

The detailed feasibility study of proposed tunnel has been outsourced through the firm Yogma Engineering Co. Ltd, Korea in Joint Venture with the Indian firm feedback Infra Private Ltd, Gurgaon (India). The firm has carried out detailed feasibility study of four options to access the geotechnical viability of the project., Accordingly the option No 03 has finally been found most suitable meeting all the geotechnical parameters and hence accepted by the department. A plan showing all the four options is enclosed for ready reference.

The finally accepted option No. 03 for the construction of the proposed tunnel stands out in technical compression with the rest of three proposals in terms of vertical gradient, accessibility to the tunnel portals and economy in costs of construction including the whole life costs in operation, ventilation, lighting and maintenance of the tunnel.

### 7.6 STUDY OF VENTILATION CAPACITY FOR OPTIONS

4 options were studied and the option no. 3 was chosen as the best one by BRO. The details are:

Table 7-6: Proposed Options based on Ventilation

		Option 1	Option 2	Option 3	Option 4
Tunnel data	Slope (%)	0.4 - 3.4	0.5 - 1.5	1.94	2.04
	Average altitude (m)	679	684	678	671
Required amount of ventilation By pollutant	Smoke (m <sup>3</sup> /s)	90	77	81	58
	CO (m <sup>3</sup> /s)	176	163	152	110
	NO <sub>x</sub> (m <sup>3</sup> /s)	67	52	69	51
	Application (m <sup>3</sup> /s)	176	163	152	110
Recommendations		Not Recommended	Not Recommended	Recommended by BRO	Not Recommended

Figure 7-1: Proposed Options based on Ventilation

