EM-000	A	DRAWINGS LIST ELECTRICAL & MECHANICALWORKS
3	BBMP-EM-001	A	BBMP-ALIGNMENT LAYOUT WITH S/Sn
4	BBMP-EM-002	A	MAIN ELECTRICAL SCHEMATIC
5	BBMP-EM-003	A	ELECTRICAL SCHEMATIC FOR SUB-STATION-1,2,7,& 8 (1695m.)
6	BBMP-EM-004	A	ELECTRICAL SCHEMATIC FOR SUB-STATION-3,4,5,& 6 (1895m.)
7	BBMP-EM-005	A	ELECTRICAL SCHEMATIC FOR SUB-STATION- 9,& 10
8	BBMP-EM-006	A	ELECTRICAL SCHEMATIC FOR SUB-STATION-11,13, & 15 (PG.EXIT, RG.EXIT-1,RC EXIT-2)(1600m.)
9	BBMP-EM-007	A	ELECTRICAL SCHEMATIC FOR SUB-STATION-14 (RC ENTRY)
10	BBMP-EM-008	A	ELECTRICAL SCHEMATIC FOR SUB-STATION-16 (LB ENTRY & LB EXIT)(2196m.)
11	BBMP-EM-009	A	ELECTRICAL SCHEMATIC FOR SUB-STATION-12 (PG ENTRY) (1085m.)
12	BBMP-EM-010	B	MAIN TUNNEL LAYOUT OF 11/.433KV. SUB-STATION
13	BBMP-EM-011	A	MAIN TUNNEL LAYOUT OF 11/.433KV. NITCH SUB-STATION
14	BBMP-EM-012	A	33KV.SUB-STATION BUILDING VENTILATION SUB-STATION LAYOUT- 1,2,3,4 & 5
15	BBMP-EM-013	A	DG. BUILDING TYPE-1 & 2 VENTILATION SUB-STATION LAYOUT- 1,2,3,4 & 5
16	BBMP-EM-014	A	MAIN TUNNEL LIGHTING LAYOUT (Sheet-1/2)
17	BBMP-EM-015	A	TUNNEL AUTOMATION SYSTEM SCADA, SYSTEM ARCHITECTURE
18	BBMP-EM-016	A	MAIN TUNNEL GENERAL SCHEMATIC DIAGRAM FOR CCTV. SURVEILLIANCE SYSTEM
19	BBMP-EM-017	A	TYPICAL IP TELEPHONE,SOS & PUBLIC ADDRESS SYSTEM
20	BBMP-EM-018	A	TYPICAL CROSS SETION (Sheet-1/4)
21	BBMP-EM-019	A	SOS STATIONS EQUIPMENT (Sheet-1/2)
22	BBMP-EM-020	A	MAIN TUNNEL SIGNAGE LOCATION (Sheet-1/2)
23	BBMP-EM-021	A	MAIN TUNNEL CCTV. LOCATION (Sheet-1/2)
24	BBMP-EM-022	A	MAIN TUNNEL P.A.SPEAKER LOCATION (Sheet-1/2)

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	03.01.25	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	03.01.25	03.01.25	03.01.25
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

Document Originators (First Issue)

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Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

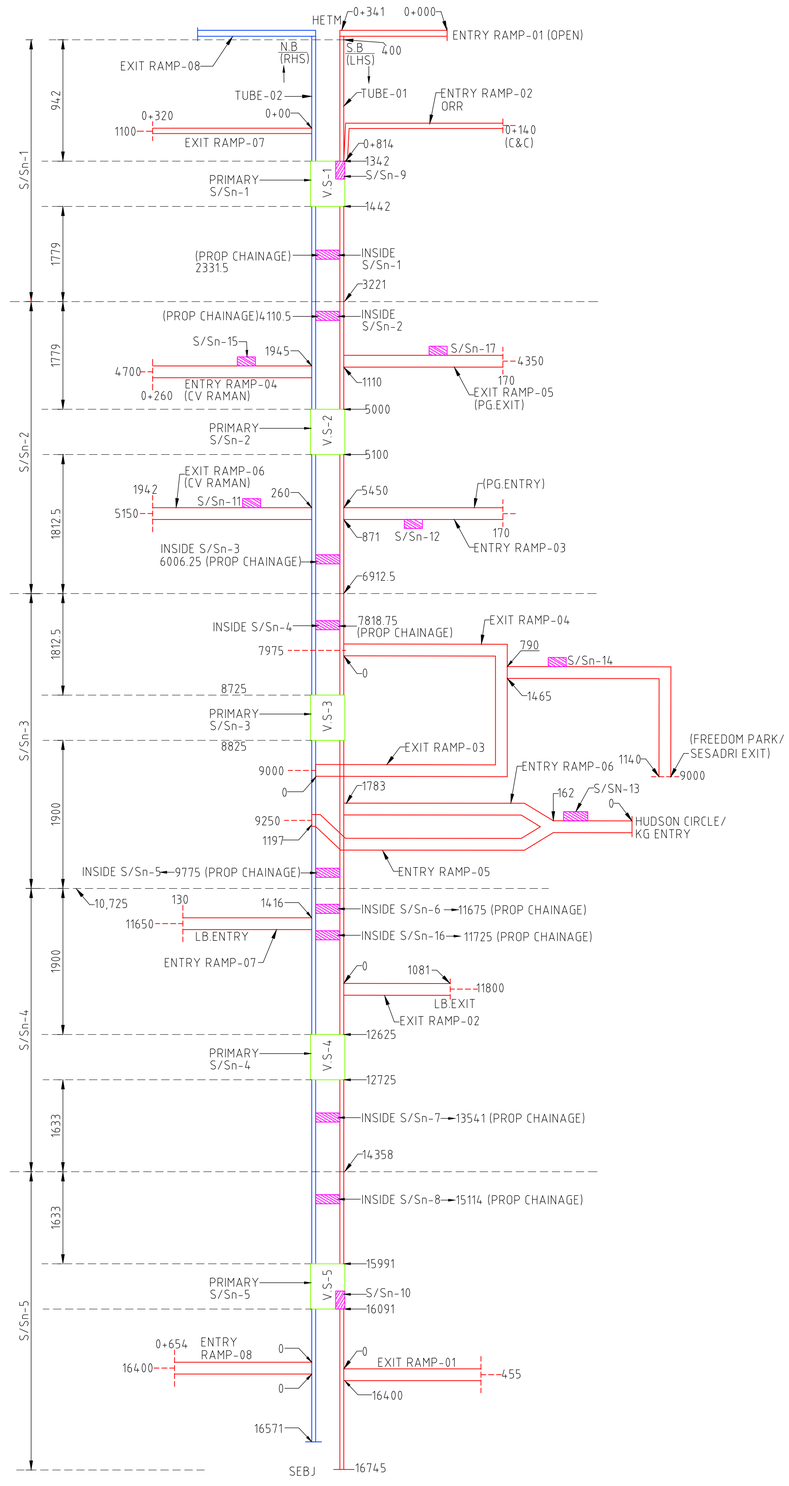
CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: DRAWINGS LIST ELECTRICAL & MECHANICAL WORKS

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-000	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN-2025	DPR

Original Drawing Size A1



FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	23.09.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	23.09.24	23.09.24	23.09.24
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

Document Originators (First Issue)

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6, SAROJINI HOUSE, Agha Khan Hall (1st Floor)
Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

CLIENT

Bruhat Bengaluru Mahanagra Palike

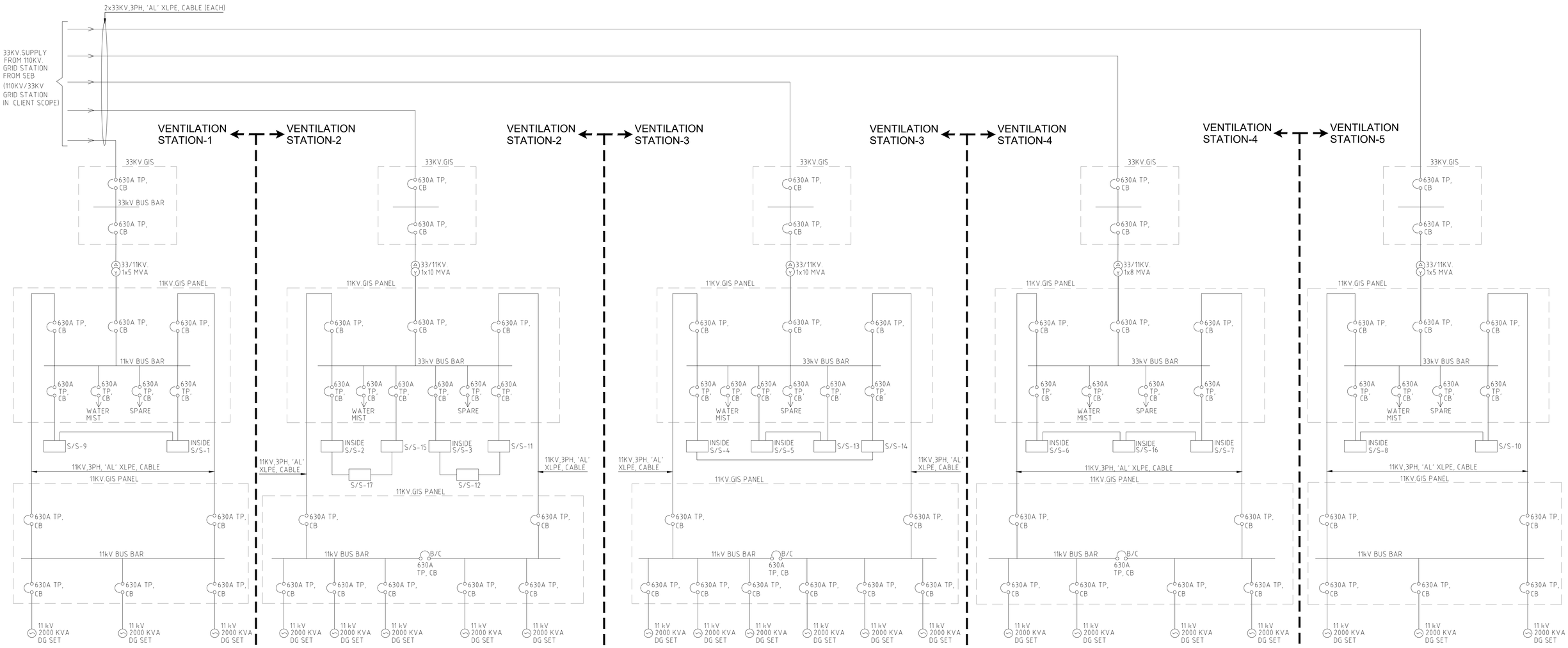
DRAWING TITLE

BBMP-ALIGNMENT LAYOUT WITH S/Sn

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-001	A

SCALE	DATE (Initial issue)	STATUS
N.T.S	16.01.25	DPR

Original Drawing Size A1



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REFERENCE DRAWINGS

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REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	20.09.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	20.09.24	20.09.24	20.09.24
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CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE

MAIN ELECTRICAL SCHEMATIC

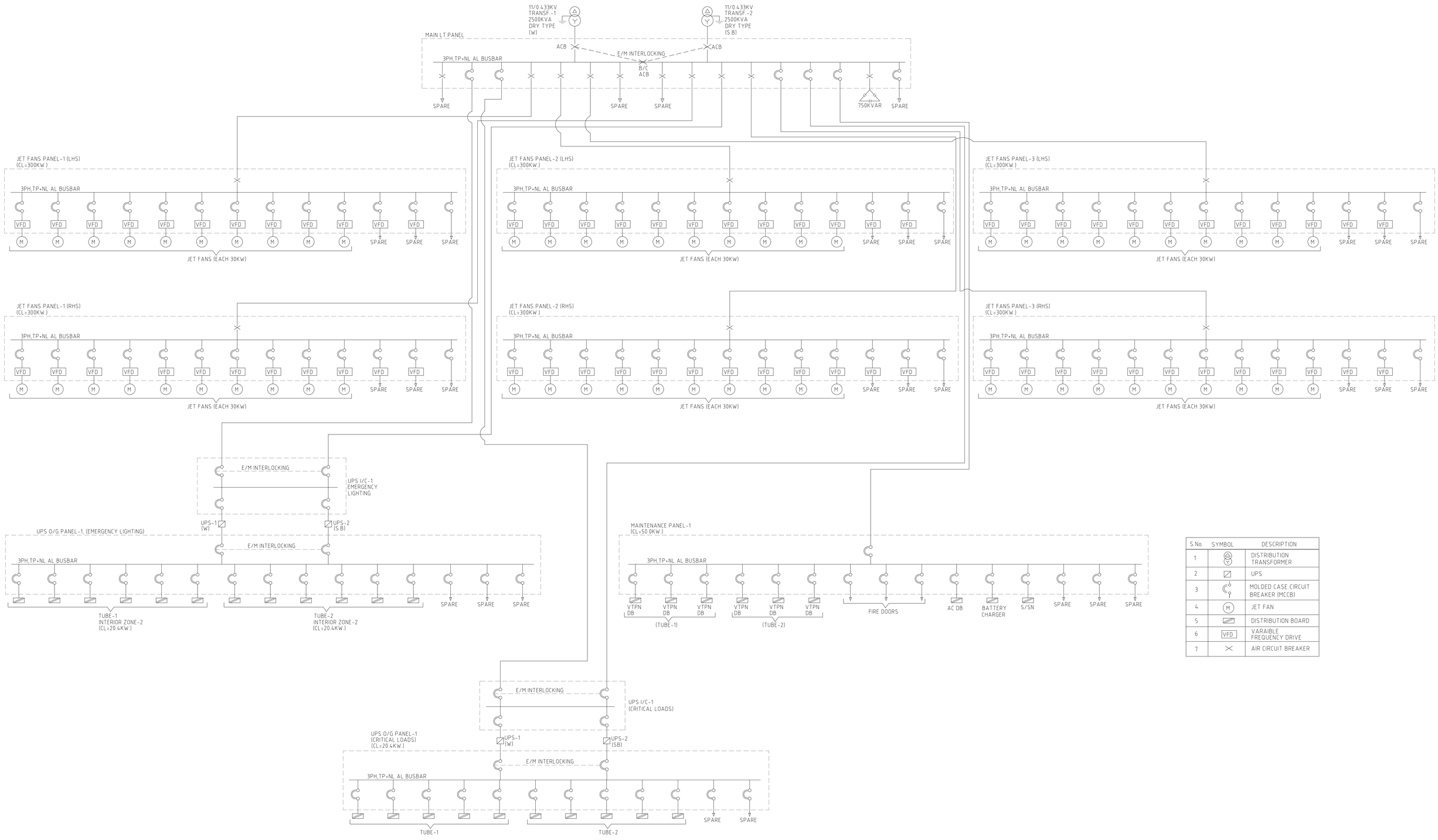
PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

PROJECT ID :	DRAWING NUMBER	REV
140172	BBMP-EM-002	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN, 2025	DPR

Original Drawing Size A1



S.No.	SYMBOL	DESCRIPTION
1		DISTRIBUTION TRANSFORMER
2		UPS
3		MOLDED CASE CIRCUIT BREAKER (MCCB)
4	M	JET FAN
5		DISTRIBUTION BOARD
6	VFD	VARAIBLE FREQUENCY DRIVE
7		AIR CIRCUIT BREAKER

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	18.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	18.10.24	18.10.24	18.10.24
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

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Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

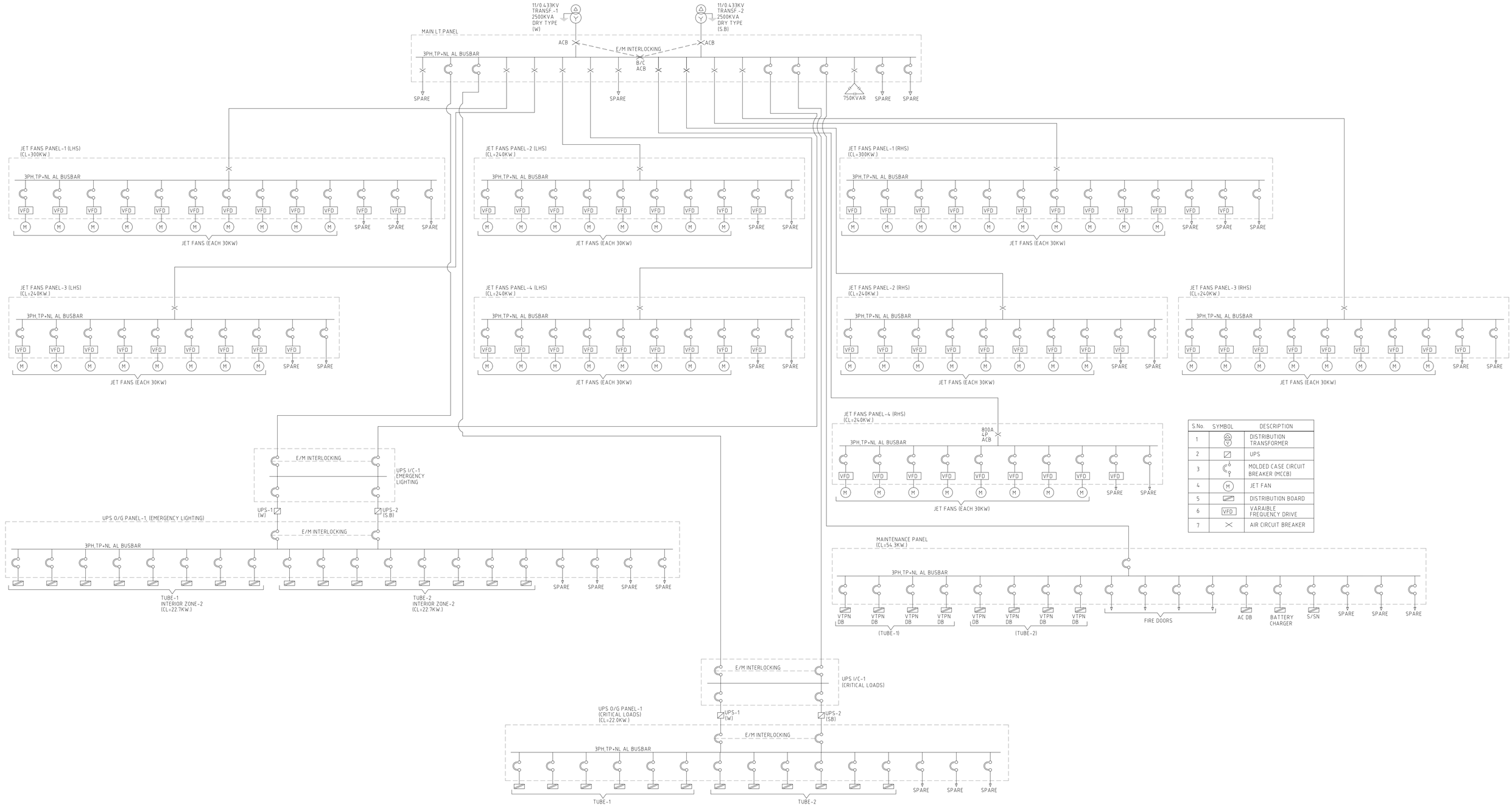
CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: ELECTRICAL SCHEMATIC FOR SUB-STATION-1,2,7 & 8 (1779m.)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-003	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN, 2025	DPR

Original Drawing Size A1



S.No.	SYMBOL	DESCRIPTION
1		DISTRIBUTION TRANSFORMER
2		UPS
3		MOLDED CASE CIRCUIT BREAKER (MCCB)
4	M	JET FAN
5		DISTRIBUTION BOARD
6	VFD	VARAIBLE FREQUENCY DRIVE
7		AIR CIRCUIT BREAKER

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	18.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	18.10.24	18.10.24	18.10.24
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PROJECT TITLE

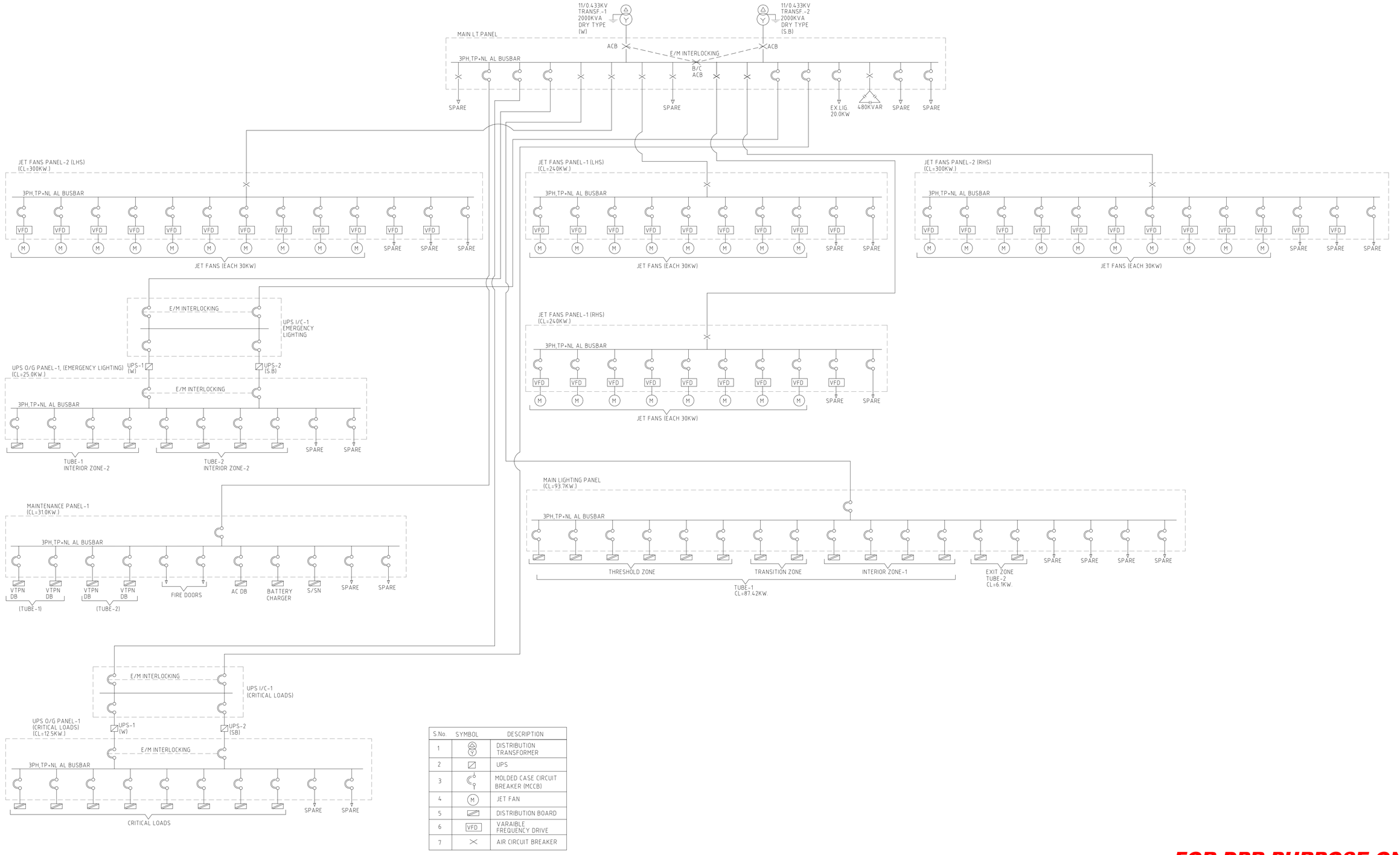
CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: ELECTRICAL SCHEMATIC FOR SUB-STATION-3,4,5 & 6 (1900m.)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-004	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN, 2025	DPR



