

**City of Moscow Mills, Missouri
Street, Sidewalk, and Parking Lot
Construction Standards**

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**City of Moscow Mills, Missouri
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Subchapter A – Streets, Curbs and Driveway Entrances Construction Standards

(I A) --- Street Right-of ways and pavement widths

A. **All Public Streets** within the corporate limits of The City of Moscow Mills will have Right-of-Ways and pavement widths as follows:

1. Minor Streets

- a. **Residential** streets will have fifty (50) foot wide Right-of Ways with Twenty-six (26) foot pavement widths.
- b. **Non-Residential** streets will have Fifty (50) foot Right-of-Ways with sidewalks and Twenty-seven (27) foot wide Pavements. Non-Residential streets will have forty (40) foot Right-of-Ways **without sidewalks** and twenty-seven (27) foot Pavement Widths.

2. Collector Streets

- a. **Minor collector** streets will have fifty-four (54) wide Right-of Ways and thirty-Three (33) foot wide pavement. Minor Collector streets will be defined as streets with estimated average daily traffic (based on ultimate development) of between 2000 - 4000 vehicles per day.
- b. **Major collector** streets will have sixty (60) foot wide Right-of-ways and thirty-nine (39) foot wide pavements. Major Collector streets will be defined (based on ultimate development) of between 4000-6000 vehicles per day.

(II A) --- Street Pavement Requirements

(as detailed in Appendix “A” of this Construction Standard)

A. **Minor Streets**

1. Residential Street Pavement and base will meet

The following requirements:

- a. Six (6) inches of Portland Cement concrete on a four (4) inch thick, properly compacted, aggregate base which will be on a properly compacted subgrade.
- b. Two (2) inches of Type “C” bituminous concrete wearing surface on Seven (7) inches of type “X” bituminous concrete base on four (4) inches thick, properly compacted, aggregate subbase on properly compacted subgrade.

2. Non-Residential Street Pavement and base will meet the Following requirement:

- a. Seven (7) inches of Portland Cement concrete on a four (4) inch thick, properly compacted, aggregate subbase which will be on properly compacted sub-grade.
- b. Two (2) inches of type "C" bituminous concrete wearing surface on eight and one half (8 ½) type "X" bituminous concrete base on four (4) inch thick, properly compacted, aggregate subbase on property compacted sub-grade.

B. Collector Streets:

- 1. **Minor Collector Streets** pavement and base will meet the following requirement:
 - a. Seven (7) inches of Portland Cement concrete on four (4) inch thick, properly compacted, aggregate subbase on a properly compacted subgrade.
 - b. Two (2) inches of type "C" bituminous concrete wearing surface on eight and one half (8 ½) inches of type "X" bituminous concrete base on four (4) inch thick, properly compacted, aggregate subbase on a properly compacted subgrade.
- 2. **Major Collector Street** pavement and base will meet the following requirements:
 - a. Seven (7) inches of Portland Cement concrete on four (4) inch thick, properly compacted, aggregate subbase on properly compacted subgrade.
 - b. Two (2) inches of type "C" bituminous concrete wearing surface on eight and one half (8 ½) inches of type "X" bituminous concrete base on four (4) inch thick, properly compacted, aggregate subbase on properly compacted subgrade.

C. Temporary Pavement

- 1. **All Temporary** pavement will consist of four (4) inches of type "C" bituminous concrete wearing surface on seven (7) inches of properly compacted aggregate subbase.

D. Aggregate subbase requirements

- 1. **The aggregate subbase** for all pavements located within the corporate-limits of Moscow Mills will be ¾" minus crushed rock compacted to 95 percent of the maximum dry weight density as determined by The Standard Proctor Test.

E. Subgrade Requirements

- 1. **The Subgrade** for all pavements located within the corporate limits of Moscow Mills will be compacted to 95 percent of the maximum dry weight density as determined by The Standard Proctor Test.

(III A) --- Concrete Curbs and Gutters

- A. All curbs and gutters located within the corporate limits of Moscow Mills will be concrete as detailed in Appendix "A" of this Construction Standard.
- B. All Residential Streets will have rolled Concrete curb and gutters. All other streets will have six (6) inch concrete vertical curbs.
- C. Curbs and gutters for concrete pavement will be monolithically cast with concrete pavement.

(IV A) --- Driveway Entrances

- A. All Residential and Commercial Driveway Entrances located within the corporate limits of Moscow Mills will be concrete as detailed in Appendix "A" of this Construction Standard.
- B. When existing Driveway Entrances (pre-enactment of this Construction Standard) are re-constructed by owner, the owner will be required to construct driveway entrances using concrete and meeting all the requirements of the Moscow Mills City Code and this Construction Standard.
- C. **Commercial Driveway Entrances**
 - 1. **Minimum Width** will be 24'-0" for all Commercial Driveway Entrances.
 - 2. **Maximum Width** will be 40'-0" for all Commercial Driveway Entrances
 - 3. **All concrete** for Commercial Driveway Entrances will be a minimum Seven(7) inches thick, including sidewalk sections that cross entrance.
- D. **Residential Driveway Entrances**
 - 1. **Minimum Width** will be 10'-0" for all Residential Driveway Entrances.
 - 2. **Maximum Width** will be 20'-0" for all Residential Driveway Entrances.
 - 3. **All concrete** for Residential Driveway Entrances will be a minimum Six (6) inches thick, including sidewalk sections that cross the Entrance

(V A) ----- Concrete Standards for Pavement, Curbs and Driveway Entrances

- A. **Concrete Mix Design Criteria**

1. Minimum 28-Day Compressive strength = 3000 psi
2. Minimum Cement Content per cubic Yard of Concrete = 6 Sacks per cubic Yard
3. Maximum aggregate Size (1 inch preferred) = 1 ½ inches
4. Maximum Water Content = 6.2 gallons per sack
5. Slump = 3 inches
6. Contractor will submit to City Engineer, for approval, a concrete mix design at least 30 days before use.

B. Construction Requirements

1. Equipment

- a. Provide equipment and tools to perform the work. Provide equipment that allows the paver to operate at a constant production rate and rarely start and stop. The City Engineer may limit the production rate or batch size if equipment does not keep pace with the other operations or causes poor workmanship.
- b. Ensure that equipment operating on the pavement has rubber-tired wheels or flat steel wheels. Wait to operate concrete or shoulder paving equipment on the pavement until the concrete slab is 14 days old or has 2,500 psi (15 MPa) compressive strength.
- c. Paving equipment may be either slip-form or fixed form.
- d. Use mechanical equipment to produce the surface finish of the mainline and transverse plastic concrete grooving. Ensure that the equipment uses rectangular-shaped steel tines of the same size and uniform length. Use tines with a width between 0.08 in (2 mm) and 0.130 in (3.5 mm). Space the tines approximately ½ in (13 mm) apart.
- e. Provide fully atomizing spraying equipment with a tank agitator to place curling compounds.

C. Preparation

1. Check the subgrade and subbase as follows:

- a. Prepare the full width of the subgrade and subbase according to the Plans and Specifications.
- b. Endure that the surface immediately under the concrete pavement allows proper pavement thickness and yield.
- c. Trim high areas to the proper elevation.
- d. Ensure that the subbase can support paving equipment without rutting or bogging.

D. Construction

1. Mixing of Concrete

- a. Produce Portland cement concrete by combining authorized proportions of materials in batches according to the construction methods in this Construction Standard.
- b. Mix the concrete produced in a stationary central mix plant or at least 60 seconds after all materials have entered the drum. Reduce the mix time if representative tests show that the concrete meets requirements of ASTM C 94. Requirements For Uniformity. Never reduce the mix time to less than 50 seconds

2. Set Forms

- a. Compact the foundation under the forms true to grade. Set the form so that it firmly contacts the foundation for the entire length at the specified grade.
- b. Prevent the forms from settling or springing under the finishing machine. Clean and oil the forms before placing the concrete.

3. Dowel Bars

- a. Provide dowel bars at transverse joints.

