

# Sidewalk Specifications C700



**ROCHESTER**  
**PUBLIC WORKS**



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# Section 1 GENERAL REQUIREMENTS

## C700.101 Description

These specifications shall apply to the construction and restoration of sidewalks installed for improvement of pedestrian facilities. The work includes the construction of concrete walk and other related items as specified

Use of the term "Plans, Specifications and Special Provisions" within this specification shall be construed to mean those documents, which compliment, modify, or clarify these specifications and are accepted as an enforceable component of the Contract or Contract Documents.

## C700.102 Reference Documentation

All references to Mn/DOT Specifications shall mean the latest published edition of the Minnesota Department of Transportation Standard Specifications for Construction as modified by any Mn/DOT Supplemental Specifications issued before the date of advertisement for bids. All references to other Specifications of AASHTO, ASTM, ANSI, etc. shall mean the latest published edition available on the date of advertisement for bids.

## C700.103 Maintenance and Repair

Proper maintenance and repair of sidewalk is necessary to protect the initial investment, improve safety, access, and mobility.

Maintenance and Repair of pedestrian facilities shall conform to the FHWA "Guide for Maintaining Pedestrian Facilities for Enhanced Safety" and FHWA "Accessible Sidewalks and Street Crossings" information guide and the following:

### A. Identified hazards leading to maintenance and repairs

- 1 Surface deterioration, spalling, scaling, and popouts.
- 2 Tree Impacts, roots, low hanging branches
- 3 Changes in level/elevation, slopes, vertical displacements between adjacent surfaces
- 4 Cracks, holes, grates and other openings, railroad tracks, drainage inlets, air vents, tree grates, etc.

### B. Emergency Maintenance Measures

Emergency measures completed by City Forces only, based on complaint or weather-related event, with a planned course of action documented for ultimate repair.

- 1 May involve temporary closure if facility presents a hazard.
- 2 Bituminous or concrete patching or wedging often accompanied with warning paint markings and signage.

### C. Maintenance Measures

Maintenance measures include:

- 1 Beveling methods include grinding or horizontal cutting in accordance with the City of Rochester Detail Plate. Repairs shall have a smooth and uniform finish with a coefficient of friction meeting OSHA requirements and shall not affect adjoining panels.
- 2 Changes in level/elevation methods for slab-jacking by either sand, mud, or polymer jacking, in accordance with the City of Rochester Detail Plate. Repair holes shall be filled with suitable material, and work shall not affect adjoining panels.

Failures to either method that re-appear within 30 calendar days shall be corrected at no cost to the City. The 30 calendar day guarantee will commence after the method is completed. If the repair cannot be completed by either method, the Engineer shall designate the area as replacement and the Contractor shall be compensated as such.

## D. Replacement

Include removal of the existing panels, subgrade correction, reinforcement bars, and new concrete, in accordance with the City of Rochester Detail Plate. The Contractor guarantees the work according to the Maintenance and Repair requirements of the General Conditions.

## E. Threshold criteria for corrective action

- 1 Surface deterioration.
  - a Slabs whose surface is granular or a portion of the sidewalk surface greater than two (2) inches in width has broken out, and the result is a hole 0.5 inch or deeper
- 2 Tree Impacts:
  - a Roots – see also changes in level/elevation, and air spading requirements in the Engineering Standards.
  - b Branches to hang no lower than 6.7 feet.
- 3 Changes in level/elevation:
  - a Up to 0.25 inch can remain without corrective action.
  - b 0.25 – 1.0 inch bevel elevated panel or lift sunken, with a maximum grade of 8.3% (1:12).
  - c Over 1.0 inch replace panel or lift sunken, with a maximum grade of 8.3% (1:12).
- 4 Cracks, Gaps and grates:
  - a Openings do not allow the passage of a 0.5 inch sphere.
  - b The long dimension of the opening is perpendicular or diagonal to the dominant direction of travel
  - c Slabs fragmented by cracks into four (4) or more sections