S.No.	SYMBOL	DESCRIPTION
1		DISTRIBUTION TRANSFORMER
2		UPS
3		MOLDED CASE CIRCUIT BREAKER (MCCB)
4	M	JET FAN
5		DISTRIBUTION BOARD
6	VFD	VARAIBLE FREQUENCY DRIVE
7		AIR CIRCUIT BREAKER

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

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REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	18.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

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Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

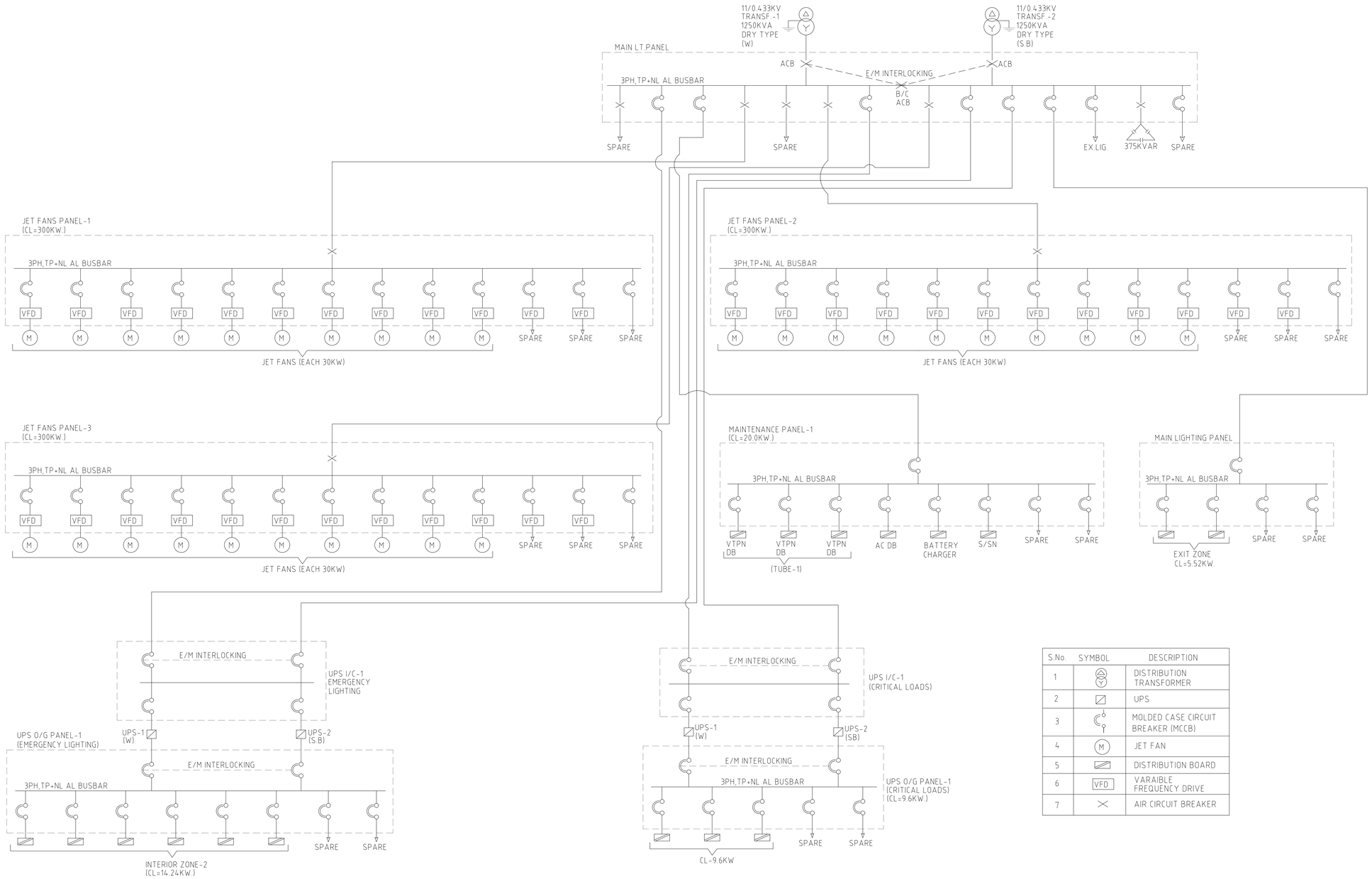
CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: ELECTRICAL SCHEMATIC FOR SUB-STATION-9 & 10

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-005	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN, 2025	DPR

Original Drawing Size A1



S.No.	SYMBOL	DESCRIPTION
1		DISTRIBUTION TRANSFORMER
2		UPS
3		MOLDED CASE CIRCUIT BREAKER (MCCB)
4	M	JET FAN
5		DISTRIBUTION BOARD
6	VFD	VARAIBLE FREQUENCY DRIVE
7		AIR CIRCUIT BREAKER

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	18.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	18.10.24	18.10.24	18.10.24
Name	MKa	MKr	ANa
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Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

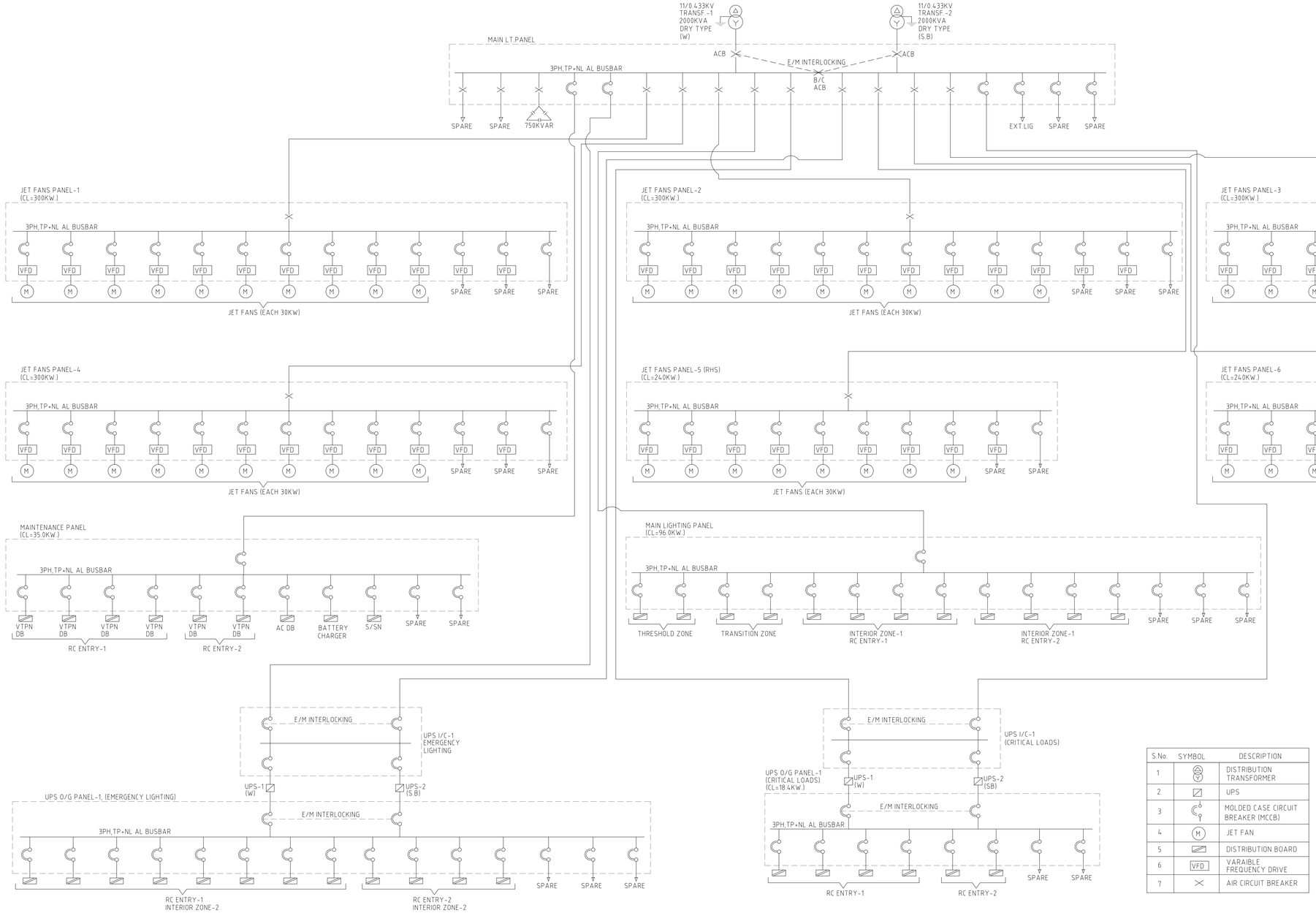
CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: ELECTRICAL SCHEMATIC FOR SUB-STATION-11&15 (1685M)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-006	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN-2025	DPR

Original Drawing Size A1



S.No.	SYMBOL	DESCRIPTION
1		DISTRIBUTION TRANSFORMER
2		UPS
3		MOLDED CASE CIRCUIT BREAKER (MCCB)
4	M	JET FAN
5		DISTRIBUTION BOARD
6	VFD	VARAIBLE FREQUENCY DRIVE
7		AIR CIRCUIT BREAKER

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	18.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	18.10.24	18.10.24	18.10.24
Name	MKa	MKr	ANa
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Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

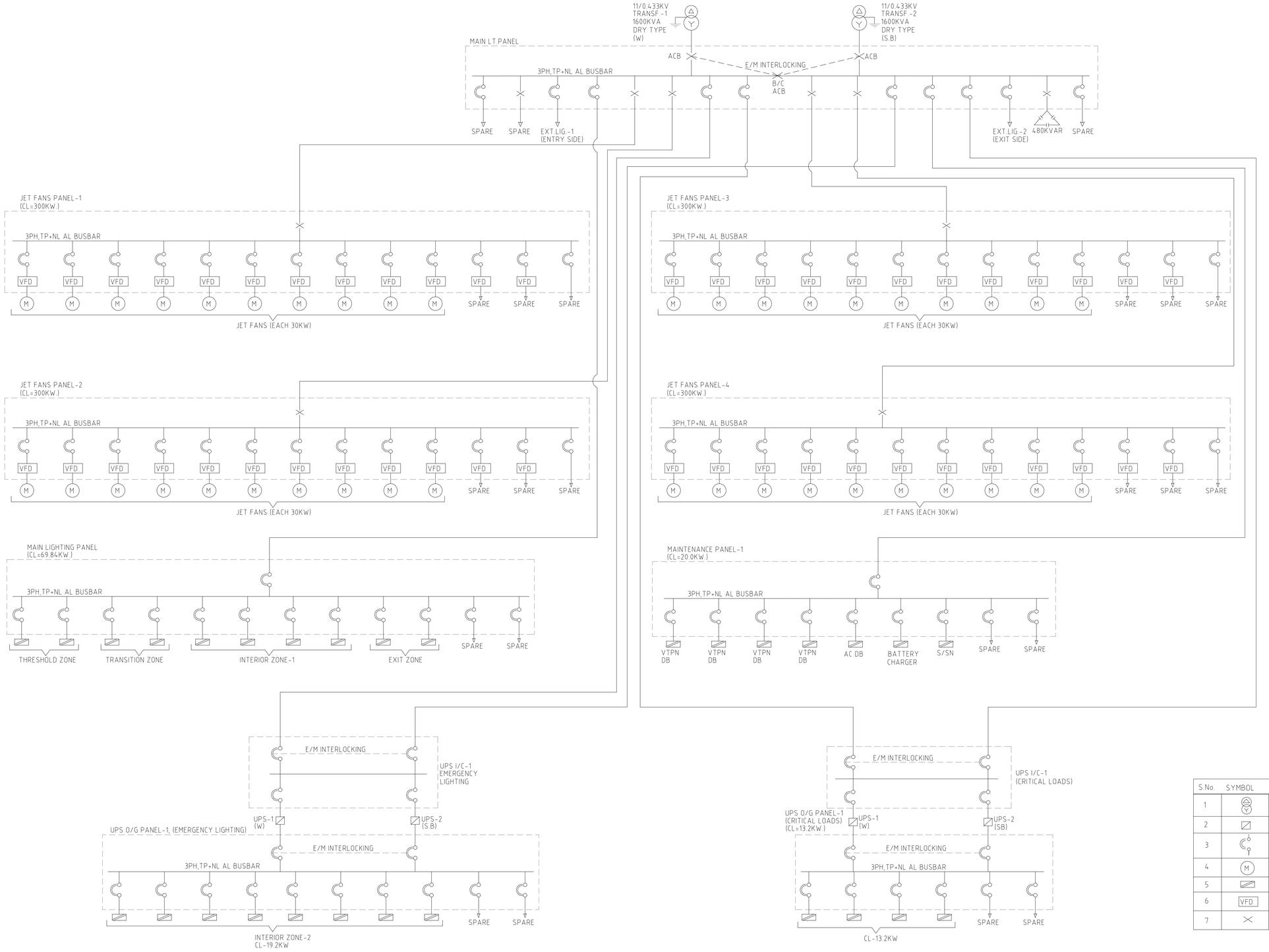
CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: ELECTRICAL SCHEMATIC FOR SUB-STATION-13 & 14 (FREEDOM PARK & HUDSON CIRCLE)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-007	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN, 2025	DPR

Original Drawing Size A1



S.No.	SYMBOL	DESCRIPTION
1		DISTRIBUTION TRANSFORMER
2		UPS
3		MOLDED CASE CIRCUIT BREAKER (MCCB)
4	M	JET FAN
5		DISTRIBUTION BOARD
6	VFD	VARAIBLE FREQUENCY DRIVE
7		AIR CIRCUIT BREAKER

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	18.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	18.10.24	18.10.24	18.10.24
Name	MKa	MKr	ANa
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Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

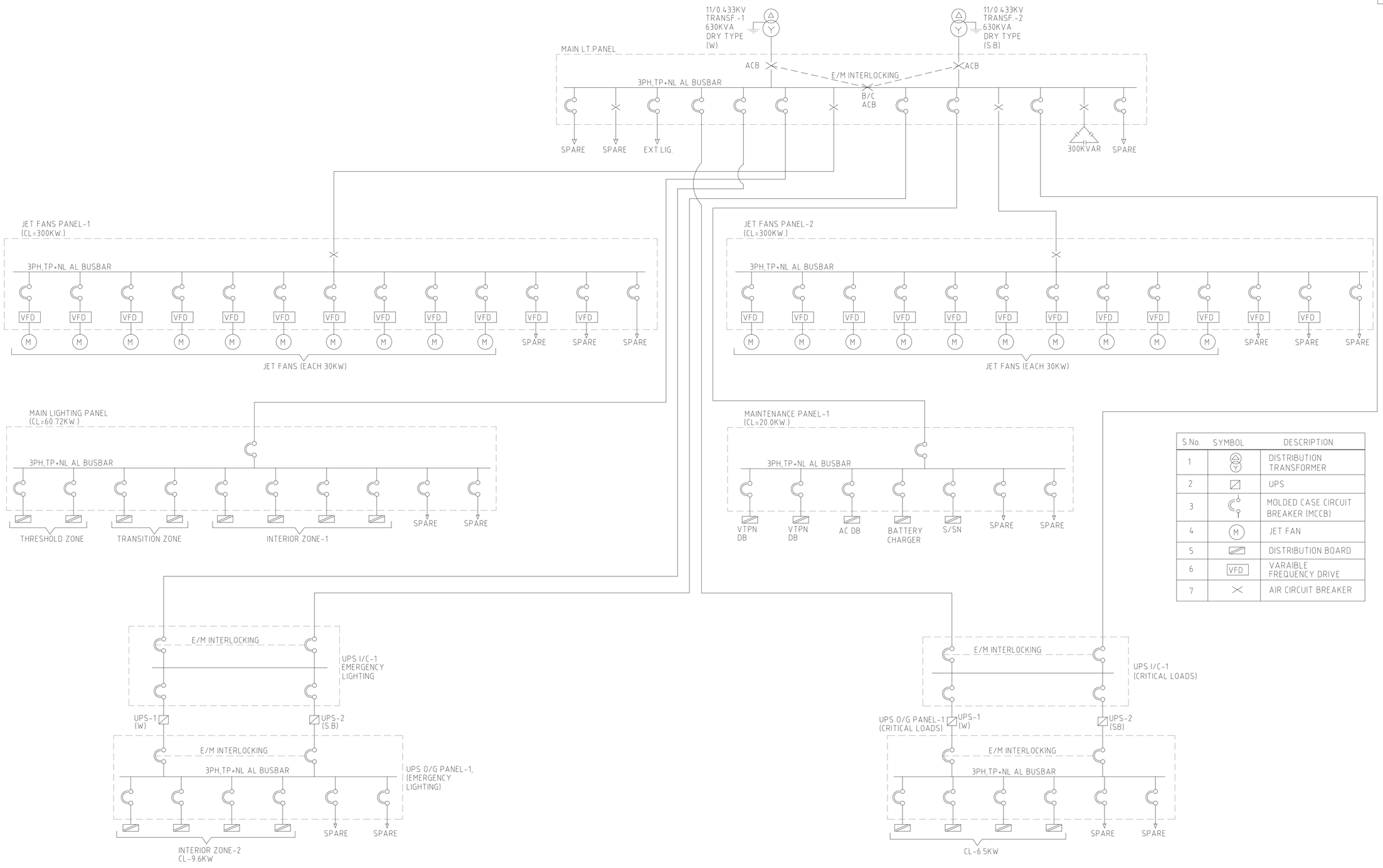
CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: ELECTRICAL SCHEMATIC FOR SUB-STATION-16 (LB ENTRY & LB EXIT)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-008	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN-2025	DPR

Original Drawing Size A1



S.No.	SYMBOL	DESCRIPTION
1		DISTRIBUTION TRANSFORMER
2		UPS
3		MOLDED CASE CIRCUIT BREAKER (MCCB)
4	M	JET FAN
5		DISTRIBUTION BOARD
6	VFD	VARAIBLE FREQUENCY DRIVE
7		AIR CIRCUIT BREAKER

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	16.01.25	REVISED DRAWING	MKa	MKr	ANa
0	18.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	18.10.24	18.10.24	18.10.24
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

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Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

CLIENT

Bruhat Bengaluru Mahanagra Palike

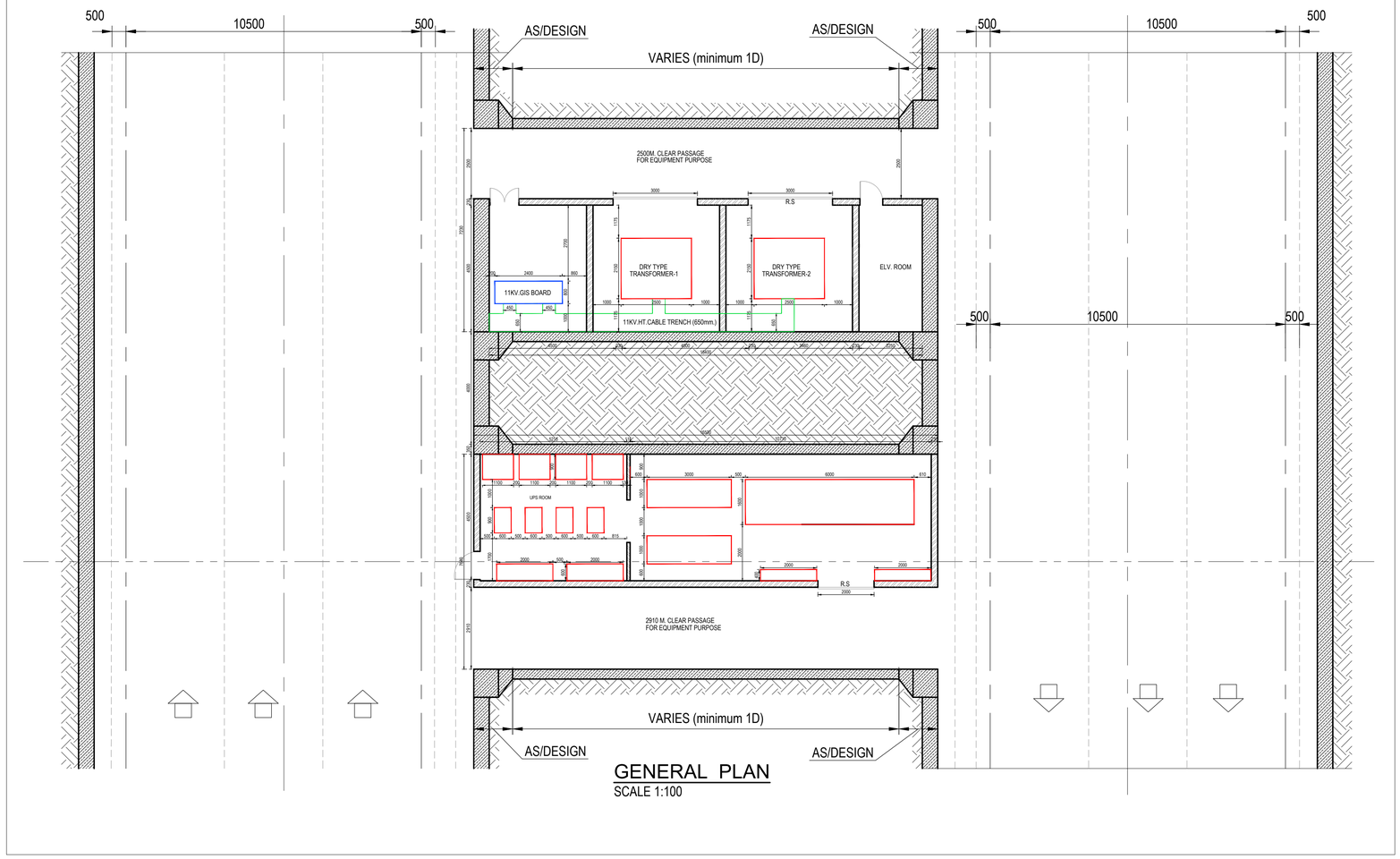
DRAWING TITLE

ELECTRICAL SCHEMATIC FOR SUB-STATION-12 &17 (940M.)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-009	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN-2025	DPR

