THE CITY OF SOLON
ENGINEERING DEPARTMENT

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solonohio.org

MEMORANDUM

To: ALL CONCRETE, MASON AND CEMENT CONTRACTORS

From: John J. Busch, PE, City Engineer

Date: January, 2021

Re: Detail Specifications for all Concrete Sidewalks, Patios, Driveways, Crosswalks and Aprons

1. DESCRIPTION

The proposed work to be covered under these specifications shall consist of the permitting and construction of sidewalks, driveways and handicap ramps with air-entrained Portland Cement Concrete, construction on an accepted prepared subgrade in conformance with the lines, grades and dimensions shown on the Plans and as directed by the City Engineer.

2. VERIFICATION

The City will verify all dimensions provided by each permit applicant prior to the issuance of a permit. No work shall begin until the verification has occurred and a permit is issued.

3. CLEANOUTS

Any drive with an existing storm or sanitary cleanout must be inspected and approved by the City of Solon Service Department prior to removal of the drive. Water boxes must be inspected by the Cleveland Division of Water.

Cleanout caps will be an East Jordan 2960Z Frame with a 296020 Cover design. The frame and cover can be purchased from the City of Solon Engineering Department. The frame will be attached to the riser using the proper fernco for the application. The fernco will be supplied by the contractor.

4. CITY INSPECTION

Two inspections will be required during the construction of the sidewalks, driveway and Handicap ramps.

The first inspection will be to check the subgrade material and form installation for conformance with these specifications. The second inspection will be to check the

quality of the delivered concrete at the time of the pour, and to ensure proper concrete placement procedures are followed. The Contractor must not begin the pour until the City Inspector is present.

Inspections must be scheduled with the Engineering Department a minimum of 24 hours before the inspection is performed. To schedule an inspection, call the City of Solon Engineering Department at (440) 349-6745.

If an inspection is scheduled and the Contractor does not cancel by 8:00 am on or before the date requested, there will be a $100.00 fee assessed to the Contractor. No further inspection will be scheduled until this fee is paid.

If there is a concrete pour performed **without** the presence of a City Inspector, the job will be red-tagged. To determine the quality of the concrete, three 4 inch diameter cores will be taken (at the Contractor's expense). The cores may be tested for compressive strength at a testing company (at the Contractor's expense) approved by the City Engineer. IF the average compressive strength of the cores is less that 4,000 psi, the work will be considered unacceptable. The Contractor will remove the portion of concrete deemed unacceptable and reconstruct the same in accordance with these specifications, with the proper inspections. A fee of $100.00 will be charged for each additional inspection required. The fee must be paid prior to the time the inspection is required.

5. SIDEWALK, DRIVEWAY, APRON AND HANDICAP RAMP DETAILS

a.) Sidewalks and driveways – 4 inches in actual thickness
b.) Sidewalk within driveway – 6 inches in actual thickness
c.) Driveway Aprons – 6 inches in actual thickness
d.) Handicap Ramps – Shall be 6 inches in actual thickness and comply with the Current ADA Requirements.

Sidewalks shall be 5 feet wide and shall slope toward the street. The slope shall be a minimum of ½ inch per 5 feet and a maximum of 1 inch per 5 feet.

Aprons shall not be placed closer than 5 feet from any fire hydrant, utility pole, or any other obstacle, which would create a hindrance to ingress or egress from the driveway.

All handicap ramps shall be installed at all intersections and designated crosswalks, (See attached details for dimensions and requirements).

All sidewalk, driveway, apron and handicap ramp work shall be performed in accordance with plans and specifications on file in the office of the City Engineer.

6. FORMS

Forms shall conform to the lines, grades and dimensions as shown on the plans or as directed by the City Engineer.

Forms shall be wood or steel, and shall be of a depth equal to the thickness of the pavement at the edge and be of sufficient strength to resist the pressure of the concrete without springing. Flexible or curved forms shall be used for construction of circular pavement edges. Bent or damaged forms will not be permitted. Forms shall be cleaned and oiled before each use.

