

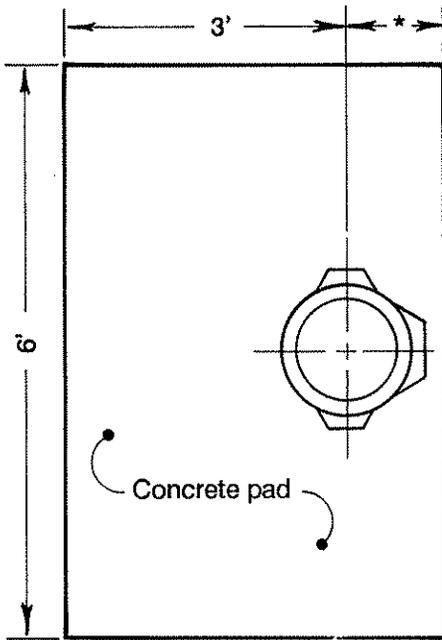
STANDARD PLANS
CITY OF BENICIA, CALIFORNIA



4/92

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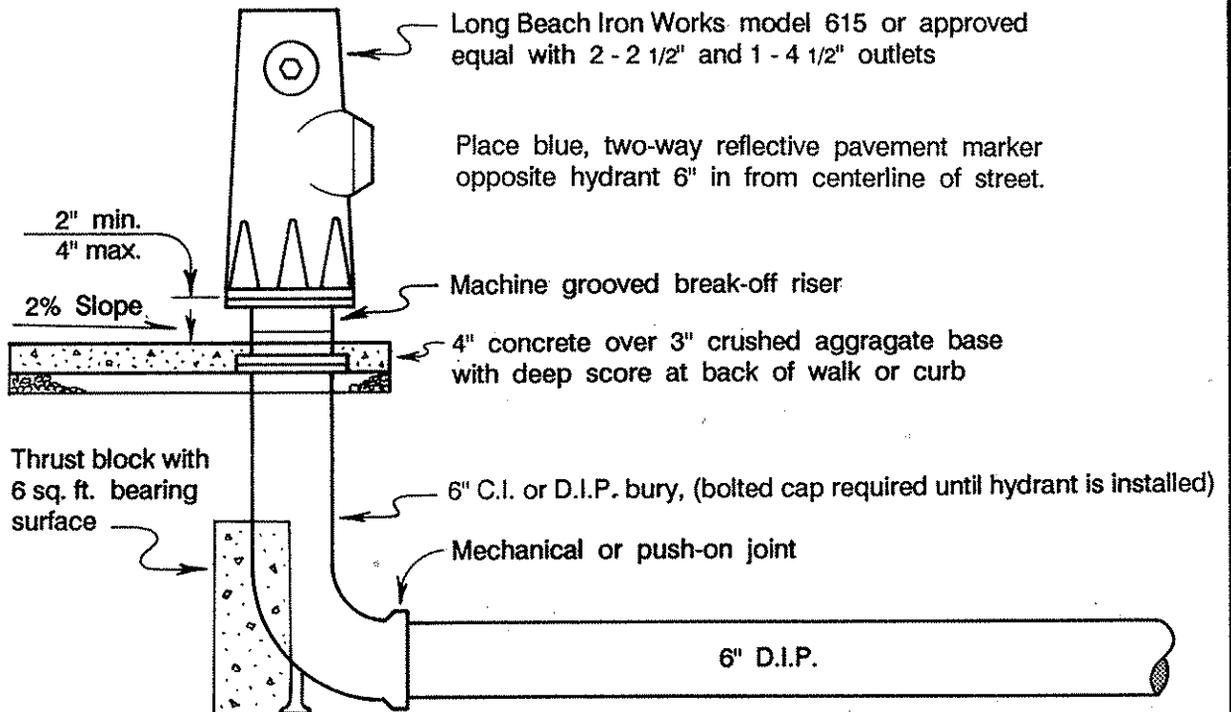
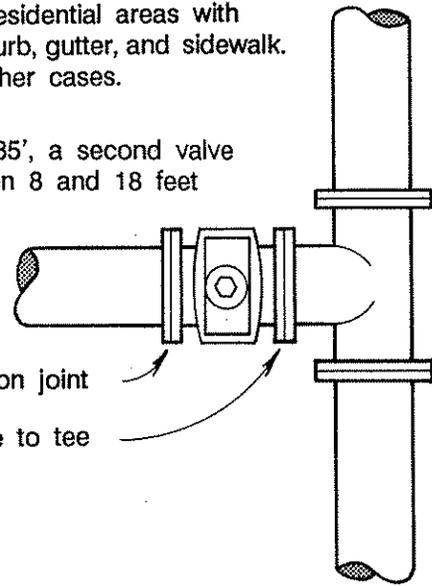


