PART 2

ROADWAYS

Abbreviations and symbols for roadway drawings

1. LETTERING SIZE: 100 Leroy minimum except for line type and other background information. Use 120 Leroy for new work installation.

2. LETTERING STYLE: Capital letters preferred.

3. EXISTING IMPROVEMENTS: Shown in light shaded dashed line.

4. NEW IMPROVEMENTS: Shown in solid continuous line.

SYMBOLS	DEFINITIONS
	CENTER LINE
15+00	CONSTRUCTION CENTER LINE
	PROPERTY OR R/W LINE
	EASEMENT LINE
	MONUMENT LINE
X X	FENCE
4250	CONTOUR LINE
4250	CONTOUR ELEVATION
	BANK SLOPES
SD	STORM DRAIN LINE
W	WATER LINE
G	GAS LINE
T	TELEPHONE CABLE
E	ELECTRIC CABLE
SS	SANITARY SEWER LINE
	ASPHALT PAVING
	FIRE HYDRANT
	WATER VALVE
WM	WATER METER
MH	MANHOLE
CB	CATCH BASIN
COB	CLEAN OUT BOX
	POLE & ANCHOR
	STREET LIGHT
	UNDISTURBED EARTH
	STRUCTURE

SYMBOLS	DEFINITIONS
	CURB & GUTTER
	SIDEWALK
	RAILROAD TRACKS
	GUARD RAIL
	OPEN DITCH, CANAL
	CULVERT
	SECTION CORNER
	SOIL BORING
	MONUMENT
BM NO. 46 ELEV. 4256.50	BENCH MARK
	SIGN
PP	POWER POLE
TP	TELEPHONE POLE
	DECIDUOUS TREE
	CONIFEROUS TREE
	P.I.
	P.C. OR P.T.
	PROFILE
	GROUND PROFILE
ROUND ARCH BOX	CULVERT
	P.V.I.
	P.V.C. OR P.V.T.
	GROUNDWATER ELEVATION

Abbreviations and symbols for roadway drawings

Plan No.
201

ASTM size No. 5 gravel per APWA section 31 05 13_2.8_B_1 may be used

Curb and gutter

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel as a substitute for untreated base course without ENGINEER's permission.~~ only on repairs or replacements less than 20 ft.
   B. If flow line grade is greater than 0.5 percent (s=0.005), provide 6 inches uncompacted thickness. If less, provide 8 inches uncompacted thickness.
   C. Place material per APWA Section 32 05 10.
   D. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution; concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

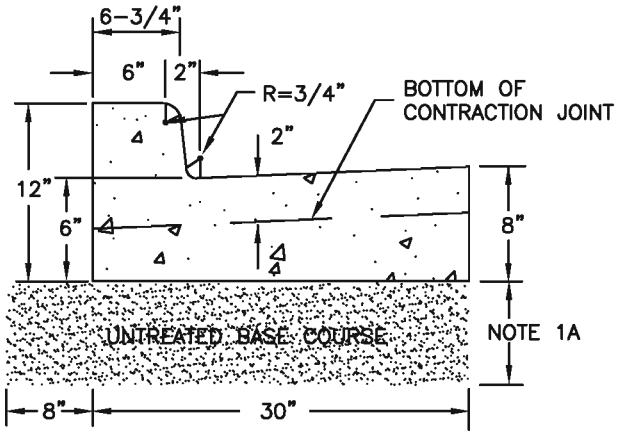
3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type FT joint filler material per APWA Section 32 13 73.~~
   ~~A. Set top of filler flush with surface of concrete.~~
   ~~B. Expansion joints are required at the start or end of a street intersection curb return.~~
   ~~C. Expansion joints are not required in slip form work.~~

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 2 inch deep or 1/4 slab thickness if slab is greater than 8 inches thick.
   B. If necessary, match location of contraction joints in portland cement concrete roadway pavements.

5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements.

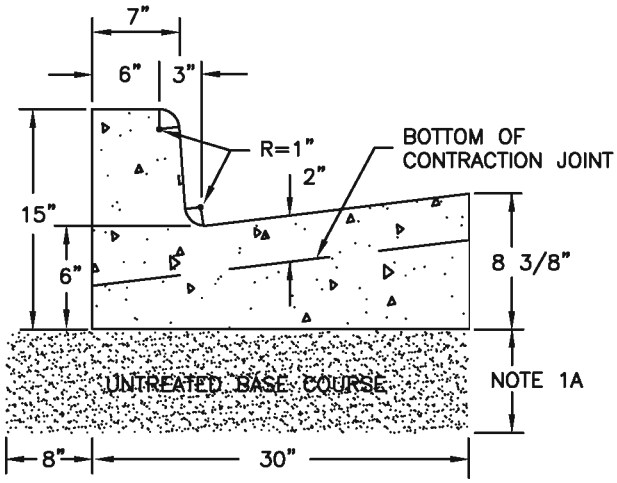
6. FINISH: Broomed.

7. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that does not drain.
   B. Protect concrete from deicing chemicals during cure.



CONCRETE AREA = 1.665 SQ. FT.

TYPE A



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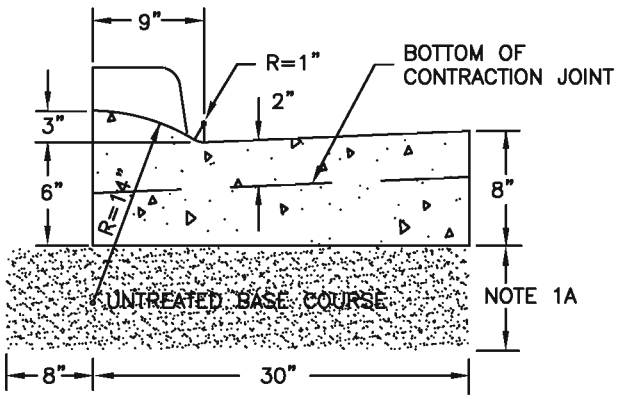
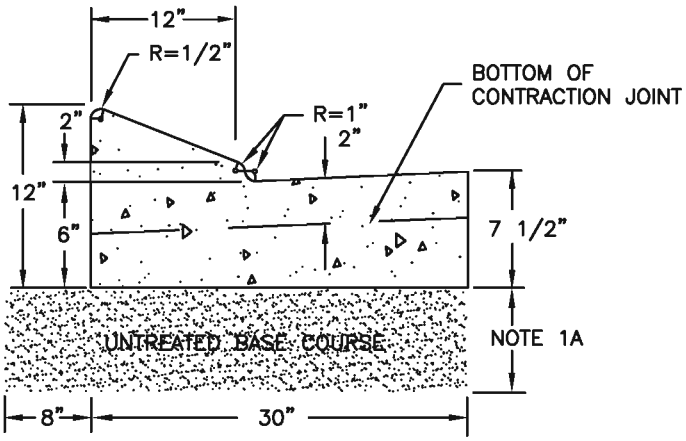
TYPE B



CONCRETE AREA = 1.517 SQ. FT.

TYPE C



CONCRETE AREA = 1.680 SQ. FT.

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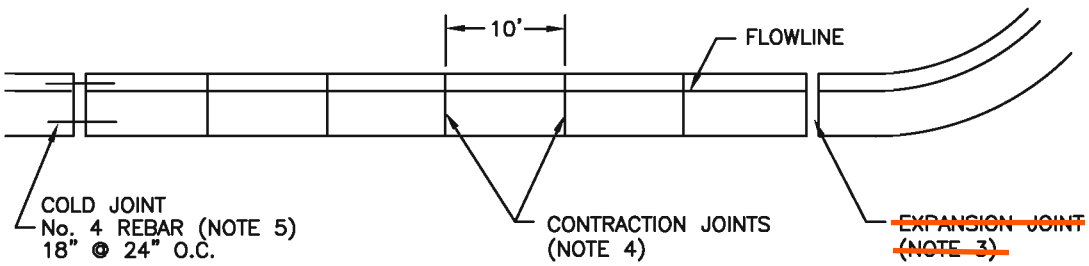


CURB AND GUTTER JOINT DETAIL

ASTM size No. 5 gravel per APWA section 31 05 13_2.8_B_1 may be used

Curb and gutter

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel~~ as a substitute for untreated base course ~~without ENGINEER's permission.~~ only on repairs or replacements less than 20 ft.
   B. If flow line grade is greater than 0.5 percent (s=0.005), provide 6 inches uncompacted thickness. If less, provide 8 inches uncompacted thickness.
   C. Place material per APWA Section 32 05 10.
   D. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution; concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

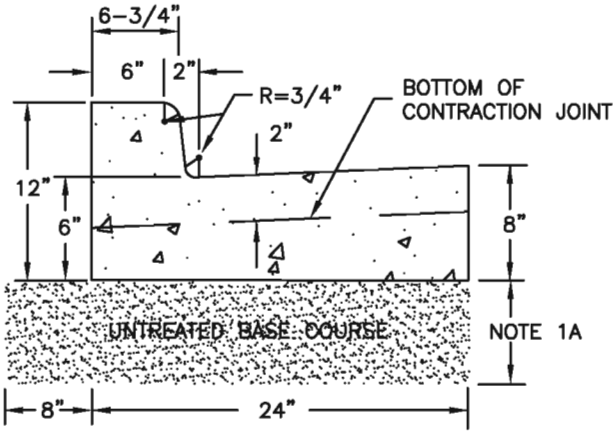
3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 wide with type F1 joint filler material per APWA Section 32 13 73.~~
   ~~A. Set top of filler flush with surface of concrete.~~
   ~~B. Expansion joints are required at the start or end of a street intersection curb return.~~
   ~~C. Expansion joints are not required in slip form work.~~

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 2 inch deep or 1/4 slab thickness if slab is greater than 8 inches thick.
   B. If necessary, match location of contraction joints in portland cement concrete roadway pavements.

5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements.

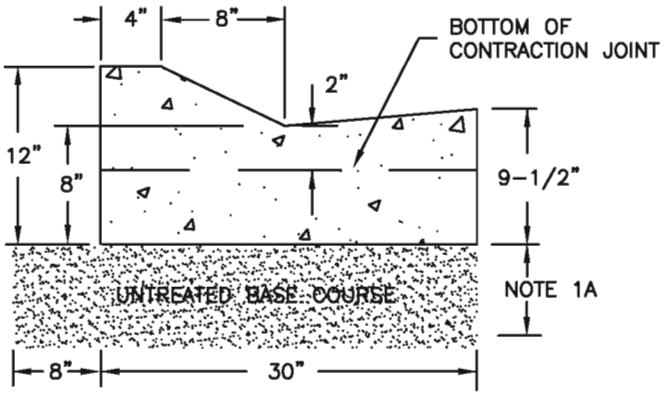
6. FINISH: Broomed.

7. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that does not drain.
   B. Protect concrete from deicing chemicals during cure.



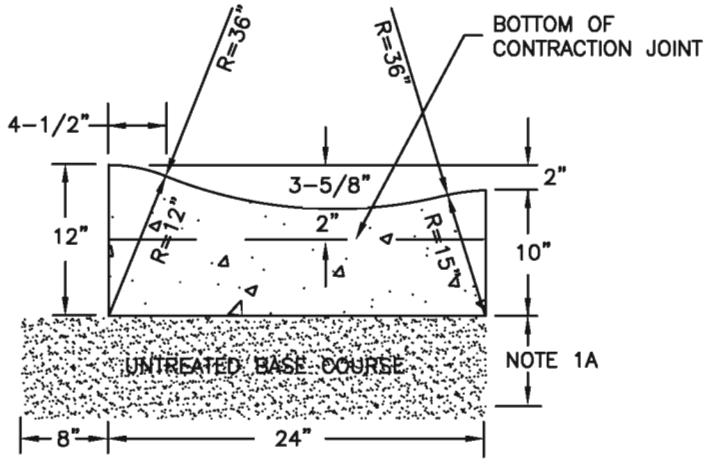
CONCRETE AREA = 1.347 SQ. FT.

TYPE E



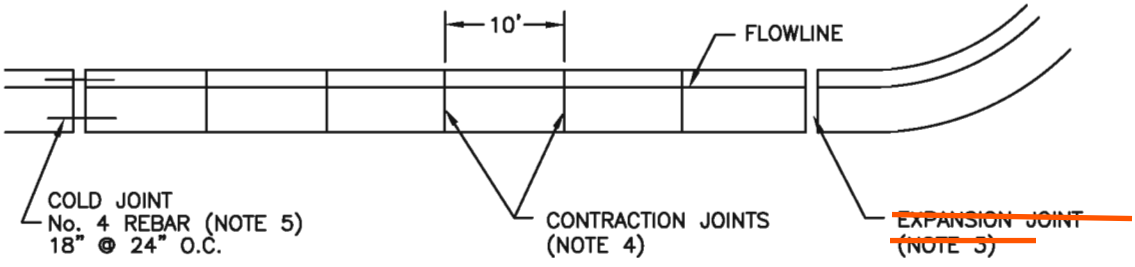
CONCRETE AREA = 1.539 SQ. FT.

TYPE F



CONCRETE AREA = 1.989 SQ. FT.

TYPE G



CURB AND GUTTER JOINT DETAIL

ASTM size No. 5 gravel per APWA section 31 05 13_2.8_B_1 may be used

Curbs

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel as a substitute for untreated base course without ENGINEER's permission.~~ only on repairs or replacements less than 20 ft.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

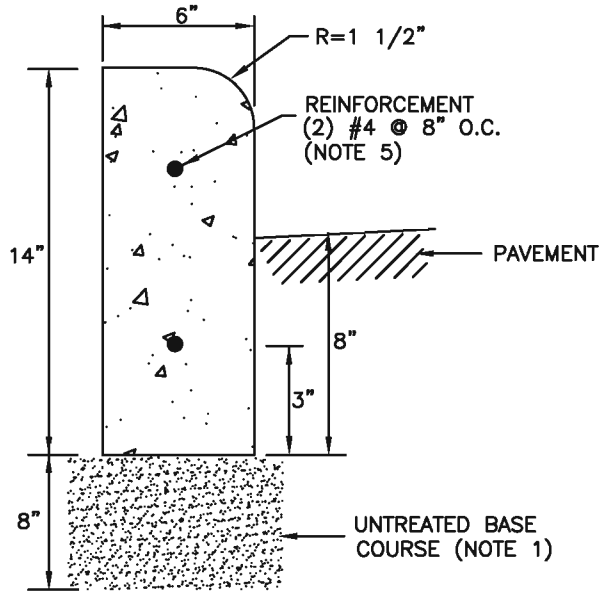
2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. ~~EXPANSION JOINT: Make expansion joints vertical., full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73.~~
   ~~A. Set top of filler flush with surface of concrete.~~
   ~~B. Expansion joints are required at the start or end of a street intersection curb return.~~
   ~~C. Expansion joints are not required in curb tangents or slip form work.~~

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 2 inches deep or 1/4 slab thickness if slab is greater than 8 inches thick.
   B. If necessary, match location of contraction joints in adjacent concrete flatwork.

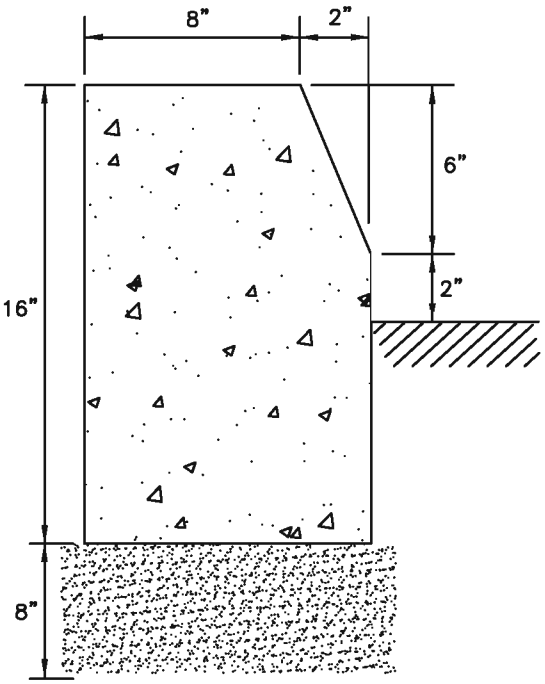
5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements.

6. FINISH: Broomed.



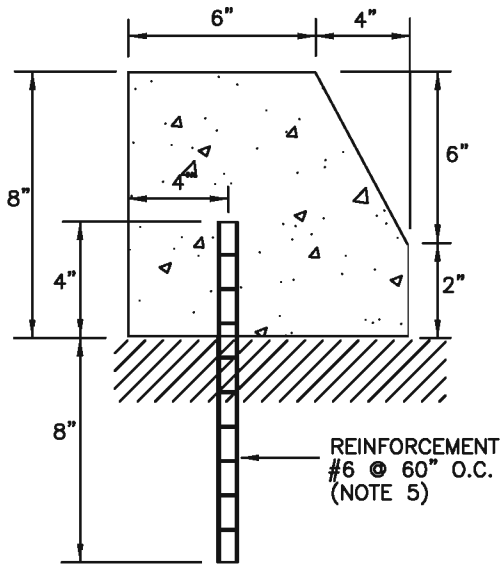
CONCRETE AREA = 0.58 SQ. FT.

TYPE P



CONCRETE AREA = 1.0278 SQ. FT.

TYPE Q



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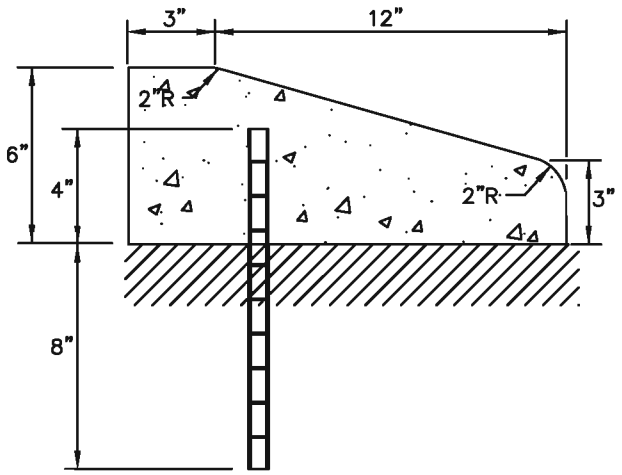
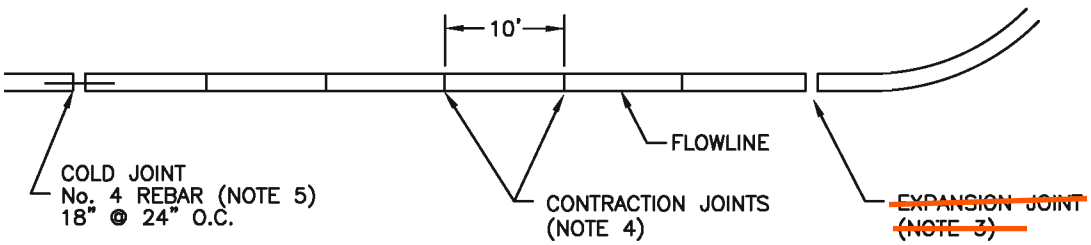
TYPE R



CONCRETE AREA = 0.487 SQ. FT.

TYPE S



JOINT SPACING DETAIL

Waterway

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

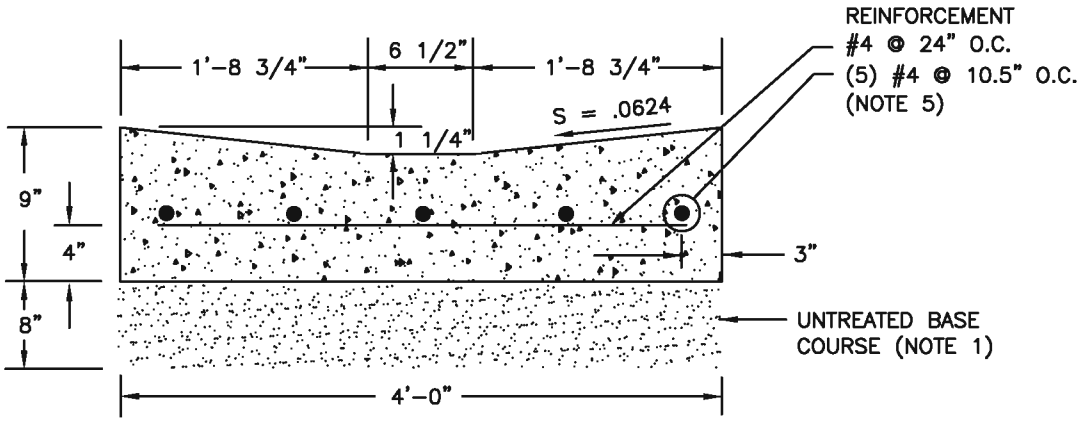
3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.~~

4. CONTRACTION JOINT: Make contraction joints vertical, at least 1/8 inch wide and 2 inches deep or 1/4 slab thickness if slab is greater than 8 inches thick.

5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements.

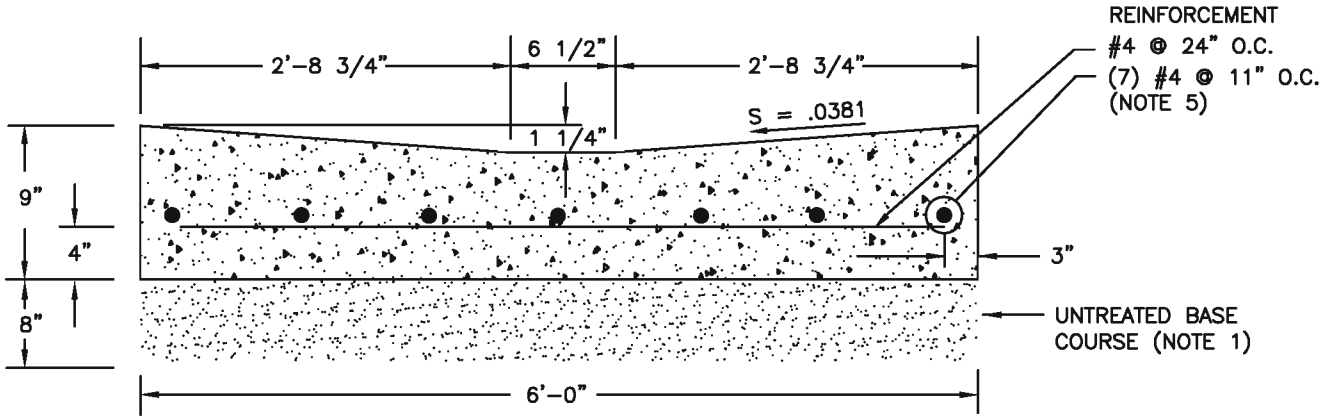
6. FINISH: Broomed.

7 PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure.



CONCRETE AREA = 2.764 SQ. FT.

4'-0" WATERWAY



CONCRETE AREA = 4.16 SQ. FT.

6'-0" WATERWAY

Waterway transition structure

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.~~

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 2 inches deep or 1/4 slab thickness if slab is greater than 8 inches thick.

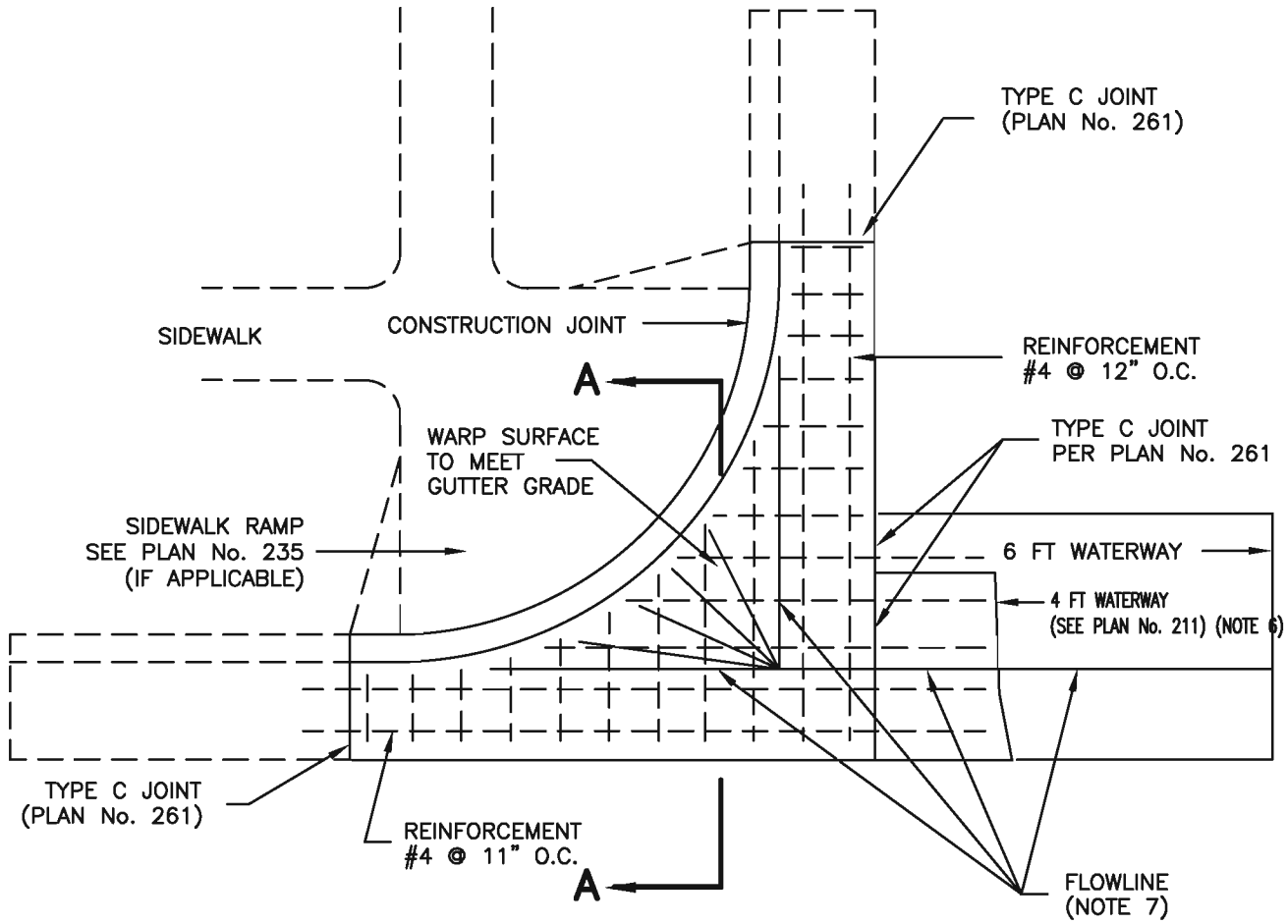
5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements.

6. WATERWAY: Use width shown on the Drawings. If not shown then 4 feet for a residential street and 6 feet for a non-residential street.

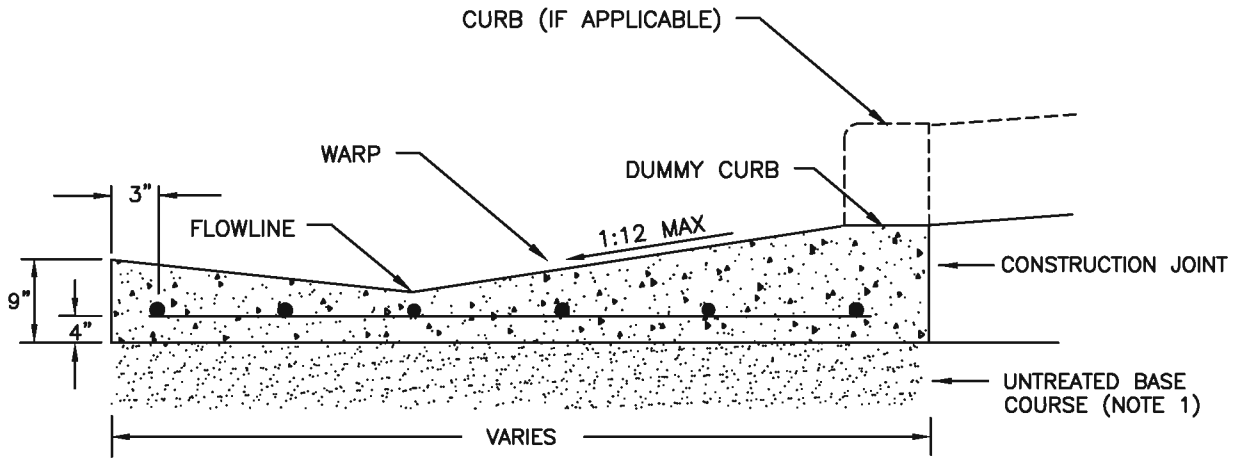
7. FLOW-LINE: A 4 feet wide waterway and a 6 feet wide waterway are shown on Plan No. 213. If a wider waterway is specified or required, offset the flow line in the waterway to match (lines up with) the curb and gutter flow line. Adjust cross slope grades to match existing slopes.

8. FINISH: Broomed.

9. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure.