# Section 2 MATERIALS

## C700.201 Concrete

Concrete shall meet the requirements of the current Minnesota Department of Transportation Standard Specifications for Highway Construction, subject to the following specific requirements and limitations:

### A. Mix Requirements

- 5 Concrete: Mn/DOT Mix No. 3F52
- 6 Air-entrained with air content of 5% to 8.5%.
- 7 Compressive strength of 4500 psi at 28 days.
- 8 All concrete must be batched from a Mn/DOT certified plant, and mix designs must be Mn/DOT approved
- 9 For High Early strength concrete use Mix No. 3HE52.
- 10 For Exposed Aggregate concrete use Mix No. 3F57EX with a coarse aggregate Class C, matching in kind around the city, similar to Winona pit number 85201.
- 11 No other admixtures will be permitted without specific approval for the specific project by the City Engineer.
- 12 Concrete walk constructed using concrete that fails to comply with any of these requirements shall be removed and reconstructed at the expense of the Contractor.

A batch ticket signifying the concrete mix design and the presence of any admixtures shall accompany each load of ready-mixed concrete. These tickets shall accompany the ready-mix truck driver. The ticket shall be available on the site to the representative of the Public Works Department. The Public Works representative shall take the ticket of any concrete not in compliance with the concrete specified in C700.201A and any non-compliant concrete shall be removed and replaced.

## C700.202 Material Tests

Ready-mix concrete supplier shall submit to the City no later than May 1, an approved concrete mix design in accordance with Mn/DOT standard procedures with the following minimum schedule or frequency:

- 1 At least once annually for each mix.
- 2 At least once annually for each aggregate material stockpile from each aggregate source.

The City reserves the right to conduct Individual field site tests as follows:

- 1 Entrained air content  
Compressive Strength Test Cylinders
  - a Shall be the average of three (3) cylinders fabricated from a single sample of concrete.
  - b All concrete sampling and testing will be done in accordance with the procedures described in the Minnesota Department of Transportation Concrete Manual.

- c Should the test set fail:
  - i The Contractor, at its expense, shall have the right to challenge the test results by having the in-place concrete tested by an independent, certified lab using a testing method approved by the City Engineer.
  - ii Concrete sidewalk for which the tests fail shall be removed and replaced at the Contractor's expense.
  - iii The frequency of city testing will be increased for that Contractor.
  - iv Repeated failures will be grounds for suspension or revocation of the Contractor's license.

## **C700.203 Membrane Curing Compound**

Membrane Curing Compound shall meet the requirements of Mn/DOT Specification Section 3754 AMS white pigment liquid curing compound. For exposed aggregate and colored concrete pavement, use MnDOT Specification Section 3753 clear curing compound.

# Section 3 CONSTRUCTION REQUIREMENTS

## C700.301 Public Utilities

The Contractor shall be responsible to protect any existing utility from damage caused by or occurring during their operations. If the work requires excavation, the Contractor shall notify utility owners by requesting on site utility locations using the state 'Gopher One-call' system.

The locations of underground facilities shown on the plans are approximate only and are shown only for the Contractor's general information. The Engineer does not assume responsibility for showing all utilities on the plans. The Contractor shall notify all public and private utilities of their work schedule, and use suitable precautions to prevent damage to pipes, conduits, and other underground or overhead structures.

## C700.302 Notice to Property Owner and Removals

The Contractor shall notify each abutting property owner at least 3 days, but not more than 5 days in advance of starting work at each location. A copy of the notice form to the Property Owner is available at the Public Works Department.

After the notice time has expired, the Contractor shall begin the work by removing any old concrete, brick, flagstone, bushes, and other items within the sidewalk area including one (1) foot each side of the sidewalk. Should the proposed sidewalk be located closer than one (1) foot from the property line, the limit of the removal shall be the property line. Trees shall not be removed except upon specific request of the owner of said tree and approval of the City Forester. Items removed shall be disposed of by the Contractor off the site in a manner acceptable to the Public Works Department and the owner of the disposal site.

