STANDARDS AND SPECIFICATIONS
OF THE
CITY OF ALLENTOWN

I. CEMENT CONCRETE SPECIFICATIONS

A. Cement concrete shall consist of portland cement, fine aggregate, coarse aggregate, water and admixtures where required. The materials for cement concrete shall conform to the following:

1. Cement - All cement used in this work shall be true portland cement and shall meet the requirements of the latest standard specifications for portland cement as adopted by the American Society for Testing Materials (ASTM).

2. Fine Aggregate - Fine aggregate shall consist of natural sand or screenings from hard, tough crushed rock or gravel consisting of quartz grains or other hard material, clean and free from any surface film or coating and graded from fine to coarse (coarse particles predominating). Fine aggregate, when dry, shall pass a screen having four meshes to the linear inch; not more than six (6%) percent shall pass the one hundred mesh sieve.

3. Coarse Aggregate - Coarse aggregate shall consist of clean, durable crushed rock, graded in size, free from vegetable or other organic matter, and shall contain no soft, flat or elongated particles. The size of the coarse aggregate shall range from one (1") inch down, not more than five (5%) percent passing a screen having four (4) meshes per linear inch; no intermediate size shall be removed.

4. Water Used For Mixing or Curing - Water shall be measure by volume or weight through an approved measuring system. The measuring system shall be readily adjustable and capable of incorporating in the batch, through a metering or weighing device, the predetermined quantity of water, to an accuracy of one (1%) percent and within one-quarter (1/4) of the specified mixing time. The metering device shall automatically register and stop the flow of the water when the designated quantity has been delivered into the mixing drum. Water shall be reasonably clean, free from vegetable matter, oil, and alkali, sugar, or other substances injurious to the finished product.

5. Admixtures - The air-entraining admixture solution shall be dispensed into the batch from a bulk supply tank. For paving, and when otherwise specified or directed, the bulk supply tank contain a minimum of two hundred fifty (250) gallons of solution at the beginning of each days

concreting operation. The dispensing system shall include a device or devices which shall detect and indicate the presence or absence of flow of the admixture.

Specifications for the above material can be found in PennDOT specifications, PUB. 408 and latest revisions.

B. Design Basis

Cement concrete shall be designed with an air content of 6.5% in the plastic state. The specified air shall be obtained through the addition of a solution of an air entraining admixture meeting the requirements of PennDOT specifications PUB. 408 and the latest revisions, using an approved visual dispenser in the quantity necessary to maintain the air content within the required range.

The air content of the plastic concrete, determined in accordance with Pennsylvania Testing Manual (PTM) No. 615 for stone and gravel, shall be maintained within a tolerance of plus or minus one and one-half (1 1/2%) percent during the work. The air content of plastic concrete includes entrapped and entrained air.

The slump range for all concrete used on curb and sidewalk shall be three (3") inches plus or minus one-half (1/2") inch.

C. Concrete Design

The concrete design submitted for approval shall comply with Table "A" PennDOT specifications PUB. 408, Class "A-A" Concrete, and shall be supported by a slump air content and flexural and/or compressive strength test data. Concrete designs may be approved on the basis of the seven (7) day strength test (class High Early Strength (H.E.S.) may be approved on the basis of three (3) day strength test); however, the twenty-eight (28) day tests shall be made to show the potential of the design mix and may be used for approval of the design. Any concrete not meeting the designed mixture, after testing, will be subject to rejection and removal and replacement by the contractor.

D. Ready-mixed Cement Concrete; General Requirements

Ready-mixed concrete is portland cement concrete, delivered to and incorporated into the work in a plastic state as specified in PennDOT specifications PUB. 408 and the latest revisions. The materials for ready-mixed cement concrete shall be controlled as required in PennDOT specifications PUB. 408 and the latest revisions. The plant, equipment, mobile mixer (truck mounted plant), the proportioning and the composition of the concrete, shall all conform to the

requirements of PennDOT specifications PUB. 408 and the latest revisions. Copies of the concrete delivery slips must be given to the inspector before the contractor receives the final inspection slip.

