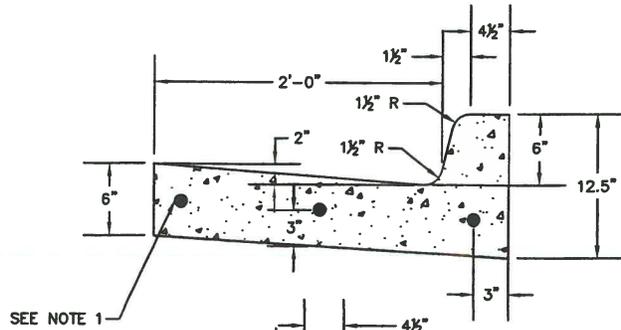


APPENDIX A
STANDARDS DETAILS

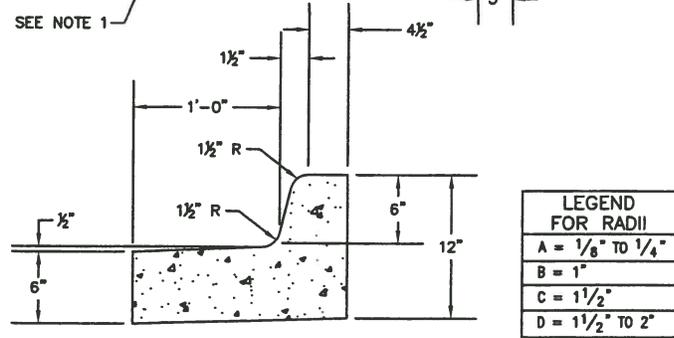
STANDARD DETAIL INDEX

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Curb, Gutter & Sidewalk – Sidewalk and Construction Joints	SP-2
Curb, Gutter and Sidewalk – Sidewalk, Construction Joints and Notes	SP-3
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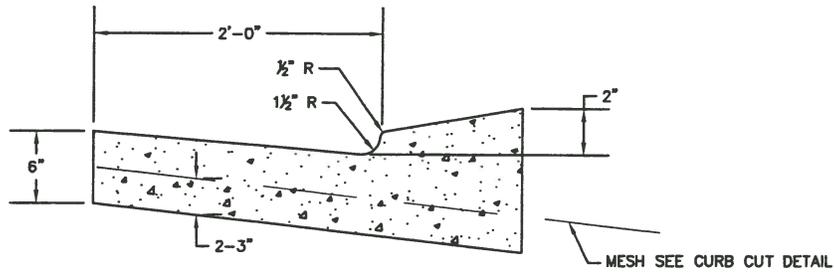
VERTICAL CURB & GUTTER



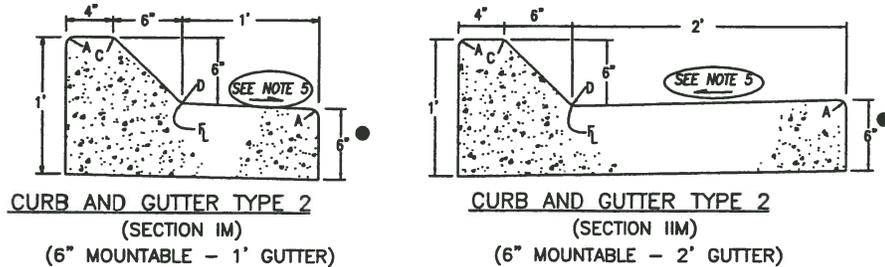
MEDIAN CURB & GUTTER



TYPICAL CURB & GUTTER AT DRIVEWAY



TYPICAL HIGH SPEED TYPE 2 (FROM CDOT M&S STANDARDS)



NOTES:

1. NO. 4 REBAR SHALL BE USED IN ALL CURB RETURNS WITH 25' OR LARGER RADII. THE REBAR SHALL BE USED FROM BEGINNING TO END OF THE CURB RETURN.
2. AT THE LOW POINT(S) OF EACH MEDIAN A DRAIN SYSTEM SHALL BE DESIGNED TO CONVEY STORM AND IRRIGATION FLOWS.
3. NATIVE SUBGRADE UNDER CURB AND GUTTER TO BE COMPACTED TO THE SPECIFICATIONS IN CHAPTER 8 OF THESE STANDARDS.
4. CHANGES TO THE HIGH SPEED TYPE 2 CURB AND GUTTER DETAIL IN THE CDOT M&S STANDARDS SHALL OVERRULE THIS DETAIL.
5. GUTTER CROSS SLOPE SHALL BE 1/2" PER FOOT WHEN DRAINING AWAY FROM CURB AND 1" PER FOOT WHEN DRAINING TOWARD CURB.

Drawn By: SBW *SBW*

Checked By: *AM*

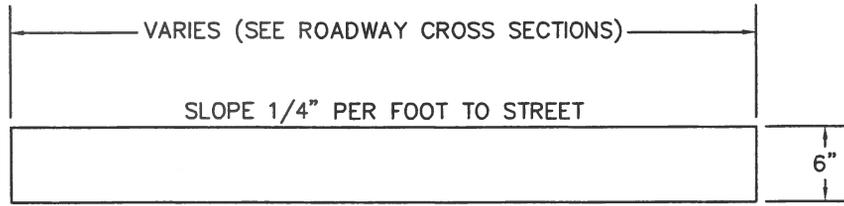
Approved By: *JES*

CURB, GUTTER AND SIDEWALK
VERTICAL CURB

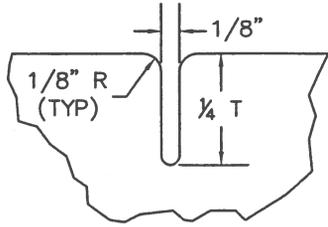
Issued: 5/10/05

Revised: 8/31/06

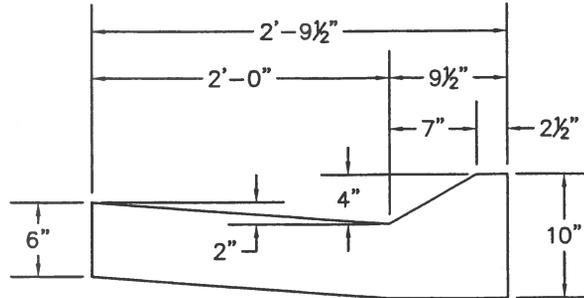
Drawing Number:
SP. 1



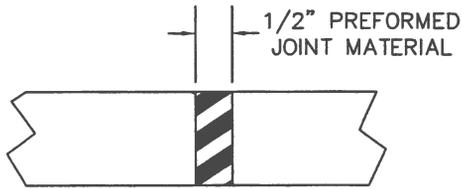
ATTACHED OR DETACHED WALK



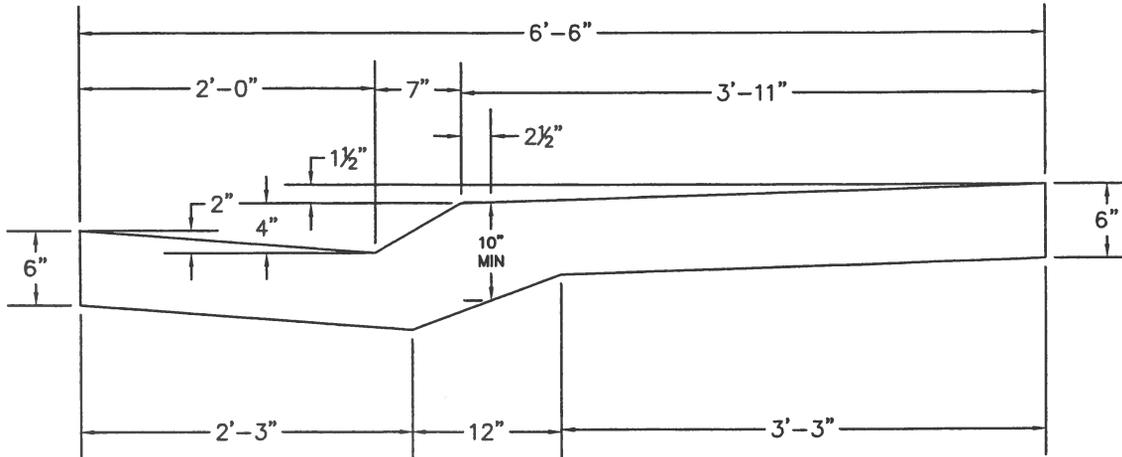
CONTRACTION OR WEAKENED PLANE JOINT



4" MOUNTABLE CURB & GUTTER



EXPANSION JOINT



MOUNTABLE COMBINATION CURB, GUTTER & WALK

Drawn By: SBW *SBW*

Checked By: *[Signature]*

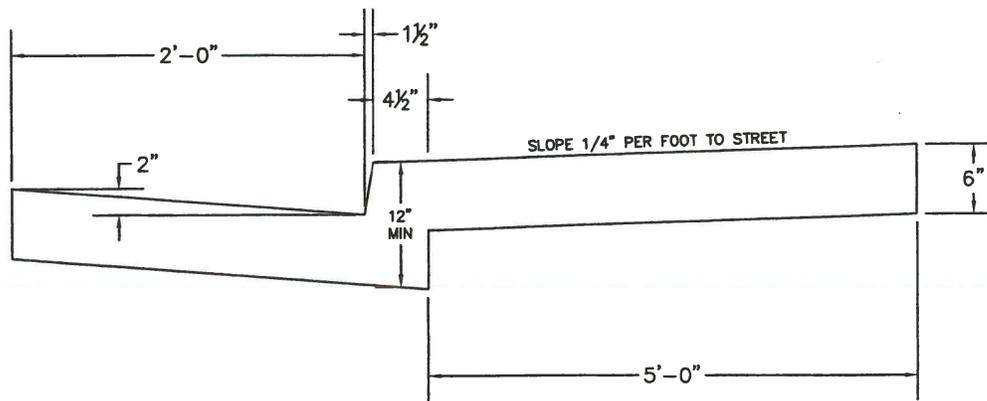
Approved By: *[Signature]*

CURB, GUTTER AND SIDEWALK
SIDEWALK AND CONSTRUCTION JOINTS

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 2



COMBINATION
VERTICAL CURB,
GUTTER & WALK

SIDEWALK, CURB AND GUTTER NOTES:

ALL SIDEWALK, CURB AND GUTTER CONSTRUCTION SHALL CONFORM WITH THE MGPEC STANDARDS FOR MATERIALS AND CONSTRUCTION INCLUDING BUT NOT LIMITED TO THE FOLLOWING;

1. ALL SIDEWALK, CURB AND GUTTER SUBGRADE SHALL CONFORM WITH THE REQUIREMENTS SET FORTH FOR THE ADJACENT ROADWAY AS DEFINED IN THE PAVEMENT DESIGN REPORT.
2. CURB AND GUTTER EXPANSION JOINTS SHALL BE 1/2-INCH WIDE AND CONSTRUCTED AT 90-FOOT INTERVALS. EXPANSION JOINTS SHALL BE FILLED WITH JOINT FILLER STRIPS, 1/2-INCH THICK CONFORMING TO ASTM D 1751, FIBER TYPE AND SHALL BE FURNISHED IN A SINGLE PIECE FOR THE FULL DEPTH AND WIDTH REQUIRED FOR THE JOINT.
3. SIDEWALK EXPANSION JOINTS SHALL BE 1/2-INCH WIDE AND CONSTRUCTED AT 100-FOOT INTERVALS. EXPANSION JOINTS SHALL BE FILLED WITH JOINT FILLER STRIPS, 1/2-INCH THICK CONFORMING TO ASTM D 1751, FIBER TYPE AND SHALL BE FURNISHED IN A SINGLE PIECE FOR THE FULL DEPTH AND WIDTH REQUIRED FOR THE JOINT.
4. JOINT FILLER SHALL BE PLACED WITH THE TOP EDGE 1/4-INCH BELOW THE CONCRETE SURFACE AND SHALL BE HELD IN PLACE BY STEEL PINS DRIVEN INTO THE SUBGRADE AT SPACING ADEQUATE TO PREVENT ANY WARPING OF THE FILLER DURING FLOATING. UPON COMPLETION OF FLOATING THE STEEL PINS SHALL BE REMOVED AND WHEN FINISHING OPERATIONS HAVE BEEN COMPLETED, THE JOINT SHALL BE EDGED WITH AN EDGING TOOL HAVING A RADIUS OF 1/8-INCH.
5. TRANSVERSE CONTRACTION (DUMMY) JOINTS SHALL BE SPACED AT THE FOLLOWING INTERVALS:
 1. 10-FOOT SPACING FOR ALL COMBINATION CURB, GUTTER AND SIDEWALK.
 2. 10-FOOT SPACING FOR ALL CURB AND GUTTER, CURBHEAD OR MOUNTABLE CURB AND GUTTER.
 3. 5-FOOT SPACING FOR ALL DETACHED SIDEWALKS.

Drawn By: SBW *SBW*

Checked By: *[Signature]*

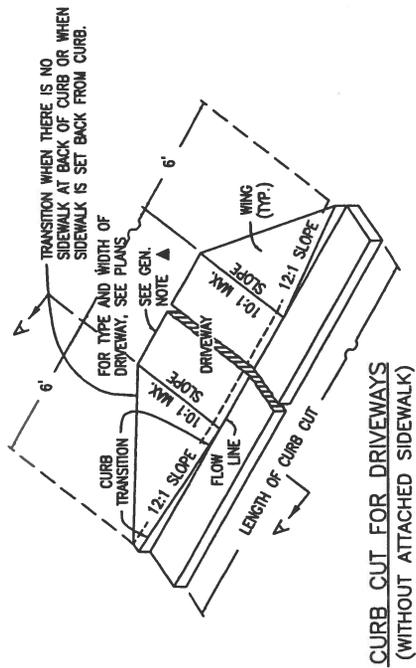
Approved By: *[Signature]*

CURB, GUTTER AND SIDEWALK
SIDEWALK, CONSTRUCTION JOINTS
AND NOTES

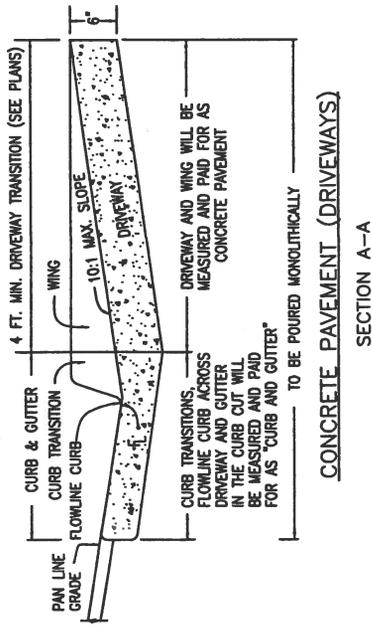
Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 3



