

**DIVISION 4.3
CITY OF SARNIA
CONCRETE
SIDEWALKS, CURBS
AND DRIVEWAYS
STANDARDS
2023**

CONCRETE MATERIALS, CONSTRUCTION METHODS AND TESTING PROCEDURES

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A. MATERIALS

1. CONCRETE FOR SIDEWALK AND CURBS AND GUTTERS

i) Ready Mix Concrete

Concrete shall comply with the requirements of OPSS. MUNI 1350 and the following specific requirements:

Description	Specification
Class of Concrete	Exposure Class C-2
Min. Compressive Strength	32 MPa at 28 days
Max. W/C Ratio	0.45
Coarse Aggregate	19mm nominal size
Air Content	5 to 8%
Maximum Slump	75mm +/- 20 mm

Only ready-mix concrete will be used. Hand-mixed or volume batch concrete will not be allowed.

Contractors must possess a current, valid Certificate of Ready Mixed Concrete production Facilities. A copy of this Certificate must be provided with your submission.

Note: The City reserves the right to hire the services of a third party for concrete testing. If the test confirms compliance with the specifications the City will pay for the test. If the test indicates non-compliance, the Contractor shall be responsible for the cost of the test and for replacing the material including associated costs such as removal, disposal and labour to re-set the concrete.

ii) Granular "A" Subbase

Granular "A" shall be 100% crushed limestone and shall meet OPSS Specification 1010 with 100% passing the 26.5 mm sieve and be approved by the City Engineer before use. Compaction of Granular "A" under sidewalks, curb, gutters and driveways shall be minimum of 100% of the maximum dry density using Method "A" as per OPSS 501.08.02.

iii) Tactile Warning Plates

Tactile Warning Plates shall be incorporated at every location with a pedestrian crossing or as specified in the contract documents. Tactile Warning Plates are to be installed on sidewalk ramps to warn visually impaired pedestrians that they are entering the roadway. According to CSA B651-201, follow O.Reg. 191/11 and meet the following requirements:

- Plates are to be uncoated cast iron material with natural rust finish.
- Plates are to be set back approximately 150mm from back of curb and it must extent the full width of the curb cut/sidewalk ramp.
- Plates are to be parallel with curb radius (ie. Not necessarily perpendicular to direction of pedestrian travel).
- This may require the use of radial plates versus square plates on larger radii.
- The ramp must have a minimum clear width of 1.5m, exclusive of any flared sides.
- Plates to come complete with L Shape anchor brackets.
- Contractor to provide shop drawings for review 2 weeks prior to installation.

The following manufactures are approved suppliers of the cast iron warning plates:

East Jordan Iron Work, East Jordan Michigan
Ontario Branch: (519) 448-3395
159 Sugar Maple Road
St. George, Ontario
N0E 1N0

Neenah Foundry, Neenah, Wisconsin
Ontario Representative: 1-866-624-9722
Crozier/Ashleigh Suffron
1 Young Street, Suite 1801
Toronto, Ontario
M5E 1W7

B. CONSTRUCTION METHODS

1. FORMS FOR CONCRETE SIDEWALK AND CURBS

The Contractor shall provide a template cut to the true section of the curb, gutter or sidewalk for the purpose of testing the forms and sub-grade. Height of side forms for sidewalk shall not be less than the required depth of the concrete.

2. REMOVAL OF EXISTING CONCRETE AND PAVED SURFACES

Existing concrete curbs and gutters, concrete sidewalks, asphalt pavement and base, concrete pavement and base and asphalt and concrete driveways shall be broken out and removed as required. In executing the work, every effort must be made to minimize damage to adjacent properties and services. Weights dropped from considerable height to cause fractures of pavements will not be permitted. Concrete and asphalt surfaces shall be saw-cut to straight lines as required before removal.

The City Engineer will determine and mark the limits of all removals.

The Contractor will be required to replace or repair, at his own expense, any damage caused by his operations to adjacent pavement, properties, services, etc. beyond the limits of removal.

Material removed shall be disposed of off the site at the expense of the Contractor.

3. JOINTS IN CURBS AND GUTTERS

Control joints shall be saw-cut in concrete curbs and gutters at maximum 3.0 metre intervals, at each side of curb cuts for

driveway or sidewalk ramps, and on each side of catchbasins a maximum distance of one metre from the catchbasin.

Where curb and gutter abuts sidewalks, saw-cuts in the curb and gutter shall align with saw-cuts in the abutting sidewalk at 3.0 metre intervals.

4. EXISTING SIDEWALK REMOVAL

Sidewalks that are to be replaced will be removed no more than one (1) day before they are to be replaced. Replacement is to follow immediately after removal without delay. Short sections of sidewalk six metres (20 feet) long or less, which are removed for reasons such as a service installation, will be restored immediately with a 25 mm cold mix surface and maintained as a smooth walkable surface until replaced. Temporary gravel sidewalk will not be acceptable.

5. CONCRETE SIDEWALKS AND DRIVEWAYS

All sidewalks will be constructed as detailed in Drawings 108-F, 112-F, 119-F, 122-F, 2485, 2486 and OPSS 350, 353, 904, and 1350. Generally, sidewalks will be constructed with a thickness of 125mm (5"). For sidewalks that cross commercial driveways, the thickness will be 200mm, as directed by the City Engineer.

Generally the tender item for payment of concrete sidewalks shall include preparation of subgrade, excavation, supply and placing of 100mm (4") of Granular "A" 100% crushed Limestone and all costs for equipment, labour and materials to construct a concrete sidewalk 125mm (5") or 200mm (8") thick.

Wheelchair ramps shall be constructed similar to drawings 2485 and 2486, as and where directed by the City Engineer. Payment for construction of these ramps shall be included in the price bid for sidewalks and curbs and gutters.