4. Placing of Concrete

- a. Unload the concrete into an approved spreading device and mechanically spread it on the grade.
- b. Place the concrete continuously between transverse joints without using intermediate bulkheads.
- c. Hand spread the concrete with shovels, not rakes.
- d. Thoroughly consolidate the concrete against the faces of forms and along the full length and sides of joint assemblies.
- e. Endure that vibration does not cause puddling or grout accumulation on the surface.

- f. For construction or expansion joints, do not use grout that accumulates ahead of the paver.
- g. Deposit concrete near the formed joints. Dump or discharge concrete only in the center of a joint assembly.
- h. Take slab depth measurements as follows:
 - 1. Probe the plastic concrete behind the paver.
 - 2. Record the station number and depth measurements at least every 500 ft. (150)m at 3 random increments across the slab.
 - 3. Provide these measurements to the City Engineer when requested.
- i. Take air and slump determination tests at a rate of at least three of each test evenly distributed during the workday. Provide the results to the City Engineer when requested.
- j. Keep reinforcing steel free of dirt, oil, paint, grease, mill scale, and loose or thick rust that could impair the bond of the steel to the concrete.

5. Placing Reinforcement (where required)

- a. Do not insert lane tie bars in unsupported sides of fresh concrete.
- b. Endure that the steel placement method does not damage or disrupt concrete.
- c. Use bent lane tie bars if needed in longitudinal formed joints, construction. However, replace broken or damaged bars at no additional cost to the City of Moscow Mills.

6. Construction of Temporary Ramps

- a. Prevent pavement slab stress by constructing a ramp of compacted earth or other material for movement on and off the pavement. Do not allow equipment that exceeds legal load limits on the pavement.

7. Consolidation and Finishing

- a. Consolidation
 - 1. Do not allow the vibrators to misalign load transfer devices, or to contact forms or base.
 - 2. Ensure that the vibrator amplitude is within the range recommended by the manufacturer.
 - Use spud vibrators with an adjustable operating frequency between 8,000 and 12,000 vibrations per minute.
 - Use surface pan vibrators with an adjustable operating frequency between 3,000 and 6,000 vibrations per minute.

3. If appropriate, use surface vibrators and internal vibrators on concrete greater than 8 in (200 mm) thick.
4. If appropriate, use surface vibrators exclusively on pavements less than 8 in (200 mm) thick.
5. Stop vibration when the machine cannot go forward.
6. Obtain uniform consolidation and density throughout the pavement.
7. If it is not uniform, stop the operation and provide methods or equipment that will produce pavement that conforms to this Standard.

b. Finishing

1. Use self-propelled slip-form paving machine designed to consolidate, screed, and float-finish the freshly placed concrete in one complete pass of the machine to minimize the necessary hand finishing to produce a dense, homogeneous pavement. Use machines equipped to vibrate the concrete for the full width and depth of the course placed in a single pass, and designed and constructed so no spreading or appreciable slumping of the concrete occurs. Use a concrete spreader, ahead of a slip-form paver that cannot otherwise satisfactorily spread, consolidate or finish the concrete. Equip the slip-form paver with a mechanical device that accurately spaces and positions the required tie bar reinforcement and that allows satisfactory mechanical or manual tie bar insertion.
2. Use a self-propelled finishing machine for formed concrete pavement with sufficient power and traction to move at a uniform speed without slipping. Use a screeding and troweling type machine equipped with at least 2 oscillating transverse screeds, adjustable for tilt and crown, and designed to both strike off and consolidate the concrete.
3. If using a finishing machine to both spread and strike off the concrete, equip it to spread the concrete uniformly with a minimum of segregation and to strike off the concrete at the required elevation.
4. Perform hand finishing only under the following conditions:
 - Irregular dimension areas where operating mechanical equipment is impractical
 - Mechanical equipment breakdown (only finish the concrete already deposited when the breakdown occurred)

•Abnormal circumstances approved by the City Engineer.

5. Ensure that the pavement surface final finish is true to grade, uniform in appearance, and free of irregular, rough, or porous areas.
6. Prevent the surface within 6 in (150mm) of the pavement edge to deviate more than 0.25 in (6 mm) in 10 ft (3m) when tested with a 10 ft (3 m) straightedge in both transverse and longitudinal directions.
7. When rain is imminent, stop paving operations and place forms against the sides of the pavement. Cover the surface of the unhardened concrete with the protective covering.
8. Removal of Forms
 - a. Do not remove forms from freshly placed concrete until it has set for at least 12 hours, unless otherwise provided.
 1. Remove forms carefully to avoid damaging the pavement.
 2. After removing the forms, immediately cure the sides of the slab using the same method used to cure the pavement surface.
 3. Remove and replace major honeycombed areas.
9. Work at Night
 - a. Provide adequate lighting for work performed at night. If lighting will not be provided at night, stop the concreting operation in time to finish and saw during daylight hours.
10. Joint Requirements
 - a. Provide dowel bars at transverse joints unless otherwise noted.
 - b. Remove and replace plain concrete pavement that cracks during construction with no additional cost to the City.
 - c. when chipping out random cracks for sealing, use nonrigid epoxy on cracks that are not under expansion-contraction influence.
 - d. Seal continuous cracks that are under movement with sealant.

- e. When removing and replacing a pavement section, remove an area at least 6 ft (1.8m) long and the full width of the lane.
 - 1. Saw to vertical face the sections to be removed and replace the concrete as a construction joint with dowels.
 - 2. Use deformed bars as dowels in the saw-cut construction joint. Use the size specified for contraction joints in the Plans.
- f. Thoroughly clean the drilled holes of contaminants and set the dowels into the hardened concrete face of the existing pavement with a Type VIII epoxy bonding compound.
- g. For contraction joints, use undamaged and properly positioned dowels in existing construction or slab replacement areas. Coat the protruding dowel portions with a thin film of heavy grease.
- h. When both sides of an existing construction or contraction joint require slab replacements, replace slabs continuously from saw-cut construction joint to saw-cut construction joint. Use dowels specified for contraction joints.
- i. Before placing concrete, uniformly apply a thin coat of heavy grease to epoxy-coated dowels.
- j. When placing slabs continuously across transverse contraction joint locations, use saw-cuts to provide planes of weakness.

11. Type of Joints

a. Longitudinal Joints

- 1. For longitudinal joints, use unpainted and uncoated deformed steel bars that are the size and length specified in the Appendix of this Construction Standard.
- 2. Place the bars perpendicular to the joint using a mechanical device, or rigidly secure the bars in place with supports.
- 3. Construct longitudinal formed joints while the concrete is in a plastic state.

4. Use methods and equipment that locate the joint reinforcement properly without disrupting it during construction
5. Cut longitudinal sawed joints with a mechanical saw within three days after the concrete is placed and before traffic or equipment enters the pavement.

b. Traverse Joints

1. Construct transverse joints in partial width or adjoining lanes to about the same joint of adjacent lanes.
2. Ensure that transverse joints in plain Portland cement concrete requiring load transfer devices contain either plastic-coated or epoxy-coated dowels.
3. Before placing concrete, secure dowel bars in place with supporting assemblies.
4. Secure the assemblies in position on the subbase to keep the dowels from moving during concrete placement.
5. Place dowel bars to a vertical and horizontal tolerance of plus or minus 1 in (25 mm) of the Plan position. Do not misalign the dowel bar more than 3/8 in per 1 ft (10 mm per 300 mm) in the horizontal or the vertical plane.
6. When using epoxy-coated dowels, coat the entire surface with a thin film of heavy waterproof grease. Ensure accurate positioning of transverse sawed joints by marking the position of dowel bar assembly locations.

c. Construction Joints

1. Do not construct transverse construction joints within 10 ft (3m) of an expansion joint, contraction joint, or transverse plane of weakness.
2. Construct transverse construction joints when interrupting concreting operations for more than one hour.