Original Drawing Size A1



GENERAL PLAN

SCALE 1:100

SCALE 1 : 100

5m 0 5m 10m

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REFERENCE DRAWINGS

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REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
B	24.12.24	CROSS PASSAGE WIDTH INCREASE	MKa	MKr	ANa
A	20.11.24	FIRST SUBMISSION	MKa	MKr	ANa

QUALITY ASSURANCE

	Drawn	Designed	Approved
Date	20.11.24	20.11.24	20.11.24
Name	MKa	MKr	ANa

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INDIA
www.geoconsult.co.in

DPR CONSULTANT :

Rodic Consultant Pvt. Ltd.
6, SAROJINI HOUSE, Agha Khan Hall (1st Floor)
Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

CLIENT

Bruhat Bengaluru Mahanagra Palike

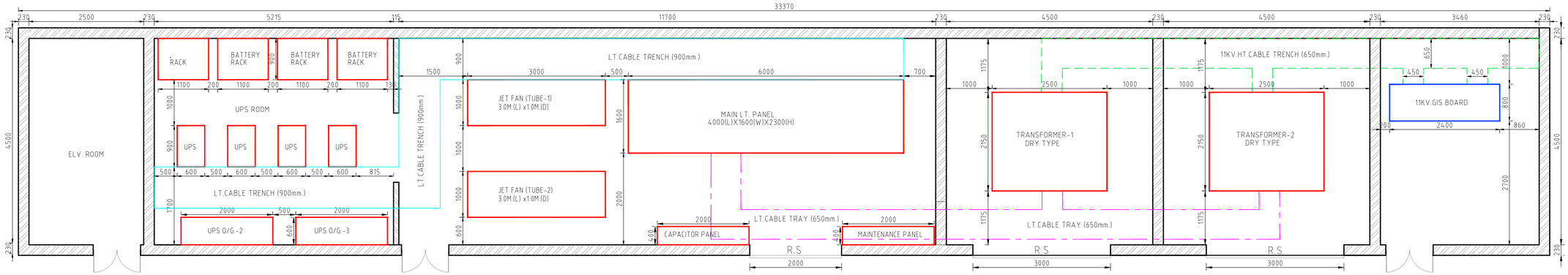
DRAWING TITLE

MAIN TUNNEL
LAYOUT OF 11/433KV.
SUB-STATION

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-010	B

SCALE	DATE (Initial issue)	STATUS
1:100	DEC. 2024	DPR

Original Drawing Size A1



SCALE 1 : 40

2m 1m 0 1m 2m 4m

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REFERENCE DRAWINGS

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REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	24.12.24	FIRST SUBMISSION	MKa	MKr	ANa

QUALITY ASSURANCE

Date	24.12.24	24.12.24	24.12.24
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CLIENT

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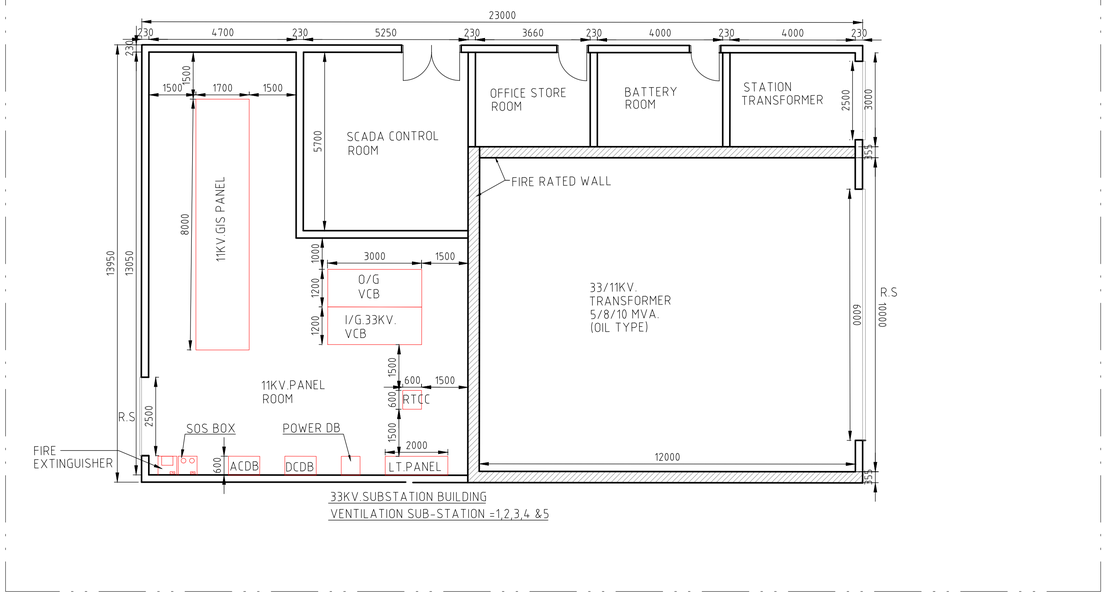
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MAIN TUNNEL
LAYOUT OF 11/.433KV.
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PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-011	A

SCALE	DATE (Initial issue)	STATUS
1:40	DEC. 2024	DPR

Original Drawing Size A1



SCALE 1 : 100

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CLIENT

Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE

33KV.SUB-STATION BUILDING VENTILATION SUB-STATION LAYOUT -1,2,3,4 & 5

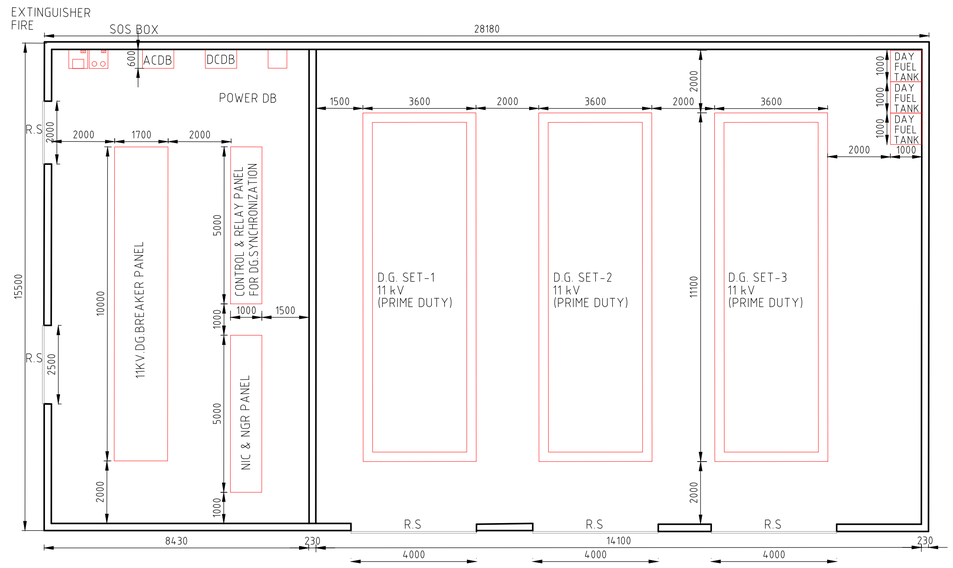
PROJECT TITLE

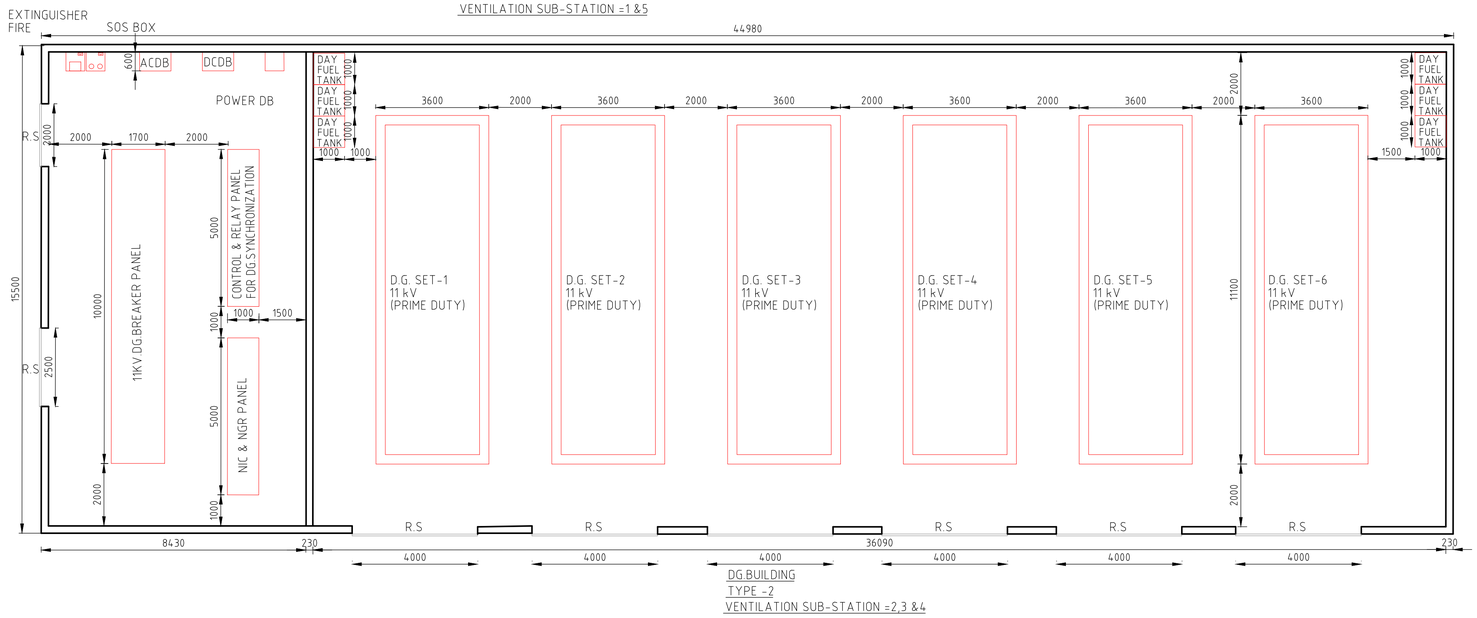
CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-012	A

SCALE	DATE (Initial issue)	STATUS
1:100	DEC, 2024	DPR

Original Drawing Size A1





SCALE 1 : 100

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PROJECT TITLE

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CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: DG.BUILDING TYPE- 1&2 VENTILATION SUB-STATION LAYOUT -1,2,3,4 & 5

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-013	A

SCALE	DATE (Initial issue)	STATUS
1:100	DEC. 2024	DPR

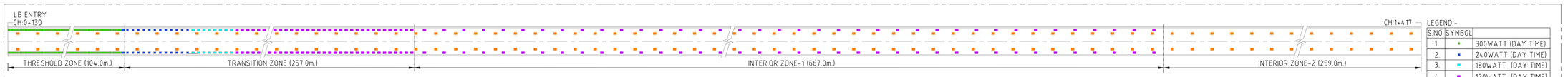
Original Drawing Size A1

NORTHBOUND TUNNEL (TYPICAL FOR SOUTHBOUND TUNNEL)



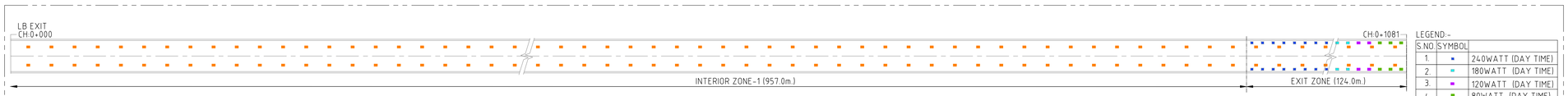
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2.		240WATT (DAY TIME)
3.		180WATT (DAY TIME)
4.		120WATT (DAY TIME)
5.		120WATT (NIGHT TIME)



LEGEND:-

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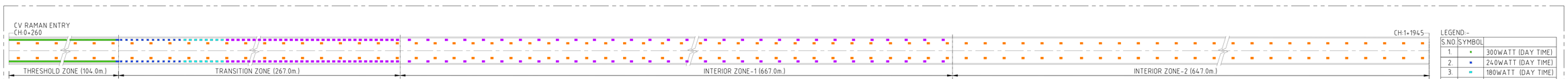
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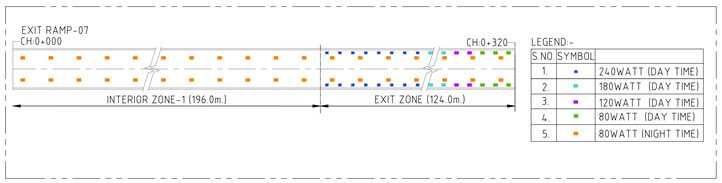
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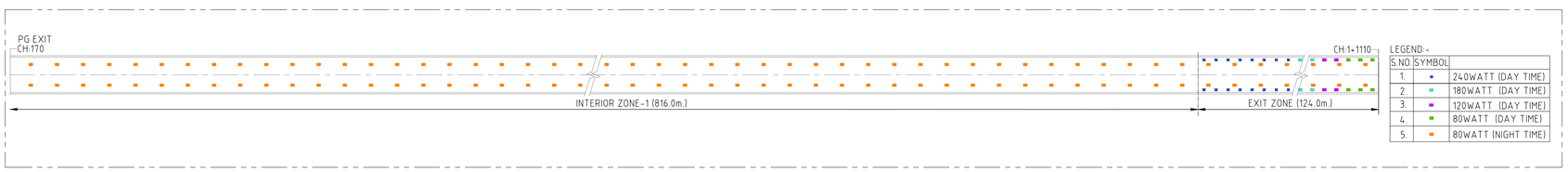
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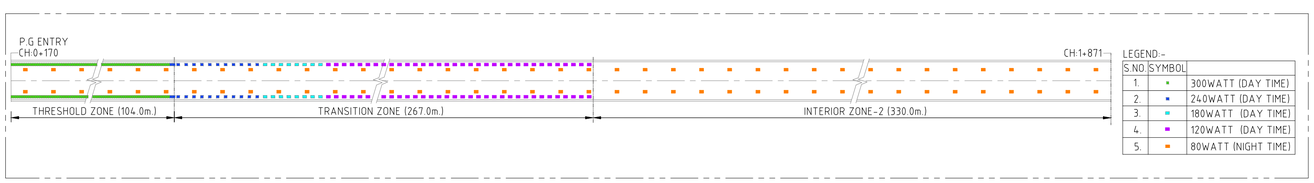
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5.		80WATT (NIGHT TIME)



LEGEND:-

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1.		240WATT (DAY TIME)
2.		180WATT (DAY TIME)
3.		120WATT (DAY TIME)
4.		80WATT (DAY TIME)
5.		80WATT (NIGHT TIME)



LEGEND:-

S.NO.	SYMBOL	
1.		300WATT (DAY TIME)
2.		240WATT (DAY TIME)
3.		180WATT (DAY TIME)
4.		120WATT (DAY TIME)
5.		80WATT (NIGHT TIME)

SCALE 1 : 1000

50m 0 50m 100m

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REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	17.01.25	REVISED DRAWING	MKa	MKr	ANa
0	15.10.24	FIRST SUBMISSION	MKa	MKr	ANa

QUALITY ASSURANCE

Date	15.10.24	15.10.24	15.10.24
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PROJECT TITLE

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CLIENT

Bruhat Bengaluru Mahanagra Palike

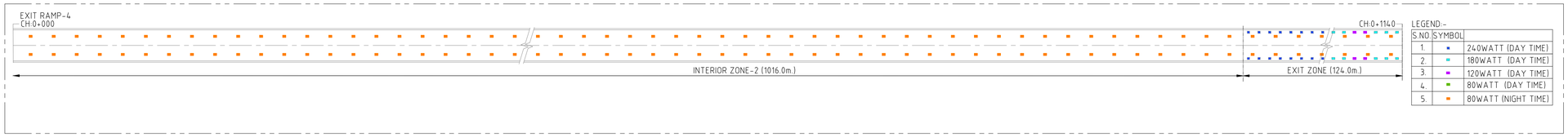
DRAWING TITLE

MAIN TUNNEL LIGHTING LAYOUT (Sheet-1/2)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-E014	A

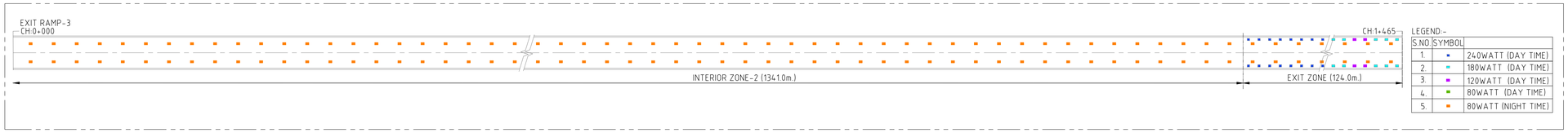
SCALE	DATE (Initial Issue)	STATUS
1000	17.01.2025	DPR

Original Drawing Size A1



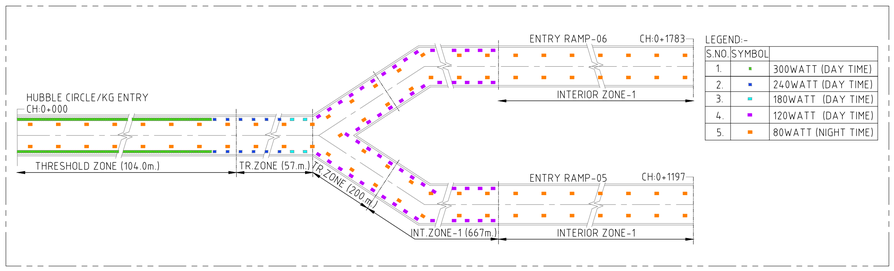
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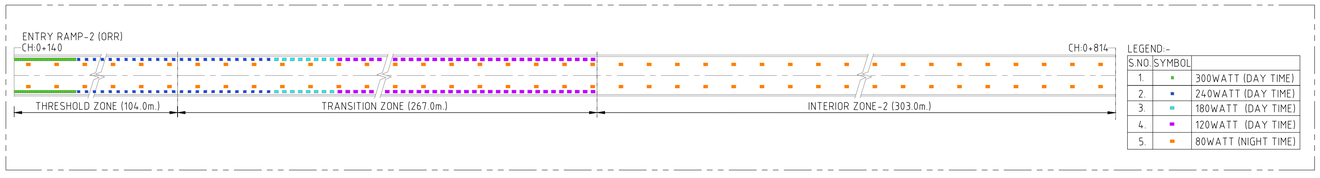
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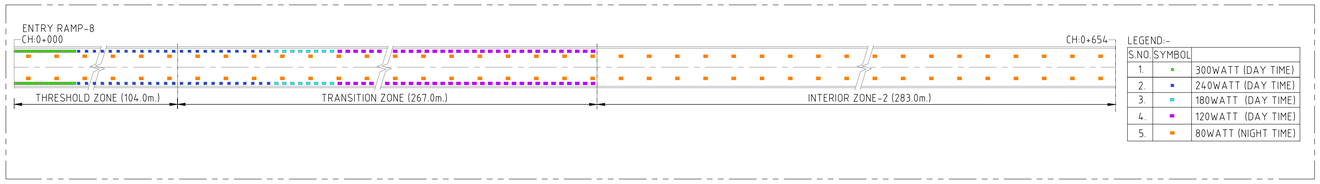
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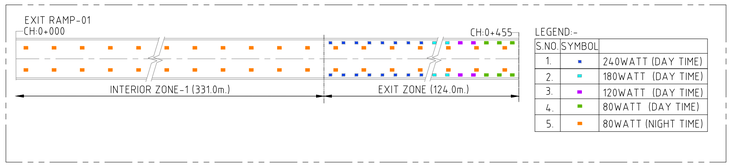
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LEGEND:-

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SCALE 1 : 1000

50m 0 50m 100m

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CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: MAIN TUNNEL LIGHTING LAYOUT (Sheet-2/2)

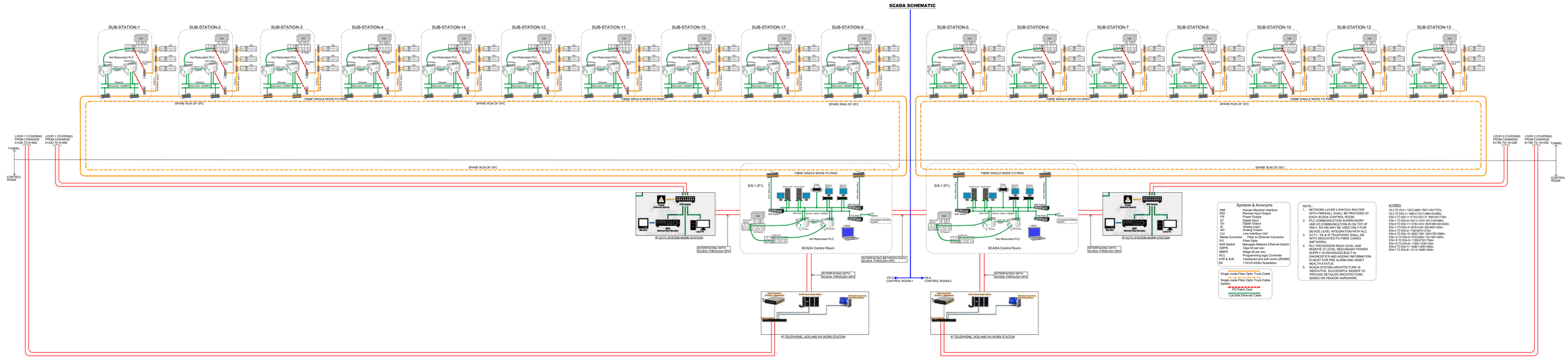
PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-E&M-E014	A

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Original Drawing Size A1



Symbols & Acronyms

HMI	Human Machine Interface
PO	Power Output
PS	Power Supply
DI	Digital Input
Do	Digital Output
AI	Analog Input
AO	Analog Output
LIU	Line Interface Unit
Media Convertor	Fiber to Ethernet Convertor
FO	Fiber Optic
N/W Switch	Managed Network Ethernet Switch
OFC	Optical Fiber Cable
MBPS	Mega bit per sec.
PLC	Programming logic Controller
H/W & Soft	Hardwired and soft comm.(RS485)
SS	11KV/0.433kv Substation

Single mode Fiber Optic Truck Cable
Single mode Fiber Optic Truck Cable (spare)
PO Patch Cord
Cat 6/6a Ethernet Cable

NOTE:-
1. NETWORK LAYER 3 SWITCH/ ROUTER PROVISION IS TO BE PROVIDED AT EACH SCADA CONTROL ROOM.
2. PLC COMMUNICATION SUPERVISORY AND I/O COMMUNICATION IS ON TCP/ IP ONLY, RS 485 MAY BE USED ONLY FOR DEVICE LEVEL INTEGRATION WITH PLC.
3. CCTV , PA & IP TELEPHONY SHALL BE INTEGRATED TO FIBRE CORES (NETWORK).
4. PLC PROCESSOR RACK LEVEL AND REMOTE I/O LEVEL REDUNDANT POWER SUPPLY SHALL BE PROVIDED. DIAGNOSTICS AND AGEING INFORMATION IS MUST FOR PRE ALARM AND ASSET HEALTH STATUS.
5. SCADA SYSTEM ARCHITECTURE IS INDICATIVE, SUCCESSFUL BIDDER TO FINALIZE THE ACTUAL ARCHITECTURE BASED ON VENDOR HARDWARE.