## C700.303 Limits of Excavation and Restoration

Excavation depth shall be the thickness of the new sidewalk plus aggregate, tapered at no less than 1 to 1 slope upward and outward. Loose and loosely compacted materials shall be removed. Disturbed areas outside the construction limits shall be replaced in kind at the Contractor's expense.

- 1 Turf Areas - The Contractor shall limit the removal and excavation width to 12 inches on each side of the sidewalk. After completion of the sidewalk, excavated areas adjacent to the sidewalk shall be regrading to match existing lawn and/or paved areas and backfilled with topsoil to an elevation that will leave the top of the sod placed approximately one (1) inch below the top of the sidewalk.
- 2 Aggregate Driveways and Driveway Approaches - The Contractor shall limit the removal and excavation width to 12 inches on each side of the sidewalk. After completion of the sidewalk, excavated areas adjacent to the sidewalk shall be backfilled with substantially the same type of aggregate materials as those in the existing driveway or driveway approach.
- 3 Bituminous Driveways and Driveway Approaches – The Contractor shall limit the excavation to a distance of two (2) feet from the sidewalk. The existing bituminous shall be saw cut or Colter cut in a straight line parallel with the edge the sidewalk and at a

distance of not less than 2 feet from the sidewalk. After completion of the sidewalk, excavated areas adjacent to the sidewalk shall be replaced with not less than 6 inches Aggregate Base. Aggregate Base shall be uniformly graded to allow the placement of bituminous material at a thickness equal to the existing bituminous but not less than three (3) inches.

- 4 Concrete Driveways and Driveway Approaches - The Contractor shall limit the removal and excavation only to the edge of the sidewalk segments being replaced. Excavation depth shall be to the base of the existing concrete driveway or driveway approach, then tapered at 1 to 1 slope to a depth of 12 inches. Loose and loosely compacted materials shall be removed. Undermining of existing concrete driveway or driveway approach shall be repaired before placing aggregate base for the sidewalk. Concrete driveway or driveway approach undermining shall be repaired using premixed concrete (Sackrete or equal) and water. Packing sand or gravel into the void shall not be permitted. The mixture shall be packed into the void and shaped with a vertical face. Mixture shall not extend under the new sidewalk. After the undermine repair has been completed, the aggregate base under the sidewalk may be placed. If abutting driveway or driveway approach concrete is damaged during the sidewalk removal, excavation, or any other portion of the work, the Contractor shall remove and replace the entire damaged concrete driveway or driveway approach panel. Partial panel removal shall not be permitted. If the damaged driveway or driveway approach does not have clear jointing pattern, the Contractor shall saw cut the driveway or driveway approach in a line parallel to the new sidewalk at a distance from the new sidewalk that will fully remove the first "crack" that approximately parallels the sidewalk. The driveway or driveway approach between the sidewalk and the saw cut shall be removed and replaced at the same thickness as the existing concrete driveway or driveway approach but not less than the thickness of the new sidewalk.

Should the proposed sidewalk be located closer than one (1) foot from the property line, the limit of the removal shall be the property line.

At any time the work requires removal of any portion of an existing driveway or sidewalk located on private property, the property owner shall be fully informed before the removal begins. The property owner shall be advised as to the nature of any damage caused to their property and as to the extent and type of repairs planned. If the repairs are the direct or indirect result of the Contractor's work, the repairs will be completed at the Contractor's expense.

## **C700.304 Tree Roots**

In areas where tree roots are encountered within the zone described in the Limits of Excavation and Restoration, the roots shall be cleanly cut with a saw at the edge or bottom of the excavation and removed. No construction method, which disturbs the roots outside of this zone, shall be permitted.

The aggregate base in this area shall conform to the requirements of ASTM 67.

Tree root removal and disposal shall be incidental to other work items.

## **C700.305 Width and Thickness**

Concrete walks in R -1 & R -2 residential areas shall be a minimum thickness of four (4) inches. Walks shall be a minimum five (5) feet wide, unless otherwise designated by the City Engineer.