3. Move an unanticipated construction joint back to the last Plan joint, if necessary. Remove and dispose of excess concrete.
4. Form construction joints by securing in place a removable bulkhead or header board.
 - Place the board so that it conforms to the full cross section of the pavement. Secure it flush with the subbase and parallel to the normal transverse joints.
 - Slot or drill the board to allow placement of reinforcement as required.
5. While the concrete is in a plastic condition, stringline the surface longitudinally and correct surface deviations greater than 1/8 in per 15 ft (3 mm per 4.6 m) in any direction.
6. When using plain Portland cement concrete pavement, place dowel bars in construction joints. Cast half the length of each dowel bar in the concrete during each phase of joint construction.
7. When using epoxy coated dowels, coat the protruding half of each dowel bar with a thin film of heavy waterproof grease before resuming joint construction. Grease coating is not required on plastic coated dowels.
8. After the concrete has hardened, dismantle the bulkhead supporting the dowels. Do not disturb the dowels.

d. Contraction Joints

1. Create planes of weakness in plain Portland cement concrete pavement by cutting joints in the pavement surface.
2. Create the planes as follows:
 - a. Saw transverse contraction joints before the pavement cracks. Begin sawing when the concrete has hardened enough to prevent surface raveling, usually 4 hours after placement, but no more than 34 hours.
 - b. Continue sawing day and night regardless of weather conditions.

e. Expansion Joints

1. Form expansion joints by securing a removable bulkhead that conforms to the full cross section of the pavement. Use bulkheads that can construct a vertical expansion wall without offsets, indentations, or burrs.
2. Use expansion joint filler required.
3. Furnish and install preformed joint filler in lengths equal to the pavement width or the width of one lane. Do not use damaged or repaired joint fillers.
4. Position the expansion joint filler vertically in the joint and at the proper grade. Use an installing bar or other device to secure the expansion joint filler at the proper grade and alignment.

12. Curing the Concrete

1. Impervious Membrane Method

To use this method:

- a. Spray the entire surface of the pavement with white pigmented curing compound immediately after finishing the surface and before the concrete has set.
If the pavement is cured initially with cotton mats, burlap, or cotton fabric, apply the compound after removing the mats.
- b. Use mechanical sprayers to apply curing compound under pressure at a minimum rate of 1 gal pr 150 ft² (1L per 3.5 m²).
- c. Thoroughly mix the compound with uniformly dispersed white pigments.
- d. During application, use a mechanical device to stir the compound continuously.
- e. Use a hand sprayer (if required) to spray odd widths, odd shapes and concrete surfaces exposed by removing forms.
- f. Do not apply curing compound to the inside faces of joints to be sealed.

- g. If the membrane film becomes damaged within the curing period, repair the damaged portions immediately with additional compound.

2. White Polyethylene Sheeting

- a. Cover the top surface and sides of the pavement with polyethylene sheeting. Lap the units at least 18 in (450 mm).
- b. Place the sheeting and weigh it down so that it contacts the surface.
- c. Extend the sheeting beyond the edges of the slab at least twice the thickness of the pavement.
- d. Unless otherwise specified, maintain the covering in place for 72 hours after placing the concrete.

3. Burlap, cotton Fabric, or other methods.

Contractor may cure the pavement with burlap, cotton fabrics, or other materials if the section remains wet for the duration specified by the City Engineer.

4. Cold Weather Curing

- a. Remove and replace concrete that freezes before the initial set time at no cost to the City.
- b. Use polyethylene or canvas to protect concrete that has set but is exposed to freezing temperatures within 24 hours of placement. Ensure that the internal concrete temperature is above freezing for at least 24 hours after placing the concrete.

13. Sealing of Joints

- a. Immediately after completing the curing period, fill in the joints with joint sealing material before opening the pavement to traffic.
- b. During sealing, do not spill the material on the concrete surface. Immediately remove excess material on the concrete surface and clean the surface.
- c. Do not use sand or similar material as a cover for the seal

14. Opening Pavement to Traffic

- a. Wait to open the pavement slab to traffic, except for joint sawing vehicles, until the concrete is 14 days old unless representative compressive tests show that the slab has a compressive strength of 2,500 psi (15 MPa). Cure

compressive test specimens used for traffic opening as near as possible to the roadway.

- b. Protect the pavement against traffic from the public, employees, and agents.
 - 1. Erect and maintain barricades. Employ watchmen to block traffic from the newly constructed pavement for the period required in this Specification.
 - 2. Arrange the barriers away from public traffic on lanes remaining open.
 - 3. Maintain signs that clearly indicate the lanes open to public traffic.
 - 4. If traffic must go across the pavement, construct crossings satisfactory to the Engineer to bridge over the concrete. Construct the crossing without additional compensation.
 - 5. Repair or replace pavement damaged by traffic or other causes before Final Acceptance without additional compensation. Make repairs to the City Engineer's satisfaction.

(VI A) ---- Asphalt Standards

- A. **General Requirements:** grades will be established by the contractor and the grade stakes will be set to the deserved elevation by the contractor. In establishing the grades due allowances will be made for existing improvements, proper drainage, adjoining property rights and good appearance.
- B. **Preparation of Subbase:** Four (4) inches of 3.4" minus aggregate subbase shall be compacted to 95 percent of the maximum dry weight density as determined by The Standard Proctor Test.
- C. **Preparation of Subgrade:** All-debris, vegetation, or other perishable materials shall be removed from the job site, except for trees or shrubs designated for preservation. The site to be paved shall be graded to the required section and all excess material remove from the location of the work. Material in soft spots shall be removed to the depth required to provide a firm foundation and shall be replaced with a material equal to, or better than, the best subgrade material on the site. The entire subgrade will be compacted to 95 per cent of the maximum dry weight density.
- D. **Thickness of Structure:** on the prepared subgrade, four (4) inches of carefully compacted aggregate subbase will be laid. On the subbase will be laid, in two (2) courses, the type "X" Bituminous concrete base.

On that will be laid the Type "C" Bituminous concrete wearing surface, in one (1) course.

- E. **Tack Coat:** For Minor and Major Collector Streets, a tack coat will be applied at the rate of 0.10 gallons per square yard.
- F. **Sampling and Testing:** The Contractor will furnish, for testing and analysis, representative samples of the materials to be used in the work.
- G. **Smoothness:** The asphalt surface when completed, when tested with a 10 foot straightedge, shall not contain irregularities in excess of 1/4 inch.
- H. **Materials:**
 - 1. The asphalt for the plant mix will be type "C" and Type "X" and will meet the requirements for Paving and Industrial Asphalt (SS-2) of the Asphalt Institute, a certification of compliance will be required.
 - 2. Aggregate:
 - a. The aggregate for asphalt plant mix will consist of coarse aggregate, fine aggregate and, if need be, mineral filter. The coarse aggregate will be sound, angular crushed stone, or crushed gravel. The fine aggregate will be well graded, moderately sharp sands.
- I. **Mixing:** The asphalt and aggregate will be combined in a mixing plant.
- J. **Construction:**
 - 1. For areas of more than 1000 square yards, asphalt base, and surface courses will be spread and struck off with a paver. Any irregularities in the surface of the pavement course will be corrected directly behind the paver. Excess material forming high spots will be removed with a shovel or a lute. Indented areas will be filled with the mix and smooth with a lute or the edge of a shovel being pulled over the surface. Casting of mix on such areas will not be permitted.
 - 2. If it is impractical to use a paver or spreader box in areas of 1000 square yards or less, the asphalt base and surface sources may be spread and finished by hand. Wood or steel forms which are rigidly supported to ensure correct grade and cross section, may be used. Placing by hand shall be performed carefully to avoid segregation of the mix. Broadcasting of the material will not be permitted. Any lumps that do not break down readily shall be removed.
 - 3. Compaction: rolling shall start as soon as the hot-mix material can be compacted without displacement. Rolling shall continue until thoroughly compacted and all roller marks have disappeared. In

areas too small for roller, a vibrating plate compactor or hand tamper shall be used to achieve thorough compaction.