II. CONCRETE CURBING SPECIFICATIONS

A. Dimensions

The concrete curb shall have a top width of six (6") inches and be not less than twenty-one (21") inches in depth. The base width of the same shall not be less than seven and three-quarters (7 3/4") inches in width, the front face having a batter of one (1) in twelve (12) and the back shall be vertical.

B. Forms

The forms shall be made of substantial materials, preferably steel forms. They shall be smooth, free from warp and sufficiently rigid to resist springing out of shape and of a depth to conform with the thickness of the proposed depth of the curb. Before reusing, all forms must be thoroughly cleaned of mortar and dirt adhering to them. Forms shall be well secured and set to the given lines, the upper edges conforming to the grade of the finished work and shall be oiled so as to prevent the fresh concrete form adhering to the forms.

C. Rounding Edges (Nosing)

Wherever corners are to be rounded, special steel trowels shall be used while the concrete is workable. The outer edges of all surfaces shall be finished to a radius of not more than one-half (1/2") inch.

D. Joints

All curb shall be cut clear through so it consists of sections ten (10) feet long where practical. These shall be cut by use of the steel templates where the curb is cast in place.

E. Expansion Joints

Expansion joints shall be placed between sections of the curb at the ends of all radii, along all structures or as directed by the Engineer. These joints shall be filled with premolded bituminous material of at least three-eighths (3/8") of an inch in thickness. All joint material shall be trimmed to conform to the finished grade.

F. Finish

After concrete is placed into the forms, it shall be puddled and spaded thoroughly so as to insure a proper mixture, eliminating air pockets and creating uniform and smooth sides. Before the concrete has thoroughly set and while the concrete is still green, the forms shall be removed. The face shall be checked for honeycomb or large air holes (1/4" or larger). Areas affected shall be grouted in with a 50/50% mix of sand and cement and given a steel trowel finish. If the surface is unsatisfactory, the entire top 8" of the face shall be hand rubbed. Plastering or the adding of water are not permitted to achieve the final finish unless authorized by the City Engineer.

III. RADIUS CURBING SPECIFICATIONS

A. In the construction or reconstruction of curbing at the intersections of streets or alleys, the same shall be made by a curve. Unless otherwise directed by the City Engineer, the radius of the curve shall not be less than the width of the narrower intersection sidewalk, provided that the least radius shall not be less than six (6') feet. All curbing on a radius less than two hundred (200'R) feet shall be formed with flexible forms.

B. Dimensions: The concrete radius curbing shall have a top width of six (6") inches and be not less than twenty-one (21") inches in depth. The base width shall not be less than size (6") inches and having both the front and back form vertical.

C. Forms: The forms shall be made of substantial materials preferably steel forms. They shall be smooth, free from warp and sufficiently rigid to resist springing out of shape and of a depth to conform with the thickness of the proposed depth of the curb. Before reusing, all forms must be thoroughly cleaned of mortar and dirt adhering to them. Forms shall be well secured and set to the given lines, the upper edges conforming to the grade of the finished work and shall be oiled so as to prevent the fresh concrete from adhering to the forms.

D. Rounding Edges (Nosing): Refer to Section II, C of these specifications for details.

E. Joints: Refer to Section II, D of these specifications for details.

F. Expansion Joints: Refer to Section II, E of these specifications for details.

G. Finish: Refer to Section II, F of these specifications for details.

IV. PLANTER STRIP SPECIFICATIONS

A. The planter strip area adjacent to the curb is reserved for the planting of street trees and grass. However, concrete, blacktop, brick or other materials specifically approved by the City Engineer may be substituted. Such approval shall be indicated on a WORK ORDER issued for that property.

B. Refer to Section II of these specifications for details.

C. No shrubs, small trees or other plantings will be allowed in the planter strip which do not provide for free passage or use of this area, or which create a hazardous condition for both pedestrians or motorists.