Walks in the Central Business District, commercial, industrial, and multiple dwelling zones of R-3 & R-4 shall have a minimum thickness of five (5) inches. Walks in areas of commercial, industrial, and R-3 and R-4 shall be a minimum five (5) feet wide, unless otherwise designated by the City Engineer.

Walks across vehicular entrances (existing or future) shall conform to the following minimum thickness requirements:

- 1 Six (6) inches for single dwelling entrances in R -1 & R -2;
- 2 Seven (7) inches for the Central Business District, commercial, industrial, multiple dwelling entrances and alleys.

The driveway approach between the sidewalk and the street pavement or concrete curb shall be constructed in accordance with the City of Rochester Detail Plates.

## **C700.306 Preparation of Foundation Base**

The soil under the proposed walk shall be excavated or filled to bring it to "foundation level". Foundation level shall be four (4) inches below the bottom of the concrete walk and driveway approach(es).

Sod, organic material, topsoil and frozen soil shall be removed from the area below the proposed walk. Wherever wet, spongy, soft, or unstable material is encountered below the foundation level, such material shall be excavated to a depth directed by the City Engineer. These over-excavations shall be backfilled with uniform select material and compacted to 100% Standard Proctor Density

Backfill shall be made of a uniform select material provided by the Contractor, placed in layers not exceeding four (4) inches thick and compacted to 100% Standard Proctor Density. Backfill may be clay or granular materials. Clay material shall have a moisture content within 2% of optimum. Granular materials shall have a moisture content of at least 80% of optimum.

Embankment and soil fill, other than those soils used to replace unsuitable material, shall include the area from 12 inches either side of the proposed walk and sloping downward and outward at a 1 to 1 slope. Fill shall be made of a uniform select material provided by the Contractor, placed in layers not exceeding six (6) inches thick and compacted to 100% Standard Proctor Density. Fill may be clay or granular materials. Clay material shall have a moisture content within 2% of optimum. Granular materials shall have a moisture content of at least 80% of optimum.

The surface shall be graded to within 3/8 inch of the specified elevation.

## **C700.307 Forms and Grades**

Forms shall be not smaller than commercial 2x4 inch lumber for four (4) inch walks, 2x6 inch for five (5) inch and six (6) inch walks, and 2x8 inch for seven (7) inch walks and shall be sufficiently rigid to withstand the operations of placing and finishing the concrete.

Good quality commercial 2-by lumber or rigid steel forms shall be used except that flexible forms properly staked may be used on curves. Sections of straight forms 10 feet long or shorter may be used for curves having a radius of 300 feet or more. Lumber face against which the concrete is placed shall be free of knot holes, large chips or similar imperfections.

The top of the form shall be set true to line and grade. Unless otherwise noted in the Plans, Detail Plates, or Special Provisions, or directed by the City Engineer, the forms shall be set so that the completed walk will slope 1/4 inch per foot (2%) toward the street. Forms shall be securely staked and braced to hold their alignment during construction of the walk to within 1/8 inch of the specified line and grade.

All forms must be clean before using and shall be oiled with a light, clear, commercial paraffin form oil before concrete is placed.

Forms shall remain in place for a period of not less than 24 hours after placement of the concrete. Special care shall be taken when removing forms to avoid damage to the edges and the surface of the new concrete. The practice of using temporary forms or headers that are removed while the concrete is plastic shall be permitted, however the outside forms shall remain in place for not less that 24 hours.

## **C700.308 Joints**

Walks shall be divided into panels by expansion and contraction joints. Joints shall be spaced at approximately five (5) foot intervals. Wherever practicable, joints shall align with like joints in adjoining work. No panel shall have an area exceeding 40 square feet.

Joints shall be parallel with or perpendicular to the centerline of the walk. Jointing layout shall avoid angles of less than 75 degrees. Panel widths of less than three (3) feet or more than seven (7) feet shall not be permitted. The length to width ratio for panels shall not exceed 1 to 1.5.

Contraction joints shall be saw cut not more than 3/16 inch in width and shall be cut to a depth of at least 1/3 the thickness of the walk.

