

TECHNICAL SPECIFICATIONS

CONCRETE SIDEWALKS, DRIVEWAYS AND CURB AND GUTTER

I. Scope of Work

Work done under this item shall consist of the construction, reconstruction, or alteration of a one-course Portland cement concrete sidewalk, or a one-course Portland cement concrete driveway in accordance with these specifications, or a one-course Portland cement combination curb and gutter, and in conformity to the line and grades established by the Engineer. It shall also consist of the removal of existing sidewalks or driveways or curb and gutter and other obstructions for excavating and filling, for fine grading and compaction of subgrade, and all backfilling necessary to complete the work, including the disposal of surplus material and cleaning up of the work.

A. MATERIALS

1. Concrete

Concrete shall contain cement, coarse aggregate, and fine aggregate with a minimum of 3,000 pounds compressive strength per square inch at 28 days.

2. Water

Water shall be clean and free from salt, oil, or organic substances. Water from local rivers, creeks, or ditches shall not be used.

B. CONSTRUCTION METHODS – SIDEWALK AND DRIVEWAY

1. Subgrade Preparation

The subgrade for sidewalks and driveways shall be formed by excavating to the required depth, and shaped to the proper cross section, and shall be thoroughly compacted by rolling or tamping before placing any concrete to 95 % compaction.

Where tree roots are encountered, they shall be removed to a depth of one foot for the full width of the walk.

All soft and spongy places shall be removed and all depressions filled with suitable material which shall be thoroughly compacted in layers not exceeding six (6) inches in thickness.

- II. Where existing sidewalks or driveways are to be removed, they shall be removed for their entire depth and disposed of in a satisfactory manner. Entire sections of a sidewalk slab between joints shall be removed when directed by the Engineer.

1. Protection of Subgrade

Ditches and drains shall be provided and maintained to satisfactorily drain the subgrade. In no case shall sidewalk and driveway be placed on frozen or muddy subgrade. Frost crystals or mud caused by freezing and thawing shall be removed and replaced with suitable material at the Contractor's expense, or allowed to dry before placing sidewalk and driveway. If ruts are formed in the prepared subgrade, the subgrade shall be scarified and thoroughly compacted. If borrow material is required because of improper handling or drainage, the cost of such will be borne by the Contractor.

2. Grading Specifications

See Grading Specifications for Classification of Excavation General Requirements, Disposal of Excess Material, Stripping, Rock, Slopes, and Embankments.

3. Dimensions

Sidewalk slabs shall have an area of not more than thirty-six (36) square feet, and the length of the slab shall be equal to the width providing, however, that where sidewalks are to be repaired, the size of the slab replaced shall be of the same dimensions as those remaining in the old walk.

The minimum thickness of a sidewalk shall be four (4) inches, except where it is crossed by a driveway, and then it shall be a minimum of six (6). Where, in the opinion of the Engineer, driveways and sidewalks are to be subjected to very heavy traffic loads, he may designate the minimum thickness to be eight (8) inches, or may require wire mesh reinforcement or both.

4. Alignment and Grades

Sidewalks shall be constructed in conformance to the lines and grades on the Plans. Sidewalks shall have a uniform slope toward the curb of not less than one-quarter (1/4) inch per foot, nor greater than one-half (1/2) inch per foot.

The elevation of the front edge of the sidewalk shall be determined by allowing a slope upward from the top of the curb of one-half (1/2) inch per foot for the distance from the curb line to the front edge of the sidewalk.

5. Drainage

A four-inch (4") cast iron or steel pipe shall be provided where necessary to carry the drainage from down spouts under the sidewalk and parkway and through the curb. Drains may be connected to storm sewers if they exist. Vitrified clay sewer pipe may be used for drains under sidewalks and parkways in residential zones, provided the top of the bell such pipes is placed at least three inches (3") below the surface of the concrete where such piping crosses the sidewalk.

6. Forms

Forms used in construction sidewalks shall be of wood or metal for full depth of the concrete, straight, free from warp, and sufficient strength. They shall be staked securely enough to resist the pressure of the concrete without springing. If of wood, they shall be of two-inch (2") surfaced planks. All work forms shall be thoroughly cleaned before being reused.

7. Placing Concrete

No concrete shall be placed until the forms and subgrade have been approved by the Engineer. The subgrade shall be thoroughly wetted and the concrete shall be placed thereon in one course to the required depth. The concrete shall be thoroughly spaded and rammed and struck off with a template to the required grade and cross section. Successive batches of concrete shall be deposited in a continuous operation until individual sections are completed.

