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## DIVISION II: STREET DETAILS

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For comments or corrections please E-Mail at: jengineering@jeffcitymo.org

City of Jefferson
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ENGINEERING DIVISION
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CITY OF JEFFERSON STANDARD DRAWINGS
REVISED EDITION: 1/2020
Standard Street Notes

1. The Department of Public Works must be notified at least 24 hours prior to beginning construction, including grading. No street or any part thereof will be accepted by the City of Jefferson unless prior notice has been given to the Department of Public Works.
2. All construction indicated hereon shall be done in accordance with the standards and specifications of the City of Jefferson.
3. All disturbed right of way shall be sodded or seeded and mulched before the street will be accepted by the City.

Concrete Pavement

1. Concrete for curbs and pavement shall meet the specifications of MoDOT Class B–2, or MB–2 and shall have a have a minimum 28-day compressive strength of 4000 psi.
2. All concrete used on public infrastructure shall be air–entrained. The designated quantity of air by volume shall be within the range of 4.5% to 7%.
3. In street patching operations or other applications in which concrete is to be opened to traffic within 24 hours the concrete shall meet the requirements of MoDOT specification 613.10.2.3.1. Only non chloride accelerators are allowed.
4. In street patching operations or other applications in which concrete is to be opened to traffic within 4 hours the concrete shall meet the requirements of MoDOT specification 613.10.2.3.2. Only non chloride accelerators are allowed.
5. In regard to items 3 and 4 above the concrete shall reach a compressive strength of 3,000 psi within the specified times (24 hours or 4 hours) for pavements that are 8 inches thick or less, or 2,700 psi for pavements that are greater than 8 inches thick but less than 10 inches thick.
6. All dowels and tie bars used in concrete pavements shall be epoxy coated meeting MoDOT specification 1057.
7. Curb and gutter shall be finished with a light broom finish parallel to the street. Pavement is to receive a heavy broom finish perpendicular to the street.

Asphalt Pavement

1. Asphalt for pavements shall be as specified in the City of Jefferson Technical Specifications.

Subbase Material

Subbase material shall conform to one the gradations (A–D) of ASTM M147 as shown in the chart below.

<table>
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<tr>
<th>Sieve Size</th>
<th>Grading A</th>
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<th>Grading C</th>
<th>Grading D</th>
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<tr>
<td>2 in.</td>
<td>100</td>
<td>100</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<tr>
<td>1 in.</td>
<td>--</td>
<td>75 – 95</td>
<td>50 – 85</td>
<td>50 – 100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>3/8 in.</td>
<td>25 – 55</td>
<td>40 – 75</td>
<td>50 – 85</td>
<td>50 – 100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>No. 4</td>
<td>15 – 40</td>
<td>20 – 45</td>
<td>25 – 50</td>
<td>40 – 70</td>
<td>55 – 100</td>
<td>55 – 100</td>
</tr>
<tr>
<td>No. 10</td>
<td>8 – 20</td>
<td>15 – 30</td>
<td>15 – 30</td>
<td>25 – 45</td>
<td>20 – 50</td>
<td>30 – 70</td>
</tr>
<tr>
<td>No. 40</td>
<td>2 – 8</td>
<td>5 – 20</td>
<td>5 – 15</td>
<td>5 – 20</td>
<td>6 – 20</td>
<td>8 – 25</td>
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* Material passing the No. 200 sieve shall be limited to a maximum of 15% for all grading classifications.
Typical Asphalt Section

Collector/Arterial Street Section

*Maximum of 4" compacted A.C. base per lift

**The edge drain may be omitted when a stormwater pipe trench is located under or behind the curb provided that the free draining subbase is connected to the granular trench backfill. The edge drain may also be omitted when shot rock or permeable subgrade stabilization is used provided subgrade is connected to a stormwater trench.
Street with Curb and Gutter Poured Monolithically  

Street with Curb and Gutter Poured Separately  

Type "A" curb and gutter (typ)  

7'  

11'-6"  

28' (residential, parking on one side)  

8'-3"  

11'-6"  

L1 or L2  

L1 or L2  

L2  

L2  

33' (collector, parking on one side)  

8'-9"  

7'-6"  

L1 or L2  

L2  

L1 or L2  

L2  

35' (residential, parking on both sides)  

9'-6"  

8'-3"  

L1 or L2  

L2  

L1 or L2  

L2  

38' (arterial, no parking)  

10'  

8'-9"  

L1 or L2  

L2  

L1 or L2  

L2  

40' (collector, parking on both sides)  

PCC Street Longitudinal Joint Layout  
for typical street widths  

Notes:  
1. Transverse joints shall be placed at 10 foot centers (max) for all PCC pavements.  
2. Sawed contraction joints (L1, T1A, and T1R) shall be a maximum of 1/8" wide with a depth of 1/3 of the pavement thickness. Joint sealing is not required for 1/8" joints.  