PLAN



SECTION A–A

Plan No.
213

Waterway transition structure

and 31 05 13_2.8_B_1 may be used

Dip driveway approach

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel as a substitute for untreated base course without ENGINEER's permission.~~
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

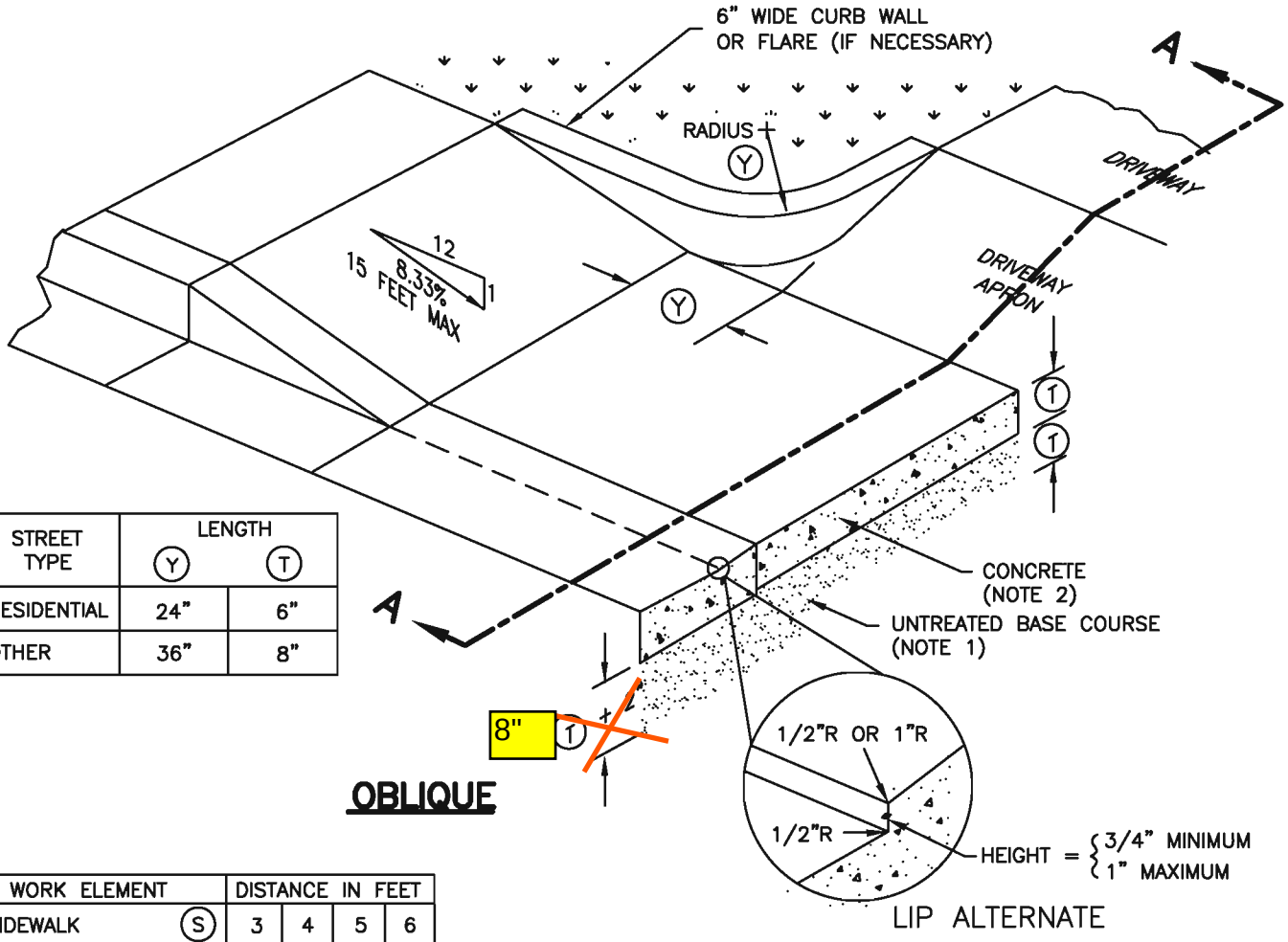
2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.~~

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 8 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. FINISH: Broomed.

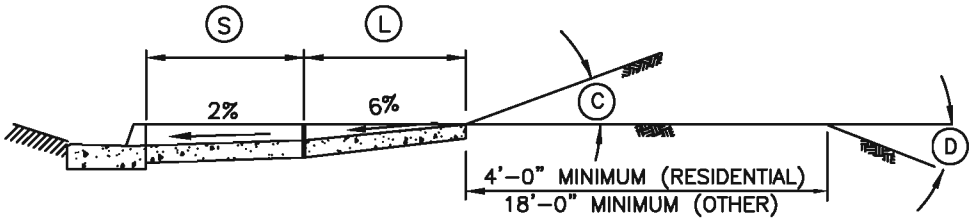
6. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure period.



STREET TYPE	LENGTH (Y)	LENGTH (T)
RESIDENTIAL	24"	6"
OTHER	36"	8"

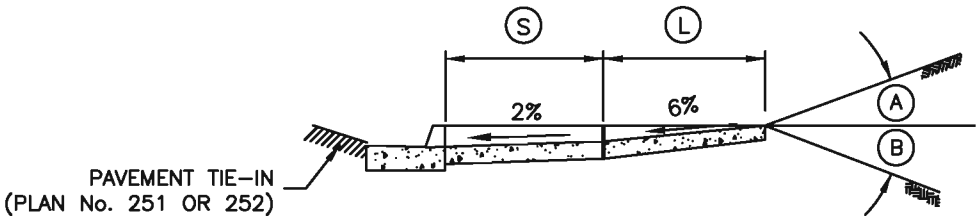
OBLIQUE

WORK ELEMENT	DISTANCE IN FEET			
SIDEWALK (S)	3	4	5	6
1" LIP ALTERNATE WITH 2 PERCENT SIDEWALK SLOPE (L)	6.0	5.5	5.0	5.0
NO LIP DRIVEWAY WITH 2 PERCENT SIDEWALK SLOPE (L)	7.0	7.0	6.5	6.0



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) (C)	(D)
RESIDENTIAL	16%	6%
OTHER	6%	2%

SECTION A–A – APPROACH REQUIRING SERVICE TRUCK ACCESS



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) (A)	(B)
RESIDENTIAL	16%	12%
OTHER	6%	8%

SECTION A–A – TYPICAL DRIVEWAY APPROACH

Dip driveway approach

Plan No.
215

and 31 05 13_2.8_B_1 may be used

Mountable curb driveway approach

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel as a substitute for untreated base course without ENGINEER's permission.~~
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

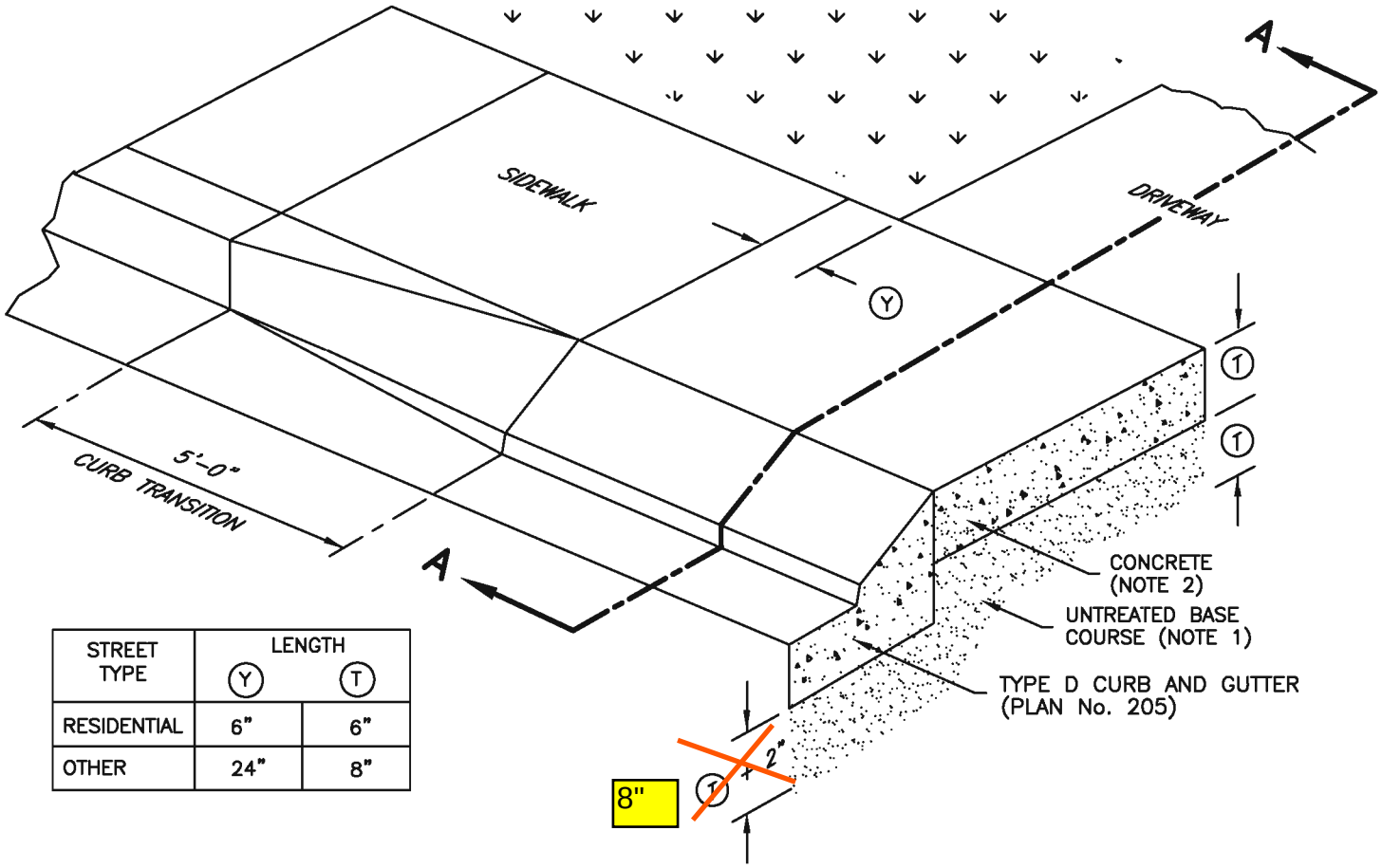
2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.~~

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

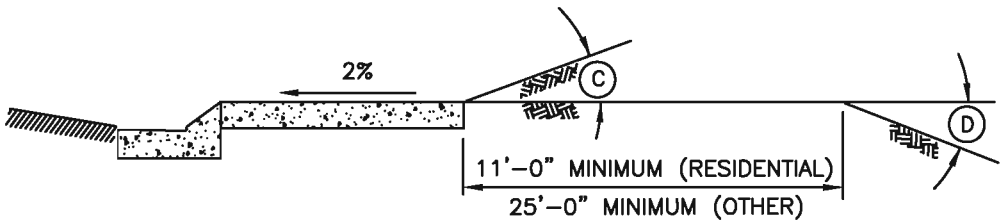
5. FINISH: Broomed.

6. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure period.



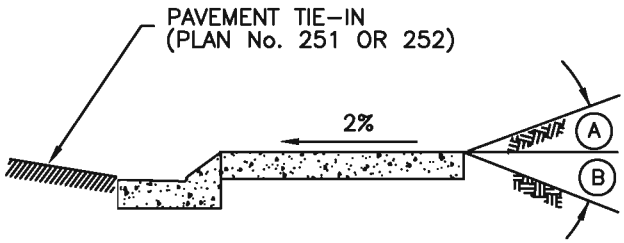
STREET TYPE	LENGTH Y	LENGTH T
RESIDENTIAL	6"	6"
OTHER	24"	8"

OBLIQUE



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) C	BREAKOVER ANGLE (MAXIMUM) D
RESIDENTIAL	16%	13%
OTHER	6%	10%

SECTION A–A – APPROACH REQUIRING SERVICE TRUCK ACCESS



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) A	BREAKOVER ANGLE (MAXIMUM) B
RESIDENTIAL	16%	12%
OTHER	6%	8%

SECTION A–A – TYPICAL DRIVEWAY APPROACH

Mountable curb driveway approach

Plan No.
216

and 31 05 13_2.8_B_1 may be used

Flare driveway approach – type A

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

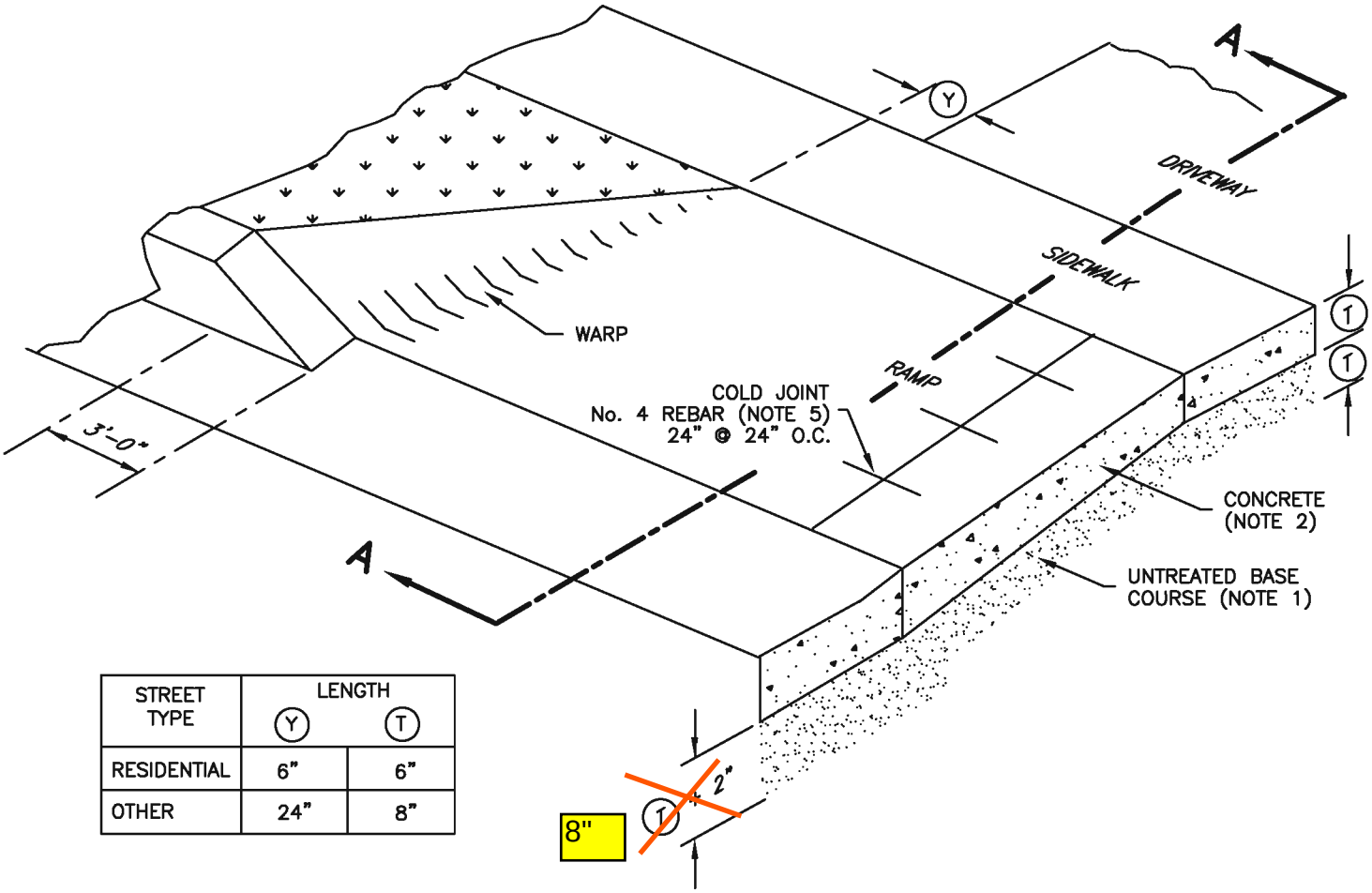
4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements . Not required if driveway ramp is constructed without a cold joint.

6. FIELD CHANGES TO SLOPE REQUIREMENTS: The following design parameters are to be used as a guide. Specific uses or site conditions may require profile design submittal for review and acceptance.
   A. As a rule, driveway grades may have a 6 percent change in slope over a 11 feet wheel base run for both crest or sag vertical curves.
   B. Where heavy truck use and fire truck access applies, or to improve design speed, design grades should be cut in half.

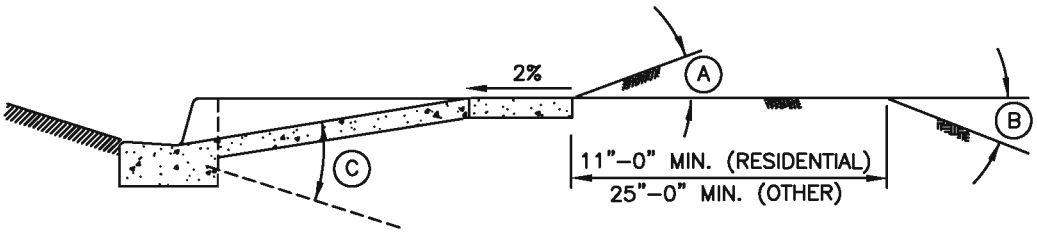
7. FINISH: Broomed.

8. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure period.



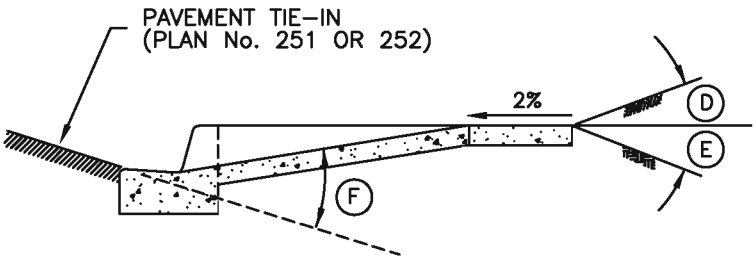
STREET TYPE	LENGTH Y	T
RESIDENTIAL	6"	6"
OTHER	24"	8"

OBLIQUE



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) A	B	C
RESIDENTIAL	16%	12%	16%
OTHER	6%	8%	10%

SECTION A–A – APPROACH REQUIRING SERVICE TRUCK ACCESS



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) D	E	F
RESIDENTIAL	16%	12%	16%
OTHER	6%	8%	10%

SECTION A–A – TYPICAL DRIVEWAY APPROACH

Flare driveway approach - type A

Plan No. **221**

and 31 05 13_2.8_B_1 may be used

Flare driveway approach – type B

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel as a substitute for untreated base course without ENGINEER's permission.~~
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.~~

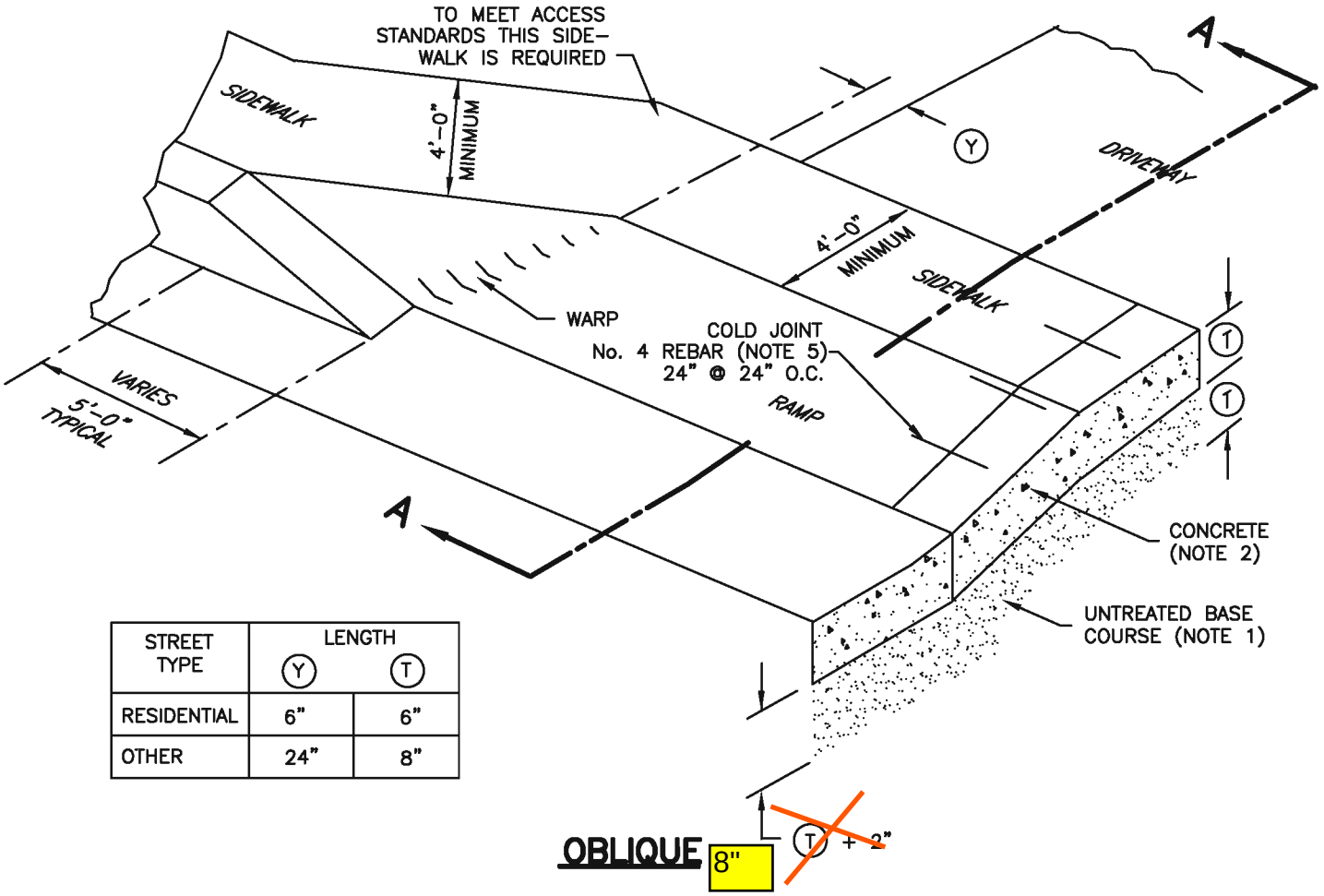
4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements . Not required if driveway ramp is constructed without a cold joint.

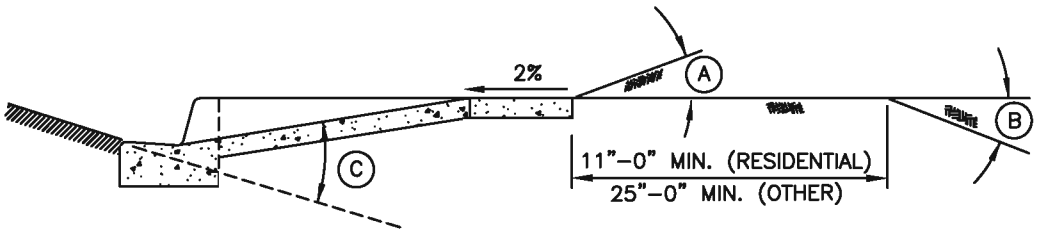
6. FIELD CHANGES TO SLOPE REQUIREMENTS: The following design parameters are to be used as a guide. Specific uses or site conditions may require profile design submittal for review and acceptance.
   A. As a rule, driveway grades may have a 6 percent change in slope over a 11 feet wheel base run for both crest or sag vertical curves.
   B. Where heavy truck use and fire truck access applies, or to improve design speed, design grades should be cut in half.

7. FINISH: Broomed.

8. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure period.

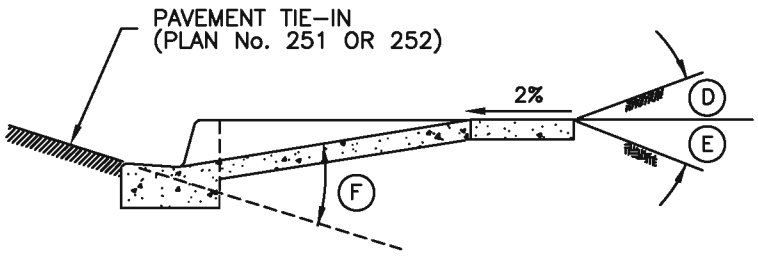


STREET TYPE	LENGTH Y	LENGTH T
RESIDENTIAL	6"	6"
OTHER	24"	8"



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) A	B	C
RESIDENTIAL	16%	12%	16%
OTHER	6%	8%	10%

SECTION A–A – APPROACH REQUIRING SERVICE TRUCK ACCESS



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) D	E	F
RESIDENTIAL	16%	12%	16%
OTHER	6%	8%	10%

SECTION A–A – TYPICAL DRIVEWAY APPROACH

Plan No.

221

Flare driveway approach - type B

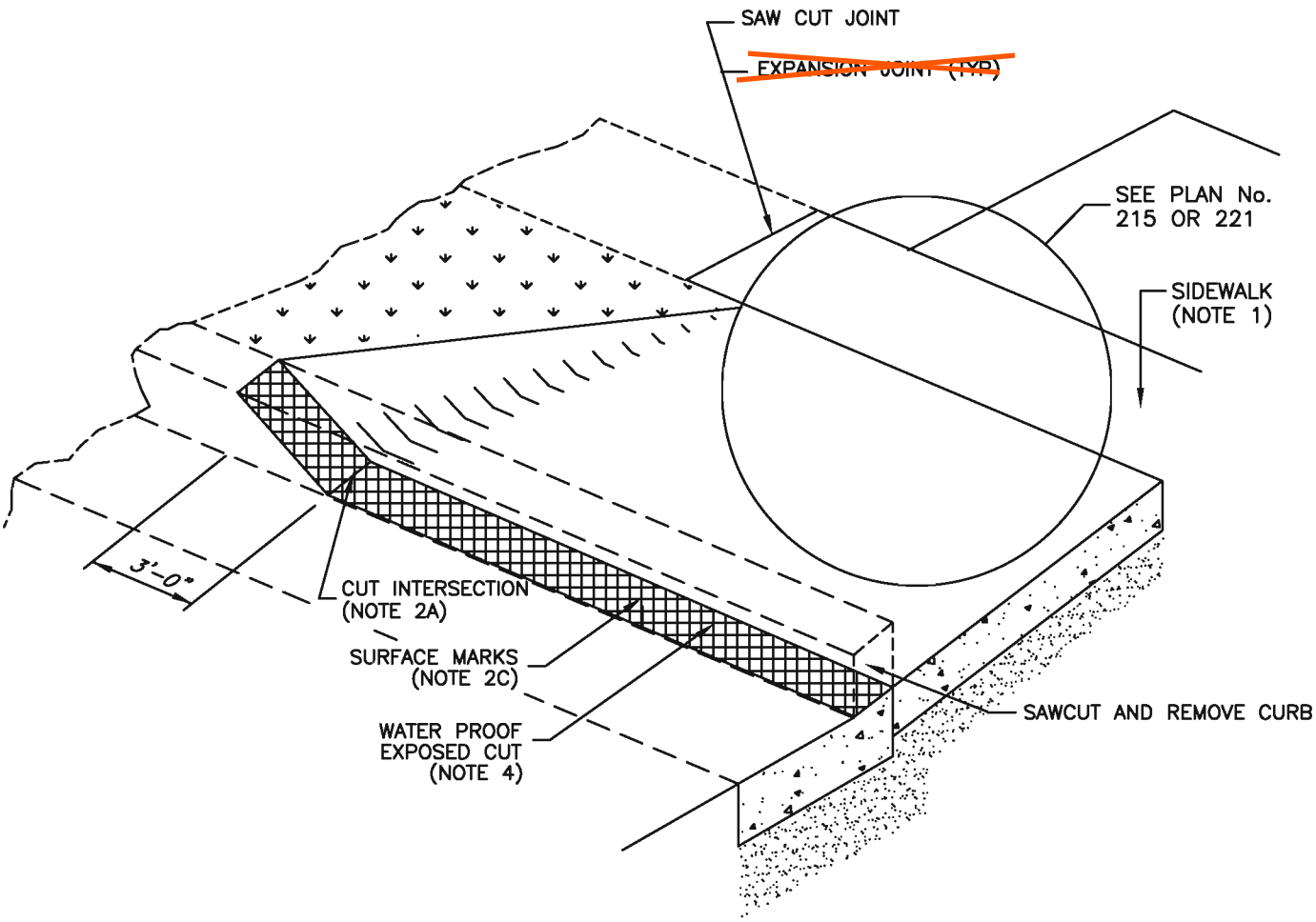
Saw-cut driveway approach

1. SIDEWALK:
   A. Remove and replace all deteriorated, weak, or unsound concrete.
   B. Thickness of sidewalk at driveway ramp to match thickness of driveway ramp.
   C. Match elevation of driveway walk to the nearest joint beyond the width of the driveway.

2. CURB CUTTING:
   A. No over-cutting where cuts merge.
   B. Bevel front edge at flow-line or have saw-cut match flow-line.
   C. Grind sawed surface so that no blade marks appear.

3. ~~EXPANSION JOINT: Make expansion joints vertical.~~
   ~~A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.~~

4. WATER PROOFING: Follow APWA Section 07 19 00 requirements.



OBLIQUE

Plan No.

