



VOLUME 2:
STANDARD PLANS

December 2019

100 Series: Streets and Roadway

200 Series: Storm Drain

300 Series: Street Lighting

400 Series: Traffic

500 Series: Sewer

600 Series: Park and Landscape

700 Series: Not Used

800 Series: Water



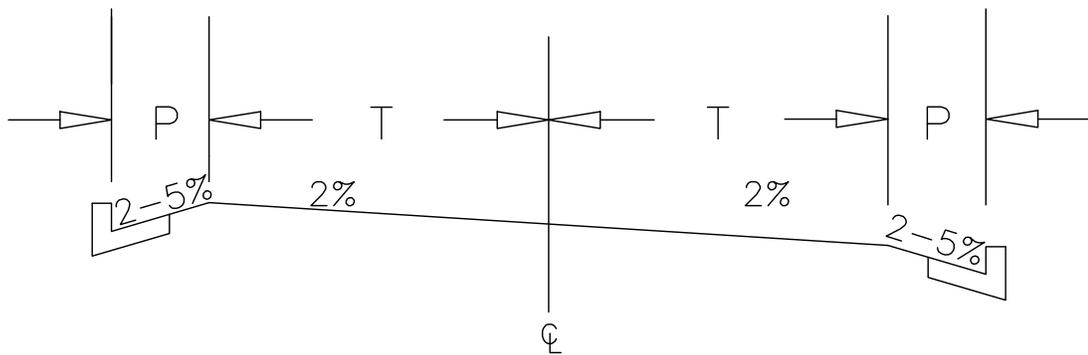
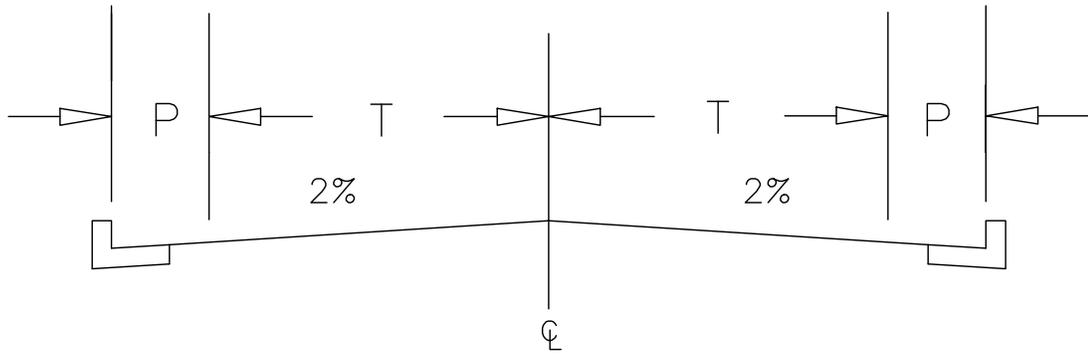
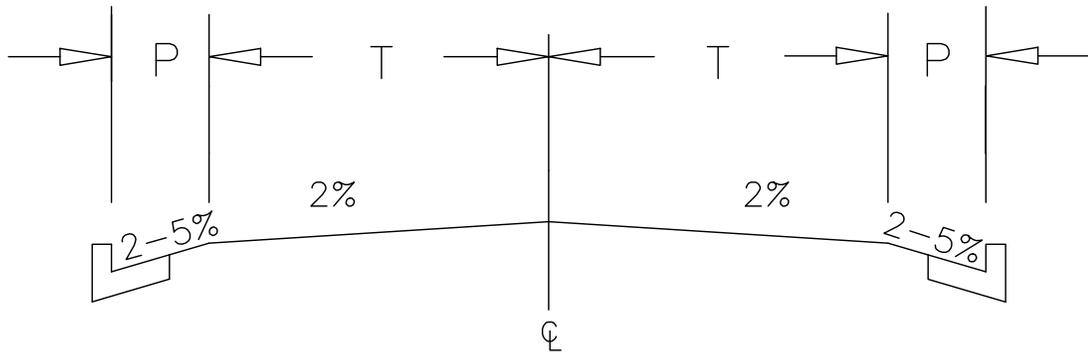
VOLUME 2: STANDARD PLANS

December 2019

100 Series: Streets and Roadway

- 100. CROWNS
- 101. STREET LAYOUT
- 102. STREET SECTION
- 103. CURB, GUTTER SIDEWALK, AND SIDEWALK WARP
- 104. CURB RETURN
- 105. VISIBILITY REQUIREMENTS
- 106. DRIVEWAY - RESIDENTIAL, COMMERCIAL INDUSTRIAL
- 107. DRIVEWAY - STREETS WITHOUT CURB 7 GUTTER
- 108A. CUL-DE-SAC
- 108B. CUL-DE-SAC W/ ISLAND 48' RADIUS
- 109. RESIDENTIAL STREET KNUCKLE
- 110. HAMMERHEAD TURNAROUND
- 111. EMERGENCY VEHICLE TURNOUT
- 112. EDGE GRIND AT SIDE STREET AND END OF OVERLAY
CONFORM
- 113. EDGE GRIND AT GUTTER AND CENTERLINE FOR OVERLAY
- 114. STREET WIDENING
- 115. STREET BARRICADE
- 116. SIDEWALK BARRICADE
- 117. SIDEWALK, CURB & GUTTER REPLACEMENT DETAILS
- 118. AC CONFORM DETAIL AT CURB AND GUTTER REPLACEMENT
- 119. CROSS GUTTER
- 120. STANDARD PERMANENT MONUMENT
- 121. REFERENCE MONUMENT LOT CORNER AT STREET FRONTAGE
- 122. STUB FUTURE CONNECTION STREET POSTING
- 123. ADJUST TO GRADE EXISTING STREET APPURTENANCES
- 124. ANGLED PARKING BAY WITH CROSS GUTTER
- 125. BUS STOP AT INTERSECTION, MID BLOCK AND CONCRETE PAD
DETAIL
- 126. STANDARD TRENCH DETAIL, TRENCH BACKFILL AND
SURFACING.
- 127. ROAD WIDTH TRANSITIONS

- 128. UTILITY ACCESS ROAD
- 129. BACK OF SIDEWALK CONFORMS
- 130. PRIVATE WALKWAY CONFORM, P.C.C. & ASPHALT CONCRETE
- 131. TYPICAL SPACING - WEAKENED PLANES, SCORE MARKS AND EXPANSION JOINTS
- 132. CLASS I BIKE PATH
- 133A. MULTI-RESIDENTIAL AND COMMERCIAL CURB CUTS
- 133B. RESIDENTIAL CURB CUTS
- 134. DRIVEWAY CONFORM, P.C.C. & A.C.
- 135. BRASS SURVEY MARKER
- 136. CITY MONUMENT COVER
- 137. CITY MONUMENT COVER REPLACEMENT



DESIGN AND CONSTRUCTION STANDARDS

CROWNS

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

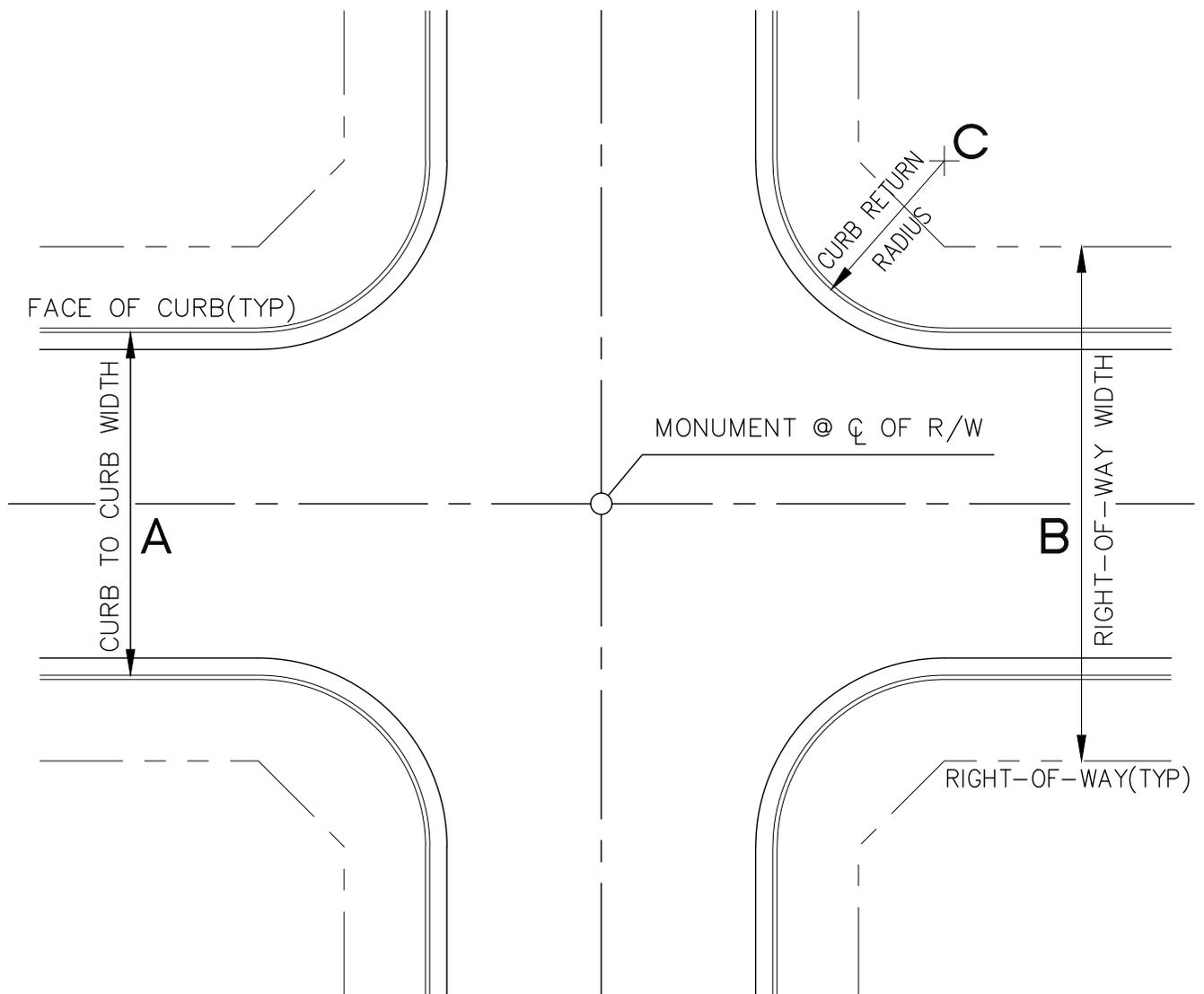
100

PAGE 1 OF 1

SCALE: NONE

STREET TYPE	A CURB TO CURB	B RIGHT-OF-WAY	C CURB RADIUS
CROSTOWN CONNECTOR	60'-64'	92'-104'*	ALL CURB RADII TO BE 28 FEET MINIMUM UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER
COMMERCIAL (4 LANES)	66'-70'	90'-102'*	
COMMERCIAL (2 LANES)	44-48'	68'-80'*	
INDUSTRIAL	38'	64'**	
NEIGHBORHOOD	30'	56'**	
RURAL LANE	20-30''	46'-56'**	
ALLEY	20' MIN.	20' MIN.**	

* ADDITIONAL LANDSCAPE PARCELS & PUBLIC UTILITY EASEMENTS MAY BE REQUIRED PER ZONING CODE.
 ** ADDITIONAL PUBLIC UTILITY EASEMENTS MAY BE REQUIRED ON BOTH SIDES OF RIGHT-OF-WAY.



DESIGN AND CONSTRUCTION STANDARDS

STREET LAYOUT

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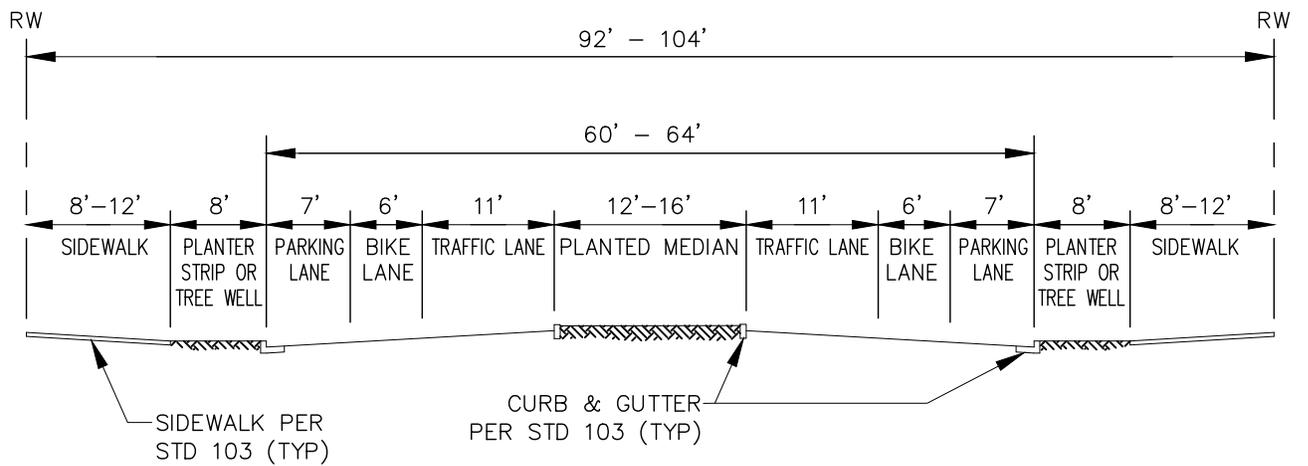
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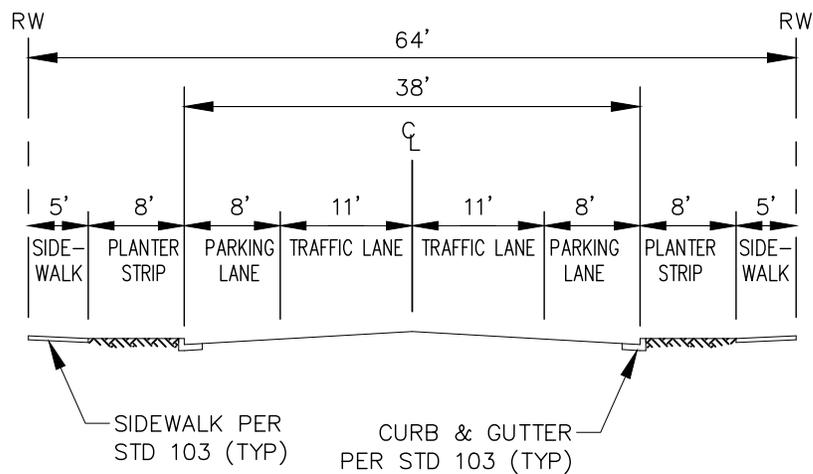
101

PAGE 1 OF 1

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CROSTOWN CONNECTOR



INDUSTRIAL STREET



DESIGN AND CONSTRUCTION STANDARDS

STREET SECTION

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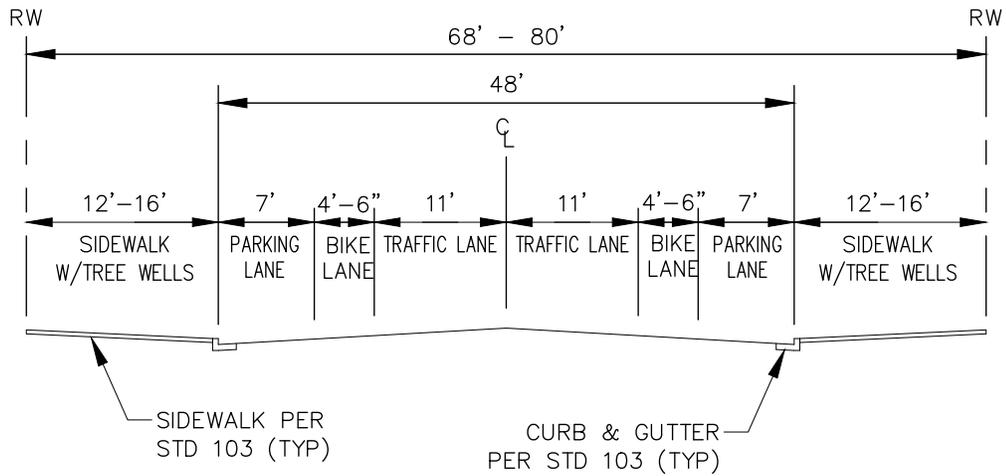
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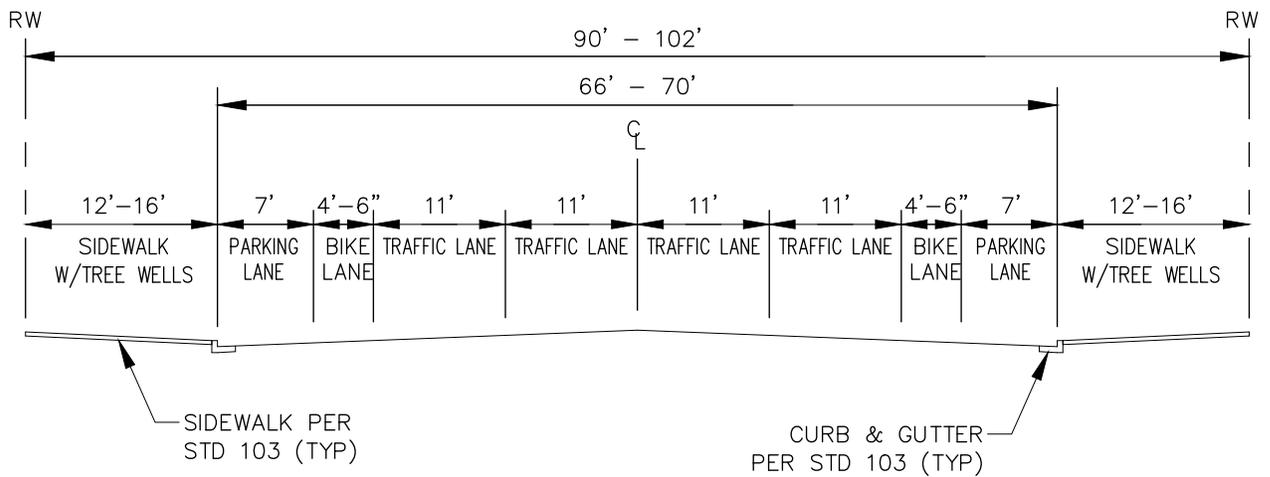
102

PAGE 1 OF 3

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COMMERCIAL STREET (2 LANES)



COMMERCIAL STREET (4 LANES)



DESIGN AND CONSTRUCTION STANDARDS

STREET SECTION

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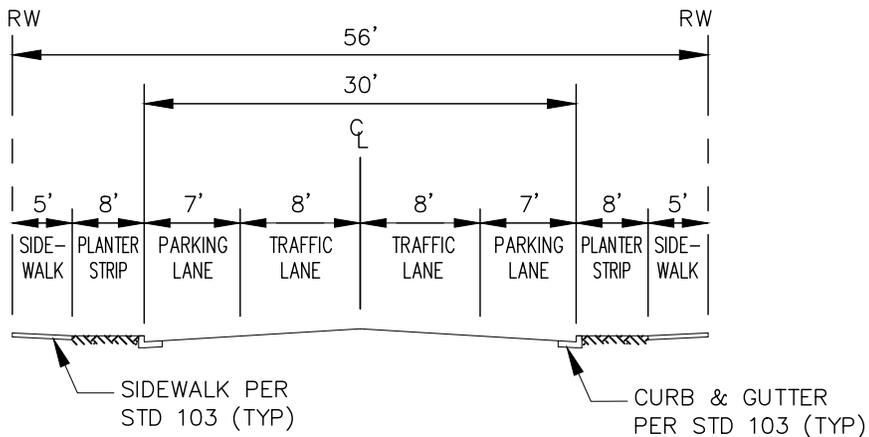
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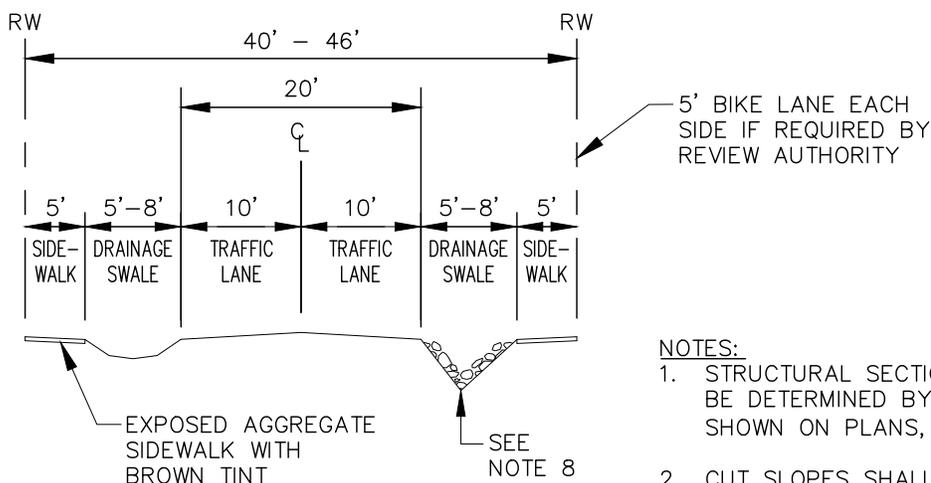
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PAGE 2 OF 3

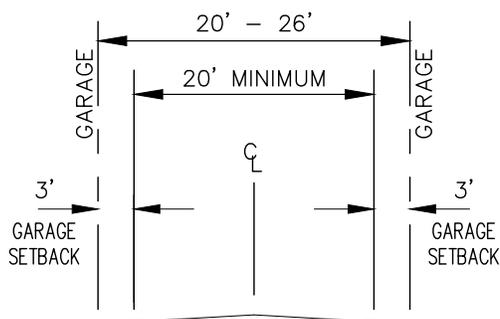
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NEIGHBORHOOD STREET



RURAL LANE



ALLEY

NOTES:

1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED BY SOILS REPORT AND SHOWN ON PLANS, SHOW "R" VALUE & T.I.
2. CUT SLOPES SHALL BE A MAXIMUM OF 2:1, UNLESS SOILS REPORT DETERMINES OTHERWISE.
3. FILL SLOPES SHALL BE A MAXIMUM OF 2:1.
4. CONSTRUCTION OUTSIDE RIGHT-OF-WAY LINE SHALL REQUIRE SLOPE EASEMENTS.
5. A 10' P.U.E. MAY BE REQUIRED ADJACENT TO THE RIGHTS-OF-WAY.
6. LANDSCAPE PARCEL WIDTHS PER PROJECT APPROVAL.
7. INSTALL SHOULDER BACKING MATERIAL PER CALTRANS STANDARD SPECIFICATIONS.
8. ROCK SLOPE PROTECTION MAY BE REQUIRED TO PREVENT EROSION ON STEEPER GRADES.
9. SEE STD 101, STREET LAYOUT, FOR CURB RADIUS WIDTHS.



DESIGN AND CONSTRUCTION STANDARDS

STREET SECTION

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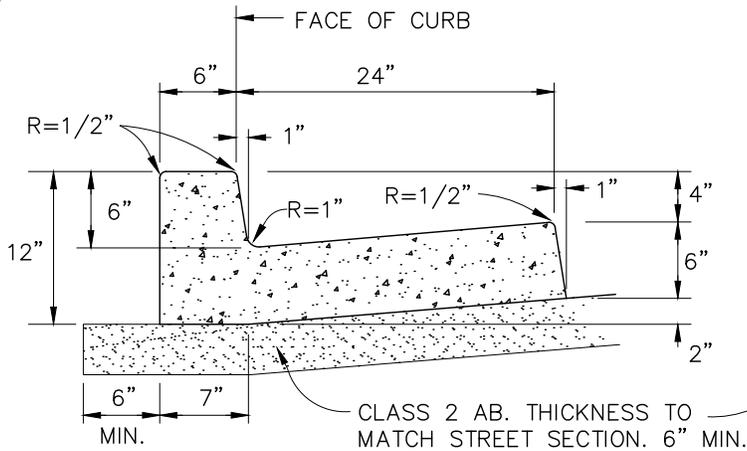
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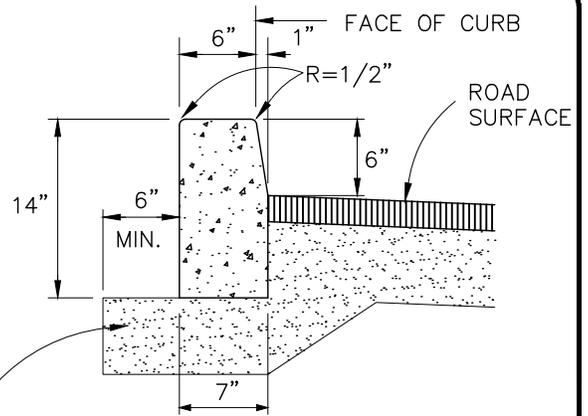
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PAGE 3 OF 3

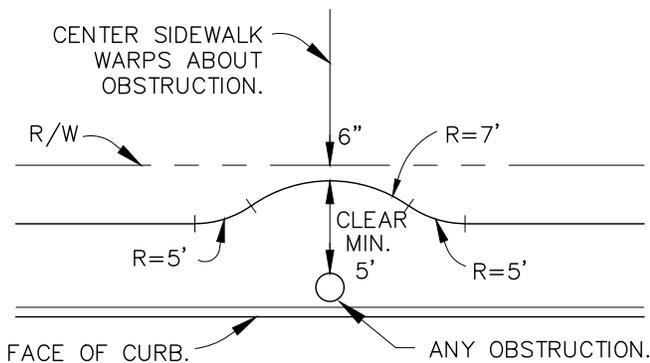
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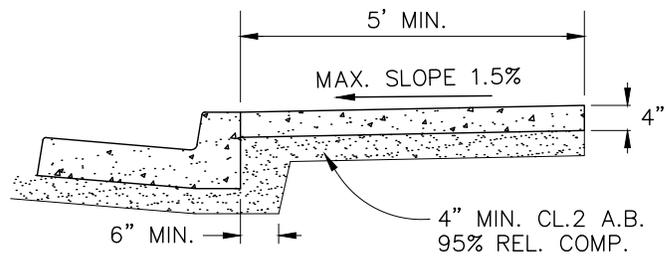
STANDARD CURB AND GUTTER



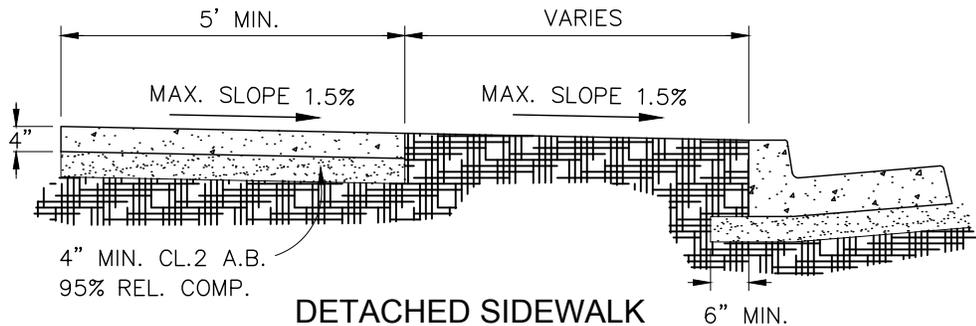
STANDARD VERTICAL CURB



SIDEWALK WARP (CONTIGUOUS SIDEWALK)



CONTIGUOUS SIDEWALK



DETACHED SIDEWALK

NOTES:

1. ALL CONCRETE SHALL BE CALTRANS "MINOR CONCRETE", SECTION 90-2, 3,000 PSI WITH 2 LBS PER CUBIC YARD OF JET BLACK COLORING ADD MIXTURE.
2. EXPANSION JOINTS, 1/4 INCH WIDE, SHALL BE INSTALLED AT EACH SIDE OF STRUCTURES, AT ENDS OF CURB RETURNS AND AT THE TOP OF DRIVEWAY TAPERS.
3. EXPANSION JOINTS SHALL BE INSTALLED AT 60-FOOT INTERVALS, WITH WEAKENED PLANE JOINTS EVERY 15 FT.
4. SIDEWALKS SHALL BE SCORED INTO 5-FOOT SQUARES UNLESS SPECIFIED BY ENGINEER.
5. EXPANSION JOINTS SHALL BE PLACED IN CURB, GUTTER AND SIDEWALK AT ALL CURB RETURNS.
6. WEIGHT OF CURB AND/OR SIDEWALK AND CLASS 2 AGGREGATE SHALL EXCEED THE EXPANSION PRESSURE OF THE BASEMENT SOIL 'R' VALUE.



DESIGN AND CONSTRUCTION STANDARDS

CURB, GUTTER, SIDEWALK, AND SIDEWALK WARP

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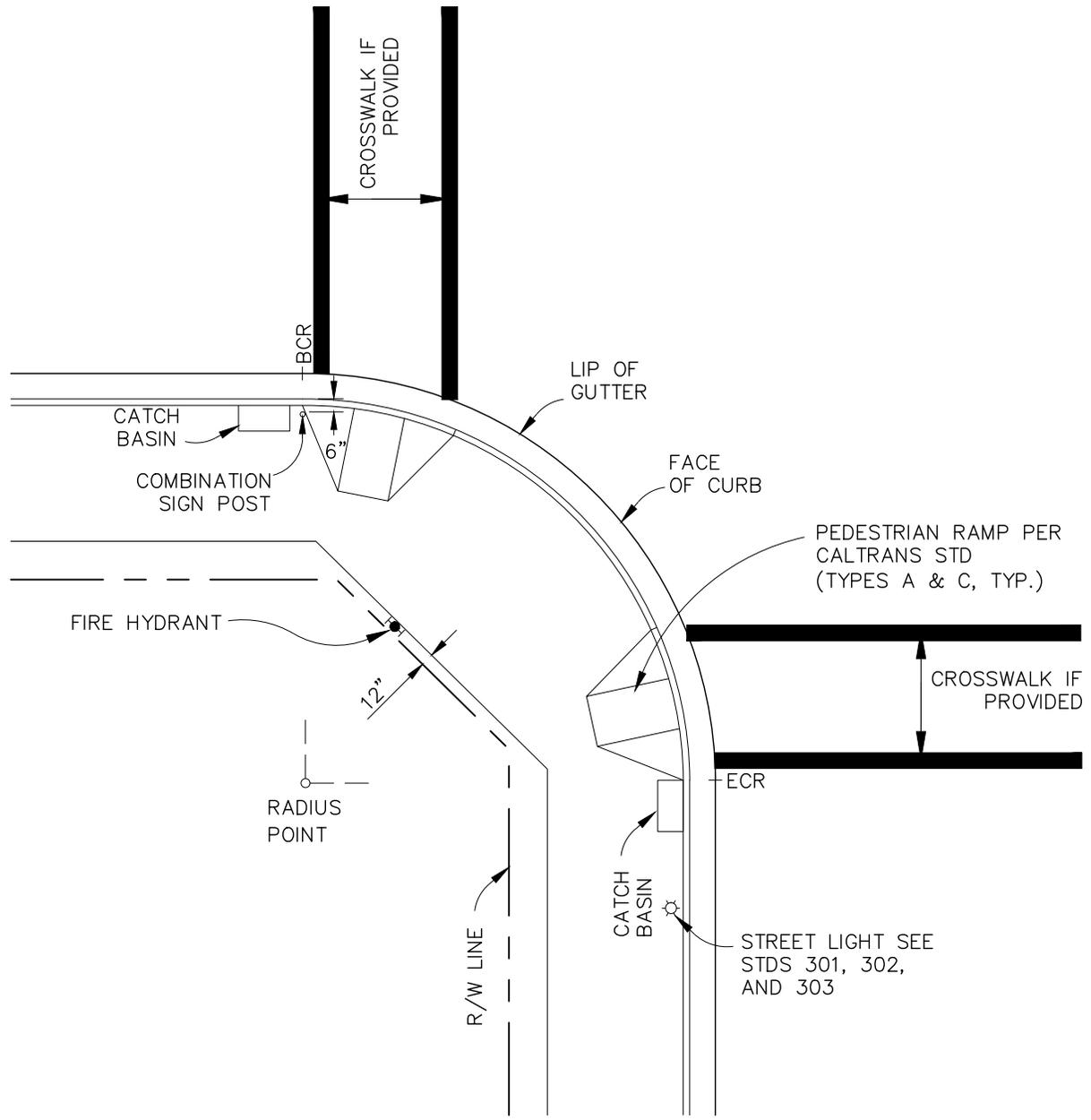
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STD. NO.

103

PAGE 1 OF 1

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DESIGN AND CONSTRUCTION STANDARDS

CURB RETURN

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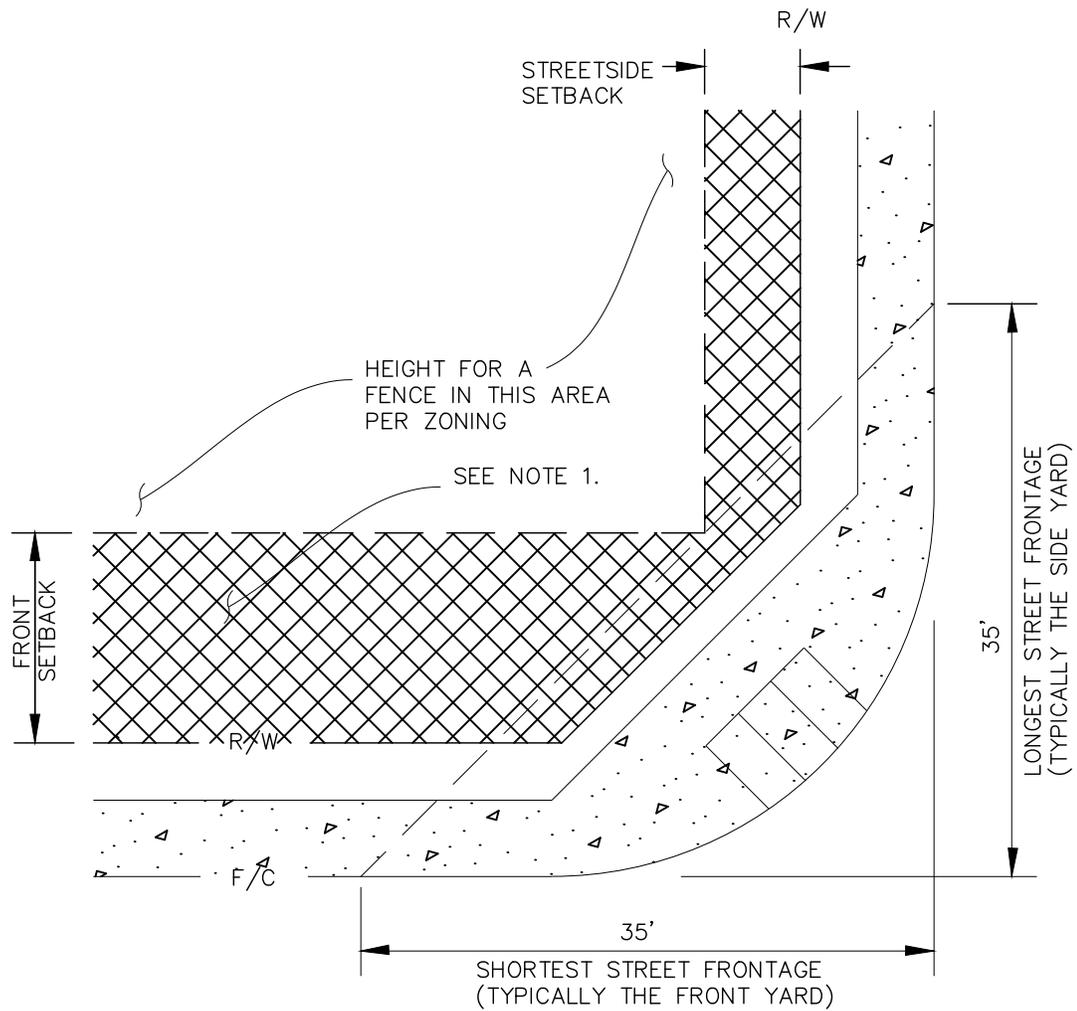
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STD. NO.

104

PAGE 1 OF 1

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INTERSECTION

NOTES:

1. WITHIN THIS AREA ALL SHRUBS, BUSHES, FENCES AND OTHER IMPROVEMENTS SHALL BE RESTRICTED TO A 36" MAXIMUM HEIGHT, AND TREES MAINTAINED TO A CLEARANCE OF 7'-0" ABOVE GROUND (MIN.)
2. SETBACKS SHALL BE PER COTATI MUNICIPAL CODE 17.30.040 (E) (2)



DESIGN AND CONSTRUCTION STANDARDS

VISIBILITY REQUIREMENTS

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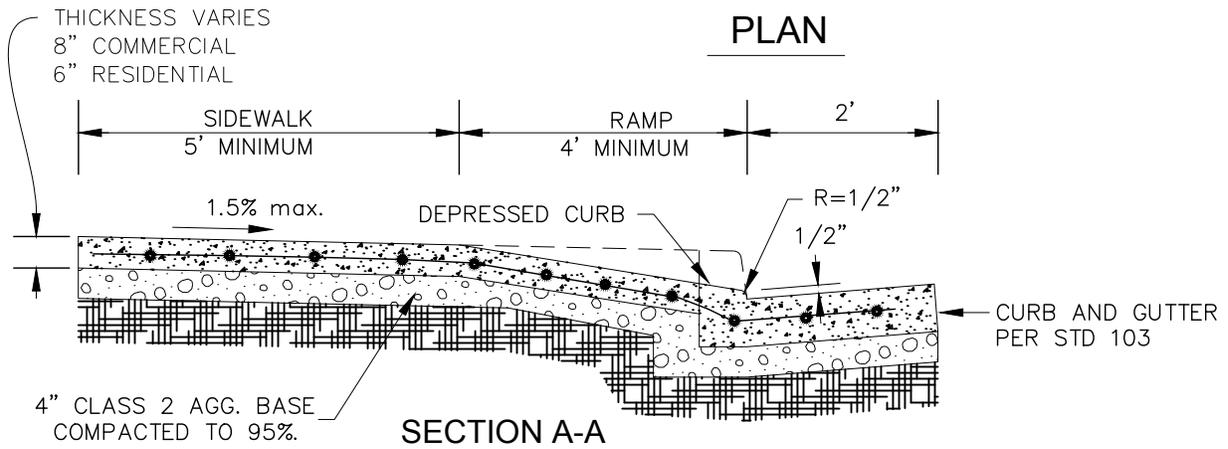
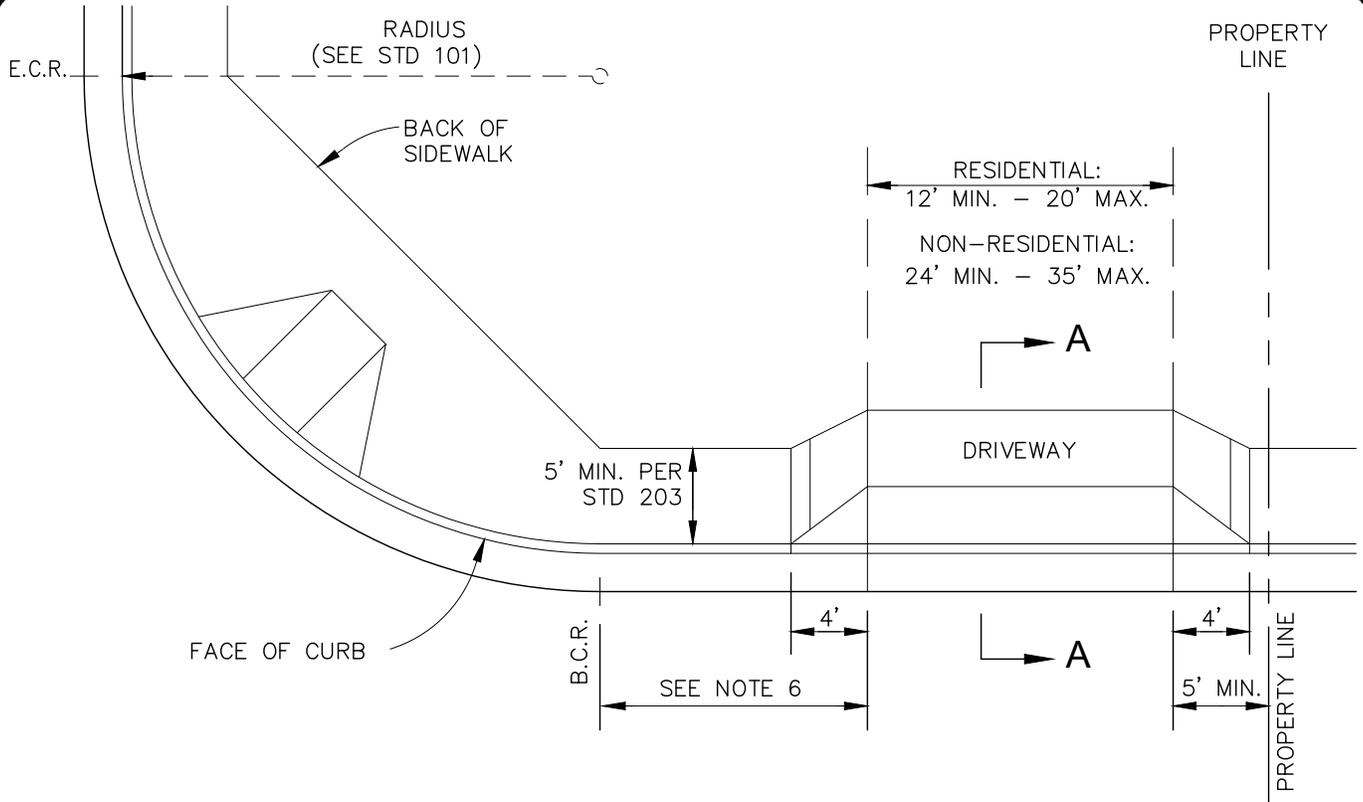
STD. NO.

105

PAGE 1 OF 1

DECEMBER 2019

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NOTES:

1. WEAKENED PLANE JOINTS SHALL BE INSTALLED AT THE CENTER OF ALL DRIVEWAYS OVER 20' WIDE.
2. MAXIMUM SIDEWALK CROSS SLOPE 1.5%.
3. MEANDER SIDEWALK AT OBSTRUCTIONS AND DRIVEWAYS TO MAINTAIN 5.0' MINIMUM CLEARANCE.
4. ALL CONCRETE SHALL BE CALTRANS "MINOR CONCRETE", SECTION 90-2, 3,000 PSI WITH 2 LBS PER CUBIC YARD OF JET BLACK COLORING ADD MIXTURE.
5. PLACE #4 REBAR AT 12" BOTH WAYS THROUGHOUT DRIVEWAYS WITHIN THE STREET RIGHT OF WAY AND SIDEWALK SUBJECT TO VEHICLE TRAFFIC.
6. RESIDENTIAL DRIVEWAY RAMP SHALL BE MINIMUM 20' FROM B.C.R.
7. NO DRIVEWAY SHALL BE LOCATED LESS THAN 150' FROM NEAREST INTERSECTION UNLESS APPROVED BY CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

DRIVEWAY - RESIDENTIAL

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 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

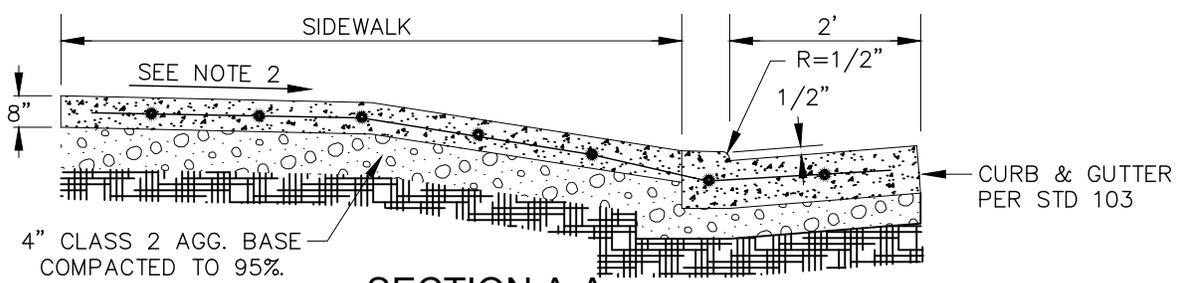
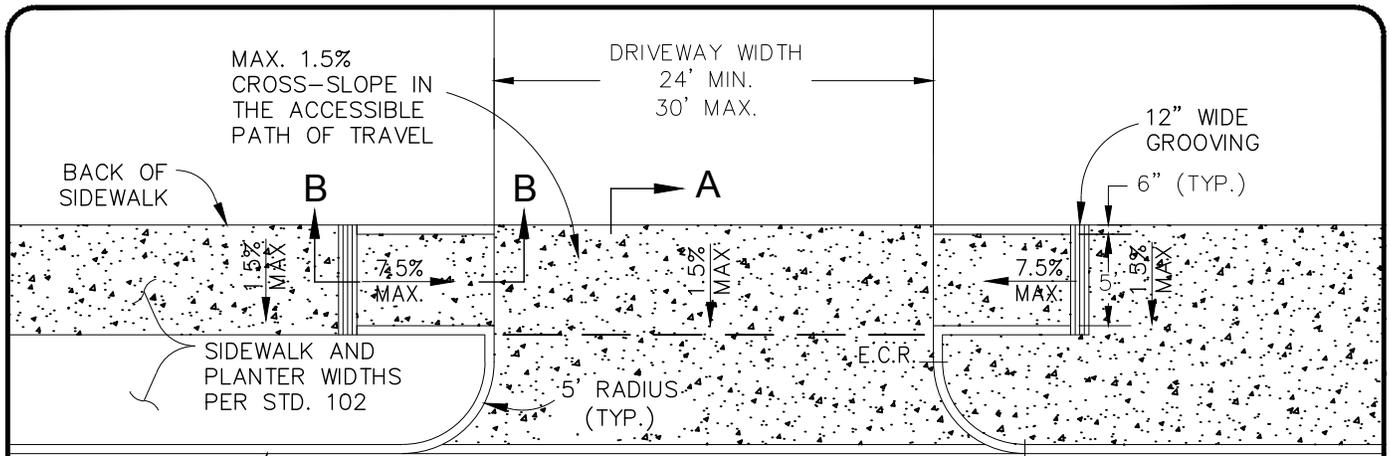
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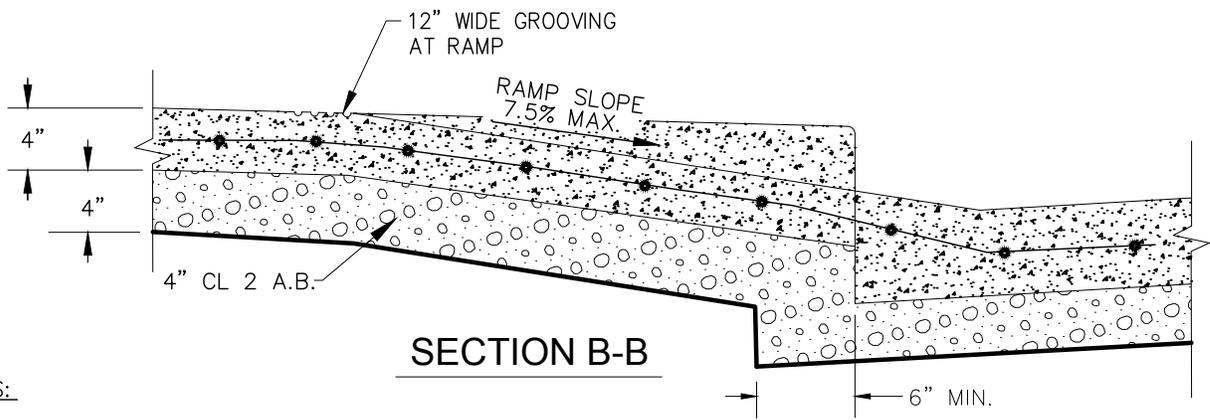
106

PAGE 1 OF 2

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SECTION A-A



SECTION B-B

NOTES:

1. WEAKENED PLANE JOINTS SHALL BE INSTALLED AT THE CENTER OF ALL DRIVEWAYS OVER 20' WIDE.
2. MAXIMUM CROSS SLOPE 1.5% IN THE ACCESSIBLE PATH OF TRAVEL. MAXIMUM 10% SLOPE ON DRIVEWAY.
3. ALL CONCRETE SHALL BE CALTRANS "MINOR CONCRETE", SECTION 90-2, 3,000 PSI WITH 2 LBS PER CUBIC YARD OF JET BLACK COLORING ADD MIXTURE.
4. PLACE #4 REBAR AT 12" BOTH WAYS THROUGHOUT COMMERCIAL AND INDUSTRIAL DRIVEWAYS WITHIN THE STREET RIGHT OF WAY AND SIDEWALK SUBJECT TO VEHICLE TRAFFIC.
5. NON-RESIDENTIAL DRIVEWAY RAMP SHALL BE 50' MINIMUM FROM B.C.R. AND 70' MINIMUM ON CROSSTOWN CONNECTOR STREETS.



DESIGN AND CONSTRUCTION STANDARDS

DRIVEWAY, COMMERCIAL/INDUSTRIAL

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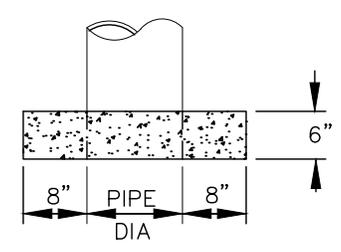
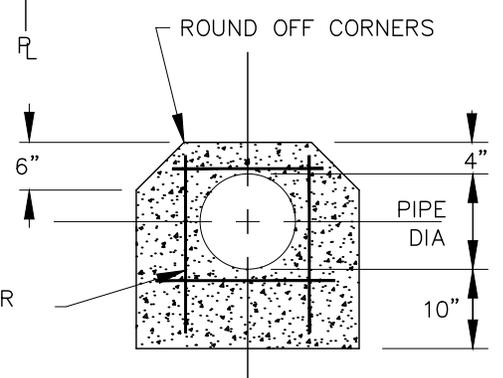
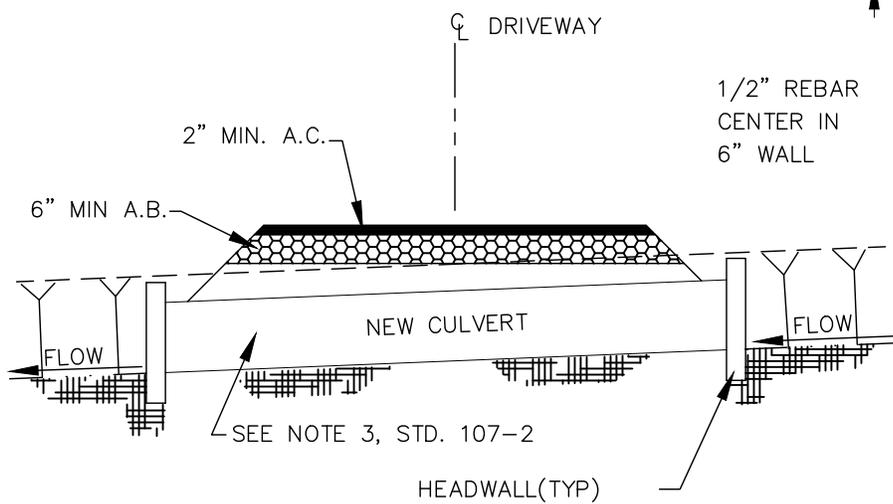
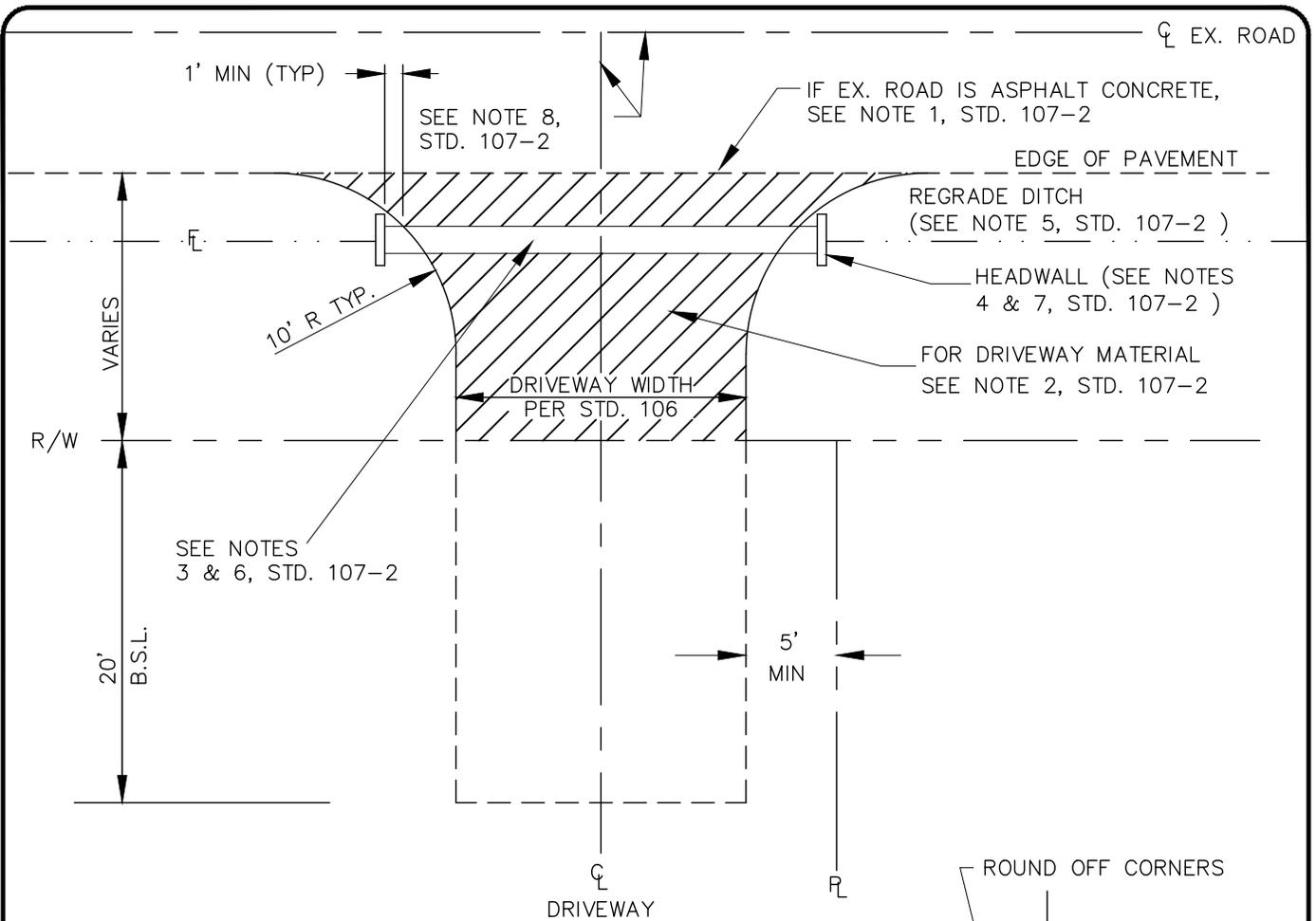
STD. NO.

106

PAGE 2 OF 2

DECEMBER 2019

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HEADWALL
NO SCALE

	DESIGN AND CONSTRUCTION STANDARDS		STD. NO.
	DRIVEWAY STREETS WITHOUT CURB & GUTTER		107 PAGE 1 OF 2
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER		DECEMBER 2019	SCALE: NONE

NOTES:

1. NEATLY CUT EXISTING EDGE OF PAVEMENT AND APPLY TACK COAT.
2. DRIVEWAY MATERIAL TO BE ASPHALT CONCRETE IF ROAD FRONTING DRIVEWAY IS PAVED. DRIVEWAY TO BE CLASS 2 AGG. BASE (6" MIN) IF ROAD FRONTING DRIVEWAY IS NOT PAVED, PAVING SHALL CONSIST OF 2" A.C. OVER 6" A.B. MIN. WITH THE APPROVAL OF THE CITY ENGINEER, CLASS 2 AGG. BASE CAN BE ELIMINATED AND 4" OF ASPHALT CONCRETE CAN BE USED.
3. CULVERT, IF REQUIRED SHALL BE 12" DIA. MINIMUM R.C.P., IN CITY RIGHT OF WAY. IN NO CASE SHALL PIPE BE SMALLER THAN UP STREAM CULVERT.
4. PLACE CONCRETE HEADWALL AT ENDS OF CULVERT. (SEE DETAIL ON PAGE 1 OF 2)
5. REGRADE DITCH ADJACENT TO PROPERTY LINE FOR ENTIRE FRONTAGE OF PROPERTY, IF REQUIRED.
6. IF CULVERT IS NOT REQUIRED, (DEPTH FROM FINISHED SURFACE OF DRIVEWAY TO FLOWLINE OF PIPE IS LESS THAN 16") DEPRESS DRIVEWAY FOR FLOWLINE TO PASS ROADSIDE DRAINAGE WITH MAX. OF 10% SLOPE ON DRIVEWAY.
7. ALL CONCRETE SHALL BE CALTRANS "MINOR CONCRETE", SECTION 90-2, 3,000 PSI WITH 2 LBS PER CUBIC YARD OF JET BLACK COLORING ADD MIXTURE.
8. ALL DRIVEWAYS TO INTERSECT EXISTING STREETS AT 90 DEGREES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
9. WHEN CHANGES IN DRIVEWAY CENTERLINE GRADE EQUAL 10% OR GREATER, A VERTICAL CURVE SHALL BE CONSTRUCTED BETWEEN SECTIONS OF UNIFORM GRADE IN ACCORDANCE WITH THE TABLE BELOW:

<u>GRADE CHANGE</u>	<u>MINIMUM LENGTH OF VERTICAL CURVE</u>
	10 FEET (MINIMUM)
20% IN HUMPS	20 FEET (MINIMUM)
20% SAGS	30 FEET (MINIMUM)

GRADE CHANGES FROM 11% TO 19% SHALL HAVE A VERTICAL CURVE LENGTH PROPORTIONAL TO THE ABOVE VALUES.

10. AT ALL DRIVEWAY/ ROAD INTERSECTIONS THE DRIVEWAY SHALL BE LOCATED SUCH THAT ADEQUATE SIGHT DISTANCE IS PROVIDED BASED ON THE SPEED LIMIT OF THE ROAD. 10 FT. OF SIGHT DISTANCE MUST BE PROVIDED IN EACH DIRECTION FOR EVERY MILE PER HOUR OF POSTED SPEED LIMIT. (I.E. 250 FT OF SIGHT DISTANCE MUST BE PROVIDED, IN EACH DIRECTION, FOR A POSTED SPEED LIMIT OF 25 M.P.H.)



DESIGN AND CONSTRUCTION STANDARDS

**DRIVEWAY
STREETS WITHOUT CURB AND GUTTER**

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

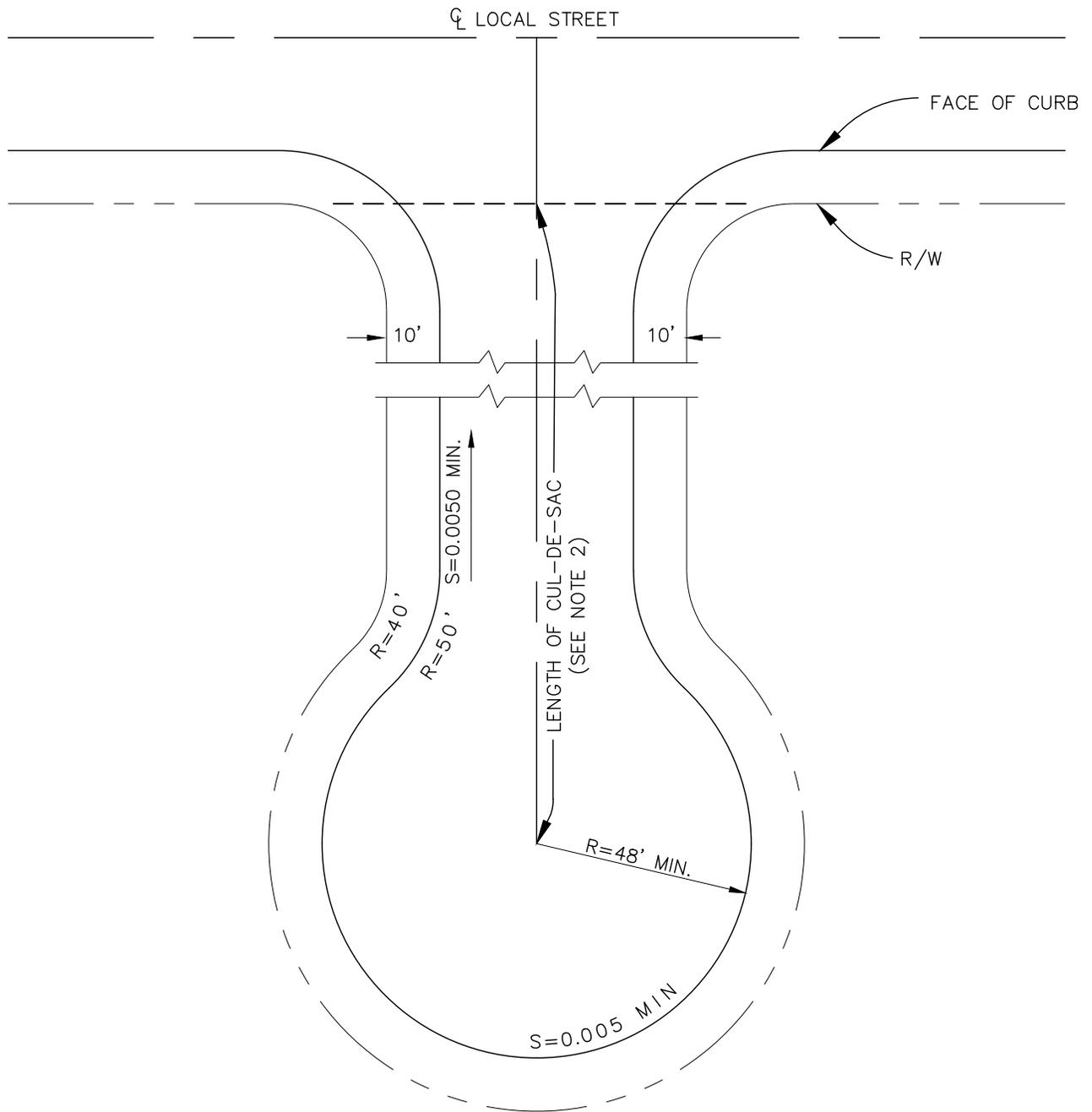
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STD. NO.

107

PAGE 2 OF 2

SCALE: NONE



NOTES:

1. CROSS SLOPE IN BULB AREA SHALL BE MINIMUM 2% MAXIMUM 4%.
2. MAXIMUM LENGTH OF CUL-DE-SAC: RESIDENTIAL 500'
COMMERCIAL 300'
3. LONGER WILL REQUIRE APPROVAL OF THE CITY, AND CONFORMANCE WITH FIRE CODE APPENDIX D.



DESIGN AND CONSTRUCTION STANDARDS

CUL-DE-SAC

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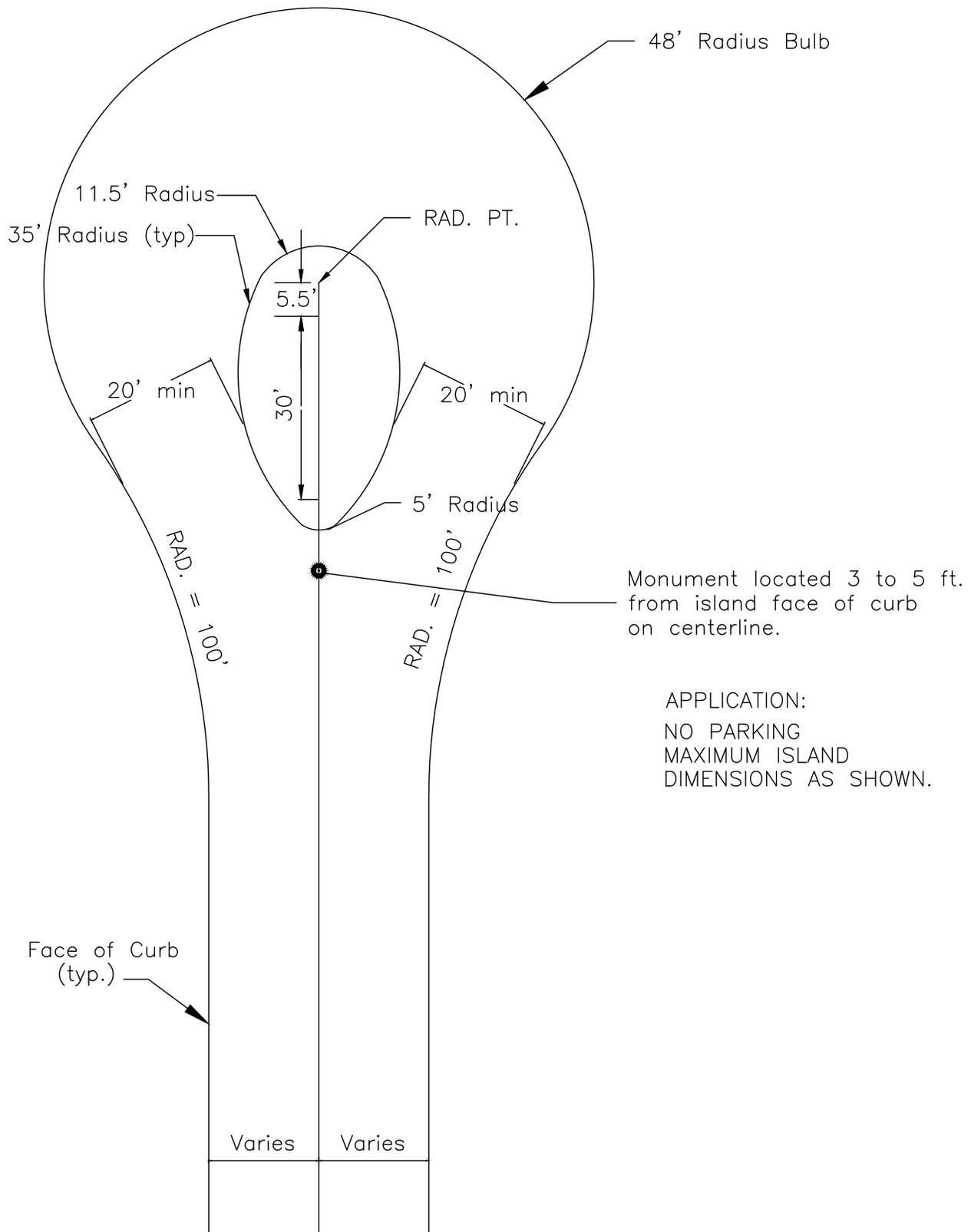
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STD. NO.

108A

PAGE 1 OF 1

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DESIGN AND CONSTRUCTION STANDARDS

CUL-DE-SAC W/ ISLAND 48' RADIUS

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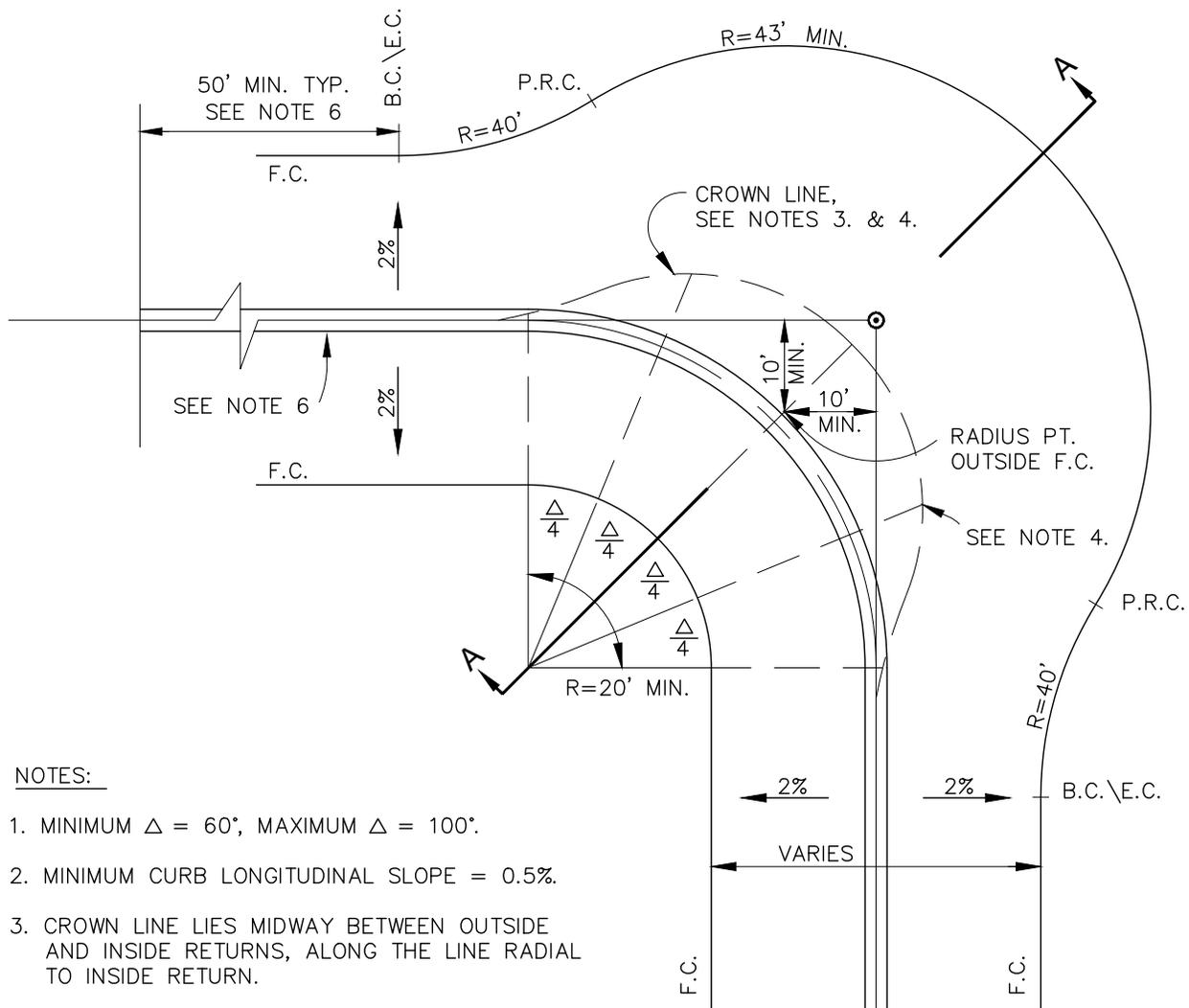
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108B

PAGE 1 OF 1

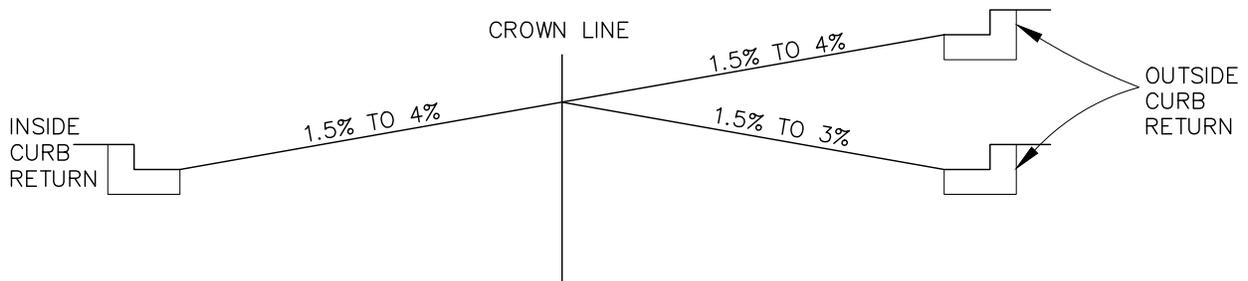
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NOTES:

1. MINIMUM $\Delta = 60^\circ$; MAXIMUM $\Delta = 100^\circ$.
2. MINIMUM CURB LONGITUDINAL SLOPE = 0.5%.
3. CROWN LINE LIES MIDWAY BETWEEN OUTSIDE AND INSIDE RETURNS, ALONG THE LINE RADIAL TO INSIDE RETURN.
4. CROWN LINE ELEVATION TO BE SHOWN ON THE PLANS AT $\Delta/4$ POINTS.
5. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
6. PLACE CALTRANS DETAIL 22, CENTERLINE STRIPE AT LEAST 50' BEYOND THE BC/EC'S.



DESIGN AND CONSTRUCTION STANDARDS

RESIDENTIAL STREET KNUCKLE

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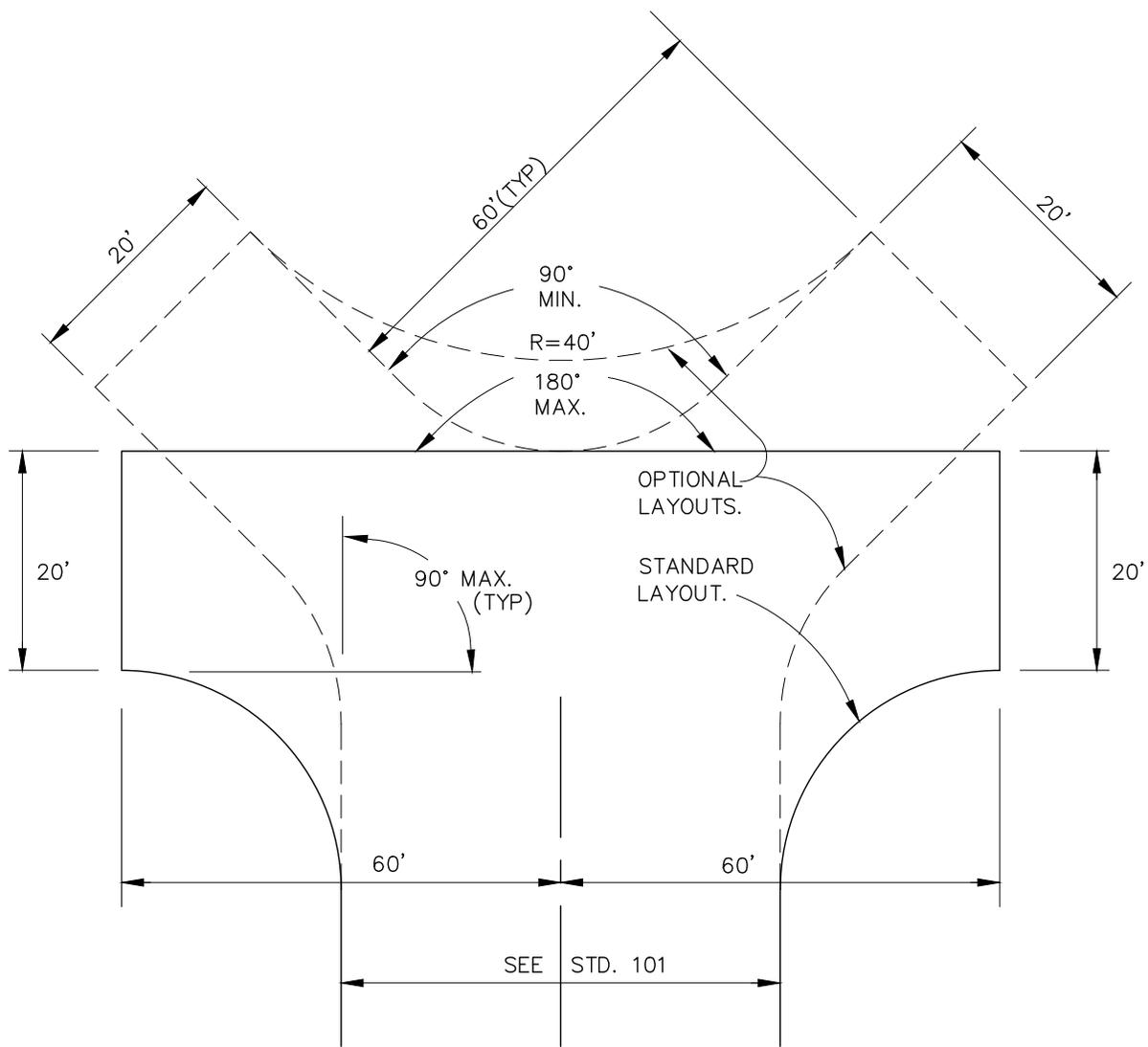
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STD. NO.

109

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. FOR RESIDENTIAL STREETS, PRIVATE STREETS, AND DEAD-END ROADS IN EXCESS OF 150'.
2. TO BE USED ONLY WHEN SPECIFICALLY AUTHORIZED BY THE TOWN ENGINEER AND FIRE PROTECTION DISTRICT.
3. ALL RADII 28', EXCEPT AS NOTED
4. SINGLE-SIDED TURNAROUNDS OF EQUIVALENT DIMENSIONS MAY BE USED.
5. ACCORDING TO APPENDIX "D" OF CALIFORNIA FIRE CODE



DESIGN AND CONSTRUCTION STANDARDS

HAMMERHEAD TURNAROUND

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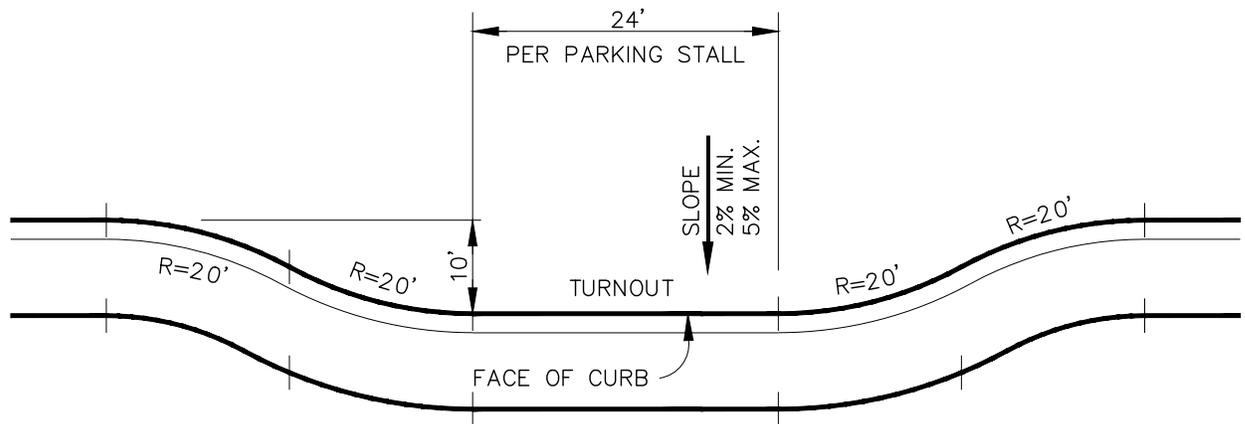
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STD. NO.

110

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. EMERGENCY TURNOUT TO BE USED AS APPROVED BY THE CITY ENGINEER.
2. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

EMERGENCY VEHICLE
TURNOUT

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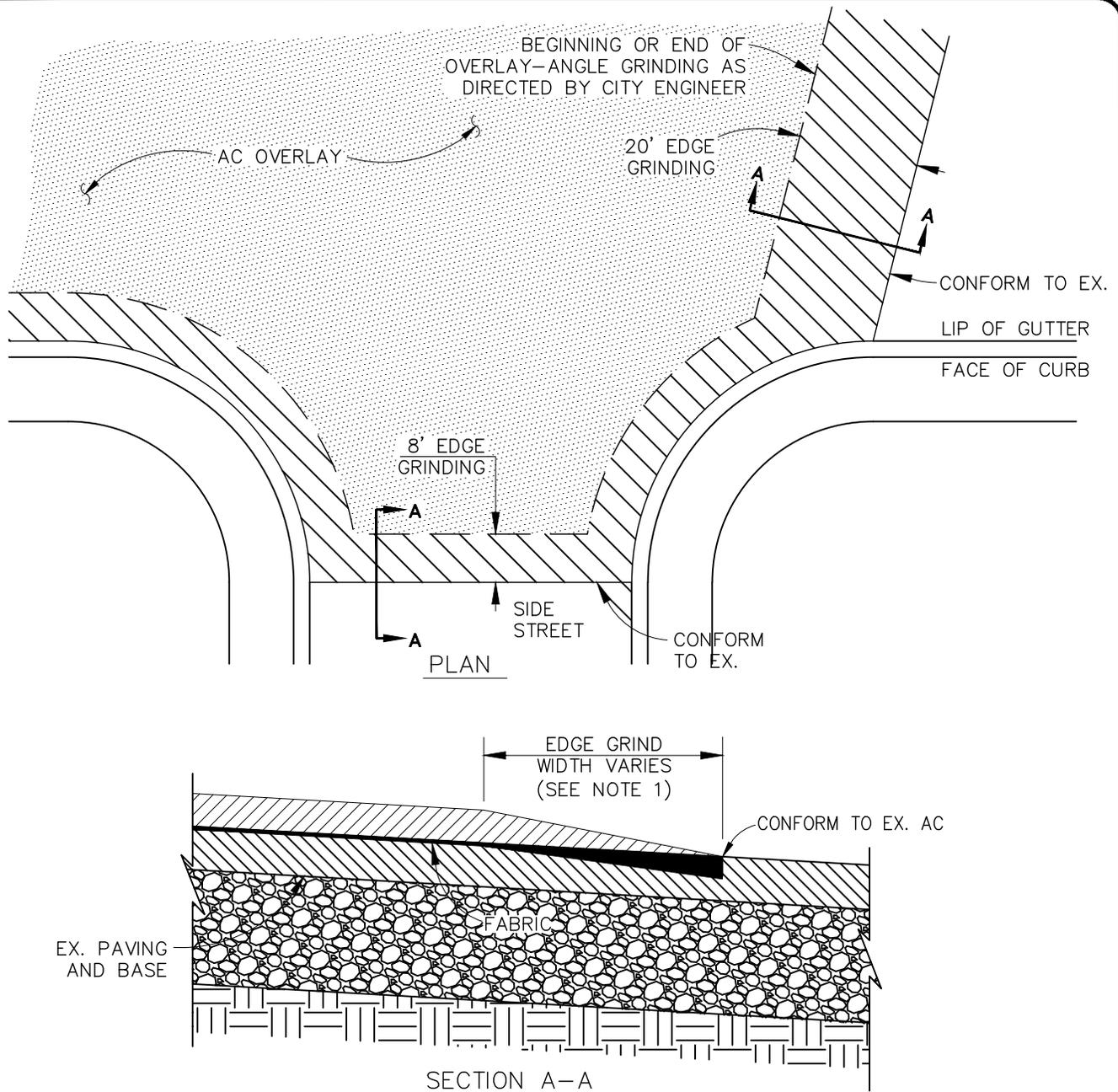
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STD. NO.

111

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. EDGE GRINDING SHALL BE 20ft WIDE ON STREET TO BE OVERLAID, 8ft WIDE ON SIDE STREETS, AND DEPTH OF 0.15ft±.
2. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. A TACK COAT, TYPE SS-1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39-3.04 "TRANSPORTING, SPREADING, AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.
5. GEOTEXTILE FABRICS SHALL CONFORM TO SECTION 88, "GEOSYNTHETICS" OF THE CALTRANS STANDARD SPECIFICATIONS AND THESE REQUIREMENTS. PAVEMENT REINFORCING FABRIC SHALL BE PETROTAC OR APPROVED EQUAL.



DESIGN AND CONSTRUCTION STANDARDS

EDGE GRIND AT SIDE STREET AND
END OF OVERLAY CONFORM

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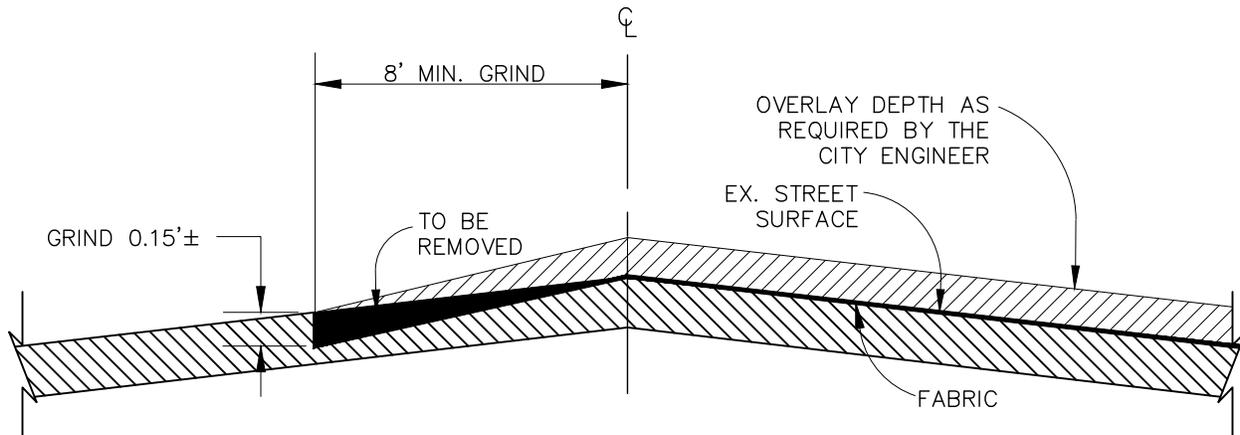
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112

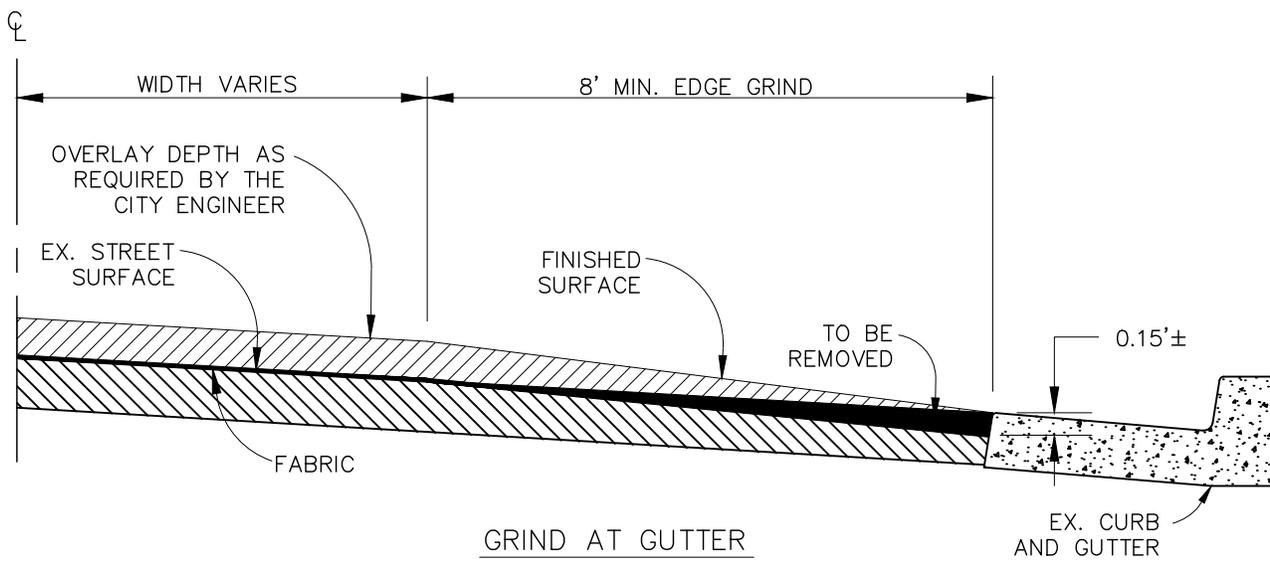
PAGE 1 OF 1

DECEMBER 2019

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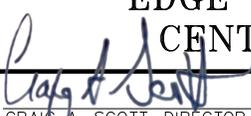
GRIND AT CENTERLINE

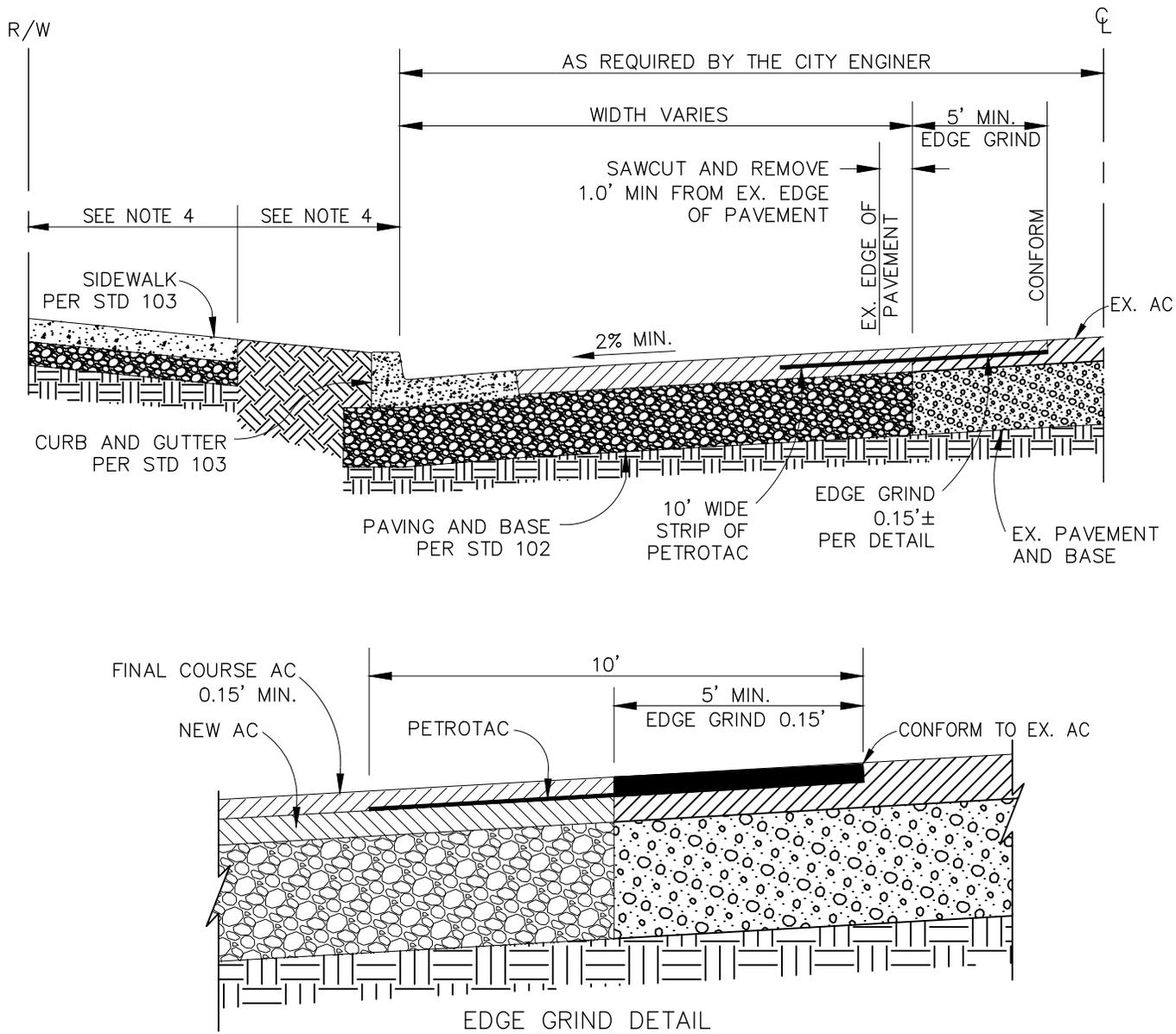


GRIND AT GUTTER

NOTES:

1. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. A TACK COAT, TYPE SS-1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39-3.04 "TRANSPORTING, SPREADING, AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.
5. GEOTEXTILE FABRICS SHALL CONFORM TO SECTION 88, "GEOSYNTHETICS" OF THE CALTRANS STANDARD SPECIFICATIONS AND THESE REQUIREMENTS. PAVEMENT REINFORCING FABRIC SHALL BE PETROTAC OR APPROVED EQUAL.

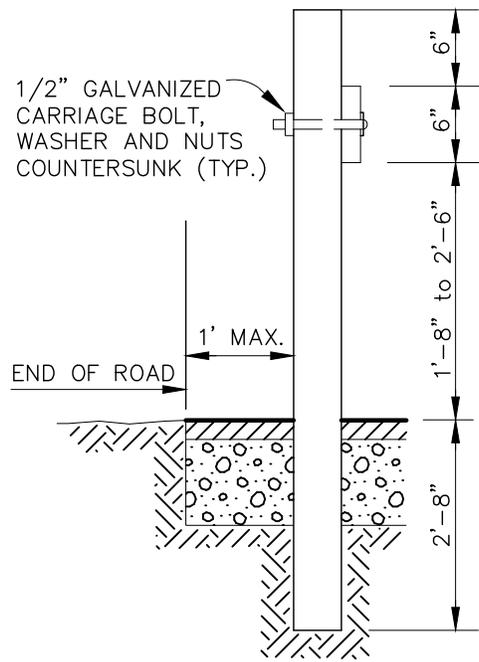
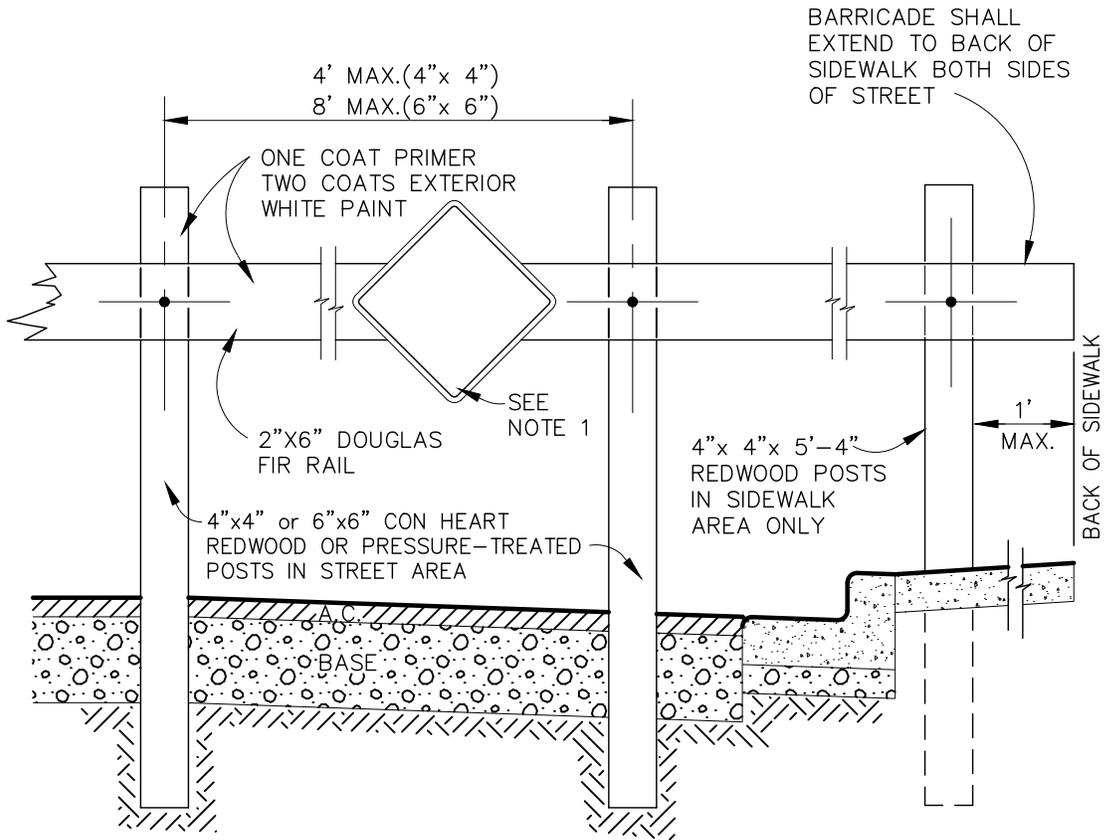
	DESIGN AND CONSTRUCTION STANDARDS	STD. NO. 113
	EDGE GRIND AT GUTTER AND CENTERLINE FOR OVERLAY	PAGE 1 OF 1
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER	DECEMBER 2019	SCALE: NONE



NOTES:

1. A TACK COAT, TYPE SS-1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.
2. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39-3.04 "TRANSPORTING, SPREADING, AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.
3. GEOTEXTILE FABRICS SHALL CONFORM TO SECTION 88, "GEOSYNTHETICS" OF THE CALTRANS STANDARD SPECIFICATIONS AND THESE REQUIREMENTS. PAVEMENT REINFORCING FABRIC SHALL BE PETROTAC OR APPROVED EQUAL.
4. WIDTH VARIES PER STREET DESIGN GUIDELINES AND/OR STD 101.

	DESIGN AND CONSTRUCTION STANDARDS	STD. NO.
	STREET WIDENING	114
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER	DECEMBER 2019	PAGE 1 OF 1 SCALE: NONE



NOTES:

1. INSTALL 18" X 18" ALUMINUM TYPE N-2 (CA) OBJECT MARKER, HIGH INTENSITY REFLECTOR RED BACKGROUND WITH BLACK BORDER, MAXIMUM 8' O.C., MINIMUM 3 LOCATIONS, PER CALTRANS STANDARD PLANS A73B.
2. INSTALL SIGN BEHIND BARRICADES ON STUB STREETS. SEE CITY STD 233.
3. USE METAL BEAM BARRICADE FOR INSTALLATIONS OTHER THAN DEAD-END STREETS.



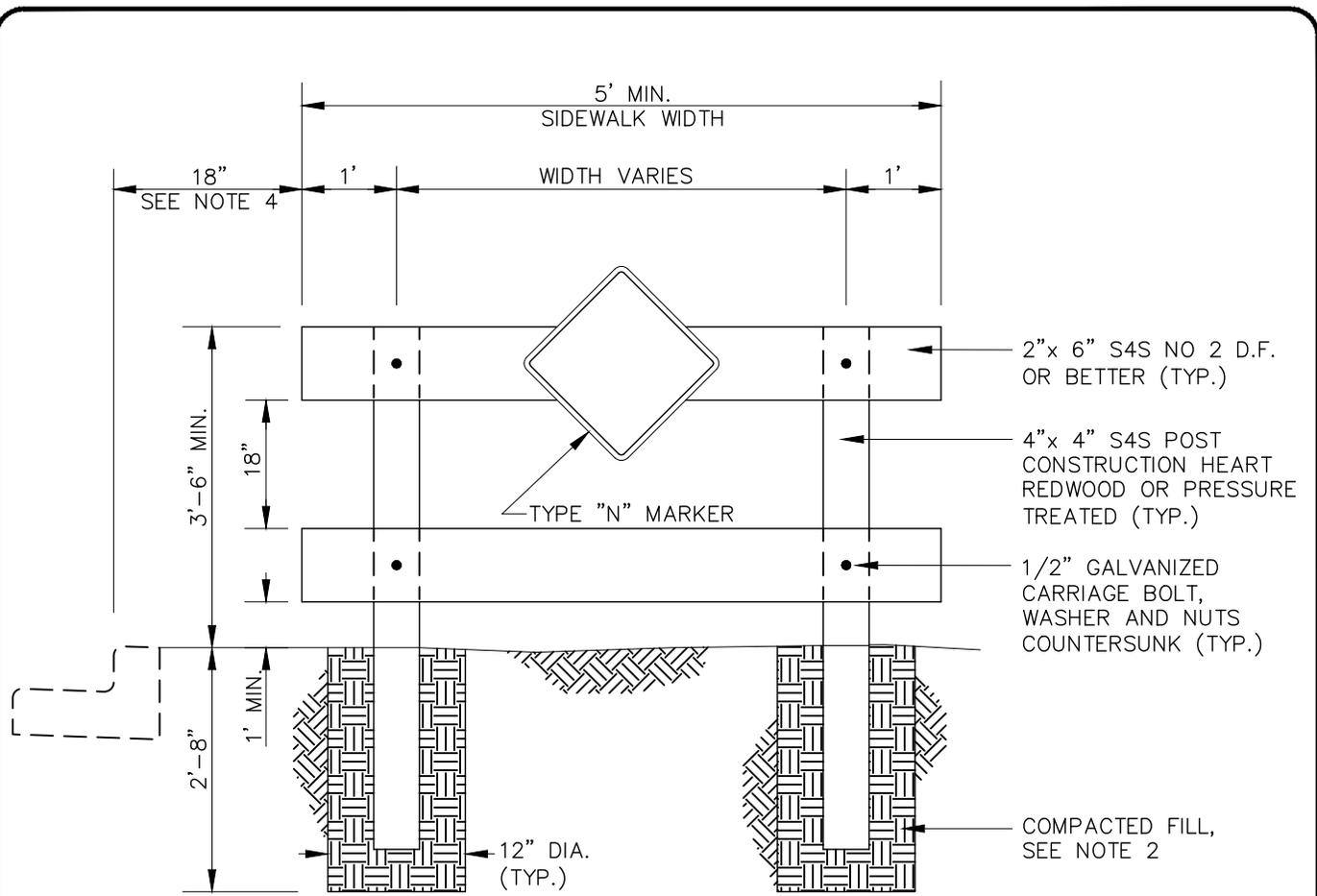
DESIGN AND CONSTRUCTION STANDARDS

STREET BARRICADE

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STD. NO.
115
PAGE 1 OF 1
SCALE: NONE

DECEMBER 2019



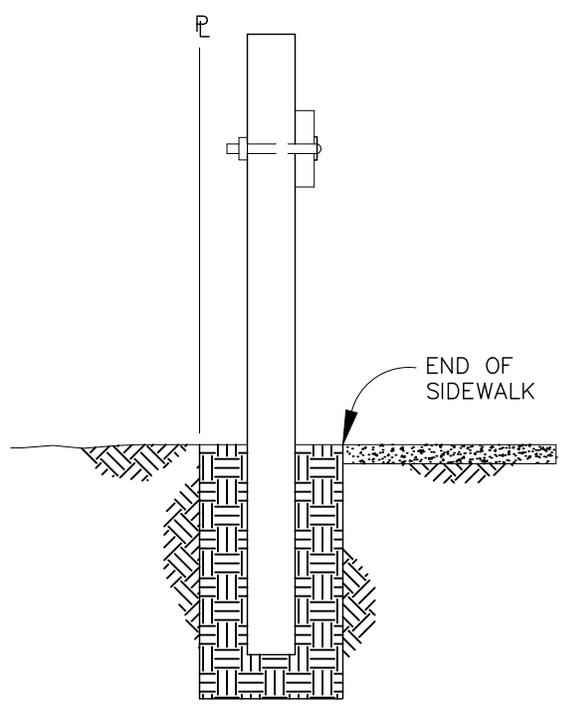
2" x 6" S4S NO 2 D.F. OR BETTER (TYP.)

4" x 4" S4S POST CONSTRUCTION HEART REDWOOD OR PRESSURE TREATED (TYP.)

1/2" GALVANIZED CARRIAGE BOLT, WASHER AND NUTS COUNTERSUNK (TYP.)

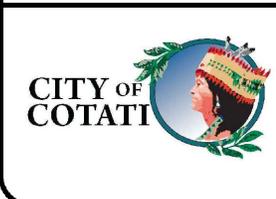
COMPACTED FILL, SEE NOTE 2

12" DIA. (TYP.)



NOTES:

1. PAINT ALL EXPOSED SURFACES WITH ONE COAT OF PRIMER AND TWO COATS OF GLOSS WHITE EXTERIOR ENAMEL AFTER CONSTRUCTION.
2. POSTS SHALL BE BACKFILLED AND COMPACTED WITH NATIVE SOIL.
3. ALL PORTION OF POSTS TO BE INSTALLED BELOW FINISHED GRADE SHALL BE TREATED WITH WOOD PRESERVATIVE.
4. IF SIDEWALK IS CONTIGUOUS TO CURB, BARRICADE SHALL BE 18" BACK FROM FACE OF CURB.
5. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

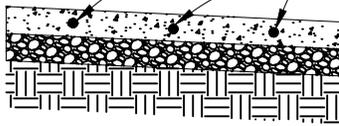
SIDEWALK BARRICADE

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STD. NO.
116
PAGE 1 OF 1
SCALE: NONE

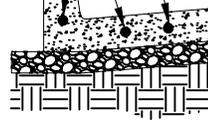
DECEMBER 2019

DRILL AND EPOXY BARS INTO THE MIDDLE OF THE EX. SIDEWALK (3 MIN.)

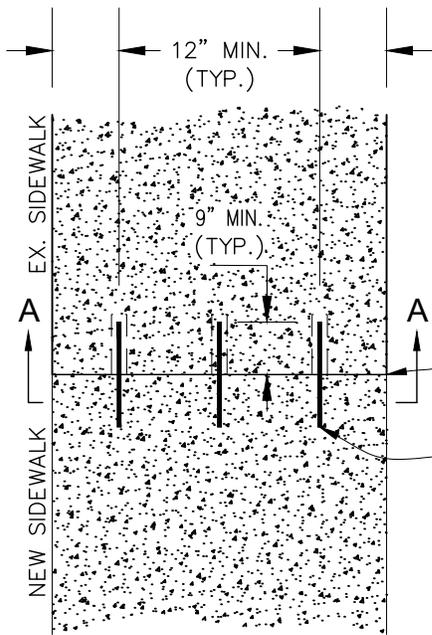


SECTION A-A

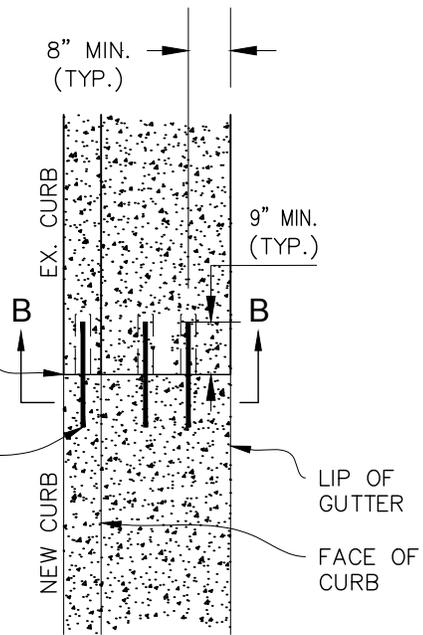
DRILL AND EPOXY BARS INTO THE MIDDLE OF EXISTING CURB AND GUTTER PAN (3 MIN.)



SECTION B-B



SIDEWALK PLAN



CURB PLAN

TROWEL SCORE LINE IN FRESH CONCRETE

#3, GRADE 40 REBAR (TYPICAL)

LIP OF GUTTER

FACE OF CURB

NOTES:

1. CURB AND GUTTER AND SIDEWALK CONSTRUCTION SHALL CONFORM TO CITY STANDARD 103.
2. ALL SOFT OR SPONGY SUB-GRADE MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL AS REQUIRED BY THE CITY ENGINEER.
3. REINFORCING BARS SHALL BE MINIMUM GRADE 40 AND SHALL CONFORM TO SECTION 52, "REINFORCEMENT" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. EPOXY USED FOR BONDING REINFORCING BARS TO EXISTING CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF SECTION 95, EPOXY AND SECTION 95-2.03, "EPOXY RESIN ADHESIVE FOR BONDING NEW CONCRETE TO OLD CONCRETE" OF THE CALTRANS STANDARD SPECIFICATIONS.
5. SIDEWALK SHALL BE SAWCUT AND REMOVED TO THE NEAREST CONTROL JOINT (SCORE, EXPANSION OR WEAKENED PLANE JOINT). CURB AND GUTTER SHALL BE SAWCUT AND REMOVED TO THE NEAREST CONTROL JOINT OR AS DIRECTED BY THE CITY INSPECTOR.



DESIGN AND CONSTRUCTION STANDARDS

SIDEWALK, CURB & GUTTER REPLACEMENT DETAILS

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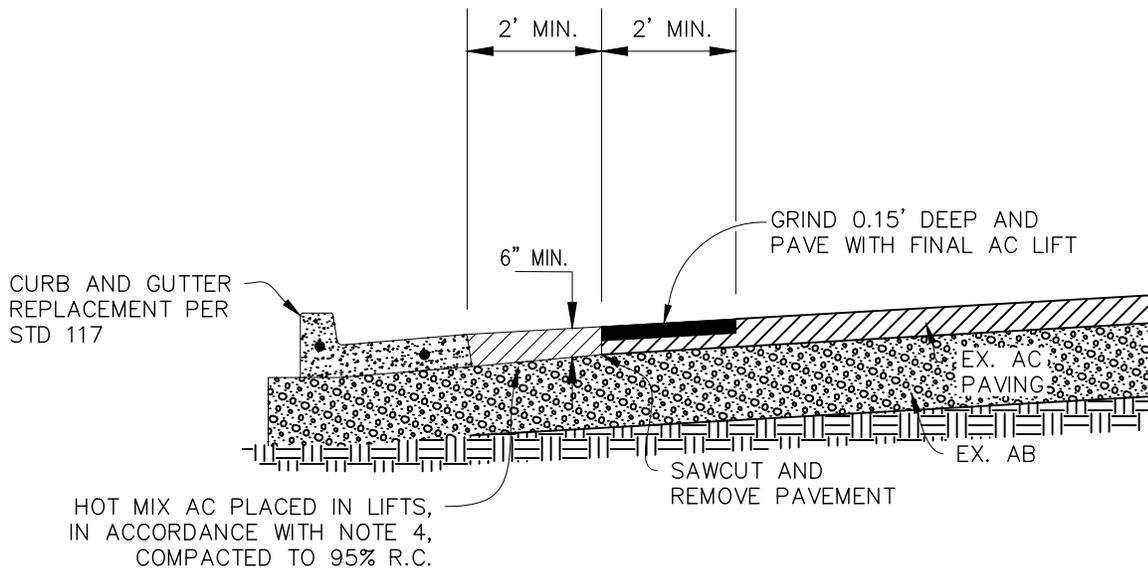
DECEMBER 2019

STD. NO.