D. Trees shall not be planted within 35' of an intersection.

V. CONCRETE SIDEWALK SPECIFICATIONS

A. Dimensions

Sidewalk blocks shall have an average area of twenty-five (25) square feet. Blocks having an area greater than one hundred (100) square feet, shall be reinforced with wire mesh. The depth of a slab may be one of three (3) approved types. They are:

1. Type "6" - six (6") inches of Type AA concrete on two (2") inches of a 3/4" coarse graded tamped stone bed.

2. Type "5" - five (5") inches of Type AA concrete on three (3") inches of a 3/4" coarse graded tamped stone bed.

3. Type "4" - four (4") inches of Type AA concrete on four (4") inches of a 3/4" coarse graded tamped stone bed.

4. Steel slag stone shall be considered an experimental material as bedding.

B. Forms

Refer to Section II, B of these specifications for details.

C. Rounding Edges

Refer to Section II, C of these specifications for details.

D. Joints

The outer edges of all surfaces shall be finished to a radius of not less than one-half (1/2") inch. Sections of sidewalk shall be separated by division plates or expansion material not exceeding one-quarter (1/4") inch thick and separation must be through to the stone base. The method of placing the various sections shall be as to produce a straight clean cut between them or cutting a straight groove in the surface not less than one-third (1/3) of the entire depth off the slab. Edges shall be rounded to a radius of not less than one-half (1/2") of an inch.

E. Expansion Joints

Expansion joints shall be placed at intersections or where the sidewalk butts up against concrete and other structures. These joints shall be filled with premolded bituminous material of at least three-eighths (3/8") of an inch in thickness. Joint to be of an approved material. All joint material shall be trimmed to conform to finish grade.

F. Finish

After concrete is placed into the forms, it shall be puddled and spaded so as to insure a thorough mixture, eliminate air pockets and create uniform and smooth sides. The final surface can be either a wooden float or a broom finish. At no time shall plastering or the addition of water be permitted to achieve the final finish.

G. Slope

In general, the pitch or slope of the sidewalk from the curb to the property line shall be three-eighths (3/8") of an inch per foot ascending from the curb line. At intersecting streets, warping may be used to conform to the intersection grades.

VI. BRICK SIDEWALK SPECIFICATIONS

A. Responsibility of Property Owner for Brick Sidewalks

It is the responsibility of the property owner to contact the appropriate utility companies in order to determine the condition of underground utility lines. The property owner shall contact the City Bureau of Water Distribution and Service Maintenance for an inspection of the curb boxes at least seventy-two (72) hours prior to brick sidewalk construction.

B. Materials

1. Brick - Brick pavers for sidewalk surfaces shall meet the requirements of the American Society for Testing Materials (ASTM) C902-79a, Class SX, Type I and shall be 4" x 8" x 2 1/4" in nominal size. Coring or frogging is not acceptable.

2. Cement - All cement used in this work shall be true portland cement and shall meet the requirements of the latest standard specifications for portland cement, American Society for Testing Materials (ASTM), C150-80, Type I.

3. Fine Aggregate

   a. Fine aggregate for the mortar mix shall be of mason sand which shall be washed free of clay and conform to the American Society for Testing Materials (ASTM) C144-76e.

   b. Fine aggregate for the concrete shall be of the type specified in Section I, A (2) of these specifications.

4. Coarse Aggregate

   a. Coarse aggregate for the subgrade shall consist of No. 57 stone.

   b. Coarse aggregate for the concrete base shall be the type specified in Section I, A(3) of these specifications.

5. Expansion Joints

   Expansion joint material shall be of silicone rubber and/or butyl rubber, three-eighths (3/8") of an inch to one-half (1/2") of an inch wide.

6. Mortar

   Mortar for brick paving shall be Type M and meet the requirements of the American Society for Testing Materials (ASTM) C270-80a natural or white in color. Admixtures of color shall not be added.

7. Mortar Joints

   Mortar joints shall be flush, no less than three-eighths (3/8") of an inch wide nor more than five-eighths (5/8") of an inch wide.