Saw-cut driveway approach

222

and 31 05 13_2.8_B_1 may be used

Open driveway approach

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel as a substitute for untreated base course without ENGINEER's permission.~~
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. ~~EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.~~

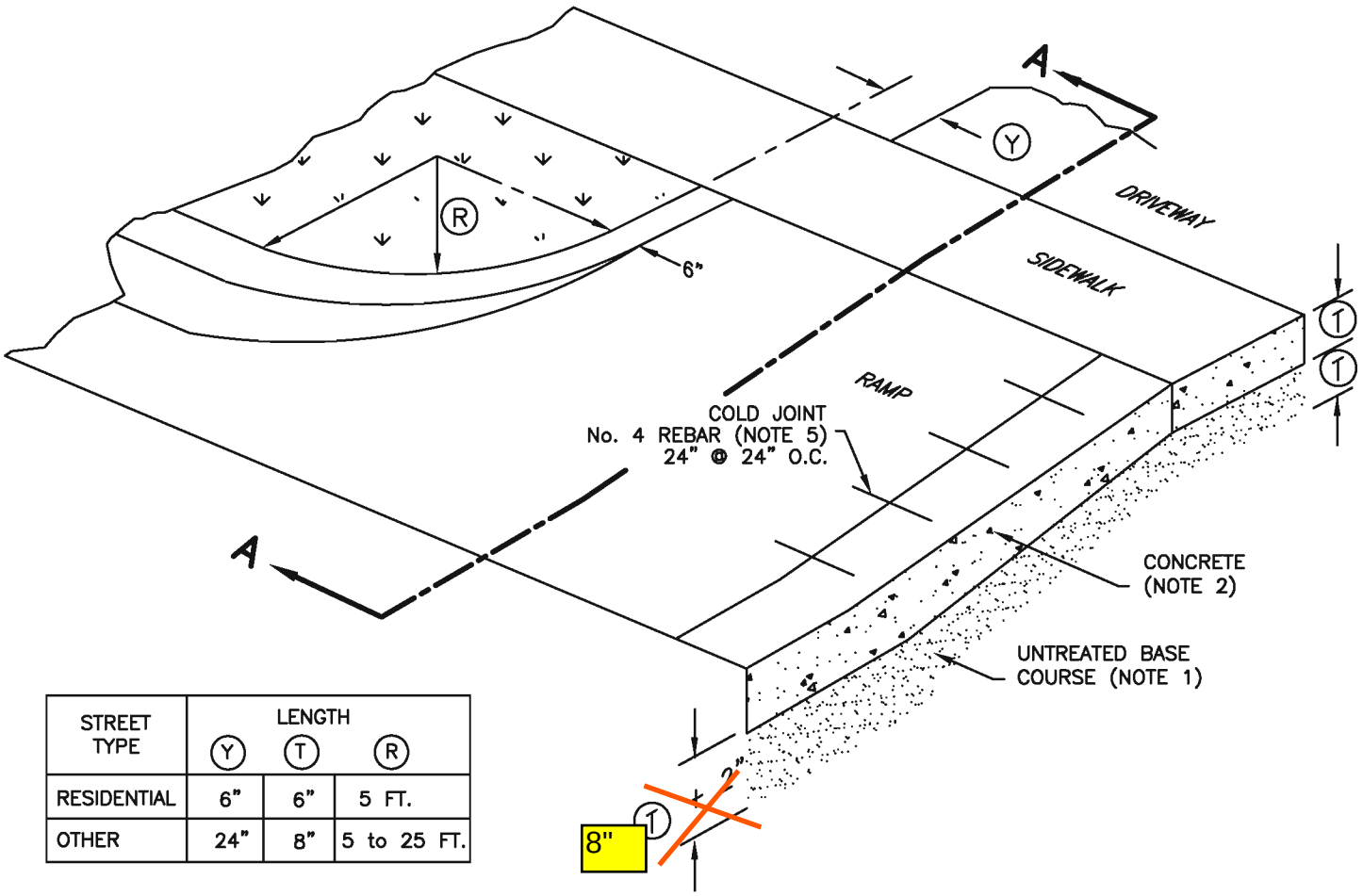
4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements . Not required if driveway ramp is constructed without a cold joint.

6. FIELD CHANGES TO SLOPE REQUIREMENTS: The following design parameters are to be used as a guide. Specific uses or site conditions may require profile design submittal for review and acceptance.
   A. As a rule, driveway grades may have a 6 percent change in slope over a 11 feet wheel base run for both crest or sag vertical curves.
   B. Where heavy truck use and fire truck access applies, or to improve design speed, design grades should be cut in half.

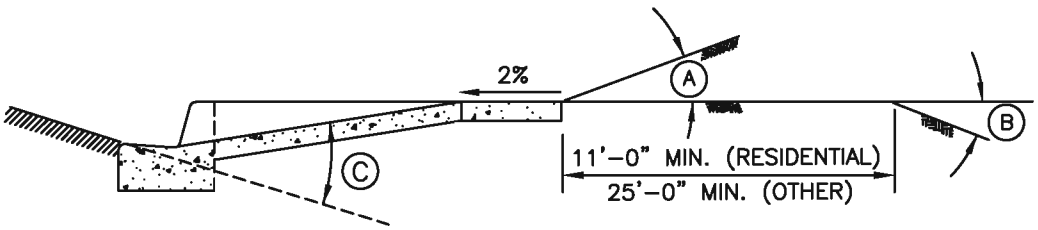
7. FINISH: Broomed.

8. PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure period.



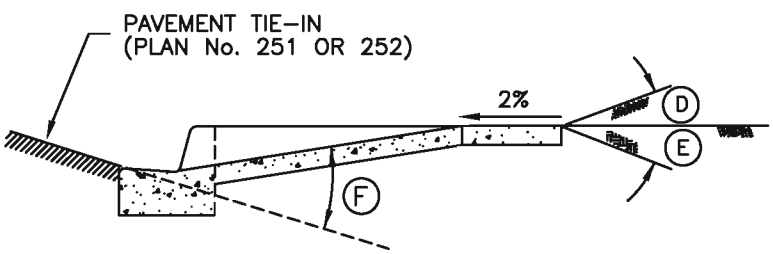
STREET TYPE	LENGTH Y	T	R
RESIDENTIAL	6"	6"	5 FT.
OTHER	24"	8"	5 to 25 FT.

OBLIQUE



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) A	B	C
RESIDENTIAL	16%	12%	16%
OTHER	6%	8%	10%

SECTION A–A – APPROACH REQUIRING SERVICE TRUCK ACCESS



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) D	E	F
RESIDENTIAL	16%	12%	16%
OTHER	6%	8%	10%

SECTION A–A – TYPICAL DRIVEWAY APPROACH

Plan No.
225

Open driveway approach

and 31 05 13_2.8_B_1 may be used

Piped driveway approach

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. ~~Do not use gravel as a substitute for untreated base course without ENGINEER's~~ permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3 ~~EXPANSION JOINT: Make expansion joints vertical, full depth 1/2 inch wide with type F1 joint~~ filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 2 inches deep or 1/4 slab thickness if slab is greater than 8 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is .2.5 times the slab thickness (in inches) to a maximum of 15 feet.

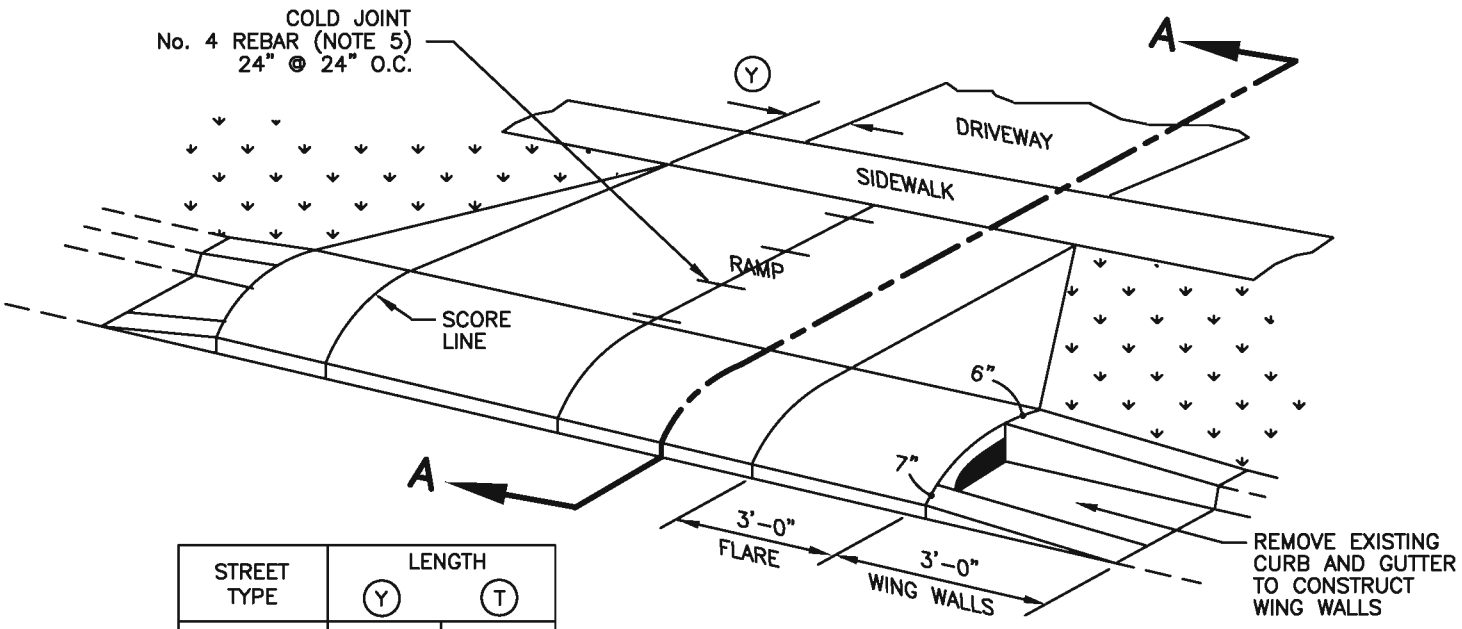
5. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements . Not required if driveway ramp is constructed without a cold joint.

6. FIELD CHANGES TO SLOPE REQUIREMENTS: The following design parameters are to be used as a guide. Specific uses or site conditions may require profile design submittal for review and acceptance.
   A. As a rule, driveway grades may have a 6 percent change in slope over a 11 feet wheel base run for both crest or sag vertical curves.
   B. Where heavy truck use and fire truck access applies, or to improve design speed, design grades should be cut in half.
   C. Grades subject to roadway crown and gutter span to be reviewed by ENGINEER for high centering and vehicle approach speed.

7. FINISH: Broomed.

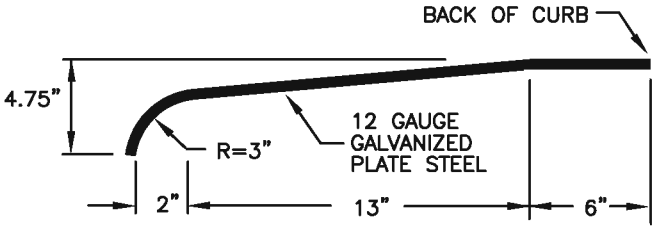
8 PROTECTION AND REPAIR:
   A. Fill flow-line with water. Repair construction that doesn't drain.
   B. Protect concrete from deicing chemicals during cure period.

DO NOT CONSTRUCT THIS APPROACH WITHOUT ENGINEER'S WRITTEN APPROVAL

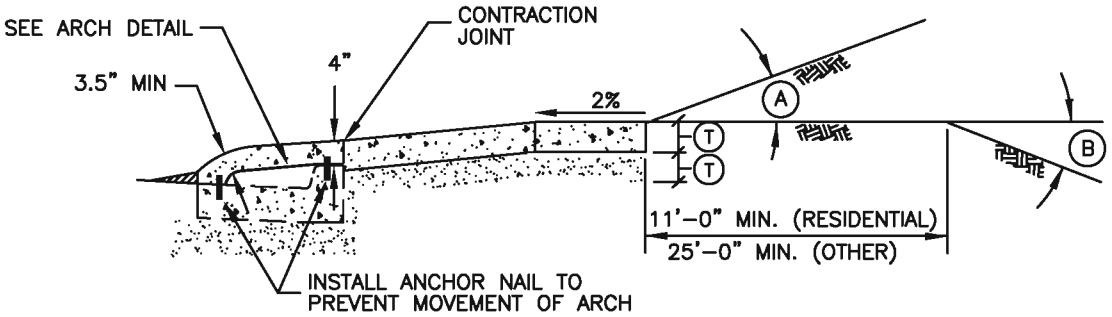


STREET TYPE	LENGTH Y	LENGTH T
RESIDENTIAL	6"	6"
OTHER	24"	8"

OBLIQUE

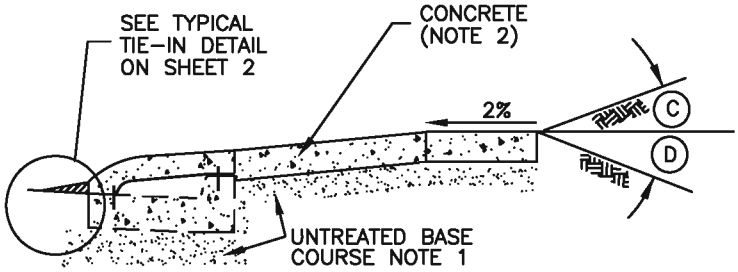


ARCH DETAIL



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) A	B
RESIDENTIAL	16%	12%
OTHER	6%	8%

SECTION A–A – APPROACH REQUIRING SERVICE TRUCK ACCESS



STREET TYPE	BREAKOVER ANGLE (MAXIMUM) C	D
RESIDENTIAL	16%	12%
OTHER	6%	8%

SECTION A–A – TYPICAL DRIVEWAY APPROACH

Piped driveway approach

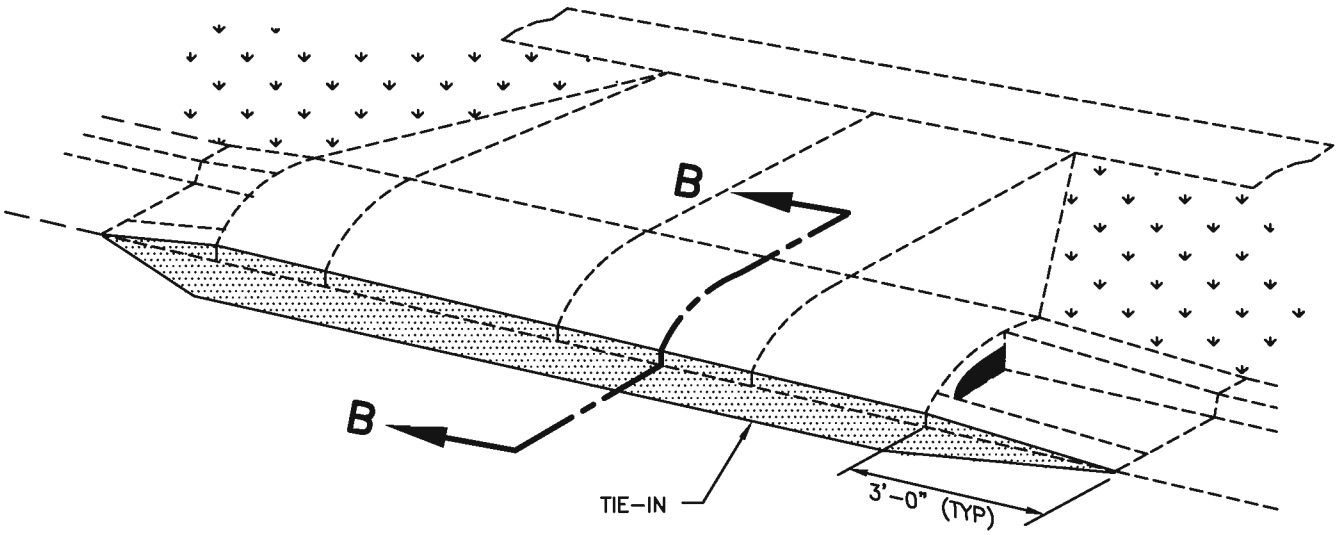
Plan No. **229**

Piped driveway approach

1. ASPHALT CONCRETE: As specified in APWA Section 32 12 05. Compaction to be within range of 92 to 96 percent relative to ASTM D 2041 (Rice Method).

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Use caution; however, as concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel. See APWA Section 03 20 00 requirements.



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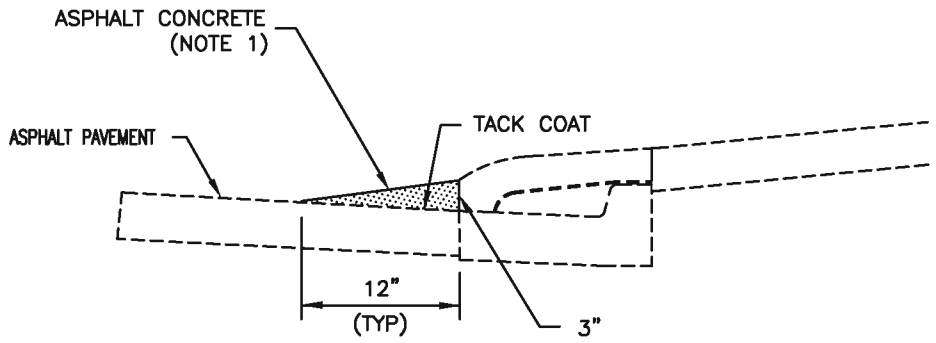
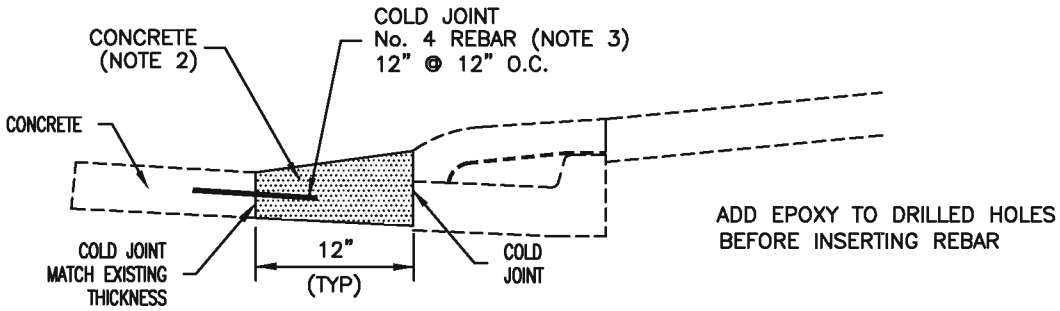


SECTION B–B – ASPHALT TIE–IN



SECTION B–B – CONCRETE TIE–IN

Plan No.

Piped driveway approach

229

and 31 05 13_2.8_B_1 may be used

Concrete sidewalk

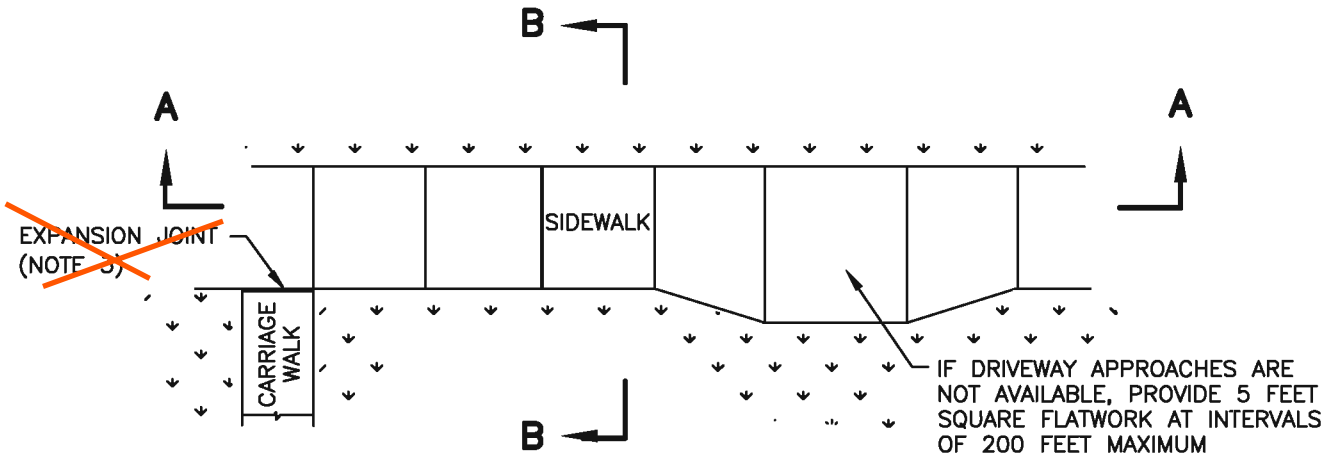
1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution; concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

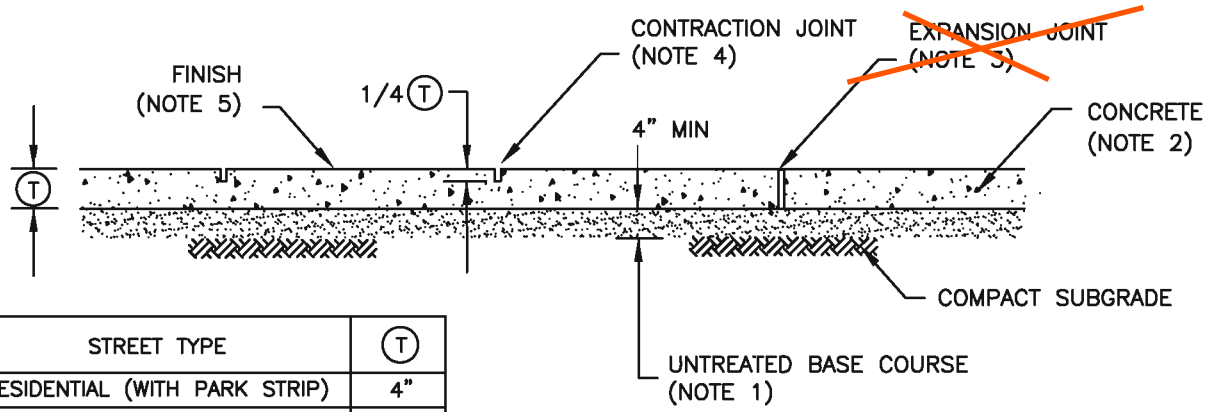
3. EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73.
   A. Set top of filler flush with surface of concrete.
   B. Expansion joints are not required in slip formwork except at the start or end of the installation activity.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.

5. FINISH: Broomed.



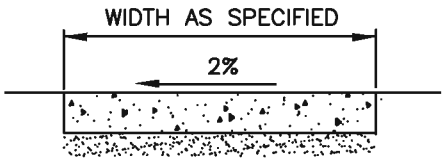
PLAN



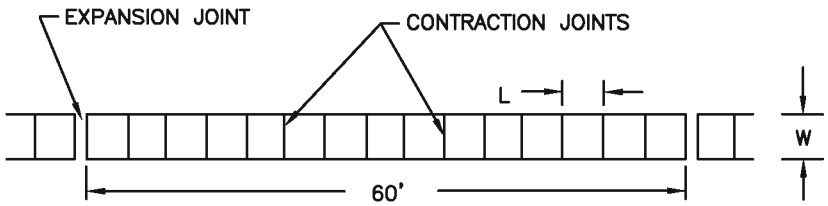
STREET TYPE	T
RESIDENTIAL (WITH PARK STRIP)	4"
RESIDENTIAL (NO PARK STRIP)	4"
OTHER	4"
REPLACEMENTS	MATCH EXISTING, 4" MIN.

SEE DRIVEWAY APPROACH PLANS FOR SIDEWALK THICKNESS AT DRIVEWAYS

SECTION A–A



SECTION B–B



$L_{MIN} = W$

L_{MAX} (in feet) = 2.5 x T (in inches)
OR
= 15 FEET MAX.

SIDEWALK JOINT DETAIL

Patterned concrete park strip

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

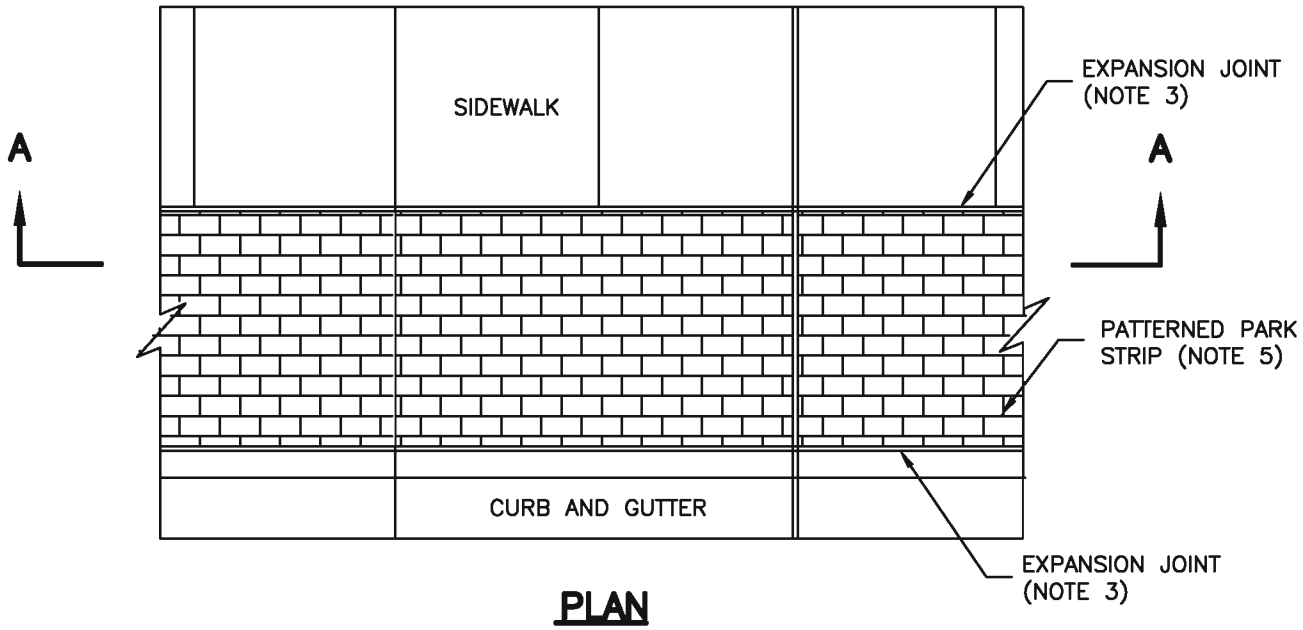
2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution; concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical, full depth, 1/2 inch wide with type F1 joint filler material per APWA Section 32 13 73.
   A. Set top of filler flush with surface of concrete.
   B. Place joints to match expansion joint locations in sidewalk.

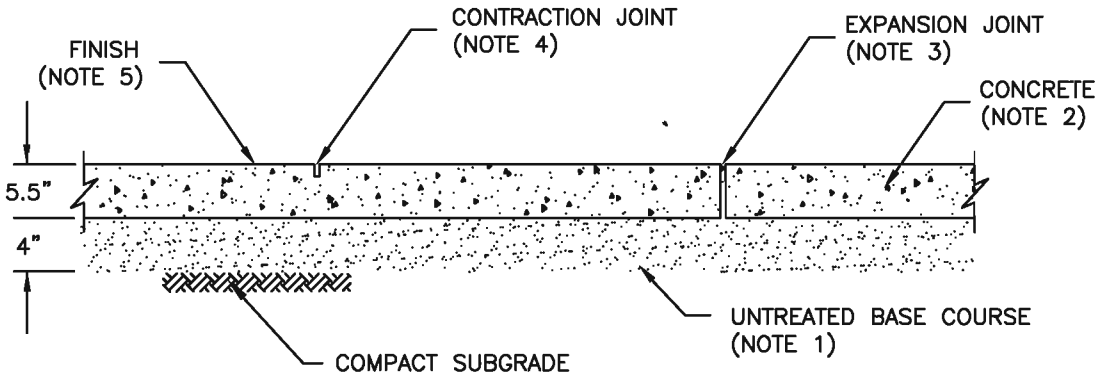
4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. For non-square panels, maximum length to width ratio is 1.5 to 1.

5. PATTERN: Place pattern uniformly over surface to a depth of 1/2 inch.

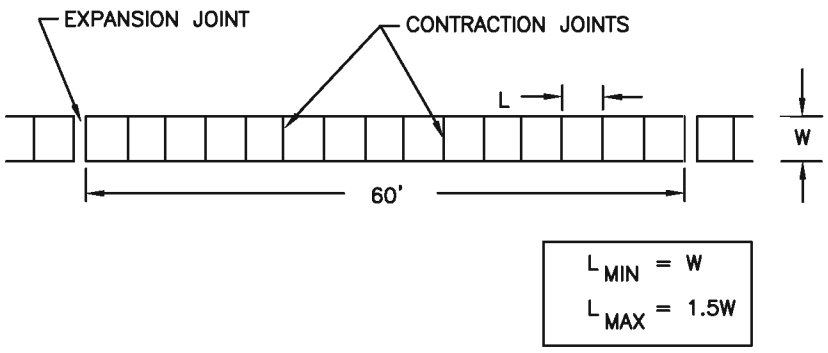
6. COLOR: As specified or as selected by ENGINEER.



PLAN



SECTION A–A



PARK STRIP JOINT DETAIL

Plan No.
232

Patterned concrete park strip

Corner curb cut assembly

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution, concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical.
   A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. FLARE: If a flare is in a pedestrian circulation area, the slope of the flare shall be 1:10 (10%) maximum measured perpendicular to the pedestrian access route.

6. DETECTABLE WARNING SURFACE: A detectable warning surface is required in a ramp, transition, or landing that provides a flush connection to the street. Perpendicular and non-perpendicular connections are shown in APWA Plan No. 238.