**CURB CUT FOR DRIVEWAYS
(WITHOUT ATTACHED SIDEWALK)**

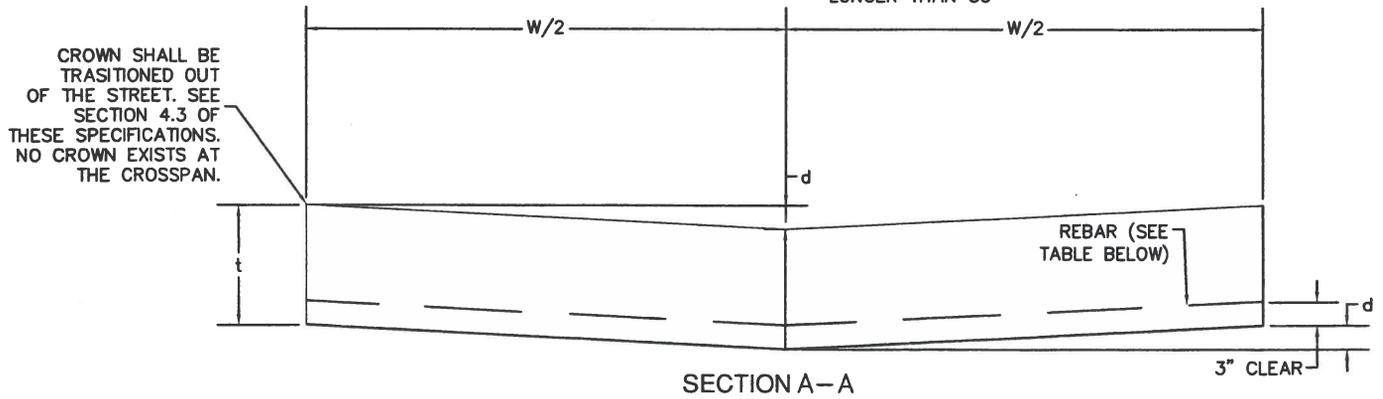
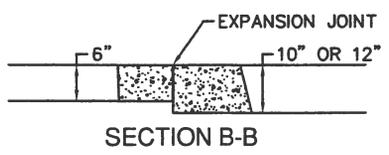
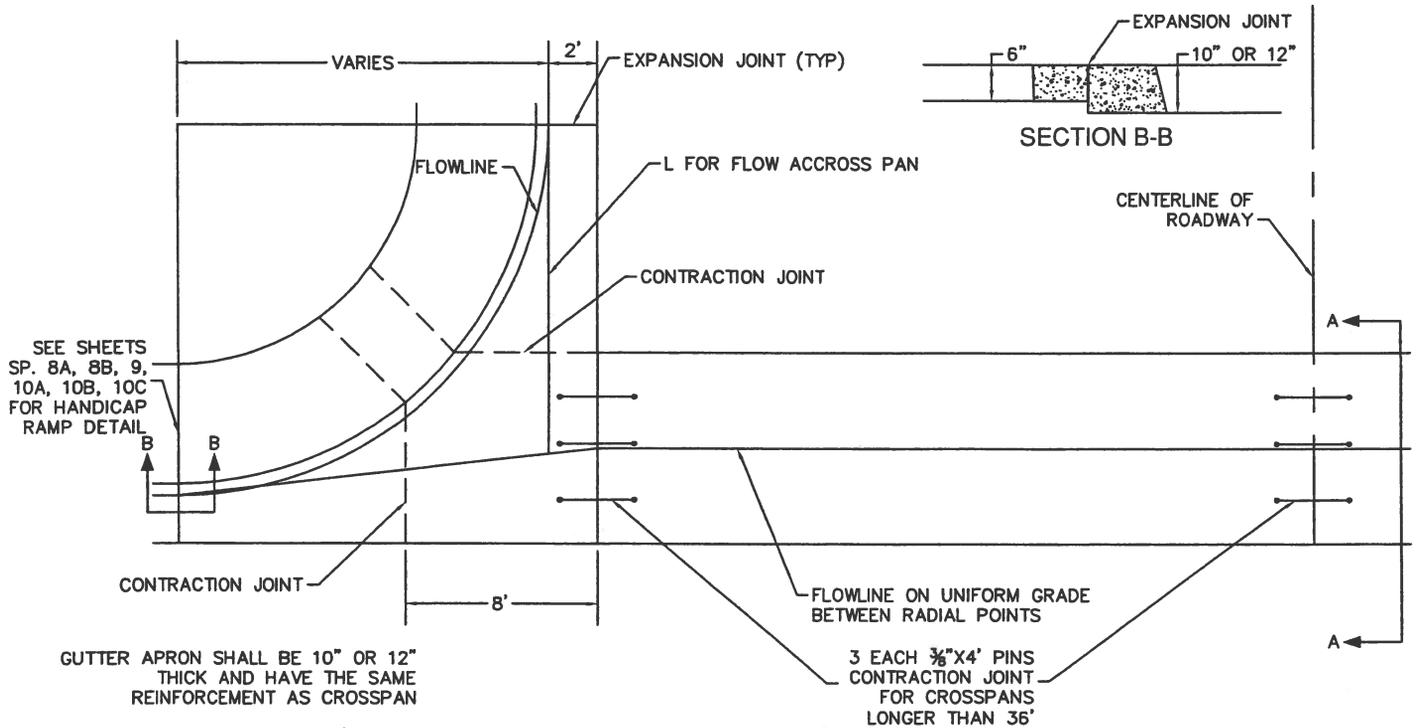


**CONCRETE PAVEMENT (DRIVEWAYS)
SECTION A-A**

Drawn By: SBW *SBW*
 Checked By:
 Approved By:

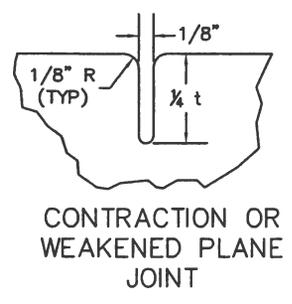
RESIDENTIAL DRIVEWAY
DEPRESSIONS

Issued: 5/10/05
 Revised: 8/31/06
 Drawing Number:
 SP. 4



CROSSPAN INFORMATION			
WIDTH (W)	DEPTH (d)	THICKNESS (t)	THICKNESS (t)
8'	2"	10" W/ #4	12" NO REBAR
10'	2 1/2"	10" W/ #4	12" NO REBAR

PAN LENGTH	REBAR REQUIREMENTS
36'	0.10 SQ.IN. PER FOOT (#4 @ 18")
46'	0.13 SQ.IN. PER FOOT (#4 @ 18")
64'	0.20 SQ.IN. PER FOOT (#4 @ 12")
84'	0.26 SQ.IN. PER FOOT (#4 @ 9")



NOTES:
 1. THE CROSSPAN SHALL BE 12" THICK WITHOUT REINFORCING, 10" WITH REINFORCING AS DETAILED ABOVE.

Drawn By: SBW *[Signature]*
 Checked By: *[Signature]*
 Approved By: *[Signature]*

CROSSPANS
 TYPE 1

Issued: 5/10/05
 Revised: 8/31/06
 Drawing Number:
 SP. 6

CURB RAMP GENERAL NOTES

1. CURB RAMPS SHALL BE INSTALLED AT SIDEWALK/STREET TRANSITIONS, IN ACCORDANCE WITH THE AMERICAN'S WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG), LATEST REVISION, AND CRS43-2-107(2). CURB RAMPS SHALL ALSO BE PROVIDED AT MID-BLOCK LOCATIONS IN THE VICINITIES OF COMMERCIAL AREAS, HOSPITALS AND MEDICAL CENTERS, ATHLETIC STADIUMS AND AT T-INTERSECTIONS.
2. ALL RAMPS MUST BE LOCATED INSIDE CROSSWALKS OR IN FRONT OF STOP BARS.
3. DIRECTIONAL RAMPS ARE THE PREFERRED STANDARD FOR NEW CONSTRUCTION ON ALL ARTERIAL AND COLLECTOR ROADWAY APPLICATIONS. BI-DIRECTIONAL RAMPS WILL BE ALLOWED IN RESIDENTIAL APPLICATIONS AND IN RETROFIT SITUATIONS WHERE REQUIRED.
4. STANDARD RAMP DETAILS SHALL APPLY TO ALL NEW CONSTRUCTION OR REHABILITATION OF EXISTING ROADWAYS, CURBS OR SIDEWALKS. THESE DETAILS MAY BE MODIFIED IN RETROFIT APPLICATIONS TO FIT ACTUAL FIELD CONDITIONS WITH COUNTY ENGINEER'S APPROVAL. CONSTRAINTS SUCH AS LIMITED RIGHT-OF-WAY, SIGNIFICANT GRADE DIFFERENCES, DRAINAGE ISSUES, ETC., MAY NEED TO BE TAKEN INTO CONSIDERATION AT SPECIFIC LOCATIONS WHEN LOCATING AND CONFIGURING THE RAMP DIMENSIONS. ALL MODIFICATIONS TO STANDARD RAMP DETAILS SHALL BE AS DIRECTED AND APPROVED BY THE COUNTY ENGINEER.
5. MINIMUM WIDTH OF RAMPS SHALL BE 4 FEET.
6. RAMP SLOPES SHALL NOT BE STEEPER THAN 12:1 (8.33%), NOR BE LESS THAN 1/4" PER FOOT (2%), EXCEPT AS ALLOWED FOR ALTERATIONS OF EXISTING FACILITIES IN ADAAG. A 12:1 (8.33%) RAMP SLOPE WILL BE ALLOWED IF A 3 FOOT MINIMUM WIDTH LANDING IS PROVIDED (2% MAX. CROSS SLOPE). IF A LANDING IS NOT PROVIDED, THE RAMP SLOPE SHALL NOT EXCEED 1/4" PER FOOT (2%).
7. THE MAXIMUM SLOPE OF THE GUTTER IN FRONT OF CURB RAMP SHALL BE 5/8" PER FOOT (5%). FOR A STANDARD 2' GUTTER PAN THE MAXIMUM RISE AT THE LIP OF THE GUTTER SHALL BE 1 1/4" AND SHALL BE ACHIEVED BY WARPING THE GUTTER LIP FROM 2" TO 1 1/4" WITHIN 5' FROM EITHER EDGE OF THE RAMP. THE LOWER GUTTER LIP MAY BE CONTINUED AROUND THE FULL CURB RETURN RADIUS AT THE COUNTY ENGINEER'S DISCRETION. LONGITUDINAL STREET FLOWLINE GRADES SHALL BE MAINTAINED THROUGH THE RAMP AREA. THE GRADE OF THE GUTTER LIP SHALL BE MODIFIED AS DESCRIBED ABOVE.
8. SPECIAL DESIGNS MAY BE REQUIRED WHEN CURB GRADES ARE GREATER THAN 4% OR WHERE THE ANGLE OF THE INTERSECTION IS LESS THAN 75 DEGREES OR MORE THAN 105 DEGREES.
9. CURB AND GUTTER, RAMP SECTION AND ADJACENT SIDEWALK SHALL BE POURED MONOLITHICALLY UNLESS APPROVED OTHERWISE BY THE COUNTY ENGINEER.
10. A 1/2" WIDE, FULL DEPTH EXPANSION JOINT SHALL BE REQUIRED WHERE THE CURB RAMP MEETS AN ADJACENT RIGID PAVEMENT OR STRUCTURE.
11. SIDEWALKS SHALL BE RAMPED WHERE A DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.
12. AVOID PLACING DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, OR OTHER OBSTRUCTIONS IN LINE WITH CURB RAMP ACCESS AREAS. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF DRAINAGE STRUCTURES, EXCEPT WHERE EXISTING DRAINAGE STRUCTURES ARE BEING UTILIZED WITHIN NEW CONSTRUCTION.
13. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE ARAPAHOE COUNTY INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS OR AS REQUIRED BY THE PROJECT SPECIFICATIONS. CONCRETE MATERIALS FOR CURB RAMPS SHALL PROVIDE A 28-DAY COMPRESSIVE STRENGTH AT OR ABOVE 4000 P.S.I.
14. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.), FOR STREETS AND HIGHWAYS.

Drawn By: SBW 

Checked By: 

Approved By: 

CURB RAMPS FOR
PHYSICALLY HANDICAPPED

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 7

DETECTABLE WARNING NOTES

- 15. TRUNCATED DOME DETECTABLE WARNING PANELS SHALL BE INSTALLED WITHIN CURB RAMPS AT ALL SIDEWALK/STREET TRANSITIONS, AS DESCRIBED BY THE AMERICAN'S WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG), LATEST REVISION.
- 16. DETECTABLE WARNING DEVICES SHALL BE EAST JORDAN IRON WORKS DETECTABLE WARNING PLATES, CDOT APPROVED PRODUCT NUMBER 2673, OR COUNTY ENGINEER APPROVED EQUAL. COLOR SHALL BE NATURAL FINISH.
- 17. CONTRASTING COLOR REQUIREMENT SHALL BE MET BY TRUNCATED DOME SECTIONS AND NOT BY USE OF COLORED CONCRETE.
- 18. ALL DETECTABLE WARNING AREAS SHALL START A MINIMUM OF 6 INCHES FROM THE FLOWLINE OF THE CURB AND NOT BE MORE THAN 8 INCHES FROM ANY POINT ON THE FLOW LINE OF THE CURB. ALL DETECTABLE WARNING AREAS SHALL BE 24 INCHES IN LENGTH AND COVER THE COMPLETE WIDTH OF THE RAMP AREA ONLY.
- 19. SURFACE APPLIED TRUNCATED DOME PANELS ARE ONLY ALLOWED ON PRE-EXISTING CURB RAMPS AND ARE NOT ALLOWED IN NEW CONSTRUCTION.

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Checked By:_____

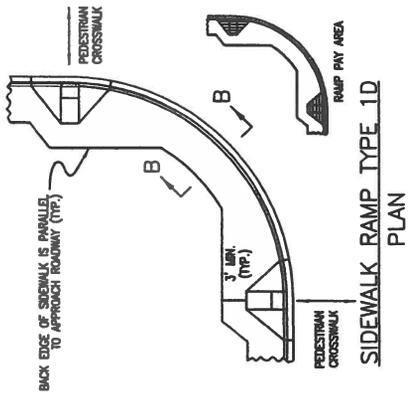
Approved By:_____

CURB RAMPS FOR
PHYSICALLY HANDICAPPED

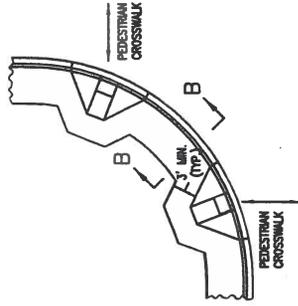
Issued: 5/10/05

Revised: 2/4/08

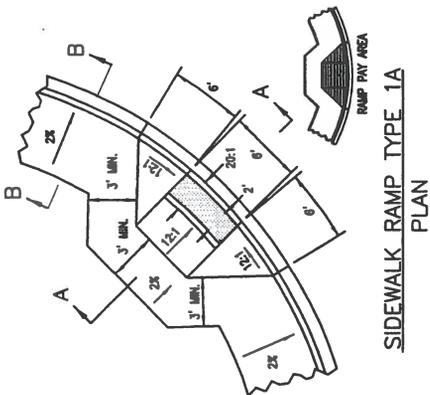
Drawing Number:
SP. 8



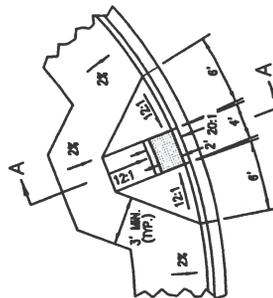
SIDEWALK RAMP TYPE 1D
PLAN



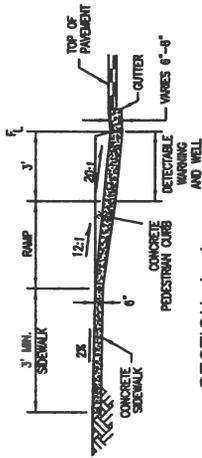
SIDEWALK RAMP TYPE 1B
PLAN



SIDEWALK RAMP TYPE 1A
PLAN



RAMP DETAIL
FOR SIDEWALK RAMP
TYPES 1B, 1C, 1D



SECTION A-A



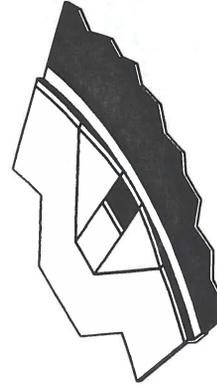
SECTION B-B



SECTION C-C

GENERAL NOTES

1. AVOID PLACING DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.
2. RAMP SLOPES SHALL NOT BE STEEPER THAN 12:1. THE DETECTABLE WARNING AND WELL AREA SLOPES SHALL NOT BE STEEPER THAN 20:1.
3. USE DETECTABLE WARNING DETAILS LOCATED IN THE ARAPAHOE COUNTY INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS.