L1 = Longitudinal contraction joint  
L2 = Longitudinal construction joint  
T1R = Transverse contraction joint on a residential street  
T1A = Transverse contraction joint on a arterial street
Transverse Contraction Joint for Residential Streets
t1r

Transverse Contraction Joint for Arterial Streets
t1a

See sealing detail
1" smooth bar

Existing
1" smooth dowel

Preformed filler material
Expansion tube
Drilled hole 1/8" larger than bar Ø

Transverse Expansion Joints
t3

Sealing Detail
Joint sealer
Preformed filler material

Longitudinal Contraction Joint
l1

Longitudinal and Transverse Construction Joints
l2 and t2

Notes:
1. Sawed joints are to be a maximum of 1/8" wide. Joint sealing is not required for 1/8" joints.
2. Expansion joints shall be a minimum of 1/2" wide. The top 1" of the filler material is to be removed and the joint is to be sealed with hot poured joint sealer meeting the MoDOT specification 1057.5. Dowels are to be 1" Ø smooth bars with expansion tubes and grease on one end.
3. All tie bars and dowels used in concrete pavements shall be epoxy coated meeting MoDOT specification 1057.
4. All bars placed in existing concrete shall be bonded to the concrete using epoxy or polyester bonding agents meeting the specification of MoDOT section 1039.30
5. All dowel and bar supports shall meet the requirements of MoDOT.
Reinforcement for PCC Pavement

Notes:

Reinforced joints in PCC pavement shall be as follows:

L1 Longitudinal Contraction Joints
24" #4 deformed bars at 30" centers centered on joint

L2 Longitudinal Construction Joints
24" #4 deformed bars at 30" centers centered on joint

T1A Transverse Contraction Joints Arterial Streets
18" x 1" dia. smooth dowels at 12' centers centered on joint

T1R Transverse Contraction Joints Residential Streets
No dowels required

T2 Transverse Construction Joints
24" #4 deformed bars at 12" centers centered on joint

T3 Transverse Expansion Joints
18" x 1" dia. smooth dowels at 12' centers centered on joint with expansion caps on one end of bar
Notes:
1. Transverse expansion joints "T3" shall be installed at radius points on the northern and eastern legs of intersecting concrete streets and at intervals not exceeding 500 feet.
2. Transverse joints are to be placed at 10 foot center to center (max) and should be arranged to match the joints in the curb and gutter.
3. Longitudinal joint spacing shall be as indicated on sheet 20.03.

See sheet 22.06 for commercial driveway details

All residential and commercial driveways shall be a minimum of 35' from the back of the parallel street curb. See 22.07 for additional details.
Type "A" Curb and Gutter

Notes:

1. Expansion joints shall be installed at curb return radius points on intersecting streets, when expansion is installed in the street, and at ends of inlet transitions. These 1/2" expansion joints shall have 5/8" diameter x 18" long smooth dowels. These dowels shall be greased and wrapped on one end with expansion tubes.

2. Control joints may be sawed or pre-formed.

3. Curb pan can be constructed at 2.0% cross slope when the street and curb are constructed monolithically or on arterial streets when asphalt is placed under the curb.

4. When a tilt out pan is constructed the pan shall be tilted out no more than the cross slope of the adjoining street.

*Pan thickness increases to match concrete pavement thickness on arterial streets. Back of curb dimension increases as the pan dimension increases.
Type "A" Curb and Gutter
at Residential Drive Approach

1 1/2" deep control joints at 10' centers

24" #4 deformed bars at joint between approach and curb and gutter (typ)

Type "A" Curb and Gutter
at Sidewalk Ramps

1 1/2" deep control joints at 10' centers

5/8" per foot

18" by 5/8" smooth dowel bars (typ)

1/2" expansion material

Expansion tube on greased bar (typ)

Notes:
1. Refer to notes on previous page.

*Pan thickness increases to match concrete pavement thickness on arterial streets. Back of curb dimension increases as the pan dimension increases.
Access easement 10' beyond pavement typ

30' min 30' min

20'

Property line

Pavement thickness shall match adjoining street pavement

City Street

Varies

Hammer Head Type

Pavement thickness to match adjoining street pavement

City Street

20'

30' min

20' min

R10'

Driveways are not permitted off of temporary turnaround.