Expansion joints shall be 1/4 inch wide unless otherwise specified, shall be the full thickness of the walk, and shall be of pre-formed expansion joint material in accordance with Mn/DOT Specification 3702 Types A-E. Expansion material secured in a manner that will prevent movement or displacement during the placement of the concrete.

Expansion joints shall be placed in the following locations:

- 1 Along any abutting masonry.
- 2 Along the foundation of any building.
- 3 Along concrete curb.

- 4 At pedestrian ramps in accordance with the Mn/DOT Pedestrian Curb Ramp Details Standard Plan 5-297.250
- 5 Around any concrete base or structure
- 6 Along both sides of abutting concrete driveway and driveway approach.
- 7 At intervals not exceeding 100 feet and at all property lines known or indicated on the Plans.
- 8 As directed by the City Engineer.

All joints shall be sawcut. Tooled joints allowed only as approved by Engineer. Sawing of joints shall be conducted as soon as the condition of the concrete permits and before any random cracking occurs.

Where new concrete is placed against existing pavement, the existing pavement edge should be sawcut smooth.

## **C700.309 Posts and Utility Boxes**

Posts for parking meters, street signs, or other installations shall be surrounded with a 1/4 inch or thicker sleeve. Future post locations shall also be provided with sleeves. Sleeves shall be the full thickness of the sidewalk and concrete shall be prevented from going under, through or to the inside of the sleeve.

Curb stops located in the sidewalk shall be set in the sidewalk in accordance with City of Rochester Detail Plates.

All curb stops, valve boxes, frames, or covers within the limits of a concrete walk shall be raised or lowered as required, and be adjusted flush with the finished surface of the walk.

## **C700.310 Placing Concrete**

Concrete shall be placed in accordance with the requirements of Mn/DOT Section 2521, subject to the following specific requirements:

- 1 At least three (3) working hours notice shall be given to the Engineer to provide for the inspection of the base and forms before any concrete is placed. The Contractor shall complete corrections and adjustments to the base, forms, and other installations before placing concrete as the Engineer prescribes.
- 2 Immediately before the concrete is placed the base shall be moistened.
- 3 Concrete shall not be placed on a frozen material. Concrete shall not be placed when the air temperature is less than 35°F nor shall it be placed when the air temperature is less than 40°F and falling. When the predicted low temperature is less than 45°F, cold weather protection shall be placed in accordance with Mn/DOT specifications. Cold weather protection shall continue for not less than 7 days.
- 4 The concrete placed shall be vibrated to remove voids and struck off to the required grade then floated smooth.

## **C700.311 Finishing**

The surface of the sidewalk shall be trowelled to a dense and closed, but not glossy, finish. The edges of the walk shall be tooled with an approved edging tool in a manner that leaves a neat and smooth border.

Except for pedestrian ramps and other exposed aggregate areas, the surface shall be finished with a light brush finish using only tools approved by the City Engineer. Brushing shall be uniform and transverse at right angles to the centerline of the walk and shall be sufficient to eliminate any marks left by prior operations.

The surface shall not vary more than 1/8 inch from the elevation or the alignment specified. Joints shall not vary more than 1/4 inch from the prescribed alignment.

## **C700.312 Pedestrian Ramps**

Pedestrian ramps shall be constructed in accordance with the City of Rochester Detail Plate and the Mn/DOT Pedestrian Curb Ramp Details Standard Plan 5-297.250. Grades shall not exceed the maximum grades shown on the Detail Plate or Standard Plan.

All pedestrian ramps should be designed as combined directionals or a one-way directional when crossing is not permitted in both directions. When a directional ramp cannot be constructed, a designer shall then consider a fan or modified fan followed by a depressed corner. A diagonal pedestrian ramp shall not be constructed without approval of the City Engineer.

When constructing bi-directional ramps, concrete shall be placed between the ramps when a ramp is less than 5 feet in length or the total area between the ramps is 25 square feet or less.