ISOMETRIC VIEW

Drawn By: SBW *[Signature]*
 Checked By: *[Signature]*
 Approved By: *[Signature]*

CURB RAMPS FOR
 PHYSICALLY HANDICAPPED
 ATTACHED WALK
 WITH 2% PLATFORM

Issued: 5/10/05

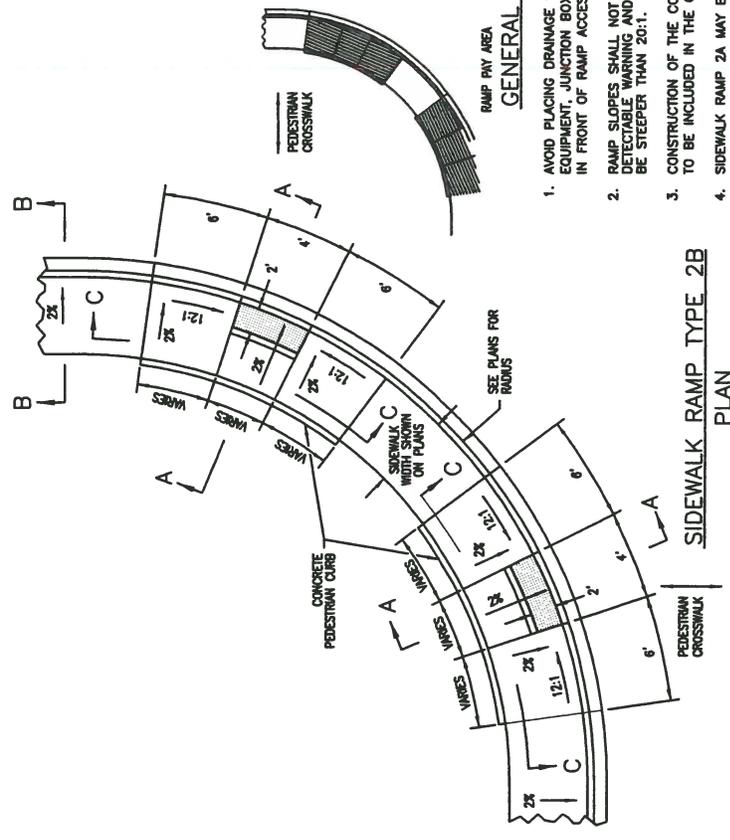
Revised: 8/31/06

Drawing Number:
 SP. 10A

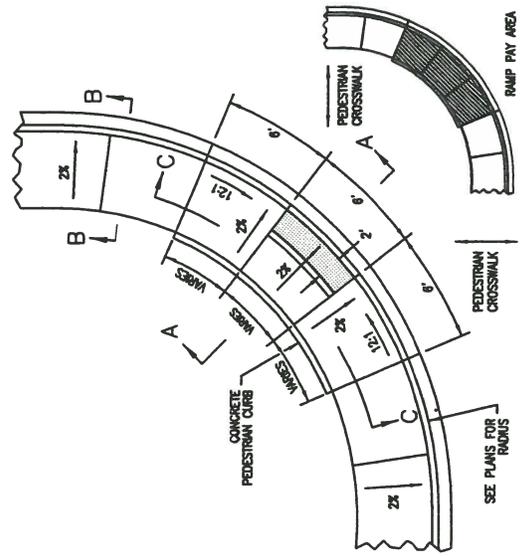
Drawn By: SBW *[Signature]*
 Checked By: *[Signature]*
 Approved By: *[Signature]*

CURB RAMP FOR
 PHYSICALLY HANDICAPPED
 ATTACHED WALK
 WITH DEPRESSED RAMP

Issued: 5/10/05
 Revised: 8/31/06
 Drawing Number:
 SP. 10B



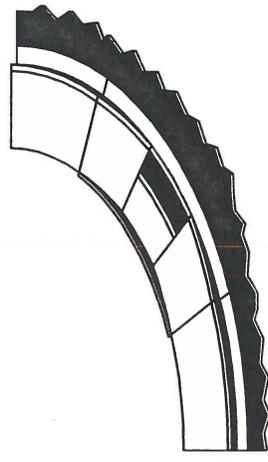
SIDEWALK RAMP TYPE 2B
 PLAN



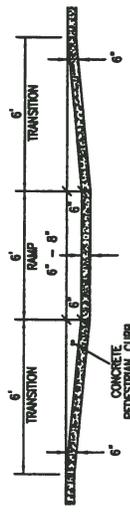
SIDEWALK RAMP TYPE 2A
 PLAN

GENERAL NOTES

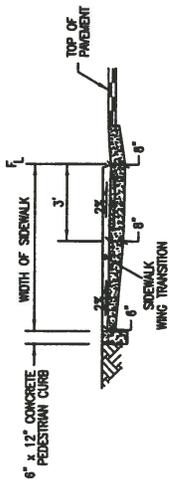
1. AVOID PLACING DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.
2. RAMP SLOPES SHALL NOT BE STEEPER THAN 12:1. THE DETECTABLE WARNING AND WELL AREA SLOPES SHALL NOT BE STEEPER THAN 20:1.
3. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB TO BE INCLUDED IN THE COST OF THE CURB RAMP.
4. SIDEWALK RAMP 2A MAY BE USED IN MID-BLOCK.
5. USE DETECTABLE WARNING DETAILS LOCATED IN THE ARAPAHOE COUNTY INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS.



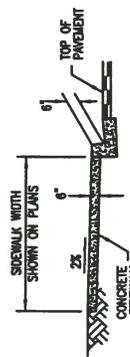
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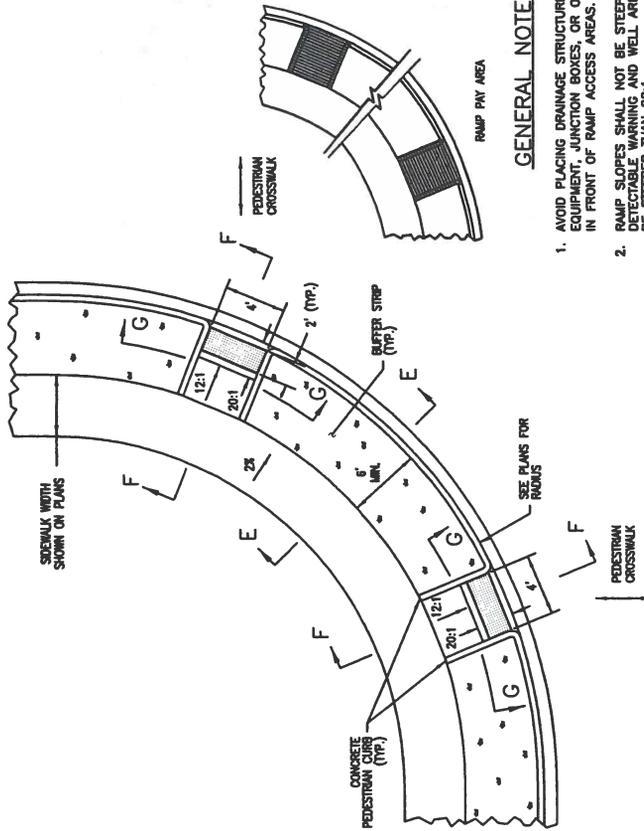
SECTION C-C



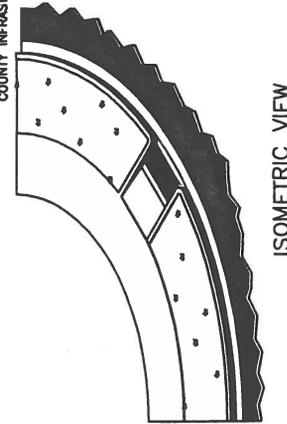
SECTION A-A



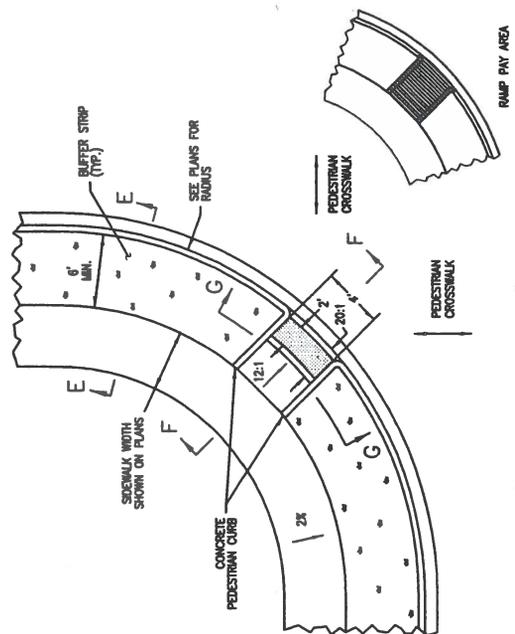
SECTION B-B



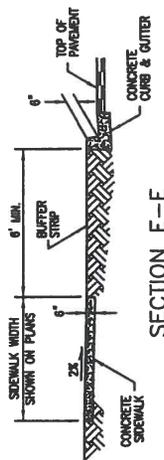
SIDEWALK RAMP TYPE 3B
PLAN



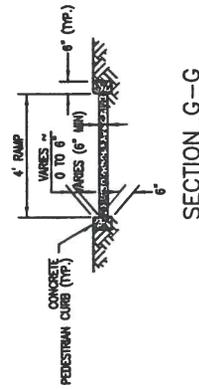
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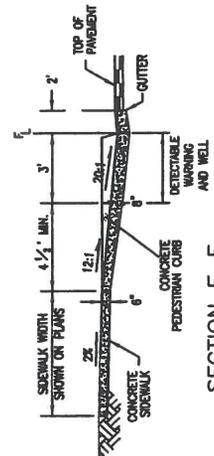
SIDEWALK RAMP TYPE 3A
PLAN



SECTION E-E



SECTION G-G



SECTION F-F

GENERAL NOTES

1. AVOID PLACING DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.
2. RAMP SLOPES SHALL NOT BE STEEPER THAN 12:1. THE DETECTABLE WARNING AND WELL AREA SLOPES SHALL NOT BE STEEPER THAN 20:1.
3. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB TO BE INCLUDED IN THE COST OF THE CURB RAMP.
4. USE DETECTABLE WARNING DETAILS LOCATED IN THE ARAPAHO COUNTY INFRASTRUCTURE DESIGN AND CONSTRUCTION STAND.

Drawn By: SBW *SBW*

Checked By: *[Signature]*

Approved By: *[Signature]*

CURB RAMPS FOR
PHYSICALLY HANDICAPPED
DETACHED WALK

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 10C

TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

MARK	DIA IN.	O.C. SPACING	TYPE	ALL INLETS		INLETS, H ≈ 5'				INLETS, H ≈ 5'			
				L = 5'		10'		15'		10'		15'	
				NO.REQ'D.	LENGTH	NO.REQ'D.	LENGTH	NO.REQ'D.	LENGTH	NO.REQ'D.	LENGTH	NO.REQ'D.	LENGTH
401		11"	II	15	*	21	*	26	*	11	*	11	*
402		11"	II	7	*	13	*	18	*	7	*	7	*
403		9"	II	*	4'-10"	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-10"
405		6"	VI	11	6'-10"	21	6'-10"	31	6'-10"	11	6'-10"	11	6'-10"
406		6"	VIII	7	8'-10"	7	13'-10"	7	18'-10"	7	8'-10"	7	8'-10"
407	1/2"	9"	II	*	5'-10"	*	10'-10"	*	15'-10"	*	5'-10"	*	5'-10"
408		12"	II	3	6'-10"	3	11'-0"	3	16'-0"	3	11'-0"	3	16'-0"
409		8"	II	6	5'-10"	6	10'-10"	6	15'-10"	6	10'-10"	6	15'-10"
410		11"	VII							3	*	3	*
411		11"	II							3	5'-2"	3	10'-2"
412		11"	II							3	2'-9"	3	2'-9"
413		9"	II							7	10'-10"	7	15'-10"
501		5 1/2"	IV	11	3'-4"	22	3'-4"	33	3'-4"	22	3'-4"	33	3'-4"
502	5/8"	5 1/2"	III							11	11'-5"	17	11'-5"
503		5 1/2"	II	5	3'-6"	16	3'-6"	27	3'-6"	6	3'-6"	6	3'-6"
504		5 1/2"	IX									5	8'-4"
601	3/4"	2 1/2"	V	2	8'-10"	2	8'-10"	2	8'-10"	2	8'-10"	4	8'-10"
#8[B.5				1	5'-10"	1	10'-10"	1	15'-10"	1	10'-10"	1	15'-10"
				2BARS,1ROD	---	4BARS,3RODS	---	8BARS,5RODS	---	4BARS,3RODS	---	8BARS,5RODS	---

* VARIABLE, REFER TO TABLE TWO.

☉ INCLUDE 18" NO. 4 BARS (SEE CHANNEL LAYOUT DETAIL).

▼ SEE CURB FACE ASSEMBLY ON SHEET 1 AND CHANNEL LAYOUT DETAILS ON THIS SHEET.

REGULAR INLETS

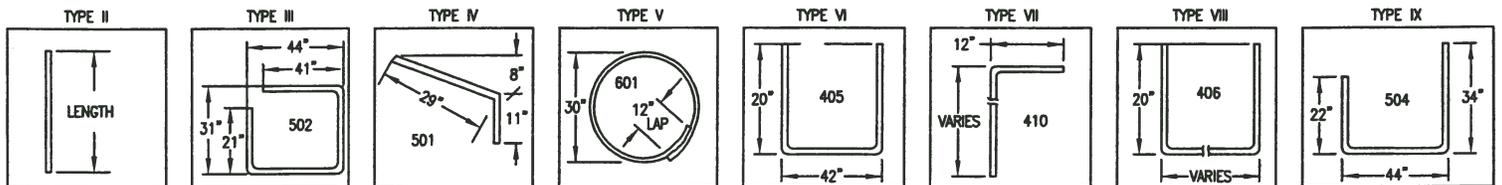
DROP BOX INLETS

TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"

'H'	LENGTH			NO. REQ'D. REGULAR		NO. REQ'D. DROP BOX		L=5'		L=10'		L=15'	
	401	402	410	403	407	403	407	CU.YD.CONC.	LB.STEEL	CU.YD.CONC.	LB.STEEL	CU.YD.CONC.	LB.STEEL
	3'-0"	2'-8"	1'-8"		10	7			3.2	285	5.3	497	7.4
3'-6"	3'-2"	2'-2"		10	7			3.4	305	5.7	528	7.9	747
4'-0"	3'-8"	2'-8"		12	9			3.7	326	6.0	559	8.4	786
4'-6"	4'-2"	3'-2"		12	9			3.9	334	6.4	571	8.8	803
5'-0"	4'-8"	3'-8"		14	11			4.1	354	6.7	602	9.3	844
5'-6"	5'-2"	4'-2"	3'-5"	16	13	15	6	4.4	375	6.0	607	7.4	850
6'-0"	5'-8"	4'-8"	3'-11"	16	13	16	6	4.6	382	6.2	616	7.6	860
6'-6"	6'-2"	5'-2"	4'-5"	18	15	18	8	4.8	402	6.4	637	7.8	880
7'-0"	6'-8"	5'-8"	4'-11"	20	17	19	10	5.0	423	6.6	654	8.0	897
7'-6"	7'-2"	6'-2"	5'-5"	20	17	20	10	5.3	430	6.9	664	8.3	907
8'-0"	7'-8"	6'-8"	5'-11"	22	19	22	12	5.5	451	7.1	684	8.5	927
8'-6"	8'-2"	7'-2"	6'-5"	24	21	23	14	5.7	471	7.3	702	8.7	944
9'-0"	8'-8"	7'-8"	6'-11"	24	21	24	14	6.0	479	7.6	711	9.0	954
9'-6"	9'-2"	8'-2"	7'-5"	26	23	26	16	6.2	499	7.8	732	9.2	974
10'-0"	9'-8"	8'-8"	7'-11"	28	25	27	18	6.4	520	8.0	749	9.4	992
10'-6"	10'-2"	9'-2"	8'-5"	28	25	28	18	6.7	527	8.3	759	9.7	1001
11'-0"	10'-8"	9'-8"	8'-11"	30	27	30	20	6.9	547	8.5	779	9.9	1022

NOTE: FOR L=5', L=10' AND L=15'
REGULAR INLETS: TOTAL QUANTITIES NEEDED ARE OUTSIDE OF THE HEAVY BLACK LINE.
DROP BOX INLETS: TOTAL QUANTITIES NEEDED ARE INSIDE OF THE HEAVY BLACK LINE

STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL.