8. Joints

Contraction joints shall be provided uniformly to separate the slab, and shall be cut in a straight line to a depth equal to at least one-third (1/3) of the total slab thickness. The joint shall be not less than one-eighth inch (1/8"), nor more than one-fourth inch (1/4") in width.

A one-half inch (1/2") expansion joint filled with joint filler shall be placed between all sidewalks and adjoining backs of curbs and between the intersection of two (2) sidewalks and between all sidewalks and driveways. Sidewalks constructed adjacent to buildings shall be separated from the building with a similar joint. The maximum distance between transverse expansion joints shall be fifty (50) feet. The joint filler

shall extend the full depth of the concrete and shall be one-fourth (1/4) of an inch below the finished surface of the sidewalk.

9. Finishing

After the freshly-poured concrete has been brought to the establishing grade, it shall be floated with a wooden float to produce a surface free from irregularities. The final surface shall be obtained by troweling with a steel trowel or hand float and brushing lightly with a light weight brush in a transverse direction so as to produce a uniform gritty surface of the proper texture. All edges and joints shall be rounded to one-fourth inch (1/4").

No more concrete shall be laid than can be properly finished and covered during daylight, unless artificial light satisfactory to the Engineer is provided.

10. Cold Weather Pouring

Concreting operations shall not be undertaken or continued when the surrounding air temperature is below 40° F or the local weather reports indicate the possibility of temperatures of 32°F or lower within the ensuing twenty-four (24) hours, unless provisions are made to insulate or heat the concrete in a manner satisfactory to the Engineer. In any event, the Contractor shall plan and protect his work in a manner which will assure satisfactory results. Any concrete damage by freezing shall be removed and replaced by the Contractor at his own expense.

Concrete when deposited in the forms, shall have a temperature of not less than 50°F nor more than 90°F. The concrete shall be maintained at a temperature of not less than 50°F for a period of at least seventy-two (72) hours in case of normal concrete, or twenty-four (24) hours when high early cement is used. Concrete shall not be deposited on a frozen subgrade.

11. Curing and Protection

Immediately after finishing operations have been completed, the entire surface of the concrete shall be covered and cured under burlap or other material approved by the Engineer. The burlap shall be free from holes, dirt, clay, or other foreign matter. Reclaim burlap shall not be permitted. The burlap shall weigh not less than twelve (12) ounces per ten (10) square feet when dry. Additional layers may be used to obtain the equivalent weight

Curing operations shall be carried on at all times when the air surrounding the concrete is 50°F or greater. After finishing the concrete, and the

surface is hardened sufficiently or prevent marring, the entire surface shall be covered with one layer of thoroughly saturated burlap overlapping at least six inches (6") at joints to prevent gaps. Additional layers of burlap to result in a total of not less than twenty-four (24) ounces of burlap per ten (10) square feet of surface shall be spread, thoroughly saturated, upon the first layer. The covering shall be maintained fully wetted for seventy-two (72) hours after the concrete has been placed. Water shall be applied by a spray fine enough to avoid damage to the fresh concrete.

Liquid membrane forming curing compound may be used in lieu of keeping the concrete wet. When used, it shall be applied at a rate of one (1) gallon per one hundred fifty (150) square feet of area immediately after the concrete has been finished and the surface water sheen has disappeared. After the curing compound has been applied, the concrete shall be kept covered with a tarpaulin or heavy building paper for at least three (3) days to protect the surface from traffic and rain. Sufficient barricades, signs, and warning devices shall be provided by the Contractor to protect the finished concrete.

12. Removal of Forms and Backfilling

After the concrete has set sufficiently, the forms shall removed and the spaces on both sides shall be backfilled with suitable earth, uniformly spread and compacted/ The areas between the curb and sidewalk, and immediately back of the sidewalk, shall be left in a smooth, neat, and workmanlike condition.

13. Protection of Concrete

Immediately after the forms have been removed, traffic shall be excluded from crossing the concrete for a period of approximately fourteen days (14) days by erection and maintenance of suitable barricades. The Contractor shall be responsible for any damage resulting from traffic within the fourteen (14) day period and he shall remove and replace any concrete damage as directed by the Engineer.

