CHAPTER G11

EARTHWORK

PERFORMANCE

A. Basic Function:

1. Modify the Site grades and soils as required for construction of the Project and the integration of the Project with adjacent grades, streets, structures, sidewalks and trails, for proper functioning of the Project, and as indicated in the 50% Schematic Plans and Conceptual Documents.

2. Earthwork for the Pedestrian Landbridge and any other Project elements over the Triangle Garage or other structures shall meet the requirements of Chapter C Bridges and Structures.

3. Design and grade earthwork to comply with applicable compaction, load bearing and other earthwork requirements of City of Seattle code and University soil compaction standards for all Project elements.

4. Stockpile and protect onsite soils in compliance with the requirements of the City of Seattle Stormwater, Grading and Drainage Control Code.

5. Excavation spoils, when they meet the appropriate fill criteria, may be used to fill the depressed roadway within the Rainier Vista axis north of NE Pacific Pl. to establish subgrades.
   a. At Design-Builders option, an agreement may be made with the Sound Transit U250 contractor to have that contractor deposit suitable fill from the station excavation to the Rainier Vista project. Sound Transit and the University are committed to assist in these negotiations to obtain a cost effective solution for all parties.
   b. Dispose of spoils in excess of unsuitable for fill criteria in a legal manner.

6. Where earthwork elements also must function as elements defined within another element group, meet the requirements of both element groups.

7. In addition to the requirements of this Chapter, comply with all applicable requirements as defined elsewhere in this document.

B. Design Criteria:

1. Retaining Walls: Design retaining walls to permanently resist soil and water pressure, as well as live loads.

2. Subgrade: Design subgrades to match loading requirements of final surfaces.

3. Back fill: Material used in filling shall be approved by a Licensed Geotechnical Engineer and be appropriate to the site and the intended use of that portion of the Site.

4. Native onsite soil for use as backfill shall be free of organics, debris and other deleterious material and shall meet the requirements for Common Borrow in accordance with WSDOT Standard Specification section 9-03.14(3).
   a. Native onsite material is not suitable for Structural Fill, but may be used for common fill, providing it can be properly worked and compacted.
   b. The Design-Builders may coordinate with Sound Transit link light rail tunneling project for use of native material to be used as common fill.

C. Personnel Requirements:

1. The Design-Builders shall provide a Geotechnical Engineer licensed under Title 18 RCW, who
shall be in responsible charge of all earthwork design elements of the Project.

D. Durability:

1. Erosion Resistance: Comply with the requirements of Chapter G1 Site Preparation and Chapter G12 TESC.

E. Operation and Maintenance:

1. Ease of Maintenance:
   a. Design and construct earthwork elements so that they are permanent, not requiring periodic maintenance to maintain stability or appearance.

F. Substantiation:

1. The Design-Builder shall submit the following documents for verification of products used on site:
   a. Gradation and moisture-density relation test results for each type of fill and backfill material at least 10 working days prior to their delivery at the Site. Test results shall demonstrate that materials meet the City of Seattle and University criteria.
   b. Samples of materials proposed for use as fill or backfill and the source location of each material.
   c. Field compaction test results.
   d. Documentation regarding location of disposal site for excavated spoils, for acceptance by the University, prior to site grading activities.
2. The Design-Builder shall maintain construction and inspection records in order to ascertain that the work is accomplished in accordance with the terms and in the manner proposed on the approved plans and otherwise in accordance with the requirements of the Contract documents.

METHODS OF CONSTRUCTION

A. All earthwork (whether performed by the Design-Builder or by the Utility Purveyor) shall comply with all applicable federal, state and local rules and regulations and any applicable permits or franchises, in addition to the standards provided below. The Design-Builder’s performance of the Work shall comply with all applicable requirements of the Contract Documents.

B. Construct using the then-current edition of all the following practices and procedures:

2. City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction.
3. Construction involving University utilities will be coordinated with the University and constructed using guidelines found in the Facilities Services Design Guide.
4. Other construction standards of Utility Purveyors encountered within or adjacent to the Site.

