



## Sidewalk Replacement Criteria

**The following are the criteria used to determine if sidewalk needs to be replaced in the City of Watertown:**

- Any slab raised one-half inch (1/2") or more, which is considered a trip hazard
- Any slab which is cracked, chipped or spalled
- Any slab which cross slope exceeds 1/2" per foot.
- ADA Requirement for change in level between squares of not more than one-half inch (1/2"); a cross slope (slope measured perpendicular to the direction of travel) of two percent (2%) grade; and running slope (gradient measured parallel to the direction of travel) of not greater than five percent (5%) for up to a maximum two and one half feet (2 1/2 feet) of vertical change. A section of sidewalk may have a grade five to eight point three percent (5 – 8.3%) if level landings are provided every two and one half feet (2 1/2 feet) of vertical change.



## CONCRETE SIDEWALK SPECIFICATIONS

### **GENERAL**

Concrete sidewalks shall be constructed in accordance with these specifications and the requirements of the State of Wisconsin, Department of Transportation, Standard Specifications for Road and Bridge Construction, Current Edition (hereafter "Standard Specifications"). Concrete sidewalks shall conform to the lines and grades established by the City Engineer. All removal and replacements will be made as ordered by the City Engineer.

The Contractor shall construct one-course sidewalks shall be a minimum of forty-eight inches (48") in width, with a minimum thickness of four (4) inches in accordance with the plans and specifications. Sidewalk through a driveway section and concrete driveway approaches shall be a minimum thickness of six (6) inches in residential areas and a thickness of eight (8) inches through commercial driveway sections and concrete driveway approaches.

### **Pedestrian Safety**

All pedestrian walkways are to adhere to ADA (American Disability Act) standards as well as align with the recommendations set forth in the current edition of The Wisconsin Guide to Pedestrian Best Practices. Pedestrian safety hazards include but are not limited to obstruction hazards, tripping hazards, protruding objects, ground level obstacles and slopes with extreme grade.

### **Obstruction of Pedestrian Travel**

Changes in level between formed concrete block which construct the pedestrian walkway is to be no more than one-half inch (1/2") pursuant of ADAAG Chapter 4, Section 4.5. Concrete forms with a change in level above one-half inch (1/2") shall be replaced to obtain a maximum grade of 8.3 percent (8.3%) per inspection by the City Engineer. Changes in level between formed concrete block from one-quarter inch (1/4") to one-half inch (1/2") may be beveled with a maximum bevel slope of fifty percent (50%).

Ground level obstacles which include but are not limited to; offsets, gaps or openings in drainage grates, tree grates, manhole covers, hatches, valves, vaults or other utility coverings, sanitary clean-out covers, pull boxes, water curb boxes and other access features. The features promote concentrated stress and premature failure of the concrete forms which make up pedestrian walkways. The best way to eliminate these areas of concentrated stress is to not locate these features in the pedestrian walkway. In areas where it is unavoidable to include these features in the pedestrian walkway,



then these features shall be mounted so that they are flush with the level of the walkway and adhere to the same standards in level changes as for concrete forms. Additionally, there shall be four feet (4') of walkway provided that is free and clear of any ground level obstacle.

### **Slopes**

#### **Cross Slope**

The cross slope of a walking area is the slope measured perpendicular to the direction of travel. Cross slopes facilitate drainage of the walking surface as well as pose difficulties for pedestrians during inclement weather. Sidewalks shall have a cross slope of two percent (2%) grade, as cross slopes with a less than two percent (<2%) grade are known to cause drainage issues.

#### **Running Slope**

Running slope or grades of a walking surface is the gradient measured parallel to the direction of travel. Sidewalks with steep grades may cause difficulties for all pedestrians, especially during inclement weather. The maximum grade for any sidewalk shall be five percent (5%) for up to a maximum two and one half feet (2-1/2 ft) of vertical change. A section of sidewalk may have a grade of five to eight point three percent (5-8.3%) if level landings are provided every two and one half feet (2-1/2 ft) of vertical change.

