

SECTION 204 – SUBGRADE PREPARATION

204-1 DESCRIPTION

This work shall consist of shaping and compaction of the subgrade prior to construction of a subbase, base, or surface course and shall include excavation and/or shifting of materials resulting from rough grading, trenching, or other prior construction activities. Subgrade preparation shall include all work to the depths specified on the plans or in the Special Provisions. When subgrade preparation depths are not specified, the depth shall be assumed to be a minimum of 6 inches below the surface of the finished subgrade.

Prior to subgrade preparation, the ENGINEER shall verify that the grading is within tolerance specified in Subsection 202-3.1. Work shall not begin on the subgrade preparation until the ENGINEER has approved that the grading has met the tolerances.

"Unstable," "Unsuitable," "Suitable," and "Unsatisfactory" soil or aggregate items are referred to in Subsection 202-1.

204-2 CONSTRUCTION REQUIREMENTS

204-2.1 GENERAL. In all areas, prior to placing any of the base course specified under Section 300, the entire subgrade surface shall be scarified to a specified depth of not less than 6 inches and dried or uniformly moistened to obtain required compaction. Excess suitable excavated material shall be stockpiled and reused whenever possible in the project. Stockpiled material which is reused shall be measured in its final section and paid for as "Unclassified Excavation."

Excavation of material for curb and gutter installation shall be measured by the cubic yard (CY) and paid for at the unit price bid for "Unclassified Excavation" completed and accepted by the ENGINEER.

Excavation and hauling of material from one point to another point on the roadbed to adjust the grade line and stockpiling excess material, if any, adjacent to the project shall be considered incidental to the "Subgrade Preparation" bid items.

All rocks larger than 2 inches in size and other unsuitable material shall be removed and replaced with approved backfill material. Any portions of the subgrade not easily accessible to machine operations, such as valley gutters, shall be brought to the proper elevation and compacted by methods approved by the ENGINEER.

During the course of preparing the subgrade and until the curb and gutter and pavement courses have been constructed, it shall be the CONTRACTOR's responsibility to protect the subgrade against, and repair, any damage caused by, adverse weather, public traffic, and the CONTRACTOR's own operations. The subgrade shall at all times be completed for a sufficient distance ahead of hauling and spreading base or surface material to allow adequate opportunity for inspection. No materials shall be placed on the subgrade until it has been checked and approved by the ENGINEER.

204-2.2 COMPACTION. The subgrade shall be compacted by approved compaction equipment. Approved compaction equipment shall include sheepfoot rollers, pneumatic packers, mechanical packers, mechanical rammers, vibratory equipment, trucks, tractors, scrapers, motor graders, and all other types of equipment used in excavating, transporting, and placing the subgrade. Subgrade preparation depths specified on the plans or special provisions or the minimum 6 inches required below the surface of the finished subgrade shall be compacted to 95 percent of Maximum Dry Density as determined by ASTM D1557 with a moisture content falling within plus or minus 3 percent of the Optimum Moisture Content as determined by said testing method. The surface after compaction shall be true to line, grade, and cross section.

The CONTRACTOR shall engage an independent soils testing laboratory, approved by the ENGINEER, to determine the soil proctors and perform the required compaction testing to be determined by the ENGINEER.

The compaction control tests for this section are based on one (1) individual compaction test per 750 square yards of area. The CONTRACTOR shall be responsible for all retesting of failing tests and a proctor determination to represent each soil condition to be encountered on the project. The locations and depths of compaction testing shall be at the discretion of the ENGINEER during construction. Should it become necessary to require an additional number of initial compaction tests, over and above the number specified for bidding purposes, the City of Watford City shall be responsible for all costs associated with additional testing performed by an independent testing laboratory. The CONTRACTOR, however, will be required to assume the cost of all retesting of failed tests regardless of the total number required during construction.

Compaction testing to determine densities may be accomplished with a nuclear density testing apparatus and/or the sand cone method. Should disputes arise concerning test results they will be resolved by using the sand cone method of testing.

Written reports of all test results shall be supplied to the ENGINEER and the CONTRACTOR by the testing laboratory as soon as possible. To expedite construction progress it is necessary that the CONTRACTOR and ENGINEER be furnished with the results of all tests as soon as testing is completed.

The availability of the independent testing laboratory when needed and speed of testing and reporting are to be considered the responsibility of the CONTRACTOR.

Compaction control tests as stated above shall be incidental to the unit price bid for 204-3.1 "Subgrade Preparation."

No payment or measurement for payment will be made for suitable materials removed, manipulated, and replaced to obtain density in the specified depth of subgrade preparation. The moisture content of the subgrade materials shall fall within the range of plus or minus 4 percent of the Optimum Moisture Content before any attempt is made to obtain the specified density. Any removal, manipulation, aeration, replacement, watering and recompaction of suitable materials necessary to obtain the required

density shall be considered as incidental to the subgrade preparation operation and shall be performed by the CONTRACTOR at no additional cost to the project.

If the desired compaction cannot be obtained by manipulation, wetting, or drying of the specified depth of the subgrade because the material is found to be "Unsuitable" or "Unsatisfactory," as defined in Section 202-1, or when the ENGINEER directs manipulation, wetting, or drying below the specified subgrade preparation depth, or when materials below the specified subgrade preparation depth must be removed because they are found to be "Unsuitable," or "Unsatisfactory," thus hampering subgrade operations, this work will be paid for in accordance with Section 126 "Extra Work" of said construction specifications unless a "Subcut Excavation" item is included as a bid item on the proposal for the particular unit of the project.

If the instability of suitable materials below the specified subgrade preparation depth is a result of excessive moisture from rains, surface runoff, or frost action, the ENGINEER reserves the right to suspend the work to allow the materials to recover strength without any liability for the costs that may be claimed by the CONTRACTOR due to the suspension of work. Extension of time, however, will be granted in this case.

204-2.3 TOLERANCES. In those areas upon which a subbase, base, or surface course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with a 16-foot straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2 inch, or shall not be more than 0.05 of a foot from true grade established by grade hubs or pins.

The CONTRACTOR shall perform all surveying required to prepare the subgrade, to the tolerances specified, incidental to other bid items. The CONTRACTOR shall place a survey stake at the crown line on 50-foot intervals on all streets at the elevation approved by the ENGINEER. Additional staking may be required on sharp vertical and horizontal curves and at intersections and valley gutters as determined by the ENGINEER.

204-3 MEASUREMENT AND PAYMENT

204-3.1 SUBGRADE PREPARATION. Subgrade Preparation shall be measured by the square yard (SY) and paid for at the unit price bid for "Subgrade Preparation" complete and accepted by the ENGINEER.

204-3.1A SUBGRADE PREPARATION (1 FOOT DEEP). Subgrade Preparation shall be measured by the square yard (SY) and paid for at the unit price bid for "Subgrade Preparation (1 Foot Deep)" completed and accepted by the ENGINEER.

204-3.1B SUBGRADE PREPARATION (1.5 FEET DEEP). Subgrade Preparation shall be measured by the square yard (SY) and paid for at the unit price bid for "Subgrade Preparation (1.5 Feet Deep)" completed and accepted by the ENGINEER.