

DETAIL NO.

251



STANDARD DETAIL  
ENGLISH

RETURN TYPE DRIVEWAYS

REVISED

01-01-2017

DETAIL NO.

251

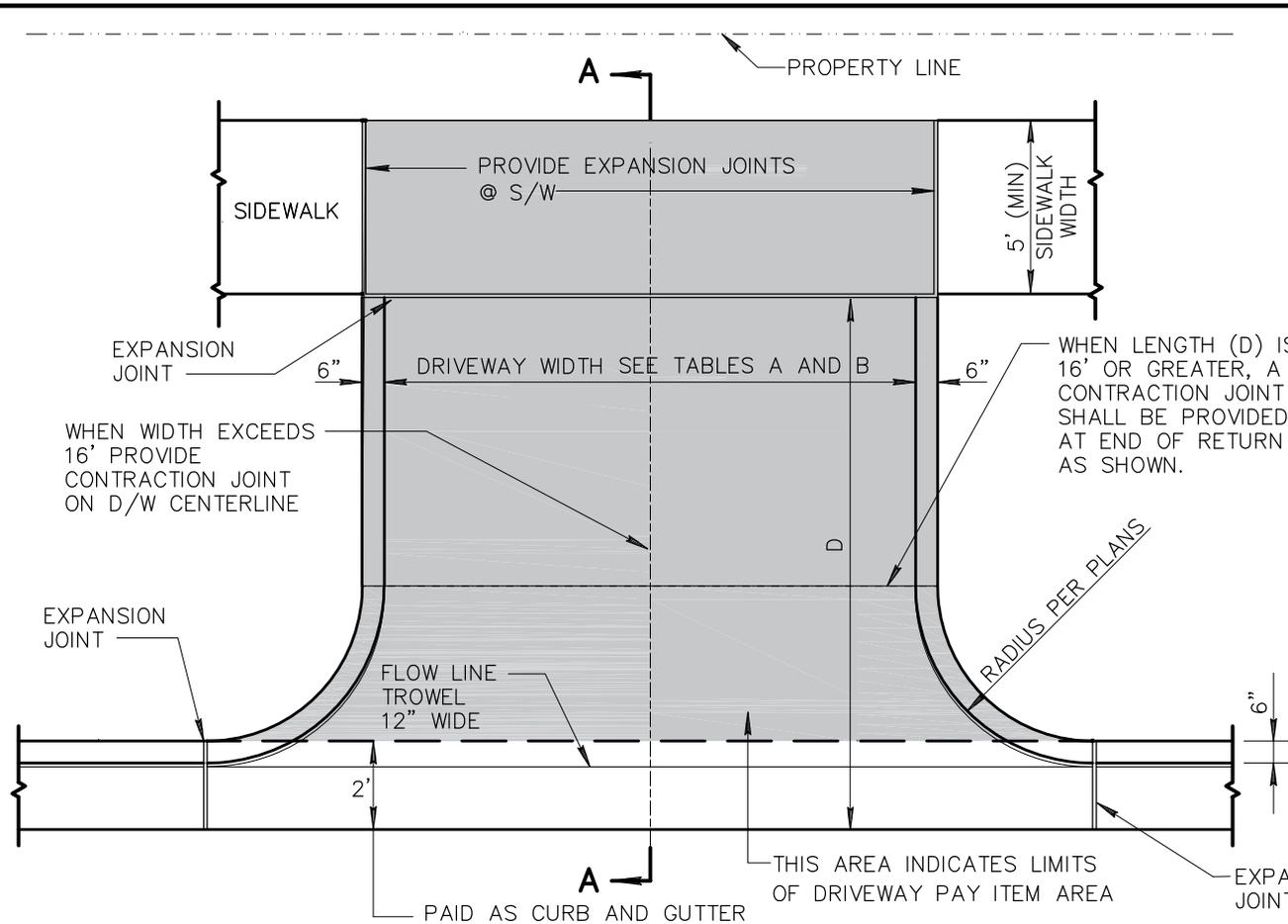
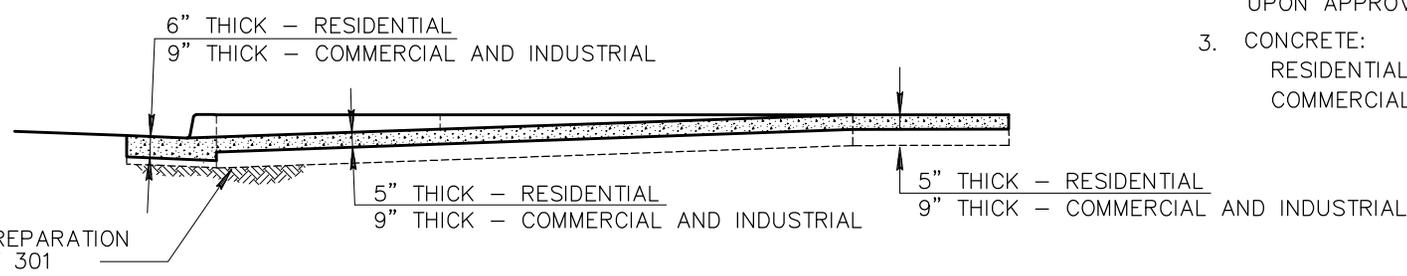


TABLE A		
ZONING	DRIVEWAY WIDTH	
	MIN*	MAX
<b>COMMERCIAL AND INDUSTRIAL</b>		
COMMERCIAL	16'	40'
INDUSTRIAL	16'	40'
* 24' WHERE 2-WAY TRAFFIC IS ANTICIPATED		