117

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. CURB AND GUTTER CONSTRUCTION SHALL CONFORM TO CITY STD 103.
2. ALL SOFT OR SPONGY SUB-GRADE MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL AS REQUIRED BY THE CITY ENGINEER.
3. A TACK COAT, TYPE SS-1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39-3.04 "TRANSPORTING, SPREADING, AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.



DESIGN AND CONSTRUCTION STANDARDS

AC CONFORM DETAIL AT
CURB AND GUTTER REPLACEMENT

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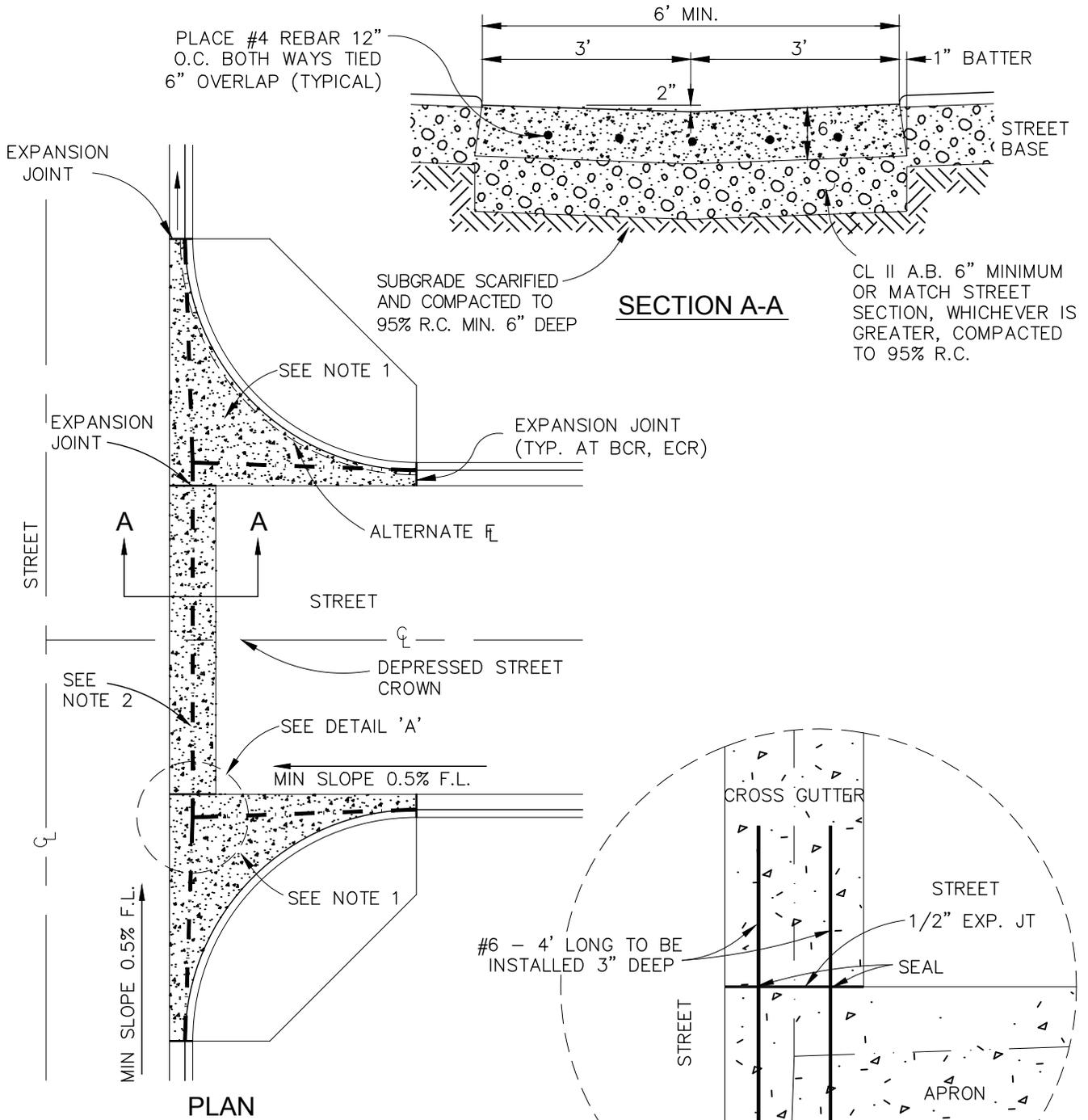
DECEMBER 2019

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118

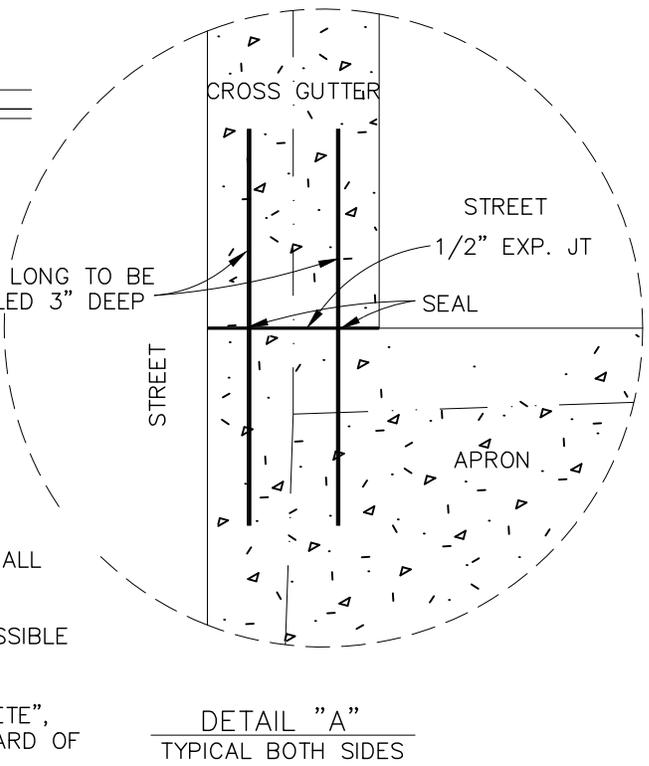
PAGE 1 OF 1

SCALE: NONE



NOTES:

1. THE MAXIMUM SLOPE ADJACENT TO CURB RAMPS SHALL CONFORM TO CALTRANS STANDARD PLANS.
2. CROSS GUTTER MAY NOT BE LOCATED IN THE ACCESSIBLE ROUTE OF TRAVEL.
3. ALL CONCRETE SHALL BE CALTRANS "MINOR CONCRETE", SECTION 90-2, 3,000 PSI WITH 2 LBS PER CUBIC YARD OF JET BLACK COLORING ADD MIXTURE.



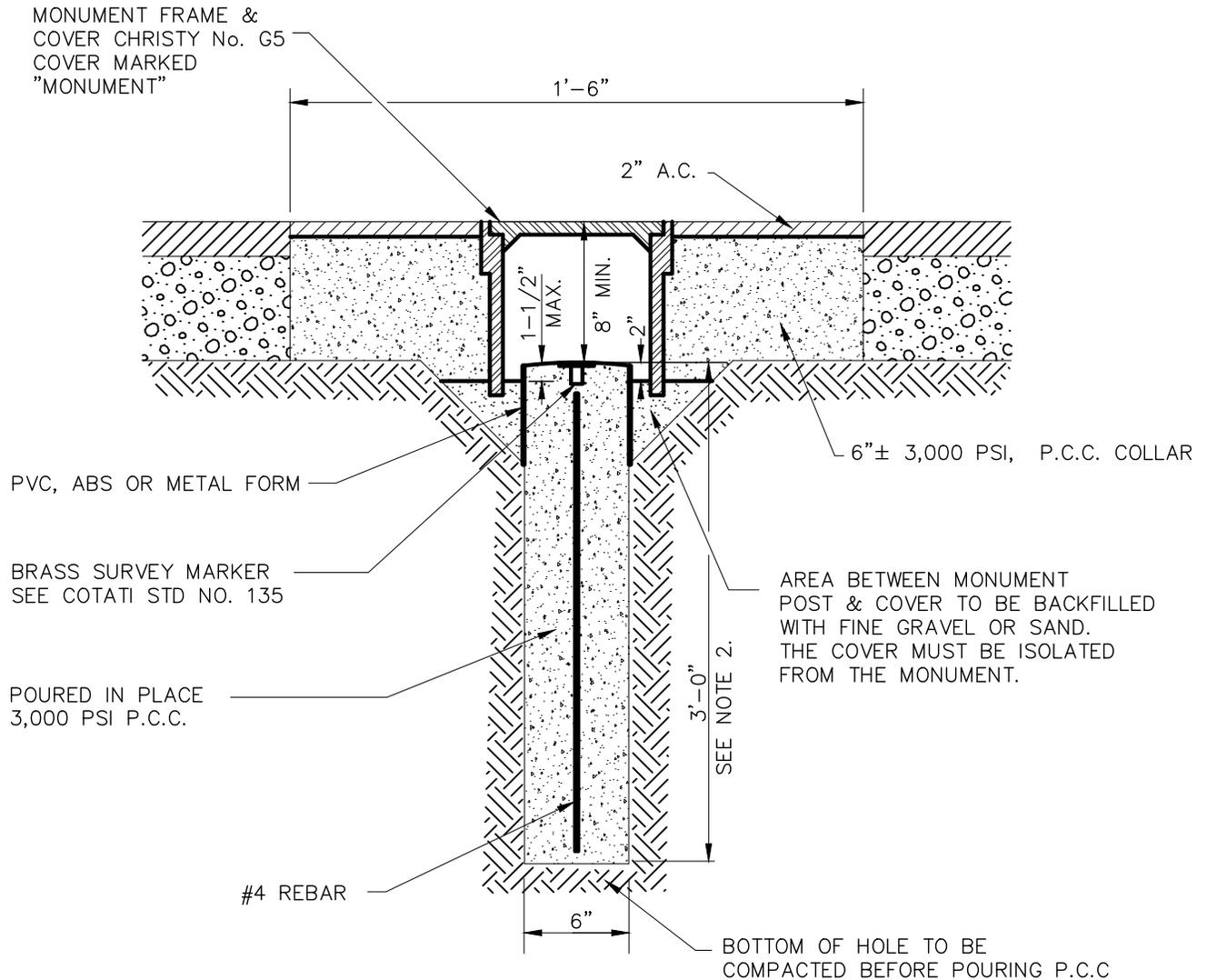
DESIGN AND CONSTRUCTION STANDARDS

CROSS GUTTER

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STD. NO.
119
PAGE 1 OF 1
SCALE: NONE

DECEMBER 2019



NOTES:

1. SURVEYOR OR ENGINEER SETTING THE MONUMENT SHALL INDICATE EXACT POINT BY MAKING A CROSS ON THE CAP AND SHALL STAMP YEAR SET AND HIS/HER LICENSE TYPE AND NUMBER.
2. THE DEPTH OF THE MONUMENT POST SHALL BE LENGTHENED AS DICTATED BY THE GROUND CONDITIONS OR AS APPROVED BY THE CITY ENGINEER. IN SOFT GROUND OR FILL AREAS, THE MONUMENT POST SHALL BE LENGTHENED TO BED IT ON A STABLE BASE.



DESIGN AND CONSTRUCTION STANDARDS

STANDARD PERMANENT MONUMENT

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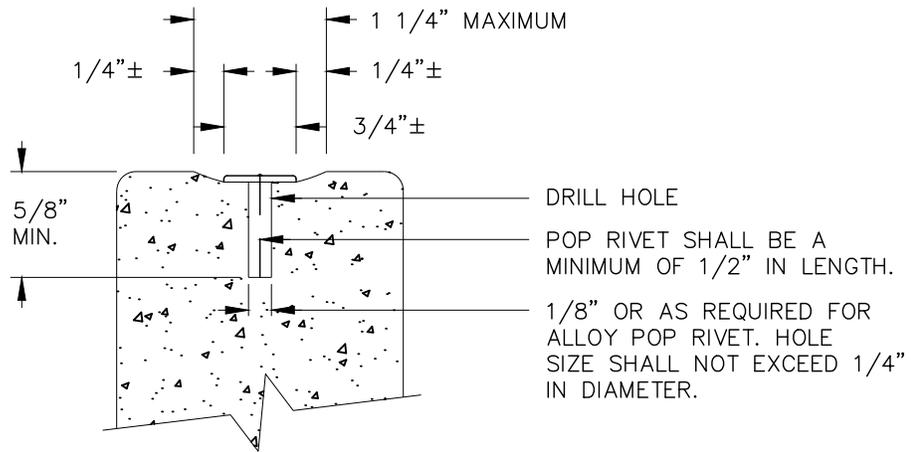
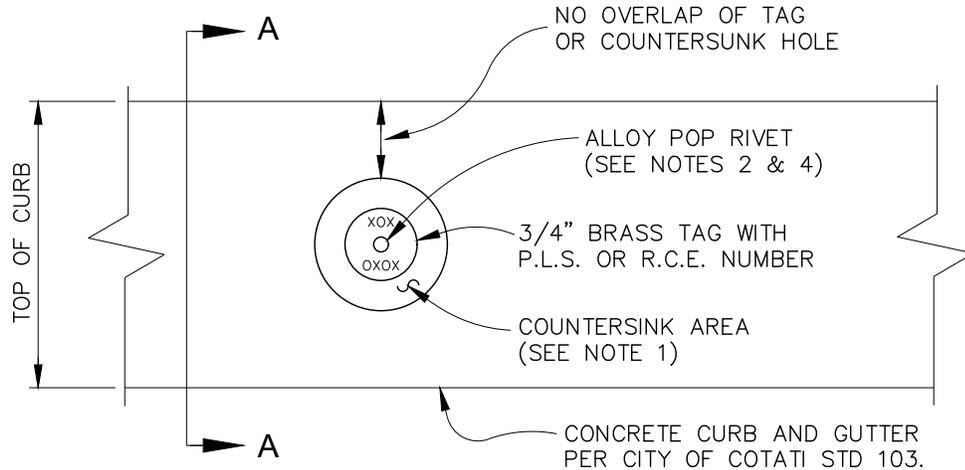
STD. NO.

120

PAGE 1 OF 1

DECEMBER 2019

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SECTION A-A

NOTES:

1. BRASS TAG SHALL BE COUNTERSUNK SO THAT TOP OF TAG AND RIVET IS AT OR BELOW THE SURFACE OF THE TOP OF CURB. BRASS TAG SHALL BE SET TO ENSURE A PERMANENTLY PLACED MONUMENT. EPOXY RESIN MAY BE USED IN ADDITION TO ABOVE METHODS.
2. DRILL HOLE SHALL BE DRILLED ONLY. AN ALLOY POP RIVET SHALL BE USED TO ATTACH BRASS TAG TO TOP OF CURB.
3. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
4. IMPACT FASTENERS ARE NOT ALLOWED.



DESIGN AND CONSTRUCTION STANDARDS

**REFERENCE MONUMENT LOT CORNER
AT STREET FRONTAGE**

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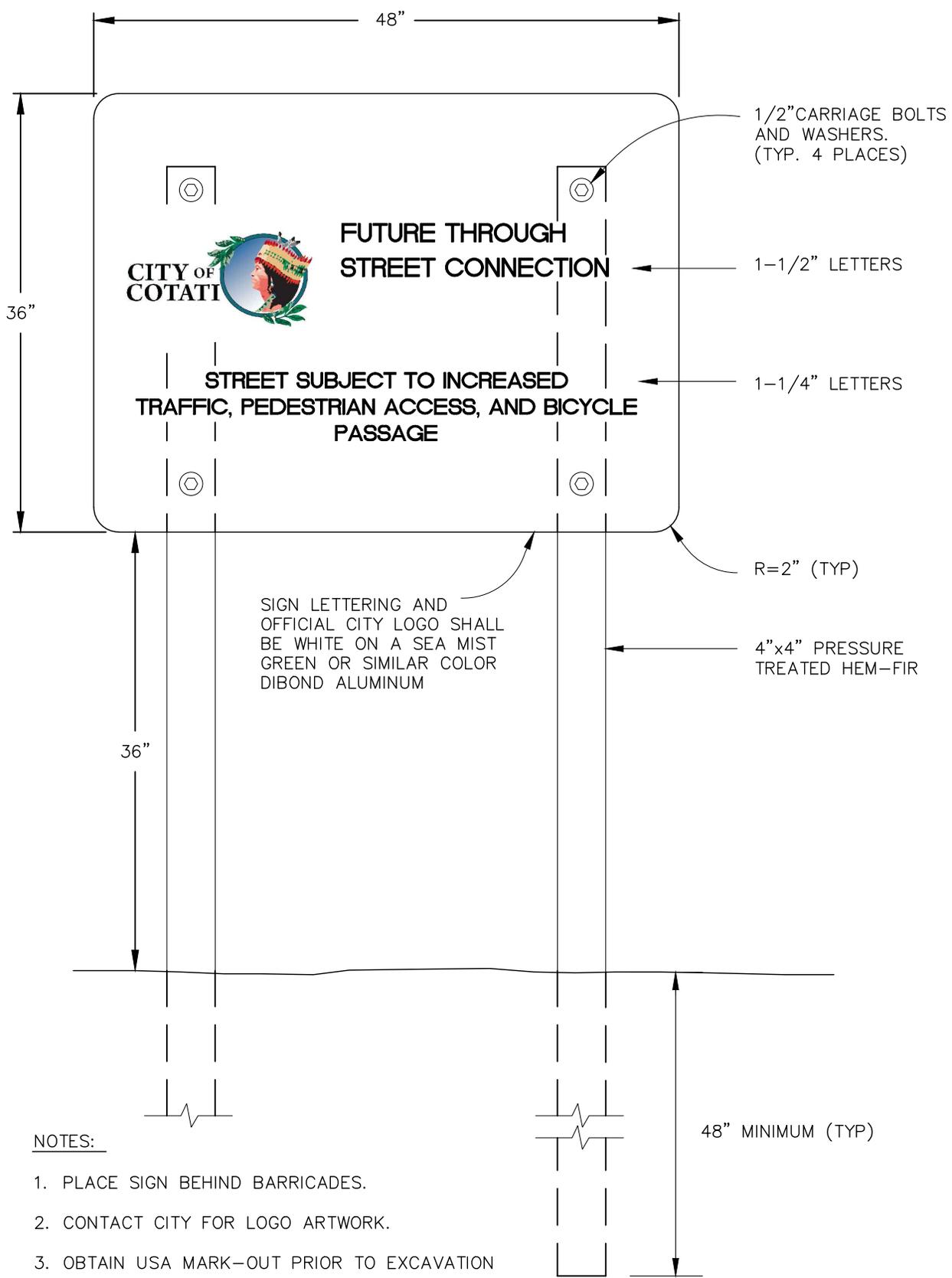
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121

PAGE 1 OF 1

DECEMBER 2019

SCALE: NONE



NOTES:

1. PLACE SIGN BEHIND BARRICADES.
2. CONTACT CITY FOR LOGO ARTWORK.
3. OBTAIN USA MARK-OUT PRIOR TO EXCAVATION



DESIGN AND CONSTRUCTION STANDARDS

STUB FUTURE CONNECTION STREET POSTING

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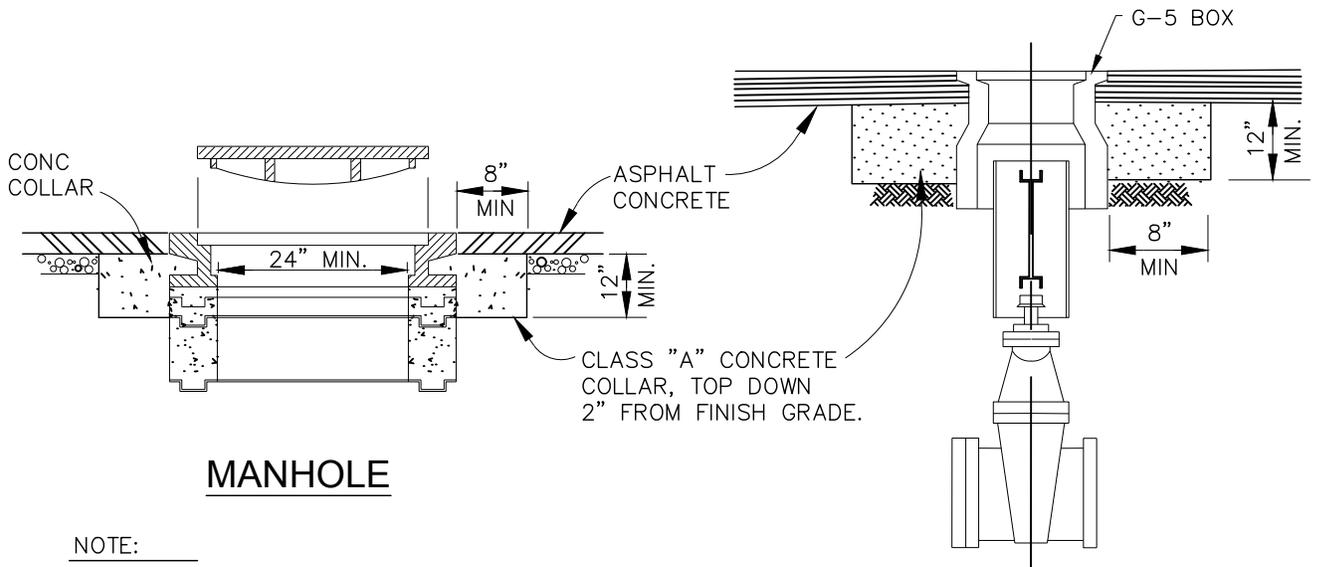
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STD. NO.

122

PAGE 1 OF 1

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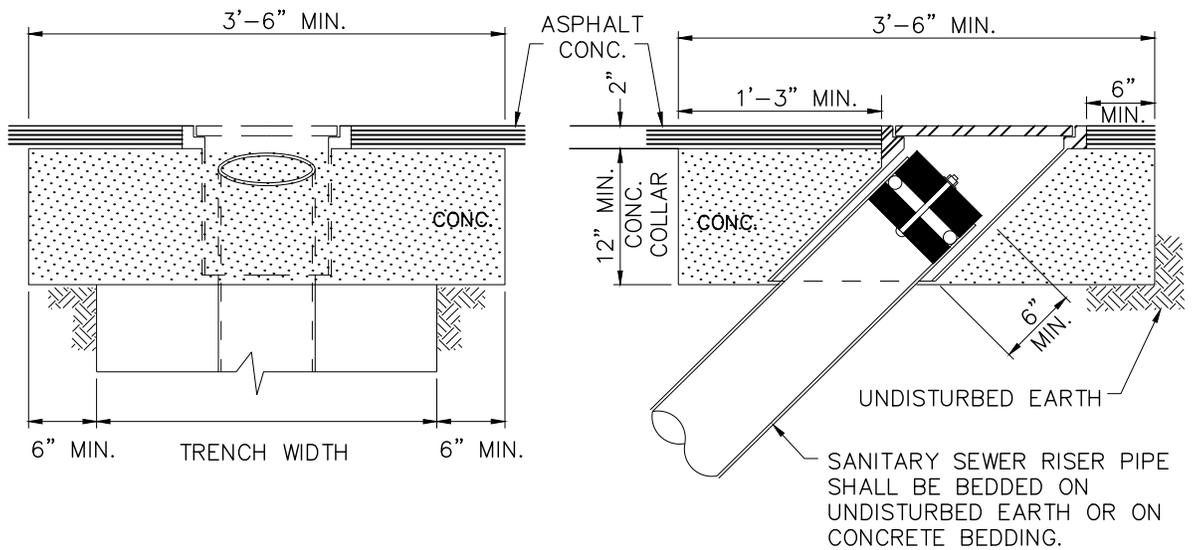


MANHOLE

WATER VALVE

NOTE:

1. PRIOR TO ADJUSTING MANHOLE TO GRADE, A CATCHMENT SOCK SHALL BE PLACED IN THE MANHOLE OPENING TO PREVENT MATERIAL FROM ENTERING THE SEWER OR STORM DRAIN.



SEWER CLEANOUT



DESIGN AND CONSTRUCTION STANDARDS

ADJUST TO GRADE EXISTING STREET APPURTENANCES

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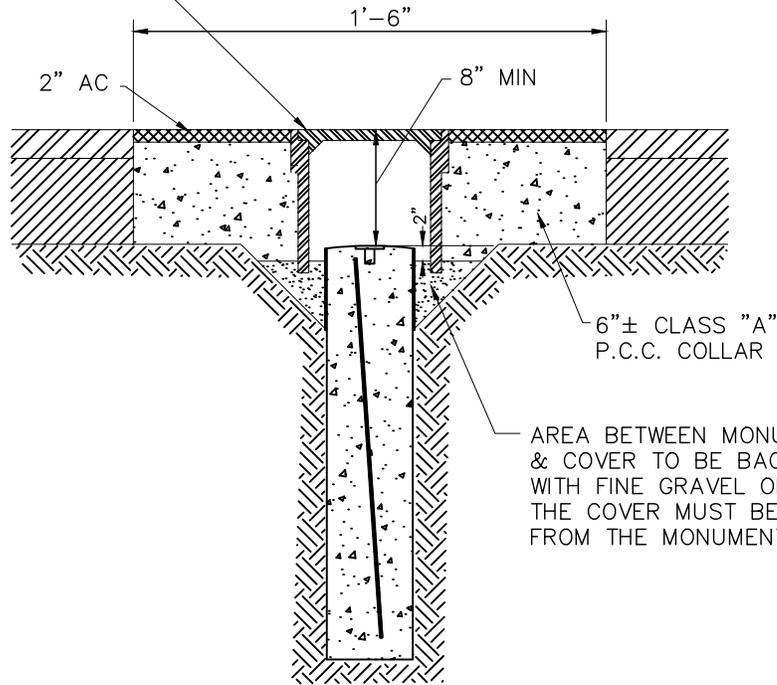
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123

PAGE 1 OF 2

SCALE: NONE

MONUMENT FRAME & COVER



MONUMENT



DESIGN AND CONSTRUCTION STANDARDS

ADJUST TO GRADE EXISTING
STREET APPURTENANCES

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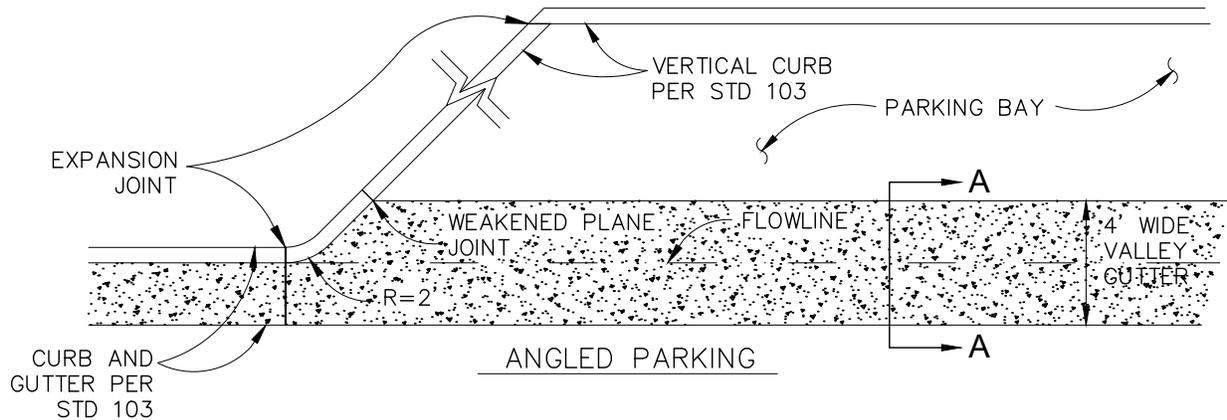
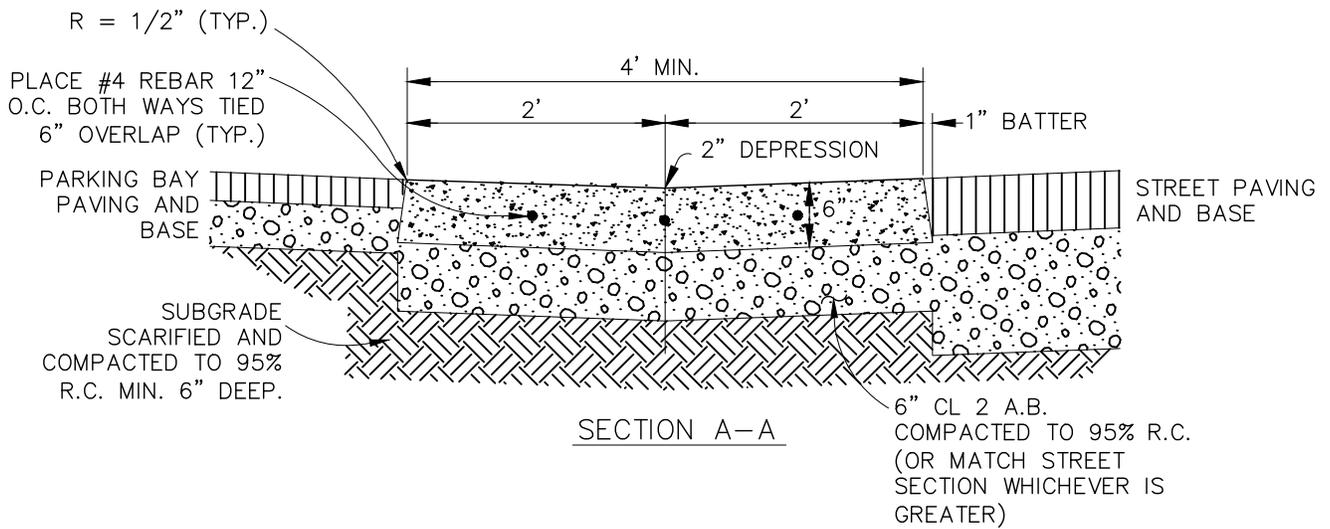
DECEMBER 2019

STD. NO.

123

PAGE 2 OF 2

SCALE: NONE



NOTES:

1. ALL CONCRETE SHALL BE CALTRANS "MINOR CONCRETE", SECTION 90-2, 3,000 PSI WITH 2 LBS PER CUBIC YARD OF JET BLACK COLORING ADD MIXTURE. EXPANSION JOINTS, 1/4 INCH WIDE, SHALL BE INSTALLED WHERE SHOWN.
2. EXPANSION JOINTS SHALL BE INSTALLED AT 60-FOOT INTERVALS, WITH WEAKENED PLANE JOINTS EVERY 15 FEET OR 20 FEET.



DESIGN AND CONSTRUCTION STANDARDS

ANGLED PARKING BAY WITH CROSS GUTTER

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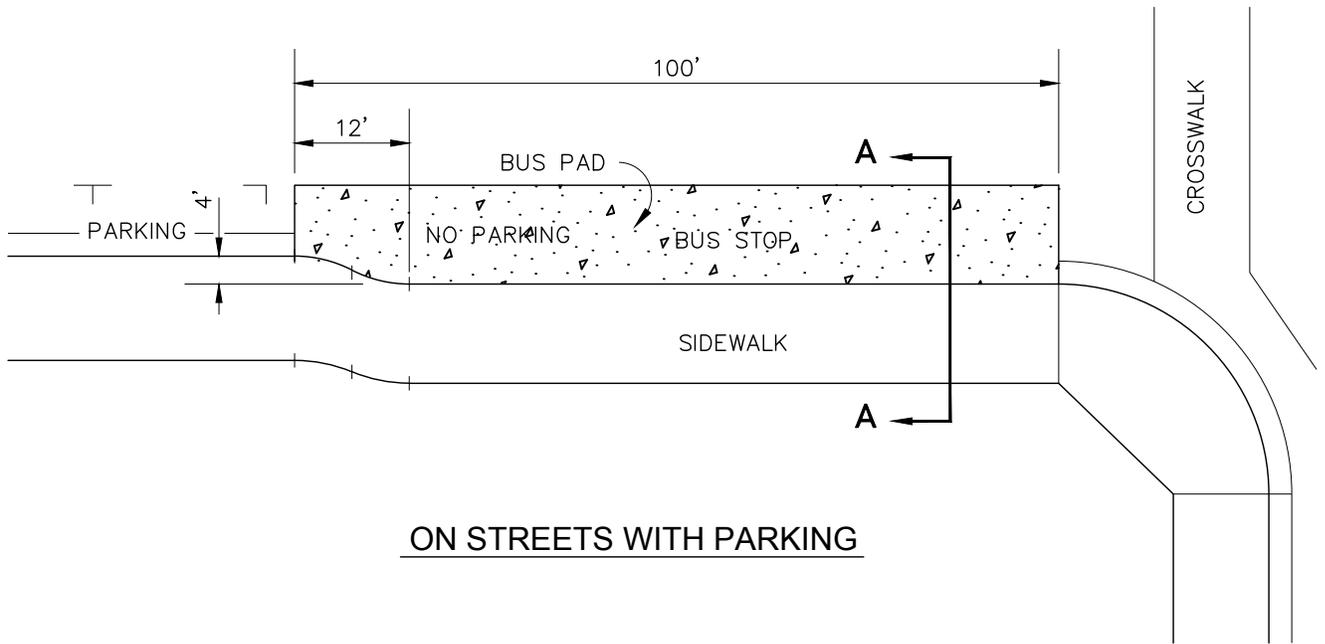
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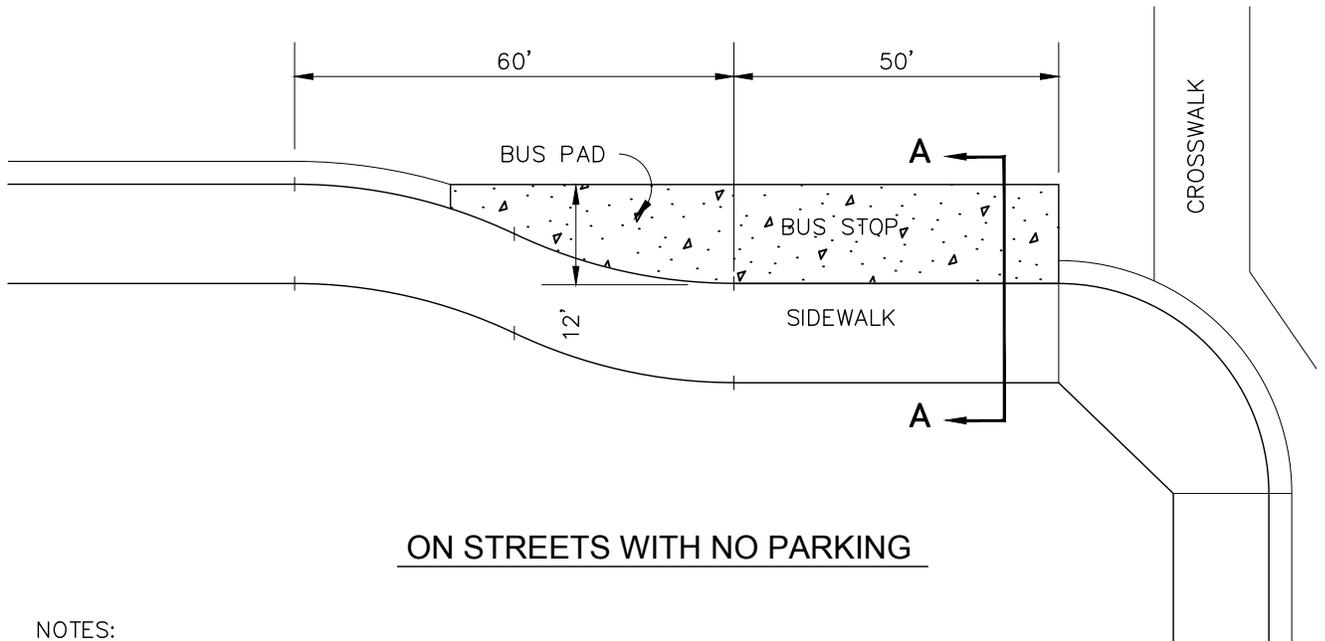
124

PAGE 1 OF 1

SCALE: NONE



ON STREETS WITH PARKING



ON STREETS WITH NO PARKING

NOTES: _____

1. SEE SECTION A-A, SHEET 3.
2. BUS BENCHES AND SHELTER SHALL BE LOCATED BEHIND THE SIDEWALK OR IN SUCH A MANNER THAT A MINIMUM 5' CLEAR SIDEWALK IS PROVIDED.
3. DESIGN SHALL CONFORM TO THESE REQUIREMENTS, EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

BUS STOP
AT INTERSECTION

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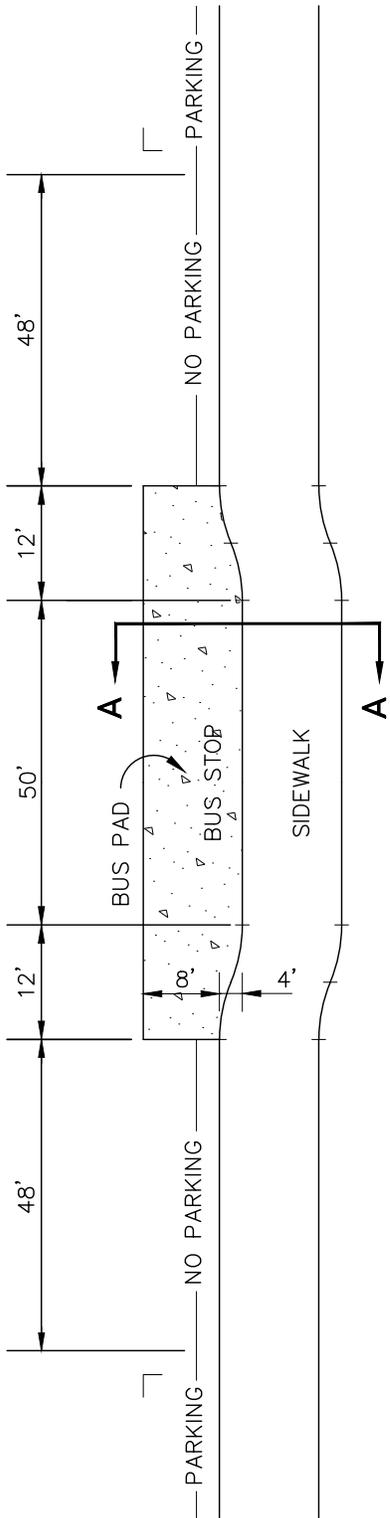
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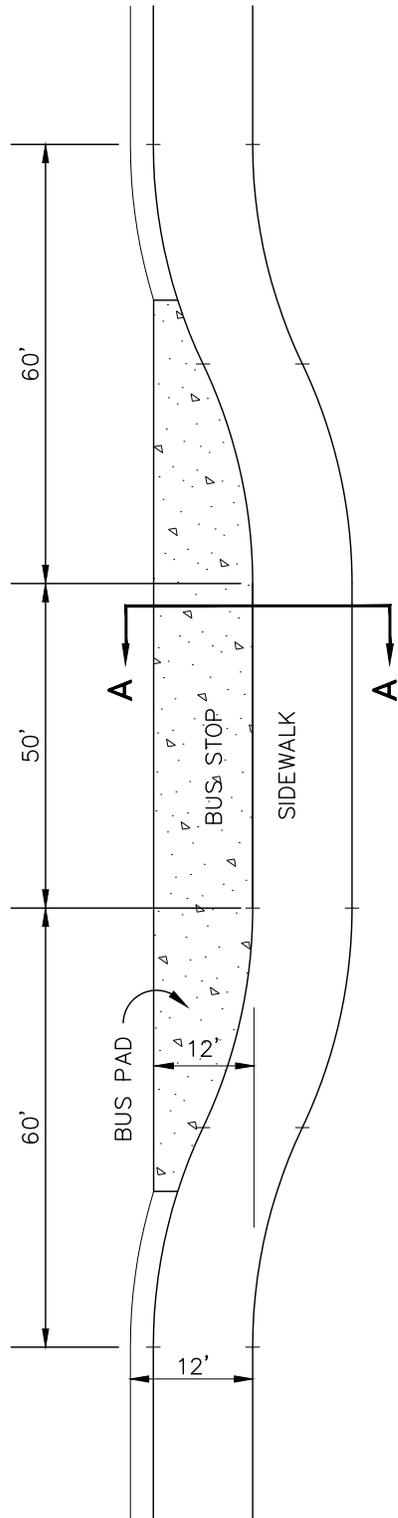
PAGE 1 OF 3

DECEMBER 2019

SCALE: NONE



ON STREETS WITH PARKING



ON STREETS WITH NO PARKING

NOTES:

1. SEE SECTION A-A, SHEET 3.
2. BUS BENCHES AND SHELTER SHALL BE LOCATED BEHIND THE SIDEWALK OR IN SUCH A MANNER THAT A MINIMUM 5' CLEAR SIDEWALK IS PROVIDED.
3. DESIGN SHALL CONFORM TO THESE REQUIREMENTS, EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

BUS STOP AT MID BLOCK

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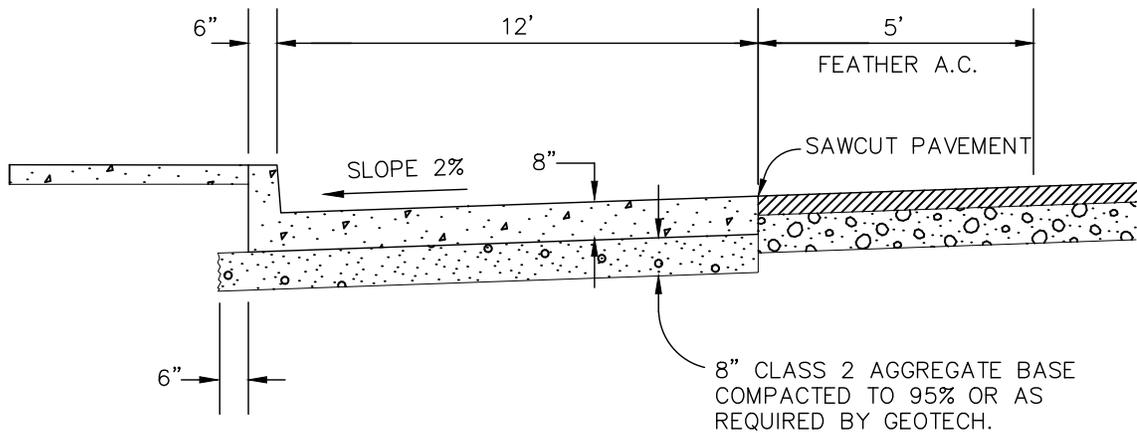
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STD. NO.

125

PAGE 2 OF 3

SCALE: NONE



SECTION A-A

NOTES:

1. EXPANSION JOINTS & SCORE MARKS TO MATCH EXISTING CURB, GUTTER, & SIDEWALK.
2. ALL CONCRETE SHALL BE CALTRANS "MINOR CONCRETE", SECTION 90-2, 3,000 PSI WITH 2 LBS PER CUBIC YARD OF JET BLACK COLORING ADD MIXTURE.
3. CONSTRUCT SUBDRAINS WHEN REQUIRED BY CITY ENGINEER.
4. REINFORCING STEEL REQUIRED IN CONC. #4 @ 12" O.C. EACH WAY, OR #5 @ 16" O.C. EACH WAY.
5. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

BUS STOP CONCRETE
PAD DETAIL

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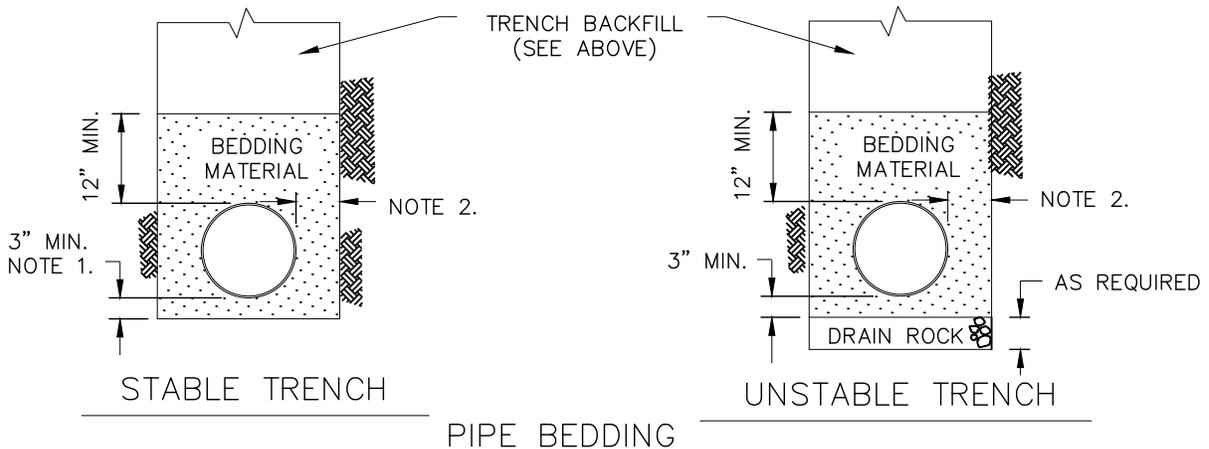
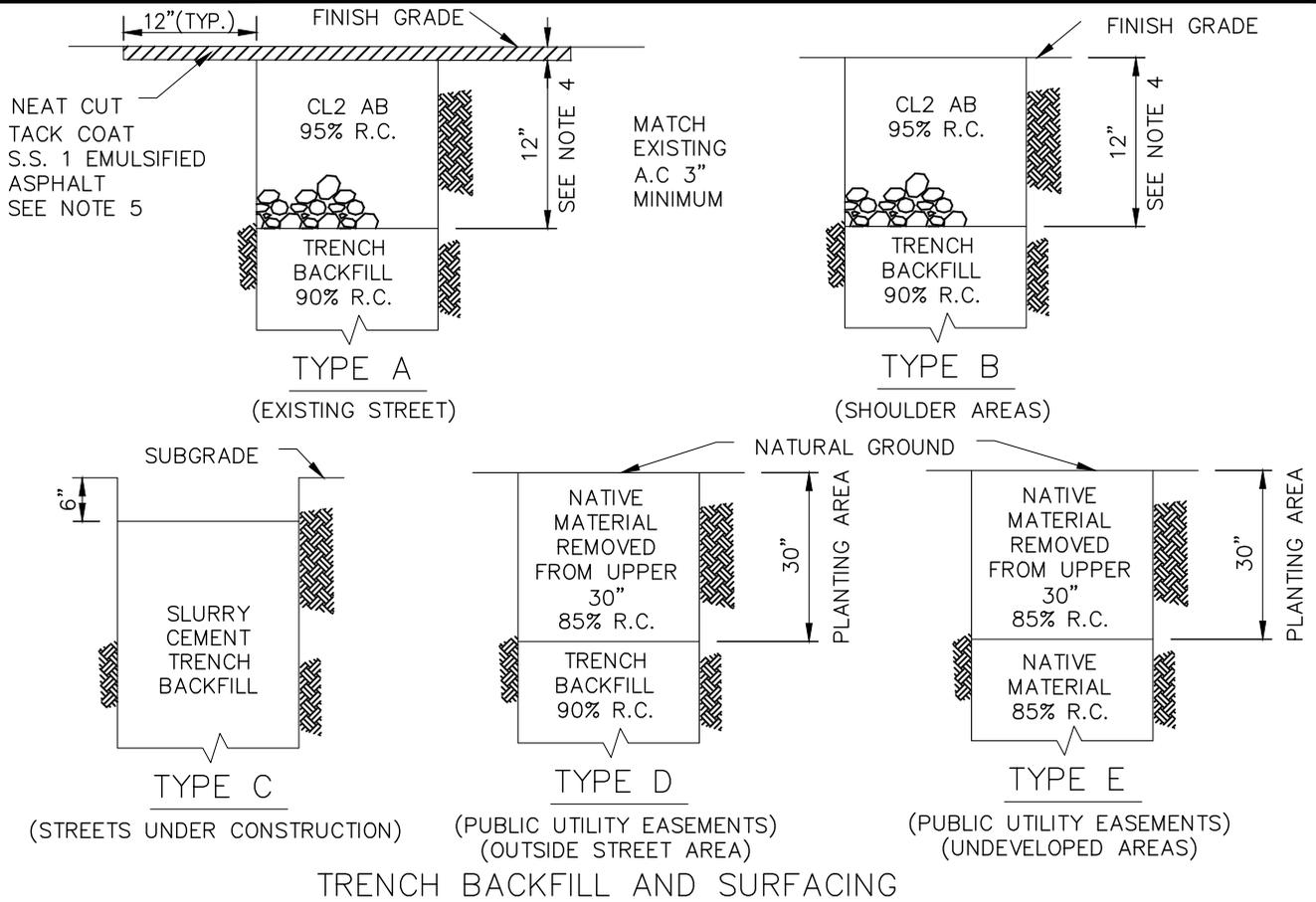
DECEMBER 2019

STD. NO.

125

PAGE 3 OF 3

SCALE: NONE



NOTES:

1. 1/4 PIPE O.D. OR 4" MIN. WHEN EXCAVATION IS IN ROCKY GROUND.
2. PIPE DIAMETER 18" OR LESS: 6" MINIMUM, 9" MAXIMUM. PIPE DIAMETER GREATER THAN 18": 9" MINIMUM, 12" MAXIMUM.
3. RELATIVE COMPACTION DESIGNATED R.C.
4. THE STREET STRUCTURAL SECTION SHALL BE A MIN. OF 3" A.C. ON 12" A.B. OR MATCH EXISTING PAVEMENT THICKNESS, WHICHEVER IS THICKER OR AS SPECIFIED ON PLANS.
5. NEATLY CUT PAVEMENT MIN. 12" FROM EDGE OF TRENCH AFTER TRENCH IS BACKFILLED. 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 3 FEET OF THE FINAL SAW CUT.



DESIGN AND CONSTRUCTION STANDARDS

**STANDARD TRENCH DETAIL
 TRENCH BACKFILL AND SURFACING**

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DECEMBER 2019

STD. NO.

126

PAGE 1 OF 2

SCALE: NONE

MATERIAL SPECIFICATIONS

DRAIN ROCK MAY BE USED AS BEDDING UNDER PIPE FOR SLOPES LESS THAN 8%. DRAIN ROCK SHALL BE 100% CRUSHED AND SHALL CONFORM TO THE FOLLOWING GRADING:

1-1/2"	1"	1/2"	#4
100	95-100	0-30	0-4

CUT OFF WALLS SHALL BE PROVIDED WHEN SHOWN ON THE PLANS OR REQUIRED BY THE ENGINEER.

PIPE BEDDING: THE FOLLOWING DATA IS REPRESENTATIVE OF THE GRADATION OF THE 3/8" CHIP
COARSE DURABILITY = 54
INDEX DURABILITY = 51

<u>SIEVE OPENING SIZE</u>	<u>PERCENT PASSING</u>
3/4"	100
1/2"	100
3/8"	95
#4	52
#8	9
#200	2

WHEN SAND BEDDING IS PROPOSED FOR UTILITY CONDUIT INSTALLATION, THE MATERIAL SPECIFICATIONS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW 5 WORKING DAYS BEFORE CONSTRUCTION.

AGGREGATE BASE SHALL CONFORM TO THE REQUIREMENTS OF SECTION 26 OF THE STATE STANDARD SPECIFICATIONS CLASS 2, 3/4" MAXIMUM. HOT MIX ASPHALT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 39 OF THE CALTRANS STANDARD SPECIFICATIONS, TYPE A, 1/2" MAXIMUM, MEDIUM.

COMPACTION REQUIREMENTS

DRAIN ROCK SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR.

PIPE BEDDING MATERIAL USED TO GRADE THE TRENCH SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR WHEN IT IS PLACED OVER DRAIN ROCK OR WHEN DEPTH IS GREATER THAN 6 INCHES.

MECHANICAL COMPACTION:

TRENCH BACKFILL SHALL BE PLACED IN UNIFORM, HORIZONTAL LAYERS NOT EXCEEDING EIGHT (8) INCHES IN THICKNESS BEFORE COMPACTION. EACH LAYER SHALL BE COMPACTED, USING MECHANICAL MEANS, TO THE SPECIFIED DENSITY SHOWN ON THE PLANS.

THE CONTRACTOR MAY, AT HIS SOLE OPTION AND AT HIS SOLE EXPENSE, CONSTRUCT A TEST TRENCH SECTION WHICH DEMONSTRATES METHODS, EQUIPMENT, OR MATERIALS WHICH WILL RELIABLY ACHIEVE THE REQUIRED COMPACTION IN LIFTS GREATER THAN 8 INCHES. AT ITS SOLE DISCRETION, THE CITY MAY INCREASE THE MAXIMUM ALLOWABLE LIFT THICKNESS PERMITTED BASED UPON THE RESULTS DEMONSTRATED BY THE TEST TRENCH SECTION. SHOULD SUBSEQUENT TESTING DEMONSTRATE THAT THE REQUIRED COMPACTION IS NOT BEING RELIABLY ACHIEVED, THE CITY MAY, AT ITS SOLE DISCRETION, REDUCE THE MAXIMUM LIFT THICKNESS TO ITS ORIGINAL VALUE OF 8 INCHES.

JETTING: JETTING IS NOT ALLOWED.



DESIGN AND CONSTRUCTION STANDARDS

STANDARD TRENCH DETAIL

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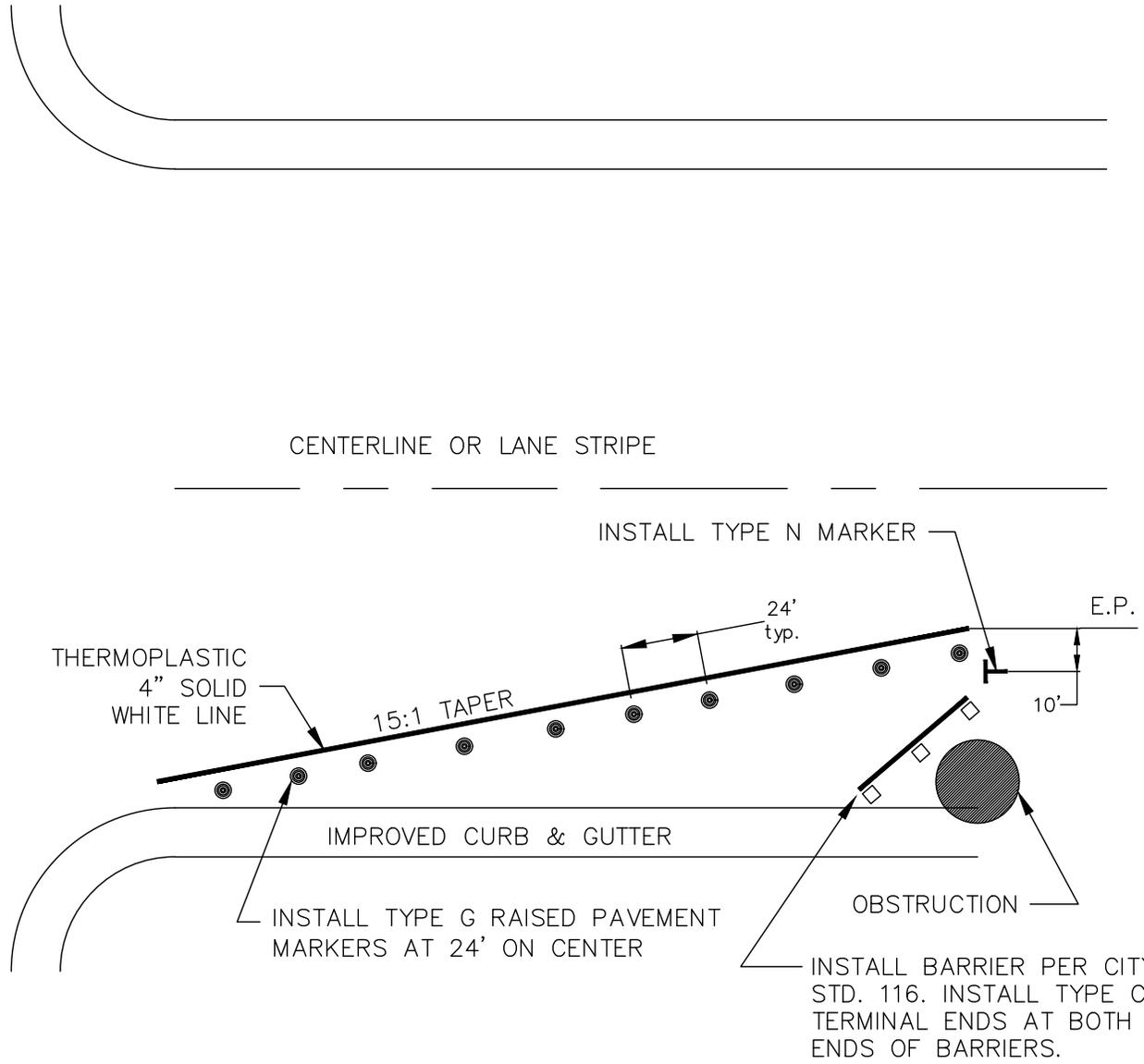
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STD. NO.

126

PAGE 2 OF 2

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DESIGN AND CONSTRUCTION STANDARDS

ROAD WIDTH TRANSITIONS

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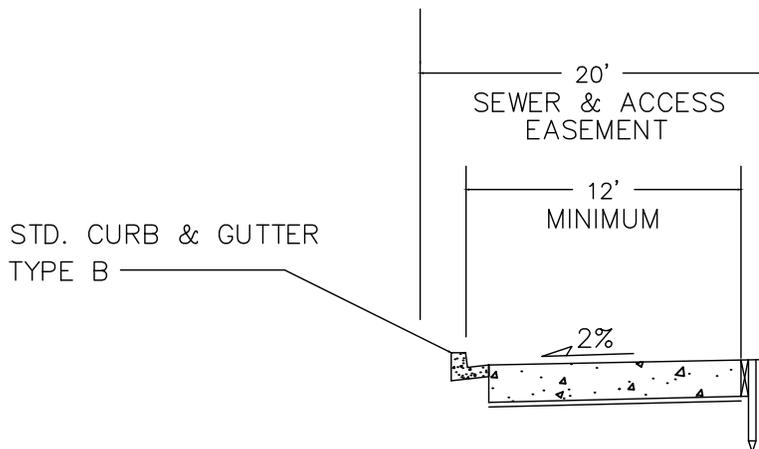
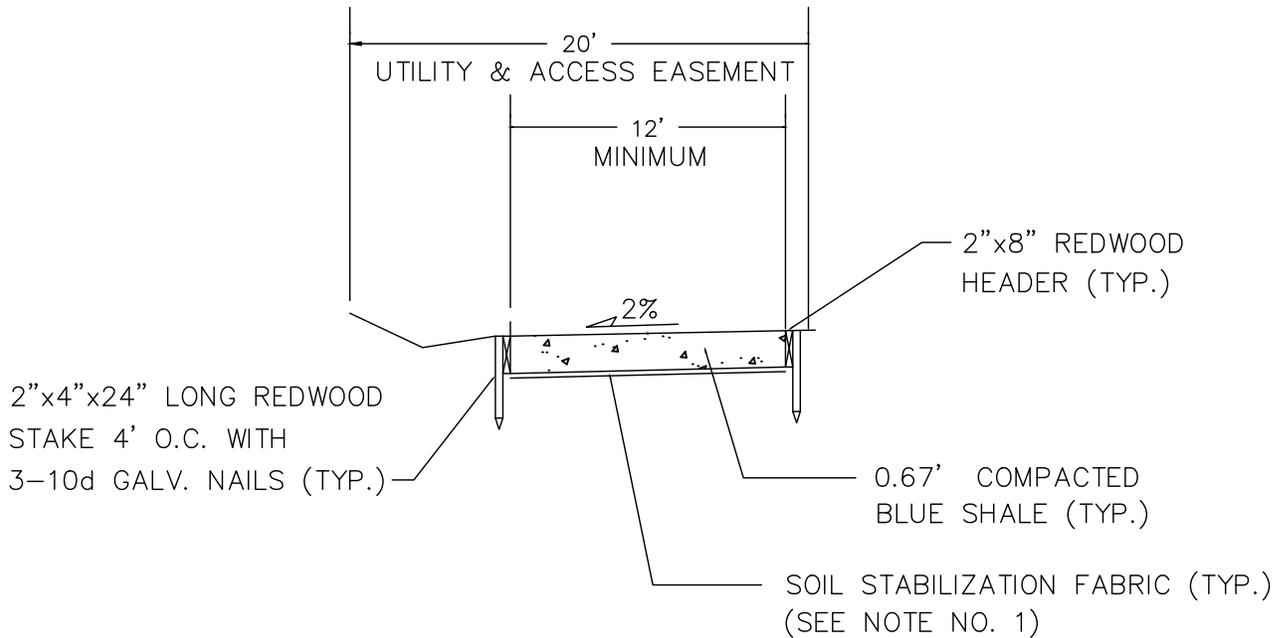
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127

PAGE 1 OF 1

DECEMBER 2019

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1. SOIL STABILIZATION FABRIC SHALL BE MIRAFI 500-X OR EQUAL.
2. ALL ACCESS ROADS HAVING A GRADE OVER 5% SHALL BE PAVED WITH 6 INCHES OF CLASS II AGGREGATE BASE AND 2 INCHES OF ASPHALT CONCRETE.
3. ALL ACCESS ROADS HAVING A CURVE WITH A RADIUS OF LESS THAN 100 FEET SHALL BE INCREASED IN WIDTH TO 20 FEET WITH A MINIMUM INSIDE RADIUS OF 20 FEET.
4. A HAMMERHEAD TURNAROUND MAYBE REQUIRED AT THE END OF THE UTILITY ACCESS ROAD AT THE DISCRETION OF THE UTILITIES DEPARTMENT.
5. THE SUBGRADE SHALL BE COMPACTED TO 95% RC.



DESIGN AND CONSTRUCTION STANDARDS

UTILITY ACCESS ROAD

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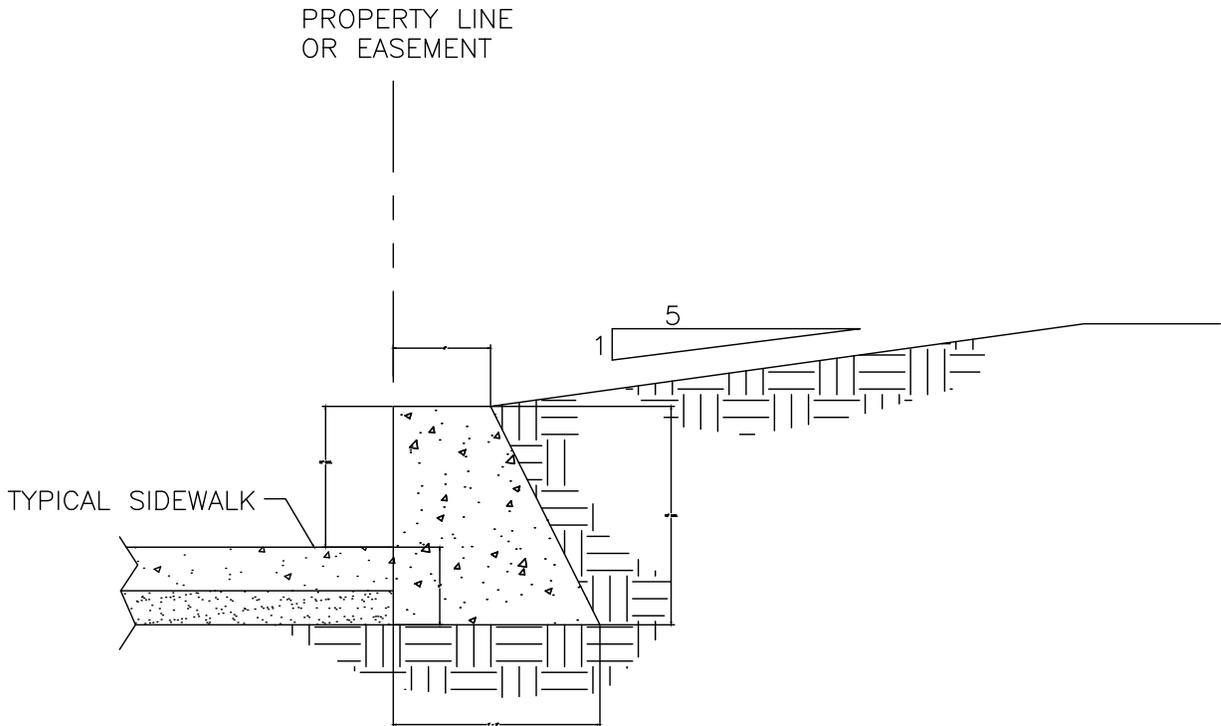
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STD. NO.

128

PAGE 1 OF 1

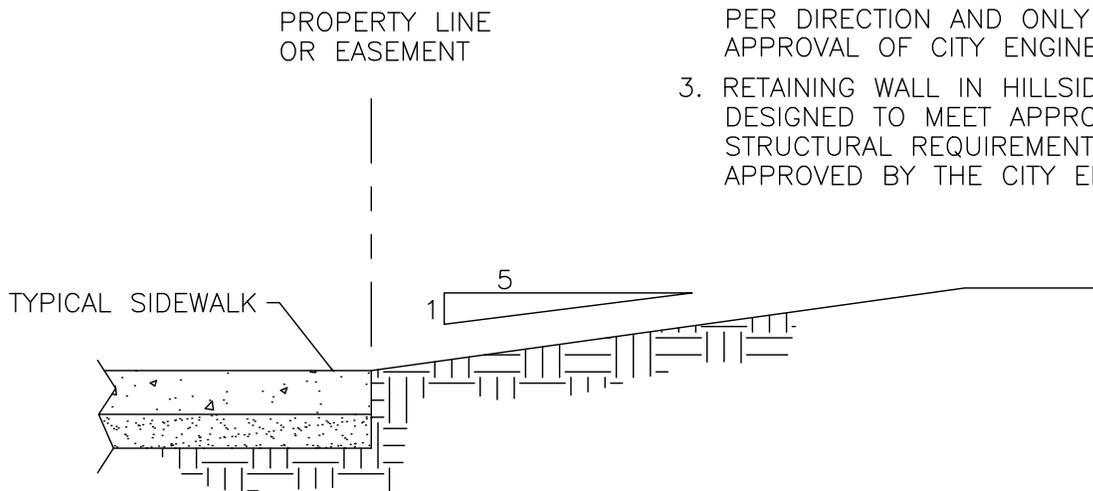
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WITH RETAINING WALL

NOTES:

1. IN FLATLAND AREAS, MAX SLOPE OF GROUND TO BE 5:1 OR FLATTER AS DIRECTED BY THE CITY ENGINEER.
2. RETAINING WALL TO BE INSTALLED AS PER DIRECTION AND ONLY WITH APPROVAL OF CITY ENGINEER.
3. RETAINING WALL IN HILLSIDES TO BE DESIGNED TO MEET APPROPRIATE STRUCTURAL REQUIREMENTS AND AS APPROVED BY THE CITY ENGINEER.



WITHOUT RETAINING WALL



DESIGN AND CONSTRUCTION STANDARDS

BACK OF SIDEWALK CONFORMS

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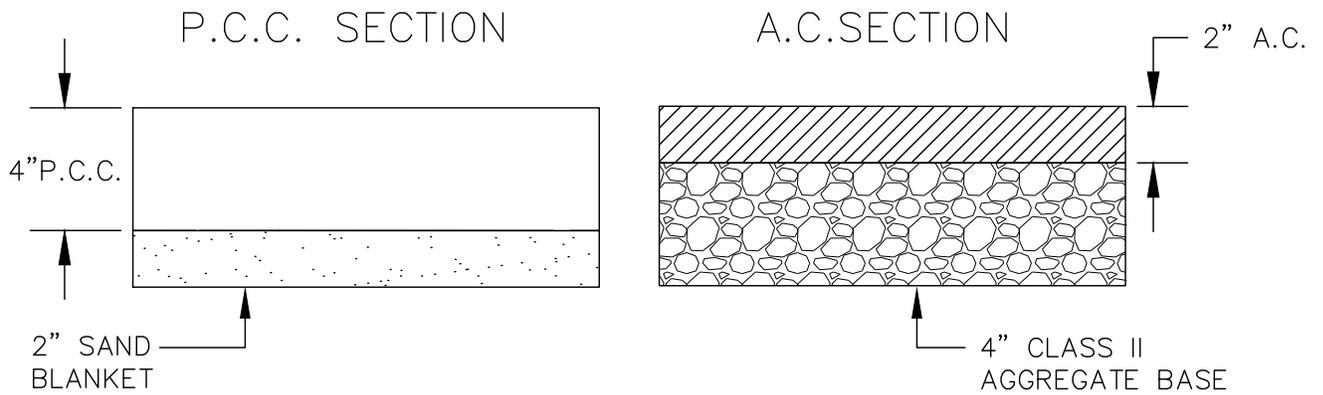
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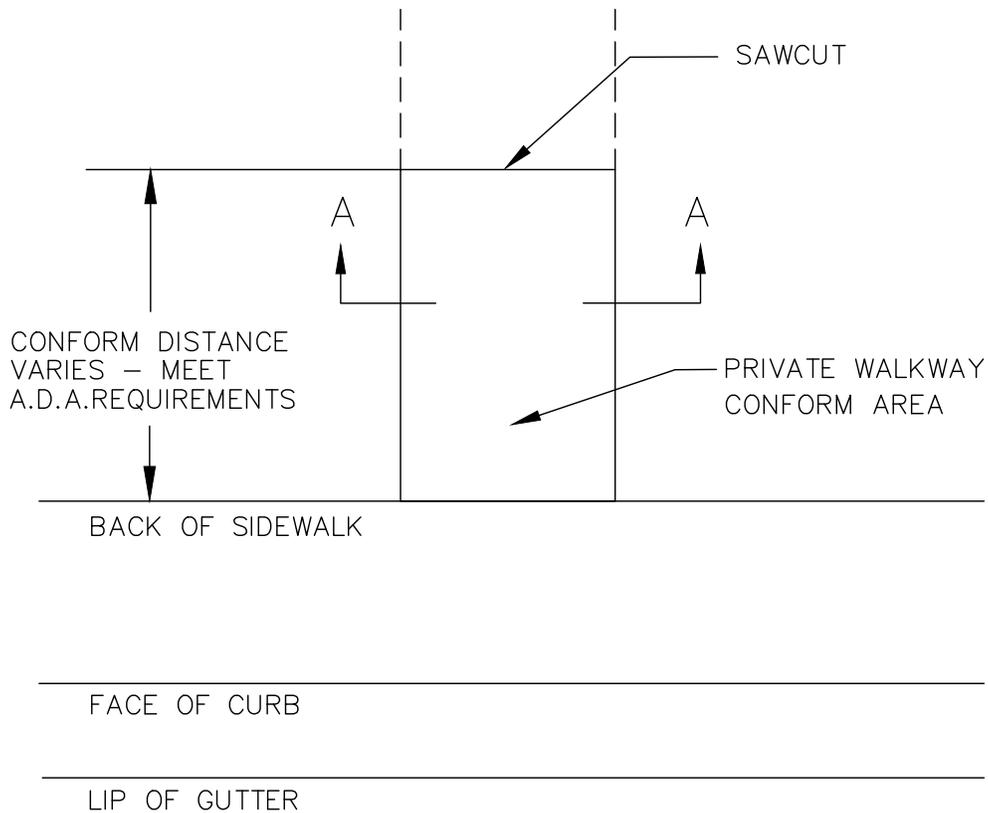
PAGE 1 OF 1

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SECTION A-A



DESIGN AND CONSTRUCTION STANDARDS

PRIVATE WALKWAY CONFORM
P.C.C. & ASPHALT CONCRETE

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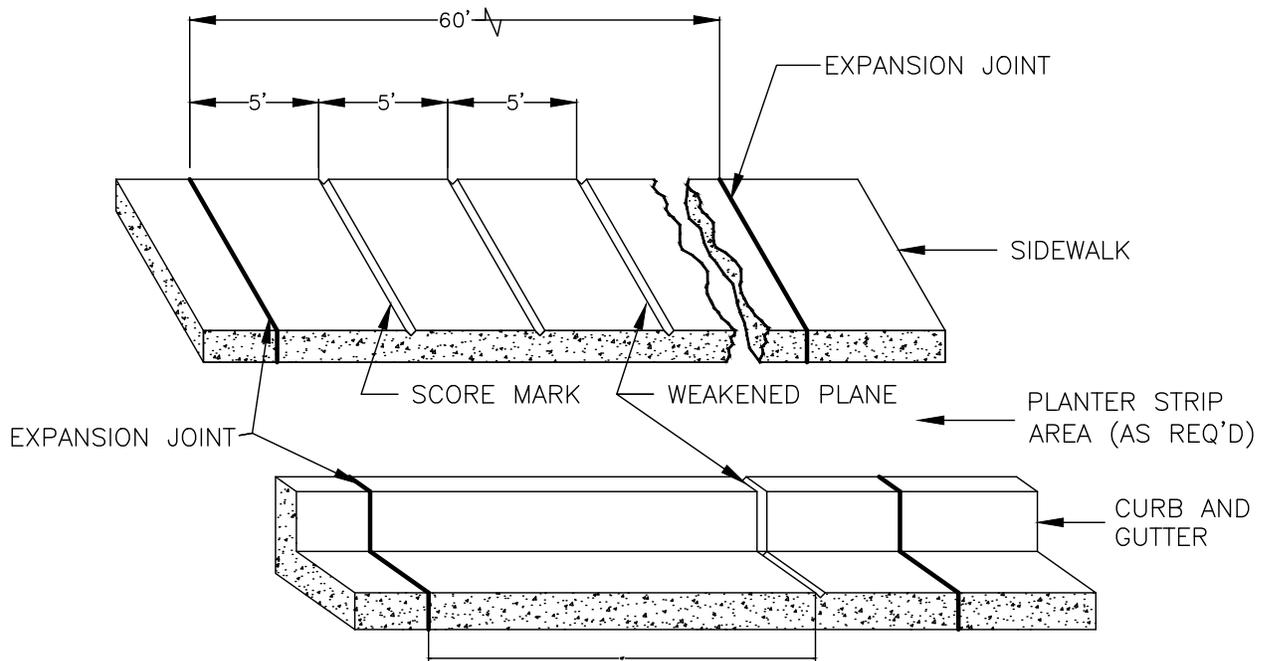
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STD. NO.

130

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. WEAKENED PLANE: 1/8" WIDE x 1" DEEP IN SIDEWALKS, 1/8" WIDE x 1 1/2" DEEP IN CURB AND GUTTER.
2. EXPANSION JOINTS MATERIAL TO BE 1/4" THICK PRE-MOLDED JOINT FILLER FULL THICKNESS OF CONCRETE. APPROVED MECHANICAL JOINTS MAY BE USED IN WALKS IN LIEU OF EXPANSION JOINTS.
3. SCORE MARKS FOR SIDEWALKS 6' & MORE IN WIDTH: LONGITUDINAL SCORE MARK ALONG CENTER OF WALK.
4. EXPANSION JOINTS SHALL BE INSTALLED IN THE CURB & GUTTER AT ALL CURB RETURNS.
5. EXPANSION JOINTS SHALL BE PLACED IN THE SIDEWALK AT THE SAME LOCATION AS THOSE IN THE CURB & GUTTER WHEN THE SIDEWALK IS CURB ADJACENT, UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.
6. SIDEWALK SHALL HAVE 4" BASE MATERIAL (CLASS II AGGREGATE BASE ROCK OR SAND), 4" OF P.C.C., AND HAVE A 2% SLOPE TOWARDS THE STREET.
7. SCORING PATTERN SHOULD MATCH ADJOINING SIDEWALKS.



DESIGN AND CONSTRUCTION STANDARDS

TYPICAL SPACING – WEAKENED PLANES, SCORE MARKS, AND EXPANSION JOINTS

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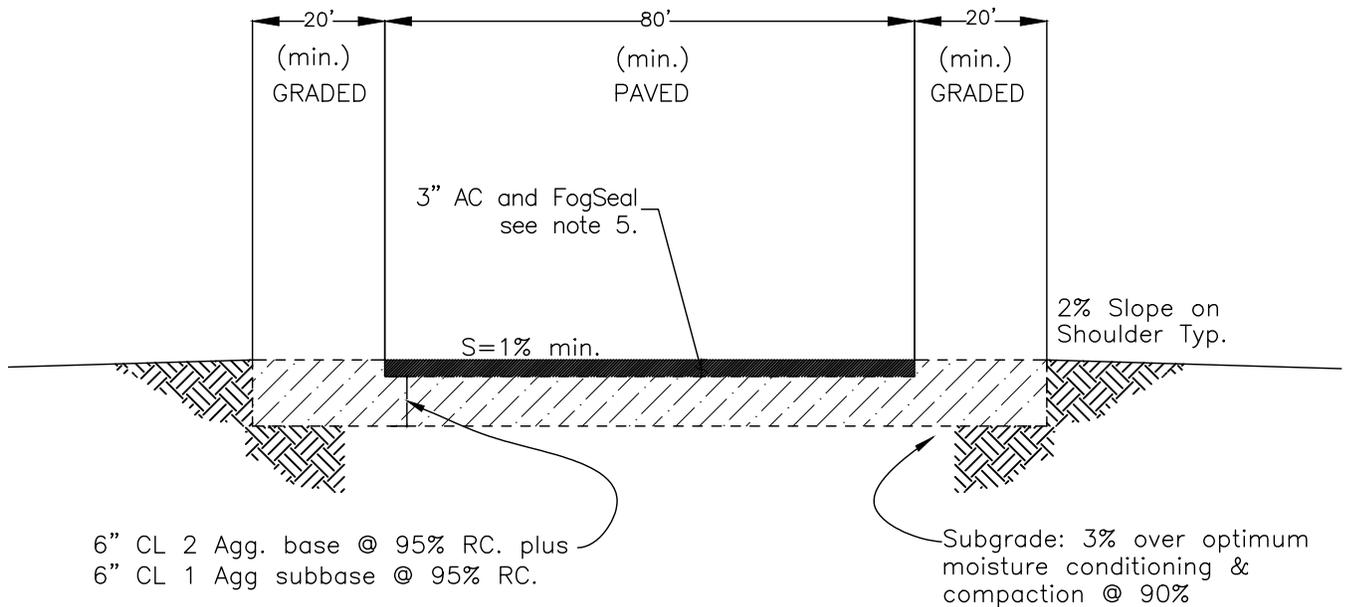
STD. NO.

131

PAGE 1 OF 1

SCALE: NONE

CLASS I BIKE PATH OR MULTIUSE TRAIL



NOTES:

1. DESIGN OF BIKE PATH OR MULTIPURPOSE PATH SHALL BE PER CHAPTER 1000 OF THE HIGHWAY DESIGN MANUAL.
2. THE MINIMUM PAVED WIDTH FOR A TWO-WAY BIKE PATH SHALL BE 8 FT. THE MINIMUM PAVED WIDTH FOR A ONE-WAY BIKE PATH SHALL BE 4.5 FT. A MINIMUM 1-3 FT. GRADED AREA SHALL BE PROVIDED ADJACENT TO THE PAVEMENT. A 3 FT. GRADED AREA IS RECOMMENDED TO PROVIDE CLEARANCE FROM POLES, TREES, WALLS, FENCES, GUARDRAILS, OR OTHER LATERAL OBSTRUCTIONS.
3. A MINIMUM 1-3 FT. HORIZONTAL CLEARANCE TO OBSTRUCTIONS SHALL BE PROVIDED ADJACENT TO PAVEMENT.
4. THE VERTICAL CLEARANCE TO OBSTRUCTIONS ACROSS THE CLEAR WIDTH OF THE PATH SHALL BE A MINIMUM OF 9 FT.
5. CONSTRUCTION OF PCC BIKE PATH SHALL COMPLY WITH SECTION 73-1 STATE STANDARD SPECIFICATIONS.
6. CONCRETE SHALL CONTAIN 564 LB. (6 SACKS) OF PORTLAND CEMENT PER CUBIC YD. AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. AT 28 DAYS.
7. PROVIDE SAWED TRANSVERSE JOINTS, 1" DEEP AT 12' SPACINGS
8. TYPE II PORTLAND CEMENT COMPLYING WITH ASTM 150
9. CONCRETE SHALL COMPLY WITH "MINOR CONCRETE" OF CALTRANS STATE SPECIFICATIONS
10. SURFACE FINISH SHALL BE TRANSVERSE MEDIUM BROOM FINISH
11. APPLY CURING COMPOUND PER THE CALTRANS STANDARD SPECIFICATIONS
12. JOINTS SHALL BE SAWCUT 10 FT. ON CENTER



DESIGN AND CONSTRUCTION STANDARDS

CLASS I BIKE PATH

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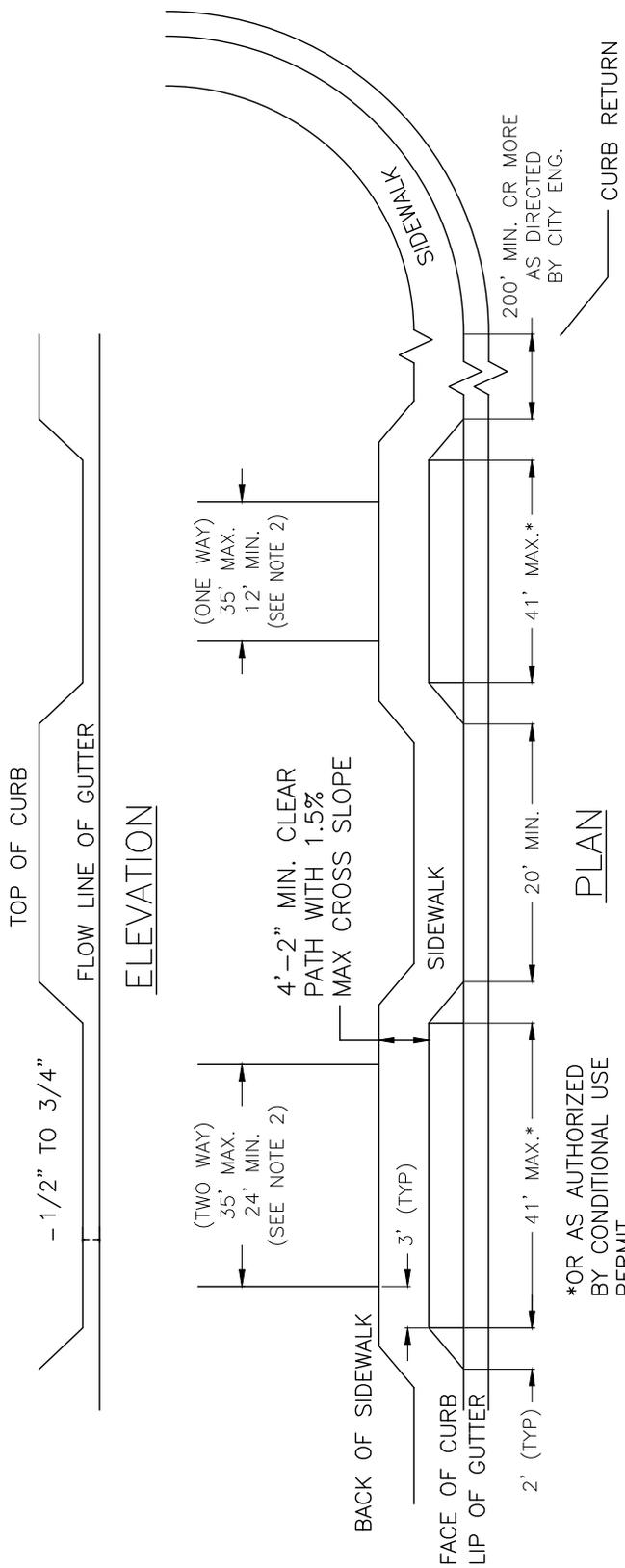
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132

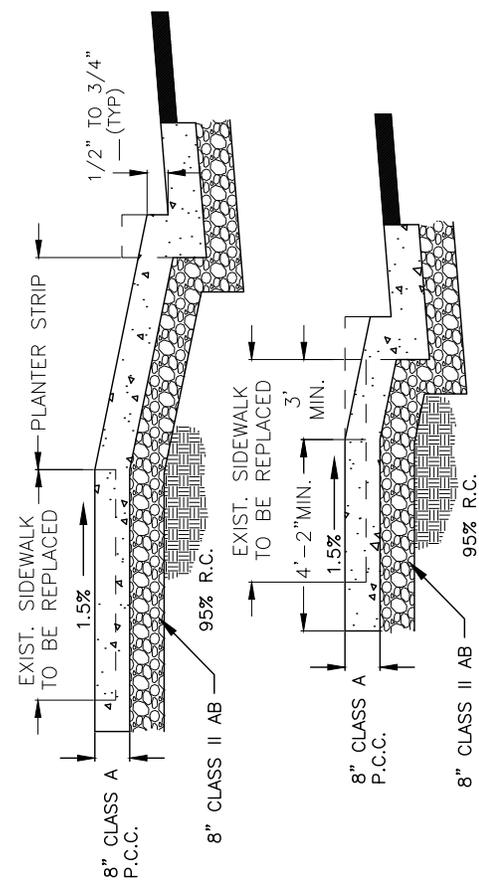
PAGE 1 OF 1

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- NOTES:**
1. MAXIMUM OF ONE CURB CUT PER PARCEL FRONTAGE, EXCEPT AS AUTHORIZED BY THE CITY ENGINEER.
 2. A MAXIMUM OF 41' WILL BE ALLOWED FOR CURB CUTS, EXCEPT AS OTHERWISE APPROVED BY CONDITIONAL USE PERMITS.
 3. CURB ISLANDS BETWEEN DRIVEWAYS SHALL NOT BE LESS THAN 20' AT TOP TO TOP ON A SINGLE PARCEL.
 4. WHERE NO SIDEWALK IS TO BE INSTALLED, DRIVEWAY APRON SHALL BE CONCRETE TO PROPERTY LINE.
 5. DRIVEWAYS SHALL NOT ENCRUCH ON CURB RETURNS OR PROPERTY LINE EXTENSIONS.
 6. CONCRETE SHALL BE 1-1/2" MAX. AGGREGATE (6 SACK).
 7. 1/8" x 1-1/2" DEEP WEAKENED PLANE JOINTS TO BE PLACED ON BOTH SIDES OF DRIVEWAY.



DESIGN AND CONSTRUCTION STANDARDS
MULTI-RESIDENTIAL AND COMMERCIAL CURB CUTS

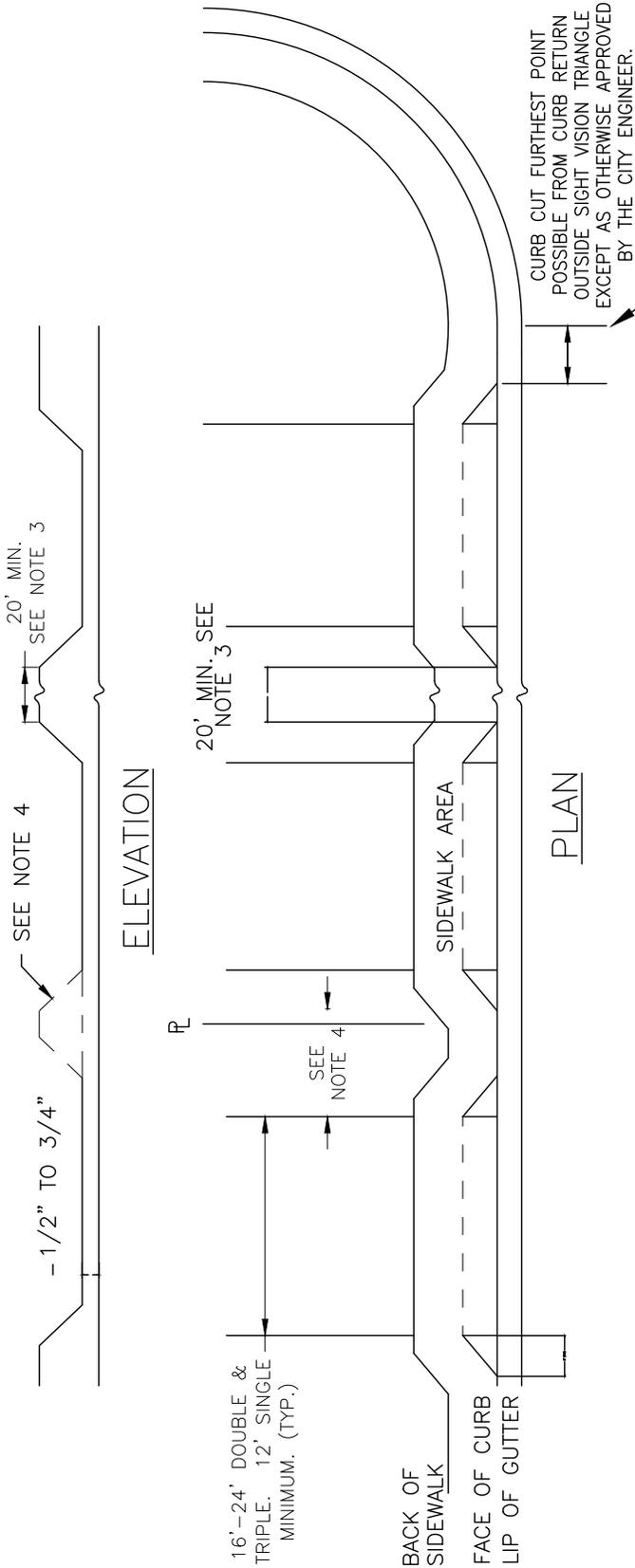
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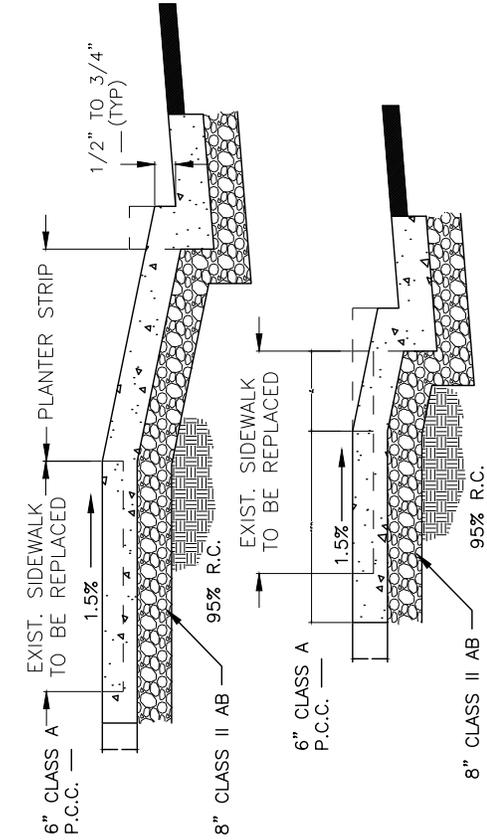
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133A

PAGE 1 OF 1

SCALE: NONE



- NOTES:**
1. MAXIMUM OF ONE CURB CUT PER PARCEL FRONTAGE.
 2. A MAXIMUM OF 24' WILL BE ALLOWED FOR CURB CUTS, EXCEPT AS OTHERWISE APPROVED BY CONDITIONAL USE PERMITS.
 3. CURB ISLANDS BETWEEN DRIVEWAYS SHALL NOT BE LESS THAN 20' AT TOP TO TOP ON A SINGLE PARCEL.
 4. OMIT CURB ISLANDS WHEN ADJACENT DRIVEWAYS ARE LESS THAN 6' APART.
 5. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
 6. WHERE NO SIDEWALK IS TO BE INSTALLED, DRIVEWAY APRON SHALL BE CONCRETE TO PROPERTY LINE.
 7. DRIVEWAYS SHALL NOT ENCRUCH ON CURB RETURNS OR PROPERTY LINE EXTENSIONS.
 8. CONCRETE SHALL BE 1-1/2" MAX. AGGREGATE (6 SACK).
 9. 1/8" x 1-1/2" DEEP WEAKENED PLANE JOINTS TO BE PLACED ON BOTH SIDES OF DRIVEWAY.



TYPICAL SECTIONS



DESIGN AND CONSTRUCTION STANDARDS

RESIDENTIAL CURB CUTS

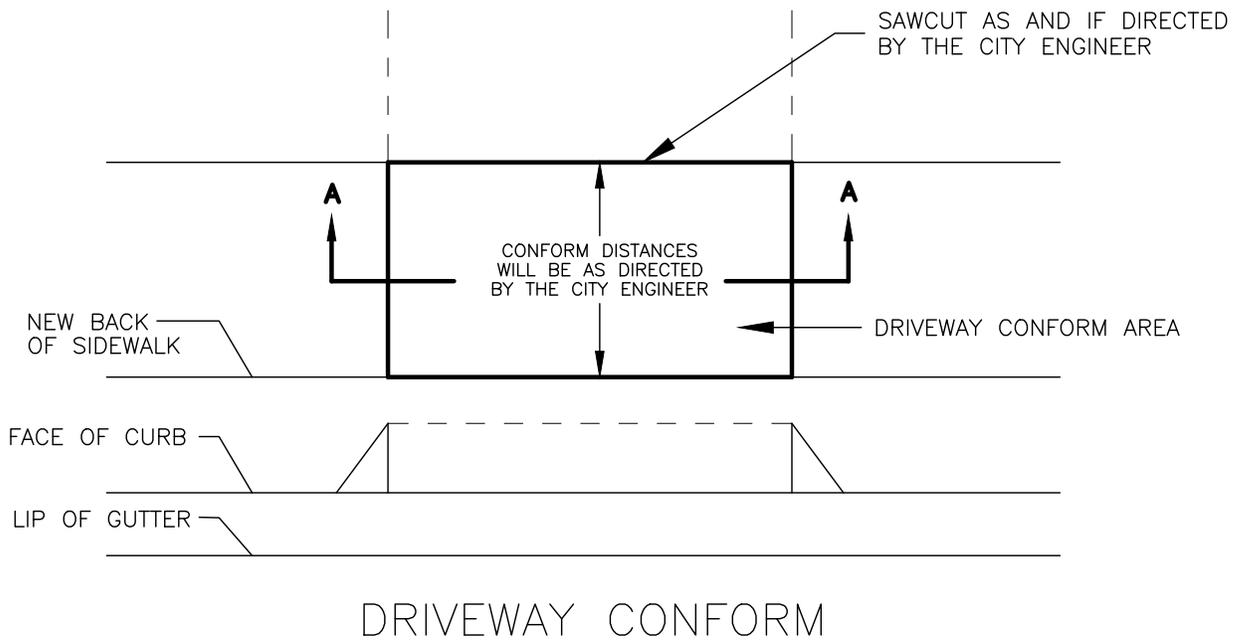
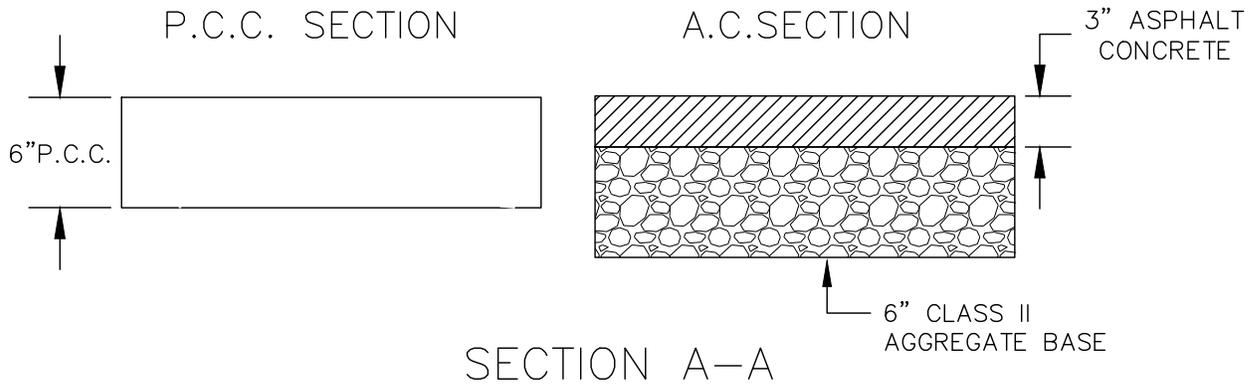
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STD. NO.
133B

PAGE 1 OF 1

SCALE: NONE



NOTE:

1. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

DRIVEWAY CONFORM P.C.C. & A.C.

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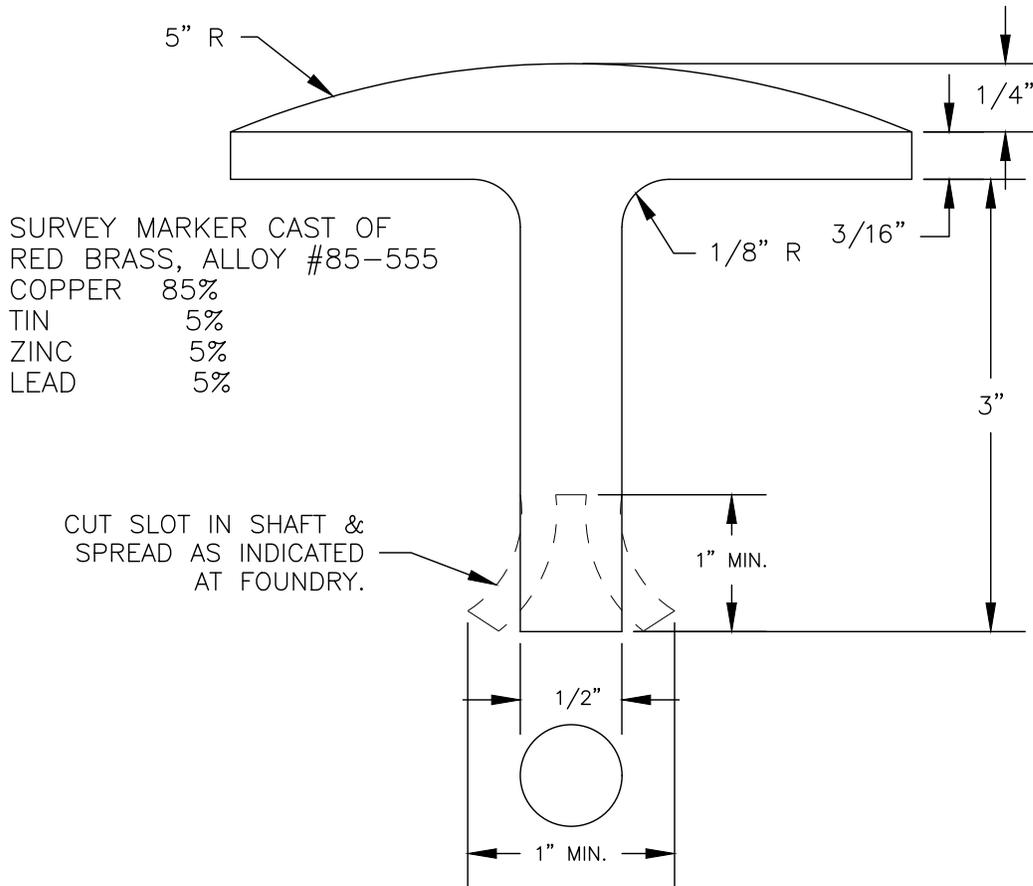
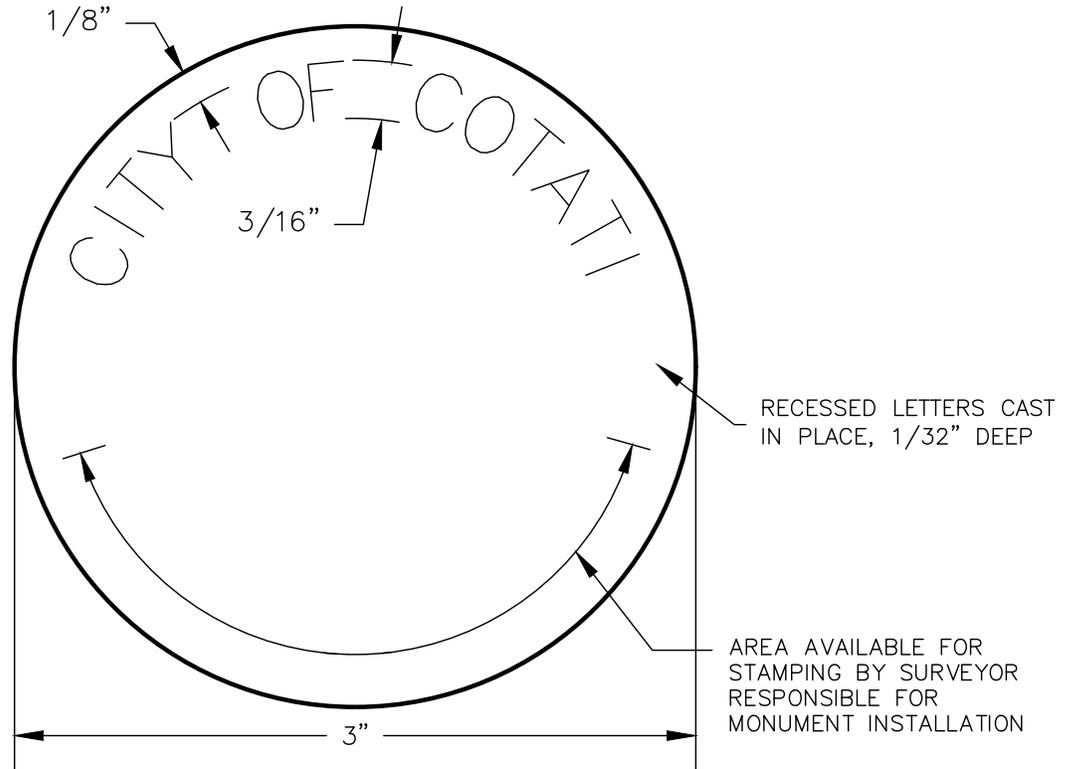
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STD. NO.

134

PAGE 1 OF 1

SCALE: NONE



DESIGN AND CONSTRUCTION STANDARDS

BRASS SURVEY MARKER

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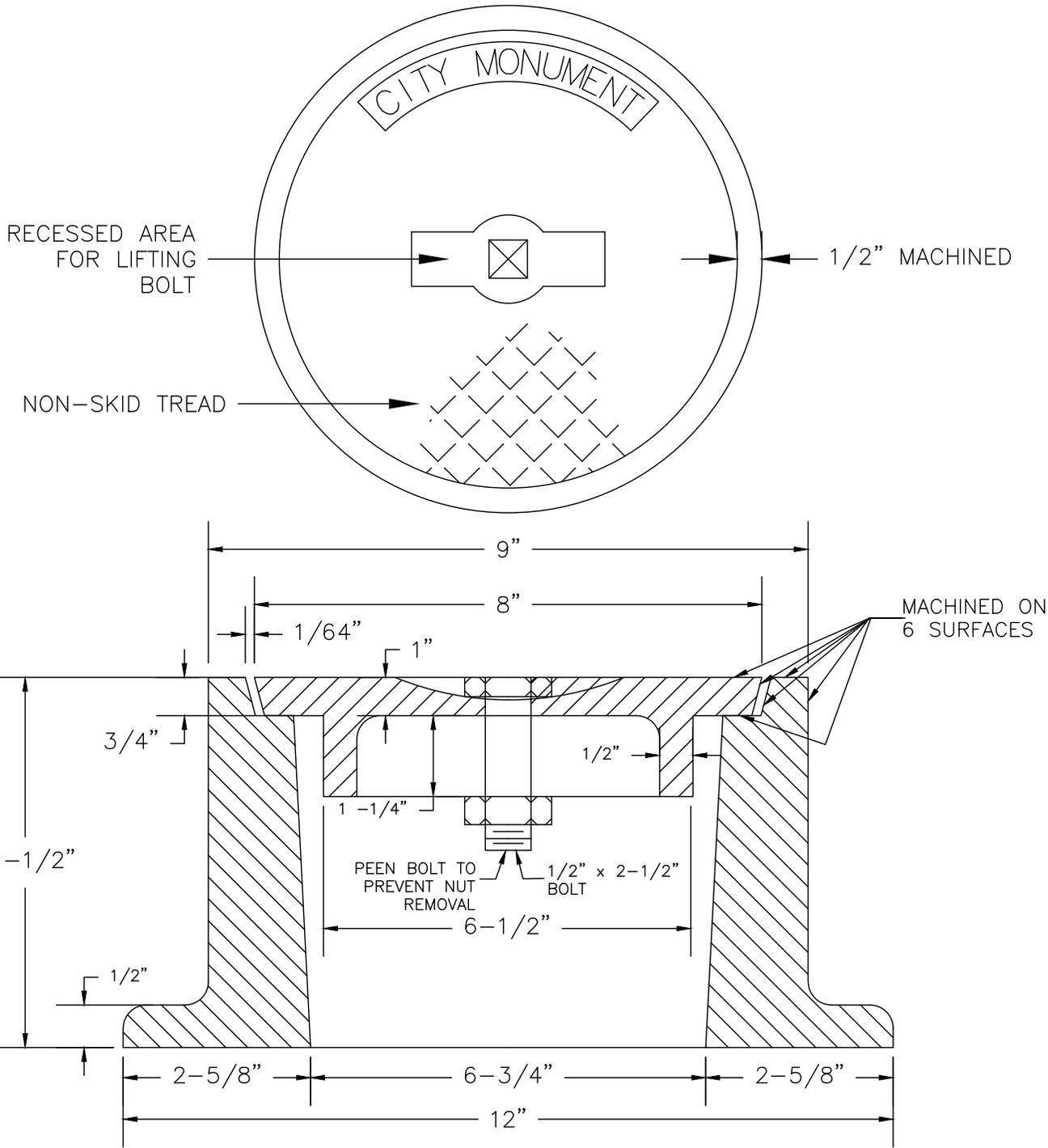
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STD. NO.

135

PAGE 1 OF 1

SCALE: NONE



APPROVED MONUMENT COVERS

1. PHOENIX NO. P-2001-A OR "P-2001-E"
2. "VISCO NO. 129"
3. "AMERICAN BRASS AND IRON FOUNDRY MODEL 5020-21"
4. ARTMARK PROD. CO. APC-51
5. SANTA ROSA CAST PRODUCTS SP-51
6. ALTERNATE - FORNI CORPORATION TYPE 80-60-03

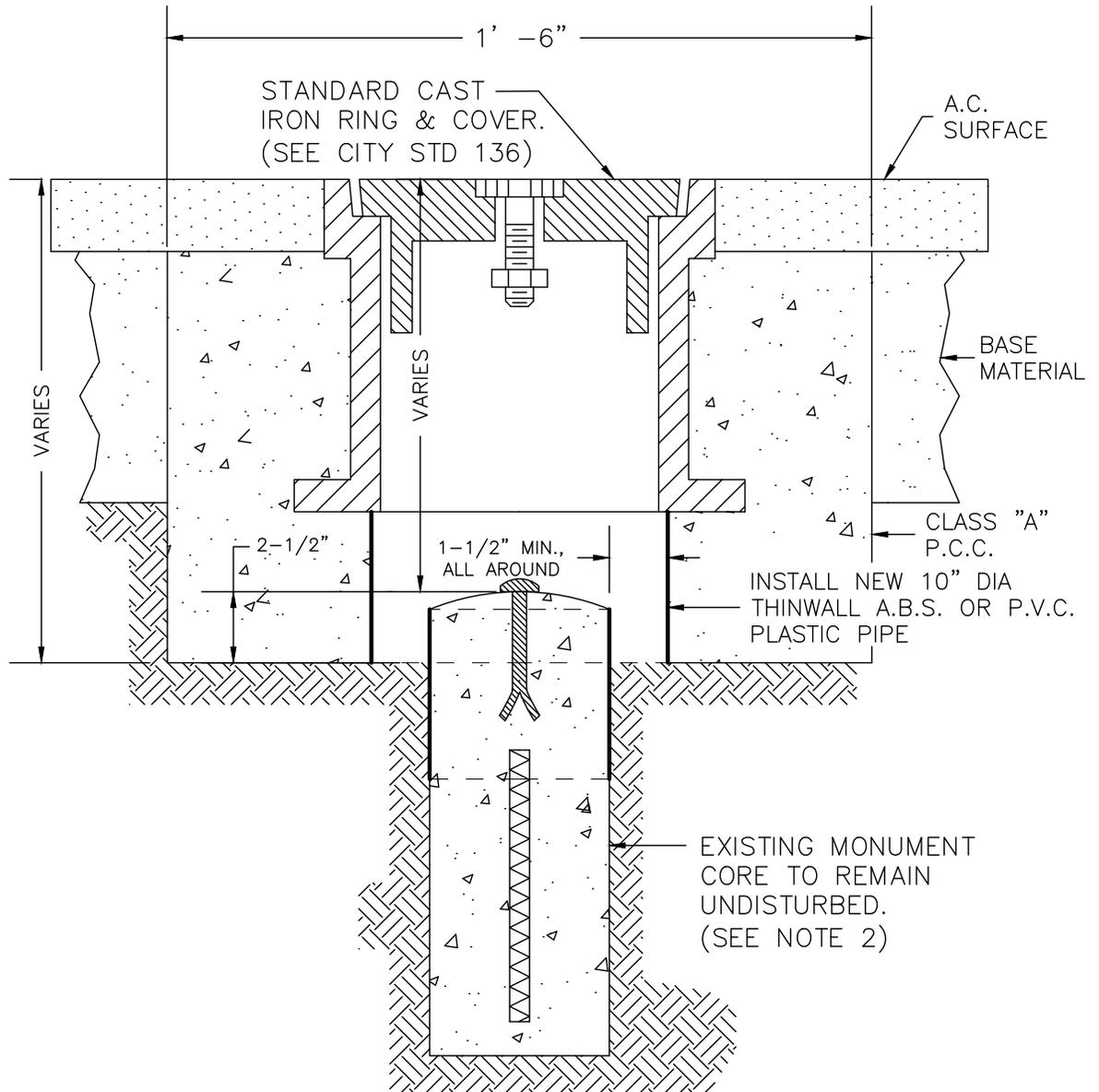
NOTES:

1. ASTM CLASS 30 IRON CASTINGS DIPPED IN ASPHALT PAINT.



DESIGN AND CONSTRUCTION STANDARDS	
CITY MONUMENT COVER	
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER	DECEMBER 2019

STD. NO. 136 PAGE 1 OF 1 SCALE: NONE
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NOTES:

1. EXISTING MONUMENT COVER, CONCRETE COLLAR AND OTHER MATERIAL SHALL BE REMOVED TO A DEPTH OF 2-1/2" BELOW TOP OF EXISTING MONUMENT.
2. DO NOT DISTURB EXISTING MONUMENT CORE. IF DISTURBED, CONTRACTOR SHALL REPLACE AS PER STD. 120 AT HIS EXPENSE FOR INSTALLATION AND SURVEY TIME NECESSARY TO RELOCATE THE ORIGINAL MONUMENT POSITION.



