

**SECTION 2**  
**DIVISION 31**  
**EARTHWORK**

## **DIVISION 31 - EARTHWORK**

**Note: This is a guide for Designers only. Contents shall not be used in lieu of specifications as part of the Designer’s contract documents.**

### **PRIMARY GUIDANCE**

1.1 Existing Topography:

- A. All new project site plans shall be developed from a new topographical map developed specifically for that project; not from “record document” information or previous project grading plans. Surveys will be conducted by a North Carolina professional land surveyor. Accurate information is essential and “special” conditions such as asbestos, lead paint, underground tank leaks, etc, shall be addressed.

### **SUBSURFACE EXPLORATION**

1.2 Designer Responsibilities:

- A. Designer shall direct a soils exploration program (see N.C. Construction Manual, Section 204.1.c) as judged necessary in consultation with the University. The Designer shall contact the UPM and submit a Request for Proposals for soils exploration. UPM will provide names of pre-qualified testing companies. This will include investigative work and surveyor reports, laboratory tests (incl. test borings), soil analysis (incl. load bearing capabilities), and related site analysis. The designer shall study plans of existing underground utilities and shall locate borings to avoid these utilities. Bored holes are to be backfilled, finish graded, and seeded. Submit six copies of the site exploration report to the University.
  - 1. Information To Be Included In Contract Documents:
    - a. Show all boring locations, cross sections, and soil conditions. Also, show all existing conduits, drains, utility lines, sewers, tunnels, cables, trees, paving, walks, foundations, and other objects or obstructions, whether used or abandoned. Facilities Management will assist with identifying existing conditions and will provide drawings as available. Clearly indicate the project boundary.

### **SECTION 31 1000 – SITE CLEARANCE**

#### **PART 1 - EXECUTION**

1.1 Clearing:

- A. Organic material scheduled for demolition shall be stripped. Contractor will provide option to the UPM for the re-use of this material. Debris not wanted by the university shall be promptly removed from University property.

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**PART 1 - GENERAL**

**1.1 ALLOWANCES**

- A. Rock removal allowances shall be realistic estimates based on the subsurface exploration data. Designer is responsible for coordinating the number and locations of soil borings with the UPM to ensure sufficient geotechnical data is available (see Appendix).

**PART 2 - PRODUCTS**

**PART 3 - EXECUTION**

**3.1 EXCAVATION FOR STRUCTURES**

Excavations shall not be permitted which undermine the integrity of adjacent structures, paving, or utilities.

**3.2 BACKFILL**

- A. Backfill material shall be free of debris.
- B. Foundation backfill under planting beds and lawn: The upper 2 feet of soil below finish grade – 90% maximum. Remainder of backfill – 95% if depth is less than 10 feet; - 100% if depth exceeds 10 feet.
- C. Under lawn and planting areas not adjacent to structures: The upper one foot of soil below finish grade – 90% maximum. Remainder – 95%.

**3.3 GRADING**

- A. Maintain existing grade inside drip line of trees to be saved. Do not allow open excavations adjacent to trees for longer than two days to prevent soil moisture reduction.
- B. Finish Grading:
  - 1. Slopes shall be flat enough to allow mowing (generally 1:3 or less); steeper slopes will be permitted only in areas where maintenance-free erosion control (groundcover planting, rip-rap, etc.) is planned. All areas disturbed by construction operations and not covered by building, paving, etc. shall be fine graded and seeded.

**3.4 COMPACTION**

- A. Soil Compaction Control:
  - 1. Compaction control shall be provided for all fill, backfill, and embankments both inside and outside the perimeter of the structure. Field compaction tests and related laboratory analysis shall be performed by a qualified independent laboratory (conforming to ASTM standards), under the supervision of a registered professional engineer specializing in geotechnical engineering. Soils proposed for fill, backfill, and embankments shall be analyzed by the geotechnical engineer to determine acceptability; no soil shall be placed until approved by the geotechnical engineer. A representative of the testing laboratory shall provide inspection during placement and compaction operations; tests shall be made in quantity that will assure uniform compaction and density of each course or lift of fill.

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2. Outside of structures: Extreme care shall be taken to obtain proper compaction in areas which abut walls, curbs, adjacent slabs, and other structures where use of mechanical compactors is difficult.

3.5 FIELD QUALITY CONTROL

- A. The University solicits proposals for the testing laboratory. The designer will provide the UPM with a scope of services for the Materials testing contract. Note that this construction materials testing program is different from the soils exploration program.

**SECTION 31 6000 – PILE FOUNDATIONS**

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

- A. Before a decision to use pile foundations, the designer shall make a thorough examination of structures and occupancies and equipment adjacent to the site to determine what effect vibratory forces will have. Wood piles are prohibited.
- B. The designer shall devise tests of pile foundations and provide full time inspection of pile driving and caisson construction to assure conformance with the drawings and specifications.