

SECTION 02220
SITE PREPARATION, EXCAVATION AND EARTHWORK FOR FOUNDATIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. All requirements of Division 0 and Division 1 forms a part of this section.
- A. A subsurface investigation and soils report have been completed for this project. All work in this section shall comply with the soils report.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with federal, state, local, and other duly constituted authorities in matters pertaining to:
 - 1. Permitting
 - 2. Disposal of and hauling of waste material
 - 3. Safety precautions
 - 4. Barricades
 - 5. Protection of environmental matters

1.03 SCOPE OF WORK

- A. Perform all work specified herein as indicated within the grading area, i.e., that area within which earth grades are shown to be approximately 5 feet outside building perimeter. Remainder of property is to be left undisturbed, except as otherwise authorized for such purposes as spoil or stock pile areas, temporary ditches, swales and/or haul or access roads, in which case such authorized areas become part of the grading area. This work includes, but is not limited to, the following:
 - 1. Clearing and grubbing of vegetation and debris of all kinds.
 - 2. Stripping.
 - 3. Excavating to grade and subgrades.
 - 4. Excavating and backfilling for foundations.
 - 5. Providing finish load-bearing subgrades for foundations.
 - 6. Disposal of removed materials.
 - 7. Dewatering.
 - 8. Laboratory testing.
- B. Related work not specified under this subdivision.
 - 1. Excavation of backfill for utilities.
 - 2. Finish grading.

1.04 GENERAL

- A. Contractor shall obtain a copy of the soils report for use with this section.

- B. The Contractor shall examine all drawings and the specifications, consulted the records of adjacent construction and of any existing utilities, and the connections, if any, and noted all conditions and limitations which may influence the work required by this Section.
- C. Where recommendations presented in the soils report conflict with this section, the soils report shall govern.

1.05 EXISTING STRUCTURES

- A. Care shall be exercised during excavation, backfilling, and compaction work to avoid damage to existing buildings or foundations.

1.06 PROTECTION

- A. Protect trees and dispose of all removed trees including stumps and roots.
- B. Protect benchmarks, existing structures, fences, sidewalks, paving, and curbs from equipment and vehicular traffic.
- C. Protect above and below grade utilities which are to remain.
- D. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave in or loose soil from falling into excavation.
- E. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- F. Control grades in vicinity of excavations to prevent surface water running into excavated areas.
- G. Conduct earthwork operations under this division to insure against rainwash and silting of watercourses, ponds and adjoining property resulting therefrom. Should such silting occur, restore such areas to their original condition if outside the grading areas, or to lines, grades and conditions shown specified if within grading areas, all at no cost to the Owner.

PART 2 MATERIALS

2.01 FILL MATERIALS

- A. Fill material shall be as specified in the soils report or at least clean fine sand, free of rubble, organics, clay, debris and other unsuitable material. Fill should be tested and approved prior to acquisition.
- B. Source of new material and length of haul shall be the Contractor's responsibility.
- C. Drainage fill: Crushed stone or gravel so that 100% passes 1-1/2" sieve with not more than 10% passing a No. 4 sieve.

PART 3 EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
 - 1. Identify known underground utilities. Stake and flag locations.
 - 2. Identify and flag surface and aerial utilities.
 - 3. Notify companies to remove and relocate utilities as required.
 - 4. Maintain and protect existing utilities remaining which pass through work area.
- B. If required, perform remedial dewatering prior to any earthwork operations.
- C. Clear and grub site as defined in the soils report.
- D. Proof-roll the subgrade in accordance with the soils report and under the observation of the testing laboratory. Proof-rolling will help locate any zones of especially loose or soft soils not encountered in the soil test borings. Then undercut, or otherwise treat these zones as recommended by the testing lab.
- E. Testing the subgrade for compaction will be as directed by the testing laboratory and as shown on the structural drawings.

3.02 FILL

- A. Fill in areas where required shall be placed in loose lifts as directed by the soils report.
- B. In load-bearing areas, fill shall be compacted as recommended in the soils report or at least to 95% of maximum modified Proctor dry density. A moisture content within two percent (2%) points of optimum indicated by the modified Proctor test (ASTM D-1557) is recommended.
- C. Perform compliance tests within the fill as directed by the testing lab.