TABLE B		
ZONING	DRIVEWAY WIDTH	
	MIN*	MAX
<b>RESIDENTIAL</b>		
MAJOR STREET	16'	30'
COLLECTOR STREET	12'	30'
LOCAL STREET	12'	30'
* 16' WIDTH IS DESIRABLE		

**NOTES:**

1. EXPANSION JOINT SHALL COMPLY TO SECTION 340.
2. THIS TYPE D/W TO BE USED ONLY UPON APPROVAL OF ENGINEER.
3. CONCRETE:  
RESIDENTIAL CLASS B  
COMMERCIAL AND INDUSTRIAL CLASS A



**SECTION A-A**

**NOTES:**

1. A CONCRETE COLLAR IS REQUIRED WHERE PIPES OF DIFFERENT DIAMETERS OR MATERIALS ARE JOINED, OR WHERE THE CHANGE IN ALIGNMENT OR GRADE EXCEEDS THAT ALLOWED FOR ON ORDINARY JOINTS.
2. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHOULD BE THOSE OF THE LARGER PIPE. D=D-1, OR D-2 WHICHEVER IS GREATER.
3. OMIT REINFORCING ON PIPE 24" OR LESS IN DIAMETER.
4. WHERE REINFORCING IS REQUIRED, THE DIAMETER OF THE CIRCULAR TIES SHALL BE THE OUTSIDE DIAMETER OF PIPE+T.
5. FIELD CLOSURES OF PIPE OF THE SAME DIAMETER AND WITHOUT CHANGE IN GRADE OR ALIGNMENT SHALL BE MADE WITH A CONCRETE COLLAR.
6. CONCRETE SHALL BE CLASS B PER SECT. 725.
7. ALL REBAR SHALL HAVE 3" MINIMUM CLEAR COVER.
8. PIPE ENDS TO BE TRIMMED SUCH THAT THE MAXIMUM DISTANCE BETWEEN PIPES AT ANY POINT IS 2".
9. AN ENGINEER APPROVED WATER STOP IS REQUIRED ON ALL PIPES EXCEPT CONCRETE PIPE.

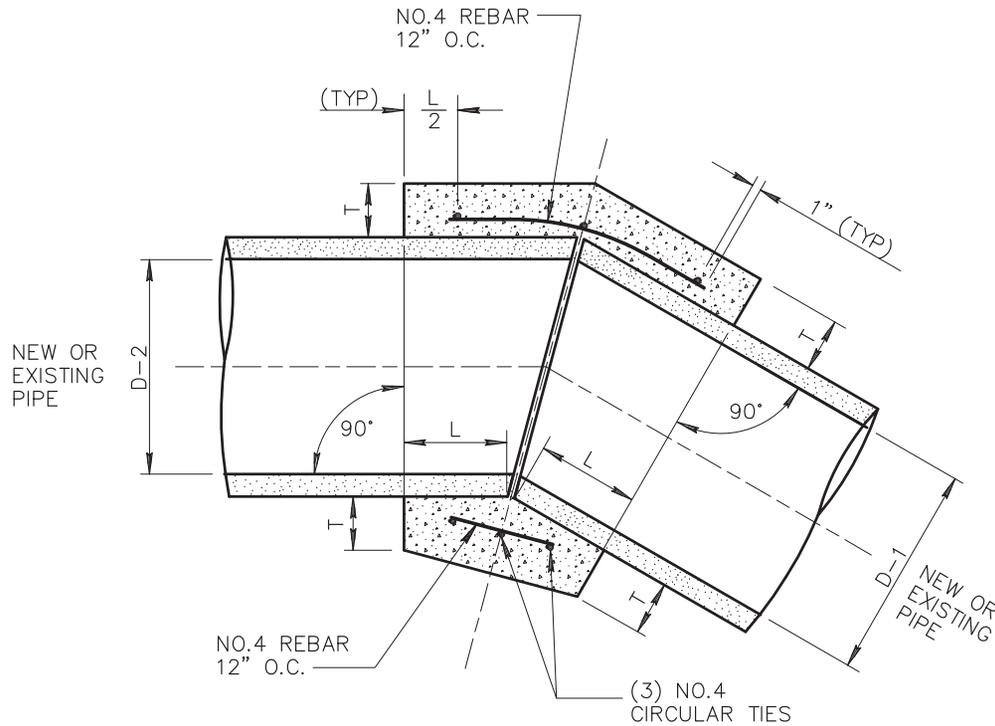


TABLE		
D	L	T
18"	1.0'	5"
24"	1.0'	6"
36"	1.5'	8"
57"	1.5'	10"
66"	1.75'	11"

FOR PIPE SIZES NOT LISTED AND LESS THAN 66" USE THE NEXT SIZE LARGER.