* 1' behind sidewalk in residential areas with monolithically placed curb, gutter, and sidewalk.
 2' behind curb in all other cases.

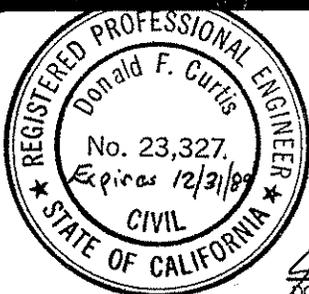
For runs greater than 35', a second valve shall be placed between 8 and 18 feet from the hydrant.

Mechanical or push-on joint

Bolt valve to tee



Also see ST - 3, Concrete Related Notes



CITY OF BENICIA

DEPARTMENT OF PUBLIC WORKS

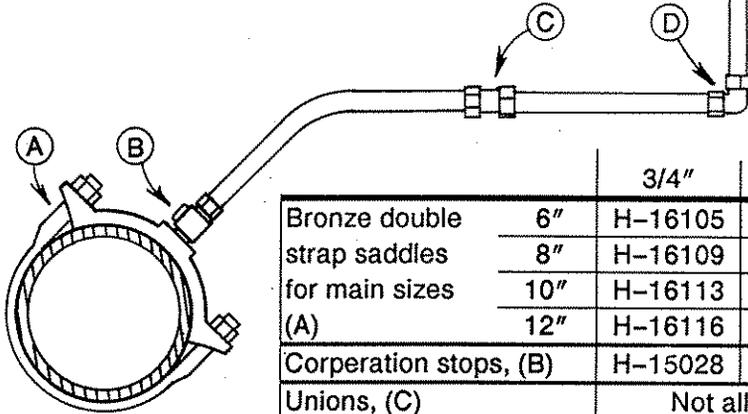
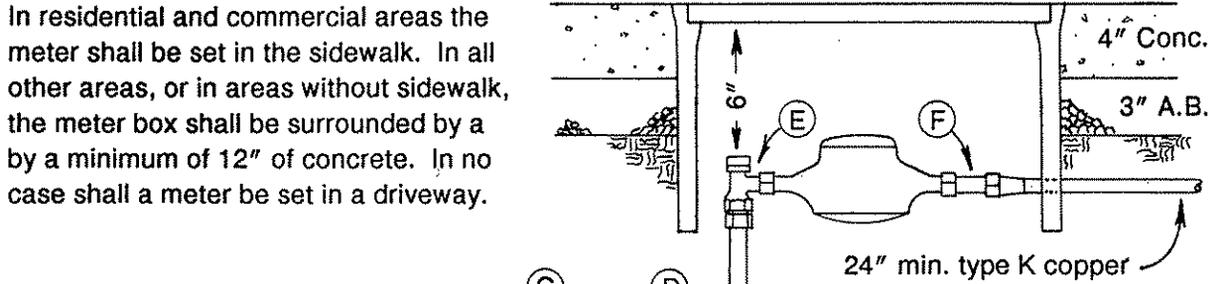
FIRE HYDRANT INSTALLATION

Donald F. Curtis
 DONALD F. CURTIS CITY ENGINEER

DATE: JULY 1988
 REVISED: 4/92

W - 1

In residential and commercial areas the meter shall be set in the sidewalk. In all other areas, or in areas without sidewalk, the meter box shall be surrounded by a by a minimum of 12" of concrete. In no case shall a meter be set in a driveway.