DESIGN AND CONSTRUCTION STANDARDS

CITY MONUMENT COVER REPLACEMENT

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STD. NO.

137

PAGE 1 OF 1

SCALE: NONE

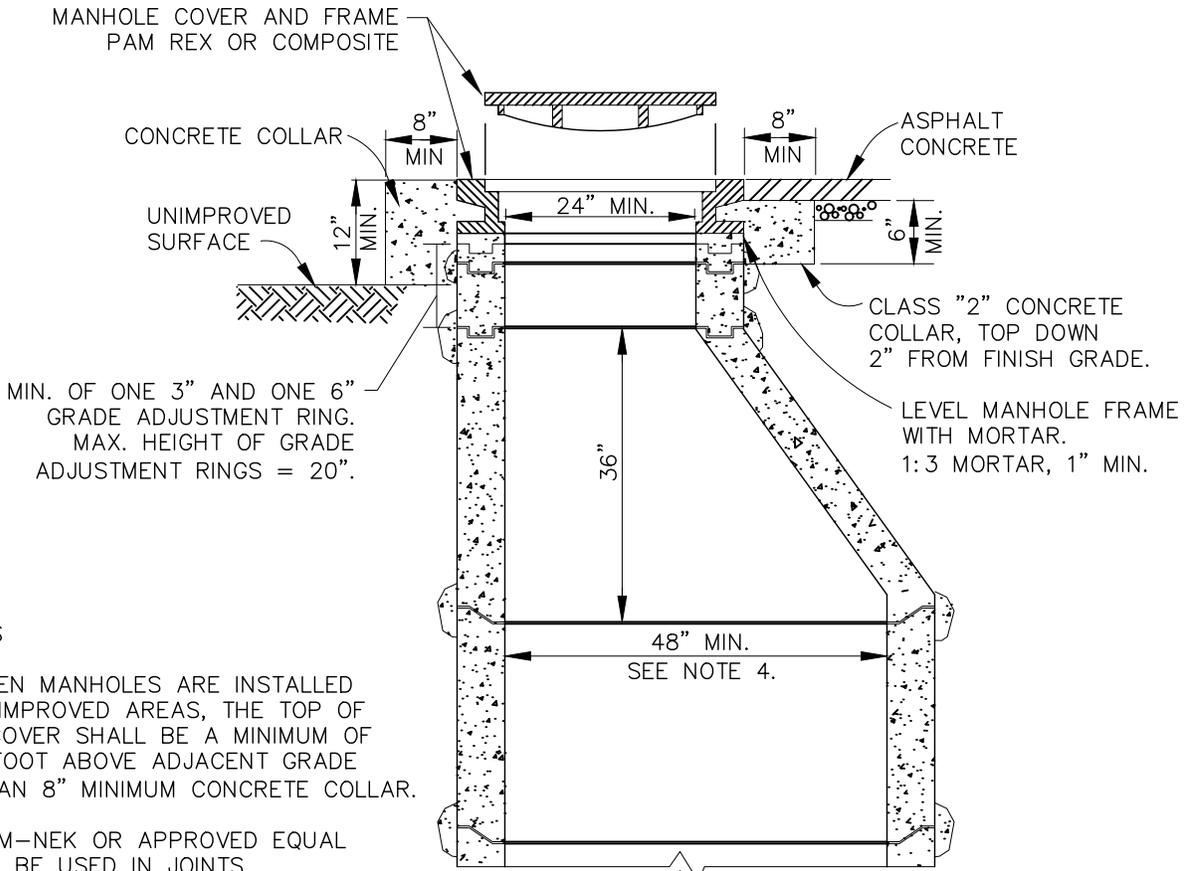


VOLUME 2: STANDARD PLANS

December 2019

200 Series: Storm Drain

- 202. STORM DRAIN PRECAST MANHOLE
- 203. STORM DRAIN PRECAST MANHOLE REDUCER SLAB
- 204. STORM DRAIN PRECAST CONCENTRIC MANHOLE
- 205. CURB OPENING CATCH BASIN
- 206. CATCH BASIN FOR PIPES LARGER THAN 24"
- 207A. PRECAST CATCH BASIC HOOD
- 207B. TYPE I CATCH BASIN
- 208. STORM DRAIN GALLERY
- 209. TYPICAL STORM DRAIN OUTFALL DETAIL
- 210A. SIDEWALK DRAIN
- 210B. 3"x12" CAST IRON SIDEWALK DRAIN
- 211. STORM DRAIN MARKER
- 212. AREA DRAIN DROP INLET FLUSH OPENING
- 213. AREA DRAIN DROP INLET SIDE OPENING
- 214. PRECAST SIDE-OPENING FIELD DRAIN
- 215. SIDEWALK DRAIN CATCH BASIN 12"x12"
- 216. SIDEWALK DRAIN CATCH BASIN 16"x16"
- 217. REINFORCED CONCRETE PIPE COLLAR
- 218. TYPICAL BIO-RETENTION UNIT



NOTES

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MINIMUM OF ONE FOOT ABOVE ADJACENT GRADE WITH AN 8" MINIMUM CONCRETE COLLAR.

2. RAM-NEK OR APPROVED EQUAL SHALL BE USED IN JOINTS. PLASTERING OF JOINTS REQUIRED IF HIGH WATER CONDITIONS EXIST.

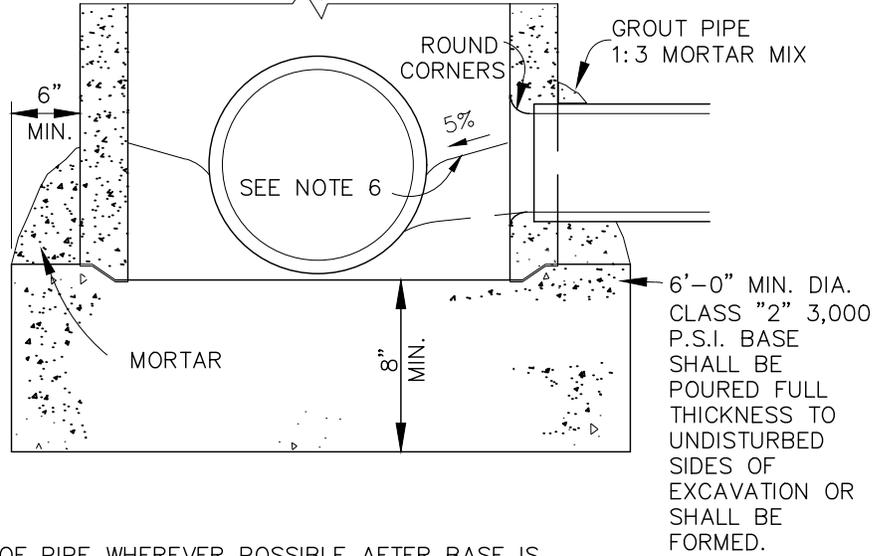
3. CONE SECTION SHALL BE ECCENTRIC UNLESS OTHERWISE SPECIFIED BY THE CITY ENGINEER.

4. MANHOLES OVER 7' IN DEPTH, OR WITH A PIPE OVER 36" DIAMETER, SHALL BE 5' IN DIAMETER UNLESS OTHERWISE PERMITTED BY THE CITY ENGINEER.

5. SET ALL RINGS IN A 1:3 MORTAR BED. WET BOTH TONGUE AND GROOVE BEFORE APPLYING MORTAR AND SETTING RING. WIPE INSIDE OF JOINTS SMOOTH AND PLASTER OUTSIDE OF JOINT WITH 1/2" LAYER OF MORTAR.

6. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE AFTER BASE IS POURED, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES. SET RING BASE IN MORTAR.

7. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.



DESIGN AND CONSTRUCTION STANDARDS



STORM DRAIN PRECAST MANHOLE

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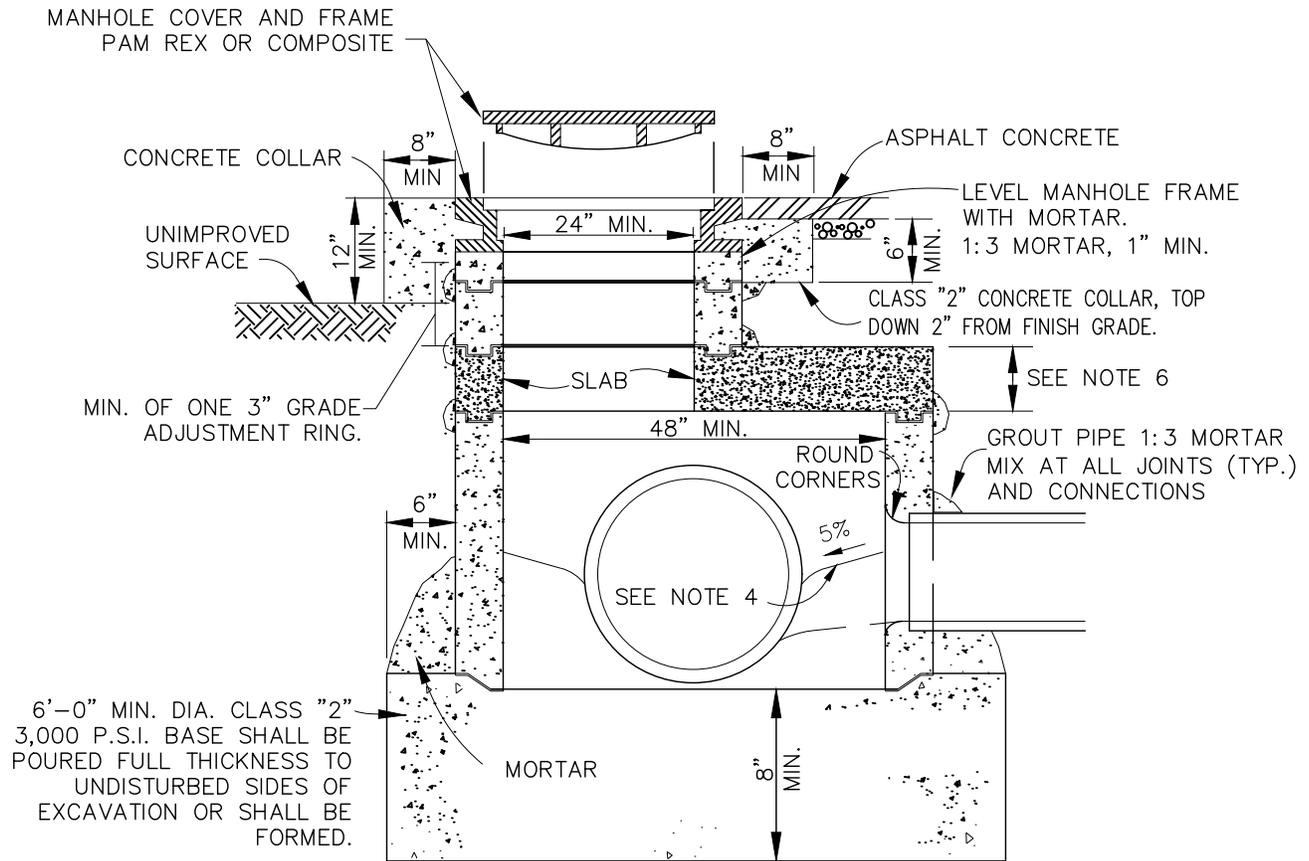
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202

PAGE 1 OF 1

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NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MINIMUM OF ONE FOOT ABOVE ADJACENT GRADE WITH AN 8" MINIMUM CONCRETE COLLAR.
2. RAM-NEK OR APPROVED EQUAL SHALL BE USED IN JOINTS. PLASTERING OF JOINTS REQUIRED IF HIGH WATER CONDITIONS EXIST.
3. SET ALL RINGS IN A 1:3 MORTAR BED. WET BOTH TONGUE AND GROOVE BEFORE APPLYING MORTAR AND SETTING RING. WIPE INSIDE OF JOINTS SMOOTH AND PLASTER OUTSIDE OF JOINT WITH 1/2" LAYER OF MORTAR.
4. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER BASE IS POURED, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF MANHOLE WALL AND CONSTRUCT U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES. SET RING BASE IN MORTAR.
5. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
6. PRECAST ECCENTRIC REDUCER SLAB DESIGNED AND REINFORCED FOR H2O HIGHWAY LOADING. CONTRACTOR SHALL PROVIDE CERTIFICATE OF COMPLIANCE.



DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN PRECAST MANHOLE REDUCER SLAB

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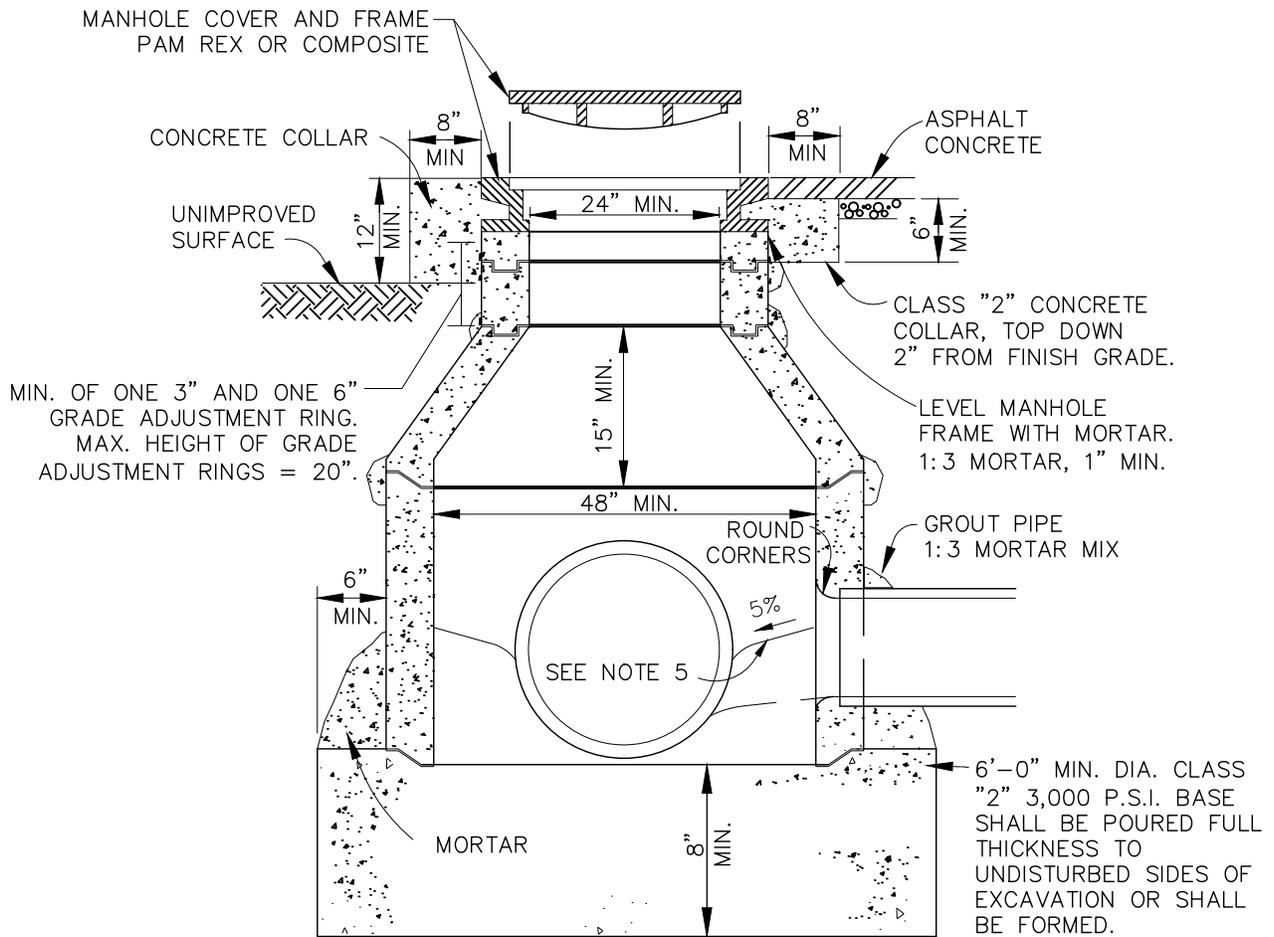
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STD. NO.

203

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. CONCENTRIC CONE SECTION SHALL BE APPROVED BY THE CITY ENGINEER BEFORE INSTALLATION.
2. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MINIMUM OF ONE FOOT ABOVE ADJACENT GRADE WITH AN 8" MINIMUM CONCRETE COLLAR.
3. RAM-NEK OR APPROVED EQUAL SHALL BE USED IN JOINTS. PLASTERING OF JOINTS REQUIRED IF HIGH WATER CONDITIONS EXIST.
4. SET ALL RINGS IN A 1:3 MORTAR BED. WET BOTH TONGUE AND GROOVE BEFORE APPLYING MORTAR AND SETTING RING. WIPE INSIDE OF JOINTS SMOOTH AND PLASTER OUTSIDE OF JOINT WITH 1/2" LAYER OF MORTAR.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER BASE IS POURED, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES. SET RING BASE IN MORTAR.
6. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.



DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN PRECAST
CONCENTRIC MANHOLE

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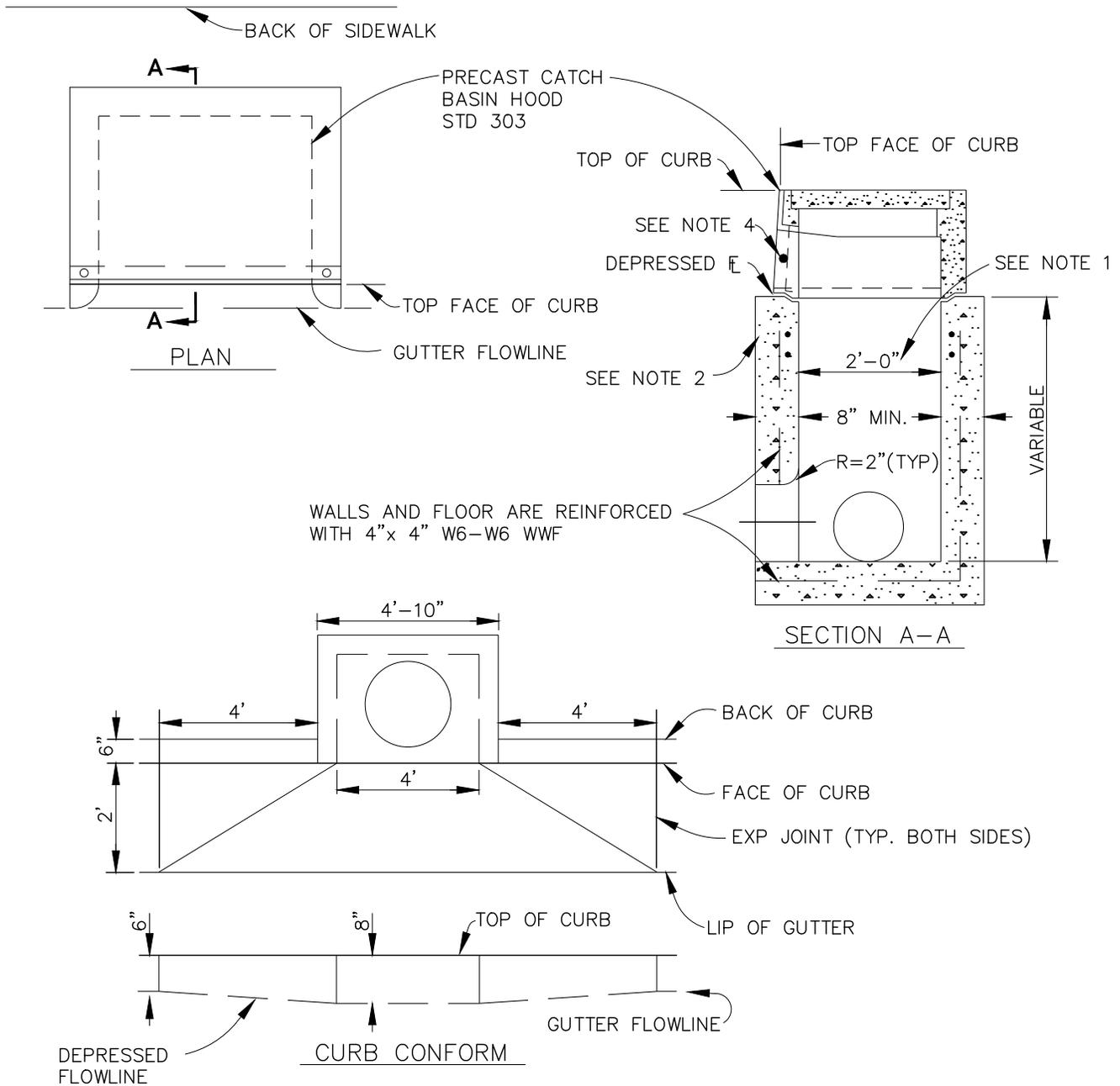
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STD. NO.

204

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. IF PIPE INTO OR OUT OF THE CATCH BASIN IS LARGER THAN 24", UNIT SHALL BE TAILOR-MADE BY SUPPLIER, OR FIELD-FABRICATED PER CITY STD 207.
2. APPROVED ALTERNATES FOR CURB INLET BASE SECTIONS: US CONCRETE PRECAST PRODUCTS BASE SECTION MODEL 4A; PHOENIX PRECAST CONC. PRODUCTS BASE SECTION MODEL D14,2
3. ALL HOOD, BASE, AND PIPE CONNECTIONS SHALL BE GROUTED.
4. SEE STD 207A FOR HOOD DETAIL.
5. APPLY STORM DRAIN MARKER PER CITY STD 211.



DESIGN AND CONSTRUCTION STANDARDS

**CURB OPENING
CATCH BASIN**

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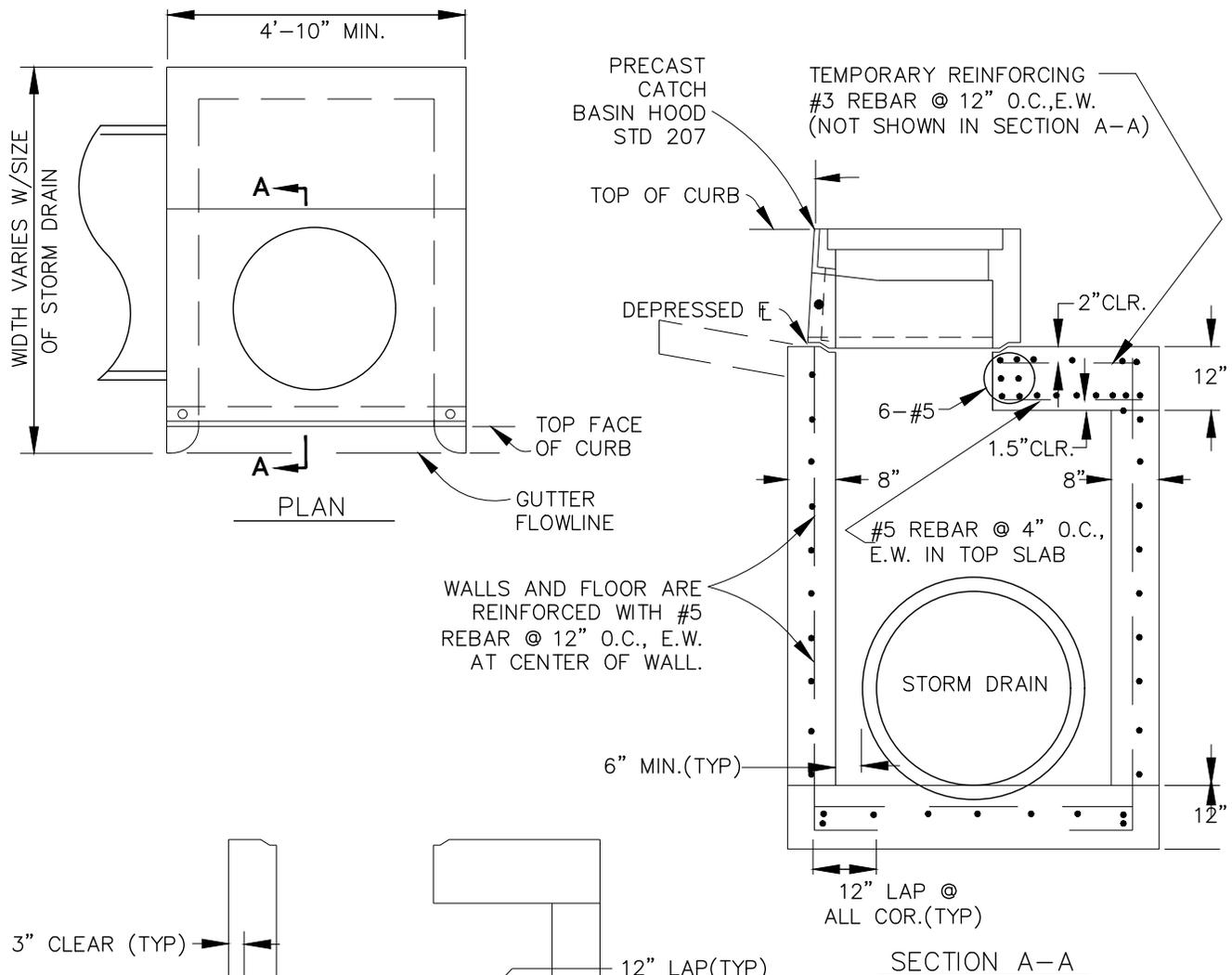
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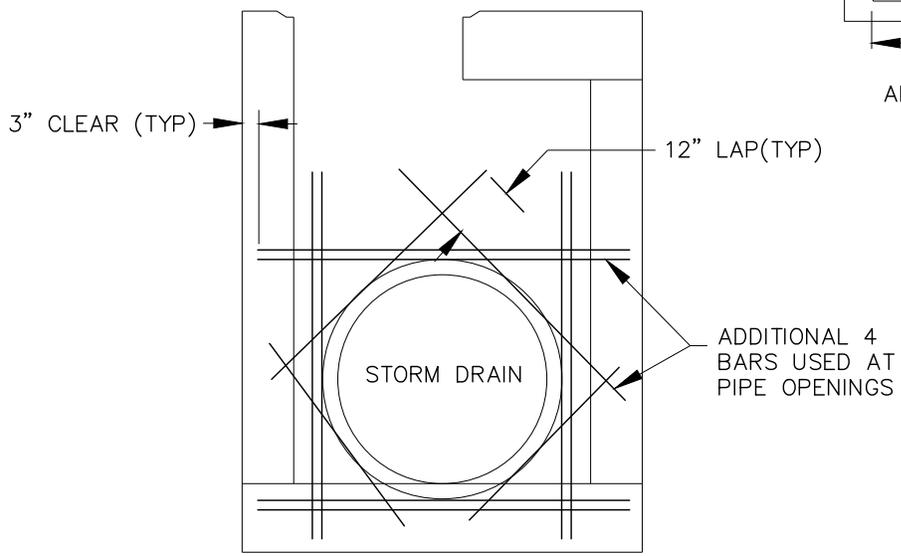
205

PAGE 1 OF 1

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WALLS AND FLOOR ARE REINFORCED WITH #5 REBAR @ 12" O.C., E.W. AT CENTER OF WALL.



REINFORCING USED @ OPENINGS

NOTE:

1. APPLY STORM DRAIN MARKER PER CITY STD 211.



DESIGN AND CONSTRUCTION STANDARDS

CATCH BASIN FOR PIPES
LARGER THAN 24"

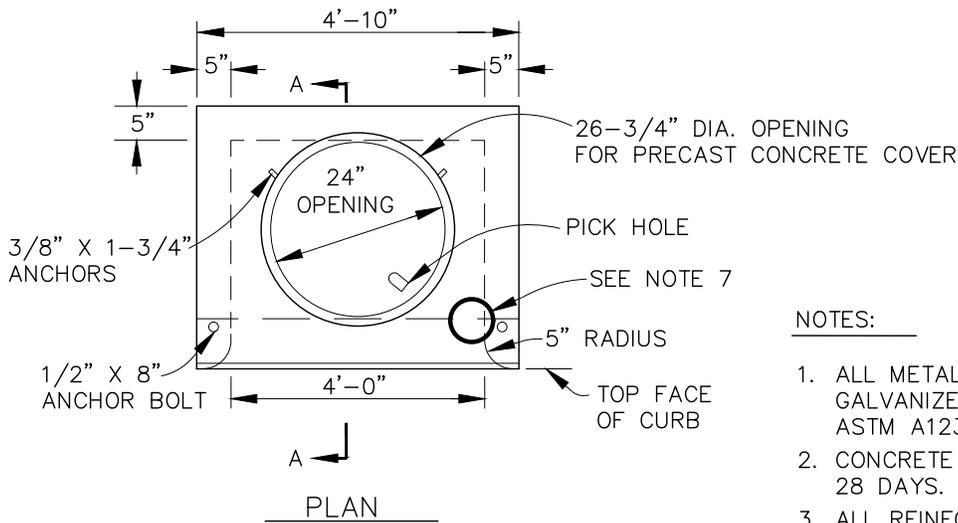
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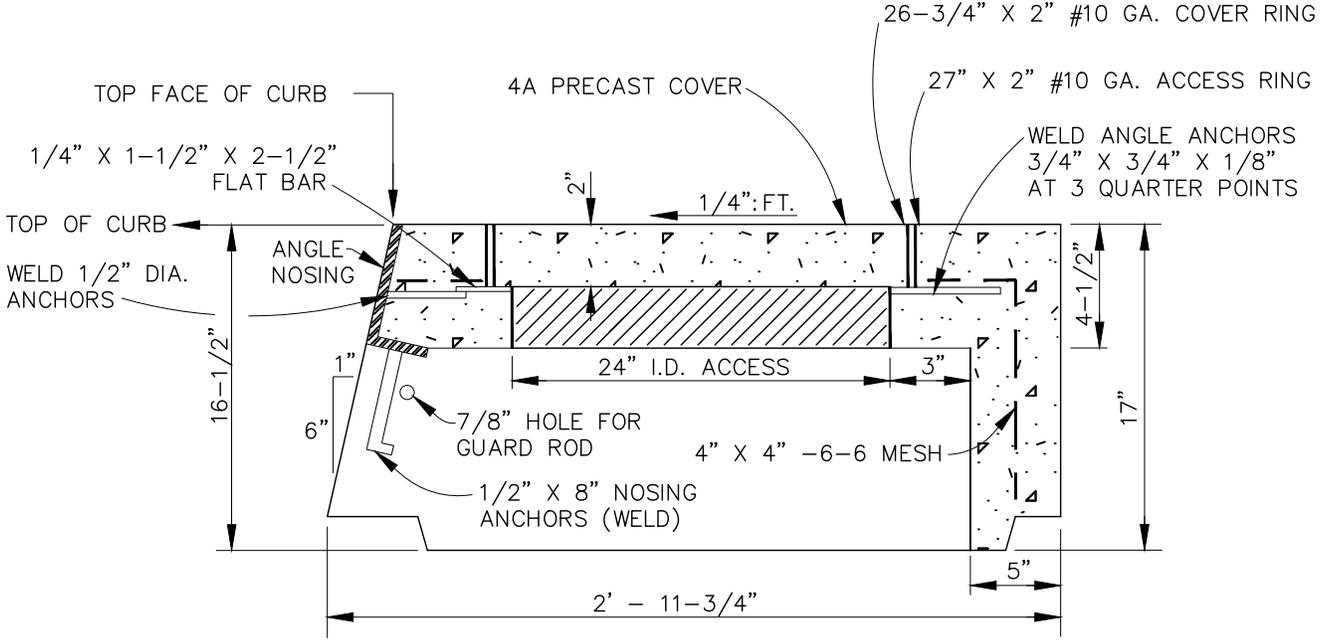
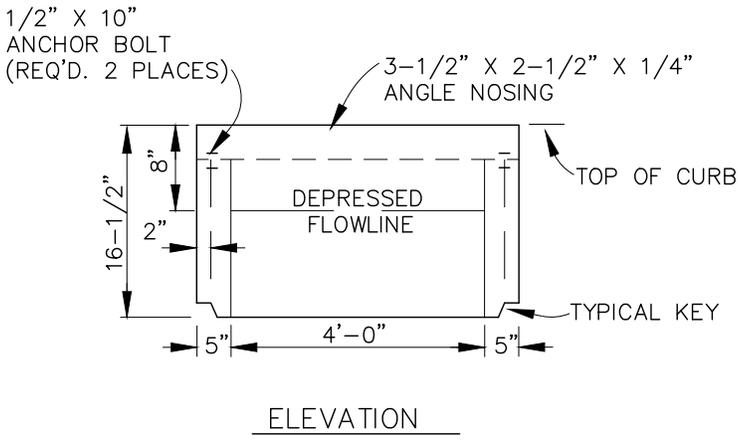
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206

PAGE 1 OF 1

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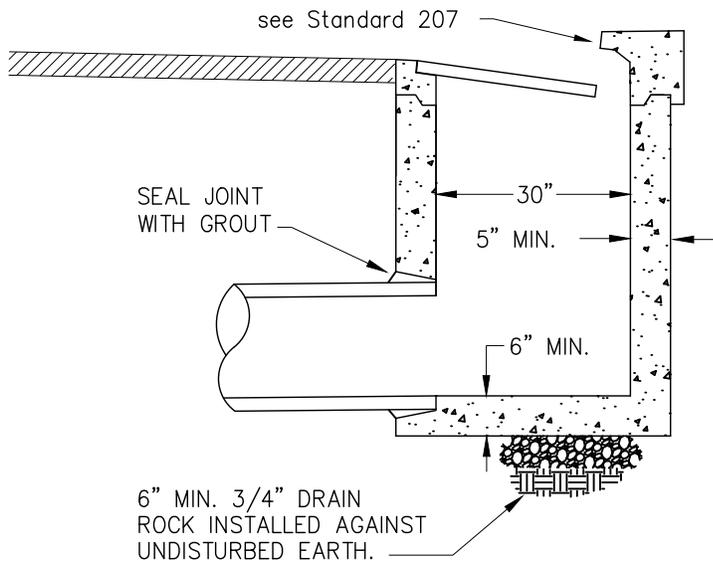
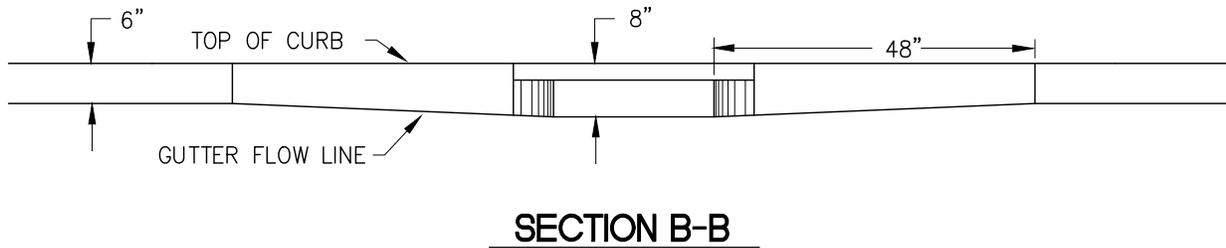
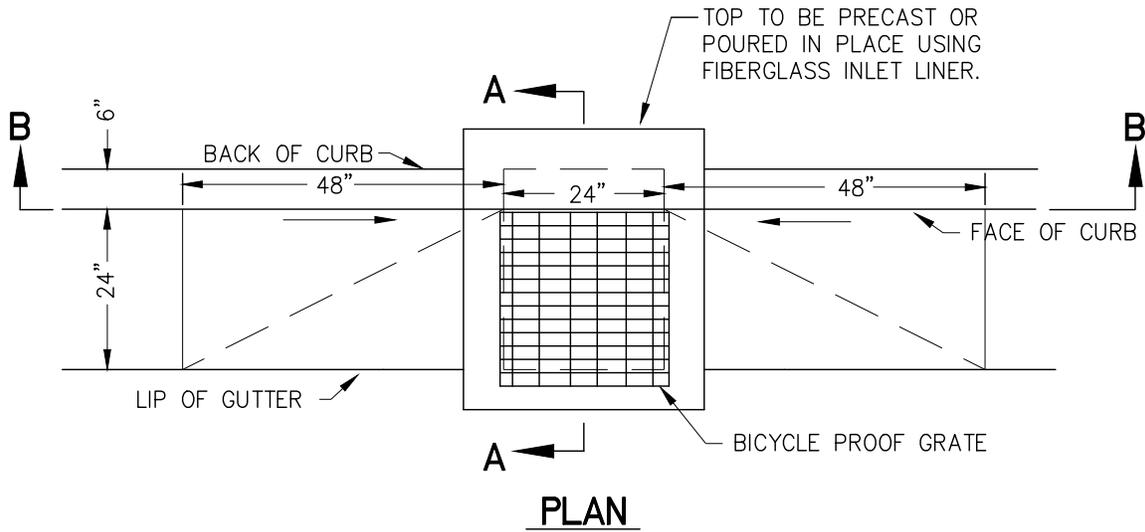


- NOTES:
1. ALL METAL PARTS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123.
 2. CONCRETE SHALL TEST 3000 PSI AT 28 DAYS.
 3. ALL REINFORCING SHALL BE 4" X 4" - 6/6 MESH.
 4. WEIGHT OF UNIT COMPLETE = 1500± LBS. COVER ONLY = 100± LBS.
 5. 3/4" GALVANIZED STEEL GUARD ROD FOR OPENINGS IN EXCESS OF 9" HEIGHT.
 6. BASE MAY BE PRECAST OR CAST IN PLACE TO SUIT.
 7. ATTACH "DRAINS TO CREEK" DECAL PER STD 304.



APPROVED ALTERNATES:
 CENTRAL PRE-CAST PRODUCTS MODEL 4A
 OLDCASTLE PRECAST MODEL CIN-2.5A-4AC TOP

	DESIGN AND CONSTRUCTION STANDARDS	STD. NO.
		207A
PRECAST CATCH BASIN HOOD		PAGE 1 OF 1
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER	DECEMBER 2019	SCALE: NONE



NOTES:

1. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI IN 28 DAYS.
2. GRATE AND NOSING ANGLE SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A-123.
3. GRATE FRAMES SHALL BE INSTALLED TIGHT AGAINST GUTTER FLOWLINE.
4. CATCH BASIN BOX AND GRATE SHALL BE CONSTRUCTED TO WITHSTAND H₂O LOADING.
5. INSTALL LABEL PER CITY STD 211.

ONLY TO BE USED WHERE SPECIFICALLY APPROVED BY VARIANCE.

APPROVED TYPE I CATCH BASINS
See Engineer's approved list



DESIGN AND CONSTRUCTION STANDARDS

TYPE I CATCH BASIN

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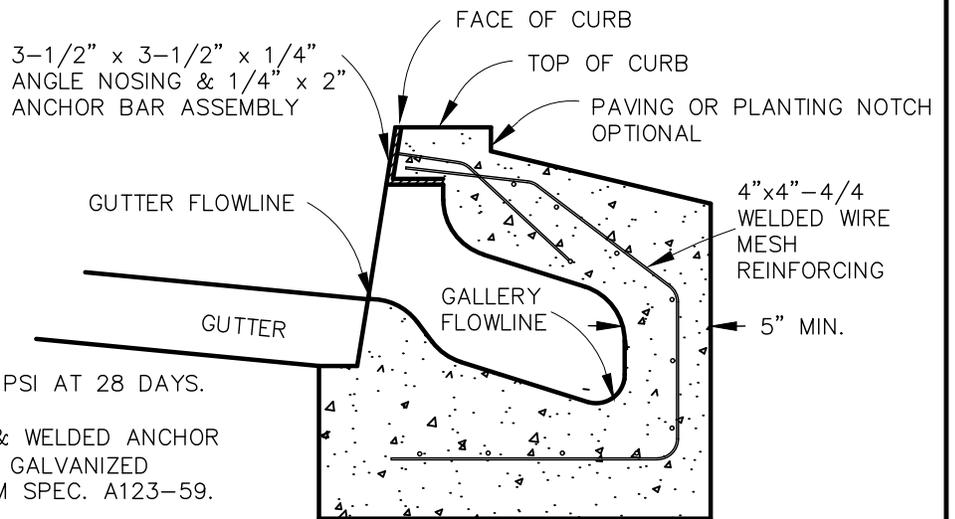
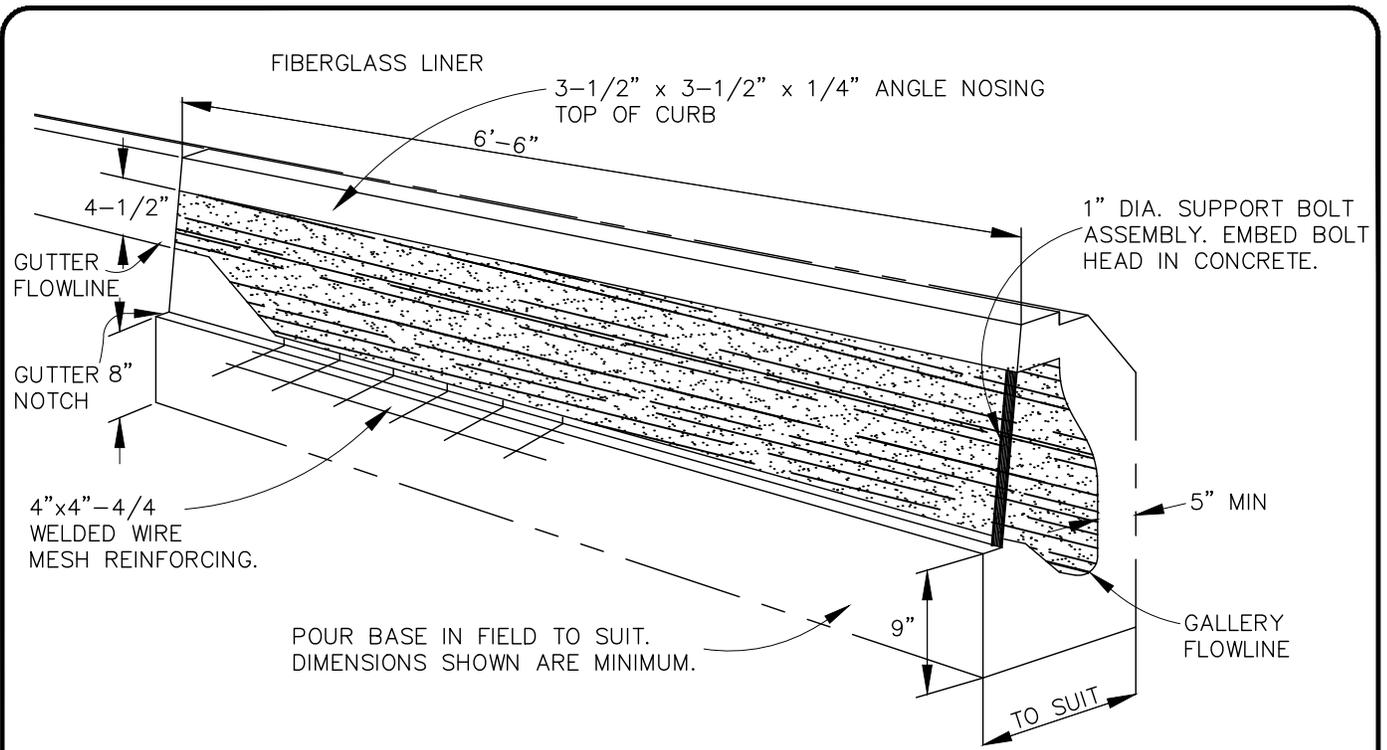
DECEMBER 2019

STD. NO.

207B

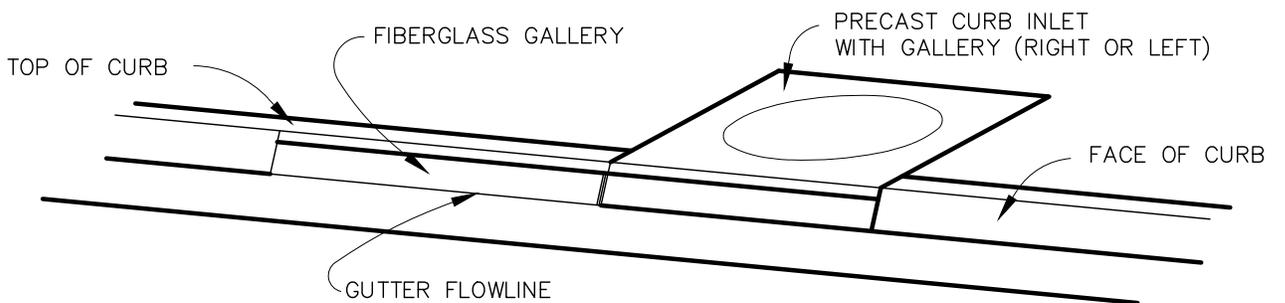
PAGE 1 OF 1

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NOTES:

1. CONCRETE SHALL TEST 3000 PSI AT 28 DAYS.
2. NOSING ASSEMBLY (ANGLED & WELDED ANCHOR BARS) SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM SPEC. A123-59.
3. EITHER CAST-IN-PLACE OR PRECAST UNITS ARE ACCEPTABLE.



DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN GALLERY

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

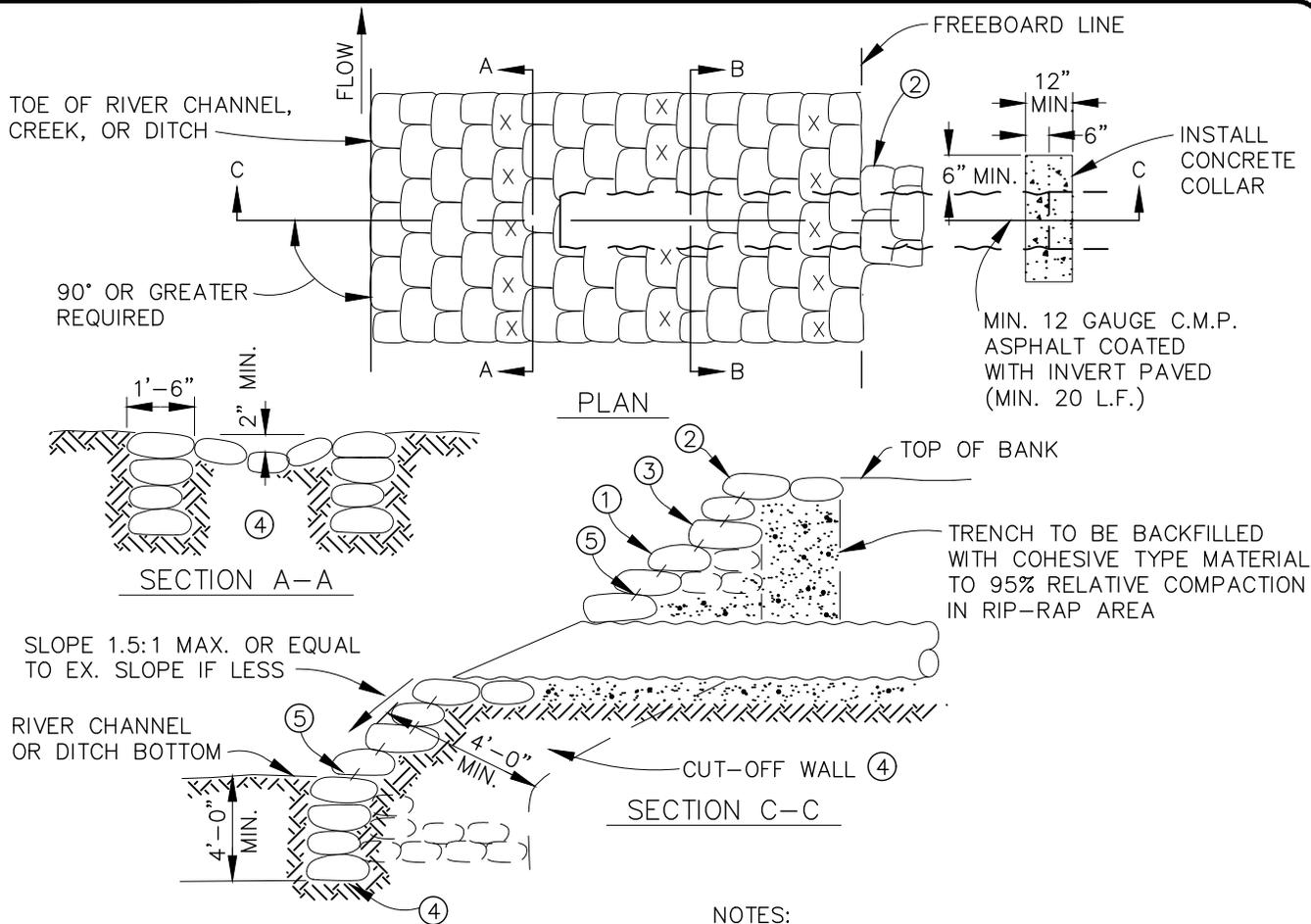
DECEMBER 2019

STD. NO.

208

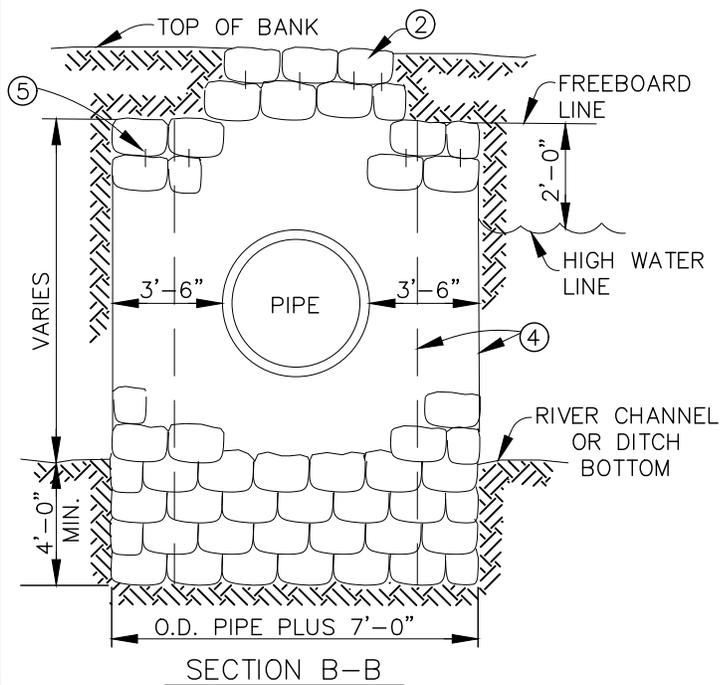
PAGE 1 OF 1

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NOTES:

1. FACE OF RIP-RAP TO BE COINCIDENT WITH EXISTING (OR FUTURE DESIGN) SIDE SLOPE OF CHANNEL.
2. CARRY RIP-RAP TO TOP OF BANK IN TRENCH EXCAVATION ABOVE FREEBOARD.
3. SACK CONCRETE RIP-RAP PLACED ON UNDISTURBED SOIL. ANY OVER-EXCAVATION MUST BE FILLED WITH SACKS, NO EARTH BACKFILL WILL BE PERMITTED. (EVERY FIFTH COURSE TO BE A HEADER COURSE. ⊗)
4. INSTALL CUT-OFF WALL UPSTREAM & DOWN-STREAM TO AN ELEVATION WHICH IS EQUAL TO THE FREEBOARD ELEVATION OR TOP OF PIPE, WHICH EVER IS HIGHER, AND ACROSS THE BOTTOM WITH 4.0 MINIMUM DEPTH.
5. IN ALL TOP COURSES AND THROUGHOUT, IF SIDE SLOPE IS STEEPER THAN 1:1 AND/OR HIGHER THAN 10 FEET, DRIVE ONE #4 REINFORCING BAR 18" LONG THROUGH EACH SACK. DO NOT LEAVE ENDS OF BARS EXPOSED, NOR DRIVE INTO DIRT.
6. OUTFALLS TO BE APPROVED BY FISH & WILDLIFE AND FLOOD CONTROL AS APPROPRIATE.



DESIGN AND CONSTRUCTION STANDARDS

TYPICAL STORM DRAIN
OUTFALL DETAIL

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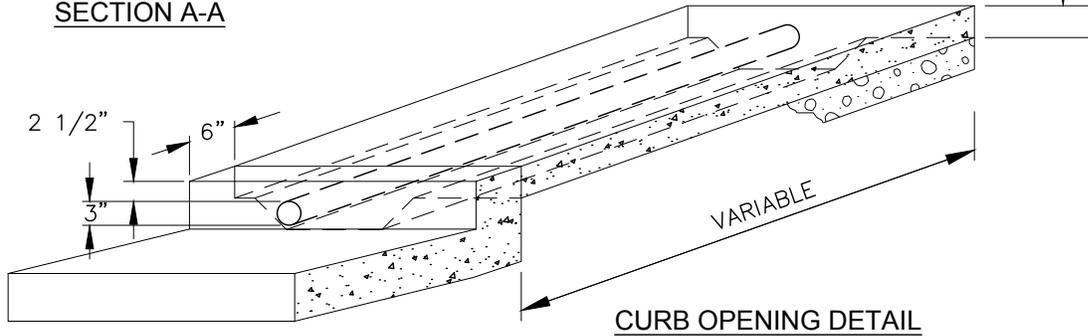
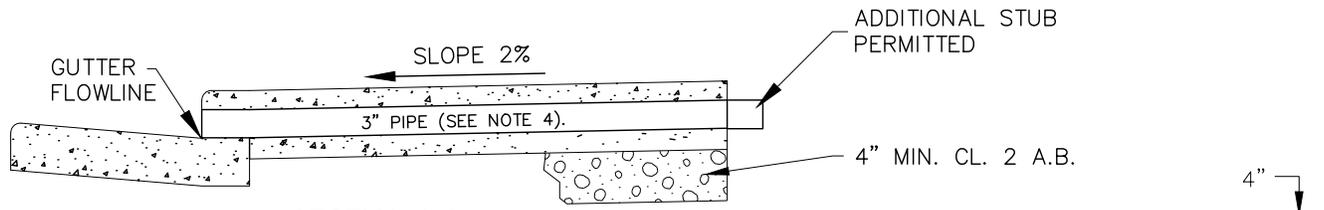
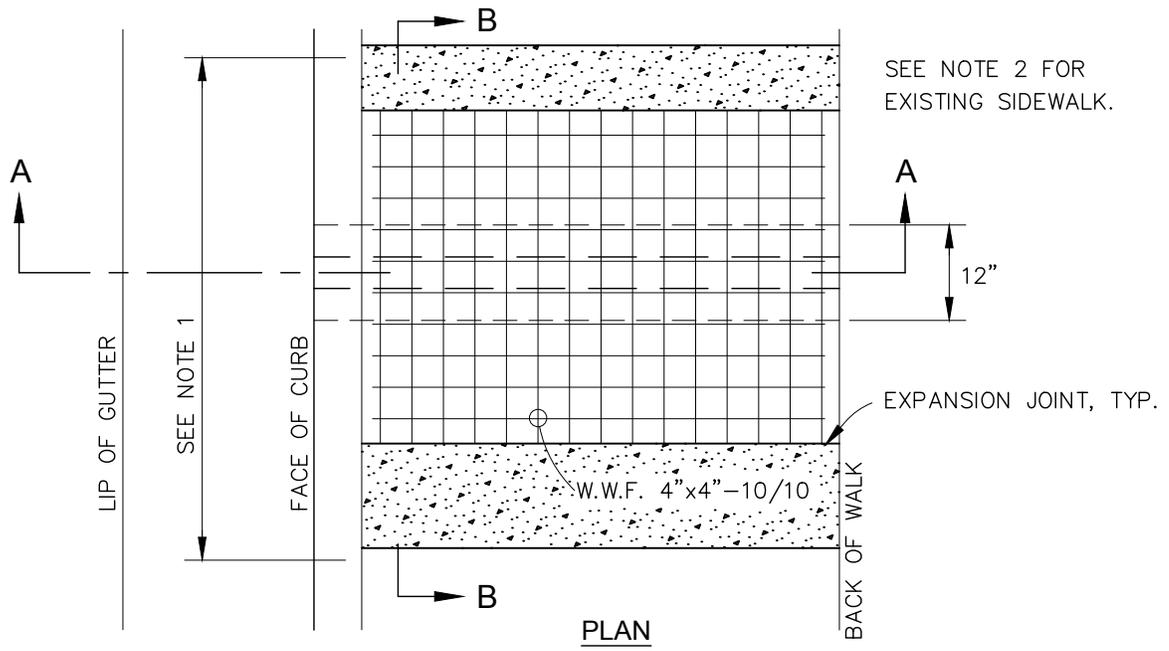
JULY 2019

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209

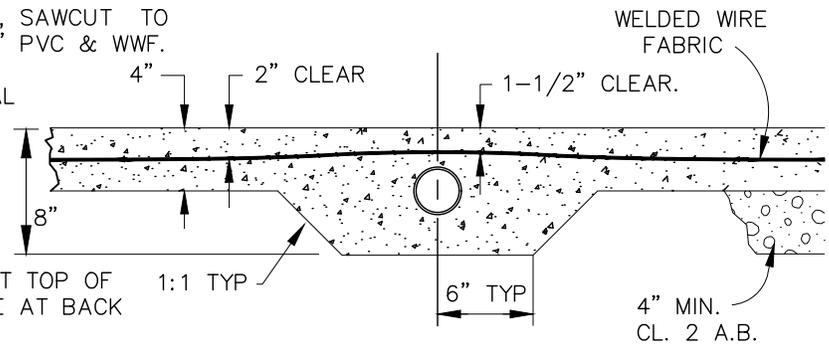
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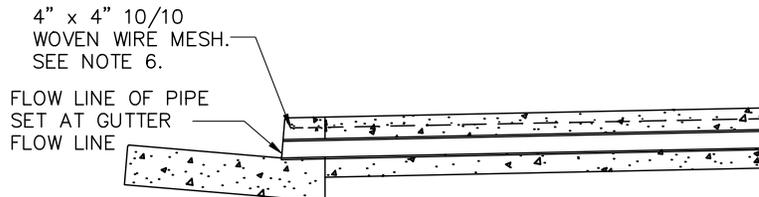
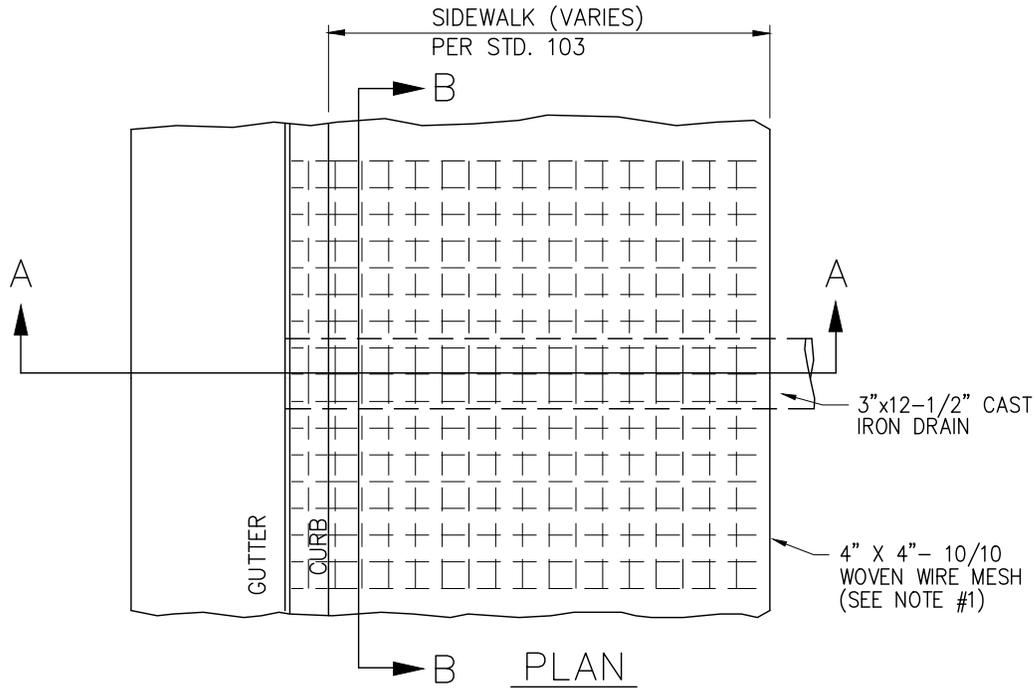


NOTES:

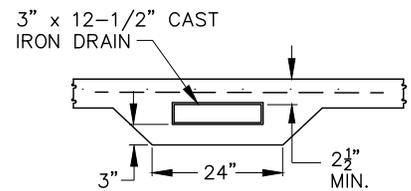
1. MINIMUM ONE (1) SIDEWALK DRAIN PER RESIDENTIAL LOT SHALL BE INSTALLED IN NEW SUBDIVISIONS.
2. WELDED WIRE FABRIC (WWF) SHALL BE MIN. 2' WIDE IN NEW SIDEWALK. IF SIDEWALK IS EXISTING, SAWCUT TO NEAREST EXPANSION JOINTS TO PLACE 3" PVC & WWF. WWF TO BE THE WIDTH OF THE REMOVED SIDEWALK SECTION. LENGTH SHALL EQUAL SIDEWALK WIDTH MINUS 4".
3. ON-SITE DRAINAGE AND LOCATION OF CURB OUTLETS SHALL BE BY THE OWNER TO THE SATISFACTION OF THE CITY ENGINEER.
4. DRAIN PIPE SHALL BE INSTALLED SO THAT TOP OF PIPE IS 2 1/2" MIN. BELOW FINISH GRADE AT BACK OF SIDEWALK
5. SIDEWALK DRAIN TO BE 3" SCH 40 HEAVY WALL RIGID POLYVINYL CHLORIDE PIPE OR APPROVED SUBSTITUTE.



	DESIGN AND CONSTRUCTION STANDARDS	STD. NO.
		SIDEWALK DRAIN
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER	DECEMBER 2019	PAGE 1 OF 1
		SCALE: NONE



SECTION A - A



CAST IRON SIDEWALK DRAIN

See Engineer's approved list

NOTES:

1. WIRE MESH SHALL BE FULL WIDTH OF SIDEWALK MINUS 2". LENGTH OF WIRE MESH SHALL, AT A MINIMUM, EQUAL THE WIDTH AND BE CENTERED OVER THE PIPE.
2. ON-SITE DRAINAGE AND LOCATION OF CURB OUTLETS SHALL BE BY OWNER TO THE SATISFACTION OF THE CITY ENGINEER.
3. DRAIN PIPE SHALL BE INSTALLED SO THAT THE TOP OF PIPE IS 2½" (MIN.) BELOW FINISHED GRADE AT BACK OF SIDEWALK.
4. SIDEWALK SHALL BE REMOVED TO THE NEAREST SCOREMARK.
5. IF SIDEWALK AND GUTTER ARE NOT CONTIGUOUS, REMOVE CURB AND GUTTER A MINIMUM OF ONE FOOT ON EACH SIDE OF THE DRAIN PIPE. DOWEL NEW GUTTER TO EXISTING CURB AND GUTTER WITH (2) 12" #4 REBARS, PLACE ONE DOWEL IN CURB AND ONE IN GUTTER PAN USING EPOXY.
6. IF SIDEWALK AND GUTTER ARE CONTIGUOUS, POUR MONOLITHIC WITH WIRE FABRIC EXTENDING INTO CURB.



DESIGN AND CONSTRUCTION STANDARDS

3" x 12" CAST IRON SIDEWALK DRAIN

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

210B

PAGE 1 OF 1

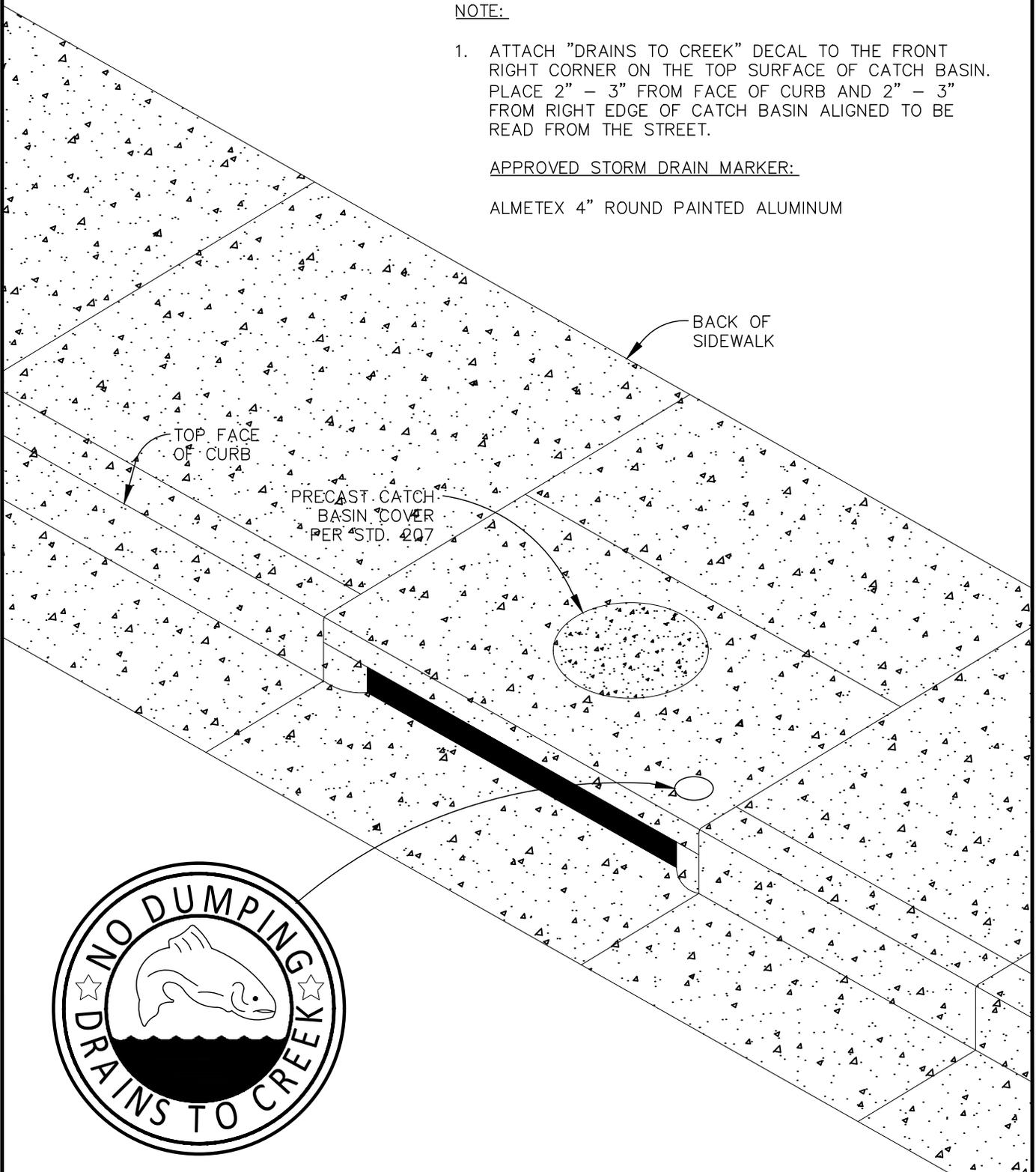
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NOTE:

1. ATTACH "DRAINS TO CREEK" DECAL TO THE FRONT RIGHT CORNER ON THE TOP SURFACE OF CATCH BASIN. PLACE 2" - 3" FROM FACE OF CURB AND 2" - 3" FROM RIGHT EDGE OF CATCH BASIN ALIGNED TO BE READ FROM THE STREET.

APPROVED STORM DRAIN MARKER:

ALMETEX 4" ROUND PAINTED ALUMINUM



DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN MARKER

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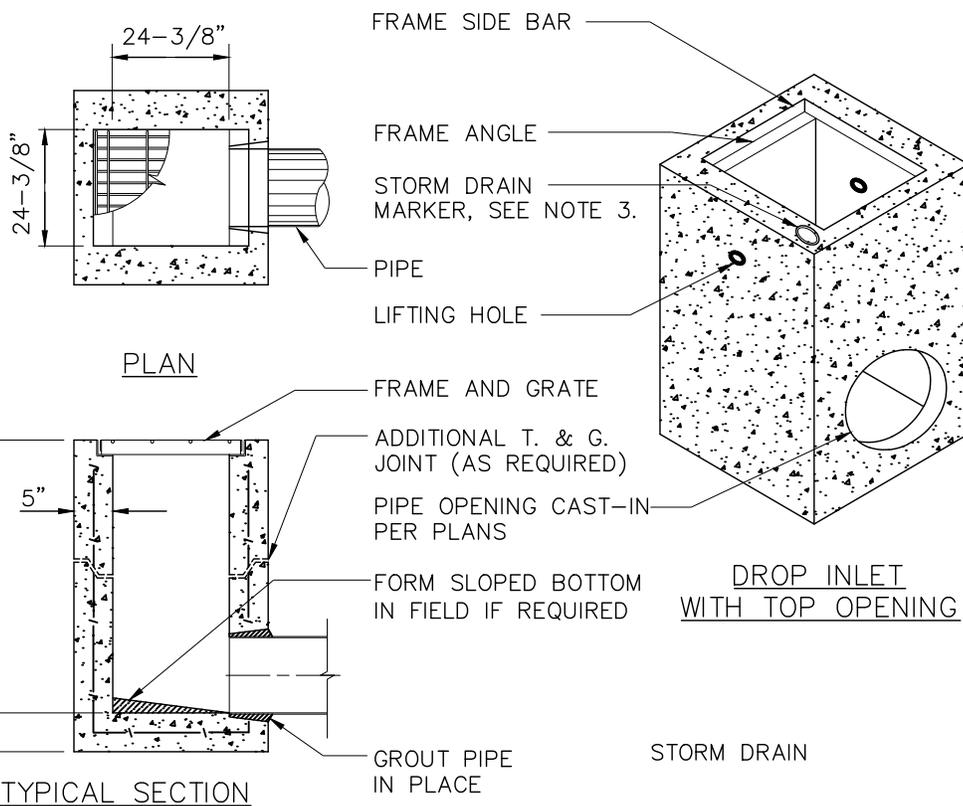
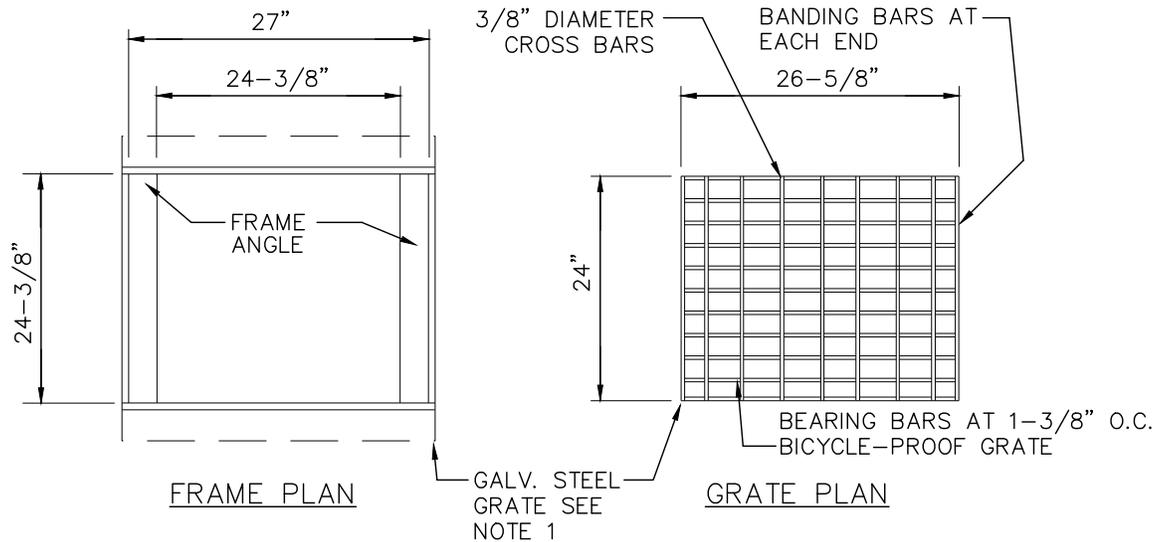
DECEMBER 2019

STD. NO.

211

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. FRAMES AND GRATES SHALL BE TRAFFIC RATED AND GALVANIZED. FRAMES SHALL BE US CONCRETE PRECAST MODEL CB2424TF GRATES SHALL BE MODEL CB2424TG OR AS APPROVED BY CITY ENGINEER.
2. DROP INLET SHALL BE US CONCRETE PRECAST MODEL CB2424 OR AS APPROVED BY CITY ENGINEER.
3. ATTACH "DRAINS TO CREEK" MARKER, PER CITY STD 211, TO THE FRONT RIGHT CORNER ON THE TOP SURFACE OF DROP INLET ALIGNED TO BE READ FROM THE STREET.



DESIGN AND CONSTRUCTION STANDARDS

**AREA DRAIN DROP INLET
FLUSH OPENING**

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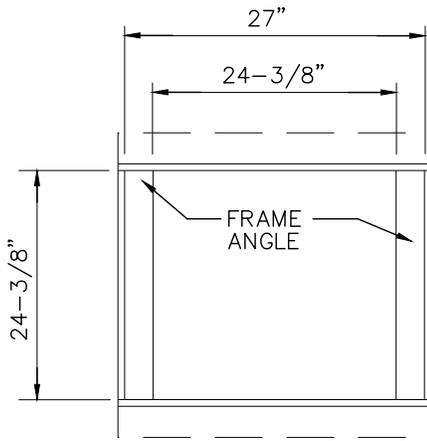
DECEMBER 2019

STD. NO.

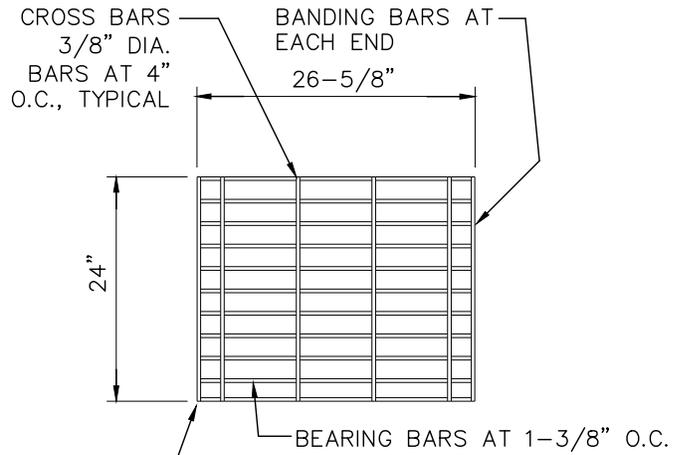
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PAGE 1 OF 1

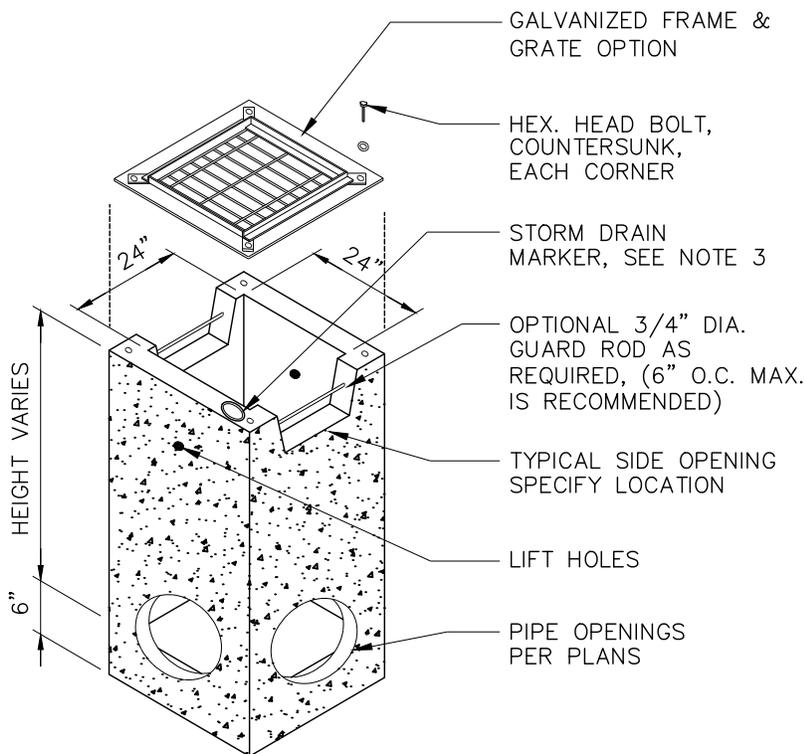
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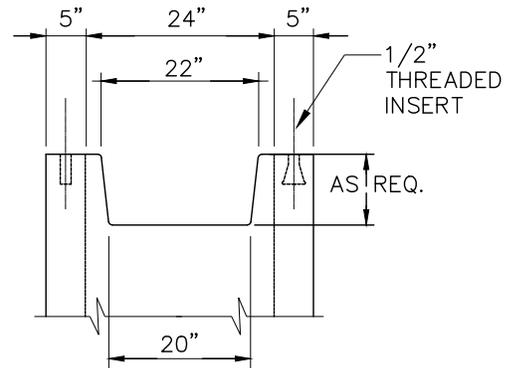
FRAME PLAN



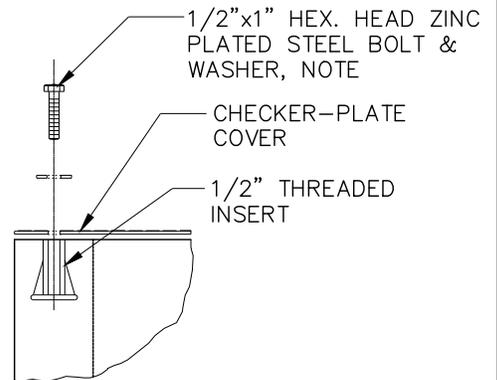
GRATE PLAN



DROP INLET WITH SIDE OPENING



TYPICAL SIDE OPENING



STEEL COVER FASTENING DETAIL

NOTES:

1. FRAMES AND GRATES SHALL BE TRAFFIC RATED AND GALVANIZED. FRAMES SHALL BE US CONCRETE PRECAST MODEL CB2424TF GRATES SHALL BE MODEL CB2424TG OR AS APPROVED BY CITY ENGINEER.
2. DROP INLET SHALL BE US CONCRETE PRECAST MODEL CB2424 OR AS APPROVED BY CITY ENGINEER.
3. ATTACH "DRAINS TO CREEK" MARKER, PER CITY STD 211, TO THE FRONT RIGHT CORNER ON THE TOP SURFACE OF DROP INLET ALIGNED TO BE READ FROM THE STREET.



DESIGN AND CONSTRUCTION STANDARDS

AREA DRAIN DROP INLET SIDE OPENING

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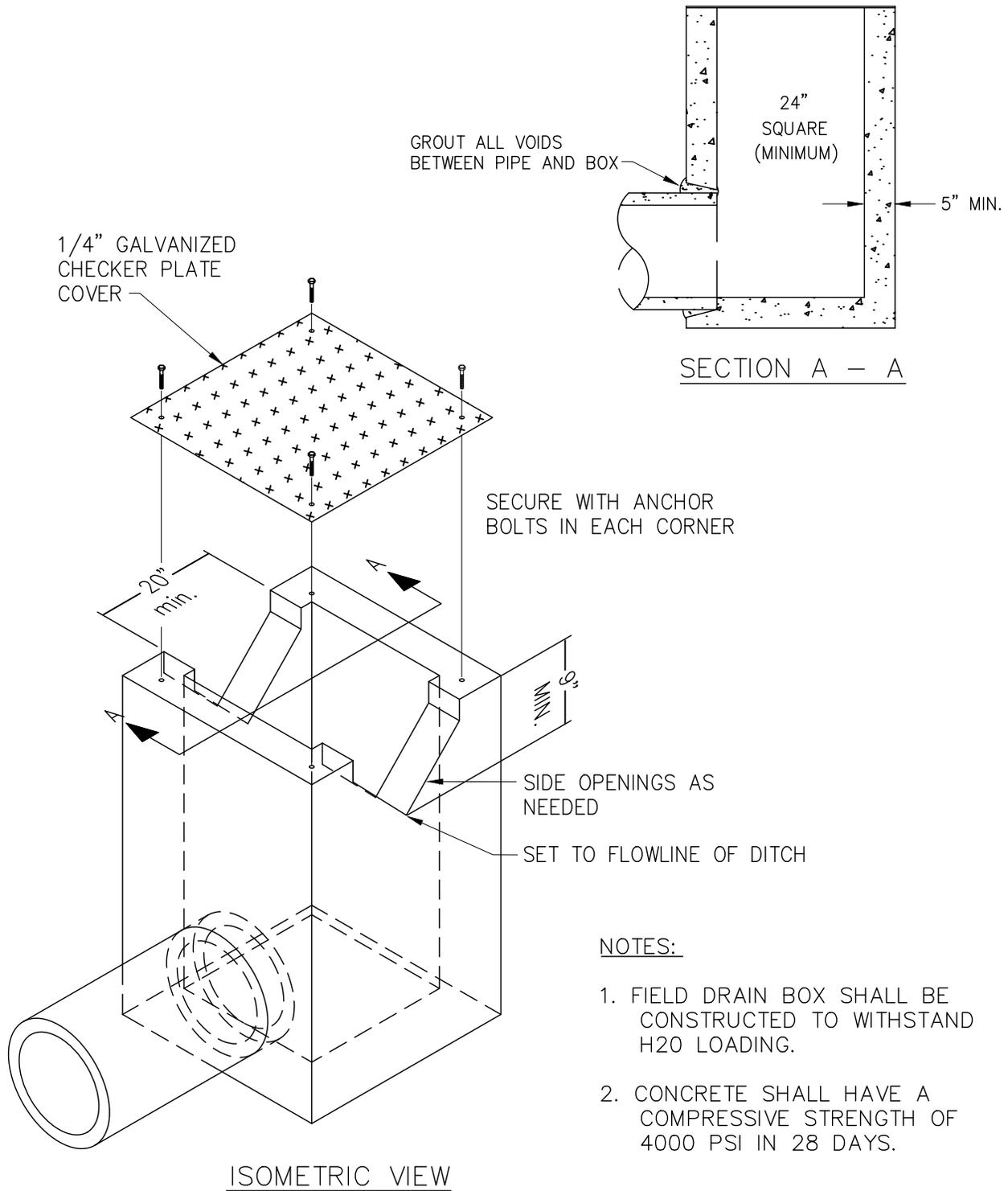
STD. NO.

213

PAGE 1 OF 1

DECEMBER 2019

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PRECAST SIDE OPENING FIELD DRAIN



DESIGN AND CONSTRUCTION STANDARDS

PRECAST SIDE-OPENING FIELD DRAIN

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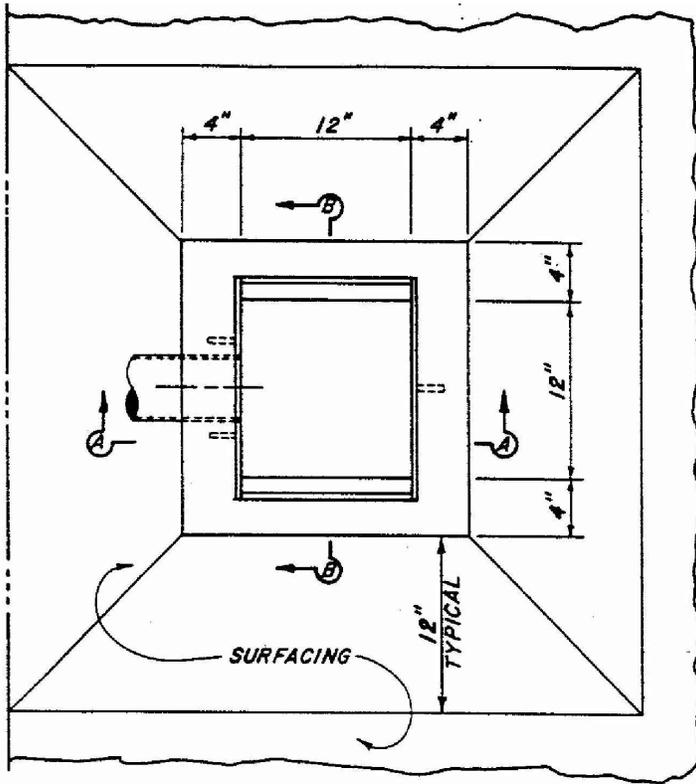
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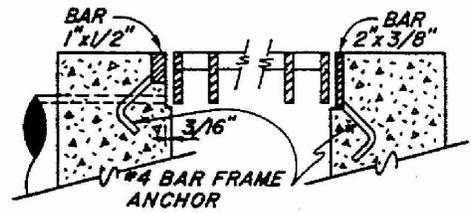
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PAGE 1 OF 1

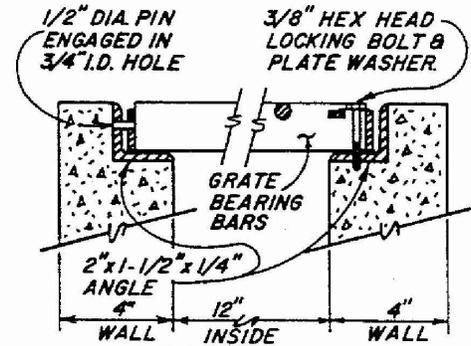
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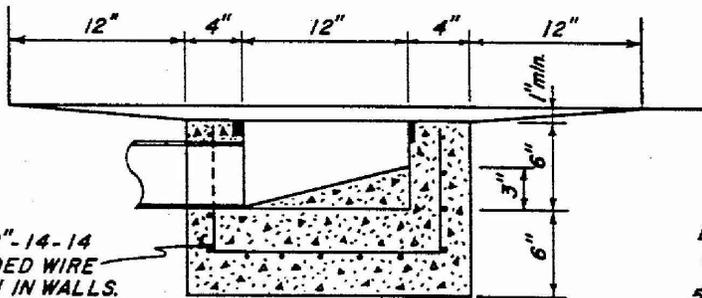
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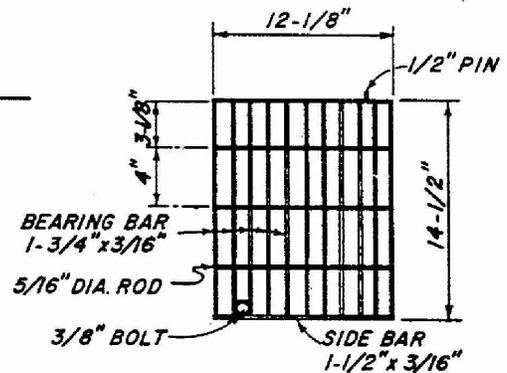
SECTION A-A



SECTION B-B



ELEVATION



GRATE DETAIL

NOTES:

1. ALL CONCRETE SHALL HAVE COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS AND MEET CALTRANS SPECIFICATIONS.
2. GRATING & FRAMES ARE TO BE ASSEMBLED & MADE TO FIT BEFORE DELIVERY ON THE JOB SITE.
3. ALL STEEL COMPONENTS TO BE GALVANIZED AFTER FABRICATION. AFTER ERECTION ALL ABRADED SURFACES SHALL BE CLEANED FREE OF RUST & OIL AND NEATLY SOLDERED OVER WITH 50-50 SOLDER.
4. SEE STD. NO. 210A FOR SIDEWALK UNDERDRAIN DETAIL.



DESIGN AND CONSTRUCTION STANDARDS

SIDEWALK DRAIN CATCH BASIN 12" x 12"

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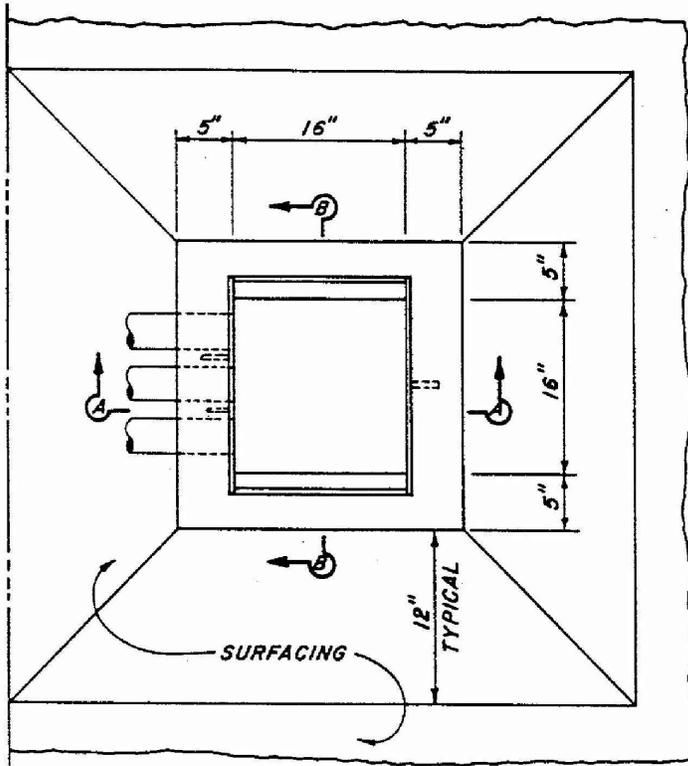
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215

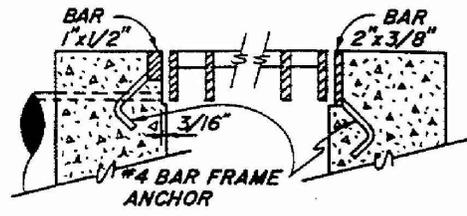
PAGE 1 OF 1

DECEMBER 2019

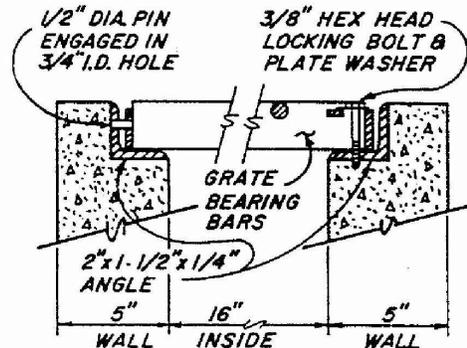
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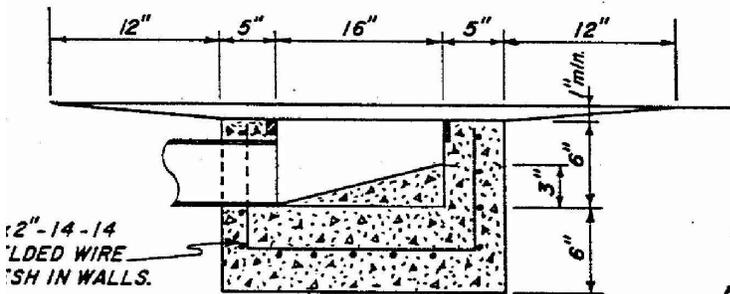
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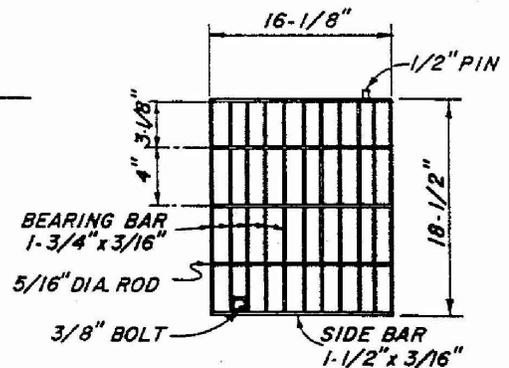
SECTION A-A



SECTION B-B



ELEVATION



GRATE DETAIL

NOTES:

1. ALL CONCRETE SHALL HAVE COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS AND MEET CALTRANS SPECIFICATIONS.
2. GRATING & FRAMES ARE TO BE ASSEMBLED & MADE TO FIT BEFORE DELIVERY ON THE JOB SITE.
3. ALL STEEL COMPONENTS TO BE GALVANIZED AFTER FABRICATION. AFTER ERECTION ALL ABRASED SURFACES SHALL BE CLEANED FREE OF RUST & OIL AND NEATLY SOLDERED OVER WITH 50-50 SOLDER.
4. SEE STD. NO. 210A FOR SIDEWALK UNDERDRAIN DETAIL.



DESIGN AND CONSTRUCTION STANDARDS

SIDEWALK DRAIN CATCH BASIN 16" x 16"

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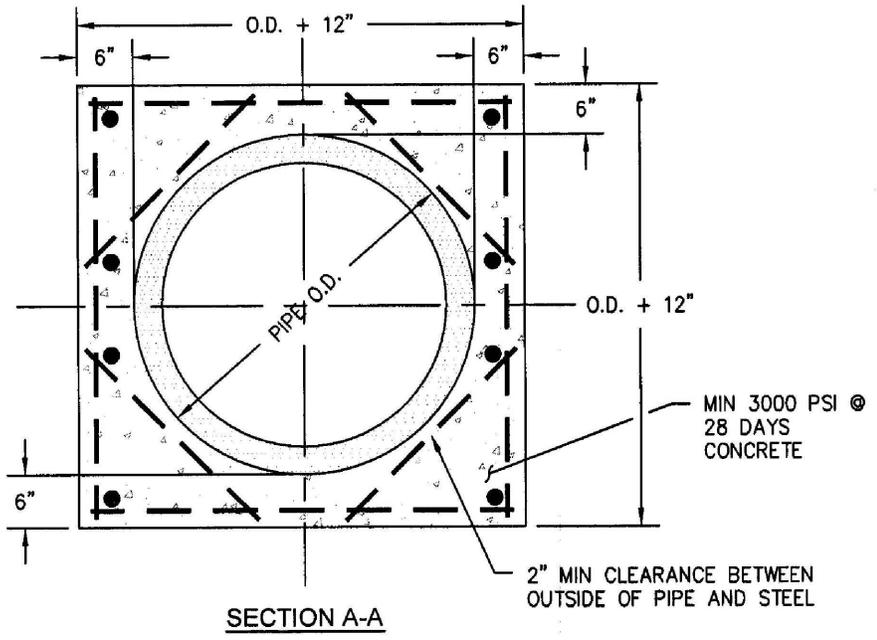
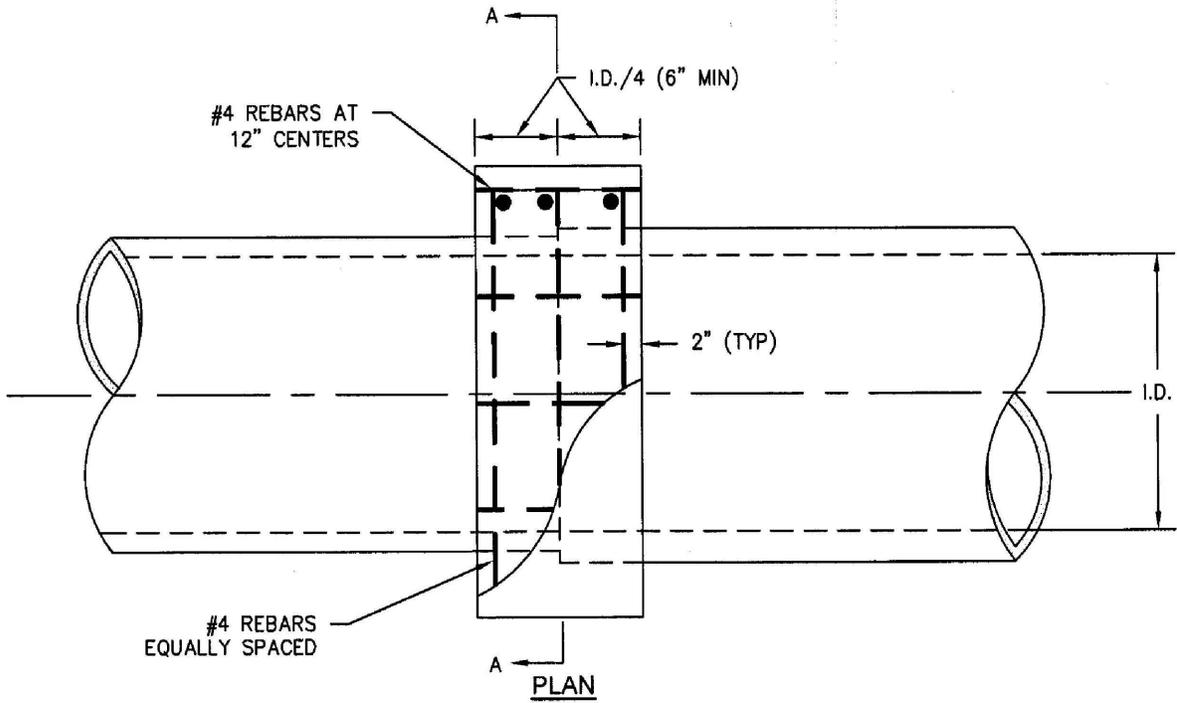
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216

PAGE 1 OF 1

DECEMBER 2019

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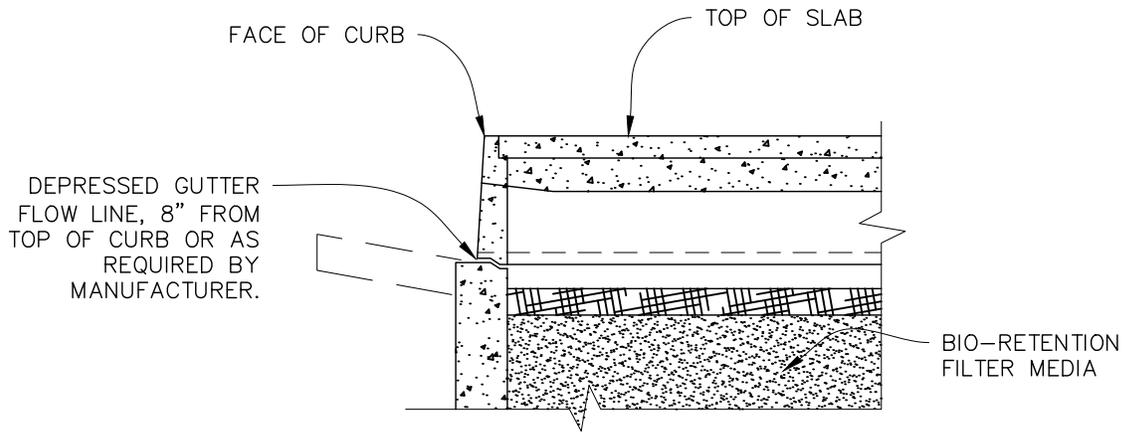
DESIGN AND CONSTRUCTION STANDARDS

REINFORCED CONCRETE PIPE COLLAR

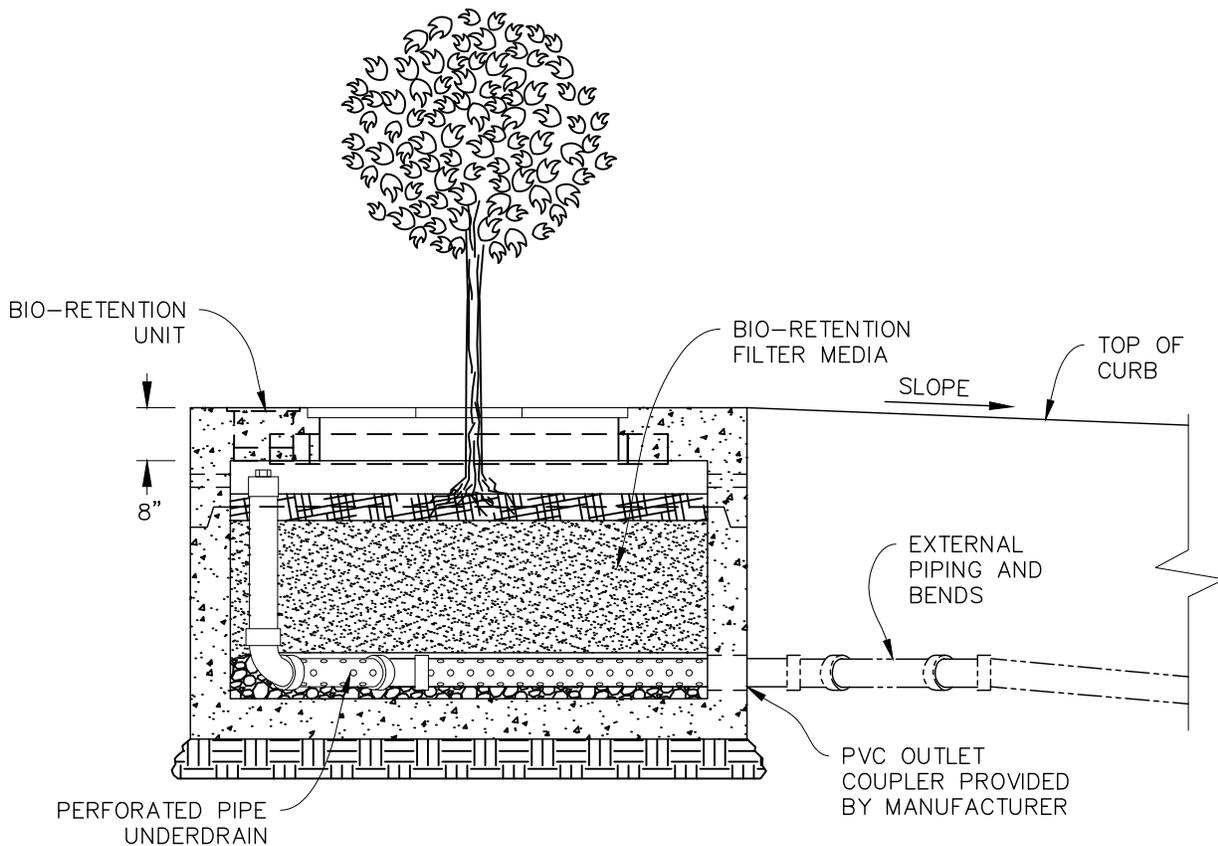
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STD. NO.
217
 PAGE 1 OF 1
 SCALE: NONE

DECEMBER 2019



SECTION A-A



SECTION B-B



DESIGN AND CONSTRUCTION STANDARDS

TYPICAL BIO-RETENTION UNIT

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STD. NO.

218

PAGE 1 OF 1

DECEMBER 2019

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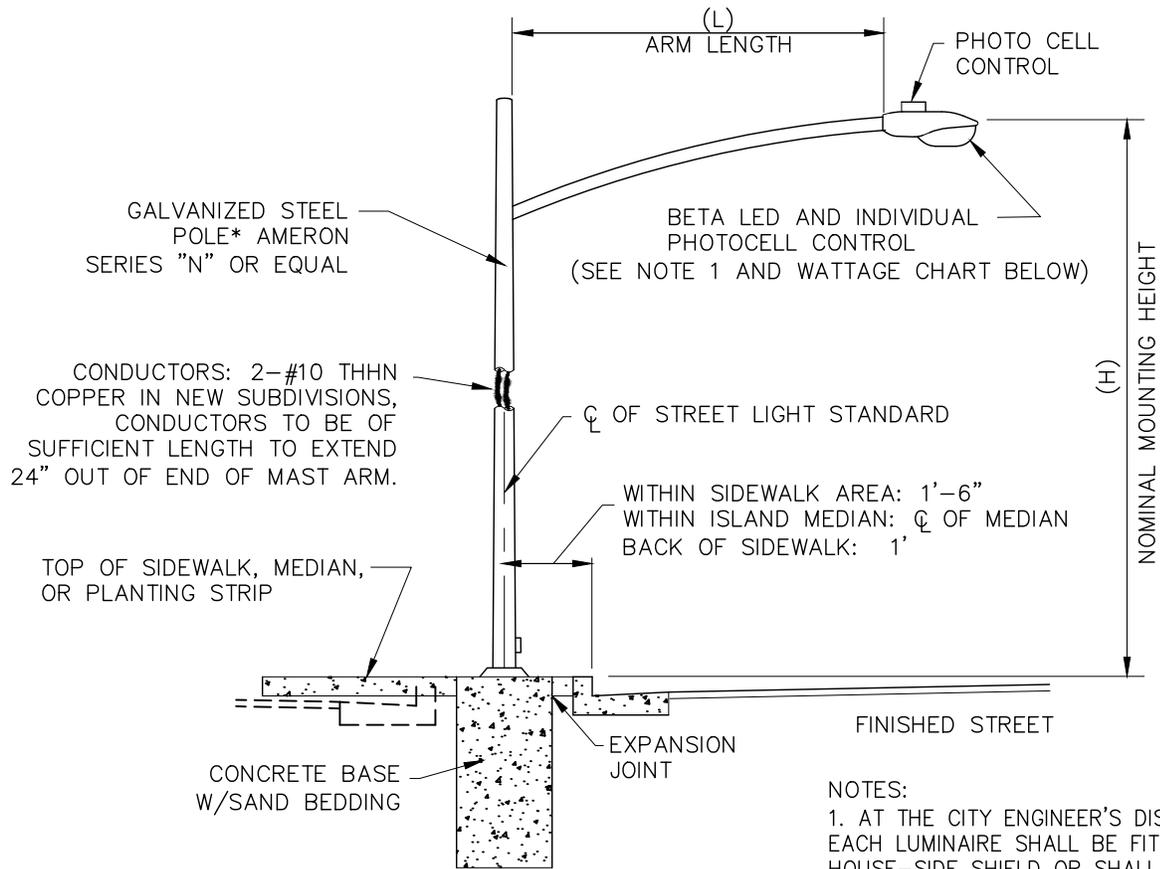


VOLUME 2: STANDARD PLANS

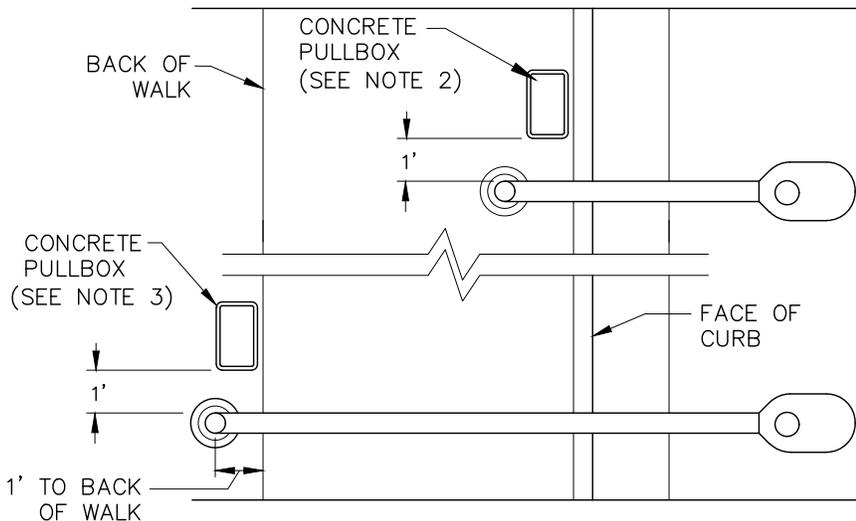
December 2019

300 Series: Street Lighting

- 301. STANDARD STREET LIGHT
- 302. STREET LIGHT - DECORATIVE
- 303. STREET LIGHT MISCELLANEOUS DETAILS
- 304. ELECTRIC SERVICE DETAIL
- 305. LATERAL LIGHT DISTRIBUTION
- 306. JOINT TRENCH LAYOUT FOR STREET LIGHT CONDUIT



- NOTES:
1. AT THE CITY ENGINEER'S DISCRETION, EACH LUMINAIRE SHALL BE FITTED WITH A HOUSE-SIDE SHIELD OR SHALL HAVE AN OPTICAL SYSTEM PRODUCING "FORWARD THROW" OR "ASYMMETRICAL" DISTRIBUTION.
 2. INSTALL #5 CONCRETE PULLBOX AT ALL LIGHT STANDARDS, NEXT TO POLE, PARALLEL AND FLUSH TO CURB & GUTTER.
 3. INSTALL #5 CONCRETE PULLBOX AT ALL LIGHT STANDARDS, NEXT TO POLE, PARALLEL AND FLUSH TO TOP OF SIDEWALK.
 4. THESE STREET LIGHTS ARE ONLY TO BE USED WITH THE APPROVAL OF THE CITY ENGINEER. ALTERNATES TO BE SPECIFICALLY APPROVE BY THE CITY ENGINEER.
- LIGHT FIXTURE MANUFACTURED BY BetaLED
 MODEL NUMBER
 STR-LWY-2M-HT-XX-D-UL-SV-525-R-DIM
- *SPACING AND WATTAGE SHALL BE DETERMINED THROUGH A PHOTOMETRIC STUDY TO ACHIEVE CITY LIGHTING STANDARDS AND UNIFORMITY.