BAR BENDING DIAGRAMS ~ (Dimensions are Out-to-Out of bar)

Drawn By: SBW *SBW*

Checked By: *PH*

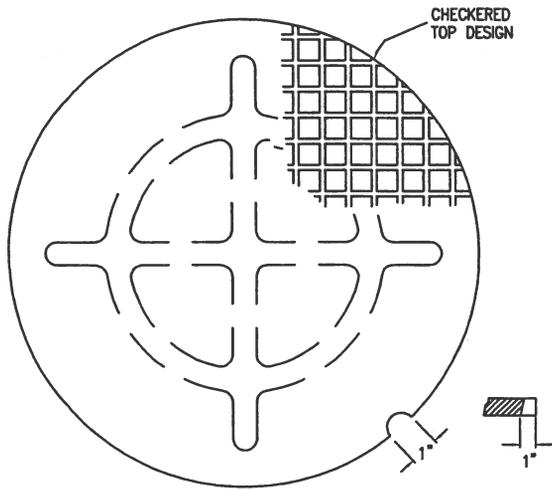
Approved By: *JEP*

CURB INLET
TYPE R

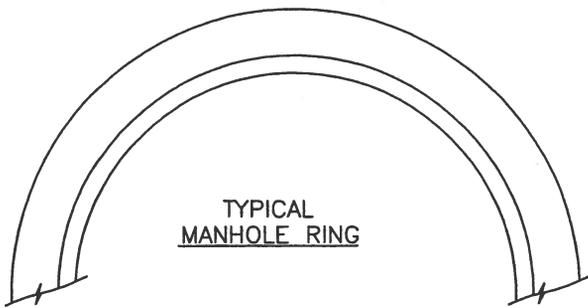
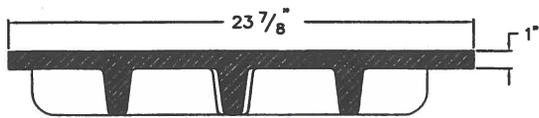
Issued: 5/10/05

Revised: 8/31/06

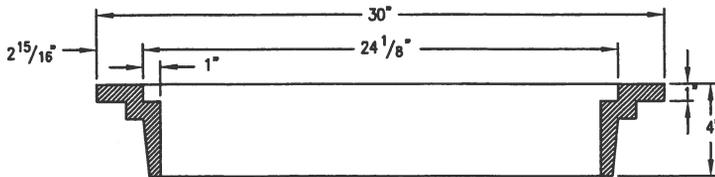
Drawing Number:
SP. 11c



TYPICAL
MANHOLE COVER



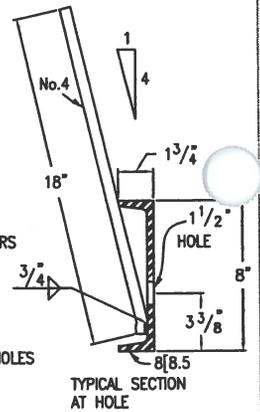
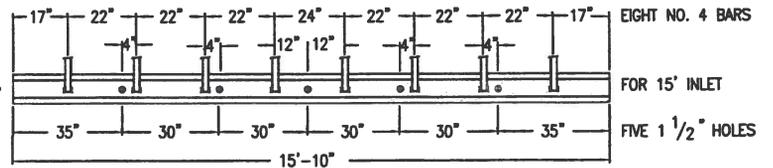
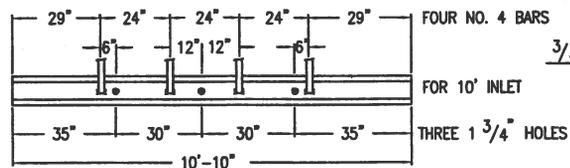
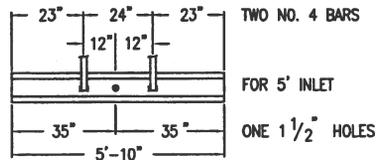
TYPICAL
MANHOLE RING



WEIGHTS: COVER = 125 LBS.
RING = 135 LBS.
TOTAL = 260 LBS.

GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS B.
2. CONCRETE WALLS SHALL BE FORMED ON BOTH SIDES AND SHALL BE 8 IN. THICK.
3. INLET STEPS SHALL BE IN ACCORDANCE WITH AASHTO M 199.
4. CURB FACE ASSEMBLY SHALL BE GALVANIZED AFTER WELDING.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 IN. CURB AND GUTTER CORNERS SHALL BE FINISHED TO MATCH THE EXISTING CURB AND GUTTER BEYOND THE TRANSITION GUTTER.
6. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. ALL REINFORCING BARS SHALL BE EPOXY COATED.
7. DIMENSIONS AND WEIGHTS OF TYPICAL MANHOLE RING AND COVER ARE NOMINAL.
8. MATERIAL FOR MANHOLE RINGS AND COVERS SHALL BE GRAY OR DUCTILE CAST IRON CONFORMING TO 712.06.
9. SINCE PIPE ENTRIES INTO THE INLET ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK. QUANTITIES INCLUDE VOLUMES OCCUPIED BY PIPES.
10. STRUCTURAL STEEL SHALL BE GALVANIZED AND SHALL CONFORM TO THE REQUIREMENTS OF 712.06.



CHANNEL LAYOUT DETAILS

Drawn By: SBW *[Signature]*

Checked By: *[Signature]*

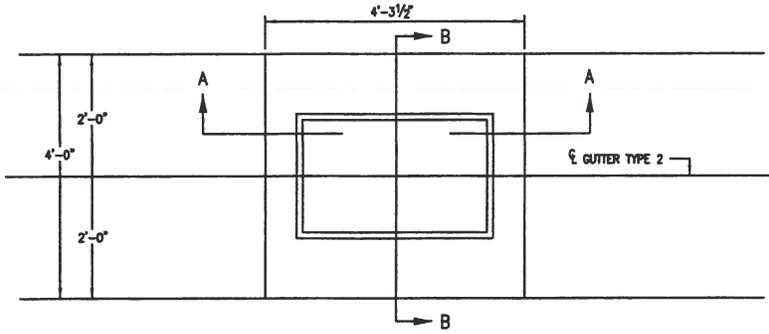
Approved By: *[Signature]*

CURB INLET
TYPE R

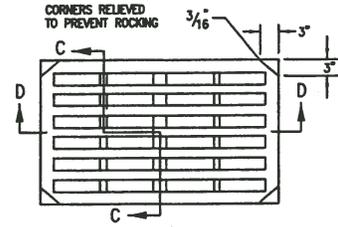
Issued: 5/10/05

Revised: 8/31/06

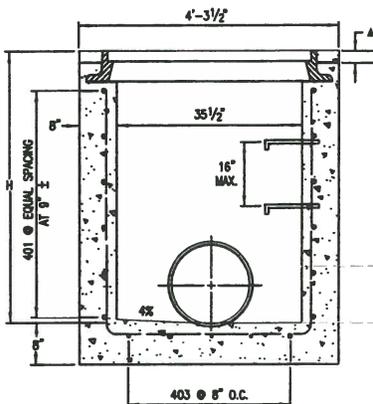
Drawing Number:
SP. 11d



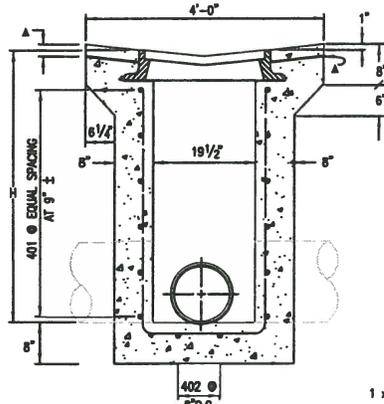
PLAN OF TYPE 13 INLET FOR GUTTER TYPE 2



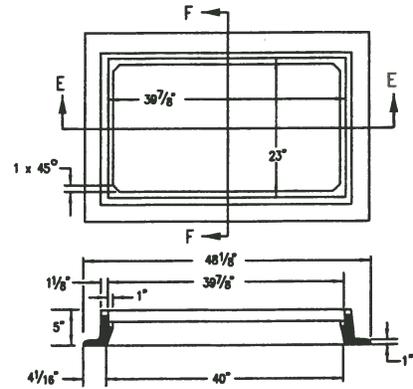
SECTION D-D
NO. 13 GRATE



SECTION A-A

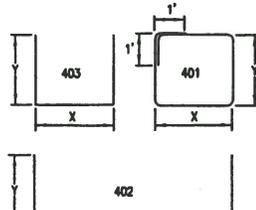


SECTION B-B



SECTION E-E
NO. 13 GRATING & FRAMES

APPROX. WEIGHT 590 LBS.



ALL DIMENSIONS ARE OUT-TO-OUT OF BAR.
BENDING DIAGRAM

Drawn By: SBW *SBW*

Checked By: *MH*

Approved By: *JEP*

CURB INLET
TYPE 13

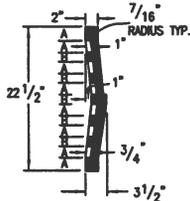
Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 12

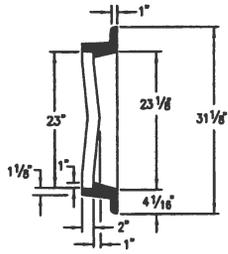
GENERAL NOTES

1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. CAST-IN-PLACE CONCRETE WALLS SHALL BE FORMED ON BOTH SIDES.
3. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED $\frac{3}{4}$ IN.
4. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. ALL REINFORCING BARS SHALL BE EPOXY COATED.
5. STEPS SHALL BE PROVIDED WHEN INLET DIMENSION "H" EXCEEDS 3 FT.-6 IN. AND SHALL BE IN ACCORDANCE WITH AASHTO M 109.
6. ALL GRATES AND FRAMES SHALL BE GRAY OR DUCTILE CAST IRON CONFORMING TO 712.06. GRATES AND FRAMES SHALL BE DESIGNED TO WITHSTAND HS 20 LOADING.



SECTION C-C

- A = $1\frac{3}{4}$ "
- B = $11\frac{1}{8}$ "
- C = $7\frac{15}{16}$ "



SECTION F-F

QUANTITIES

H	CONCRETE	REINFORCING STEEL	NO. OF 401 BARS REQ'D.
	CU. YD.	Ø LB.	
3'-0"	1.3	72	4
3'-6"	1.5	76	4
4'-0"	1.6	80	5
4'-6"	1.8	104	6
5'-0"	1.9	109	6
5'-6"	2.1	122	7
6'-0"	2.2	136	8
6'-6"	2.4	141	8
7'-0"	2.5	154	9
7'-6"	2.7	168	10
8'-0"	2.8	173	10
8'-6"	3.0	187	11
9'-0"	3.1	200	12
9'-6"	3.3	205	12
10'-0"	3.4	219	13

Ø INCLUDES 1% FOR OVERRUN.
NOTE: CONCRETE QUANTITIES INCLUDE VOLUME OCCUPIED BY PIPE.

BAR LIST FOR H=3'-0"

MARK	NO. REQ'D.	DIMENSIONS		LENGTH
		X	Y	
401	4	3'-6"	2'-2"	13'-4"
402	2	3'-4 1/2"	* 2'-8 1/2"	8'-5 1/2"
403	5	2'-1 1/2"	* 2'-7"	7'-2 1/2"

* ADD 6 IN. TO THIS DIMENSION FOR EACH 6 IN. INCREASE OF "H" OVER 3 FT.-0 IN.

NOTE:

SEE PLAN DETAILS FOR LOCATION AND SIZE OF PIPE.

- ▲ WHEN BITUMINOUS MATERIAL IS TO EXTEND TO THE EDGE OF THE GRATING FRAME, CONCRETE MAY BE DEPRESSED.

Drawn By: SBW *[Signature]*

Checked By: *[Signature]*

Approved By: *[Signature]*

CURB INLET
TYPE 13

Issued: 5/10/05

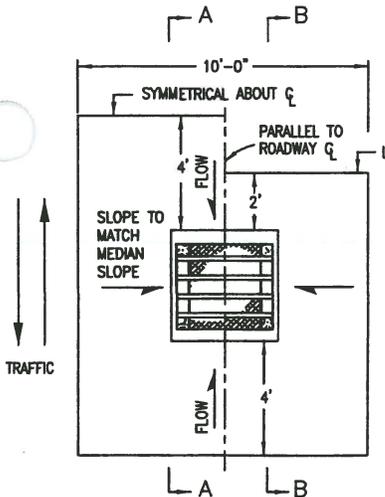
Revised: 8/31/06

Drawing Number:
SP. 13

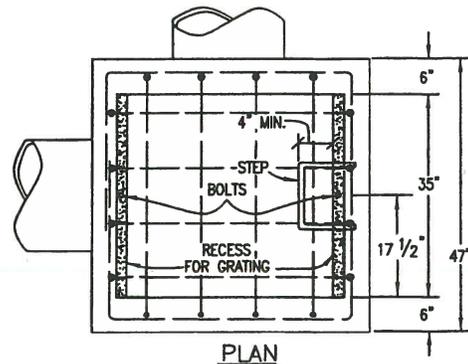
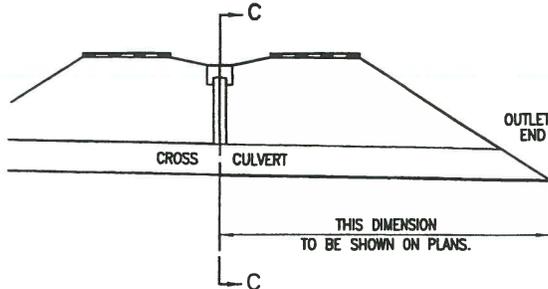
STEEL GRATE QUANTITIES

NO. PIECES	DESCRIPTION	LENGTH	LB. PER FT.	WEIGHT (LBS.)
4	S4 x 7.7 BEAM	40"	7.70	103
2	3 1/2" x 1/4" FLAT	26 5/8"	2.98	13
2	3" x 1/4" FLAT	26 5/8"	2.55	12

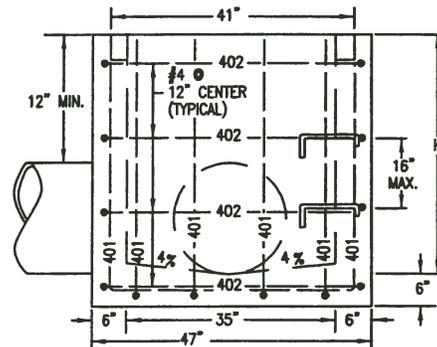
TOTAL 128 LBS.