C. Areas of the Site over the Triangle Garage or other structures:

1. Methods of construction of earthwork for the Pedestrian Bridge and any other Project elements over the Triangle Garage or other structures shall meet the requirements of Chapter C – Bridges and Structures.
D. All other areas of the Site:
   1. Changing of Grade Levels:
      a. Use one or more of the following methods:
         1) Grading.
         2) Removal of excess soil from Site.
   2. Excavation:
      a. Use one or more of the following methods:
         1) Machine excavation.
         2) Hand excavation.
         3) Caissons.
         4) Dredging.
         5) Tunneling or boring.
   3. Excavation Support and Protection:
      a. Driven piles, sheet piles and similar construction methods causing vibration are not permitted unless otherwise allowed by the University.

E. The Design-Builder shall obtain all governmental approvals and other clearances, permits, approvals and agreements necessary for earthwork and shall verify that the same have been obtained prior to commencing or permitting the commencement of any construction affected thereby. The Design-Builder shall verify that the Work performed (whether by the Design-Builder or by or on behalf of the Utility Purveyor) complies with the requirements of such governmental approvals and other clearances, permits, approvals and agreements.

F. Construct Impacting Utilities:
   1. The Design-Builder shall perform all Work that will impact Utilities, and shall support, secure, and exercise care with respect to Utilities to avoid damage to them. The Design-Builder shall ensure continuity of all existing Utility services to all users except when the Utility Purveyor determines that temporary interruption is necessary and acceptable.
   
   2. The Design-Builder shall comply with all applicable governmental rules relating to grading or excavation in the area of underground Utilities. Before starting construction that may affect any Utilities in a particular area (whether underground or overhead), the Design-Builder shall notify the affected Utility Purveyors in writing at least 30 Calendar Days prior to the start of the work. It is the responsibility of the Design-Builder to contact the Utility One-Call Locate Center at 1-800-424-5555 prior to performing any excavation. The Design-Builder is responsible for maintaining all appropriate clearances and setbacks from active power lines per SCL Construction Guidelines.

   3. If any Utilities are damaged by Design-Builder activities, the Design-Builder shall immediately notify the affected Utility Purveyor, the Utility One-Call Locate Center, and University. The Design-Builder shall bear all costs associated with damage caused by the Design-Builder, including Utility downtime, all reconstruction, all remediation of hazards, litigation, loss of product, Utility start up, and delay costs. At the Utility Purveyor’s request, the Design-Builder shall repair the damage; or the Utility Purveyor may choose to repair the damage at the Design-Builder’s expense. All repairs by the Design-Builder shall be performed to the reasonable satisfaction of the Utility Purveyor. The Design-Builder shall pay any reimbursement due pursuant to this paragraph within 30 Calendar Days after receipt of the Utility Purveyor’s invoice.
therefore, unless otherwise provided in an applicable relocation agreement.

G. The Design-Builder shall perform all inspection, sampling, and testing of the soils.

2. Test each fill and backfill lift at a minimum rate of one per 2,500 square feet of rough graded area, one per 1,000 square feet of structural fill area or foundation areas, one per 200 lineal feet of utility trench, one per 100 linear feet of channel, a minimum of two tests per lift along MSE Walls under 200 linear feet, and a minimum of four tests per lift along MSE Walls over 200 linear feet, unless otherwise specified or agreed to by the University.

   a. Tests shall consist of:

      1) Moisture content - ASTM D 2216.

      2) Gradation - ASTM D 422 and ASTM C 136, as required to verify compliance with material specifications.

      3) In-place density and moisture content - ASTM D 2922 and ASTM D 3017.

      4) Moisture-density relationships - ASTM D 1557 every 2000 CY or when material changes, whichever occurs first.

   b. The frequency of tests shown above shall govern the actual quantity of tests. Any retesting that is required because the initial test showed that Work did not comply with the Contract Documents shall be provided and paid for at the Design-Builder’s sole expense.

END OF CHAPTER G11