All forms shall be set in conformance to the required grade and alignment as identified on either the approved topo for a new home or approved driveway permit and be supported on thoroughly compacted material for their full length. After the setting of the form, the top face of the form shall not vary from a true plane more than one-eighth inch in ten (10) feet, and the vertical face shall not vary more than one-quarter inch in ten (10) feet and they shall be tested by the Contractor. Variations from the above requirements shall be eliminated by resetting the forms. Shimming with loose earth, pebbles, etc. will not be permitted. The alignment and grade of all forms set shall be approved by the City Inspector before and immediately prior to the placing of the concrete. Any areas where the form has shifted outward greater than ½ inch from the true line due to the pressure of the placement of the concrete, may require the removal and replacement of said area as deemed necessary by the City Engineer.

7. SUBBASE

A base of a minimum of 3 inches thick granular material consisting of crushed limestone (with no reinforcing) of an approved gradation shall be spread upon an **approved subgrade and compacted**. The gradation of the aggregate shall meet the following:

All aggregate shall be **limestone**, and meet the gradation requirements for number #57, #8 and ODOT Item 304-Aggregate Base. NO RECYCLED MATERIALS WILL BE PERMITTED.

For concrete replacement in existing driveways, an inspection must be scheduled to inspect the existing base material. At the discretion of the City Inspector and/or the City Engineer, additional material of #57 limestone aggregate base may be required.

For new and old driveway construction, the Contractor shall dig down to the aggregate over the curb drain at the street and fill this area with #57 limestone aggregate as specified above.

For new driveways, the Contractor shall dig down along the portion of the new driveway at the front of the garage. The driveway shall be poured against the floor of the garage and the 4-inch ledge shall support the driveway.

8. PROPORTIONING OF CONCRETE

All concrete used shall be 6-½ sack design mix with no options and shall be proportioned in accordance with Class C concrete using crushed limestone aggregate. **Fly ash** will not be permitted in roadways, driveways or sidewalks. Aggregate size shall be a maximum of ¾ inch. Concrete shall contain 6 +/- 2 percent entrained air.

Slump shall be maintained between a normal slump of 1-4 inches with a maximum of 5 inches. No concrete shall be used with a slump greater than the maximum allowable.

9. PLACING CONCRETE

Prior to placing of the concrete, the subgrade shall be checked for any high spots by use of a stringline and rule under the supervision of the representative of the City. Any high spots found shall be corrected and rechecked.

The subgrade or subbase shall be sprinkled at such a manner so that it will be in a thoroughly moistened condition when the concrete is deposited thereon.

All surrounding concrete shall be thoroughly inspected and free of foreign material prior to placing of the concrete.

No concrete shall be placed between November 1st – April 15th or when the air temperature is less than 33 degrees Fahrenheit or when the subgrade is frozen.

Ready mixed concrete shall be mixed and delivered in accordance with ODOT Item 499.04. Mixed concrete from the central mixers shall be transferred to the site of the work and discharge shall be completed within one (1) hour after the combining of the water and cement.

Any concrete not discharged after the one (1) hour time limit shall not be used, unless approval is obtained from the representative of the City. Under no circumstances shall any concrete be used after a period of ninety (90) minutes has elapsed after the combining of the water and cement. Each truck delivering concrete shall have the load delivery ticket showing the time at which the truck was dispatched from the mixing plant. The time shall be stamped by a clock and shall be available to the City Inspector upon request.

Retempering concrete by adding water or by other means will not be permitted. When concrete is delivered in transit mixers or agitators, additional water may be added within the specified water – cement ratio limits. Sufficient mixing must be performed to adjust the slump and to regenerate the specified air content throughout the batch, provided all operations are performed prior to discharging any of the batch and only after receiving approval from the representative of the City. When making these adjustments, the concrete shall be mixed a minimum of 30 revolutions at mixing speed. If these conditions are not adhered to and the slump is found to exceed 5 inches the concrete will be rejected.