DETAIL NO.  
**505**

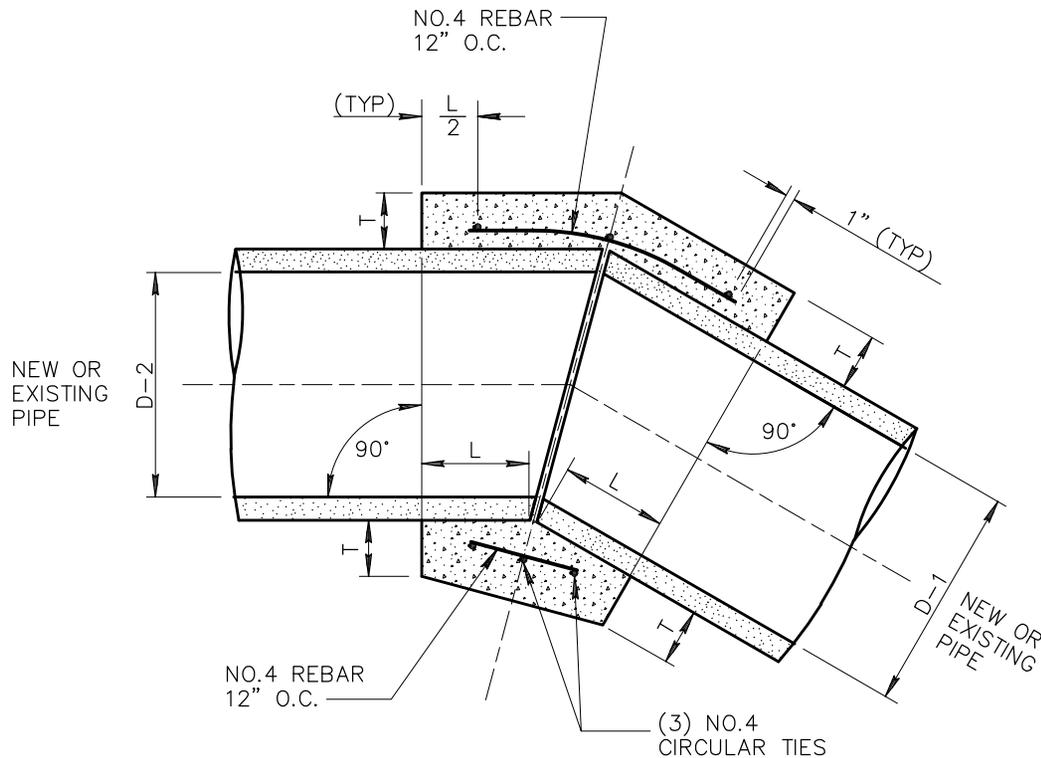


STANDARD DETAIL  
ENGLISH

**CONCRETE COLLAR FOR PIPE**

DRAFT  
**REVISED**  
01-01-2018

DETAIL NO.  
**505**



**NOTES:**

1. A CONCRETE COLLAR IS REQUIRED WHERE PIPES OF DIFFERENT DIAMETERS OR MATERIALS ARE JOINED, OR WHERE THE CHANGE IN ALIGNMENT OR GRADE EXCEEDS THAT ALLOWED FOR ON ORDINARY JOINTS.
2. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHOULD BE THOSE OF THE LARGER PIPE.  $D=D-1$ , OR  $D-2$  WHICHEVER IS GREATER.
3. OMIT REINFORCING ON PIPE 24" OR LESS IN DIAMETER.
4. WHERE REINFORCING IS REQUIRED, THE DIAMETER OF THE CIRCULAR TIES SHALL BE THE OUTSIDE DIAMETER OF PIPE+T.
5. FIELD CLOSURES OF PIPE OF THE SAME DIAMETER AND WITHOUT CHANGE IN GRADE OR ALIGNMENT SHALL BE MADE WITH A CONCRETE COLLAR.
6. CONCRETE SHALL BE CLASS B PER SECT. 725.
7. ALL REBAR SHALL HAVE 3" MINIMUM CLEAR COVER.
8. PIPE ENDS TO BE TRIMMED SUCH THAT THE MAXIMUM DISTANCE BETWEEN PIPES AT ANY POINT IS 2".
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FOR PIPE SIZES NOT LISTED AND LESS THAN 66" USE THE NEXT SIZE LARGER.

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ENGLISH

**CONCRETE COLLAR FOR PIPE**

REVISED

01-01-2018

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## SECTION 787

### GRAY IRON CASTINGS

#### 787.1 GENERAL:

The castings shall be true to pattern in form and dimension and free from pouring faults, spongings, cracks, blowholes, or other defects in locations affecting their strength and value for the service intended. Castings shall be filleted boldly at angles, and the arises shall be sharp and true.

Before the castings are removed from the foundry, they shall be thoroughly cleaned and the parting lines, gates, and risers ground flush.

#### 787.2 TEST SPECIMENS:

Test coupons shall be cast separately of the castings, using a mold as described in ASTM [A48](#). A representative of the Engineer may be present at the time a melt is poured to identify both coupons and castings.

Two test coupons are required for each melt poured. Additional coupons shall be cast for use as replacements or in case a retest is required.

A representative of the Engineer may discard and replace specimens which show obvious lack of continuity of metal or if the machining is defective.

The manufacturer shall machine the tension specimens to the dimension specified for specimen B of ASTM [A48](#), at no additional cost to the Contracting Agency.

When approved by the Engineer transverse tests may be made in lieu of tensile tests, in which case the castings shall meet the requirements of ASTM [A48](#).

#### 787.3 MANHOLE FRAME AND COVER SETS: Change from Class 30 to Class 35 to match manhole cover details.

Castings shall conform to ASTM [A48](#), Class 35 and AASHTO M306. The bearing surfaces of the frames and covers shall be machined and the cover shall seat firmly onto the frame without rocking.

Covers shall be the types and shall be imprinted as shown on the plans or standard details.

#### 787.4 RAILINGS, RAILING POSTS, AND WHEEL GUARDS:

Castings shall conform to ASTM [A48](#), Class 40.

#### 787.5 ROCKERS, ROCKER PLATE BEARINGS, AND BEARING PLATES FOR BRIDGES:

Castings shall conform to ASTM [A48](#), Class 50.

Castings shall be machined and finished as specified on the plans provided that tool marks on sliding contact surfaces shall run in the direction of plate movement, or in the case of rocker plate bearings, perpendicular to the rocker movement. Tool marks shall be not more than 1/32 inch apart.

#### 787.6 UNCLASSIFIED CASTINGS:

All castings not specifically classified, shall conform to the requirements of ASTM [A48](#), Class 30.