(VII A) --- Pavement Markings

A. Description

1. Provide contractor grade acrylic, striping paint for new asphalt or coated asphalt.
2. Provide contractor grade acrylic, alkyd, or chlorinated rubber striping paint for existing asphalt and concrete pavements or restriping.

B. Environmental Requirements

1. Apply marking paint in dry weather when pavement and atmospheric temperatures are (50) degrees F. Or above and are anticipated to remain above fifty (50) degrees F. For four (4) hours after completing application.

C. Equipment for Striping

1. Commercial compressed air spray striping machine capable of applying an even coating at the manufacturer's recommended thickness in an even width across the stripe.
2. Commercial airless spray striping machine capable of applying an even coating at the manufacturer's recommended thickness in an even width across the stripe.

D. Preparation for striping

1. Provide qualified technician to supervise equipment and application of marking. Layout markings using guide lines, templates and forms. Stencils and templates shall be professionally made to industry standards. "Free hand" painting of arrows, symbols, or wording shall not be allowed.
2. Thoroughly clean surfaces free of dirt, sand, gravel, oil and other foreign matter.

E. Application of Striping Paint

1. Apply marking paint at a rate of one (1) gallon per three to four hundred (300-400) lineal feet of four (4) inch wide stripes.
2. Colors: yellow or white
3. Width: four (4) inches

4. Before applying paint, submit striping plan to City Engineer for approval.

F. Protection

1. Barricade marked areas during installation and until the marking paint is dried and ready for traffic.

Subchapter B - Sidewalks

(I B) --- Concrete Mix

- A. Minimum width for sidewalks constructed within the corporate limits of Moscow Mills will be 4' - 0".
- B. Minimum thickness for sidewalks constructed within the corporate limits of Moscow Mills will be 4 inches.
- C. Ramps will be constructed as detailed in Appendix "A" of this Construction Standard and shall meet all the requirements of the "Americans with Disabilities Act".

(II B) ---- Construction of Sidewalks

A. Public Utilities

1. The Contractor shall be responsible to protect any existing utility from damage caused by or occurring during their operations. If the work requires excavation, the Contractor shall notify utility owners by requesting on site utility locations.

B. Notice to Property owners and removals

1. The Contractor shall notify each abutting property owner at least 3 days, but not more than 5 days in advance of starting work at each location.
2. After the notice time has expired, the Contractor shall begin the work by removing any old concrete, brick, flagstone, bushes, and other items within the sidewalk area including one foot each side of the sidewalk. Should the proposed sidewalk be located closer than one foot from the property line, the limit of the removal shall be the property line. Trees shall not be removed except upon specific request of the owner of said tree. Items removed shall be disposed of by the Contractor off the site in a manner acceptable to the City of Moscow Mills.

C. Limits of Excavation and Restoration

1. Turf Areas - The Contractor shall limit the removal and excavation width to 12" (inches) on each side of the sidewalk. After completion

of the sidewalk, excavated areas adjacent to the sidewalk shall be regrading to match existing lawn and/or paved areas and backfilled with topsoil to an elevation that will leave the top of the sod placed approximately 1" (inch) below the top of the sidewalk.

2. Aggregate Driveways - The Contractor shall limit the removal and excavation width to 12" (inches) on each side of the sidewalk. After completion of the sidewalk, excavated areas adjacent to the sidewalk shall be backfilled with substantially the same type of aggregate materials as those in the existing driveway.
3. Bituminous Driveways - The Contractor shall limit the excavation to a distance of 2' (feet) from the sidewalk. The existing bituminous shall be saw cut or Colter cut in a straight line parallel with the edge the sidewalk and at a distance of not less than 2' (feet) from the sidewalk. After completion of the sidewalk, excavated areas adjacent to the sidewalk shall be replaced with not less than 6" (inches) Aggregate Base. Aggregate Base shall be uniformly graded to allow the placement of bituminous material at a thickness equal to the existing bituminous but not less than 3" (inches).
4. Concrete Driveways - The Contractor shall limit the removal and excavation only to the edge of the sidewalk segments being replaced. Excavation depth shall be to the base of the existing concrete driveway, then tapered at 1 to 1 slope to a depth of 12" (inches). Loose and loosely compacted materials shall be removed. Undermining of existing concrete driveway shall be repaired before placing aggregate base for the sidewalk. Concrete driveway undermining shall be repaired using premixed concrete (Sackrete or equal) and water. Packing sand or gravel into the void shall not be permitted. The mixture shall be packed into the void and shaped with a vertical face. Mixture shall not extend under the new sidewalk. After the undermine repair has been completed, the aggregate base under the sidewalk may be placed. If abutting driveway concrete is damaged during the sidewalk removal, excavation, or any other portion of the work, the Contractor shall remove and replace the entire damaged concrete driveway panel. Partial panel removal shall not be permitted. If the damaged driveway does not have clear jointing pattern, the Contractor shall saw cut the driveway in a line parallel to the new sidewalk at a distance from the new sidewalk that will fully remove the first "crack" that approximately parallels the sidewalk. The driveway between the sidewalk and the saw cut shall be removed and replaced at the same thickness as the existing concrete driveway but not less than the thickness of the new sidewalk.
5. Should the proposed sidewalk be located closer than one foot from the property line, the limit of the removal shall be the property line.
6. At any time the work requires removal of any portion of an existing driveway or sidewalk located on private property, the property owner

shall be fully informed before the removal begins. The property owner shall be advised as to the nature of any damage caused to their property and as to the extent and type of repairs planned. If the repairs are the direct or indirect result of the Contractor's work, the repairs will be completed at the Contractor's expense.

D. Tree Roots

1. In areas where tree roots are encountered within the zone described 'in the Limits of Excavation and Restoration, the roots shall be cleanly cut with a saw at the edge or bottom of the excavation and removed. No construction method, which disturbs the roots outside of this zone, shall be permitted.
2. Tree root removal and disposal shall be incidental to other work items.

E. Sidewalks Across Driveway Entrances

1. Six (6) inches for Residential Driveway Entrances
2. Seven (7) inches for Commercial Driveway Entrances

F. Preparation of Subgrade

1. The soil under the proposed walk shall be excavated or filled to bring it to "foundation level". Foundation level shall be 1" below the bottom of the concrete walk, and 4" below in driveway entrances.
2. Sod, vegetable material, topsoil and frozen soil shall be removed from the area below the proposed walk. Wherever wet, spongy, soft, or unstable material is encountered below the foundation level, such material shall be excavated to a depth directed by the City Engineer. These over-excavations shall be backfilled with uniform select material and compacted to 95% Standard Proctor Density.
3. Backfill shall be made of a uniform select material provided by the Contractor, placed in layers not exceeding 4" (inches) thick and compacted to 95% Standard Proctor Density. Backfill may be clay or granular materials. Clay material shall have a moisture content within 2% of optimum. Granular materials shall have a moisture content of at least 80% of optimum.
4. Embankment and soil fill, other than those soils used to replace unsuitable material, shall include the area from 12" (inches) either side of the proposed walk and sloping downward and outward at a 1 to 1 slope. Fill shall be made of a uniform select material provided by the Contractor, placed in layers not exceeding 6" (inches) thick and compacted to 95% Standard Proctor Density. Fill may be clay or granular materials. Clay material shall have a moisture content

within 2% of optimum. Granular materials shall have a moisture content of at least 80% of optimum.