3.03 EXCAVATION

- A. Excavation shall conform to the dimensions and elevations shown on the drawings, but excavation lines shall be such as to provide sufficient clearance for the proper execution of the work to be installed. Allowances shall be made for work and inspections. Bottom of all excavations shall be trimmed to the levels indicated and sloping surfaces cut in steps shown on drawings. After carrying the excavation to the required depth, the Contractor shall await the inspection and testing of the bearing soil.
- B. Control of ground water, including all necessary equipment, to maintain all excavated areas in a dry condition shall be the responsibility of the Contractor.
- C. Sides of temporary excavations can be cut to maximum slope of 1:1. However, no claim may be made by the Contractor for extra work for damages resulting from slope stability failure.

- D. The bottom of foundation excavations shall be compacted after excavation to densify any soils loosened in the excavation process. Backfill soils placed adjacent to footing or walls shall be carefully compacted with a light rubber tired roller or vibratory plate compactor to avoid damaging the footings and walls. Approved sand fills placed in footing excavations above the bearing level, in trench excavations, and in other areas which are expected to provide slab support and foundation embedment constraint shall be placed in loose lifts not exceeding 6 inches and shall be compacted to a minimum of 95% of the maximum modified Proctor dry density.
- E. Test all footing cuts for compaction to a depth of 1 foot, as directed by the testing laboratory.

3.04 DEWATERING

- A. Refer to the soils report for an estimate of seasonal high ground water table.
- B. The geotechnical testing laboratory shall determine the depth of ground water just prior to construction to determine what dewatering will be required.
- C. Water control will consist of, but not necessarily be limited to, well points, sumps, and pumps, in conjunction with berms and any needed ditches. Deep wells will not be permitted.
- D. Approval by the Architect of data submitted shall not relieve the Contractor of full responsibility for adequacy of dewatering system. In the event that during the progress of the work it is determined that the dewatering system is inadequate, the Contractor shall install and operate such additional dewatering equipment and/or make such changes in the system or plan of operation as may be necessary to perform the dewatering system in an adequate manner.
- E. Groundwater shall be maintained at least 24 inches below all earthwork, foundations, and compacted surfaces, or as directed by the testing laboratory.

3.05 BACKFILL UNDER AND AROUND BUILDING AREA

- A. All debris shall be removed from excavations prior to backfilling and filling.
- B. Backfill under and around building area shall be placed in loose layers not exceeding 12" and shall be compacted as defined in the soils report or at least to a density equal to 95% of the modified Proctor maximum dry density as per ASTM D698-70.
- C. Backfill in electrical plumbing and mechanical trenches shall be compacted to previously specified density.

3.06 GRADING

- A. Grade areas to lines and elevations indicated, including adjacent transition areas. Smooth finish surface within specified tolerances. Compact and bring to uniform

levels or slopes between points where elevations are shown or between such points and existing grades.

- B. Unless shown on the drawings, slope the grade evenly to provide drainage away from the building.
- C. Complete the grading operations after the building has been finished, utilities installed, site improvements constructed, and all excavated materials, rubbish, and debris removed from the site. Leave grade for lawns and planted areas clean and at required grades.

3.07 TESTING

- A. A qualified licensed geotechnical testing laboratory shall be retained to perform all necessary quality control testing for earthwork.
- B. All testing shall comply with the project soils report.
- C. See structural drawings for a minimum testing program.
- D. Provide samples of materials proposed for fills as required. Cooperate with laboratory personnel in obtaining samples, and during quality control testing.

3.08 SPECIAL NOTES

- A. Fill material shall not be placed against walls until 7 days after grouting of masonry cells. Compaction of exterior fill and interior backfill shall not be performed until wall grout has cured 14 days.
- B. Do not use drum compactor within 6 feet of walls. Compaction within 6 feet of walls shall be accomplished with a hand operated vibratory compactor.

END OF SECTION 02220