

Basis of Design

This section applies to the design and installation of foundations including piling.

Design Criteria

- Base foundation design on the recommendations in the Geotechnical Engineering Report.
- Neither Owner nor Consultant shall be responsible for the interpretation drawn by the Contractor from any subsurface information received from the Owner or Consultant.
- Structures located on the Montlake Landfill that are supported on piling need to have the piling extend down to the underlying firm clay layer in order to avoid additional loading on the refuse and peat.
- It shall be the Contractor's responsibility to satisfy themselves regarding subsurface conditions and to install piles into the bearing stratum.
- Driven piles are not recommended because of noise and vibration issues.
- In regards to pile installation; an "Obstruction" shall be defined as rocks or logs over 24 inches in diameter. Owner will only be responsible for additional costs if obstruction is greater than 24" in any direction.
- Augercast and pin piles shall meet the requirements found in the most current applicable Seattle Department of Planning and Development (DPD) Director's Rule. This requirement applies to all UW properties.
- Controlled Density Fill is acceptable for backfilling over-excavation with the approval of the Geotechnical Engineer.

Design Evaluation

- Schematic Design Phase: Plan showing type of foundation.
- Design Development Phase: Plan showing foundations, piling and typical sections. Draft specifications.
- Contract Document Phase: All information required for the installation of foundations and piling. Final specifications.

Construction Submittals

- Product data: For each type of material indicated
- Require that a detailed sequence and procedure for construction of piling be submitted to the Engineer of Record for review 21 days prior to any pile installation.

Quality Assurance

- Testing and inspection services will be provided by the Owner. The Contractor shall cooperate and provide access and samples when requested by the Owner.
- See Concrete section for material inspection.

Related Sections

- Facilities Services Design Guide - General Requirements
- Facilities Services Design Guide - Shoring
- Facilities Services Design Guide - Slab on Grade
- Facilities Services Design Guide - Sub-Grade Walls
- Facilities Services Design Guide - Concrete

Products, Material and Equipment

- See Facilities Services Design Guide - Concrete.
- Minimum concrete strength for augercast piles and drilled piers is 5000 psi.
- Timber piles shall be Douglas Fir treated with Creosote to a minimum net retention of 17 PCF.

Installation, Fabrication and Construction

- In general, comply with industry standard practice.
- Provide suitable spacers at least one set every 6 feet in concrete piles or piers.
- Place augercast piling by rotating a continuous flight-hollow-shaft auger into the ground to a predetermined depth. Place reinforcing while mortar is still fluid.
- Locate pile centers to an accuracy of ± 3 inches and plumb within 2%. Place augercast piles no closer than 4 feet center-to-center until the grout in the previously poured pile has set for 12 hours.
- Place augercast pile high strength grout during auger withdrawal under sufficient pressure to fill the hole and prevent hole collapse, and to cause the lateral penetration of the grout into soft or porous zones of the surrounding soil. Provide a head of at least several feet of grout above the injection point around the perimeter of the auger flighting at all times during the raising of the auger so that the grout has a displacing action, removing any loose materials from the hole.
- Provide a calibrated pressure gage on the augercast pile grout pump, in clear view of the operator, and maintain at all times, a positive pressure (approximately 2.5 times the ground water pressure). The minimum volume of grout placed in the hole shall be at least 10% greater than the net volume of the augered hole. The amount of grout placed shall be determined by attaching a counter to a displacement-type pump to record the number of strokes.
- Submit drilling logs for each augercast pile. Include identification mark, shaft diameter, bottom elevation, top elevation, nature and location of obstructions, water conditions during drilling, and grout placement.
- Contractor shall provide temporary casing for drilled piers where required due to field conditions including groundwater and caving.

- Concrete placed into drilled piers shall be conveyed in a manner to prevent separation or loss of materials. In no case shall the concrete be allowed to freefall more than 5 feet. Tremie concrete where required.
- Temporary foundations, such as for tower cranes, that are outside the footprint of the building need to be removed.

END OF DESIGN GUIDE SECTION