- End of Section -

## SECTION 714

TABLE 714-2

## MICRO-SURFACING JOB MIX FORMULA

ASTM TEST METHOD	ISSA TECHNICAL BULLETIN	TEST	REQUIREMENTS
<a href="#">D244</a>		Residual Asphalt, % by dry weight of aggregate	6.0 – 11.5
<a href="#">D242</a>		Mineral Filler, % by dry weight of aggregate.	0.1 – 2.0
		Modifier Content, % (see Section <a href="#">714.6</a> )	4, minimum.
		Additive	As required for mix properties
		Water	As required for mix properties
<a href="#">C136/ C117</a>		Aggregate Grading	Meets requirements of Table <a href="#">714-1</a>
	TB-106	Consistency, cm.	2.5-3.0
	TB-100	Abrasion Loss (Wet Track Abrasion Test) One Hour Soak, g/ft <sup>2</sup> Six Day Soak, g/ft <sup>2</sup>	50, maximum 75, maximum
	TB-114	Wet Stripping, %	90, minimum
	TB-139	Wet Cohesion Test, at 77° F Set Time Test: (30 minutes), kg-cm Early Rolling Traffic Time: (60 minutes), kg-cm	12, minimum 20, minimum
	TB-102	Quick Set Emulsion Mix Properties Micro-Surfacing Setting Test, 70-85 ° F. (1-hour cure) Micro-Surfacing Water Resistance Test, 70-85 ° F. (30-minute cure)	No Brown Stain No More Than Slight Discoloration
	TB-115	Split Consistency Test	Uniform
	TB-113	Mix Time Micro-Surfacing Mixing, 70-85 ° F., Sec.	120, minimum
	TB-147	Measurement of Stability and Resistance to Compaction, Vertical and Lateral Displacement of Multi-layered Fine Aggregate Cold Mixes	Lateral Displacement 5%, maximum Specific Gravity 2.10, maximum
	TB-109	Loaded Wheel Sand Adhesion	50 g/ft <sup>2</sup> , maximum

**714.7.2.1 Bulking Effect (ASTM [C29](#) Modified):** The laboratory shall further report the quantitative effects of moisture content in the unit weight of the aggregate (bulking effect).

#### 714.8 TEST CERTIFICATES AND REPORTS:

Test certificates and reports for the bituminous material shall be furnished in accordance with Section [711](#).

#### 714.9 CONVERSION OF QUANTITIES:

Volumetric conversions shall be accomplished in accordance with Section [713](#).

- End of Section -

## SECTION 715

Delete  
Test >>

TABLE 715-2			
SLURRY SEAL JOB MIX FORMULA			
ASTM TEST METHOD	ISSA TECHNICAL BULLETIN	TEST	REQUIREMENTS
<del>D244</del>		Residual Asphalt, % by dry weight of aggregate: Type I Type II Type III	10.0 – 16.0 7.5 – 13.0 6.5 – 12.0
D242		Mineral Filler, % by dry weight of aggregate.	0.1 – 2.0
		Modifier Content, % (see Section 715.4), if applicable	3, minimum.
		Additive	As required for mix properties
		Water	As required for mix properties
C136/ C117		Aggregate Grading	Meets requirements of Table 715-1
	TB-106	Consistency, cm.	2.0-3.0
	TB-100	Abrasion Loss (Wet Track Abrasion Test) One Hour Soak, g/ft <sup>2</sup> Six Day Soak, g/ft <sup>2</sup>	75, maximum 75, maximum
	TB-114	Wet Stripping, %	90, minimum
	TB-139	Modified Cohesion Test, at 77° F Set Time Test: (30 minutes), kg-cm Early Rolling Traffic Time: (60 minutes), kg-cm	12, minimum 20, minimum
	TB-102	Quick Set Emulsion Mix Properties Slurry Seal Setting Test, 70-85 ° F (1-hour cure) Slurry Seal Water Resistance Test, 70-85 ° F (30-minute cure)	No Brown Stain No More Than Slight Discoloration
	TB-115	Split Consistency Test	Uniform
	TB-113	Mix Time Slurry Seal Mixing, 70-85 ° F, Sec.	120, minimum
	<del>TB-147</del>	<del>Measurement of Stability and Resistance to Compaction, Vertical and Lateral Displacement of Multi-layered Fine Aggregate Cold Mixes</del>	<del>Lateral Displacement 5%, maximum</del> Specific Gravity 2.10, maximum
	TB-109	Loaded Wheel Sand Adhesion	50 g/ft <sup>2</sup> , maximum

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**715.7.2.1 Bulking Effect (ASTM C29):** The laboratory shall further report the quantitative effects of moisture content in the unit weight of the aggregate (bulking effect).

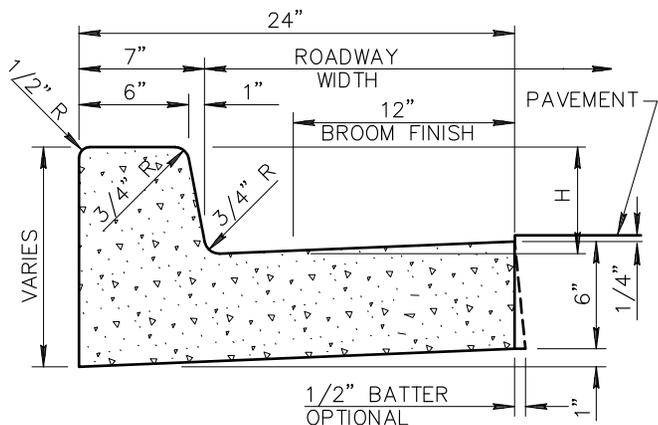
#### 715.8 TEST CERTIFICATES & REPORTS:

Test certificates and reports for the bituminous material shall be furnished in accordance with Section 711.