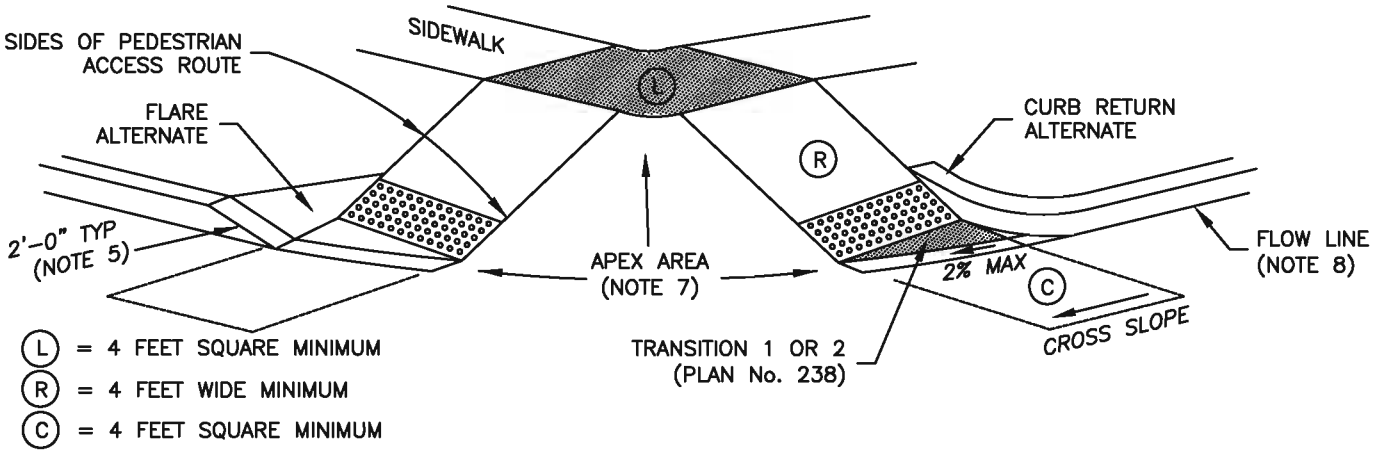
7. APEX AREA: The apex area may have curb and gutter, curb walls, flares, ramps, landings, detectable warning surface and landscaping. Flow-line grade may exceed 2 percent to match street grade.

8. PROTECTION AND REPAIR:
   A. Protect concrete from deicing chemicals during cure.
   B. Fill flow line with water. Repair construction that doesn't drain.

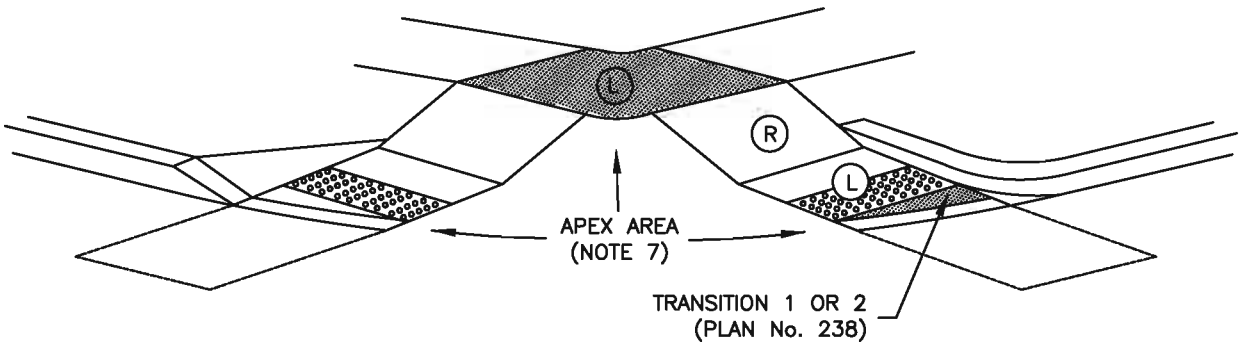
LANDING AT SIDEWALK LEVEL

NARRATIVE:

- SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP, LANDING, AND TRANSITION MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE.
- IF THE SIDES OF A PEDESTRIAN ACCESS ROUTE OR THE EXTENSION OF A LATERAL LINE OF THE SIDEWALK INTERSECTS A FLOW–LINE RADIUS, THEN A CORNER CURB CUT ASSEMBLY MUST BE CONSTRUCTED.
- GRADE BREAKS AT ENDS OF RAMPS MUST BE PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
- USE OF FLARES, CURB RETURNS, CURB WALLS, ETC., ARE AT ENGINEER'S DISCRETION.
- LENGTH OF ANY RAMP NOT REQUIRED TO EXCEED 15 FEET.



EXAMPLE A



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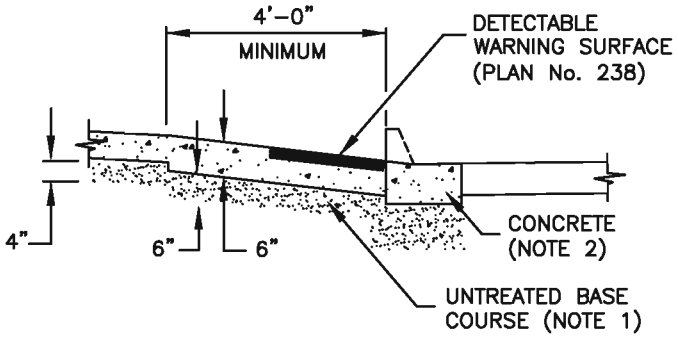


MATERIALS

		RUNNING SLOPE	CROSS SLOPE
LANDING	(L)	1:48 (2%)	1:48 (2%)
RAMP	(R)	1:12 (8.33%)	1:48 (2%)
CLEAR SPACE	(C)	1:20 (5%)	1:48 (2%)

CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL

MAXIMUM SLOPES

Corner curb cut assembly

Plan No. **235**

Corner *curb cut assembly*

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution, concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical.
   A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. FLARE: If a flare is in a pedestrian circulation area, the slope of the flare shall be 1:10 (10%) maximum measured perpendicular to the pedestrian access route.

6. DETECTABLE WARNING SURFACE: A detectable warning surface is required in a ramp, transition, or landing that provides a flush connection to the street. Perpendicular and non-perpendicular connections are shown in APWA Plan No. 238.

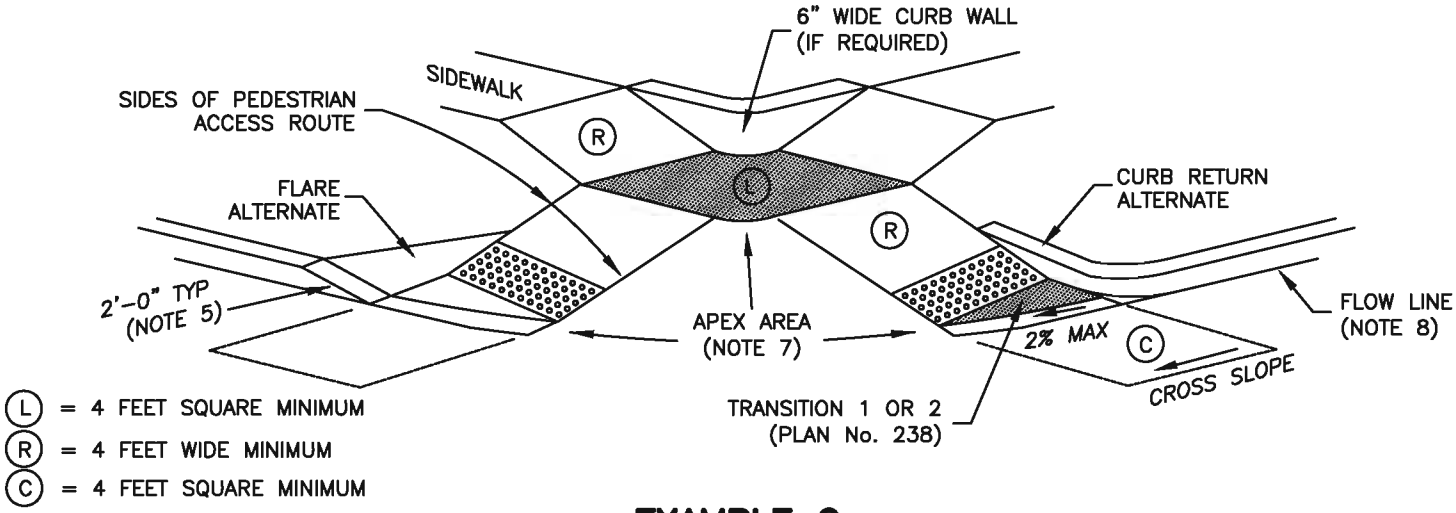
7. APEX AREA: The apex area may have curb and gutter, curb walls, flares, ramps, landings, detectable warning surface and landscaping. Flow-line grade may exceed 2 percent to match street grade.

8. PROTECTION AND REPAIR:
   A. Protect concrete from deicing chemicals during cure.
   B. Fill flow line with water. Repair construction that doesn't drain.

LANDING BETWEEN SIDEWALK AND STREET LEVELS

NARRATIVE:

- SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP, LANDING, AND TRANSITION MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE.
- IF THE SIDES OF A PEDESTRIAN ACCESS ROUTE OR THE EXTENSION OF A LATERAL LINE OF THE SIDEWALK INTERSECTS A FLOW–LINE RADIUS, THEN A CORNER CURB CUT ASSEMBLY MUST BE CONSTRUCTED.
- GRADE BREAKS AT ENDS OF RAMPS MUST BE PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL
- USE OF FLARES, CURB RETURNS, CURB WALLS, ETC., ARE AT ENGINEER'S DISCRETION.
- LENGTH OF ANY RAMP NOT REQUIRED TO EXCEED 15 FEET.



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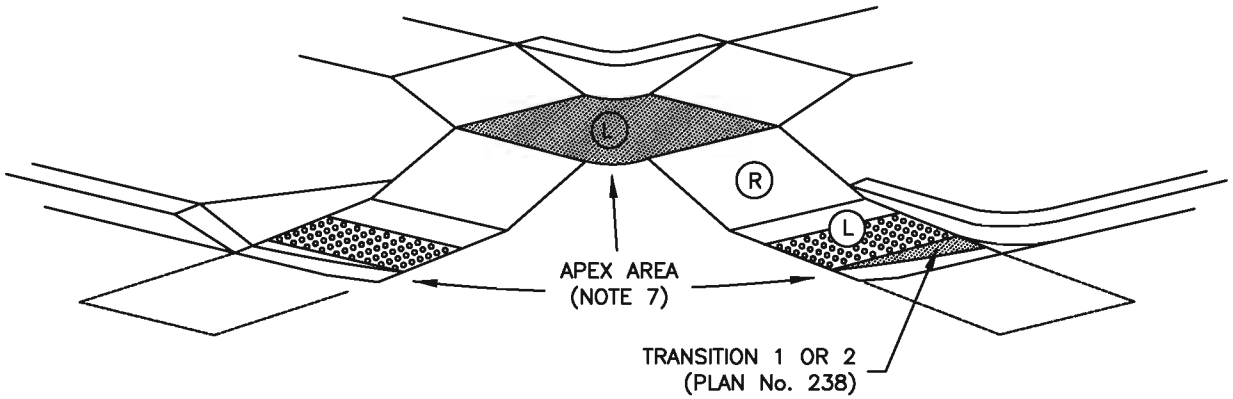

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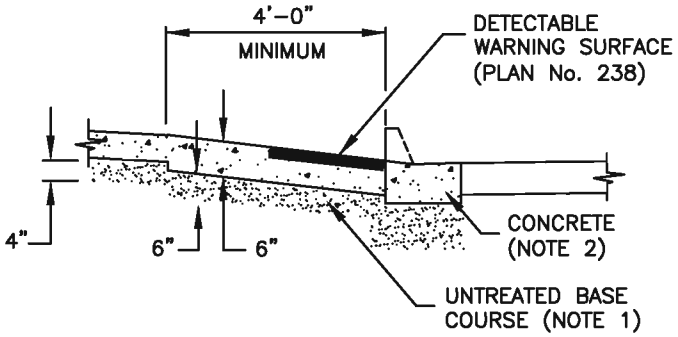


MATERIALS

		RUNNING SLOPE	CROSS SLOPE
LANDING	(L)	1:48 (2%)	1:48 (2%)
RAMP	(R)	1:12 (8.33%)	1:48 (2%)
CLEAR SPACE	(C)	1:20 (5%)	1:48 (2%)

CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL

MAXIMUM SLOPES

Corner curb cut assembly

Plan No. **235**

Corner curb cut assembly

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution, concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical.
   A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. FLARE: If a flare is in a pedestrian circulation area, the slope of the flare shall be 1:10 (10%) maximum measured perpendicular to the pedestrian access route.

6. DETECTABLE WARNING SURFACE: A detectable warning surface is required in a ramp, transition, or landing that provides a flush connection to the street. Perpendicular and non-perpendicular connections are shown in APWA Plan No. 238.

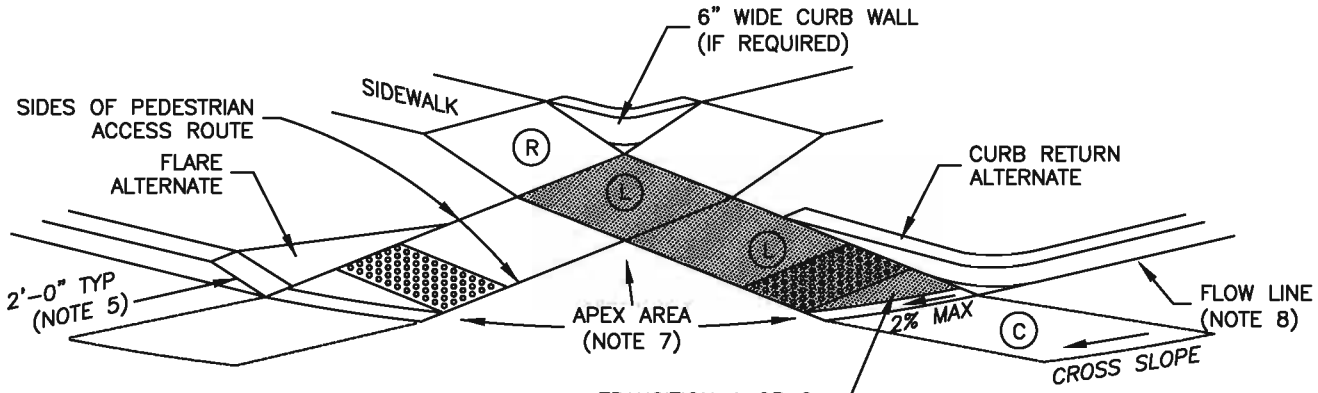
7. APEX AREA: The apex area may have curb and gutter, curb walls, flares, ramps, landings, detectable warning surface and landscaping. Flow-line grade may exceed 2 percent to match street grade.

8. PROTECTION AND REPAIR:
   A. Protect concrete from deicing chemicals during cure.
   B. Fill flow line with water. Repair construction that doesn't drain.

LANDING AT STREET LEVEL

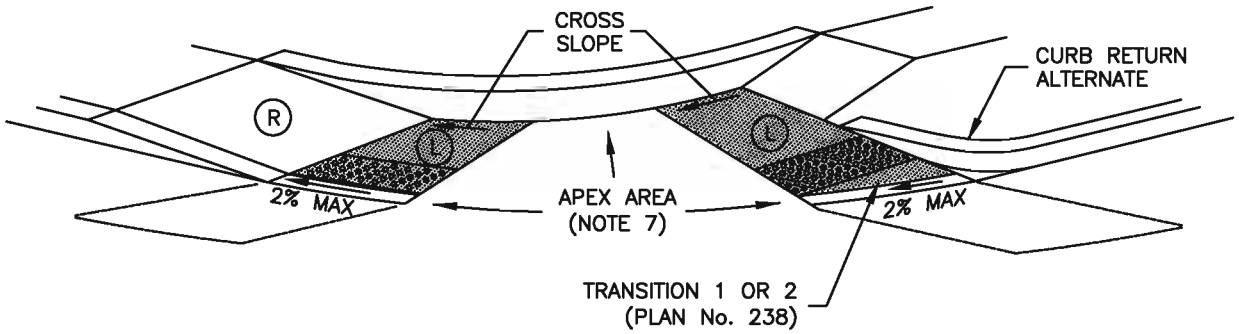
NARRATIVE:

- SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP, LANDING, AND TRANSITION MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE.
- IF THE SIDES OF A PEDESTRAIN ACCESS ROUTE OR THE EXTENSION OF A LATERAL LINE OF THE SIDEWALK INTERSECTS A FLOW-LINE RADIUS, THEN A CORNER CURB CUT ASSEMBLY MUST BE CONSTRUCTED.
- GRADE BREAKS AT ENDS OF RAMPS MUST BE PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
- USE OF FLARES, CURB RETURNS, CURB WALLS, ETC., ARE AT ENGINEER'S DISCRETION.
- LENGTH OF ANY RAMP NOT REQUIRED TO EXCEED 15 FEET.



EXAMPLE E

(WITH NO PARK STRIP) (WITH PARK STRIP)



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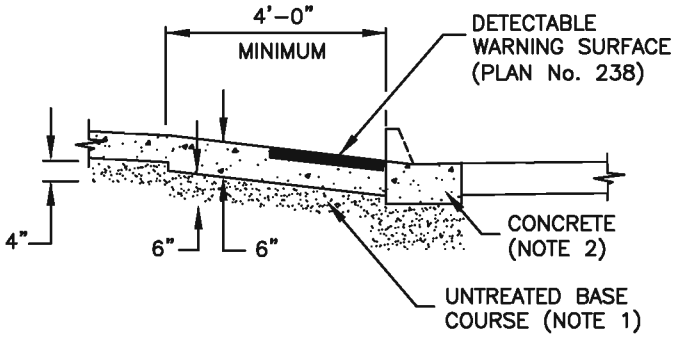


MATERIALS

		RUNNING SLOPE	CROSS SLOPE
LANDING	(L)	1:48 (2%)	1:48 (2%)
RAMP	(R)	1:12 (8.33%)	1:48 (2%)
CLEAR SPACE	(C)	1:20 (5%)	1:48 (2%)

CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL

MAXIMUM SLOPES

Corner curb cut assembly

Plan No. **235**

Tangent curb cut assembly

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution, concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical.
   A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. FLARE: If a flare is in a pedestrian circulation area, the slope of the flare shall be 1:10 (10%) maximum measured perpendicular to the pedestrian access route.

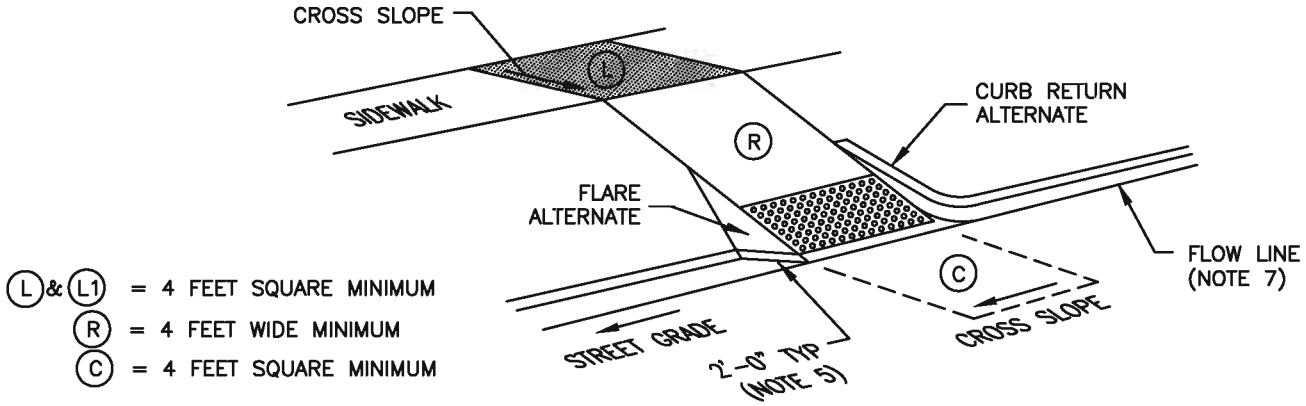
6. DETECTABLE WARNING SURFACE: A detectable warning surface is required in a ramp, transition, or landing that provides a flush connection to the street. Perpendicular and non-perpendicular connections are shown in APWA Plan No. 238.

7. PROTECTION AND REPAIR:
   A. Protect concrete from deicing chemicals during cure.
   B. Fill flow line with water. Repair construction that doesn't drain.

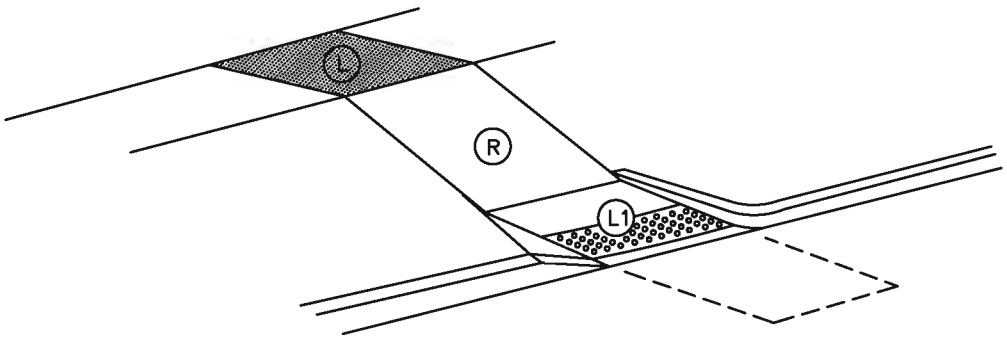
LANDING AT SIDEWALK LEVEL

NARRATIVE:

- SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP AND LANDING MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE.
- GRADE BREAKS AT ENDS OF RAMPS MUST BE PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
- USE OF FLARES, CURB WALLS, ETC., ARE AT ENGINEER'S DISCRETION.
- LENGTH OF ANY RAMP NOT REQUIRED TO EXCEED 15 FEET.



EXAMPLE 1



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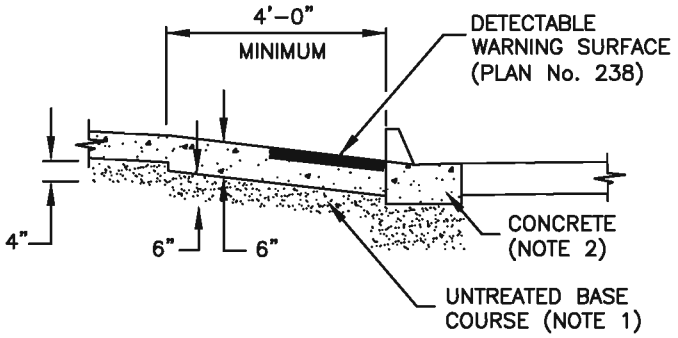


MATERIALS

		RUNNING SLOPE	CROSS SLOPE
LANDING	L	STREET GRADE	1:48 (2%)
	L1	1:48 (2%)	STREET GRADE
RAMP	R	1:12 (8.33%)	STREET GRADE
CLEAR SPACE	C	1:20 (5%)	STREET GRADE

CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL

MAXIMUM SLOPES

Tangent curb cut assembly

Plan No. **236**

Tangent curb cut assembly

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution, concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical.
   A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

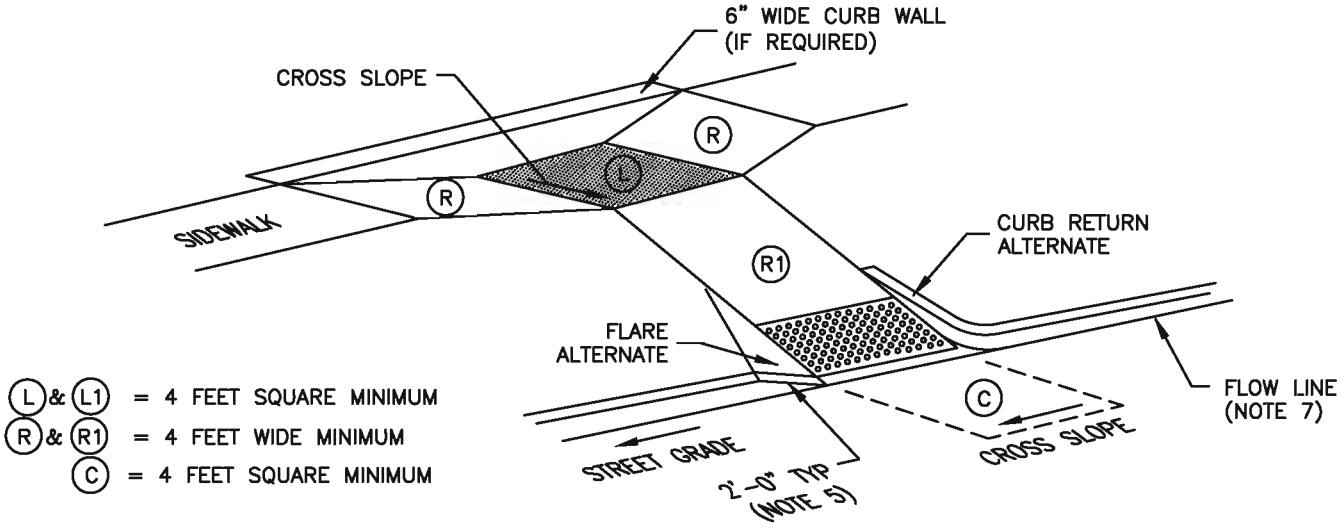
5. FLARE: If a flare is in a pedestrian circulation area, the slope of the flare shall be 1:10 (10%) maximum measured perpendicular to the pedestrian access route.

6. DETECTABLE WARNING SURFACE: A detectable warning surface is required in a ramp, transition, or landing that provides a flush connection to the street. Perpendicular and non-perpendicular connections are shown in APWA Plan No. 238.

7. PROTECTION AND REPAIR:
   A. Protect concrete from deicing chemicals during cure.
   B. Fill flow line with water. Repair construction that doesn't drain.

LANDING BETWEEN SIDEWALK AND STREET LEVELS

NARRATIVE:
- SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP AND LANDING MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE.
- GRADE BREAKS AT ENDS OF RAMPS MUST BE PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
- USE OF FLARES, CURB WALLS, ETC., ARE AT ENGINEER'S DISCRETION.
- LENGTH OF ANY RAMP NOT REQUIRED TO EXCEED 15 FEET.



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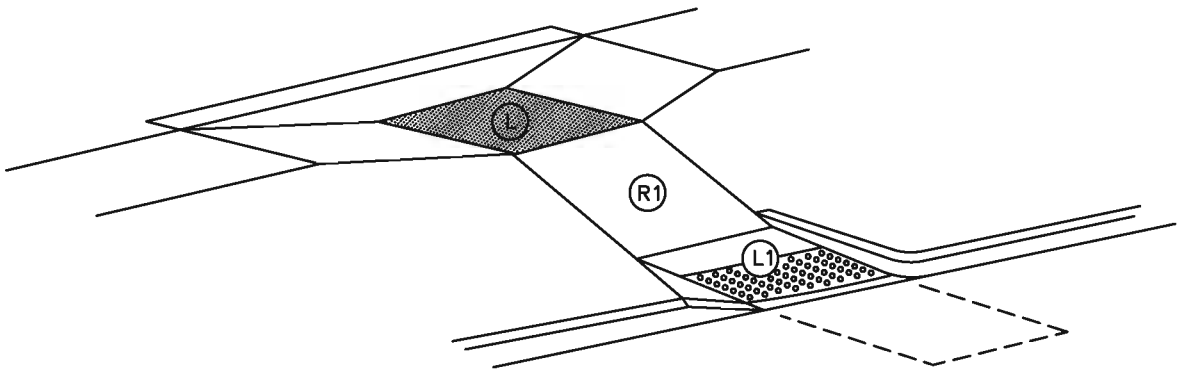

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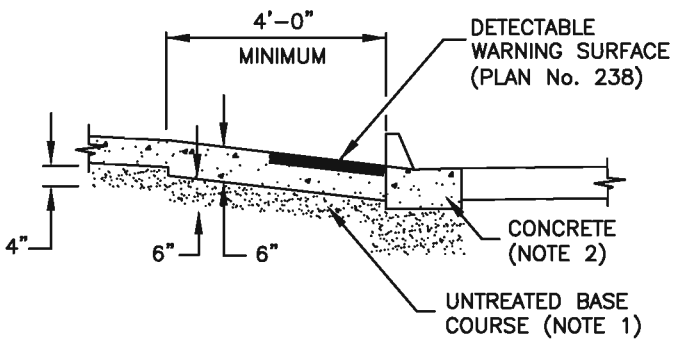


MATERIALS

		RUNNING SLOPE	CROSS SLOPE
LANDING	L	STREET GRADE	1:48 (2%)
	L1	1:48 (2%)	STREET GRADE
RAMP	R	1:12 (8.33%)	1:48 (2%)
	R1	1:12 (8.33%)	STREET GRADE
CLEAR SPACE	C	1:20 (5%)	STREET GRADE

CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL.

MAXIMUM SLOPES

Tangent curb cut assembly

Plan No.
236

Tangent curb cut assembly

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If necessary, provide concrete that achieves design strength in less than 7 days. Caution, concrete crazing (spider cracks) may develop if air temperature exceeds 90 degrees F.
   B. Place concrete per APWA Section 03 30 10.
   C. Provide 1/2 inch radius on concrete edges exposed to public view.
   D. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

3. EXPANSION JOINT: Make expansion joints vertical.
   A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. FLARE: If a flare is in a pedestrian circulation area, the slope of the flare shall be 1:10 (10%) maximum measured perpendicular to the pedestrian access route.

6. DETECTABLE WARNING SURFACE: A detectable warning surface is required in a ramp, transition, or landing that provides a flush connection to the street. Perpendicular and non-perpendicular connections are shown in APWA Plan No. 238.