5. The surface shall be graded to within 3/8" (inch) of the specified elevation.

G. Forms and Grades

1. Forms shall be not smaller than commercial 2x4 lumber for 4" (inch) walks, 2x6 for 5" (inch) and 6" (inch) walks, and 2x8 for 7" (inch) walks and shall be sufficiently rigid to withstand the operations of placing and finishing the concrete.
2. Good quality commercial 2" (inch) lumber or rigid steel forms shall be used except that flexible strips properly staked may be used on curves. Sections of straight forms 10' (feet) long or shorter may be used for curves having a radius of 300' (feet) or more. Lumber face against which the concrete is placed shall be free of knot holes, large chips or similar imperfections.
3. The top of form shall be set true to line and grade. The forms shall be set so that the completed sidewalk will slope 1/4" (inch) per foot toward the street. Forms shall be securely staked and braced to hold their alignment during construction of the sidewalk to within 1/8" (inch) of specified line and grade.
4. All forms must be clean before using and shall be oiled with a light, clear, commercial paraffin form oil before concrete is placed.
5. Forms shall remain in place for a period of not less than 24 hours after placement of the concrete. Special care shall be taken when removing forms to avoid damage to the edges and the surface of the new concrete. The practice of using temporary forms or headers that are removed while the concrete is plastic shall be permitted, however the outside forms shall remain in place for not less than 24 hours.

H. Joints

1. Walks shall be divided into panels by expansion and contraction joints. Joints shall be spaced at approximately 5' (foot) intervals. Whenever practicable, joints shall align with like joints in adjoining work. No panel shall have an area exceeding 40 square feet.
2. Joints shall be parallel with or perpendicular to the centerline of the walk. Jointing layout shall avoid angles of less than 75 degrees. Panel widths of less than 3 feet or more than 7 feet or more than 7 feet shall not be permitted. The length to width ratio for panels shall not exceed 1 to 1.5.
3. Contraction joints shall be saw cut not more than 3/16" (inch) in width and shall be cut to a depth of at least 1.3 the thickness of the walk.

4. Expansion joints shall be ½ (inch) wide unless otherwise specified, shall be the full thickness of the walk, and shall be of pre-formed expansion joint material. Expansion material secured in a manner that will prevent movement or displacement during the placement of the concrete.
5. Expansion joints shall be placed in the following locations:
 - a. Along any abutting masonry.
 - b. Along the foundation of any building.
 - c. Along concrete curb.
 - d. All around the intersection of two public walks.
 - e. Around any concrete base or structure.
 - f. Along both sides of abutting concrete driveways.
 - g. At intervals not exceeding 100' (feet) and at all property lines known or indicated on the Plans.
 - h. As directed by the City Engineer.

I. Utility Boxes

1. All curb stops, valve boxes, frames, or covers within the limits of a concrete walk shall be raised or lowered as required, and be adjusted flush with the finished surface of the walk.

J. Placing Concrete

1. At least 3 working hours notice shall be given the City Engineer to provide for the inspection and of the base and forms before any concrete is placed. The Contractor before placing concrete as the City Engineer prescribes shall complete corrections and adjustments to the base, forms, and other installations.
2. Immediately before the concrete is placed the base shall be moistened.
3. Concrete shall not be placed on a frozen material. Concrete shall not be placed when the air temperature is less than 35 degrees Fahrenheit nor shall it be placed when the air temperature is less than 40 degrees Fahrenheit and falling. Concrete placed whenever the predicted low temperature is less than 45 degrees Fahrenheit, cold weather protection shall be used and continue for not less than 7 consecutive days.
4. The concrete placed shall be vibrated to remove voids and struck off to the required grade then floated smooth.

K. Finishing

1. The surface of the sidewalk shall be troweled to a dense and closed, but not glossy, finish. The edges of the walk shall be tooled with an approved edging tool in a manner that leaves a neat and smooth border.
2. Except for pedestrian ramps and other exposed aggregate areas, the surface shall be finished with a light brush finish using only tools approved by the City Engineer. Brushing shall be uniform and transverse at right angles to the centerline of the walk and shall be sufficient to eliminate any marks left by prior operations.
3. The surface shall not vary more than 1/8" (inch) from the elevation or the alignment specified. Joints shall not vary more than 1/4" (inch) from the prescribed alignment.

L. Pedestrian Ramps

1. Ramps shall be constructed as detailed in Appendix "A" of this Construction Standard and shall meet all the requirements of the "Americans with Disabilities Act".

M. Curing of Concrete

1. The concrete for sidewalks shall be cured using the same techniques as for concrete pavement that were described earlier in this chapter.

N. Backfill and Cleanup

1. After removal of the forms, all debris, excess material, tools and equipment shall be removed from the site within 48 hours.
2. In turf areas, approved topsoil material shall be placed against the sides of the walk to a minimum depth of 6" (inches) or the full excavation depth, whichever is less. The area shall be fine graded and all rocks of 1/2" (inch) diameter or larger shall be removed. The surface of the topsoil shall be firm, smooth, and uniformly graded. Topsoil shall be graded so that the surface of the sod is approximately 1" (inch) below the abutting sidewalk and the adjacent paved areas to allow for swelling of the sod grass root zone.
3. Turf areas outside the areas defined in the Limits of Excavation and Restoration shall be sodded at the Contractor's expense.
4. Turf areas within the areas defined in the limits of Excavation and Restoration shall be sodded by the Contractor.
5. Adjacent concrete walks and driveways, bituminous driveways, gutter lines and street areas shall be swept and left clean and free of debris.

6. The cost of backfilling and cleanup shall be incidental to the Work.

Subchapter C – Minimum Parking Lot Pavement Design

A. All parking lots located within the city limits of Moscow Mills will meet the following minimum pavement design.

B. **Parking lot criteria.**

Light duty parking lot criteria

<u>Vehicle type</u>	<u>Vehicles per day</u>	<u>Vehicles per year</u>
Cars and light trucks	1,000	365,000
Medium trucks and buses	10	3,650
Heavy trucks and buses	occasional	10
Totals	1,010	368,660

Heavy duty parking lot criteria

<u>Vehicle type</u>	<u>Vehicles per day</u>	<u>Vehicles per year</u>
Cars and light trucks	5,000	2,000,000
Medium trucks and buses	10	3,650
Heavy trucks and buses	5	1,800
Totals	5,015	2,005,450

C. **Minimum Parking Lot Pavement Design**

1. **Light duty parking lot**

- a. Concrete pavement = a minimum of 5 inches of concrete pavement over a prepared subgrade with joints at a maximum of 12.5 feet.
- b. Asphalt over aggregate base course = a minimum of 2.5 inches of hot mix asphalt over 6.0 inches of aggregate base course.
- c. Full depth asphalt over prepared = 6.0 inches of hot mix asphalt over prepared subgrade.

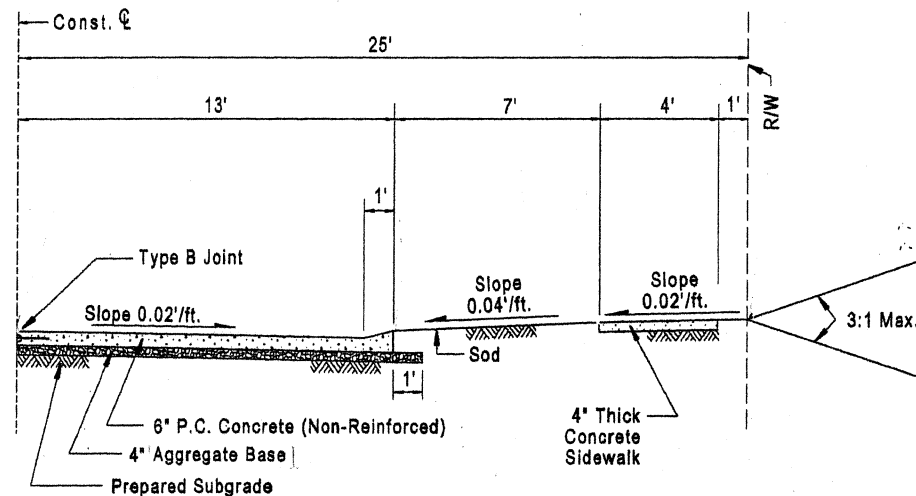
2. **Heavy duty parking lot**

- a. Concrete pavement = a minimum of 7 inches of concrete pavement over a prepared subgrade with joints at a minimum of 15.0 feet
- b. Asphalt over aggregate base course = a minimum of 5.5 inches of hot mix asphalt over 9.0 inches of aggregate subgrade.
- c. Asphalt over prepared subgrade = a minimum 9.0 inches of hot mix asphalt over a prepared subgrade.