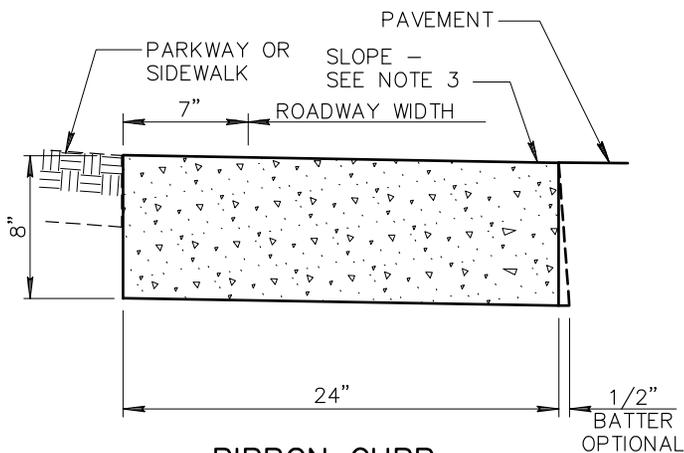
#### 715.9 CONVERSION OF QUANTITIES:

Volumetric conversions shall be accomplished in accordance with Section 713.

- End of Section -



**VERTICAL CURB AND GUTTER  
(TYPE A)**



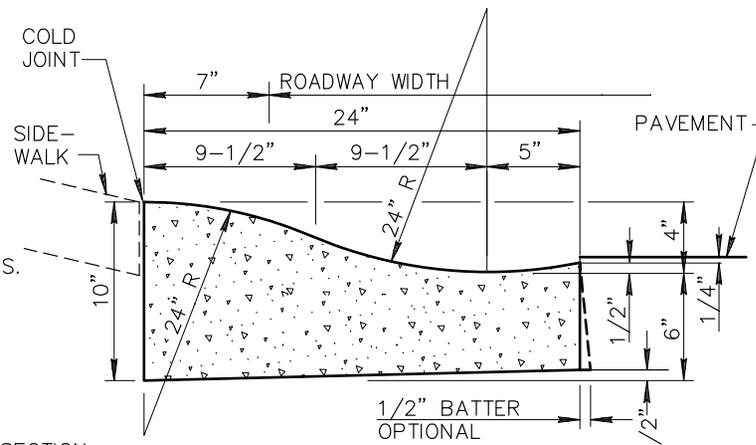
**RIBBON CURB  
(TYPE B)**

**NOTES: (TYPE A)**

1. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN. SEE SECT. 340.
2. H=6" OR AS SPECIFIED ON PLANS.
3. CONTRACTION JOINT SPACING 10' MAXIMUM.
4. EXPANSION JOINTS AS PER SECT. 340.
5. CLASS 'B' CONCRETE PER 725.
6. WHEN THE ADJACENT PAVEMENT SECTION SLOPES AWAY FROM THE GUTTER, THE SLOPE OF THE GUTTER PAN SHALL MATCH PAVEMENT CROSS SLOPE.

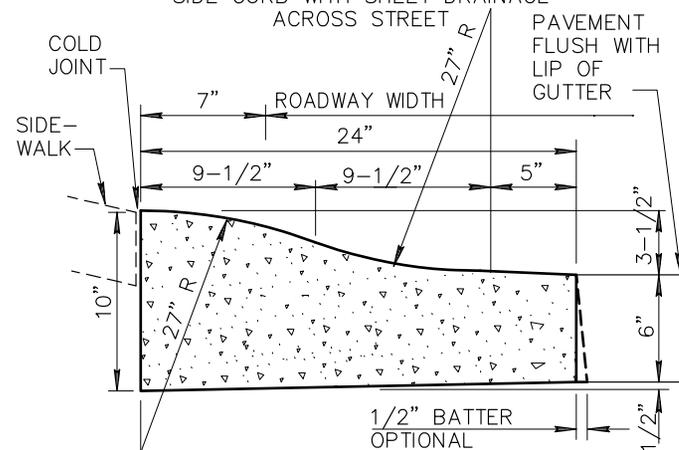
**NOTES: (TYPE B)**

1. CONSTRUCT CURB AND INSTALL 1/2" MASTIC EXPANSION JOINTS, A.S.T.M. D-1751. SECT. 340.
2. BROOM FINISH ALL SURFACES.
3. RIBBON CURB MAY SLOPE TOWARDS PAVEMENT OR PARKWAY AS INDICATED ON PLANS.
4. CONTRACTION JOINT SPACING 10' MAXIMUM.
5. CONCRETE SHALL BE CLASS 'B' PER SECT. 725 AND INSTALLED PER SECT. 505.



**ROLL CURB AND GUTTER  
(TYPE C)**

SPECIAL SECT. USE FOR HIGH SIDE CURB WITH SHEET DRAINAGE ACROSS STREET

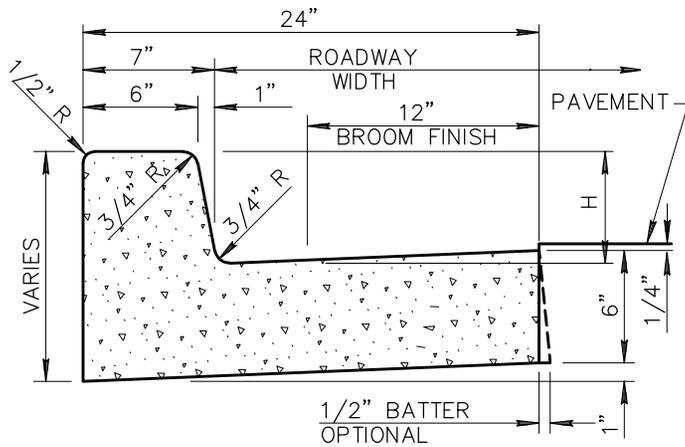


**(TYPE D)**

**NOTES: (C & D)**

1. ALL WORK AND MATERIALS SHALL CONFORM TO SECT. 304, 505 AND 725. BROOM FINISH TO EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAXIMUM.
3. EXPANSION JOINTS AS PER SECT. 340.
4. CLASS 'B' CONCRETE PER 725.