### **SUBGRADE**

A new sub-base may be required by the City Engineer if the soil in the subgrade is soft or spongy in places and will swell or shrink with changes in temperature and moisture content. Any material found to be unsuitable, such as muck, peat, marl, soft clay and other such materials subject to frost heaving, differential frost action or unable to provide adequate support for surface improvements, shall be excavated and removed from the job site. If a new sub-base is required, it shall consist of granular material and shall be spread to a depth of at least three inches (3") and thoroughly compacted. While compacting the sub-base the material shall be thoroughly wet and shall be wet when the concrete is deposited but should not show any pools of water. Where necessary for the construction of ramps and drive approaches, the curb shall be cut for its full depth. If the Contractor undercuts the subgrade two inches (2") or more, at the contractor's expense, the subgrade shall be brought to grade by using gravel fill and it shall be thoroughly compacted. Where sidewalk is placed over excavations such as tree roots or sewer laterals, four and one-half inch (4-1/2") reinforcing bars shall be placed to prevent settling or cracking of the sidewalk. Where necessary to cut or remove tree roots, adequate precautions shall be taken so as to protect exposed roots and preserve existing trees. In a fill section, the subgrade for the sidewalk shall be extended one foot (1 ft) on each side of the walk before sloping down at a 3:1 slope.



The width of all cuts and fills shall be such that they conform to the final grading requirements as hereinafter stated.

### **FORMS**

Forms shall be of wood or metal and shall be straight and of sufficient strength to resist spring, tipping or other displacement during the process of depositing and consolidating the concrete. If of wood, forms shall be surfaced plank of at least two inch (2") nominal thickness stock except for curved sections; and if of metal they shall be of approved section and shall have a flat surface on top. The forms shall have a depth of at least equal to the depth of the sidewalk. They shall be securely staked and braced to the required line and grade of the City Engineer and shall be sufficiently tight to prevent leakage of mortar. All forms shall be cleaned thoroughly and oiled before the concrete is placed against them. The transverse slope toward the curb shall be one-quarter inch (1/4") per foot (1 ft) unless otherwise directed by the Engineer.

### **CONCRETE**

Concrete used for sidewalks shall be according to pertinent sections of Section 501 of the Standard Specifications for Air-Entrained, Grade A-2 Concrete.

### **PLACING AND FINISHING CONCRETE**

The foundation, forms and reinforcement, when required, shall be checked and approved by the Engineer before the concrete is placed. The concrete shall be placed on a moist foundation, deposited to the required depth and consolidated and spaded sufficiently to bring the mortar to the surface, after which it shall be struck off and floated with a wooden float. Before the mortar has set, the surface shall be steel troweled and lightly brushed.

### **JOINTS**

Sidewalk shall be divided in sections by means of contraction joints.

Insofar as feasible, sidewalk shall be divided into sections not less than three feet (3 ft) nor more than twelve feet (12 ft) in any dimension.

A contraction joint in sidewalk shall consist of a slot or groove, at least one inch (1") in depth and one-fourth inch (1/4") in width.

One-half inch (1/2") transverse expansion joint filler shall be placed through the sidewalk at uniform intervals of not more than ninety-six feet (96 ft).



Expansion joint filler shall extend to the full depth of the concrete and the top shall be slightly below the finished surface of the sidewalk.

One-half inch (1/2") expansion joint filler shall be placed between the sidewalk and back of abutting parallel curb and gutter and one inch (1") between sidewalk and buildings or other rigid structures.

One-half inch (1/2") expansion joint filler shall be placed between sidewalk approaches and the back of curb and gutter or edge of pavement.

The concrete at the faces of all joints shall be thoroughly spaded and compacted to fill the voids and the surface shall be finished smooth and true to grade. The edges of the sidewalk along forms and joints shall be rounded with an edger of one-fourth inch (1/4") radius.