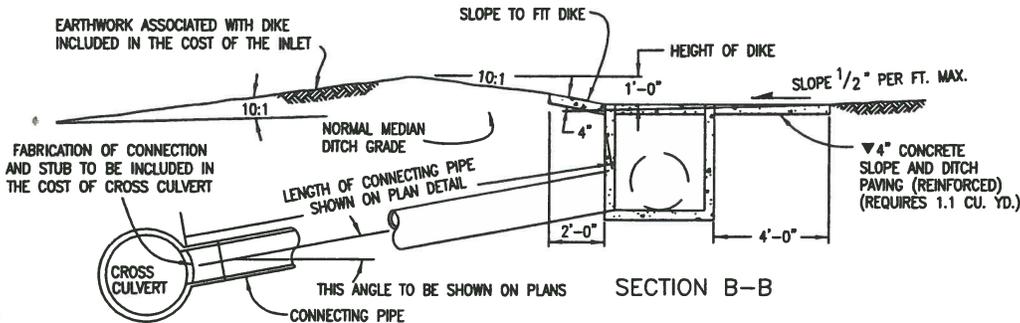
INLET WITH DITCH PAVING



PLAN

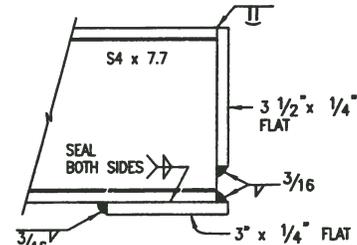


**ELEVATION
CONCRETE INLET**



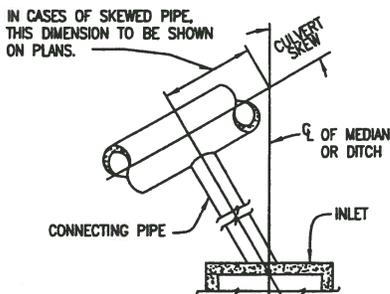
SECTION B-B

**INLET ON GRADE
(FLOW FROM ONE DIRECTION)**

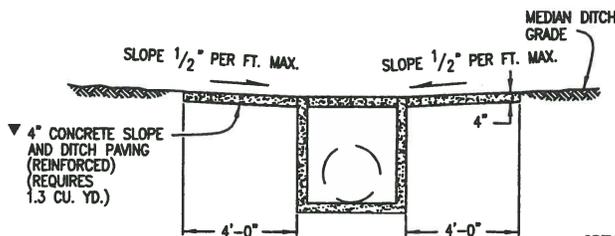


SECTION D-D

**SECTION C-C
INLET CONNECTED TO A CROSS CULVERT**

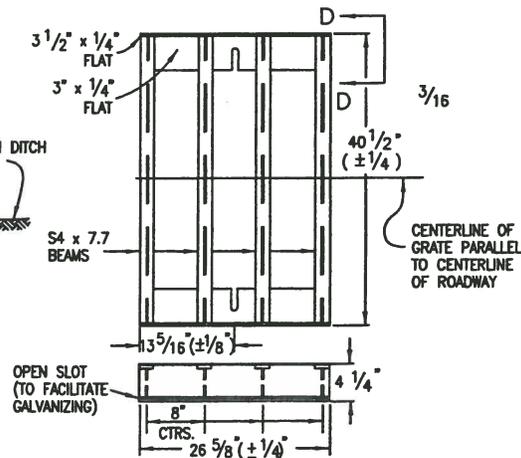


**INLET CONNECTED TO A
SKEWED CROSS CULVERT**



SECTION A-A

**INLET AT BOTTOM
OF VERTICAL CURVE**



STANDARD INLET GRATE

Drawn By: SBW *[Signature]*

Checked By: *[Signature]*

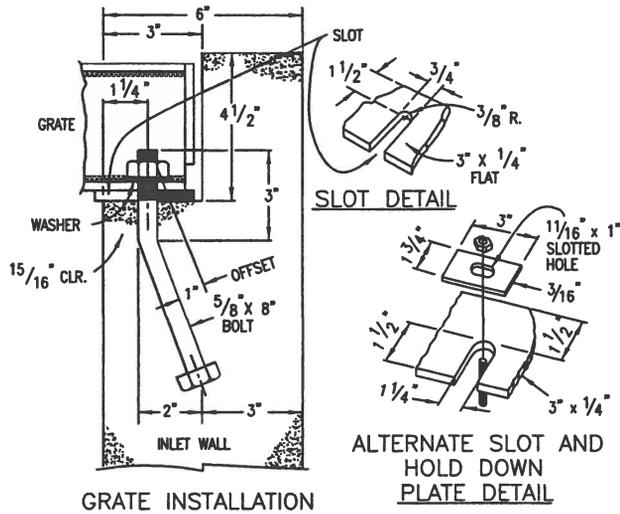
Approved By: *[Signature]*

INLET
TYPE C

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 14a

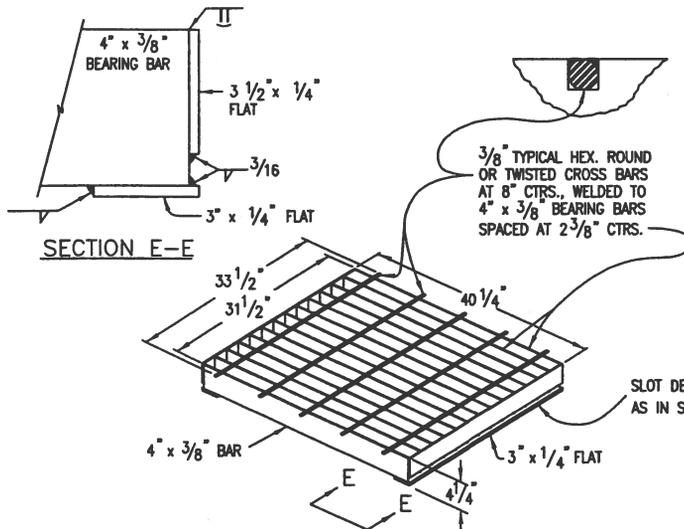


GRATE INSTALLATION
DETAIL

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. REINFORCING BARS SHALL BE EPOXY COATED AND DEFORMED, AND SHALL HAVE A MINIMUM 2 IN. CLEARANCE.
3. CONCRETE SLOPE AND DITCH PAVING SHALL CONFORM TO SECTION 507. REINFORCEMENT FOR CONCRETE SLOPE PAVING SHALL BE 6 X 6 - W1.4 OR 6 X 6 - W2.1 X W2.1.
4. STRUCTURAL STEEL FOR GRATES AND GRATE INSTALLATION HARDWARE SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH 712.06.
5. THE STANDARD INLET GRATES SHALL BE USED ON ALL TYPE C INLETS UNLESS CLOSE MESH GRATES ARE SPECIFIED ON THE PLANS.
6. STEPS SHALL BE PROVIDED WHEN INLET DIMENSION "H" EXCEEDS 3 FT.-6 IN. AND SHALL BE IN ACCORDANCE WITH AASHTO M 199.
7. SEE SHEET M-604-11, INLET, TYPE D, FOR REINFORCEMENT AROUND THE PIPE OPENING.

▼ - CONCRETE SLOPE AND DITCH PAVING WILL BE REQUIRED WHEN SHOWN ON PLANS.



CLOSE MESH GRATE

HYDRAULICALLY INEFFICIENT, POOR TOLERANCE FOR DEBRIS AND ICE. USE FOR PEDESTRIAN AND BICYCLE AREAS.

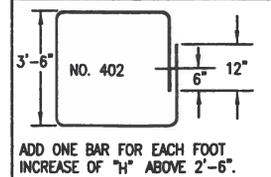
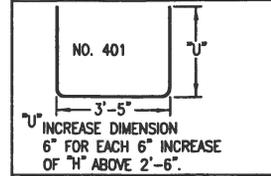
QUANTITIES
FOR ONE INLET

H	CONCRETE * (cu. YDS.)	REINF. STEEL (LBS.)	NO. STEPS REQ'D.
2'-6"	0.9	75	0
3'-0"	1.0	80	0
3'-6"	1.2	96	0
4'-0"	1.3	101	1
4'-6"	1.4	116	2
5'-0"	1.5	122	2
5'-6"	1.7	137	2
6'-0"	1.8	142	3
6'-6"	1.9	158	3
7'-0"	2.0	163	3
7'-6"	2.2	179	4
8'-0"	2.3	184	4
8'-6"	2.4	199	4
9'-0"	2.5	205	5
9'-6"	2.7	220	5
10'-0"	3.0	235	6
11'-6"	3.4	251	6

* INCLUDES VOLUME OCCUPIED BY PIPES.

BAR LIST FOR H=2'-6"
AND BENDING DIAGRAM

MARK	NO. REQ'D.	HGT.	LENGTH
401	2	2'-3"	7'-11"
401	6	2'-7" 5/8"	8'-7"
402	3		15'-0"



ALL BARS TO BE 1/2" DIA. CUT OR BEND AROUND PIPES AS REQUIRED. 402 BARS WILL BE EQUALLY SPACED FROM EACH OTHER.

Drawn By: SBW *[Signature]*

Checked By: *[Signature]*

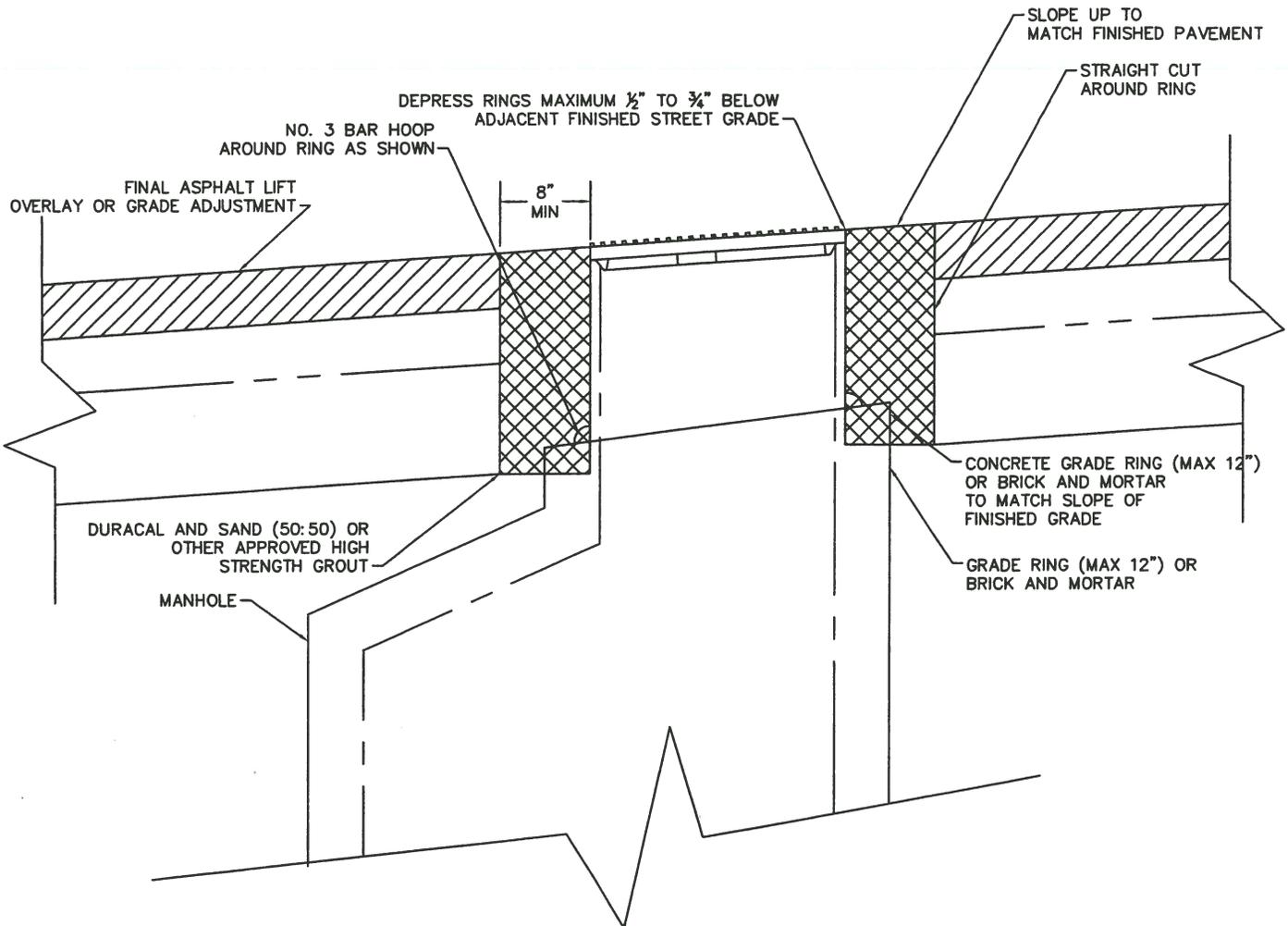
Approved By: *[Signature]*

INLET
TYPE C

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 14b



NOTES:

1. ADEQUATE BARRICADES SHALL BE PLACED AND MAINTAINED UNTIL THE COLLAR ATTAINS A COMPRESSIVE STRENGTH OF 3000 PSI OR GREATER.
2. DURACAL GROUT SHALL BE A MIXTURE OF 100 LBS DURACAL, 26 LBS WATER (3.12 GALLONS) AND 100 LBS OF SAND CONFORMING TO ASTM C-35.