Branch Type

Notes
The hammerhead turnaround may be placed on the adjoining property if easement is acquired from adjoining property owner.
Standard Cul-de-Sac

Install inlets prior to cul-de-sac when on a downhill approach

Additional inlets as may be necessary

Offset Cul-de-Sac

Varies

R20'

R40'

R20'

R40'

Varies
Notes
Dimensions for the placement of sharrows are the minimum allowed. Site conditions such as lane width, topography, or additional thru lanes may result in alternate placement.

AASHTO
Shared Lane Markings
"Sharrows"

MUTCD
Bike Lane Markings
Excavation in Right of Way

All excavations in any right of way in the City shall be made in the following manner:

1. The location of new facilities to be constructed on right-of-way shall be approved by the Director of Public Works. No new facilities shall be constructed under roadways, unless undue hardship is imposed by placement outside of the roadway. The edge of a trench for excavations paralleling curbs outside of roadways shall be kept a minimum of three (3) feet from the back of curb.

2. The permit holder shall notify the Director of the time the excavation is to begin a minimum of two (2) hours prior to its commencement.

3. Road closures require the prior approval of the Director. Five (5) working days’ notice is required for work involving the closure of a roadway to traffic. If the work involved is due to a need for immediate repair or other good cause, the Director may reduce or waive the required notice. When closing a street to traffic, the permit holder shall notify the communications division of the police department of the time the roadway will be closed and at the time the roadway is reopened to traffic.

4. The permit holder shall provide, erect and maintain such barricades, signs, flags, and lighting at the excavation area as may be required by the most recent edition of the Manual on Uniform Traffic Control Devices. For arterial streets a traffic control plan designed and sealed by a Professional Engineer shall be submitted.

All excavations in any roadway shall conform with the following additional procedures:

1. The outer edges of all cuts through paved surfaces shall be sawed the full depth of the pavement thickness by use of a power driven concrete saw to obtain a smooth and square cut. If an excavation is made in a roadway with a surface deficiency, the pavement removal shall be expanded to a point where a smooth straight edge can be maintained. If the contractor fails to saw the pavement, the city shall perform this operation or have this operation performed, and the cost thereof shall be charged to the contractor.

2. Asphalt pavement shall be removed to a minimum width of twelve (12) inches beyond each edge of the excavated trench. Concrete pavement shall be removed to the nearest pavement joint unless a twelve (12) inch wide bench can be achieved by the removal of one half of a pavement panel. All cuts shall be square. No panel shall be cut in a manner which results in a panel with a length that is more than twice its width. Benching is not required for trenches six (6) inches wide or less.

3. In the event the entire width of a roadway is to be excavated, the excavation and backfill shall be completed within one-half of the width of the roadway prior to any excavation commencing in the remaining half of the roadway if practical as determined by the Director.

4. No open cuts will be permitted across arterial streets unless undue hardship is imposed. Approval of the Director must be obtained prior to an open cut being made across an arterial street.

5. For the three (3) years following the resurfacing of a roadway, no open cuts will be permitted on that roadway for any work that could have been foreseen.

6. In the event an excavation crosses a curb or curb and gutter, the curb or curb and gutter shall be removed and replaced a minimum of one half of the affected curb section. If the trench extends to within twelve (12) inches of the centerline of the curb section the entire section shall be replaced. If a bore under curb or curb and gutter is made or utility is pushed under the curb and material under the curb sloughs creating a void under the curb or curb and gutter, the entire width of curb or curb and gutter shall be removed and replaced in accordance with the above requirements. All reconstructed curb or curb and gutter shall be doweled to the existing curb or curb and gutter.

7. If an excavation takes place at an intersection that has a sidewalk and the excavation damages or leads to the removal of the sidewalk, ramp, or curb, a sidewalk ramp that is compliant with the City of Jefferson Standard Drawings shall be constructed.
Backfill in Right of Way

All excavations within any right of way of the City shall be backfilled in the following manner:

1. Permit holder shall notify the Director of the time when backfilling is to be commenced at least two (2) hours before commencement, and upon its completion.

2. Backfilling shall be accomplished as quickly as good working practice permits, and an excavation shall not be left open and unfilled for a longer period of time than is deemed reasonable and necessary by the Director.

3. All excess materials excavated shall be removed by the permit holder from the site of the excavation area. Shot rock in compacted lifts may be used to stabilize the bottom of excavations.

4. Excavations under paved portions of the right-of-way shall be backfilled with a crushed stone aggregate material having a maximum diameter of one (1) inch and shall be placed in lifts not exceeding six (6) inches. Each lift shall be compacted with a flat plate tamper, vibratory rammer, wheeled compactor, or other compacting device appropriate for the material being used before any additional material is placed in the excavation.

