

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 GENERAL: This section describes excavating, hauling, and disposing of surplus excavated material; and placing and compacting specified materials necessary to construct the project.

1.02 STANDARD SPECIFICATIONS: Unless otherwise modified herein, work under this section shall conform to the below sections of the “Hawaii Standard Specifications for Road And Bridge Construction”, dated 2005, as amended, of the State Department of Transportation, Highways Division, hereinafter referred to as “DOT Standard Specifications”. All references to measurement and payment shall be deleted.

A. Excavation and EmbankmentSection 203

1.03 GENERAL REQUIREMENTS

A. It shall be the responsibility of the Contractor to examine the site and determine for himself the existing conditions affecting the work.

B. Obvious conditions of the site existing on the date of the bid opening shall be accepted as part of the work, even though they may not be clearly indicated on the drawings and/or described herein or may vary therefrom.

C. All debris of any kind accumulated from clearing shall be disposed of from the site, and the whole area left clean. The Contractor shall be required to make all necessary arrangements relative to the proposed place of disposal.

1.04 CLEARING AND GRUBBING: The Contractor shall clear off and remove from the entire area within the area to be improved, all vegetation, stumps, large roots, buried logs, garbage and other unsuitable material.

1.05 REMOVAL AND REPAIR WORK: The Contractor shall exercise every precaution to preserve and protect all structures, walkways or utility improvements which are to remain or be relocated. Portions of walkway and pavement which are to remain shall be saw cut neat and true to line. Restore all pavement and curbs upon completion of the work.

1.06 SEQUENCE OF WORK: All sequence of work shall be subject to the approval of the Engineer.

1.07 PROTECTION

EARTHWORK

- A. Barricade: Erect temporary barricade as necessary to prevent people from entering into project area, to the extent as approved by the Engineer. Such barricade shall not be less than 5'-0" in height. The extent of barricades may be adjusted as necessary with the approval of the Engineer. This work shall be accomplished at no extra cost to the State of Hawaii.
 - B. Take all precautions and safety measures as required to protect the State of Hawaii free and harmless from liability of any kind. Conduct operations with minimum interference to streets, driveways, sidewalks, passages, etc.
 - C. Adequate precautions shall be taken before commencing and during the course of the work to ensure the protection of life, limb and property.
 - D. The Contractor shall protect from damage all surrounding structures, trees, plants, grass, walks, pavement, etc. Any damage will be repaired or replaced by the Contractor to the satisfaction of the Engineer.
- 1.08 PERMITS: The Contractor shall obtain and pay for necessary permits prior to the commencement of work.
- 1.09 MAINTAINING TRAFFIC
- A. The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, traffic, activities, etc.
 - B. When necessary, the Contractor shall provide, erect and maintain lights, barriers, etc., as required by traffic and safety regulations with special attention to protection of life.
- 1.10 CONSTRUCTION LINES, LEVELS AND GRADES
- A. The Contractor shall verify all lines, levels and elevations indicated on the drawings before any clearing, excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer and any change shall be made in accordance with his instruction. The Contractor shall not be entitled to extra payment if he fails to report the discrepancies before proceeding with any work whether within the area affected or not.
 - B. All lines and grades shall be verified and established by a Surveyor or Civil Engineer licensed in the State of Hawaii.
 - C. The laying out of base lines, establishment of grades and staking out the entire work shall be done by a licensed Surveyor or licensed Civil Engineer. He shall be solely responsible for their accuracy. Erect and maintain substantial batter boards showing construction lines and levels.

- 1.11 CLEAN UP: Clean up and remove all debris accumulated from construction operations from time to time, when and as directed by the Engineer. Upon completion of the construction work and before final acceptance of work, remove all surplus materials, equipment, etc., and leave entire jobsite clean and neat.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Yard fill: Suitable material from the excavation may be used for fill with the approval of the Engineer.
- B. Structural Fill: New structural fill below exterior concrete slabs or paving, with allowance for depth of cushion fill, shall be aggregate base course.
- C. Topsoil: Imported, fertile, friable soil of loamy character having normal amounts of natural humus, free from subsoil, clay, refuse, roots, weeds, noxious weeds, nematodes or other deleterious matter, and free from toxic amounts of either acid or alkaline elements and capable of sustaining healthy plant life. Stones and earth lumps shall not be greater than one inch in largest dimension. Red humic latosol soils, or types known as "Palolo clay" or "Lualualei clay" are unacceptable. Topsoil excavated in connection with the construction of this project may be used in lieu thereof. Topsoil is subject to approval by Engineer.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Protective Measures:
1. All excavations shall be protected and guarded against danger to life, limb and property.
 2. Shoring, cribbing and logging, as required to safely preserve the excavations and earth banks, free from damages resulting from the work shall be provided and installed by the Contractor.
 3. All excavations shall be kept free from standing water. The Contractor shall do all pumping and draining that may be necessary to remove water to the extent required in carrying on the work. Grading shall be controlled so that the ground surface is properly sloped to prevent water run-off into structural foundation and open trenching excavations.