Drawn By: SBW *[Signature]*

Checked By: *[Signature]*

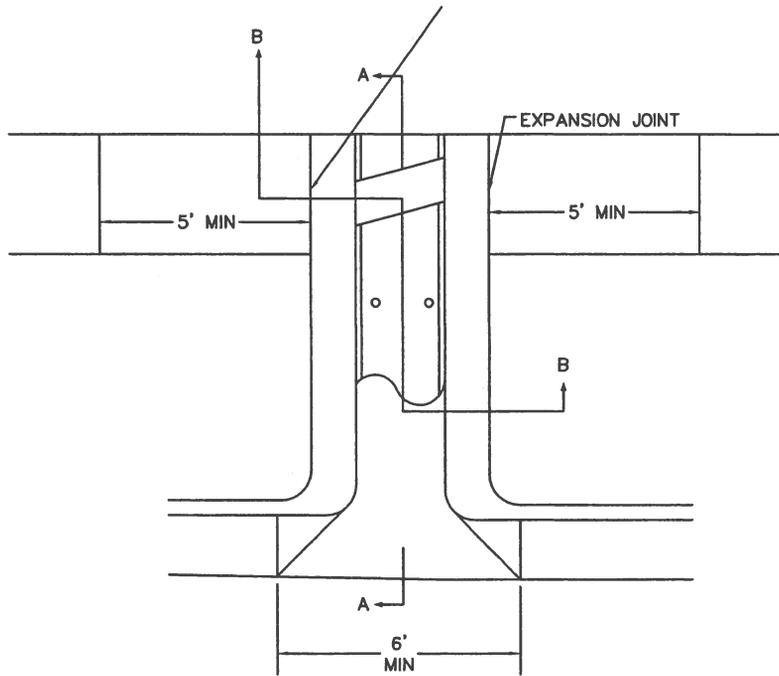
Approved By: *[Signature]*

MANHOLE RING AND COVER
ADJUSTMENT

Issued: 5/10/05

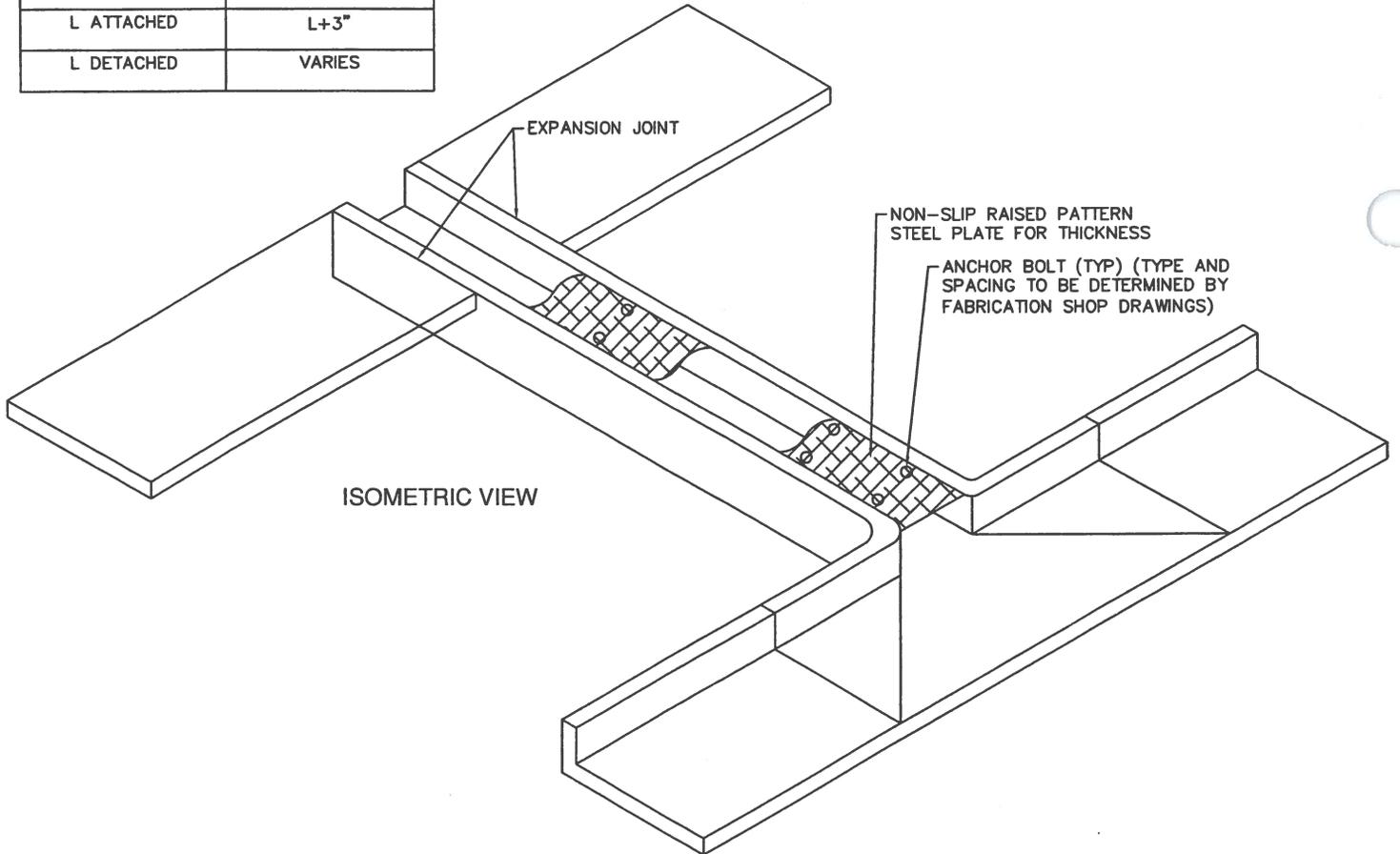
Revised: 8/31/06

Drawing Number:
SP. 15



PLAN VIEW

TYPE OF WALK	LENGTH OF PLATE
L ATTACHED	L+3"
L DETACHED	VARIES



Drawn By: SBW *SBW*

Checked By: *MA*

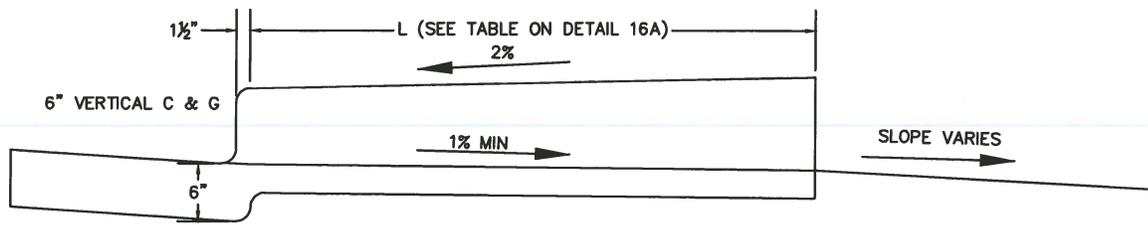
Approved By: *JEP*

SIDEWALK CHASE
IF PERMITTED BY VARIANCE

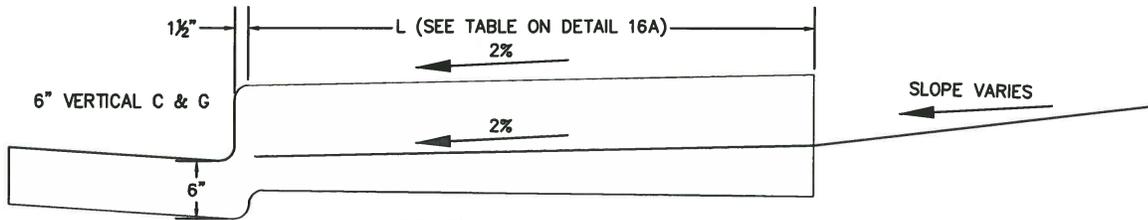
Issued: 5/10/05

Revised: 8/31/06

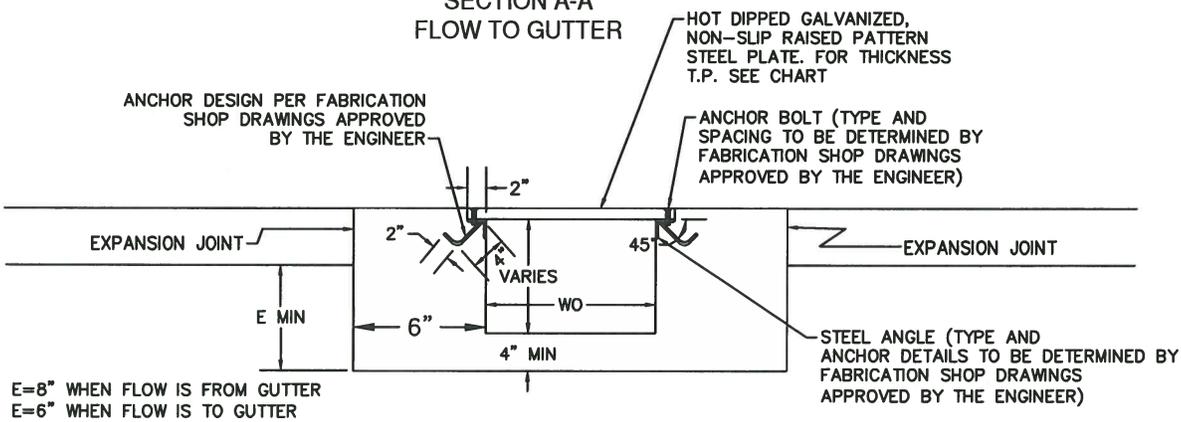
Drawing Number:
SP. 16a



SECTION A-A
FLOW FROM GUTTER

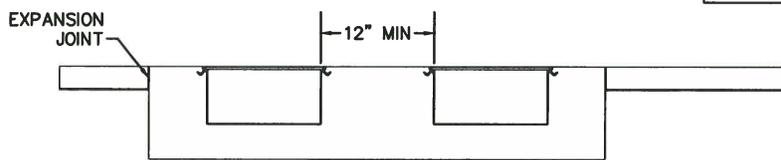


SECTION A-A
FLOW TO GUTTER



SECTION B-B
SINGLE CHASE

W.O. WIDTH OF OPENING	TP THICKNESS OF PLATE
12"	1/2"
12"-18"	5/8"



SECTION B-B
MULTIPLE CHASE
WHEN OPENINGS ARE LARGER THAN 18"

Drawn By: SBW/VT

Checked By:

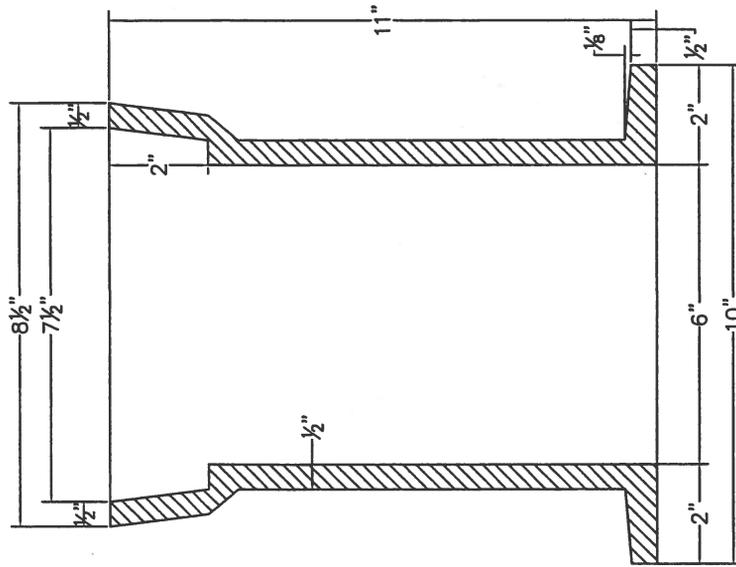
Approved By:

SIDEWALK CHASE
IF PERMITTED BY VARIANCE

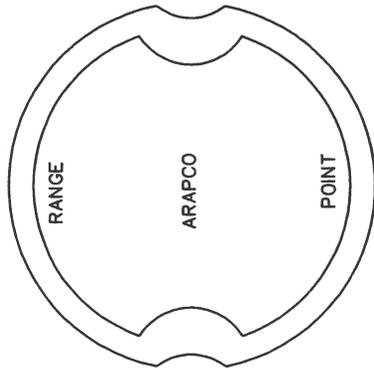
Issued: 5/10/05

Revised: 9/10/13

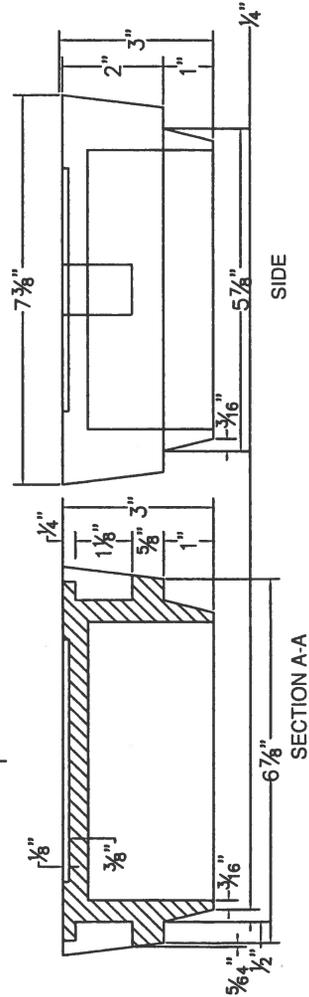
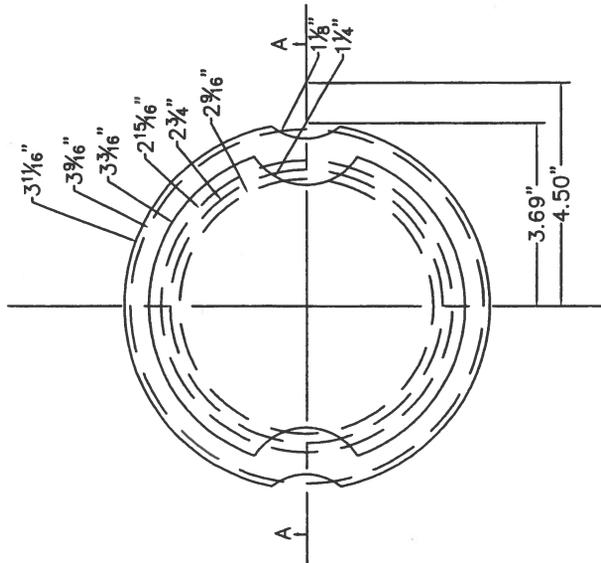
Drawing Number:
SP. 16b



NOTES:
 LETTERS SHALL BE NOT LESS THAN 5/8" HIGH &
 RAISED 1/8" ABOVE SURFACE
 ALL FILLETS & ROUNDS RADI=1/8"



REQUIRED LETTERING FOR
 BOX COVER



Drawn By: SBW *[Signature]*

Checked By: *[Signature]*

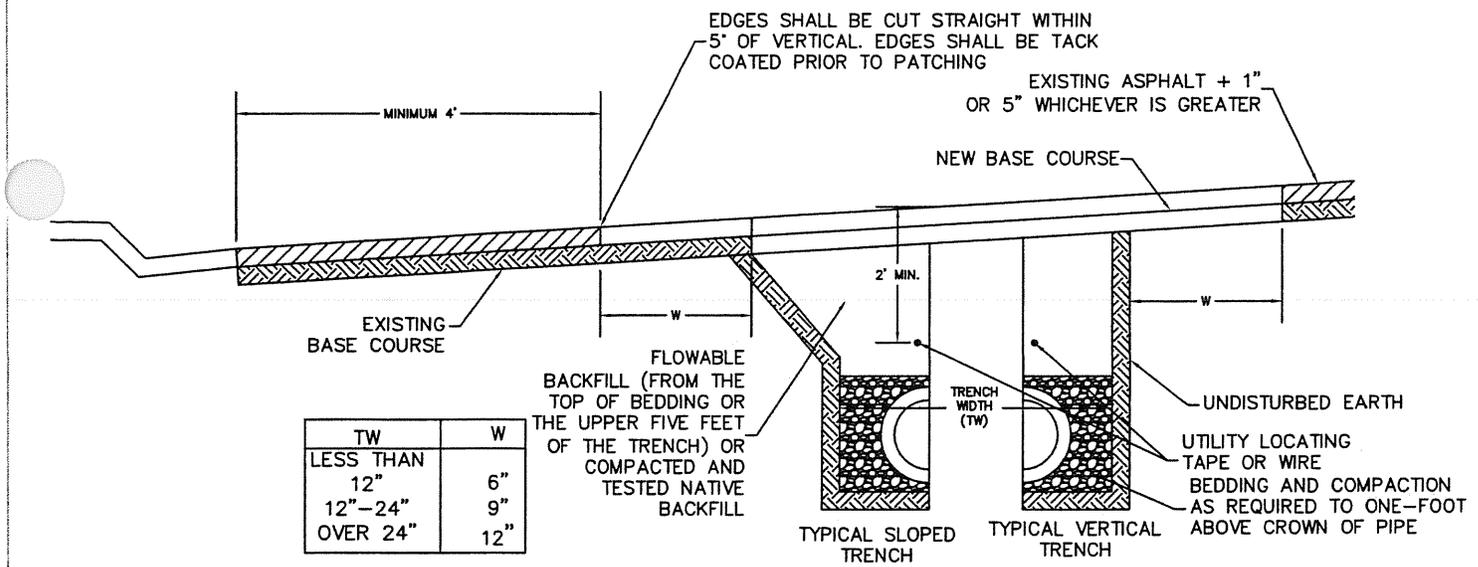
Approved By: *[Signature]*

RANGE BOX

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
 SP. 17



TW	W
LESS THAN 12"	6"
12"-24"	9"
OVER 24"	12"

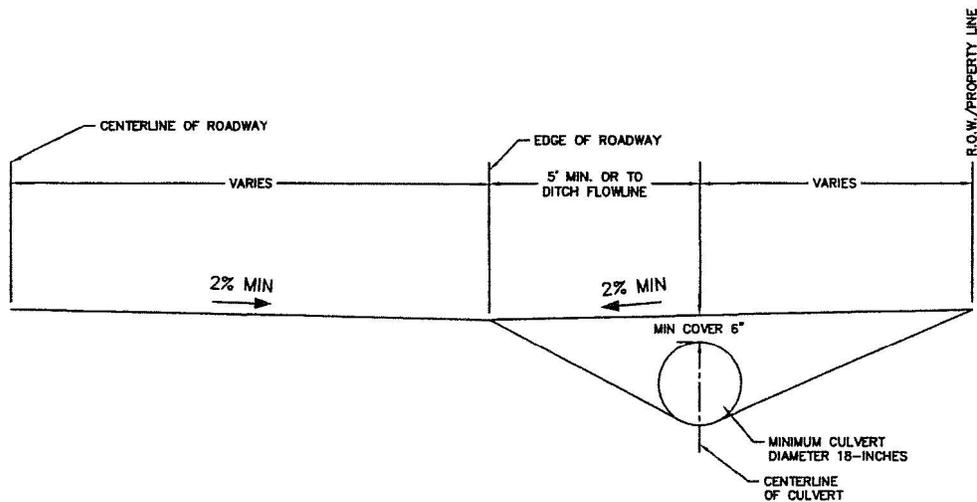
NOTES:

1. THIS TRENCH PATCHING DETAIL SPECIFIES REQUIREMENTS IN ADDITION TO THOSE SPECIFIED IN THE MGPEC STANDARDS AS ADOPTED.
2. ANY UTILITY INSTALLED WITHIN THE RIGHT-OF-WAY (ROW) OR EASEMENTS SHALL HAVE UTILITY LOCATING TAPE OR WIRE OVER THE TOP OF THE UTILITY LOCATED A MINIMUM OF 2'-0" BELOW FINAL GRADE OR LOCATED ON UTILITY IF MINIMUM DEPTH CANNOT BE ACHIEVED
3. A CONSTRUCTION TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO AND APPROVED BY ARAPAHOE COUNTY PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS IN THE RIGHT-OF-WAY.
4. TRENCH SHALL BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES OR STRUCTURES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
5. THE TRENCH WIDTH SHALL BE CONFINED TO THOSE MINIMUM DIMENSIONS, WHICH WILL PERMIT PROPER INSTALLATION AND ACCEPTABLE PIPE LOADING, AS ESTABLISHED BY CURRENT ACCEPTABLE ENGINEERING PRACTICES.
6. EXISTING ASPHALT OR PAVEMENT SHALL BE CUT BACK A MINIMUM OF W (SEE ABOVE) BEYOND THE TRENCH LIMITS OR TO SOUND PAVEMENT WHICHEVER IS GREATER. IF ENCROACHMENT INTO THE OUTSIDE 4-FOOT ZONE OR IF AN ISLAND IS LOCATED INSIDE THE 4-FOOT ZONE, THE 4-FOOT ZONE SHALL BE INCLUDED IN THE REQUIRED PATCH.
7. BACKFILL SHALL MEET MGPEC STANDARDS, ITEM 18, SECTIONS 18.1, 18.2, 18.2.1, 18.2.2, 18.2.3 AND 18.2.4 EXCEPT WHERE THESE STANDARDS DICTATE OTHERWISE.
8. FULL DEPTH ASPHALT CAN BE USED AS AN ALTERNATIVE TO BASE COURSE. A RATION OF 3 INCHES OF BASE COURSE TO 1 INCH OF ASPHALT SHALL BE USED IN THE SUBSTITUTION.
9. A TEMPORARY COLD-MIX PATCH, 4-INCHES IN DEPTH, WILL BE REQUIRED FOR ALL STREET CUTS IF A PERMANENT HOT-MIX ASPHALT PATCH CANNOT BE APPLIED FOR ANY REASON IMMEDIATELY FOLLOWING CONSTRUCTION.
10. THE TEMPORARY PATCH SHALL BE MAINTAINED UNTIL THE PERMANENT HOT-MIX ASPHALT PATCH IS APPLIED WITHIN A MAXIMUM OF 7 CALENDAR DAYS.
11. COMPACTION TESTING RESULTS SHALL BE A MINIMUM OF 95% COMPACTION WITHIN THE LIMITS OF THE ROADWAY AND 90% WHEN OUTSIDE THE LIMITS OF THE ROADWAY.

