

SECTION 6 - CONCRETE

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6.1. PURPOSE

- 6.1.1. The purpose of this section is to specify the methods for the installation and replacement of sidewalk, drive aprons, driveways, and curb and gutter.

6.2. GENERAL

- 6.2.1. In areas with chairback curb, sawcutting of the curbing to create depressed curb is not permitted. The curbing in the area of a drive apron or a curb ramp shall be removed in its entirety and replaced with modified (depressed) curb and gutter.

6.3. LEBANON STANDARD CONCRETE

- 6.3.1. Lebanon Standard Concrete is ODOT Class C Portland cement concrete possessing the following qualities:
- 6.3.1.1. Minimum water to cement (w/c) ratio of 0.50.
 - 6.3.1.2. No fly ash.
 - 6.3.1.3. Minimum compressive strength of 4,000 psi.
 - 6.3.1.4. Air entrainment of 6% ±2%.
- 6.3.2. All concrete exposed to the elements shall be Lebanon Standard Concrete.

6.4. PERMIT REQUIRED

- 6.4.1. No person, corporation or firm, other than an authorized employee of the City, shall construct a driveway, driveway approach connecting to a public street or right-of-way, or cut, break out or remove any curb along any street or other public way, or construct any new sidewalks located within the public right-of-way without first obtaining a permit. Each day of such violation shall constitute a separate offense. The City Engineer or his/her designate may require such construction plans or drawings with the permit application as he/she deems necessary to:
- 6.4.1.1. Permit all reviewing authorities to make an intelligent and conclusive review of the application.
 - 6.4.1.2. Enable the contractor to construct the proposed facility in accordance with the terms of the permit.
 - 6.4.1.3. Enable the individual responsible for inspection to insure that the facility is constructed in accordance with the terms of the permit.

6.4.1.4. Serve as a record of the construction authorized by the permit.

6.5. ADA COMPLIANCE

6.5.1. All newly constructed, repaired, or replaced sidewalk and/or curb ramps shall be made completely compliant with the latest edition of the American with Disabilities Act (ADA). This includes providing proper slopes and cross-slopes of all sidewalk and curb ramps and the provision of truncated dome paver warning devices at all curb ramps.

6.6. RESPONSIBILITY OF MAINTENANCE AND REPAIR

6.6.1. As regulated by Chapter 903 of the City of Lebanon, Codified Ordinances, each property owner within the City has the responsibility of maintaining in good repair the sidewalk and driveway aprons abutting their property.

6.6.2. The construction and repair of all curb and gutter and handicap ramps along public roadways within the City of Lebanon shall be the responsibility of and shall be done at the expense of the City of Lebanon. Curb and gutter shall be repaired/replaced based on a field inspection by the City Engineer in coordination with the annual street resurfacing program. As part of the City of Lebanon's annual street resurfacing program, the City Engineer shall designate improvement areas. In these improvement areas, new curb and gutter may be installed and/or defective curb and gutter shall be repaired or replaced at the expense of the City of Lebanon. Only the defective curb and gutter within the defined improvement areas will be replaced at the expense of the City of Lebanon. The property owner may elect to repair and/or replace defective curb and gutter that is not within the annual improvement areas at the property owner's sole expense.

6.7. CRITERIA FOR REPAIRING SIDEWALK, CURBING AND DRIVEWAY APRONS

6.7.1. The objectives for the repair of sidewalk, curb & gutter, and driveway aprons are as follows: pedestrian safety, proper drainage, coordination with other City of Lebanon street projects, and maintaining property values. In all cases, the views and concerns of the property owner will be taken into consideration and in all marginal cases; the decision shall be to the benefit of the property owner.

6.7.2. The following three sections indicate the checklist of the determination of replacement for sidewalks, curb & gutter, and driveway aprons:

6.7.2.1. Sidewalks

6.7.2.1.1. Any block having a crack or cracks. Generally, if more than one crack, the block shall be replaced, if single crack is one eighth (1/8) inch or more in width, the block shall be replaced.

6.7.2.1.2. Adjoining blocks or portions thereof whose edges differ vertically by more than one half (1/2) of an inch or create a tripping hazard.

6.7.2.1.3. Blocks that have holes in them one (1) inch or more in diameter or are cracked or broken in such a manner that pieces of concrete are missing or loose.

6.7.2.1.4. Blocks having depressions, reverse cross slope (sloping away from the street), or below back of curb grade causing the impoundment of mud or water.

6.7.2.1.5. Sidewalk that has a twenty-five (25) percent or larger area that is generally deteriorated as evident by spalling, raveling, or irregular surfaces.