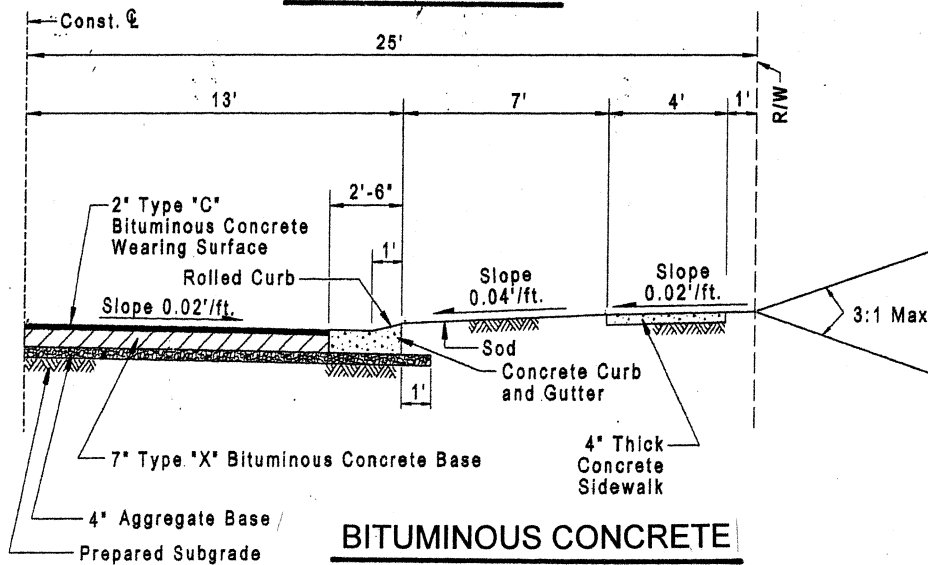
**MOSCOW MILLS
STREET AND SIDEWALK
CONSTRUCTION STANDARDS**

Appendix “A”

**Streets, curbs and
sidewalk detail
drawings**



P.C. CONCRETE



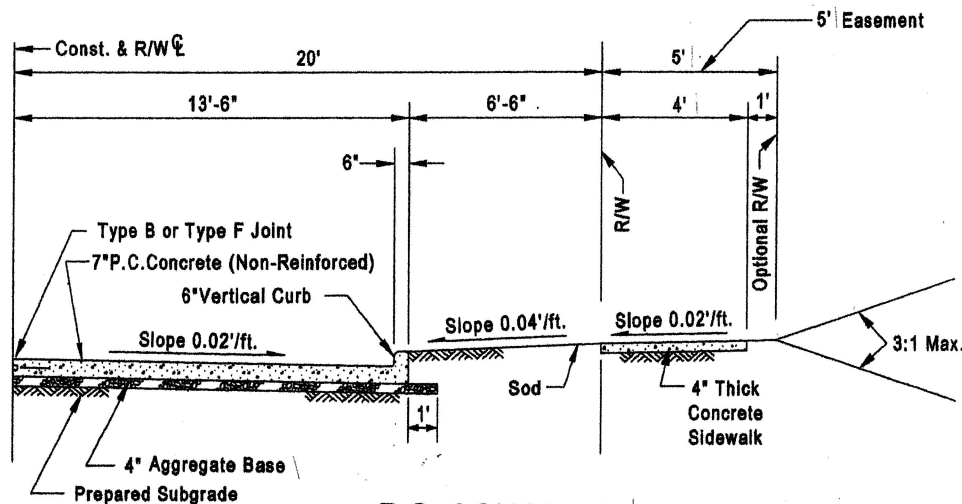
BITUMINOUS CONCRETE

GENERAL NOTES

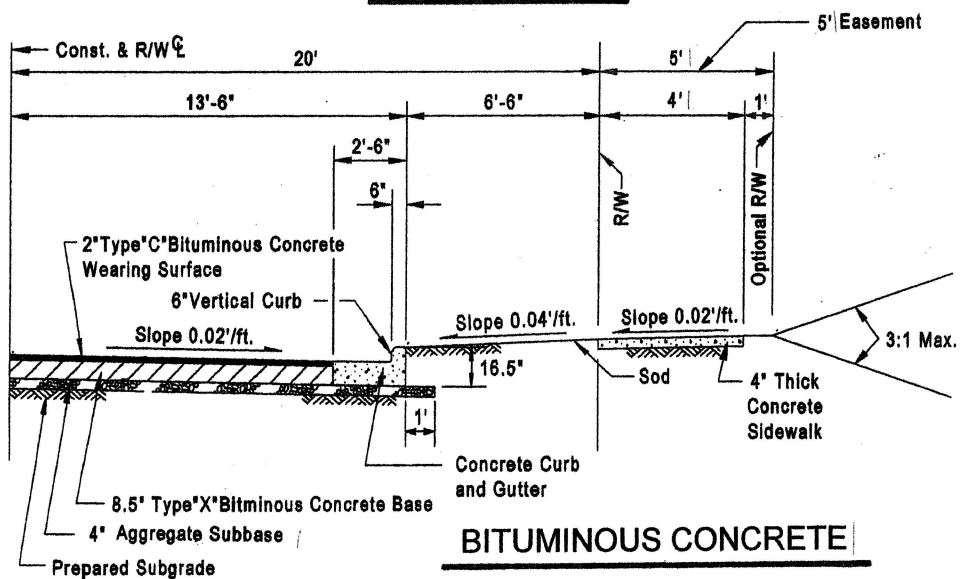
- 1) Do not scale drawings, follow dimensions.
- 2) Sections shown are symmetrical about construction line.

MOSCOW MILLS

RESIDENTIAL STREET
DETAILS
(MINOR STREET)



