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Department of Administration
State Construction Office

SITE PREPARATION AND GRADING CRITERIA

INTRODUCTION

These criteria are established to provide uniform construction practices and method to cover contingencies associated with the unknowns of subsurface conditions. Construction documents must be prepared in a manner to establish directives that minimize post-construction negotiations on normal construction projects.

To clarify the intent of these criteria, “Designer” will be defined as the registered professional entity or its representative responsible by contract to the State Government for the design of a state project. “Contractor” will be defined as the legal entity or its representative responsible by contract to the State Government for the construction of a state project.

Design and construction administration are the sole responsibility of the Designer. The physical construction of the project is the sole responsibility of the Contractor.

CONSTRUCTION DOCUMENT DIRECTIVES

A. State a concise, clear definition of the Contractor’s responsibilities for the construction.

B. Specify a complete extent of contract work established by professional evaluation and study of conditions relative to construction of the project. The information is to be presented in a form that shall be used by contractors for preparation of bids for the construction.

C. The geotechnical report contains recommendations that are intended to be for use by the Designer. The Designer is to incorporate those recommendations that he deems appropriate into the project specifications as specific directives. Direct specification or drawing note references to the geotechnical report (“See geotechnical report for earthwork requirements”, etc.) are <u>not acceptable</u>. The geotechnical report shall be included, in its entirety, in the project specification manual with a clear admonition that it is included for the Contractor’s information only.

SITE INVESTIGATION

A. The Designer, upon obtaining a design contract, shall observe the project sited conditions and existing site information (past site history) to establish the need for additional site information on surface and subsurface conditions.

B. Upon the Designer's conclusion relative the requirements for surveys, the Designer is to provide a request to the owning agency stating the extent of surveys, explorations, and investigations needed for the preparation of construction documents. After approval by the owning agency, the Designer shall solicit letters of interest for these services. Following Qualification Based Selection procedures, the Designer and owning agency shall select an appropriate firm for each survey, exploration, or investigation. The owning agency will contract with the selected firms for these services, unless the Designer wishes to make the selected firm a part of the Design Team and contract directly with that firm.

C. A ground control survey shall include, but not be limited to, the establishment of property lines, existing structures, easements, rights-of-way, above & below ground utilities, vertical control with relative elevations, and horizontal control with relative coordinates. Necessary points shall be established and marked at the site to provide adequate construction control for the project (benchmarks, coordinate control points, baselines, etc.). The site survey and subsequent site plans shall depict any floodplain encroachment.

D. A subsurface exploration scope shall be established with input from the providing firm, the Designer, and the Designer's civil & structural consultants. The subsurface exploration shall consist of, but not be limited to, adequate soil boring s to establish subsurface criteria and site construction directives. The foundation report shall include a location of all soil tests and borings made, an establishment of soil classifications in accordance with the Unified Soil Classification System (ASTM D 2487), ground water conditions, soil compaction recommendations, soil support estimates with settlement projections from loads, and deep support system recommendations when required by engineering judgment. The Site Class, per NC Code Chapter 16 seismic provisions, shall be determined.

E. Presumptive Load-Bearing Values: Presumptive load-bearing values may be used only when the project configuration falls within *all* Chapter 18 NC Code limitations for use of such values. Additionally, the Designer is expected to adequately address project-specific settlement considerations.

ROCK EXCAVATION

A. Rock excavation shall be specified in a manner to be fair to the contractor and the owning agency. It is important to study the soil investigation report to establish the problems expected in the excavation and grading at the site.

B. When conditions indicate the possibility of rock excavation, provide a clear and concise definition of each type of rock excavation expected for the project. Rock types may include categories such as Mass Rock, Trench Rock, Caisson Rock, etc. It is important to provide definitions on a project-specific basis.

C. Specify a realistic quantity of rock material that must be included by the Contractor in the base bid for each type of rock excavation. The specifications and Forms of Proposal must be structured to accommodate the differing contractual arrangements that may result depending upon the award of the project contract under the Single-Prime or Multiple-Prime options.