STREET CLASSIFICATION	WITHIN S/W POLE (H)	WITHIN S/W ARM (L)	BACK OF S/W POLE (H)	BACK OF S/W ARM (L)	MAX. SPACING*
ARTERIAL	32'-6"	8'-0"	32'-3"	12'-0"	100'
COLLECTOR & INDUSTRIAL	28'-0"	6'-0"	27'-6"	10'-0"	200'
RESIDENTIAL	27'-6"	4'-0"	27'-3"	8'-0"	200'



DESIGN AND CONSTRUCTION STANDARDS

STANDARD STREET LIGHT

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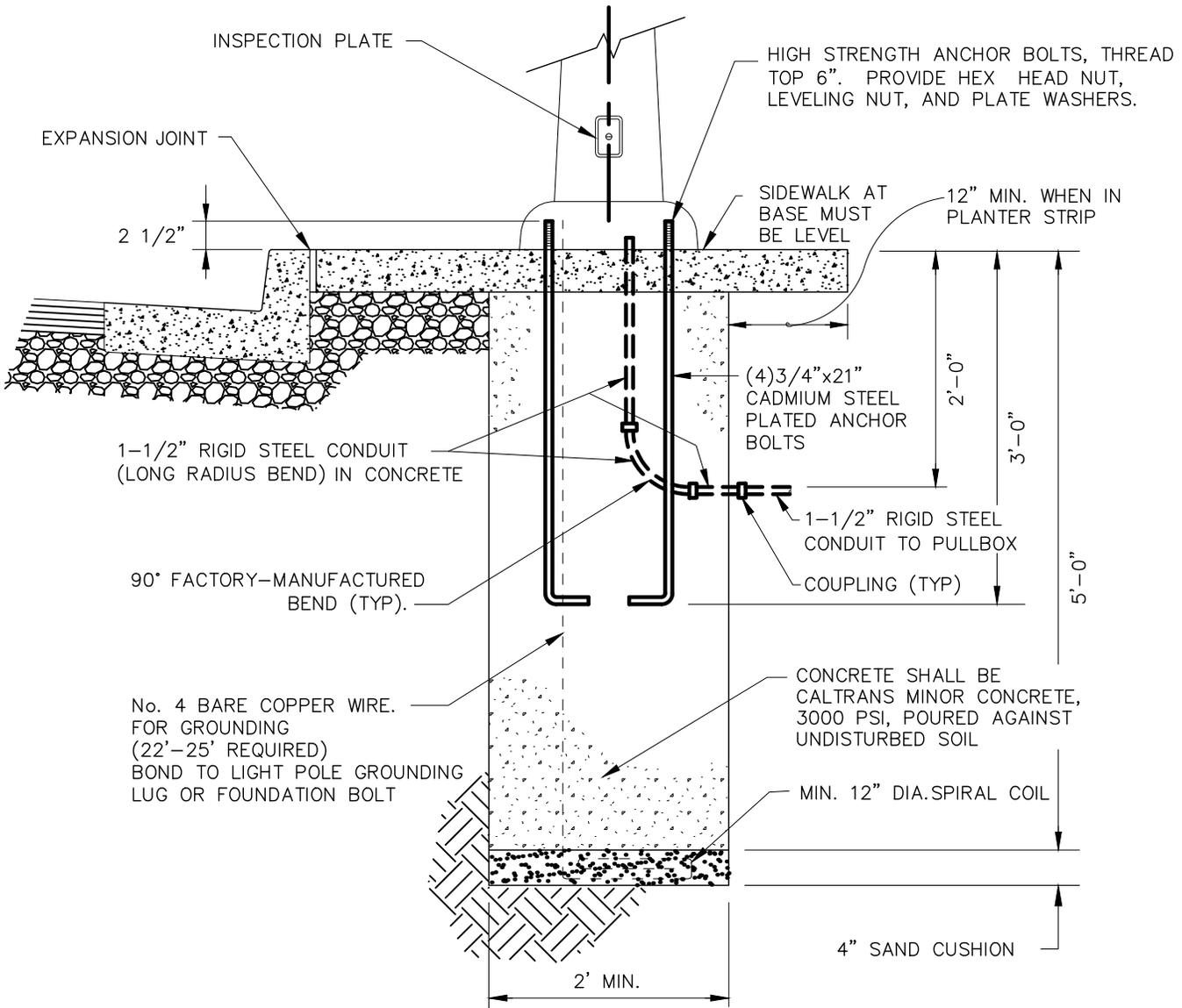
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.
301

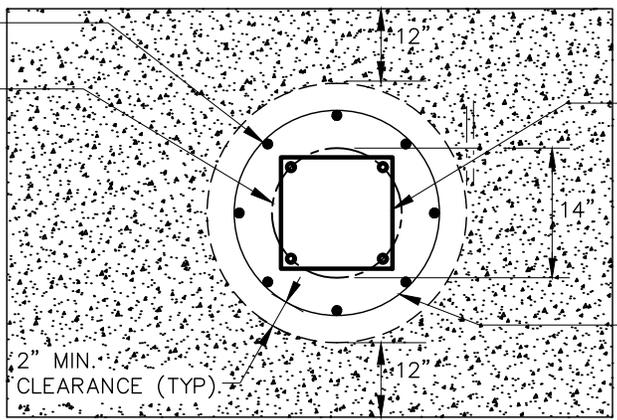
PAGE 1 OF 2

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8-#4 BARS VERTICAL, TIE TO HOOPS

14" DIA. BOLT CIRCLE 4-HOLES, 90° APART ALIGN WITH CURB



#3 HOOPS AT 12" O.C., TIE TO VERTICAL BARS. 2" MIN. CLEARANCE FROM REBAR CAGE TO EXCAVATION WALL.

FOUNDATION DETAIL



DESIGN AND CONSTRUCTION STANDARDS

STANDARD STREET LIGHT

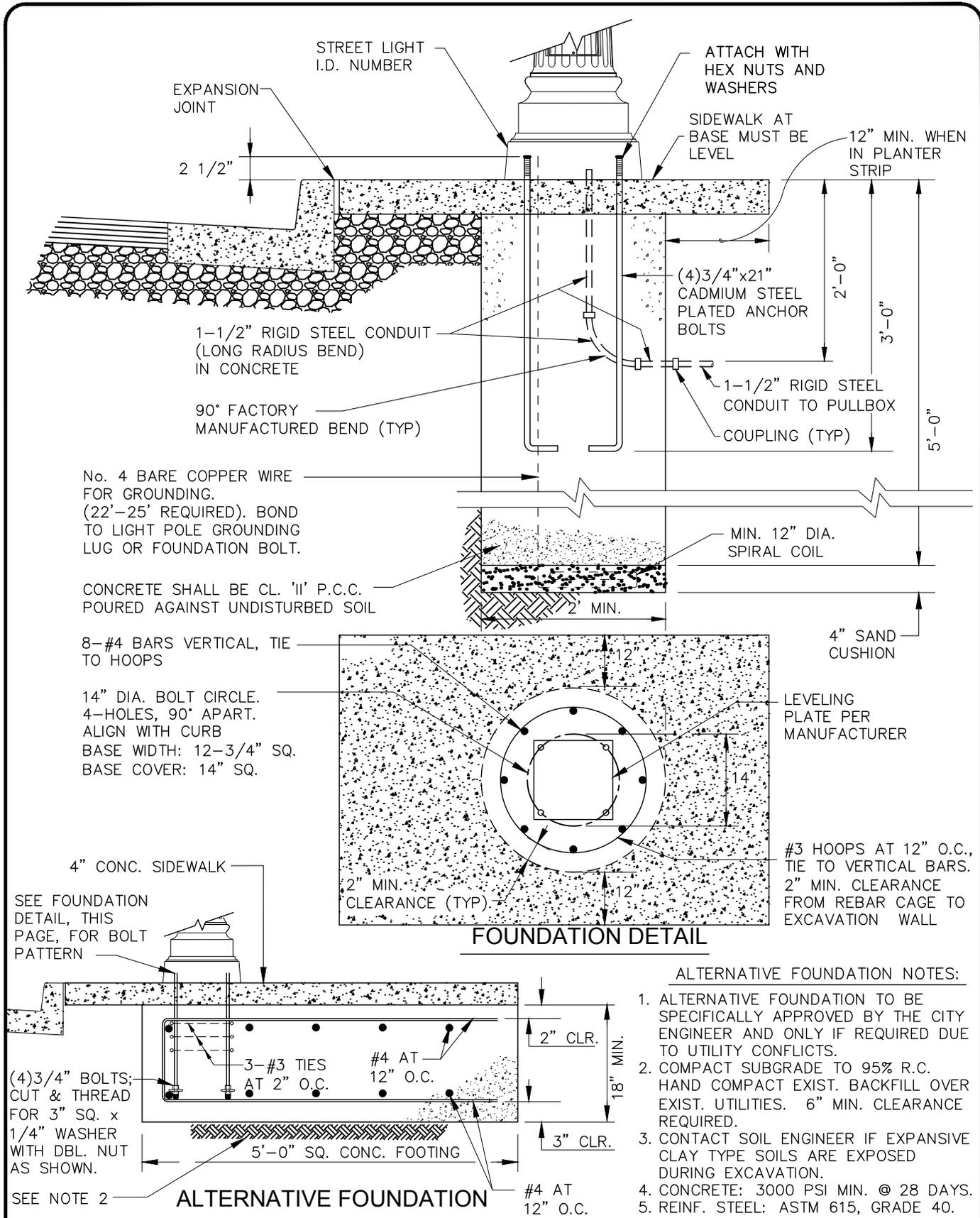
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DECEMBER 2019

STD. NO.
301

PAGE 2 OF 2

SCALE: NONE



No. 4 BARE COPPER WIRE FOR GROUNDING. (22'-25' REQUIRED). BOND TO LIGHT POLE GROUNDING LUG OR FOUNDATION BOLT.

CONCRETE SHALL BE CL. 'II' P.C.C. POURED AGAINST UNDISTURBED SOIL

8-#4 BARS VERTICAL, TIE TO HOOPS

14" DIA. BOLT CIRCLE. 4-HOLES, 90° APART. ALIGN WITH CURB
 BASE WIDTH: 12-3/4" SQ.
 BASE COVER: 14" SQ.

FOUNDATION DETAIL

ALTERNATIVE FOUNDATION NOTES:

1. ALTERNATIVE FOUNDATION TO BE SPECIFICALLY APPROVED BY THE CITY ENGINEER AND ONLY IF REQUIRED DUE TO UTILITY CONFLICTS.
2. COMPACT SUBGRADE TO 95% R.C. HAND COMPACT EXIST. BACKFILL OVER EXIST. UTILITIES. 6" MIN. CLEARANCE REQUIRED.
3. CONTACT SOIL ENGINEER IF EXPANSIVE CLAY TYPE SOILS ARE EXPOSED DURING EXCAVATION.
4. CONCRETE: 3000 PSI MIN. @ 28 DAYS.
5. REINF. STEEL: ASTM 615, GRADE 40.

SEE FOUNDATION DETAIL, THIS PAGE, FOR BOLT PATTERN

(4)3/4" BOLTS; CUT & THREAD FOR 3" SQ. x 1/4" WASHER WITH DBL. NUT AS SHOWN.

ALTERNATIVE FOUNDATION



DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT - DECORATIVE

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

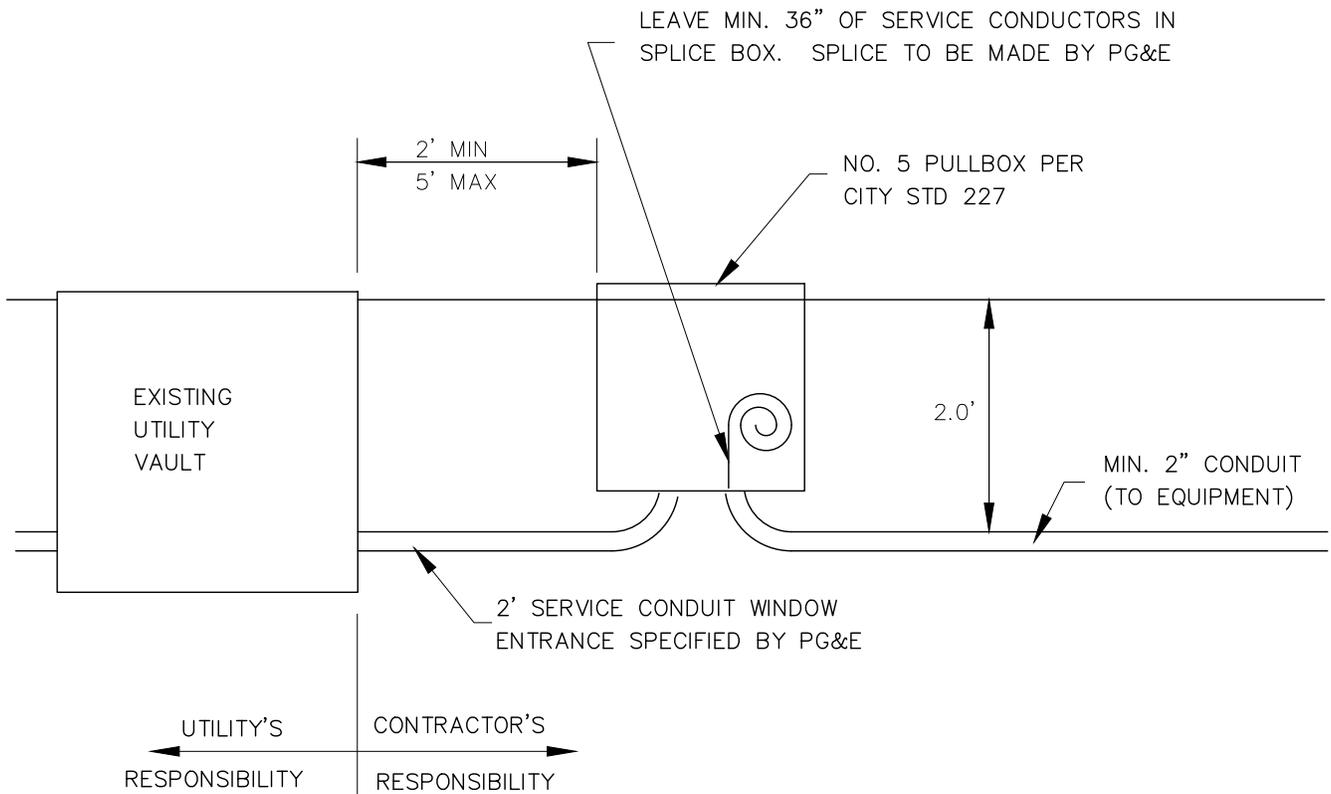
DECEMBER 2019

STD. NO.

302

PAGE 2 OF 2

SCALE: NONE



NOTES:

1. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. CONTRACTOR TO INSTALL CONDUIT INTO UTILITY COMPANY VAULT WITH UTILITY COMPANY REPRESENTATIVE IN ATTENDANCE.
3. CONTRACTOR TO INSTALL #5 PULLBOX AND 2" SERVICE CONDUIT (WHEN NONEXISTENT) AND 2" CONDUIT AND CONDUCTORS FROM EQUIPMENT TO PULLBOX.
4. CONDUIT AND CONDUCTOR SPLICE BOX ON SHORT SIDE. NO LONG-SIDE OR BOTTOM ENTRY PERMITTED.



DESIGN AND CONSTRUCTION STANDARDS

ELECTRIC SERVICE DETAIL

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

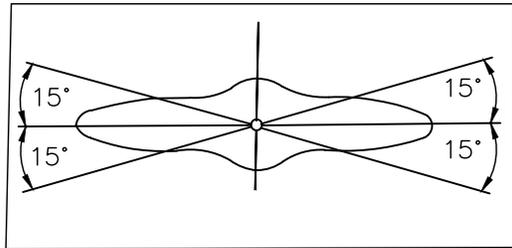
DECEMBER 2019

STD. NO.

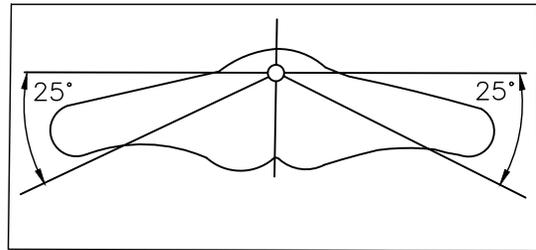
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PAGE 1 OF 1

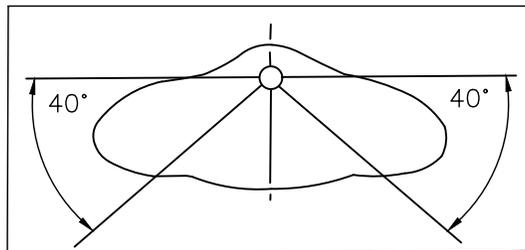
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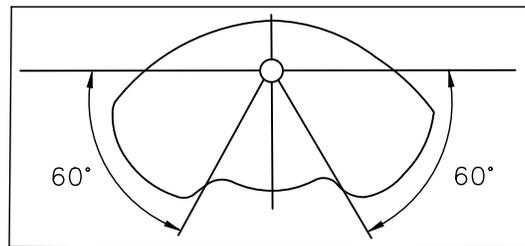
TYPE 1
CENTER OF STREET



TYPE 2
SIDE OF STREET



TYPE 3
SIDE OF STREET



TYPE 4
SIDE OF STREET



DESIGN AND CONSTRUCTION STANDARDS

LATERAL LIGHT DISTRIBUTION

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

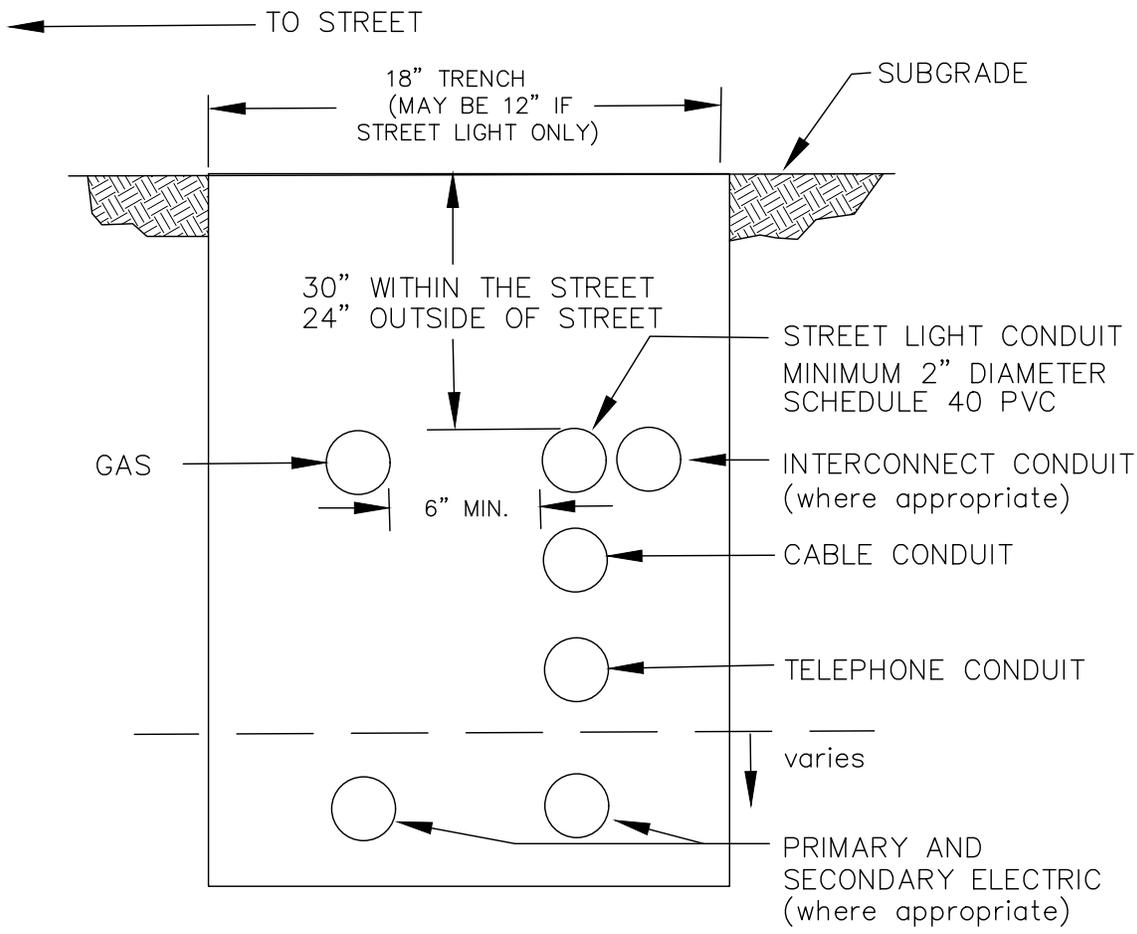
DECEMBER 2019

STD. NO.

305

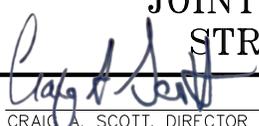
PAGE 1 OF 1

SCALE: NONE



NOTES:

1. IF JOINT TRENCH IS USED, THE TRENCH LAYOUT SHALL CONFORM TO THE ABOVE CONFIGURATION, UNLESS OTHERWISE SPECIFICALLY APPROVED BY THE CITY ENGINEER.
2. A RUN OF CONDUIT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR ¼ BENDS (360° TOTAL) INCLUDING OFFSETS AND BENDS LOCATED AT PULL BOXES AND SERVICE POINTS (NATIONAL ELECTRIC CODE 347-14).
3. PULLBOXES REQUIRED ON BOTH SIDES OF EACH STREET CROSSING.
4. IF JOINT TRENCH IS USED, COSTS SHALL BE BORNE BY THE DEVELOPER. JOINT TRENCH DESIGN SHALL BE THE RESPONSIBILITY OF THE DEVELOPER.
5. NO MORE THAN ONE STREET LIGHT CONDUIT IN ANY PG&E SERVICE POINT.
6. PRIOR TO ANY STREET LIGHT CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE THREE COPIES OF THE JOINT TRENCH OR STREET LIGHT CONDUIT PLAN TO THE INSPECTOR AND MEET THE INSPECTOR ON-SITE TO REVIEW STREET LIGHT CONDUIT PLANS & IDENTIFY ALL PULL BOX LOCATIONS & CONDUIT STREET CROSSINGS.
7. REFERENCE THE JOINT TRENCH COMPOSITE OR STREET LIGHT CONDUIT PLANS FOR CONDUIT LOCATION AND CONDUCTOR SCHEDULE.

	DESIGN AND CONSTRUCTION STANDARDS	STD. NO.
	JOINT TRENCH LAYOUT FOR STREET LIGHT CONDUIT	306
 <small>CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER</small>	DECEMBER 2019	PAGE 1 OF 1 SCALE: NONE

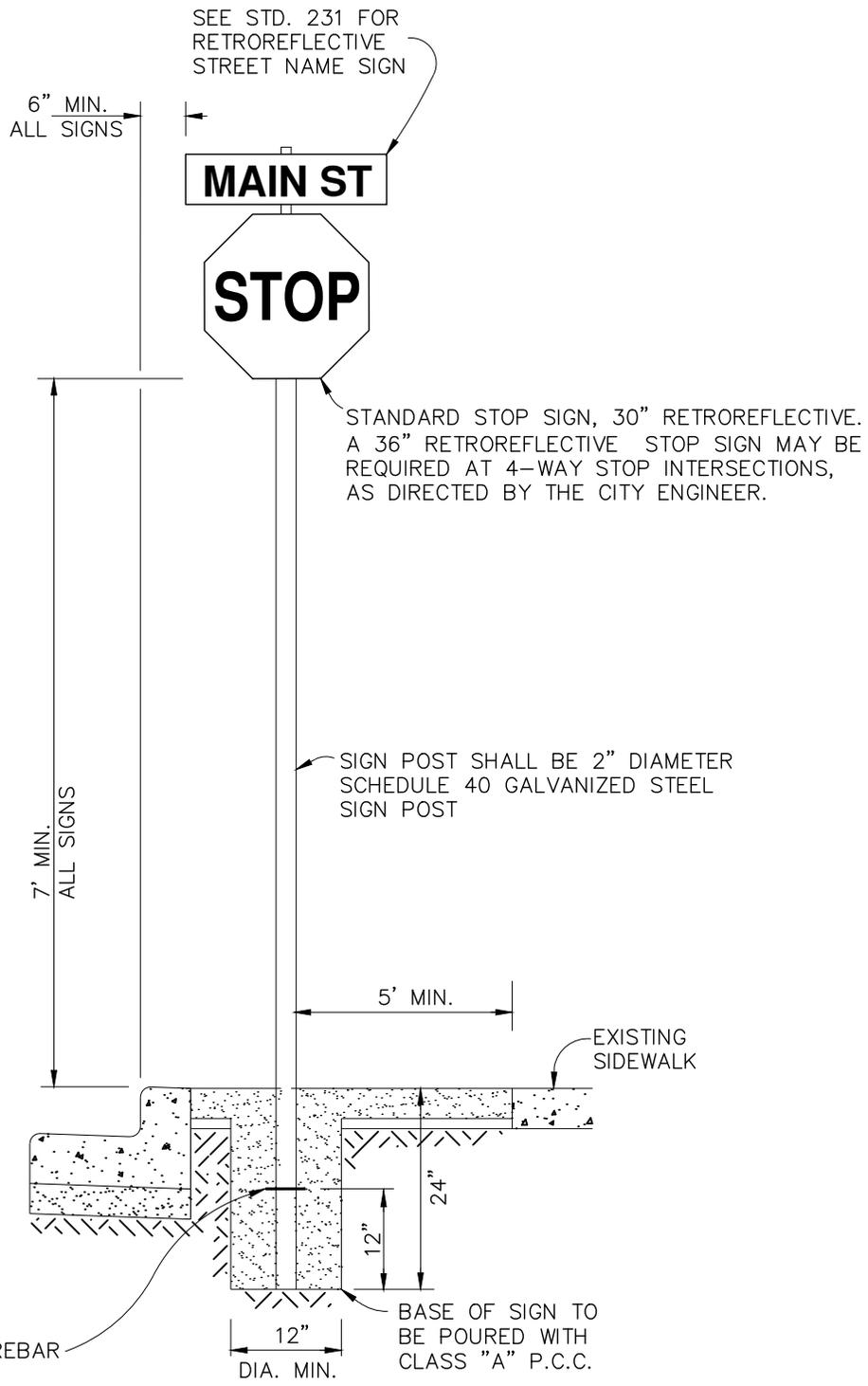


VOLUME 2: STANDARD PLANS

December 2019

400 Series: Traffic

- 401. STOP SIGN POST LOCATION
- 402. STREET NAME SIGN
- 403. STREET NAME SIGNS - MAST-ARM MOUNTED, BRACE DETAIL
- 404A. ADVANCE STREET NAME SIGNS
- 404B. TRAFFIC SIGNS & ADVANCE STREET NAME SIGNS - MOUNTING
DETAILS
- 404C. TRAFFIC SIGNS & ADVANCE STREET NAME SIGNS - TYPICAL
INSTALLATIONS
- 405. TRAFFIC STREET NAME SIGNS, SIGNALIZED INTERSECTIONS
- 406. TRAFFIC STREET NAME SIGNS, NON-SIGNALIZED
INTERSECTIONS
- 407. TRAFFIC MARKINGS MEDIAN ISLAND TREATMENT
- 408. PROJECT SIGN
- 409. BIKE LANE SIGNS



DESIGN AND CONSTRUCTION STANDARDS

STOP SIGN POST LOCATION

Craig A. Scott

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

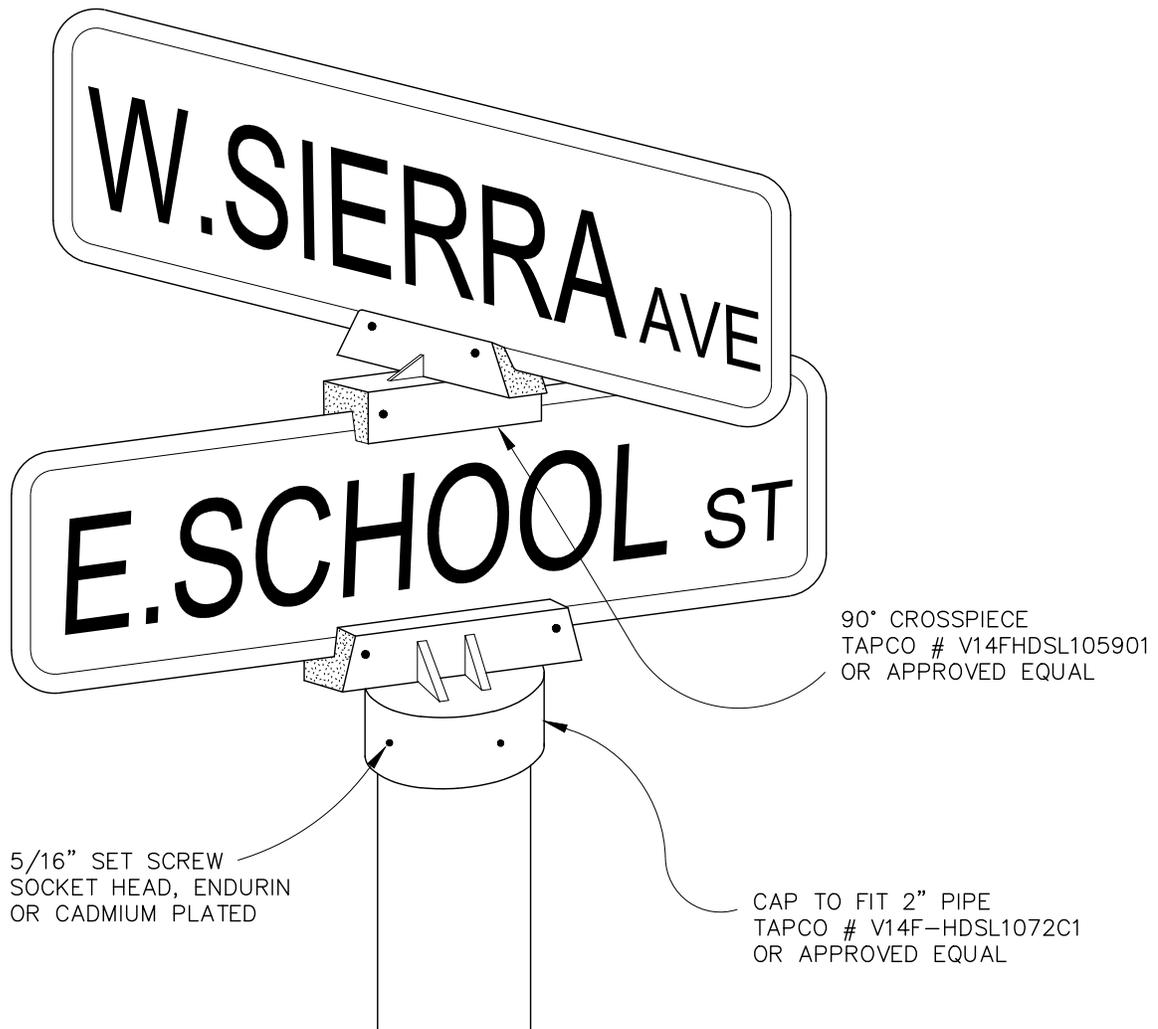
DECEMBER 2019

STD. NO.

401

PAGE 1 OF 1

SCALE: NONE



POLE MOUNTING

NOTES:

1. PUBLIC AND PRIVATE STREET NAMES SHALL NOT BE COMBINED ON THE SAME POLE.
2. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. USE ANTI-SEIZE ON ALL MOUNTING HARDWARE.



DESIGN AND CONSTRUCTION STANDARDS

STREET NAME SIGN

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

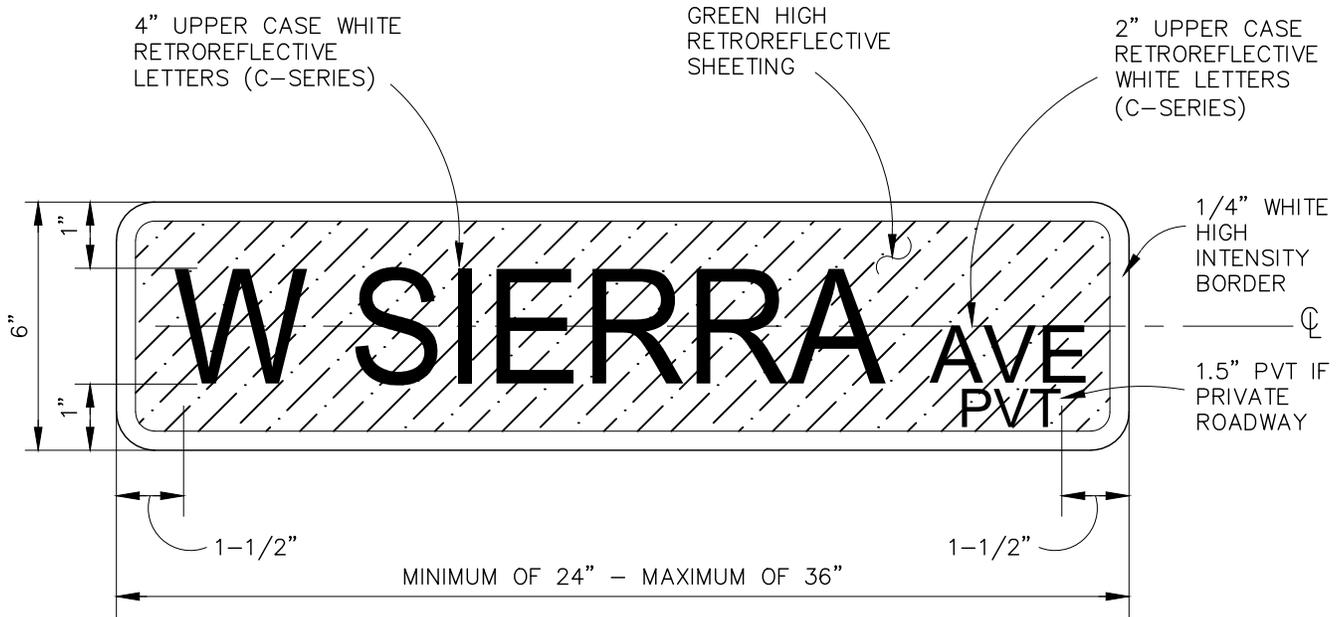
DECEMBER 2019

STD. NO.

402

PAGE 1 OF 2

SCALE: NONE



NOTES:

1. BLANKS ARE 0.080" ALUMINUM PER CALTRANS SPECIFICATIONS
2. SIGNS TO BE DOUBLE-FACED
3. B-SERIES LETTERING MAY BE USED IF STREET NAME IS TOO LONG FOR MAXIMUM LENGTH SIGN
4. SIGNS SHALL BE FINISHED WITH "SAFE FACE" PROTECTIVE FINISH
5. ALL ENDS SHALL BE 3/4" RADIUS
6. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER

SHEETING: DG3-WH1-4090
 FONT: FHWA



DESIGN AND CONSTRUCTION STANDARDS

STREET NAME SIGN

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

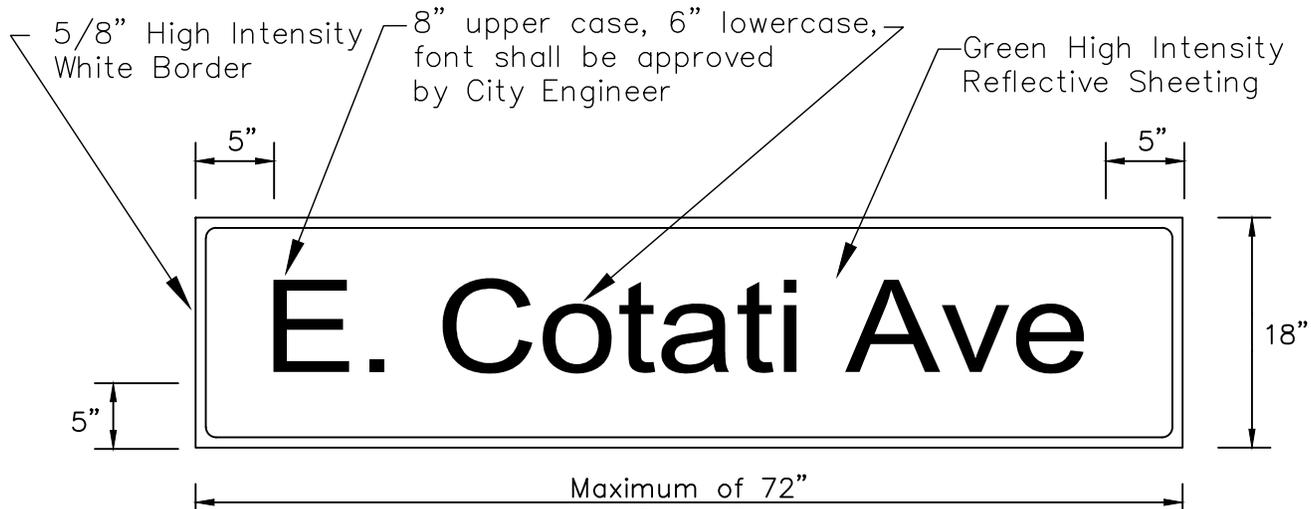
STD. NO.

402

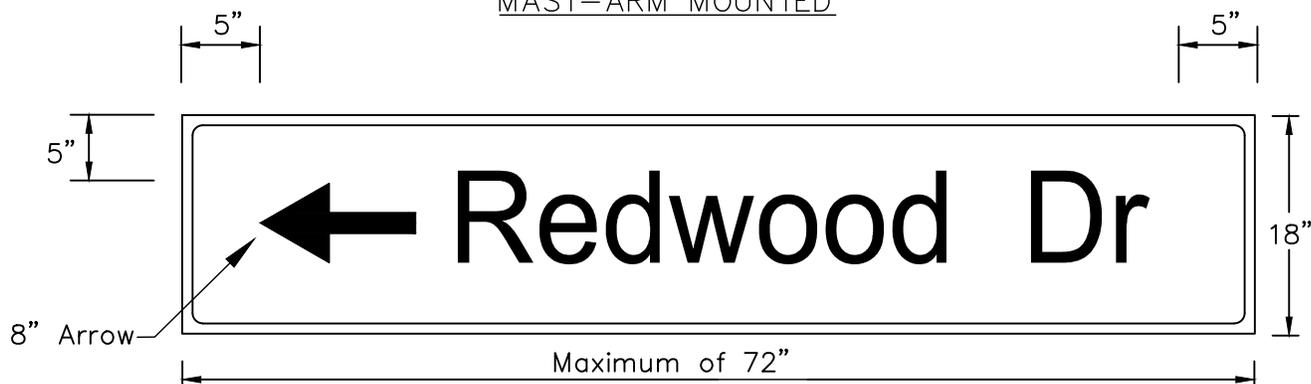
PAGE 2 OF 2

DECEMBER 2019

SCALE: NONE



DETAIL A
TYPICAL STREET NAME SIGN
MAST-ARM MOUNTED



DETAIL B
STREET NAME CHANGE AT INTERSECTION
MAST-ARM MOUNTED

NOTES:

1. Blanks are 0.125" aluminum per Caltrans Specifications.
2. Font, dimensions and spacing of letters shall be per the latest edition of the FHWA Standard Alphabets for Traffic Control Devices.
3. All Overhead Street Name Signs shall be double sided, and shall be mounted at all signalized intersections where mast arms exist, One double-sided sign shall be installed on each mast-arm. When street names change at the intersection, the overhead street name signs shall be double sided, with one side acting as the "near-side" sign and the other side acting as the "far-side". The "far-side" sign shall display the name of the street to the right and shall have an arrow facing away from the street name and towards the right. The "near-side" sign shall display the name of the street to the left and shall have an arrow facing away from the street name and towards the left.



DESIGN AND CONSTRUCTION STANDARDS

STREET NAME SIGNS -
 MAST-ARM MOUNTED

Craig A. Scott
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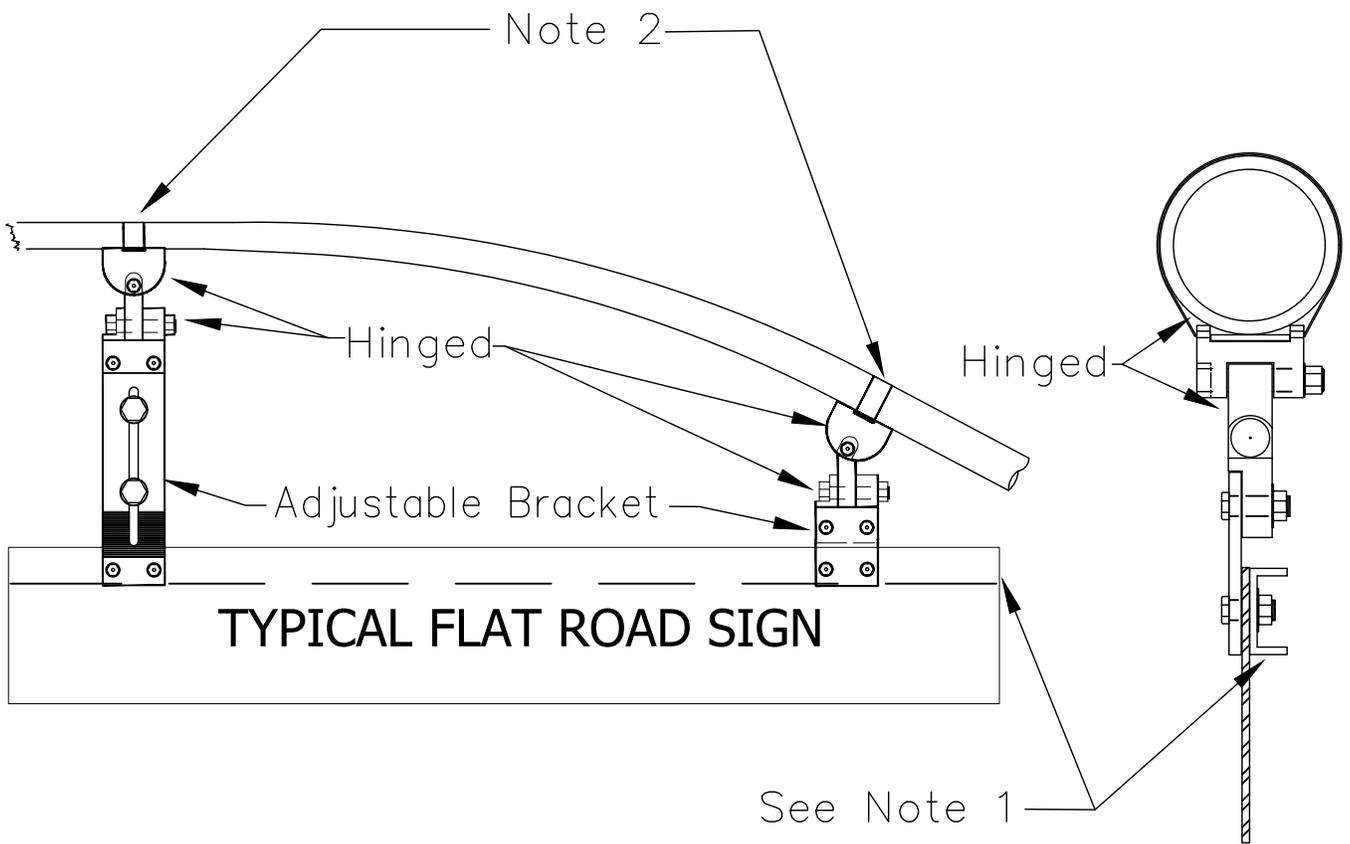
DECEMBER 2019

STD. NO.

403

PAGE 1 OF 2

SCALE: NONE



Notes:

1. All signs shall be reinforced by mounting on a 1" x 2" aluminum 3/16" channel back brace.
2. a. Mounting bolts shall be 5/16" x 1" stainless steel.
b. Banding shall be 0.030" x 0.55" double wrap.
3. Location of sign mounting on mast arm shall be determined by the City Traffic Engineer during the plan check process.
4. Adjustable brackets shall be used as necessary to horizontally level the sign.



DESIGN AND CONSTRUCTION STANDARDS

STREET NAME SIGNS -
MAST-ARM MOUNTED - BRACE DETAIL

Craig A. Scott

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

403

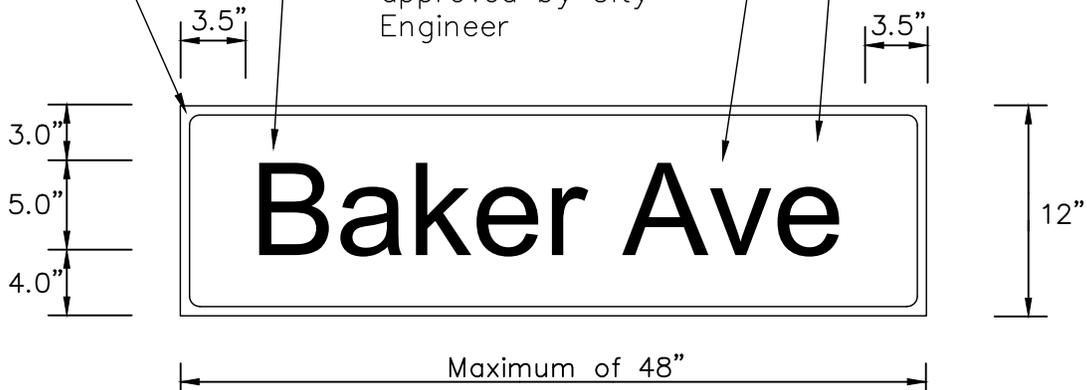
PAGE 2 OF 2

SCALE: NONE

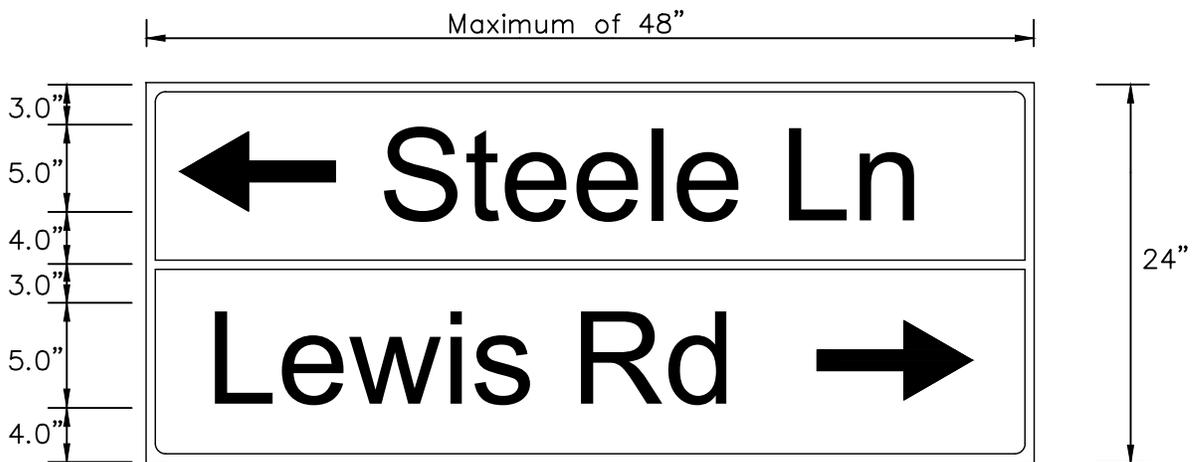
1" High Intensity White Border

5" Font shall be approved by City Engineer

Green High Intensity Reflective Sheeting



DETAIL A – TYPICAL ADVANCE STREET NAME SIGN



DETAIL B – STREET NAME CHANGE

NOTES:

1. Blanks are 0.080" aluminum.
2. Font, dimensions and spacing of letters shall be per the latest edition of the FHWA Standard Alphabets for Traffic Control Devices. Any variation in font size shall be approved by City Engineer.
3. When street name changes from one side of the intersection to the other the sign design shall conform to Detail B – Street Name Change.



DESIGN AND CONSTRUCTION STANDARDS

ADVANCE STREET NAME SIGNS

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

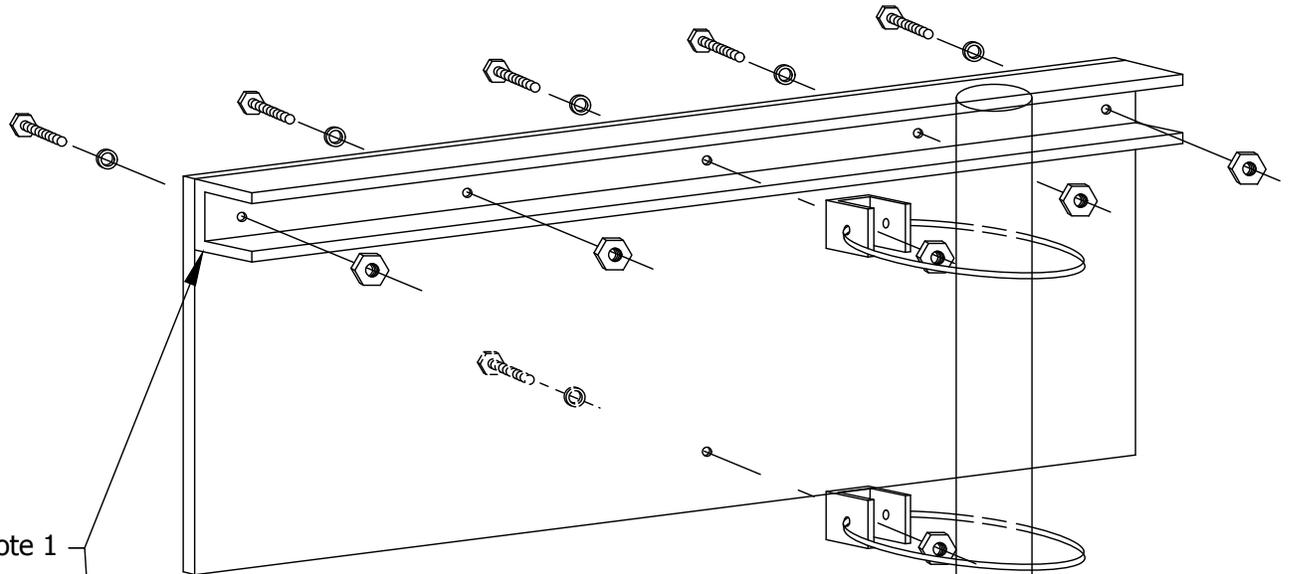
STD. NO.

404A

PAGE 1 OF 1

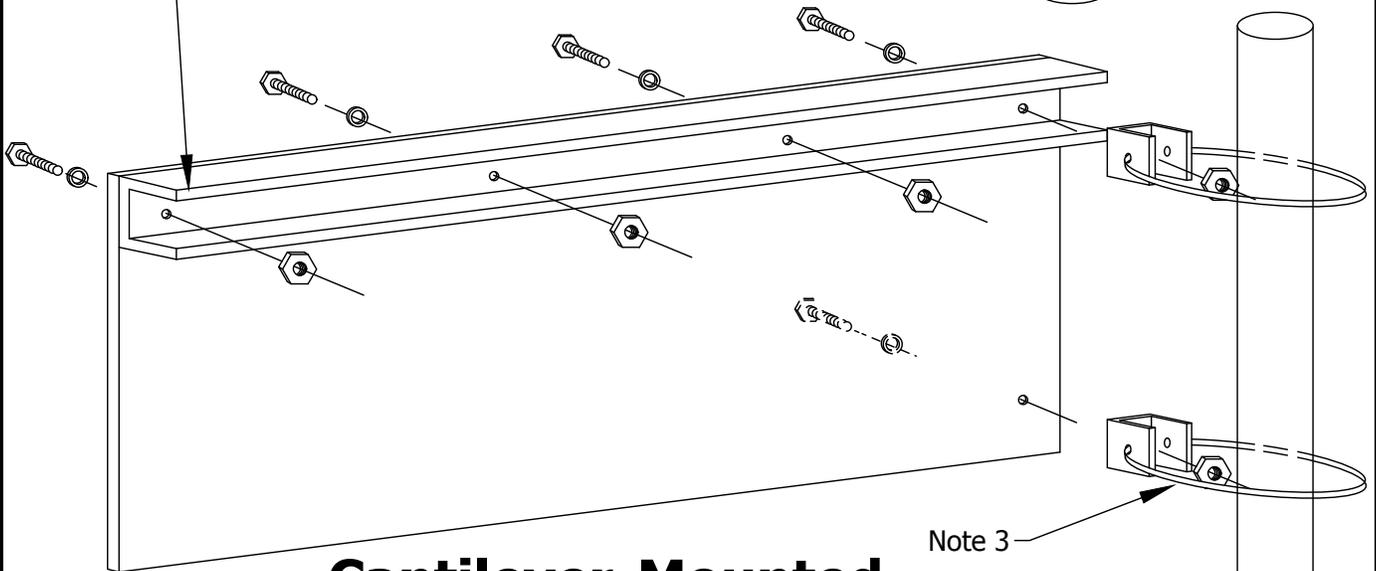
DECEMBER 2019

SCALE: NONE



Note 1

Center-Mounted



Note 3

Cantilever-Mounted

1. For all cantilever-mount signs and any center-mount signs that exceed 36", use 1"x2" aluminum 3/16 channel back brace.
2. For center mount signs 36" or less in length, use 1/4 14x3/4 hex washer self-drilling screw and mount directly to 2" pole.
3. Use 3/4" heavy duty 0.032" stainless steel mounting banding with 3/4" heavy-duty banding buckle, for street light applications.



DESIGN AND CONSTRUCTION STANDARDS

TRAFFIC SIGNS & ADVANCE STREET
NAME SIGNS – MOUNTING DETAILS

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

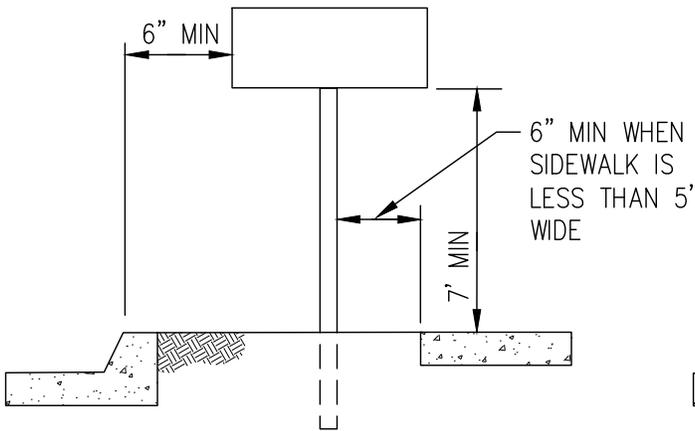
DECEMBER 2019

STD. NO.

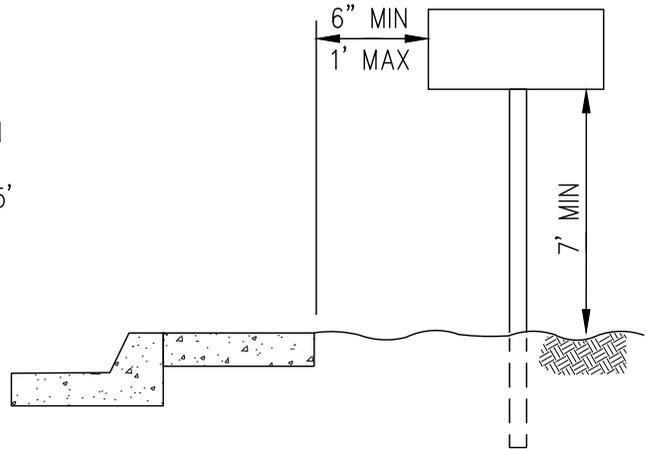
404B

PAGE 1 OF 1

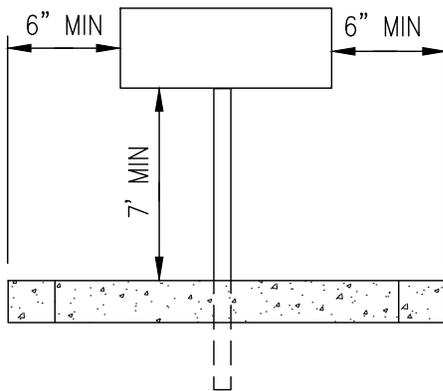
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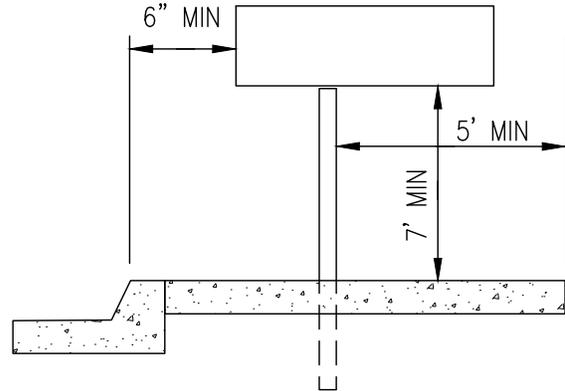
PLANTER STRIP



BEHIND SIDEWALK



MEDIAN



ON SIDEWALK

TYPICAL INSTALLATIONS



DESIGN AND CONSTRUCTION STANDARDS

TRAFFIC SIGNS & ADVANCE STREET
NAME SIGNS – TYPICAL INSTALLATIONS

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

STD. NO.

404C

PAGE 1 OF 1

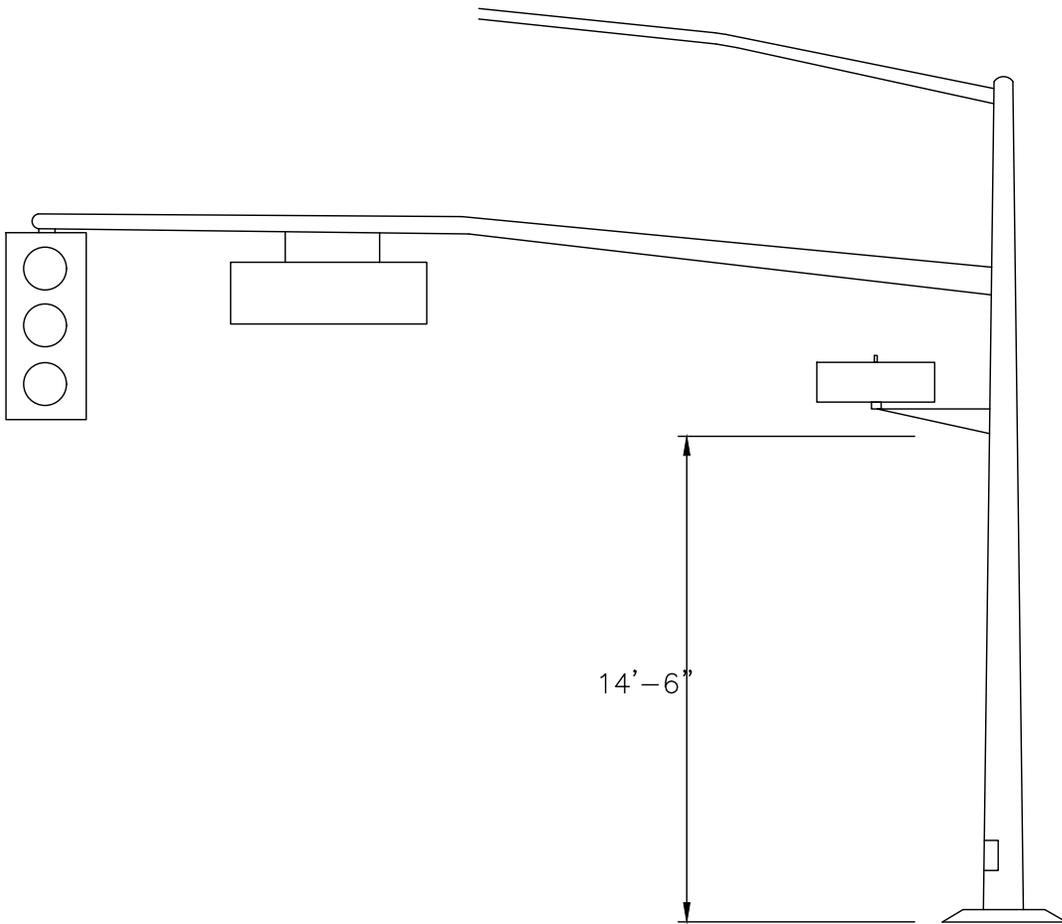
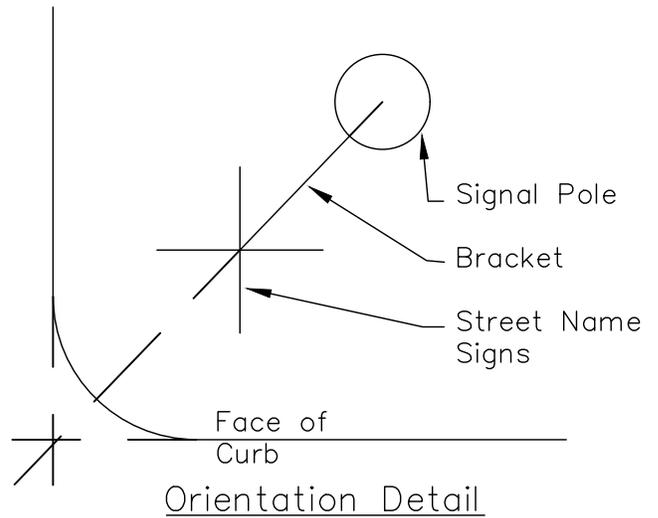
DECEMBER 2019

SCALE: NONE

Notes:

1. The traffic signal poles that will receive street name signs shall be determined by the City Engineer during the plan check process.

2. All sign brackets, cantilever mounts and associated hardware must be designed specifically for the installation of traffic signs, and specifications for this hardware must be submitted for approval by the City Engineer prior to construction.



DESIGN AND CONSTRUCTION STANDARDS

TRAFFIC STREET NAME SIGNS
SIGNALIZED INTERSECTIONS

Craig A. Scott

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

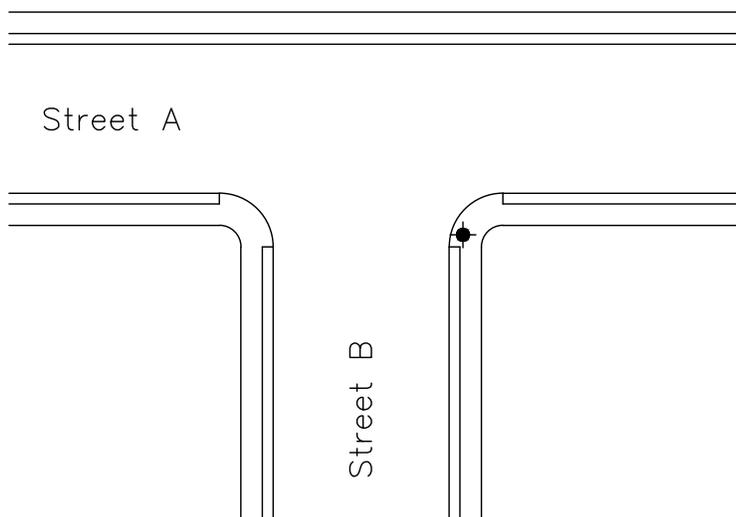
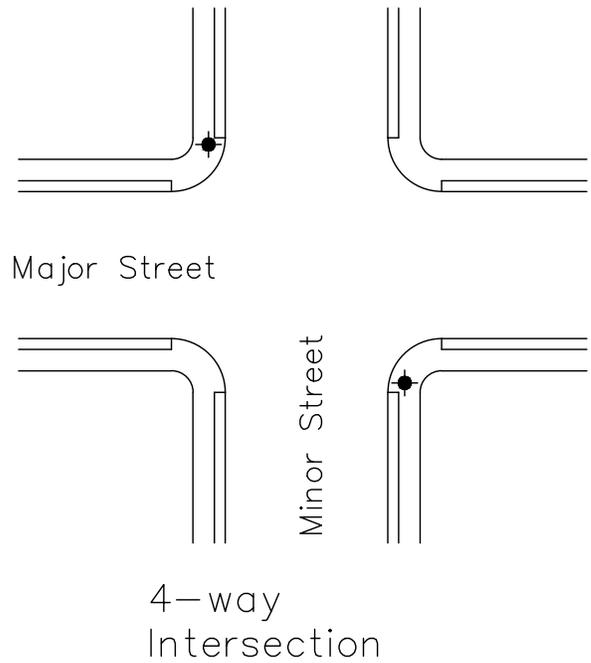
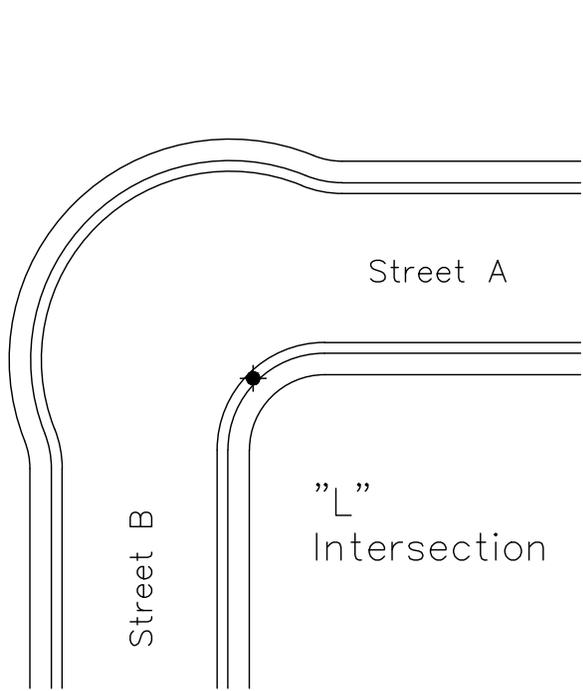
DECEMBER 2019

STD. NO.

405

PAGE 1 OF 1

SCALE: NONE



Legend

◆ Street Name Sign

"T" Intersection

Notes

1. Where Stop Signs are present, the Street Name Signs shall be installed above the Stop Sign, per Std. 401.



DESIGN AND CONSTRUCTION STANDARDS

TRAFFIC STREET NAME SIGNS
NON-SIGNALIZED INTERSECTIONS

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

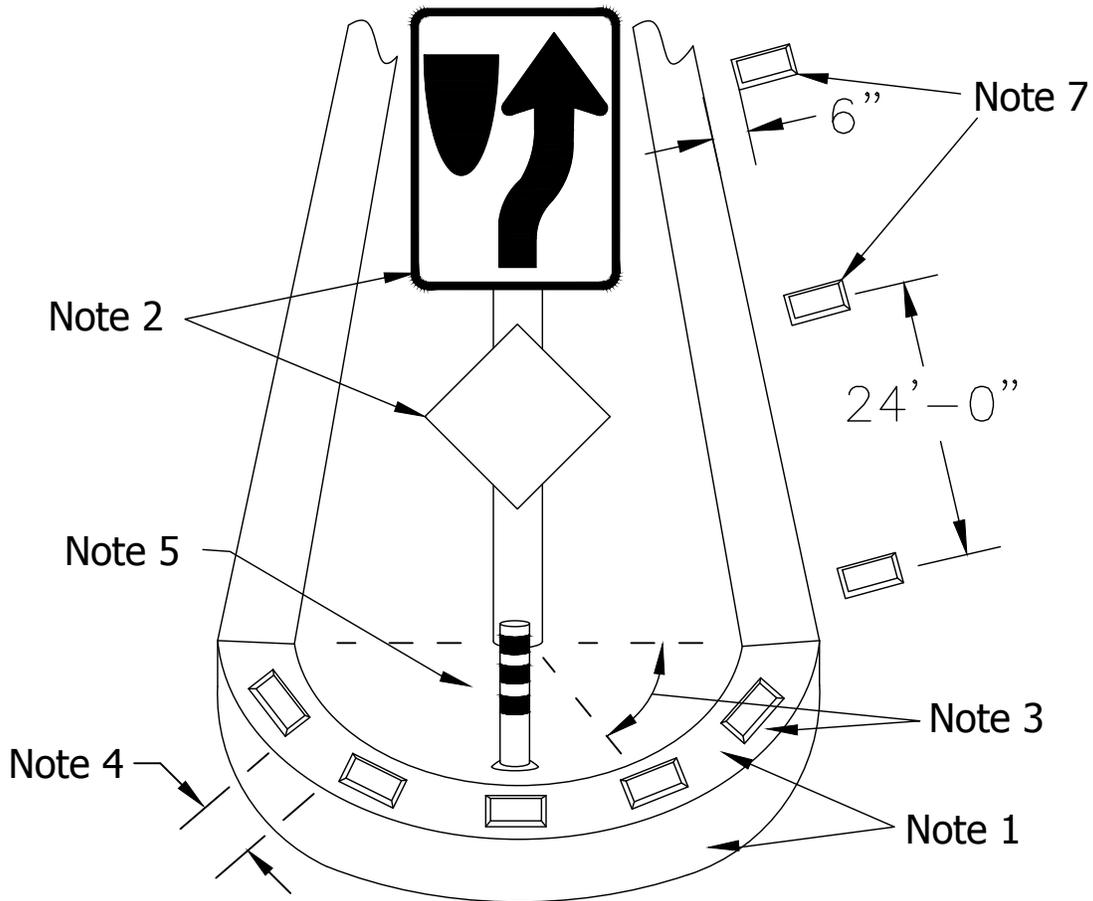
DECEMBER 2019

STD. NO.

406

PAGE 1 OF 1

SCALE: NONE



Notes:

1. The top and face of the curb at the island nose shall be painted white, with reflective glass beads.
2. When the width of a median island is 3 feet or greater and the island separates traffic of opposite directions, a R4-7 'Keep Right' symbol sign and Type 1 (OM1-3) object marker (per CA MUTCD figure 2C-13) shall be installed at the midpoint of the island nose defined by the radius.
3. Two-way reflective markers shall be installed on top of the curb at the island nose, along radial lines as illustrated in the drawing. The color of these markers shall be in conformance with California MUTCD section 3A, white markers shall be used if the island separates traffic of the same direction and yellow markers shall be used if the island separates traffic of opposite directions.
4. The minimum number of two-way reflective markers on the island nose, shall be five, with one at each beginning of curve and one at the mid point. The maximum distance between markers shall be 2 feet. Additional markers shall be installed to maintain this maximum allowable spacing. Additional markers shall be installed in such a way that the spacing between all markers is equal.
5. A Type Q marker per CA MUTCD fig. 2C-13 shall be installed at the midpoint of the island nose, surface mounted and just behind the island curb, as shown.
6. On median islands which separate traffic of the same direction, a W12-1 Double Arrow Sign shall be used in place of the R4-7.
7. Left Edge Line raised pavement markers shall be placed 6" from the median's face of curb, and shall be spaced 24' on center as shown above.



DESIGN AND CONSTRUCTION STANDARDS

TRAFFIC MARKINGS
MEDIAN ISLAND TREATMENT

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

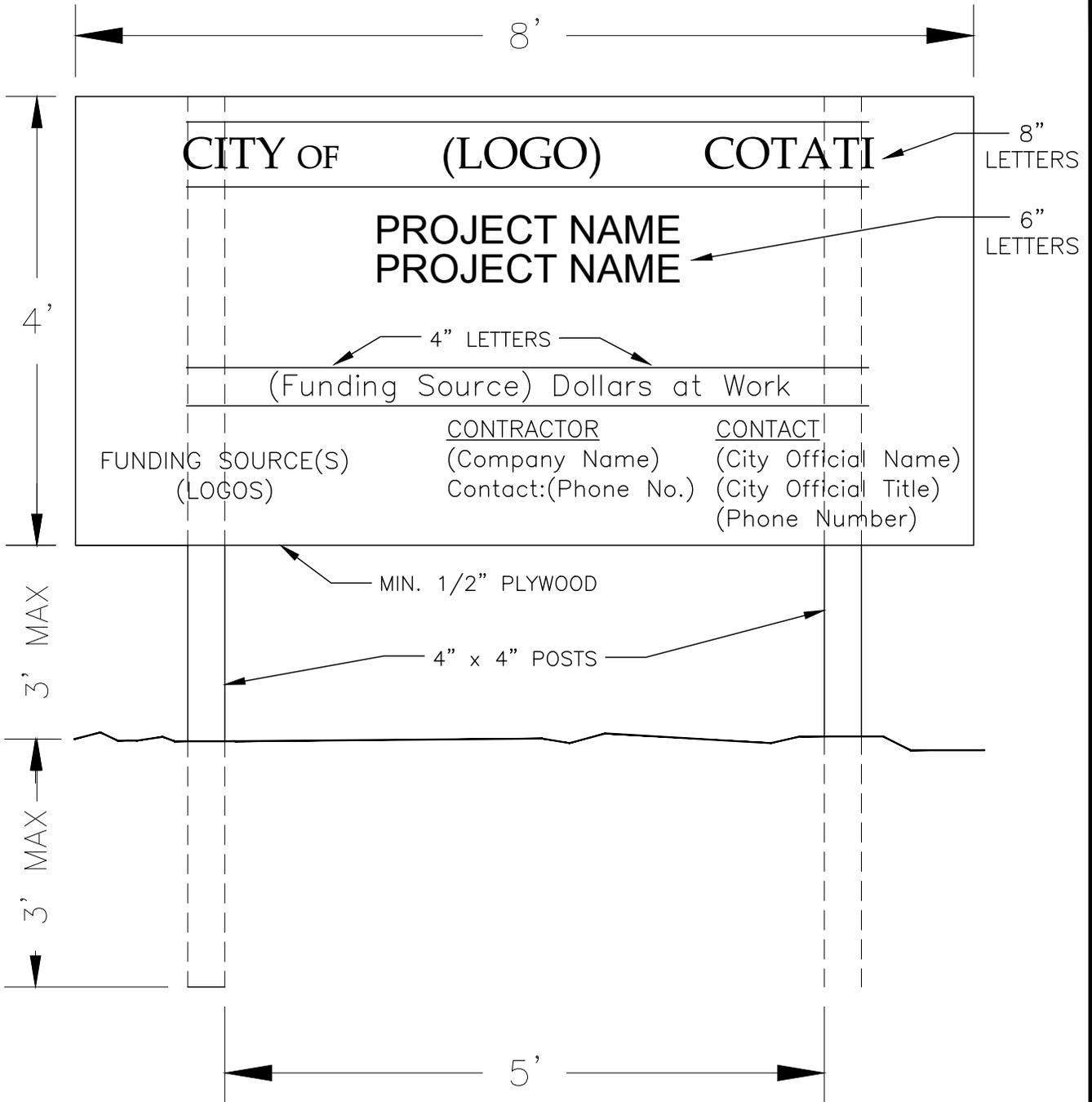
DECEMBER 2019

STD. NO.

407

PAGE 1 OF 1

SCALE: NONE



1. USE APPROPRIATE LETTER THICKNESS AND SIZE.
2. WORDING AND SIGN LOCATION SHALL BE APPROVED BY THE CITY ENGINEER
3. WHITE LETTERS ON BLUE SIGN



DESIGN AND CONSTRUCTION STANDARDS

PROJECT SIGN

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

408

PAGE 1 OF 1

SCALE: NONE



R8-3a/R81
Combination
12" x 18"



R5-6/R5-1
Combination
12" x 18"

NOTES:

1. "NO PARKING"/ "BIKE LANE" COMBINATION SIGN SHALL BE 12" X 18" ALUMINUM, TYPE R8-3a/R81. THE COLORING SHALL BE WHITE BACKGROUND WITH BLACK BORDER, BLACK TEXT, BLACK BIKE SYMBOL AND RED CROSS OUT SYMBOL.
2. "BICYCLE WRONG WAY"/ "NO BICYCLES" COMBINATION SIGN SHALL BE 12" x 18" ALUMINUM, TYPE R5-6/R5-1. THE COLORING SHALL BE RED UPPER BACKGROUND, WHITE LOWER BACKGROUND. BLACK BORDER, WHITE TEXT AND RED CROSS OUT SYMBOL. THIS SIGN MAY BE PLACED FACING WRONG-WAY BICYCLE TRAFFIC, SUCH AS ON THE LEFT SIDE OF A ROADWAY AND MAY BE MOUNTED BACK-TO-BACK WITH OTHER SIGNS TO MINIMIZE VISIBILITY TO OTHER TRAFFIC.
3. ALL SIGNS SHALL BE PRISMATIC REFLECTIVE SHEETING FOR USE ON BIKEWAYS, INCLUDING SHARED-USE PATHS AND BICYCLE LANE FACILITIES.
4. INSTALLATION AND SPACING SHALL BE PER MUTCD 2014 EDITION AND AS APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

BIKE LANE SIGNS

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

409

PAGE 1 OF 1

SCALE: NONE



VOLUME 2: STANDARD PLANS

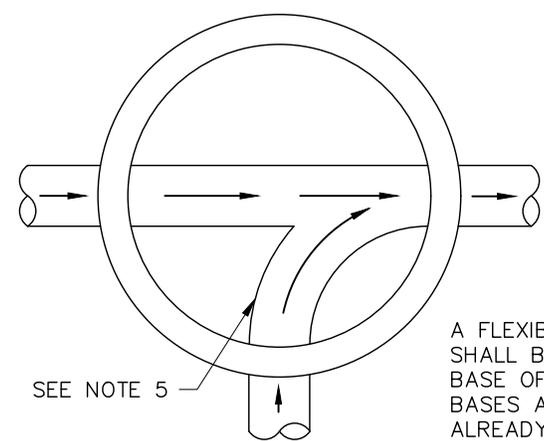
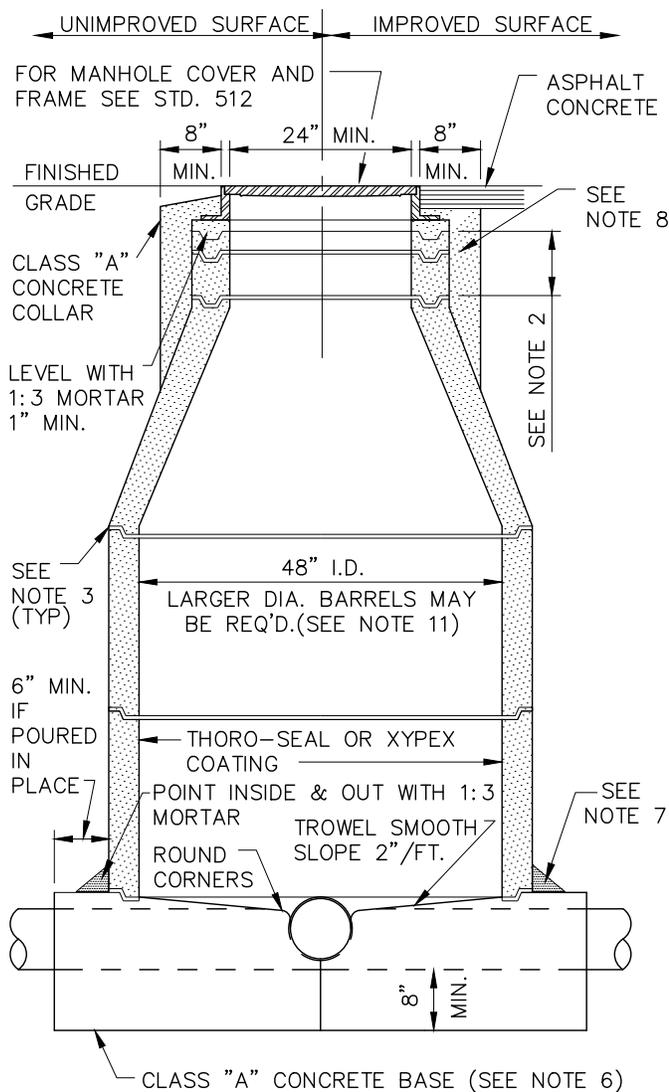
December 2019

500 Series: Sewer

- 500A. STANDARD 48" DIAMETER PRECAST CONCRETE MANHOLE
SANITARY SEWER
- 500B. STANDARD 60" DIAMETER PRECAST CONCRETE MANHOLE
SANITARY SEWER
- 502. SHALLOW MANHOLES & JUNCTION STRUCTURES FOR MULTIPLE
LATERALS
- 503. INSIDE DROP MANHOLE
- 504. OUTSIDE DROP MANHOLE
- 505. RODDING INLET
- 506. MAINLINE CLEANOUT
- 507. ABANDONED PIPE PLUG DETAIL
- 508. ABANDONED MANHOLE
- 509. SEWAGE PEAK LOAD FACTOR VS POPULATION
- 510. SEWER CONTRIBUTION ACCORDING TO ZONING AND USE
- 511. STANDARD PRECAST CONCRETE MANHOLE REDUCER SLAB
SANITARY SEWER
- 512. MANHOLE COVER
- 512A. MANHOLE COVER REPLACEMENT
- 513. 4" & 6" SEWER SERVICE LATERAL AND CLEANOUT
- 514. SEWER SERVICE OBSTRUCTION
- 515. DISCHARGE FOR PRIVATE FORCE MAIN
- 516. SEWER-WATER MAIN CROSSING DETAILS
- 517. MISCELLANEOUS PIPE INSTALLATION DETAILS
- 518. PVC SEWER PIPE DEFLECTION MANDREL
- 519. TWO-STAGE GREASE INTERCEPTOR
- 520. THREE-STAGE SAND AND GREASE INTERCEPTOR
- 521. SAMPLING MANHOLE EXTERIOR USE
- 522. SAMPLING BOX BUILDING INTERIOR
- 523. THREE-STAGE GREASE-INTERCEPTOR
- 524. CONTROL SAMPLING MANHOLE
- 525. RECREATIONAL VEHICLE DISPOSAL FACILITY
- 526. FOOD FACILITY ENCLOSURE

- 530A. GENERAL SEWER SYSTEM TESTING
- 530B. GENERAL SEWER SYSTEM TESTING
- 530C. SEWER MANHOLE TESTING
- 531. LOW-PRESSURE AIR TEST TABLE
- 532. PVC SANITARY SEWER
- 533. PIPE PENETRATION DETAIL
- 534. 4" COMBINATION AIR VALVE FOR SEWER FORCE MAIN
- 535. WATER, SEWER, RECYCLED WATER & STORM DRAIN PIPELINE SEPARATION

- 536. CLEANOUT DETAIL AT BUILDING
- 537. TYPICAL SEWER SERVICE CONNECTION DETAILS
- 538. BACKWATER CHECK VALVE INSTALLATION
- 539. SEWER SERVICE TRENCH DETAIL
- 540. SEWER SERVICE LATERAL
- 541. PIPE - STRUCTURE CROSSING DETAIL



MANHOLE BASE
CHANNELIZATION PLAN

NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF ONE FOOT ABOVE ADJACENT FINISHED GRADE.
2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 20". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP JOINT 1-1/2" (3/4 X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
4. CONE SECTION (TAPER) MUST BE CONCENTRIC FOR 48" MANHOLE UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE CITY ENGINEER.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER LOWER RING SECTION IS SET, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. PRECAST BASE TO BE FROM A DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN ROCK SUBBASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS), AND PLASTER 6" FILLET, 1:3 MORTAR.
8. CLASS "A" CONCRETE COLLAR SHALL BE 2" BELOW FINISHED GRADE.
9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED BY THE CITY ENGINEER.
11. 48" I.D. MANHOLE TO BE USED ONLY FOR SEWER MAINS LESS THAN 18" DIAMETER AND LESS THAN 8 FT. DEEP FROM FINISHED GRADE. USE 60" I.D. MANHOLES PER STD. 500B FOR ALL OTHER APPLICATIONS.
12. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
13. MANHOLE TO BE DEWATERED AND DRY PRIOR TO INSPECTION.

A FLEXIBLE COUPLING, AS APPROVED BY THE TOWN ENGINEER, SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12" OF THE BASE OF THE MANHOLE (TYP). NOT REQUIRED WHEN PRECAST BASES ARE MANUFACTURED WITH FLEXIBLE COUPLINGS ARE ALREADY INSTALLED

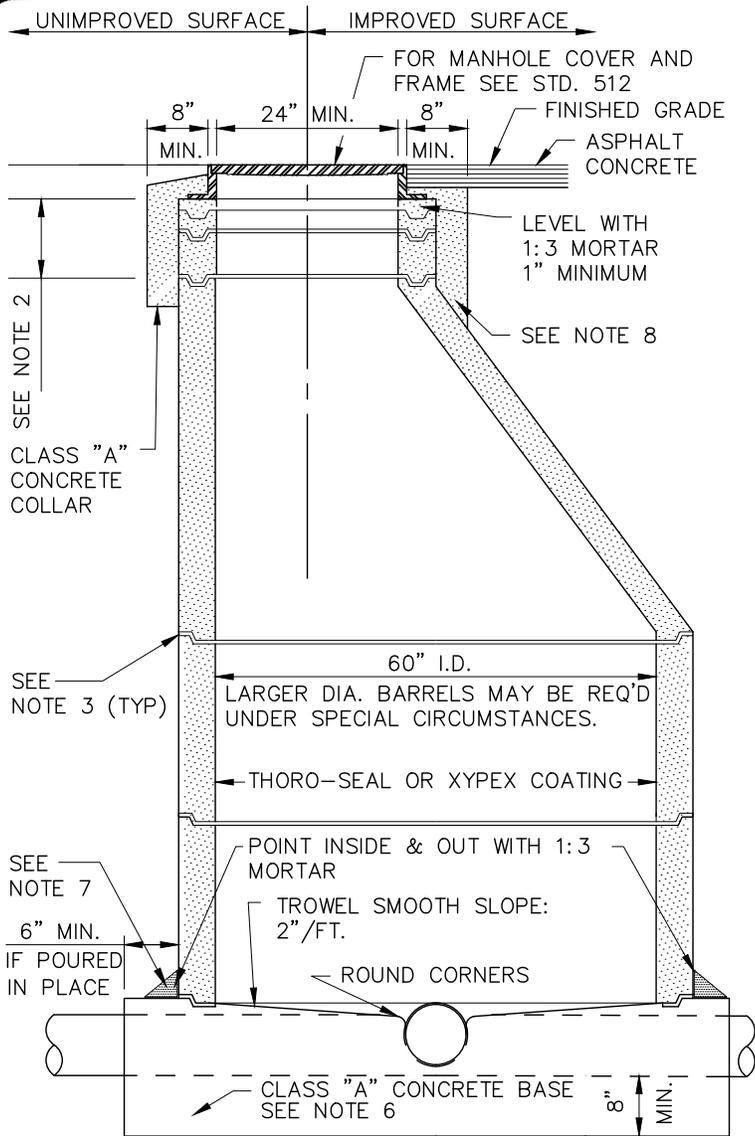


DESIGN AND CONSTRUCTION STANDARDS
**STANDARD 48" DIAMETER
 PRECAST CONCRETE MANHOLE
 SANITARY SEWER**

Craig A. Scott
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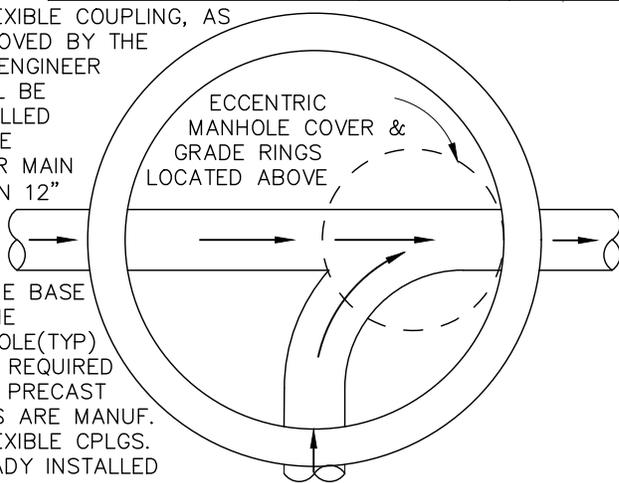
STD. NO.
500A
 PAGE 1 OF 1
 SCALE: NONE

DECEMBER 2019



A FLEXIBLE COUPLING, AS APPROVED BY THE CITY ENGINEER SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12"

OF THE BASE OF THE MANHOLE(TYP) -NOT REQUIRED WHEN PRECAST BASES ARE MANUF. W/FLEXIBLE CPLGS. ALREADY INSTALLED



MANHOLE BASE

CHANNELIZATION PLAN AND LOCATION OF ECCENTRIC MANHOLE COVER

NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.
2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 20". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP JOINT 1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
4. CONE SECTION (TAPER) MUST BE ECCENTRIC FOR 60" MANHOLE UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE CITY ENGINEER.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER LOWER RING SECTION IS SET, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF MANHOLE WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. PRECAST BASE TO BE FROM DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN SUB-BASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL SHALL BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS), AND PLASTER 6" FILLET, 1:3 MORTAR.
8. CLASS "A" CONCRETE COLLAR SHALL BE 2" BELOW FINISHED GRADE.
9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED BY THE CITY ENGINEER.
11. 60" I.D. MANHOLE TO BE USED FOR ALL TRUNK AND COLLECTOR SEWERS 18" TO 30" OR WHERE DIMENSION FROM FINISHED GRADE TO THE SEWER FLOW LINE IS GREATER THAN 8'-0", AS INDICATED ON THE DESIGN PLANS.
12. MANHOLES ON TRUNK SEWERS LARGER THAN 30" SHALL BE SIZED BY THE CITY ENGINEER.
13. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
14. MANHOLE TO BE DEWATERED AND DRY PRIOR TO INSPECTION.



DESIGN AND CONSTRUCTION STANDARDS

**STANDARD 60" DIAMETER
PRECAST CONCRETE MANHOLE
SANITARY SEWER**

Craig A. Scott

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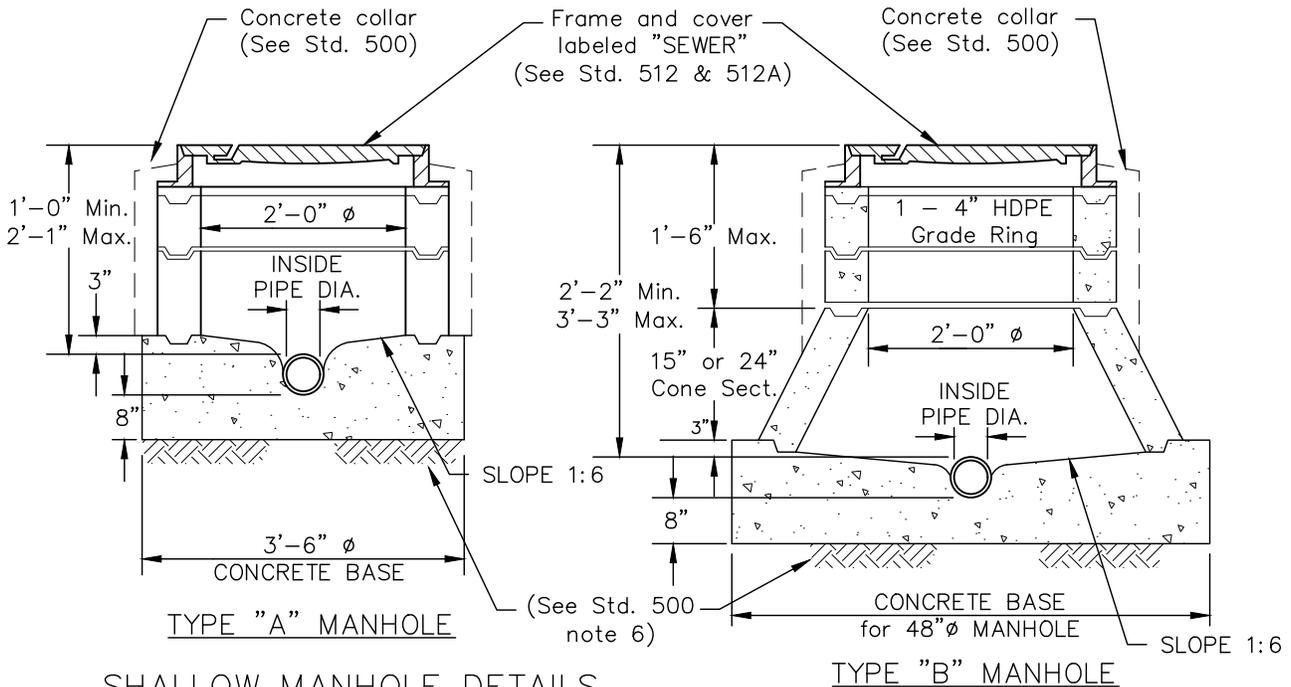
DECEMBER 2019

STD. NO.

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PAGE 1 OF 1

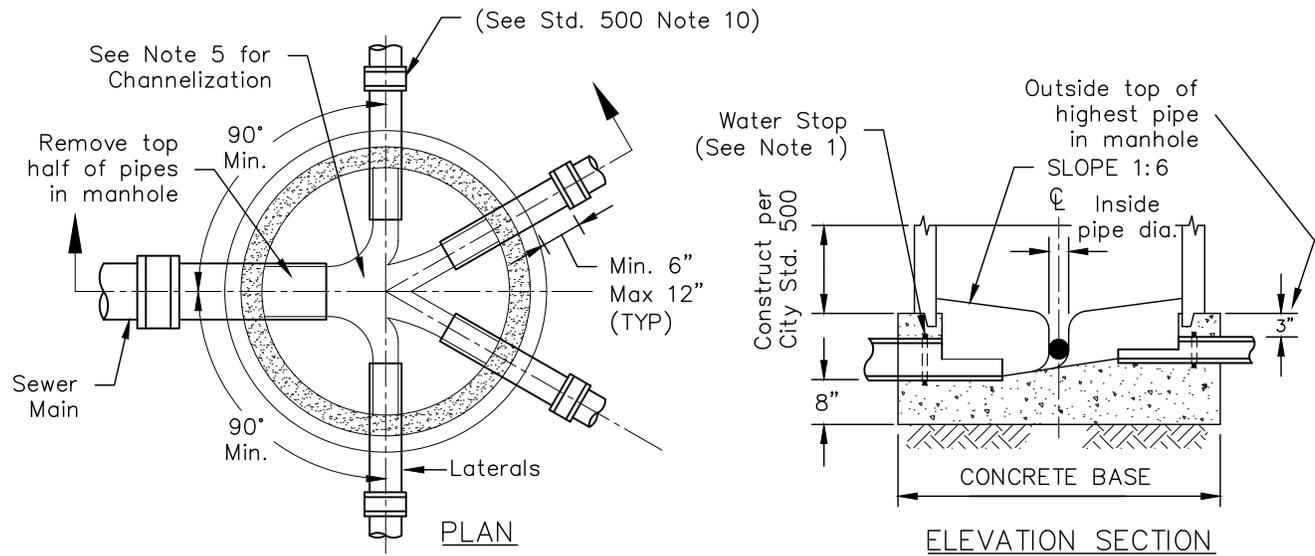
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SHALLOW MANHOLE DETAILS

NOTES:

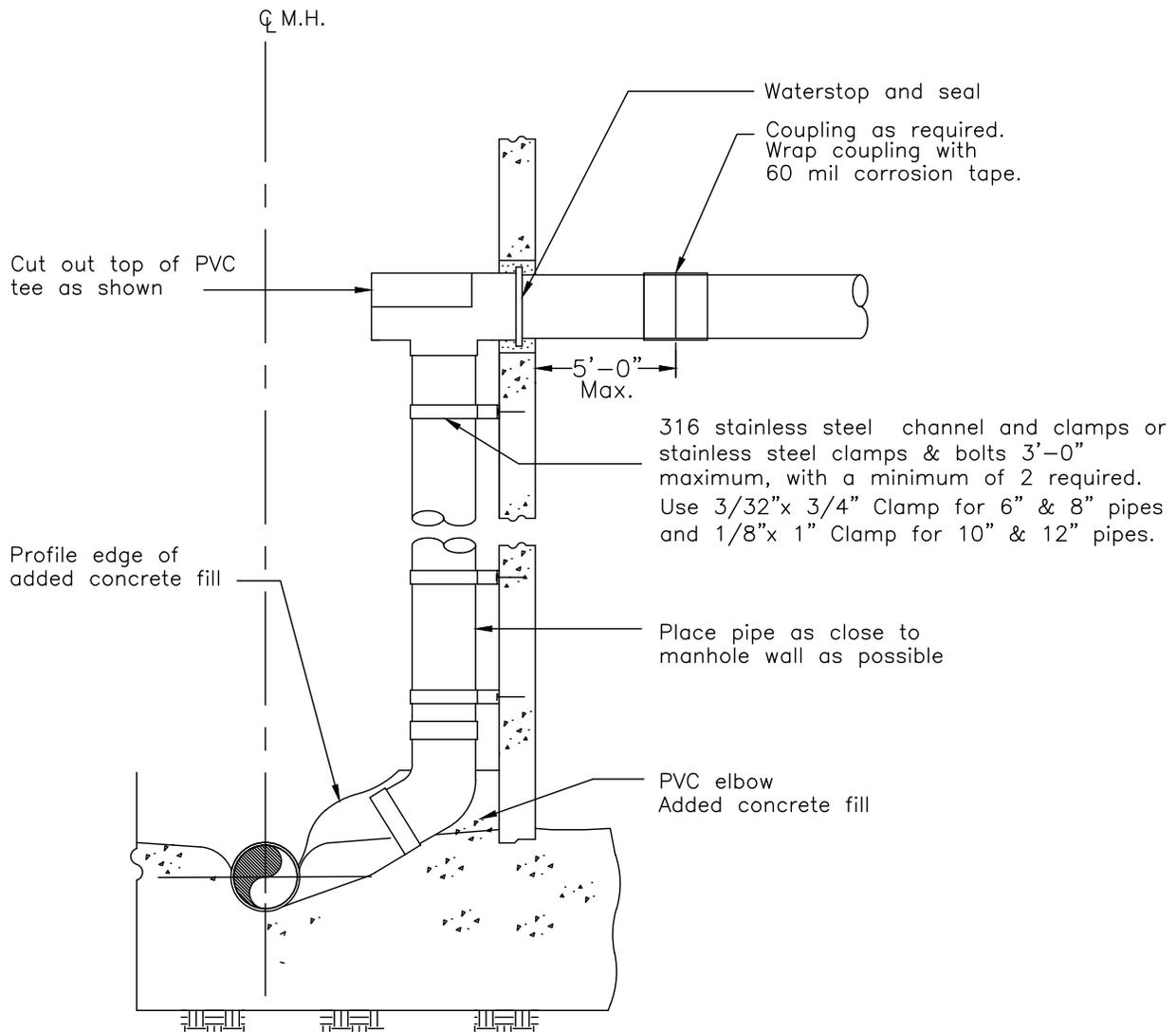
1. See Std. 500 for typical construction details
2. Install foam and tape to seal chimney section. Conform to all details listed in Std. 500.
3. Type 'A' Manhole to be installed only where specifically approved by the City Engineer.



JUNCTION STRUCTURE FOR MULTIPLE LATERALS

NOTES:

1. An approved water stop shall be installed on all pipe entering or leaving a manhole and centered under manhole wall as shown.
2. Generally, the elevations of the top of all pipes entering the manhole base block shall be the same.
3. The maximum number of laterals to be connected to a manhole is (4) four.
4. See Std. 500 for manhole construction details.
5. The channels shall be formed to provide smooth flow through the manhole to the satisfaction of the City Engineer.
6. Channels and laterals through the exterior of the base shall be constructed radially.



NOTES:

1. Manholes constructed using this standard shall be 60" in diameter and installed in conformance with Std 500B. Use 72" MH where there are two drop connections.
2. Enclose elbow in concrete. Form smooth channel with sweep to manhole flowline.
3. Install waterstop in accordance with manufacturer's instructions as shown.
4. PVC pipe and fittings shall have same nominal size and SDR rating as incoming pipes.



DESIGN AND CONSTRUCTION STANDARDS

INSIDE DROP MANHOLE

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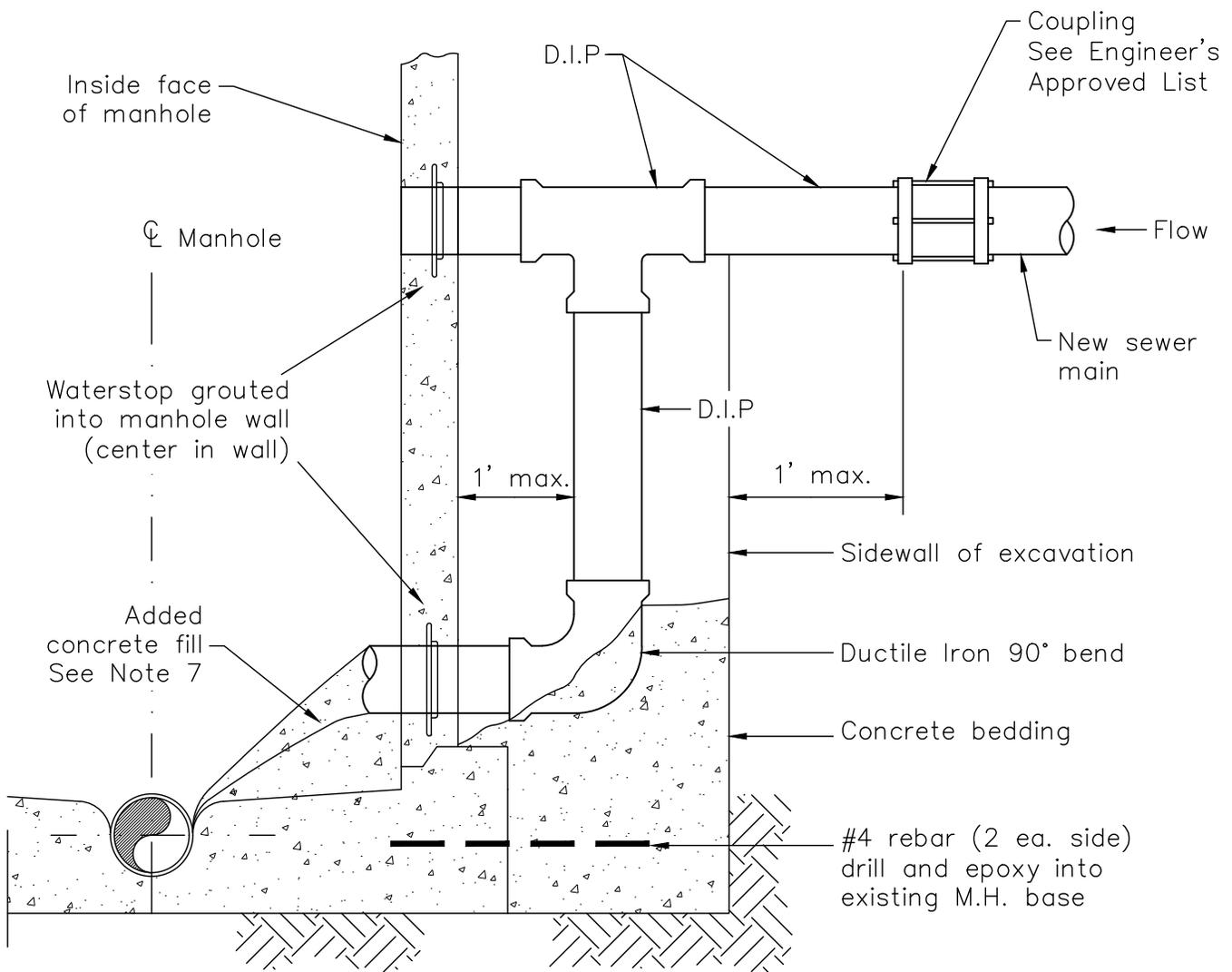
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STD. NO.

503

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. Ductile iron pipe shall be pressure class 350 per AWWA C151
2. Pipe and fittings shall be furnished with push-on or mechanical joints. Fittings shall conform to ANSI/AWWA C110/C153.
3. To be installed only where specifically approved by the Director of Utilities
4. Drop inlet pipe and fittings shall be the same size as the incoming sewer main.
5. See Std. 503 for standard inside drop installation
6. Install waterstop in accordance with manufacturer's instructions as shown.
7. Form smooth channel with sweep to manhole flowline.



DESIGN AND CONSTRUCTION STANDARDS

OUTSIDE DROP MANHOLE

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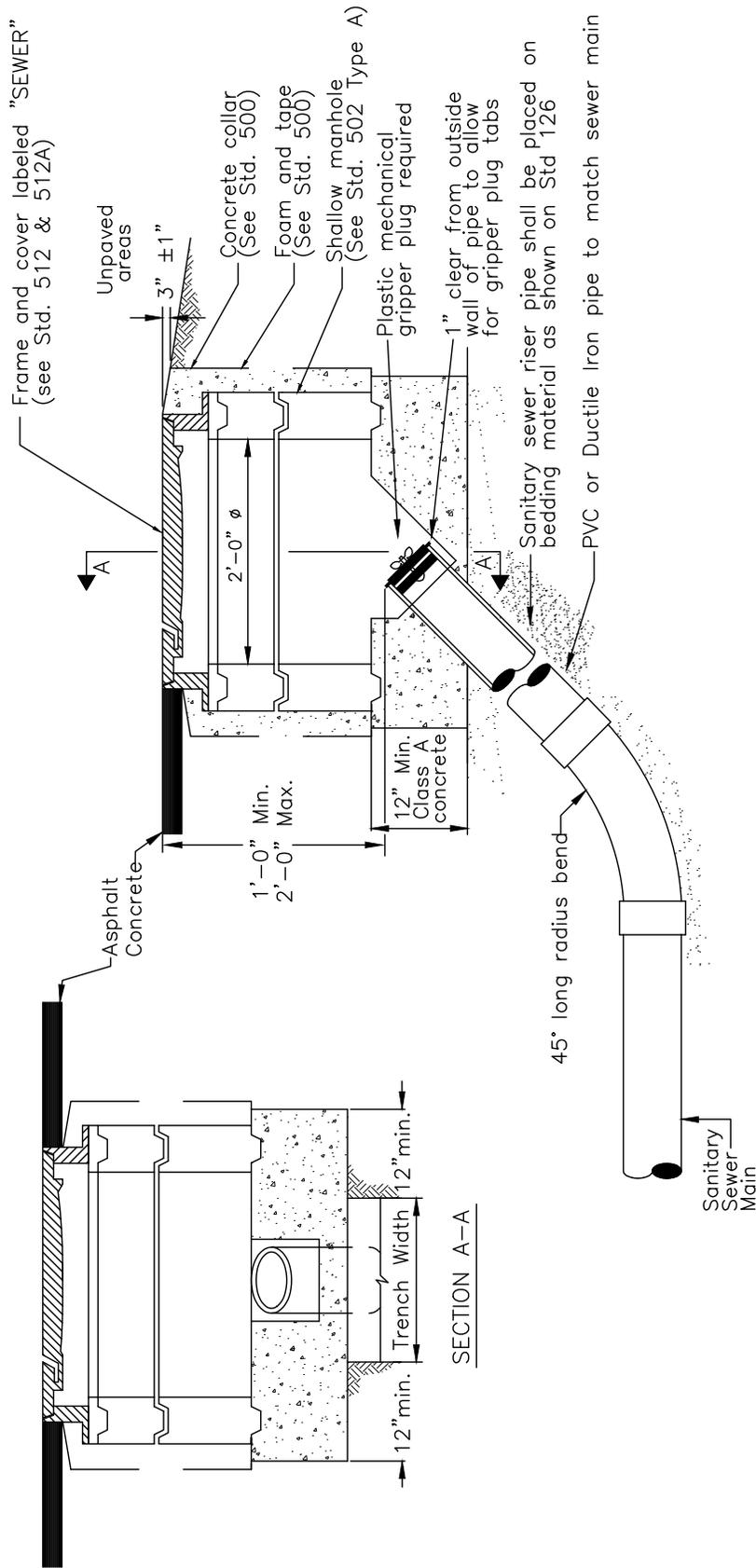
DECEMBER 2019

STD. NO.

504

PAGE 1 OF 1

SCALE: NONE



Note: To be used for main sizes 10" or less and where sewer main will not be extended



DESIGN AND CONSTRUCTION STANDARDS

RODDING INLET

STD. NO.