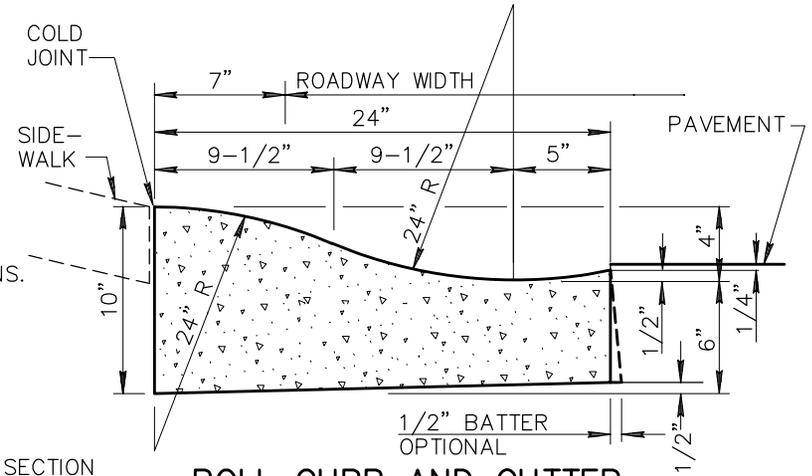
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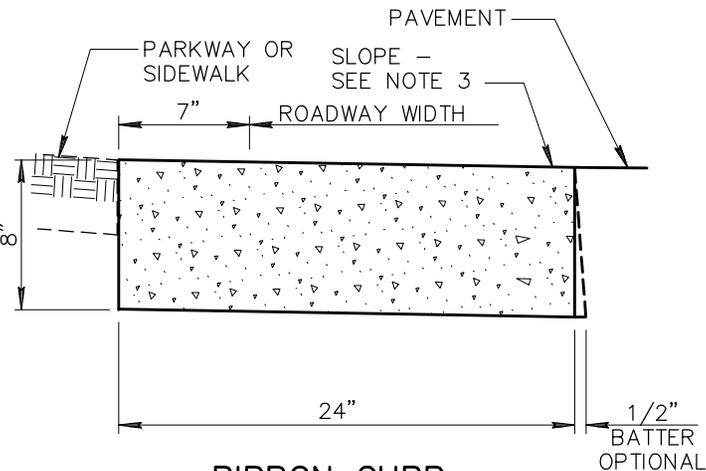
**VERTICAL CURB AND GUTTER  
(TYPE A)**

**NOTES: (TYPE A)**

1. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN. SEE SECT. 340.
2. H=6" OR AS SPECIFIED ON PLANS.
3. CONTRACTION JOINT SPACING 10' MAXIMUM.
4. EXPANSION JOINTS AS PER SECT. 340.
5. CLASS 'B' CONCRETE PER 725.
6. WHEN THE ADJACENT PAVEMENT SECTION SLOPES AWAY FROM THE GUTTER, THE SLOPE OF THE GUTTER PAN SHALL MATCH PAVEMENT CROSS SLOPE.



**ROLL CURB AND GUTTER  
(TYPE C)**

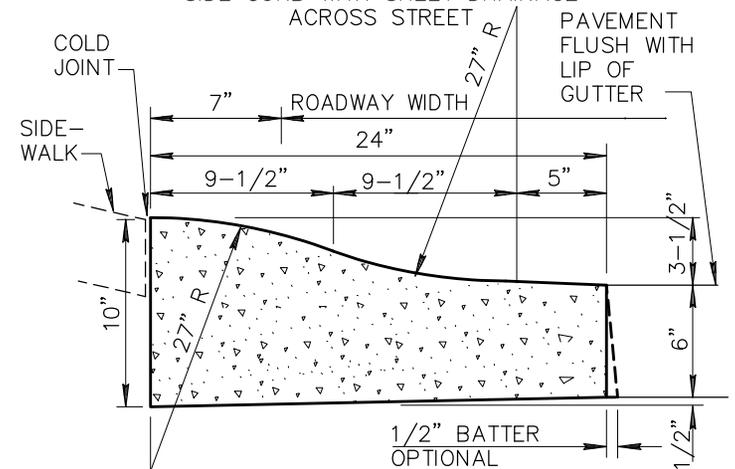


**RIBBON CURB  
(TYPE B)**

**NOTES: (TYPE B)**

1. CONSTRUCT CURB AND INSTALL 1/2" MASTIC EXPANSION JOINTS, A.S.T.M. D-1751. SECT. 340.
2. BROOM FINISH ALL SURFACES.
3. RIBBON CURB MAY SLOPE TOWARDS PAVEMENT OR PARKWAY AS INDICATED ON PLANS.
4. CONTRACTION JOINT SPACING 10' MAXIMUM.
5. CONCRETE SHALL BE CLASS 'B' PER SECT. 725 AND INSTALLED PER SECT. 505.

SPECIAL SECT. USE FOR HIGH SIDE CURB WITH SHEET DRAINAGE ACROSS STREET



**(TYPE D)**

**NOTES: (C & D)**

1. ALL WORK AND MATERIALS SHALL CONFORM TO SECT. 340, 505 AND 725. BROOM FINISH TO EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAXIMUM.
3. EXPANSION JOINTS AS PER SECT. 340.
4. CLASS 'B' CONCRETE PER 725.