C. Brick Sidewalk Construction

The sidewalk shall consist of a new brick wearing surface placed upon a three-quarter (3/4") of an inch Type M mortar leveling bed of the prescribed mortar mixture. The brick pavers and mortar shall be placed upon a four (4") inch concrete base which shall be of a Class AA concrete and as specified in Section I of these specifications. The concrete base shall be constructed on a compacted subgrade filled with four (4") inches of No. 57 stone.

D. Excavations

Excavations for all brick sidewalk work shall be filled for foundation with clean No. 57 stone. The same shall be compacted before any work is placed thereon. Excavations for brick sidewalks shall be made to a depth of at least eleven (11") inches below curb grade.

E. Base

1. Concrete - Concrete for the base course shall be a class AA concrete and shall be of the proportions and mix as specified under Section I of these specifications. The depth of the concrete base shall be four (4") inches.

2. Curing - All concrete used for the base course shall be cured with the use of polyethylene sheets (minimum 4 mil thickness) or other natural curing process, unless other methods are specifically approved by the City Engineer. The concrete base shall be covered for a minimum of three (3) days. No protective coatings or curing compounds shall be used for this type of work.

3. Expansion Joints - Shall be placed every fifteen (15') feet of concrete and brick pavers and shall be of butyl rubber and/or silicone rubber. Expansion joints shall also be used between the curb and the pavers and between the pavers and the existing structure and as noted on City drawings.

4. Finish - Shall be a tine broom finish.

5. Forms - Shall be as specified under Section V, B of these specifications.

6. Joints - Shall be as specified under Section V, D of these specifications.

7. Slope - Shall be as specified under Section V, G of these specifications.

8. Surface Area Dimensions - The dimensions shall be as specified under Section V,A of these specifications.

9. Alternate Materials - Other materials such as Blacktop, Modified Stone, etc. may be used on an experimental basis as approved by the City Engineer.

F. Mortar Mix

The mortar for the mortar bed and the brick pavers shall be Type M. When proportioning, the sand shall be damp and loose. Bonding compound shall be added in accordance with the manufacturer's specifications. Proportions shall be securely controlled and approved measuring containers shall be used. All water used in mixing mortar shall be clear and free of deleterious materials which would impair the work. The mortar ingredients shall be mixed in a mechanical batch mixer for a minimum of five (5) minutes. Mortar for patching shall be thoroughly mixed by hand in a mortar box. Mortar shall be periodically retempered, as required to insure workability; however, in no case shall mortar be used which has begun to set, or which has been mixed for more than two and one-half (2 1/2) hours, measured from initial mixing.

Placement of the leveling bed shall be limited to the maximum area which can be covered with brick pavers before the initial set.

G. Mortar Application

Prior to placing the brick, the bonding compound shall be applied to the cleaned and dry subpaving as specified by the manufacturer. It shall not be placed until the subpaving is in the condition required by the manufacturer of the bonding compound and until it has been approved as such by the appropriate City agency. Brick shall be placed in a full mortar bed no less than three-quarter (3/4") of an inch thick. The sides and ends of the pavers shall be completely encased in mortar with the joints thoroughly packed full and free from voids. All pavers shall be free of contaminants.

H. Placement and Construction

Brick pavers shall be set plumb and true to line with level horizontal joints. Expansion joints shall be placed in the brick paving as indicated on the City drawings. The expansion joint materials shall be placed in accordance with the manufacturer's instructions.

All surfaces onto which mortar is to be placed shall be free of dirt, oil and other matter which would prevent the required bond. If it becomes necessary to stop a masonry run, toothing will not be permitted. It shall be racked back instead.

The exposed surfaces of partially or totally set masonry joints shall be cleaned and lightly wetted to assure a proper bond with new work.

Mortar shall be cured by immediately covering it with plastic and same remain covered for three (3) days to maintain it in a damp condition.

Around curves, the bricks shall be placed in radial courses, and at the outside of the curve, the space between the courses shall not exceed one-half (1/2") of an inch. When the curvature is such that the space between courses at the outside of the curve would exceed one-half (1/2") of an inch, bricks shall be laid in radial courses transversely across the pavement. No portion of a brick less than five (5") inches in length shall be used for closure.

