

**02060 Grade Construction for Sidewalk, Curb and Gutter****Index**

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**02060-1      General****1.1            Description**

This section specifies the requirements for constructing the grade (foundation) for concrete sidewalk, curb and gutter, which shall consist of excavation, embankment construction, and subgrade preparation to the lines, grades, and dimensions specified.

**1.2            Definitions****1.2.1         Subgrade**

The upper finished layer of material (usually earth) on which the levelling course or the concrete is placed.

**1.2.2         Rock Excavation**

Excavation of boulders or rock fragments having a dimension exceeding 600 mm measured in any one direction.

**1.2.3         Granular Base Layer:**

The layer placed just above the subgrade. It typically consists of sand and gravel, crushed stone or quarry rock, slag or other hard durable material of mineral origin. It is typically dense graded with the amount of fines limited to promote drainage.

**02060-2      Materials****2.1            Embankment and Subgrade**

All material used for embankment and subgrade construction shall be approved by the Engineer. If construction so necessitates the use of borrow material, it will be obtained from the adjacent roadway or as designated by the Engineer.

**2.2            Base Aggregate**

Specifications for base aggregate are contained in the Aggregates Specification 03001-3.2.2 "Base Aggregate".

The aggregate shall not be delivered before it has been tested and approved.

**02060-3     Equipment**

All tools, machinery, plant and equipment used in executing any part of the work shall be suitable for the work to be carried out and shall be maintained in efficient working order and where any of the machinery, plant or equipment is found to be unsatisfactory, it shall be improved or replaced, by the Contractor, to the satisfaction of the Engineer.

**02060-4     Construction****4.1           Excavation**

Excavation shall include the removal and satisfactory disposal of all material encountered including earth, gravel, asphalt walk and asphalt driveways required for the construction of sidewalk, curb and gutter. Excavation for boulevards (where required) shall be carried out concurrently with this excavation. The Contractor shall incorporate suitable excavated materials into embankment construction.

Adequate suitable material shall also be retained on site to enable backfilling of the sidewalk, curb and gutter.

All inferior material subject to frost action, soft, spongy or yielding spots, or organic material shall be entirely removed and disposed of as directed by the Engineer. Where such materials occur in cut or existing fill sections such that their removal will result in excavation below the subgrade elevation, extra excavation will be authorized by the Engineer. These areas shall be backfilled with material approved by the Engineer.

**4.2           Embankment**

Embankments shall be constructed by placing and compacting successive layers of uniform thickness not exceeding 150 mm.

Approved mechanical compaction equipment shall be used to achieve a minimum of 98 percent of the Standard Proctor Density in each layer. Hauling equipment will not be accepted in lieu of compaction equipment.

When more embankment material is required than is readily available from normal excavation for new subdivision development locations, the Contractor will be permitted to borrow from an adjacent unimproved roadway provided that the borrow area is levelled to:

1. maintain surface drainage,
2. accommodate all vehicular traffic.

Along improved roadways, the Contractor shall supply any material required beyond that which is available from related excavation.

#### **4.3 Surplus Material**

Surplus excavated material shall not be sold under any circumstances. It may be wasted by the Contractor only when no specific location is given by the Engineer. When a location is designated, the Contractor shall haul, dump and level the material as directed.

#### **4.4 Subgrade Preparation**

Subgrade Preparation only applies to grade construction - subgrade.

Grade Construction-Base requires no defined operation for subgrade preparation but does require compactive effort to create a firm foundation for the placement of the granular base.

Subgrade preparation shall be carried out to a depth not less than 150 mm below the bottom of the concrete structure and extending 125 mm beyond each side of the proposed concrete structure. All material shall be scarified and mixed, then wetted or dried. The subgrade shall be compacted to a minimum of 98% of the Standard Proctor Density by means of approved mechanical compaction equipment. Sheepfoot rollers may be required by the Engineer in locations with cohesive soil.

The finished subgrade shall be proof-rolled with a piece of heavy equipment such as a fully loaded single or tandem axle truck of sufficient axle load to expose any soft spots in the subgrade. There will be no direct payment for proof-rolling, and it shall be an integral part of subgrade acceptance. Soft spots detected by proof-rolling shall be repaired at the Contractor's expense.

Transverse or longitudinal service trenches that have not thoroughly settled shall be excavated and backfilled with approved material and compacted to a minimum of 98% of the Standard Proctor Density. The type of mechanical compactor to be used shall be approved by the Engineer.

Where concrete is hand formed final grade preparation and compaction shall be carried out after the forms are placed. The correct screed shall be used to check the subgrade elevation to ensure adequate thickness for sand or granular levelling course and concrete. When the subgrade preparation is approved, the Contractor will be permitted to place and compact the levelling course which will give the required sidewalk thickness.

A levelling course will not be required when subgrade is cut to design grade and cross section, as with a rotary trimmer. Any loose material left on top of the grade by this operation shall be removed or compacted.

The surface of the subgrade after final trimming and rolling shall be within  $\pm 10$  mm of the design cross-section and staked elevations.

Boulevard preparation where required shall be carried out concurrently with the subgrade preparation.