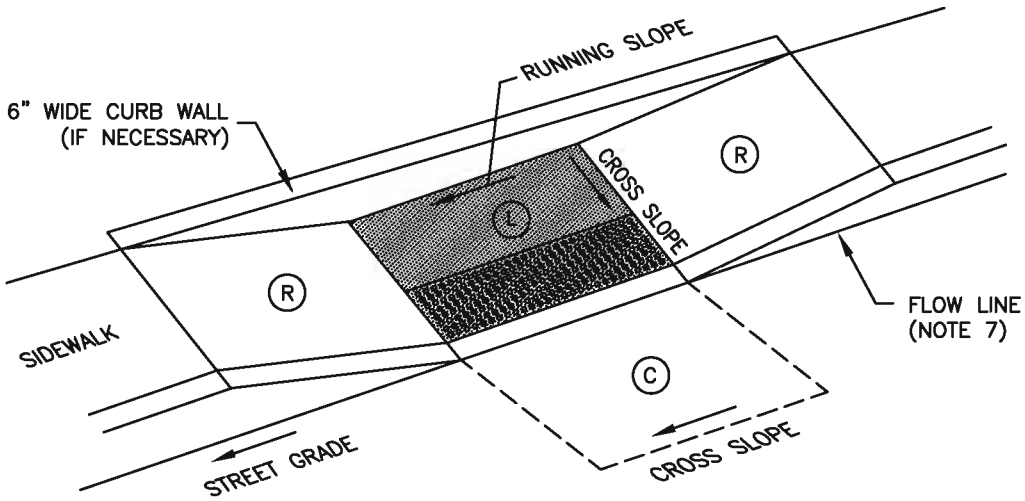
7. PROTECTION AND REPAIR:
   A. Protect concrete from deicing chemicals during cure.
   B. Fill flow line with water. Repair construction that doesn't drain.

LANDING AT STREET LEVEL

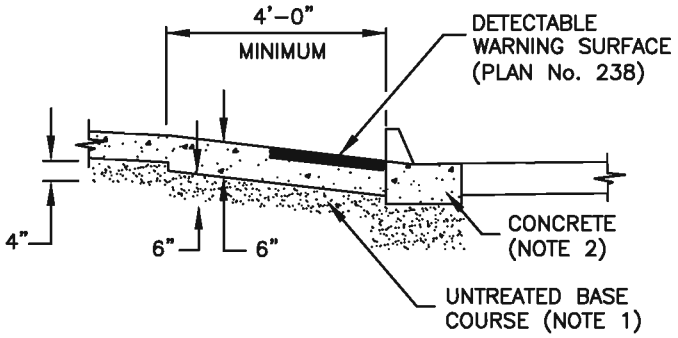
NARRATIVE:

- SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP AND LANDING MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE.
- GRADE BREAKS MUST BE PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
- USE OF FLARES, CURB WALLS, ETC., ARE AT ENGINEER'S DISCRETION.
- LENGTH OF ANY RAMP NOT REQUIRED TO EXCEED 15 FEET.

(L) = 4 FEET SQUARE MINIMUM
(R) = 4 FEET WIDE MINIMUM
(C) = 4 FEET SQUARE MINIMUM



EXAMPLE 5



MATERIALS

		RUNNING SLOPE	CROSS SLOPE
LANDING	(L)	STREET GRADE	1:48 (2%)
RAMP	(R)	1:12 (8.33%)	1:48 (2%)
CLEAR SPACE	(C)	1:20 (5%)	STREET GRADE

CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL.

MAXIMUM SLOPES

Tangent curb cut assembly

Plan No.
236

Islands and median

1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.

2. CONCRETE: Class 4000 per APWA Section 03 30 04.

3. EXPANSION JOINT: Make expansion joints vertical.
   A. Full depth 1/2 inch thick type F1 joint filler material per APWA Section 32 13 73. Set top of filler flush with surface of concrete.

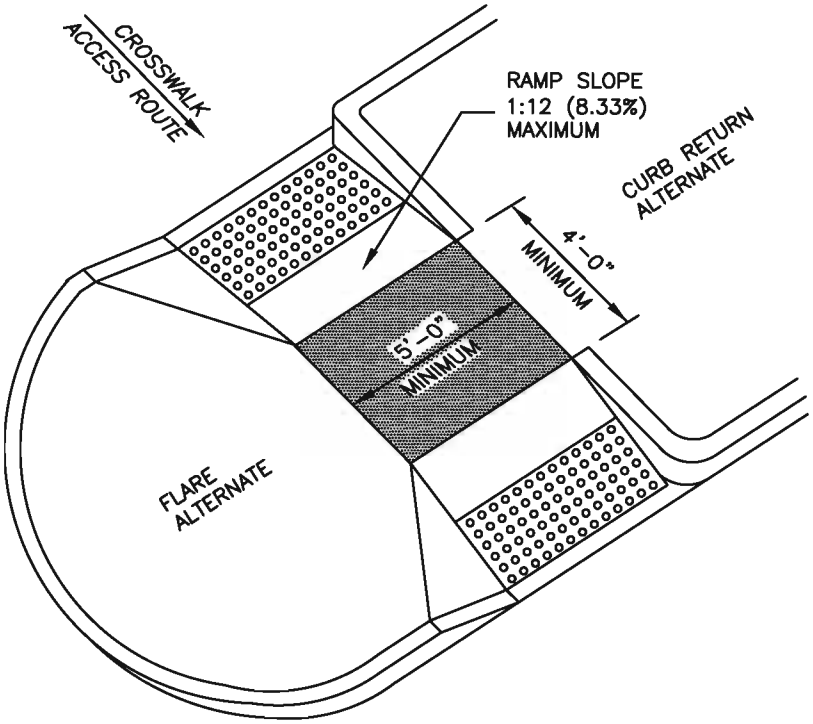
4. CONTRACTION JOINT: Make contraction joints vertical.
   A. 1/8 inch wide and 1 inch deep or 1/4 slab thickness if slab is greater than 4 inches thick.
   B. Maximum length to width ratio for non-square panels is 1.5 to 1.
   C. Maximum panel length (in feet) is 2.5 times the slab thickness (in inches) to a maximum of 15 feet.

5. FLARE: If a flare is in a pedestrian circulation area, the slope of the flare shall be 1:10 (10%) maximum measured perpendicular to the pedestrian access route.

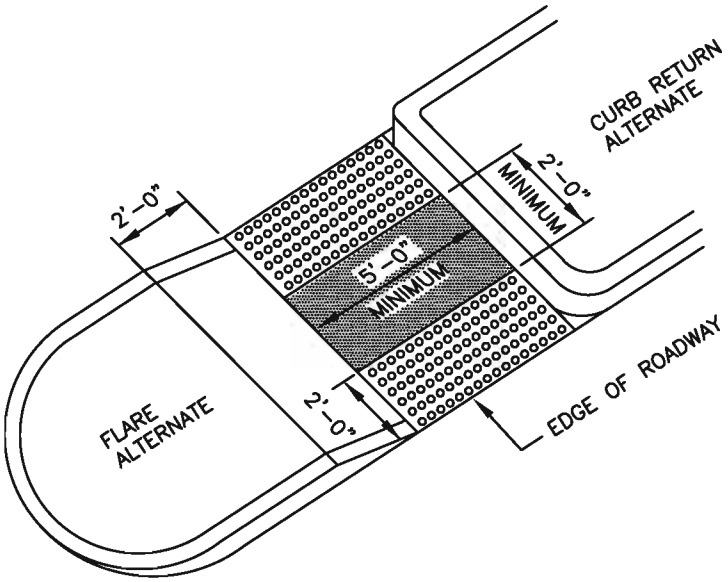
6. DETECTABLE WARNING SURFACE: Access through islands and medians can add difficulty to the crossing for some users. There are many factors to consider when placing the detectable warning surface. The edges of the warning surface can be useful as cues to the direction of a crossing. Perpendicular and non-perpendicular connections are shown in APWA Plan No. 238.

NARRATIVE:

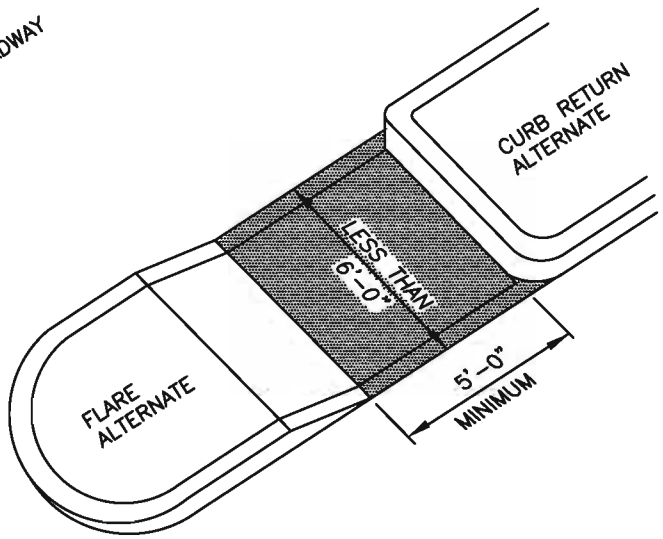
- WHEN DECIDING TO CUT–THROUGH A MEDIAN OR ISLAND, OR TO RAMP AN ISLAND, CONSIDER SLOPE AND CROSS SLOPE OF ROAD, DRAINAGE, AND WIDTH OF MEDIAN OR ISLAND.
- WHERE THERE IS NO ISLAND CURB, LOCATE THE DETECTABLE WARNING AT EDGE OF ROADWAY.



REFUGE ISLAND



CUT–THROUGH ISLAND



MEDIAN

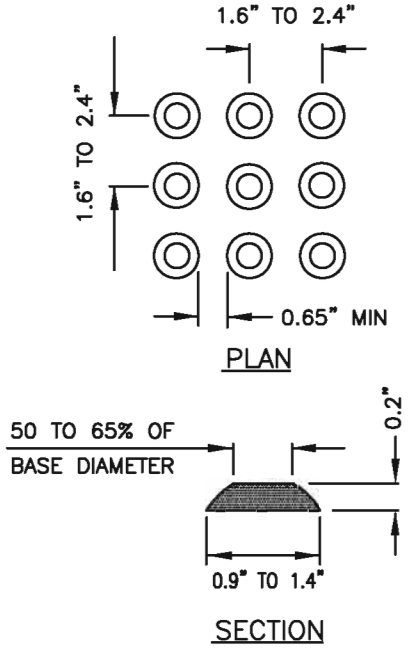
Detectable warning surface

1. DETECTABLE WARNING SURFACE:
   A. Dome Size:
      1. Base diameter – 0.9 inches minimum, 1.4 inches maximum.
      2. Top diameter – 50 percent of the base diameter minimum to 65 percent of the base diameter maximum.
      3. Height: - 0.2 inches.
   B. Dome Spacing:
      1. Center to center spacing – 1.6 inches minimum, 2.4 inches maximum.
      2. Base-to base spacing of 0.65 inches minimum measured between the most adjacent domes.
   C. Dome Row Alignment:
      1. Perpendicular Assembly: Perpendicular to the bottom grade break
      2. Non-perpendicular Assembly Transition 1: Perpendicular to grade break at the bottom of the ramp.
      3. Non-perpendicular Assembly Transition 2: Perpendicular or radial to the flow line.
   D. Contrast: Provide a surface that contrasts visually with adjacent walking surface either light-on-dark, or dark-on-light.
   E. Size:
      1. 2 feet minimum in the direction of pedestrian travel.
      2. Full width of area where a ramp, transition, or landing provides a flush connection to the street. Minimum width of flush connection is 4 feet.

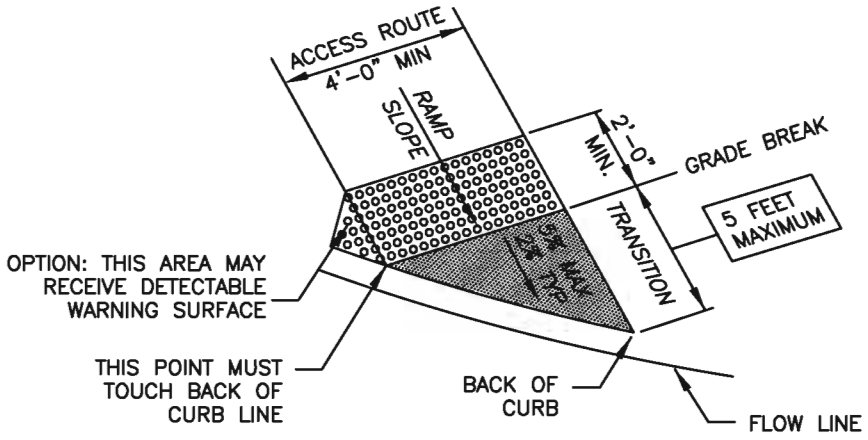
2. PAVER
   A. Material: ENGINEER's choice of
      1. Geotextile filter fabric, bedding and joint sand, and solid interlocking concrete paver units per APWA Section 32 14 13.
      2. Brick and mortar (not shown) per APWA Section 32 14 16.
   B. Layout: All cut pavers are half pavers or larger.

3. RIBBED PANEL
   A. Material: CONTRACTOR's choice with ENGINEER's acceptance.
   B. Layout: Trim panel, as required matching required geometries.
   C. Installation: Per manufacturer's recommendations.

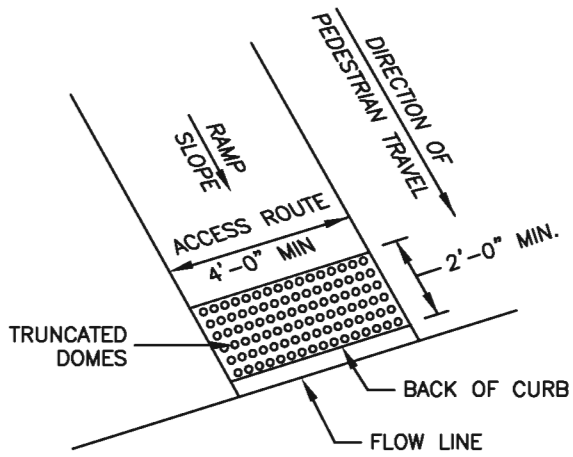
4. TILE
   A. Material: CONTRACTOR's choice with ENGINEER's acceptance.
   B. Layout: Trim panel, as required matching required geometries.
   C. Installation: Per manufacturer's recommendations.



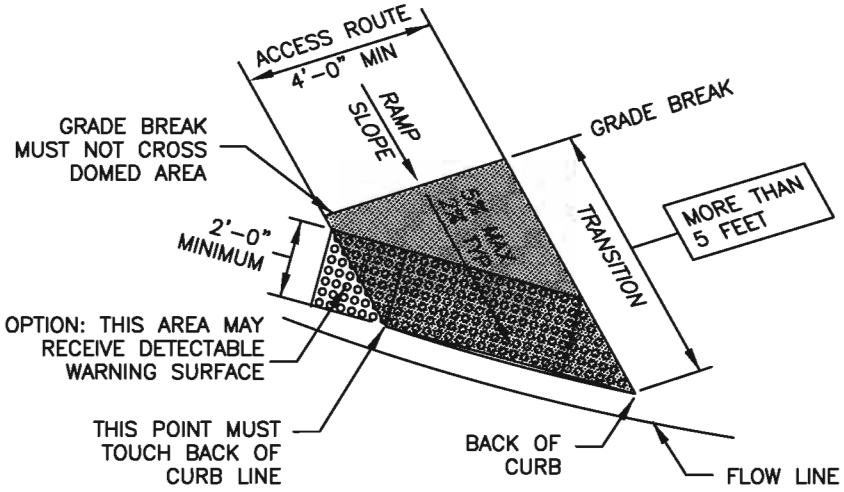
TRUNCATED DOME DETAIL



TRANSITION 1

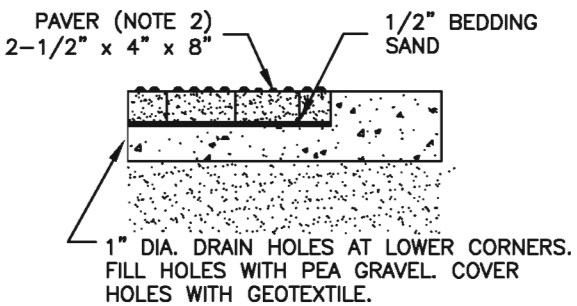


PERPENDICULAR ASSEMBLY

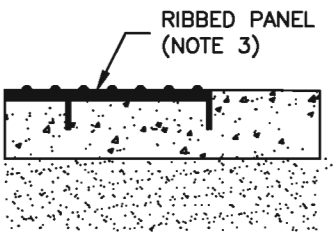


TRANSITION 2

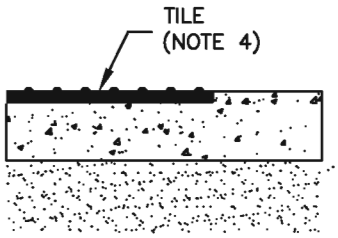
NON-PERPENDICULAR ASSEMBLY



DETAIL-P



DETAIL-R



DETAIL-T

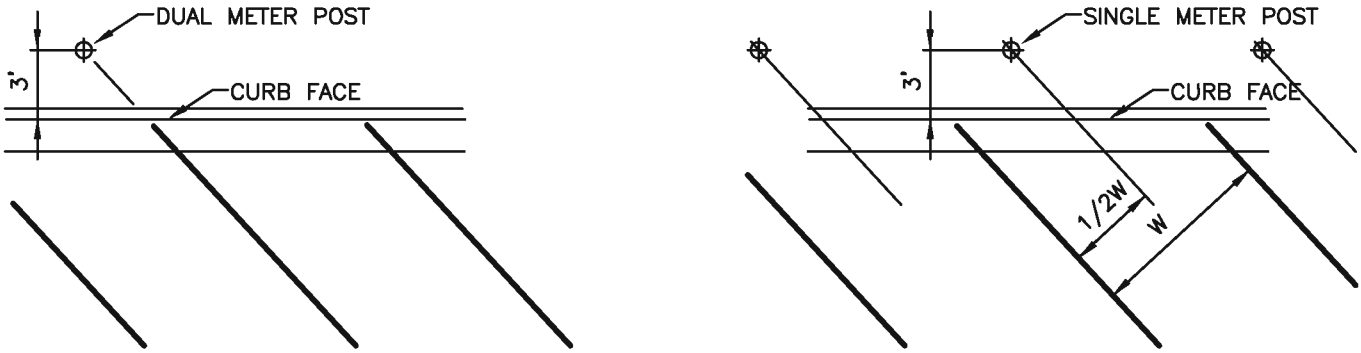
Detectable warning surface

Plan No.
238

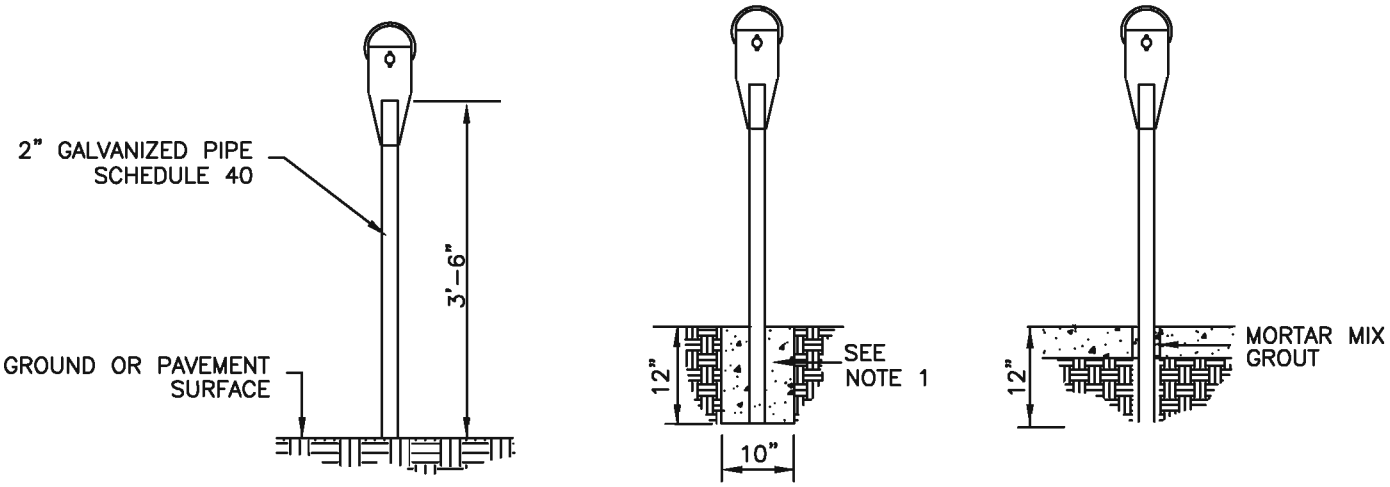
Parking meter post

1. CONCRETE: Class 2000 minimum per APWA Section 03 30 04.

PARALLEL PARKING



ANGLE PARKING



DETAILS

Parking meter post

Plan No.
241

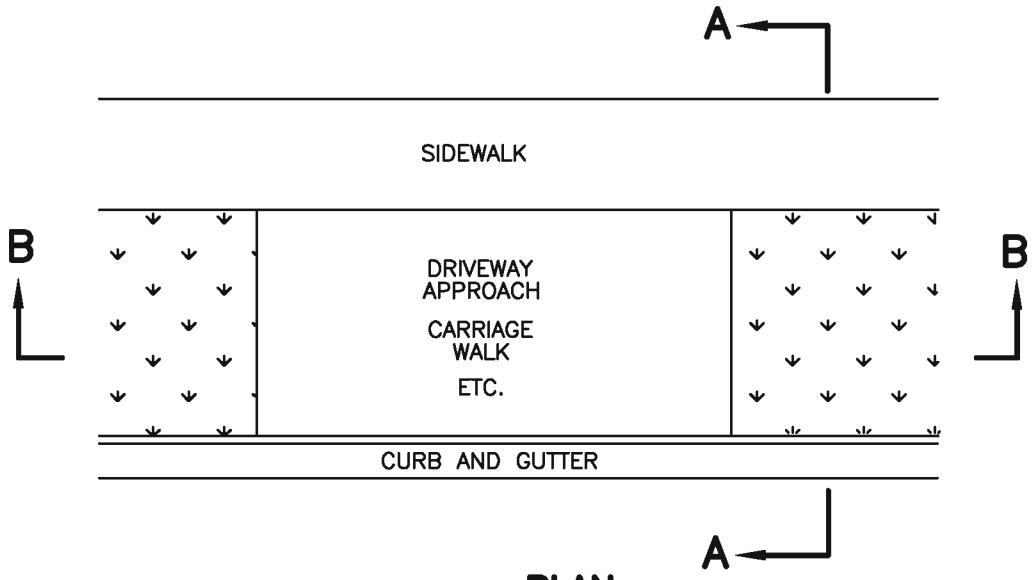
Form strip filler

1. BACKFILL: Use native materials. Compact to prevent settling.

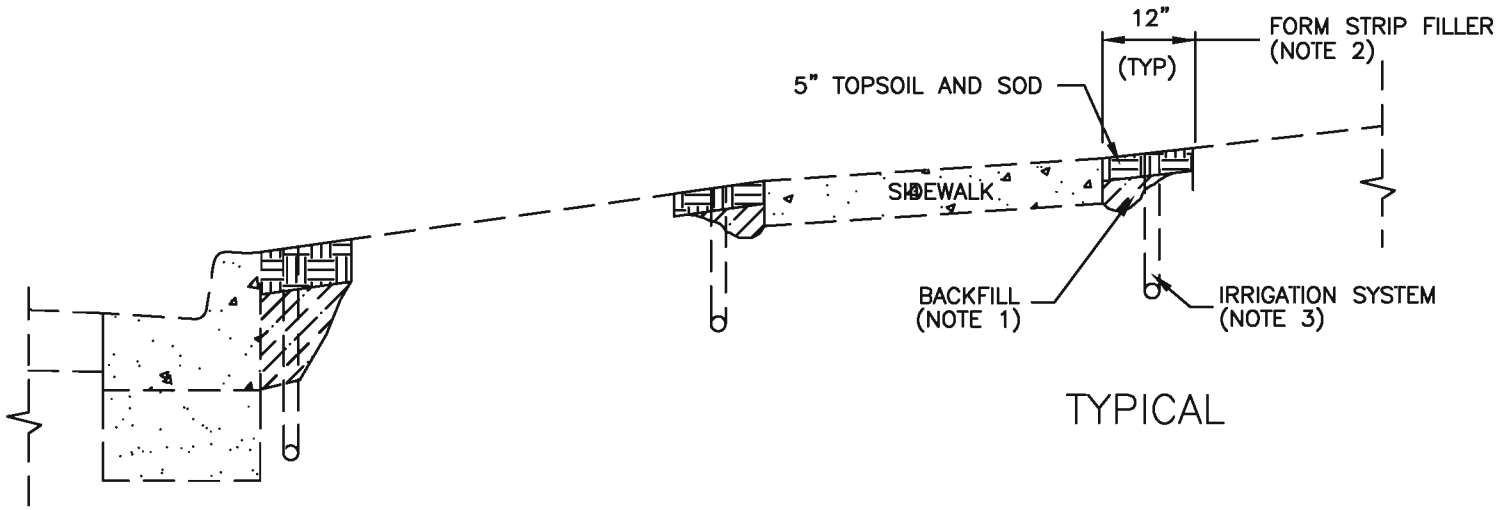
2. WIDTH OF REPLACEMENT: Any sod placed wider than 1 foot must be authorized by the ENGINEER.

3. IRRIGATION SYSTEM: Retain and protect existing irrigation systems. Repair damage caused by construction operation.

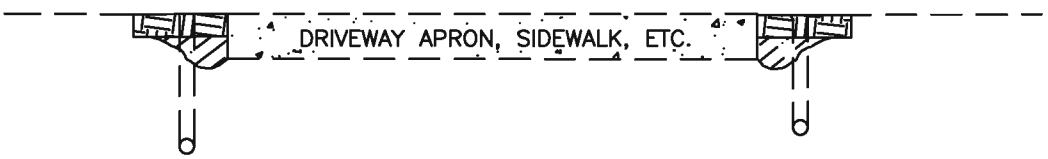
4. TOPSOIL AND SOD: Supply and install topsoil and sod per APWA Section 31 05 13 and APWA Section 32 92 00 respectively.



PLAN



SECTION A–A



SECTION B–B

Form strip filler

Plan No.
242

Asphalt concrete pavement tie in

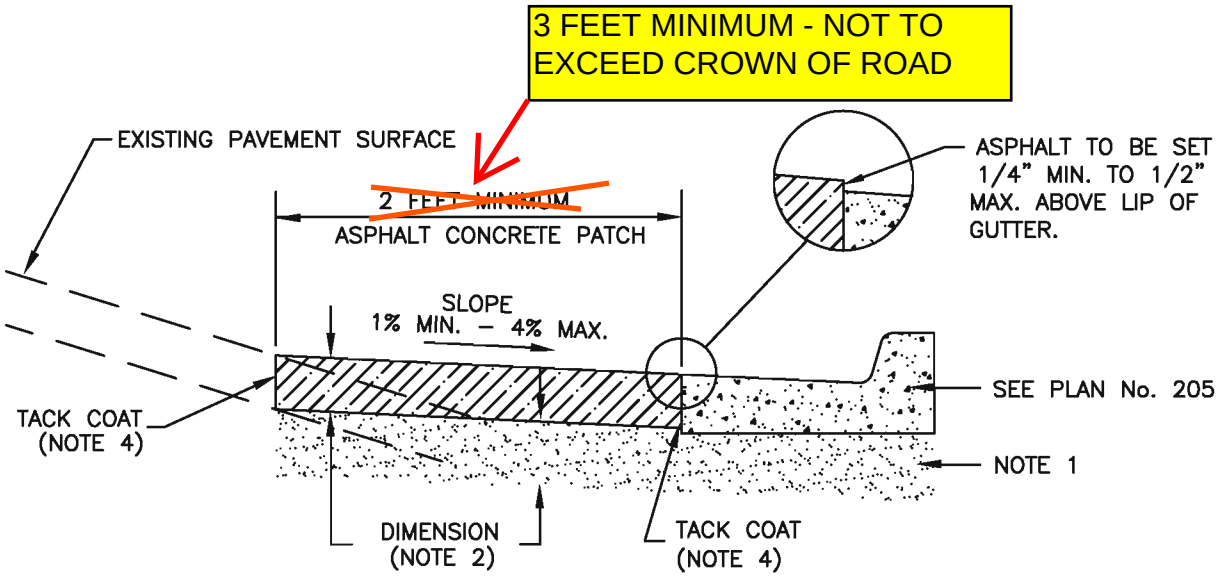
1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. DIMENSION:
   A. Aggregate Base: Match existing thickness or 8 inches minimum.
   B. Asphalt Pavement: Match thickness plus 1 inch, or
      1) 6 inches maximum in residential streets
      2) 8 inches maximum in non-residential streets.

