

**CITY OF DETROIT
DEPARTMENT OF PUBLIC WORKS
CITY ENGINEERING DIVISION**



**STANDARD SPECIFICATIONS
FOR
PAVING AND RELATED CONSTRUCTION**

**PREPARED BY
BUREAU OF STREETS**

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ALLEY PAVEMENT

6.1

DIVISION 6

I. SCOPE

6.I.1 WORK INCLUDED

The work under this Division shall consist of constructing a Portland Cement concrete alley pavement and related items as listed:

- A. Concrete "alley pavement." with and without curb, for various designated thicknesses.
- B. Concrete "alley pavement - high-early strength" with and without curb, for various designated thicknesses.
- C. Concrete "integral roll curb", various heights.
- D. Longitudinal dummy - groove contraction joint.
- E. Test cores.

6.I.2 REFERENCED PUBLICATIONS

Referenced specifications for concrete shall be as specified in Division 4.

American Society for Testing and Materials Standards (A.S.T.M.)

Code

Identification Title

- | | |
|--------------|--|
| C 42 | Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete |
| C 174/C 174M | Standard Test Method for Measuring Thickness Concrete Elements Using Drilled Concrete Cores |
| D 1751 | Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous types) |

Federal Specifications (Fed. Spec.)

Code

Identification Title

- | | |
|-------------------------|---|
| SS-S-164
Amendment 4 | Sealing Compound; Hot Poured Type, For Joints in Concrete |
|-------------------------|---|

American Association of State Highway Transportation Officials (A.A.S.H.T.O.)

Code

Identification Title

- | | |
|-----------------|---|
| M 33/As Revised | Preformed Expansion Joint Filler for Concrete (Bituminous Type) |
|-----------------|---|

ALLEY PAVEMENT**II. MATERIALS****6.II.1 MATERIALS BY REFERENCE**

Articles referenced here from other Divisions are to apply to this Division as though repeated herein.

Water	4.II.1
Cement	4.II.2
Fine Aggregate (Sand)	4.II.3
Coarse Aggregate	4.II.4
Admixtures	4.II.5

6.II.2 JOINT MATERIAL

Filler for expansion joints shall be premolded bituminous. A.S.T.M. D 1751.

Filler for contraction joints shall be bituminous joint filler. A.A.S.H.T.O. M 33.

Poured joint filler shall be hot-poured rubber-type compound, Fed. Spec. SS-S-164.

6.II.3 CURING MATERIALS:

White membrane curing compound for curing concrete shall be as specified under Article 5.II.4.

III. CONSTRUCTION PROCEDURE**6.III.1 CONSTRUCTION PROCEDURE BY REFERENCE**

Articles referenced here from other Divisions are to apply to this Division as though repeated herein unless otherwise specified.

Handling and Storage of Concrete Materials	4.III.1
Proportioning Concrete Materials	4.III.2
Air Entrainment and Consistency	4.III.3
Batching, Mixing, and Transporting Concrete	4.III.4
Straightedge Testing, Surface Correction and Edging	5.III.9
Removal of Forms	5.III.11
Curing and Protection	5.III.12
Cold Weather Work	5.III.15
Final Cleanup	5.III.16

6.III.2 FORMS

Pavement forms shall be straight and free from distortion, and of sufficient strength to resist spring during the process of placing concrete against them. The forms shall be of an approved section, with a flat surface on top, and shall be of the full depth of the pavement.

Forms for radius corners shall be steel or thin board, accurately formed to true radius, and held by bracing and stakes to maintain a true curve.

After the subgrade has been prepared, paving forms shall be set accurately to the lines and grades established by the Engineer. The forms shall be adequately staked and braced to resist the pressure of the concrete and shall have uniform bearing on the subgrade throughout their entire length and width. Forms shall be set directly in contact with the finished subgrade which shall be thoroughly compacted for a sufficient distance outside the pavement area to adequately support the forms.

All forms shall be thoroughly cleaned and oiled before concrete is placed against them.

6.III.3 PLACING CONCRETE

Before pavement concrete is placed, the subgrade shall be prepared and tested as specified under 3.III.1B.4. The condition of the subgrade shall be approved by the Engineer before concrete is placed thereon.

The concrete shall be distributed or spread as soon as placed. The concrete shall be deposited on the subgrade in such a manner as to require as little rehandling as possible. Any additional spreading required shall be done by means of shovels. The method and manner of placing shall be such as to avoid segregation and separation of the materials. The concrete shall be distributed to such depth and sufficiently above grade so that when consolidated and finished, the surface shall conform to the required finished grade. The concrete along the faces of the forms and adjacent to joints shall be consolidated and compacted to fill all voids and insure a dense smooth surface.