Unfinished and finished masonry work, as well as stored materials, shall be protected at all times from the effects of the weather, marring, soiling, and all other damage. Materials meeting American Society for Testing Materials (ASTM), Portland Cement Association and National Concrete Masonry Association specifications shall be used to provide this protection. Stored materials shall be stacked off the ground.

Unless adequate provisions are made for heating and drying materials and for protecting completed work, no masonry work shall be permitted when the ambient temperature is less than 48 degrees F or is falling. No masonry work shall be laid on frozen materials, nor shall frozen units or bricks be placed. During hot weather, mortar shall be protected from the direct rays of the sun when the ambient temperature is 85 degrees F or above. No brick shall be placed when the ambient temperature is above 98 degrees F.

The use of chemicals or salts in the mortar mixes to lower the freezing point, or the use of admixtures to accelerate setting or to procedure higher than normal strengths at early periods will not be permitted.

I. Protection of Brick Sidewalks

The mortared brick sidewalk shall be left undisturbed for a period of one (1) day, and covered with large sheets of plywood or hardwood to protect against staining and damage from light impact loads.

J. Drainage

The method of drainage shall be determined by the City Engineer of his representative. Plastic pipe or diamond plate and channel shall be used as indicated on City drawings.

K. Existing Signs

Sleeve forms shall be used for all existing signs prior to brick sidewalk construction.

VII. ROOF DRAINS

A. All roof and waste water conducted directly to a street or storm sewer shall be by means of a three (3") inch plastic pipe under the sidewalk and through the curb or by use of a channel formed in the sidewalk and covered with a diamond plated steel sheet or cover or by use of a drainage swale formed in the sidewalk provided such swale will not constitute a public nuisance or hazard. (Refer to standard drawing for details)

All such drainage devices, whether on or below the surface of the sidewalk shall be the responsibility of the property owner to construct and maintain.

VIII. CROSS-OVERS; DRIVEWAYS AND HANDICAP RAMPS SPECIFICATIONS

A. Commercial Cross-overs - All commercial driveways across the sidewalk and/or sidewalk area shall conform to the typical standards of the Bureau of Engineering and shall be constructed of eight (8") inches of concrete in depth and shall be reinforced with 6" x 6" #6 wire mesh, placed two (2") inches from the bottom surface of concrete. Commercial cross-overs may not exceed fifty (50') feet in width unless special conditions dictate. Variances from the above requirements can only be granted by the Bureau of Traffic Planning and Control and the City Engineer, jointly.

B. Residential Cross-overs - All residential driveways across the sidewalk and/or sidewalk area shall conform to the typical standards of the Bureau of Engineering and shall be constructed of six (6") inches of concrete in depth. Residential cross-overs cannot exceed thirty (30') feet in width unless special conditions dictate. Variances to the above requirements can only be granted by the Bureau of Traffic Planning and Control and the City Engineer, jointly.

C. Handicap Ramps - All ramps for the handicapped shall be constructed of six (6") inches of concrete in depth and shall conform to the typical standards of the Bureau of Engineering. The contractor shall contact the Bureau of Engineering, prior to the placement of any handicap ramp.

IX. CURING AND PROTECTIVE COATINGS SPECIFICATIONS

A. Concrete Curing Compound - Membrane curing shall be by application of a sealing compound which forms a water retaining membrane on the surface of all exposed

concrete. The sealing compound shall be the liquid membrane-forming curing compound, clear or white and conform to the requirements of the PennDOT specifications PUB. 408 and the latest revisions, and shall be of uniform consistency and quality within each container and from shipment to shipment.

All surfaces cured by the membrane method shall be given the required normal finish prior to application of the curing compound.

The compound shall be applied in two (2) coats to the surface by spraying, rolling or brushing to provide a continuous uniform membrane over all areas. The coverage of each application (coat) shall not exceed three hundred (300) square feet of concrete surface per gallon of compound.