KI FIBRES

VS-2 TO VS-4 = 1307Ø-Ø80= 765?+100+?70%
VS-2 TO S/S-1= 1307Ø-Ø80= 765?+100+?70%
S/S-1 TO S/S-1= 4116.5.5Ø1.5+ 1965+Ø+?70%
S/S-1 TO S/S-9= 2431.5+Ø+ 947.5+Ø+Ø90%
S/S-9 TO S/S-11= 150.+Ø+ 3076+Ø0+Ø+Ø2%
S/S-11TO S/S-3= 3970.5150+ 820+Ø0+ 102%
S/S-3 TO S/S-4= 1Ø0Ø.5+Ø+ 1Ø0+?0%
S/S-4 TO S/S-12= 5Ø0Ø.?Ø0+ 102+?0%=2Ø0%
S/S-12 TO S/S-9= 9?2.Ø50+ ?2+?Ø0+Ø0%
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A	24.01.25	REVISED SCHEME	MKa	MKr	ANa
0	22.10.24	FIRST SUBMISSION DPR	MKa	MKr	ANa

QUALITY ASSURANCE

Date	22.10.24	22.10.24	22.10.24
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

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INDIA
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DPR CONSULTANT :

Rodic Consultant Pvt. Ltd.
6, SAROJINI HOUSE, Agha Khan Hall (1st Floor)
Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

CLIENT

Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE

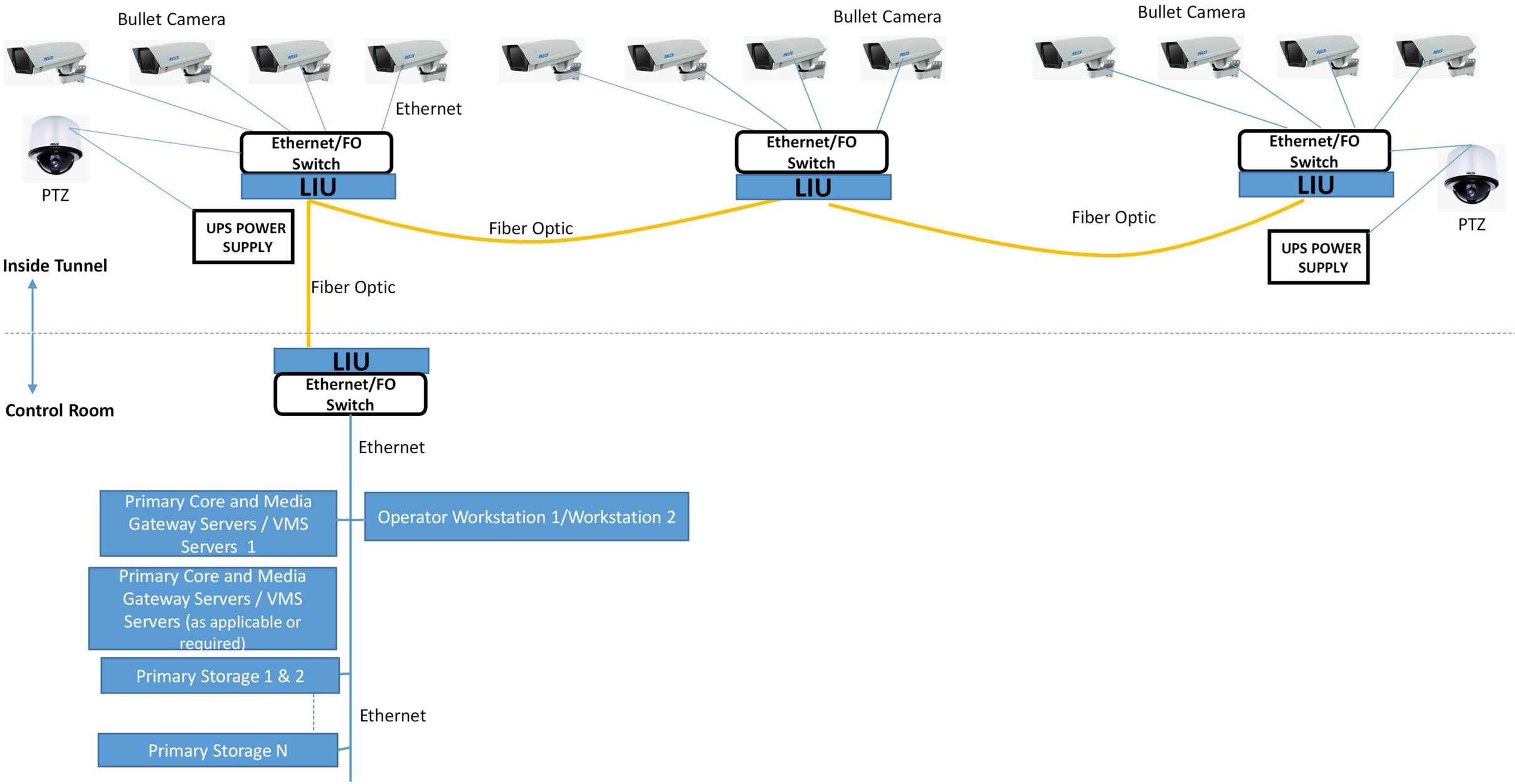
TUNNEL AUTOMATION SYSTEM SCADA SYSTEM ARCHITECTURE

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-015	A

SCALE	DATE (Initial issue)	STATUS
NTS	JAN / 2025	DPR

Original Drawing Size A1

CCTV Surveillance Schematic Diagram



LEGENDS:-

LIU LINE INTER PHASE UNIT

PAN TILT ZOOM CAMERA (PTZ)

BULLET CAMERA

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

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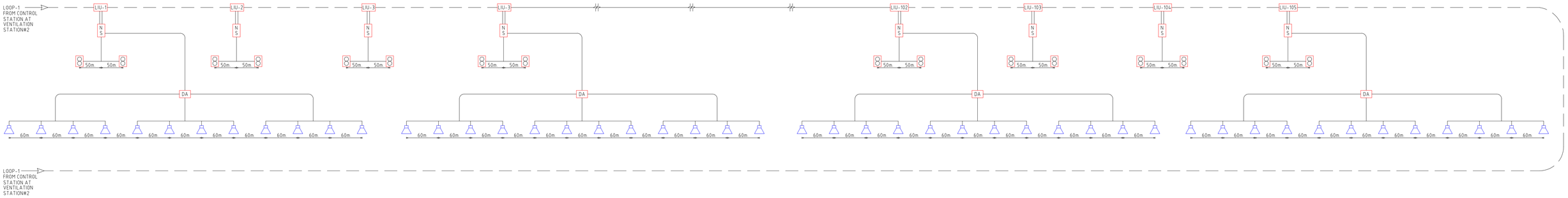
CLIENT: Bruhat Bengaluru Mahanagra Palike

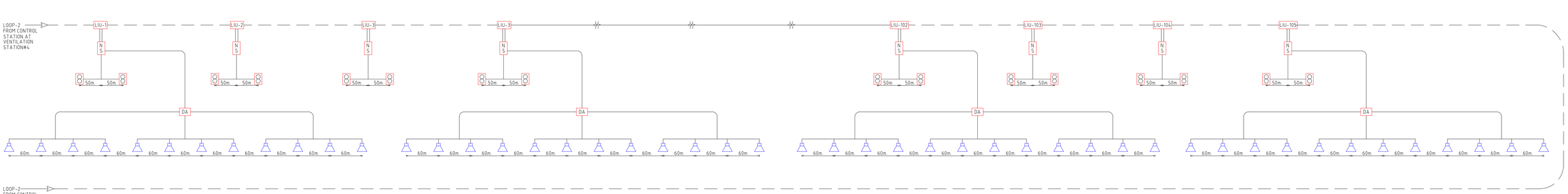
DRAWING TITLE: MAIN TUNNEL GENERAL SCHEMATIC DIAGRAM FOR CCTV.SURVEILLIANCE SYSTEM

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-016	A

SCALE	DATE (Initial issue)	STATUS
N.T.S	OCT-2024	DPR

Original Drawing Size A1





LEGEND :-

LIU	LINE INTERFACE UNIT STAND FOR NUMBER
NS	NETWORK SWITCH
	SOS BOX
	SPEAKERS
DA	DIGITAL AMPLIFIER

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REFERENCE DRAWINGS

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CLIENT

Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE

TYPICAL IP TELEPHONE,SOS & PUBLIC ADDRESS SYSTEM

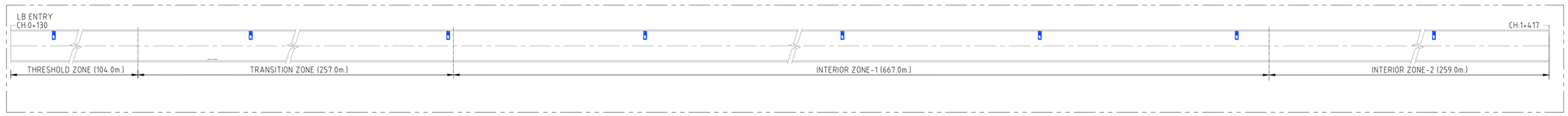
PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-017	A

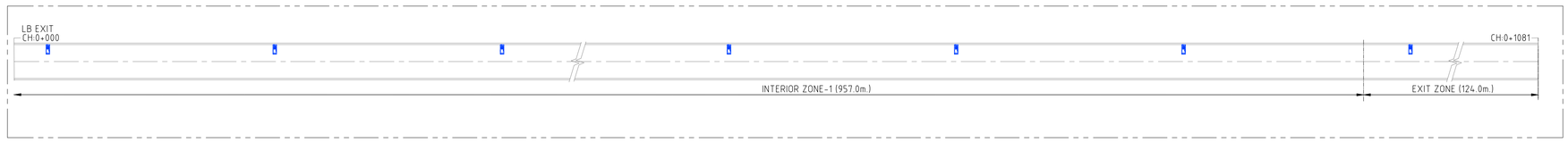
SCALE	DATE (Initial issue)	STATUS
N.T.S	OCT. 2024	DPR

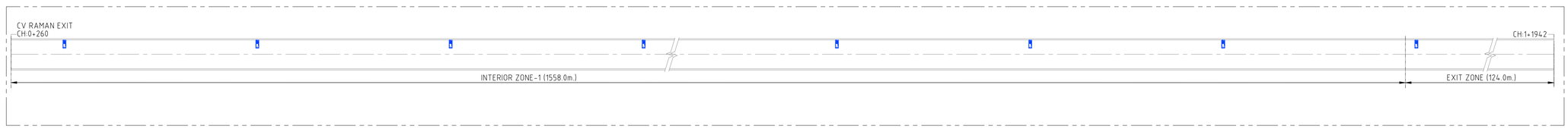
Original Drawing Size A1

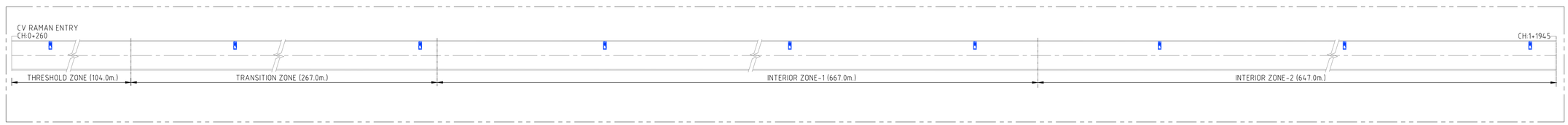
NORTHBOUND TUNNEL (TYPICAL FOR SOUTHBOUND TUNNEL)

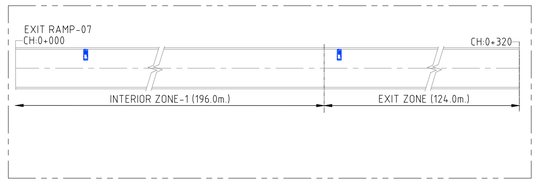


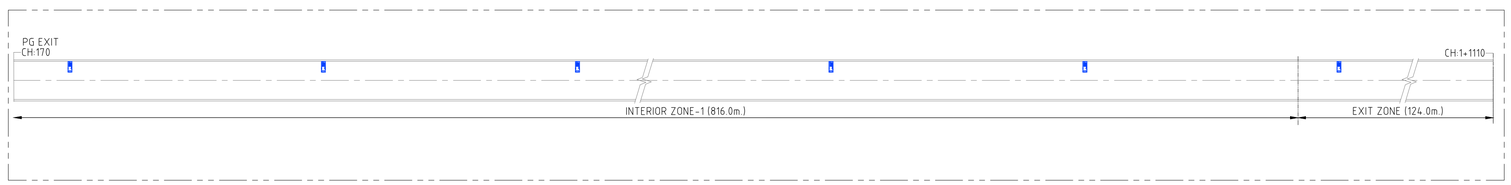


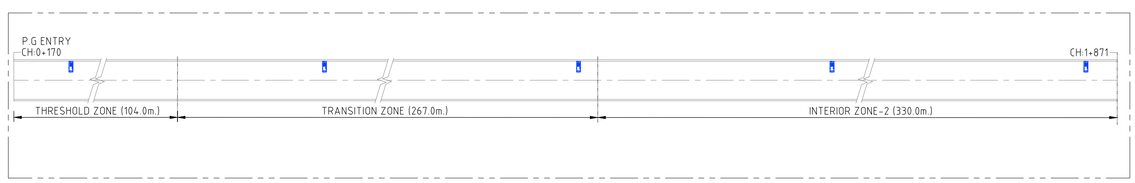












LEGEND:-

S.NO.	SYMBOL	
1.		1-EMERGENCY PHONE (SOS) @ 100m.C/C 2-EMERGENCY PUSH BUTTON @ 100m.C/C

SCALE 1 : 1000

50m 0 50m 100m

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REFERENCE DRAWINGS

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REVISIONS

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PROJECT TITLE

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CLIENT

Bruhat Bengaluru Mahanagra Palike

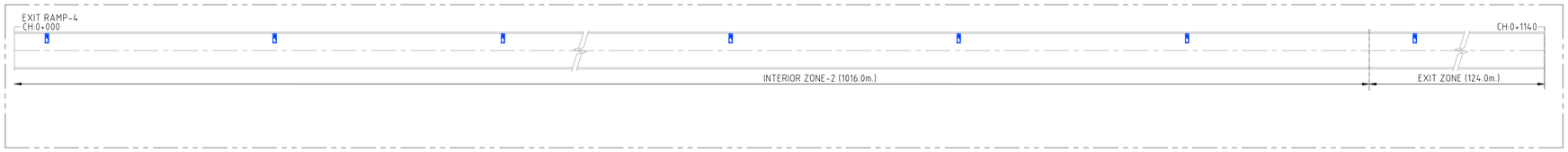
DRAWING TITLE

SOS STATIONS EQUIPMENT (Sheet-1/2)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-E019	A

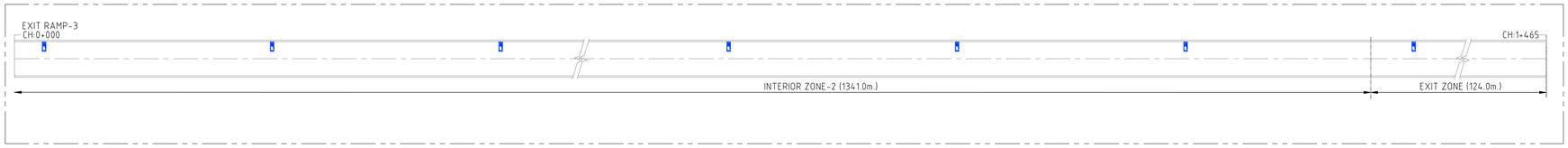
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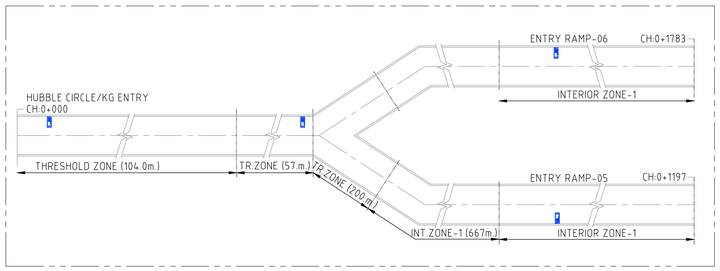
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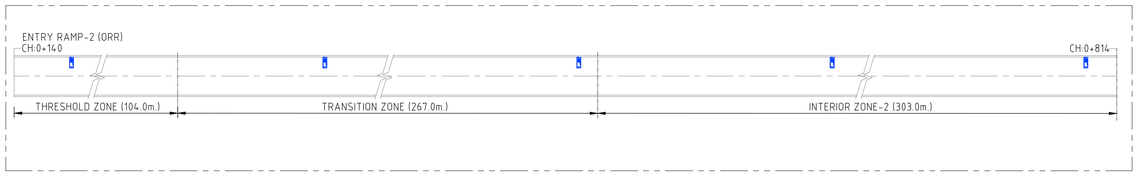


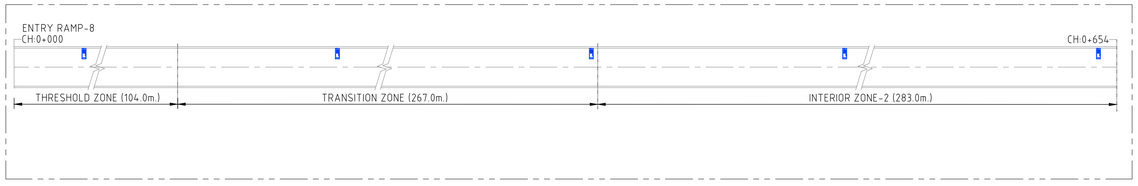
LEGEND :-

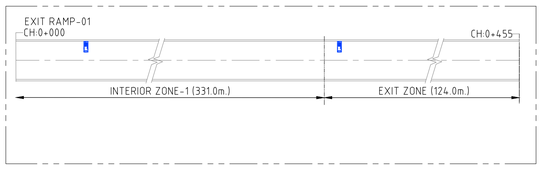
S.NO.	SYMBOL	
1.		1-EMERGENCY PHONE (SOS) @ 100m.C/C 2-EMERGENCY PUSH BUTTON @ 100m.C/C











SCALE 1 : 1000

50m 0 50m 100m

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PROJECT TITLE

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CLIENT

Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE

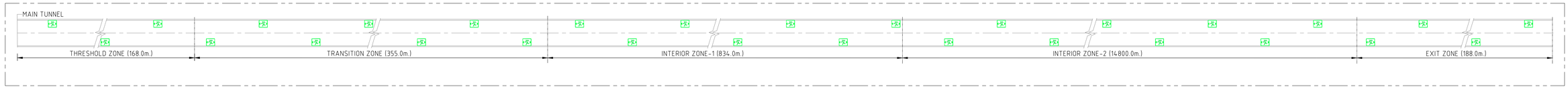
SOS STATIONS EQUIPMENT (Sheet-2/2)

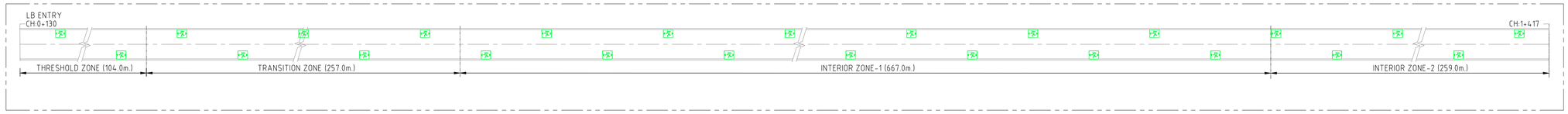
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I 40172	BBMP-EM-E019	A

