

## 1.0 EXCAVATION AND FILL

### 1.1 GENERAL

- .1 The excavation or fill shall be made to provide proper grade, lines and cross-section for the laying of concrete sidewalks, curbs and gutters, driveway crossings, or combined sidewalks, curbs and gutters as shown on the plans. Irregularities in the grade may be adjusted by use of compacted crushed gravel. Prior to placing of concrete the grade shall be compacted to a uniform density of at least ninety-eight percent (98%) of Standard Proctor Density. If in the opinion of the Engineer there is the danger of excessive absorption of concrete water by the base, the Contractor shall adequately sprinkle the base with water. Should any place be found not affording a firm foundation, those places shall be excavated and replaced with suitable base material approved by the Engineer.
- .2 In preparing the sub-base the Contractor shall be required to excavate for a sufficient distance to give a slope of one and one-half (1 ½) horizontal to one (1) vertical from the back of the sidewalk, except in the case of the driveways which shall be sloped as directed by the Engineer.

## 2.0 EXCAVATION

### 2.1 BREAKING OUT

The Contractor shall break out existing sidewalk, curb and gutter to limits designated by the Engineer and shall be responsible for any damage caused to adjoining sections of concrete structures as a result of insufficient care during removal. Public and/or private areas of lawn shall be cut and rolled back a sufficient distance to prevent any damage from occurring during the course of construction and replaced to its origin once construction is completed. Cutting of pavement shall be considered a necessary part of the breakout where it is not possible to remove the pavement. The pavement shall be cut to a minimum of 0.5 meters from the edge of the proposed edge of gutter, and shall be cut so that the edge of pavement is uniform. The unit rate bid for break out on the Tender Form shall include breaking, removal and hauling to the disposal areas of all the excavated material.

### 2.2 DISPOSAL OF SURPLUS MATERIAL

All excavated material from sidewalk, curb and gutter construction shall be disposed of as directed by the Engineer. Such removal, haulage and disposal of excess material shall be included in the unit rate bid for sidewalks, curbs and gutters construction.

- .1 All excavated material can be disposed of at the Lethbridge Regional Landfill site north of the City. An attempt will be made to designate areas close to the job site where clean fill dirt can be to its best advantage; however, if no fill areas are available, the fill dirt will be accepted at the Landfill.

### **2.3 SIDEWALK EXCAVATION**

Prior to excavating for sidewalks, all boulevards shall be cleared of cinders and debris, which shall be removed during the course of excavating to sub-grade. All excavation for sidewalks shall be accomplished by means of a backhoe or other equipment approved by the Engineer. Excavated material which at the discretion of the Engineer is suitable for backfill, shall be placed on the boulevard and all excess material shall be hauled away without delay at the Contractor's expense.

Excavated material which at the discretion of the Engineer is suitable for backfill, shall be placed on the boulevard or a site approved by him.

### **2.4 CURB AND GUTTER EXCAVATION**

All excavation for curb and gutter shall be accomplished by means of a power shovel, back-hoe or front-end-loader equipped with a bucket meeting the required width to accommodate the forms. All surplus material shall be loaded and hauled away from the work without delay at the Contractor's expense. Excavated material which at the discretion of the Engineer is suitable for backfill, shall be placed on the boulevard or a site approved by him.

### **2.5 CUTTING BELOW GRADE**

Should the Contractor excavate below the proper level for sub-grade, then the deficiency shall be made up of suitable base material approved by the Engineer as per Clause 1.1.1 of these Specifications without any extra allowance for the same. Undrained hollows in the base shall be drained to the Engineer's satisfaction without any extra charge.

### **2.6 DEFECTIVE PLACES**

Soft, spongy, or defective areas which are unsuitable to build a suitable foundation, shall be excavated to a depth specified by the Engineer. Areas included are in and around the work site and all such places shall be made good as per Clause 1.1.1 of these Specifications.

**3.0 FILL**

**3.1 FILL MATERIAL - GRANULAR BASE**

- .1 Crushed stone or gravel consisting of hard, durable, angular particles, free from clay, cementation, organic, material, frozen material and other deleterious materials.
- .2 Physical properties of Aggregates:
  - % Fracture, by weight (2 faces) - 60 min.
  - Los Angeles Abrasion, loss, % - 45 max.
  - Liquid Limit, % - 25 max.
  - Plasticity Index, % - 6 max.
  - Lightweight Particles, % - 5 max.
  - California Bearing Ratio, when compacted to 100% of ASTM D698 - 80 min.
- .3 Gradation to be within the following limits when tested to ASTM C-117 with sieve sizes to CAN/CGSBD 8-GP-2M rather than ASTM E11, and to have a smooth curve without sharp breaks when plotted on a semi-log grading chart

**3.2 25 mm CRUSHED GRAVEL**

SIEVE SIZE	PERCENT PASSING BY WEIGHT
25 000	100
16 000	73 – 94
10 000	56 –80
5 000	40 – 66
1 250	24 – 45
315	13 – 27
160	9 – 19
80	4 – 10

**3.3 GRANULAR SUB-BASE**

- .1 Screened or crushed stone or gravel consisting of hard, durable particles free from clay lumps, cementation, organic material, frozen material, and other deleterious material.