The depositing and spreading of the concrete shall be continuous, as far as possible, between transverse joints. In the case of a temporary shutdown, the concrete at the unfinished end of the slab shall be covered with wet burlap. In the event of an unavoidable interruption of the work continuing more than 1/2 hour, a construction joint shall be placed provided the section is 3 meters (10 feet) or more in length between joints. Sections less than 3 meters (10 feet) in length shall not be permitted, and if constructed, shall be removed.

ALLEY PAVEMENT

6.III.4 CONSOLIDATION AND STRIKE OFF

The entire area of the pavement shall be so consolidated as to ensure a minimum of voids.

The concrete shall be struck off with a screed to the cross-section and thickness shown on the Plans. The screed shall be set on side forms and upon a temporary center form or guide. The temporary center form or guide shall be firmly staked or fastened to the exact line and grade of the alley gutter. This line and grade shall be produced to the center of the alley from the Engineer's stakes set at each grade change; intermediate points shall be accurately set by T-bars or other suitable methods.

The alley pavement edge shall be located in accordance with the Plans and additionally warped as is necessary to meet adjacent garage entrances and existing pavements.

In all cases the minimum thickness of the pavement shall be the thickness shown on the Plans.

Cement mortar gathered from the surface of the concrete already placed shall not be used for filling boot tracks or stony areas. Such areas shall be dug out, refilled with concrete, and worked smooth.

6.III.5 FLOATING

After striking off, the surface shall be finished to a gritty texture by means of a wooden float. If a metal float is used for final finishing, no more than two passes may be made over the surface.

6.III.6 JOINTS

- A. General: Expansion joints and contraction joints shall be constructed as shown on the Plans.

All joints shall be constructed true to line with their faces perpendicular to the surface of the pavement. Transverse joints shall be constructed at right angles to the center line of the pavement, unless otherwise required, and shall not vary more than 6 mm (1/4-inch) from a true line. Longitudinal joints shall be constructed parallel to the center line of the pavement, unless otherwise required, and shall not vary more than 6 mm (1/4-inch) from their true designated position.

The surface of the pavement adjacent to all joints shall be finished to a true surface. The surface across the joint shall be tested with a 3-meter (10-foot) straightedge as the joints are finished, and any irregularities shall be corrected before the concrete has hardened.

6.III.6 JOINTS (CONT'D)

- B. Longitudinal Contraction Joints: Longitudinal Contraction joints shall be constructed in pavements 5.2 meters (17 feet) or greater in width, unless otherwise directed by the Engineer.

The Longitudinal Contraction joints shall be constructed 150 mm (6 inches) from and parallel to the center line by cutting with a saw, to a minimum depth of 50 mm (2 inches) after the concrete has hardened sufficiently to permit sawing without damage to the pavement. The joint shall be cut within 24 hours after the concrete has been poured. The sawed joint shall be immediately flushed out with a jet of water.

The Longitudinal Contraction joints shall be constructed 150 mm (6 inches) from the alley gutter on the high side of the pavement if the pavement is warped enough to shift the alley gutter from the center line of the pavement.

The concrete saw shall be adequately powered, self-propelled and constructed to cut hardened concrete rapidly with a water cooled diamond edge or abrasive saw blade to a depth of at least 65 mm (2-1/2 inches). The minimum width of saw blade shall be 5 mm (3/16-inch).

- C. Transverse Contraction Joints: Transverse Contraction joints shall be constructed at locations shown on the Plans. The premolded filler shall be placed in the concrete after rough finishing of the slab has been completed. The top edge of the premolded filler shall be placed with the top edge flush with the adjacent concrete surface. Concrete shall not bridge over the top of the premolded filler.
- D. Construction Joints: Construction joints shall be key joints, with provision for joint filler, as shown on the Plans. Construction joints shall be placed at the ends of all pours and at places where paving operations are stopped for a period of more than 1/2 hour, except where such pours end at expansion joints. Construction joints shall be formed by placing a bulkhead.

Bulkheads for construction joints shall be of lumber not less than 150 mm (2 inches) nominal thickness, shaped to conform to the cross-section of the pavement.

- E. Expansion Joints: 25-mm (1-inch) transverse expansion joints shall be located at all intersections and at locations shown on Plans. 38-mm (1½ inch) expansion joints shall also be placed along the edge of pavement abutting building walls or other solid structures.