10. PLACING REINFORCEMENT

Reinforcement is not required, but if used shall be placed according to the following:

a.) When reinforced concrete pavement is placed in one layer, the reinforcement may

be placed in its final position prior to concrete placement by use of reinforcing chairs. The chairs shall be positioned so that full support of the reinforcing is achieved without excessive deflection of the reinforcing between chairs.

b.) When reinforced concrete is placed in two layers, the entire bottom layer shall be placed and struck off to such a depth that the mat of reinforcement may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed as specified directly upon the concrete, after which the top layer of concrete shall be placed, struck off and screeded.

Separate mats of reinforcing shall be overlapped a minimum of eighteen (18) inches. Reinforcing steel shall be free of foreign material consisting of dirt, oil, paint and grease. Rust other than mil scale rust will be considered a foreign material and will be unacceptable. The reinforcing shall be placed between the center of the concrete and the top third but in no cases shall it be closer three inches to the surface.

11. SURFACE FINISH

The finish of sidewalk, driveway or handicap ramps shall immediately follow the placing of the concrete. Unless otherwise approved, all driveways and sidewalks will be finished with a **Broom Finish.** Care shall be sufficiently exercised when the concrete is being worked to properly imbed the coarse aggregate and to produce concrete uniform in appearance, density and composition and free of depressions. The application of drying cement to hasten drying of the surface is prohibited and wetting of the surface to work the concrete is prohibited.

Immediately prior to the finishing of the concrete surface, joints shall be cut in accordance with the plans and details on file in the office of the City Engineer. City sidewalks in driveways shall conform with driveway cuts. The joints shall be formed by a cutting tool or other means satisfactory to the City Engineer. All 4 inch thick sidewalks shall have joints cut to a minimum depth of one inch. Where manhole castings are encountered, the joint spacings shall be adjusted to place a joint to dissect the casting.

Joints in driveway and apron areas shall be cut using a concrete saw or some other means satisfactory to the City Engineer. All cuts shall be made to a depth of ¼ the depth of the concrete, and shall be a minimum of 1/8 inch in width. The pattern and spacing of joints shall be in a manner that would conform to industry standards and deemed appropriate to the City Engineer.

12. CURING AND PROTECTION

Immediately after the finishing operations have been completed and after the free water has disappeared; all exposed surfaces shall be cured by one of the following or other approved system by the City Engineer:

a). Spraying thereon a uniform application of curing membrane in such

a manner as to provide a continuous uniform film without marring the surface of the concrete. The material shall conform to O.D.O.T. Specification (Item No. 705.07 and Item No. 451.10) and shall be applied with an approved spraying apparatus. A minimum of one gallon of material shall be used for 200 square feet of surface treated. The curing material shall be thoroughly agitated prior to application.

b). The placing of a 3 mil plastic sheeting and straw or thermo-blankets over the surface during cold weather. Due care shall be taken not to mark the surface. All edges shall be weighted down to prevent blow by and the drying of the edges.

The use of the above described methods of curing shall be limited to those periods of time when the air temperature does not fall below 33 degrees Fahrenheit during the initial seven (7) days of cure time for the concrete.

If the original driveway was marked for cleanout locations, the finished driveway must be marked in the same manner to designate the clean out locations for the storm and sanitary as follows:

a. A + designation will represent the storm. Storm: +
b. A Δ designation will represent the sanitary. Sanitary: Δ
c. A W designation will represent the water. Water: W

13. WASHING OUT CONCRETE TRUCKS AND EQUIPMENT

As part of the City's commitment and utilizing best management practices toward improving water quality, concrete contractors must provide a designated area for washing out concrete trucks delivering their concrete, as well as cleaning their own equipment. Contractors must be vigilant to assure that trucks and equipment do not get washed out in gutters or catch basins. In the event that a truck or equipment is observed washing out in a gutter or catch basin, the contractor will have his registration revoked. Upon the completion of the concrete work, the concrete contractor shall remove all contents of the washout area from the site.

Note: All references to the ODOT specifications refer to the 2010 ODOT CMS.