- .2 Physical Properties Of Aggregates:
  - Los Angeles Abrasion, Loss,% - 50 max.
  - Liquid Limit, % - 25 max.
  - Plasticity Index, % - 6 max.
  - Lightweight particles, % - 5 max.
  - California Bearing Ratio,  
when compacted to 100% of ASTM D698 - 20 min.
  - Crushed Particles (1 Face,  
plus 5 000 sieve fraction ),% - 25 min.
  
- .3 Gradation to be within the following limits when tested to ASTM C- 117 with sieve sizes to CAN/CGSBD 8-GP-2M rather than ASTM E11, and to have a smooth curve without sharp breaks when plotted on a semi-log grading chart.

SIEVE SIZE	PERCENT PASSING BY WEIGHT
75 000	100
25 000	65 – 100
10 000	40 – 100
5 000	30 – 90
2 500	25 – 65
630	15 – 35
160	5 – 15
80	3 – 10

- .4 In the event that base course materials appear unsatisfactory and subsequent test analysis indicates that the material does not meet specifications, such tests will be at the expense of the Contractor, and the material shall be removed and replaced with satisfactory material at the expense of the Contractor.

**3.4 PLACING AND COMPACTING**

- .1 Crushed base course gravel shall be mixed and placed in layers not exceeding 150 mm in thickness when compacted. Materials shall be spread in uniform lifts, without segregation to such loose depths that when compacted, the layer shall have the required thickness. Each lift of granular material shall be compacted at the optimum moisture content, to ninety-eight percent (98%) of the maximum dry density as determined by the Standard Proctor Density Test for the material used. All granular base gravel will be paid for at the unit rate on the Tender Form for supply, placing and compacting.

### 3.5 BACKFILL

- .1 On completion of any concrete construction, the longitudinal side or sides of all sidewalks shall be backfilled with well tamped fill dirt at a minimum slope of one and one-half (1-1/2) to one (1) from the top of the concrete. New areas of construction will not be made accessible to the Contractor until the preceding work site has been backfilled to the satisfaction of the Engineer.

### 3.6 CONSOLIDATION OF TRENCHES AND EXCAVATIONS

- .1 All trenches or excavations that have been made in connection with sewers, private drains, water pipes or conduits, or for any other purpose and which are not thoroughly settled, shall be opened up, well tamped and watered as directed by the Engineer until thoroughly compacted. The excavation of such unconsolidated areas, will be paid for at the unit rate on the Tender Form for extra excavation and fill as outlined in Clause 3.8 of these Specifications.

### 3.7 FORMATION OF BED

- .1 The sub-grade must be thoroughly compacted by rolling, or by use of vibrating type compactors as per Clause 1.1.1 of these Specifications, before any base course is placed in areas where fill has been placed previously.

### 3.8 EXTRA EXCAVATION AND FILL

- .1 Extra excavation and fill will be paid for when the original surface of the ground is more than 150mm above the surface of the surface elevation of the finished walk, or top of curb in the case of curb and gutter construction, and then only for the actual quantity between such original surface of the ground and 0.15 metres above the finished surface of the walk or top of curb and also for the excavation of unconsolidated or unsuitable areas below the sub-grade. All other excavation shall be included on the Tender Form for sidewalk or curb and gutter or combined sidewalk, curb and gutter construction. The unit measurement of excavation shall be the cubic metre and bid price shall be compensation in full for the excavating, loading, and dumping as directed by the Engineer.

For the purpose of computing the volume of extra excavation,, the width of excavation shall be considered to be the width of the actual concrete structure plus one-half (0.50) metres, and the depth of excavation shall be the excess cut on the centre line of the work as outlined above or in the case of unconsolidated areas, it shall be the depth below the sub-grade.

Extra fill will be paid for when the original surface is below the sub-grade elevation of the structure at the unit rate bid per cubic metre for 25mm and/or 75mm crushed gravel. The method of measurement in this case shall be truck-box measurement, and gravel slips signed by the Engineer or his representative will be required for payment.