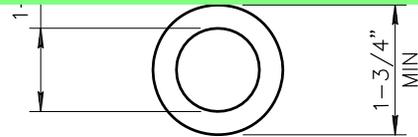
PIPE SLEEVE DETAIL

MATERIAL: STEEL PER ASTM A513 2" SQUARE OPERATING NUT (WITH

3/16" (0.1875) weld shown on the CAD files used for MAG approval

3/16" (0.1875) weld shown on the 2017 shop drawing

3/16" (0.1875) weld 2014 shop drawing



3/8" (0.375) weld shown on the CAD files used for MAG approval

3/16" (0.1875) weld shown on the 2017 shop drawing.

sleeve not shown on the 2014 shop drawing

NOTES:

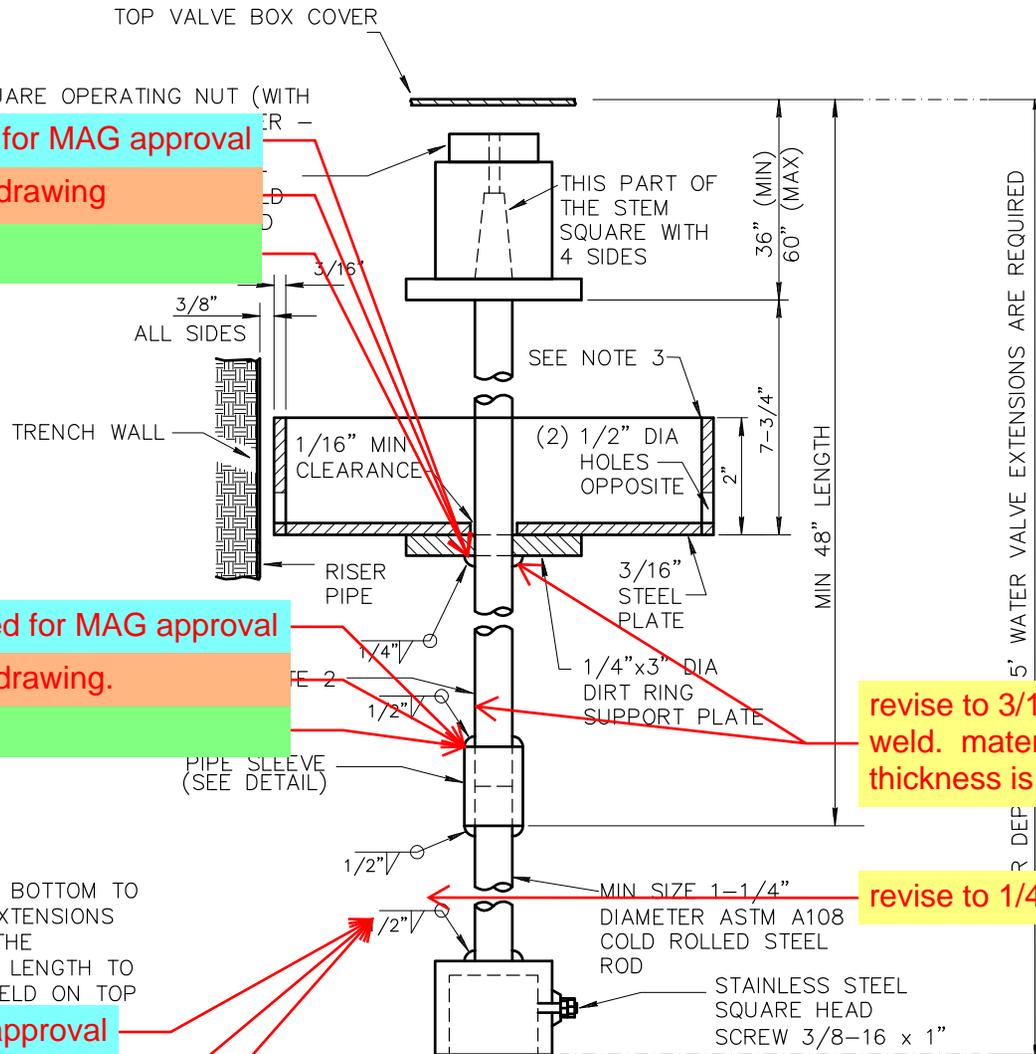
- EXTENSION STEM: WITH A SQUARE SOCKET ON THE BOTTOM TO FIT A 2" SQUARE VALVE OPERATING NUT. VALVE EXTENSIONS ARE REQUIRED ON ALL VALVES INSTALLED WHERE THE OPERATING NUT IS OVER 5' BELOW THE SURFACE. LENGTH TO FIT EACH INSTALLATION. OPERATING NUT TO BE HELD ON TOP

weld not shown on the CAD files used for MAG approval

3/6" (0.1875) weld shown on the 2017 shop drawing

1/4" (0.25) weld 2014 shop drawing.

LOWER PORTION OF THE 1-1/4" EXTENSION ROD.



