

7.0 RETAINING WALL GROUND ANCHORS

7.1 Context

Retaining walls are required in the vicinity of the Muttart Stop and along the portal access road and, at these two locations, ground anchors are among the options available to Project Co for retaining wall stabilization. The areas where anchors may potentially be used and the potential subsurface extent are coarsely shown in (Figure 2.1b and 2.1c). Anchors would be installed by drilling into adjacent lands and will extend down and away from the wall through the subsurface at an angle. There would be no surface disturbance in the lands shown in yellow stippling outside the Project Area and anchor use will be limited to lands owned by the City.

7.2 Assessment Methods

Valued Ecosystem Components

Considering that the need for retaining walls and some form of support was identified in the 2013 EISA, and the limited activities that are required in support of the installation of ground anchors, VECs selected for this project component are few (Table 7.1).

Study Area

The study areas, for this assessment are shown in yellow in Figure 2.1b and 2.1c. As surface disturbance is not involved, no field investigations were required.

Table 7.1. Justification for the selection of VECs – Retaining wall ground anchors

Valued Environmental Components	Potential for Additional or Unique Issues ¹	Relative Abundance or Status	Public Concern	Professional Concern	Economic Importance	Regulatory Concern	Relevant Legislation/Bylaw/Policy
Valued Ecosystem Components							
Geology/Geomorphology	Yes			✓		✓	• Bylaw 7188
Soils	No						
Hydrology Surface Water/ Groundwater	No						
Fish and Fish Habitat	No						
Vegetation	No						
Wildlife	No						
Habitat Connectivity	No						
Valued Socio-economic Components							
Land Disposition and Land Use Zoning	No						
Residential Land Use	Yes			✓		✓	• Bylaw 7188
Recreational Land Use	No						
Utilities	No						
Worker and Public Safety	No						
Visual Resources	No						
Valued Historic Components							
Historical Resources	No						

¹ In instances where it was determined that no potential existed for additional or unique issues to arise, no further consideration to that VEC was given

7.3 Key Issues

Key issues were identified by: 1) examining the project component location, known conditions and potential project activities; 2) considering concerns raised by the public and city services departments; and 3) applying professional judgement. Following are the key issues identified in association with retaining wall ground anchors:

- Will subsurface works adversely impact slope stability?
- Will local residents be adversely affected by anchor installation?

7.4 Existing Conditions

7.4.1 Geomorphology and Geotechnical Stability

As this part of the river valley has a history of slope instability and fill placement, any subsurface works should be premised with geotechnical investigations to ensure local and global slope stability and retaining wall integrity. Thurber Engineering has indicated that for ground anchors to be effective, they should be installed into competent soil or bedrock beyond any potential slip surfaces. No site-specific studies have been undertaken to date but these are planned.

7.4.2 Residential Land Use

There are no residences in the immediate vicinity of the retaining walls expected to be installed at Muttart Stop. Several Riverdale residences border LMRP in the vicinity of the walls anticipated to be installed along the portal access road and, in one point location, the private property boundary abuts the park boundary and the Project Area boundary, as reflected by the “notch” shown in the boundary in Figure 2.1b.

7.5 Potential Impacts and Mitigation Measures

7.5.1 Geomorphology and Geotechnical Stability

Prior to the installation of the retaining walls Project Co will undertake a detailed site-specific geotechnical investigation and assessment for retaining walls and associated support methods, this will include an analysis of ground anchor installation if they wish to use them. The report will be submitted to the City for approval and all approved recommendations will be implemented.

7.5.2 Residential Land Use

7.5.2.1 Impacts to Local Residents during Construction Activities

Impacts and Mitigation Measures

Several Riverdale residences bordering east LMRP are situated immediately upslope from the planned retaining wall and potentially associated ground anchors. Anchor installation will respect private property boundaries and the Project Agreement will restrict anchors to beneath City-owned lands. Anchor installation can be achieved using several techniques, at least one of which, pounding, can be a significant, temporary source of noise. To reduce potential for noise disturbance to local residents at both locations, the Project Agreement will specify installation by drilling. Drilling is not anticipated to generate noise levels more noticeable than the general construction activities. Based on these considerations, ground anchors are not anticipated to worsen impacts on residents or residences any more than general construction noise will.

7.6 Summary Assessment

7.6.1 Summary of Residual Impacts

This assessment identified no residual impacts or outstanding issues.

7.6.2 *Monitoring Requirements*

No monitoring requirements unique to this project component will be required. Monitoring requirements specific to noise and general construction activities are already defined in the general Project Agreement.

7.6.3 *Resolution of Key Environmental Issues*

The following are brief answers to the questions initially posed for this project component

Will ground anchors adversely impact slope stability?

No. Project Co will undertake geotechnical investigations prior to retaining wall installation and will only install ground anchors if they will be effective and will have no adverse impact on slope stability.

Will local residents be adversely affected by anchor installation?

Unlikely. Construction activities will be undertaken in accordance with the *Community Standards Bylaw* and to reduce potential for noise disturbance to local residents, the Project Agreement will specify ground anchor installation by drilling at both locations. Drilling is not anticipated to generate noise levels more noticeable than that from general construction activities. Anchors will not extend underneath privately-held lands.