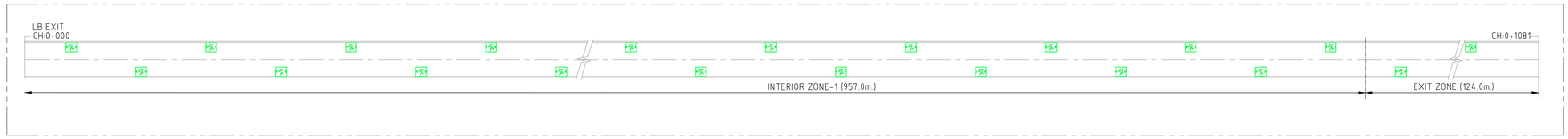
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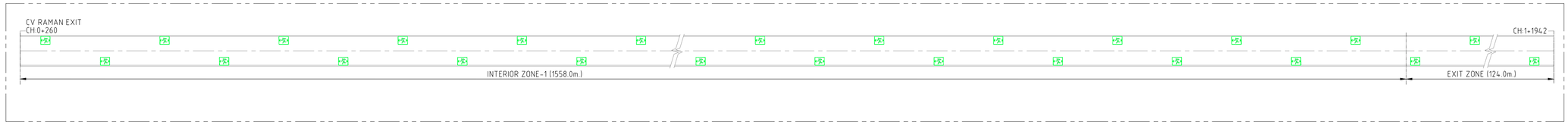
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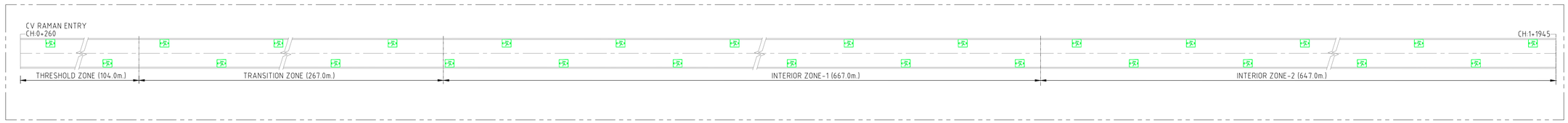
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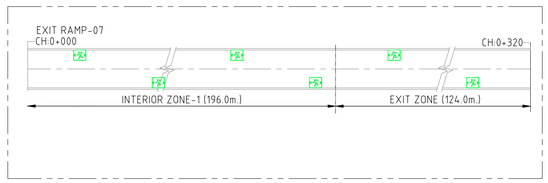


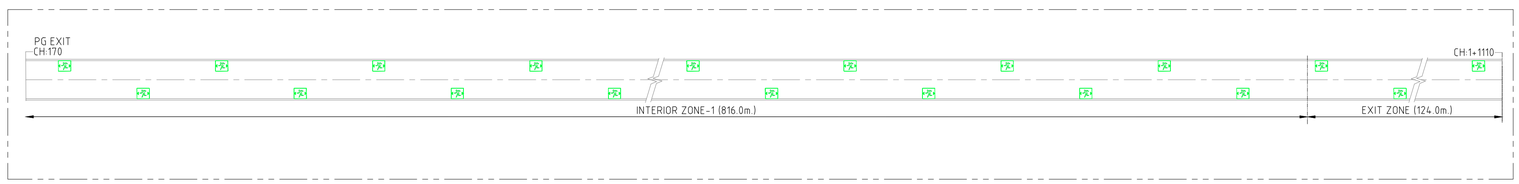






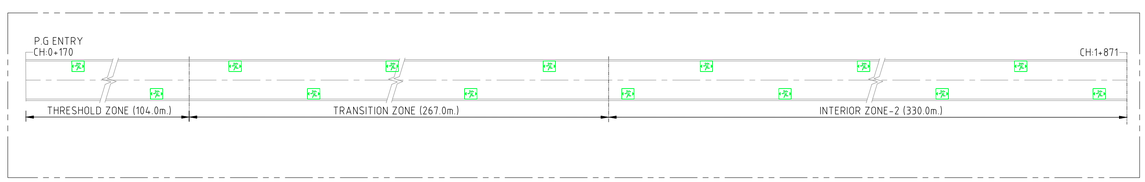






LEGEND:-

S.NO.	SYMBOL	
1.		EMERGENCY WAY FINDER (PSI.EWF.550D)



SCALE 1 : 1000

50m 0 50m 100m

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REFERENCE DRAWINGS

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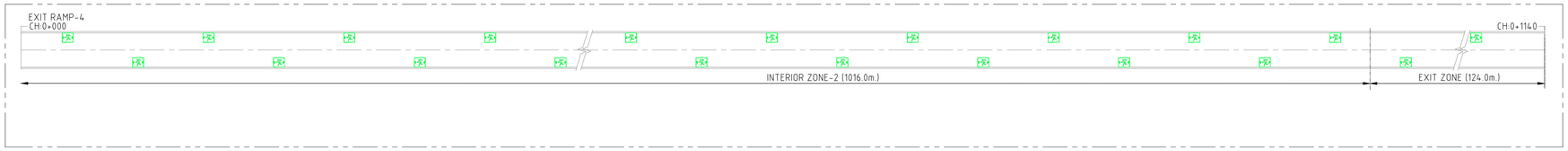
DRAWING TITLE

MAIN TUNNEL SIGNAGE LOCATION (Sheet-1/2)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-E020	A

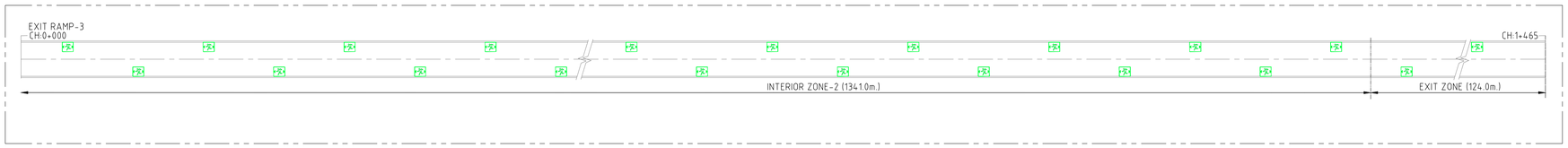
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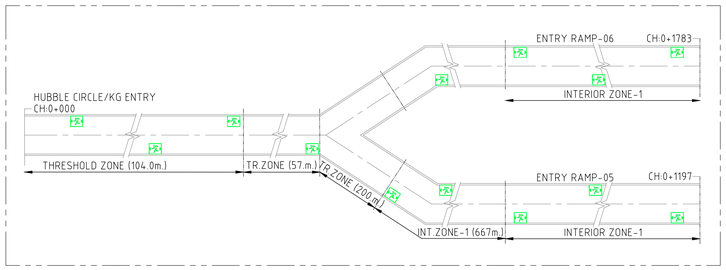
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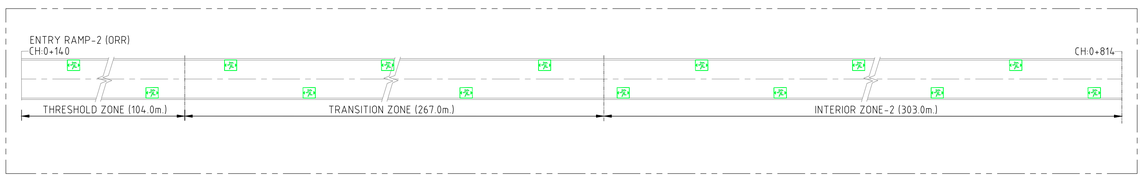


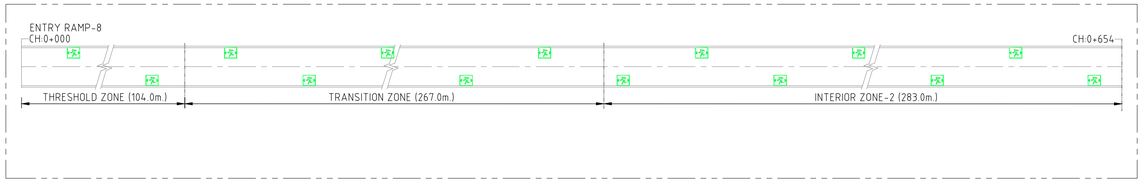
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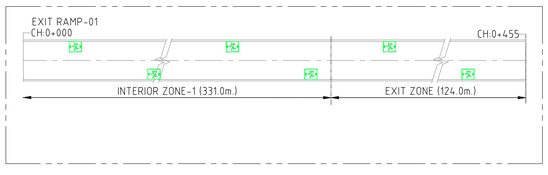
S.NO.	SYMBOL	
1.		EMERGENCY WAY FINDER (PSI.EWF.550D)











SCALE 1 : 1000

50m 0 50m 100m

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	27.01.25	REVISED DRAWING	MKa	MKr	ANa
0	22.01.25	FIRST SUBMISSION	MKa	MKr	ANa

QUALITY ASSURANCE

Date	22.01.25	22.01.25	22.01.25
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

Document Originators (First Issue)

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TUNNEL DESIGN CONSULTANTS :

GEOCONSULT INDIA PVT. LIMITED
04b106, WeWork Platina Tower, MG Road Near Sikandarpur Metro Station, Sector 28, Gurugram , Haryana 122001
INDIA
www.geoconsult.co.in

DPR CONSULTANT :

Rodic Consultant Pvt. Ltd.
6, SAROJINI HOUSE, Agha Khan Hall (1st Floor)
Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

CLIENT: Bruhat Bengaluru Mahanagra Palike

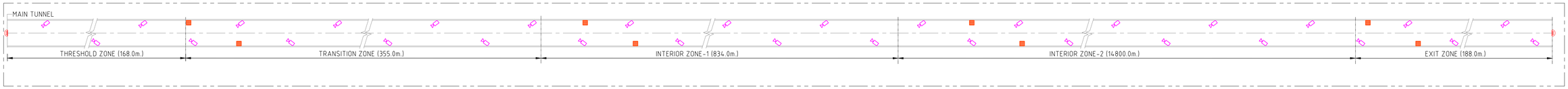
DRAWING TITLE: MAIN TUNNEL SIGNAGE LOCATION (Sheet-2/2)

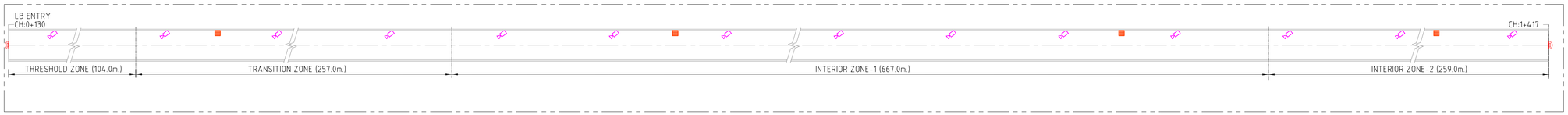
PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-E020	A

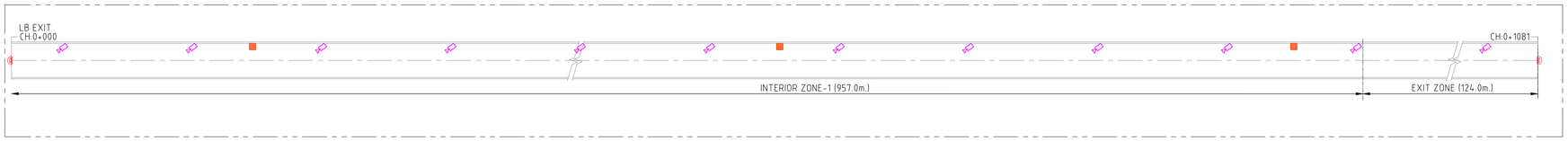
SCALE	DATE (Initial Issue)	STATUS
1000	27.01.2025	DPR

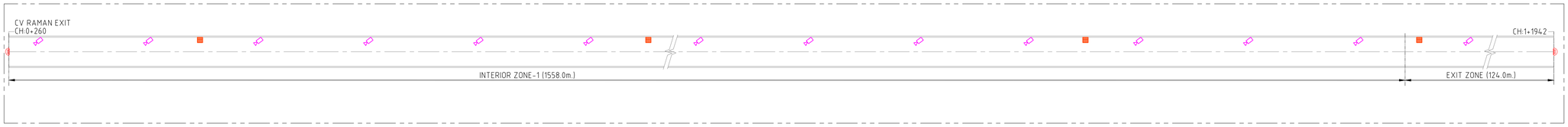
Original Drawing Size A1

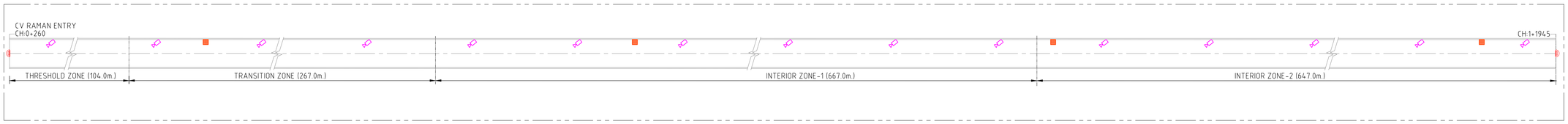
NORTHBOUND TUNNEL (TYPICAL FOR SOUTHBOUND TUNNEL)

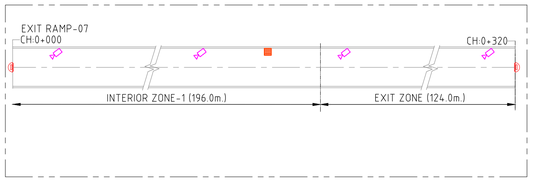


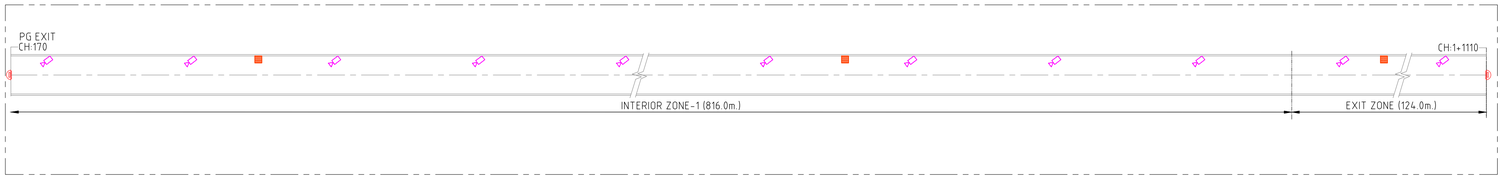


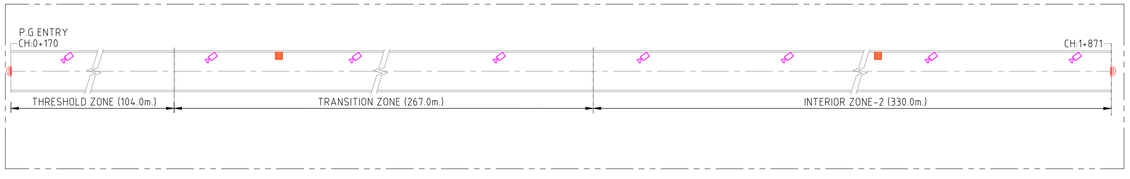












LEGEND:-

S.NO.	SYMBOL	
1.		CCTV.CAMERA @ 80m.C/C.HIGHT =5.0m.
2.		CCTV.PTZ CAMERA AT PORTAL HIGHT =5.0m.
3.		NETWORK PANEL FOR CCTV. SYSTEM

SCALE 1 : 1000

50m 0 50m 100m

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	24.01.25	REVISED DRAWING	MKa	MKr	ANa
0	21.01.25	FIRST SUBMISSION	MKa	MKr	ANa

QUALITY ASSURANCE

Date	21.01.25	21.01.25	21.01.25
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

Document Originators (First Issue)

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TUNNEL DESIGN CONSULTANTS :

GEOCONSULT INDIA PVT. LIMITED
04b106, WeWork Platina Tower, MG Road Near Sikandarpur Metro Station, Sector 28, Gurugram , Haryana 122001
INDIA
www.geoconsult.co.in

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Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

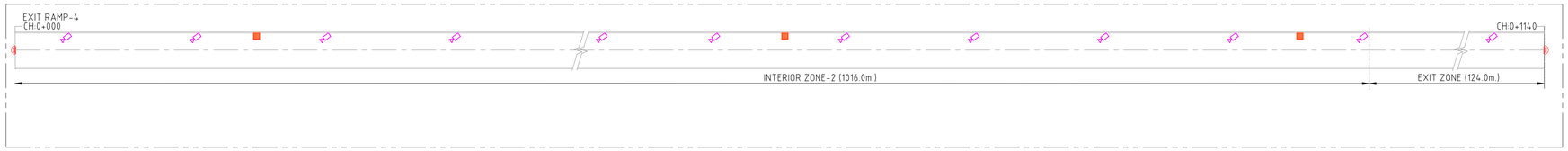
CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: MAIN TUNNEL CCTV. CAMERA LOCATION (Sheet-1/2)

PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-E021	A

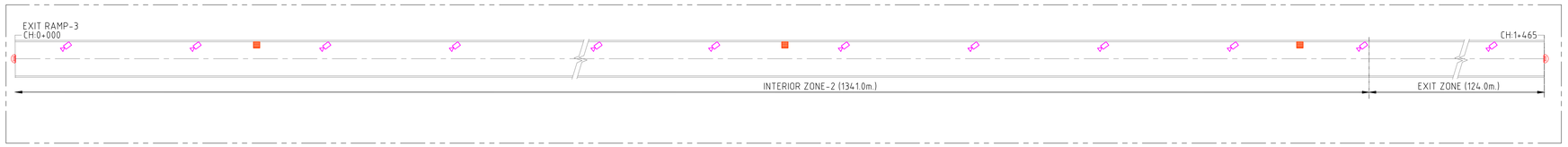
SCALE	DATE (Initial Issue)	STATUS
1000	24.01.2025	DPR

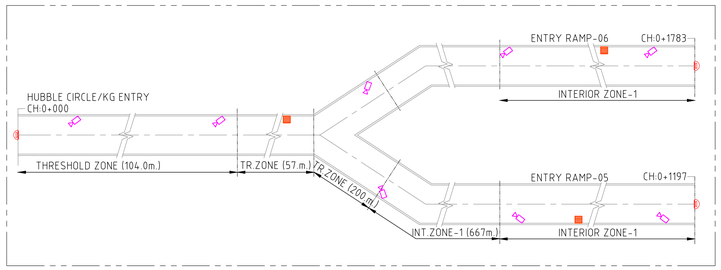
Original Drawing Size A1

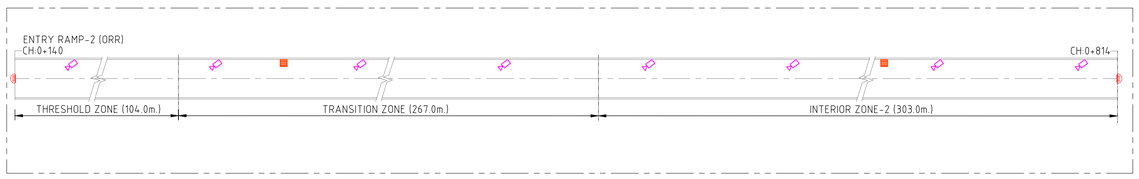


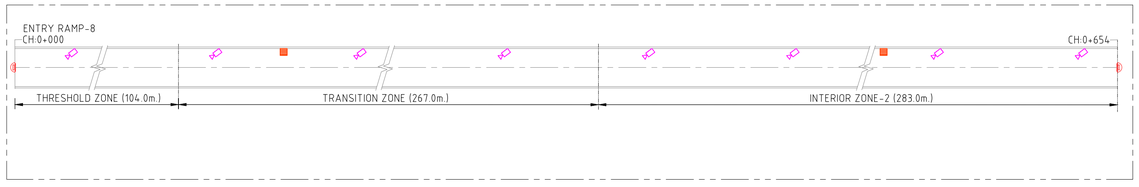
LEGEND:-

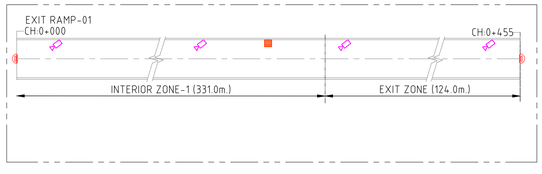
S.NO.	SYMBOL	
1.		CCTV.CAMERA @ 80m.C/C HIGHT =5.0m.
2.		CCTV.PTZ CAMERA AT PORTAL HIGHT =5.0m.
3.		NETWORK PANEL FOR CCTV. SYSTEM











SCALE 1 : 1000

50m 0 50m 100m

FOR DPR PURPOSE ONLY

REFERENCE DRAWINGS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISIONS OF THE FOLLOWING DRAWINGS...