6.7.2.1.6. Blocks that cause an abrupt change in the slope of the sidewalk.

6.7.2.1.7. Sidewalks that have settled due to utility installation.

6.7.2.2. Curb and Gutter

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- 6.7.2.2.1. Any section that has horizontal cracks or cracks causing spalling or breaking away of the curb section.
 - 6.7.2.2.2. Any section having vertical cracks. Following guidelines are followed:
 - 6.7.2.2.2.1. If vertical crack in center of ten-foot section ($\pm 1/2''$), the crack may be saw cut and grouted.
 - 6.7.2.2.2.2. If vertical crack located in ten-foot section in any area other than the center of the section, half of the section shall be removed and replaced.
 - 6.7.2.2.3. Adjoining sections or portions whose edges differ vertically by more than one-half (1/2) inch.
 - 6.7.2.2.4. Any section in which the concrete has deteriorated leaving aggregate exposed.
 - 6.7.2.2.5. Sections where the gutter impounds water.
 - 6.7.2.2.6. Any section having material (asphalt, concrete, mortar, etc.) added to the gutter so as to impede normal flow.
 - 6.7.2.2.7. Sections that cause an abrupt change in slope.
 - 6.7.2.3. Driveway Aprons
 - 6.7.2.3.1. Driveway apron sections that have multiple cracks or a single crack with a width of one-quarter (1/4) inch or more in width.
 - 6.7.2.3.2. Driveway apron sections that differ vertically by one-half (1/2) inch or more above or below the sidewalk and/or the back of the curb abutting the drive apron.
 - 6.7.2.3.3. Driveway apron sections that are cracked or broken in such a manner that pieces of concrete are missing or loose or will cause a situation where pieces can become missing or loose.
 - 6.7.2.3.4. Driveway aprons that are dipped across the sidewalk in such a manner that creates an abrupt change of grade in the sidewalk.
 - 6.7.2.3.5. Abandoned driveway aprons shall be removed and curbing replaced.
- 6.8. CONCRETE SIDEWALK, DRIVEWAY, AND DRIVE APRON CONSTRUCTION SPECIFICATIONS**
- 6.8.1. General
 - 6.8.1.1. Description
 - 6.8.1.1.1. This work shall consist of constructing concrete sidewalks, driveways, and driveway aprons on a prepared base course in accordance with these specifications, Item 608 of the most recent edition of the Ohio Department of Transportation Construction and Material Specifications Manual and to the line, grades, and dimensions shown on the plans or established by the City Engineer.
 - 6.8.1.2. Included work
 - 6.8.1.2.1. The work shall encompass removal of existing sidewalks, driveways, and drive aprons located in the area of the new work, excavation to grade, and excavation of unsuitable sub-grade materials, furnishing and placing of backfill and bedding material and any pavement repairs related to the removal and replacement of existing sidewalks, driveways, and drive aprons.
 - 6.8.2. Widths
 - 6.8.2.1. Sidewalks
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6.8.2.1.1. In residential areas, the width of sidewalks shall be a minimum of four feet.

6.8.2.1.2. In commercial areas, the width of sidewalks shall be a minimum of five feet.

6.8.2.2. Driveways

6.8.2.2.1. In residential areas, no access point width shall be less than nine feet, or more than 20 feet at right-of-way line, or more than 30 feet at curb line unless otherwise approved by the City Engineer in coordination with the City of Lebanon Planning Commission.

6.8.2.2.2. In all other areas, access point widths shall not be less than 12 feet, nor more than 36 feet in width at right-of-way line, nor more than 48 feet at curb line unless otherwise approved by the City Engineer in coordination with the City of Lebanon Planning Commission.

6.8.3. Materials

6.8.3.1. Base Course Material

6.8.3.1.1. Material for the base course shall consist of four (4) inches of clean ODOT Item 304 crushed limestone aggregate (no slag).

6.8.3.2. Concrete

6.8.3.2.1. All concrete shall be Lebanon Standard Concrete.

6.8.3.3. Incidentals

6.8.3.3.1. Preformed joint filler shall conform to the requirements of ASTM D994.

6.8.4. Construction

6.8.4.1. Base Course

6.8.4.1.1. Excavation shall be carried to the depth required for the thickness of the concrete in addition to the four (4) inches of ODOT Item 304. The foundation shall be shaped to the proper section and thoroughly compacted. If soft or unsuitable sub-grade material is encountered, it shall be removed to a depth as directed by the City Engineer and backfilled with acceptable material. If suitable granular sub-grade material, as determined by the City Engineer, is encountered at the grade of the sidewalk and compaction not disturbed, the base course need not be placed.