On formed surfaces, the first coat shall be applied immediately after stripping of forms and the finishing of the concrete. If the surface is dry, the concrete shall be thoroughly wet with water and the curing compound applied just as the surface film of water disappears. The second application shall be applied after the first application has set.

Operations by the contractor (traffic and other) shall be such as to avoid damage to the coating of curing compound for a period of not less than ten (10) days. Any membrane that is damaged or that peels from the concrete surface within ten (10) days after the initial application shall be repaired. The above curing will be performed in accordance with PennDOT specifications PUB. 408 and the latest revisions. Curing compound will be used from March 1 to September 30 of the contract year or as directed by the City Engineer.

B. Protective Coating - The protective coating shall be blended by volume and shall consist of 50% Boiled Linseed Oil and 50% Mineral Spirits meeting the following requirements, and which shall be furnished blended, in a container as directed. The non-volatile content of the blend coating shall be based on the specific gravities of the components.

C. Boiled Linseed Oil - Boiled linseed oil shall meet the requirements of the American Society for Testing Materials (ASTM) D260, Type I, except it shall dry on glass within eighteen (18) hours.

D. Mineral Spirits - Mineral spirits shall be the grade of petroleum distillate known as mineral or petroleum spirits for use in thinning paints (paint thinner). It shall be clear and free from water and suspended matter and the color shall be no darker than as aqueous solution of potassium dichromate containing 0.0048 grams per liter.

The above protective coating shall be applied as specified in the PennDOT

specifications PUB. 408 and the latest revisions. Linseed Oil and Mineral Spirits will be applied starting October 1 of the contract year or as directed by the City Engineer.

X. TESTING OF CONCRETE SPECIFICATIONS

All concrete used for work performed within the public right-of-way within the City limits, will be subject to testing which will be conducted by the City and as directed by the City Engineer. Acceptance slips will be given to the contractor upon completion of the test, if the concrete meets the specified requirements. If the concrete does not meet the specified requirements, air entrainment-slump and temperature, the City will reject the load and the contractor will not be allowed to place the defective concrete. Any concrete that does not meet compressive test criteria will have to be replaced at the expense of the contractor or supplier.

The cost of all concrete which is rejected because of not meeting the specified requirements, will be borne by either the contractor or the supplier. At no time, will the City be held liable for any expenses incurred by the contractor or supplier, for down time and/or defective materials.

XI. COLD WEATHER CONCRETING SPECIFICATIONS

A. Concrete

High early concrete shall be used when the temperatures are below 50 degrees F (at night) and/or at the discretion of the City Engineer. At no time shall calcium chloride be used as an accelerator. Concrete slips must be retained by the contractor for verification of the use of high early concrete when required and specified. Under no conditions shall concrete be poured when the temperature is below freezing.

B. Covering and Insulation

During the cold weather months and as directed by the Engineer, the contractor will be required to cover and protect all concrete to prevent it from being affected by frost. Combinations of salt hay, straw, plastic sheeting and/or thermal blankets shall be placed and secured to and remain over the concrete for a period of three (3) days, to maintain a minimum concrete temperature of 50 degrees F.

The use of insulating materials for cold weather concreting does not relieve the contractor of any of his responsibilities. Their use does not change or modify any of the requirements of specifications regarding the mixing, placing or curing of concrete during cold weather.

C. Protective Coating

After the three (3) day curing period the covering and insulation shall be removed and the protective coating (linseed oil and mineral spirits) applied as required in Sections IX, B; IX, C; IX, D.

Any concrete which has been affected by freezing due to the contractor not following the above requirements, shall be removed and replaced by the contractor as directed by the Engineer.

All costs associated with removal and replacement shall be borne by the contractor and at no cost to the property owner of the City.

XII. SLABJACKING

A. Work Orders

1. Shall be as specified under Section 907.7 and 907.17 of the City Ordinances modified as follows: add "the contractor shall show satisfactory qualifications and successful experience with this type of work". Also, the method of work shall be noted on the work order. Prior to the issuance of the work order, a site inspection by the Bureau of Engineering will be required. This will be to verify that slabjacking is feasible (i.e. structural integrity, surface condition, grades, amount of raising required, etc.). Final determination of feasibility shall be by the City Engineer.