REVISIONS

REV.	DATE	PARTICULARS	Drawn	Checked	Approved
A	24.01.25	REVIESD DRAWING	MKa	MKr	ANa
0	21.01.25	FIRST SUBMISSION	MKa	MKr	ANa

QUALITY ASSURANCE

Date	21.01.25	21.01.25	21.01.25
Name	MKa	MKr	ANa
	Drawn	Designed	Approved

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TUNNEL DESIGN CONSULTANTS :

GEOCONSULT INDIA PVT. LIMITED
04b106, WeWork Platina Tower, MG Road Near Sikandarpur Metro Station, Sector 28, Gurugram , Haryana 122001
INDIA
www.geoconsult.co.in

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Bhagwan Dass Road, New Delhi-110001 (India)
Ph: 011 69217900 , Fax : 011 49434500

CLIENT: Bruhat Bengaluru Mahanagra Palike

DRAWING TITLE: MAIN TUNNEL CCTV. CAMERA LOCATION (Sheet-2/2)

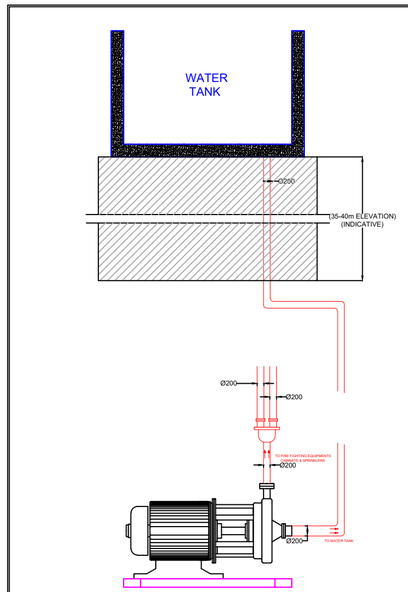
PROJECT TITLE

CONSULTANCY SERVICES FOR PREPRATION OF DPR FOR THE WORK OF CONSTRUCTION OF UNDERGROUND VEHICULAR TUNNEL FROM HEBBAL ESTEEM MALL JUNCTION TO SILK BOARD KSRP JUNCTION

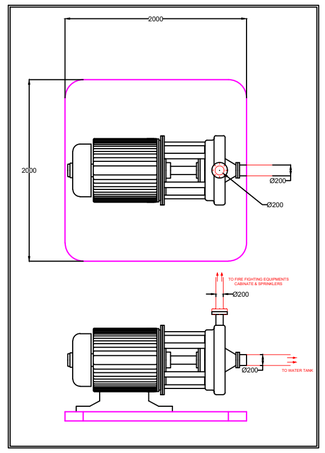
PROJECT ID :	DRAWING NUMBER	REV
I 40172	BBMP-EM-E021	A

SCALE	DATE (Initial Issue)	STATUS
1000	24.01.2025	DPR

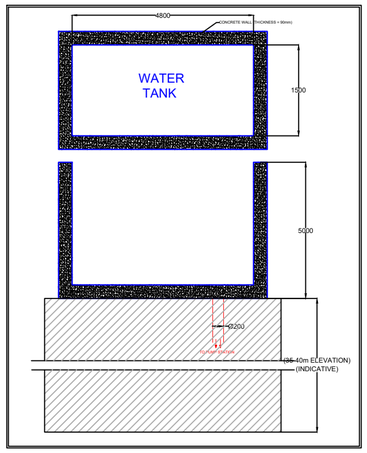
FIRE FIGHTING & VENTILATION
VENTILATION ARRANGEMENT



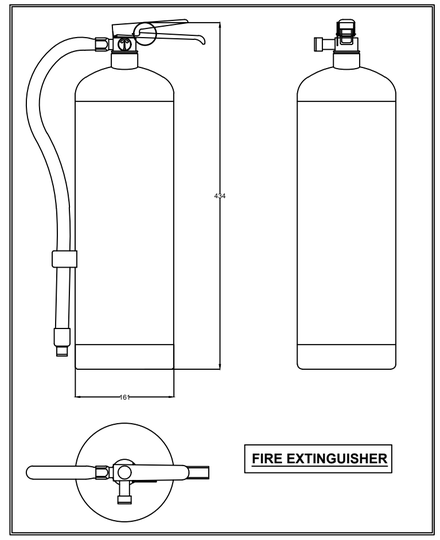
PIPELINE ARRANGEMENT



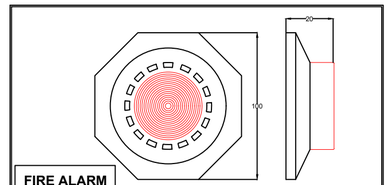
PUMP STATION



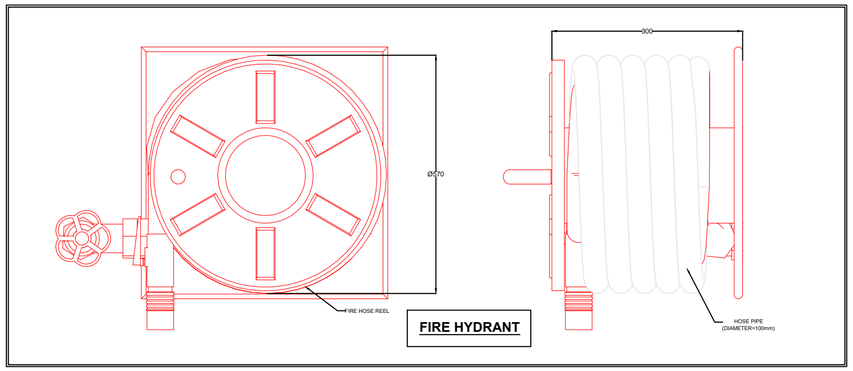
WATER TANK



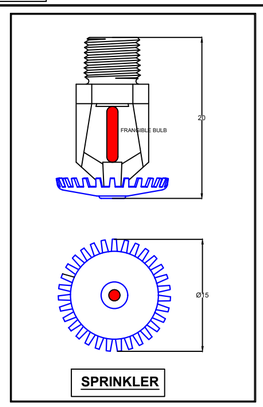
FIRE EXTINGUISHER



FIRE ALARM



FIRE HYDRANT



SPRINKLER

NOTE:

1. ALL THE DIMENSTIONS ARE SCALED & ARE IN MM.
2. WATER TANK AND PUMP STATION ALIGNMENT IS GIVEN IN SHEET 1B.
3. PIPE CONNECTIONS IN DETAIL GIVEN IN SHEET 1B.
4. FIRE ALARM AND SPRINKLER ARRANGEMENT ALIGNMENT ARE GIVEN IN SHEET 1A.

SHEET 1B MOUNTING SPECIFICATIONS

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT
GOVERNMENT OF KARNATAKA
Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:
RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA
CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near
Sikanderpur Metro Station Sector 28, Gurugram
Haryana INDIA

DRAFT DETAILED PROJECT REPORT

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- H=:-1:2500
V=:-1:250
Sheet size: A2

Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

Drawing Title: FIRE FIGHTING SYSTEM SPECIFICATIONS

Drawing No.: RC/1640/HO/HBT/TU/DWG/01/R0

Hebbal Esteem mall junction

Silk Road



DENOTION SYMBOLS WITH COLOUR CODES & DIMENSTIONS

S. NO.	SYMBOLS	NAMES	DIMENSTIONS(in mm)	POSITIONS
1.		SPRINKLER	Ø15	EVERY 4000 mm
2.		FIRE ALARM SENSOR		EVERY 20000 mm
3.		FIRE ALARM		EVERY 100000 mm
4.		WATER TANK	4800X1500X5000	REFERENCE IN DRAWING
5.		PUMP STATION	2000X2000	REFERENCE IN DRAWING
6.		SHAFT	100000X50000	REFERENCE IN DRAWING
7.		ENTRY/EXIT RAMP	-	REFERENCE IN DRAWING
8.		EXHAUST DUCT	5000X6000	REFERENCE IN DRAWING
9.		FRESH AIR DUCT	5000X5000	REFERENCE IN DRAWING
10.		PIPES	Ø32mm(B), Ø100mm(C), Ø200mm(A)	Ø32mm(B) AT EVERY 4000 mm
11.		CABINATE FOR FIRE FIGHTING EQUIPMENTS, FIRE EXTINGUISHER, HOSE PIPE	1000X1400X400	EVERY 90000mm
12		FIRE EXTINGUISHER	Ø 161,H=343	EVERY 90000mm

DISTANCE BETWEEN TWO SHAFT

SHAFT 1-2	3700
SHAFT 2-3	3700
SHAFT 3-4	3900
SHAFT 4-5	3300
TOTAL	14600

NOTE: ALL THE DIMENSTIONS ARE IN MM

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	JAN.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:

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1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
040106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

Designed:	RR		Scale :- AS SHOWN
Drawn:	SS		
Checked:	AT		
Approved:	HRY		Sheet size: A0

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	TUNNEL LINE DIAGRAM PIPE
Drawing No.	RC/1640/HO/HBT/TU/DWGD/01/R0



DENOTION SYMBOLS WITH COLOUR CODES & DIMENSTIONS

S. NO.	SYMBOLS	NAMES	DIMENSTIONS(in mm)	POSITIONS
1.		SPRINKLER	Ø15	EVERY 4000 mm
2.		FIRE ALARM SENSOR		EVERY 20000 mm
3.		FIRE ALARM		EVERY 100000 mm
4.		WATER TANK	4800X1500X5000	REFERENCE IN DRAWING
5.		PUMP STATION	2000X2000	REFERENCE IN DRAWING
6.		SHAFT	100000X50000	REFERENCE IN DRAWING
7.		ENTRY/EXIT RAMP	-	REFERENCE IN DRAWING
8.		EXHAUST DUCT	5000X6000	REFERENCE IN DRAWING
9.		FRESH AIR DUCT	5000X5000	REFERENCE IN DRAWING
10.		PIPES	Ø32mm(B), Ø100mm(C), Ø200mm(A)	Ø32mm(B) AT EVERY 4000 mm
11.		CABINATE FOR FIRE FIGHTING EQUIPMENTS, FIRE EXTINGUISHER, HOSE PIPE	1000X1400X400	EVERY 90000mm
12		FIRE EXTINGUISHER	⌀ 161,H=343	EVERY 90000mm

DISTANCE BETWEEN TWO SHAFT

SHAFT 1-2	3700
SHAFT 2-3	3700
SHAFT 3-4	3900
SHAFT 4-5	3300
TOTAL	14600

NOTE: ALL THE DIMENSTIONS ARE IN MM

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	JAN.:- 2025	-

CLIENT
GOVERNMENT OF KARNATAKA
Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

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NEW DELHI - 110001 (INDIA)
GEOCONSULT INDIA PRIVATE LIMITED
048106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

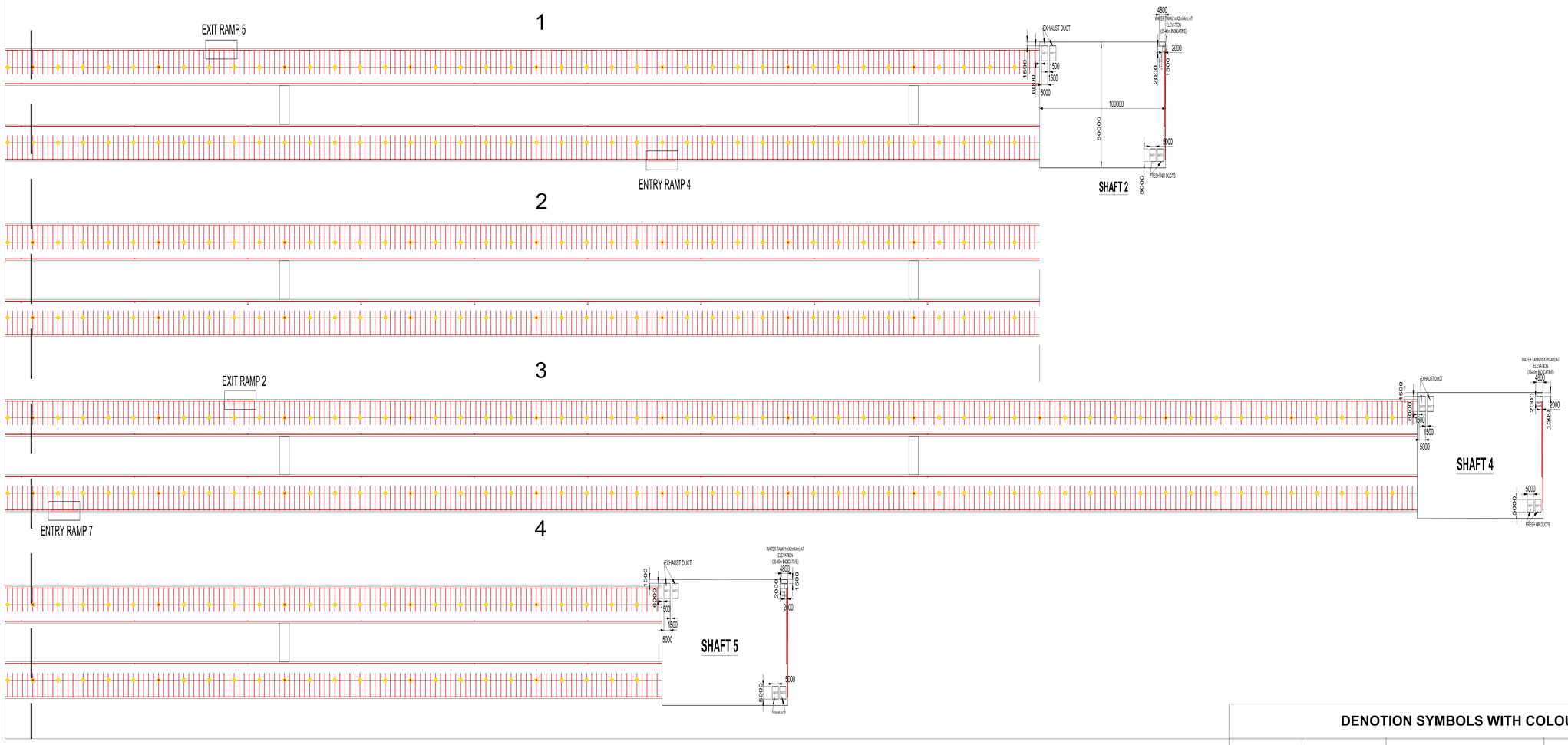
Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN
Sheet size: A0

Project	"Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"
Drawing Title	TUNNEL LINE DIAGRAM PIPE
Drawing No.	RC/1640/HO/HBT/TU/DWGD/02/R0

Hebbal Esteem mall junction

Silk Road



DISTANCE BETWEEN TWO SHAFT

SHAFT 1-2	3700
SHAFT 2-3	3700
SHAFT 3-4	3900
SHAFT 4-5	3300
TOTAL	14600

DENOTION SYMBOLS WITH COLOUR CODES & DIMENSTIONS

S. NO.	SYMBOLS	NAMES	DIMENSTIONS(in mm)	POSITIONS
1.		SPRINKLER	Ø15	EVERY 4000 mm
2.		FIRE ALARM SENSOR		EVERY 20000 mm
3.		FIRE ALARM		EVERY 100000 mm
4.		WATER TANK	4800X1500X5000	REFERENCE IN DRAWING
5.		PUMP STATION	2000X2000	REFERENCE IN DRAWING
6.		SHAFT	100000X50000	REFERENCE IN DRAWING
7.		ENTRY/EXIT RAMP	-	REFERENCE IN DRAWING
8.		EXHAUST DUCT	5000X6000	REFERENCE IN DRAWING
9.		FRESH AIR DUCT	5000X5000	REFERENCE IN DRAWING
10.		PIPES	Ø32mm(B), Ø100mm(C), Ø200mm(A)	Ø32mm(B) AT EVERY 4000 mm
11.		CABINATE FOR FIRE FIGHTING EQUIPMENTS, FIRE EXTINGUISHER, HOSE PIPE	1000X1400X400	EVERY 90000mm
12		FIRE EXTINGUISHER	Ø 161,H=343	EVERY 90000mm

NOTE: ALL THE DIMENSTIONS ARE IN MM

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	JAN.:- 2025	-

CLIENT: GOVERNMENT OF KARNATAKA; Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT: RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)
GEOCONSULT INDIA PRIVATE LIMITED
040106 WeWork, Plutina Tower MG Road Near Sikandarpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

Designed:	RR		Scale :- AS SHOWN
Drawn:	SS		
Checked:	AT		
Approved:	HRY		Sheet size: A0

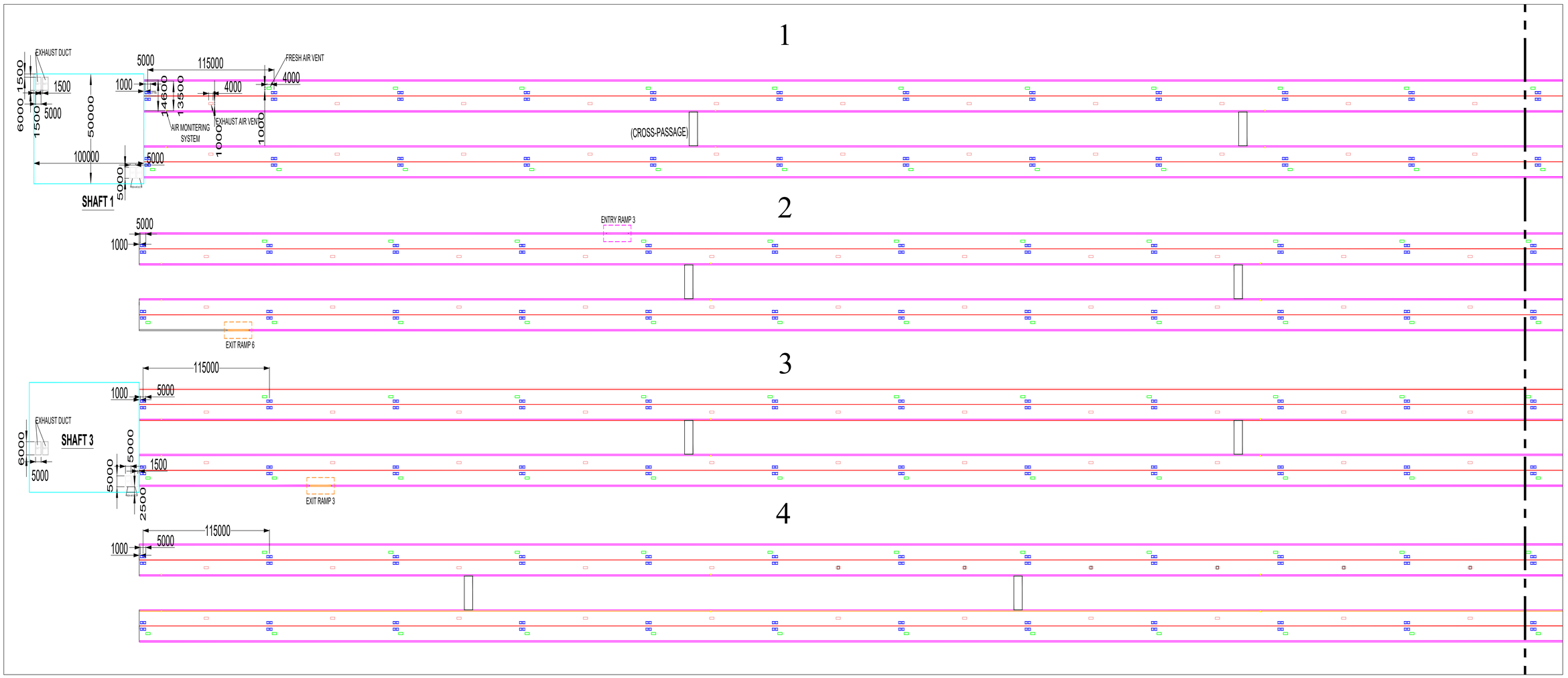
Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

Drawing Title: TUNNEL LINE DIAGRAM PIPE

Drawing No.: RC/1640/HO/HBT/TU/DWGD/02/R0

Hebbal Esteem mall junction

Silk Road



DISTANCE BETWEEN TWO SHAFT

SHAFT 1-2	3700
SHAFT 2-3	3700
SHAFT 3-4	3900
SHAFT 4-5	3300
TOTAL	14600

DENOTION SYMBOLS WITH COLOUR CODES & DIMENSTIONS

S. NO.	SYMBOLS	NAMES	DIMENSTIONS(in mm)	POSITION
1.		JET-FAN	Ø1000, Ø=800, LENGTH=5000	AT EVERY 115000mm
2.		EXHAUST AIR VENT	2000X1200	AT EVERY 115000 mm
3.		FRESH AIR VENT	2000X1200	AT EVERY 115000 mm
4.		WATER TANK	2000X1000X4000	ELEVATION 35-40 m (INDICATIVE)
5.		PUMP STATION	2000X2000	REFERENCE IN DRAWING
6.		SHAFT	100000X50000	REFERENCE IN DRAWING
7.		ENTRY/EXIT RAMP	-	REFERENCE IN DRAWING
8.		EXHAUST DUCT	5000X6000	REFERENCE IN DRAWING
9.		FRESH AIR DUCT	5000X5000	REFERENCE IN DRAWING
10.		AIR QUALITY SENSOR	93X90	AT EVERY 500000 mm

NOTE: ALL THE DIMENSTIONS ARE IN MM

REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
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CONSULTANT:

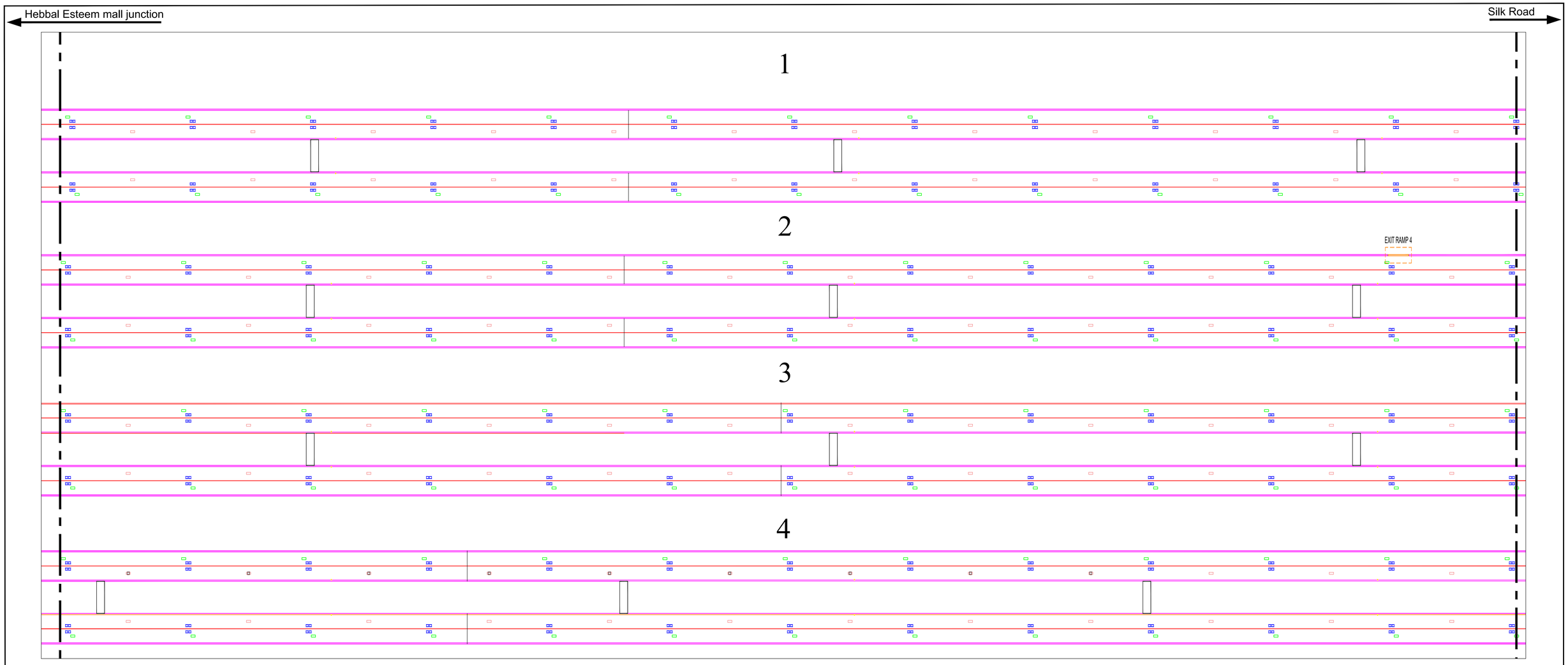
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GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