6.8.4.2. Forms

6.8.4.2.1. Sidewalk forms shall be wood, at least one and three-quarters inches (1-3/4") (2-by lumber) in thickness or steel of equal rigidity. The height of the forms shall be the same as the thickness of the concrete sidewalk. Flexible strips may be used on curbs. Forms shall be held securely in place by stakes or braces, in such a manner to keep the form top of edges true to line and grade. Sidewalks shall be sloped at one quarter (1/4) inch per foot toward the curb.

6.8.4.2.1.1. In no case shall 2 x 4 lumber forms be used for driveways or drive aprons. If 2 x 4 lumber is used, the inspection will be failed and the concrete shall not be placed.

6.8.4.3. Expansion Joints

6.8.4.3.1. City of Lebanon approved expansion joints shall be placed to within one quarter (1/4) inch below the surface of the concrete. Expansion joints (3/4 inch thick) shall be placed at intervals of 40 feet for new sidewalk construction. Expansion joints shall also be placed between the sidewalk and driveway approaches, intersection sidewalks, and buildings; between the sidewalk and all structures (fire hydrants, light standards, and poles which extend through the sidewalk); at all points of curvature; and where new concrete abuts existing concrete.

6.8.4.3.2. Expansion joint material shall have the same height dimension as the concrete being poured.

6.8.4.3.3. Material

6.8.4.3.3.1. All expansion joint material shall be of the following types:

6.8.4.3.3.1.1. Vinyl

6.8.4.3.3.1.2. Recycled rubber

6.8.4.3.3.2. Asphaltic or fiber expansion joint material is not acceptable.

6.8.4.4. Control Joints

6.8.4.4.1. The surface of the sidewalk shall be divided by control joints constructed at right angles to the centerline of the sidewalk. These control joints shall extend a minimum of one-fourth (1/4) the thickness of the slab in depth and shall be placed at intervals no greater than five (5) feet and be edged.

6.8.4.5. Placing and Finishing

6.8.4.5.1. **The sub-grade and forms shall be visually inspected by the City of Lebanon prior to the placement of the concrete.** Concrete shall be placed continuously for the entire width of the slab, and finished to a true and even surface with a straight float.

6.8.4.5.1.1. The concrete for sidewalks shall be four (4) inches thick except through driveways, which shall be six (6) inches thick in residential areas and seven (7) inches thick in commercial areas.

6.8.4.5.1.2. The concrete for driveways shall be five and one-half (5-1/2) inches thick in residential areas, and six (6) inches thick in commercial areas.

6.8.4.5.1.3. The concrete for drive approached shall be six (6) inches thick in residential areas and seven (7) inches thick in commercial areas.

6.8.4.5.2. **Sidewalks shall be kept at correct sidewalk grade when constructed within driveway aprons ramped in the gutter.** The surface shall be given a rough float finish or light transverse brooming as directed by the property owner or the City of Lebanon. Forms shall remain in place for a minimum of 24 hours after the concrete is placed. Sidewalk shall be cured with City of Lebanon approved curing compounds. After the concrete has set and the forms removed, the excavated areas shall be immediately backfilled.

6.8.4.5.3. Sidewalk finishing shall be consistent with neighboring sidewalk, i.e., if neighboring properties have edge marks, newly placed sidewalk shall receive edge marks.

6.8.4.6. Measurement

6.8.4.6.1. The square footage of sidewalk, driveway, or driveway apron shall be the actual number of square feet of sidewalk of the specified thickness, in place, completed and accepted by the City of Lebanon.

6.9. CONCRETE CURB AND GUTTER CONSTRUCTION SPECIFICATIONS

6.9.1. General

6.9.1.1. Description

6.9.1.1.1. This work shall consist of the construction of concrete curb and gutter on a prepared bed in accordance with these specifications and Item 609 of the most recent edition of the Ohio Department of Transportation Construction and Materials Specifications Manual and to the line, grades, and dimensions shown on the plans or established by the City Engineer.

6.9.1.2. Included Work

6.9.1.2.1. This work shall encompass excavation to grade, excavation of unsuitable sub-grade materials, furnishing and placing of backfill and bedding material, and removal of existing curb and gutter located in the area of new work.

6.9.2. Materials

6.9.2.1. Base Course Material

6.9.2.1.1. Material for the base course shall consist of ODOT Item 304 crushed limestone aggregate (no slag).

6.9.2.2. Concrete

6.9.2.2.1. All concrete shall be Lebanon Standard Concrete.

6.9.3. Construction

6.9.3.1. Base Course

6.9.3.1.1. Excavation shall be carried to the required depth and the sub-grade shall be shaped to the proper section and thoroughly compacted. The base course shall be four (4) inches thick of ODOT Item 304 crushed limestone aggregate (no slag) and shall be placed and compacted. If soft or unsuitable sub-grade material is encountered, it shall be removed to a depth as directed by the City of Lebanon and backfilled with acceptable material. If suitable granular sub-grade material, as determined by the City Engineer, is encountered at the grade of the curb and gutter and compaction not disturbed, the base course need not be placed.