Drawn By: SBW *[Signature]*
 Checked By: *[Signature]*
 Approved By: *[Signature]*

TRENCH PATCHING
DETAIL

Issued: 5/10/05
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 Drawing Number:
 SP. 18



NOTES:

1. A CONSTRUCTION PERMIT IS REQUIRED FROM THE DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT THE RURAL DRIVEWAY CULVERT SHALL BE INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE "INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS".
2. UNLESS OTHERWISE NOTED, COVER SHALL BE A MINIMUM OF 6-INCHES OF ROAD BASE.
3. THE DRIVEWAY SLOPE SHALL BE EITHER +2% OR -2% FOR A MINIMUM OF 5-FEET FROM THE EXISTING EDGE OF ROADWAY.
4. CULVERT SHALL BE A MINIMUM OF 18-INCHES DIAMETER CORROGATED METAL PIPE (CMP) 16-GUAGE, WITH FLARED END SECTIONS ON EACH END.
5. CULVERT SHALL HAVE A MINIMUM 2% LONGITUDINAL GRADE TO CONVEY THE DITCH FLOWS.
6. THE MINIMUM LENGTH OF THE CULVERT SHALL BE 24-FEET.
7. DRIVEWAY SHALL BE CROWNED IN THE CENTER WITH A MINIMUM CROSS SLOPE OF 2% TO EACH EDGE.

Drawn By: SBW *SBW*

Checked By: *Ch*

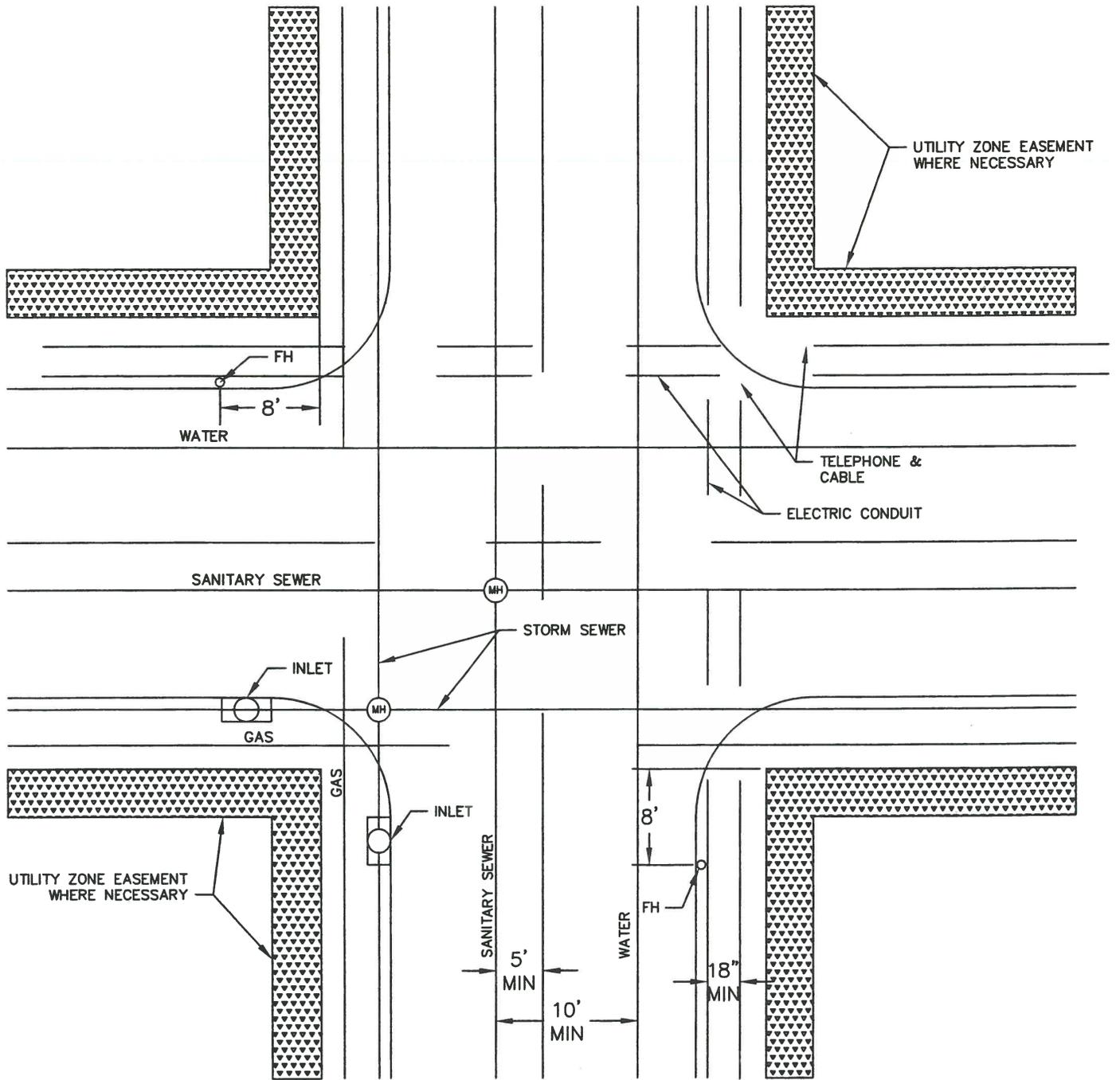
Approved By: *JSP*

DRIVEWAY CULVERT DETAIL FOR
NON-CURBED RURAL AREAS

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Revised: 8/31/06

Drawing Number:
SP. 19

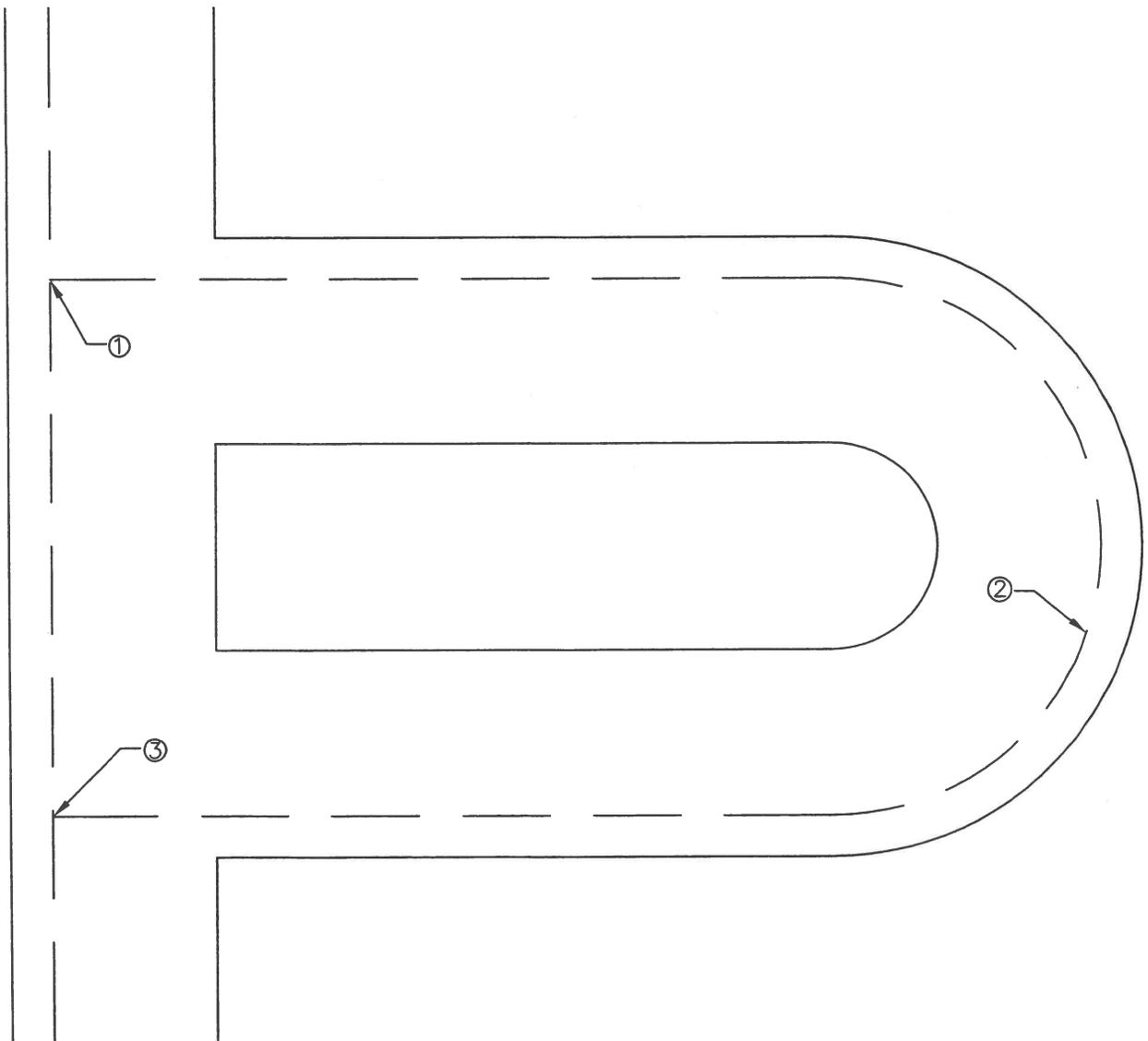


NOTE:
 THIS STANDARD IS A GUIDE ONLY AND DEVIATIONS WILL BE ACCEPTABLE WHERE CONDITIONS DICTATE. DIMENSIONS SHOWN ARE DESIRABLE BUT DO NOT GOVERN. THE INTENTION IS TO SHOW THE RELATIVE POSITION OF ALL UTILITIES.

Drawn By: SBW
 Checked By: _____
 Approved By: _____

UTILITY LINE LOCATION
 GENERAL

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 Drawing Number:
 SP. 20



EXAMPLE OF A UTILITY RELOCATION
TO A NORMAL POSITION AT AN INTERSECTION

1. CARRY A UTILITY AROUND CORNER.
2. STAY ON SAME SIDE OF STREET.
3. RETURN UTILITY TO NORMAL SIDE OF STREET AT INTERSECTION.

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Checked By: *[Signature]*

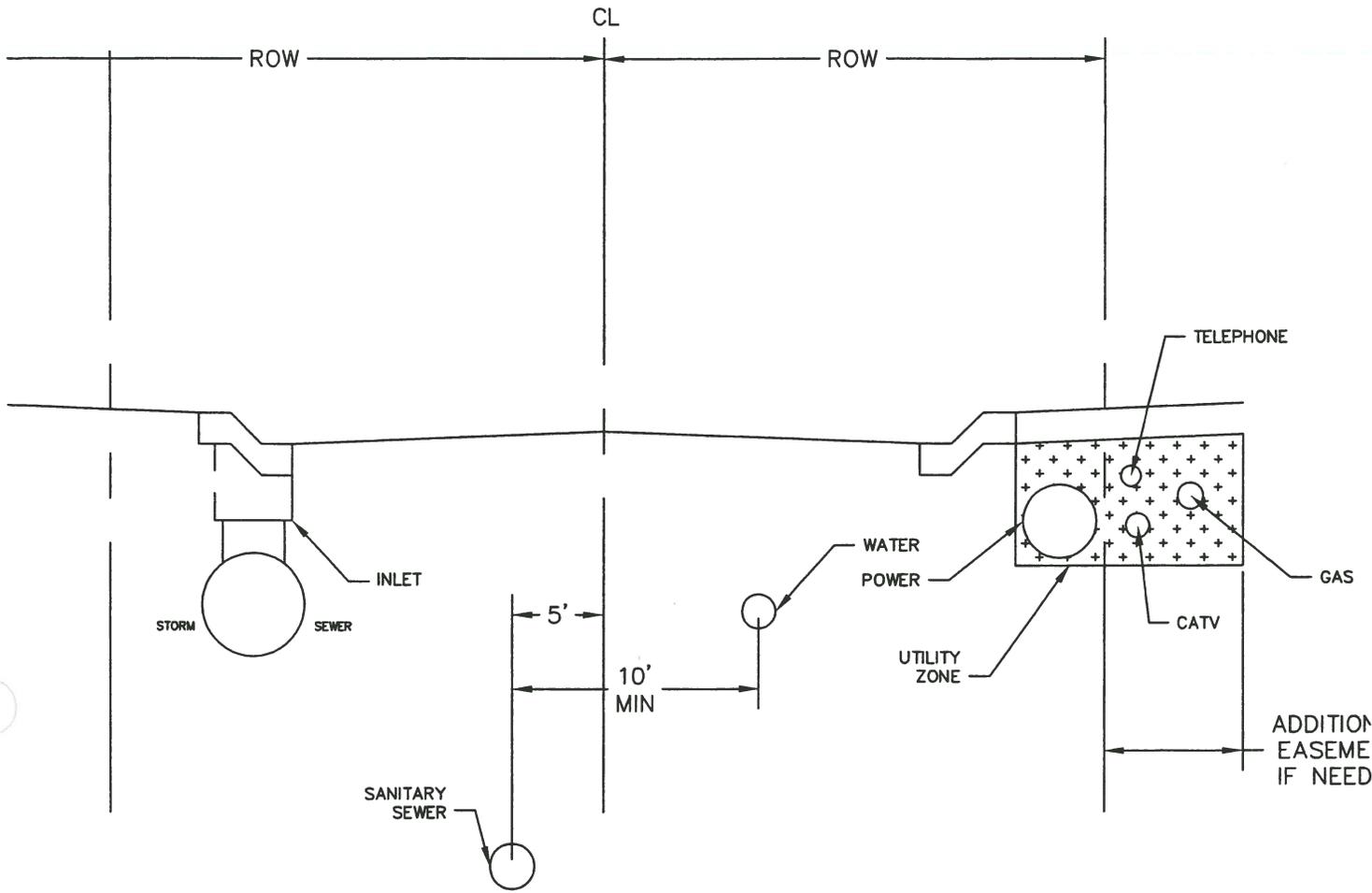
Approved By: *[Signature]*

UTILITY LINE LOCATION
GENERAL

Issued: 5/10/05

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Drawing Number:
SP. 21



MINIMUM ALLOWABLE DEPTHS

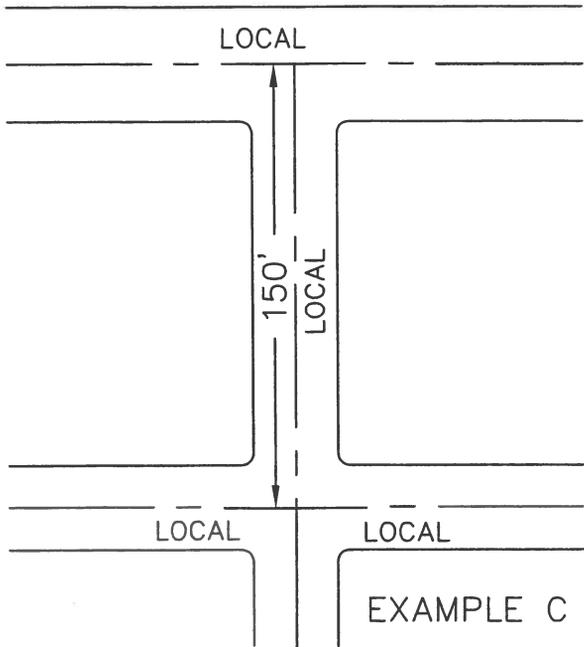
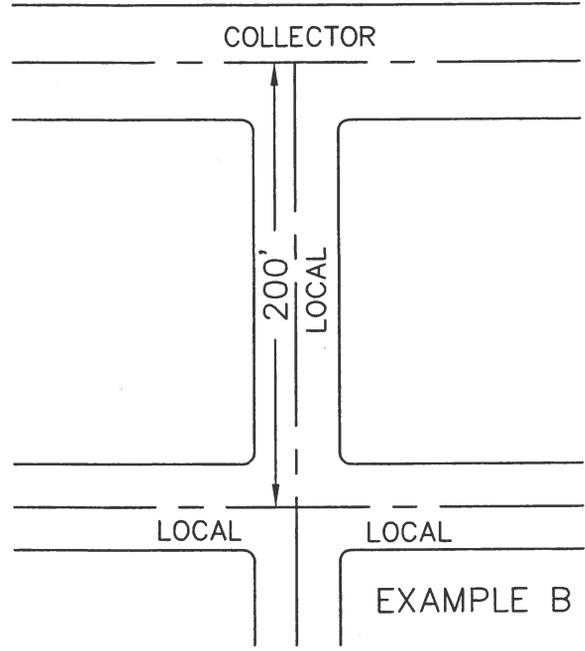
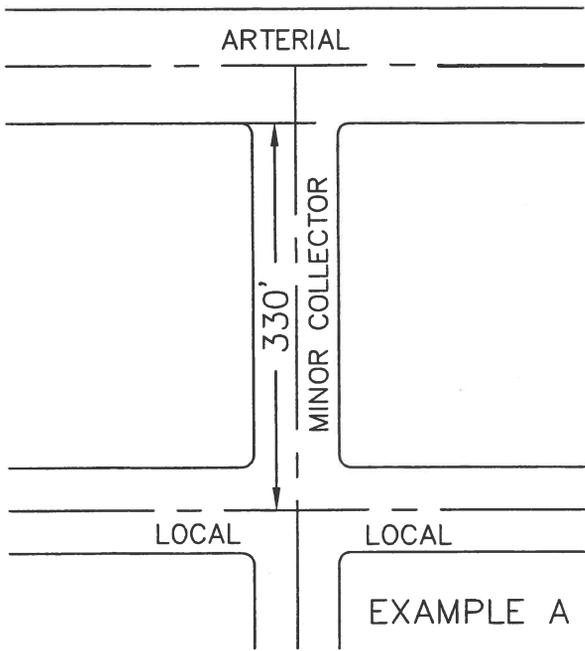
STREET LIGHTS	30" MIN
GAS	30" MIN
TELEPHONE	30-36" MIN
ELECTRIC POWER	42" MIN
STORM SEWER	40" MIN
SANITARY SEWER	60" MIN
CATV	24" MIN
WATER	54" MIN
FIBEROPTIC	36" MIN