The bottom of the premolded filler shall be set 38 mm (1½ inches) or more below the bottom of the slab. The premolded filler shall be set and held in a vertical position. The joint shall be free from concrete and the end of the joint cleaned of hardened concrete as soon as the forms are removed.

6.III.6 JOINTS (CONT'D)

- E. The premolded joint filler shall be furnished in lengths not less than the lane widths being poured, except that lengths greater than 3.7 meters (12 feet) will not be required. Where more than one section is allowed and used in a joint, the sections shall be fastened together with a half lap scarf joint securely clipped together. The scarf shall have a minimum length of 75 mm (3 inches).

During installation, the joint filler shall be held securely in place. The top edge of the filler shall be protected, while the concrete is being placed.

Transverse expansion joints only shall be sealed.

- F. **Sealing Joints:** Joints shall be filled and sealed in accordance with sub-article 5.III.5.C "Sealing Joints".

Payment for construction of all joints in the concrete shall be included in the paving cost and will be paid for at the Contract Unit Price per square meter (square yard) for "Alley Pavement".

6.III.7 CURB CONSTRUCTION

- A. **General:** The curbs shall be constructed in conformance with the types and details as specified on the Plans. All curbs, including circles at intersections, shall be integral roll curb, unless otherwise specified on the Plans or in the Proposal for the Contract.

The concrete shall be placed and spaded sufficiently to eliminate voids and so that the roll curb and slab shall form an integral unit.

- B. **Expansion Joints:** The expansion joints in the slab shall be carried through the integral roll curb.

- C. **Contraction Joints:** Contraction joints in the integral roll curb shall be placed at all contraction joints in the slab and shall be of the same type of construction.

- D. **Finishing:** The edges and back top edge of the curb and all transverse joints and planes of weakness shall be rounded with an approved finishing tool having a radius of 6 mm (1/4-inch). The face of the curb, at the top of all curb and at the bottom of the integral curb, shall be rounded with approved finishing tools having the radii shown on the Plans. The exposed surfaces of the curb shall be finished smooth and even. Neat cement shall not be used as a dryer to facilitate the finishing of the surface.

6.III.7 CURB CONSTRUCTION (CONT'D)

E. Basis of Payment:

1. **Integral Roll Curb:** Integral roll curb will be paid for in lineal meters (lineal feet) at the Contract Unit Price for "Integral Roll Curb," various heights. This price shall be full compensation for construction of the integral curb and for all excavation and backfilling.
2. **Integral Roll Curb at Returns:** Integral Roll type curb will be paid for as part of the pavement pay items under 6.III.13.

6.III.8 FINAL SURFACE FINISHING

Final surface finishing shall be as specified under 5.III.10.

6.III.9 CONTRACTOR'S STAMP

The Contractor's name and the month, day, and year in which the pavement was laid shall be carefully and clearly impressed in the concrete surface of each end slab, as directed by the Engineer.

The stamp or plate used for the marking shall have an approximate maximum outside dimension of 100 x 150 mm (4 x 6 inches). The Contractor's name and the current year's date shall be in such characters and arrangement that a legible and indelible impression may be made in the concrete.

The work will be considered incidental to the cost of construction.

6.III.10 BARRICADES

Temporary alley barricades shall be constructed and placed as detailed on standard Plans.

Barricades shall be incidental to the cost of construction.

6.III.11 FINAL CLEANUP

Any concrete spilled on the pavement or structures shall be removed and the pavement or structures thoroughly cleaned before the concrete sets. Spilled concrete shall not be washed into sewers or drains. The site of the work shall be restored to a neat and sightly appearance, including the removal of excess earth, materials, forms, and equipment.

6.III.12 OPENING OF PAVEMENT

The barricades shall be promptly removed and the pavement opened to traffic when so directed by the Engineer, which generally will be upon the expiration of the curing period.

6.III.13 BASIS OF PAYMENT

- A. **Concrete Alley Pavement - Standard Strength:** Standard Strength concrete pavement will be paid for in square meters (square yards) of area at the Contract Unit Price for "Alley Pavement", for various designated thickness.
- B. **Concrete Alley Pavement - High Early Strength:** High-early strength concrete pavement will be paid for in square meters (square yards) of area at the Contract Unit Price for "Alley Pavement - High Early Strength", for the various designated thicknesses.

IV. TESTS AND GUARANTEES**6.IV.1 TESTS AND GUARANTEES BY REFERENCES**

Articles referenced here from other Divisions are to apply to this Division as though repeated herein.

Coring the Pavement	5.IV.1
Measuring and Testing the Core	5.IV.2
Price Adjustments	5.IV.3