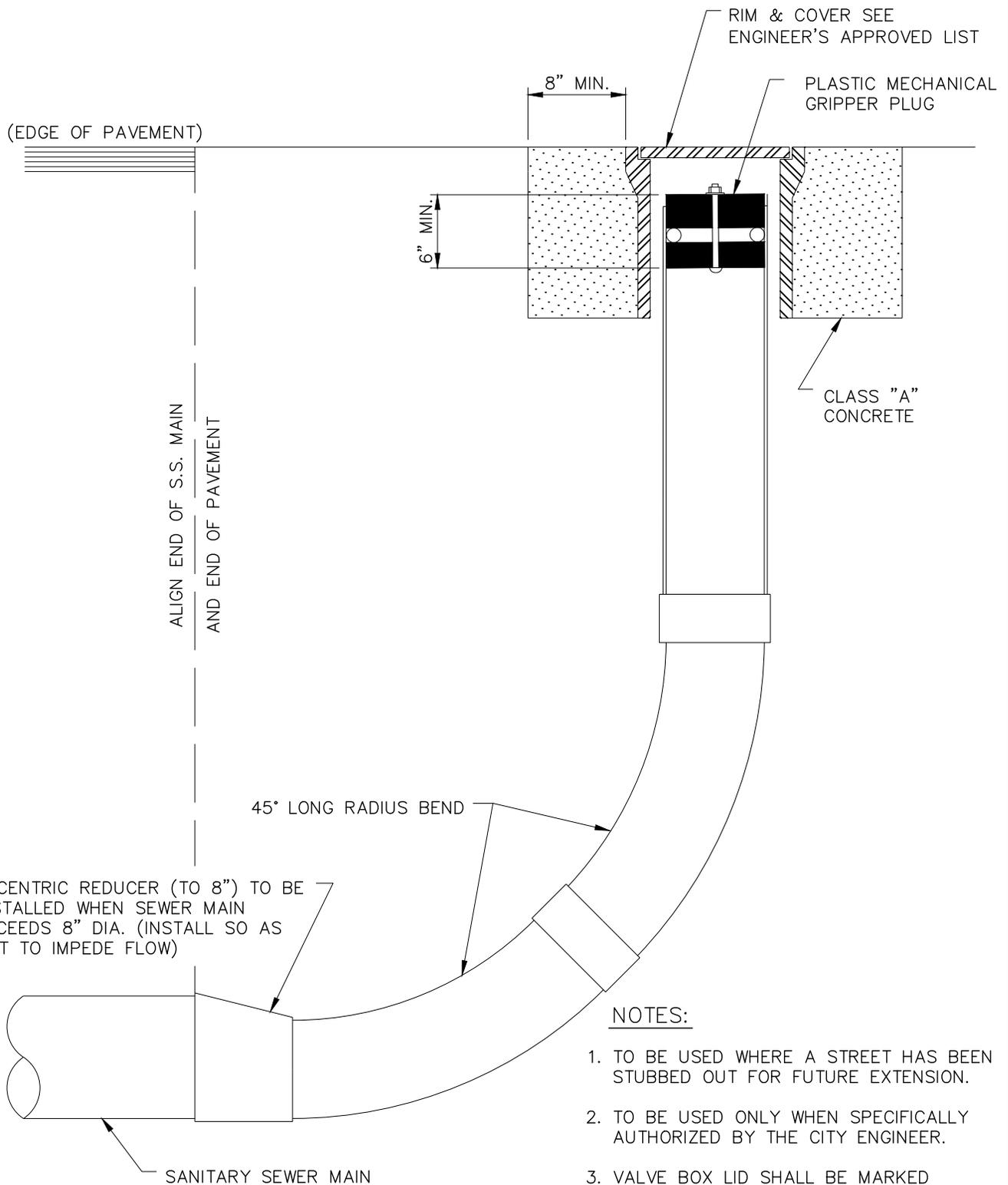
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PAGE 1 OF 1

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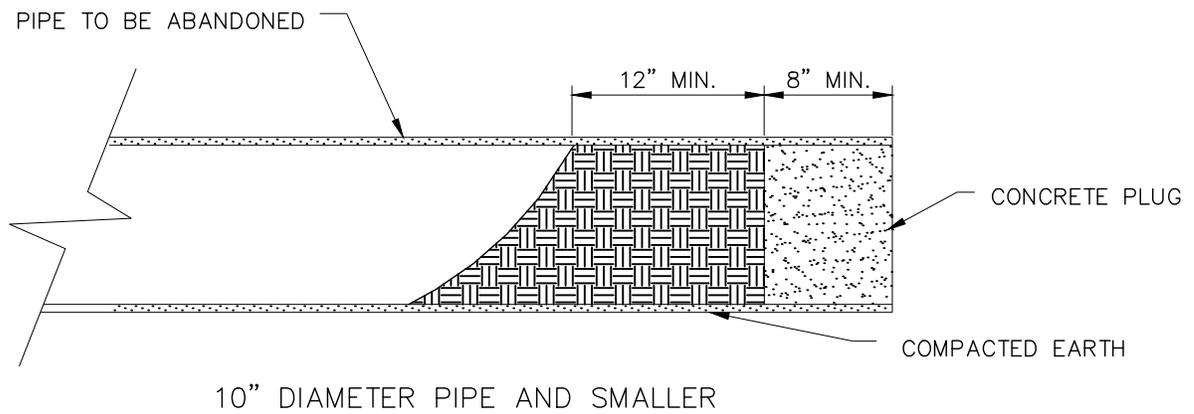
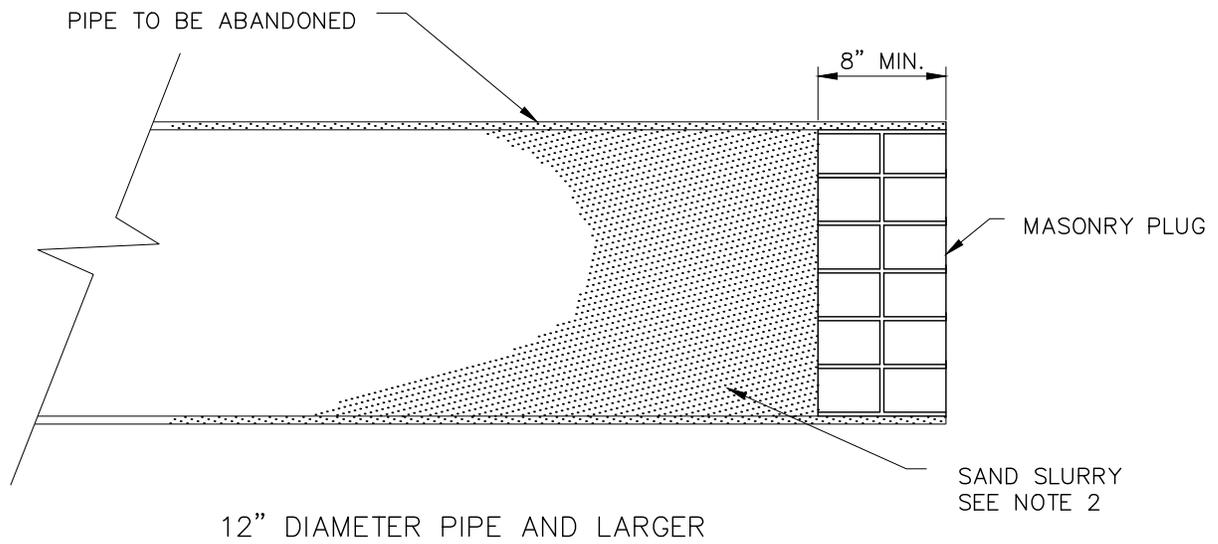
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NOTES:

1. TO BE USED WHERE A STREET HAS BEEN STUBBED OUT FOR FUTURE EXTENSION.
2. TO BE USED ONLY WHEN SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER.
3. VALVE BOX LID SHALL BE MARKED "SEWER".
4. IF DEPTH IS LESS THAN 3 FEET, USE STD. 505

	DESIGN AND CONSTRUCTION STANDARDS		STD. NO.
	MAINLINE CLEANOUT		506
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER		DECEMBER 2019	PAGE 1 OF 1 SCALE: NONE



NOTES:

1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE CITY ENGINEER.
2. ABANDONED PIPES, 12" AND LARGER, SHALL BE BROKEN INTO EVERY 50' AND SHALL BE FILLED COMPLETELY WITH SAND SLURRY.



DESIGN AND CONSTRUCTION STANDARDS

ABANDONED PIPE
PLUG DETAIL

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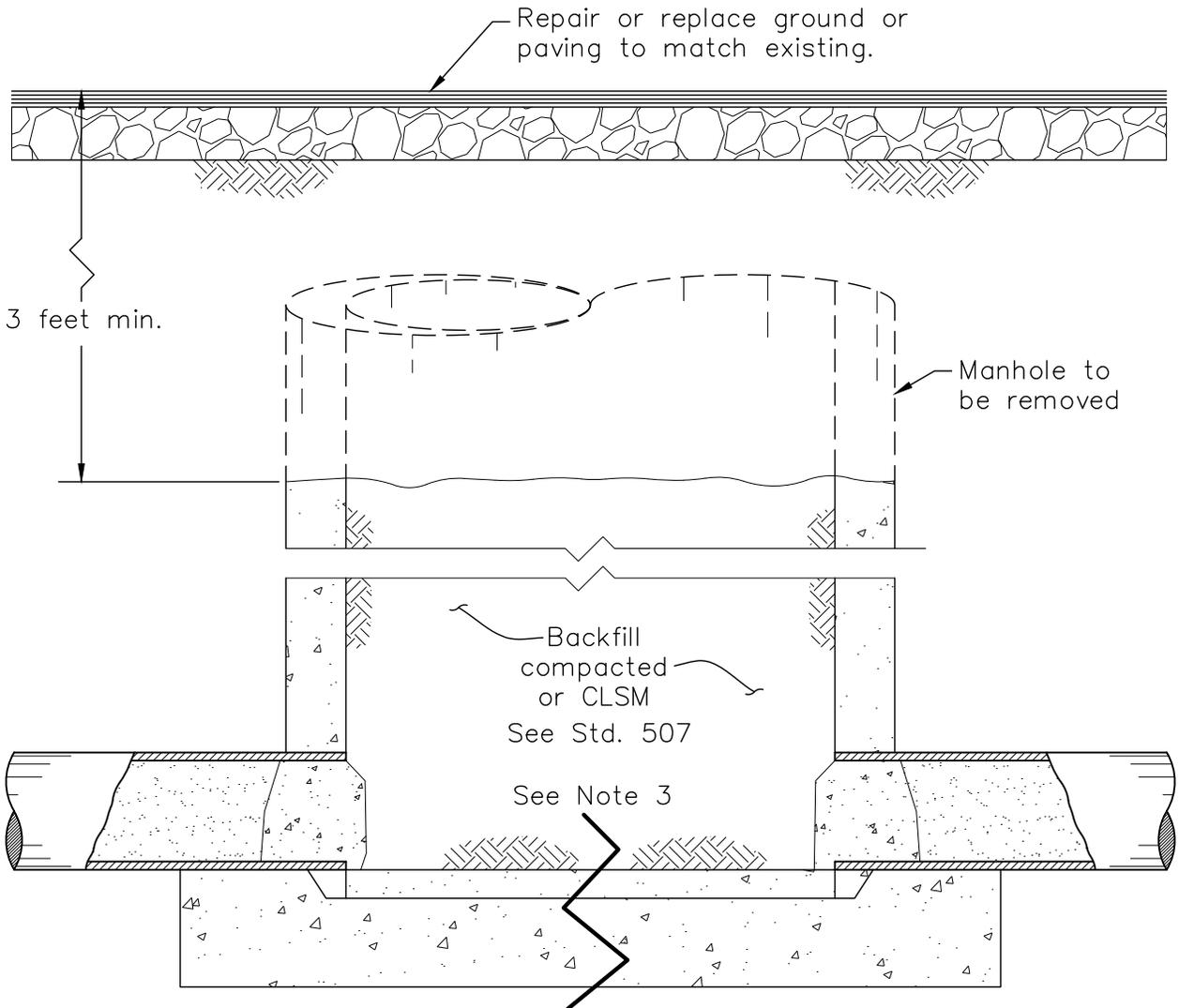
DECEMBER 2019

STD. NO.

507

PAGE 1 OF 1

SCALE: NONE



ONLY ALLOWED WITH SPECIFIC APPROVAL BY THE CITY ENGINEER

NOTES:

1. Remove frame, cover, taper and barrel sections as required to a minimum of 3' below finished grade.
2. After plugging all pipes in manhole, the remaining portion of the barrel section and all voids created by the removal of the upper portions of the manhole, shall be backfilled and compacted to 90% relative density. Use trench backfill or pipe bedding material per Std. 126.
3. Bottom of manhole shall be broken/holes created for drainage.



DESIGN AND CONSTRUCTION STANDARDS

ABANDONED MANHOLE

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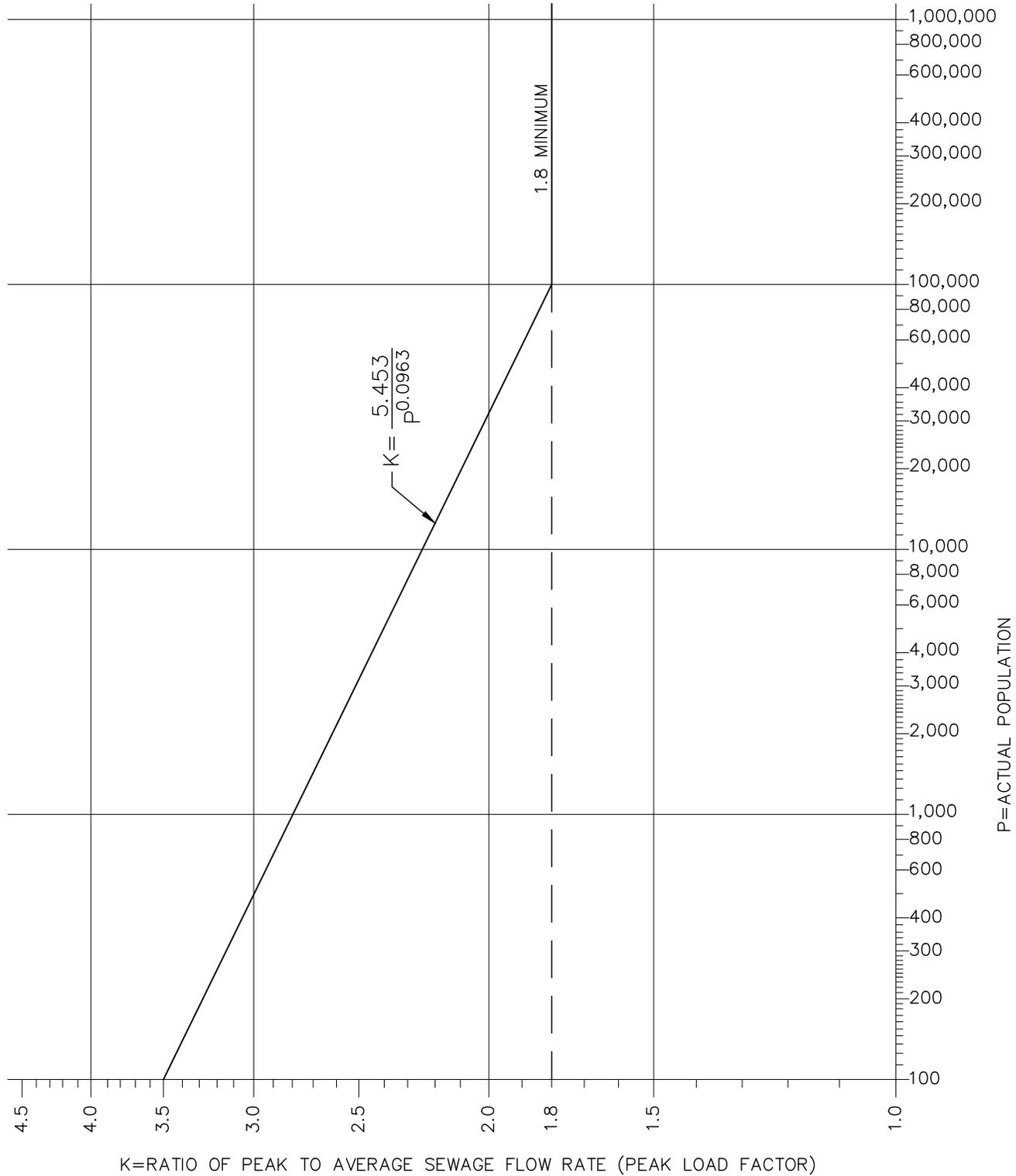
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STD. NO.

508

PAGE 1 OF 1

SCALE: NONE



DESIGN AND CONSTRUCTION STANDARDS

SEWAGE PEAK LOAD FACTOR VS. POPULATION

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STD. NO.

509

PAGE 1 OF 1

DECEMBER 2019

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Land Use	Units per acre	People per unit	People per acre	Description
Residential	N/A	3.25	13	Single Family Residential
Residential	6 (7 max)	3.25	19.5	Single Family Residential
Residential	8 (14 max)	3.25	26	Two Family Residential
Residential	25 (29 max)	**	55 to 81	Multiple Family Residential
Residential	8 (10 max)	**	19 to 26	
Residential	12 (15 max)	**	29 to 39	
Residential	16 (20 max)	**	38 to 52	
Residential	25 (30 max)	**	57 to 81	
Residential	30 (43 max)	**	82 to 98	
Residential	30 (43 max)	**	82 to 98	
Residential	75 (110 max)	**	209 to 243	High Rise
Residential	-	-	16	Rural Residential
Mobile Homes	9	2.5	22.5	Mobile Homes or Trailer Parks
Schools	-	Attendance	-	20 gallons per person per 24 hours
Eating Establishments	-	Seating Capacity	-	40 gallons per person per 24 hours
Light Commercial	8	2	16	Commercial stores
U	-	-	16	Unclassified
	-	-	16	Light Industrial

N/A = Not Applicable

****Apartments:**

Studio and one bedroom 1.9
 Two or more bedrooms 2.25

****Condominium**

Studio and one bedroom 2.25
 Two or more bedrooms 3.25

Note: The estimated densities shown above represent an average contribution rate and must be increased in some situations.



DESIGN AND CONSTRUCTION STANDARDS

SEWER CONTRIBUTION ACCORDING TO ZONING AND USE

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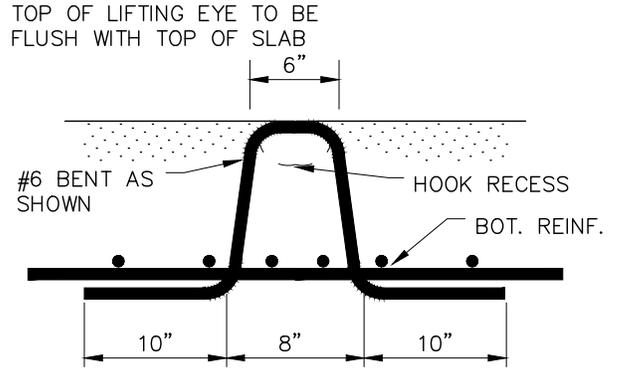
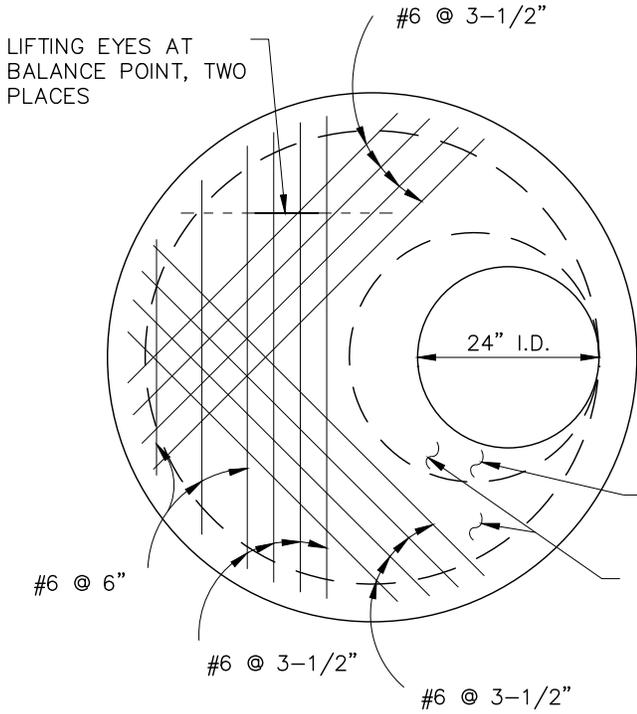
STD. NO.

510

PAGE 1 OF 1

DECEMBER 2019

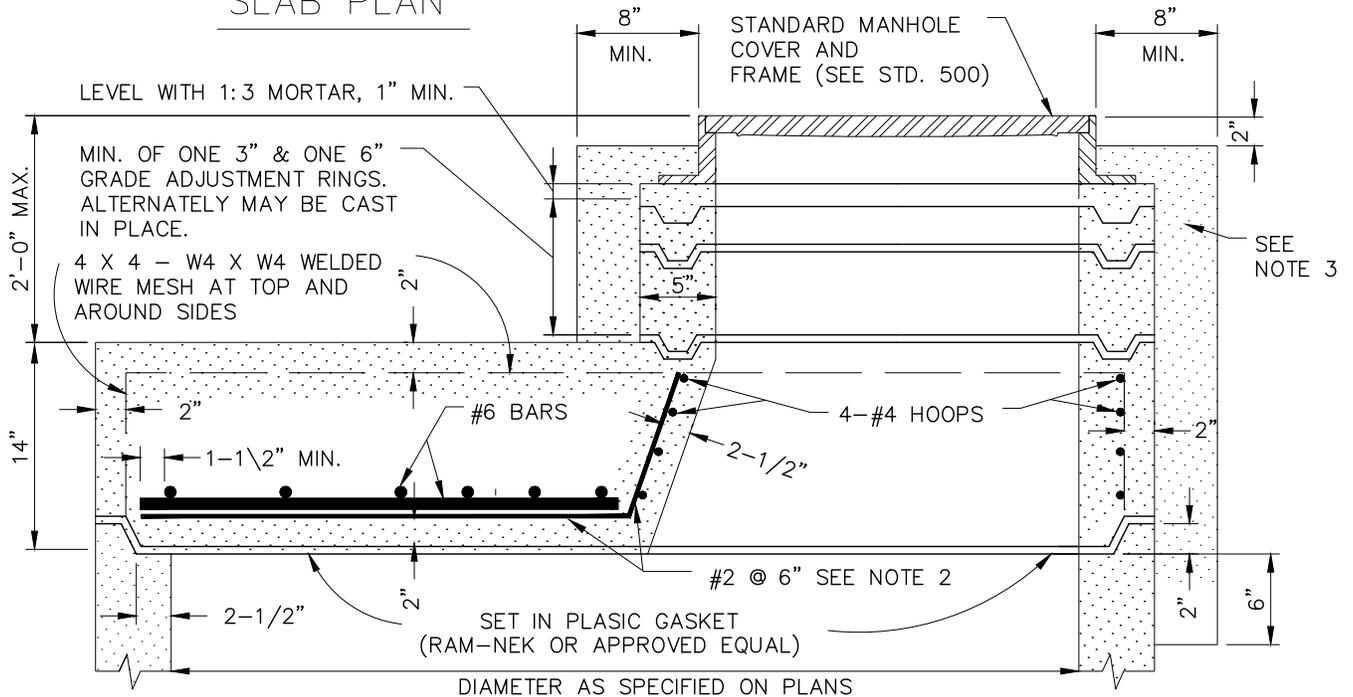
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4-#4 HOOPS AROUND ACCESS OPENING

#2 @ 6" AROUND OPENING SEE NOTE 2

SLAB PLAN



NOTES:

1. FOR DETAILS AND SPECIFICATIONS OF BASE AND BARREL SECTIONS, SEE STDS. 500A OR 500B.
2. #2 BARS BENT UP AND SPACED 6" O.C. AROUND 24" OPENING. HORIZONTAL LEGS TO FAN OUT EQUALLY SPACED, TO 2-1/2" CLEAR AT EDGE OF SLAB.
3. CLASS "II" CONC. COLLAR.



DESIGN AND CONSTRUCTION STANDARDS
**STANDARD PRECAST CONCRETE
 MANHOLE REDUCER SLAB
 SANITARY SEWER**

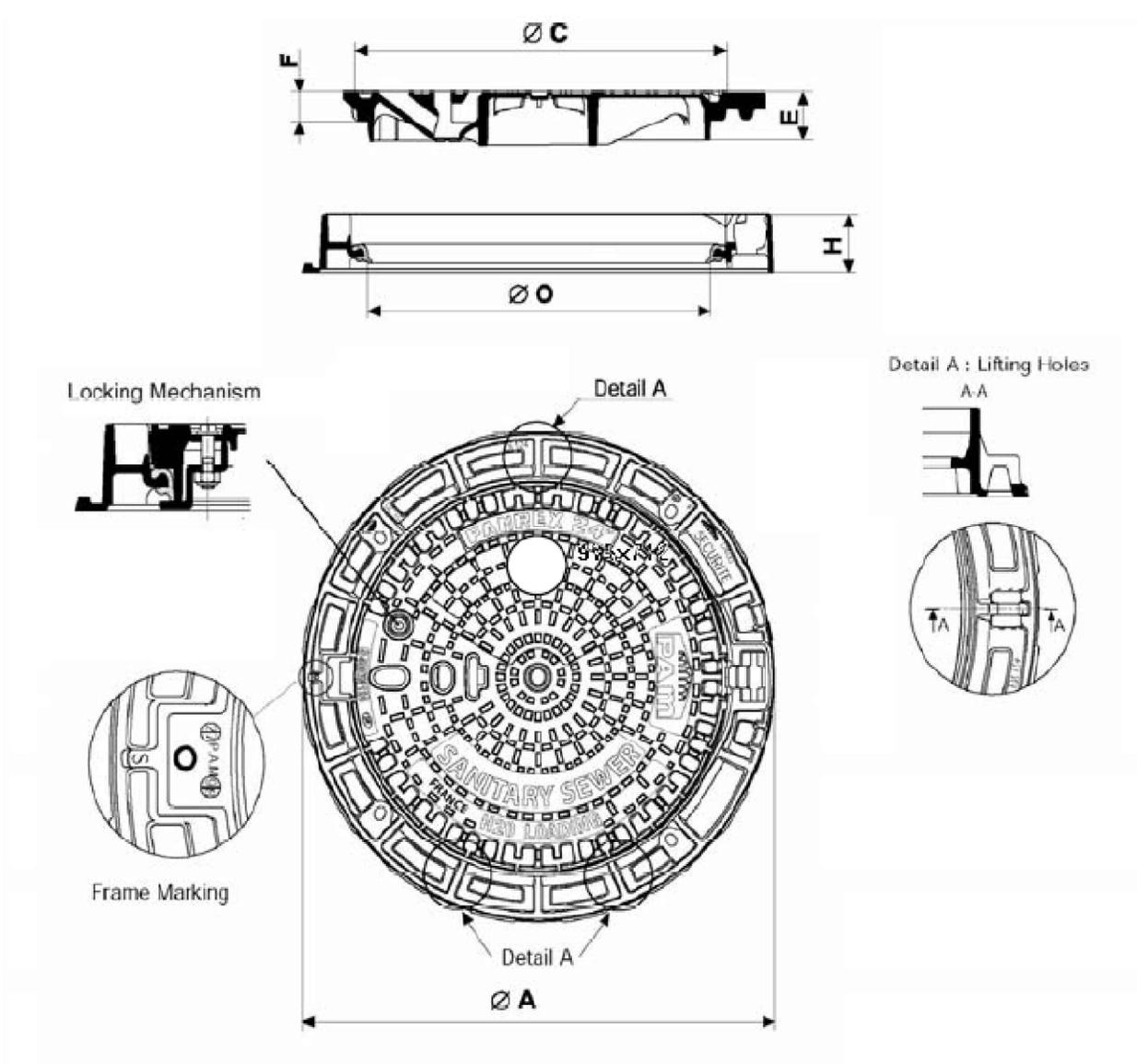
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STD. NO.
511

PAGE 1 OF 1

SCALE: NONE



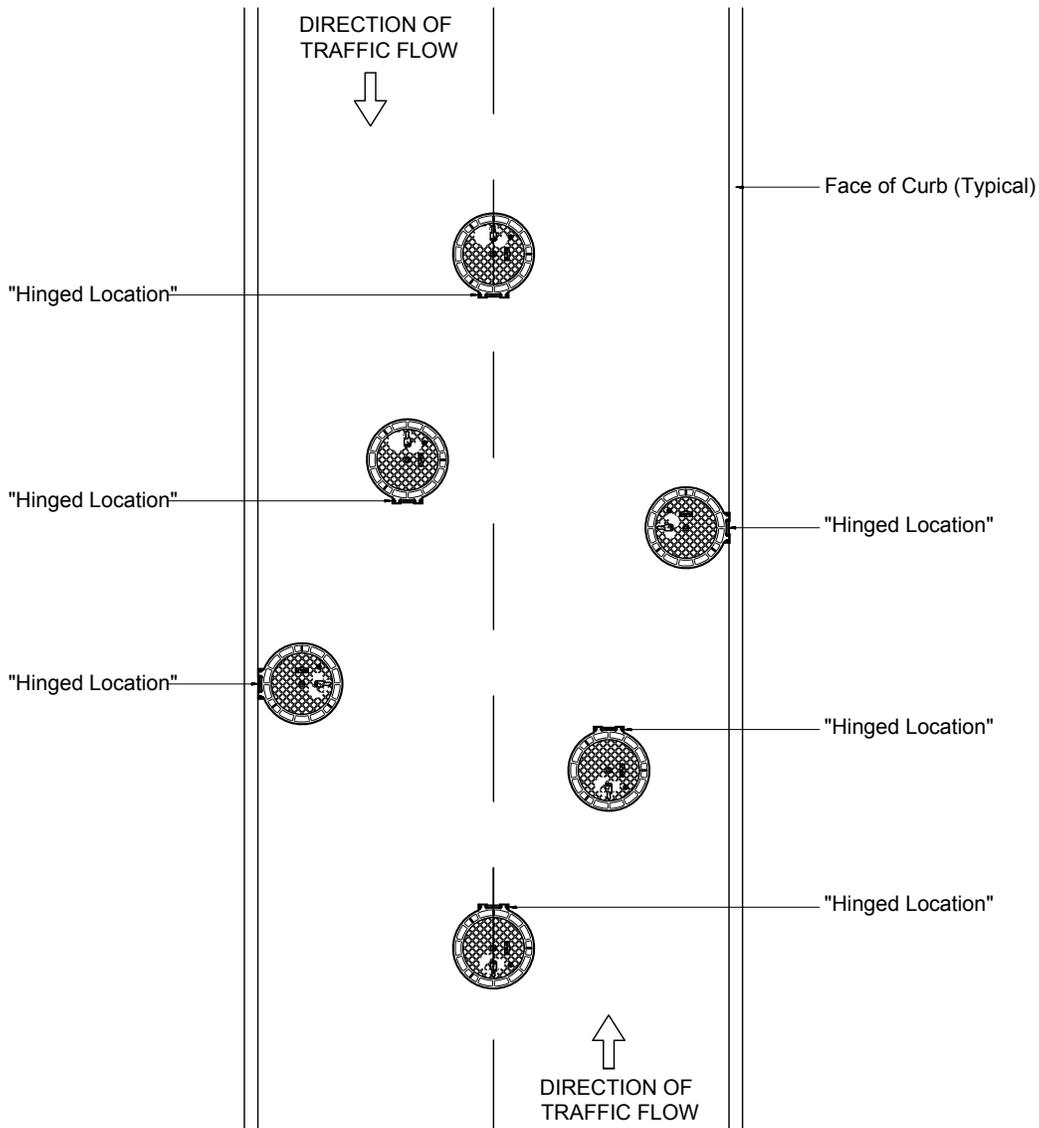
NOTES:

1. Specify sanitary sewer, storm drain, electrical vault, or water for labeling of cover when ordering. All castings shall be dipped in approved ASPHALTUM or BITUMINOUS Paint.
2. All material used in manufacturing shall conform to A.S.T.M. designation A-48 Class 35 B, or of United States Government Specifications QQ1-652b.
3. Minimum weight components: Cover - 122 pounds
Frame - 73 pounds
4. Lockable covers are required on all sewer mains located in easements, on school grounds, through parks, and on any trunk sewers larger than 12" in diameter. Coat threads on locking bolt with never cease or Teflon-based pipe dope upon installation of lock.
5. Covers shall be one-man operable using standard tools.

APPROVED MANHOLE FRAME & COVER

See Engineer's Approved List

	DESIGN AND CONSTRUCTION STANDARDS	STD. NO.
	 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER	512 PAGE 1 OF 1
MANHOLE COVER		SCALE: NONE
		DECEMBER 2019



NOTES:

1. Specify storm drain, electrical vault, or water when ordering.
All castings shall be dipped in approved ASPHALTUM or BITUMINOUS Paint.
Layout not applicable for GMI lids
2. All material used in manufacturing shall conform to A.S.T.M. designation A-48 Class 35 B, or of United States Government Specifications QQ1-652b.
3. Minimum weight components: Cover - 122 pounds
Frame - 73 pounds
4. Lockable covers are required on all sewer mains located in easements, on school grounds, through parks and any trunk sewer. Locks will be required on all manholes not located in a paved City maintained street.
5. Covers shall be one-man operable using standard tools.

APPROVED MANHOLE FRAME & COVER

See Engineer's Approved List



DESIGN AND CONSTRUCTION STANDARDS

MANHOLE COVER PLACEMENT

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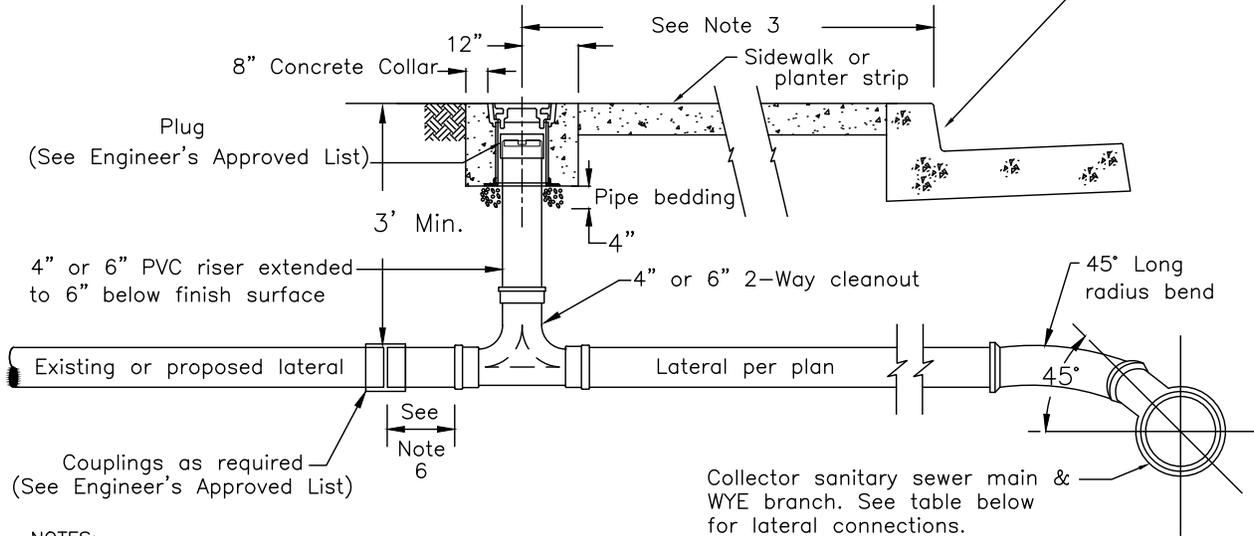
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PAGE 1 OF 1

SCALE: NONE

CLEANOUT BOX
(See Engineer's Approved List)

4" high "S" marked on
face of curb or at back of sidewalk
for lateral location.



NOTES:

1. The sewer service lateral shall be of sufficient depth to adequately serve the building site, and in no case shall be less than 3 FT. deep at the cleanout unless otherwise authorized by the City Engineer.
2. Where problems are anticipated in providing sewer service to a given building site, the lateral invert at the cleanout shall be staked by the owner's engineer.
3. Cleanout must be installed within the Public Right of Way or P.U.E. Cleanout to be installed 18" from face of curb or 12" maximum behind sidewalk. Where service is in driveway, install cleanout 18" behind apron.
4. In cases where the cleanout installation conflicts with existing facilities, the contractor shall verify any alternate location with the City Engineer prior to installation.
5. Minimum 2% slope for 4" laterals and a min. 1% slope for 6" laterals are required unless a variance is specifically approved by City Engineer and the Building Official.
6. A minimum of 12" when connecting to existing sewer lateral or extend to 1' behind P.U.E. or sidewalk for new construction.
7. For new construction, install cap or plug at end of service lateral.
8. Lateral material shall be PVC SDR 26 or Ductile Iron.
9. Cleanout components shall be the same size as the lateral.
10. Tap fittings on mains smaller than 12" may only be used under the approval of City Engineer.
11. All service lateral joints shall have water tight gaskets.
12. Trench details shall be per City STD. 126.
13. Lateral joints are to be wrapped using 60 mil 6" corrosion prevention tape.

Collector sanitary sewer main & WYE branch. See table below for lateral connections.
Min. invert elev. of WYE branch equals centerline of sewer main.

LATERAL CONNECTIONS TO EXISTING MAINS:

Main Size & Material	Connection Type	Couplings
6-10" ACP, VCP	Cut in PVC wye w/12" spools each end	Rubber w/Steel shear bands
6-10" PVC	Cut in PVC wye w/12" spools each end	Rigid water tight slip couplings
6-10" DIP	Cut in DIP wye w/12" spools each end	DIP couplings
12" and larger	Tap fitting see Engineer's approved list	NA



DESIGN AND CONSTRUCTION STANDARDS

4" & 6" SEWER SERVICE LATERAL AND CLEANOUT

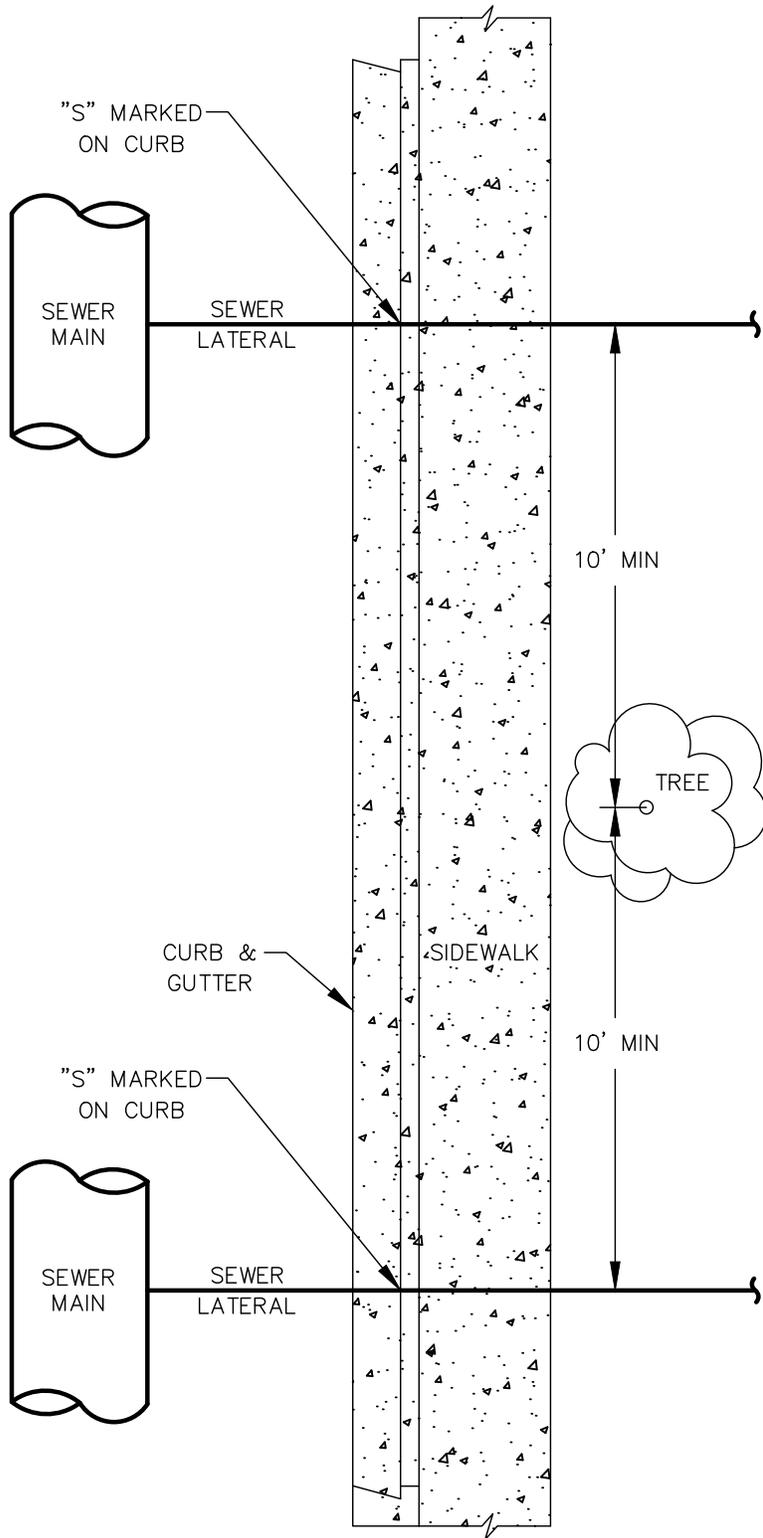
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DECEMBER 2019

STD. NO.
513

PAGE 1 OF 1

SCALE: NONE



REQUIREMENTS:

1. NO TREES OR LARGE SHRUBS SHALL BE ALLOWED WITHIN 10 FT. OF ANY SEWER FACILITY.
2. "S" STAMPED ON CURB



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DESIGN AND CONSTRUCTION STANDARDS

SEWER SERVICE OBSTRUCTIONS

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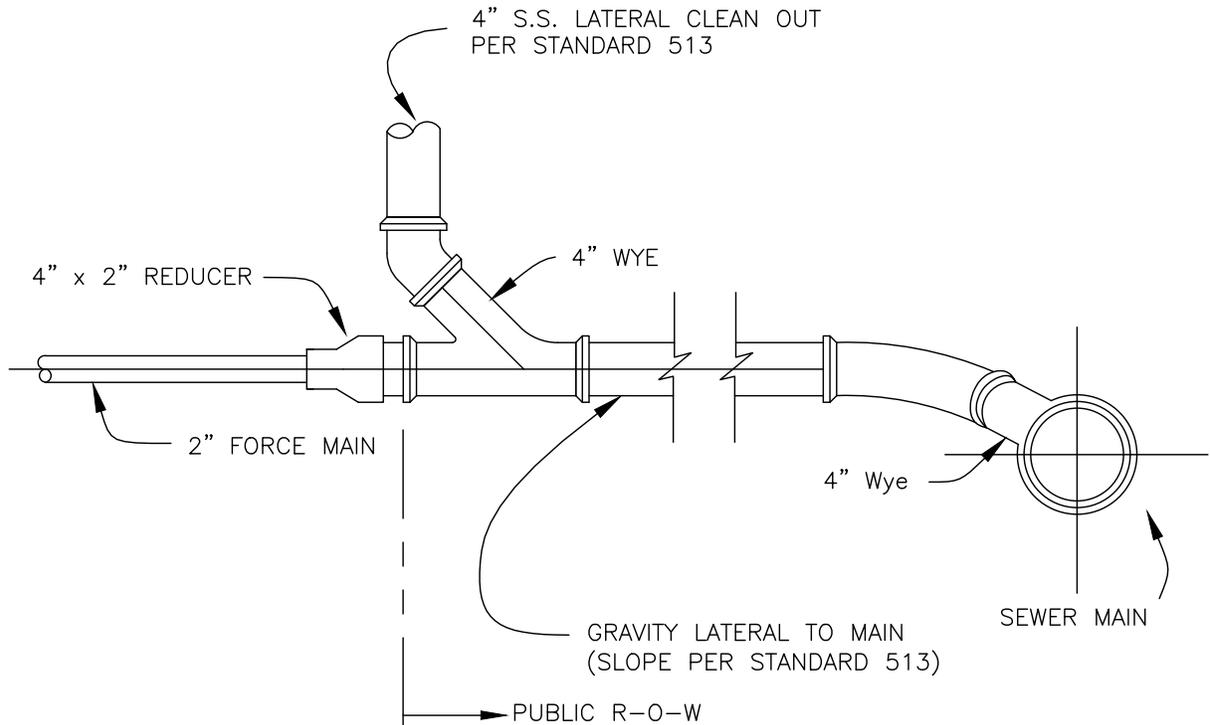
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STD. NO.

514

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. MUST BE USED FOR ALL PRIVATE SEWAGE LIFT STATION DISCHARGES. NO DISCHARGES MAY BE MADE DIRECTLY TO THE COLLECTOR SEWER, TRUNK SEWER, OR MANHOLE.
2. ANY ALTERNATE DESIGN MUST BE APPROVED BY THE CITY ENGINEER.
3. CONSTRUCTION DETAILS, SLOPE AND MATERIALS CONFORM TO STD. #513. (GRAVITY SECTION OF LATERAL ONLY)
4. ALL SERVICE LATERAL JOINTS SHALL HAVE WATER TIGHT GASKETS.
5. FORCE MAIN SHALL BE PRESSURE TESTED PRIOR TO ACCEPTANCE.



DESIGN AND CONSTRUCTION STANDARDS

DISCHARGE FOR PRIVATE FORCE MAIN

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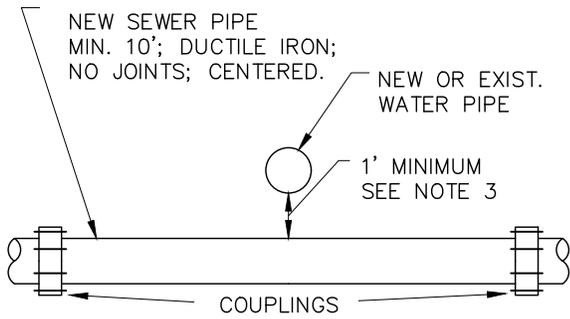
DECEMBER 2019

STD. NO.

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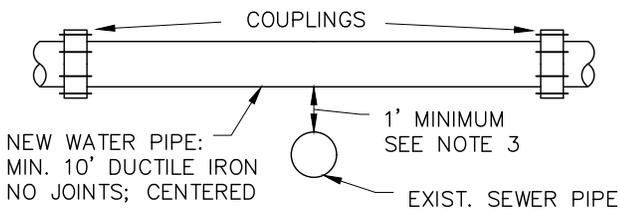
PAGE 1 OF 1

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**NEW SEWER UNDER
NEW OR EXISTING WATER**

CASE 1

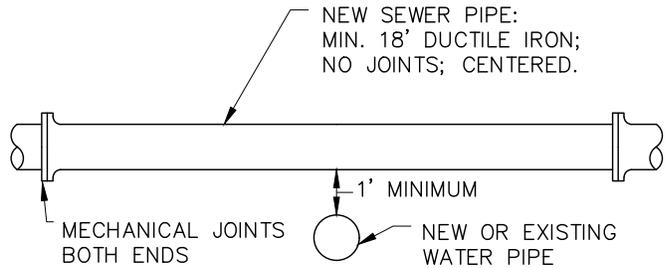


**NEW WATER OVER
EXISTING SEWER**

CASE 3

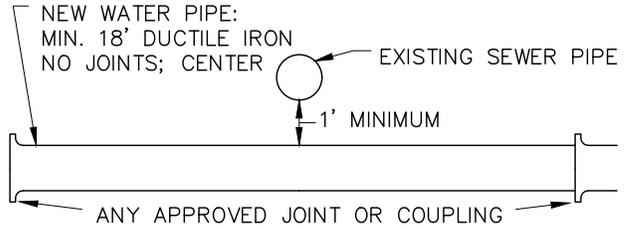
NOTES:

1. THIS STANDARD APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS OF LARGER DIAMETER SHALL BE AS APPROVED BY THE CITY ENGINEER.
2. ALL NEW DUCTILE IRON SHALL BE WRAPPED IN POLYETHYLENE PER CITY CONSTRUCTION SPECIFICATIONS.
3. WHERE SEWER CROSSES BELOW A WATER MAIN, WITH MORE THAN 1' VERTICAL CLEARANCE, NO SPECIAL INSTALLATION IS REQUIRED.
4. "NEW PIPE UNDER EXISTING-CASE 5" SHALL BE USED WHEN THE EXISTING PIPE HAS A JOINT OVER OR WITHIN 2' OF THE NEW TRENCH.
5. ANY PIPE-PIPE CROSSING WITH LESS THAN 1' VERTICAL CLEARANCE SHALL NOT BE INSTALLED WITHOUT APPROVAL OF THE CITY ENGINEER.
6. FOR WATER MAIN LOWERING DETAIL, SEE STD. 855
7. SEE CITY'S APPROVED LIST FOR APPROVED COUPLINGS.



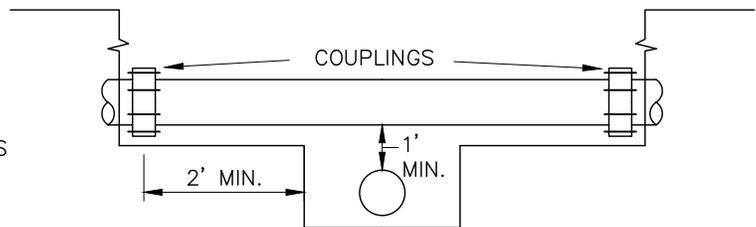
**NEW SEWER OVER
NEW OR EXISTING WATER**

CASE 2



**NEW WATER UNDER
EXISTING SEWER**

CASE 4



NEW PIPE UNDER EXISTING

CASE 5 - SEE NOTE 4



DESIGN AND CONSTRUCTION STANDARDS

**SEWER-WATER MAIN CROSSING
DETAILS**

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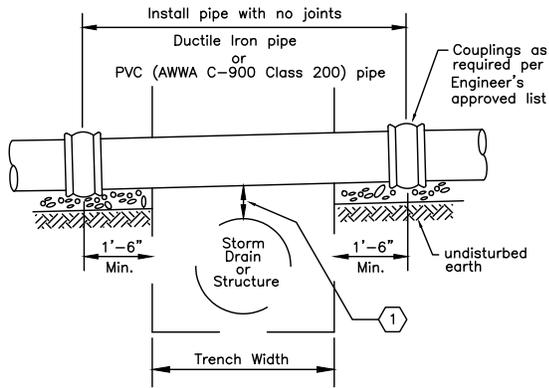
DECEMBER 2019

STD. NO.

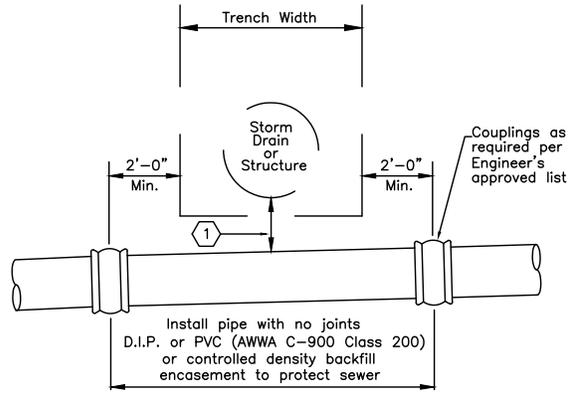
516

PAGE 1 OF 1

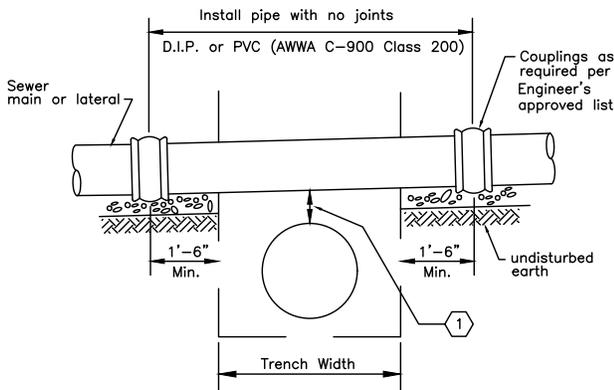
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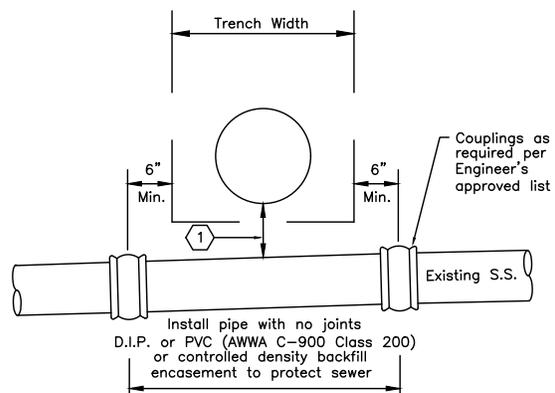
INSTALLATION OVER PIPE OR STRUCTURE



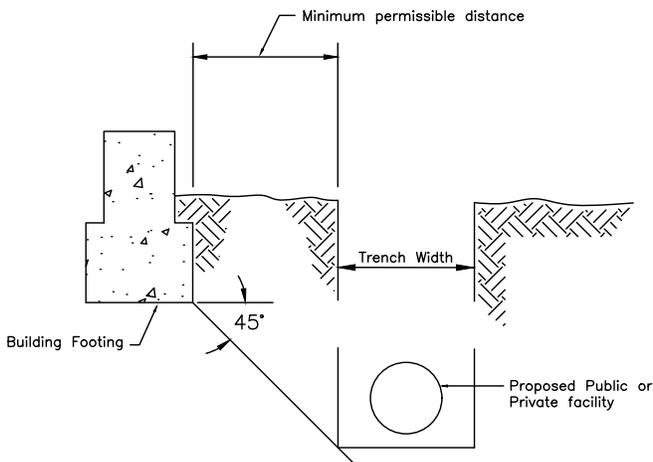
INSTALLATION UNDER PIPE OR STRUCTURE



INSTALLATION OF PIPE OR STRUCTURE UNDER SANITARY SEWER



INSTALLATION OF PIPE OR STRUCTURE OVER SANITARY SEWER



DETAIL OF BUILDING SETBACK FROM UNDERGROUND UTILITY*

* NOTE: REQUIRED PER UNIFORM PLUMBING CODE SECTION 315.1

DETAIL GENERAL NOTES:

1. This detail **DOES NOT** apply to water crossings. See STD.-516 for all water crossings.
2. Encase Ductile Iron pipe in polyethylene per City of Cotati Construction Specifications.

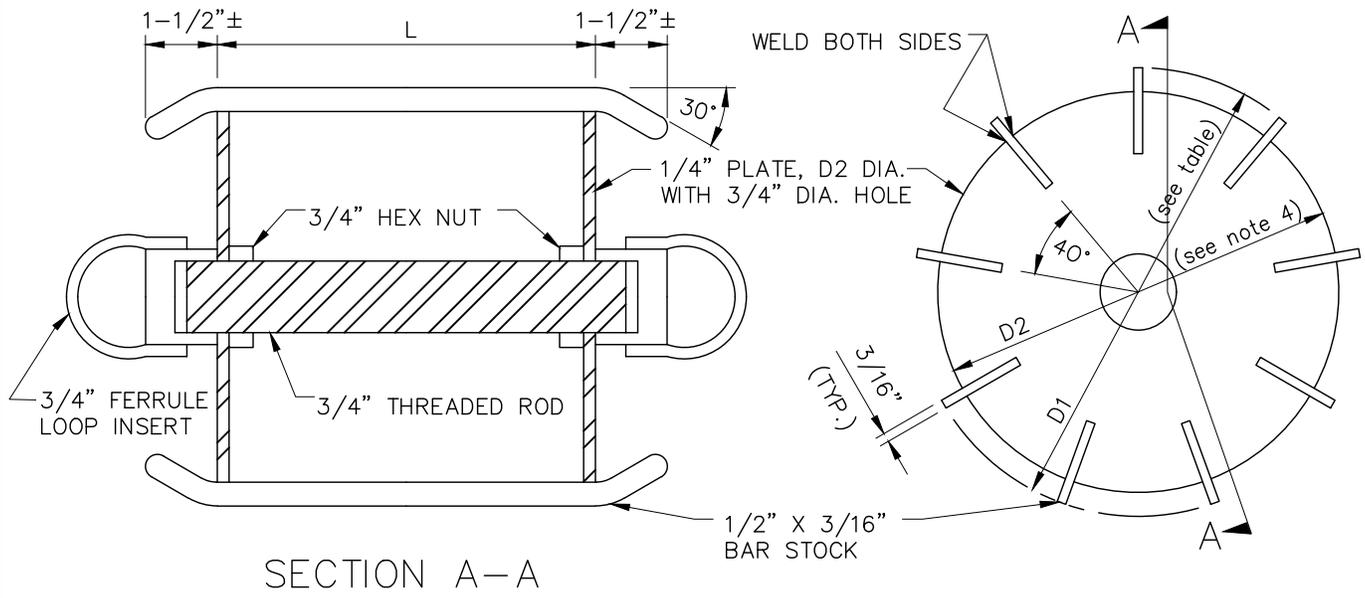
DETAIL SHEET NOTES ①

1. Clearances shall be 1' minimum. If 1' clearance is unachievable, obtain approval of City Engineer.



DESIGN AND CONSTRUCTION STANDARDS
**MISCELLANEOUS PIPE INSTALLATION
 DETAILS**
Craig A. Scott
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STD. NO.
517
 PAGE 1 OF 1
 DECEMBER 2019
 SCALE: NONE



SECTION A-A

		MANDREL DIAMETER (D-1) SEE NOTE 3	
		5% DEFLECTION	
NOM. PIPE DIA.	L	SDR35	SDR26
6"	6"	5.619	5.503
8"	8"	7.524	7.366
10"	10"	9.405	9.207
12"	12"	11.191	10.961
15"	15"	13.849	13.559

NOTES:

1. MARK ALL MANDRELS WITH ASTM SPECIFICATION NUMBER, SDR NUMBER AND DEFLECTION.
2. THE 1/2" BAR STOCK ON EDGE PROVIDES CLEARANCE TO PASS SMALL AMOUNTS OF SOIL WHICH MAY BE IN PIPE.
3. MANDREL DIAMETER HAS BEEN CALCULATED BASED ON SECTION 306-1.2.12 OF THE "GREENBOOK" STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND/OR DIMENSIONS GIVEN IN TABLE 1 OF ASTM STANDARD D3404.
4. PLATE DIAMETER SHALL BE 1" LESS THAN THE MANDREL DIAMETER.



DESIGN AND CONSTRUCTION STANDARDS

PVC SEWER PIPE DEFLECTION MANDREL

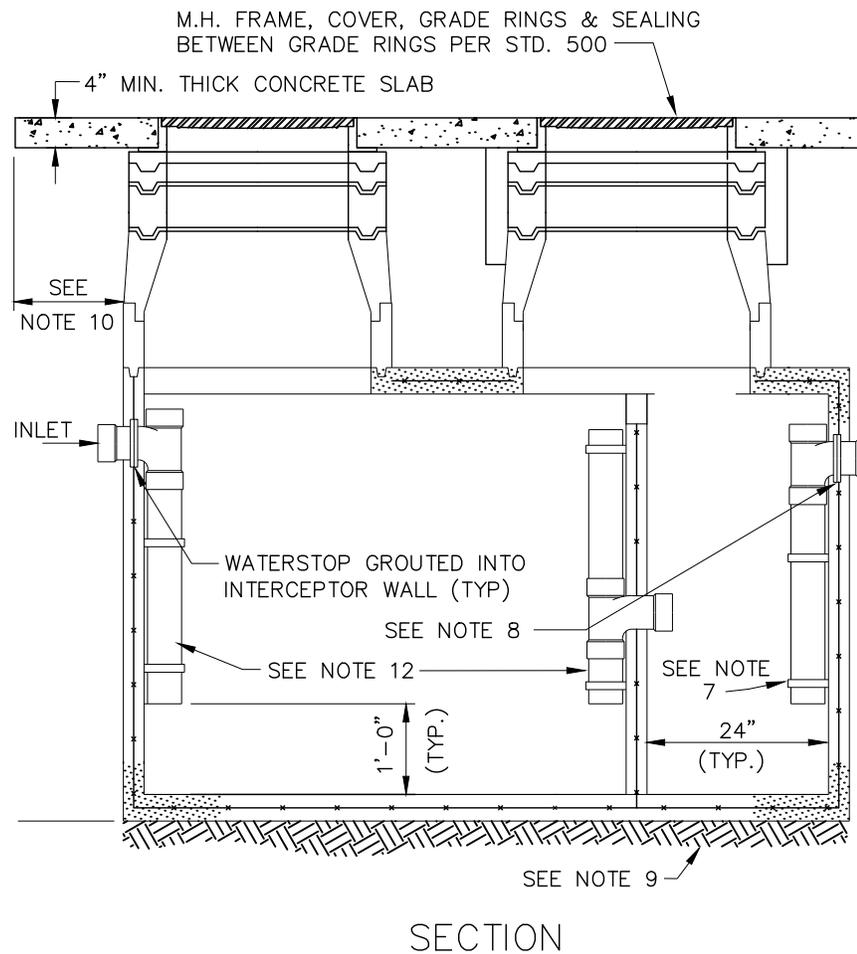
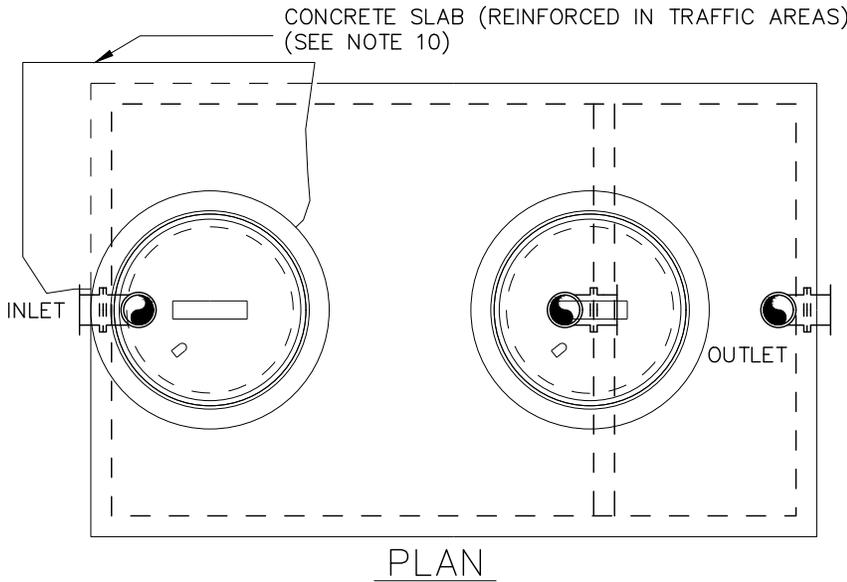
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DECEMBER 2019

STD. NO.
518

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. PREMANUFACTURED TANK SHALL BE PER ENGINEER'S APPROVED LIST.
2. ALL GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE PUBLIC RIGHT-OF-WAY EXCEPT WITH THE WRITTEN APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.
3. GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE OF BUILDINGS IN A LOCATION ACCESSIBLE TO WASTEHAULER PUMPER. LOCATION SUBJECT TO THE APPROVAL OF THE DIRECTOR OF UTILITIES.
4. TANK CAPACITY TO BE DETERMINED AT THE TIME OF PERMIT APPLICATION.
5. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBSTITUTED FOR REVIEW BY THE CITY.
6. INTERCEPTOR TO BE USED IN CONJUNCTION WITH "SAMPLING MANHOLE" PER CITY STD. 521.
7. STAINLESS STEEL CLAMP AND BOLTS 3'-0" O.C. MAX. (TYP) MIN. TWO REQUIRED.
8. A WATERSTOP CONSISTING OF A STANDARD MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUDED INTO THE INTERCEPTOR WALL NEAR THE CENTER OF THE INLET AND OUTLET WALLS.
9. PLACE 3" MIN. BEDDING MATERIAL PER CITY STANDARD 126.
10. CONCRETE SLAB TO EXTEND MIN. 24" BEYOND ALL SIDES OF TANK IN TRAFFIC AREAS.
11. INSTALL INTERCEPTOR PER MANUFACTURER'S STANDARDS.
12. PIPE AND FITTINGS TO BE 4" SCHEDULE 40 PVC DWV.
13. ALL SURFACE WATER MUST DRAIN AWAY FROM MANHOLES.
14. ALL WASTE MUST ENTER THROUGH INLET FITTINGS ONLY.
15. PROTECTIVE COATING SHALL COVER ALL INTERNAL SURFACES AND MEET THE CRITERIA OF ASTM-309.



DESIGN AND CONSTRUCTION STANDARDS

TWO-STAGE GREASE INTERCEPTOR

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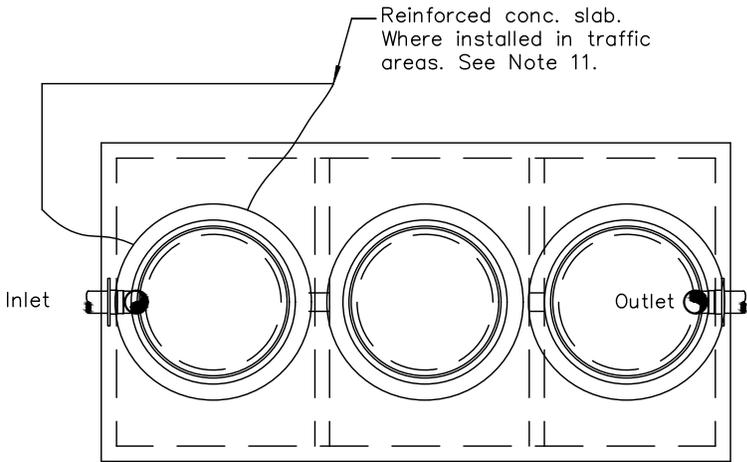
DECEMBER 2019

STD. NO.

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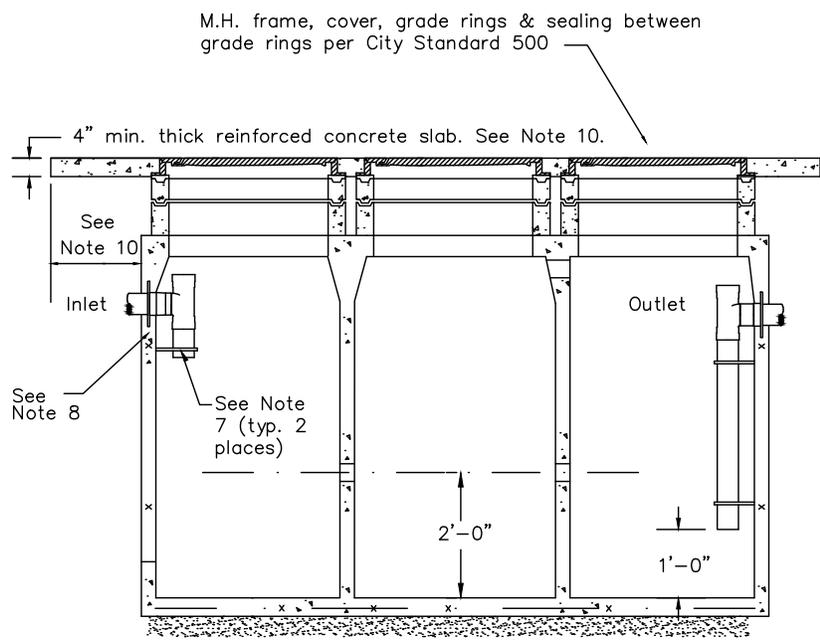
PAGE 1 OF 1

SCALE: NONE



Note:
All waste must enter through inlet fitting only.

PLAN



SECTION

Notes:

1. Pre manufactured tank shall be per Engineer's approved list.
2. All grease interceptors shall be located outside public right-of-way except with written approval of the Engineering Dept.
3. Grease interceptors shall be located outside of buildings in a location accessible to wastehauler pumper. Location subject to the approval of City Engineer.
4. Tank capacity to be determined at the time of permit application.
5. Alternate design by a Registered Engineer may be substituted for review by the City.
6. Interceptor to be used in conjunction with "Sampling Manhole" per City Std. 521.
7. Stainless steel clamp and bolts 3'-0" o.c. max. (typ.) min. 2 required.
8. A waterstop consisting of a standard manhole adapter gasket as supplied by the pipe manufacturer shall be grouted into the interceptor wall near the center of the inlet and outlet walls.
9. Place 3" min. bedding material per City Standard 126.
10. Supplier to provide adequate reinforcing for proposed depth of cover and location. Include adequate live load.
11. Concrete slab to extend min. 24" beyond all sides of tank in traffic areas. Slab shall be designed and approved for HS20 rating for traffic areas.
12. Install interceptor per manufacturer's specifications.
13. Pipe and fittings to be 4" schedule 40 PVC DWV.
14. All surface water must drain away from manholes.
15. Protective coating shall cover all internal surfaces and meet the criteria of ASTM-C1315.



DESIGN AND CONSTRUCTION STANDARDS

THREE-STAGE SAND AND GREASE INTERCEPTOR

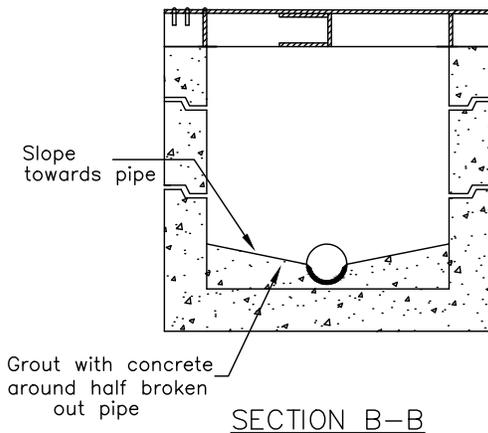
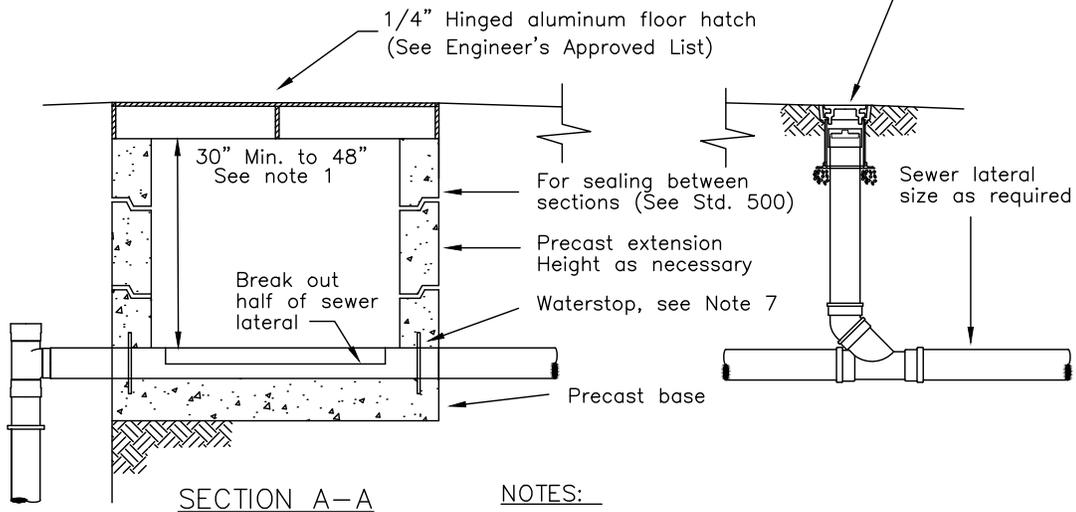
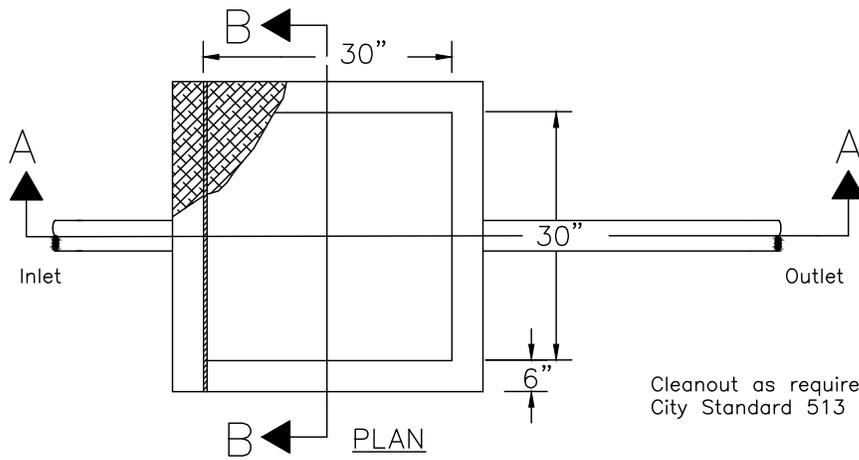
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DECEMBER 2019

STD. NO.
520

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. If less than 30", review with Industrial Waste Division for additional vault requirements. If greater than 48", install sampling manhole similar to Standard 500 or 502 with flow-through cutaway pipe as per this standard.
2. Sampling manhole to be located outside of Public Right of way except with written approval of the City Engineer.
3. An alternative design by a Registered Engineer may be submitted for review by the City Engineer's Office.
4. Location subject to the approval of the City Engineer.
5. Manhole shall be 30" x 30" inside dimension precast box with 24" x 24" hinged aluminum floor hatch.
6. All surface water must drain away from sampling manhole.
7. A waterstop consisting of a standard manhole adapter gasket as supplied by the pipe manufacturer to be grouted into the box wall near the center of the wall.



DESIGN AND CONSTRUCTION STANDARDS

SAMPLING MANHOLE
EXTERIOR USE

Craig A. Scott
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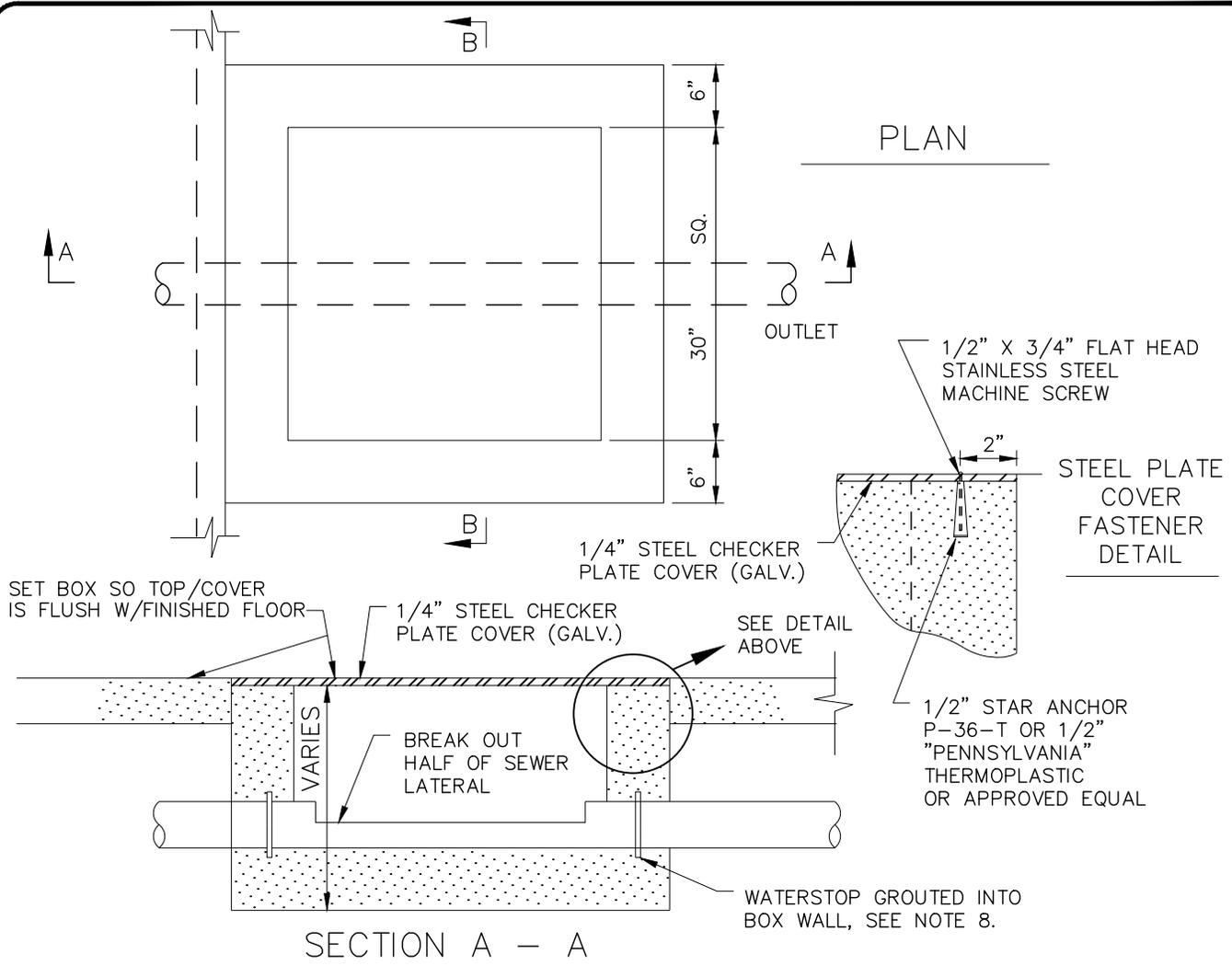
DECEMBER 2019

STD. NO.

521

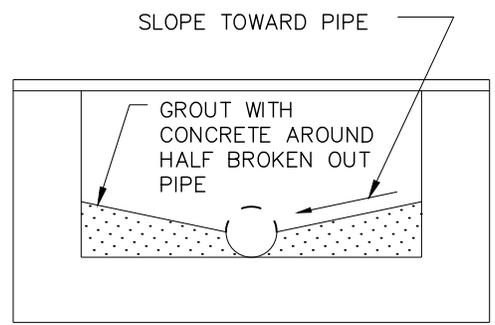
PAGE 1 OF 1

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NOTES:

1. TO BE USED IN THE INTERIOR OF BUILDINGS IN CONJUNCTION W/SAMPLING MANHOLE AND TO BE UPSTREAM OF THE SAMPLING MANHOLE.
2. LOCATION SUBJECT TO THE APPROVAL OF THE TOWN ENGINEER. TO BE USED ONLY WITH THE APPROVAL OF THE CITY ENGINEER.
3. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW BY THE CITY
4. BOX SHALL BE SANTA ROSA CAST PRODUCTS MODEL 5K OR APPROVED EQUAL.
5. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING BOX.
6. SAMPLING BOX TO BE USED IN CONJUNCTION WITH EITHER STDS. 519 OR 520.
7. A WATERSTOP CONSISTING OF A STANDARD MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUDED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.



SECTION B - B



DESIGN AND CONSTRUCTION STANDARDS

**SAMPLING BOX
BUILDING INTERIOR**

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

STD. NO.

522

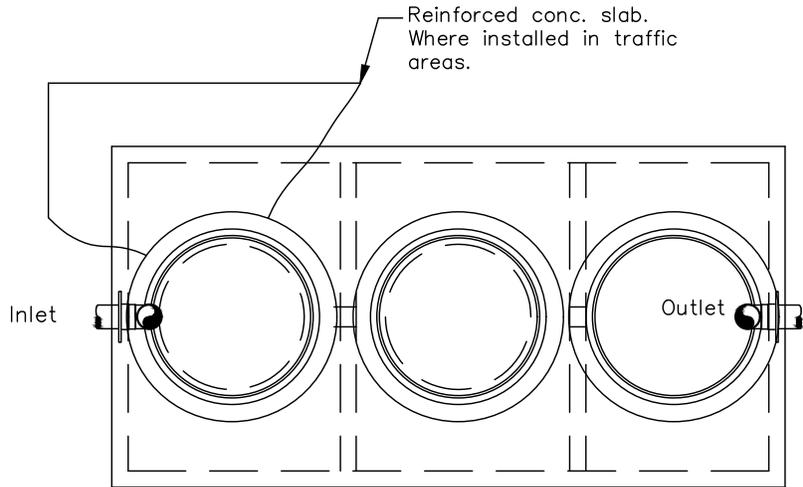
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DECEMBER 2019

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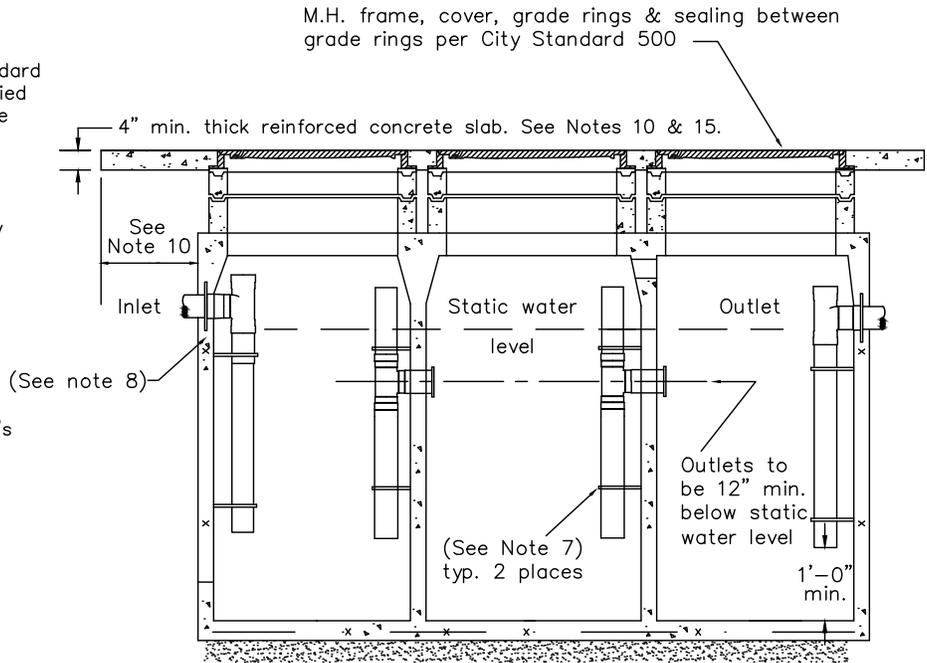
Notes:

1. Pre manufactured tank shall be per Engineer's approved list.
2. All grease interceptors shall be located outside public right-of-way except with written approval of the City Engineer.
3. Grease interceptors shall be located outside of buildings in a location accessible to waste hauler pumper. Location subject to the approval of City Engineer.
4. Tank capacity to be determined at the time of permit application.
5. Alternate design by a Registered Engineer may be substituted for review by the City.
6. Interceptor to be used in conjunction with "Sampling Manhole" per City Std. 521.
7. Stainless steel clamp and bolts 3'-0" o.c. max. (typ.) min. 2 required.
8. A waterstop consisting of a standard manhole adapter gasket as supplied by the pipe manufacturer shall be grouted into the interceptor wall near the center of the inlet and outlet walls.
9. 3" min. bedding material per City Trench Standard 126.
10. Concrete slab to extend min. 24" beyond all sides of tank in traffic areas. Slab shall be designed and approved for HS20 rating for traffic areas.
11. Install interceptor per manufacturer's specifications.
12. Pipe and fittings to be 4" schedule 40 PVC DWV.
13. All surface water must drain away from manholes.
14. Protective coating shall cover all internal surfaces and meet the criteria of ASTM-309.
15. Supplier to provide adequate reinforcing for proposed depth of cover and location. Include adequate live load.



Note:
All waste must enter through inlet fitting only.

PLAN



SECTION



DESIGN AND CONSTRUCTION STANDARDS

THREE-STAGE
GREASE INTERCEPTOR

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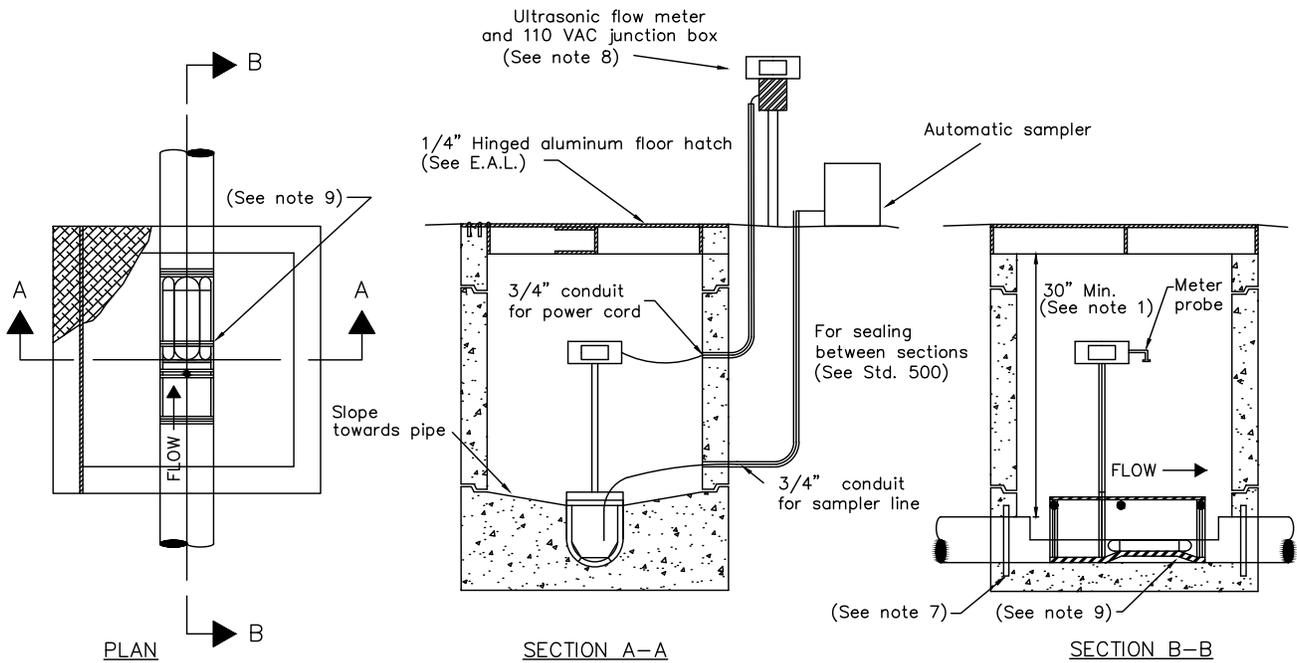
DECEMBER 2019

STD. NO.

523

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. IF DEPTH IS LESS THAN 30", REVIEW WITH ENVIRONMENTAL SERVICES DIVISION FOR ADDITIONAL VAULT REQUIREMENTS. IF GREATER THAN 48", INSTALL SAMPLING MANHOLE SIMILAR TO STANDARD 500 WITH FLOW-THROUGH CUTAWAY PIPE AS PER THIS STANDARD.
2. SAMPLING MANHOLE TO BE LOCATED OUTSIDE OF PUBLIC RIGHT-OF-WAY EXCEPT WITH WRITTEN APPROVAL OF THE CITY ENGINEER. THE SAMPLING MANHOLE SHALL BE SITUATED IN A SECURE LOCATION.
3. AN ALTERNATIVE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW BY THE CITY ENGINEER.
4. LOCATION SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
5. MANHOLE SHALL BE 30" X 30" INSIDE DIMENSION PRECAST BOX WITH 24" X 24" HINGED ALUMINUM FLOOR HATCH.
6. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING MANHOLE.
7. A WATERSTOP CONSISTING OF A STANDARD MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER TO BE GROUTED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.
8. INSTALL 110 VAC JUNCTION BOX FOR 4-20MA TO PROVIDE PULSE OUTPUT FOR FLOW PROPORTIONAL SAMPLING.
9. INSTALL A PALMER BOWLUS, PARSHALL STYLE FLUME, OR APPROVED EQUAL PER MANUFACTURER'S RECOMMENDATIONS. FLUME SHALL BE PLACED IN THE CENTER OF THE BOX.



DESIGN AND CONSTRUCTION STANDARDS

CONTROL SAMPLING MANHOLE

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

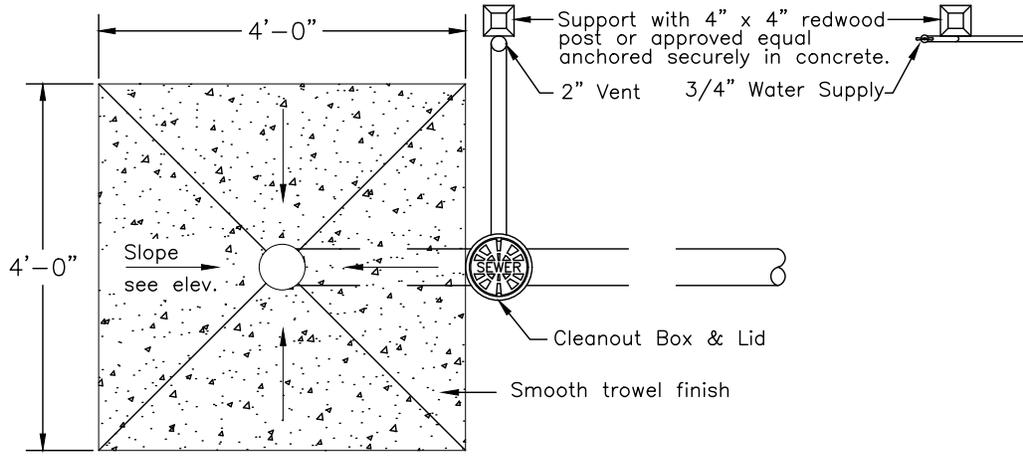
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PAGE 1 OF 1

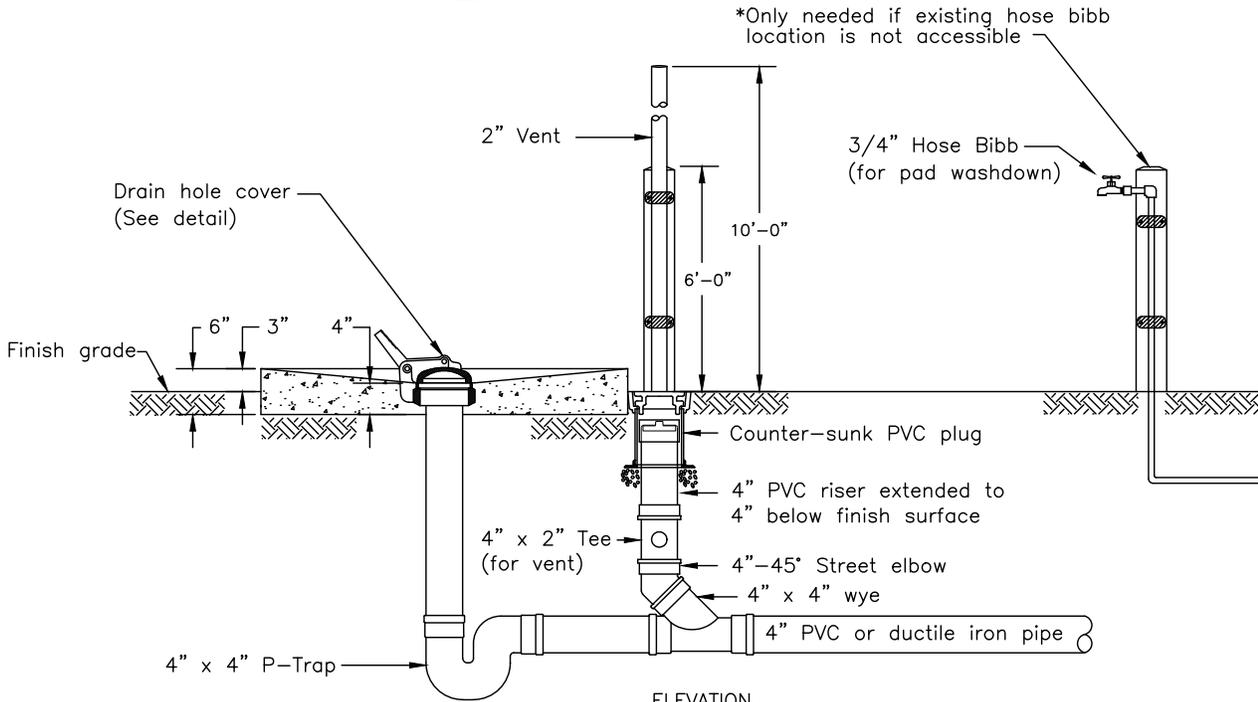
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CONCRETE PAD

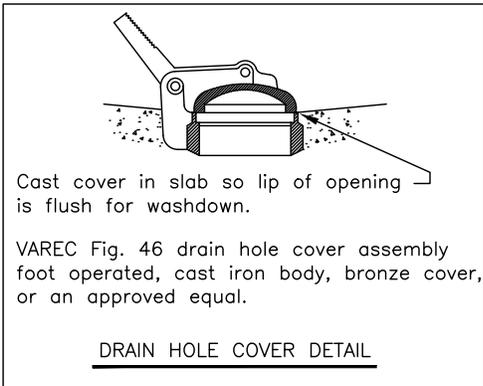
Reinforced with
6" x 6" / 10 x 10
welded wire fabric



PLAN VIEW



ELEVATION



NOTES:

1. Must install Reduced Pressure Backflow Prevention Device on water service prior to installation of this disposal facility. See Std. 876.
2. See Std. 513 & Engineer's approved list for cleanout box and cover.



DESIGN AND CONSTRUCTION STANDARDS

RECREATIONAL VEHICLE DISPOSAL FACILITY

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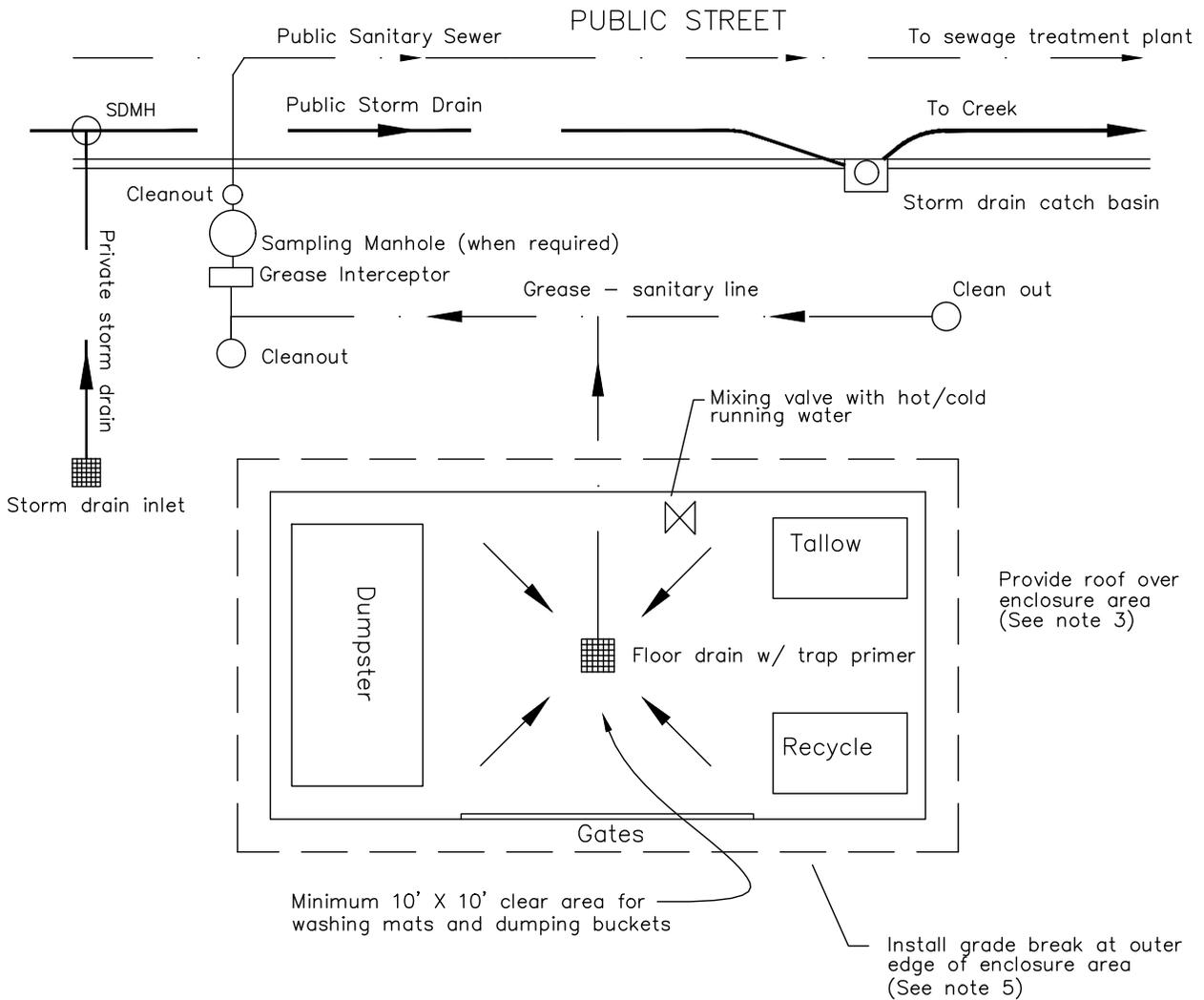
DECEMBER 2019

STD. NO.

525

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. ALL WASTE STORAGE, RECYCLING CONTAINERS INCLUDING DUMPSTERS, TALLOW BINS, AND MAT WASHING TO BE LOCATED IN AN ENCLOSED AREA. THE ENCLOSURE SHALL BE DESIGNED TO PREVENT ANY WASTE OR GARBAGE FROM ENTERING THE STORM DRAIN SYSTEM, TO CONTAIN SPILLS WITHIN THE ENCLOSURE, FACILITATE CLEANING, AND TO PREVENT RAINWATER FROM ENTERING THE ENCLOSURE.
2. MINIMUM HEIGHT OF ENCLOSURE SHALL BE 7 FEET.
3. A ROOF STRUCTURE IS REQUIRED TO PREVENT RAIN WATER FROM ENTERING THE DUMPSTERS, CONTAINERS, OR THE SANITARY SEWER. ROOF STRUCTURE SHALL BE HIGH ENOUGH TO ALLOW CLEARANCE FOR OPENING DUMPSTERS.
4. THE ENCLOSURE SHALL HAVE A FLOOR DRAIN, WITH TRAP PRIMER, AND SHALL BE CONNECTED TO A GREASE INTERCEPTOR WHICH DISCHARGES TO THE SANITARY SEWER. THE FLOOR DRAIN SHALL BE CONNECTED TO A MINIMUM SIZE INTERCEPTOR EQUIVALENT TO A ZURN MODEL Z1170, SIZE 700 35/70 GREASE TRAP EQUIPPED WITH A FLOW CONTROL VALVE.
5. FINISHED SURFACES SURROUNDING ENCLOSURE SHALL PROVIDE DRAINAGE AWAY FROM ENCLOSURE.
6. ALL FOOD FACILITY ENCLOSURES REQUIRE A BUILDING PERMIT AND DESIGN REVIEW APPROVAL FROM THE BUILDING DEPARTMENT. THE ENCLOSURE SHALL CONFORM TO ALL PROVISIONS OF THE CALIFORNIA FIRE CODE AND CALIFORNIA BUILDING CODE. ENCLOSURE WALLS AND ROOF MUST BE DESIGNED BY AN LICENSED ARCHITECT, CIVIL ENGINEER OR STRUCTURAL ENGINEER.
7. THIS STANDARD SHALL APPLY TO ATTACHED OR DETACHED FOOD FACILITY ENCLOSURES.



DESIGN AND CONSTRUCTION STANDARDS

FOOD FACILITY ENCLOSURE

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DECEMBER 2019

STD. NO.

526

PAGE 1 OF 1

SCALE: NONE

Testing. After pipe installation, placement and compaction of backfill, and after satisfactory compaction results have been obtained, but prior to placement of pavement, all sewer lines and manholes shall be tested. The Contractor must assume the risk of correcting defects in workmanship or materials revealed by the tests.

Air Pressure Test. Each section of sewer shall be tested between manholes by plugging and bracing all openings in the sewer main line and the upper ends of a house sewer connection. Contractor shall use calibrated gauges with a psi range of 0-10 psi, and a maximum increment of 0.2 psi. The leakage test shall be conducted in the following manner:

Air shall be introduced into the pipeline until 3.0 psi gauge pressure has been reached, at which time the flow of air shall be reduced and the internal air pressure shall be maintained between 2.5 and 3.5 psi for at least 2 minutes. Pressure in the pipeline shall be constantly monitored by a gauge and shall not be allowed to exceed 5 psi.

After the temperature has stabilized and no air leaks at the plugs have been found, the air pressure shall be permitted to drop to 2.5 psi, then a stopwatch or sweep-second-hand watch shall be used to determine the time lapse required for the air pressure to drop to 1.5 psi.

If the time lapse is less than that shown in the table on STD 531, the necessary repairs must be made prior to acceptance by the Engineer.

The Sewer Infiltration Test. In areas of high ground water, an infiltration test shall be conducted. The amount of water collected and measured during the test period from the section being tested shall not exceed a rate of 25 gal/dia/in/mi/day. The test period shall be a minimum of 30 minutes.

Television (TV) Camera Inspection. In addition to the above, the Contractor shall hire an independent television inspection service to perform a closed-circuit television inspection of all newly constructed sewers. A DVD of the television inspection shall be produced and delivered to the Engineer in color DVD format, together with a typed log of the inspection. This inspection shall be performed before streets are paved.

The Contractor shall provide suitable access for the TV Inspection vehicle to the satisfaction of the City Engineer. In general, the TV Inspection shall be performed after trench compaction is successfully completed. The City Engineer may require TV Inspection after trench and roadway base material compaction and after any other construction that may damage the sewer line (water, storm drain, gas, etc.).

The Contractor shall notify the Public Works Inspector 48 hours in advance of the date for television inspection. During this inspection, the Contractor or his authorized representative shall be present to observe the video pictures as provided by the television camera.

The following videotape observations shall be considered defects in the construction of the sewer pipelines and will require corrections prior to acceptance:

1. Off grade - 1" in 10', or over, deviation from grade;
2. Joint separations
3. Offset joints - over 3/8" minimum offset at invert, or 1% of I.D., whichever is smaller.
4. Chips in pipe ends - none more than 1/4" deep;
5. Cracked or damaged pipe or evidence of the presence of an external object bearing upon the pipe (rocks, roots, etc.);
6. Infiltration;
7. Debris or other foreign objects;
8. Other obvious deficiencies when compared to Approved Plans and Specifications, these Standards and Standard drawings. (continued on City Std. 530B)



DESIGN AND CONSTRUCTION STANDARDS

GENERAL SEWER SYSTEM TESTING

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

530A

PAGE 1 OF 1

SCALE: NONE

The Contractor shall notify the City in writing of any deficiencies revealed by the television inspection that will require repair, following which the Contractor shall excavate and make the necessary repairs and request a television re-inspection. Television re-inspection shall be at the Contractor's expense.

Mandrel Test. Flexible pipe must also be cleaned and tested with a mandrel having a cross section of at least 95 percent of the specified average inside diameter. This test will be conducted as outlined in Standard Specifications for Public Works Construction Section 306 - 1.2.12 and City STD. 518.

Obstructions due to deflection shall be corrected by replacement of the over-deflected pipe, not by re-rounding in place.

If a section of pipe fails to meet the mandrel test and is reinstalled and fails the second time, said section(s) of pipe shall be replaced with an approved rigid pipe material.

The Contractor shall retest the pipe using a mandrel with an effective circular cross section having a diameter of at least 95% of the specified average inside diameter eleven (11) months after recordation of Notice of Completion or after the acceptance by the City Council of a subdivision. Any pipe which fails to pass the mandrel test shall be replaced at the expense of the Contractor. The City reserves the right to determine the longitudinal limits of any pipe that is required to be replaced. Pipe replacement shall be guaranteed by the project maintenance bond.

Repair and Retesting. Sections failing any required test shall be repaired by means acceptable to the Engineer. Even if the test for leakage is within the prescribed limits, the Contractor shall repair any obvious leaks. Retesting is required of repaired areas before final acceptance of the sewers by the Engineer.

Force Mains. All force mains shall be subject to hydrostatic and leak testing as defined in Section 99-1.18 Hydrostatic Test. The high point of all changes in slope shall have combination air and vacuum/airs release valves per City STD. 534. Where City STD. 534 references Water Main in this detail Sewer Force Main is substituted. Blow-offs shall be placed at low points and shall be specifically designed for Sanitary Sewer Force Mains.



DESIGN AND CONSTRUCTION STANDARDS

GENERAL SEWER SYSTEM TESTING

Craig A. Scott
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DECEMBER 2019

STD. NO.

530B

PAGE 1 OF 1

SCALE: NONE

Manhole Tests Required

Vacuum Test: Each manhole shall be tested immediately after assembly and again prior to paving. Vacuum testing requires the following steps:

- (a) All lift holes shall be plugged with an approved non-shrink grout.
- (b) All pipes entering the manhole shall be plugged, taking care to securely brace the plug from being drawn into the manhole.
- (c) The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations.
- (d) A vacuum of 10 inches of mercury shall be drawn and the vacuum shut off. With the valves closed, the time shall be measured for the vacuum drop to 9 inches. The manhole shall pass if the time is greater than 60 seconds for 48 inch diameter, 75 seconds for 60 inch diameter, and 90 seconds for 72 inch diameter manholes.

(Alternate - As approved by City Engineer) Water Test: A leakage test shall be made for each manhole. This test shall be made by plugging all the openings into the manhole and filling the manhole with water to an elevation not greater than one foot below a fixed point on the metal manhole rim. The water should be introduced into the test manhole at least four hours in advance of the official test period to allow the manhole material to become saturated. The manhole shall then be refilled to the original water level at the start of the official test period. After a period of four hours, the water elevation shall be measured from the same point on the manhole rim and the loss of water during the test period calculated; enough water shall be measured into the manhole to restore the water to the level existing at the beginning of the test, and the amount added taken as the total leakage.

The allowable leakage at the manhole during the four hour test period shall be 0.55 gallons per each foot of manhole depth (for a 4' diameter manhole), as measured from the lowest point in the manhole to the original water level. Should an initial test show excess leakage in the manhole, the manhole shall be waterproofed by grouting and/or other approved waterproofing methods satisfactory to the Engineer and the test repeated until an acceptable total leakage is obtained. For a 5' diameter manhole, allowable leakage shall be 0.85 gallons per each foot of manhole depth.



DESIGN AND CONSTRUCTION STANDARDS

SEWER MANHOLE TESTING

Craig A. Scott
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DECEMBER 2019

STD. NO.

530C

PAGE 1 OF 1

SCALE: NONE

TIME (T) in Seconds

Main Line		4" Laterals					Main Line		6" Laterals				
Dia. (in)	Length (ft)	House Connection Length (ft)					Dia. (in)	Length (ft)	House Connection Length (ft)				
		0	100	200	300	400			0	100	200	300	400
8"	0	0	20	40	50	70	8"	0	0	40	80	100	100
	50	40	50	70	90	80		50	40	70	110	110	110
	100	70	90	100	100	90		100	70	110	120	110	110
	150	110	120	110	100	100		150	110	120	120	120	110
	200	140	120	110	110	100		200	140	130	120	120	120
	300	140	130	120	110	110		300	140	130	120	120	120
400	140	130	120	120	110	400	140	130	130	120	120		
10"	50	50	70	90	100	90	10"	50	50	90	120	120	110
	100	110	130	120	110	110		100	110	140	130	130	120
	200	170	150	140	130	120		200	170	150	140	140	130
	300	170	160	150	140	130		300	170	160	150	140	140
	400	170	160	150	150	140		400	170	160	150	150	140
12"	50	80	100	110	110	110	12"	50	80	120	140	130	120
	100	160	170	150	140	130		100	160	170	150	140	140
	200	200	180	170	160	150		200	200	180	170	160	150
	300	200	190	180	170	160		300	200	190	180	170	160
	400	200	190	180	180	170		400	200	190	180	180	170
15"	50	120	140	160	140	130	15"	50	120	160	160	150	140
	100	250	220	190	170	160		100	250	210	190	170	160
	200	260	230	220	200	190		200	260	230	210	200	190
	300	260	240	230	220	210		300	260	240	220	210	200
	400	260	240	230	220	220		400	260	240	230	220	210
18"	50	180	200	190	170	150	18"	50	180	220	190	170	160
	100	310	260	230	210	190		100	310	260	220	200	190
	200	310	280	260	250	230		200	310	280	260	240	220
	300	310	290	280	260	250		300	310	290	270	260	240
	400	310	290	280	270	260		400	310	290	280	270	260
21"	50	240	260	230	200	180	21"	50	240	260	220	200	180
	100	360	310	280	250	230		100	360	300	260	240	220
	200	360	330	310	290	280		200	360	330	300	280	260
	300	360	340	320	310	300		300	360	330	320	300	290
	400	360	340	330	320	310		400	360	340	330	310	300
24"	50	320	320	270	240	210	24"	50	320	310	260	220	200
	100	410	360	320	290	270		100	410	350	310	280	260
	200	410	380	360	340	320		200	410	370	350	320	310
	300	410	390	370	360	350		300	410	380	360	350	330
	400	410	390	380	370	360		400	410	390	370	360	350
27"	50	400	370	310	280	250	27"	50	400	350	290	260	230
	100	460	410	370	340	310		100	460	390	350	320	290
	200	460	430	410	390	370		200	460	420	390	370	350
	300	460	440	420	410	390		300	460	430	410	390	380
	400	460	450	430	420	410		400	460	440	420	410	390
30"	50	490	420	360	310	280	30"	50	480	390	330	290	260
	100	510	460	420	380	360		100	510	440	390	360	330
	200	510	480	460	440	420		200	510	470	440	420	390
	300	510	490	470	460	440		300	510	480	460	440	420
	400	510	500	480	470	460		400	510	490	470	460	440
33"	50	560	460	400	350	320	33"	50	560	440	370	320	290
	100	560	510	460	430	400		100	560	490	440	400	370
	200	560	530	510	490	460		200	560	520	490	460	440
	300	560	540	520	510	490		300	560	530	510	490	470
	400	560	550	530	520	510		400	560	540	520	510	490
36"	50	610	510	440	390	360	36"	50	610	480	410	360	320
	100	610	560	510	480	440		100	610	540	480	440	410
	200	610	580	560	530	510		200	610	570	540	510	480
	300	610	590	570	560	540		300	610	590	560	540	520
	400	610	600	580	570	560		400	610	590	570	560	540
39"	50	660	560	490	440	390	39"	50	660	530	450	390	350
	100	660	610	560	520	490		100	660	590	530	480	450
	200	660	630	610	580	560		200	660	620	590	560	530
	300	660	640	620	610	590		300	660	640	610	590	570
	400	660	650	630	620	610		400	660	640	620	610	590
42"	50	710	610	540	480	430	42"	50	710	580	490	430	390
	100	710	660	610	570	540		100	710	640	580	530	490
	200	710	680	660	630	610		200	710	670	640	610	580
	300	710	690	680	660	640		300	710	690	660	640	620
	400	710	700	680	670	660		400	710	690	670	650	640



DESIGN AND CONSTRUCTION STANDARDS

LOW-PRESSURE AIR TEST TABLE

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

STD. NO.

531

PAGE 1 OF 1

DECEMBER 2019

SCALE: NONE

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS OF 8-INCH - 18-INCH DIAMETER FOR MAINS AND 4-INCH AND 6-INCH FOR SERVICES CONFORMING TO ASTM D3034 MAY BE INSTALLED UNDER THIS STANDARD WITH INSTALLATION CONFORMING TO ASTM RECOMMENDED PRACTICE D2321; ASTM D3034 AND D2321 ARE SUBJECT TO CITY STANDARDS FOR TRENCHING AND BACKFILL AND THE MODIFICATIONS BELOW:

1. ELASTOMERIC GASKET JOINTS ARE REQUIRED (ASTM F477). RUBBER GASKET (A-LOCK OR APPROVED EQUAL) AT PIPE / MANHOLE CONNECTION IS REQUIRED.
2. A MINIMUM SDR VALUE OF 26 IS REQUIRED.
3. THE SEWER MAIN SHALL BE PROVED WITH MANDREL BEFORE STREETS ARE PAVED AND ONE MONTH PRIOR TO THE END OF THE WARRANTY PERIOD.

THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS REQUIRED TO PREVENT EXCAVATED OR OTHER FOREIGN MATERIAL FROM GETTING INTO THE PIPE DURING THE LAYING OPERATION. AT ALL TIMES, WHEN LAYING OPERATIONS ARE NOT IN PROGRESS, AT THE CLOSE OF THE DAY'S WORK, OR WHENEVER THE WORKMEN ARE ABSENT FROM THE JOB, CLOSE AND BLOCK THE OPEN END OF THE LAST SECTION OF PIPE PLACED TO PREVENT ENTRY OF FOREIGN MATERIAL OR CREEP OF THE GASKETED JOINTS.

STUBOUTS FROM MANHOLES AND FOR FUTURE CONNECTION BY OTHERS SHALL BE PLUGGED OR CLOSED OFF WITH TEMPORARY PLUGS.

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT THE "UPLIFT" OR FLOATING OF THE LINE PRIOR TO THE COMPLETION OF THE BACKFILLING OPERATION.

A STANDARD PIPE JOINT SHALL BE LOCATED OUTSIDE THE EDGE OF THE STRUCTURE OR MANHOLE ON EACH PIPE CONNECTION TO A STRUCTURE OR MANHOLE. SEE CITY STANDARD STD. - 500.

PVC PIPE IS ONLY ALLOWED WHERE SEWER WILL CARRY FLOWS FROM RESIDENTIAL DEVELOPMENTS. NEITHER PVC PIPE, NOR ANY OTHER FLEXIBLE PIPE ACCEPTED BY THE CITY FOR PARTICULAR APPLICATIONS, SHALL BE UTILIZED IN HORIZONTAL AND/OR VERTICAL CURVE SECTIONS. THESE TYPES OF PIPE ARE ONLY ALLOWED WHERE ENTIRE LENGTH, BETWEEN TWO MANHOLES IS STRAIGHT.



DESIGN AND CONSTRUCTION STANDARDS

PVC SANITARY SEWER

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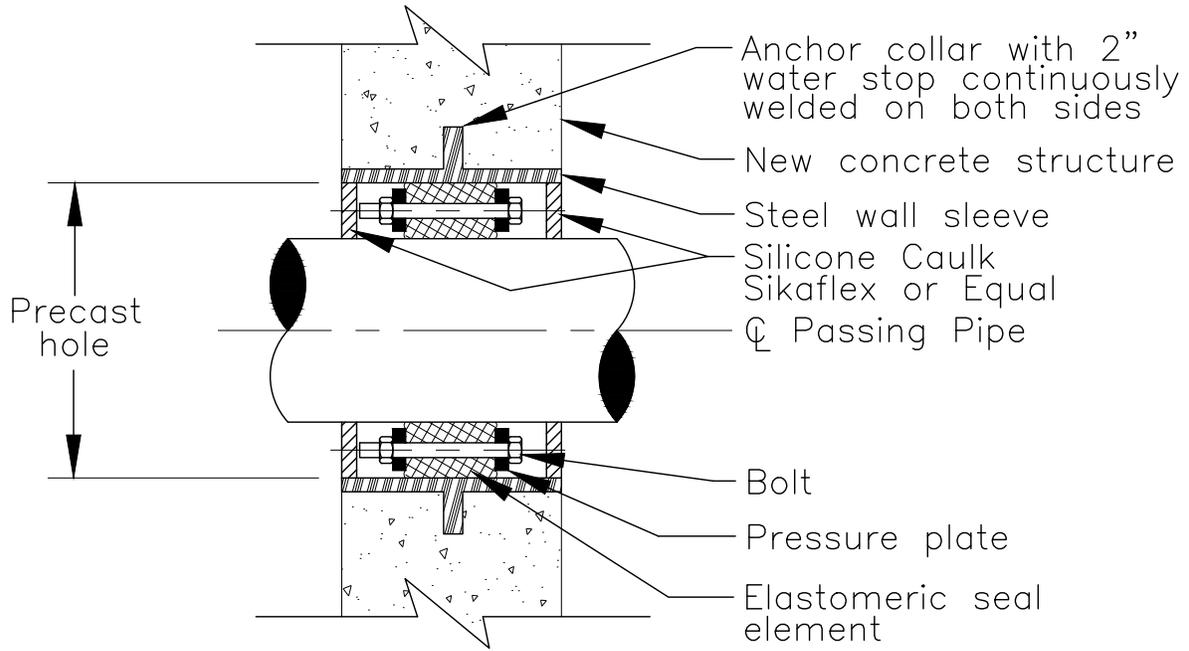
DECEMBER 2019

STD. NO.

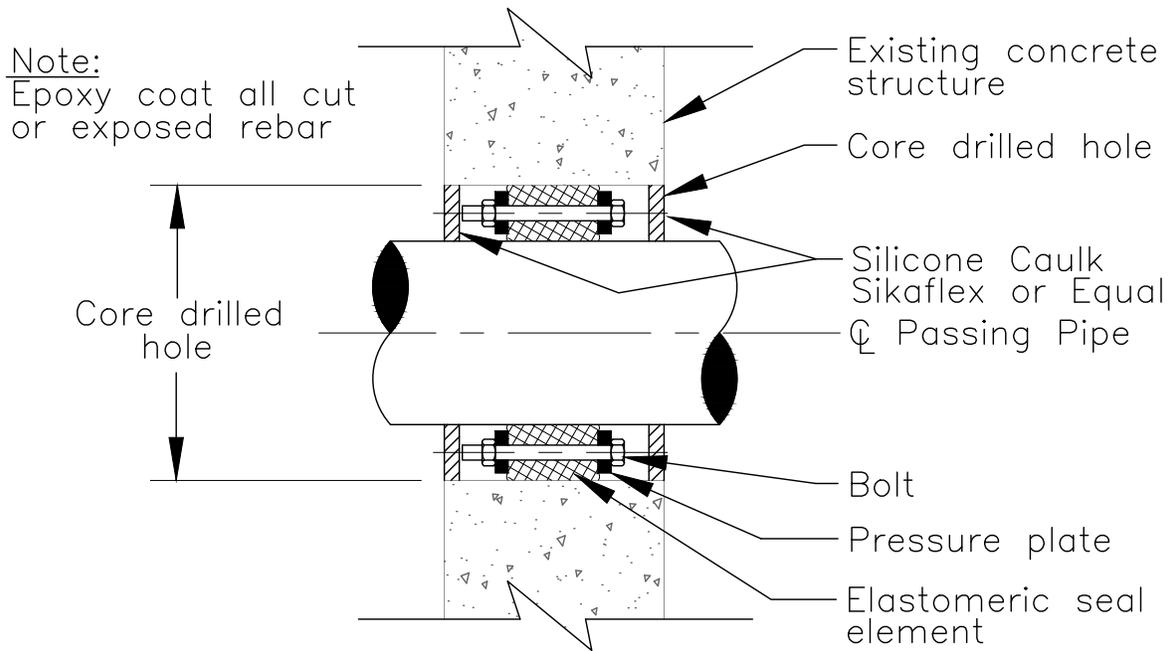
532

PAGE 1 OF 1

SCALE: NONE



NEW CONCRETE STRUCTURE



EXISTING CONCRETE STRUCTURE

APPROVED MODULAR SEALS

See Engineer's Approved List



DESIGN AND CONSTRUCTION STANDARDS

PIPE PENETRATION DETAIL

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DECEMBER 2019

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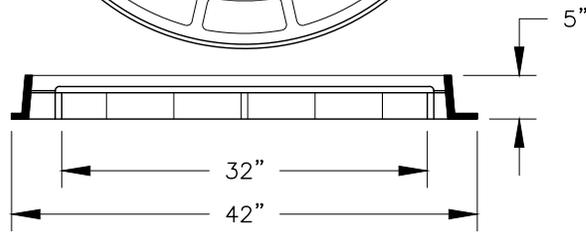
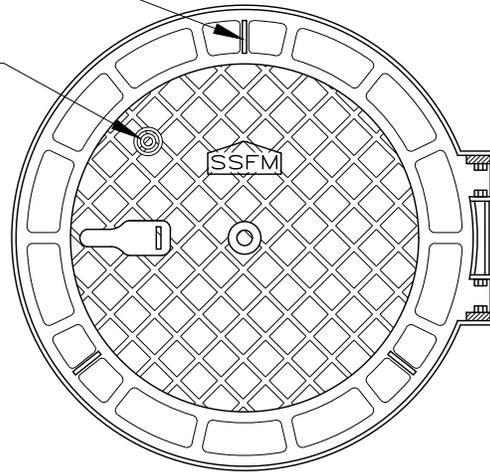
533

PAGE 1 OF 1

SCALE: NONE

Liftings Holes
(typ of 3)

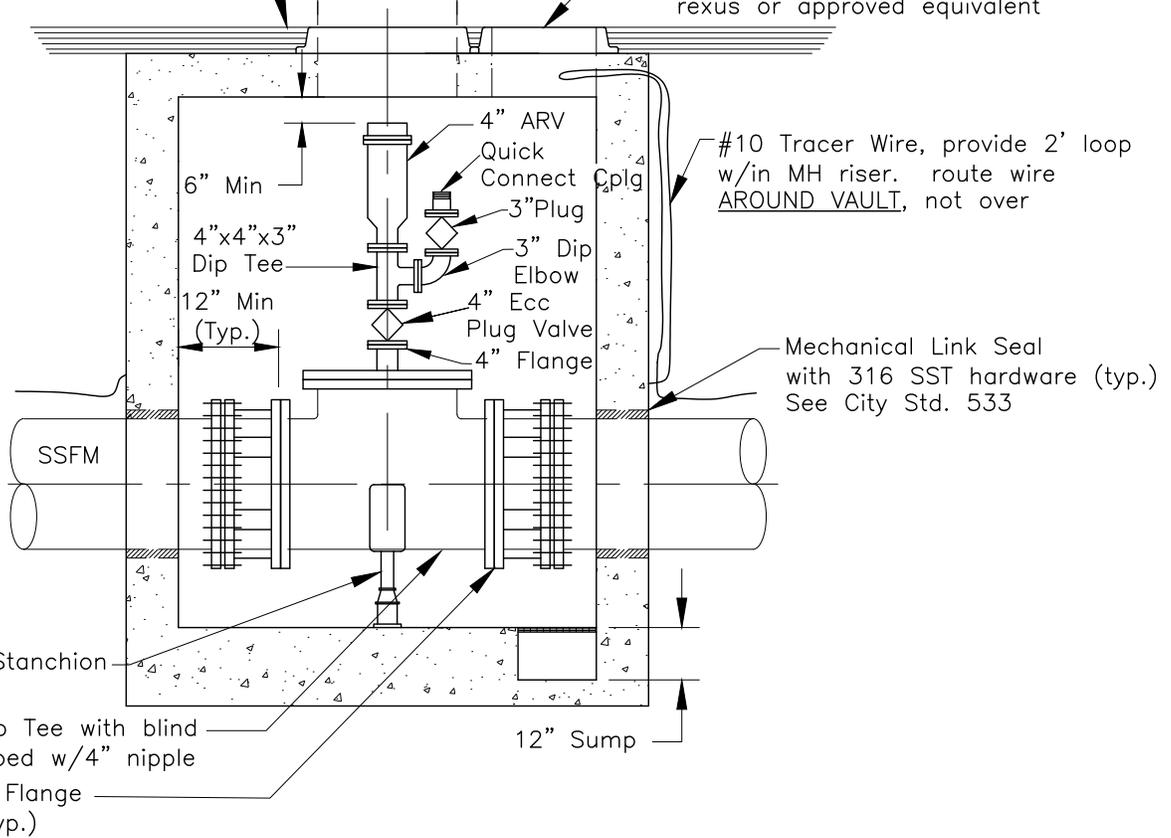
Locking
Mechanism



Manhole Frame and Cover,
see detail above

32"
Opening

Traffic-rated 24" square vented
and hinged MH Cover and 4"
Frame located over sump, par
rexis or approved equivalent



#10 Tracer Wire, provide 2' loop
w/in MH riser. route wire
AROUND VAULT, not over

Mechanical Link Seal
with 316 SST hardware (typ.)
See City Std. 533

SST Pipe Stanchion

Flanged Dip Tee with blind
flange tapped w/4" nipple
Restrained Flange
Adaptor (typ.)

12" Sump



DESIGN AND CONSTRUCTION STANDARDS

4" COMBINATION AIR VALVE FOR
SEWER FORCE MAIN

Craig A. Scott
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STD. NO.

534

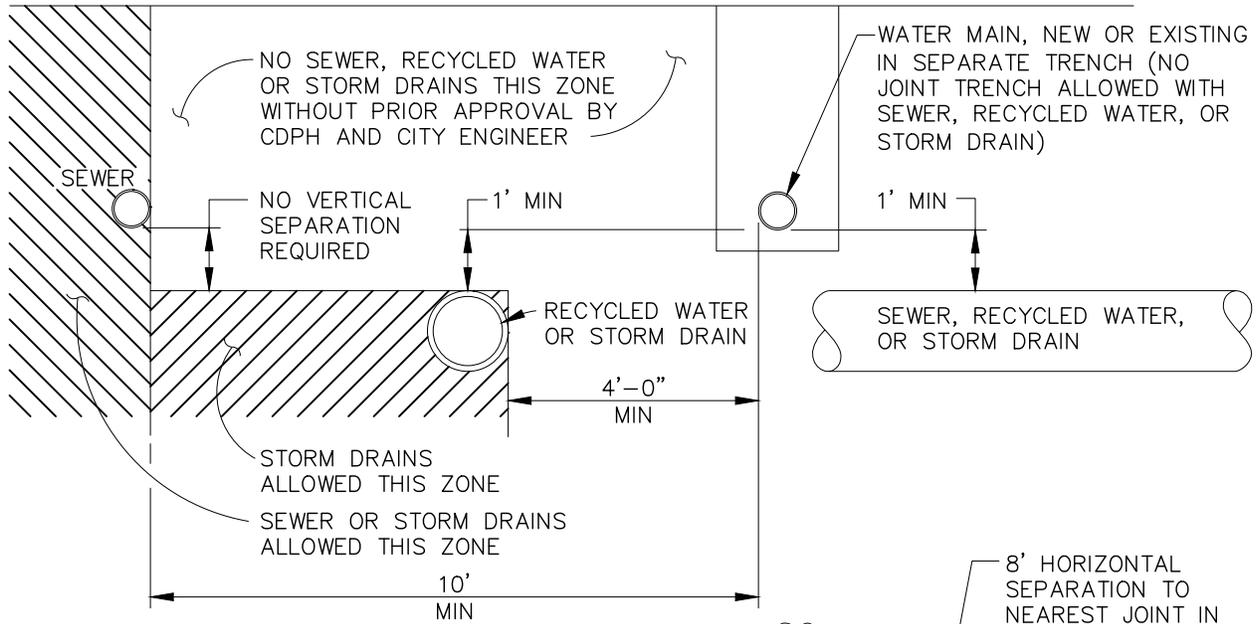
PAGE 1 OF 1

DECEMBER 2019

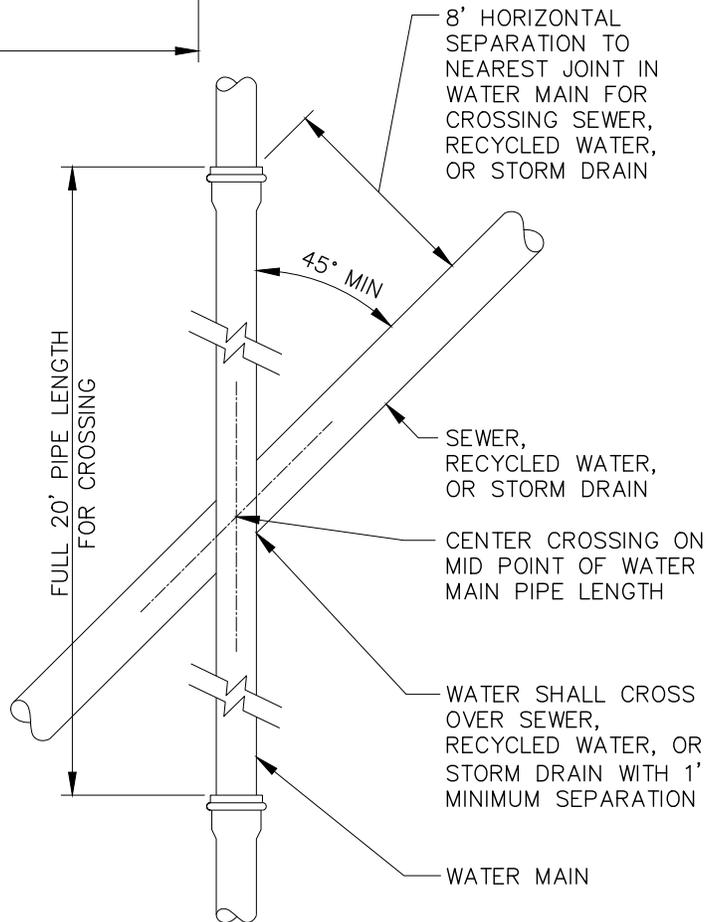
SCALE: NONE

PARALLEL CONSTRUCTION

CROSSINGS



SECTION



CROSSING PLAN

NOTES:

1. WATER MAIN SEPARATION REQUIREMENTS SHALL BE PER CALIFORNIA WATERWORKS STANDARDS, SECTION 64572.
2. REDUCTIONS OF THESE SEPARATION SPECIFICATIONS MAY BE ALLOWED WITH PRIOR APPROVAL FROM CITY ENGINEER AND CALIFORNIA DEPARTMENT OF HEALTH (CDPH).
3. "RECYCLED WATER" IN THIS DETAIL REFERS TO DISINFECTED TERTIARY RECYCLED WATER.
4. "SEWER" IN THIS DETAIL INCLUDES PIPELINES CONVEYING:
 - UNTREATED SEWAGE
 - PRIMARY AND SECONDARY TREATED SEWAGE
 - DISINFECTED SECONDARY EFFLUENT
 - HAZARDOUS FLUID SUCH AS FUELS,
 - INDUSTRIAL WASTES, AND
 - WASTEWATER SLUDGE.



DESIGN AND CONSTRUCTION STANDARDS

WATER, SEWER, RECYCLED WATER & STORM DRAIN PIPELINE SEPARATION

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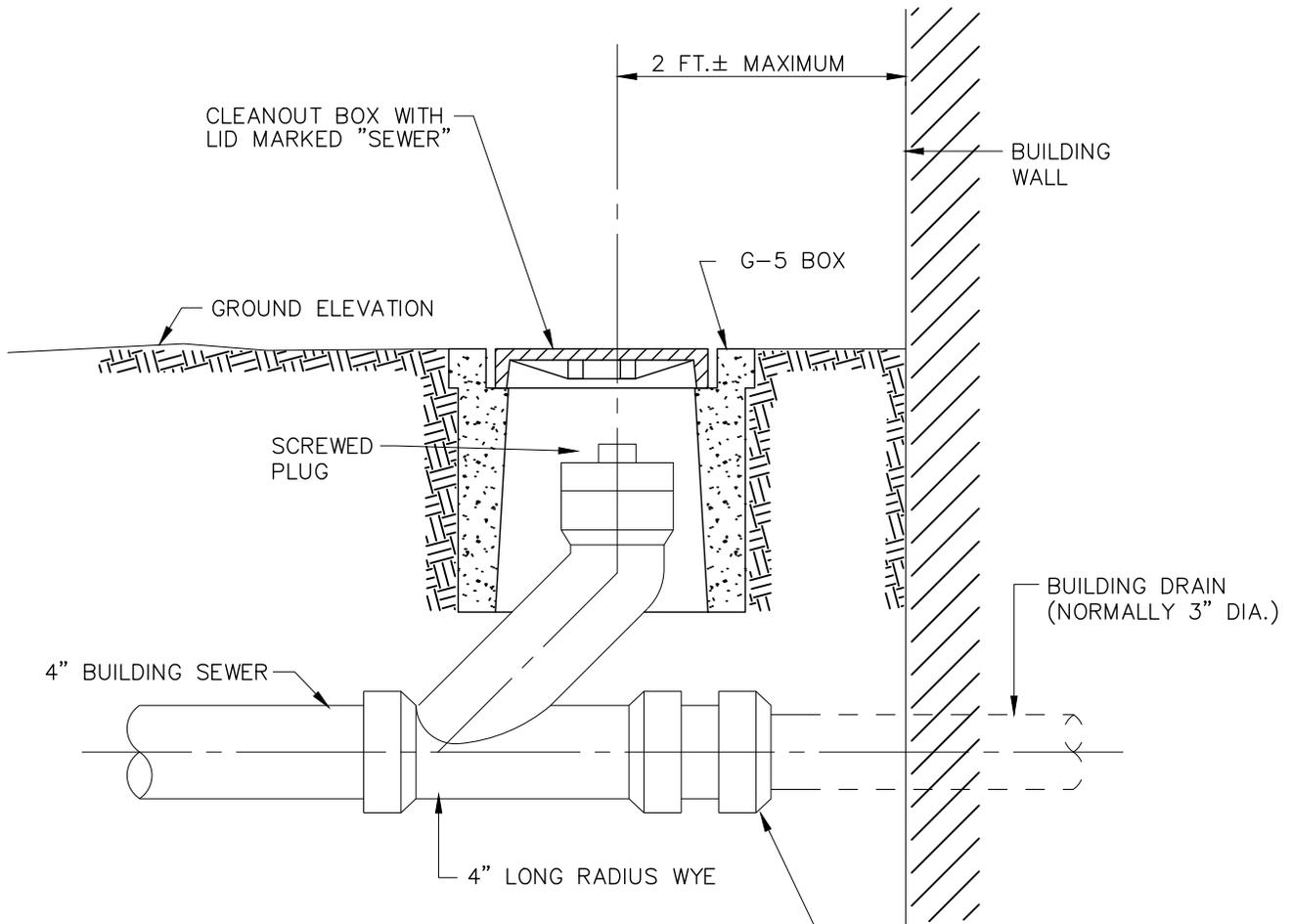
DECEMBER 2019

STD. NO.

535

PAGE 1 OF 1

SCALE: NONE



INSTALL PIPE FITTING WHERE NECESSARY TO INCREASE PIPE SIZE OF BUILDING DRAIN TO BUILDING SEWER (WHERE TWO PIPES OF DISSIMILAR MATERIALS ARE TO BE JOINED, THEY SHALL BE JOINED WITH A "CALDER" OR EQUAL COUPLING.)



DESIGN AND CONSTRUCTION STANDARDS

CLEANOUT DETAIL AT BUILDING

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DECEMBER 2019

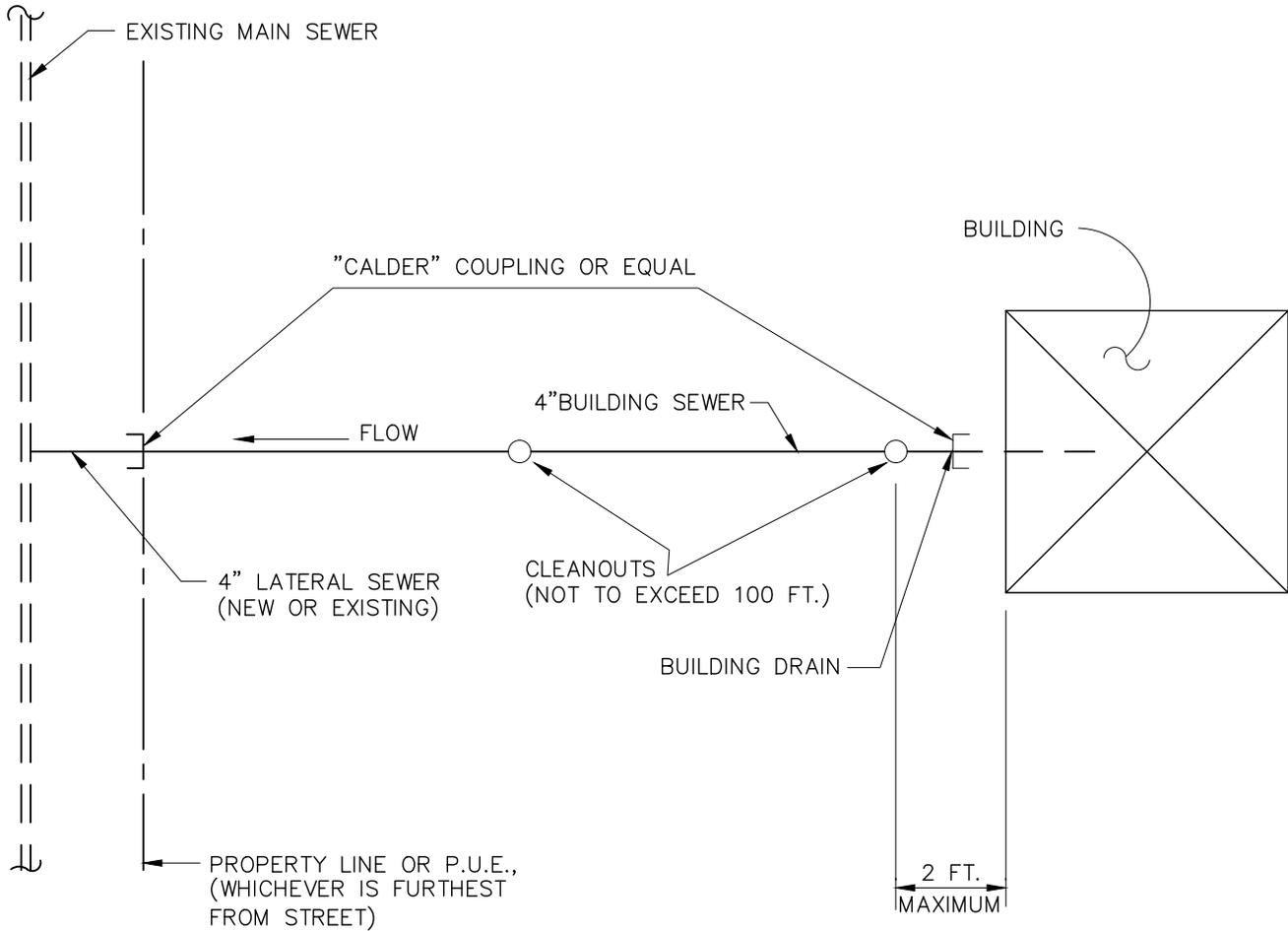
STD. NO.

536

PAGE 1 OF 1

SCALE: NONE

NOTE: WHERE BUILDING SEWERS ARE LOCATED UNDER DRIVEWAYS, CAST IRON OR DUCTILE IRON SEWER PIPE SHALL BE USED.



PLAN



DESIGN AND CONSTRUCTION STANDARDS

TYPICAL SEWER SERVICE CONNECTION DETAILS

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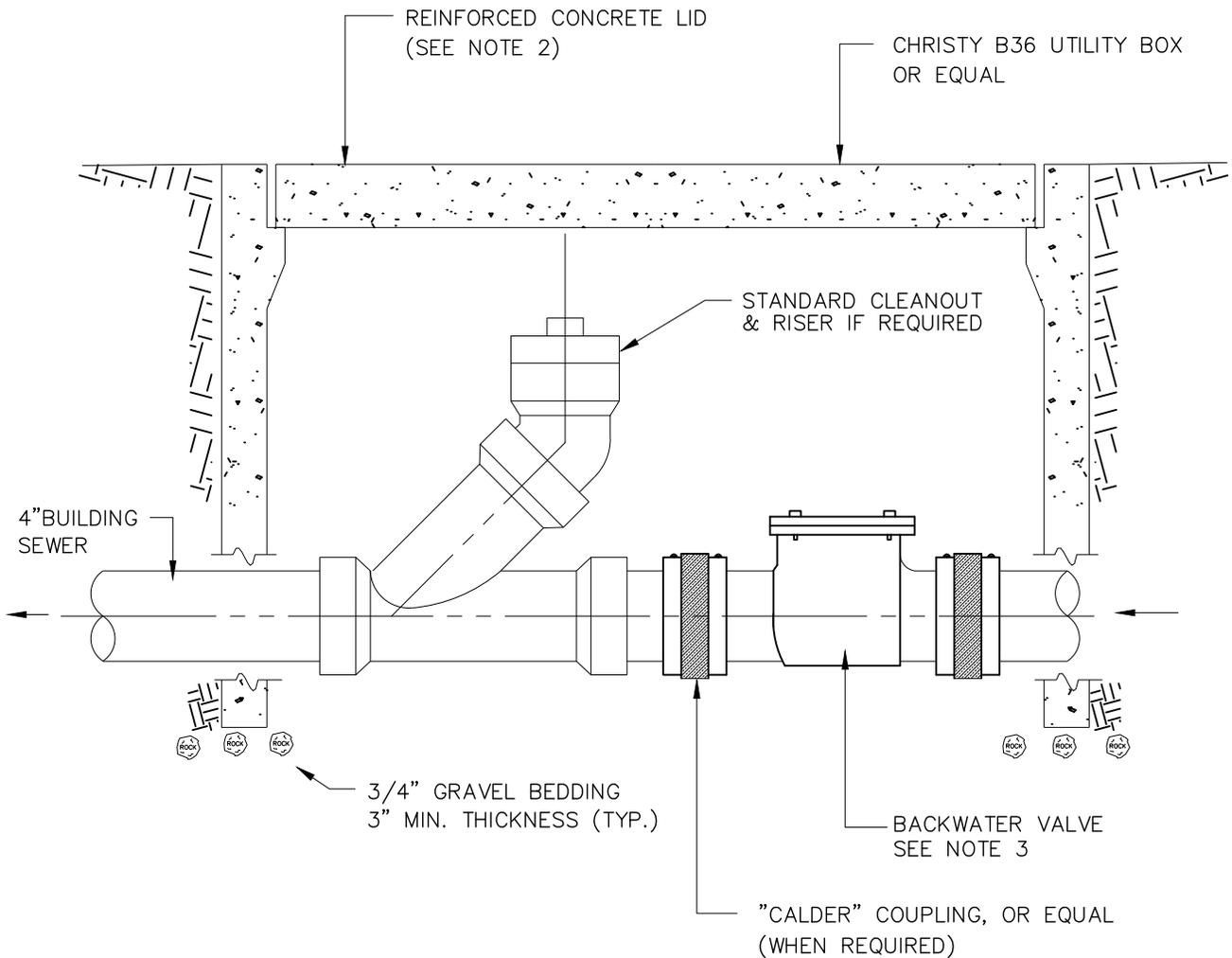
DECEMBER 2019

STD. NO.

537

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. THIS INSTALLATION IS REQUIRED WHEREVER THE LOWEST FINISHED FLOOR ELEVATION IS TWELVE (12") INCHES, OR LESS ABOVE THE TOP ELEVATION OF THE NEAREST UPSTREAM MANHOLE OR CLEANOUT.
2. IF THE LID IS SUBJECT TO VEHICULAR TRAFFIC, USE LID DESIGNED FOR H-20 TRAFFIC LOADINGS.
3. BACKWATER VALVE SHALL BE CAST IRON OR CAST BRONZE. VALVE SHALL BE APPROVED BY THE CITY ENGINEER.



DESIGN AND CONSTRUCTION STANDARDS

BACKWATER CHECK VALVE
INSTALLATION

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DECEMBER 2019

STD. NO.

538

PAGE 1 OF 1

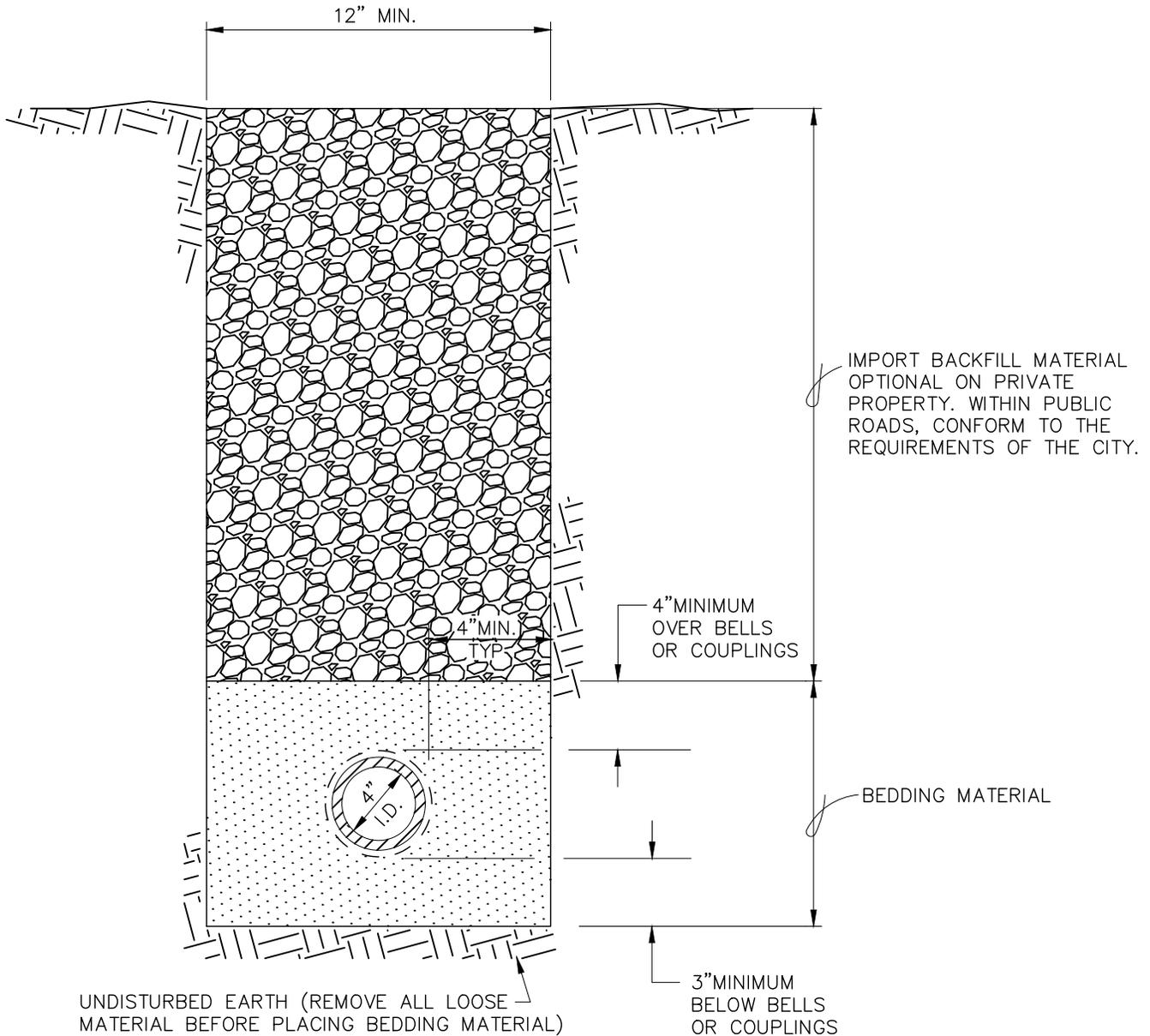
SCALE: NONE

NOTES:

PIPE BEDDING AND TRENCH BACKFILL MATERIAL SHALL BE A WELL-GRADED MATERIAL AND SHALL HAVE A MINIMUM SAND EQUIVALENT VALUE OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADINGS:

	PERCENT PASSING					
	3"	3/4"	3/8"	NO.4	NO.16	NO.200
PIPE BEDDING	100	80-100	10-50	5-30	0-4	
TRENCH BACKFILL	NATIVE MATERIAL MAY BE USED					

IN ADDITION, WHEN TESTED WITH THE FOLLOWING SERIES OF SIEVES, NO MORE THAN 25% OF THE MATERIAL WILL BE RETAINED BETWEEN ANY ADJACENT SIEVES: 3", 2-1/2", 2", 1-1/2", 1", 3/4", 1/2", 3/8", NO. 4, NO. 8, NO. 16, NO. 30, NO. 50, NO. 100, AND NO. 200.



DESIGN AND CONSTRUCTION STANDARDS

SEWER SERVICE TRENCH DETAIL

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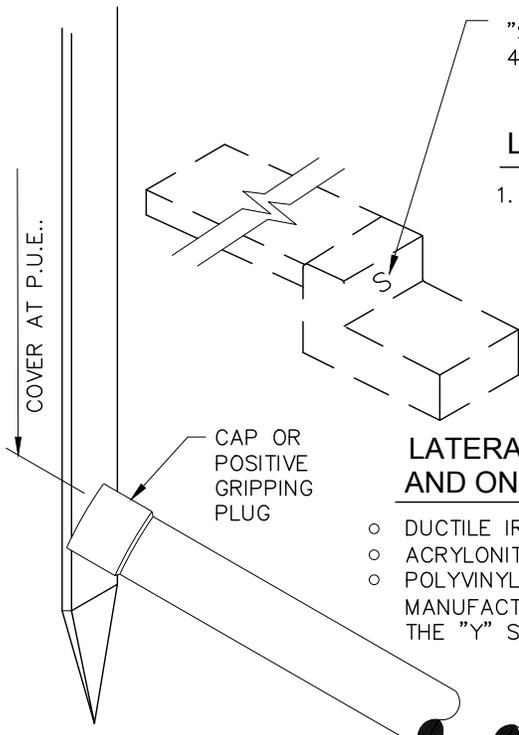
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STD. NO.

539

PAGE 1 OF 1

SCALE: NONE



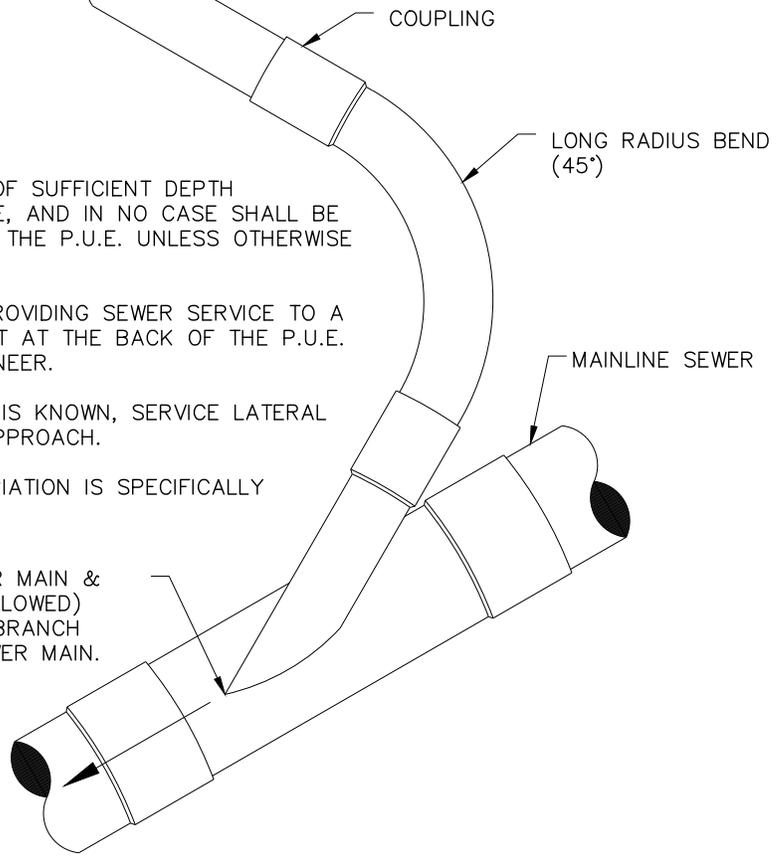
"S" MARKED ON FACE OF CURB-
4" HIGH WHERE LATERAL CROSSES CURB LINE

LATERAL CONNECTIONS TO EXISTING MAINS

1. SADDLE WITH RUBBER GASKET AND STAINLESS STEEL STRAPS,

LATERAL PIPE MATERIAL TO BE 4" MINIMUM AND ONE OF THE FOLLOWING:

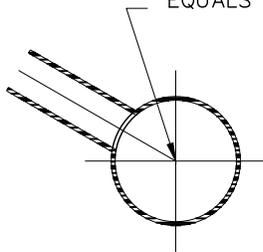
- DUCTILE IRON PIPE
- ACRYLONITRILE-BUTADLENE-STYRENE (ABS PIPE, SDR-35)
- POLYVINYL CHLORIDE (PVC) PIPE, SDR 35 WHEN USED WITH A MANUFACTURED "Y" SPECIFICALLY DESIGNED FOR PVC LATERALS. THE "Y" SHALL BE OF THE SAME MATERIAL AS THE SEWER MAIN.



NOTES:

1. THE SEWER SERVICE LATERAL SHALL BE OF SUFFICIENT DEPTH TO ADEQUATELY SERVE THE BUILDING SITE, AND IN NO CASE SHALL BE LESS THAN 3 FT. DEEP AT THE BACK OF THE P.U.E. UNLESS OTHERWISE AUTHORIZED BY THE CITY ENGINEER.
2. WHERE PROBLEMS ARE ANTICIPATED IN PROVIDING SEWER SERVICE TO A GIVEN BUILDING SITE, THE LATERAL INVERT AT THE BACK OF THE P.U.E. SHALL BE STAKED BY THE OWNER'S ENGINEER.
3. WHERE DRIVEWAY LOCATION INFORMATION IS KNOWN, SERVICE LATERAL SHALL BE LOCATED OUTSIDE DRIVEWAY APPROACH.
4. MINIMUM 2% SLOPE EXCEPT WHERE A VARIATION IS SPECIFICALLY APPROVED BY THE CITY ENGINEER.

COLLECTOR SANITARY SEWER MAIN & WYE BRANCH. (TEE NOT ALLOWED)
MIN. INVERT ELEV. OF WYE BRANCH EQUALS CENTERLINE OF SEWER MAIN.



DESIGN AND CONSTRUCTION STANDARDS

SEWER SERVICE LATERAL

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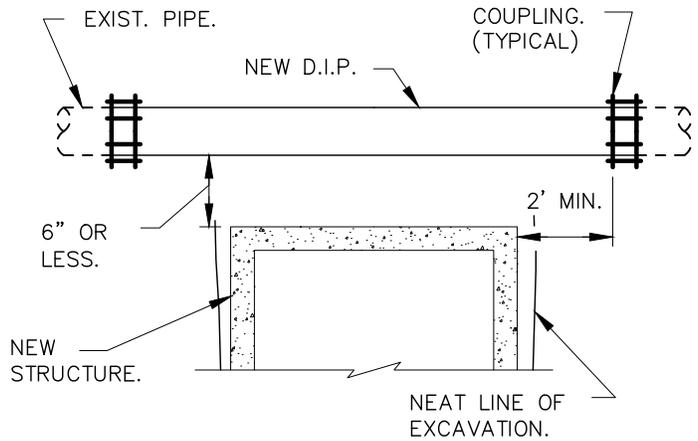
DECEMBER 2019

STD. NO.

540

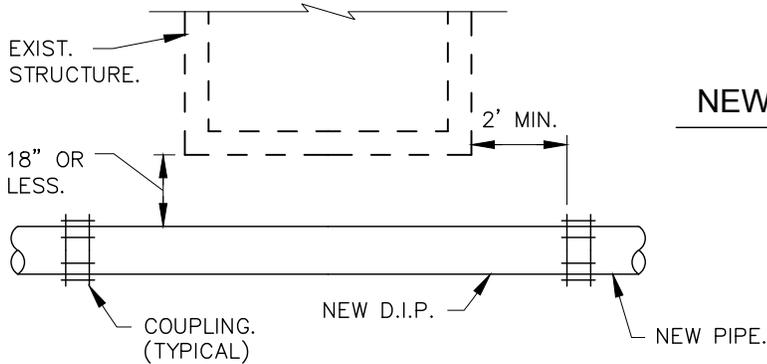
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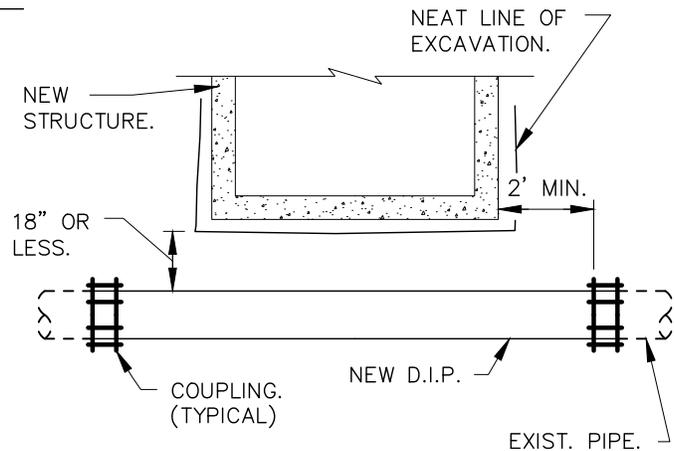
NEW STRUCTURE UNDER EXIST. PIPE

TYPE C



NEW PIPE UNDER EXIST. STRUCTURE

TYPE A



NEW STRUCTURE OVER EXIST. PIPE

TYPE B

NOTES:

1. THIS STD. APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS INVOLVING PIPES OF LARGER DIAMETER SHALL BE AS APPROVED BY THE CITY ENGINEER.
2. WHEN PIPES CROSS WITHIN THE DIMENSIONS SHOWN, A NEW DUCTILE IRON PIPE SECTION SHALL BE INSTALLED AS DETAILED.
3. ALL DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE FILM IN TUBE FORM.
4. ANY TYPE "A" INSTALLATION REQUIRING MORE THAN ONE LENGTH OF PIPE SHALL BE ENCASED PER STD. 525.
5. SEE CITY'S APPROVED LIST FOR APPROVED COUPLINGS.



DESIGN AND CONSTRUCTION STANDARDS

PIPE - STRUCTURE CROSSING DETAIL

Craig A. Scott
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DECEMBER 2019

STD. NO.

541

PAGE 1 OF 1

SCALE: NONE

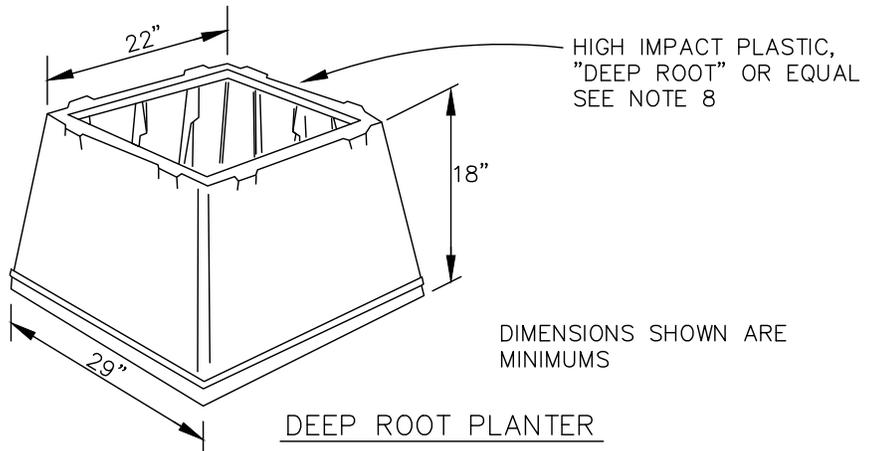
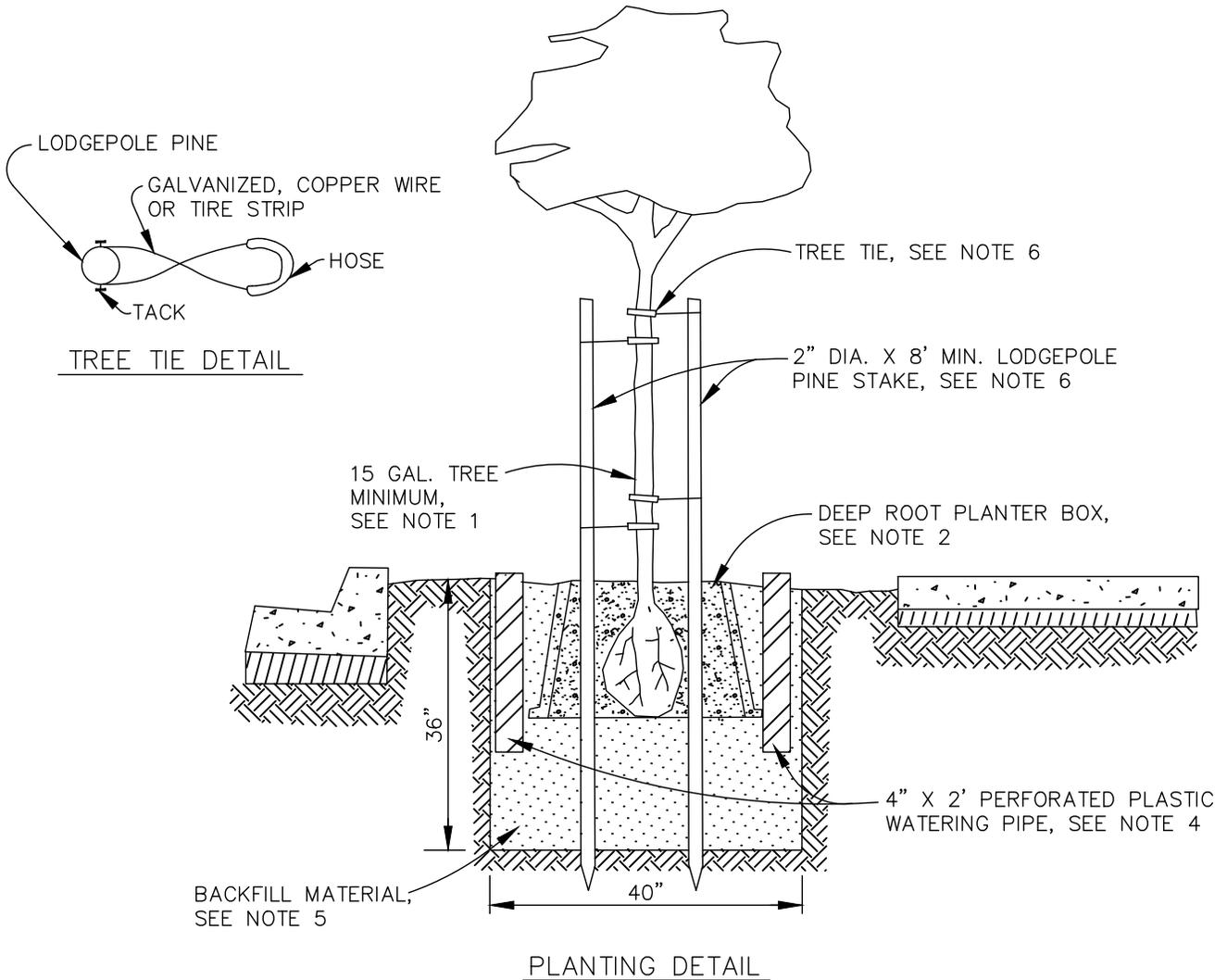


VOLUME 2: STANDARD PLANS

December 2019

600 Series: Park and Landscape

- 601. STREET TREE PLANTING
- 602. TREE GRATE AND FRAME DETAIL, INSTALL LOCATION
- 603. STREET TREE PLANTING, CU-STRUCTURAL SOIL
- 604. MEDIAN ISLAND TREE PLANTING, CU-STRUCTURAL SOIL
- 605. STREET TREE PLANTING AT ANGLED PARKING BAY, CU-STRUCTURAL SOIL
- 606. SUB-DRAIN DETAIL
- 607. CITY BENCH
- 608. BIKE RACK
- 609A. 36-GALLON TRASH RECEPTACLE
- 609B. 36-GALLON RECYCLE RECEPTACLE



(NOTES ON PAGE 2)



DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING

Craig A. Scott
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DECEMBER 2019

STD. NO.
601

PAGE 1 OF 2

SCALE: NONE

GENERAL NOTES

1. TREES SHALL BE OF A SIZE NOT LESS THAN 8 FT. IN HEIGHT NOR LESS THAN 1 INCH CALIPER. A TREE MAY BE REJECTED IT IS NOT OF A SHAPE OR CONDITION ACCEPTABLE TO THE CITY OF COTATI.
2. THE TREE SHALL BE PLANTED IN DEEP ROOT PLANTER BOX. THE PLANTER BOX MUST BE A MINIMUM OF 22 INCHES AT THE TOP, 29 INCHES AT THE BOTTOM AND 18 INCHES DEEP.
3. THE TREE SHALL BE PLANTED IN A HOLE 40 INCHES SQUARE BY 36 INCHES DEEP.
4. INSTALL TWO DEEP-WATERING PERFORATED PLASTIC PIPES AS SHOWN. FILL PIPES WITH 3/4 INCH CLEAN DRAIN ROCK.
5. TREES SHALL BE PLANTED IN A MIXTURE OF 1/2 NATIVE SOIL AND 1/2 LEAF MOLD OR REDWOOD MULCH.
6. TREES SHALL BE STAKED WITH TWO 2-INCH BY 8 FT. MINIMUM LODGE POLE PINE STAKES OR EQUAL. STAKES SHALL BE COATED WITH GREEN PRESERVATIVE STAIN. TREES SHALL BE TIED WITH "GRO STRAIT" TREE TIES, OR SIMILAR.
7. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. APART TO A MAXIMUM OF 50 FT. APART DEPENDING ON THE TYPE OF THE TREE. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. FROM CURB RETURNS, 15 FT. FROM STREET LIGHTS AND 6 FT. FROM DRIVEWAYS, SEWER LATERALS AND WATER SERVICES, OR AS OTHERWISE APPROVED BY THE CITY OF COTATI.
8. DEEP ROOT PLANTER SHALL BE FABRICATED FROM A HIGH-DENSITY AND HIGH-IMPACT PLASTIC SUCH AS POLYVINYL CHLORIDE, ABS OR POLYETHYLENE AND HAVE A MINIMUM THICKNESS OF 0.06 INCH. THE PLASTIC SHALL HAVE 1/2 INCH HIGH RAISED VERTICAL RIBS ON THE INNER SURFACE SPACED NOT MORE THAN SIX (6) INCHES APART.



DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING

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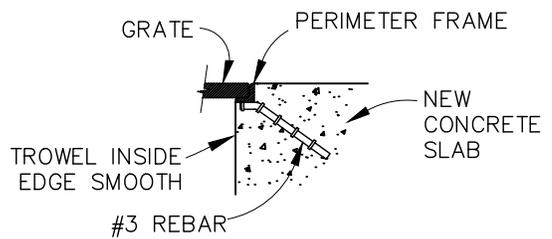
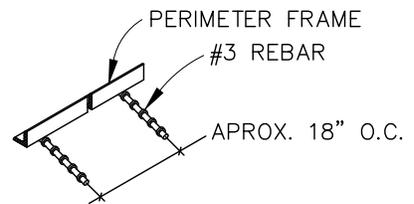
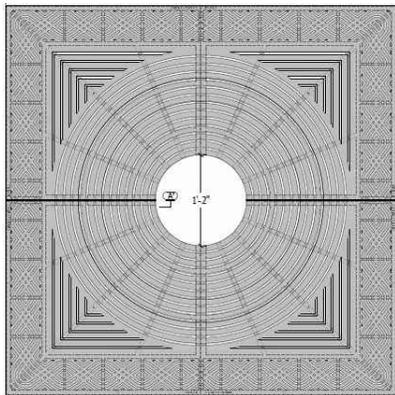
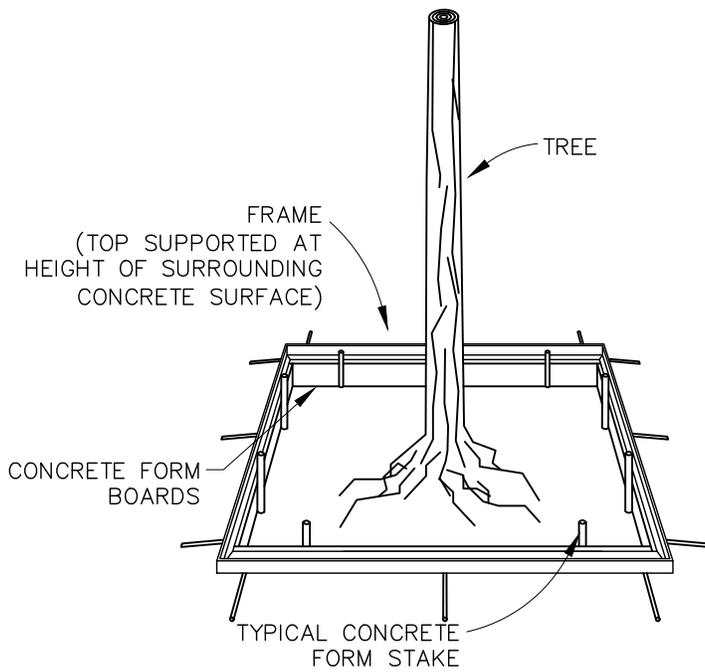
STD. NO.

601

PAGE 2 OF 2

DECEMBER 2019

SCALE: NONE



"S" STANDARD USED WITH NEW SURROUND SLABS

NOTES:

1. TREE FRAME SHALL BE INSTALLED 6" BEHIND BACK OF CURB, PER STD. 602, SHEET 2 OF 2.
2. TREE GRATE FRAME INSTALLATION: STANDARD "S" FRAME USED AS CONCRETE FORM. STAKES OR SPREADERS REQUIRED TO KEEP FRAME FROM DEFORMING DURING CONCRETE PLACEMENT.



DESIGN AND CONSTRUCTION STANDARDS

TREE GRATE AND FRAME DETAIL

Craig A. Scott
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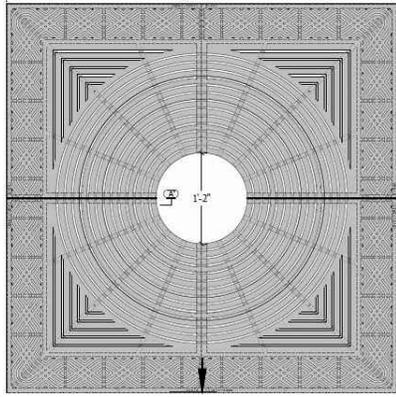
DECEMBER 2019

STD. NO.

602

PAGE 1 OF 2

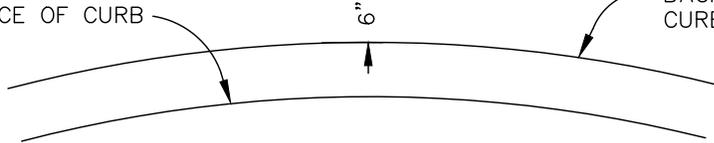
SCALE: NONE



5' SQUARE TREE
GRATE AND FRAME

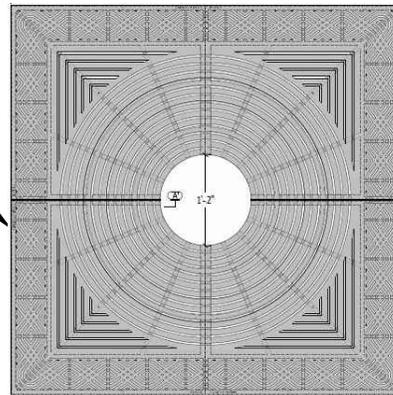
FACE OF CURB

BACK OF CURB



OUTSIDE CURVE INSTALLATION

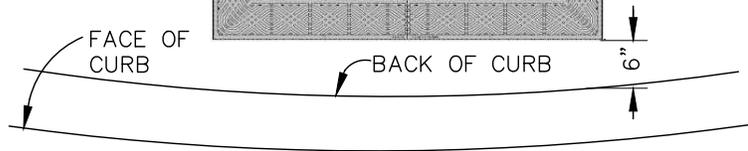
SCALE: NTS



5' SQUARE TREE
GRATE AND FRAME

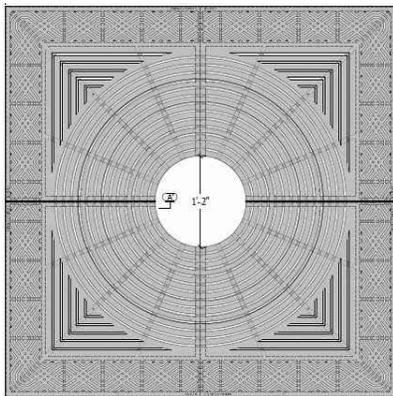
FACE OF CURB

BACK OF CURB



INSIDE CURVE INSTALLATION

SCALE: NTS



5' SQUARE
TREE
GRATE AND FRAME

FACE OF CURB

BACK OF CURB



TANGENT INSTALLATION

SCALE: NTS

NOTE:

1. TREE GRATE AND FRAME SHALL BE URBAN ACCESSORIES 5' SQUARE CHINOOK 2000, CARDINAL C291-GN20 POLYESTER PATINA TEXTURE SEMI GLOSS COATED, H-20 LOAD RATED, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. RETROFIT FRAME ONLY ALLOWED WITH CITY ENGINEER APPROVAL.



DESIGN AND CONSTRUCTION STANDARDS

TREE GRATE AND FRAME DETAIL
INSTALL LOCATION

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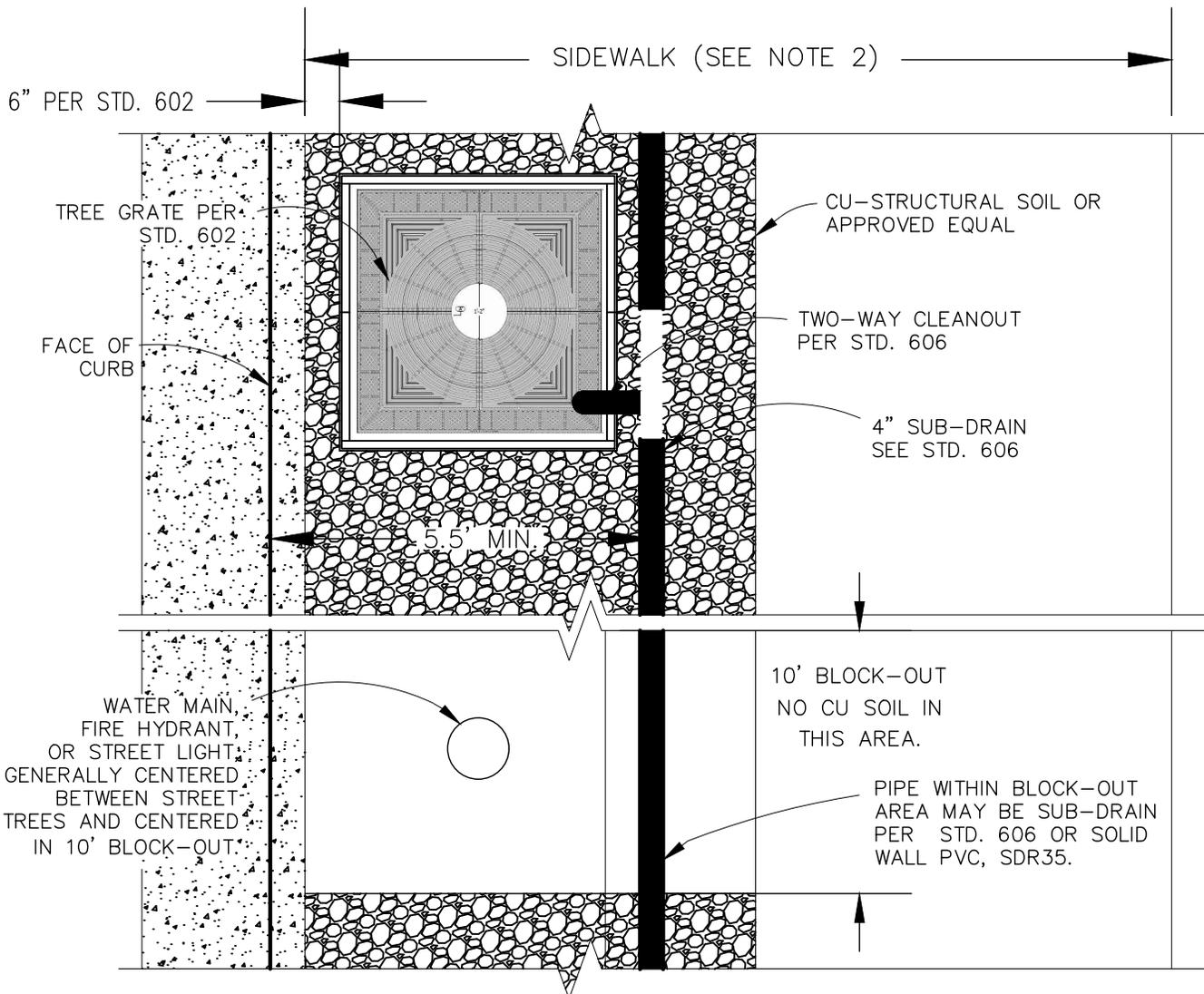
DECEMBER 2019

STD. NO.

602

PAGE 2 OF 2

SCALE: NONE



PLAN

NOTES:

1. SEE STD. 606 FOR SUB-DRAIN AND CLEANOUT DETAILS.
2. SIDEWALK WIDTH VARIES, SEE CITY OF COTATI STREET DESIGN GUIDELINES AND STD. 201 FOR MINIMUM SIDEWALK WIDTHS.
3. CLEANOUTS SHALL BE SPACED IN ACCORDANCE WITH STD. 606.
4. CU-STRUCTURAL SOIL SHALL BE CONTINUOUS LONGITUDINALLY ACROSS THE FRONTAGE EXCEPT WHERE BLOCK-OUTS ARE REQUIRED. THE VOLUME CALCULATION EQUATION AND METHODOLOGY PROPAGATED BY CORNELL UNIVERSITY MAY BE USED TO MINIMIZE THE VOLUME OF CU-STRUCTURAL SOIL REQUIRED.



DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING
CU-STRUCTURAL SOIL

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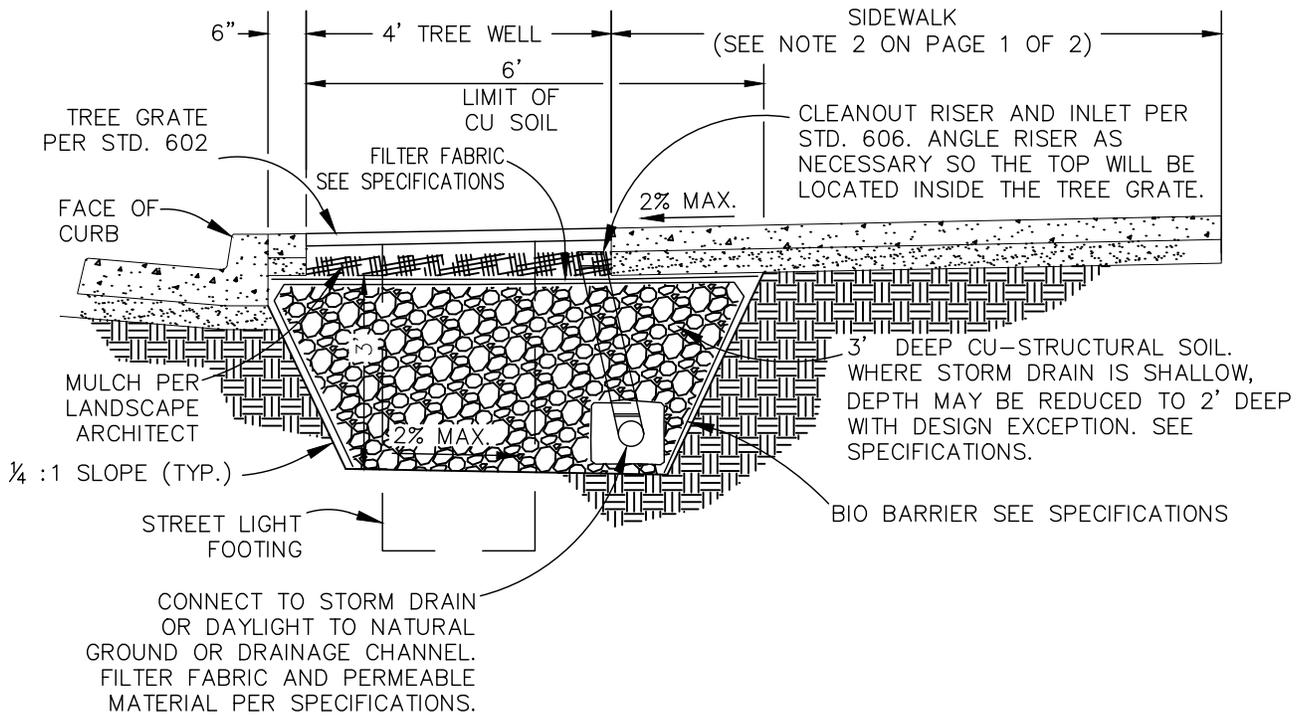
STD. NO.

603

PAGE 1 OF 2

DECEMBER 2019

SCALE: NONE



PROFILE

SCALE: NTS

NOTE:

1. VOLUME CALCULATION:

V REQUIRED = 2 CUBIC FEET X PROJECTED AREA OF THE CANOPY.

FOR A TREE WITH 20FT DIAMETER CANOPY, $V = \Pi \times (20/2)^2 \times 2 = 630\text{FT}^3$



DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING
CU-STRUCTURAL SOIL

Craig A. Scott
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DECEMBER 2019

STD. NO.

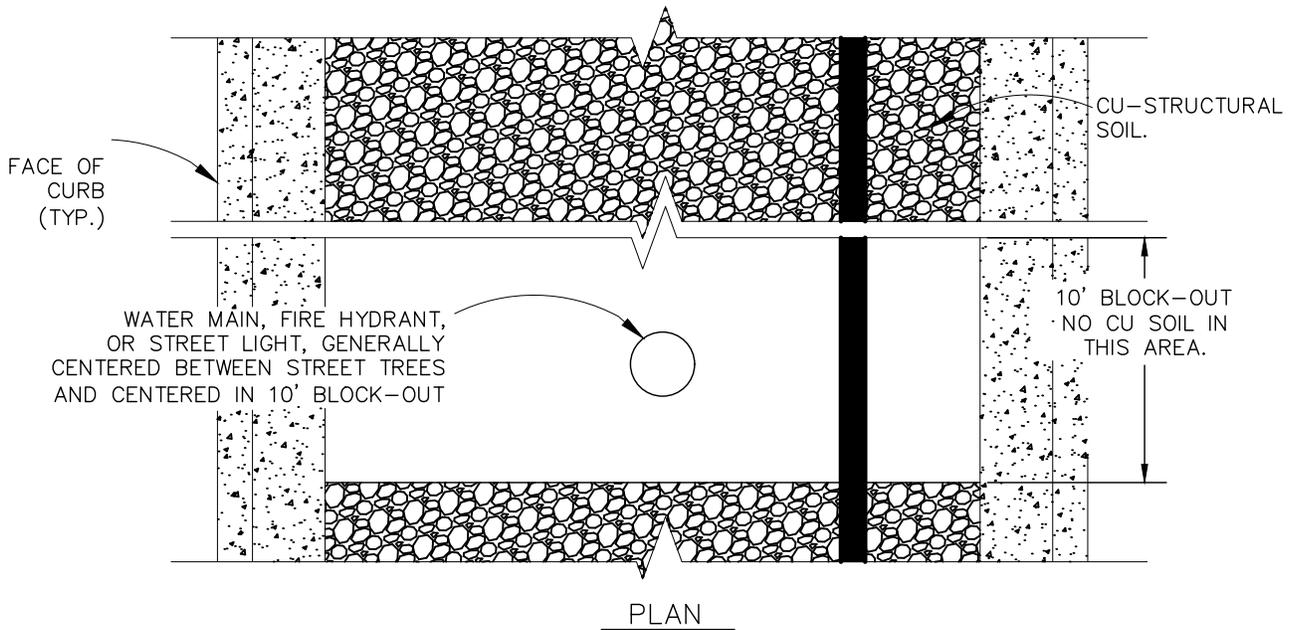
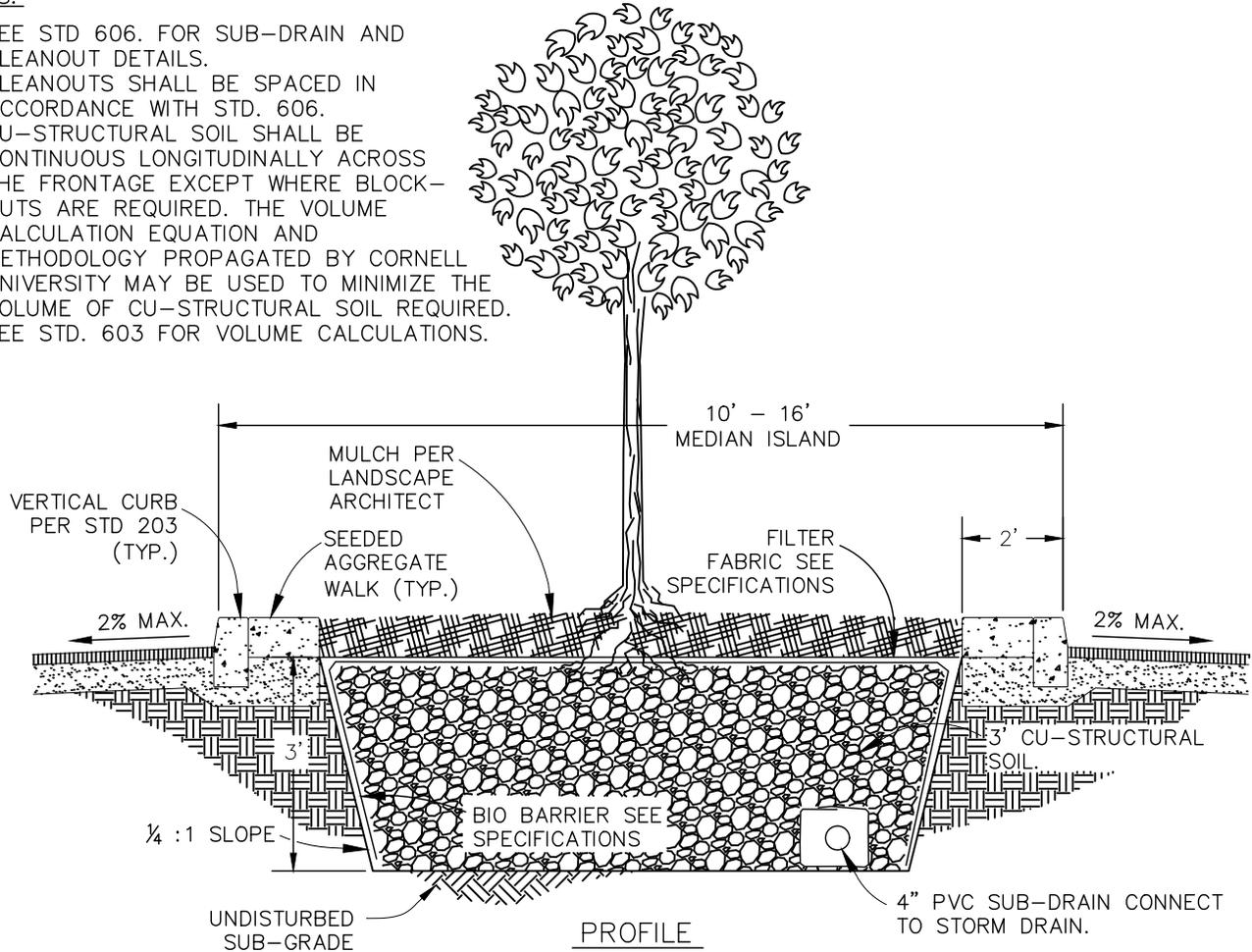
603

PAGE 2 OF 2

SCALE: NONE

NOTES:

1. SEE STD 606. FOR SUB-DRAIN AND CLEANOUT DETAILS.
2. CLEANOUTS SHALL BE SPACED IN ACCORDANCE WITH STD. 606.
3. CU-STRUCTURAL SOIL SHALL BE CONTINUOUS LONGITUDINALLY ACROSS THE FRONTAGE EXCEPT WHERE BLOCK-OUTS ARE REQUIRED. THE VOLUME CALCULATION EQUATION AND METHODOLOGY PROPAGATED BY CORNELL UNIVERSITY MAY BE USED TO MINIMIZE THE VOLUME OF CU-STRUCTURAL SOIL REQUIRED.
4. SEE STD. 603 FOR VOLUME CALCULATIONS.



DESIGN AND CONSTRUCTION STANDARDS

MEDIAN ISLAND TREE PLANTING
CU-STRUCTURAL SOIL

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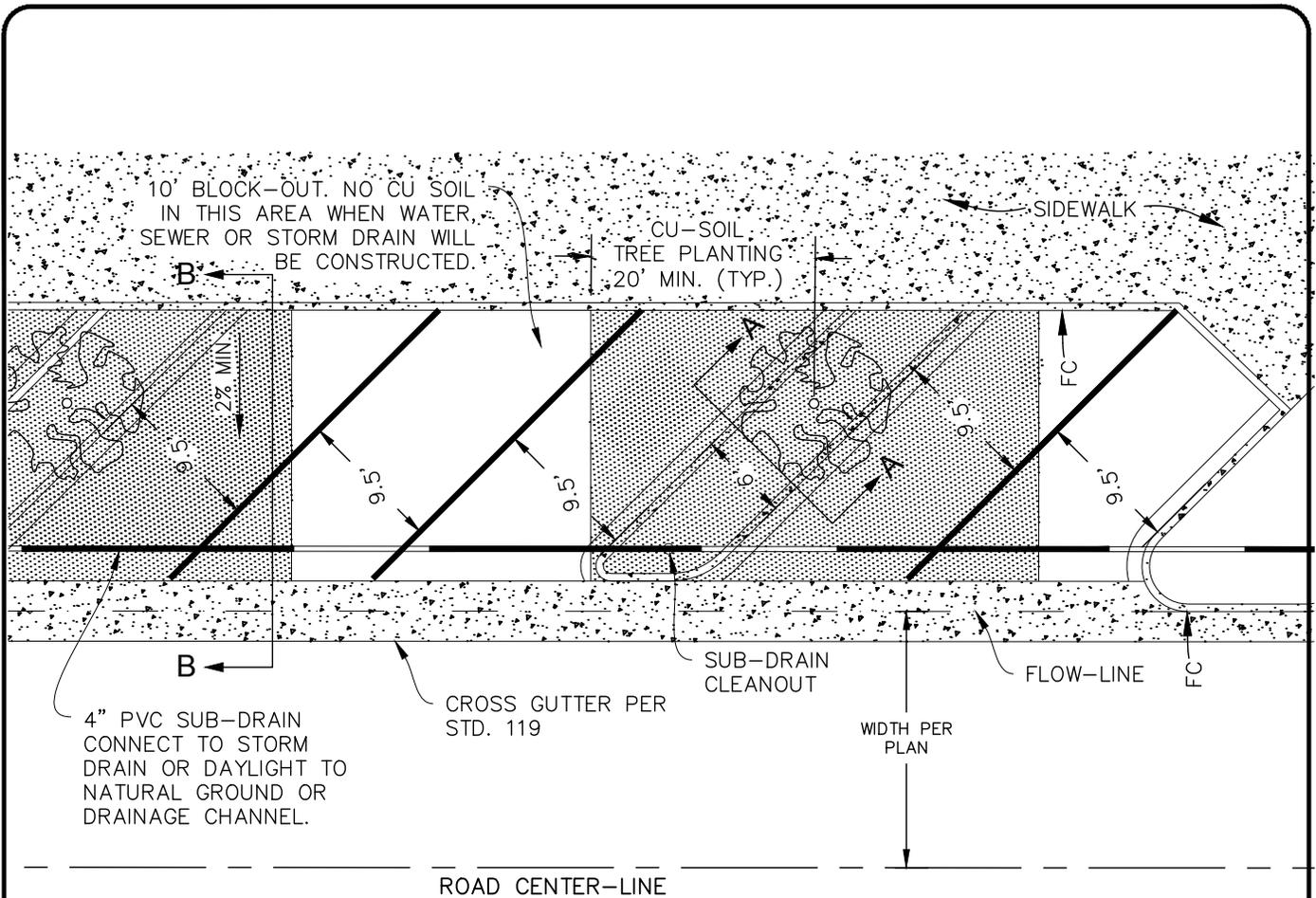
DECEMBER 2019

STD. NO.

604

PAGE 1 OF 1

SCALE: NONE



PLAN VIEW

NOTES:

1. SEE STD. 606 FOR SUB-DRAIN AND CLEAN-OUT DETAILS.
2. SIDEWALK WIDTH VARIES, SEE STD. 103 FOR MINIMUM SIDEWALK WIDTHS.
3. CLEANOUTS SHALL BE SPACED IN ACCORDANCE WITH STD. 606.
4. FOR OAK TREE PLANTING, CU-STRUCTURAL SOIL SHALL BE INSTALLED A MINIMUM OF 20' EITHER SIDE OF THE OAK TREE AS SHOWN. THE VOLUME CALCULATION EQUATION AND METHODOLOGY PROPAGATED BY CORNELL UNIVERSITY MAY BE USED TO MINIMIZE THE VOLUME OF CU-STRUCTURAL SOIL REQUIRED.
5. VOLUME CALCULATION:

V REQUIRED = 2 CUBIC FEET X PROJECTED AREA OF THE CANOPY.

FOR A TREE WITH 20 FT DIAMETER CANOPY, $V = \pi \times (20/2)^2 \times 2 = 630\text{FT}^3$



DESIGN AND CONSTRUCTION STANDARDS STREET TREE PLANTING AT ANGLED PARKING BAY CU-STRUCTURAL SOIL

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

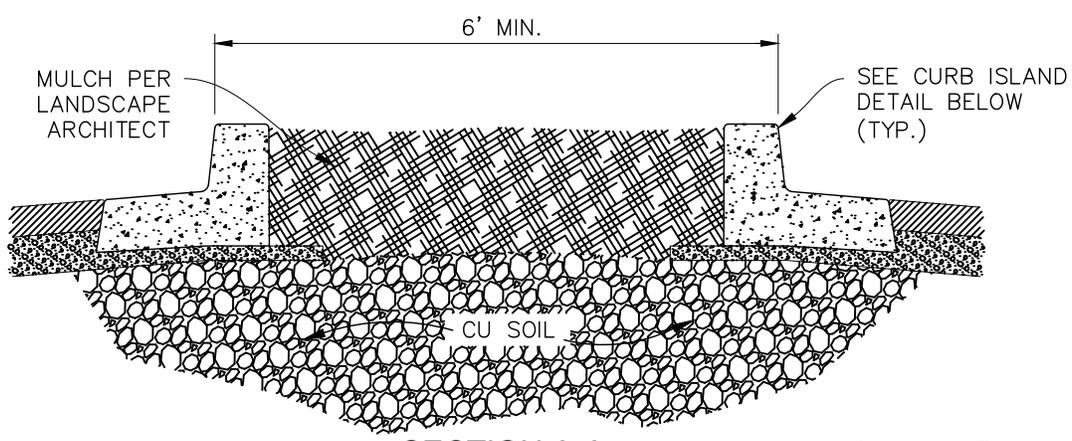
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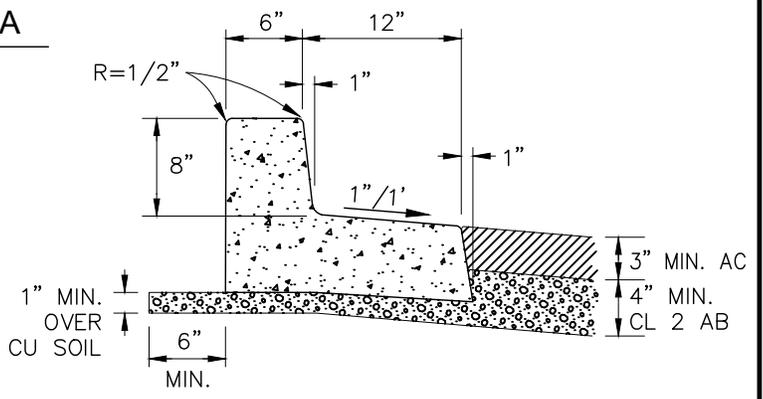
605

PAGE 1 OF 2

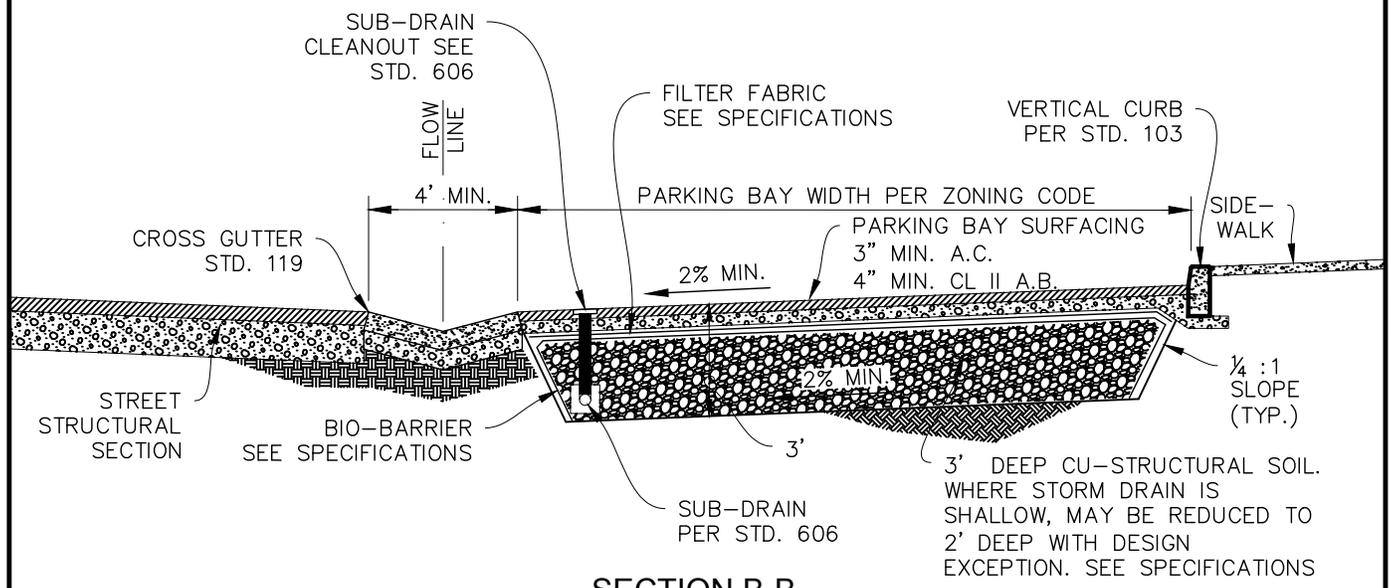
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SECTION A-A



CURB ISLAND DETAIL



SECTION B-B



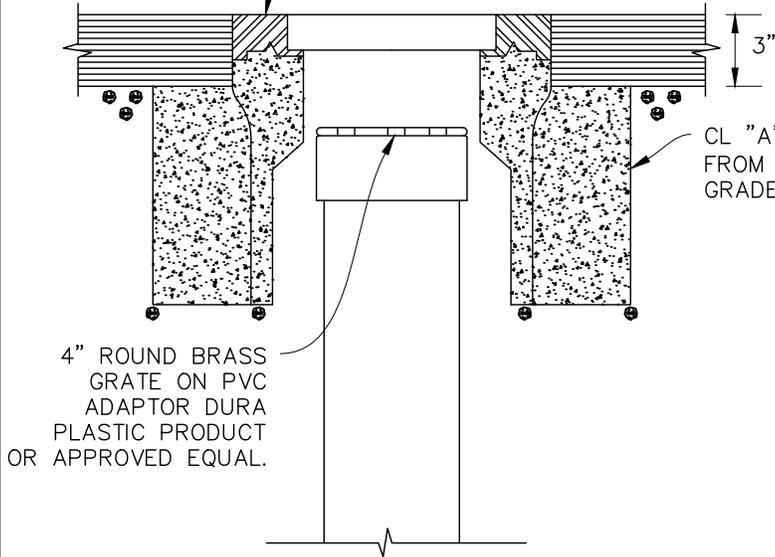
DESIGN AND CONSTRUCTION STANDARDS
**STREET TREE PLANTING
 AT ANGLED PARKING BAY
 CU-STRUCTURAL SOIL**

Craig A. Scott
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

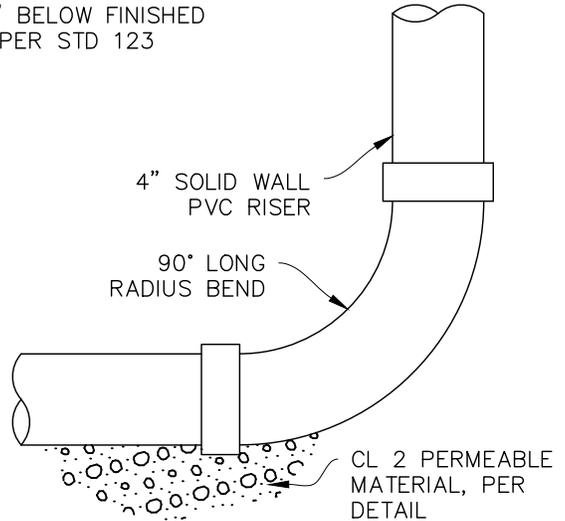
DECEMBER 2019

STD. NO.
605
 PAGE 2 OF 2
 SCALE: NONE

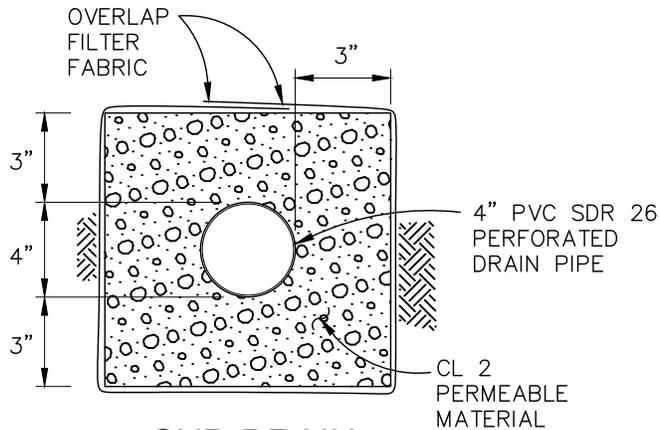
PRECAST VALVE BOX SET FLUSH WITH STREET SURFACE WITH CAST IRON RING AND COVER MARKED "DRAIN". VALVE BOXES TO BE CHRISTY G-5 OR APPROVED EQUAL. VALVE BOX REQUIRED IN PAVED AREAS OR AS DIRECTED BY THE CITY ENGINEER.



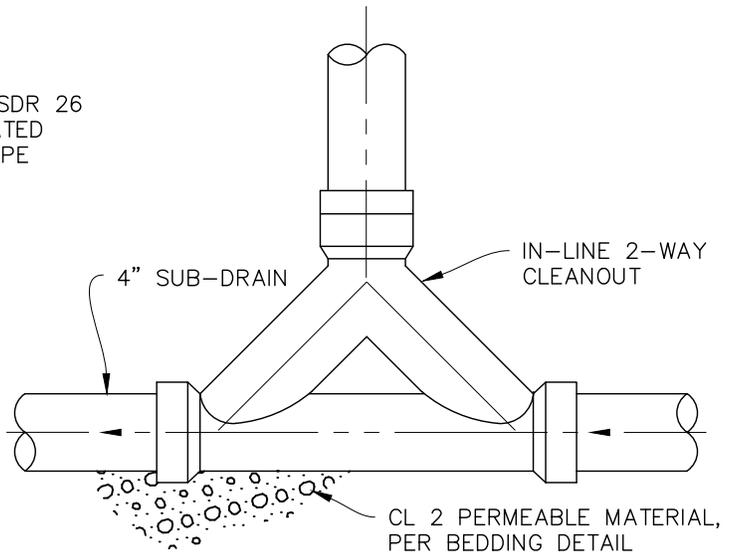
RISER DETAIL



END OF LINE CLEANOUT



SUB-DRAIN BEDDING DETAIL



TWO-WAY CLEANOUT



DESIGN AND CONSTRUCTION STANDARDS

SUB-DRAIN DETAIL

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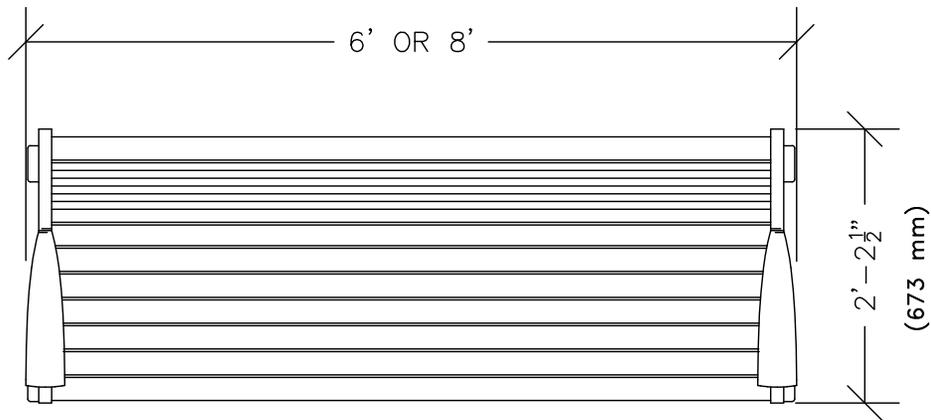
DECEMBER 2019

STD. NO.

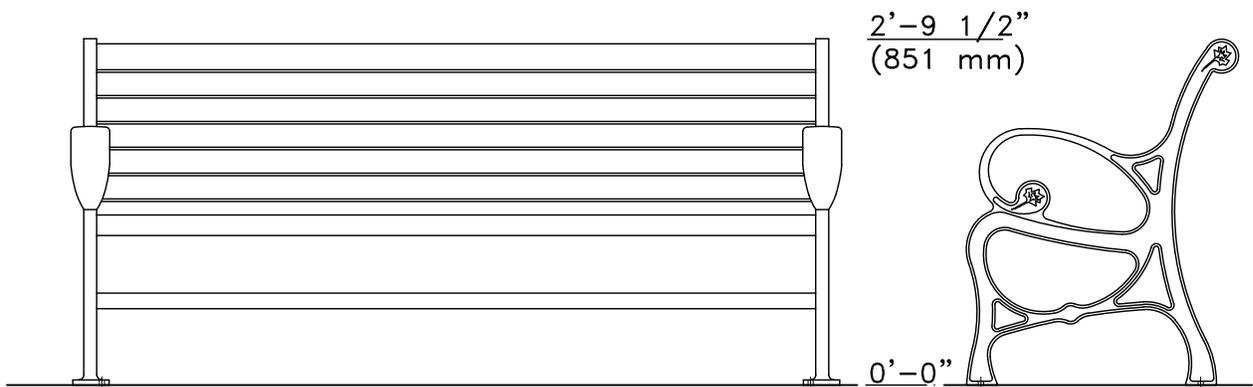
606

PAGE 1 OF 1

SCALE: NONE



TOP VIEW



FRONT VIEW

END VIEW

1/2" (13 mm) DIA. HOLES PROVIDED FOR ANCHORS BY OTHERS. (TYPICAL-4)

NOTES:

1. TIMBERFORM RESTORATION MODEL NO. 2118 BENCH WITH ARMRESTS MANUFACTURED BY COLUMBIA CASCADE COMPANY
2. 6' OR 8' NOMINAL LENGTH, AS REQUIRED BY CITY ENGINEER
3. ROSE GRAPHIC ON BENCH ENDS
4. ALUMINUM SLATS
5. SLATS AND FRAMES SHALL BE BLACK FACTORY COATED
6. BENCH SHALL BE SECURED TO SIDEWALK OR CONCRETE FOOTING WITH CITY-APPROVED CONCRETE ANCHORS.



DESIGN AND CONSTRUCTION STANDARDS

CITY BENCH

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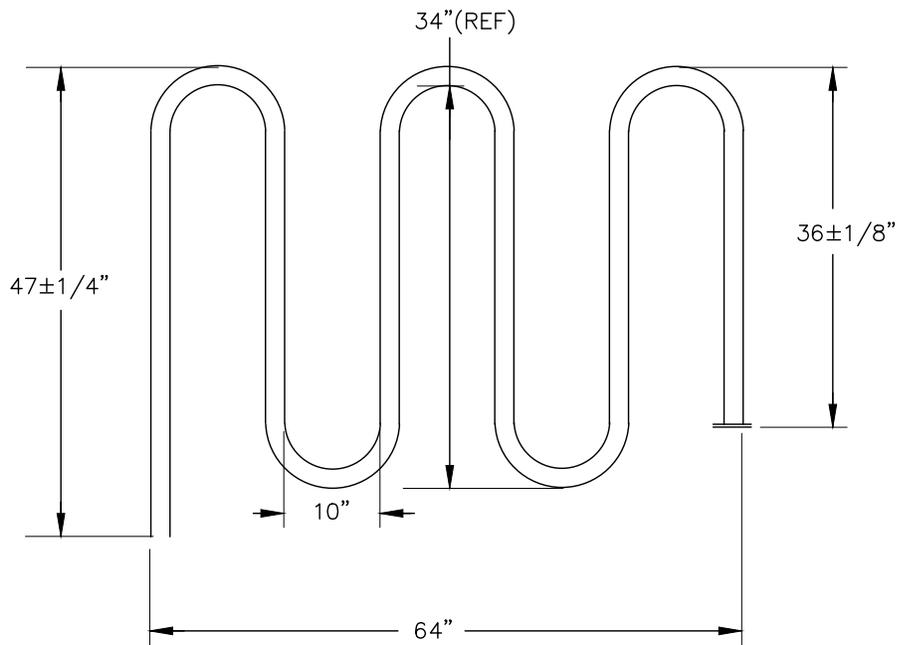
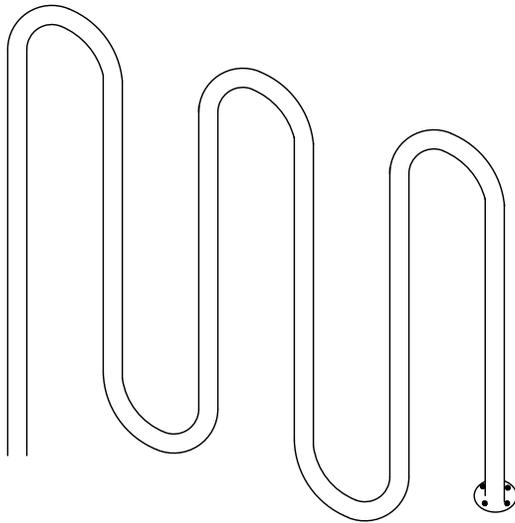
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607

PAGE 1 OF 1

DECEMBER 2019

SCALE: NONE



NOTES:

1. GROUND MOUNT REQUIRED FOR ALL NEW CONSTRUCTION. RETROFITS MAY USE SURFACE MOUNT STYLE WITH APPROVAL OF CITY ENGINEER.
2. CONSTRUCTED OF 2-3/8" O.D. SCHEDULE 40 GALVANIZED PIPE.
3. FACTORY POWDER-COATED FINISH IN BROWN.
4. 7-CAPACITY BIKE RACK (HDWBR-7 MANUFACTURED BY JAYPRO SPORTS EQUIPMENT).



DESIGN AND CONSTRUCTION STANDARDS

BIKE RACK

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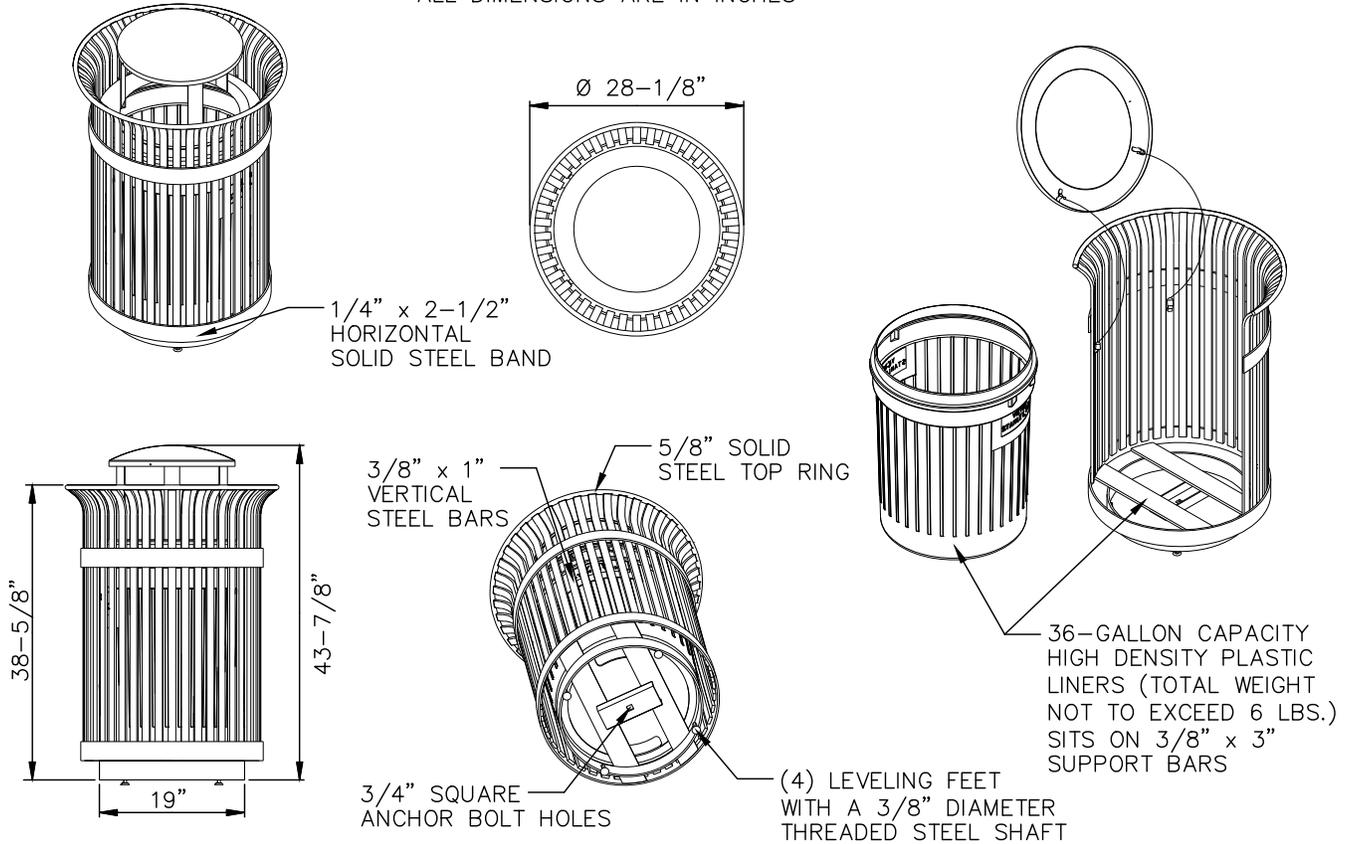
STD. NO.

608

PAGE 1 OF 1

SCALE: NONE

* ALL DIMENSIONS ARE IN INCHES *



NOTES:

1. VICTOR STANLEY S-42 IRONSITE SERIES
2. FACTORY POWDER-COATED BLACK BARREL
3. FACTORY POWDER-COATED BLACK STANDARD TAPERED LID
4. RECYCLE RECEPTACLE (609B) TO BE PAIRED WITH TRASH RECEPTACLE
5. RECEPTACLES SHALL BE SECURED TO SIDEWALK OR CONCRETE FOOTING WITH CITY-APPROVED CONCRETE ANCHORS
6. MOUNTING SHALL BE EVEN AND LEVEL



DESIGN AND CONSTRUCTION STANDARDS

36-GALLON TRASH RECEPTACLE

Craig A. Scott

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DECEMBER 2019

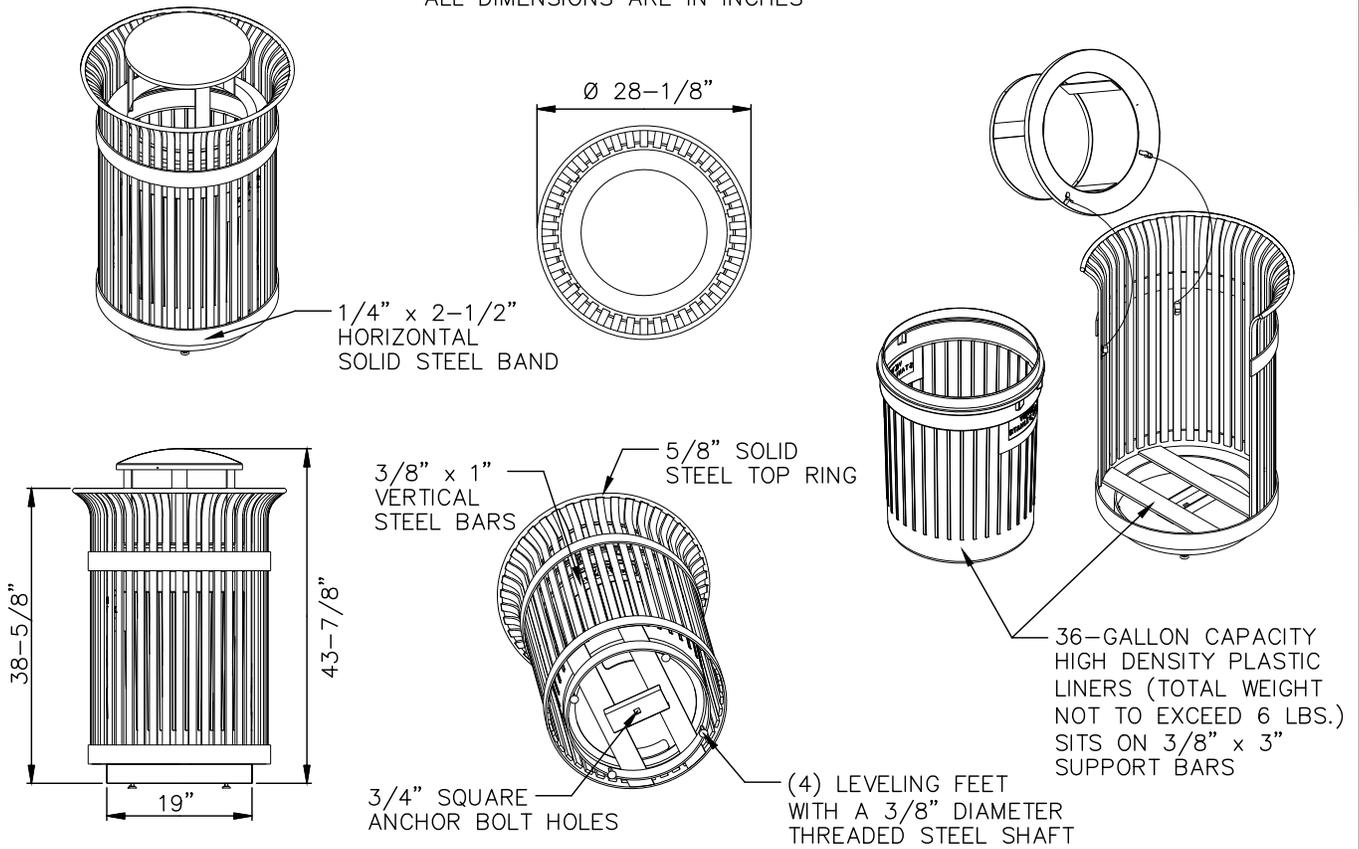
STD. NO.

609A

PAGE 1 OF 1

SCALE: NONE

* ALL DIMENSIONS ARE IN INCHES *



NOTES:

1. VICTOR STANLEY S-42 IRONSITE SERIES
2. FACTORY POWDER-COATED BLACK BARREL
3. FACTORY POWDER-COATED GREEN S-2 FORMED DOME LID
4. RECYCLE LID SHALL HAVE RECYCLE DECAL APPROVED BY CITY ENGINEER
5. TRASH RECEPTACLE (609A) TO BE PAIRED WITH RECYCLE RECEPTACLE
6. RECEPTACLES SHALL BE SECURED TO SIDEWALK OR CONCRETE FOOTING WITH CITY-APPROVED CONCRETE ANCHORS
7. MOUNTING SHALL BE EVEN AND LEVEL



DESIGN AND CONSTRUCTION STANDARDS

36-GALLON RECYCLE RECEPTACLE

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DECEMBER 2019

STD. NO.

