

**ITEM 03608.0103 M - PORTLAND CEMENT CONCRETE SIDEWALKS
& DRIVEWAYS**

DESCRIPTION:

Under these items the Contractor shall construct or replace Portland Cement Concrete sidewalks and/or driveways as shown on the plans or as directed by the Engineer.

MATERIALS:

The requirements of the following sections of the NYSDOT Standard Specifications, Construction and Materials, shall apply unless otherwise indicated in the contract documents:

DISAPPROVED BY
EI 06-020

- Portland Cement 701-01
- Coarse Aggregates 703-02
- Concrete Sand 703-07
- Premoulded Resilient Joint Filler 705-07
- Wire Fabric for Concrete Reinforcement 709-02
- Admixtures 711-08
- Water 712-01

Concrete for the lower course of two-course sidewalks and driveways shall comply with the requirements for Class A concrete, as defined in the aforementioned NYSDOT Standard Specifications, Table 501-3, "Concrete Mixtures." This concrete shall attain a minimum compressive strength of 24,135 kPa when tested at twenty-eight (28) days in accordance with ASTM C39-80.

The mortar topping for the upper course of two-course sidewalks and driveways shall consist of Portland Cement, concrete sand, water, and, if necessary, air-entraining agent. The mixture shall be proportioned to contain one (1) part of Portland Cement to two (2) parts of Concrete Sand. Sufficient water shall be added to obtain proper workability and to yield a twenty-eight (28) day compressive strength of 27,580 kPa when tested in accordance with ASTM C39-80. The air content of the freshly-mixed mortar topping shall be six (6) percent, plus or minus one (1) percent.

CONSTRUCTION DETAILS:

FORM WORK:

Forms shall be of lumber with nominal thickness of 50 mm or of steel of equal rigidity and strength. No forms shall be less than 125 mm in depth for sidewalks or 180 mm for driveways. Flexible strips may be used for curves. The forms shall be staked or otherwise held to the established grade of walk. All forms shall be properly cleaned and wood forms shall be thoroughly wetted, and metal forms oiled before depositing any material against them. The walk shall be constructed of rectangular slabs which shall not have any dimensions greater than

ITEM 03608.0103 M - PORTLAND CEMENT CONCRETE SIDEWALKS & DRIVEWAYS

1.830 m shall be reinforced with reinforcing mesh (150 mm x 150 mm) or with any other reinforcement approved by the Engineer. Reinforcement shall not cross an expansion joint. When joined, reinforcement shall be lapped sufficiently to develop the full strength of the metal.

The total thickness of walks shall be 125 mm and shall consist of a wearing surface course 25 mm thick placed upon a base course 100 mm thick. Driveways shall have a total depth of 180 mm and shall consist of a wearing course 25 mm thick placed upon a base course 150 mm thick.

Contraction (tooled) joints shall be placed between expansion joints at equal intervals not exceeding 1.830 m. These joints shall be formed either by the use of division plates (steel), 4 mm thick, or by approved methods of cutting a groove in the surface of the finished concrete.

Where the sidewalk line intersects a building, walk, permanent structure or other location as designated by the Engineer, a 13 mm, non-extruding pre-molded expansion joint shall be provided, and placed at intervals not exceeding 6.096 m in sidewalks.

Expansion joints shall be pre-molded strips of asphaltic felt of the required thickness, as wide as the thickness of the walk and laid in one piece as long as the full length of the slab. Expansion joint material shall conform to the requirements specified above.

Expansion joints shall extend from the surface to the subgrade, be at right angles to the sidewalk surface and be constructed prior to placing the concrete.

PLACING:

Concrete shall not be placed upon a dry or dusty subgrade. The subgrade shall be sprinkled or lightly wetted before placing the concrete. No concrete shall be placed on a frozen subgrade or when the temperature is or predicted to be within twenty-four (24) hours, less than 4°C, except with written permission of the Engineer.

Sidewalks and driveways shall be constructed in two courses. The concrete for the base course shall be deposited on the subgrade and thoroughly consolidated with an immersion type vibrator. The vibrator shall not come in contact with the forms or the subgrade, nor shall the vibrator be operated longer than four (4) seconds in any one location.