### **CURING OF CONCRETE**

All concrete work shall be cured by the impervious coating method, the wet fabric method or the paper method.

For the initial curing, while the concrete is fresh, water shall be applied in a fine spray to avoid injury, and the burlap shall be kept wet.

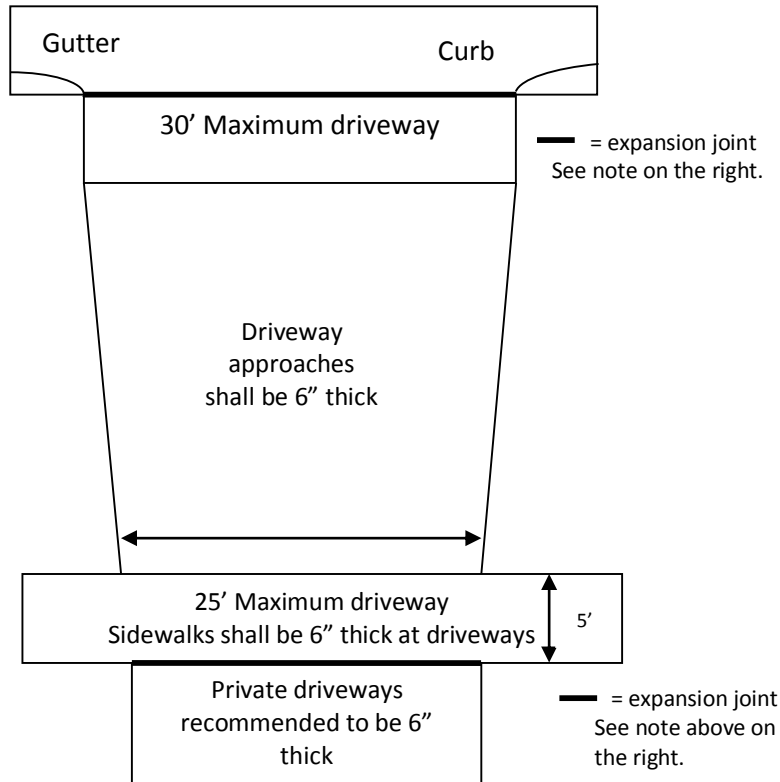
On the day following the placing of concrete, for the wet fabric method or the paper method, and on the final curing the concrete surface shall show the presence of free water under the covering for the following 72 hours.

### **PROTECTION OF WORK**

The Contractor and property owner shall furnish and maintain adequate barriers and lights to protect the work and the public both by day and night. They will be held responsible for any damages caused by themselves, their agents or employees neglecting to take such precautions.

## SPECIFICATIONS AND PLANS FOR CONCRETE DRIVEWAY APPROACHES, SIDEWALKS AND TERRACE WALKS

### DRIVEWAY APPROACHES



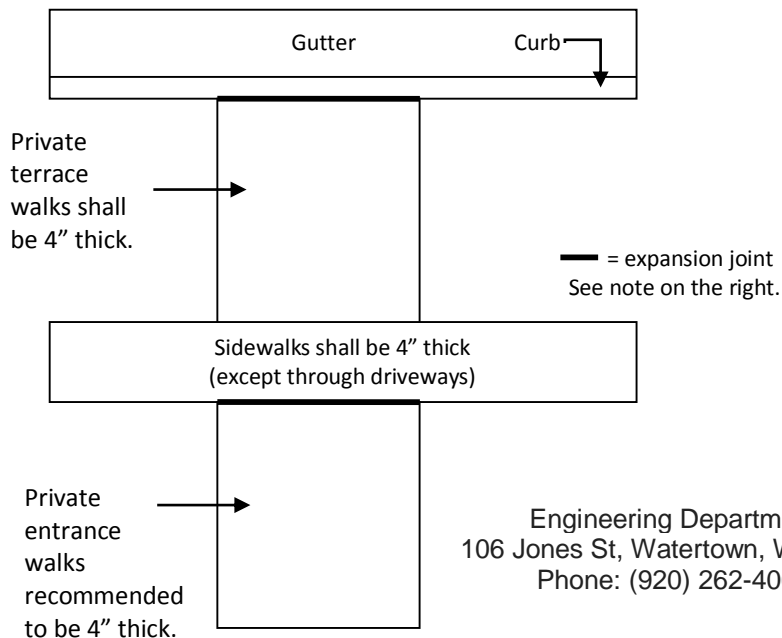
1/2" expansion joints shall be used at these two locations and shall completely separate all concrete in the driveway approach and driveway from the concrete in the sidewalk and in the curb, including the rolled-up portion of the curb and driveway approach.