P.C. CONCRETE



BITUMINOUS CONCRETE

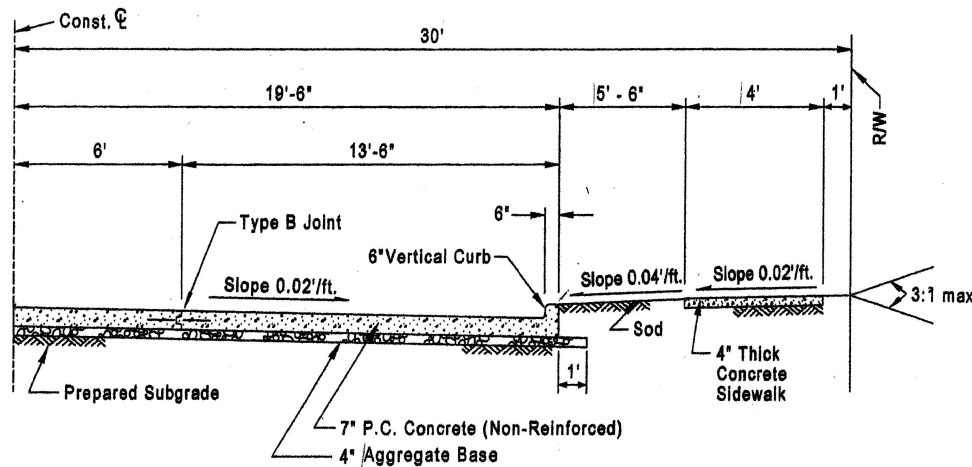
GENERAL NOTES

1. Do not scale drawing. Follow dimensions.
2. Sections are symmetrical about construction centerline.

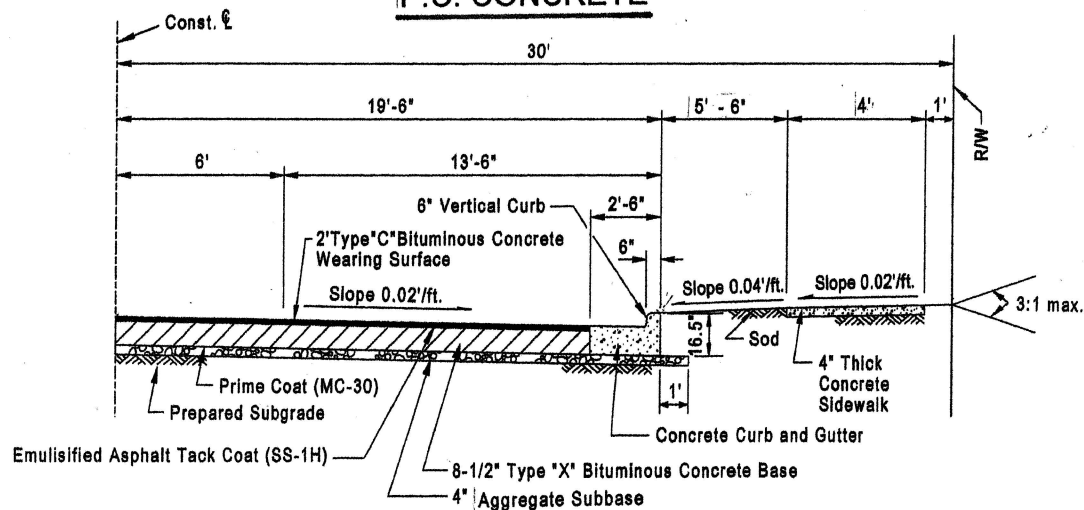
MOSCOW MILLS

NON - RESIDENTIAL
STREET DETAILS
(MINOR STREET)

**MINOR COLLECTOR
STREET DETAILS
(54 FT. R/W)**



P.C. CONCRETE



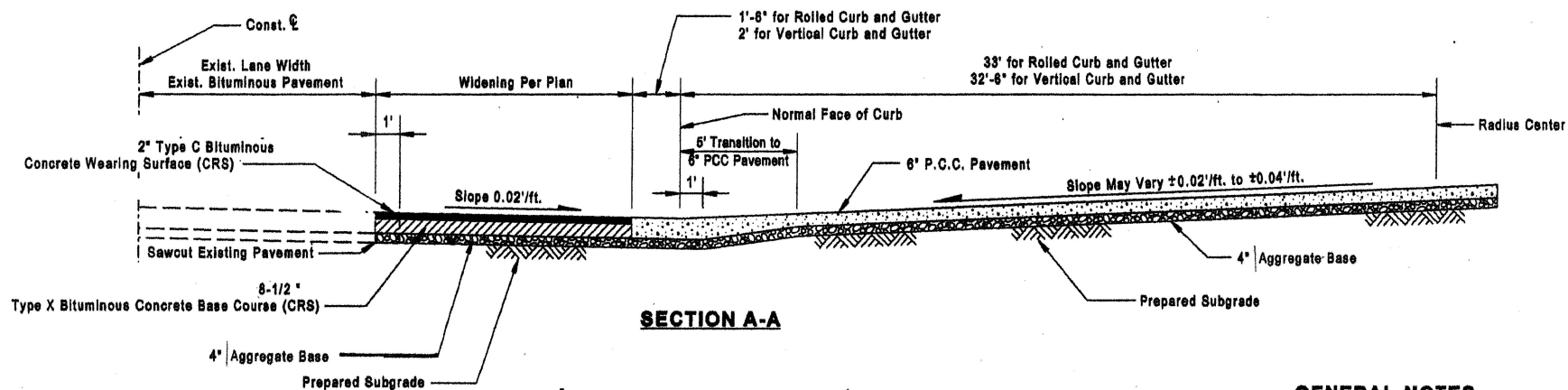
BITUMINOUS CONCRETE

GENERAL NOTES

1. Do not scale drawings, follow dimensions.
- 2) Sections are symmetrical about construction centerline.
- 3) Additional pavement thickness, reinforcement and/or base is required for heavy vehicular usage or high traffic volumes.
- 4) Sidewalk thickness increases to 6" at Residential Driveways and 7" at Commercial Driveways.
- 5) All necessary pavement markings shall be required

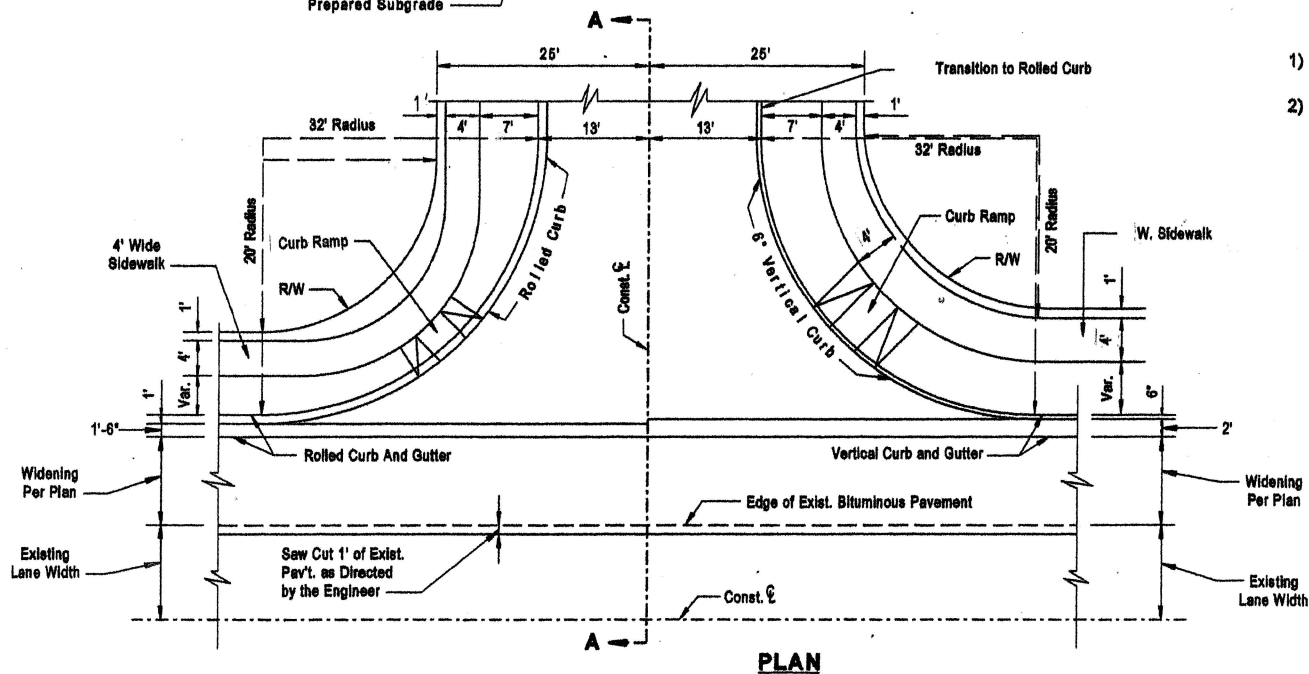
MOSCOW MILLS

**MAJOR COLLECTOR
STREET DETAILS
(60 FT. R/W)**



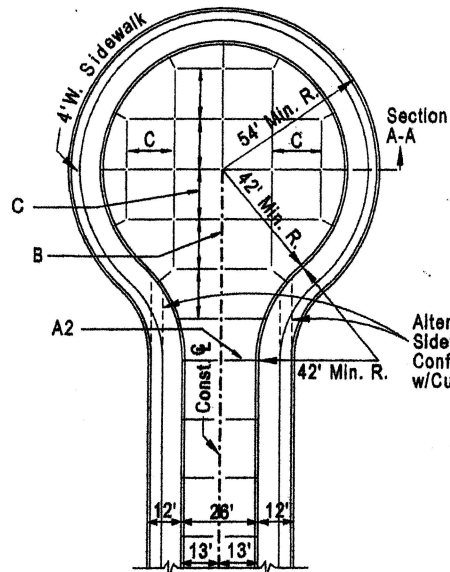
GENERAL NOTES

- 1) Do not scale drawing, follow dimensions.
- 2) Sections are symmetrical about construction centerline.

