Cassiar Connector Project: Tunnel and Tunnel Systems

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Abstract:
The focal point of Vancouver's Cassiar Connector project is a 724 metre long, four-lane tunnel which eliminates at-grade intersections of the Trans Canada Highway and the city street system, and improves traffic flow to and from the Second Narrows Bridge.

The cut-and-cover structure is designed as a double concrete arch with two lanes per "tube" and shoulders that are wide enough to ultimately accommodate two additional lanes. At the south end, the tunnel and collector roads make up a four span structure, taking Adanac Street over the top of the tunnel. At Hastings Street, the principal street crossing over the tunnel, a small tunnel adjoining the main structure provides a future transit loop.

The longitudinal ventilation system, specially suited to tunnels of this length, incorporates pairs of jet fans hanging from the tunnel roof at regular intervals. A fully-automatic control system operates on the basis of time of day, traffic count and carbon monoxide levels, activating fans as necessary.

Tunnel illumination uses a combination of counterbeam and normal high pressure sodium lighting, Lights are more closely spaced at the tunnel entrances than in the centre to allow drivers' eyes to adjust to the conditions inside the tunnel.

Safety features include escape doors between "tubes" for use during fire or emergency, SOS boxes at every escape door, radio communication and continuous closed circuit TV monitoring. Smoke detectors are built into the ceiling, and fire mains suspended from the roof provide water to fire department connections in the SOS boxes. Loop detectors count traffic and indicate stalls.

The control building, situated above the tunnel, contains all electrical and controls equipment. Sample information is relayed directly to the Ministry of Transportation and Highways Burnaby Control Centre.

Keywords: Tunnel Structure; Tunnel Section Construction; System Integration; Systems Installation; Finishes; Model Testing; Achievements; Team.