14. Removal of Defective Work

The Engineer shall have the authority to and shall require the removal of any sidewalk or portion thereof laid under these specifications which does not conform to the requirements as set forth herein. Upon notification in writing by the Engineer, the Contractor shall take immediate action to correct the faulty work at his own expense.

15. Cleaning Site

Prior to the acceptance of the work, all surplus and rejected material and unsightly objects such as stones, stumps, limbs, roots, concrete, etc., shall be removed from the site and not be considered complete until all cleaning up has been done and the site is of a neat appearance, with appropriate seeding, fertilizer, etc., completed.

B. CONSTRUCTION METHODS – CURB AND GUTTER

1. Subgrade

The subgrade shall be excavated to the required depth below the finished surface in accordance with the plans to the lines and grades established by the Engineer. All soft and yielding material or other unsuitable material shall be removed and replaced with suitable material, and the subgrade shall be compacted thoroughly and finished to a firm, smooth surface. No curb and gutter shall be poured until the subgrade is approved by the Engineer. If borrow material is required because of improper handling or drainage, the cost of such will be borne by the Contractor.

2. Protection of Subgrade

Ditches and drains shall be provided and maintained to satisfactorily drain and subgrade. In no case shall curb and gutter be placed on frozen or muddy subgrade. Frost crystals or mud caused by freezing and thawing shall be removed and replaced with suitable material at the Contractor's expense, or allowed to dry before placing any curb and gutters. If ruts are formed in the prepared subgrade, the subgrade shall be scarified and thoroughly compacted.

3. Grading Specifications

See Grading Specifications for Classification of Excavation, General Requirements, Disposal of Excess Material, Stripping, Rock, Slopes, and Embankments.

4. Forms

The forms shall be of metal of the necessary dimensions to construct the combined curb and gutters specified in the plans. Wood forms may be used where conditions make the use of metal forms impractical. The forms shall be set true to the line and grade established by the Engineer, and held rigidly in position so as to prevent leakage of mortar and springing out of line when the concrete is placed in them. The forms shall be true in line, free from warping or bending.

5. Placing of Concrete

The subgrade shall be moistened and the concrete shall be placed in the forms and tamped sufficiently to bring the mortar to the surface, after which it shall be finished smooth and even by means of a wooden float.

The curb and gutter shall be constructed in place in uniform sections ten (10) feet in length. The joints between sections shall be formed by steel templates one-eighth inch (1/8") in thickness, of the width and depth of the curb and gutter. The templates shall be left in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place. Expansion joints of suitable material shall be provided at the points designated on the plans or as directed by the Engineer.

6. Finishing

The edge of the curb and gutter shall be finished with an approved edging tool of one-half inch (1/2") radius. Joints shall be similarly finished immediately after the templates have been removed.

The forms shall be left in place until the concrete has set sufficiently so that they can be removed without injury to the curbing. Upon the removal of the forms, the concrete shall be rubbed down to a smooth and uniform finish, but no plastering will be allowed.

No more concrete shall be laid than can be properly finished and covered during daylight, unless adequate artificial light satisfactory to the Engineer is approved.

7. Removing Forms

Forms shall not be removed from freshly placed concrete until it has set for at least twelve (12) hours. They shall be carefully removed and in such a manner as to prevent damage to the edges of the concrete and two (2) parts of fine aggregate.

8. Other Specifications

See Sidewalk Specifications for Cold Weather Pouring, Curing, Protection of Concrete, Removal of Defective Work, and Cleaning Site.

C. METHOD OF MEASUREMENT

1. The area of concrete sidewalk and driveway completed and accepted shall be measured and computed in square yards. No measurement shall be made of fine grading of subgrade and backfill. Any common excavation necessary shall be included in the unit price for sidewalk and driveway. Borrow material will be measured in cubic yards and determined by the average end method at one hundred (100) foot intervals.
2. The length of combination curb and gutter including drop driveway complete and accepted shall be measured in linear feet. The measurements of the curb and gutter shall be measured along the bottom of the gutter near the face of the curb. No measurement shall be made of fine grading of subgrade and backfill. Any common excavation necessary shall be included in the unit price for curb and gutter.

D. BASIS OF PAYMENT

Payment will be made for all items complete and accepted on the unit or lump sum prices as stated in the proposal and measured and previously stated. The sum of each payment shall be full compensation for all materials, labor, and other costs to the Contractor.