609B

PAGE 1 OF 1

SCALE: NONE



VOLUME 2: STANDARD PLANS

December 2019

800 Series: Water

- 850. WATER MAIN CONSTRUCTION NOTES
- 851. HARNESS INSTALLATION FOR FLANGE FITTINGS
- 852. HARNESS INSTALLATION
- 853. CONCRETE ANCHOR BLOCKS FOR VERTICAL BENDS
- 854. CONCRETE THRUST BLOCKS FOR HORIZONTAL BENDS
- 855. WATER MAIN LOWERING
- 856. WATER MAIN OVER STRUCTURE
- 857. FIRE HYDRANT AND LATERAL, LOCATION
- 858. PUMPER CONNECTION
- 859. TYPICAL TEMPORARY BLOWOFF AND/OR METERED CONNECTION – MAINS UNDER CONSTRUCTION
- 860. TEMPORARY METERED CONNECTION WHEN FIRE FLOW IS REQUIRED
- 861. BLOW-OFF WITH HARNESS
- 862. FULL-SIZE BLOWOFF
- 863A. WATER SERVICE W/ FIRE SYSTEM SUPPLY – 1" & 1-1/2" METERS
- 863B. WATER SERVICE FOR 5/8" x 3/4", 1" & 1-1/2" METERS
- 864. 1" DUAL WATER SERVICE
- 865A. 2" WATER SERVICE FOR 2" OR 1-1/2" METER
- 865B. 2" WATER SERVICE FOR 2" OR 1-1/2" METER
- 866. 4" WATER SERVICE FOR 3" METER
- 867. 4" WATER SERVICE FOR 4" METER
- 868. 6" WATER SERVICE FOR 6" METER
- 869. COMBINATION WATER SERVICE STUB
- 870. COMBINATION WATER SERVICE
- 871. ALIGNMENT OF WATER MAINS AND PLACEMENT OF MAINLINE VALVES
- 872. TYPICAL DIRT STOP AND WATER MAIN ENCASEMENT
- 873. TRAFFIC-TYPE PRECAST WATER UTILITY MANHOLE
- 874. DOUBLE-CHECK VALVE BACKFLOW ASSEMBLY
- 875. BELOW GROUND DOUBLE-CHECK VALVE BACKFLOW DEVICE
- 876. REDUCED-PRESSURE BACKFLOW DEVICE

- 877. GATE VALVE
- 878. BUTTERFLY VALVE AND TAPPING VALVE
- 879. UNDERGROUND FIRE LINE SINGLE DETECTOR CHECK
INSTALLATION
- 880. DOUBLE-CHECK DETECTOR FIRE LINE BACKFLOW ASSEMBLY
- 881. PRESSURE REDUCING VALVES
- 882. SURGE ANTICIPATOR VALVE OR PRESSURE RELIEF VALVE
- 883. AIR AND VACUUM / AIR RELEASE VALVE
- 885. WATER METER FOR PRIVATE PROCESS AND EVAPORATIVE
LINES
- 886. WATER SAMPLING STATION
- 887. 4" DUCTILE IRON MULTI-SERVICE MANIFOLD
- 888. WATER SERVICE OBSTRUCTIONS

1. All material, workmanship, and construction details shall conform to the City of Cotati "Standards, Details, and Specifications."
2. Start excavation by exposing end of existing main to determine its line and grade. Start new main 8–10 feet from, and on same line and grade as, existing main. Pipe laying shall then be adjusted so depth of new main conforms to Note #3.
3. Minimum depth of cover from finished grade shall be 36" for 8" mains, 44" for 12" mains, and 48" for 14" and larger mains. Ten–inch mains must be specifically approved by the Public Works Department. Sixteen–inch and smaller main line valves shall be resilient seat gate. Eighteen–inch and larger mainline valves shall be butterfly valves. Blow–off valves shall be 2" or 3" ball valves with rotation stops.
4. No. 12 insulated copper wire shall be Laid on top of and along entire length of all non–metallic mains and shall be extended to the surface at all valve locations, blow–offs, and meter boxes sufficiently for locator equipment to be attached. Fasten the wire to the top of the pipe so as not to be displaced by backfilling procedure (one method of accomplishing this is to affix the wire to the top of the pipe with duct tape at approximately 10–foot intervals.
5. Mains to be constructed within 10 feet of sewer pipe require special installation, and design must be specifically approved by the City Engineer.
6. All trenching, backfill, and resurfacing required for installation of water system facilities shall be per City Standards.
7. Only City Public Works Department personnel shall operate valves on existing water mains or water services.
8. Services other than those shown or noted on the City–approved plans shall not be installed prior to obtaining written approval from the City Engineer.
9. Unless a larger size is otherwise shown on the plans, 1" water services shall be installed in residential developments, and 2" water services shall be installed in commercial developments.
10. Water and sewer service laterals shall be separated horizontally by a minimum of five feet.
11. At the location of each water service lateral, the letter "W" shall be inscribed into the face of the curb. The letter "W" shall be 4" high and completely legible.
12. All meter boxes, vaults, and pits shall be bedded on 3" minimum thick, $\frac{3}{4}$ " drain rock, Class II AB or other clean material with typical san equivalent of 20 minimum, uncontaminated by native soil, against compacted or undisturbed base. The gravel bed shall extend to 4" minimum beyond all sides of the meter box. Box shall be set flush with top of curb, sidewalk, or ground, whichever is applicable. Lot numbers must be noted on top side of meter box with a permanent marking pen

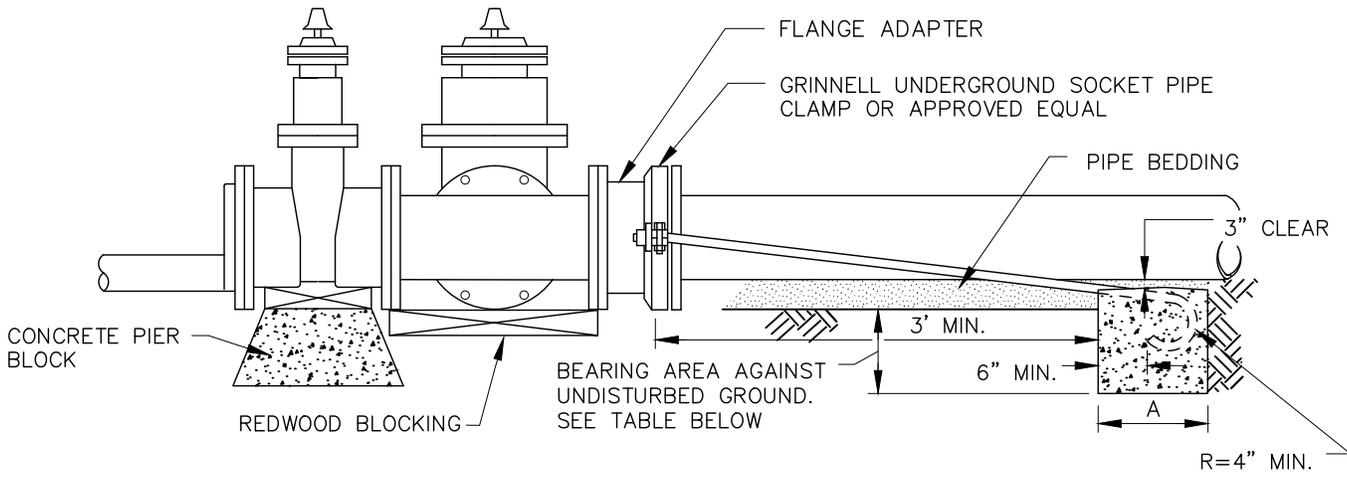
	DESIGN AND CONSTRUCTION STANDARDS		STD. NO.
	WATER MAIN CONSTRUCTION NOTES		850
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER		DECEMBER 2019	PAGE 1 OF 3 SCALE: NONE

13. Meter boxes shall be located out of traffic loading or travel areas.
14. Meter boxes and vaults shall be set so that the reading lids are aligned over the meter registers as closely as possible.
15. Unless otherwise approved by the Public Works Department, the on-site water line shall be the same size as the water meter.
16. For services larger than 1", if either the water service lateral or the on-site building line is already existing within the tolerances specified on the Details, the last one installed shall be on the same line and W grade as the existing one.
17. Items specified on the Details or the Engineer's Approved list are approved for use. All other items not on the list shall be submitted to the Public Works Department for approval.
18. Meter manifolds must be detailed and approved by the City Engineer. In general, manifolds where all fittings are 2" or less shall be constructed from threaded brass pipe and fittings from the end of the service lateral to the meter connection.
19. Gaskets for flange fittings shall conform to AWWA Standard C115.
20. To abandon a water service, expose and turn off corporation stop, then sever the lateral connection.
21. There shall be no unmetered connections to the City of Cotati water system, including connections bypassing meter for testing on-site plumbing or for obtaining construction water. Pressure testing against valves will not be allowed. When a subdivision water main has been accepted and tied in, the individual curb stops will be locked off with cable ties. Cutting off or tampering with the cable ties will constitute a straight tie-in connection. Such connections will be severed by the Public Works Department and will result in penalties including payment of fines and estimated water usage fees.
22. Upon application, Public Works Department personnel will observe installation of a 2" temporary check valve on the end of the existing main for construction water.
23. Before combustible materials may be stored or constructed on site, the Fire District must approve fire flow and access. Before a fire hydrant may be placed in service, a high-velocity flushing of the hydrant lateral shall be observed and approved by Public Works department personnel. High-velocity flushing shall consist of removing the hydrant and replacing it with a suitable elbow and diffuser. Under Public Works observation, the hydrant lateral is flushed until Public Works personnel are satisfied that the lines are clear of debris. Prior to acceptance of the on-site water main by the City, meter and double-check valve assembly may be installed per Standard 860.

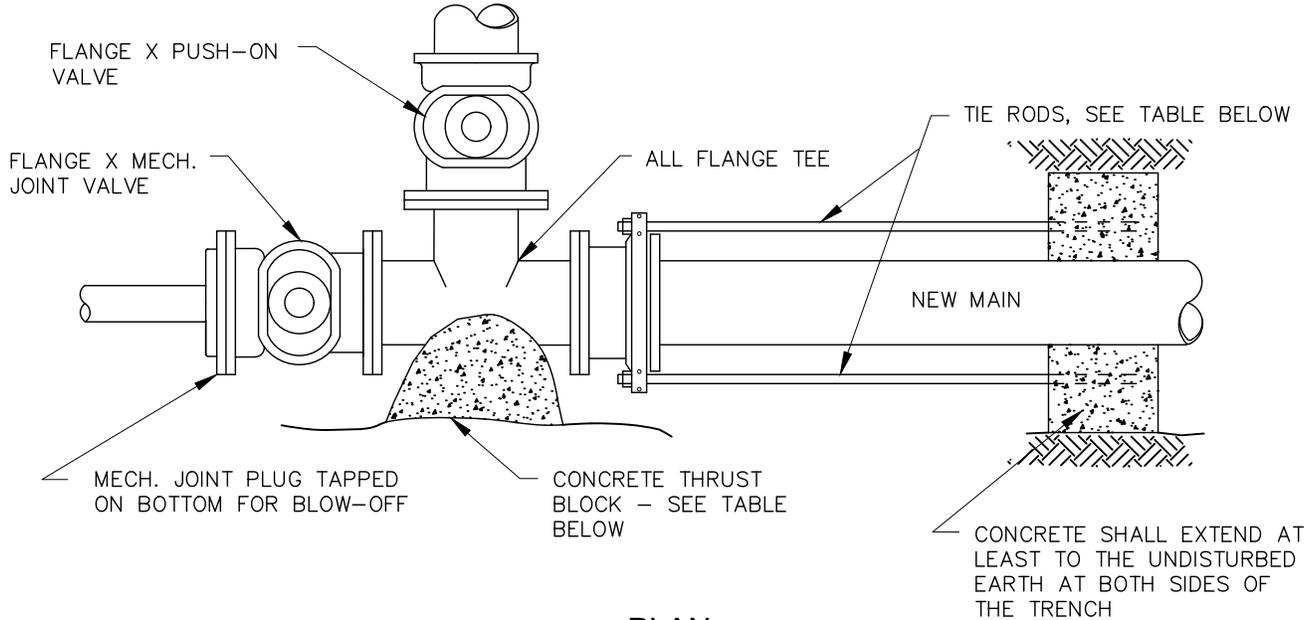
	DESIGN AND CONSTRUCTION STANDARDS		STD. NO.
	WATER MAIN CONSTRUCTION NOTES		850
 <small>CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER</small>		DECEMBER 2019	PAGE 2 OF 3 SCALE: NONE

24. Upon completion of construction, final connection will be made by the contractor at the developer's expense under inspection by a City Public Works representative, unless otherwise specified on the plans.
25. For connections to an existing water main, the contractor shall provide all excavation, shoring, backfill, and trench resurfacing per City Standards. Where the connection is to be a "hot tap," the contractor shall provide and install the tapping valve and sleeve, and will make the tap under Public Works Department observation and inspection at the developer's expense. No hot tap shall be made within four feet of a joint (measured from joint to centerline of intersecting pipe). The joint shall be removed, and the proposed hot tap shall be replaced with a "cut-in" tee. When a "cut-in" tee and valve(s) assembly is required on the plans, then contractor shall provide and install the entire assembly (including valves), and any other hardware necessary under City Public Works Department inspection, and shall provide all other works and materials necessary to complete the installation to City Standards.
26. The contractor shall coordinate all water main connection work with the City Public Works Department at (707) 792-4610, and shall give 48 hours' notice, in accordance with Construction Specifications, prior to commencing work.
27. After a street has been overlaid, all water valve boxes will be marked in white paint before the close of that workday.
28. Within 48 hours of paving, all water valve boxes will be brought to grade and inspected.

	DESIGN AND CONSTRUCTION STANDARDS		STD. NO.
	WATER MAIN CONSTRUCTION NOTES		850
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ELEVATION



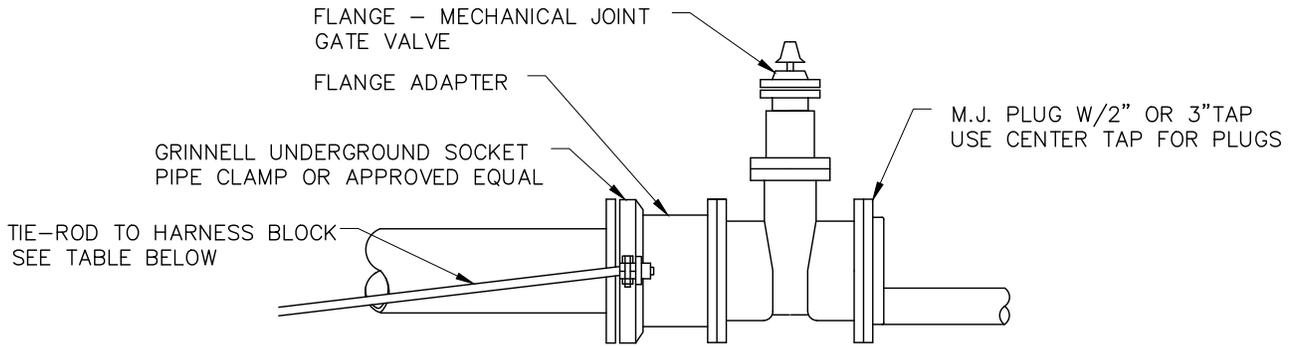
PLAN

MINIMUM DIMENSIONS				
PIPE SIZE	TIE RODS	HARNES BLOCK *	THRUST BLOCK **	
			A	
6"	5/8"	4 SQ. FT.	2'	4 SQ. FT.
8"	3/4"	7 " "	3'	7 " "
12"	1 1/8"	15 " "	3'	16 " "
OVER 12" BY THE DESIGN ENGINEER				

NOTE:
 ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.

* BEARING AREA BELOW GRADE OF PIPE AGAINST UNDISTURBED GROUND.
 ** BEARING AREA AGAINST UNDISTURBED GROUND.

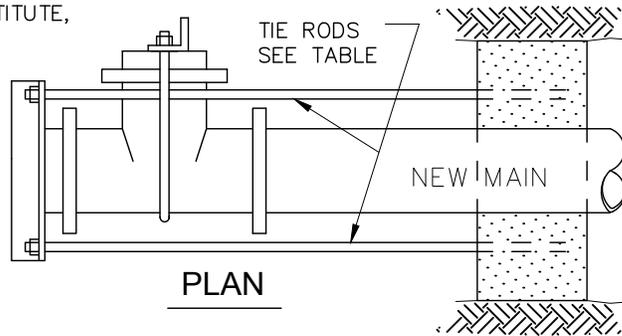
	DESIGN AND CONSTRUCTION STANDARDS		STD. NO. 851
	HARNES INSTALLATION FOR FLANGE FITTINGS		PAGE 1 OF 1
		DECEMBER 2019	SCALE: NONE
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER			



HARNESS FOR VALVE WITH PLUG

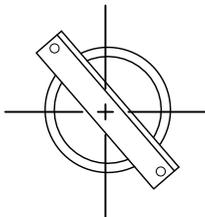
NOTE:

ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.

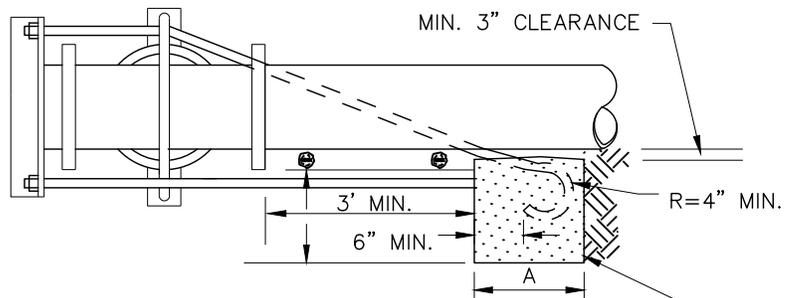


PLAN

CONCRETE SHALL EXTEND AT LEAST TO THE UNDISTURBED EARTH AT BOTH SIDES OF THE TRENCH.



PLUGS FOR MAINS 12" AND LARGER SHALL BE HELD WITH ANGLE IRON AS SHOWN. PLUGS WITH DILLY LUGS MAY BE USED FOR 6" & 8" MAINS.



ELEVATION

CONCRETE HARNESS BLOCK SEE TABLE BELOW

TYPICAL HARNESS

MINIMUM DIMENSIONS				
PIPE SIZE	TIE RODS	ANGLE IRON	* HARNESS BLOCK	A
6"	5/8"	3"X3"X1/4"	4 SQ. FT.	2'
8"	3/4"	3 1/2"X3"X1/4"	7 " "	3'
12"	1 1/8"	4"X3"X1/2"	16 " "	3'
OVER 12"	BY THE DESIGN ENGINEER			

* BEARING AREA BELOW GRADE OF PIPE AGAINST UNDISTURBED GROUND.



DESIGN AND CONSTRUCTION STANDARDS

HARNESS INSTALLATION

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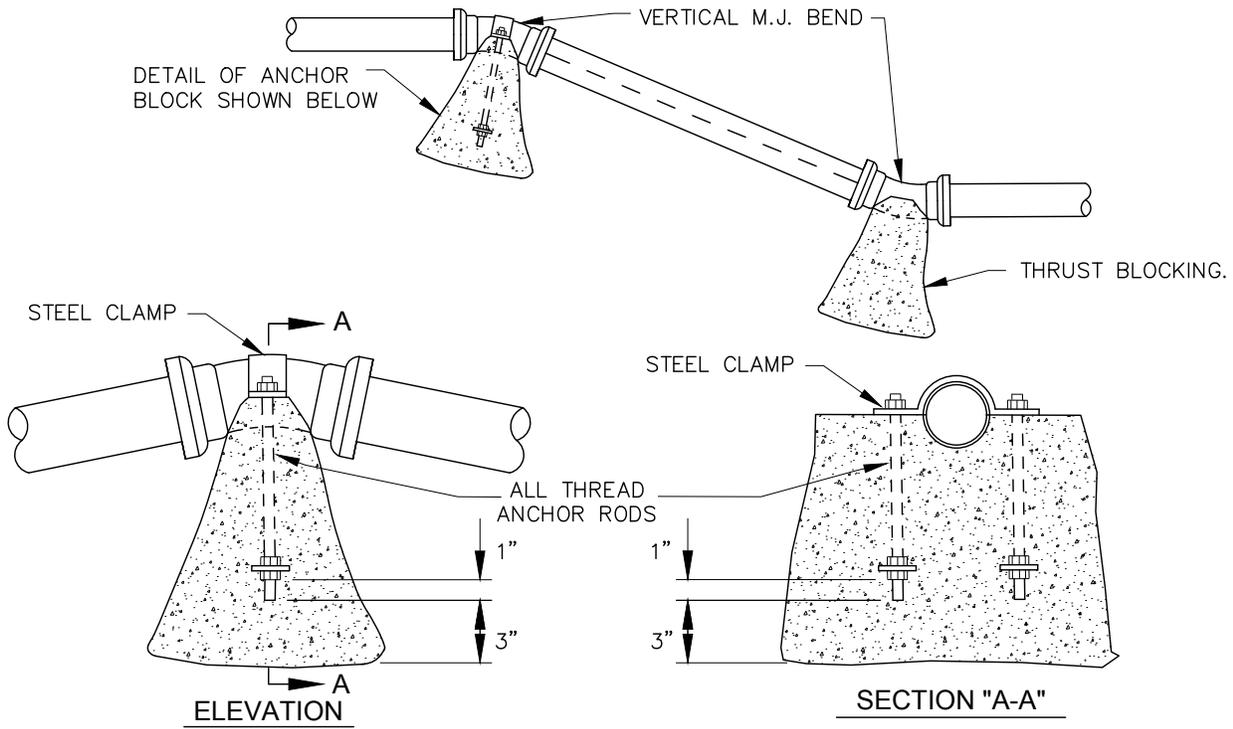
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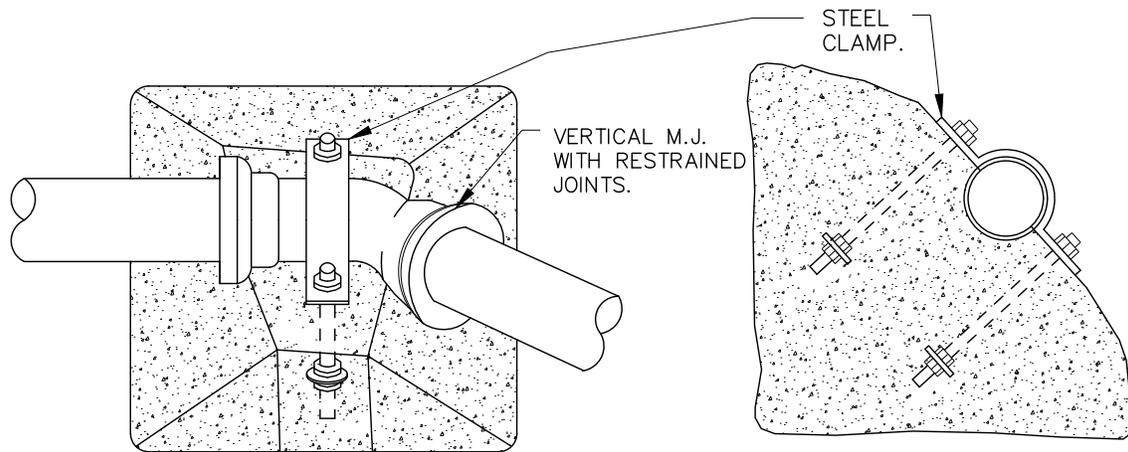
852

PAGE 1 OF 1

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TYPICAL CONCRETE ANCHOR BLOCK FOR VERTICAL BEND



**TYPICAL CONCRETE ANCHOR BLOCK FOR COMBINATION
HORIZONTAL-VERTICAL BEND**

NOTES:

1. CONCRETE ANCHOR BLOCKS SHALL BE INSTALLED BY THE CONTRACTOR TO WITHSTAND A THRUST PRODUCED BY THE TEST PRESSURE OF 200 P.S.I. MINIMUM DIMENSIONS FOR CONCRETE, ANCHOR RODS, AND CLAMPS ARE LISTED IN THE TABLE.
2. USE MECHANICAL RESTRAINED JOINTS AT ALL FITTINGS.

PIPE SIZE	ANCHOR BOLTS	STEEL CLAMPS
SIZE	5/8"	3" X 1/4"
SIZE	3/4"	3-1/4" X 1/4"
SIZE	1-1/8"	4" X 1/2"



DESIGN AND CONSTRUCTION STANDARDS

**CONCRETE ANCHOR BLOCKS
FOR VERTICAL BENDS**

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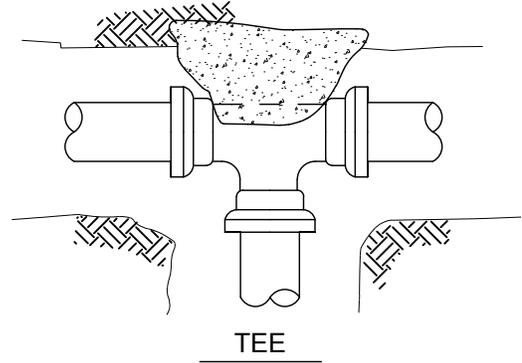
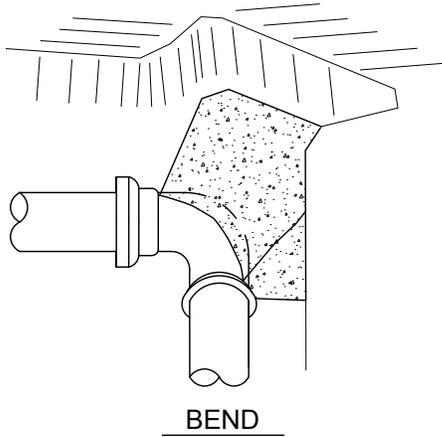
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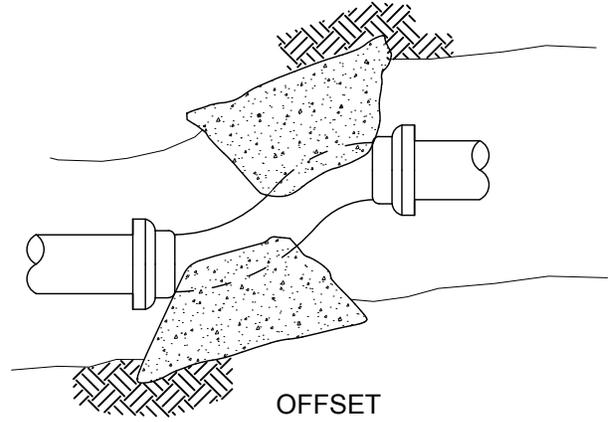
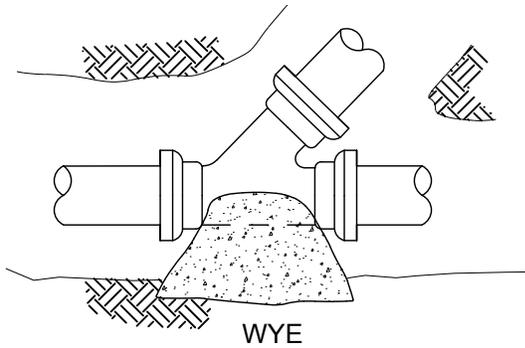
PAGE 1 OF 2

DECEMBER 2019

SCALE: NONE



**TYPICAL CONC. BLOCKING
SHOWN IN PERSPECTIVE**



NOTES:

1. Safe bearing load of soil for horizontal thrust shall not be exceeded.
2. Concrete blocking, cast-in-place, to extend from bells of fittings to undisturbed soil and entire bearing area must be against undisturbed soil.
3. In using the thrust blocking table below, assume 2000 p.s.f. bearing capacity unless otherwise shown on the plans. The design engineer shall specify thrust blocking requirements for all other soil bearing conditions.
4. For plugged leg(s) of tee or cross, use harness-type blocking as shown on Std. 852 and concrete blocking indicated in table below
5. To use this standard, a geotechnical engineer shall confirm the soil bearing capacity, or a value of 1000 p.s.f shall be used.
6. Restrained joint pipe may be substituted, with calculations, in lieu of thrust blocks.

MIN. REQUIRED BEARING AREA IN SQ. FT. PER 100 P.S.I. TEST PRESSURE *						
PIPE SIZE	SOIL BEARING CAPACITY	HARNESS BLOCKS	TEES & DEAD ENDS	90° BENDS	45° BENDS	22-1/2° BENDS
6"	1000	4	4	6	3	2
	2000	2	2	3	2	1
8"	1000	7	7	10	5	3
	2000	4	4	5	3	2
12"	1000	16	16	22	12	6
	2000	8	8	11	6	3

* MULTIPLY NO. IN TABLE BY TEST PRESSURE & DIVIDE BY 100



DESIGN AND CONSTRUCTION STANDARDS

**CONCRETE THRUST BLOCKS
FOR HORIZONTAL BENDS**

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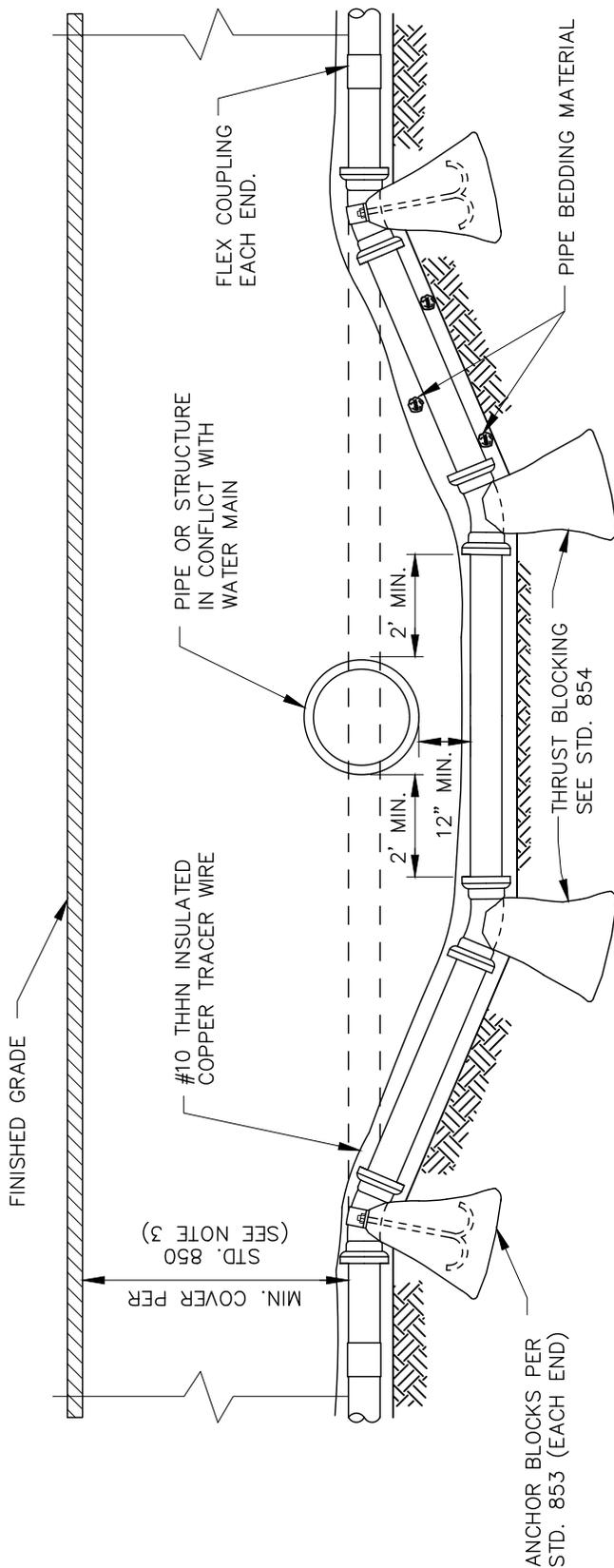
DECEMBER 2019

STD. NO.

854

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON PER CITY OF COTATI STANDARD CONSTRUCTION SPECIFICATIONS.
2. ONLY MECHANICAL JOINT FITTINGS WITH RESTRAINED JOINTS MAY BE USED.
3. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS.



DESIGN AND CONSTRUCTION STANDARDS

WATER MAIN LOWERING

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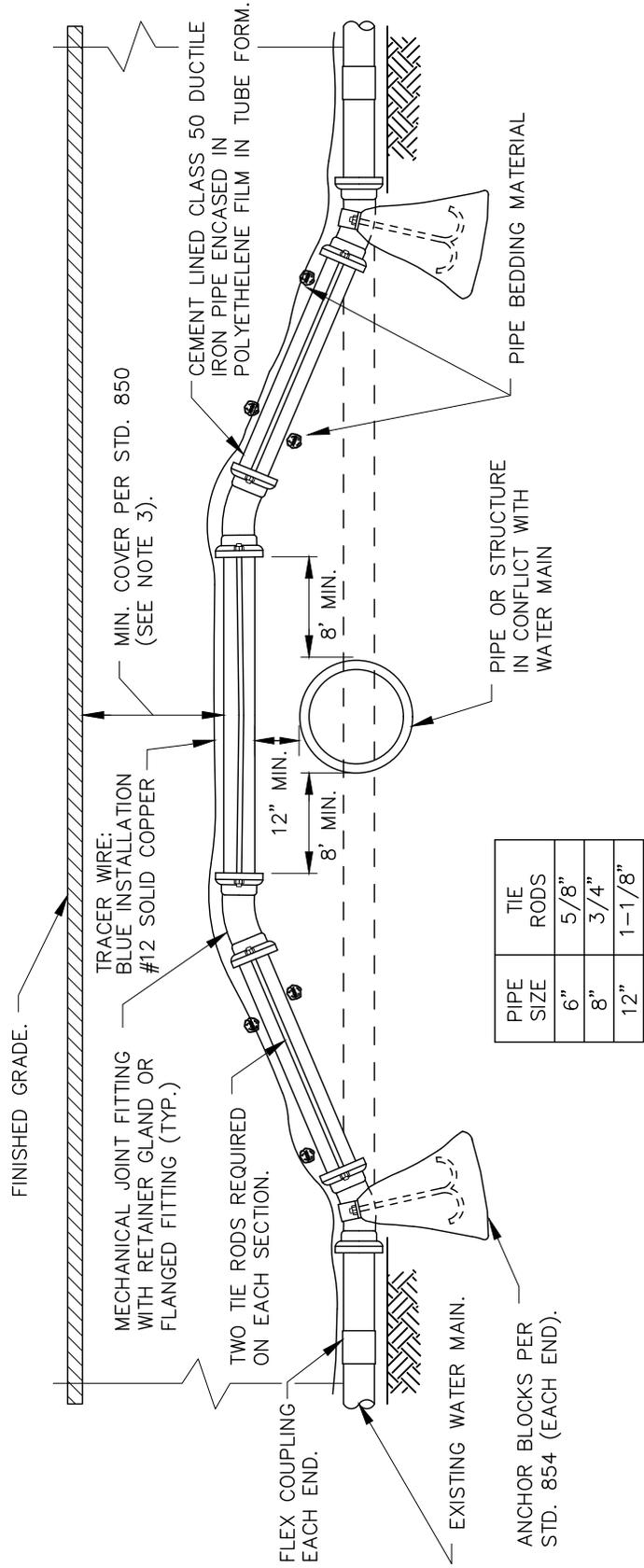
DECEMBER 2019

STD. NO.

855

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON & SHALL BE WRAPPED IN POLYETHYLENE PER THE CITY OF COTATI STANDARD CONSTRUCTION SPECIFICATIONS FOUND IN SECTION 99.
2. ONLY MECHANICAL JOINT FITTINGS WITH RESTRAINED JOINTS MAY BE USED.
3. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS - NO 90° BENDS ALLOWED.
4. TO BE USED ONLY WITH THE DIRECT APPROVAL OF THE CITY ENGINEER.
5. INSTALL AIR AND VACUUM/AIR RELEASE VALVE AT HIGH POINT PER STD. 883
6. INSTALLATION MUST COMPLY WITH CHD STANDARDS.



DESIGN AND CONSTRUCTION STANDARDS

WATER MAIN OVER STRUCTURE

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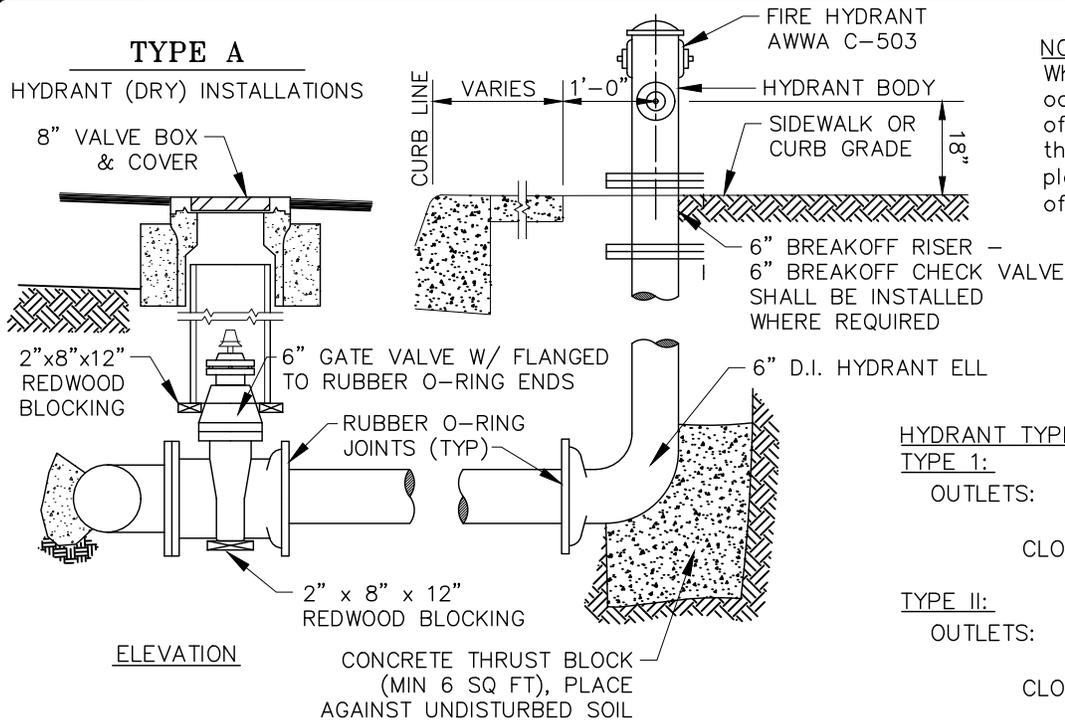
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856

PAGE 1 OF 1

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TYPE A

HYDRANT (DRY) INSTALLATIONS



NOTE:
Where planter strip occurs between back of curb & sidewalk, the hydrant shall be placed 18" from face of curb.

HYDRANT TYPES:

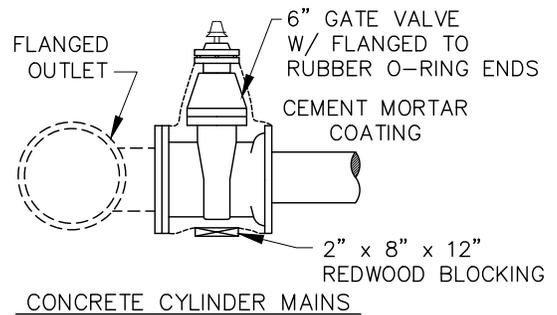
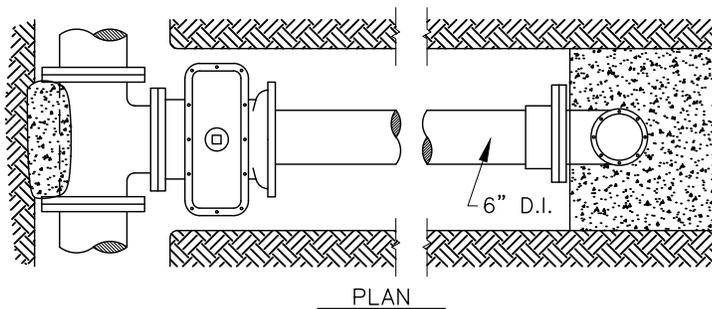
TYPE I: (RESIDENTIAL)

OUTLETS: 1-4 1/2" &
1-2 1/2"
CLOW F75

TYPE II: (COMMERCIAL)

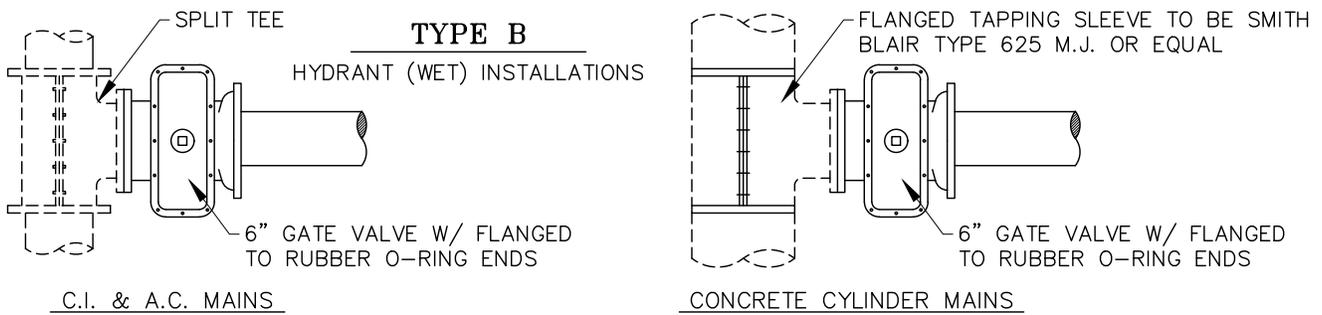
OUTLETS: 1-4 1/2" &
2-2 1/2"
CLOW F76

ELEVATION



TYPE B

HYDRANT (WET) INSTALLATIONS



NOTES:

1. CAST IRON OR ASBESTOS CEMENT MAINS WITH BARE FITTINGS: Hydrant assembly is to be bare. Apply field coating of mastic on portions of the standard tee and hydrant ell to prevent any direct contact between cast iron and concrete.
2. CONCRETE CYLINDER OR ASBESTOS-CEMENT MAINS WITH COATED FITTINGS: Coat underground portion of hydrant assembly with cement mortar



DESIGN AND CONSTRUCTION STANDARDS

FIRE HYDRANT AND LATERAL

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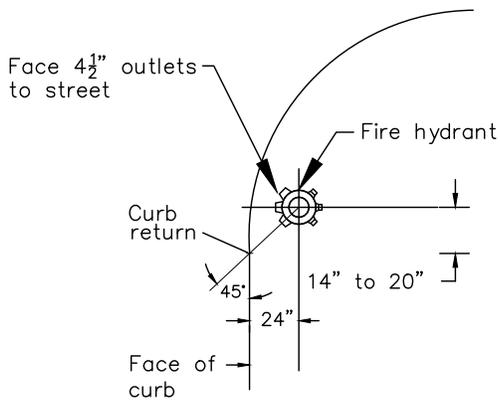
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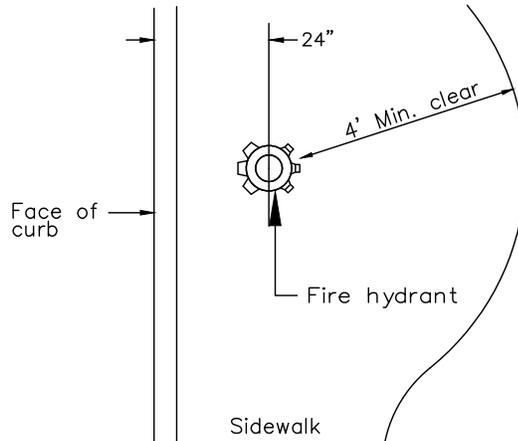
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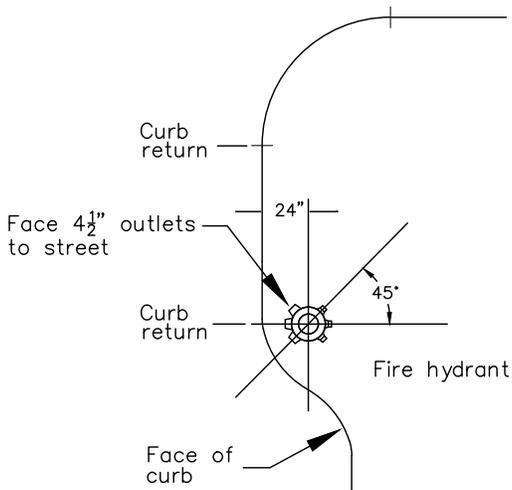
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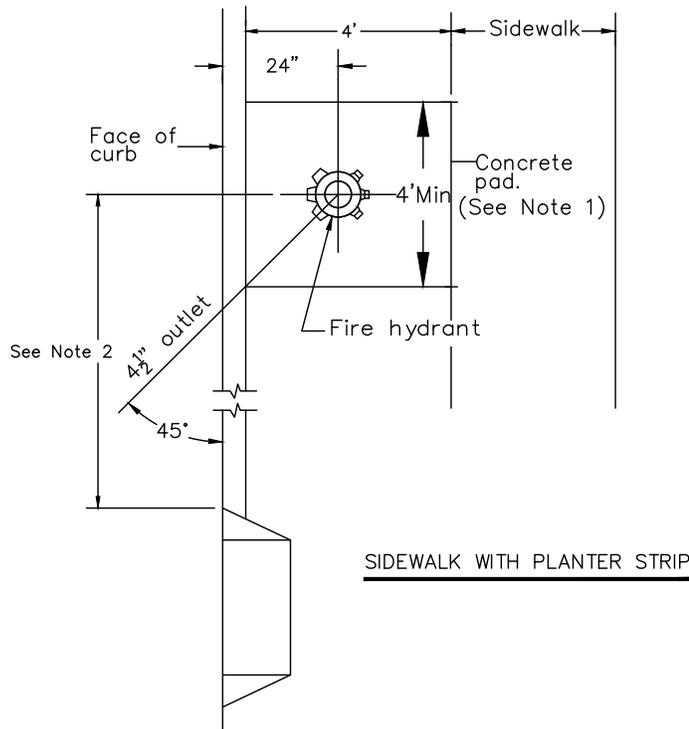
CURB RETURN



CONTIGUOUS SIDEWALK



CURB RETURN WITH NECKDOWN



SIDEWALK WITH PLANTER STRIP

NOTES:

1. Where no sidewalk exists, or where hydrant is installed in planter strip or behind sidewalk, a 4" thick 4' x 4' concrete pad shall be installed.
2. Hydrants to be a minimum of 10 feet from driveway approach in commercial or multi-family developments and a minimum of 5 feet from driveway approach in one- or two-family developments.



DESIGN AND CONSTRUCTION STANDARDS

FIRE HYDRANT LOCATION

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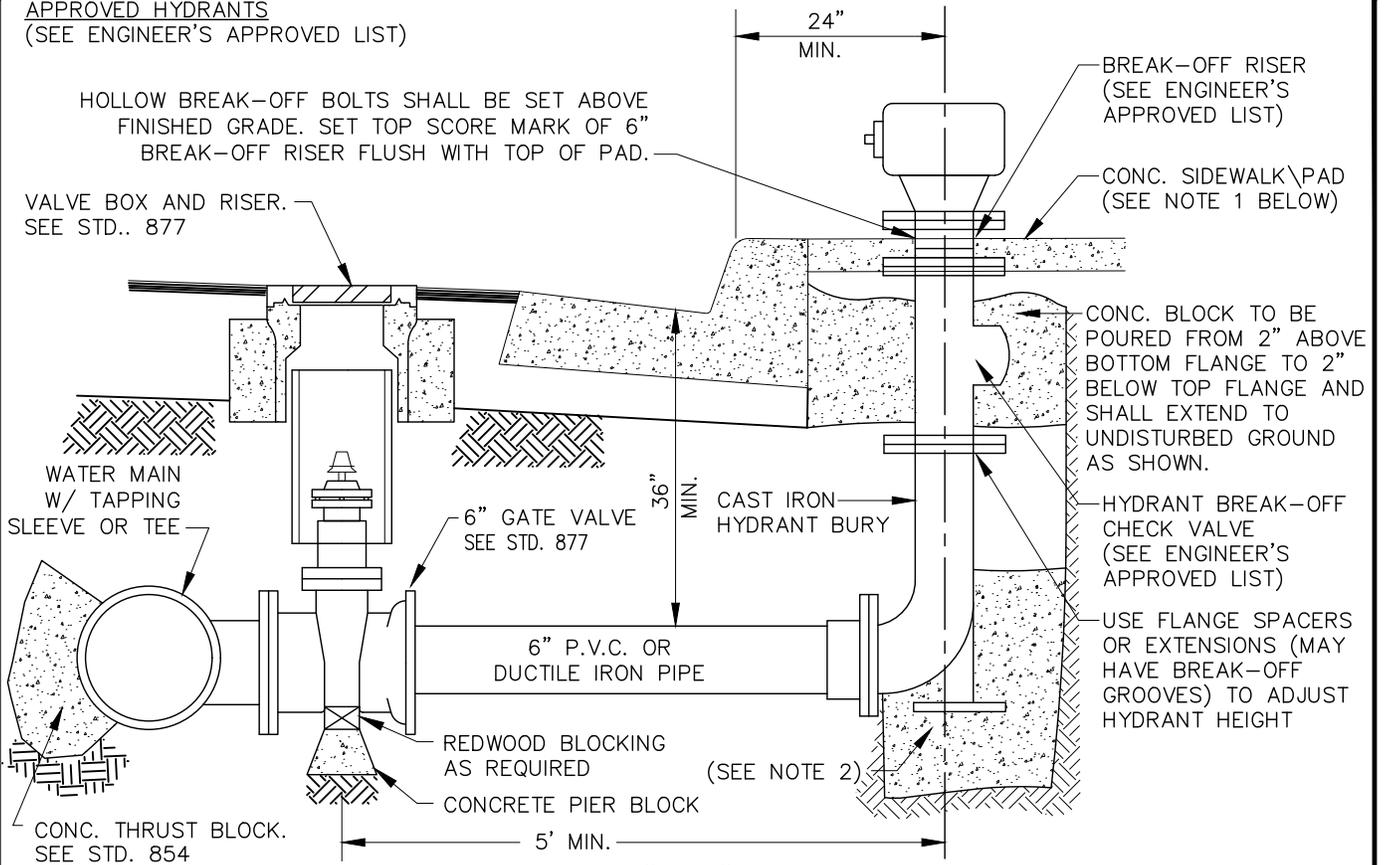
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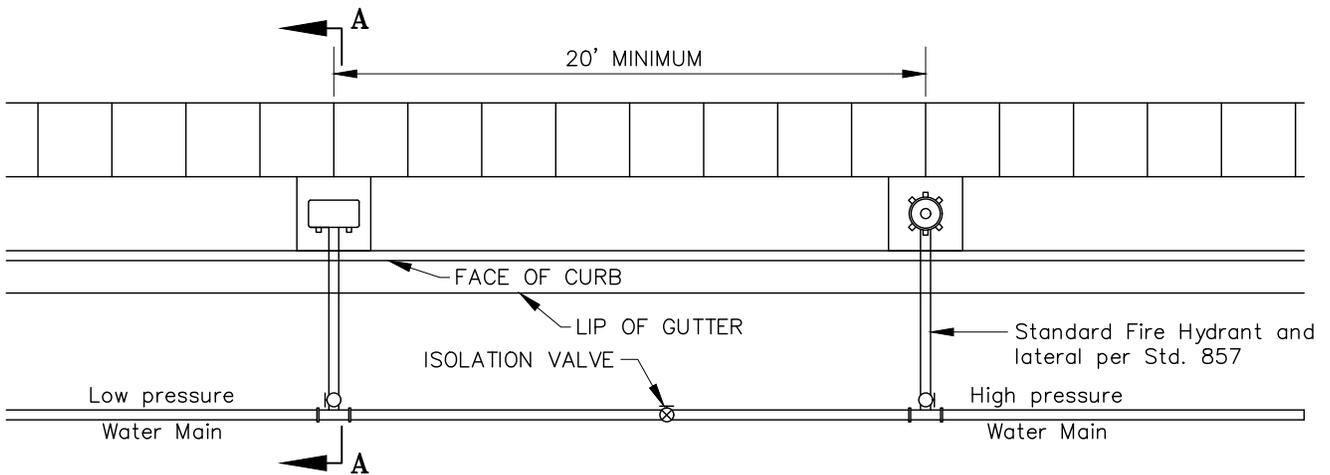
DECEMBER 2019

SCALE: NONE

APPROVED HYDRANTS
(SEE ENGINEER'S APPROVED LIST)



SECTION "A-A"



NOTES:

1. Where no sidewalk exists, or where hydrant is installed in planter strip, a 4" thick 4' x 4' concrete pad shall be installed around the base of the hydrant.
2. Restrained joints are required for all new construction from gate valve to hydrant bury. Thrust blocks are only required where existing services are being modified and restrained joints are not used.
3. Install min of 10' from commercial or multi-family driveways and 5' from one or two family driveways.
4. Point fire hydrant in accordance with AWWA Standard Specification C503. (See Engineer's Approved List) The finished paint color shall be white. All damaged paint surfaces shall be corrected by touch up prior to acceptance.



DESIGN AND CONSTRUCTION STANDARDS

PUMPER CONNECTION

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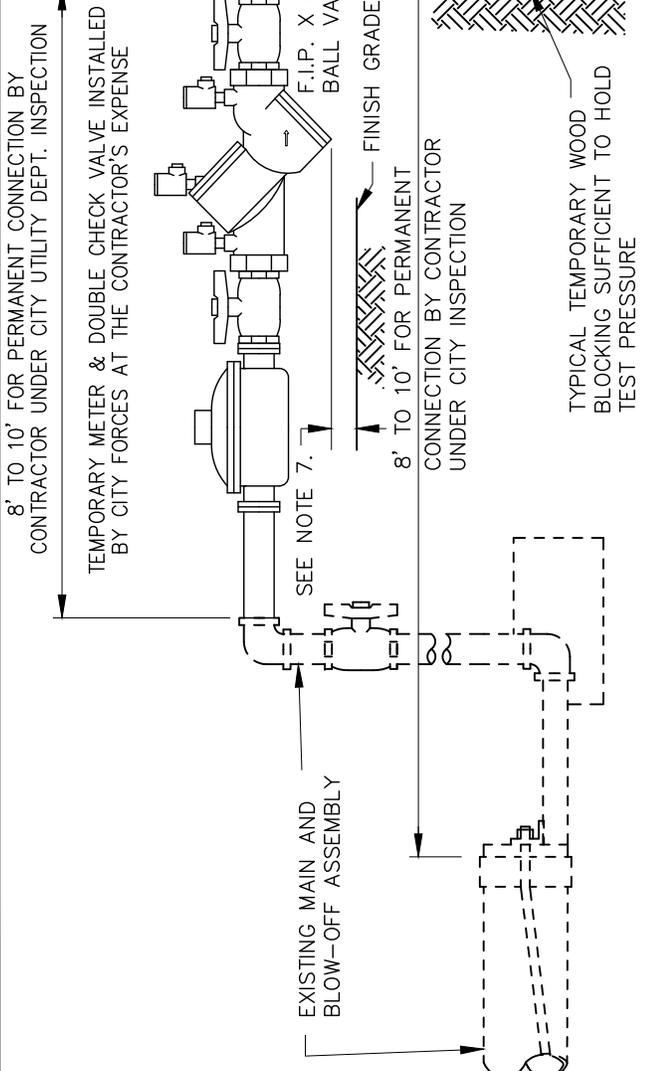
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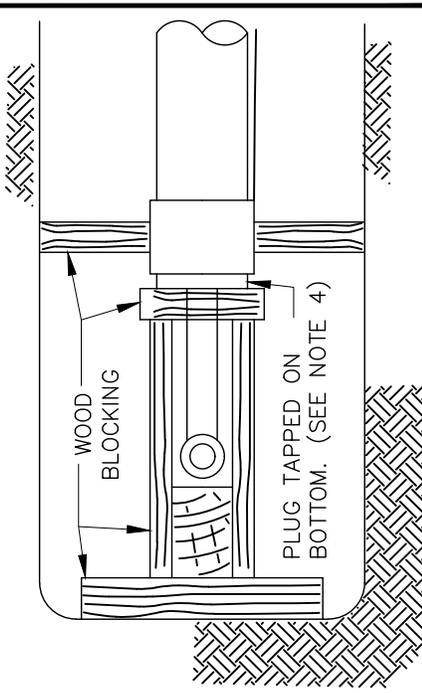
858

PAGE 1 OF 1

SCALE: NONE



ELEVATION



PLAN

NOTES:

1. END OF NEW MAIN TO BE ON SAME LINE AND GRADE AS EXISTING WHERE FEASIBLE.
2. WOOD BLOCKING TO BE USED FOR THRUST PRODUCED BY TEST PRESSURE PLUS 50 P.S.I.
3. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
4. SEE STD. 861 FOR BLOWOFF SIZE CHART. ("BLOWOFF" IS PIPE AND FITTINGS, UP TO AND INCLUDING VALVE).
5. THE CONTRACTOR SHALL MAKE THE FINAL TIE-IN UNDER THE INSPECTION OF A CITY UTILITIES DEPT. REPRESENTATIVE. INSPECTION FEES MUST BE PAID PRIOR TO SCHEDULING TIE-IN.
6. SHOULD THE BLOWOFF ON THE EXISTING MAIN BE LOCATED OUT OF THE TRAVELED WAY AS INDICATED ON STD. 861, THE TEMPORARY BLOWOFF PIPING SHALL BE EXTENDED OUT OF THE TRAVELED WAY AND THE RISERS, METER, AND CHECK VALVE WILL BE INSTALLED OUT OF TRAVELED WAY.
7. CLEARANCE TO BE 12" MIN. ABOVE FINISHED GRADE OR 6" ABOVE INUNDATION LEVEL, WHICHEVER IS HIGHER.
8. THIS INSTALLATION IS NOT ACCEPTABLE WHEN COMBUSTIBLE MATERIAL IS STORED ONSITE OR CONSTRUCTION ABOVE GRADE BEGINS. (SEE STD 860 WHEN FIRE FLOW IS REQUIRED).

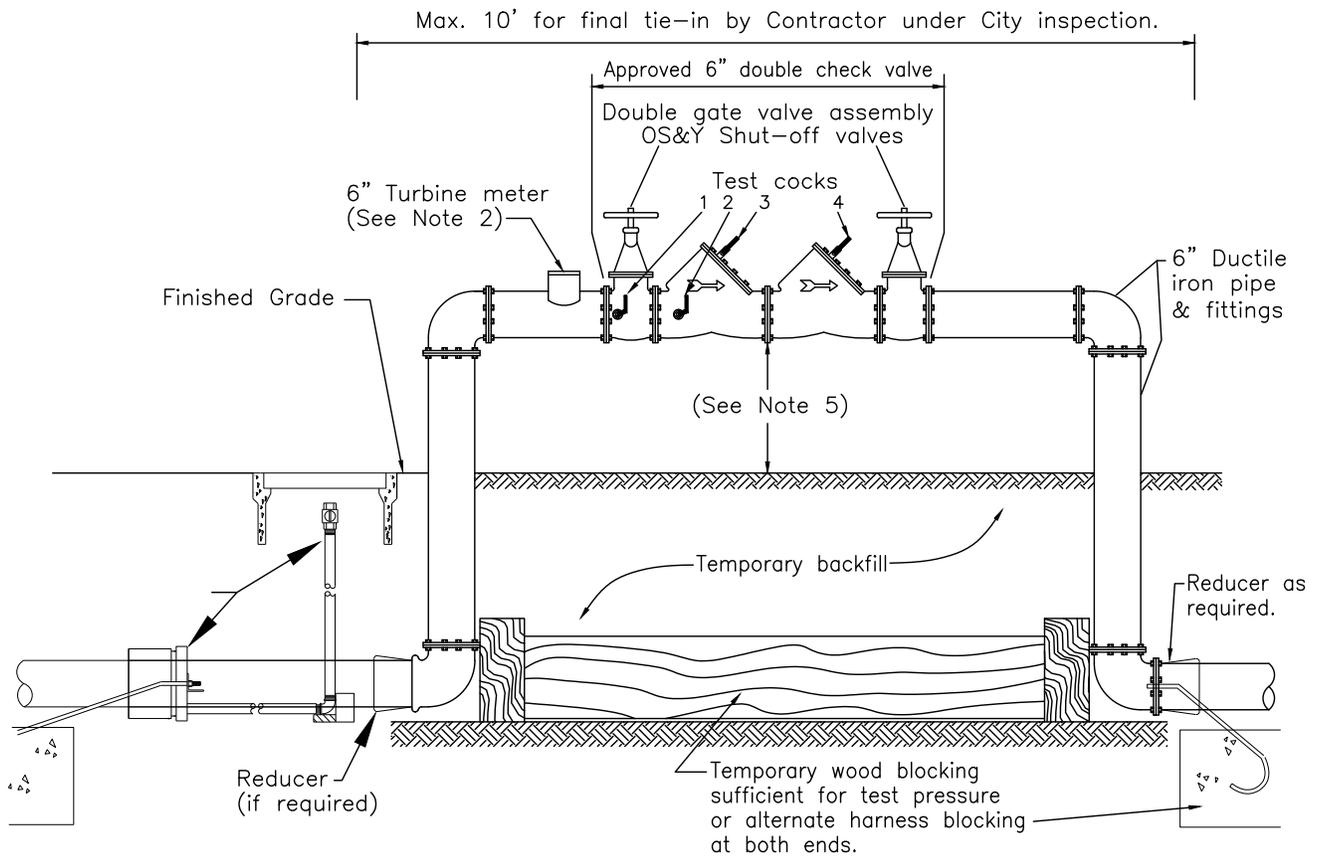


DESIGN AND CONSTRUCTION STANDARDS
TYPICAL TEMPORARY BLOWOFF
AND/OR METERED CONNECTION
MAINS UNDER CONSTRUCTION

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STD. NO.
859
 PAGE 1 OF 1
 SCALE: NONE

DECEMBER 2019



NOTES:

1. This assembly shall be installed when combustible materials will be stored or constructed on-site prior to acceptance of the on-site water main by the City. Fire flow & access must be satisfactory to the City Fire Department.
2. The Contractor shall furnish the 6" meter and have the 6" meter and double-check valve tested and certified on-site prior to activating the system. The contractor is responsible for any fees and charges incurred.
3. The Contractor shall make final tie-in under the inspection of a City Public Works Inspector. Inspection fees must be paid prior to scheduling tie-in.
4. Meters to be gallon-reading-type only.
5. Clearance to be 12" min. above finished grade or 6" above the inundation level, whichever is higher.
6. Fire lines shall be flushed per City Standard Specifications and adequate fire flow provided prior to combustible materials being stored or construction beginning on site.
7. The meter shall be installed with proper lengths of pipe both upstream and downstream of the meter. See manufacturers specifications for determining pipe length(s).
8. A Utility Billing account shall be opened with City prior to flowing water through meter.



DESIGN AND CONSTRUCTION STANDARDS

**TEMPORARY METERED CONNECTION
WHEN FIRE FLOW IS REQUIRED**

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STD. NO.

860

PAGE 1 OF 1

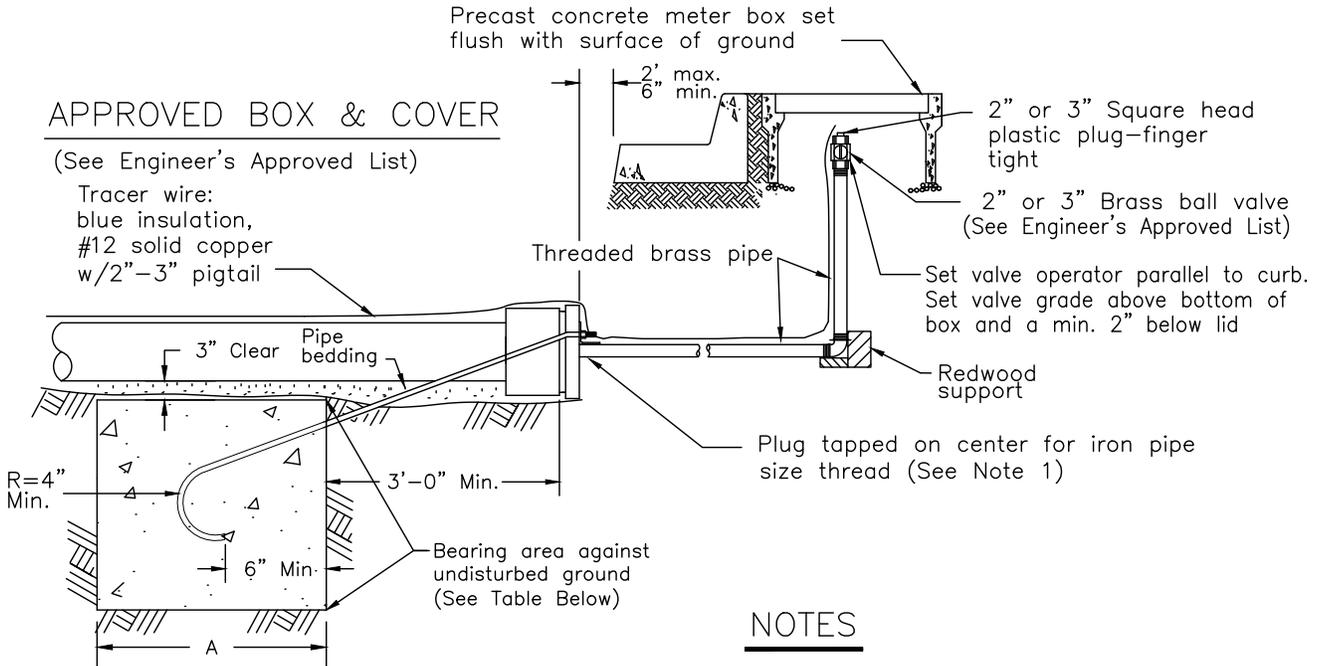
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APPROVED BOX & COVER

(See Engineer's Approved List)

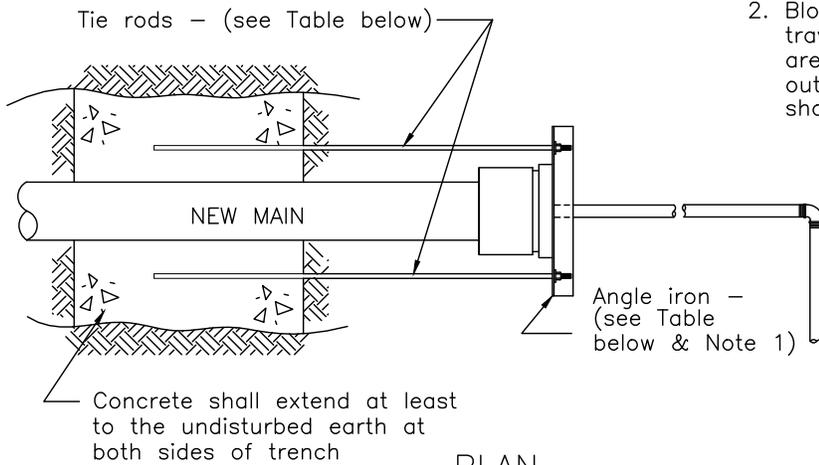
Tracer wire:
blue insulation,
#12 solid copper
w/2"-3" pigtail



ELEVATION

NOTES

1. For 6" & 8" mains, M.J. plugs or caps with dilly lugs and 2" center tap may be used in lieu of angle iron. Install angle iron off-center to accommodate center tap.
2. Blow-off shall not be installed within the traveled way. If main ends within street area, blow-off to be extended to area outside of travelway and installed as shown above.



PLAN

MINIMUM DIMENSIONS

PIPE SIZE	TIE RODS	ANGLE IRON	BEARING AREA	A	SIZE B.O.
6"	5/8"	3"x3"x1/4" *	4 Sq. Ft.	2'	2"
8"	3/4"	3 1/2"x3"x1/4"*	7 Sq. Ft.	3'	2"
12"	1-1/8"	4"x3"x1/2"	15 Sq. Ft.	3'	3"
OVER 12"	BY THE DESIGN ENGINEER				3"

* (See Note 1)



DESIGN AND CONSTRUCTION STANDARDS

BLOW-OFF WITH HARNESS

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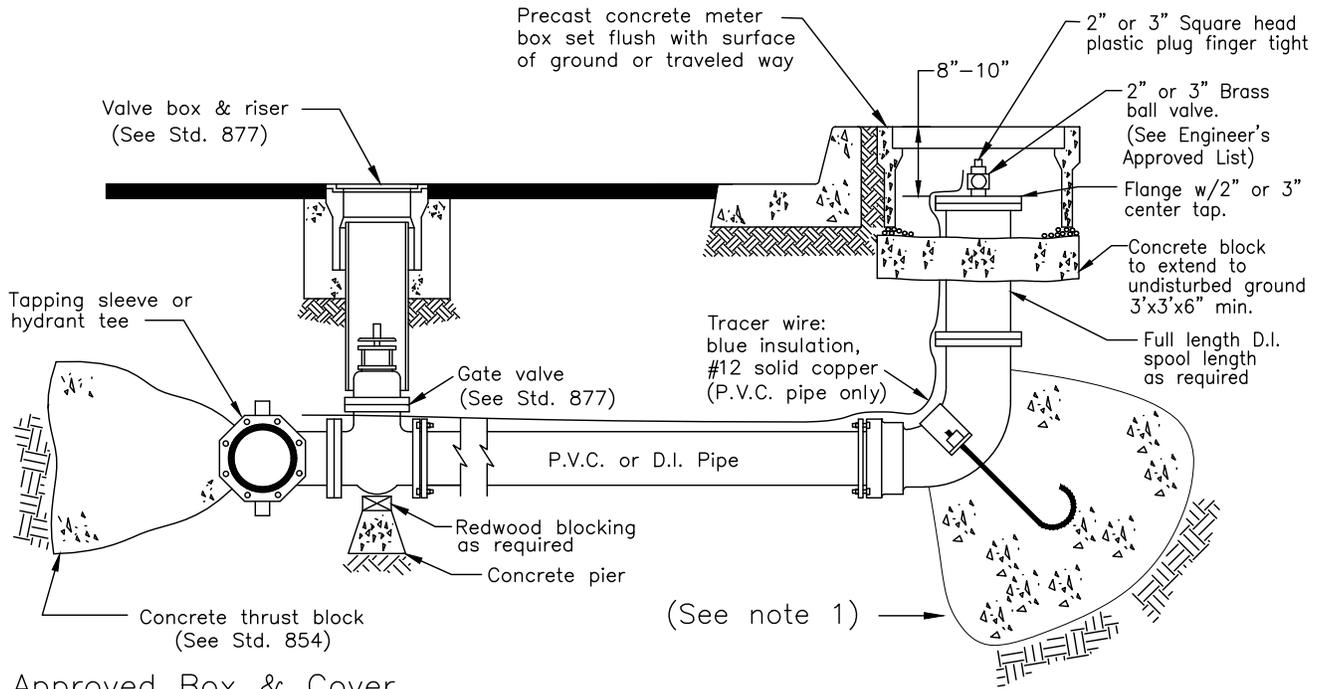
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STD. NO.

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PAGE 1 OF 1

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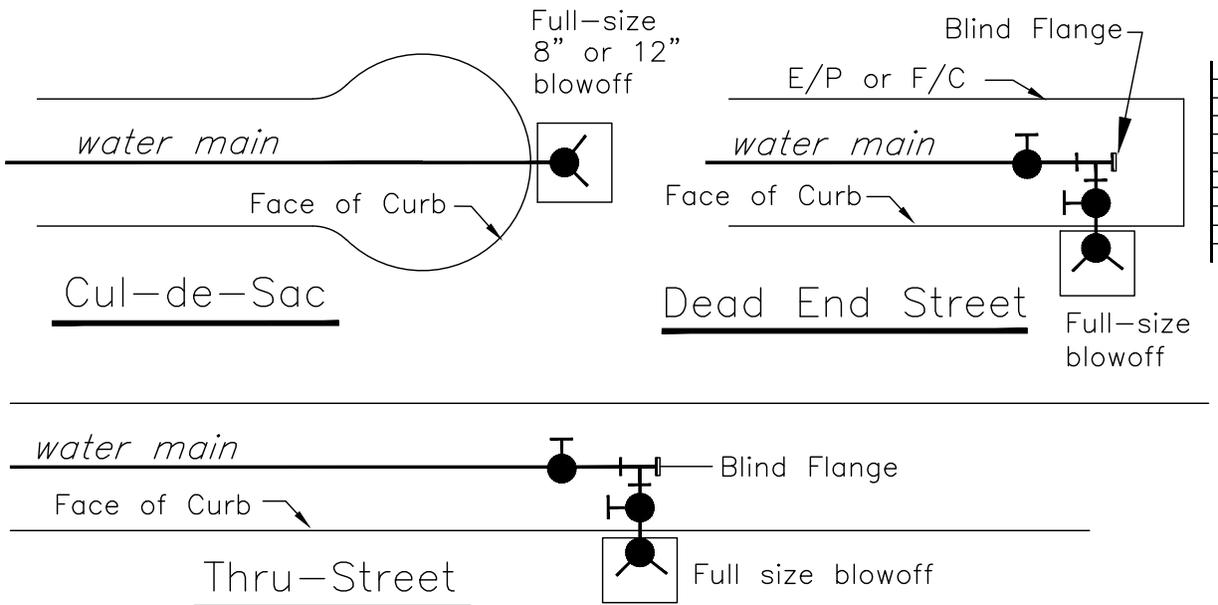


Approved Box & Cover

(See Engineer's Approved List)

NOTES

1. Restrained joints are required for all new construction from gate valve to 90° bend. Thrust blocks are only required where existing services are being modified and restrained joints are not used.
2. Blowoff piping to be the same size as the main.



DESIGN AND CONSTRUCTION STANDARDS

FULL-SIZE BLOWOFF

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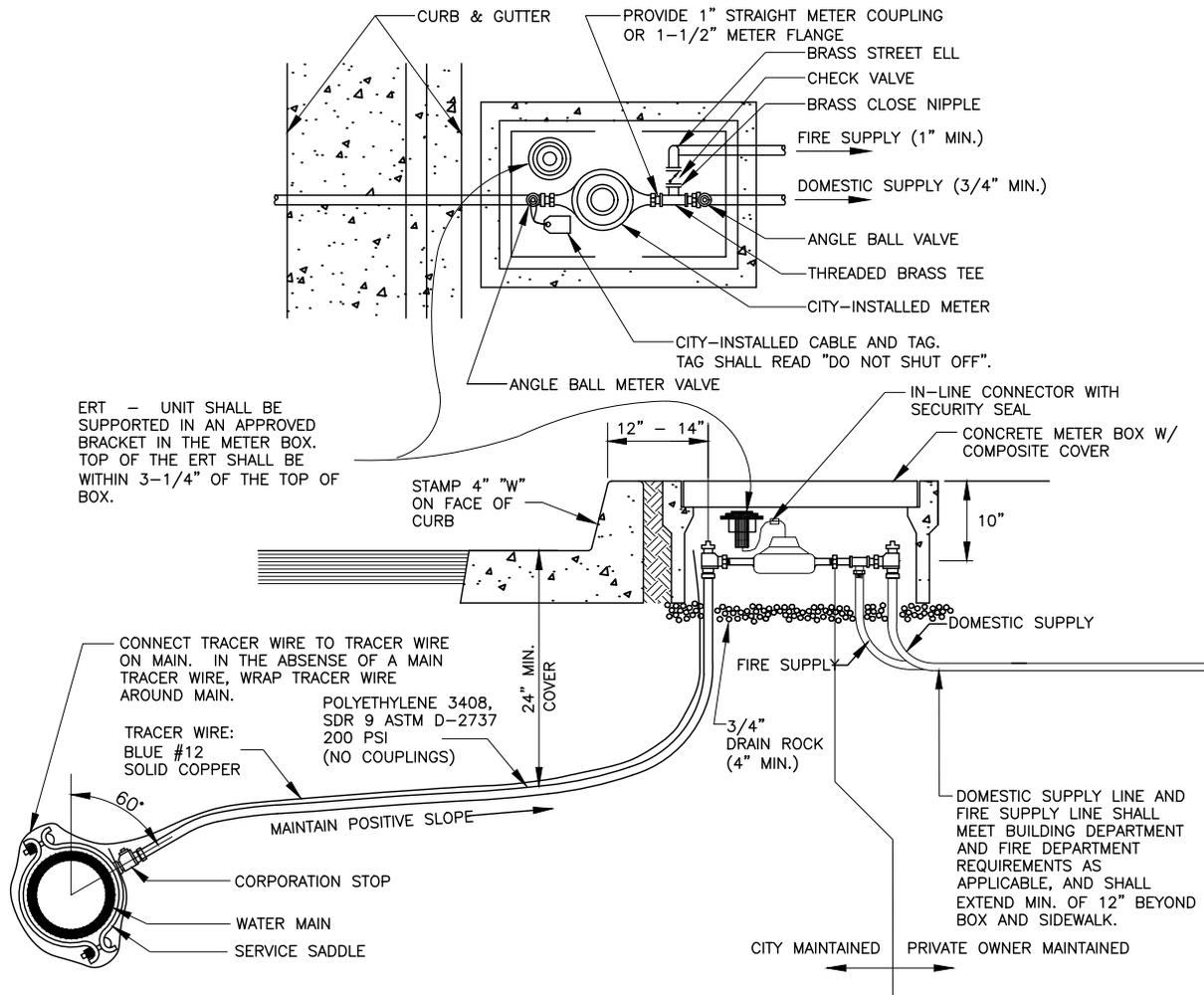
DECEMBER 2019

STD. NO.

862

PAGE 1 OF 1

SCALE: NONE



ERT - UNIT SHALL BE SUPPORTED IN AN APPROVED BRACKET IN THE METER BOX. TOP OF THE ERT SHALL BE WITHIN 3-1/4" OF THE TOP OF BOX.

CONNECT TRACER WIRE TO TRACER WIRE ON MAIN. IN THE ABSENCE OF A MAIN TRACER WIRE, WRAP TRACER WIRE AROUND MAIN.

TRACER WIRE:
BLUE #12
SOLID COPPER

POLYETHYLENE 3408,
SDR 9 ASTM D-2737
200 PSI
(NO COUPLINGS)

MAINTAIN POSITIVE SLOPE

CORPORATION STOP
WATER MAIN
SERVICE SADDLE

NOTES

1. THIS STANDARD APPLIES TO COMMERCIAL AND RESIDENTIAL SERVICES WHICH WHICH REQUIRE OR PROVIDE FIRE SPRINKLER SERVICE .
2. SET METER BOX COVER FLUSH WITH FINISHED SURFACE. THE ADDRESS MUST BE CLEARLY MARKED ON TOP OF THE METER BOX WITH PERMANENT MARKER BEFORE CITY WILL ACTIVATE SERVICE.
3. NEW METER AND ERT SHALL BE FURNISHED AND INSTALLED BY PUBLIC WORKS DEPARTMENT. OLD METER SHALL BE REMOVED ONLY BY PUBLIC WORKS DEPARTMENT.
4. SERVICE LATERAL AND BUILDING SUPPLY LINES SHALL BE INSTALLED UNDER BOX, KNOCKOUTS SHALL NOT BE USED AND BE GROUTED.
5. WATER SERVICE TO BE LOCATED IN MIDDLE THIRD OF LOT AND OUTSIDE OF DRIVEWAY APPROACH UNLESS OTHERWISE NOTED ON PLANS.
6. SERVICE LATERAL BEDDING (PEA GRAVEL) SHALL BE PLACED PRIOR TO INSTALLATION OF POLYETHYLENE TUBING.
7. REFER TO CITY WATER STANDARDS FOR CONSTRUCTION STANDARDS, SPECIFICATIONS AND ENGINEERS LIST OF APPROVED MATERIALS.
8. HYDRAULIC CALCULATIONS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 13D. HYDRANT FLOW DATA SHALL BE BASED ON ACTUAL HYDRANT FLOW TEST DATA AS PROVIDED BY THE CITY FIRE DEPARTMENT. CALCULATIONS ARE SUBJECT TO FIRE SERVICES DIVISION APPROVAL.
9. SERVICE LATERALS OF 1-1/2" (MINIMUM) SIZE SHALL BE REQUIRED FOR DUAL METER INSTALLATIONS.
10. ALL COMPRESSION FITTINGS SHALL HAVE STAINLESS STEEL INSERTS.
11. NO FENCING SHALL BE INSTALL BETWEEN STREET AND METER BOX.
12. THE METER SHALL BE INSTALLED WITH PROPER LENGTHS OF PIPE BOTH UPSTREAM AND DOWNSTREAM OF THE METER. SEE MANUFACTURER'S SPECIFICATIONS FOR DETERMINING PIPE LENGTHS.
13. A UTILITY BILLING ACCOUNT SHALL BE OPENED WITH CITY PRIOR TO FLOWING WATER THROUGH METER
14. PARKWAY STRIPS ARE PREFERABLE FOR METER BOX PLACEMENT, IF LOCATION NOT AVAILABLE, METER MUST BE WITHIN PUBLIC RIGHT-OF-WAY OR PUBLIC UTILITY EASEMENT AND OUT OF SIDEWALK

RETROFIT NOTES

1. PROVIDE HYDRAULIC CALCULATIONS VERIFYING AVAILABLE PRESSURE AND FLOW PRIOR TO MODIFICATIONS FOR FIRE SERVICE RETROFITS.
2. A SEPARATE FIRE SERVICE SHALL BE INSTALLED (PER OTHER CITY STANDARDS) WHEN CALCULATIONS SHOW FIRE



DESIGN AND CONSTRUCTION STANDARDS

WATER SERVICE W/ FIRE SYSTEM
SUPPLY - 1" & 1-1/2" METERS

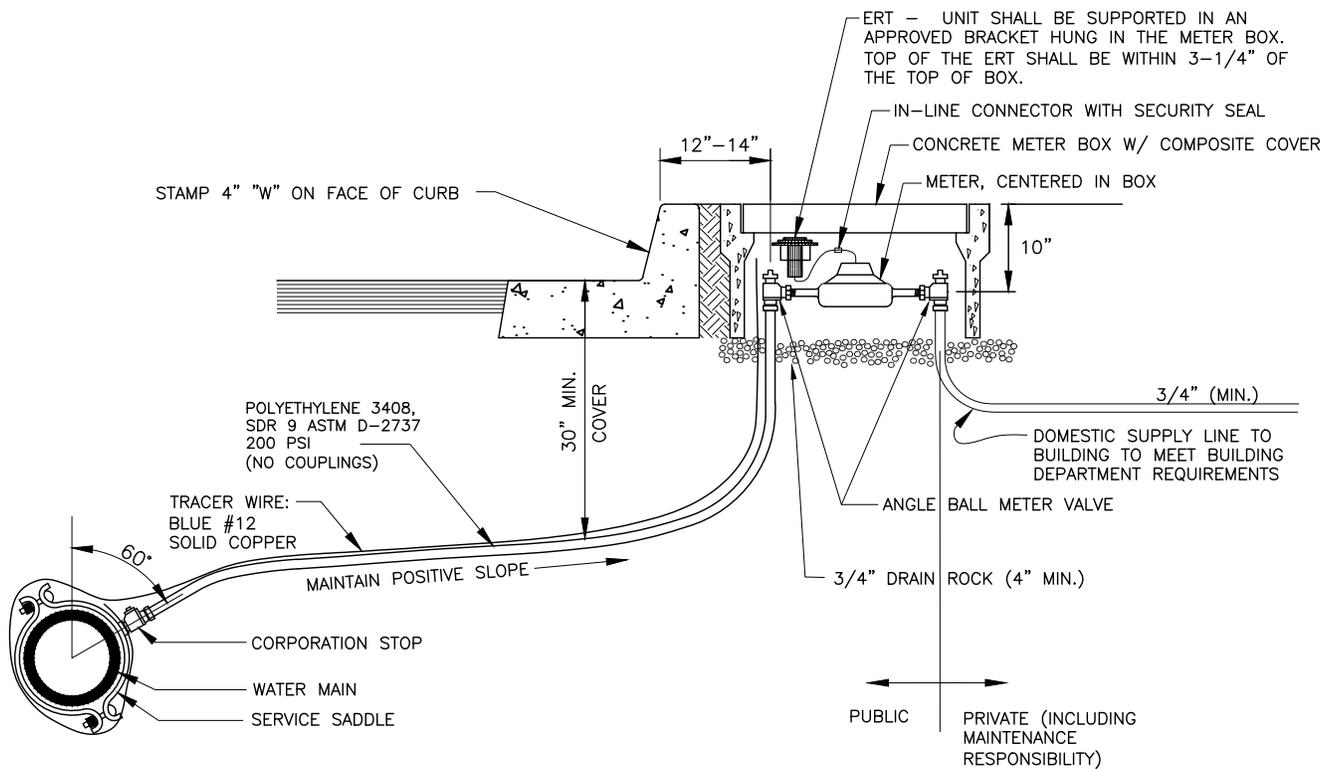
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DECEMBER 2019

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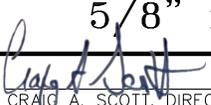
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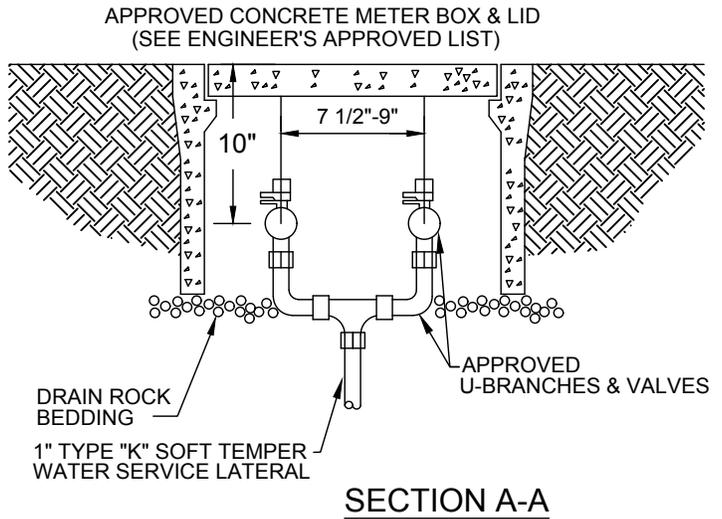
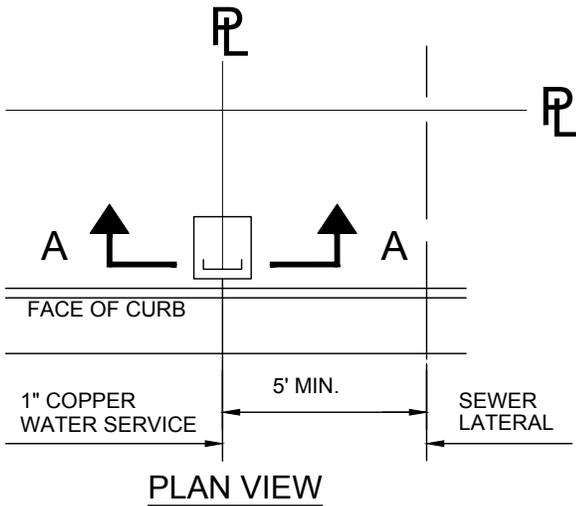
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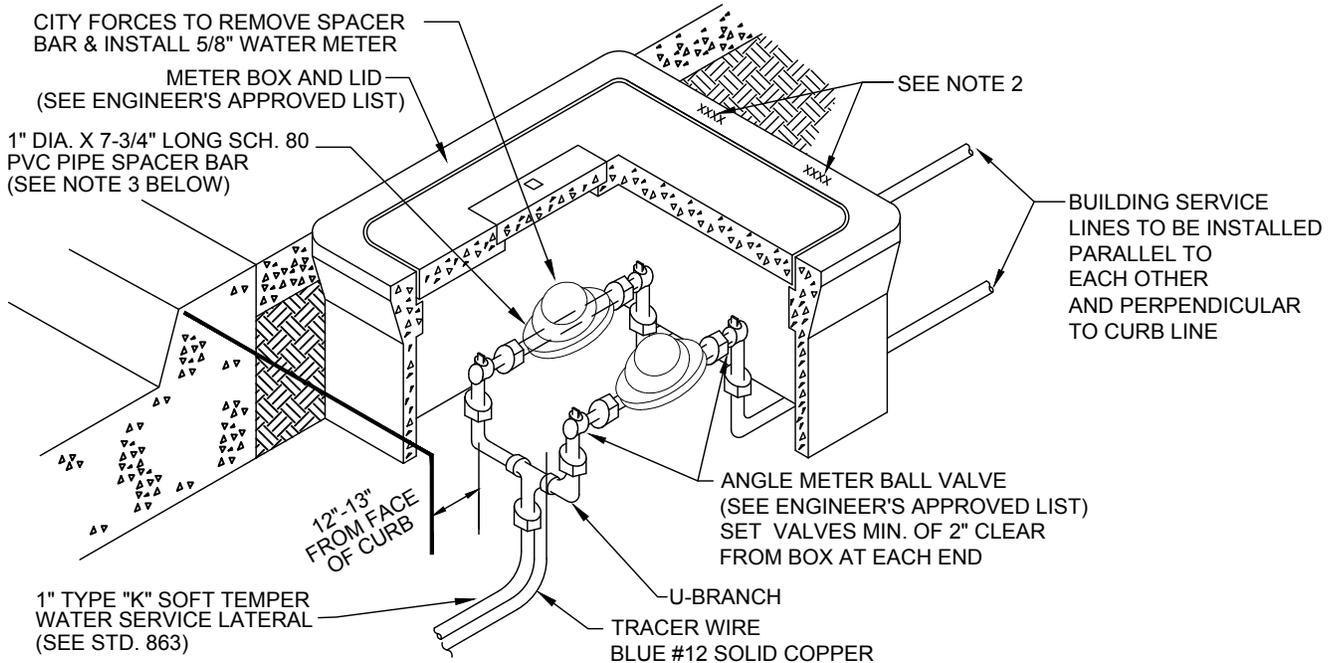
NOTES:

1. THIS STANDARD APPLIES TO COMMERCIAL OR RESIDENTIAL SERVICES WHICH HAVE A SEPARATE FIRE SPRINKLER SYSTEM.
2. SET METER BOX COVER FLUSH WITH FINISHED SURFACE. THE ADDRESS MUST BE CLEARLY MARKED ON TOP OF METER BOX WITH PERMANENT MARKER BEFORE CITY WILL ACTIVATE SERVICE.
3. NEW METER AND ERT SHALL BE FURNISHED AND INSTALLED BY PUBLIC WORKS DEPARTMENT. OLD METER SHALL BE REMOVED ONLY BY PUBLIC WORKS DEPARTMENT.
4. SERVICE LATERAL AND BUILDING SUPPLY LINES SHALL BE INSTALLED UNDER BOX; KNOCKOUTS SHALL NOT BE USED. KNOCKOUTS SHALL BE GROUTED
5. WATER SERVICE TO BE LOCATED IN MIDDLE THIRD OF LOT AND OUTSIDE OF DRIVEWAY APPROACH UNLESS OTHERWISE NOTED ON PLANS.
6. SERVICE LATERAL BEDDING (PEA GRAVEL) SHALL BE PLACED PRIOR TO INSTALLATION OF POLYETHYLENE TUBING.
7. REFER TO CITY WATER STANDARDS FOR CONSTRUCTION STANDARDS, SPECIFICATIONS AND ENGINEER'S LIST OF APPROVED MATERIALS.
8. SERVICE LATERALS SHALL BE AT LEAST ONE SIZE LARGER THAN THE LARGEST METER BEING INSTALLED FOR DUAL SERVICE INSTALLATIONS.
9. ALL COMPRESSION FITTINGS SHALL HAVE STAINLESS STEEL INSERTS.
10. CONNECT SERVICE TRACER WIRE TO THE TRACER WIRE ON THE MAIN, IN ABSENCE OF TRACER WIRE ON THE MAIN WRAP TRACER WIRE AROUND MAIN.
11. NO FENCING SHALL BE INSTALLED BETWEEN STREET AND METER BOX.
12. THE METER SHALL BE INSTALLED WITH PROPER LENGTHS OF PIPE BOTH UPSTREAM AND DOWN STREAM OF THE METER. SEE MANUFACTURER'S SPECIFICATIONS FOR DETERMINING PIPE LENGTH(S).
13. A UTILITY BILLING ACCOUNT SHALL BE OPENED WITH CITY PRIOR TO FLOWING WATER THROUGH METER.

	DESIGN AND CONSTRUCTION STANDARDS WATER SERVICE FOR 5/8" x 3/4", 1", & 1 1/2" METERS	STD. NO. 863B PAGE 1 OF 1
	 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER	DECEMBER 2019



SINGLE METER BOX INSTALLATION FOR DUAL 3/4" OR 1" MANIFOLD



NOTES:

1. Meter box to be installed so that the reading lid is centered over the meter registers.
2. In traffic loading areas, install two individual meter boxes and replace U-branch with field-made manifold.
3. Contractor to install Schedule 80 PVC spacer with threads on both ends. Drill 1/2" diameter holes @ 2" O.C. through pipe after testing service lateral.
4. Meter box knockouts will not be allowed.
5. Prior to meter set, address to be clearly marked on topside lip of meter box over each service with a permanent felt marker.
6. At a minimum, extend service lines to 12" beyond back of meter box and cap. Where sidewalk is being installed by the public improvements contractor, extend building service line to 12" beyond back of sidewalk and cap. If permanent meter service is requested prior to completion of property-side plumbing, a minimum of 10' of the building service line must be installed with a hose bib on a riser above finished grade.



DESIGN AND CONSTRUCTION STANDARDS

1" DUAL WATER SERVICE

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STD. NO.

864

PAGE 1 OF 1

DECEMBER 2019

SCALE: NONE



DESIGN AND CONSTRUCTION STANDARDS

2" WATER SERVICE
FOR 2" OR 1-1/2" METER

Craig A. Scott

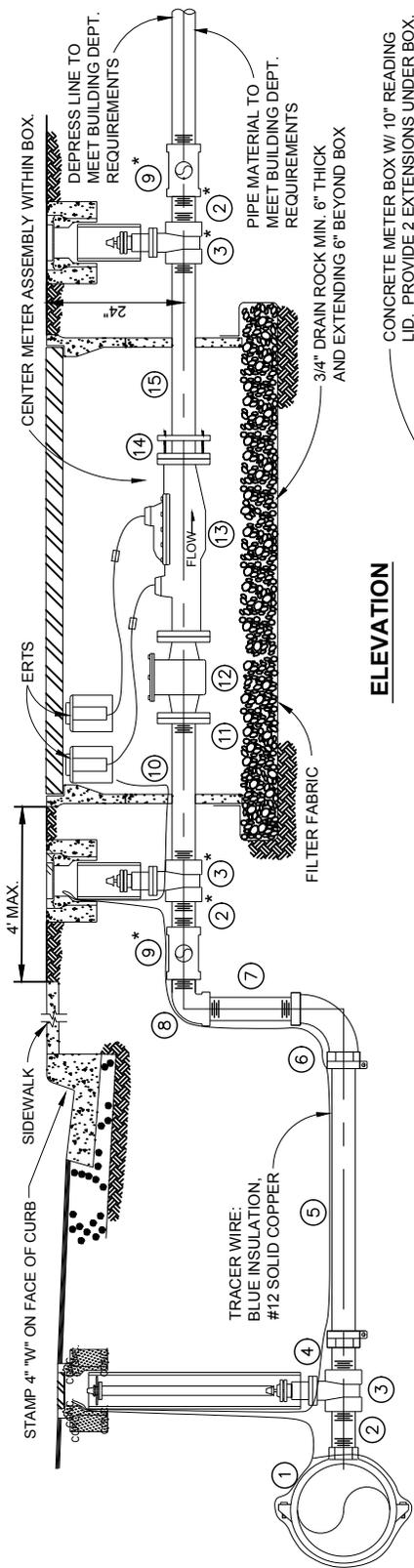
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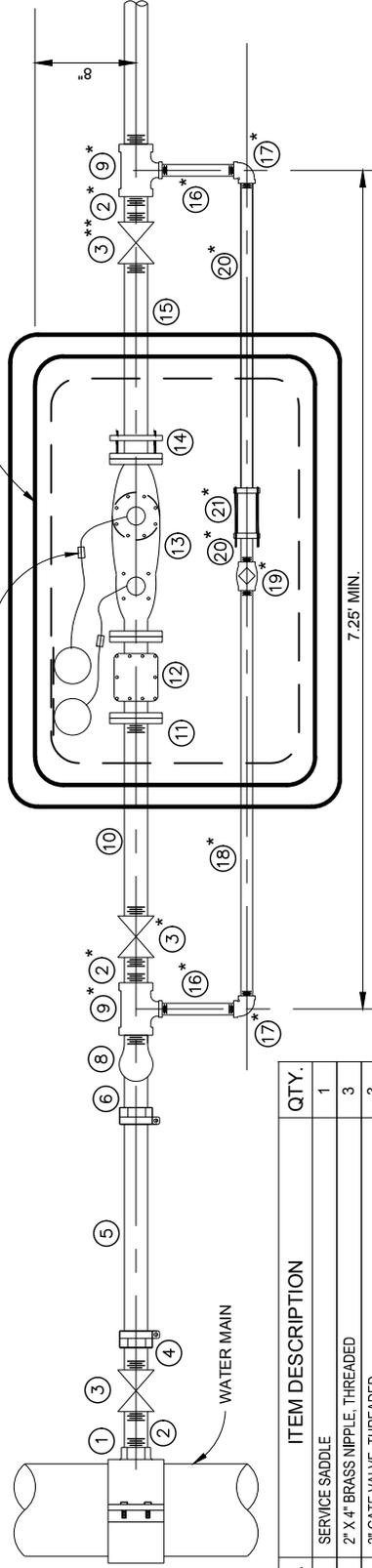
STD. NO.
865B

PAGE 1 OF 1

SCALE: NONE



ELEVATION



PLAN

NOTES:

1. BYPASS PIPING SHALL BE REQUIRED ON MULTIFAMILY RESIDENTIAL AND COMMERCIAL SERVICES. BYPASS PIPING MAY BE OMITTED ON ALL IRRIGATION SERVICES. WITH APPROVAL OF THE CITY ENGINEER, BYPASS PIPING MAY BE OMITTED ON COMMERCIAL SERVICES SERVING OFFICE OR RETAIL SPACE WITH SEPARATE FIRE SERVICES OR WHERE MULTIPLE DOMESTIC WATER SERVICES SERVE THE PROPERTY.
2. SET METER BOX COVER FLUSH WITH FINISHED SURFACE. THE ADDRESS MUST BE CLEARLY MARKED ON TOP OF METER BOX WITH PERMANENT MARKER BEFORE THE CITY WILL ACTIVATE SERVICE.
3. THE METER AND ERT SHALL BE FURNISHED AND INSTALLED BY PUBLIC WORKS DEPARTMENT. OLD METER SHALL BE REMOVED ONLY BY PUBLIC WORKS DEPARTMENT.
4. REFER TO CITY STANDARD 877 FOR GATE VALVE INSTALLATION DETAILS. VALVES MAY BE INSTALLED IN SIDEWALK WHERE SPACE LIMITATIONS EXIST.
5. REFER TO CITY WATER STANDARDS FOR CONSTRUCTION STANDARDS, SPECIFICATIONS AND ENGINEER'S LIST OF APPROVED MATERIALS.
6. JOINTS IN METER BOX SHALL BE CUT - DO NOT USE HAMMER. PRIOR TO BACKFILLING, PIPE OPENINGS AND BOX JOINTS SHALL BE GROUTED.
7. CONNECT SERVICE TRACER WIRE TO THE TRACER WIRE ON THE MAIN. IN ABSENCE OF MAIN TRACER WIRE, WRAP SERVICE TRACER WIRE AROUND THE MAIN. RUN CONTINUOUS FROM MAIN TO METER BOX WITH LOOPS INTO EACH VALVE BOX.
8. ERTS TO BE MOUNTED IN APPROVED BRACKET ATTACHED TO BOX W/SS ANCHORS. THE TOP OF ERTS SHALL BE NO MORE THAN 3-1/4" BELOW TOP OF BOX.
9. NO FENCING SHALL BE INSTALLED BETWEEN STREET AND METER BOX.
10. ALL COMPRESSION FITTINGS SHALL HAVE STAINLESS STEEL INSERTS.

NO.	ITEM DESCRIPTION	QTY.
1	SERVICE SADDLE	1
2	2" X 4" BRASS NIPPLE, THREADED	3
3	2" GATE VALVE, THREADED	3
4	2" BRASS ADAPTER, MIP X COMPRESSION	1
5	2" POLYETHYLENE 3408, SDR 9 ASTM D-2737 200 PSI (NO COUPLINGS)	1
6	2" BRASS ELL, COMP. X THREAD	1
7	2" BRASS PIPE, THREADED (LENGTH AS NECESSARY)	1
8	2" BRASS STREET ELL. (STANDARD ELL FOR NO BYPASS)	1
9	2" X 1" BRASS TEE	2
10	2" X 24" BRASS PIPE, THREADED	1
11	2" -2 BOLT THREADED METER FLANGE	1
12	2" PLATE STRAINER	1
13	2" COMPOUND METER W/ 2 TRANSMITTING REGISTERS AND 2 ERTS	1
14	2" FLEXIBLE METER COUPLING	1
15	2" BRASS PIPE, THREAD X PE (24" MIN. LENGTH)	1
16	1" X 8" BRASS NIPPLE, THREADED	2
17	1" BRASS ELL, THREADED	2
18	1" BRASS PIPE, THREADED (LENGTH AS NECESSARY)	1
19	1" BRASS BALL VALVE WITH STOPS AND LOCKWINGS	1
20	1" BRASS PIPE, THREADED X PE (LENGTH AS NECESSARY)	2
21	1" 2-BOLT DRESSER	1



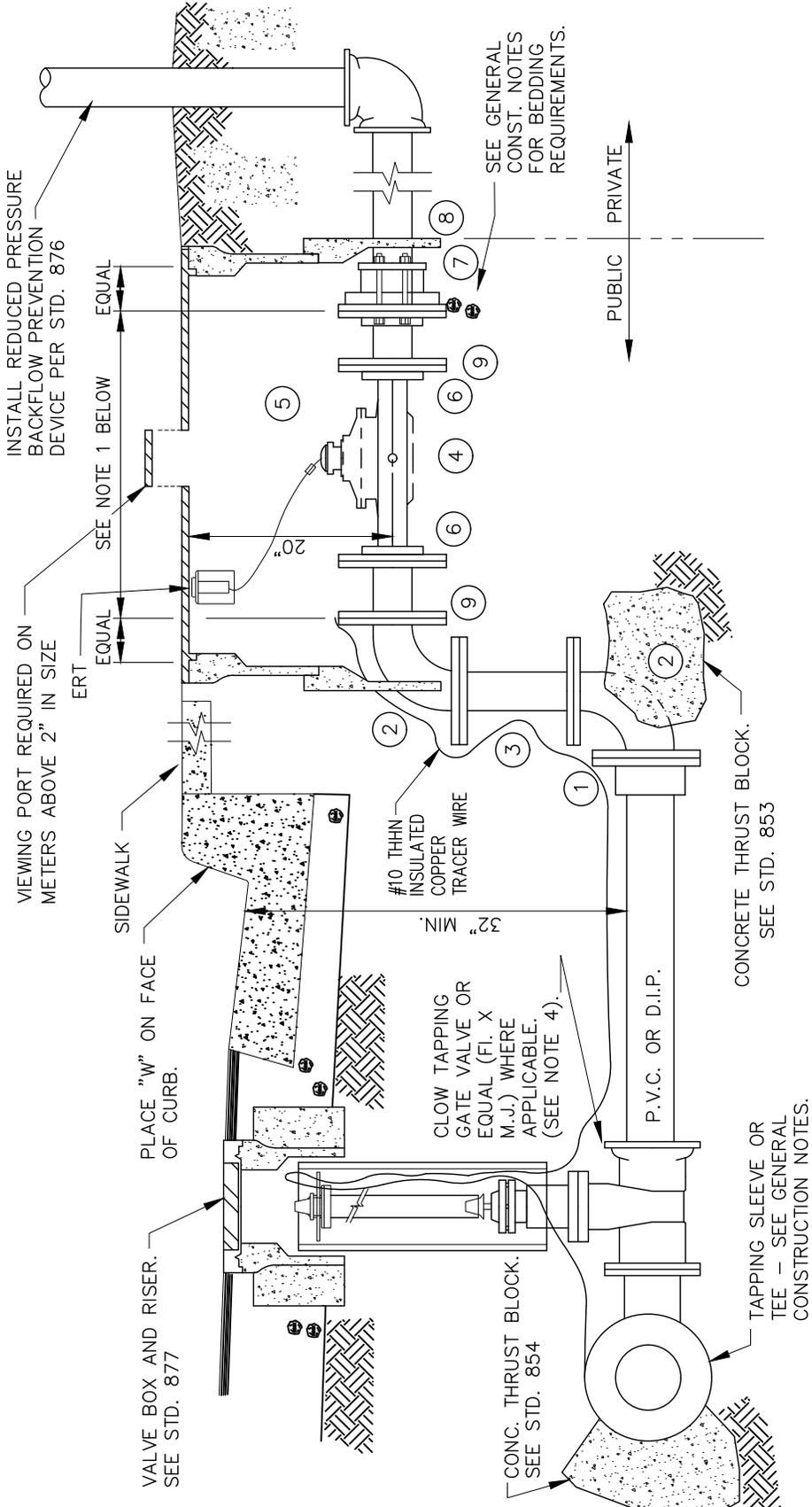
DESIGN AND CONSTRUCTION STANDARDS

**4" WATER SERVICE
FOR 3" METER**

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

STD. NO.
866
PAGE 1 OF 1
SCALE: NONE

DECEMBER 2019



NOTES

1. CONTRACTOR TO INSTALL SCHL. 40 PVC PIPE SPACER WITH 1/2" DIA. HOLES @ 2" O.C. (VERTICALLY DRILLED THRU PIPE).
2. B40 METER BOX MUST BE SET SO THE STEEL COVER IS FLUSH WITH FINISHED SURFACE.
3. SEE GENERAL CONSTRUCTION NOTES.
4. GATE VALVES TO BE RESILIENT SEAT TYPE PER AWWA SPECIFICATION C509 - SEE STANDARD 877.
5. SEE CITY'S APPROVED LIST FOR TAPPING SLEEVES, METER BOXES AND COVERS.
6. THE METER AND ERT SHALL BE FURNISHED AND INSTALLED BY PUBLIC WORKS DEPARTMENT. OLD METER SHALL BE REMOVED ONLY BY PUBLIC WORKS DEPARTMENT.

#	ITEM
1	4" FLANGE ADAPTOR
2	4" X 90° FLANGED ELL - SEE STD. 113
3	4" FLANGED SPOOL - LENGTH AS REQUIRED
4	4" X 20-1/4" SCHL. 40 PVC PIPE (SEE NOTE 1)
5	3" METER (SEE NOTE 6.)
6	4" SCHEDULE 80 P.V.C. FLANGE
7	4" UNI-FLANGE OR FL. CPLG. ADAPTER
8	4" PE X PE PIECE - LENGTH AS REQUIRED.
9	4" x 3" FLANGED REDUCER

INSTALL REDUCED PRESSURE BACKFLOW PREVENTION DEVICE PER STD. 876

SEE NOTE 1 BELOW

VALVE BOX AND RISER. SEE STD. 877

PLACE "W" ON FACE OF CURB.

SIDEWALK

VIEWING PORT REQUIRED ON METERS ABOVE 2" IN SIZE

ERT

EQUAL

#10 THHN INSULATED COPPER TRACER WIRE

3/2" MIN.

CLOW TAPPING GATE VALVE OR EQUAL (FI. X M.J.) WHERE APPLICABLE. (SEE NOTE 4).

CONC. THRUST BLOCK. SEE STD. 854

P.V.C. OR D.I.P.

CONCRETE THRUST BLOCK. SEE STD. 853

TAPPING SLEEVE OR TEE - SEE GENERAL CONSTRUCTION NOTES.

SEE GENERAL CONST. NOTES FOR BEDDING REQUIREMENTS.

