

Washington Park Light Rail
Train Station Structural
Monitoring System
Portland, Oregon

Client:

Tri-County Metropolitan Transportation District

The Washington Park Station is a key element of the Tri-County Metropolitan Transportation District's (Tri-Met's) Westside Light Rail Transit System in Portland, Oregon. The Station platforms are located 260 feet below the ground surface, with sole access provided through two 31 foot diameter concrete-lined vertical shafts. Within these shafts are high-speed elevators for transferring passengers between the surface and the Station, fixed stairways, ventilation ducts, electric power conduits, signal and communication system conduits, and a fire suppression standpipe system. The lower 180 feet of each of the shafts is constructed in bedrock and the upper portions are within a large ancient landslide.

Design criteria were established for the amount of creep movement that could be tolerated within the station before remedial work would be required. With these design criteria, both Tri-Met and the City of Portland Building Department considered it essential to adopt a long-term monitoring program. To achieve the long-term performance monitoring objectives, a monitoring system was designed and installed. The system provides real-time monitoring of the elevator shaft movements, and the movements and ground water conditions within the landslide.



The monitoring system consists of:
1) instrumentation located at the slip joints within the shaft structures and in the landslide mass near the Station, 2) both manual and automated data acquisition for monitoring the instrumentation, and 3) an integrated warning system and associated response plan if detected movements exceed predetermined threshold levels.