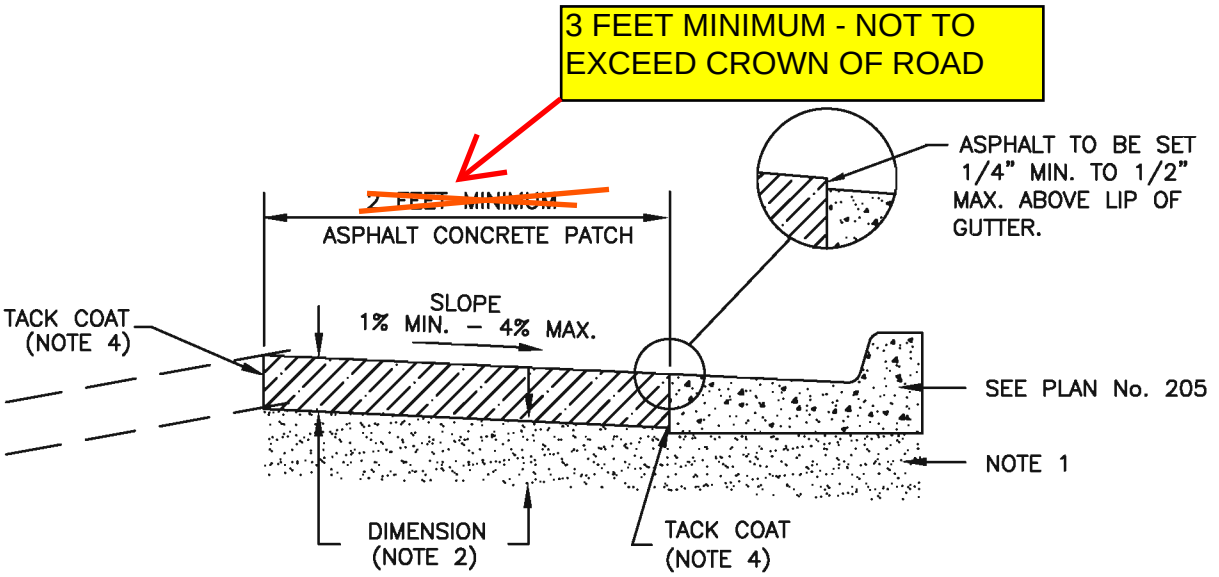
3. ASPHALT CONCRETE PAVEMENT JOINTS: Provide a neat straight joint between existing and new asphalt concrete. Saw-cut joint ~~if existing pavement exceeds 2 inches in thickness or if portland cement concrete underlies asphalt concrete pavement.~~ Or mill all joint edges

4. TACK COAT: APWA Section 32 12 14. Clean all vertical surfaces adjacent to the patch. Apply full coverage tack coat.

5. ASPHALT PAVEMENT: Use hot weather or cold weather asphalt concrete patch material specified in APWA Section 33 05 25.
   A. Install in lifts no greater than 3 inches after compaction.
   B. Compact each lift to 94 percent of ASTM D 2041 (Rice Method) plus or minus 2 percent.



CASE 1 – POSITIVE STREET SLOPE TIE–IN



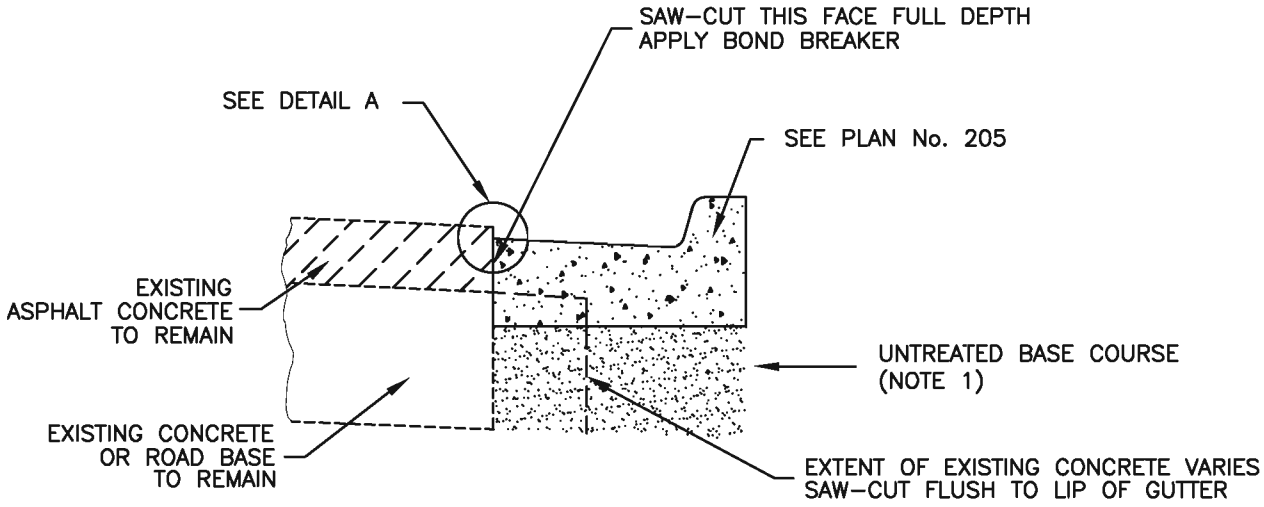
CASE 2 – NEGATIVE STREET SLOPE TIE–IN

Curb and gutter replacement without pavement tie in

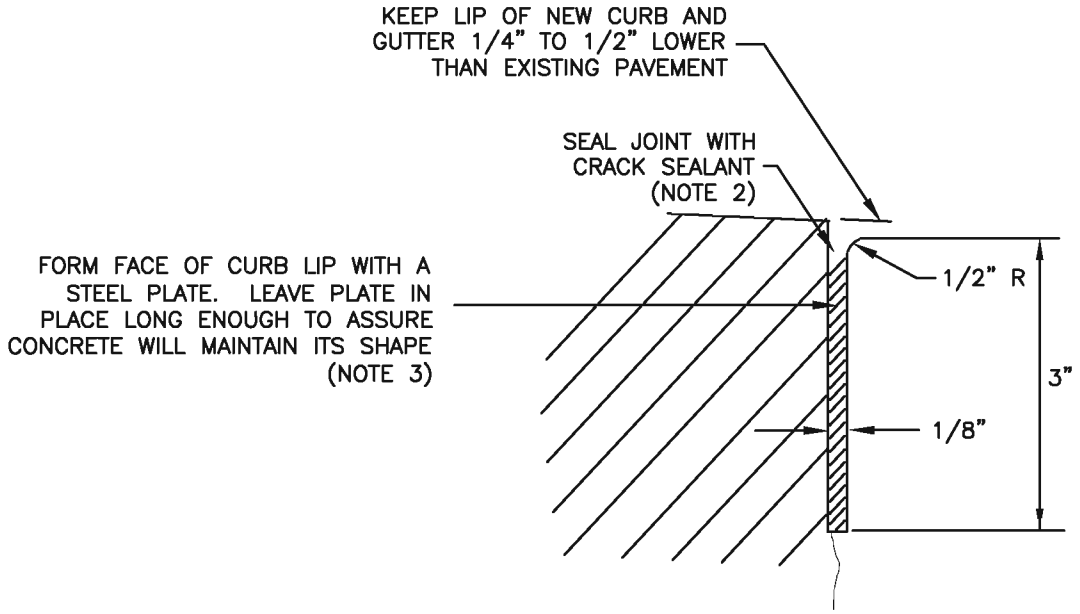
1. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

2. CRACK SEALANT: CAS1 per APWA Section 32 13 73.

3. STEEL PLATE: Plate provides a clean straight edge allowing asphalt concrete be milled out in the future for rehabilitation without damaging the curb and gutter. If straight edge between portland cement concrete and asphalt concrete cannot be provided, remove and replace curb and gutter per Plan No. 251.



SECTION



DETAIL A

Curb and gutter replacement without pavement tie-in

Plan No.
252

Asphalt concrete pavement overlay

1. MILLING: APWA Section 02 41 14.
   A. Remove compacted millings on prepared surfaces.
   B. Mill around gutter lip radii to specified depth prior to paving.

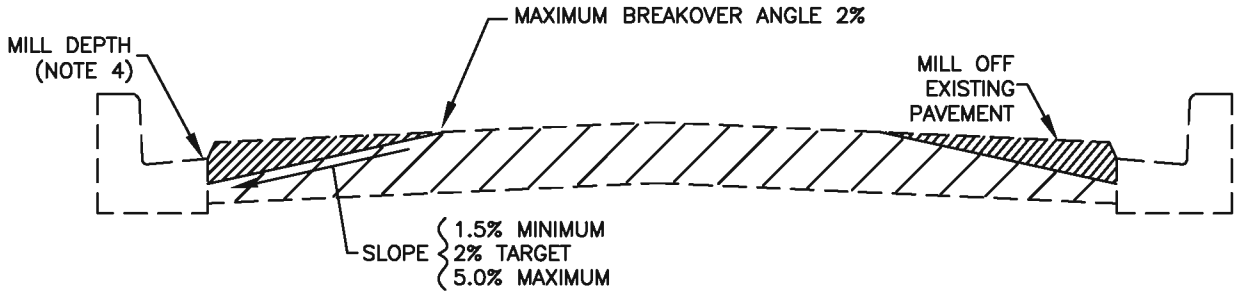
2. TACK COAT: APWA Section 32 12 14.
   A. Clean all horizontal and vertical surfaces in or adjacent to milled areas.
   B. Apply full coverage.

3. PAVING GEOTEXTILE FABRIC: APWA Section 31 05 19.
   A. Place fabric no closer than 1.5 feet from edge of new overlay pavement.
   B. Do not use fabric on grades greater than 3 percent or in travel lanes within the following distances from a signalized intersection or stop sign.
      1) 100 feet where speeds are less than 30 mph.
      2) 150 feet where speeds are greater than 30 mph.

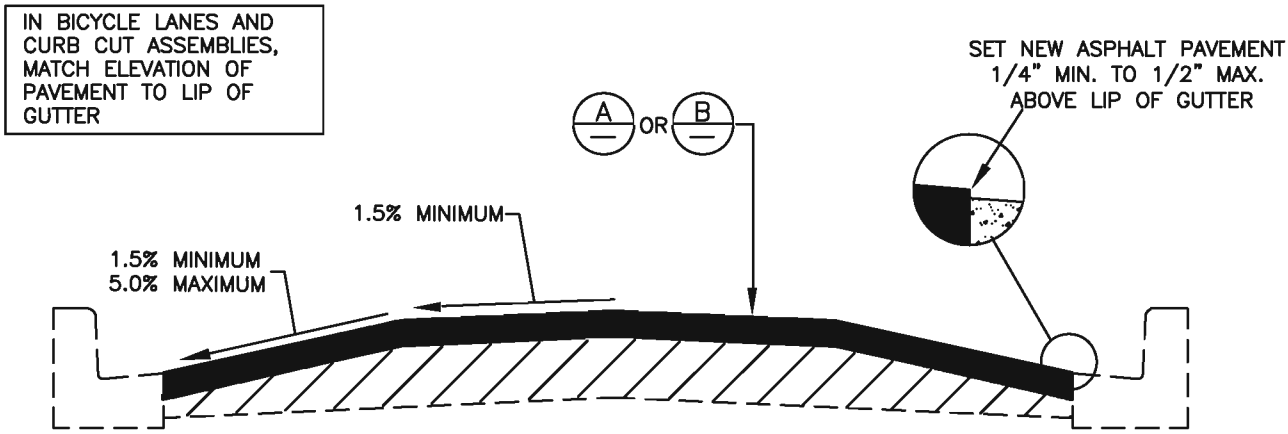
4. MINIMUM PAVEMENT OVERLAY THICKNESS:
   A. 2 times maximum aggregate particle size for asphalt concrete mixes.
   B. 4 times nominal maximum aggregate particle size for SUPERPAVE mixes.

5. PAVEMENT OVERLAY: APWA Section 32 12 16. Make pavement flush with the lip of gutter in bicycle lane and sidewalk curb cuts.

EDGE MILL

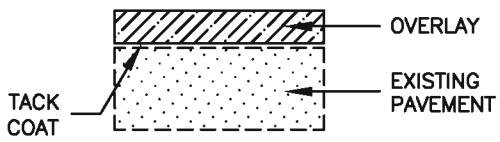


MILL

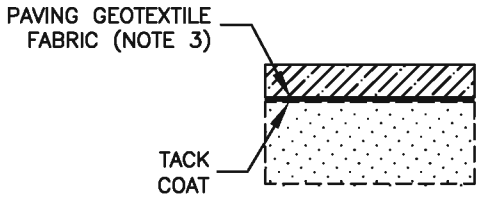


OVERLAY

SECTION



A NO FABRIC



B WITH FABRIC

Asphalt concrete pavement overlay

Plan No.
253

Asphalt concrete pavement overlay

1. MILLING: APWA Section 02 41 14.
   A. Remove compacted millings on prepared surfaces.
   B. Mill around gutter lip radii to specified depth prior to paving.

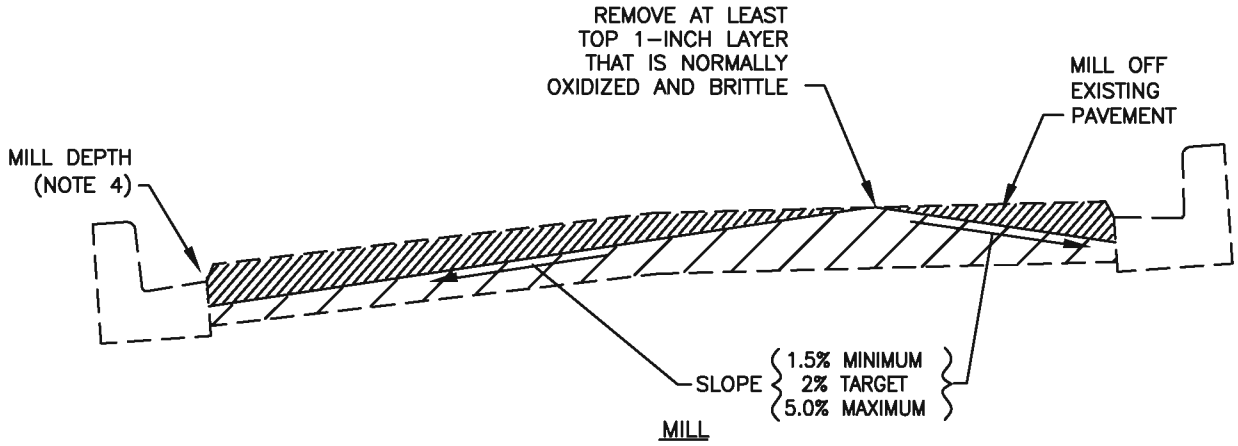
2. TACK COAT: APWA Section 32 12 14.
   A. Clean all horizontal and vertical surfaces in or adjacent to milled areas.
   B. Apply full coverage.

3. PAVING GEOTEXTILE FABRIC: APWA Section 31 05 19.
   A. Place fabric no closer than 1.5 feet from edge of new overlay pavement.
   B. Do not use fabric on grades greater than 3 percent or in travel lanes within the following distances from a signalized intersection or stop sign.
      1) 100 feet where speeds are less than 30 mph.
      2) 150 feet where speeds are greater than 30 mph.

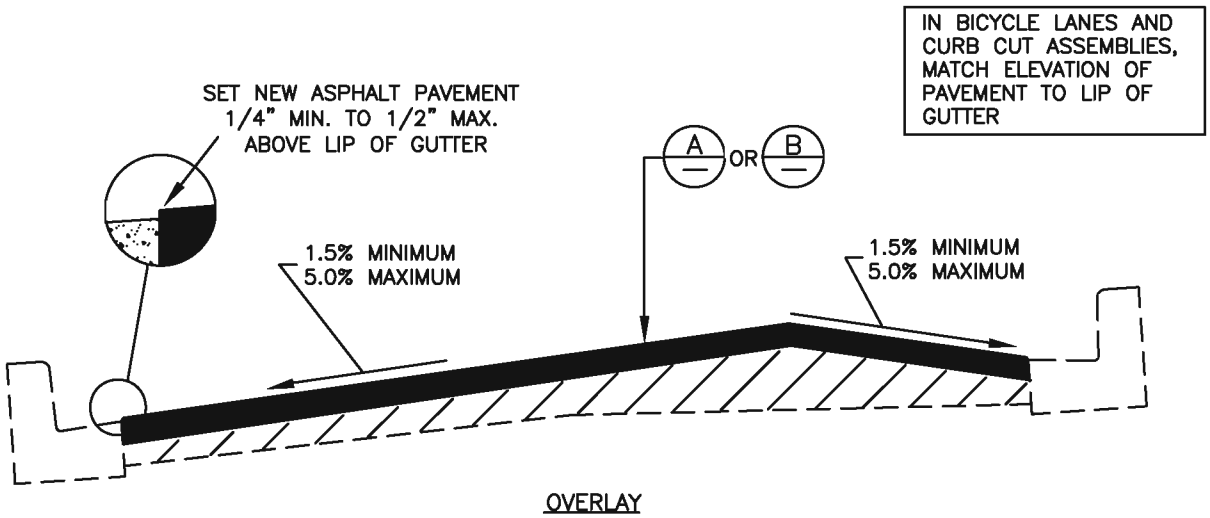
4. MINIMUM PAVEMENT OVERLAY THICKNESS:
   A. 2 times maximum aggregate particle size for asphalt concrete mixes.
   B. 4 times nominal maximum aggregate particle size for SUPERPAVE mixes.

5. PAVEMENT OVERLAY: APWA Section 32 12 16. Make pavement flush with the lip of gutter in bicycle lane and sidewalk curb cuts.

FULL WIDTH MILL

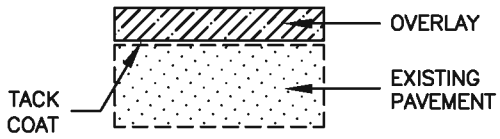


MILL

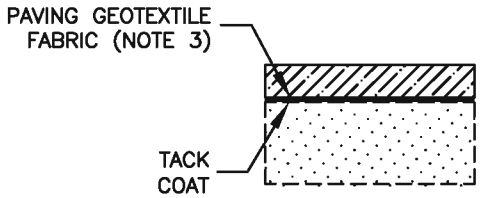


OVERLAY

SECTION



A — NO FABRIC



B — WITH FABRIC

Asphalt concrete pavement overlay

Plan No. **253**

Asphalt concrete "T" patch

1. ADDITIONAL PAVEMENT REMOVAL: Remove additional pavement to a painted lane stripe, a lip of gutter, a curb, an existing pavement patch, or an edge of the pavement if such street feature is within 2 feet of the second saw-cut.

2. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

3. FLOWABLE FILL: Provide 28 day 60 psi controlled low strength material as specified in APWA Section 31 05 15. Use fill material which flows easily and vibration is not required. Cure to initial set before placing aggregate base or asphalt pavement. Use flowable fill in excavations that are too narrow to receive compaction equipment.

4. TACK COAT: APWA Section 32 12 14. Full tack coat coverage on all vertical surfaces.

5. ASPHALT PAVEMENT: Use asphalt concrete specified in APWA Section 33 05 25.
   A. Install in lifts no greater than 3 inches after compaction.
   B. Compact to 94 percent of ASTM D 2041 (Rice Method) plus or minus 2 percent.

6. REINFORCEMENT: ASTM A 615, Grade 60, No. 5 galvanized or epoxy coated deformed steel 12 inches on center.
   A. Required if existing concrete thickness is 6 inches or greater.
   B. Not required if (1) existing concrete is less than 6 inches thick, (2) existing concrete is deteriorating, (3) excavation is less than 3 feet square, (4) asphalt pavement is substituted for concrete substrate.

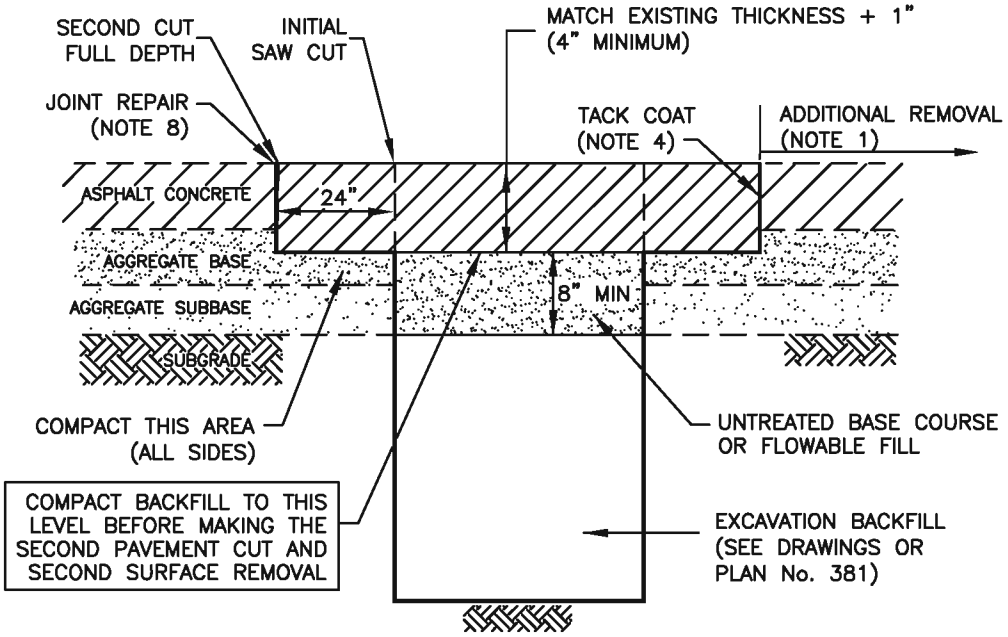
7. CONCRETE SUBSTRATE: Class 4000 per APWA Section 03 30 04. Place concrete per APWA Section 03 30 10. Cure to initial set before placing new asphalt concrete patch.

8. JOINT REPAIR: If a crack occurs at the "T" patch connection to existing pavement or at any street fixture, seal the crack per APWA Section 32 01 17.

9. PATCH REPAIR: Repair the asphalt pavement patch if any of the following conditions within the patch occur.
   A. Pavement surface distortion exceeds 1/4 inch deviation in 10 feet. Repair option: Plane off surface distortions. Coat planed surfaces with a cationic or anionic emulsion that complies with APWA Section 32 12 03 and provide sand blotter.
   B. Cracks at least 1-foot long and 1/4 inch wide occur more often than 1 in 10 square feet. Repair option: Crack seal.
   C. Asphalt raveling is greater than 1 square foot per 100 square feet. Repair option: Mill and inlay.

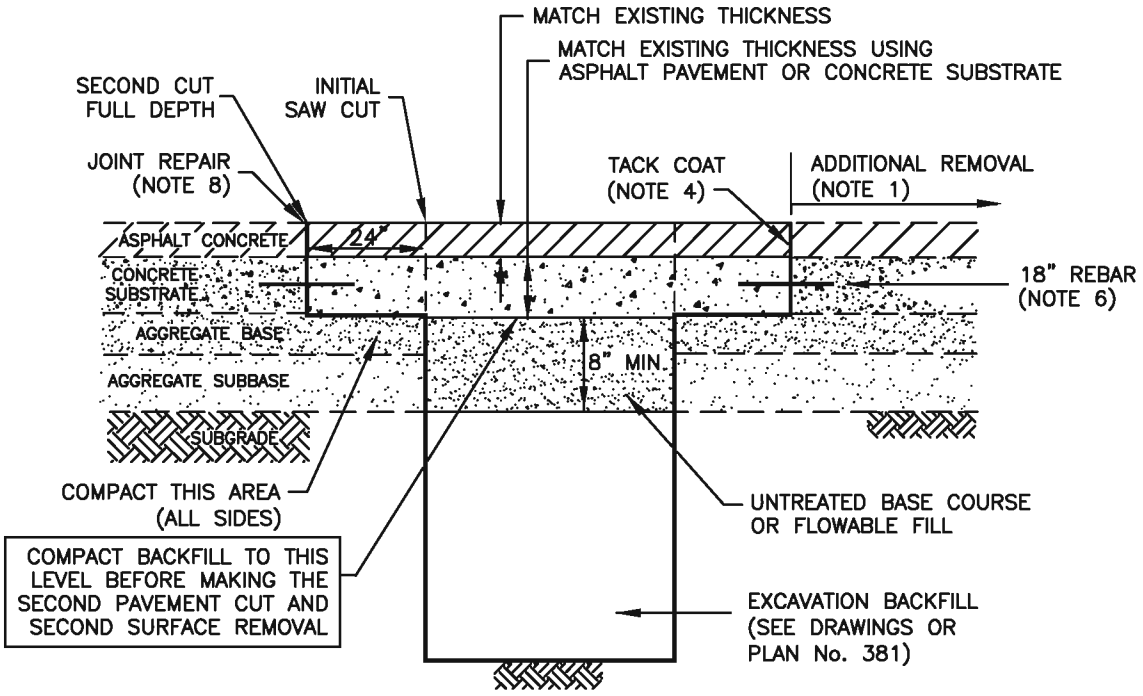
SHALLOW EXCAVATION

(LESS THAN 48 INCHES FROM PAVEMENT SURFACE TO BOTTOM OF EXCAVATION)



EXAMPLE 1

(ASPHALT RESTORATION)



EXAMPLE 2

(COMPOSITE RESTORATION)

Asphalt concrete "T" patch

Plan No.

255

Asphalt concrete "T" patch

1. ADDITIONAL PAVEMENT REMOVAL: Remove additional pavement to a painted lane stripe, a lip of gutter, a curb, an existing pavement patch, or an edge of the pavement if such street feature is within 2 feet of the second saw-cut.

2. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

3. FLOWABLE FILL: Provide 28 day 60 psi controlled low strength material as specified in APWA Section 31 05 15. Use fill material which flows easily and vibration is not required. Cure to initial set before placing aggregate base or asphalt pavement. Use flowable fill in excavations that are too narrow to receive compaction equipment.

4. TACK COAT: APWA Section 32 12 14. Full tack coat coverage on all vertical surfaces.

5. ASPHALT PAVEMENT: Use asphalt concrete specified in APWA Section 33 05 25.
   A. Install in lifts no greater than 3 inches after compaction.
   B. Compact to 94 percent of ASTM D 2041 (Rice Method) plus or minus 2 percent.

6. REINFORCEMENT: ASTM A 615, Grade 60, No. 5 galvanized or epoxy coated deformed steel 24 inches on center.
   A. Required if existing concrete thickness is 6 inches or greater.
   B. Not required if (1) existing concrete is less than 6 inches thick, (2) existing concrete is deteriorating, (3) excavation is less than 3 feet square, (4) asphalt pavement is substituted for concrete substrate.

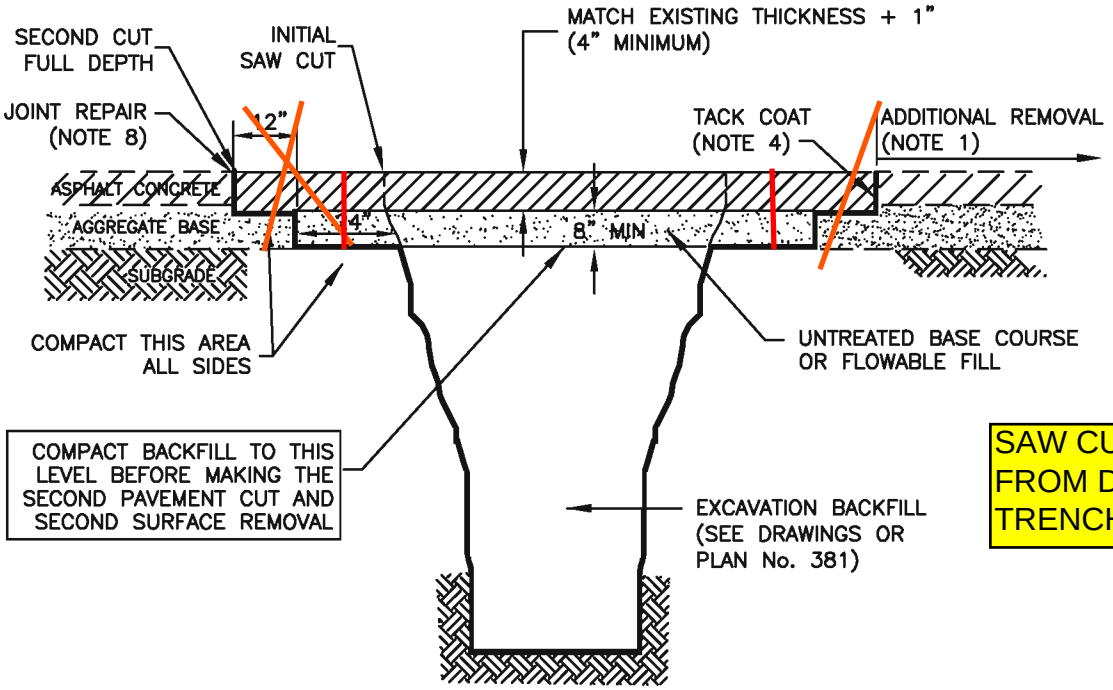
7. CONCRETE SUBSTRATE: Class 4000 per APWA Section 03 30 04. Place concrete per APWA Section 03 30 10. Cure to initial set before placing new asphalt concrete patch.

8. JOINT REPAIR: If a crack occurs at the "T" patch connection to existing pavement or at any street fixture, seal the crack per APWA Section 32 01 17.

9. PATCH REPAIR: Repair the asphalt pavement patch if any of the following conditions occur within the patch.
   A. Pavement surface distortion exceeds 1/4 inch deviation in 10 feet. Repair option: Plane off surface distortions. Coat planed surfaces with a cationic or anionic emulsion that complies with APWA Section 32 12 03 and provide sand blotter.
   B. Cracks at least 1-foot long and 1/4 inch wide occur more often than 1 in 10 square feet. Repair option: Crack seal.
   C. Asphalt raveling is greater than 1 square foot per 100 square feet. Repair option: Mill and inlay.