NOTE: THE COUNTY WILL EVALUATE DRY UTILITY DEPTHS THAT ARE OUTSIDE THE TRAVELED ROADWAY ON A CASE BY CASE BASIS

Drawn By: SBW *[Signature]*
 Checked By: *[Signature]*
 Approved By: *[Signature]*

UTILITY LINE LOCATION
GENERAL

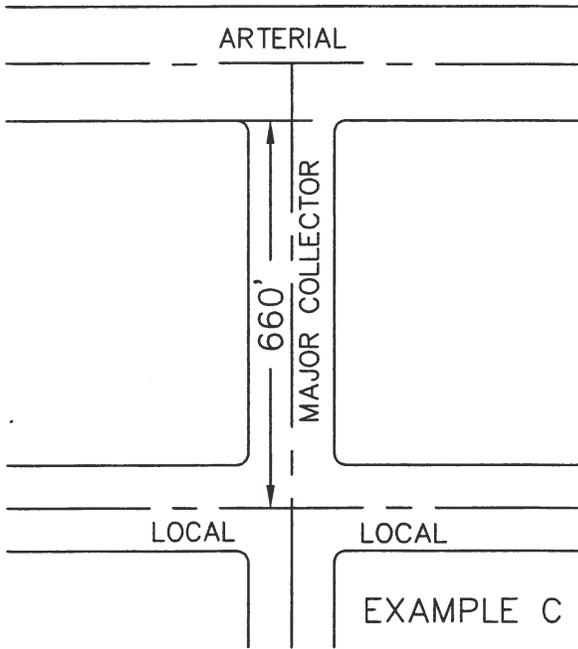
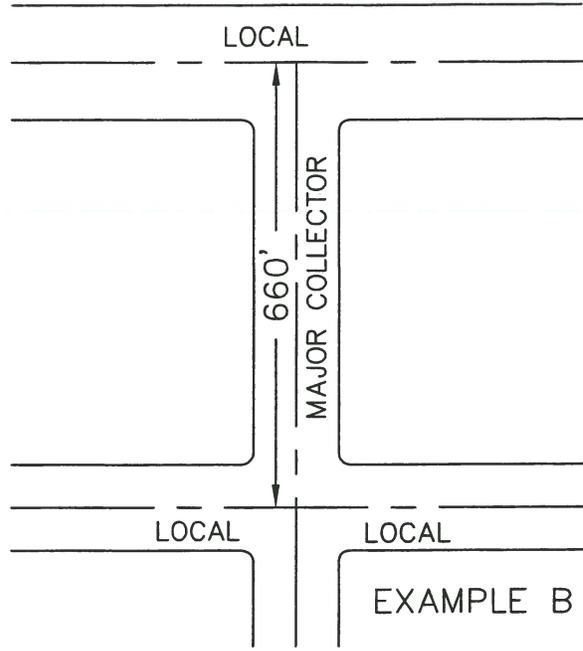
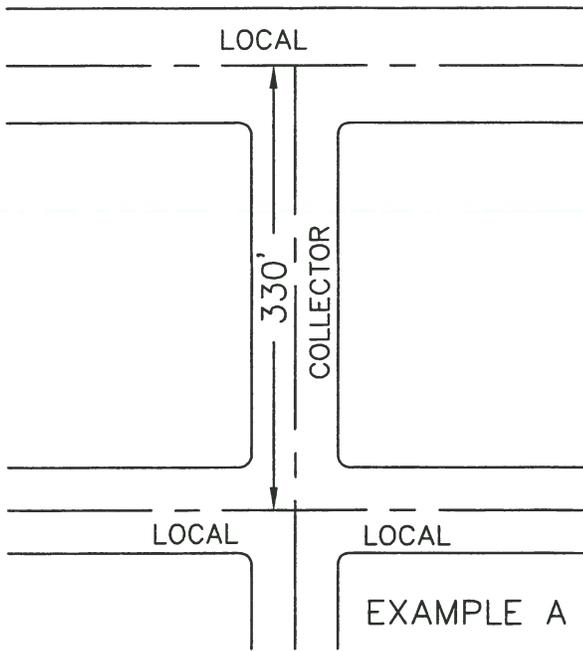
Issued: 5/10/05
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 SP. 22



Drawn By: SBW *[Signature]*
 Checked By: *[Signature]*
 Approved By: *[Signature]*

INTERSECTION SEPARATION

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 Drawing Number:
 SP. 23A



Drawn By: SBW *SBW*

Checked By: *Ch*

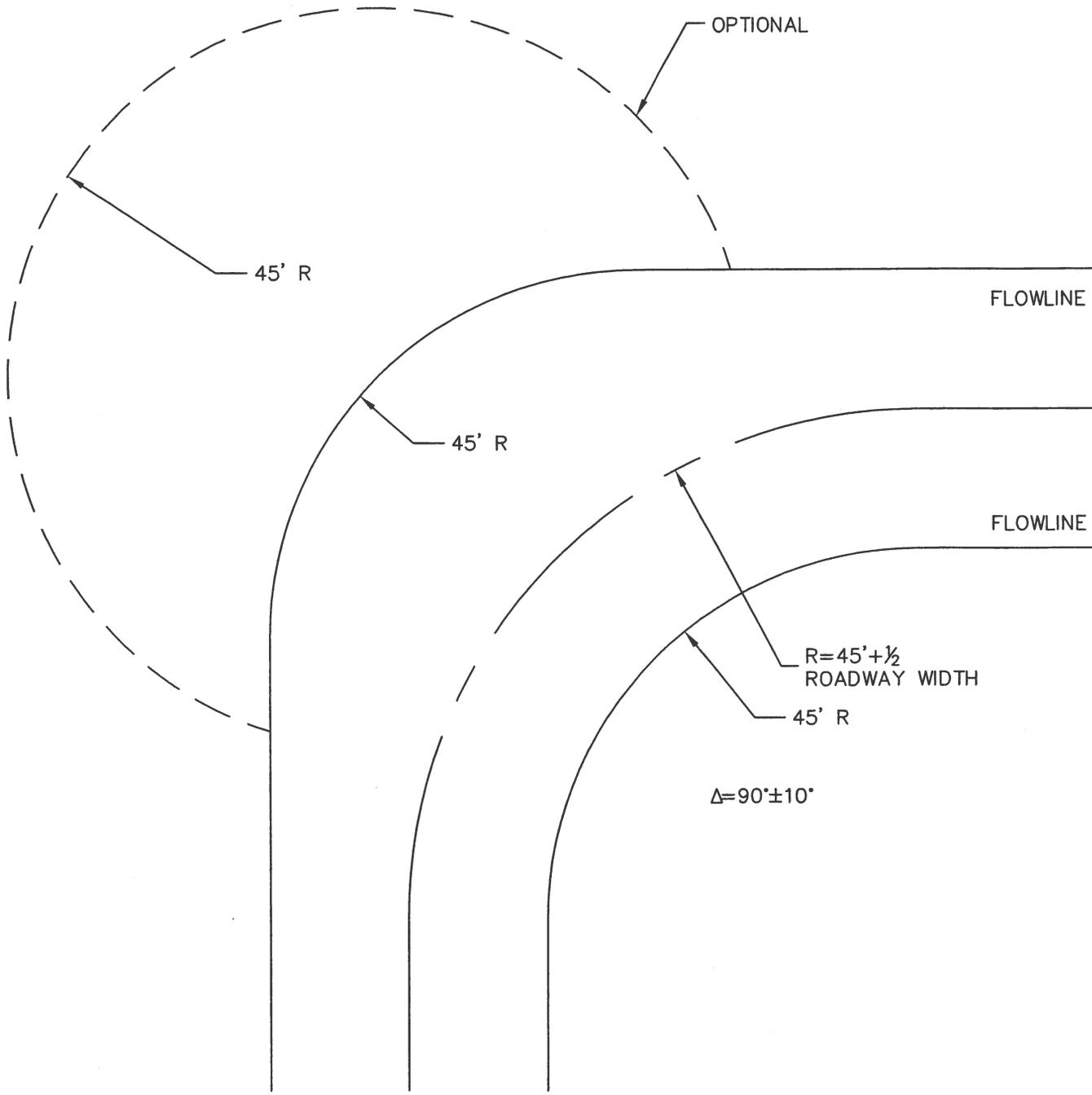
Approved By: *JSP*

INTERSECTION SEPARATION

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 23B



Drawn By: SBW *SBW*

Checked By: *MA*

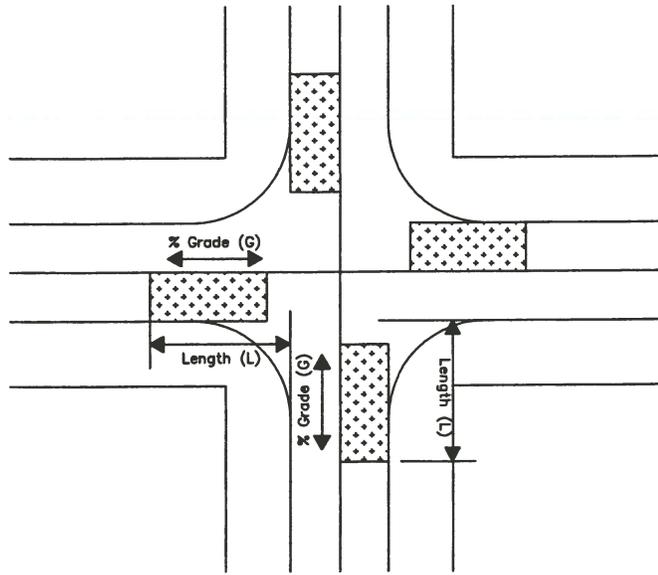
Approved By: *JEP*

KNUCKLES

Issued: 5/10/05

Revised: 8/31/06

Drawing Number:
SP. 24

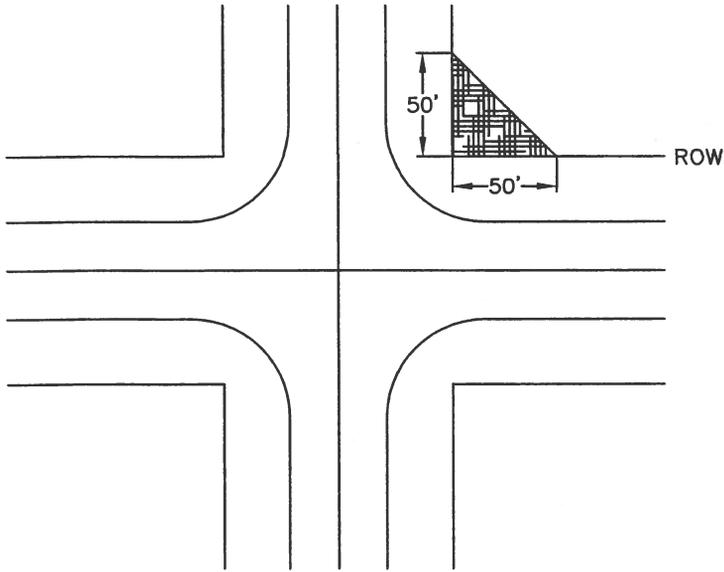


MINOR STREET \ MAJOR STREET	LOCAL	MINOR COLLECTOR	MAJOR COLLECTOR	MINOR ARTERIAL	MAJOR ARTERIAL
LOCAL	L=95' G=4%	L=100' G=4%	L=100' G=4%	L=- G=-	L=- G=-
MINOR COLLECTOR	L=- G=-	L=100' G=3%	L=120' G=3%	L=150' G=3%	L=150' G=3%
MAJOR COLLECTOR	L=- G=-	L=- G=-	L=120' G=3%	L=150' G=3%	L=200' G=3%
MINOR ARTERIAL	L=- G=-	L=- G=-	L=- G=-	L=200' G=2%	L=200' G=2%
MAJOR ARTERIAL	L=- G=-	L=- G=-	L=- G=-	L=- G=-	L=200' G=2%

Drawn By: SBW *SBW*
 Checked By: *MP*
 Approved By: *JEL*

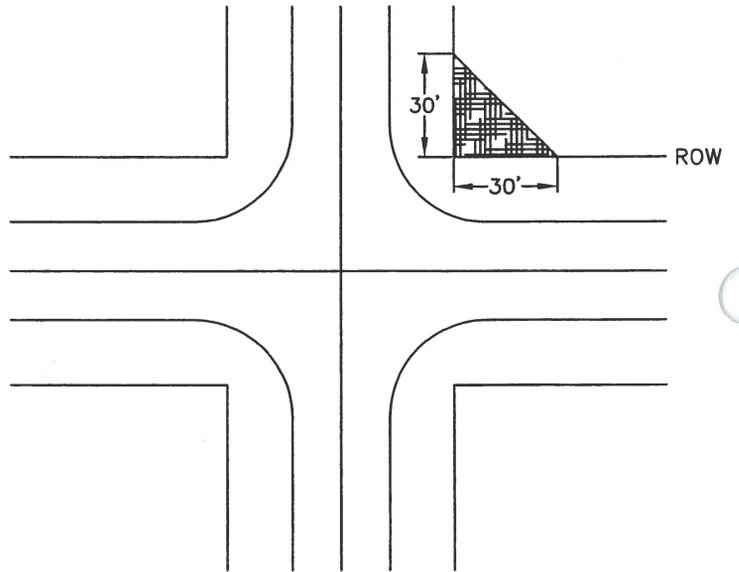
MAXIMUM PERMISSIBLE
 INTERSECTION GRADES

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 Revised: 8/31/06
 Drawing Number:
 SP-25



CASE 1 - INTERSECTIONS WITH NO TRAFFIC CONTROL

CASE 2 - INTERSECTIONS WITH TRAFFIC CONTROL ON MINOR STREET APPROACH, MAJOR STREET APPROACH HAS RIGHT-OF-WAY



Drawn By: SBW *SBW*
 Checked By: *MA*
 Approved By: *JSP*

SIGHT TRIANGLES

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 SP-26