5. Excavations not in driveways, sidewalks, or other paved surfaces and not within three feet of a roadway may use native or imported soil as backfill and shall be backfilled in a manner that will minimize settlement. The backfill shall be left flush with the adjacent area. It shall be the permit holder’s responsibility to repair any settlement that occurs within one year after placement of the backfill. In addition, in areas that are seeded, the permit holder shall be responsible for obtaining a stand of grass equal to or better than that of the surrounding yard area.

Backfill of excavations under or within three feet of the roadway shall have the following additional requirements:

1. The excavation shall be backfilled with a crushed stone aggregate material meeting one of the gradations (A–D) of ASTM M147 shown on sheet 20.01. The aggregate shall be placed in the excavation in lifts not exceeding six (6) inches. Each lift shall be compacted with a flat plate tamper, vibratory rammer, wheeled compactor, or other compacting device appropriate for the material being used before any additional material is placed in the excavation.

2. Pavement replacements shall be as depicted on sheet 21.03 or as described below.

3. In bituminous pavements that are not classified as arterial, backfill of excavations that have a minimum width of ten (10) feet and a minimum length of one hundred (100) feet may be topped with asphalt base course in lieu of concrete. The asphalt base course shall be seven (7) inches in thickness, and shall meet the standard specification for asphalt base. The asphalt shall be placed in two (2) lifts by a self-propelled mechanical paving machine. Each lift shall be compacted by a steel wheeled vibratory roller before any additional material is placed on top of it. The top of the asphalt base shall be held one and one-half (1½) inches below the top of the existing pavement. The remaining one and one-half (1½) inches shall be bituminous material meeting the specifications of BP–1.
Notes:

1. A 1 foot wide (min) bench/ledge must be maintained or established between the edge of the trench and the vertical face of the existing pavement prior to the placement of the new pavement. If the street is concrete the joint shall be located at an existing joint or may be located at the midpoint of the panel if it does not result in a panel that is more than twice as long as it is wide.

   *The bench/ledge is not required when the trench is less than 6 inches wide.

2. All concrete used for street repair shall meet the specifications set forth for 4 hour or 24 hour high early strength concrete (see sheet 20.01) as may be directed by the engineer or dictated by the circumstances. The finish shall match the finish on the adjoining street.

3. Asphalt streets which have a surface less than 6 years old shall be capped with one and one-half (1\(\frac{1}{2}\)) inches of hot mix asphalt meeting the specifications of BP-1 unless otherwise approved by the Director. If hot mix asphalt is not available the patch shall be capped with cold mix. When hot mix becomes available the cold mix is to be removed and replaced with hot mix.

   **Asphalt streets which have a surface 6 years old or older may be patched with concrete all the way to the surface. In this instance the concrete shall be 9 1/2" thick.

4. In the event that any appurtenance such as a valve box, meter, or manhole is required to be placed in an asphalt street with a surface older than 6 years and concrete is brought to the surface the concrete shall be held back 6" from the appurtenance and the remaining void filled with asphalt to facilitate future milling operations.
Right of Way Excavation and Backfill Beyond the Street

Notes:

1. Sidewalk panels shall be removed and replaced in their entirety. No partial replacement of a sidewalk panel is allowed.
2. The replacement of a driveway shall be performed such that there is no increase in the number of transverse joints in the driveway. This may require the removal of the driveway back to an existing joint. If a driveway approach is within the excavation it shall be replaced in a manner that does not increase the number of joints within the approach.
3. The contractor is responsible for the repair of any settlement for a period of one year following the completion of the project.
Type "S" Residential Drive Approach
with Curb Removed by Approved Mechanical Methods and/or
Reconstructed Curb and Gutter Intersecting an Existing Driveway

Notes:
1. The flared wing to a residential driveway shall not be located within the transition pan/wing of a stormwater inlet.
2. Dowel bars are not required at driveways when the curb is mechanically removed or when the curb is constructed/reconstructed as part of a street rehabilitation project.

* When the curb and gutter and/or street is being reconstructed the curb is to be 3/4" tall through all existing/proposed driveways.
** Maximum driveway width is 30 feet where a three vehicle garage faces the street.
Type "S" Residential Drive Approach on Asphalt Street

Privately maintained  Publicly maintained

Section A–A

Notes:
1. The flared wing to a residential driveway shall not be located within the transition pan/wing of a stormwater inlet.
2. Unless the curb is removed by approved mechanical methods the entirety of the curb and gutter section in front of the driveway approach is to be removed and replaced with a Type "A" curb and gutter section with a 3/4" tall curb.
3. In the event that a driveway approach wing falls within two feet of a contraction or construction joint in the existing curb and gutter the curb and gutter shall be removed to that joint and a standard doweled joint installed.