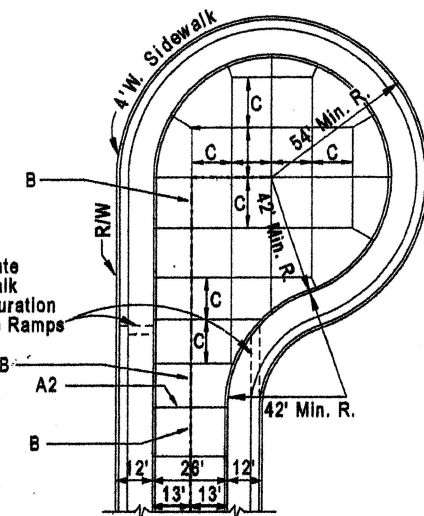


MOSCOW MILLS

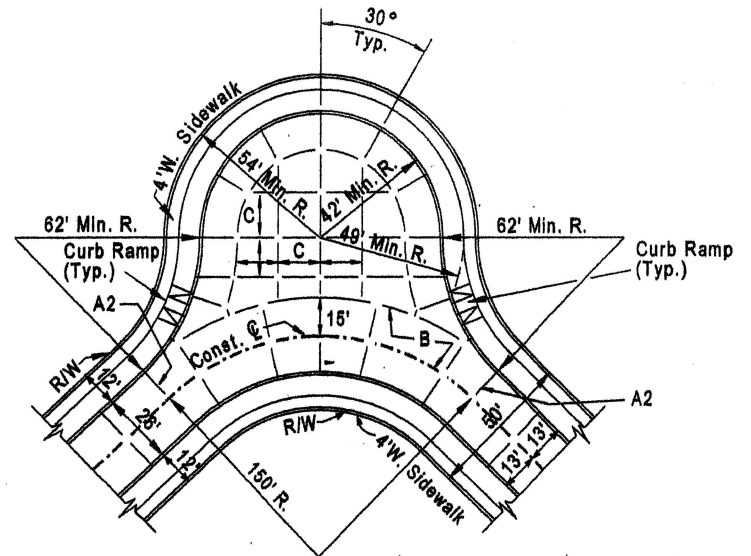
RESIDENTIAL STREET
CONCRETE ENTRANCE
DETAILS



TYPE 1



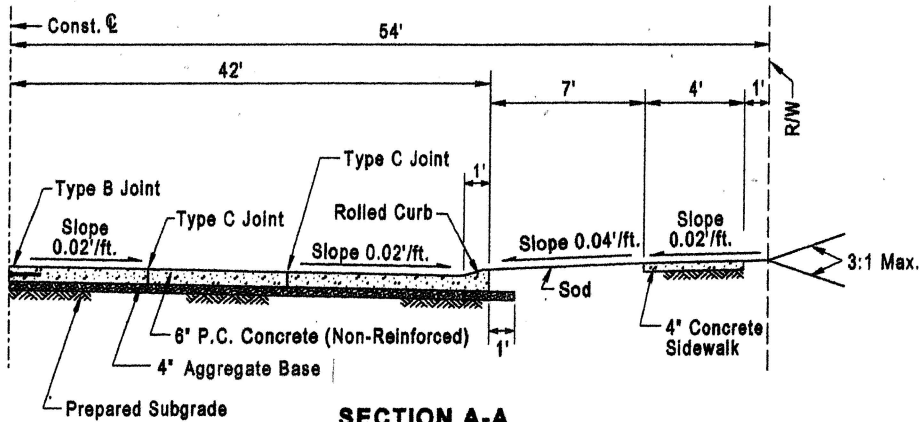
TYPE 2



TYPE 3

GENERAL NOTES

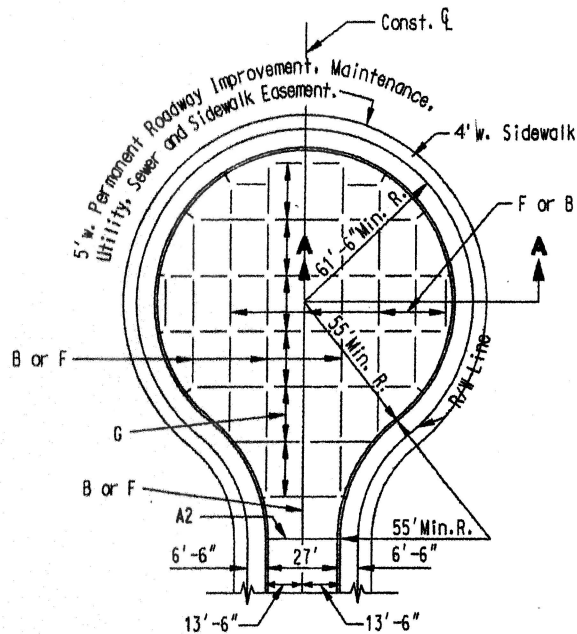
- 1) Do not scale drawing, follow dimensions.
- 2) Curb ramps are required with sidewalk and curb.
- 3) Sidewalk thickness increases to 6" at residential driveways.



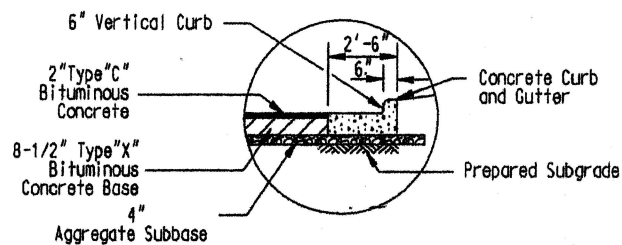
SECTION A-A

MOSCOW MILLS

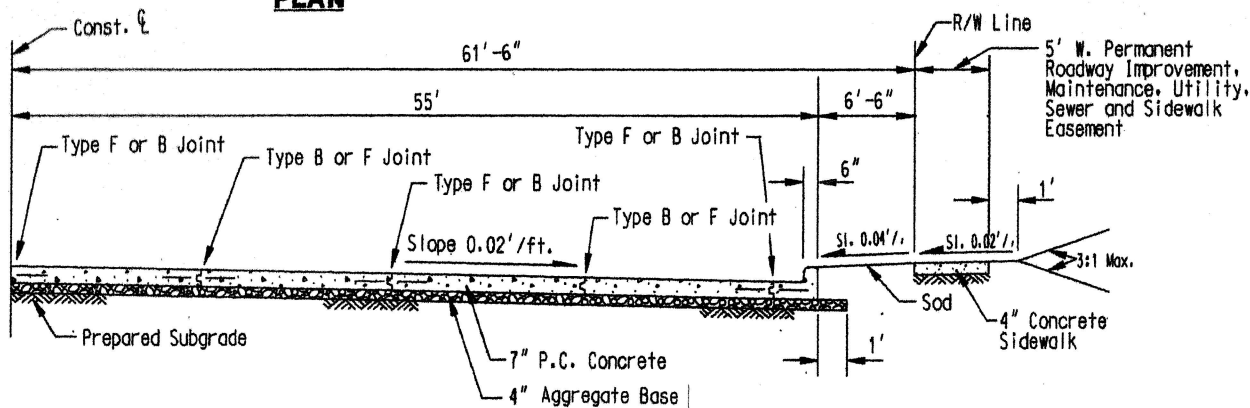
**RESIDENTIAL STREET
TURNAROUND DETAILS**



PLAN



**ALTERNATE
PAVEMENT CONSTRUCTION DETAILS**



SECTION A-A

GENERAL NOTES

- 1) Do not scale drawing, follow dimensions.
- 2) Curb ramps are required with sidewalk and curb.
- 3) Sidewalk thickness increases to 7" at commercial driveways.

MOSCOW MILLS

**NON - RESIDENTIAL ST.
TURNAROUND DETAILS**