DEEP EXCAVATION

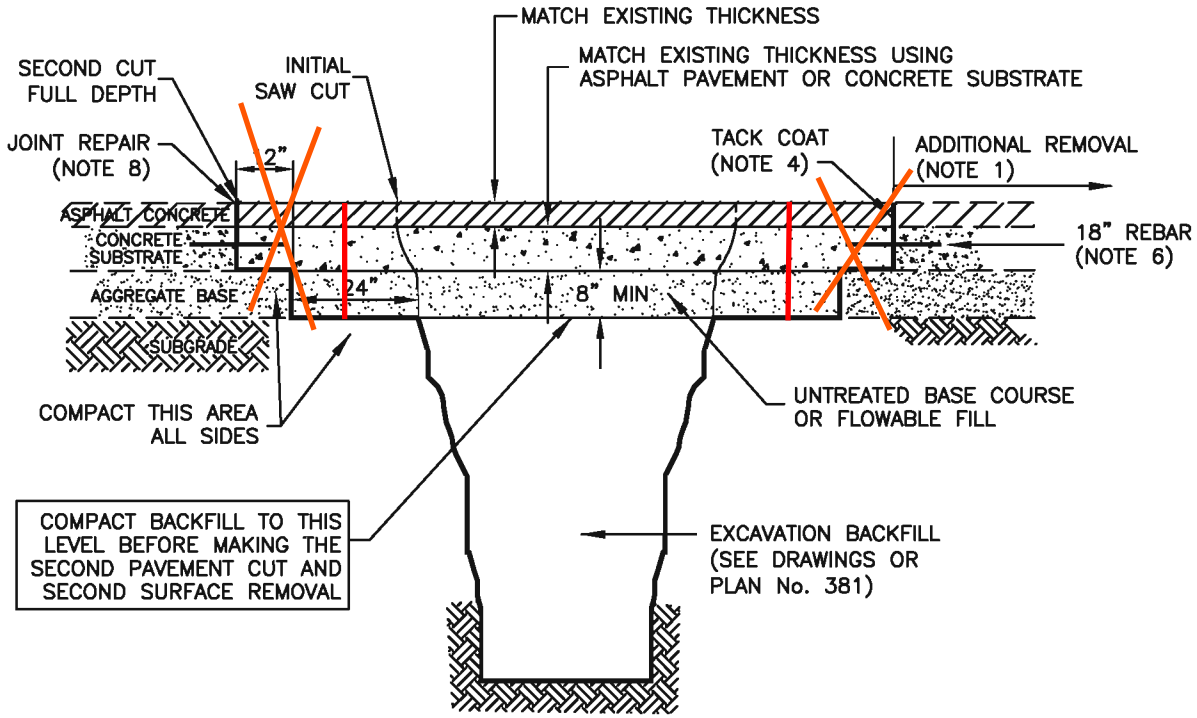
(MORE THAN 48 INCHES FROM PAVEMENT SURFACE TO BOTTOM OF EXCAVATION)



SAW CUT 1 FOOT FROM DISTURBED TRENCH WALL

EXAMPLE A

(ASPHALT RESTORATION)



EXAMPLE B

(COMPOSITE RESTORATION)

Asphalt concrete "T" patch

Plan No.
255

Concrete pavement patch

1. ADDITIONAL PAVEMENT REMOVAL: Remove additional pavement to an existing joint in the concrete slab. If greater than 1/2 slab, remove full slab.

2. UNTREATED BASE COURSE: Provide material specified in APWA Section 32 11 23.
   A. Do not use gravel as a substitute for untreated base course without ENGINEER's permission.
   B. Place material per APWA Section 32 05 10.
   C. Compact per APWA Section 31 23 26 to a modified proctor density of 95 percent or greater. Maximum lift thickness before compaction is 8 inches when using riding compaction equipment or 6 inches when using hand held compaction equipment.

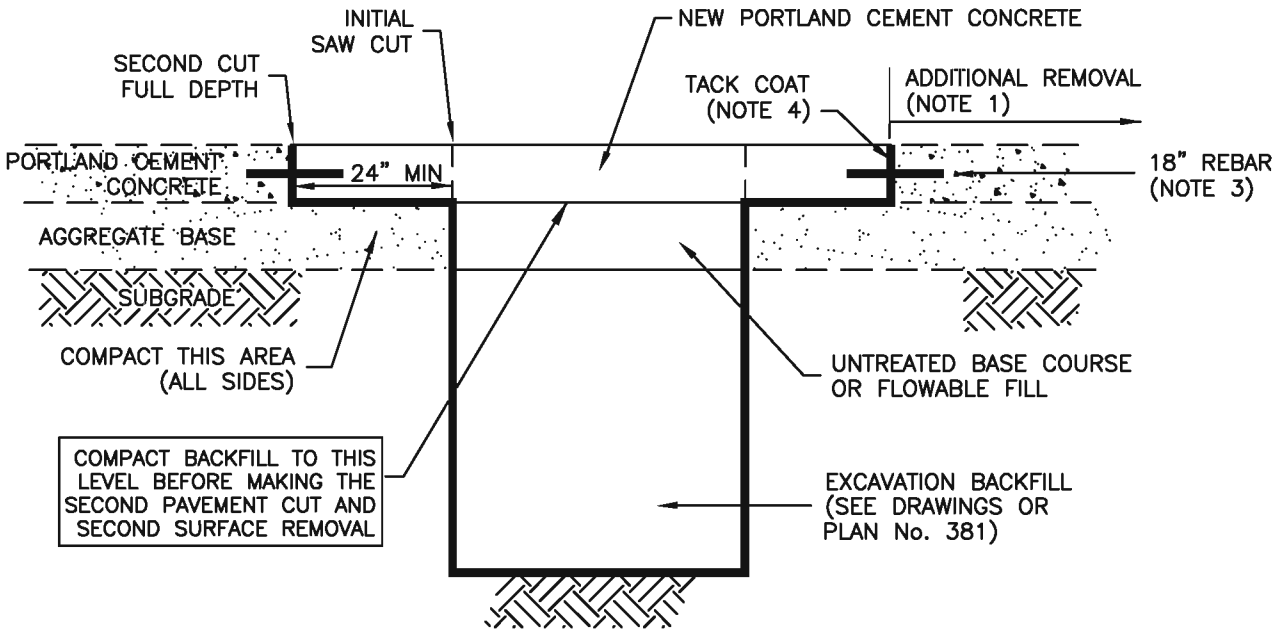
3. FLOWABLE FILL: Provide 28 day 60 psi controlled low strength material as specified in APWA Section 31 05 15. Use fill material, which flows easily, and vibration is not required. Cure to initial set before placing new concrete pavement. Use flowable fill in excavations that are too narrow to receive compaction equipment.

4. REINFORCEMENT: ASTM A 615, Grade 60, No. 5 galvanized or epoxy coated deformed steel 24 inches on center.

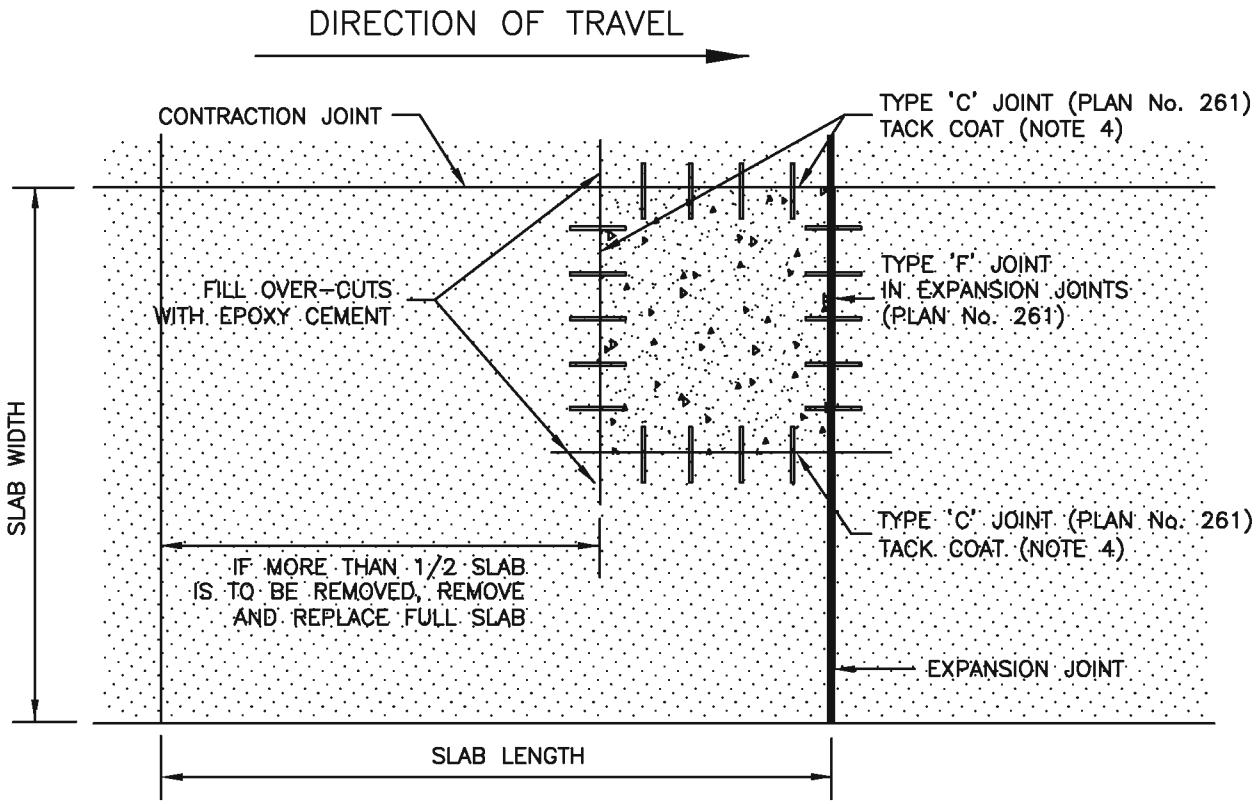
5. TACK COAT: Type II (non-redispersible) polyvinyl acetate base or acrylic base latex per ASTM C 1059. Do not apply tack coat to expansion joints.

6. CONCRETE: Class 4000 per APWA Section 03 30 04.
   A. If curb and gutter was poured monolithic to the pavement slab then such curb and gutter must also be removed and replaced or the patch slab thickness must be increased by 3 inches from the lip of gutter for 5 feet.
   B. Clean all edges of dirt, oil and loose debris prior to concrete placement. Apply a concrete bonding compound as tack coat. Place concrete per APWA Section 03 30 10.
   C. Match existing concrete thickness.
   D. Plane off surface distortions that exceed 1/4 inch deviation in 10 feet. Coat planed surfaces with a water repellant product that complies with APWA Section 07 19 00.
   E. Cure concrete per APWA Section 03 39 00 with type ID Class A or B (clear with fugitive dye) membrane forming compound unless specified otherwise.

7. JOINTS: Saw cut the surface of the new cement concrete to match existing concrete pavement joint patterns. Use the appropriate joint types shown in Plan No. 261.



ROADWAY TRENCH
(Section)



ROADWAY POTHOLE
(Plan View)

Concrete pavement patch

Plan No.
256

Concrete pavement joints

1. REINFORCEMENT: ASTM A 615, grade 60, galvanized or epoxy coated deformed steel rebar or smooth steel dowels with diameter and length as indicated.
   A. Space rebar and dowels at 12 to 15 inches on center.
   B. Grease dowels to provide movement in expansion joints.
   C. Keep tie bars in the vertical center of the concrete slab and perpendicular to the joint during concrete placement.

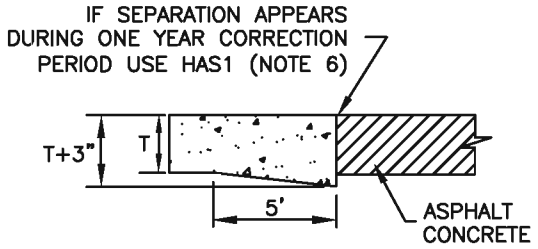
2. SAWING: Keep at least 3 working power saws on-site when concrete is being placed. Saw crack control joints (contraction joints) before shrinkage cracking takes place. Do not tear or ravel concrete during sawing. In cool weather, the joint sawing may be delayed only for the time required to prevent tearing and raveling the concrete. Cut joint to dimensions recommended by sealant manufacturer and approved by ENGINEER.

3. JOINTS: Lay out joints to aid construction and control random cracking.
   A. Longitudinal joint spacing is 12 feet for concrete pavement less than 9 inches thick and 15 feet for concrete pavement 9 inches thick and thicker.
   B. Transverse joints spacing is 30 x T (slab thickness in feet) where the maximum slab length to slab width ratio is 1.5 to 1.
   C. Extend transverse contraction joints continuously across the full width of the concrete. Make the joints coincide with curb and gutter joints.
   D. Make adjustments in joint locations to meet inlet or manhole locations.

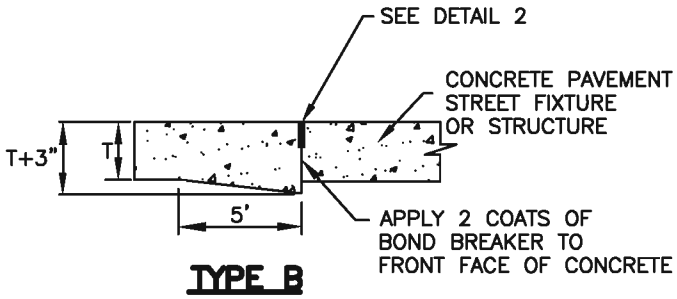
4. JOINT FILLER: Type F1 per APWA Section 32 13 73, extending to the bottom of the concrete slab.

5. BACKER ROD: Type 1 (round rod) APWA Section 32 13 73. It must be oversized approximately 25 percent to fit tightly into each joint and compatible with hot poured sealant.

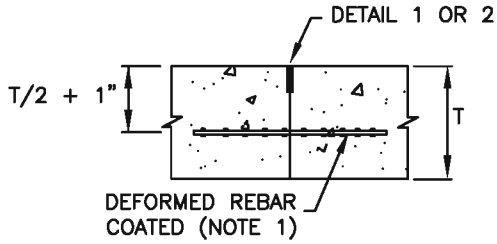
6. JOINT SEALANT: Hot applied, APWA Section 32 13 73. Remove dirt, oil and curing compounds from joint reservoir. Seal joints immediately after cleaning.



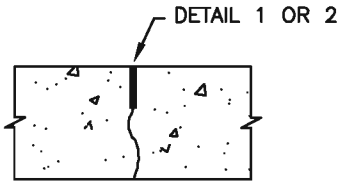
TYPE A



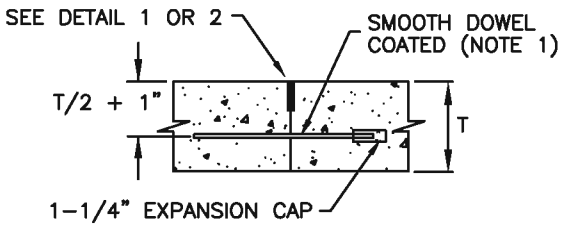
TYPE B



TYPE C

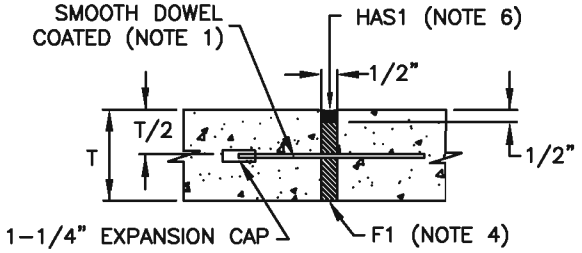


TYPE D



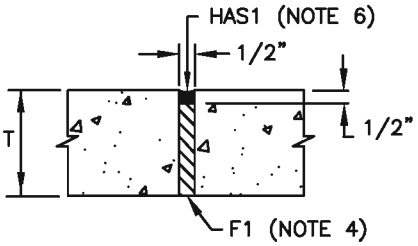
FOR DOWEL SIZE, SEE TABLE OF DIMENSIONS
ON DRAWING 2

TYPE E

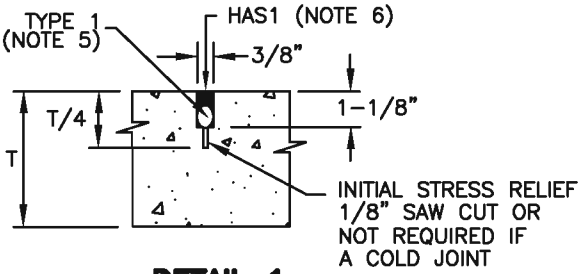


FOR DOWEL SIZE, SEE TABLE OF DIMENSION
ON DRAWING 2

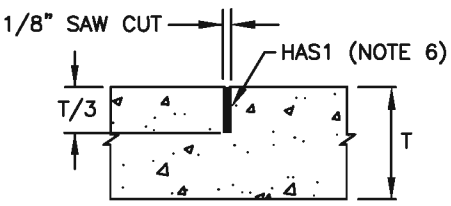
TYPE F



TYPE G



DETAIL 1



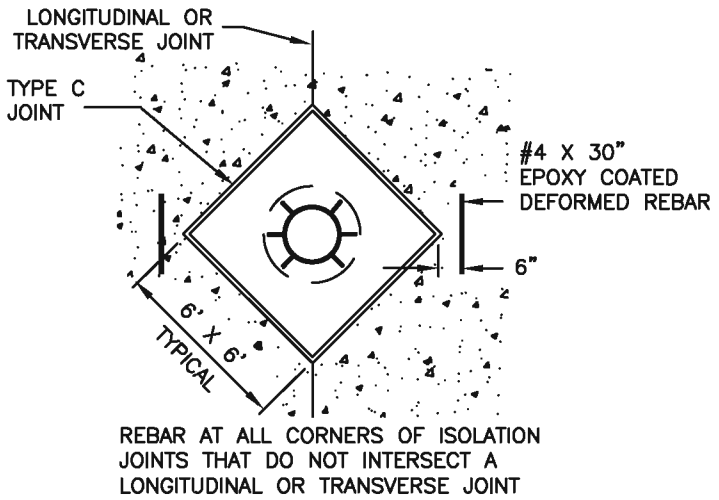
DETAIL 2

Concrete pavement joints

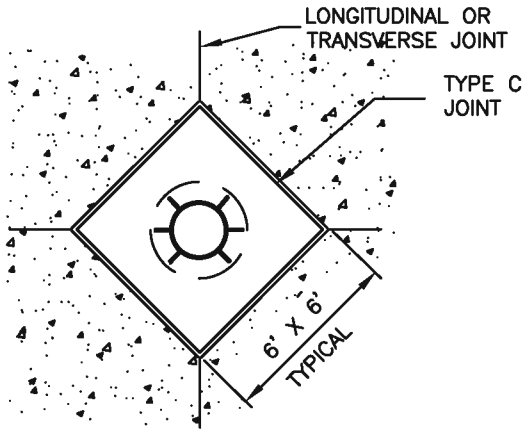
Plan No.
261

Concrete pavement joints

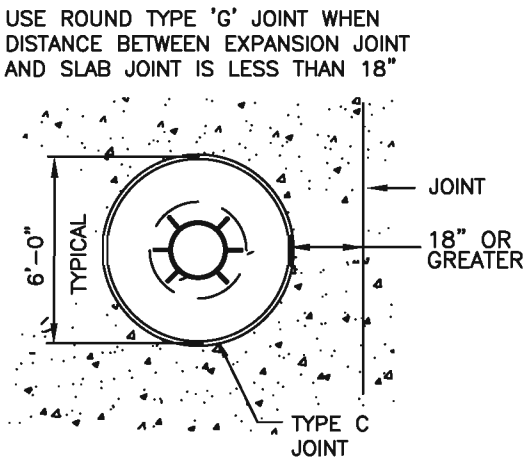
1. BASKET ASSEMBLY:
   A. Attach basket assembly firmly to existing or new base. Secure dowels and tie bars firmly in the basket assembly. All wire sizes shown are minimum.
   B. During concrete placement, keep the dowels in vertical center of the concrete, perpendicular to the joint, and parallel to the direction of concrete slab expansion.



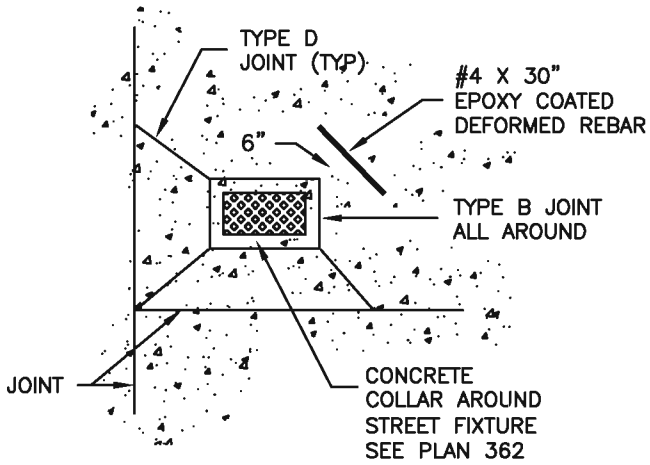
EXAMPLE 1



EXAMPLE 2



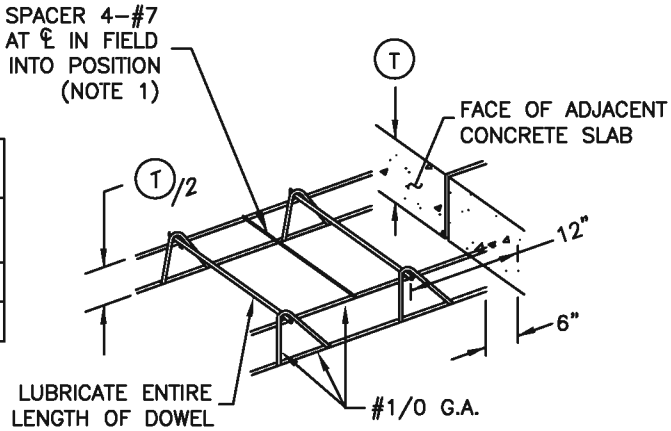
EXAMPLE 3



EXAMPLE 4

TYPICAL STREET FIXTURE ISOLATION JOINTS

DOWEL OR REBAR SIZE CHART			
(T)	DIAMETER (inches)	TOTAL LENGTH (inches)	SPACING
5"–8"	5/8	14	12" O.C.
9"–12"	1	18	12" O.C.

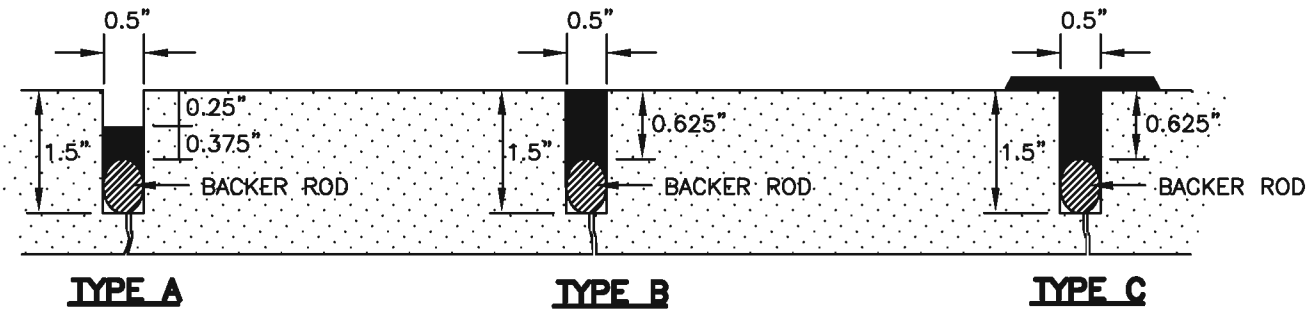


DOWEL OR TIE–BAR BASKET ASSEMBLY

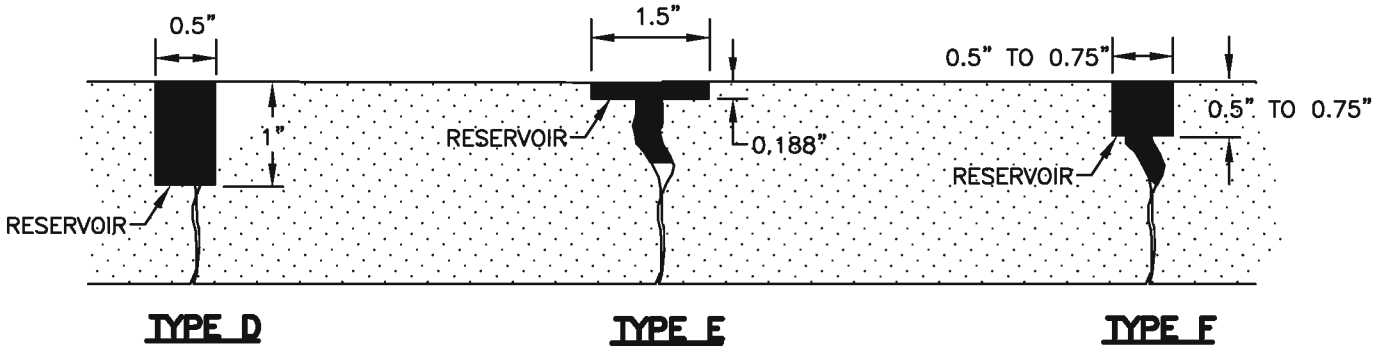
Crack sealing – asphalt pavement

1. SEALER: Asphalt rubber or rubberized asphalt per APWA Section 32 01 17.

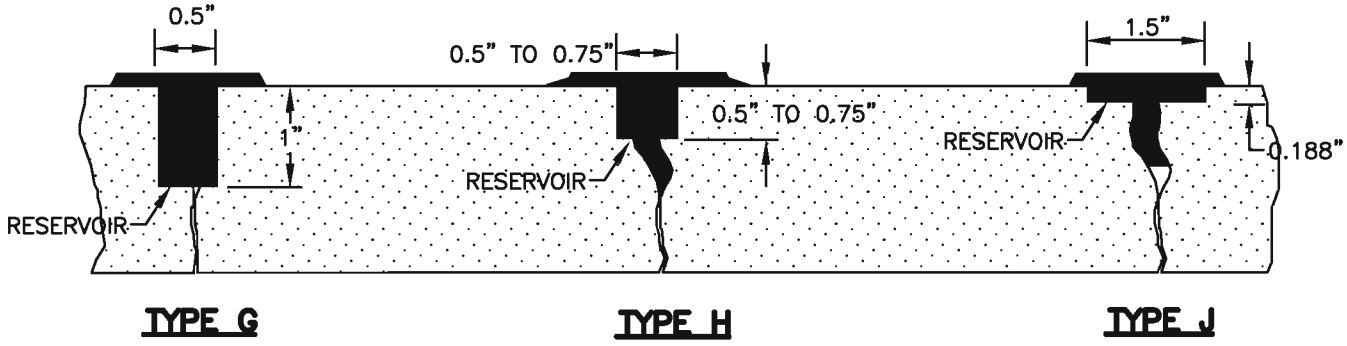
2. BACKER ROD: Type 1 round, closed cell per ASTM D 5249, (APWA Section 32 13 73).



BACKER ROD SEAL



RESERVOIR SEAL



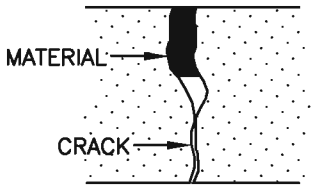
CAP AND RESERVOIR SEAL

Plan No.
265

Crack sealing - asphalt pavement

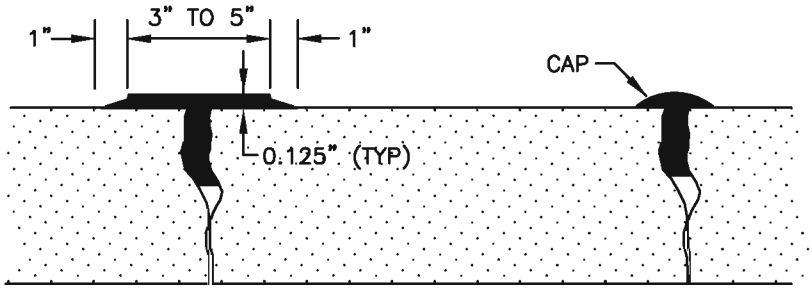
Crack filling – asphalt pavement

1. FILLER: Asphalt rubber or rubberized asphalt per APWA Section 32 01 17.



TYPE A

FLUSH FILL



TYPE A **TYPE B**

CAP FILL

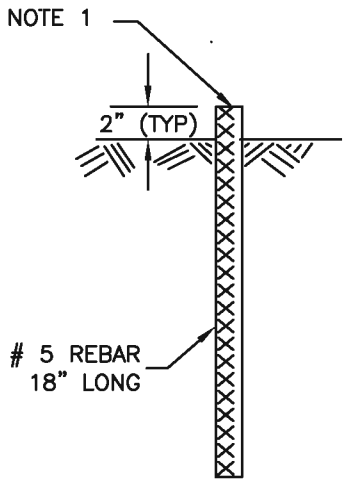
Plan No.
266

Crack filling - asphalt pavement

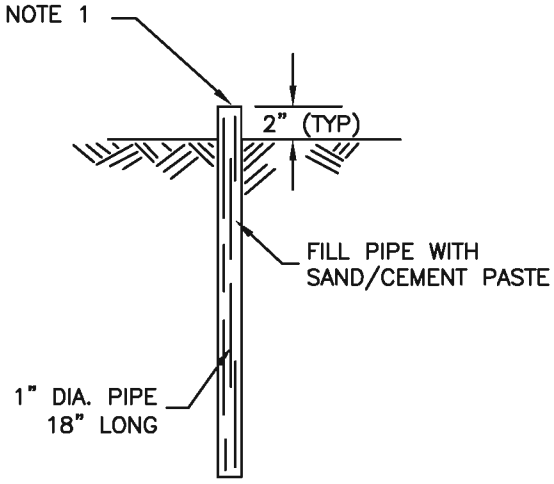
Corner and boundary markers

1. SURVEYOR'S TAG: Show surveyor's professional license number.

2. SUBDIVISIONS: Mark boundaries with type `D' marker. Mark all angle and curve points with type `D' markers, or reference them to an adjacent block or lot corner, which is also marked with a type `D' marker.