2. This work shall be considered a temporary repair to eliminate a hazard and future leveling may be required.

B. Materials

The materials for slabjacking shall meet the specifications as set in PennDOT specifications PUB. 408, Sections: 679.2 or 681.2.

C. Mix Design

The mix design shall be as specified in the current edition of the PennDOT specifications PUB. 408, Section 681 Slabjacking requirements.

D. Equipment

1. Grout Plant - The plant shall consist of a grout mixer and injection pump capable of proper proportioning of the grout material. The pump should have a pressure capability of 1000 to 1500 PSI and variable pumping rate

of 0.2 to 2 cubic feet per minute.

2. Water Tanker - A water tanker with water supply having adequate capacity and pressure for delivery to the grout machine is required.

3. Drill - A diamond tip core drill or rotary percussion drill capable of drilling the grout injection holes through the pavement is required. The equipment should be in satisfactory condition and operated in a manner that the holes are smooth, vertical and do not break out the slab bottom.

4. Miscellaneous Tools and Equipment - The contractor shall provide the necessary high pressure hoses, valving and valve manifolds with cutoffs and by pass provisions to control pressure and volume, pressure gauges with protectors, expanding packers or hose for positive seal during grout inspection, hole washing tools, drill steel, bits and any other miscellaneous tools required.

B. Slabjacking Procedure

1. Prior to starting work, the contractor must determine if any underlying cause exists that would effect the desired results. Future leveling may be necessary if the original cause of settlement has not been corrected.

2. Grout injection holes shall be no larger than 1.5 inches in diameter, drilled vertical and round. They shall not penetrate the stabilized base material below the slab. The exact layout and spacing of injection holes will vary depending on the thickness, condition, and configuration of the slab to be lifted. This spacing shall be determined by the contractor.

3. The contractor, prior to placing any grout, shall submit to the inspector his proposed grout mix design, meeting PennDOT specifications PUB. 408. These mix proportions shall be controlled by weight batching or provided packaged in uniform volume sacks. Use batching and mixing equipment capable of proportioning and mixing all ingredients at a rate that will provide adequate production and uniformity of batches. DO NOT hold mixed materials in the mixer or injection pump for more than one hour after mixing. Materials held for longer than this time will be wasted and disposed of at the contractor's expense.

4. Lifting shall start at the point of greatest settlement. The slab is to be lifted uniformly to prevent the buildup of any unnecessary stress within the concrete. The pumping rate is to be monitored and adjusted to the individual job condition until the desired grade is obtained.

F. Tolerance

Sidewalk which is raised shall not be displaced more than 0.02 foot when completed and shall be in reasonable conformity of grades for the existing curb grades. Any sidewalk which has cracked or does not meet tolerance requirements during the course of work, must be removed and replaced at the contractor's expense.

G. Drill Hole Patching

Upon completion of the work, patch drill holes to full depth with a rapid set, non-shrink epoxy concrete patching material. Stripe patches flush with the surface of the surrounding pavement.

H. Opening to Traffic

All lifted areas are to be closed to vehicular traffic for a minimum of 12 hours after grouting operations have been completed.

XIII. SLIPFORM CURBING (EXTRUDED CEMENT CONCRETE CURBING)

A. Works Orders

Shall be as specified under Section 907.7 and 907.14 of the City Ordinances, modified as follows: add "the contractor and operator shall show satisfactory qualifications and at least three (3) years experience with this type of work. References shall be submitted to the Bureau of Engineering. A review will be made on each application.

B. Materials

Refer to Section I, A of these specifications for details.

C. Design Basis

Shall be as specified under Section I, B of these specifications as follows: Cement concrete shall be designed with air content between 4% and 6% in the plastic state. The slump range of cement used on slip-form curbing and sidewalk shall be one to one and one-half (1-1 1/2") inches.