4. The existence of active underground utility lines transversing the construction area other than shown is not definitely known. Should any be encountered during excavation, the Contractor shall not disconnect same without authorization from the Engineer but shall inform the latter immediately of each discovery. The Engineer shall investigate and issue proper authorization for procedure.

B. General:

1. Excavation shall be done to the lines and grades indicated. Concrete slabs, concrete curbs, asphaltic concrete pavement, etc., not indicated to remain shall be removed or broken up into pieces of sizes permitted in other paragraphs of this section. When incorporated in fill, broken up pieces shall be well mixed with finer materials filling all spaces between the pieces.
2. Excavation for footing, foundation, etc., shall have level beds on unfilled, undisturbed, firm bearing, with stepped level where necessary. Small soft spots shall be compacted to unyielding firmness. If soil conditions are suitable and approved, footing cuts may be made to exact size of footings.
3. Excavated materials declared unusable by Engineer shall be removed from the site at the Contractor's expense.

3.02 BACKFILL:

A. Yard Area:

1. Yard fill where no concrete slab occurs shall be in 6" maximum layers (compacted thickness) compacted to 90% of maximum density.
2. The areas not covered by asphalt paving or concrete slab shall be graded to conform to finish contours.

B. Structural Fill:

1. In advance of preparing the subgrade or depositing a specified layer of material, existing material within the area where such material is to be placed, which in the opinion of the Engineer is unsuitable as a subgrade foundation, shall be removed and resulting space refilled with approved material and compacted.
2. Backfilling shall progress so that excessive unbalanced load is not introduced against any structure.

3. New structural fill material shall be placed in layers not to exceed 6 inches per compacted layer and compacted to 95% maximum density.
4. In the event of insufficient amount of structural fill or yard fill is derived from earthwork operations, import the necessary materials without any additional cost to the State. Such imported materials shall meet the requirements as specified for each category of materials.
5. The subgrade shall be graded and compacted to 95% maximum density.
6. Under slabs the cushion fill as specified shall be compacted to a level surface to 95% maximum density. Capillary barrier shall be No. 67 crush rock or S4C material.

C. Grading:

1. Grading work shall conform with the County's Grading Ordinances.
2. Rough Grading: The areas not covered by asphalt paving or concrete slab up to the contract zone limit shall be graded to conform to finish grades, with allowance for depth of topsoil. Contractor shall take the necessary precautions to prevent drainage of water into the construction area.
3. Finish Grading: Outdoor areas not covered by buildings shall be graded to finish grade and contours shown on the plans. Grading shall conform with the ordinances of the applicable County issuing the Grading Permit and as amended. Areas to be topsoiled shall be compacted to 85% of maximum density before placing topsoil. Topsoil shall be spread evenly, compacted lightly and raked to a uniform place at required contours and grades.

3.03 TESTING: Materials and compaction of subgrade and fill shall be tested by an independent testing agency approved by the Engineer and all compaction test results shall be submitted to the Engineer for approval. All cost of testing shall be borne by the Contractor. Compaction testing for each compacted layer or subgrade shall be made at location as directed by the Engineer. All test results must be approved before proceeding with placing of topsoil, or base course unless otherwise directed by the Engineer. Compaction tests shall be taken for subgrade and at every lift per 5,000 SF for buildings or structures and every lift per 200 LF for roads.

3.04 MEASUREMENT AND PAYMENT: Earthwork will not be measured nor paid for directly, but shall be considered incidental to the various contract items in the Proposal Schedule and no payment will be made therefor.

END OF SECTION