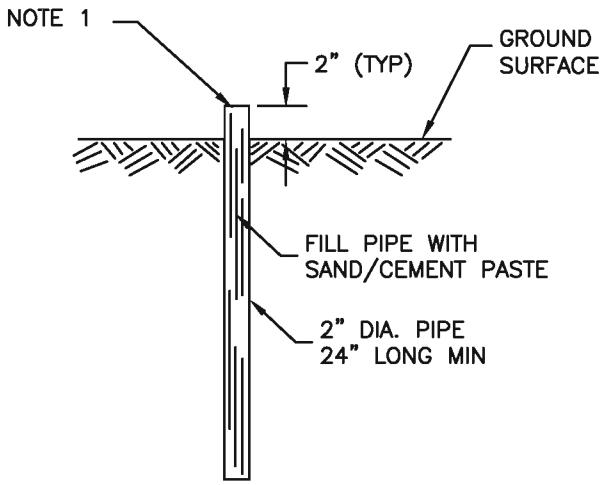


TYPE A

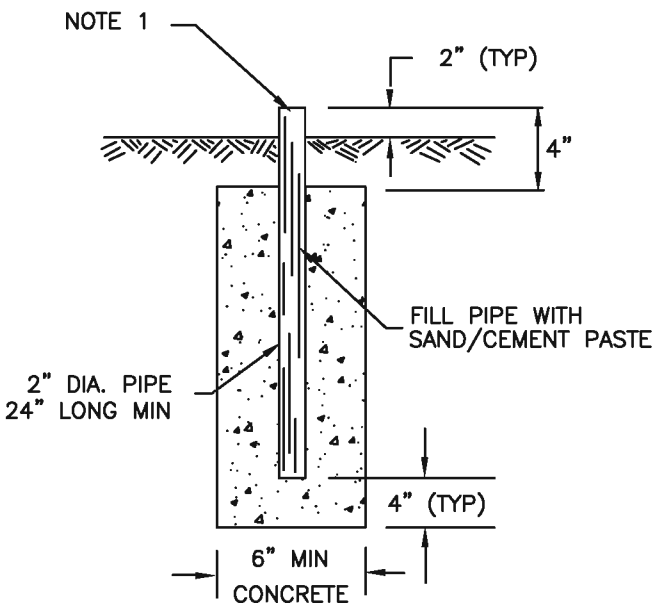


TYPE B

CORNER MARKERS



TYPE C



TYPE D

BOUNDARY MARKER

Plan No.
271

Corner and boundary markers

Monument cap and base

1. ABBREVIATIONS: The following is a list of commonly used abbreviations used on the monument cap. Apply other marks and abbreviations as applicable.

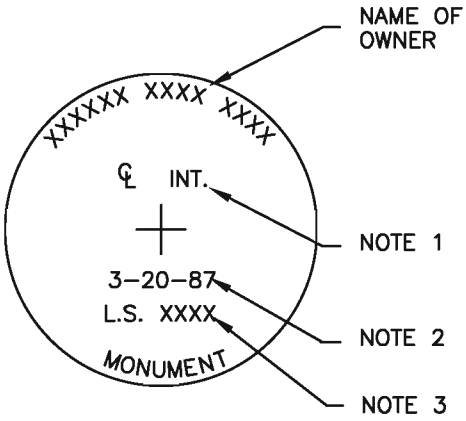
INT	Intersection
ML INT	Monument line intersection
P.C.	Point of curvature
P.C.C.	Point of compound curve
P.I.	Point of intersection
P.O.C.	Point on curve
P.O.T.	Point on Tangent
P.R.C.	Point of reverse curve
P.T.	Point of tangency
S.C.	Section Corner
W.C.	Witness corner

2. DATE: Show month, day, and year when cap was marked.

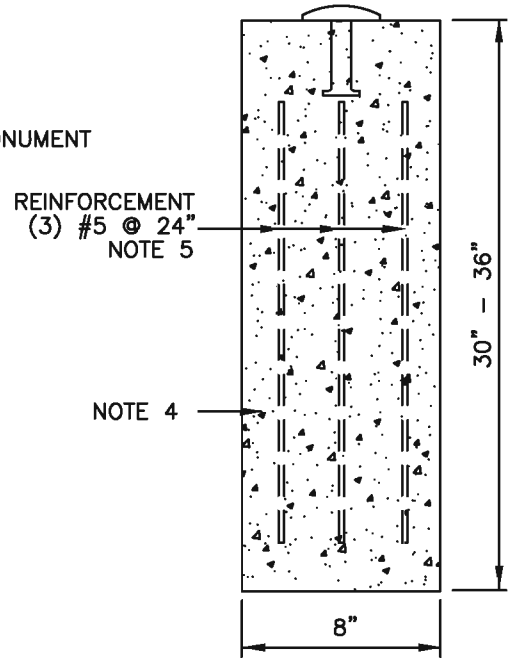
3. LICENSE: Show license number of land surveyor who marked the cap.

4. CONCRETE: Class 4000 per APWA Section 03 30 04 for precast and cast in-place monuments.

5. REINFORCEMENT: ASTM A 615, grade 60, deformed steel rebar.

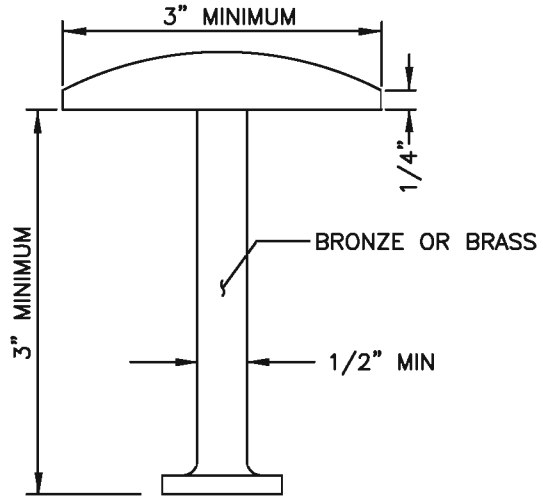


CAP PLAN

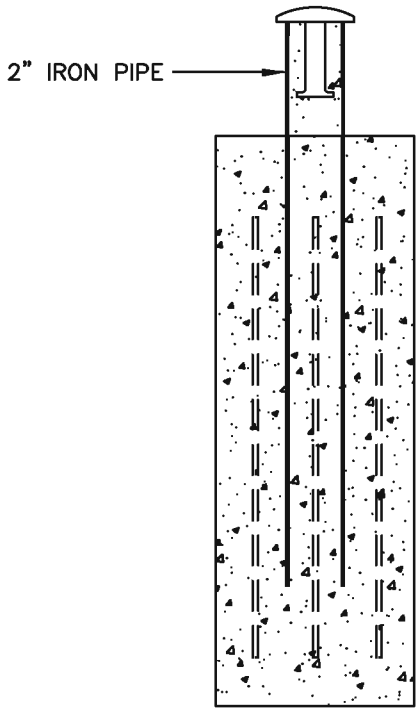


SECTION OF BASE

TYPICAL SETTING



CAP SECTION



SECTION OF BASE

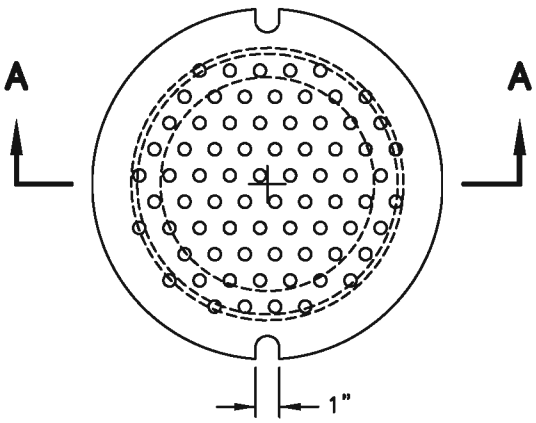
ALTERNATE SETTING

Monument cap and base

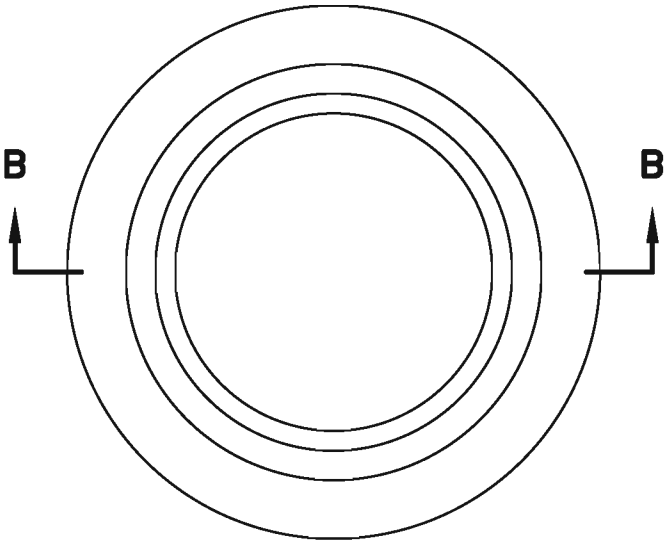
Plan No.
272

Frame and cover for monument

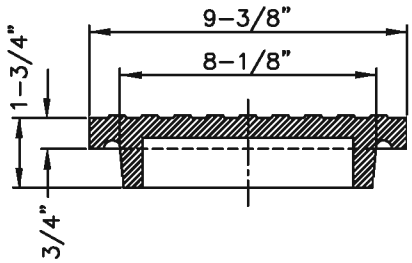
1. CASTINGS: Grey iron class 20 minimum per ASTM A 48.
2. COATINGS: Coat all metal parts with asphaltum paint.
3. SETTING: Set frame independent of monument base.



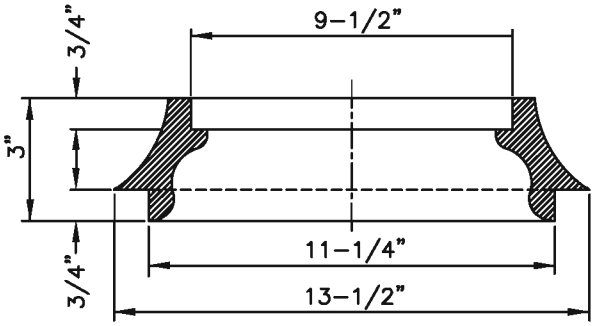
COVER



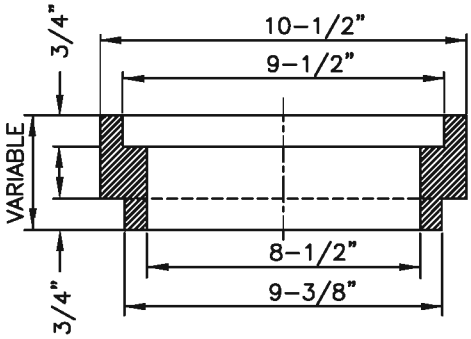
FRAME



SECTION A–A



SECTION B–B



EXTENSION

NOTE: USE EXTENSION IN PORTLAND CEMENT CONCRETE PAVEMENTS. USE FRAME IN ASPHALT CONCRETE PAVEMENTS

Plan No.

Frame and cover for monument

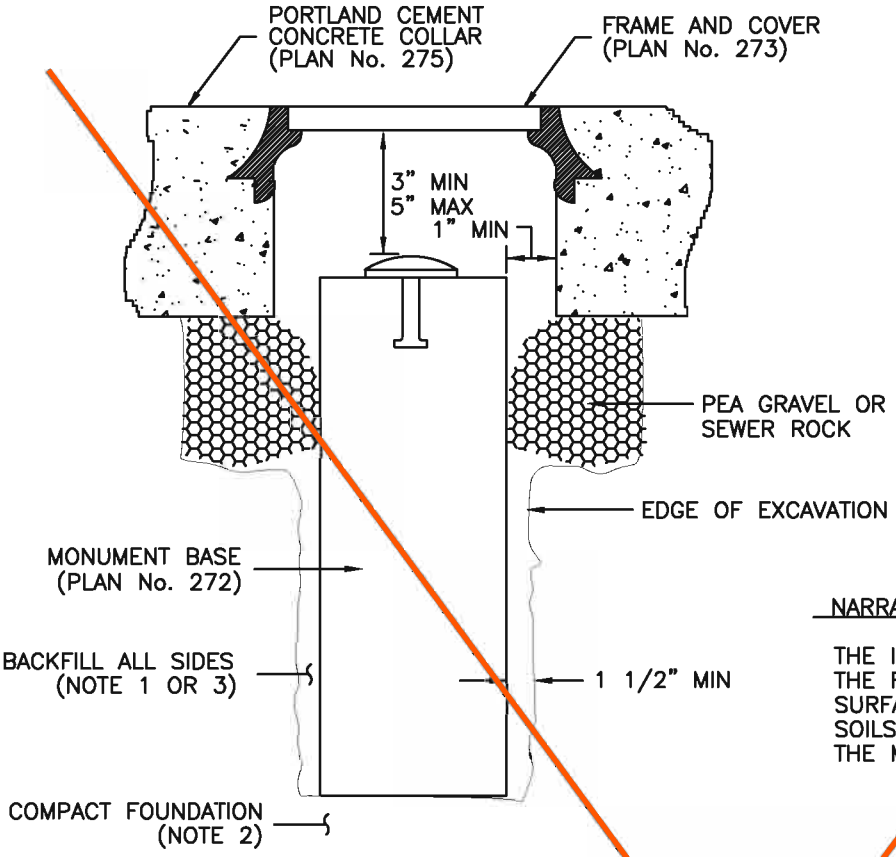
273

Survey monument placement under pavements

1. BACKFILL: Install and compact all backfill material per APWA Section 32 05 10.

2. FOUNDATION: Compact bottom of excavated hole before placement of precast or cast in-place monument post.

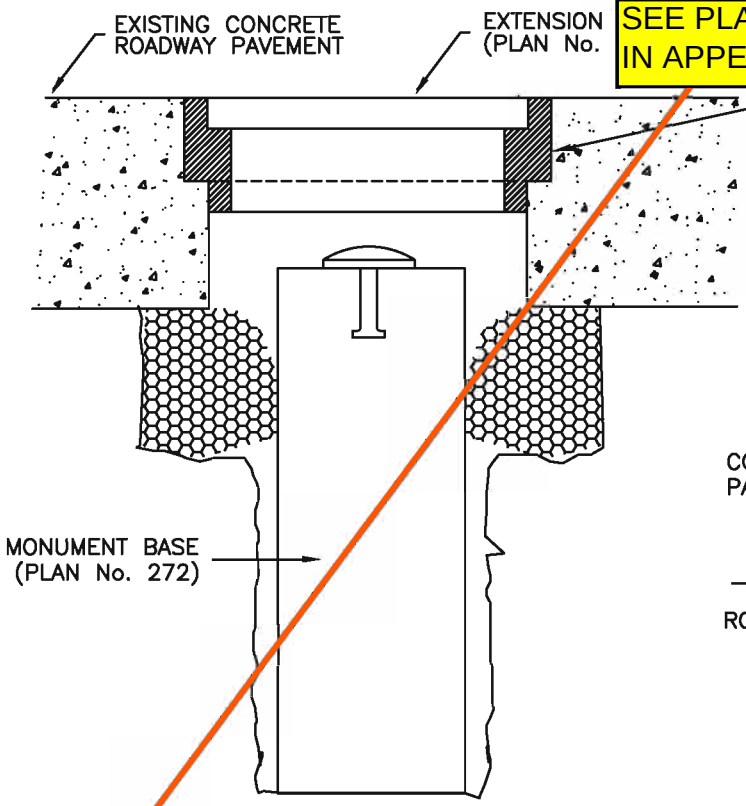
3. CONCRETE: Class 4000 per APWA Section 03 30 04.

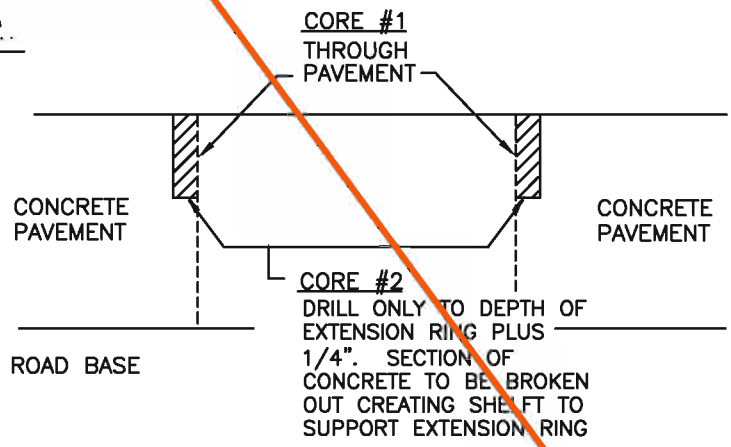


NARRATIVE

THE INSTALLED MONUMENT MUST BE INDEPENDENT OF THE ROADWAY PAVEMENT. VIBRATIONS OF THE PAVEMENT SURFACE MUST BE TRANSMITTED TO THE UNDERLYING SOILS AND NOT TO THE MONUMENT. THIS WILL ASSURE THE MONUMENT REMAINS UNDISTURBED

(A) ASPHALT CONCRETE PAVEMENTS





DETAIL 1
(REQUIRES TWO CONCRETE CORE DRILLS)

(B) CEMENT CONCRETE PAVEMENTS

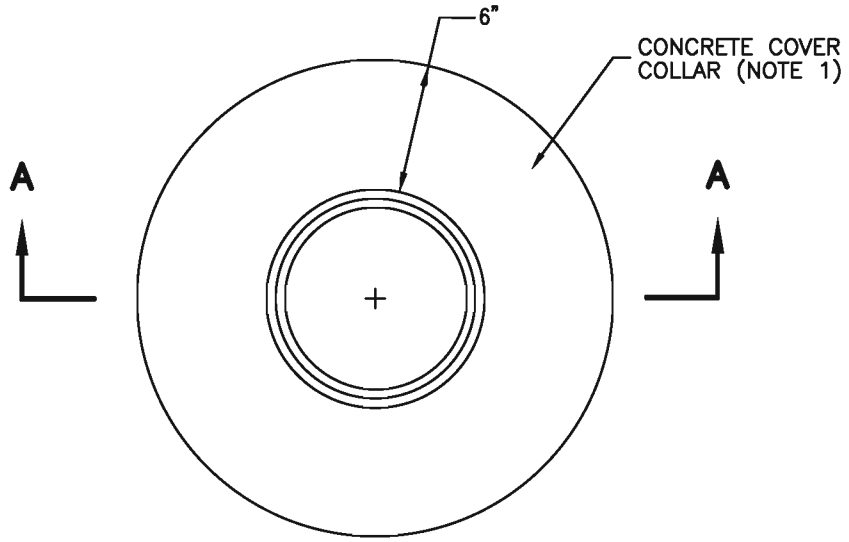
Survey monument placement under pavements

Plan No.
274

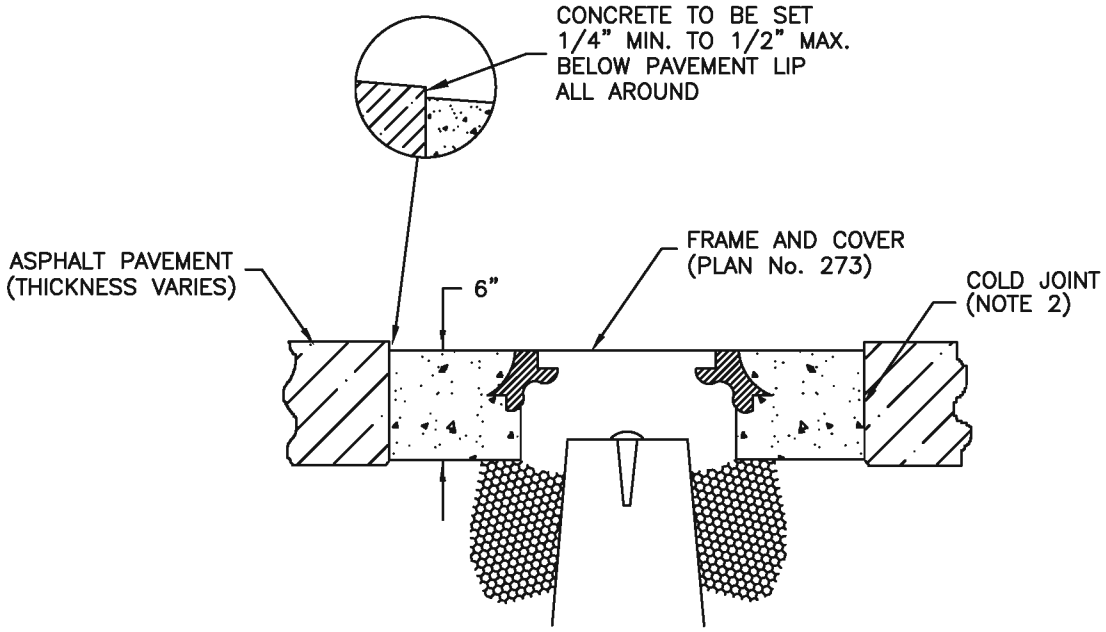
Cover collar for survey monuments

1. CONCRETE: Class 4000 per APWA Section 03 30 04. Place concrete per APWA Section 03 30 10. Cure per APWA Section 03 39 00.

2. JOINTS: Provide a neat vertical joint between existing and new asphalt concrete surfaces. Provide concentric circle cut. Clean edges of all dirt, oil and loose debris.



PLAN



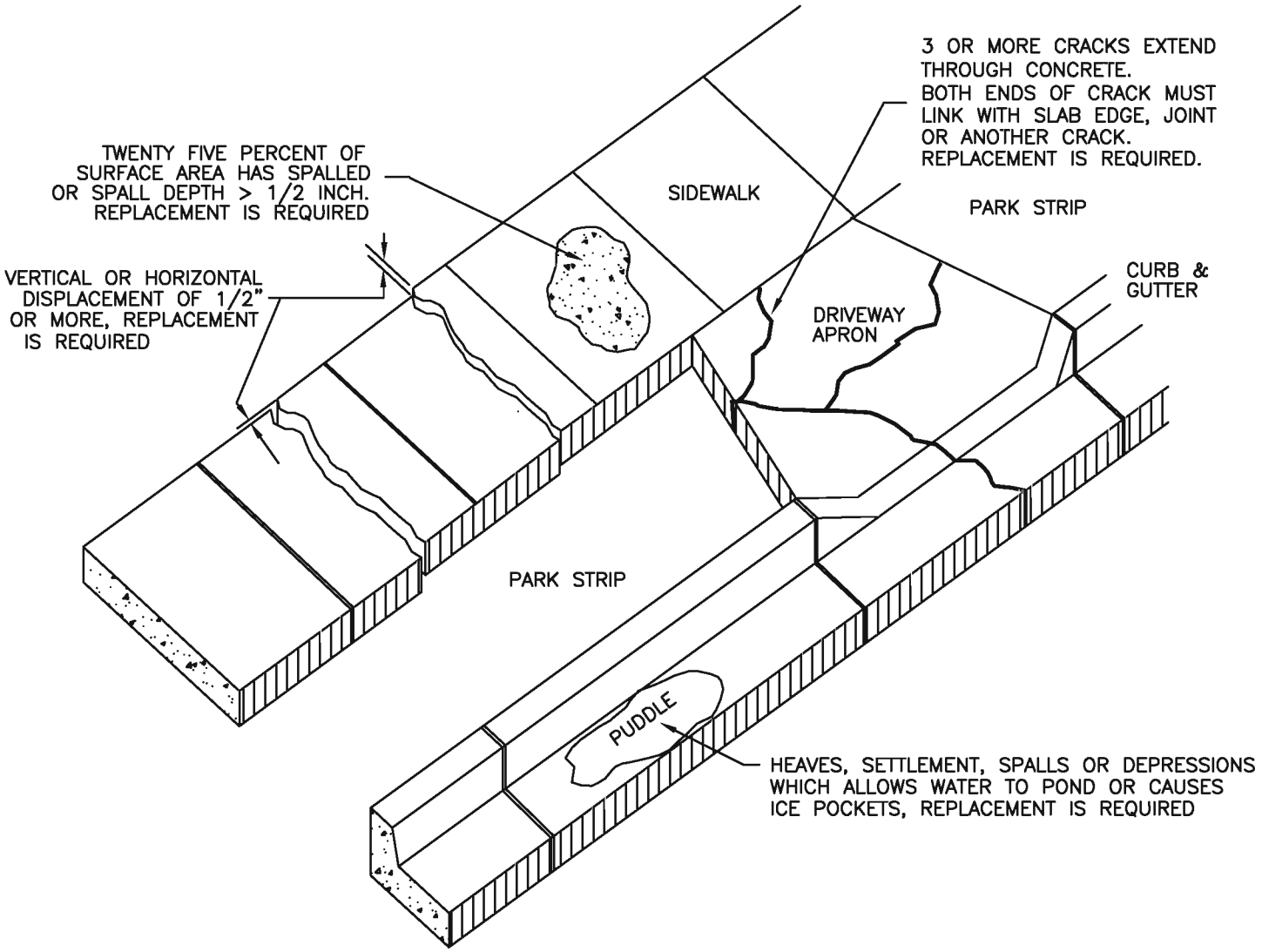
SECTION A–A

Cover collar for survey monuments

Plan No.
275

Defective concrete

1. NARRATIVE: This drawing defines parameters for determining whether new or existing concrete is defective. Replacement is required if any component has one or more of the conditions shown.



OBLIQUE

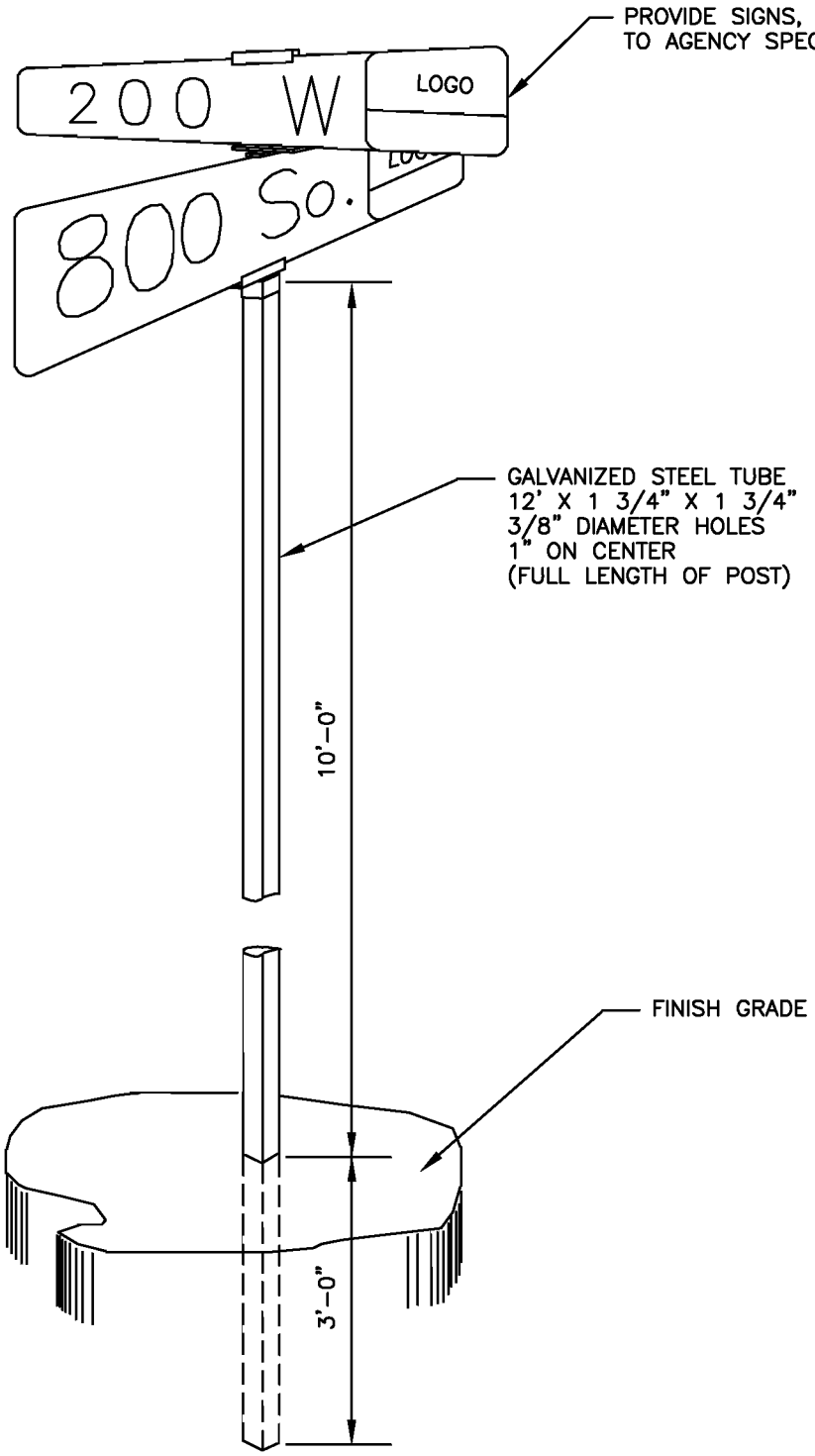
Plan No.
291

Defective concrete

Street name sign (typical)

1. FORMAT: Secure ENGINEER's approval of sign format and installation.

2. INSTALLATION:
   A. Install signs on the northwest and southeast corners of the intersection.
   B. Install the edge of the sign 2 feet from the vertical extension of the back of curb as near as possible to the approach curb P.C. (point of curvature).



Street name sign (typical)

Plan No.
292