6 bag mix, air entrained concrete of a relatively dry mix (not over a four-inch slump) shall be used in all sidewalks, driveway approaches and terrace walks and is recommended for driveways and entrance walks.

### Grades

15% recommended maximum  
10% desirable maximum

### TERRACE WALKS AND ENTRANCE WALKS



1/2" expansion joints shall be used at these two locations and shall completely separate all concrete in the terrace walks from the concrete in the curb and shall completely separate all concrete in the entrance walk from the concrete in the sidewalk.

Complete detail specifications for grades, subgrades, reinforcing over service ditches, and depositing, finishing, curing and protecting of the concrete, etc. may be secured from the City Engineering Department.

# Sidewalk Repair Manual

## CONTENTS

### SIDEWALK REPAIR METHOD - GRIND

#### SIDEWALK REPAIR METHOD - GRIND

##### **Grind**

Concrete grinding, or horizontal saw cutting, is a method typically used to remove “stub toes” that are 1 inch (1”) high or less, perpendicular to the flow of pedestrian traffic. Prior to performing work, verify with the City Engineer to determine if grinding would be an acceptable repair method.

##### **Criteria**

Criteria for allowing horizontal saw cutting methods to remove vertical displacements on concrete sidewalks:

- A) Concrete slab must not have been previously repaired.
- B) The remainder of the panel must be free of chipped, cracked, and/or spalled concrete.
- C) Vertical displacement must not be caused by settlement of an adjacent panel.
- D) Existing concrete slab shall be at least 3 inches thick (standard thickness is 4 inches).
- E) Vertical displacement shall not exceed 1 inch.
- F) Vertical displacement shall be at an existing deep joint and/or score line of the sidewalk.
- G) Spacing width between adjacent panels must not exceed ½ inch.
- H) The finished result shall have a smooth uniform appearance and texture and leave zero point of differential between slabs of crack to both sides of the sidewalk to eliminate trip hazards the full width of the sidewalk.
- I) Repairs shall be performed so that the sidewalk surface has essentially the same or slightly rougher texture as the undamaged portion on either side of the joint or score lines. Repaired surface shall not be smooth or polished and shall have a non-slip surface. Coefficient of friction (ASTM C-1028 standard COF of .5 or above).
- J) Repairs shall be performed in such a manner as to produce a neat perimeter with no stray marks. Temporary repairs shall not mar or otherwise deface adjacent concrete.
- K) Vertical displacements of ½ inch or greater can be sawed if they meet all the above requirements.
- L) Saw cuts shall have a slope not to exceed 1:12.
- M) Grinding can only be selected if the property owner performs or has his or her contractor performs all the sidewalk repairs. The City does not contract for grinding. Repairs are either down by the Owner, his/her contractor, or by the City’s contractor. If the City’s contractor performs the work, only removal and replacement method is an option.

## **Obtain Permit**

A sidewalk permit is required to perform the work. Permits can be obtained in person from the Engineering Department, 106 Jones Street, Watertown, WI 53094 during regular business hours (Monday through Friday 8 a.m. – 4:30 p.m.) or on the Engineering Department's website (<http://www.ci.watertown.wi.us/departments/engineering>).