No more than 15.25 linear meters of base course shall be placed before starting to place the top course, and the top course of mortar shall be placed within forty-five (45) minutes after the base course is placed and before initial set has occurred.

After the wearing course has been brought to the established grade, it shall be struck off and worked with a float in a manner that will thoroughly consolidate it so that the surface has a true

ITEM 03608.0103 M - PORTLAND CEMENT CONCRETE SIDEWALKS & DRIVEWAYS

contour. The upper edges of the concrete shall be rounded to a radius of 6 mm.

When wet spots occur, finishing operations should be delayed until the water either disappears or is removed with a squeegee. If a squeegee is used, cement should not be removed with the water. Under no conditions shall dry cement or sand be used to absorb this moisture or to hasten the hardening.

CURING:

Concrete shall be allowed to cure for at least three (3) days before forms are removed. Forms shall be carefully removed from the sidewalk so no edge will be broken, and the area adjacent to the sidewalk shall be immediately refilled to the grade of the new sidewalk.

All walks shall be protected by suitable coverings and shielded from traffic and the elements for at least three (3) days and shall not be open to traffic until the Engineer so directs.

All concrete walks, curbs, and driveways shall be sprayed with a white pigmented membrane curing compound immediately after finishing. Vapor-proof membranes used for curing will not require wetting.

The Contractor shall provide protection for all concrete placed in cold weather by covering with straw, tarpaulins, insulated blankets, or other approved material, and/or heated by salamanders, if needed, to keep concrete temperatures above 4° C to obtain specified concrete strengths.

TESTING:

The Contractor shall employ a qualified testing laboratory to perform quality control testing of concrete and mortar used in the construction of sidewalks and driveways.

For each concrete placement of 38.23 cubic meters or less, one series of compressive strength samples shall be fabricated. A series shall consist of three (3) test cylinders of base concrete and two (2) sets of test cubes of mortar topping. (Note that each set contains three (3) cubes.) One (1) concrete cylinder and one (1) set of mortar cubes shall be tested at seven (7) days, and two (2) cylinders and one (1) set of mortar cubes shall be tested at twenty-eight (28) days. Concrete cylinders shall be fabricated in accordance with ASTM C31-69 (1975), and tested in accordance with ASTM C39-80. Mortar cubes shall be fabricated and tested in accordance with ASTM C109-80. Copies of these test results shall be given to the Engineer and the cost of this testing shall be borne by the Contractor and included in the bid price per square meter of PCC sidewalks and/or driveways.

At the discretion of the Engineer, core samples may be taken for testing of thickness and

**ITEM 03608.0103 M - PORTLAND CEMENT CONCRETE SIDEWALKS
& DRIVEWAYS**

compressive strength. The cost of coring and testing of cores shall be borne by the City, and copies of test results shall be made available to the Contractor.

If the average thickness of the concrete sidewalk as determined by the measurements of all cores taken on the work is deficient by more than 6 mm, a deduction will be made from the contract price per square meter for the sidewalk. The amount of deduction per square meter shall be determined by subtracting from the bid price the percentage of this bid price obtained by multiplying it by the ratio of the square of the actual average depth in millimeters to the square of the required depth in millimeters.

Any part of the concrete sidewalk or driveway, which is deficient in depth by more than 13 mm will not be accepted and no payment will be made for same, and at the option of the City Engineer said sidewalk (or driveway) may be taken up and replaced according to the specification, at the Contractor's expense.

Sections of sidewalk for which core or cylinder or cube tests show the strength to be less than ninety (90) percent of the compressive strength required will not be accepted and shall be replaced at the Contractor's expense.

METHOD OF MEASUREMENT:

The quantity of sidewalks and driveways shall be the number of square meters measured in place satisfactory to the Engineer.

BASIS OF PAYMENT:

The unit price bid per square meter shall include wire fabric for reinforcement, and all other materials, equipment, and labor necessary to complete the work as called for on the plans or specified by the Engineer.