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Drawing Title	TUNNEL LINE DIAGRAM
Drawing No.	RC/1640/HO/HBT/TU/DWGD/01/R0



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SHAFT 2-3	3700
SHAFT 3-4	3900
SHAFT 4-5	3300
TOTAL	14600

DENOTION SYMBOLS WITH COLOUR CODES & DIMENSTIONS

S. NO.	SYMBOLS	NAMES	DIMENSTIONS(in mm)	POSITION
1.		JET-FAN	Ø1000, Ø=800, LENGTH=5000	AT EVERY 15000mm
2.		EXHAUST AIR VENT	2000X1200	AT EVERY 115000 mm
3.		FRESH AIR VENT	2000X1200	AT EVERY 115000 mm
4.		WATER TANK	2000X1000X4000	ELEVATION 35-40 m (INDICATIVE)
5.		PUMP STATION	2000X2000	REFERENCE IN DRAWING
6.		SHAFT	100000X50000	REFERENCE IN DRAWING
7.		ENTRY/EXIT RAMP	-	REFERENCE IN DRAWING
8.		EXHAUST DUCT	5000X6000	REFERENCE IN DRAWING
9.		FRESH AIR DUCT	5000X5000	REFERENCE IN DRAWING
10.		AIR QUALITY SENSOR	93X90	AT EVERY 500000 mm

NOTE: ALL THE DIMENSTIONS ARE IN MM

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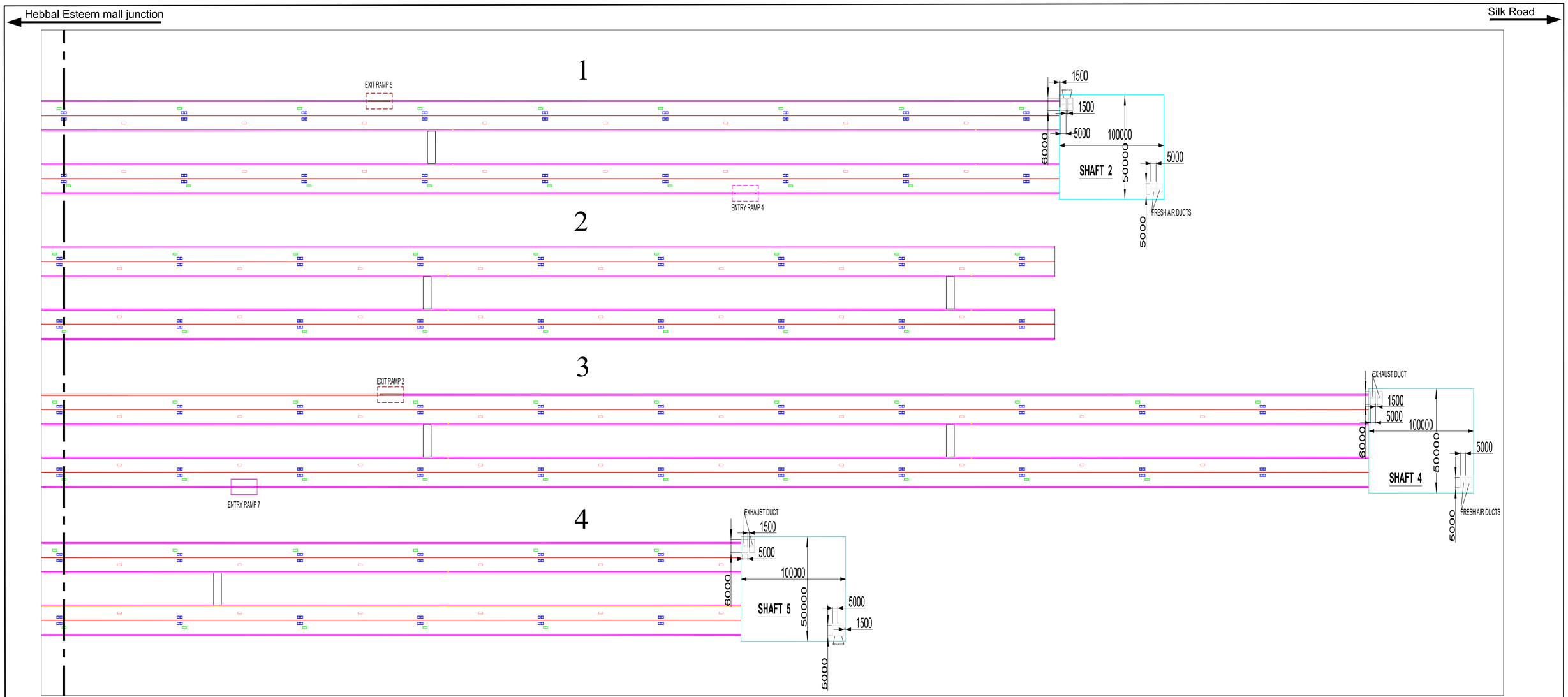
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NEW DELHI - 110001 (INDIA)
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668/106 WeWork, Plutina Tower MG Road Near Sikandarpur Metro Station Sector 28, Gurugram Haryana INDIA

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Drawing Title	TUNNEL LINE DIAGRAM
Drawing No.	RC/1640/HO/HBT/TU/DWGD/02/R0



DISTANCE BETWEEN TWO SHAFT

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SHAFT 3-4	3900
SHAFT 4-5	3300
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DENOTION SYMBOLS WITH COLOUR CODES & DIMENSTIONS

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5.		PUMP STATION	2000X2000	REFERENCE IN DRAWING
6.		SHAFT	100000X50000	REFERENCE IN DRAWING
7.		ENTRY/EXIT RAMP	-	REFERENCE IN DRAWING
8.		EXHAUST DUCT	5000X6000	REFERENCE IN DRAWING
9.		FRESH AIR DUCT	5000X5000	REFERENCE IN DRAWING
10.		AIR QUALITY SENSOR	93X90	AT EVERY 500000 mm

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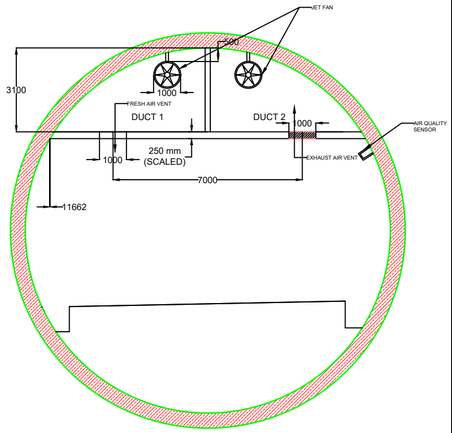
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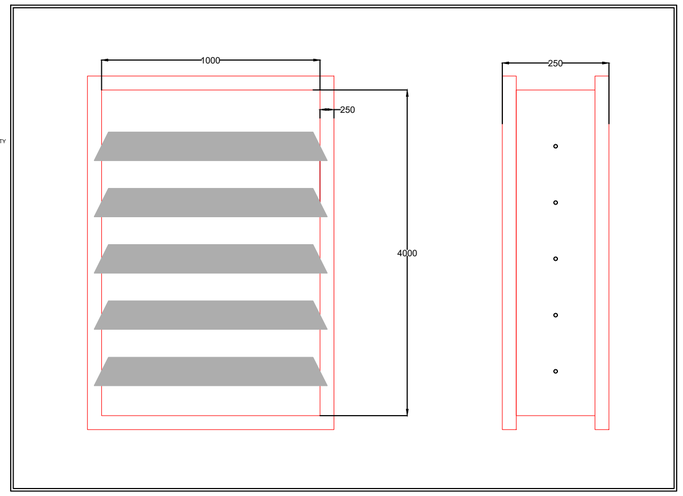
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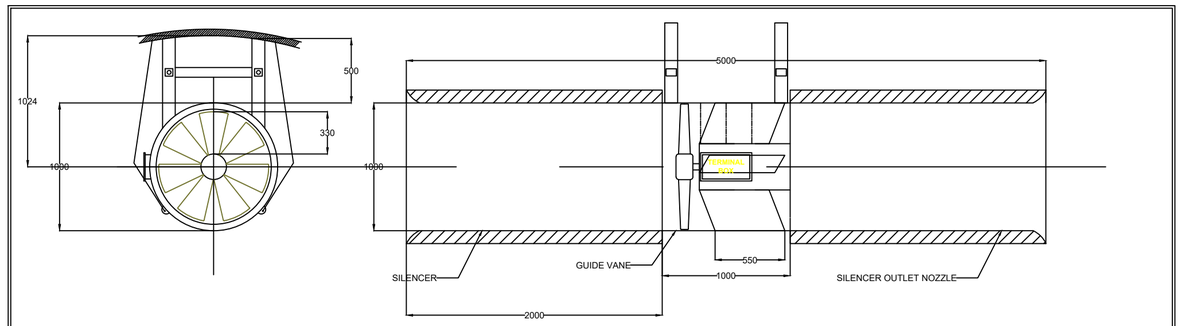
Drawing Title: TUNNEL LINE DIAGRAM

Drawing No.: RC/1640/HO/HBT/TU/DWGD/03/R0

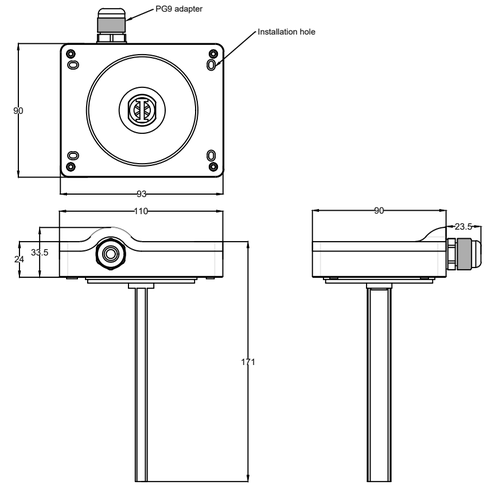




AIR VENT OPENING WITH DAMPER



TRADITIONAL JET FAN



AIR QUALITY SENSOR

NOTE: 1. ALL THE DIMENSTIONS ARE SCALED & ARE IN MM.
2. DUCT ALIGNMENT IS GIVEN IN SHEET 1A.

TRADITIONAL JET FAN SPECIFICATIONS	
DIAMETER	1000 mm
LENGTH	5000 mm
SILENCERS	BOTH END

FRESH AIR & EXHAUST AIR VENT	
FRESH AIR VENT DIMENTION	1000X3000
EXHAUST AIR VENT DIMENTION	1000X3000
DISTANCE BETWEEN 2 VENTS	11500
AIR VENT OPENING SIZE WITH DAMPER	1000X4000
DAMPER THICKNESS	3

SHEET 1A MOUNTING SPECIFICATIONS

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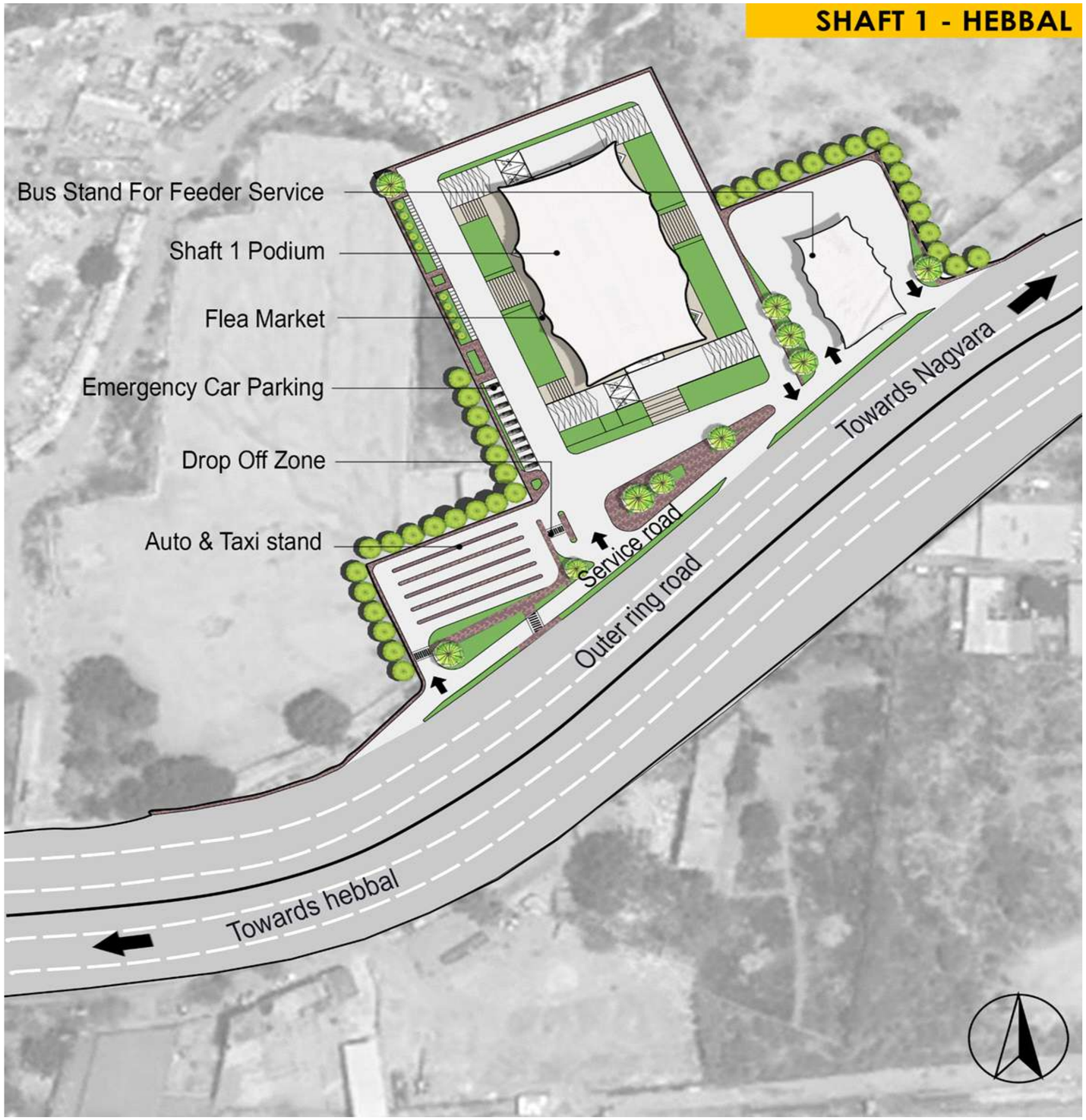
Project: "Consultancy services for preparation of DPR for the work of Construction of Underground Vehicular Tunnel from Hebbal Esteem mall junction to Silk Board KSRP junction"

Drawing Title: VENTILATION SYSTEM SPECIFICATIONS.

Drawing No.: RC/1640/HO/HBT/TU/DWG/01/R0

Appendix-B-VI

SHAFT PLAN



REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
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FINAL DETAILED PROJECT REPORT

(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
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Scale :- AS SHOWN

Sheet size: A2

Project: Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.

Drawing Title: SHAFT 1 –SITE PLAN (HEBBAL)

Drawing No.



SHAFT 1– CIRCULATION PLAN

HEBBAL

PRIMARY VEHICULAR MOVEMENT

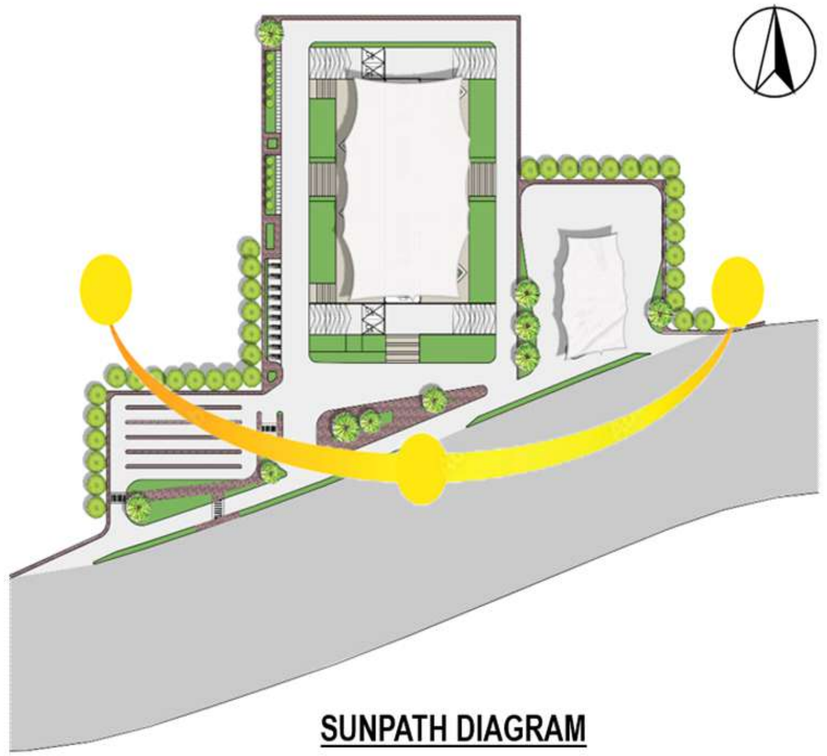
SECONDARY VEHICULAR MOVEMENT

BUS DROP OFF LOOP

AUTO/TAXI DROP OFF LOOP

PEDESTRAIN CONNECTION MOVEMENT

SERVICE ROAD



SUNPATH DIAGRAM

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Drawing Title: SHAFT-1 HEBBAL – CIRCULATION PLAN AND SUNPATH

Drawing No.



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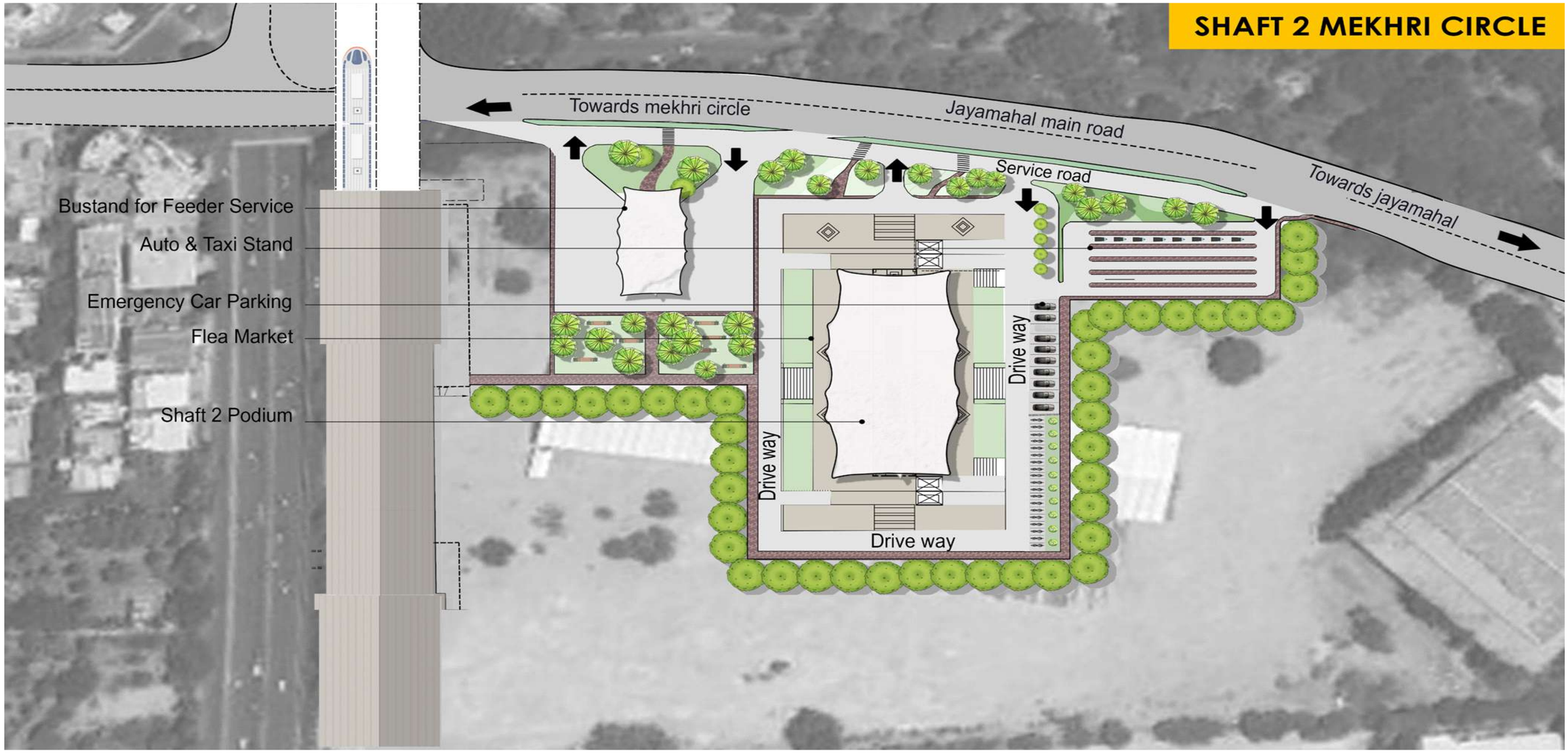
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Drawing Title	SHAFT-1 HEBBAL – CONCEPTUAL 3D MASSING
Drawing No.	