** Maximum driveway width is 30 feet where a three vehicle garage faces the street.
Type "S" Residential Drive Approach on Concrete Street

Privately maintained Publicly maintained

3' (typ/min)

6" (typ)

Residential drive approach

1/2" expansion joint

24" #4 deformed bars at 30" centers

Notes:
1. The flared wing to a residential driveway shall not be located within the transition pan/wing of a stormwater inlet.
2. Unless the curb is removed by approved mechanical methods the entirety of the curb and gutter section in front of the driveway approach is to be removed and replaced with a gutter section with a 3/4" curb. In the case of a curb poured monolithically with the street the street shall be cut at 30" from the back of the curb so that a standard gutter section can be placed with a 3/4" curb.
3. In the event that a driveway approach wing falls within two feet of a contraction or construction joint in the existing curb and gutter or street, the curb and gutter or associated street shall be removed to that joint and a standard doweled joint installed.

** Maximum driveway width is 30 feet where a three vehicle garage faces the street.
Type "S" Residential Drive Approach with
Sidewalk Adjacent to Curb

Isometric View of Type "S"
Residential Drive Approach

Profile of Type "S" Residential Drive Approach

Notes:
The design of any particular driveway is the responsibility of the design professional. This information is given as a general guide. Vertical curves should be used to transition to steeper driveways and may begin at the edge of the sidewalk. The design and construction of a driveway shall be such that a vehicle does not bottom out or drag on the approach, driveway, or street.
Type "E" Residential Drive Approach

Only to be used with sidewalk adjacent to curb and when topography prevents the use of Type "S" Approach.

Section A–A

Notes:
1. All details including mechanical curb removal, location in relation to stormwater inlets, expansion joints, deformed bars, and the treatment of monolithically poured curbs and street are the same as indicated for Type "S" Residential Drive Approaches.

* On streets steeper than 5% the ramp on the uphill side of the driveway can be terminated at 15 feet in length even though the slope exceeds 12:1. The ramp on the downhill side of steep streets shall be shortened such that slope of the ramp is towards the driveway to prevent water from the driveway from running down the sidewalk. The curb height shall match the elevation/grade of the sidewalk.

** Maximum driveway width is 30 feet where a three vehicle garage faces the street.
Commercial Drive Approach

Notes:
1. In the event that a driveway approach radius falls within two feet of a contraction or construction joint in the existing curb and gutter or street, the curb and gutter or associated street shall be removed to that joint and a standard expansion joint installed.
2. Commercial drive approaches are typically constructed with monolithic curbs. It is permissible for them to be constructed with a curb and gutter section placed separately. If this option is chosen then the gutter pan shall be extended to meet the street when the distance between the edge of the street and the gutter becomes less than 2 feet.
3. In the case of a curb poured monolithically with the street the street shall be cut at 30” from the back of the curb and the approach constructed as shown.
4. All commercial approaches regardless of the existence of sidewalks shall be constructed with an area 5 feet in width that has a slope of 2% or less to provide A.D.A. access across the approach.
5. If the commercial approach is signalized or is controlled by a stop sign the sidewalk ramps shall have detectable warning panels.
Notes:
Driveways shall meet the street at right angles whenever possible. At no time shall a driveway meet the street at an angle less than 45°.
This drawing depicts typical driveway placement. Traffic studies for specific sites may dictate alternate placement.
* In no case shall the radius of a commercial drive entrance overlap with the radius of the street.
** When a three car garage faces the street a residential drive may be 30’ wide.
Sidewalk Notes:

1. The minimum width of continuous passage shall be 48 inches.
2. The cross slope of the sidewalk shall typically be 1.5% but shall not exceed 2%. The slope is typically towards the street but may slope away from the street if it is determined that stormwater runoff will not adversely affect adjacent properties.
3. The sidewalk shall have sawed contraction joints 1/3 of the sidewalk thickness. The joints are to be placed at a spacing that is equal to the width of the sidewalk or as directed by the engineer. In no instance shall the spacing measured in feet exceed twice the sidewalk thickness measured in inches.
4. All sidewalks are to be constructed on a 4” minimum compacted subgrade. This requirement may be met with native material or granular material supplied by the contractor.
5. All concrete used for sidewalk construction shall meet the requirements for concrete pavement. See sheet 20.01.
6. The sidewalk surface shall have a non-slip light broom finish that is perpendicular to the sidewalk.
7. Sidewalks shall be cured as specified in section 502.6 of the Missouri Standard Specifications for Highway Construction.
8. Expansion joints shall be 1/2” pre molded joint filler and shall be placed as follows:
   8.1. in long runs at a maximum spacing of 300 feet.
   8.2. where one sidewalk abuts another or the sidewalk abuts a sidewalk ramp.
   8.3. where the sidewalk is parallel and adjacent to a rigid structure, not including the curb and gutter.
9. Sidewalks shall be doweled to inlets or shall be built integrally with inlet lid. See page 23.03 for details.
10. Sidewalk ramps shall be doweled to intersecting street curbs or commercial drive approaches. See page 23.06 for details.
11. All sidewalks shall meet ADA standards.
12. The reinforced section of sidewalk abutting stormwater inlets as shown on page 23.03 shall be constructed by the developer in conjunction with the construction of the street and is a requirement for street acceptance.
13. Sidewalk ramps as detailed in section 23.00 of these standards shall be constructed by the developer in conjunction with the construction of the street and are a requirement for street acceptance.
Standard Sidewalk

Sidewalk Behind Curb

Sidewalk Behind Curb in Upgrade

Sidewalk Behind Curb in Downgrade

Sidewalk Behind Curb in Steep Downgrade

Notes:
1. In areas where the ground slopes away from the street it may be permissible to slope the sidewalk away from the street after taking into account the drainage implications.
2. In sections that require retaining walls 1/2" expansion material shall be placed between the sidewalk and the wall. For downgrade walls pedestrian guard railings shall be installed.
3. Unless prohibited by terrain the standard sidewalk section is to be used. The standard sidewalk section may also include upward or downward monolithic or independent walls.
Reinforcement of Sidewalks at Inlet/Junction Boxes*

1/2" expansion material (typ)

1/2" expansion material (typ)

1/2" @ 12" deformed bars at 12" centers

5/8" @ 18" smooth bars at 12" centers (typ both sides)

Sawed contraction joint (typ both sides)

6" thick sidewalk

1 1/2" @ 14" centers

5/8" @ 18" smooth bars at 12" centers (typ both sides)

4" thick sidewalk

6" thick at dowel bars

Reinforcement of Sidewalks at Inlet/Junction Boxes*

Section A-A

Typical sidewalk

5/8" @ smooth bars centered about joint

1/2" expansion material

1' - 6"

Reinforced sidewalk

6"

4"

6"

9"

Typical inlet/junction box lid

Section B-B

1/2" @ deformed bars centered about joint

Notes:

In the event that the sidewalk behind the inlet or junction box is 12" or less in width, that portion of the sidewalk is to be poured monolithically with the lid of the inlet or junction box using the same reinforcement as used in the lid.

* The reinforced section of sidewalk abutting stormwater inlets shall be constructed by the developer in conjunction with the construction of the street and is a requirement for street acceptance.
Isometric View

Section A-A

Plan View

If sidewalk is not of a width that allows for standard length covers an appropriately sized trench cover shall be ordered from the manufacturer.

Sidewalk trench cover shall be Deeter 3990-D, Style D Solid with Deeter frame, or approved equal.
Pipe shall be placed perpendicular to the sidewalk.

Arrange contraction joints so that a joint falls directly over the pipe.

Connect to existing pipe with PVC, Fernco, or other approved fittings or extend to building.

Install elbows as needed to change grade and turn pipe to be perpendicular to sidewalk.

Sidewalk, offset from curb varies.

Plan View
sidewalk behind curb

Section A-A
Sch 40 or SDR 35 PVC, 4" Ø (max/typ)

Section B-B
when placing in new curb

4" Ø round to 3"x4" rectangular offset adaptor

Detail A

Cut curb the width of the fitting and remove. Install galvanized nails, 4 total.

Fill void with concrete.

Section B-B
when placing in existing curb
ADA Ramp Notes:

1. Sidewalk ramps shall be constructed on all curbed street intersections, commercial drive approaches, and type "E" residential drive approaches where there is existing or proposed sidewalk and as directed by the engineer.

2. Type B ramps are preferred and should be used whenever possible.

3. All ramps inclusive of the flares shall be 6" thick. In the event that a ramp is longer than 6', the portion of the ramp beyond 6' may be 4" thick.

4. Sidewalk ramps shall match the sidewalk width but shall not be less than 48" wide exclusive of the flared sides.

5. In the instance where an intersecting sidewalk abuts a flare of a ramp the flare shall have a maximum slope of 1:10. (10.0%) Ramps are to have a maximum longitudinal slope of 1:12. (8.33%) In the case where the adjacent street grade is greater than 5% it is permissible to stop the ramp when it reaches 15 feet in length even though the 1:12 slope is not attained.