## **C700.313 Central Business District and Boulevard Walk**

Within the Central Business District, walks shall be placed abutting the street curb. Walk may not be installed abutting the curb in any other area, except with specific authorization by the City Engineer.

Walks within the Central Business District and walks placed abutting the street curb shall have special decorative pattern in accordance with City of Rochester Detail Plate or as specifically approved by the City Engineer.

## **C700.314 Curing**

Concrete shall be cured in accordance with the requirements of Mn/DOT Section 2521 as modified herein. Membrane Curing Compound meeting the requirements of Mn/DOT Specification Section 3754 with white pigment shall be applied. Application rate shall be adequately dense to visual cover the gray concrete with white pigment.

Plastic sheets shall only be used as protection from rain or as a portion of cold weather protection.

Cold weather protection shall continue for no less than 7 days after casting. Straw, hay and similar loose materials shall not be used as cold weather protection.

## **C700.315 Backfill and Clean-up**

After removal of the forms, all debris, excess material, tools and equipment shall be removed from the site within 48 hours.

In turf areas, approved topsoil material shall be placed against the sides of the walk to a minimum depth of 6 inches or the full excavation depth, which ever is less. The area shall be fine graded and all rocks of 1/2 inch diameter or larger shall be removed. The surface of the topsoil shall be firm, smooth, and uniformly graded. Topsoil shall be graded so that the surface of the sod is approximately one (1) inch below the abutting sidewalk and the adjacent paved areas to allow for swelling of the sod grass root zone.

Turf areas outside the areas defined in the Limits of Excavation and Restoration shall be sodded at the Contractor's expense.

Turf areas within the areas defined in the Limits of Excavation and Restoration shall be sodded by the Contractor, unless otherwise specified in the special conditions for the Work.

Adjacent concrete walks and driveways and driveway approaches, bituminous driveways and driveway approaches, gutter lines and street areas shall be swept and left clean and free of debris.

The cost of backfilling and cleanup shall be incidental to the Work.

## **Section 4 METHOD OF MEASUREMENT**

### **C700.401 Concrete Walk**

Concrete Walk shall be measured by area computation – Each uniform thickness will be measured separately by top surface area.

### **C700.402 Pedestrian Curb Ramp**

Pedestrian Curb Ramp shall be measured by physical count (each), square feet, or square yard by top surface area as noted in the estimated quantities. Truncated domes shall be measured by the square feet. They shall include all materials, equipment and labor needed construct the pedestrian ramp, as shown in the Plans.

# Section 5 BASIS OF PAYMENT

## C700.501 Description

Payment for pedestrian facility items at the Contract prices of each design shall be compensation in full for all costs of providing a complete-in-place pathway, including excavation, foundation preparation, backfilling, finishing, restoration of surface improvements, disposal of surplus or waste materials, final cleanup, and such other work as may be specified, but excluding the construction or materials, specifically designated for payment under other Contract Items.

## C700.502 Items List

Concrete walk construction will be paid for on the basis of the following schedule:

ITEM NO	ITEM	UNIT
C700.501	__IN CONCRETE WALK REPLACEMENT	SQ FT
C700.501	__IN CONCRETE WALK REPLACEMENT	SQ YD
C700.501	__IN CONCRETE WALK REPLACEMENT	LIN FT
C700.502	PEDESTRIAN CURB RAMP	EACH
C700.502	PEDESTRIAN CURB RAMP	SQ FT
C700.502	PEDESTRIAN CURB RAMP	SQ YD
C700.503	TRUNCATED DOMES	SQ FT
C700.504	DRILL & GROUT #13 REBAR __IN LONG	EACH
C700.505	REPLACE CONCRETE CURB & GUTTER	LIN FT
C700.505	REPLACE CONCRETE CURB	LIN FT
C700.506	CONCRETE CUTTING	LIN FT
C700.506	CONCRETE CUTTING	SQ FT
C700.506	CONCRETE GRINDING	LIN FT
C700.506	CONCRETE GRINDING	SQ FT
C700.506	CONCRETE GRINDING	EACH