Plain concrete driveways shall be constructed as specified on drawings 108F, 109F, 112F and 122F at 125mm (5") or 200mm

(8") thickness including supply and placement of 100mm (4") of Granular "A" 100% crushed limestone.

At no time will water be added to the concrete on site. Concrete which is unworkable or that is too stiff to produce a satisfactory product is to be discarded at the Contractors expense.

6. TACTILE WARNING PLATES

Tactile Warning Plates shall be incorporated at every location with a pedestrian crossing or as specified in the contract documents. Tactile Warning Plates are to be installed on sidewalk ramps to warn visually impaired pedestrians that they are entering the roadway. According to CSA B651-2012 and follow O.Reg. 191/11, City of Sarnia Standard Drawings 153-F, 154-F, 155-F and meet the following requirements:

- Plates are to be uncoated cast iron material with natural rust finish.
- Plates are to be set back approximately 150mm from back of curb and it must extent the full width of the curb cut/sidewalk ramp.
- Plates are to be parallel with curb radius (ie. Not necessarily perpendicular to direction of pedestrian travel). This may require the use of radial plates versus square plates on larger radii.
- The ramp must have a minimum clear width of 1.5m, exclusive of any flared sides.
- Contractor to provide shop drawings for review 2 weeks prior to installation.
- Plates to come complete with L Shape anchor brackets.

7. CONSTRUCTION OF CURB AND GUTTER

All costs for labour, materials and equipment required to construct concrete curb as per OPSD 600.010, 108F, 119F, and 122F or to match the existing, shall be included in the unit price on the tender for construction of curb and gutter.

Payment of the tender item shall include for preparation of subgrade, excavation, supply, placing and compaction of Granular "A", and all costs for equipment, labour and material needed for the construction of the curbs and gutters.

At no time will water be added to the concrete on site. Concrete which is unworkable or that is too stiff to produce a satisfactory product is to be discarded at the Contractors expense.

8. CURB CUTS TO EXISTING CURBS

Curb cuts shall only be cut by the Approved City of Sarnia's contractor on acceptance by The City Of Sarnia Engineering and Planning Departments. Curb cuts shall conform to drawing 108-F. All costs shall be paid by the owner or developer.

9. CURB FILLS ON EXISTING CURB CUTS

All curb fills to be done by the City of Sarnia Public Works Department when approved by the Engineering Department. All costs shall be paid by the owner or developer.

10. SUPPLY AND PLACING OF GRANULAR "A"

i) Bedding Under Sidewalks, Driveways, Curbs and Gutters

All sidewalks, driveways, curbs and gutters will be placed on a 100mm (4") thick bedding of Granular "A" 100% crushed Limestone. This bedding shall be compacted to 100% maximum dry density using Method "A" as per OPSS 501.08.02.

11. SAWCUTTING OF CONCRETE

It may be necessary to saw cut concrete roads, curb and gutters, driveways or sidewalks in order to limit demolition at a straight edge. All costs required including labour, materials and

equipment to saw cut concrete will be included in the tender item for concrete.

Saw cutting of control joints of new sidewalks to deepen the trowelled joint to 40mm is not acceptable.

Water or other methods shall be used to minimize dust according to the Occupational Health and Safety Act and Regulation for Construction Projects.

12. EXCAVATION

Any excavation required to complete the work will be done to the required elevation and in a level smooth and neat fashion and shall include any compaction and preparation of the subgrade. Excavation shall include all costs for any machine work, use or rental and any hand excavation, utility locations, tree root removal, fees or any other expense incurred or necessary in the excavation process.

13. CONCRETE PROTECTION DURING CURING

All sidewalks, driveways, curb and gutters, curb cut and curb fill-ins are to be protected by the contractor according to OPSS 904. The Contractor is responsible for keeping vehicle and pedestrian traffic off the concrete during the curing process. The Contractor will be responsible to replace any concrete due to neglect or vandalism at the Contractor's expense.

14. ACCEPTANCE OF WORK

The Contractor will be responsible to protect all work from damage, indentations and abrasions caused by the public, tree branches, weather, etc. Any work that is deemed unacceptable by the City Engineer because of damage, indentation, abrasions, poor finish, poor workmanship or unacceptable material, etc. must be removed and replaced with new at no cost to the City.

C. TESTING PROCEDURES

i) Concrete

Field sampling and testing of plastic concrete for slump and air content shall be undertaken by the owner. Cylinders shall be cast as per OPSS specifications. All concrete shall meet OPSS 904 and 1350 and all reinforcing steel shall conform to OPSS 904 and 905.

When concrete cylinders are tested for compression, the compressive strengths will be calculated in accordance with CAN/CSA-A23.1-M90 Section 17.5.7.1., CAN/CSA-A23.1-M90 Section 17.5.7 Compression strength requirements, CAN/CSA-A23.1-M90 section 17.5.7.1 Standard Cured Cylinders.

The strength level of each class of concrete shall be considered satisfactory if the averages of all sets of three consecutive strength tests for that class at one age equal or exceed the specified strength, and no individual strength test is more than 3.5 MPa below the specified strength. These requirements shall not apply to field-cured specimens.

ii) Granular "A"

Testing to prove conformity to OPSS 1010 will be at the cost of the Contractor. Specific truckloads of material when delivered and observed on site to be substandard, based on the opinion of the City Engineer, will be rejected and removed from the site immediately at no cost to the City for the material, delivery or removal. When on site quality controlled testing finds that a large portion of the delivered material is substandard then the City Engineer will determine what remedial action, the quality control testing and any additional testing will be paid for by the contractor.

The granular "A" shall be compacted to 100% maximum dry density using Method "A" as per OPSS 501.08.02. and confirmed by the Geotechnical Engineer.