Prior to closing down operations for the completion of each day's work, the subbase material shall be bladed and compacted and, if necessary, covered with sufficient base material to carry traffic.

#### **4.5 Granular Base Preparation**

Material shall be kept free from clay and other types of deleterious materials for the duration of the contract. The contractors' operation shall not disturb underlying work.

Material shall be placed without segregation in uniform layers such that the thickness of the compacted layer is not greater than 150mm.

Base layers shall be bladed to a smooth surface in conformance to the required cross-section and maintained until placement of a subsequent layer where applicable.

The granular base shall be maintained to the tolerances in grade and cross-section and to the specified compaction until the project is accepted.

#### **4.6 Existing Roadways**

Any grading, or subgrade preparation, required by the Contractor to accommodate his equipment shall be the responsibility of the Contractor and he shall restore the roadway

and boulevards to their original condition within five days. Any roadway gravel contaminated by the clay or other material shall be replaced by the Contractor at his expense.

When grade construction is required along an existing gravelled street, the Contractor shall, at his own expense, blade the gravel away from the work and replace the gravel to the satisfaction of the Engineer when the sidewalk, curb and gutter construction has been completed.

During sidewalk reconstruction, if unsuitable subgrade material requires replacement, and if borrow areas, coal chutes or openings require backfilling with granular material, such work shall be carried out by the Contractor at the applicable contract unit prices.

#### **4.7 Accommodation of Equipment**

Where it is necessary to carry out extra earthwork to accommodate the Contractor's equipment (for grade preparation or concrete construction) the execution and cost of such work shall be the Contractor's responsibility.

#### **4.8 Granular Fill**

When granular fill material is specified under sidewalks, curbs, traffic islands and medians, or to backfill trenches, the specified aggregate shall be supplied, placed and compacted by the Contractor at the respective unit prices. The minimum density of the material shall be 98% of the Standard Proctor Density.

#### **4.9 Grade Protection**

The protection of the grade shall be the responsibility of the Contractor from the time that work on the site commences until the concrete structure has been completed and backfilled. If concrete construction is not included in the Contractor's work, his responsibility shall end when the base has been checked, tested and approved by the Engineer.

Any damage caused by persons, vehicles, equipment or adverse weather shall be repaired by the Contractor at his expense.

The grade shall be barricaded against unnecessary traffic. Good surface drainage on the grade and on the adjoining roadway shall be maintained by the Contractor, and he

shall drain any pools of water by ditching or pumping. No additional payment will be made for these measures.

**02060-5     Testing**

Testing will be carried out at the following approximate intervals:

Base Aggregate - Initial testing for source approval; minimum of one test per month thereafter.

Subgrade Compaction - two tests per 50 lineal metres of grade. One test is to be taken in the gutter area and one test is to be taken in the walk area.

Initial testing of the base aggregate shall be the Contractor's responsibility and he shall provide copies of reports on the following tests for approval by the Engineer:

1. Wash Sieve Analysis (CSA A23.2-2A, 5A)
2. California Bearing Ratio, Unsoaked (ASTM D1883)

Subsequent testing responsibility shall be in accordance with Section 01020 of the General Requirements.

**02060-6     Measurement****6.1           Grade Construction - Subgrade**

Grade Construction - Subgrade will be calculated in square metres based on the horizontal width of the proposed concrete structure plus 250 mm, and on the actual length constructed.

**6.2           Grade Construction - Base**

Grade Construction - Base will be calculated in square metres based on the horizontal width of the proposed concrete structure plus 250 mm, and on the actual length constructed.

**6.3           Extra Excavation**

Extra excavation will be measured by cross section and calculated in cubic metres as determined by survey grades.



**6.4 Extra Embankment Construction**

Extra embankment construction will be measured by cross section and calculated in cubic metres as determined by survey grades. Width and depth as specified by the Engineer.

**6.5 Rock Excavation**

Rock excavation will be measured in cubic metres based on the actual volume of the individual rocks.

**02060-7 Payment****7.1 Grade Construction – Subgrade**

Grade Construction - Subgrade will be paid for at the contract unit price per square metre which will be full compensation for subgrade preparation, and all incidental related work.

**7.2 Grade Construction – Base**

Grade Construction - Base will be paid for at the contract unit price per square metre which will be full compensation for removal and disposal of excess subgrade material, compaction of the finished subgrade to provide a firm and suitable subgrade, supply, placement and compaction of 150 mm of granular base to a minimum of 98% of Standard Proctor Density.

**7.3 Extra Excavation**

Extra Excavation will be paid for at the contract unit price per cubic metre which will be full compensation for excavating, loading, hauling and disposing of material, and all incidental related work.

**7.4 Extra Embankment Construction**

Extra Embankment Construction will be paid for at the contract unit price which will be full compensation for placing, compacting, trimming and incidental related work. It shall also include excavating, loading, dumping of earth material when not available from surplus excavated material.

**7.5            Rock Excavation**

Rock Excavation shall be paid for at the unit contract price per cubic metre which will be full compensation for excavating, loading, hauling and disposal of the rock, including landfill fees where applicable.

**End of Specification 02060**