PUBLIC PRIVATE



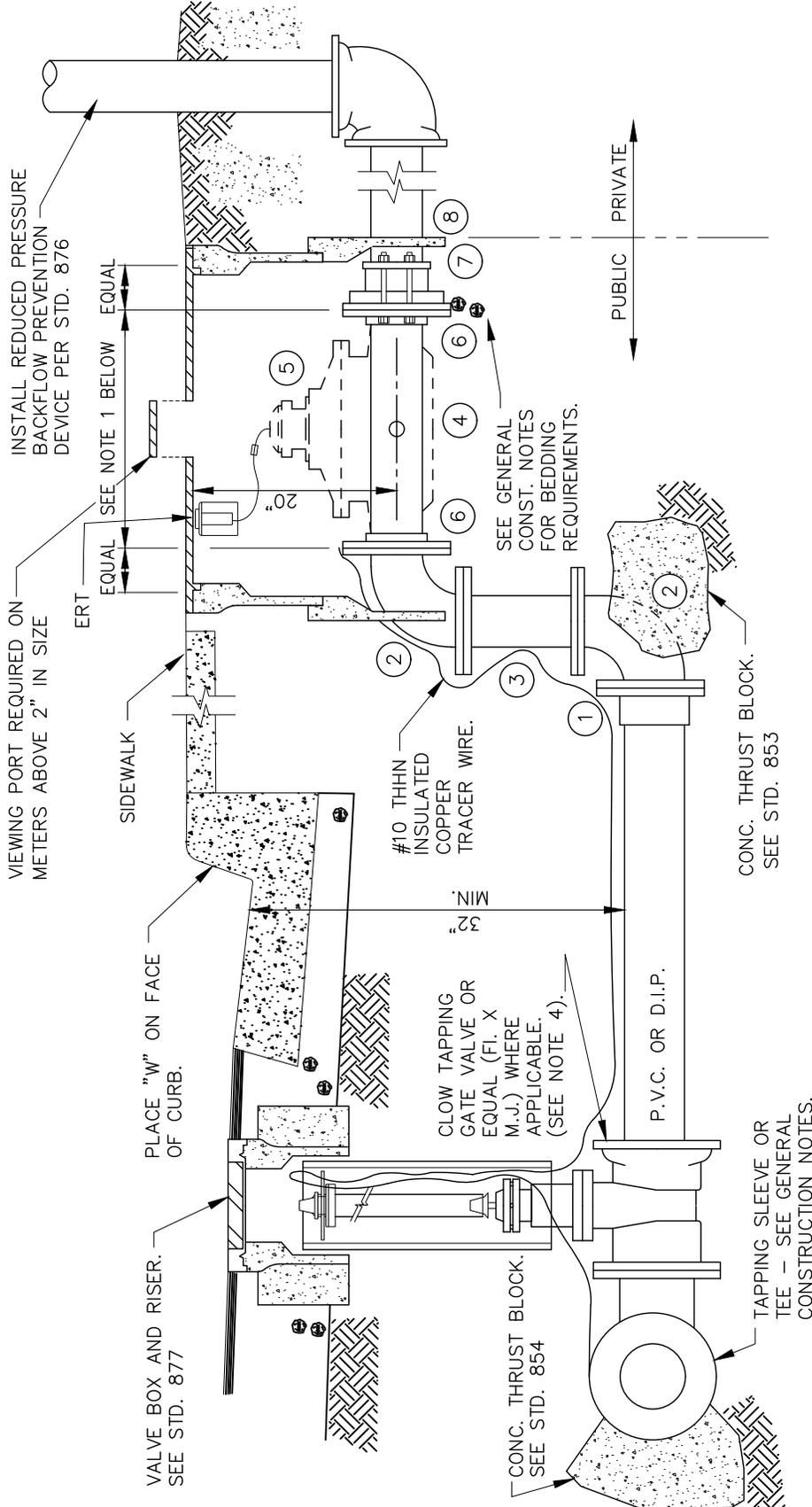
DESIGN AND CONSTRUCTION STANDARDS

**4" WATER SERVICE
FOR 4" METER**

Craig A. Scott
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DECEMBER 2019

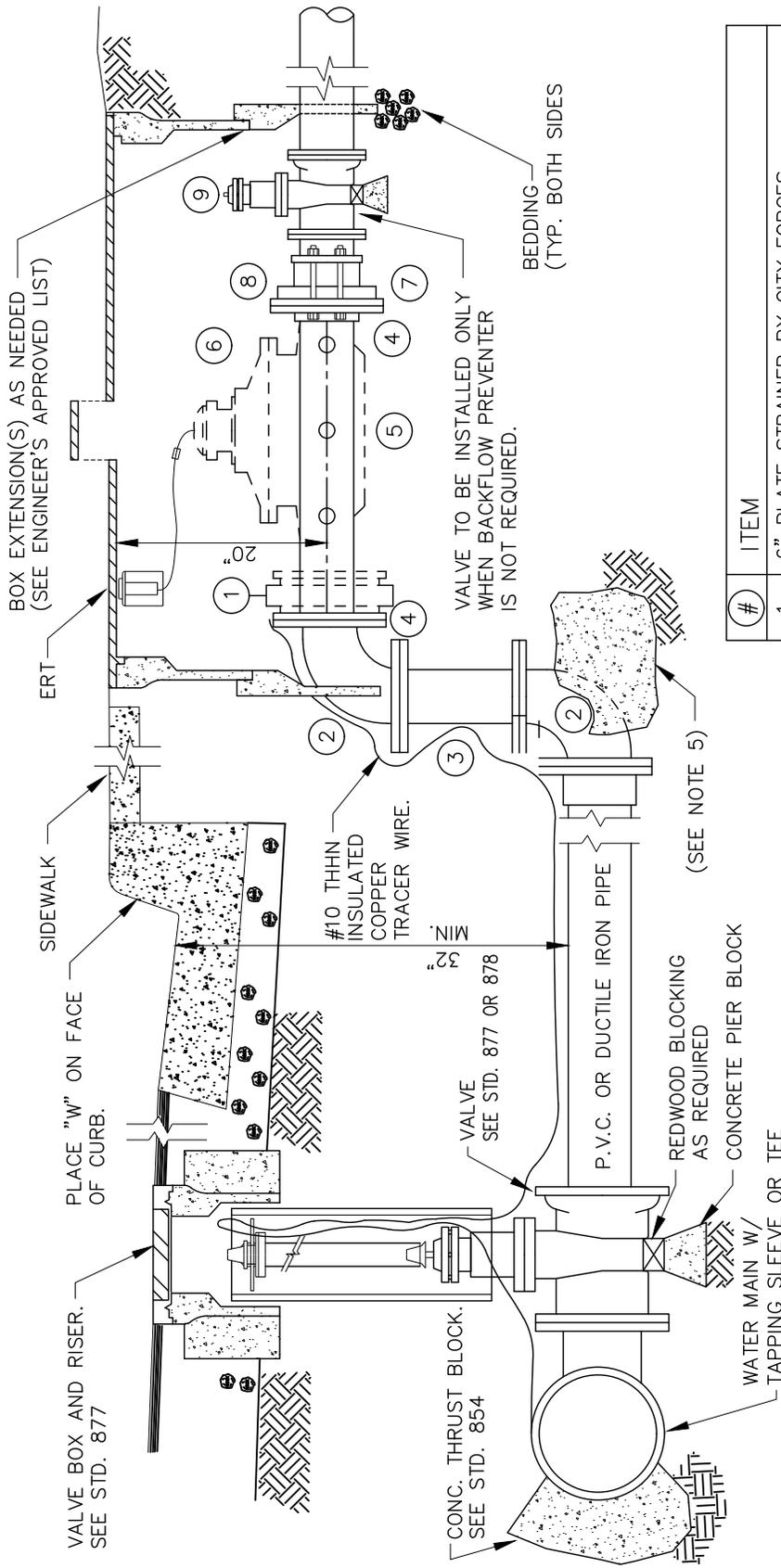
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867
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NOTES:

1. CONTRACTOR TO INSTALL SCHL. 40 PVC PIPE SPACER WITH 1/2" DIA. HOLES @ 2" O.C. (VERTICALLY DRILLED THRU PIPE).
2. B40 METER BOX MUST BE SET SO THE STEEL COVER IS FLUSH WITH FINISHED SURFACE.
3. SEE GENERAL CONSTRUCTION NOTES.
4. GATE VALVES TO BE RESILIENT SEAT TYPE PER AWWA SPECIFICATION C509 - SEE STANDARD 877.
5. SEE CITY'S APPROVED LIST FOR TAPPING SLEEVES, METER BOXES AND COVERS.
6. THE METER AND ERT SHALL BE FURNISHED AND INSTALLED BY PUBLIC WORKS DEPARTMENT. OLD METER SHALL BE REMOVED ONLY BY PUBLIC WORKS DEPARTMENT.

#	ITEM
1	4" FLANGE ADAPTOR
2	4" X 90' FLANGED ELL - SEE STD. 113
3	4" FLANGED SPOOL - LENGTH AS REQUIRED
4	4" X 20'-1/4" SCHL. 40 PVC PIPE (SEE NOTE 1)
5	4" METER (SEE NOTE 6.)
6	4" SCHEDULE 80 P.V.C. FLANGE
7	4" UNI-FLANGE OR FL. CPLG. ADAPTER
8	4" PE X PE PIECE - LENGTH AS REQUIRED.



#	ITEM
1	6" PLATE STRAINER BY CITY FORCES
2	6" X 90" FLANGE X MJ
3	6" FLANGED SPOOL - LENGTH AS REQUIRED
4	6" SCHEDULE 80 P.V.C. FLANGE
5	6" X 33-3/8" SCH. 40 PVC PIPE (SEE NOTE 1)
6	6" TURBINE METER BY CITY FORCES
7	6" FLANGED COUPLING ADAPTER
8	6" FI X PE PIECE - LENGTH AS REQUIRED.
9	6" AWWA RESILIENT WEDGE GATE VALVE (MJ)

NOTES:

1. CONTRACTOR TO INSTALL SCHL. 40 PVC PIPE SPACER WITH 1/2" DIA. HOLES @ 2" O.C. (DRILLED THROUGH PIPE). CITY FORCES TO REMOVE SPACER BAR & INSTALL 6" METER.
2. BOXES LOCATED IN TRAFFIC AREAS MUST BE SET SO THE STEEL COVER IS FLUSH WITH THE FINISHED SURFACE.
3. PRIOR TO METER SET, ADDRESS TO BE CLEARLY MARKED ON TOP OF METER BOX WITH PERMANENT MARKER.
4. BOX PIPE KNOCKOUTS TO BE GROUNDED SUFFICIENTLY TO PREVENT INTRUSION OF DIRT. PIPE OPENINGS IN BOX TO BE NEATLY CUT - DO NOT USE HAMMER.
5. RESTRAINED JOINTS ARE REQUIRED FOR ALL NEW CONSTRUCTION FROM GATE VALVE TO 90° ELL. THRUST BLOCKS ARE ONLY REQUIRED WHERE EXISTING SURFACES ARE BEING MODIFIED AND RESTRAINED JOINTS ARE NOT USED.

APPROVED METER BOXES, EXTENSIONS, AND COVERS
(SEE ENGINEER'S APPROVED LIST)

APPROVED TAPPING SLEEVES
(SEE ENGINEER'S APPROVED LIST)



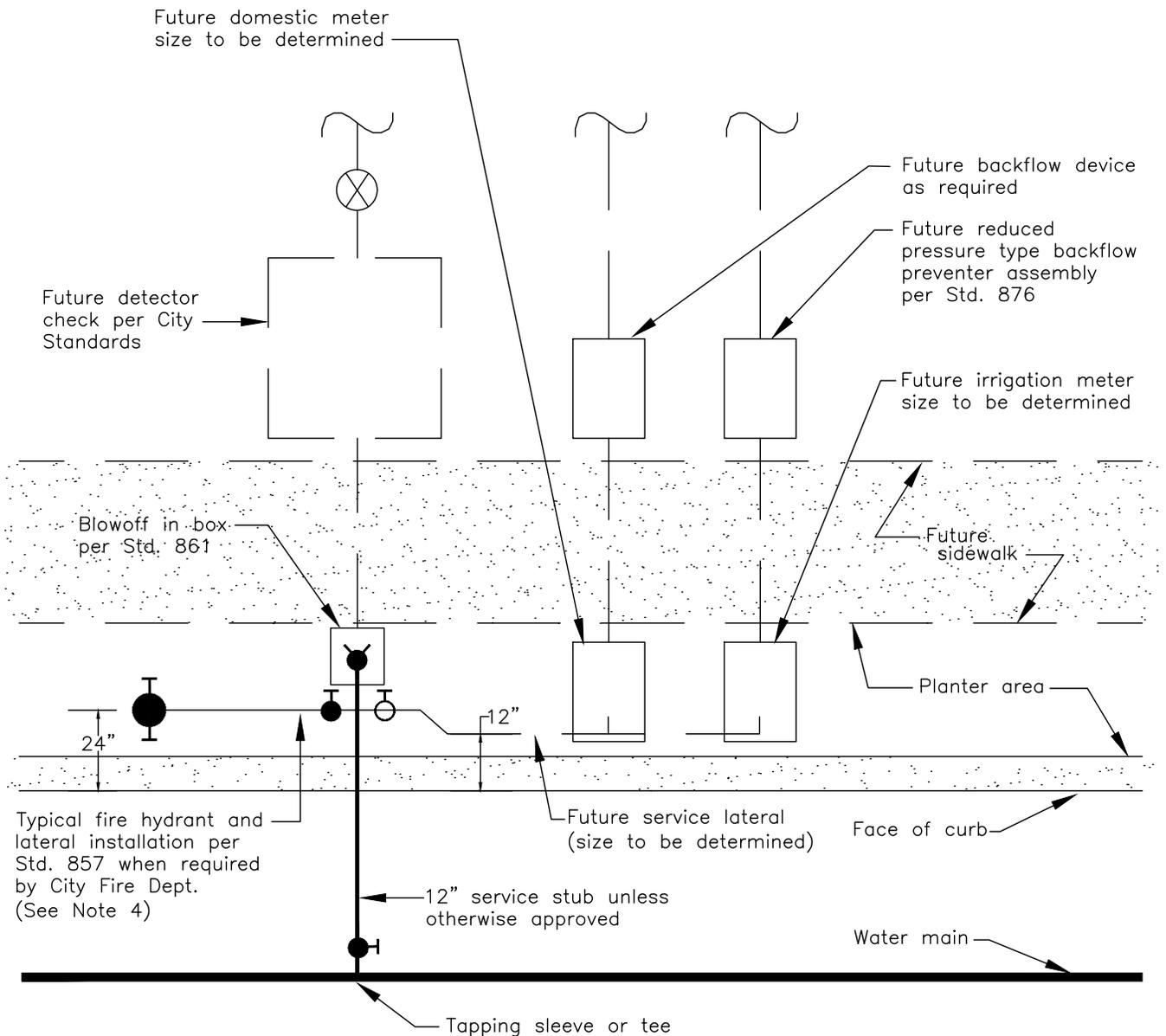
DESIGN AND CONSTRUCTION STANDARDS

**6" WATER SERVICE
FOR 6" METER**

Craig A. Scott
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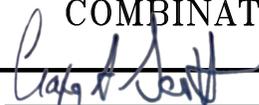
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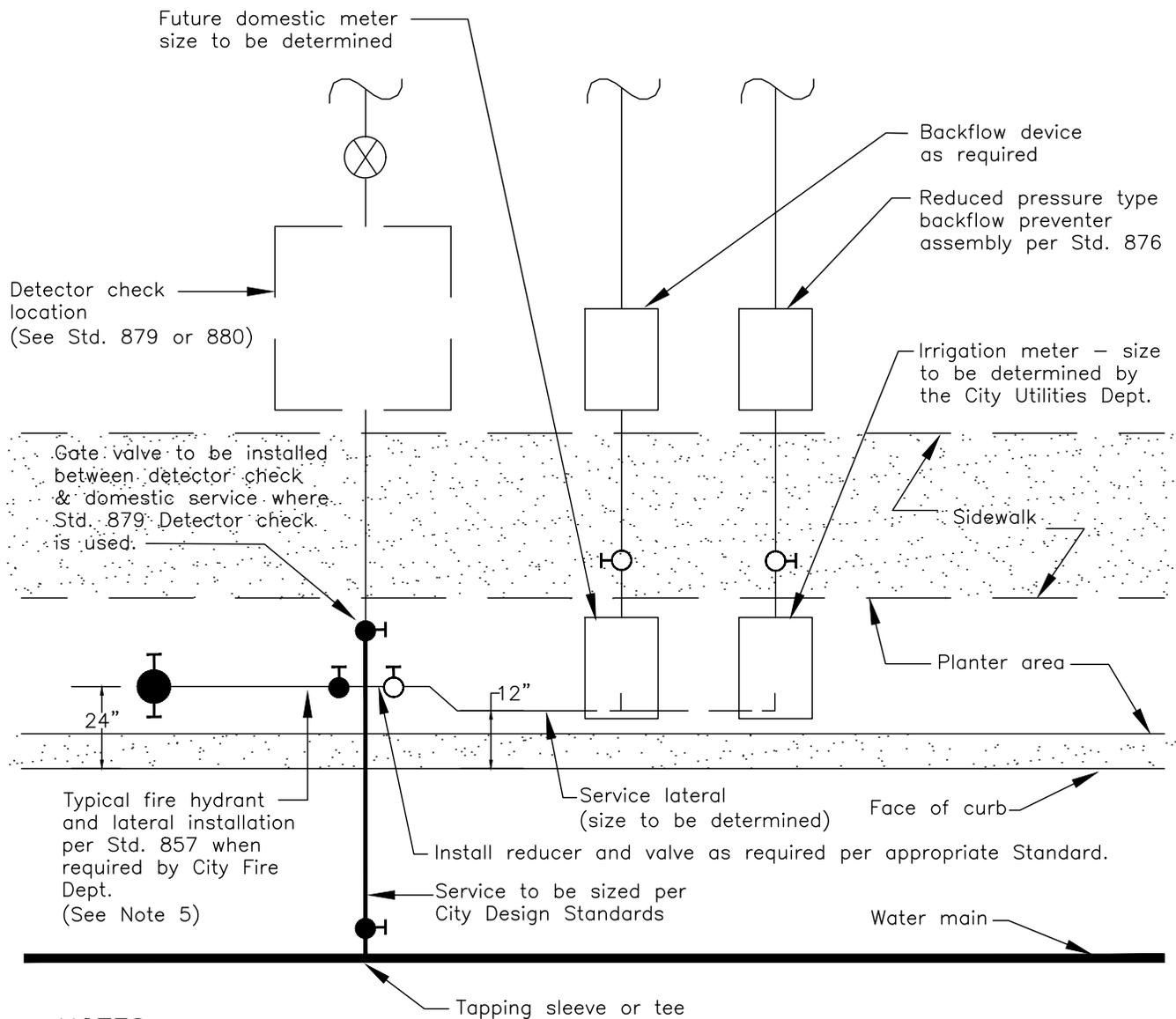
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NOTES

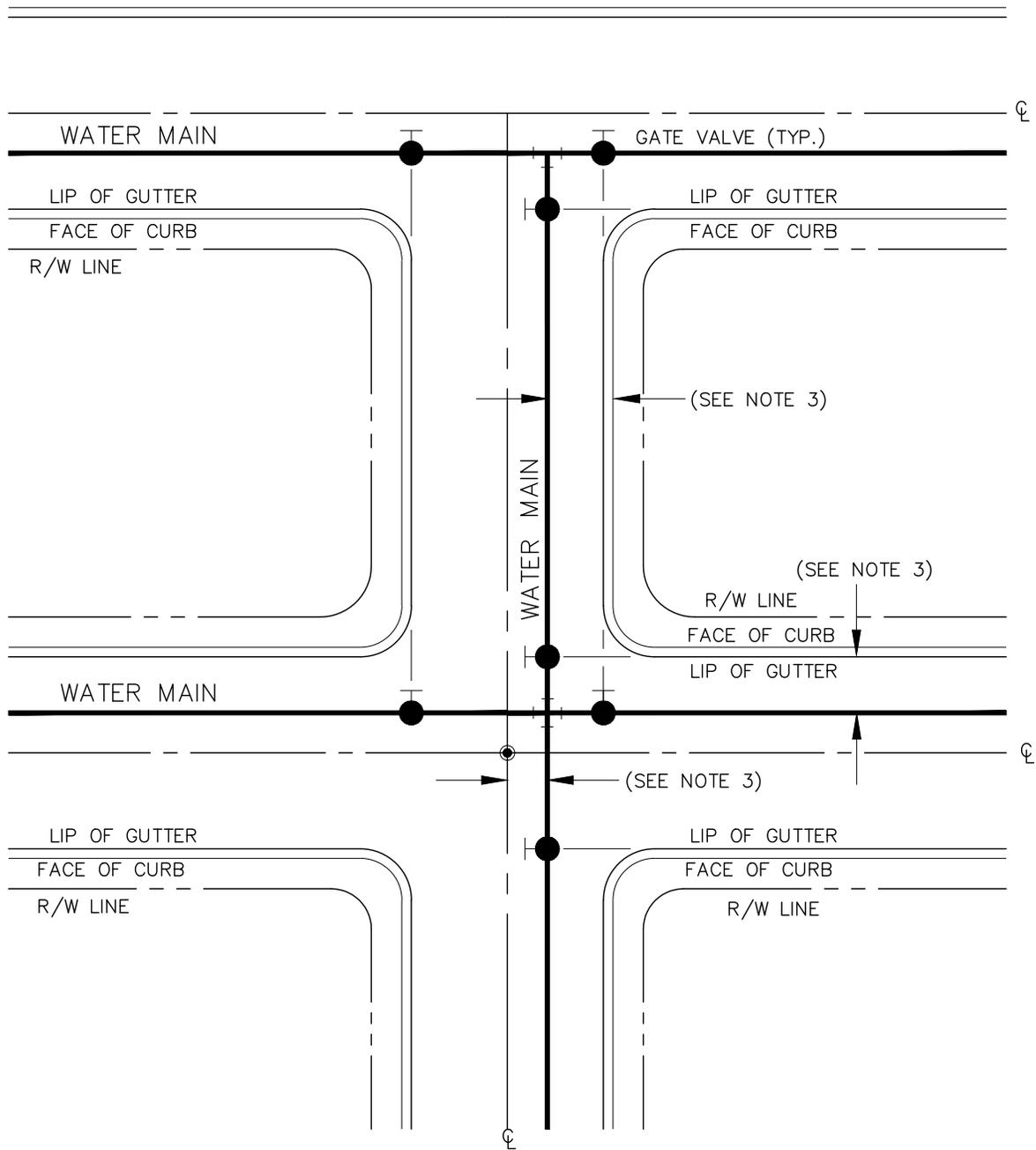
1. This standard applies to commercial and multi-residential developments where domestic, irrigation, or fire protection requirements are not established at the time of application
2. Utilities Department approval must be obtained prior to installation.
3. Where a hydrant is required, install an 8" x 6" cross or 12" x 6" cross as appropriate. Where a hydrant is not required, install manifold connection per the appropriate service lateral standard.
4. Use a slotted break-off riser as necessary to enable proper orientation of the fire hydrant outlets.
5. Restrained joints are required from gate valve to blowoff for all new construction.

	DESIGN AND CONSTRUCTION STANDARDS		STD. NO.
	COMBINATION WATER SERVICE STUB		869
 CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER		DECEMBER 2019	PAGE 1 OF 1 SCALE: NONE



NOTES

1. This standard applies to commercial and multi-residential developments where domestic, irrigation, or fire protection requirements are established at the time of application
2. When referring to this standard, specify meter and detector check sizes and appropriate standard plans.
3. When field conditions preclude the installation of meters at or near the curb line, submit detailed plans of the proposed installation for Utilities Dept. approval. All meter installations must be within public right-of-way.
4. Where a hydrant is required, install an 8" x 6" cross or 12" x 6" cross as appropriate. Where a hydrant is not required, install manifold connection per the appropriate service lateral standard.
5. Use a slotted break-off riser as necessary to enable proper orientation of the fire hydrant outlets.
6. Restrained joints are required for all new construction from gate valve at the main to the detector check valve.



NOTES:

1. WATER MAINS SHALL BE LOCATED PARALLEL TO STREET CENTERLINES UNLESS CONFLICTS WITH OTHER UNDERGROUND FACILITIES CANNOT BE AVOIDED. NON-STANDARD ALIGNMENTS SHALL BE APPROVED BY THE UTILITIES DEPT. PRIOR TO INSTALLATION.
2. MAINLINE VALVES, EXCEPT HYDRANT VALVES AND TAPPING VALVES, SHALL BE ON FACE OF CURB EXTENDED WHERE FEASIBLE.
3. INSTALL MAINS WITH CONSTANT ALIGNMENT WHENEVER POSSIBLE, MINIMUM 3' FROM THE LIP OF GUTTER AND MINIMUM 4' FROM CENTERLINE MONUMENTS.



DESIGN AND CONSTRUCTION STANDARDS

**ALIGNMENT OF WATER MAINS AND
PLACEMENT OF MAINLINE VALVES**

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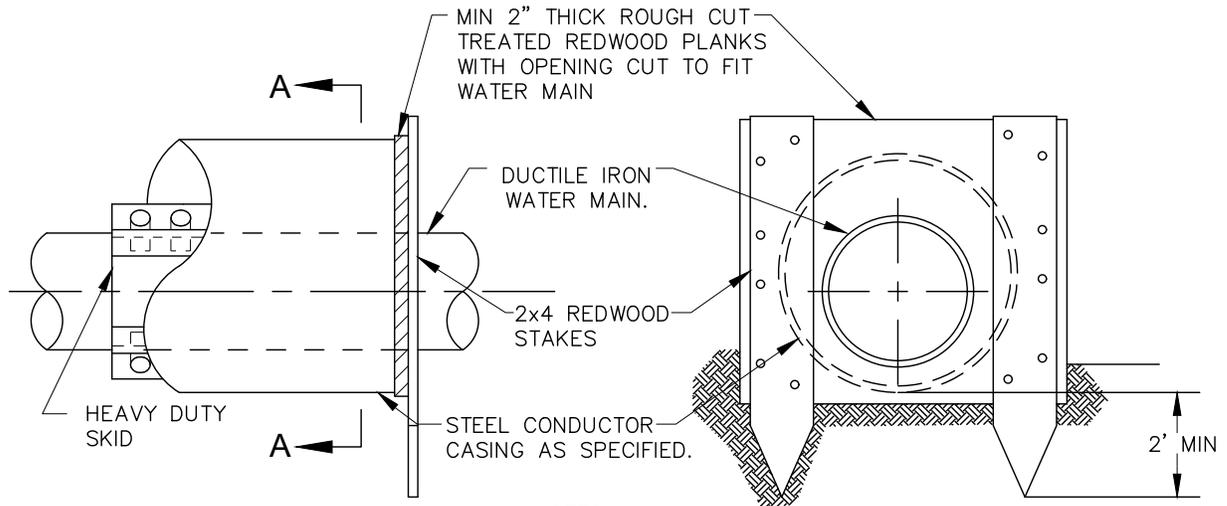
DECEMBER 2019

STD. NO.

871

PAGE 1 OF 1

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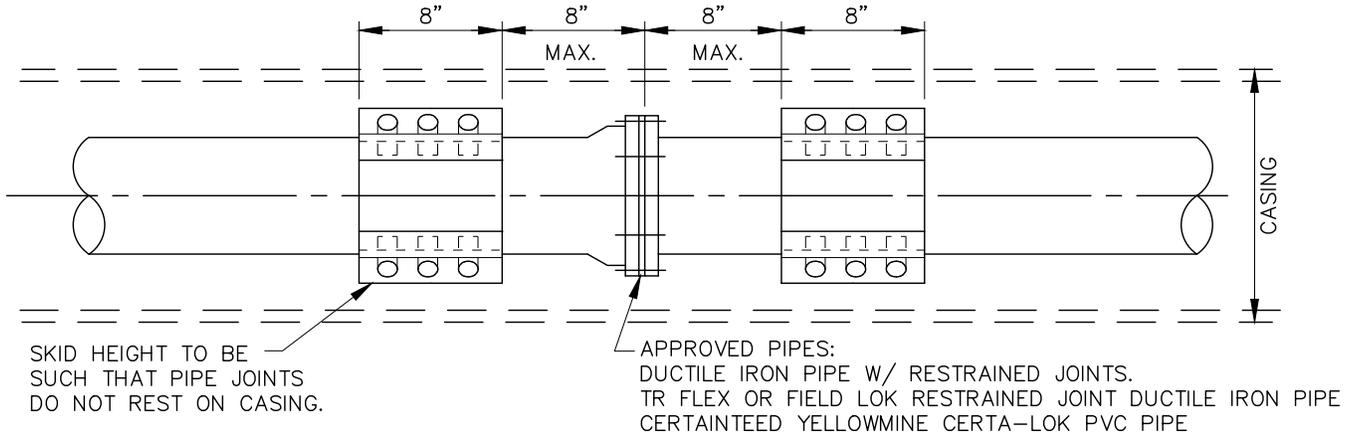


TYPICAL DIRT STOP DETAIL

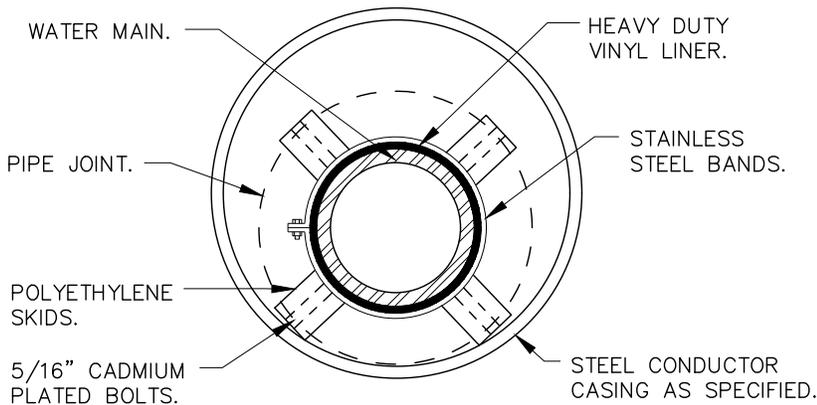
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NOTES:

1. INSTALL SKIDS PER MANUFACTURER'S SPECIFICATIONS.
2. SEE ENGINEER'S LIST OF APPROVED SKIDS.
3. WHERE CONDUCTOR CASING IS EXISTING R.C.P., BANDED REDWOOD SKIDS MAY BE INSTALLED IN LIEU OF POLYETHYLENE SKIDS WITH UTILITIES DEPT. APPROVAL.



TYPICAL PIPE JOINT AND INSULATOR



SECTION "A-A"

MINIMUM SIZE CASING REQUIRED					
PIPE SIZE	6"	8"	12"	14"	16"
CASING SIZE (INSIDE DIA.)	16"	16"	20"	24"	30"
CASING WALL THICKNESS	.250	.250	.250	.250	.375



DESIGN AND CONSTRUCTION STANDARDS

TYPICAL DIRT STOP AND WATER MAIN ENCASEMENT

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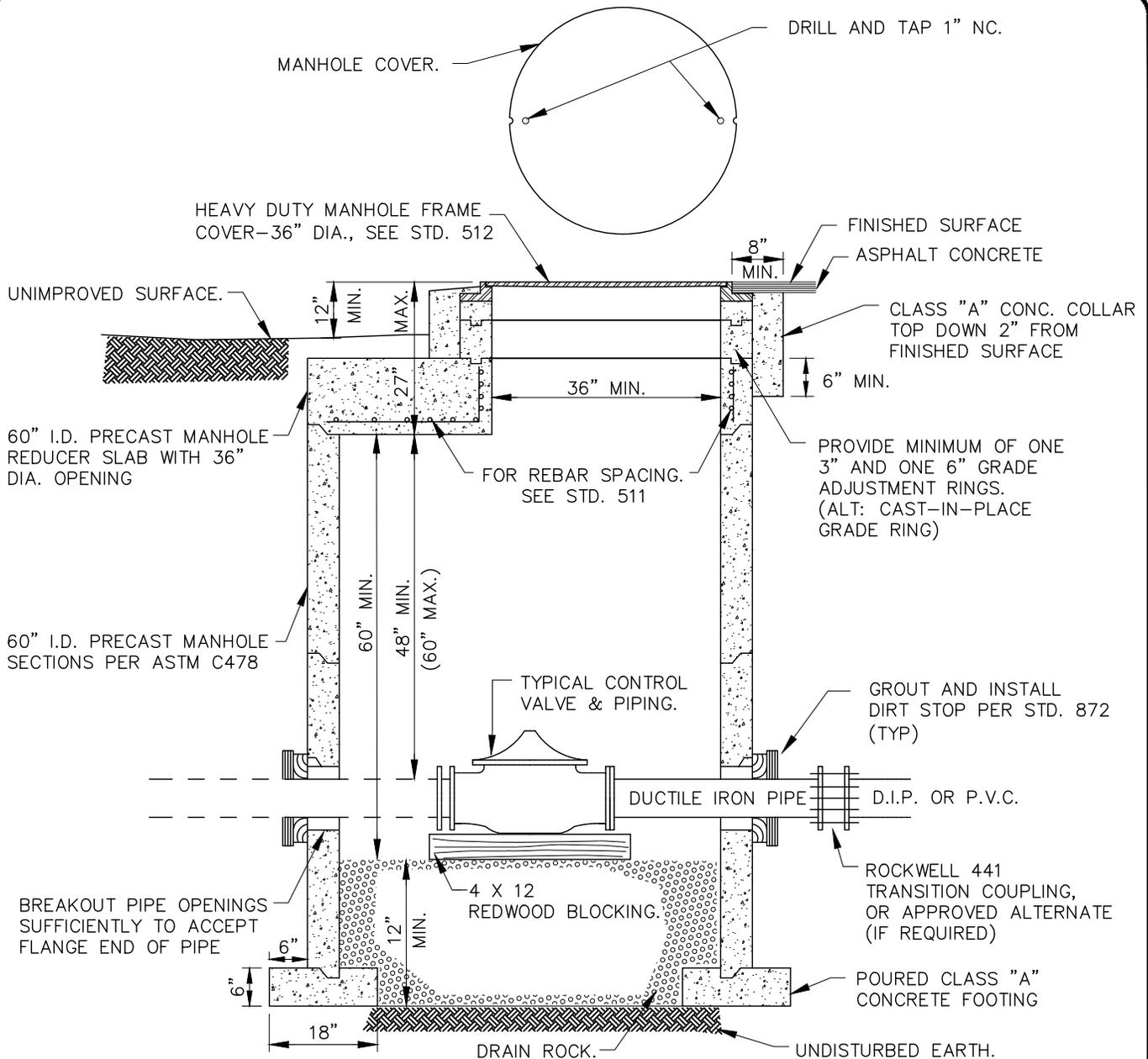
DECEMBER 2019

STD. NO.

872

PAGE 1 OF 1

SCALE: NONE

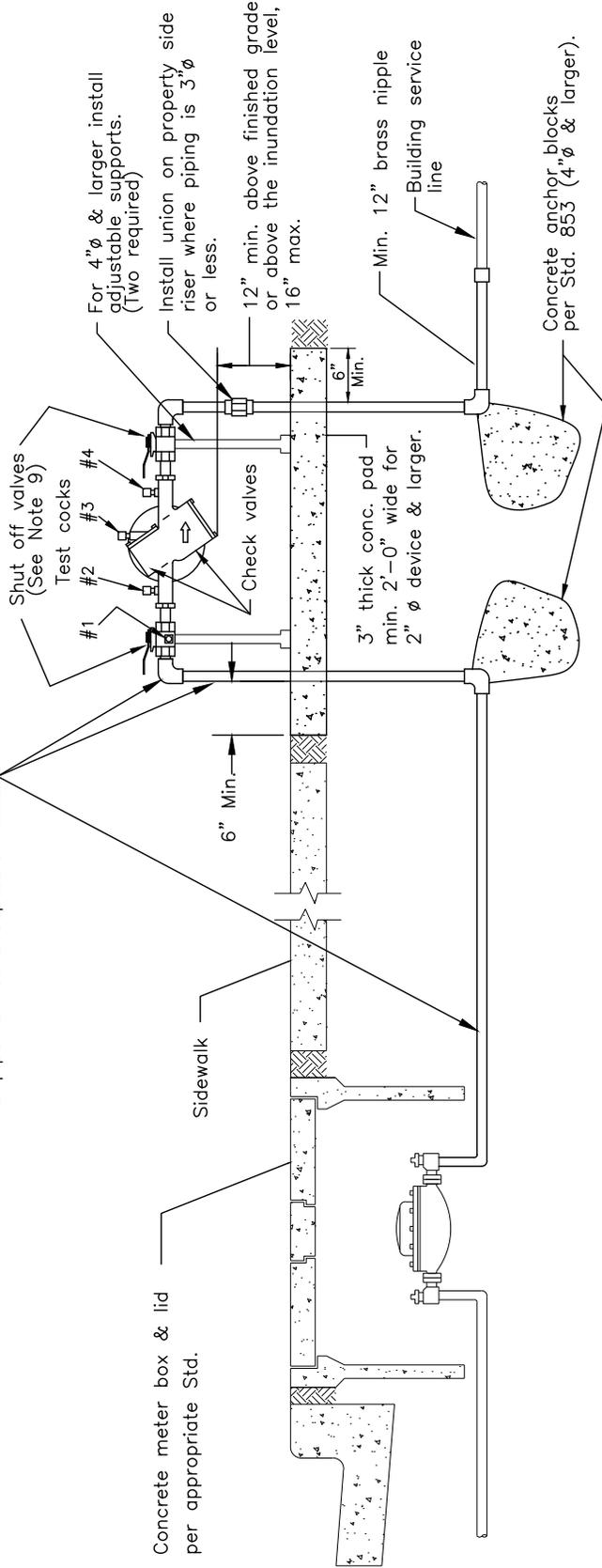


NOTES:

1. PRIOR APPROVAL OF THE USE OF THE MANHOLE-STYLE VAULT MUST BE OBTAINED FROM THE COTATI PUBLIC WORKS DEPT. FOR THE SPECIFIC SIZE AND MODEL VALVE OR APPURTENANCE TO BE INSTALLED.
2. THE MINIMUM MANHOLE I.D. SHALL BE 60".
3. ALL REDUCERS SHALL BE SLAB-STYLE. CONE-TYPE REDUCERS ARE NOT ACCEPTABLE.
4. ALL GATE VALVES SHALL BE INSTALLED ON EXTERIOR OF THE MANHOLE PER STD. 877.
5. SET ALL MANHOLE SECTIONS AND GRADE RINGS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATES.
6. WHERE POSSIBLE, INSTALL P.V.C. DRAIN PIPE FROM BASE OF MANHOLE TO DAYLIGHT OR TO STORM DRAIN.
7. SEE STD. 500 FOR CONSTRUCTION NOTES.
8. IN DESIGNATED FLOOD PLAIN AREAS, A WATERTIGHT MANHOLE SHALL BE INSTALLED WITH CONCRETE BASE.

	<p>DESIGN AND CONSTRUCTION STANDARDS</p>	<p>STD. NO.</p>
	<p>TRAFFIC-TYPE PRECAST WATER UTILITY MANHOLE</p>	<p>873</p>
<p><i>Craig A. Scott</i> CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER</p>	<p>DECEMBER 2019</p>	<p>PAGE 1 OF 1 SCALE: NONE</p>

Piping, valves, nipples, etc. shall be threaded brass for 2"φ or less, & shall be flanged ductile iron for 3"φ and greater. PVC pipe is not acceptable.



NOTES

1. Backflow assemblies shall be installed adjacent to, and on the property side of, sidewalk where applicable. Where no sidewalk exists, the double-check valve assemblies shall be installed as close as possible to the water meter location. Any conflicts shall be resolved by the City Public Works Utilities Services.
2. Approved double-check valves shall be as shown on "List of Approved Backflow Prevention Devices" (latest revision) by the University of Southern California Foundation For Cross-Connection Control & Hydraulic Research.
3. All double-check valve assemblies shall be provided with a minimum of four (4) test cocks.
4. Double-check valve assemblies shall be required for any use where an intermediate hazard exists. To be installed on all services to properties with wells, and other domestic services as determined by the City Public Works Utilities Services.
5. The piping from the meter to the double-check valve assembly and the double-check valve assembly itself must be the same size as the meter, unless otherwise approved by the Public Works Utility Services.
6. This standard will be used for all commercial installations requiring a double-check valve-type backflow preventer.
7. (Not used)
8. Any cover or screening for the backflow prevention assembly must be approved by the Engineering Dept. prior to installation.
9. Valves 2"φ & less shall be ball valves, 3"φ & greater shall be resilient seat gate valves.



DESIGN AND CONSTRUCTION STANDARDS

DOUBLE-CHECK VALVE BACKFLOW ASSEMBLY

Craig A. Scott
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DECEMBER 2019

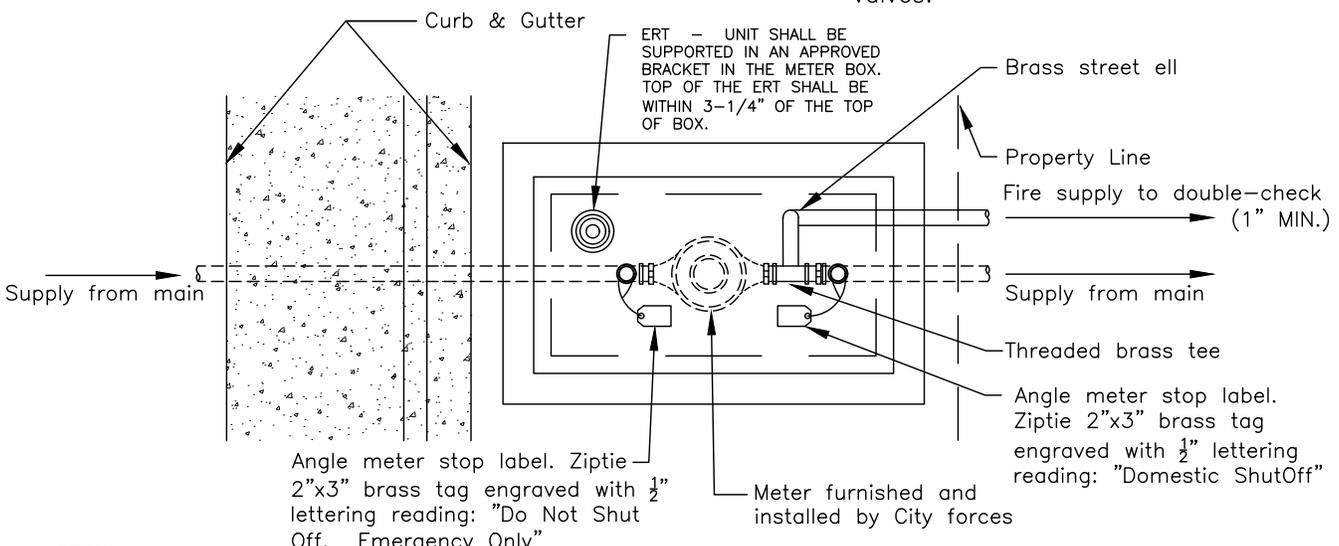
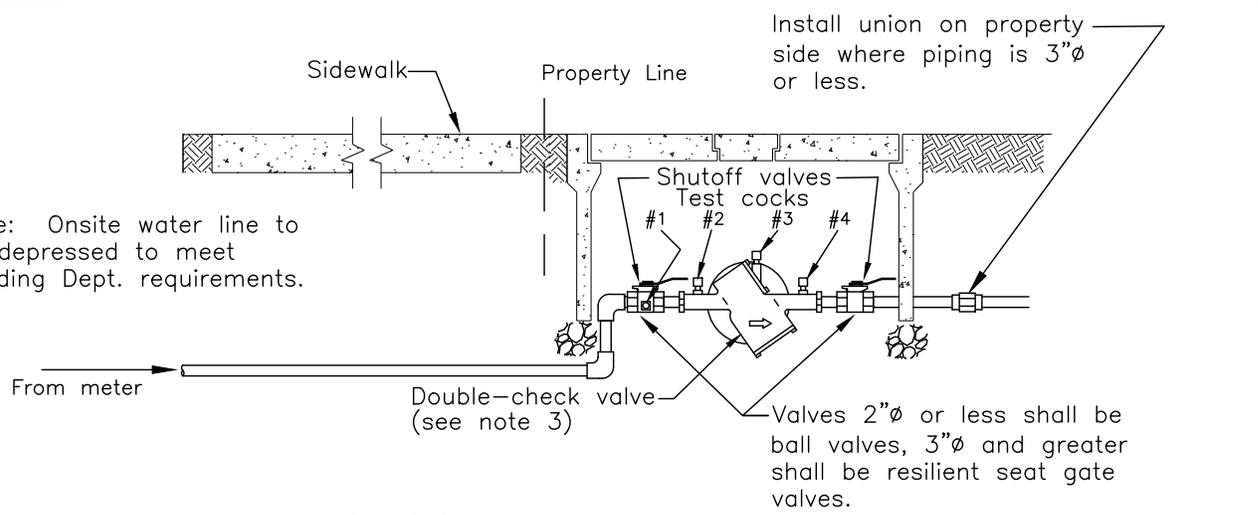
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874

PAGE 1 OF 1

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Note: Onsite water line to be depressed to meet Building Dept. requirements.



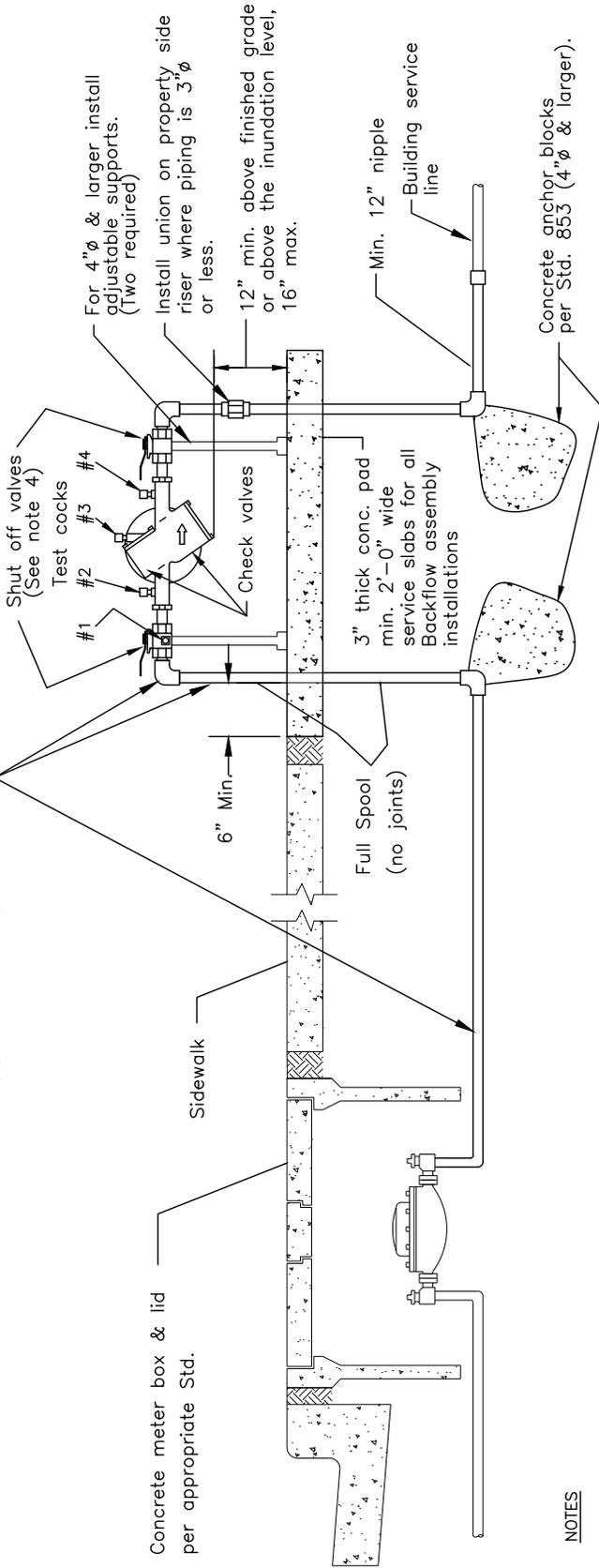
NOTES

1. This standard applies to residential connections with auxiliary water supplies onsite or where residential fire sprinkler systems are installed. Where residential fire systems are designed to circulate water with domestic systems, no backflow device is required.
2. Double-check valve assemblies shall be installed adjacent to and on the property side of sidewalk where applicable. Where no sidewalk exists, the double-check valve assemblies shall be installed as close as possible to the water meter location. Any conflicts shall be resolved by the Public Works Dept.
3. Approved double-check valves shall be as shown on "List of Approved Backflow Prevention Devices" (latest revision) by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research.
4. Piping, valves, nipples, etc. shall be threaded brass for 2" diameter or less & shall be flanged ductile iron for 3" diameter or greater. PVC pipe is not acceptable.

5. All double-check valve assemblies shall be provided with a minimum of four (4) test cocks.
6. See Engineer's Approved List for approved vaults and covers. The vaults must be centered with min. 3" clearance on all sides of meter and backflow assemblies.
7. The piping from the meter to the double-check valve assembly and the double-check valve assembly itself must be the same size as the meter unless otherwise approved by the Public Works Utilities Services supervisor.
8. See Std. 863 for installation at service and meter.
9. Backflow assemblies will be tested and certified after installation.

	DESIGN AND CONSTRUCTION STANDARDS	STD. NO.
	BELOW GROUND DOUBLE-CHECK VALVE BACKFLOW DEVICE	875
	DECEMBER 2019	PAGE 1 OF 1 SCALE: NONE
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER		

Between meter and backflow device, all piping, valves, nipples, etc. shall be threaded brass for 2"Ø or less, & shall be flanged ductile iron for 3"Ø and greater. PVC pipe is not acceptable.



NOTES

1. Reduced pressure type backflow assemblies shall be required as determined by the City Utilities Dept.
2. Approved reduced pressure backflow assemblies shall be as shown on "List of approved backflow prevention devices" (of latest revision) by the University of Southern California Foundation For Cross-Connection Control & Hydraulic Research.
3. Backflow prevention assemblies shall be installed adjacent to and on property side of sidewalk where applicable. Where no sidewalk exists, the assembly shall be installed as close as possible to the water meter location.
4. A valve of the same size as the backflow assembly shall be installed on each side of the backflow prevention assembly. Valves 2"Ø & less shall be ball valves, 3"Ø & greater shall be resilient seat gate valves.
5. Backflow prevention assembly must be covered with a hinged, green steel cage. Size and type to be approved by the Utilities Dept. prior to installation.
6. In limited space applications, valves may be installed on risers min. 4" above grade.
7. The addition of spools must be approved by the City Inspector prior to installation.
8. The piping from the reduced pressure backflow assembly & the reduced pressure backflow device valve assembly itself must be the same size as the meter unless otherwise approved by the Public Works Utilities Services supervisor.



DESIGN AND CONSTRUCTION STANDARDS

REDUCED-PRESSURE BACKFLOW DEVICE

Craig A. Scott

CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.

876

PAGE 1 OF 1

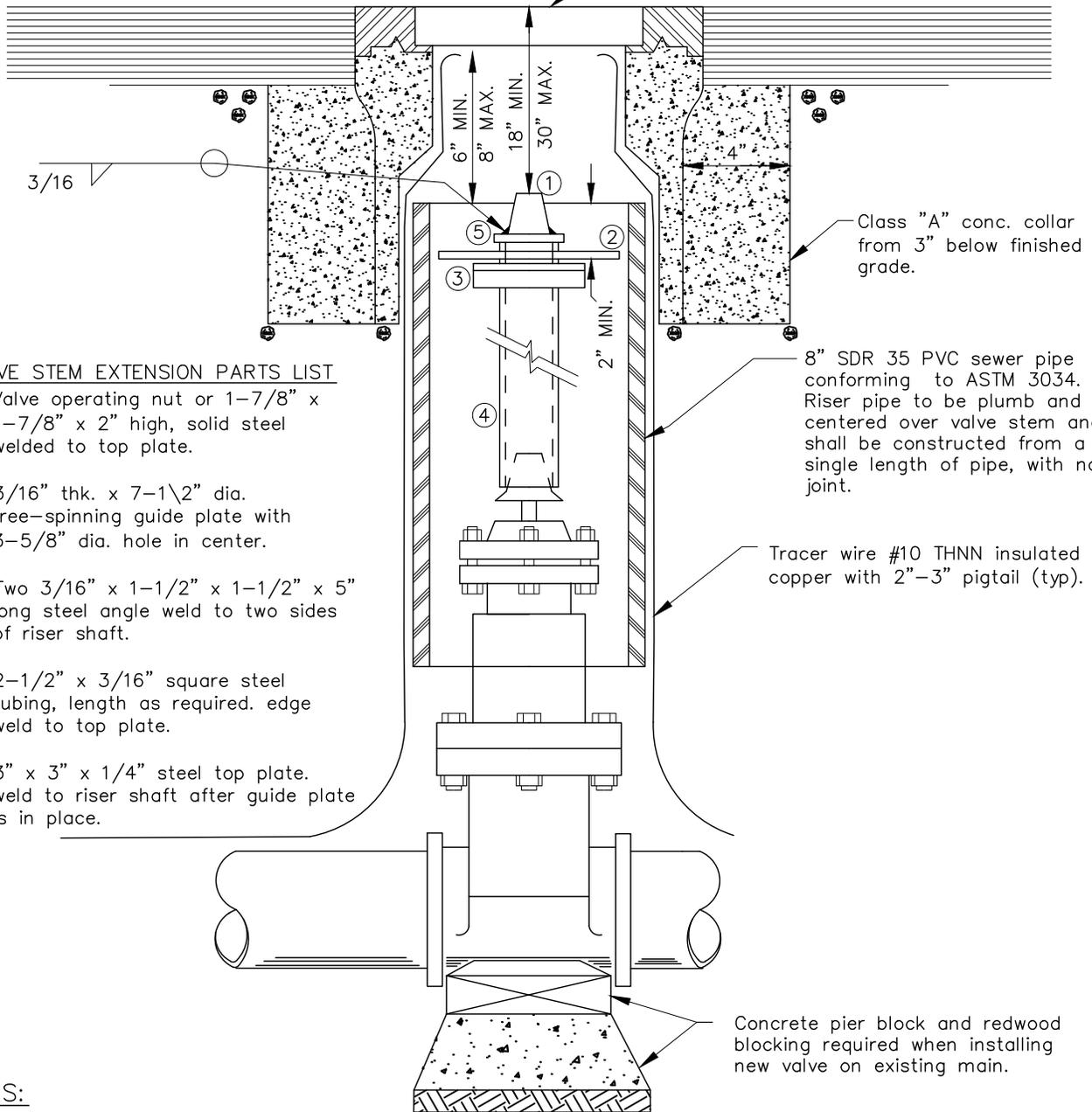
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STEM EXTENSION FABRICATION NOTES

1. All welds to riser shaft shall be fillet weld all around, as specified below.
2. All steel required for riser fabrication shall be structural steel per ASTM A36.

PRECAST VALVE BOX SET FLUSH WITH STREET SURFACE WITH CAST IRON RING AND COVER MARKED "WATER".

FINISHED GRADE.



VALVE STEM EXTENSION PARTS LIST

- ① Valve operating nut or 1-7/8" x 1-7/8" x 2" high, solid steel welded to top plate.
- ② 3/16" thk. x 7-1/2" dia. free-spinning guide plate with 3-5/8" dia. hole in center.
- ③ Two 3/16" x 1-1/2" x 1-1/2" x 5" long steel angle weld to two sides of riser shaft.
- ④ 2-1/2" x 3/16" square steel tubing, length as required. edge weld to top plate.
- ⑤ 3" x 3" x 1/4" steel top plate. weld to riser shaft after guide plate is in place.

8" SDR 35 PVC sewer pipe conforming to ASTM 3034. Riser pipe to be plumb and centered over valve stem and shall be constructed from a single length of pipe, with no joint.

Tracer wire #10 THNN insulated copper with 2"-3" pigtail (typ).

Concrete pier block and redwood blocking required when installing new valve on existing main.

NOTES:

1. Valves 2" through 12" shall be resilient wedge gate valves and valves larger than 12" shall be butterfly valves (see Std. 878) unless otherwise approved by the utilities dept.
2. Gate valves shall conform to city specification number 99-1.05.
3. All external bolts and nuts on valves shall be 304 stainless steel or the entire valve shall be wrapped tightly with polyethylene film held securely with adhesive tape.
4. If valve is installed so that the top of the operating nut is less than 30" below finished grade, the valve stem riser is not required.
5. For installation of butterfly valve and tapping valve, see Std. 878.



DESIGN AND CONSTRUCTION STANDARDS

GATE VALVE

Craig A. Scott
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STD. NO.

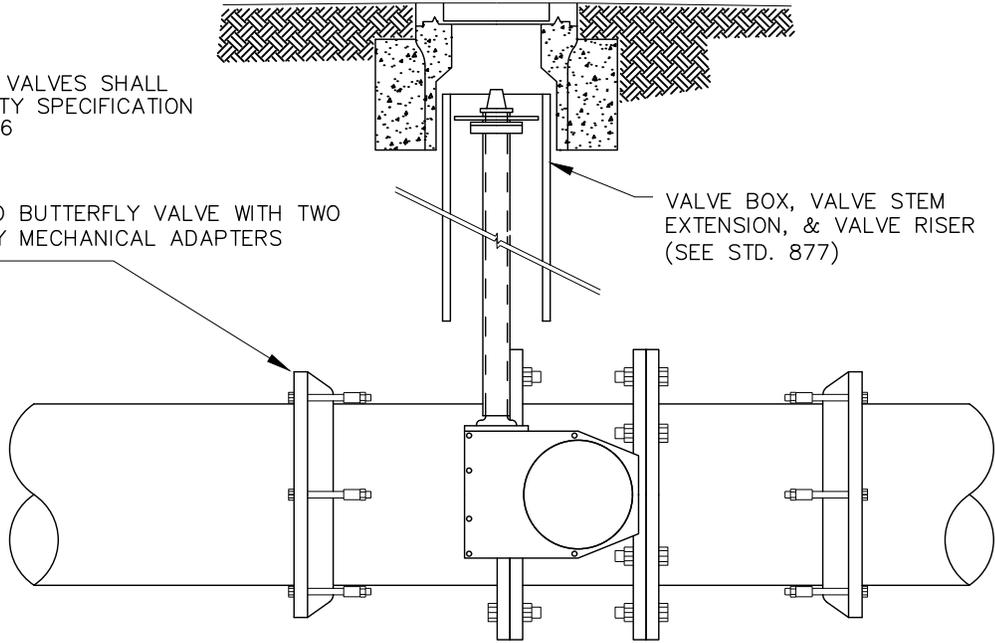
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PAGE 1 OF 1

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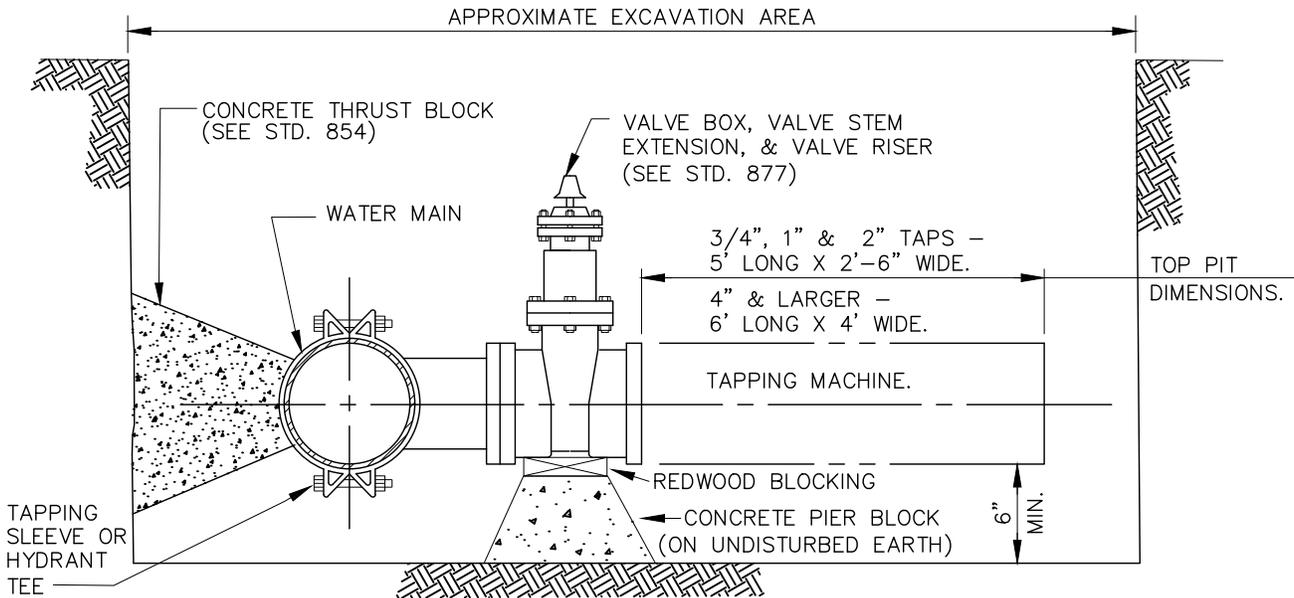
ALL BUTTERFLY VALVES SHALL CONFORM TO CITY SPECIFICATION SECTION 99-1.06

INSTALL FLANGED BUTTERFLY VALVE WITH TWO TWO FLANGED BY MECHANICAL ADAPTERS ON CL 200 PVC.



BUTTERFLY VALVE

TO BE USED ON PIPES LARGER THAN 12"



TAPPING SLEEVE & VALVE

NOTES:

1. ALL EXTERNAL BOLTS AND NUTS ON VALVES SHALL BE 304 STAINLESS STEEL OR THE ENTIRE VALVE SHALL BE WRAPPED TIGHTLY WITH POLYETHYLENE FILM HELD SECURELY WITH ADHESIVE TAPE.
2. TAPS SHALL BE MADE BY CITY FORCES. SCHEDULE THROUGH THE UTILITIES ENGINEERING DEPT.
3. VALVES 2" TO 12" SHALL BE RESILIENT WITH EDGE GATE VALVES. VALVES LARGER THAN 12" SHALL BE BUTTERFLY VALVES UNLESS OTHERWISE APPROVED BY THE UTILITIES DEPT.



DESIGN AND CONSTRUCTION STANDARDS

BUTTERFLY VALVE AND TAPPING VALVE

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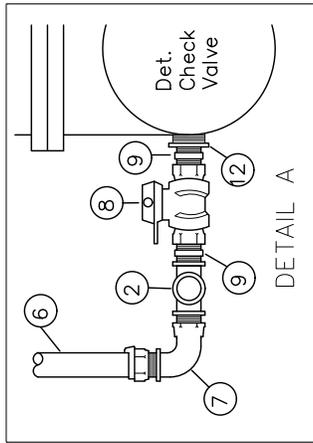
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STD. NO.

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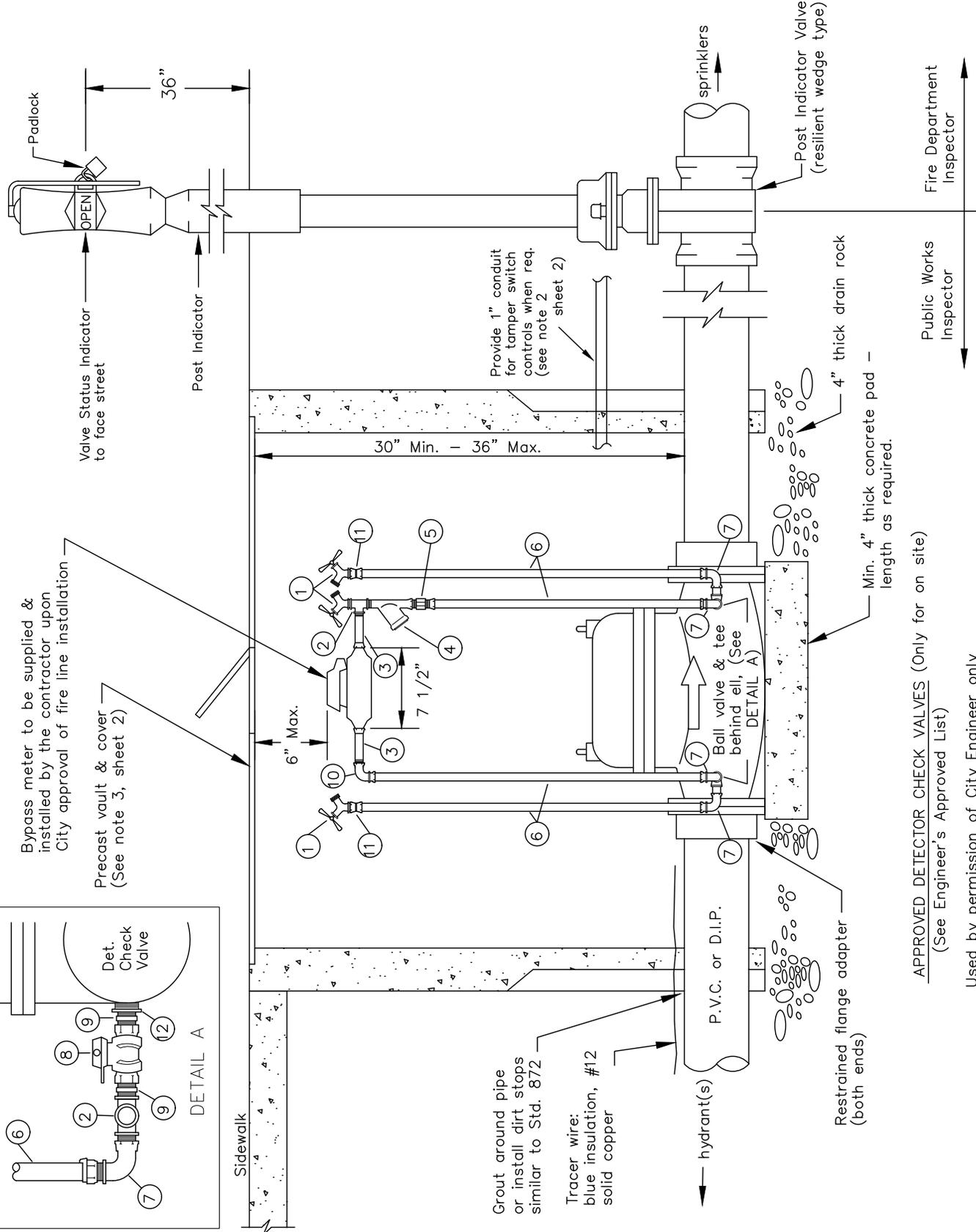
PAGE 1 OF 1

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Bypass meter to be supplied & installed by the contractor upon City approval of fire line installation

Precast vault & cover (See note 3, sheet 2)



Fire Department Inspector

Public Works Inspector

APPROVED DETECTOR CHECK VALVES (Only for on site)
(See Engineer's Approved List)

Used by permission of City Engineer only



DESIGN AND CONSTRUCTION STANDARDS

UNDERGROUND FIRE LINE SINGLE DETECTOR CHECK INSTALLATION

Craig A. Scott
CRAIG A. SCOTT, DIRECTOR OF PUBLIC WORKS/CITY ENGINEER

DECEMBER 2019

STD. NO.
879
PAGE 1 OF 3
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BY-PASS PARTS LIST

NO.	DESCRIPTION	QUANTITY	PART SIZE OR MODEL NO.*
1.	HOSE BIB – MIP	3	3/4"
2.	TEE – FIP x FIP x FIP	3	3/4"
3.	SHORT MTR SPUD – 2" L	2	C38 – 23 – 2
4.	STRAIGHT CHECK VALVE – MIP x FIP	1	HS81 – 333
5.	ADAPTER – COMP x MIP	1	C84 – 33
6.	COPPER TUBING – TYPE "K" (SOFT)	VARIES	3/4"
7.	90° ADAPTER – COMP x MIP	4	L84 – 33
8.	STRAIGHT BALL VALVE – FIP x FIP	2	B11 – 33
9.	CLOSE NIPPLE	4	3/4"
10.	90° ADAPTER – COMP x FIP	1	L14 – 33
11.	ADAPTER – COMP x FIP	2	C14 – 33
12.	BUSHING	2	3/4" x VARIES

* FORD MODEL NO'S ARE GIVEN. SUBMIT SUBSTITUTIONS FOR APPROVAL.

NOTES:

1. This Standard applies when above-ground installation is not possible due to site constraints.
2. The post indicator valve shall be installed as close as possible to the detector check vault. If a post indicator cannot be installed, an O.S. & Y. valve with locking chain must be installed inside the vault on the property side of the detector check with approval from the City Utilities Department.
3. Refer to vault size chart for proper size. Should an O.S. & Y. valve be installed in the vault, the vault size mat need to be verified by the Contractor. See the engineer's approved list for approved vaults and covers.
4. All fire line services to the post indicator valve shall be tested by the Public Works Dept. Construction inspection section per City Construction Standards. All on-site fire lines, hydrants, and the P.I.V. shall be tested & inspected by the Fire Dept. per City Fire Dept. Code.
5. Double-check detector valve assembly with bypass double-check shall be installed where the Utilities Dept. determines an extreme hazard exists. Installation details shall be approved by the Utilities Dept. prior to installation. (See Std. 880)
6. The fire department connection shall be installed and located as required by the Fire Department.
7. Post indicator valves shall be locked with a break-away lock. The top if the P.I.V. shall not be less than thirty-six inches (36") above finished grade.
8. Use only downstream of double-check detector backflow preventer.
9. Single-check valves may only be used in addition to a double-check detector check valve.



DESIGN AND CONSTRUCTION STANDARDS

UNDERGROUND FIRE LINE SINGLE DETECTOR CHECK INSTALLATION

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STD. NO.

879

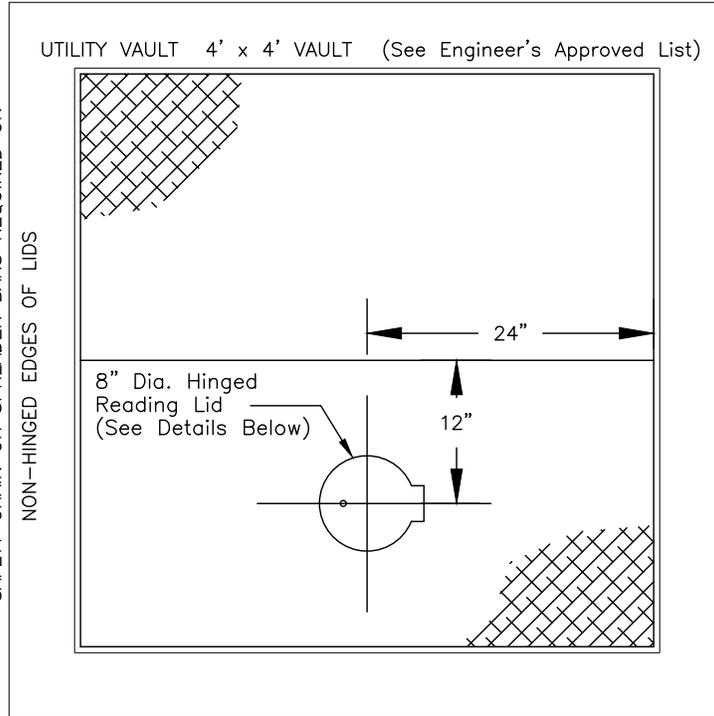
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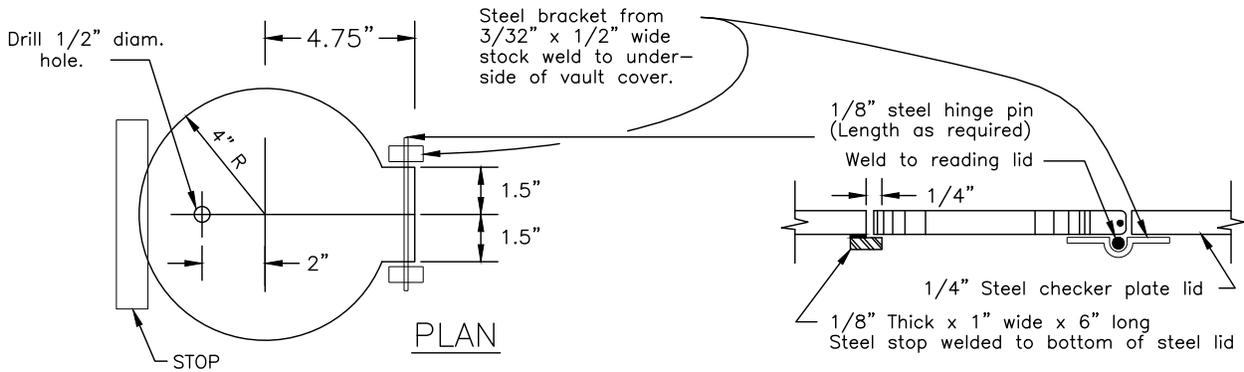
UTILITY VAULT 5' x 5' VAULT (See Engineer's Approved List)

UTILITY VAULT 4' x 4' VAULT (See Engineer's Approved List)

SAFETY CHAIN OR SPREADER BARS REQUIRED ON NON-HINGED EDGES OF LIDS



VAULT PLAN



READING LID DETAILS

NOTES

1. Reading lid shall be centered over the by-pass meter.
2. Galvanize coat all parts after welding. Vaults that are to be placed in pedestrian way must have lids with "all-grip" surface in lieu of galvanizing.



DESIGN AND CONSTRUCTION STANDARDS

UNDERGROUND FIRE LINE SINGLE DETECTOR CHECK INSTALLATION

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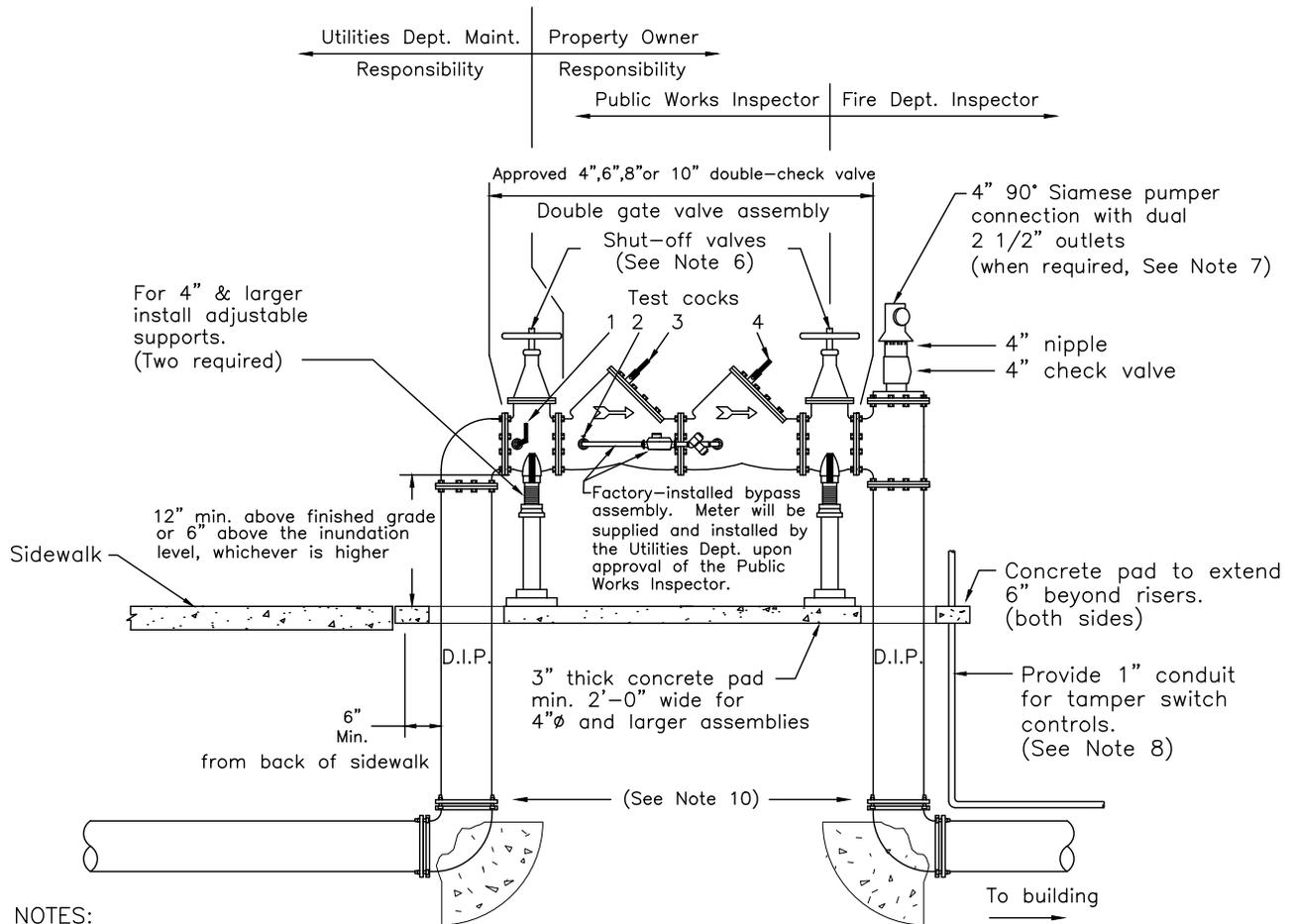
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STD. NO.

879

PAGE 3 OF 3

SCALE: NONE



NOTES:

1. This Standard is required for:
 - a.) all connections serving commercial fire sprinkler systems.
 - b.) any fire line connections to properties with auxiliary water supplies.
 - c.) sites with multiple fire line connections to the City water system.
2. Approved double-check detector backflow assemblies shall be shown on "List of approved backflow devices" of latest revision, by the University of Southern California Foundation for Cross Connection Control & Hydraulic Research.
3. All test valves shall be fitted with 1/4" female test cocks.
4. Double-check detector assembly shall be located as close as possible to the sidewalk or public right-of-way.
5. Any cover or screening for this assembly must have both Fire Department & Utility Department approval prior to installation.
6. Shut-off valves to be resilient wedge type O.S. & Y and will be chained and padlocked in the open position.
7. Must have specific approval of the Rancho Adobe Fire District prior to installation.
8. The installation shall be provided with electronic supervision monitoring when required by the Fire Department.
9. Double-check detector shall be the same size as the fire line except when a 12" fire line is required, then a 10" double detector check backflow assembly is required.
10. Restrained joints are required for all new construction from gate valve to 90° ell. Thrust blocks are only required where existing services are being modified and restrained joints are not used.



DESIGN AND CONSTRUCTION STANDARDS

DOUBLE-CHECK DETECTOR FIRE LINE BACKFLOW ASSEMBLY

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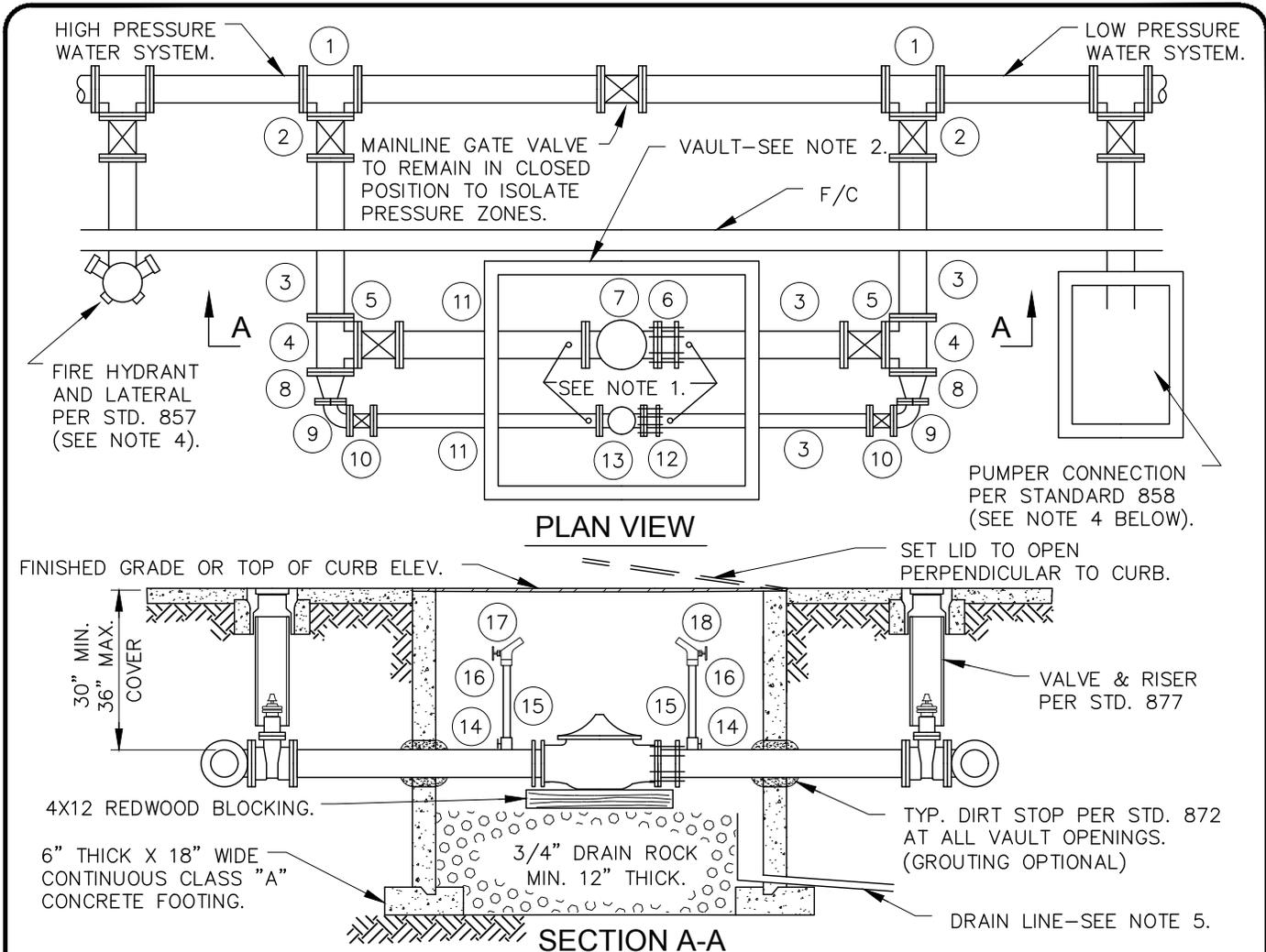
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880

PAGE 1 OF 1

DECEMBER 2019

SCALE: NONE



NOTES:

1. MAKE 3/4" TOP TAP – INSTALL RISER AS SHOWN
2. SEE THE ENGINEER'S APPROVED LIST FOR APPROVED VAULTS AND COVERS
3. THE LOW FLOW BY-PASS (PART NUMBERS 8-13) SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY THE ENGINEERING DEPT. AND SHALL BE A MIN. 4" IN SIZE. IF A SINGLE P.R.V. IS INSTALLED, CENTER IN VAULT AND CHANGE PARTS NUMBER 4 TO 90° FLANGED ELLS, AND DELETE PART 5.
4. INSTALL FIRE HYDRANT AND LOW PROFILE HYDRANT ONLY WHEN REQUIRED BY THE ENGINEERING DEPT..
5. 2" SCHEDULE 40 P.V.C. DRAIN PIPE SHALL BE INSTALLED FROM A PERFORATED SUMP CANISTER TO AN EXISTING DRAINAGE SYSTEM OR TO DAYLIGHT.
6. VALVES 18" AND LARGER SHALL BE BUTTERFLY VALVES. VALVES 16" AND SMALLER SHALL BE RESILIENT WEDGE GATE VALVES.
7. ALL PRESSURE REDUCING VALVES TO BE EPOXY FUSED, INSIDE AND OUTSIDE. (SEE ENGINEER'S APPROVED LIST)
8. RESTRAINED JOINTS ARE REQUIRED FOR ALL NEW CONSTRUCTION FROM MAINLINE GATE VALVE TO VAULT. THRUST BLOCKS ARE ONLY REQUIRED WHERE EXISTING SERVICES ARE BEING MODIFIED AND RESTRAINED JOINTS ARE NOT USED,

PARTS LIST	
#	ITEM
1	MECHANICAL JOINT TEE
2	MECHANICAL JOINT GATE VALVE STD. 877
3	DUCTILE IRON PIPE – FL. X P.E.
4	FLANGED TEE
5	FLANGED GATE VALVE STD. 877
6	FLANGED COUPLING ADAPTER
7	FLANGED P.R.V. – HIGH FLOW
8	FLANGED REDUCER
9	FLANGED 90° ELL
10	FLANGED GATE VALVE STD. 877
11	DUCTILE IRON PIPE – FL. X FL.
12	FLANGED COUPLING ADAPTER
13	FLANGED P.R.V. – LOW FLOW
14	3/4" BALLCORP (FORD FB 1000)
15	3/4" TYPE "K" COPPER TUBING
16	3/4" COMP. X F.I.P. ADAPTER (FORD C14-33)
17	3/4" M.L.P. X HOSE BIBB – BRASS
18	3/4" M.L.P. TEE WITH TWO (2) 3/4" F.I.P. X H.B.

	DESIGN AND CONSTRUCTION STANDARDS	STD. NO.
	PRESSURE REDUCING VALVES 	881
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DESIGN AND CONSTRUCTION STANDARDS
SURGE ANTICIPATOR VALVE
OR PRESSURE RELIEF VALVE

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STD. NO.
882

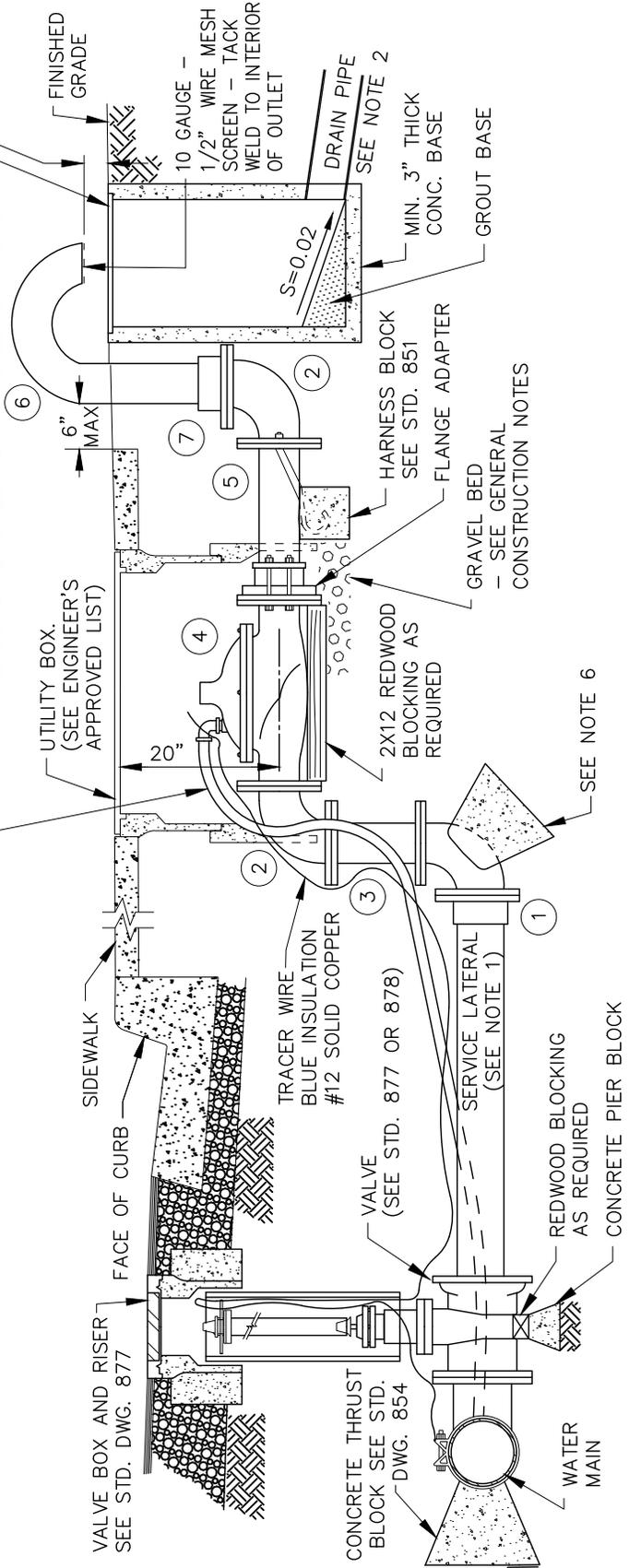
PAGE 1 OF 1

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1" POLYETHYLENE SENSING LINE—ATTACH TO SURGE ANTICIPATOR. MAKE 1" HORIZONTAL TAP CONNECTION TO WATER MAIN. SEE THE APPROVED ENGINEER'S LIST FOR STD. 863 FOR APPROVED TOPPING SADDLES AND VALVES.

12" MIN ABOVE FINISHED GRADE OR 6" ABOVE INUNDATION LEVEL, WHICHEVER IS HIGHER

PRECAST CONCRETE DROP INLET W/GALVANIZED FRAME & GRATE SIZE TO BE DETERMINED BY THE DESIGN ENGINEER & APPROVED BY THE CITY.



NOTES:

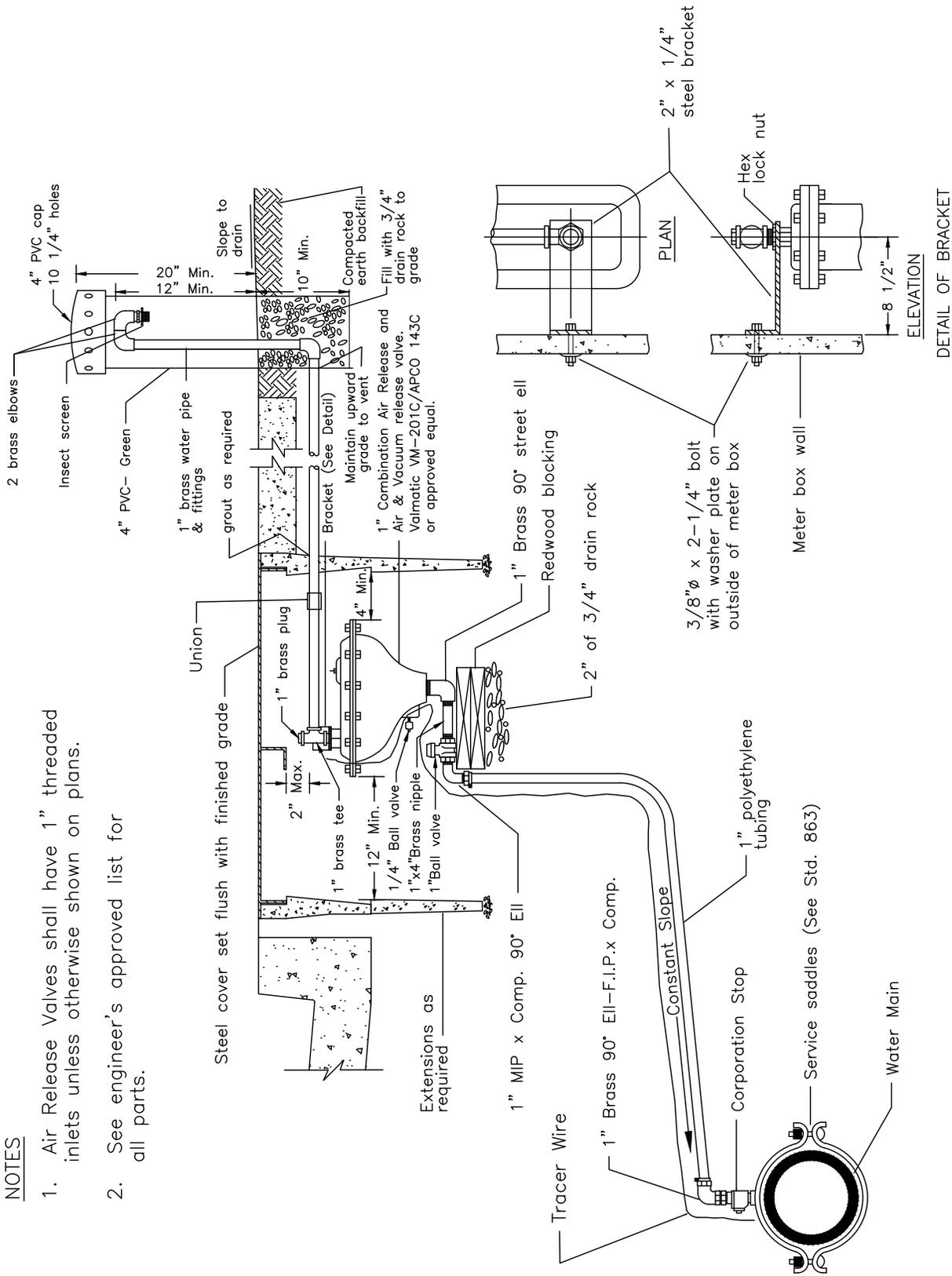
1. SERVICE LATERAL PIPE SHALL BE EITHER 4" DIAMETER OR EQUAL IN SIZE TO THE SURGE ANTICIPATOR VALVE, WHICHEVER IS GREATER. THE PIPE MATERIAL SHALL BE CI. 50 OR PC 350 DUCTILE IRON, UNLESS OTHERWISE SHOWN ON THE PLANS. SHOULD THE SURGE ANTICIPATOR VALVE BE SMALLER THAN 4", INSTALL A FLANGED REDUCER AS REQUIRED ON THE INLET SIDE OF THE VALVE.
2. DISCHARGE WATER SHALL DRAIN TO AN EXISTING DRAINAGE SYSTEM OR TO DAYLIGHT. THE PROJECT ENGINEER SHALL SUBMIT DESIGN TO THE APPROPRIATE AGENCIES FOR APPROVAL.
3. ALL PIPING & FITTINGS ON THE DISCHARGE SIDE OF THE SURGE ANTICIPATOR VALVE SHALL BE EQUIVALENT IN SIZE TO THE VALVE.
4. DISCHARGE RISER SHALL BE FABRICATED FROM STANDARD WELDED STEEL PIPE. WELDING SHALL CONFORM TO AWWA STANDARD C206. THE RISER ASSEMBLY SHALL BE TAPE COATED PER AWWA STANDARD C209.
5. CONTACT THE PUBLIC WORKS DEPARTMENT FOR SPECIFIC TELEMETRY REQUIREMENTS WHICH MUST BE MET.
6. RESTRAINED JOINTS ARE REQUIRED FOR ALL NEW CONSTRUCTION FROM GATE VALVE TO LOWER 90° BEND. THRUST BLOCKS ARE ONLY REQUIRED WHERE EXISTING SERVICES ARE BEING MODIFIED AND RESTRAINED JOINTS ARE NOT USED.

PARTS LIST

#	ITEM DESCRIPTION
1	FLANGE X M.J 90° — SIZE AS REQUIRED
2	C.I. FL 90° ELL — SIZE AS REQUIRED
3	D.I. FL. SPOOL — LENGTH AS REQUIRED.
4	VALVE SEE ENGINEER'S APPROVED LIST
5	FL. DIP — LENGTH AS REQUIRED.
6	FABRICATED WELDED STEEL DISCHARGE. SEE NOTE 4.
7	FLANGE ADAPTER — SIZE AS REQUIRED

NOTES

1. Air Release Valves shall have 1" threaded inlets unless otherwise shown on plans.
2. See engineer's approved list for all parts.



DESIGN AND CONSTRUCTION STANDARDS

**AIR AND VACUUM /
AIR RELEASE VALVE**

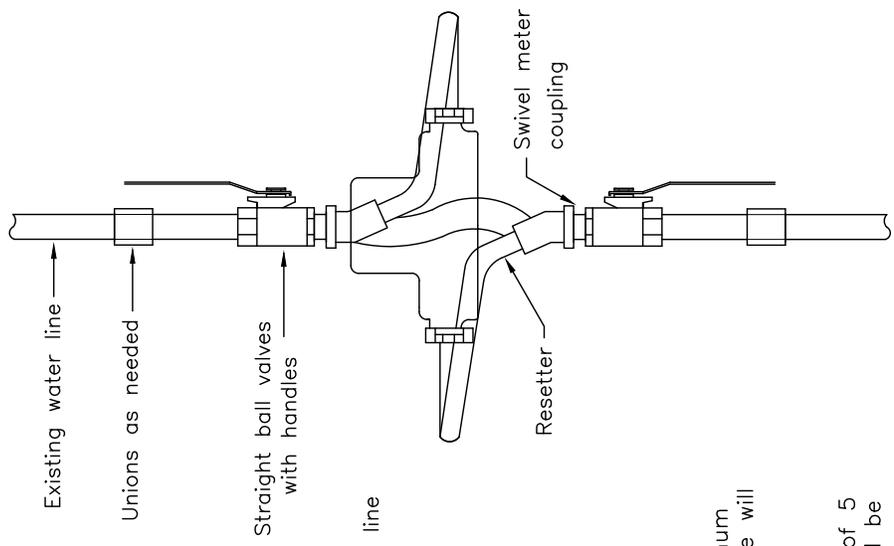
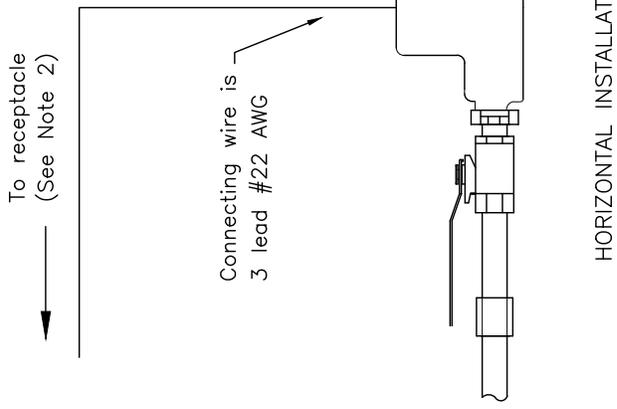
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STD. NO.
883
 PAGE 1 OF 1
 SCALE: NONE

DECEMBER 2019

METER SETTING ASSEMBLY PARTS LIST

METER SIZE	RESETTER
5/8" x 3/4"	(See Engineer's approved list)
1"	(See Engineer's approved list)



VERTICAL INSTALLATION
RESETTER REQUIRED

NOTES:

1. Install water meter and connect wiring.
2. Receptacle to be located on the outside wall of building. Receptacle to be mounted a minimum of 3 feet and a maximum of 4 feet above finished grade. The location of the receptacle will be determined by the Engineering Department.
3. Water meter must be mounted in a horizontal position. Water meter to be mounted a minimum of 3 feet and a maximum of 5 feet above finished floor. The location of the water meter will be determined by the Engineering Department.
4. Connecting wire to be installed in 1/2" diameter PVC conduit. Meter, conduit and wire may not be installed in areas with explosive atmospheres.
5. The Utilities Department will maintain the water meter only. All plumbing and wiring is the responsibility of the property owner.



DESIGN AND CONSTRUCTION STANDARDS

WATER METER FOR PRIVATE PROCESS AND EVAPORATIVE LINES

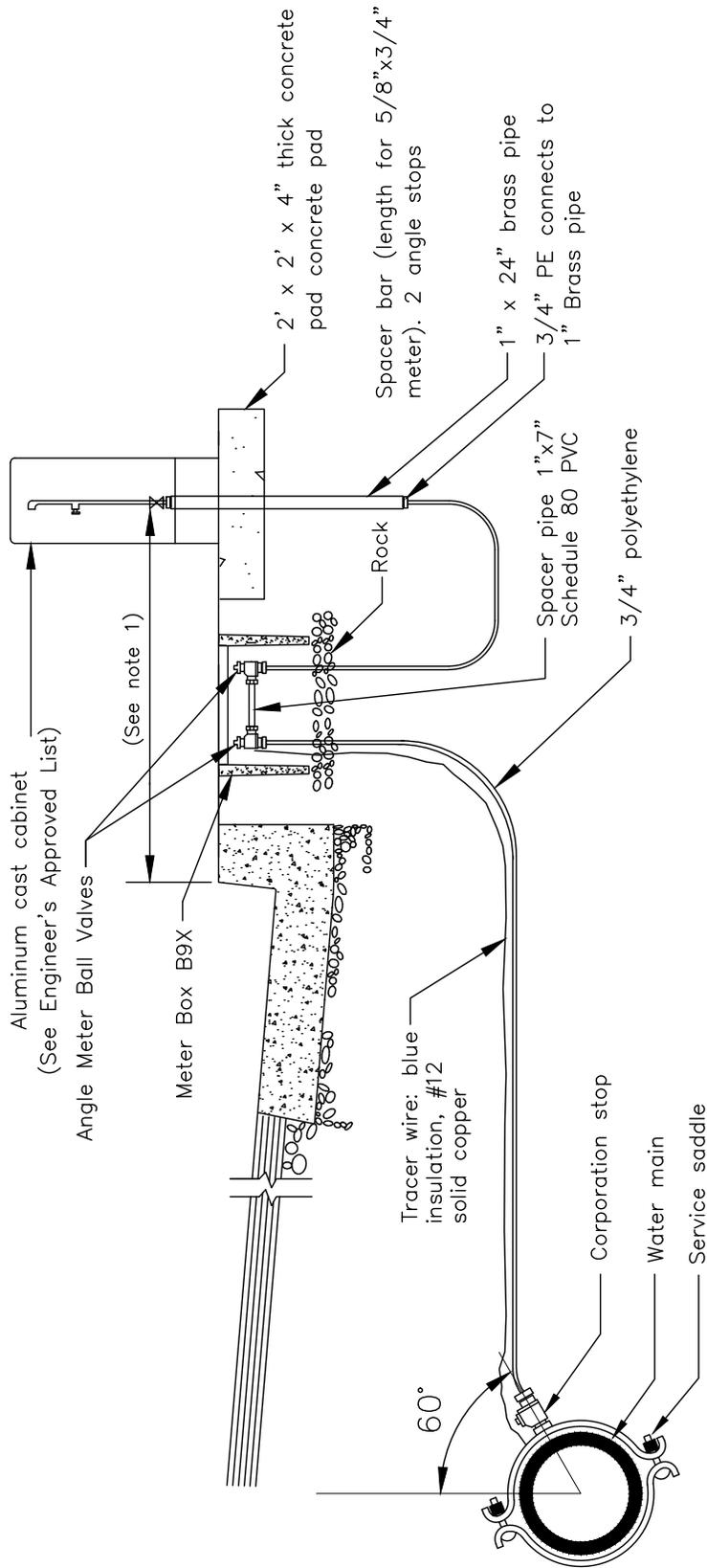
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DECEMBER 2019

STD. NO.
885

PAGE 1 OF 1

SCALE: NONE



NOTES:

1. If more than one length of 3/8" stainless steel tubing is required, stainless steel compression couplings shall be used.
2. All 3/8" tubing shall be wrapped in 10 mil tape.
3. Where planter strip exists, install min. 18" behind F/C - Where sidewalk is contiguous, install 12" behind sidewalk.

APPROVED TAPPING SERVICE SADDLES:

(See Engineer's Approved List for Standard 863)



DESIGN AND CONSTRUCTION STANDARDS

WATER SAMPLING STATION

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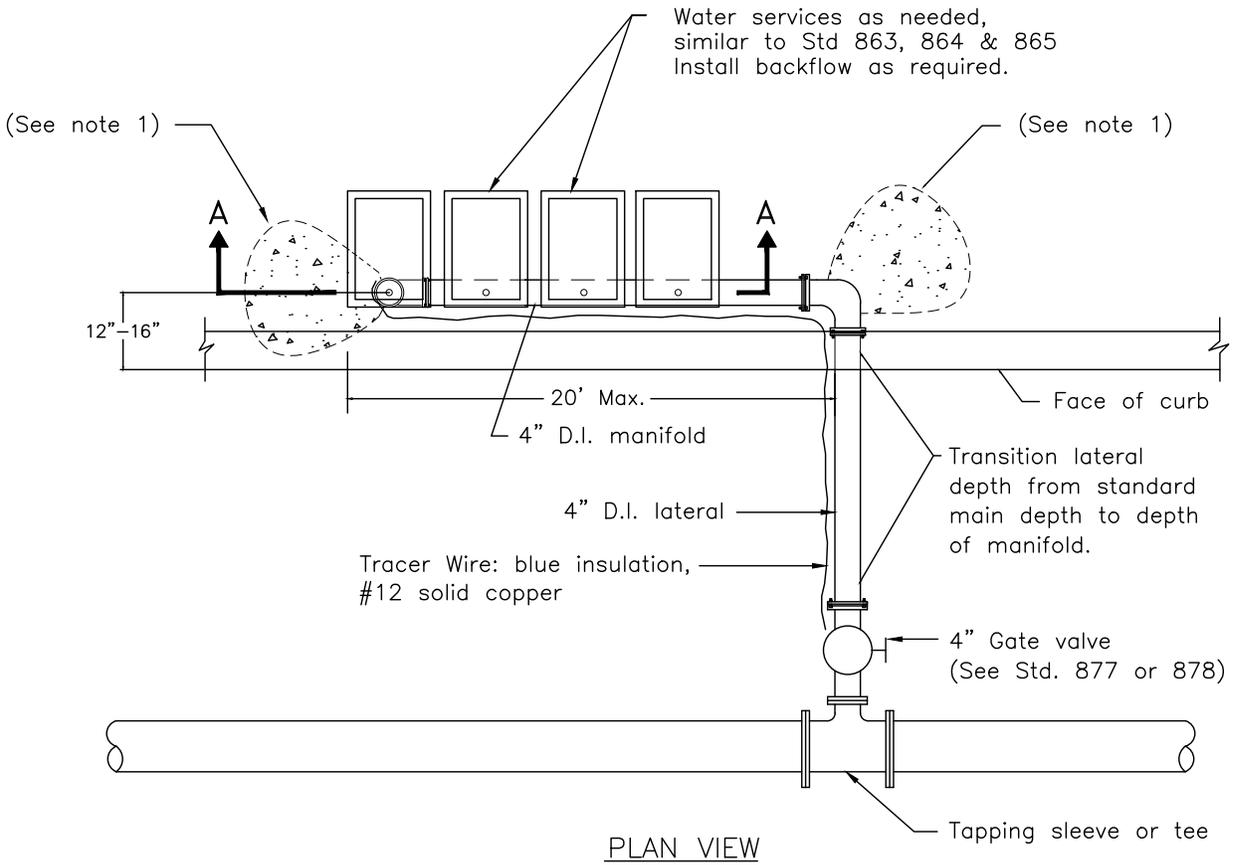
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STD. NO.

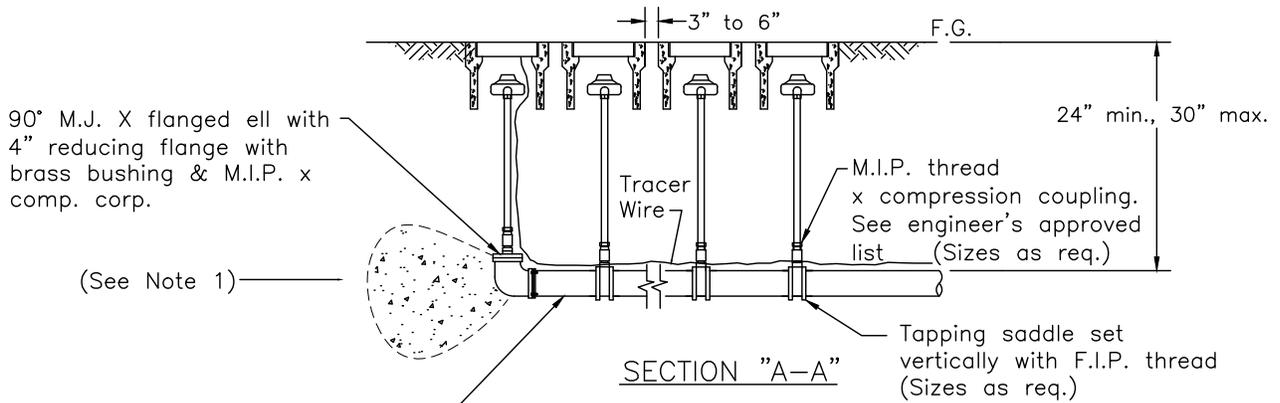
886

PAGE 1 OF 1

SCALE: NONE



PLAN VIEW



SECTION "A-A"

4" D.I. manifold to be installed with 24" minimum, 30" maximum cover.

NOTES:

1. This standard may be adapted for connection to a combination water service per Std. 870.
2. Restrained joints are required for all new construction from gate valve to end of 4" manifold. Thrust blocks are only required where existing services are being modified and restrained joints are not used.



DESIGN AND CONSTRUCTION STANDARDS

4" DUCTILE IRON
MULTI-SERVICE MANIFOLD

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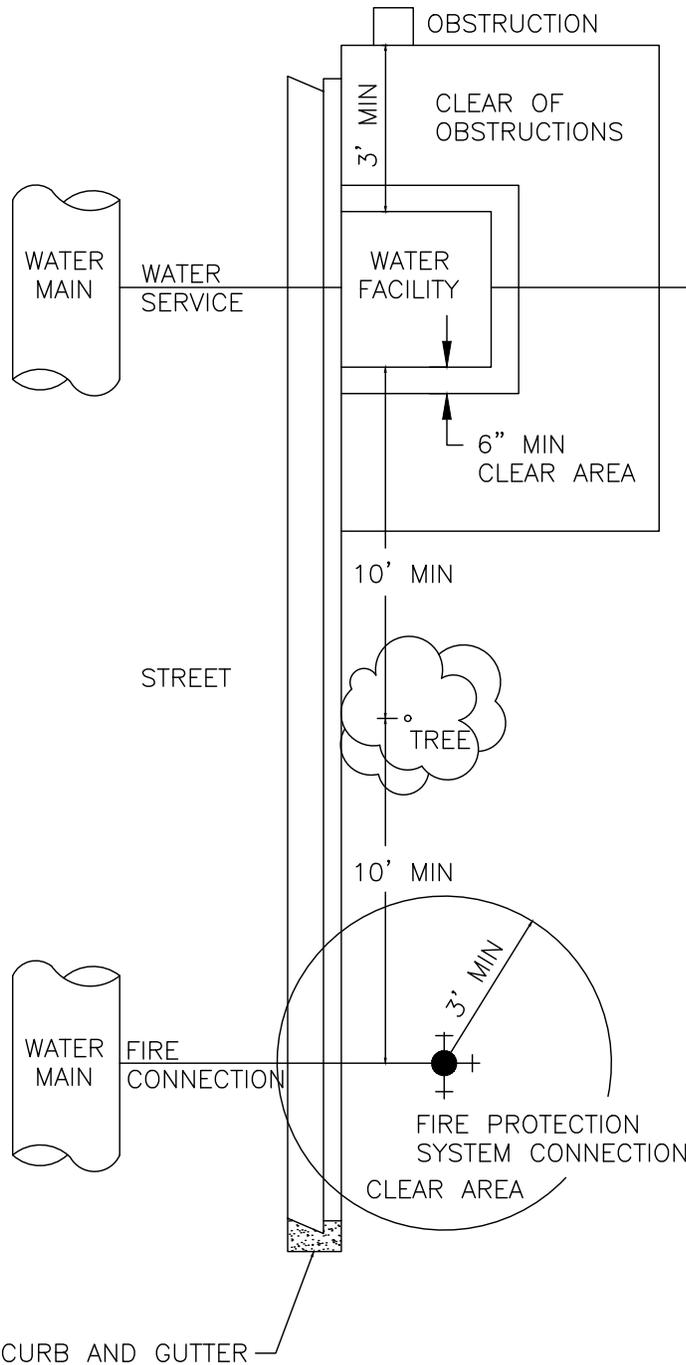
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STD. NO.

887

PAGE 1 OF 1

SCALE: NONE



DEFINITIONS

Obstructions (posts, fences, mail boxes, growth, trash, debris, storage, etc.).

Water Facility (meter boxes, valve boxes, blow offs, air vacs, backflow devices, or any other connections to the water mains of the water system).

Clear Area (free of any obstructions, shrubs, debris, overgrowth, trash, vehicles, trailers, etc.).

Permanent Structures (trees, large shrubs, foundations, or any other permanent structure).

Fire Protection System Connection (fire hydrants, fire services, fire connections, backflow devices, or any other connections on the fire protection system).

REQUIREMENTS

1. No obstructions may be placed in front of, or within 3 ft. around and 6 ft. above, any water facility as to deter or hinder free immediate access at all times.
2. A clear area 6 in. around and 6 ft. above any water facility shall be maintained by the customer.
3. No trees, foundations, or any other permanent structures shall be allowed within 10 ft. of any water facility or fire protection system connection.
4. No large shrubs shall be allowed within 5 ft. of any water facility or fire protection system connection.
5. A clear area 3 ft. around and 6 ft. above any fire protection system connection shall be maintained by the customer.



DESIGN AND CONSTRUCTION STANDARDS

WATER SERVICE OBSTRUCTIONS

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STD. NO.

888

PAGE 1 OF 1

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