

## ***FOUNDATIONS, BELOW-GRADE CONSTRUCTION***

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**Water Table:** Since much of campus frequently experiences a very high water table, extra attention shall be given to the need for waterproof sub-grade structures as well as for dewatering / water protection during the construction process.

**Excavations:** During the design phases, the PSC shall indicate on the structural or civil drawings, the anticipated limits affected by the required excavation. The PSC shall also identify if the anticipated excavations will undermine adjacent buildings, utilities, or pavements.

If an excavation is identified to infringe upon or necessitate the use of the adjacent non-university property, the PSC shall notify the University's Project Manager early in the project or no later than mid-way through 50% CD's. The University will need to negotiate terms and obtain a license to use the property prior to bidding.

If an excavation is identified to infringe upon or necessitate the use of the adjacent municipal or state right-of-way, the PSC shall notify the University's Project Manager early in the project or no later than mid-way through 50% CD's. The University and PSC will to need seek comments and requirements to add to the construction documents.

**Basement Footprint:** The basement of a building shall not extend horizontally beyond the ground level "footprint" of the building. Basements that extend beyond the building footprint are vulnerable to overhead leaks. The overhead waterproofing system required for this type of construction is extremely difficult to maintain over time.

**Foundations:** shall be cast in place concrete with reinforcing to minimize the likelihood of temperature and shrinkage cracks in the wall.

Reinforcing shall be sized and detailed to consider adjacent live loads from parking and driveways.

**Waterproofing:** All sub-grade structures shall be thoroughly waterproofed, not merely "dampproofed". In addition to being defined

in the specifications, waterproofing, especially that located at elevator pits, shall be shown and called out on the structural drawings and the architectural drawings.

Waterproofing may be liquid applied rubberized asphalt, peel and stick bituminous sheets, or bentonite sheets as appropriate for the specific conditions. In all cases, waterproofing shall be on the positive side, not the negative side. All foundation waterproofing shall incorporate a drainage board and filter fabric.

All slabs that are poured on grade shall have, at a minimum, a durable vapor retarder under the slab. Where soil borings indicate the presence of high ground water, waterproofing shall be provided beneath the slab. In said situations, details shall be provided in the construction documents showing the interface between vertical and horizontal waterproofing.

All cold joints between floors, footings and walls shall be keyed and shall have PVC waterstop installed.

**Footing Tile:** A continuous run of perforated footing drain tile piping with appropriate granular surrounding backfill shall be installed around the entire exterior perimeter of each sub-grade structure. Ground water shall drain by gravity (preferably) or shall be pumped from this system into a storm sewer system. This piping system shall not be directly connected to any interior sub-grade drainage system.