D. Concrete Design

Refer to Section I, C of these specifications for details.

E. Ready Mixed Cement Concrete

Refer to Section I, D of these specifications for details.

F. Concrete Curbing Specifications

Shall be as specified in Section II of these specifications modified as follows:

2. Forms - use a fully energized, self propelled, slipform paving machine, equipped with side forms and extruded curb templates to support the concrete laterally to prevent side slumping. Use a paver that vibrates or tamps concrete for the full width and depth of the layer being placed. Do not apply external tractive force to the machine.

4. Joints - all curbs shall be cut clear through the top 6" of curb, every ten (10) feet where practical. The remainder of the face and back is to be cut to a depth of two (2") inches.

5. Expansion Joints - refer to Section II, E adding the following:
Sufficient set and care shall be taken when cutting in the expansion joint to minimize damage and segregation of the concrete in this area. The cut-in expansion joint shall be finished to conform to the surrounding concrete finish.

G. Curing
Refer to Section IX of these specifications for details.

H. Inspections

Shall be as specified under Section 907.02 of the City Ordinance adding the following: "The contractor, prior to placing any concrete, shall request an inspection of his stringline and subgrade preparation."

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10/29/97

Discover the city
Allentown

BUREAU OF ENGINEERING
Department of Public Works
610.437.7576 Fax 610.437.7614

NOTICE

TO: ALL CURB/SIDEWALK CONTRACTORS, PLUMBERS, PROPERTY OWNERS AND PUBLIC UTILITIES

RE: SPECIFICATIONS FOR ROOT PRUNING TREES

THE ATTACHED INFORMATION, MANDATED BY THE PARKS DEPARTMENT, SHALL BE CONSIDERED A SUPPLEMENT TO OUR CONTRACTORS PACKAGE REGARDING ANY WORK PERFORMED IN THE PUBLIC RIGHT-OF-WAY OR PROPERTY OWNED BY THE CITY OF ALLENTOWN.

SPECIFICATIONS FOR ROOT PRUNING TREES IN THE PUBLIC RIGHT-OF-WAY AND ON PROPERTY OWNED BY THE CITY OF ALLENTOWN

These specifications shall be adhered to by any contractor or person who in the process of repairing or replacing streets, curbs, sidewalks and drive-ways or placing utilities in the public right-of-way or on any City property damages roots of trees and/or shrubs.

Approved Methods of Root Pruning

(1) No cutting of any part of City trees including roots shall be done without securing a permit from the City Parks Bureau (437-7627).

(2) The Parks Bureau shall be contacted seven (7) days before proposed work begins to review the planned pruning and to schedule inspection of the work sites.

(3) One of the following methods, or a combination of methods, shall be used when pruning tree roots:

   (a) Wherever possible, root pruning should only be performed on one side of a tree at a time, meaning on the sidewalk side or the street side, but not both unless specifically authorized in writing by the Parks Bureau.

   (b) The actual pruning of roots should be done using a trenching machine with a root pruning attachment or some comparable piece of equipment or cutting tool which can safely and cleanly cut roots. All roots over one (1") inch diameter shall be cut by utilization of equipment described above.

(4) If the trunk of a tree whose roots are to be pruned is of such a size that sidewalk or utility placement will not be possible, then the Bureau of Parks may require after consulting with the Department of Public Works that a sidewalk be narrowed or curved so as to allow room for the trunk to remain un-cut or that the utility be relocated.

(5) Cleanly cut roots do not need to be painted or treated in any way.

(6) Top pruning to compensate for root loss and lessen the hazard of windthrow on treated trees will be required. Pruning specifications will be determined by the Bureau of Parks but generally should include the following:

   (a) 30-50% crown mass reduction is desirable.
   (b) All dead or damaged limbs should be removed.
   (c) Any low hanging limbs or limbs causing an obstruction to buildings or utilities should be properly pruned.
   (d) Overall crown shaping should be accomplished by lateralling back branch ends.
   (e) Trees shall be raised ten (10') feet above sidewalks and fourteen (14') feet above street cartway.