If you hire a contractor, the contractor will be responsible for obtaining the permit.

Stub toes are areas in the sidewalk where part or all of one square is higher than the one next to it, causing a tripping hazard for pedestrians. It may be possible to eliminate the stub toe hazard by grinding down the high edge.

Grinding repair shall not exceed 1 inch (1") vertically. Grinding repair section surface finish shall conform to the non-slip coefficient of friction per ADAAG code (American Disability Act Accessibility Guidelines or ASTM C-1028 standard COF of 0.5 or above). This can be achieved by roughening the surface with a saw blade or other approved method.

Verify with the City Engineer to determine if grinding would be an acceptable repair method. In some areas, sidewalk sections are lifted up due to the growth of tree roots. If you grind down a stub toe caused by tree roots, **the repair may only be temporary**. Grind off the stub toe so that the concrete and/or sidewalk has a gradual slope or transition. For one half an inch (1/2") of rise, grind back six inches (6"). For a (maximum) 1 inch (1") rise, grind back twelve inches (12").

## **Equipment Needed**

Hand Tools Gloves, Goggles, Hearing Protection, Eye Protection

Power Tools Masonry Grinder

You will need a masonry grinder which can be rented.

Grinding concrete is noisy and dusty. Remember to wear hearing protection and eye protection. If the sidewalk is raised one inch (1") or less and the concrete edges are solid, the concrete may be ground to remove the stub toe hazard. Sidewalks raised greater than one inch (1") cannot be ground as this would compromise the structural integrity of the sidewalk.

Areas raised in the sidewalk greater than one inch (1") are to be removed and replaced at full depth.

Request a final inspection if all posted hazards are approved to be corrected by grinding.

## **Final Inspection**

Call the City Engineer at 920-262-4040 and request a final inspection. Please provide the posted address. If the work is found satisfactory, a "Repairs are Complete" card will be left at the door, excluding businesses and rental properties.

If work is found unsatisfactory, a "Repairs Not Acceptable" card will be left at the door, excluding businesses and rental properties, listing corrections that need to be made. Another final inspection will have to be requested. Inspection cards for businesses and rental properties will be brought back to the office and filed with the corresponding posting.





THE CITY OF  
**WATERTOWN**

**Sidewalk Permit**  
**No fee**

Date: \_\_\_\_\_

Property Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

Name: \_\_\_\_\_

Please check one: I am the  Owner  Contractor

is hereby permitted to construct a sidewalk at the above-mentioned address and is permitted to use not more than one-third of the street adjacent to said property for the purpose of placing material, forms, platforms, machinery or other property to be used in the construction of said sidewalk during the term of this permit.

Said sidewalk contractor or property owner shall construct said sidewalk in accordance with the rules, regulations and specifications concerning said work as set forth by the CITY OF WATERTOWN ENGINEERING DEPARTMENT. Information can either be obtained on the Engineering Department's website (<http://www.ci.watertown.wi.us/departments/engineering>) or from Engineering Department staff during regular business hours (Monday through Friday 8 a.m. – 4:30 p.m.).

During the progress of said sidewalk work, said permittee shall put up and maintain around the same, sufficient barriers and lights effectively to prevent the happening of any accident, and shall be liable for all damages caused by failure to do so, and shall further be liable for all damages caused by negligence or carelessness in the prosecution of said work. The permittee shall be responsible for damage to any person or property within one (1) month following the permit date.

**Permittee shall call the Engineering Department at (920) 262-4060 for inspection of forms at least 24 hours prior to pouring concrete. This permit shall expire in thirty (30) days.**

Once completed this form shall be emailed to [nikkiz@cityofwatertown.org](mailto:nikkiz@cityofwatertown.org) , mailed or hand delivered to the City of Watertown Engineering Department, PO Box 477, 106 Jones Street, Watertown, WI 53094.

**By completing this application, permittee is agreeing to the above terms and conditions.**