7. All ramps which are not parallel with the sidewalk (ie. type A and C ramps) shall have a landing whose slope is typically 1.5% in all directions but does not exceed 2% in any direction.

8. Sidewalk ramps should not be aligned with drainage structures.

9. All ramps shall be constructed prior to the sidewalk construction unless otherwise approved.

10. The transition from the flow line of the gutter to back of the curb in the area of a sidewalk ramp shall be smooth with no vertical offset and a rise of no more than 1/2".

11. Ramps shall be doweled to the curb and gutter, monolithic curb, or drive approach with 18" long #4 bars on 12" centers.

Detectable Warning Panels:

1. All sidewalk ramps, in locations where the sidewalk intersects a commercial entrance having a traffic control sign or signal, or where the sidewalk intersects a street or alley, shall have detectable warning panels.

2. Detectable warning panels are to be placed at the base of the sidewalk ramp such that the closest point is within 2" to 6" from the back of the curb. (see ramp details). The panels are to be placed across the full width of the ramp, and shall extend along the ramp for a distance of 24". The distance between the back of the curb and the start of the most distant point of the detectable warning panels shall not exceed 5'. In a situation which would cause the panels to exceed 5' the panels shall be placed radially with the ramp.

3. The detectable warning panels shall be one of the following:

   3.1. Wet-Set High-Impact Polymer Tiles or Wet-Set Cast Iron Tiles as manufactured by TufTile. (888-960-8897) TufTile.com
   3.2. TekWay High Performance ADA Domes as produced by StrongGo Industries. (866-439-3216) stronggo.com
   3.3. Cast in place removable tactile panels produced by ADA Solutions, Inc. (800-372-0519) adafile.com
   3.4. Other cast in place panels that are compliant with ADAAG and PROWAG and receive the approval of the engineer.

4. The contractor shall follow the manufacturers recommendations of the installation of the panels. The panels shall match the slope of the ramp and shall be placed such that no vertical displacement occurs between the panel and the surrounding concrete. The panels are to be red in color or in the case of cast iron they may be unpainted.

No lip. Concrete shall transition from flow line of gutter to the back of curb and gutter section with no more than 1/2" rise.

Partial Section of Sidewalk Ramp
Ramp "A1"

Isometric View

Match sidewalk width 5' (min)

Landing 1.5% typ 2% max slope in all directions

Sidewalk

Expansion joint

Detectable warning panels

Ramp "A2"

Isometric View

Match sidewalk width

Landing 1.5% typ 2% max slope in all directions

Sidewalk

Expansion joint

Detectable warning panels

Type "A" curb and gutter

Type "A" curb and gutter

10:1 (max)

12:1 (max)

1.5% (typ)

1.5% (max)

10:1 (max)
Landing 1.5% typ 2% max slope in all directions
Match sidewalk width 4' minimum

Type "A" curb and gutter

Detectable warning panels

Ramp "A3"

Isometric View

Plan View

Landing 1.5% typ 2% max slope in all directions
Match sidewalk width 4' minimum

Type "A" curb and gutter

Detectable warning panels

Ramp "A4"

Isometric View

Plan View
Ramp "B1"

Ramp "B2"

Detectable warning panels

Expansion joint

Landing 1.5% typ 2% max slope in all directions

Match sidewalk width (typ)

1.5% (typ)

3:1 (max)

3:1 (max)

1:5 (typ)

2:1 (max)

Type "A" curb and gutter

Isometric View

Plan View
Landing 1.5% typ 2% max slope in all directions

Sidewalk

Expansion joint

Match sidewalk width (typ)

12:1 (max)

5% (max)

5% (max)

Transition area

2% (max)

Detectable warning panels

Grade break*

Ramp "B3"

Isometric View

Plan View

Landing 1.5% typ 2% max slope in all directions

Expansion joint

Sidewalk

10:1 (max)

12:1 (max)

12:1 (max)

10:1 (max)

5% (max)

Transition area

2% (max)

Detectable warning panels

Grade break*

Ramp "B4"

Isometric View

Plan View

* Typical of all type B ramps located within curb radius.
The ramp may be terminated at 15 feet in length even if it has not yet reached a slope of 12:1. Typical for all Type "B" ramps.

15' minimum if 12:1 slope cannot be obtained

5' (max) if longer panels must be placed radially (see below)

5% (max)

Transition area

2% (max)

Ramp "B5"

Detectable warning panels

Notes (typical for all Type "B" ramps)
1. Ramps on the downhill side shall be constructed to slope toward the drive approach or cross street.
2. Ramp to match sidewalk width.