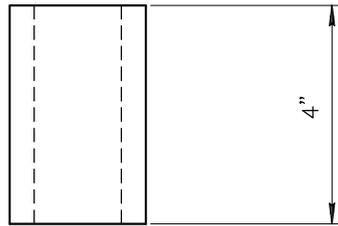
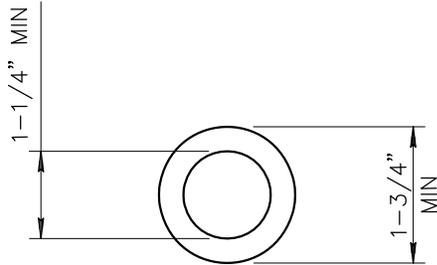
revise to 3/16 inch weld. material thickness is 1/4 inch.

revise to 1/4 inch weld

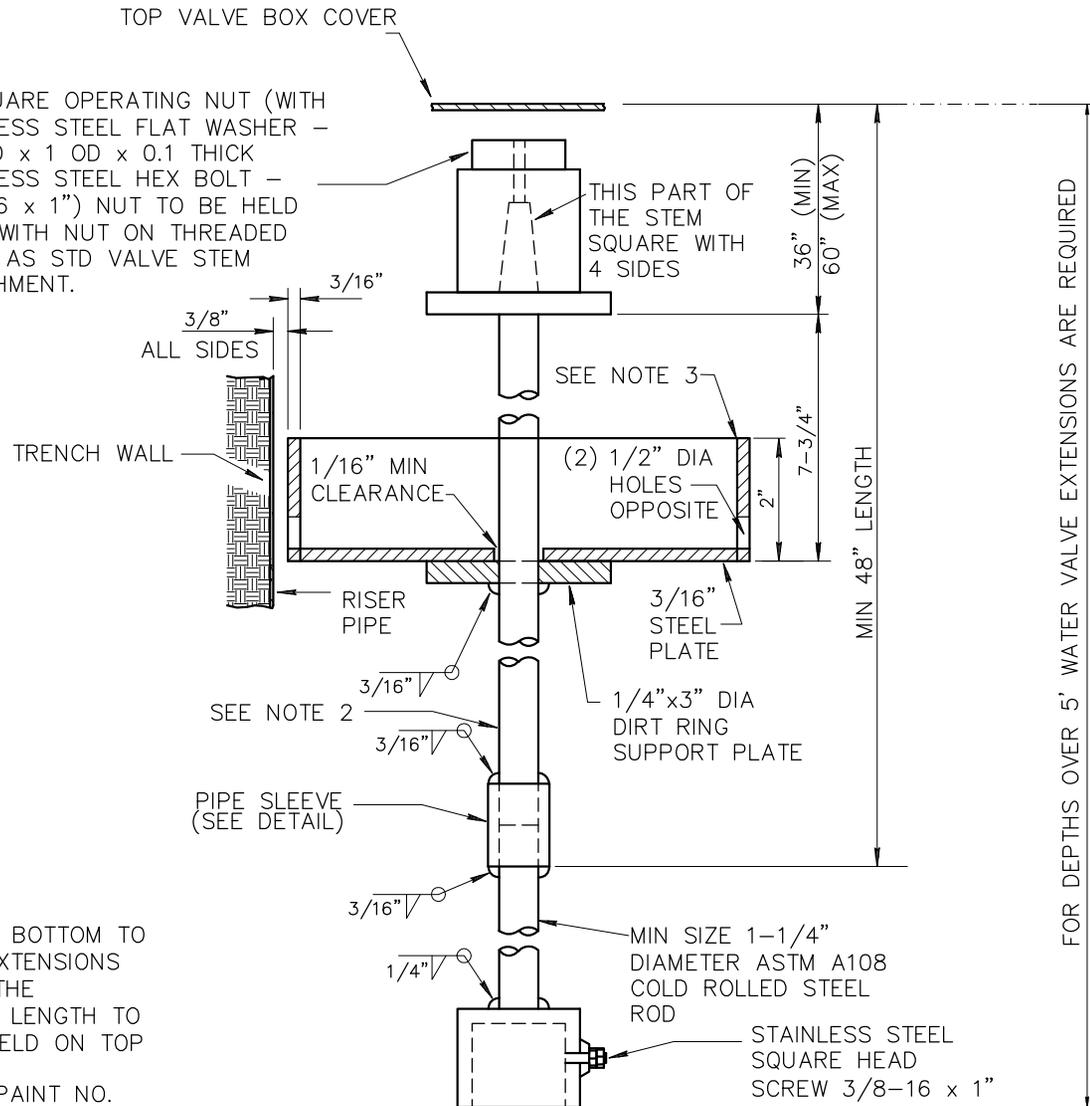
5' WATER VALVE EXTENSIONS ARE REQUIRED

# PIPE SLEEVE DETAIL

MATERIAL: STEEL PER ASTM A513



2" SQUARE OPERATING NUT (WITH STAINLESS STEEL FLAT WASHER - 0.43 ID x 1 OD x 0.1 THICK STAINLESS STEEL HEX BOLT - 3/8-16 x 1") NUT TO BE HELD DOWN WITH NUT ON THREADED SHAFT AS STD VALVE STEM ATTACHMENT.



## NOTES:

1. EXTENSION STEM: WITH A SQUARE SOCKET ON THE BOTTOM TO FIT A 2" SQUARE VALVE OPERATING NUT. VALVE EXTENSIONS ARE REQUIRED ON ALL VALVES INSTALLED WHERE THE OPERATING NUT IS OVER 5' BELOW THE SURFACE. LENGTH TO FIT EACH INSTALLATION. OPERATING NUT TO BE HELD ON TOP OF EXTENSION WITH STOP NUT.
2. PAINTING: ALL STEEL TO HAVE A PRIME COAT OF PAINT NO. 1-D AND ONE HEAVY APPLICATION (FINISH COAT) OF PAINT NO. 9 AS PER SECTION 790.
3. DIRT RING TO FLOAT FREELY ON THE TOP OF THE SUPPORT PLATE.
4. PIPE SLEEVE SHALL BE SECURELY WELDED TO THE UPPER AND LOWER PORTION OF THE 1-1/4" EXTENSION ROD.