D. The specifications are to be written to require the Contractor to expose and clean the rock material for inspection and measurement by the Designer. State that any material moved or removed will be considered earth excavation unless it is first measured and approved by the Designer. The Designer is to be the final judge as to what is classified as rock excavation.

E. The Designer may provide a method in the specifications that the Contractor may use to prove that material should be classified as rock excavation. The specifications may be written to allow the Contractor to provide a demonstration that, for example, the material cannot be ripped with a crawler tractor rated at a minimum of 50,000 pounds drawbar pull at one mile per hour, pulling a single-tooth ripper. Similarly, for Trench Rock, the Contractor may provide a demonstration that, for example, the material cannot be removed with a backhoe equipped with a minimum ½ cubic yard heavy-duty trenching bucket placed on a machine capable of a lifting capacity of 7,500 pounds at a trench depth of 10 feet. Such specifications should state that the Contractor may be required to provide the demonstration equipment's specification data verifying the minimum equipment ratings and that the equipment shall be in good repair and proper working condition. The Designer is cautioned that the above equipment specifications are for illustrative purposes only; project specifications should reflect the capabilities of common contemporary equipment.

UNSUITABLE SOIL MATERIAL

A. When the soil investigation report or engineering judgement based on site visit indicates unsuitable soil material may be encountered below design elevations, a reasonably estimated base bid quantity of unsuitable soil shall be stated in the specifications.

B. A unit price shall be solicited as the basis of adjustment of the final contact cost. The specifications must clearly indicate that the unit price includes the excavation of the unsuitable soil, the appropriate offsite disposal of the unsuitable material, its replacement

with satisfactory (per the project specifications) soil, and that replacement soil placed & compacted per the project specifications.

C. Evaluate the project site for its ability to furnish satisfactory replacement soil in quantities equaling and exceeding the estimated unsuitable soil quantities. Based on this evaluation, define the project's base bid quantities and unit price solicitations with regard to on-site or off-site borrow, or a combination thereof.

UNIT PRICES & BASE BID QUANTITIES OF ROCK OR UNSUITABLE SOIL

A. The State Construction Office stresses that realistic quantities (for unsuitable soil and each class of rock excavation and, if applicable, in each prime contract) must be explicitly defined for the base bids. These quantities should be stated only <u>once</u> within the contract documents.

B. Unit prices shall be solicited, for each class of rock or unsuitable soil, for the adjustment of the final contract compensation up or down, depending upon the quantity of such material actually encountered.

C. If a project site's history or the boring results suggest that base-bid quantity estimates are not likely to be accurate, the Forms of Proposal should include not only a base-bid amount of rock excavation and unit cost for removal of additional material in quantities close to the base-bid amount, but also should include unit cost solicitations for specifically defined ranges of rock removal quantities. Reiterate that compensation by means of these unit prices shall be the <u>only</u> compensation due the Contractor when additional rock is encountered.

ROCK EXCAVATION OR UNSUITABLE SOIL <u>NOT</u> ANTICIPATED

A. If, after study of the soil investigation report, rock excavation or unsuitable soil are not anticipated, then base bid quantities of such work are <u>not</u> defined in the construction documents.

B. Solicit unit prices for classes of rock excavation or unsuitable soil that reasonably might apply to the specific project. The Designer is reminded that, in absence of a base bid amount of rock or unsuitable soil, the solicited unit prices will be add-only unit prices. In other words, the price quotation will not be rationalized by the possibility that the Contractor might have to *credit* the owner with that unit price, as he might if encountered rock or unsuitable soil quantities were less than a defined base bid amount. It is therefore particularly important that the Designer thoughtfully evaluate the unit price quotations prior to recommending the award of the contract.

SITE DRAINAGE DIRECTIVES

A. The site drainage must be designed to carry runoff without erosion of soils on site and must not subject the facility to flooding at any time.

B. When an overland emergency flow route is provided that will not subject the facility to any flooding hazard, a storm return frequency of 10 years is to be used for basis of the design. If an emergency flow route is not provided, a storm return frequency of 100 years is to be used.

C. Building foundation drains shall have points of outfall explicitly shown the site drawings. Catchall phrases like “run to daylight” or “connect to nearest storm sewer” are not acceptable.