Isometric View
* The ramp may be terminated at 15 feet in length even if it has not yet reached a slope of 12:1. Typical for all Type "B" ramps.

15' minimum is 12:1 slope cannot be obtained
5% (max)

Ramp

1.5% (typ)
2% (max)

Type "A" curb and gutter
Curb shall match grade of ramp

Detectable warning panels
2% (max)

Ramp "B6"

Notes (typical for all Type "B" ramps)
1. Ramps on the downhill side shall be constructed to slope toward the drive approach or cross street.
2. Ramp to match sidewalk width.

Isometric View

5' (max), if longer panels must be placed radially (see above)

15' minimum if 12:1 slope cannot be obtained
3:1

Ramp* 12:1 (max)
Expansion joint

Sidewalk
Type "A" curb and gutter
Curb shall match grade of ramp

Detectable warning panels

Ramp "B6" Small Radius

Plan View
* The ramp may be terminated at 15 feet in length even if it has not yet reached a slope of 12:1. Typical for all Type "C" ramps.

![Diagram of Ramp C1 and C2]

**Ramp C1**
- Variable height monolithic curb
- Detectable warning panels
- Curb shall match grade of ramp (typ)
- Landing 1.5% typ 2% max slope in all directions

**Ramp C2**
- Variable height monolithic curb
- Detectable warning panels
- Curb shall match grade of ramp
- Landing 1.5% typ 2% max slope in all directions

15' minimum if 12:1 slope cannot be obtained (typ)
The ramp may be terminated at 15 feet in length even if it has not yet reached a slope of 12:1. Typical for all Type "C" ramps.

15' minimum if 12:1 slope cannot be obtained (typ)

Sidewalk

Variable height monolithic curb

Ramp*

12:1 (max)*

Expansion joint

Type "A" curb and gutter

Landing 1.5% typ 2% max slope in all directions

Detectable warning panels

Ramp "C3"

Isometric View

Plan View

Isometric View

Plan View

Variable height monolithic curb

Ramp*

12:1 (typ/max)

Expansion joint

Type "A" curb and gutter

Landing 1.5% typ 2% max slope in all directions

Detectable warning panels

Ramp "C4"
* The ramp may be terminated at 15 feet in length even if it has not yet reached a slope of 12:1. Typical for all Type "C" ramps.

15' minimum if 12:1 slope cannot be obtained (typ)

Landing 1.5% typ 2% max slope in all directions

Expansion joint

Ramp*

5' (min)

Ramp "C5"

12:1 (min)

12:1 (typ/max)

12:1 (max)*

1.5% (typ)

(max)

Type "A" curb and gutter

Detectable warning panels

Sidewalk

Plan View

Isometric View

<table>
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<th>Street Grade (%)</th>
<th>Minimum Ramp Length (feet)</th>
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<td>15.00</td>
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<tr>
<td>&gt; 5</td>
<td>15 min.</td>
</tr>
</tbody>
</table>

* For downgrades steeper than 6% shorten the ramp to maintain a 4% slope towards the cross street or driveway.
Downtown Sidewalk Finish

The sidewalk finish shall be an exposed 3/8" (max) Osage River aggregate. This finish is to be achieved on all exposed (non-colored) concrete construction including sidewalks and accessible ramps.

Exposed Aggregate Finish: Expose Osage River aggregates and sand of pavement surfaces as follows:
1. Immediately after floating, spray-apply chemical surface retarder to pavement according to the manufacturer’s written instructions.
2. Cover with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Block inlets or gutter line to contain washed material for cleanup and disposal.
4. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon bristle broom.
5. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required.
6. Exposed Aggregate Concrete shall be sealed. Sealer to be approved by the Engineer.

Contractor may achieve the exposed aggregate finish by other methods upon approval by the engineer.

Curb and Gutter and driveway approaches may be of plain concrete, or other color variation approved by the director.

All concrete shall have a 28 day compressive strength of 4000 psi.

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Location of Required Exposed Aggregate Finish
Notes:
1. Handrail may be necessary when the two foot bench is not maintained and the downward side slope exceeds 3:1. Handrail is also required on sections with downhill walls.
2. All details pertaining to ADA ramps and detectable warning panels shall be the same as those for sidewalks.
Plan View

Section A-A

Bus Shelter Pad Detail

Notes:
1. This detail is for a standard bus shelter pad installation. Installation may vary based on sidewalk location and other factors.
2. The landing pad and shelter pad should be kept under 2% longitudinal slope to the greatest extent possible.
3. Monolithic curbs or retaining walls may be necessary to allow for the installation of the shelter pad and or sidewalk.