SHAFT 2 MEKHRI CIRCLE



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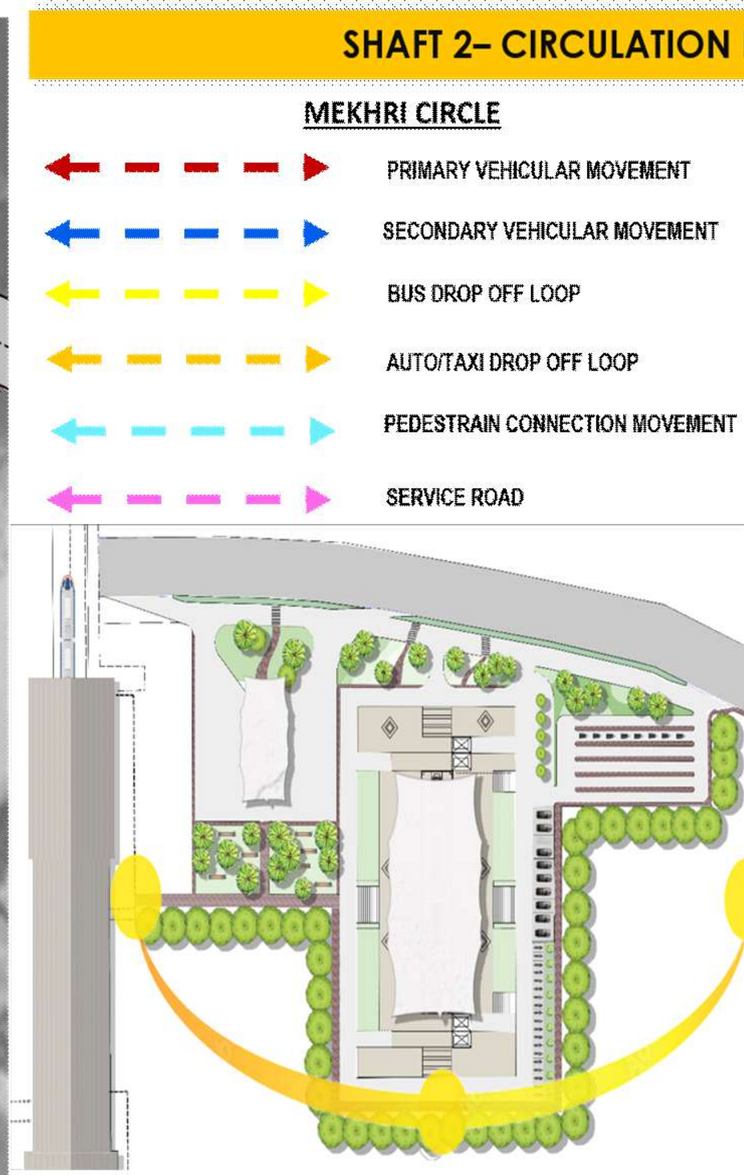
Project: Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.

Drawing Title: SHAFT 2 –SITE PLAN (MEKHRI CIRCLE)

Drawing No.



SHAFT 2– CIRCULATION PLAN



SUNPATH DIAGRAM

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Drawing Title	SHAFT-2 MEKHRI CIECLE – CIRCULATION PLAN AND SUNPATH
Drawing No.	



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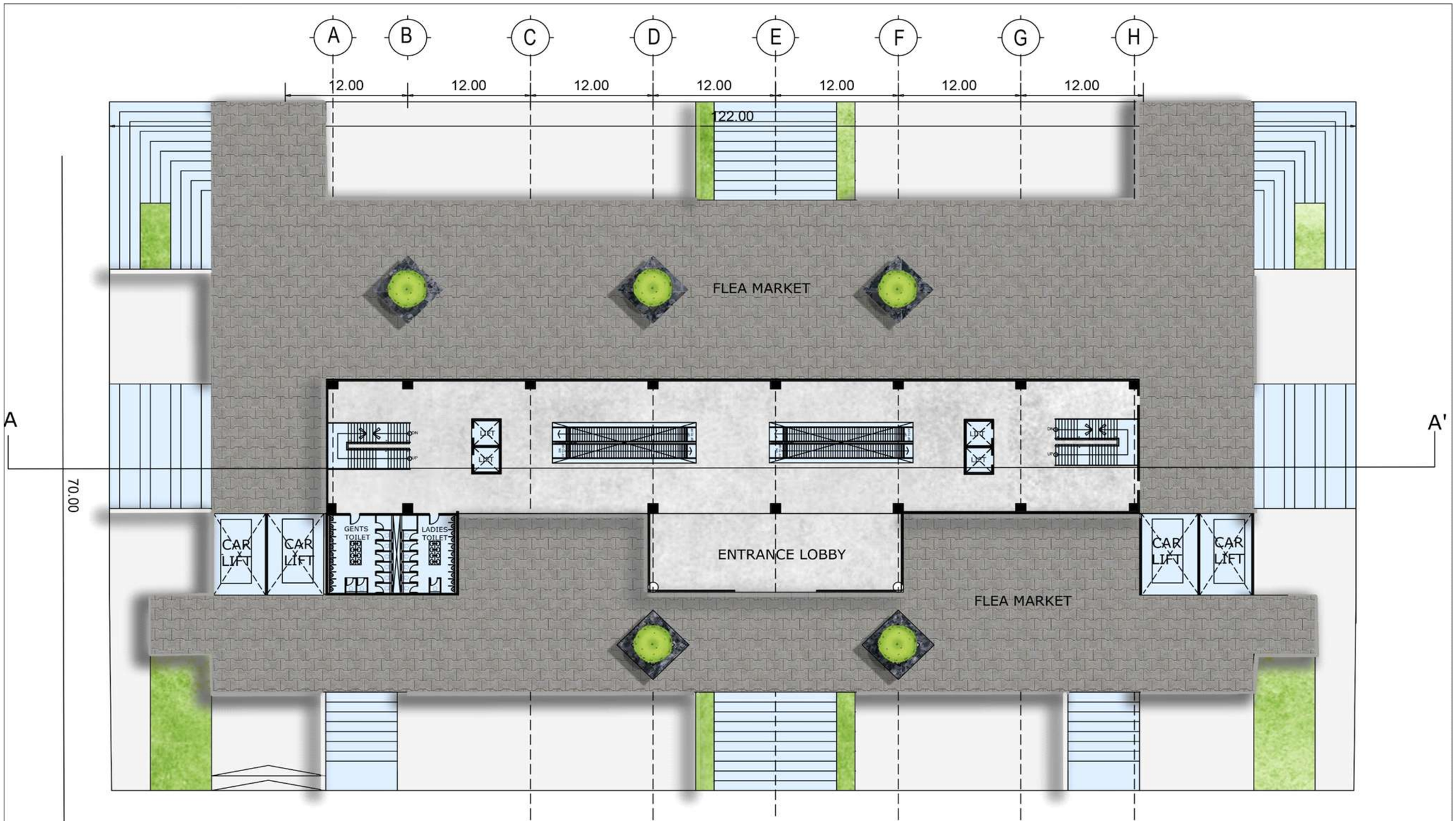
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Drawing Title	SHAFT-2 MEKHRI CIRCLE – CONCEPTUAL 3D MASSING
Drawing No.	



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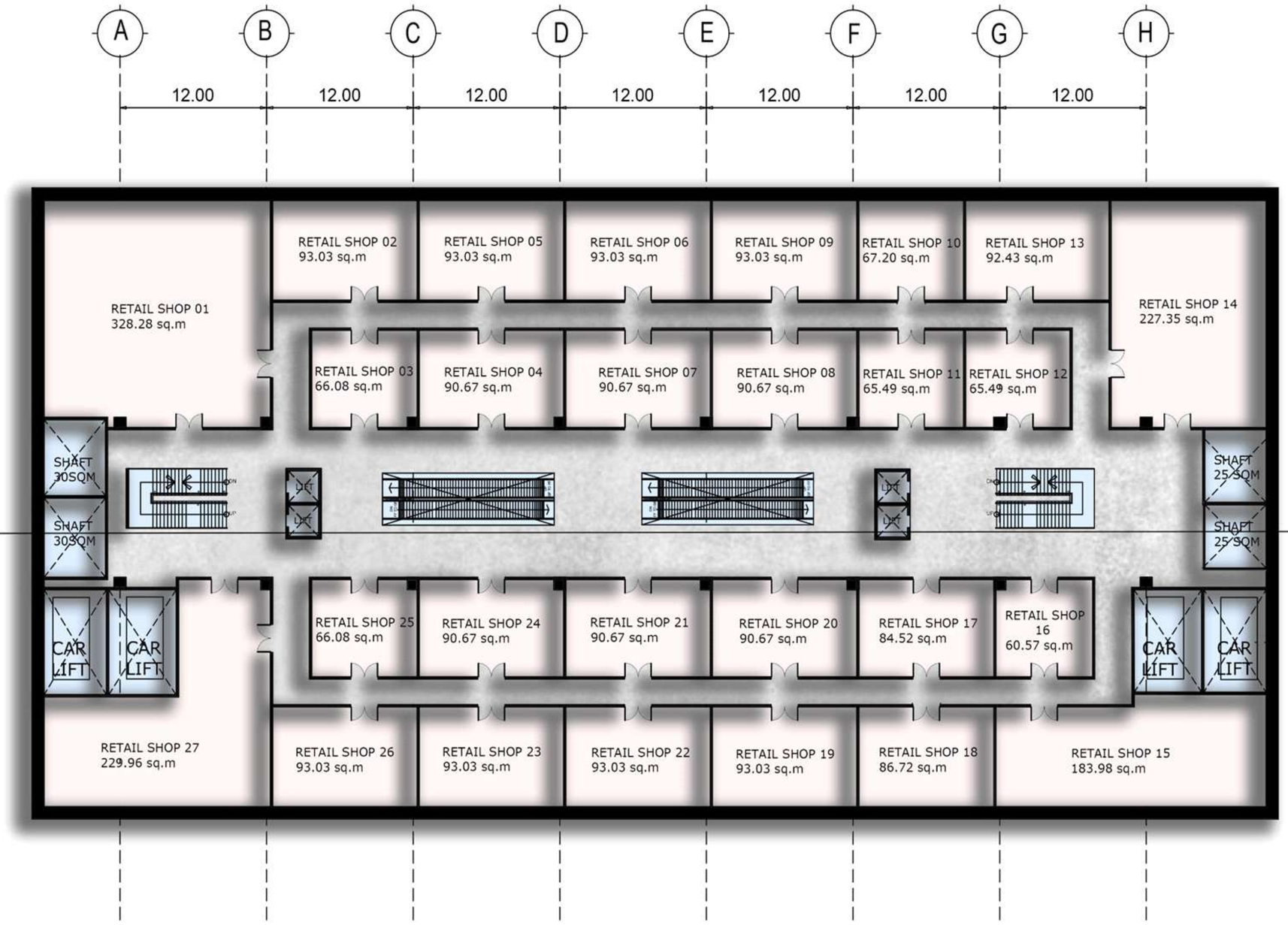
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Drawing Title	SHAFT TYPICAL FLOOR PLANS – PODIUM GROUND LEVEL FLOOR PLAN
Drawing No.	



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04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

FINAL DETAILED PROJECT REPORT

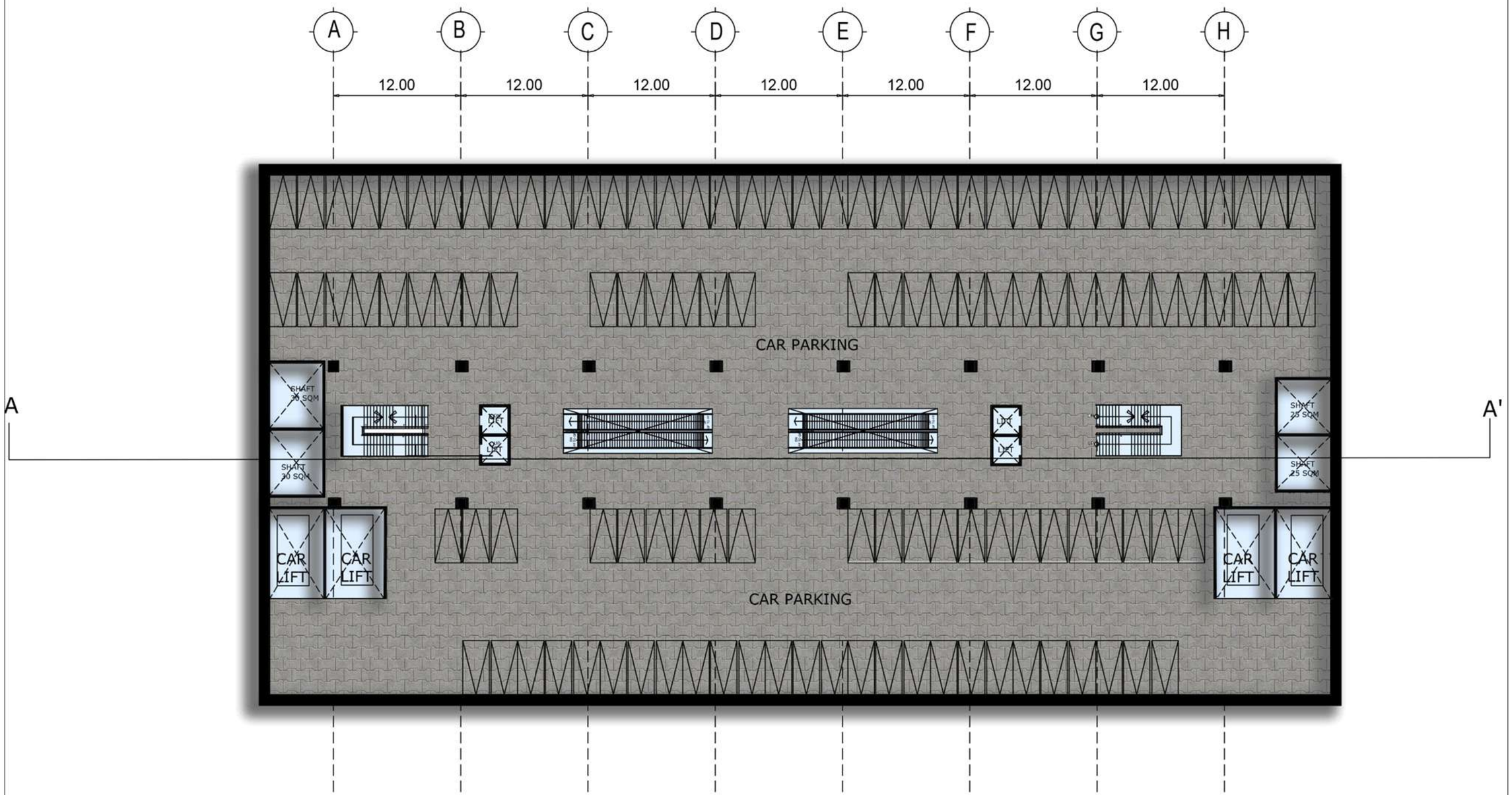
(Package 1 : Km 0.000 to km 8.748 of North South Corridor connecting Hebbal to Silk Board.)

Designed:	RR	
Drawn:	SS	
Checked:	AT	
Approved:	HRY	

Scale :- AS SHOWN

Sheet size: A2

Project	Construction of twin tube Underground Vehicular Tunnel (3-lane Configuration each) from Hebbal near Esteem Mall junction (Km. 0+000) to Shesadri Road, freedom park (Km 8.748) of North South Corridor including launching and retrieval shaft (at Km 1+375 and Km 5+050), entry exit ramps at Hebbal (Km 0+000) and ORR, entry and Entry & exit ramps at CV Raman Road and Jaymahal road.
Drawing Title	SHAFT TYPICAL FLOOR PLANS – LEVEL 1 AND 2 FLOOR PLANS – RETAIL SHOPS
Drawing No.	



REVISION	DATE	AMENDMENT \ ISSUE DESCRIPTION
R0	Jan.:- 2025	-

CLIENT

GOVERNMENT OF KARNATAKA

Bruhat Bangalore Mahanagara Palike

AE/Infra Div.-RI,BBMP	
AEE/Infra Div.-RI,BBMP	
EE/Infra Div.-RI,BBMP	
EIC- BBMP	

CONSULTANT:

RODIC CONSULTANTS PVT. LTD.
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

GEOCONSULT INDIA PRIVATE LIMITED
04B106 WeWork, Platina Tower MG Road Near Sikanderpur Metro Station Sector 28, Gurugram Haryana INDIA

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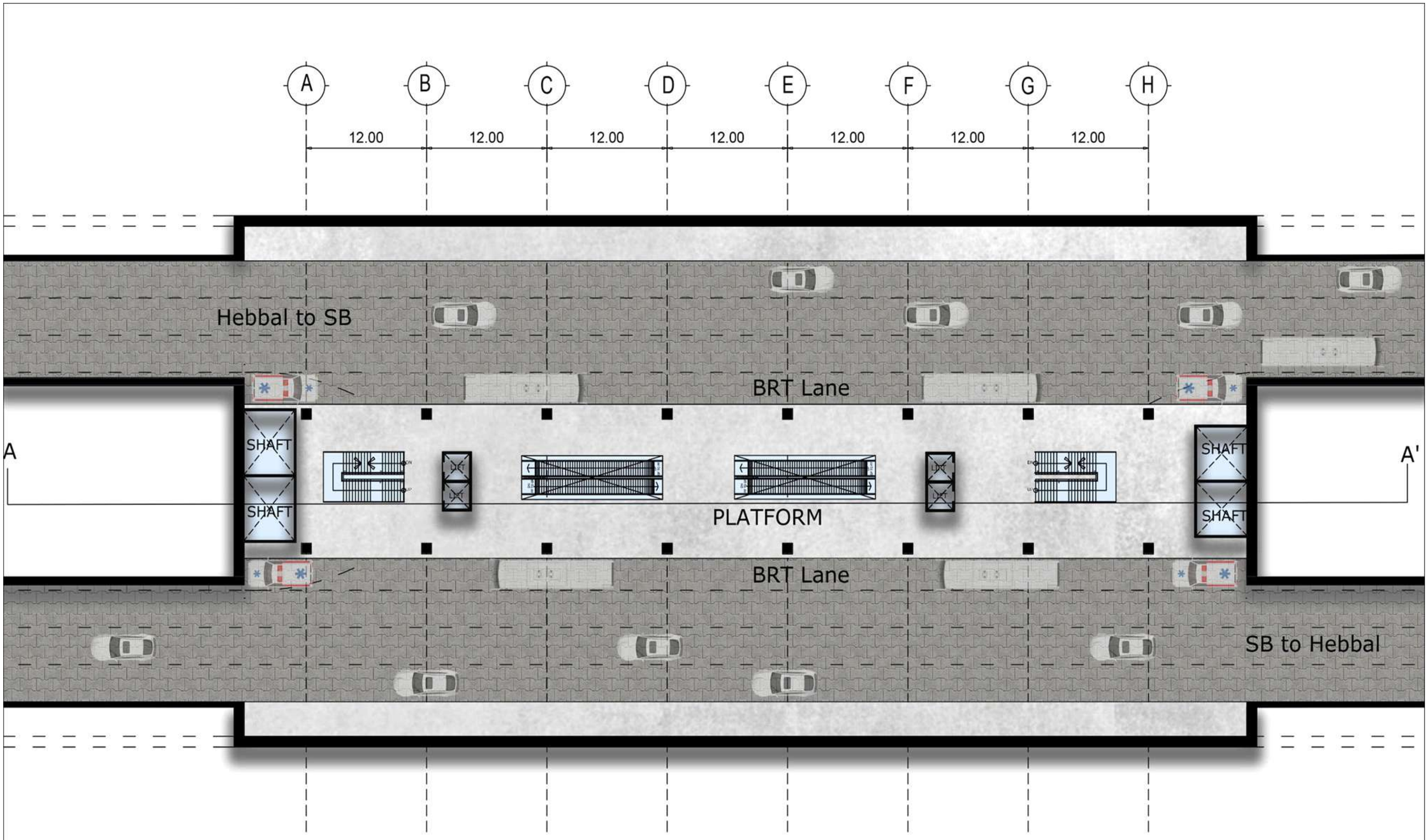
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Drawing Title: SHAFT TYPICAL FLOOR PLANS – LEVEL 3 FLOOR PLAN – MLCP (PARKING)

Drawing No.



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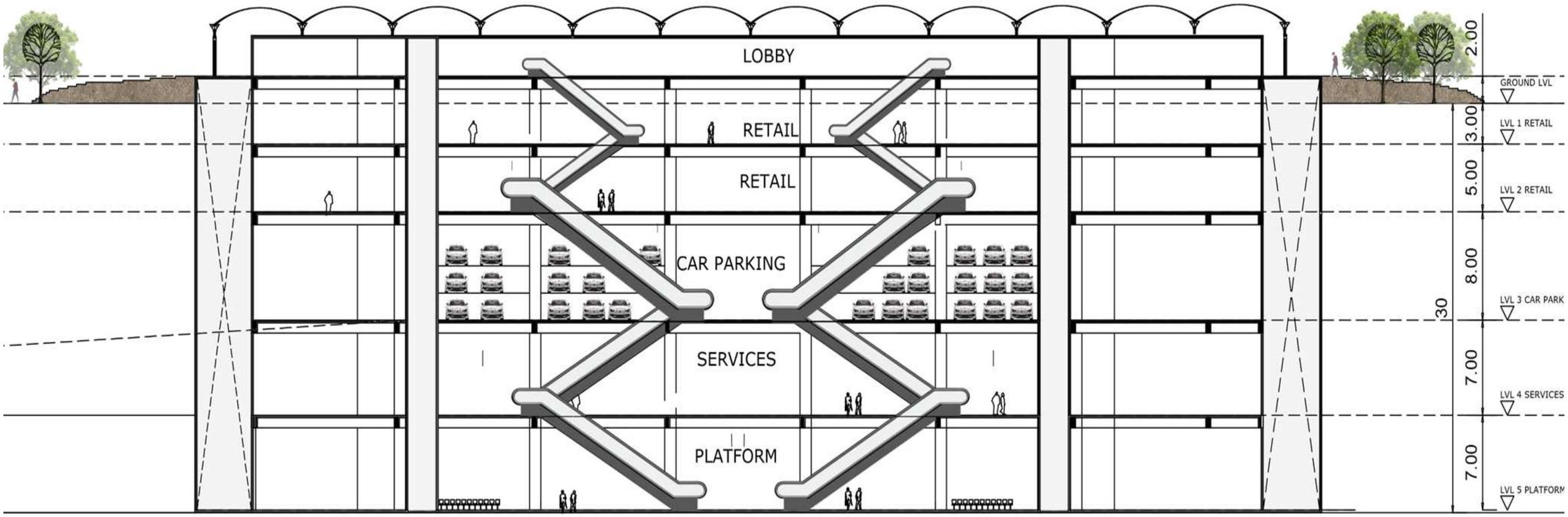
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Drawing Title	SHAFT TYPICAL FLOOR PLANS – LEVEL 5 FLOOR PLAN – TUNNEL PLATFORM
Drawing No.	



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Drawing Title: SHAFT TYPICAL SECTION

Drawing No.



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