6.9.3.2. Forms and Joints

6.9.3.2.1. If curbing is to be hand-installed, curb forms shall be held securely in place by stakes or braces, in such a manner to hold the top of the form edges to true line and grade. Forms shall and must be placed on all repair work abutting the existing street pavement. The existing pavement shall be removed to allow forms to be installed.

6.9.3.2.2. If the curbing is to be machine installed, guide stakes and lines shall be utilized to keep the curb lines and grades straight and true.

6.9.3.2.3. All curb and combination curb and gutter shall have control joints constructed at five-foot (5') intervals with an average depth of at least one half of an inch (1/2") or more in depth. City of Lebanon approved expansion joints shall be placed a minimum of one quarter (1/4) of an inch below the surface of the concrete. Control joints may also be saw cut into the concrete. Expansion joints shall be placed at intervals of 100 feet for new construction. Expansion joints shall also be placed where new curb & gutter abuts existing curb & gutter and between curb & gutter and sidewalk, at all curb ramps, and at all points of curvature.

6.9.3.3. Placing and Finishing

6.9.3.3.1. The sub-grade and forms shall be visually inspected by the City of Lebanon prior to the placement of the concrete. The gutter plate shall have a minimum slope of one inch (1") per foot and a minimum thickness of nine inches (9"). The total thickness of the curb and gutter plate shall be as shown in the standard drawing found in the Appendix. The concrete shall be placed in the forms to permit thorough spading. The curb & gutter concrete shall be placed separately from driveway approach and sidewalk concrete. The concrete shall be spaded in such a manner as to eliminate all voids. The top of curb shall be floated in such a manner to thoroughly compact the concrete and produce a smooth and even surface. The finished surface shall be free of irregularities, waves, and shall be uniform in texture. Concrete curb, and combination curb and gutter shall be cured in accordance with Item 451 of the most recent version of the Ohio Department of Transportation's Construction Material and Specifications Manual.

6.9.3.3.1.1. Forms for curb and combination curb & gutter shall remain in place for a minimum of 24 hours after the concrete is placed. Once the forms and spoil material have been removed, it shall be the contractor's responsibility to backfill and compact all voids between the new gutter and pavement with asphaltic concrete material as to eliminate any and all hazards.

6.9.3.4. Utility Markings

6.9.3.4.1. The location of any underground utility service lines that pass under curb shall be stamped into the curb.

6.9.3.4.1.1. Water service lines shall be marked with the letter 'W'.

6.9.3.4.1.2. Sanitary sewer laterals shall be marked with the letter 'S'.

6.9.3.4.1.3. Electric services shall be marked with the letter 'E'.

6.9.3.4.1.4. Telecommunication (telephone, cable, etc.) service lines shall be marked with the letter 'T'.

6.9.3.4.1.5. Utility crossovers shall be marked with the letter 'X'.

6.9.3.4.1.5.1. Electric crossovers shall be marked with the letters 'EX'.

6.9.3.4.1.5.2. Telecommunications crossovers shall be marked with the letters 'TX'.

6.9.3.4.2. Whenever a section of curbing is to be replaced in which the curb to be replaced has a utility marking, the new section of curb shall have the proper utility markings stamped into the new concrete.

6.9.3.5. Method of Measurement

6.9.3.5.1. The footage of curb length measured will be the actual number of lineal footage of curb or combination curb and gutter complete in place and accepted by the City of Lebanon. The measurement shall be taken along the front of curb.

6.10. COLD WEATHER PLACEMENT OF CONCRETE

6.10.1. ACI 306R (latest edition), published by the American Concrete Institute, shall be followed when cold weather is expected and/or encountered, as determined by the City Engineer.

6.10.1.1. Cold weather is determined as follows:

6.10.1.1.1. The average daily air temperature (average of the highest and lowest temperatures from midnight to midnight) is below 40 degrees Fahrenheit, and,

6.10.1.1.2. The air temperature is not greater than 50 degrees Fahrenheit for more than one half of any 24-hour period.

6.10.2. In no case will the placement of concrete be allowed to be placed on frozen (less than 33 degrees Fahrenheit) ground or sub base.

6.10.3. Prior to allowing placing any concrete during cold weather, the Contractor shall submit a formal written cold weather placement policy/procedures to the Office of the City Engineer.

6.10.4. Concrete shall be kept above freezing by the continuous use of blankets for a minimum of seven (7) days after being placed and finished.

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