		SERVICE SIZE			
		3/4"	1"	1-1/2"	2"
Bronze double strap saddles for main sizes (A)	6"	H-16105	H-16105	H-16105	H-16105
	8"	H-16109	H-16109	H-16109	H-16109
	10"	H-16113	H-16113	H-16113	H-16113
	12"	H-16116	H-16116	H-16116	H-16116
Corperation stops, (B)		H-15028	H-15028	H-15023	H-15023
Unions, (C)		Not allowed		H-15403	H-15403
90° fittings, (D)		12" min. radius bend		H-15526	H-15526
Angle meter stops, (E)		H-14258	H-14258	H-14277	H-14277
Jumper lengths		7-1/2"	10-3/4"	13"	17"
Spuds, (F)		H-10890	H-10890	Flanged	
Christy meter boxes and lids		B-9	B-16	B-36	B-36
		B-9G	B-16G	B-36G	B-36G

NOTES:

1. Service lines are to be type K soft copper. 1-1/2" and 2" lines shall be supplied straight lengths.
2. All taps are to be done "hot" with an approved tapping machine.
3. Service lines of 3/4" or 1" diameter shall be continuous, no splices.
4. Place the appropriate jumper between the angle meter stop and the spud. The City will set the meter.
5. Corperation stops, unions, 90°s, and angle meter stops are Mueller 110 compression fittings. All threads are I.P.
6. Catalog numbers listed are for Mueller and Christy brand products. Any other materials must be preapproved by the City Engineer.



CITY OF BENICIA

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STANDARD WATER SERVICE

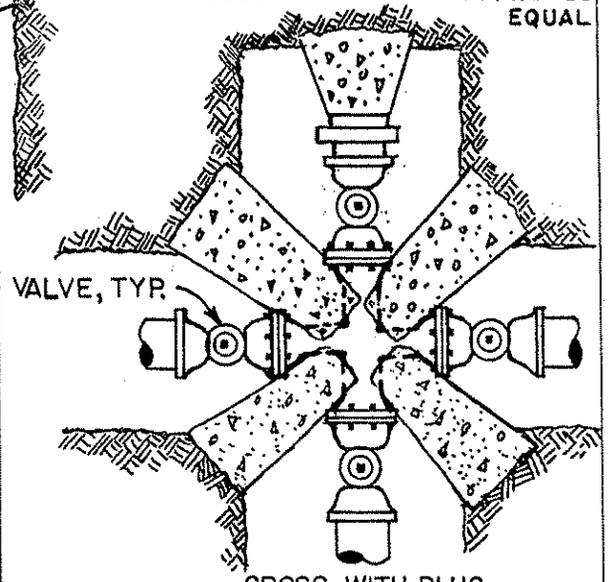
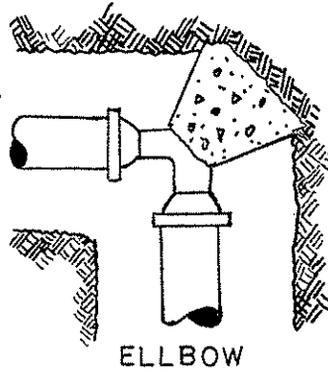
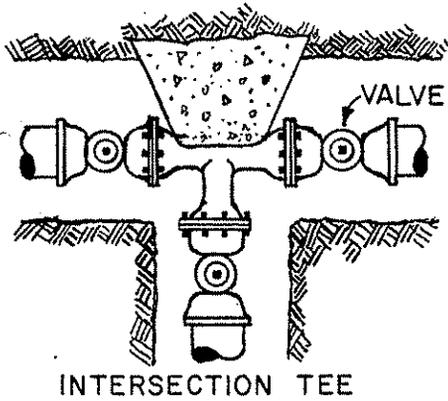
Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: JUNE 1989
REVISED:

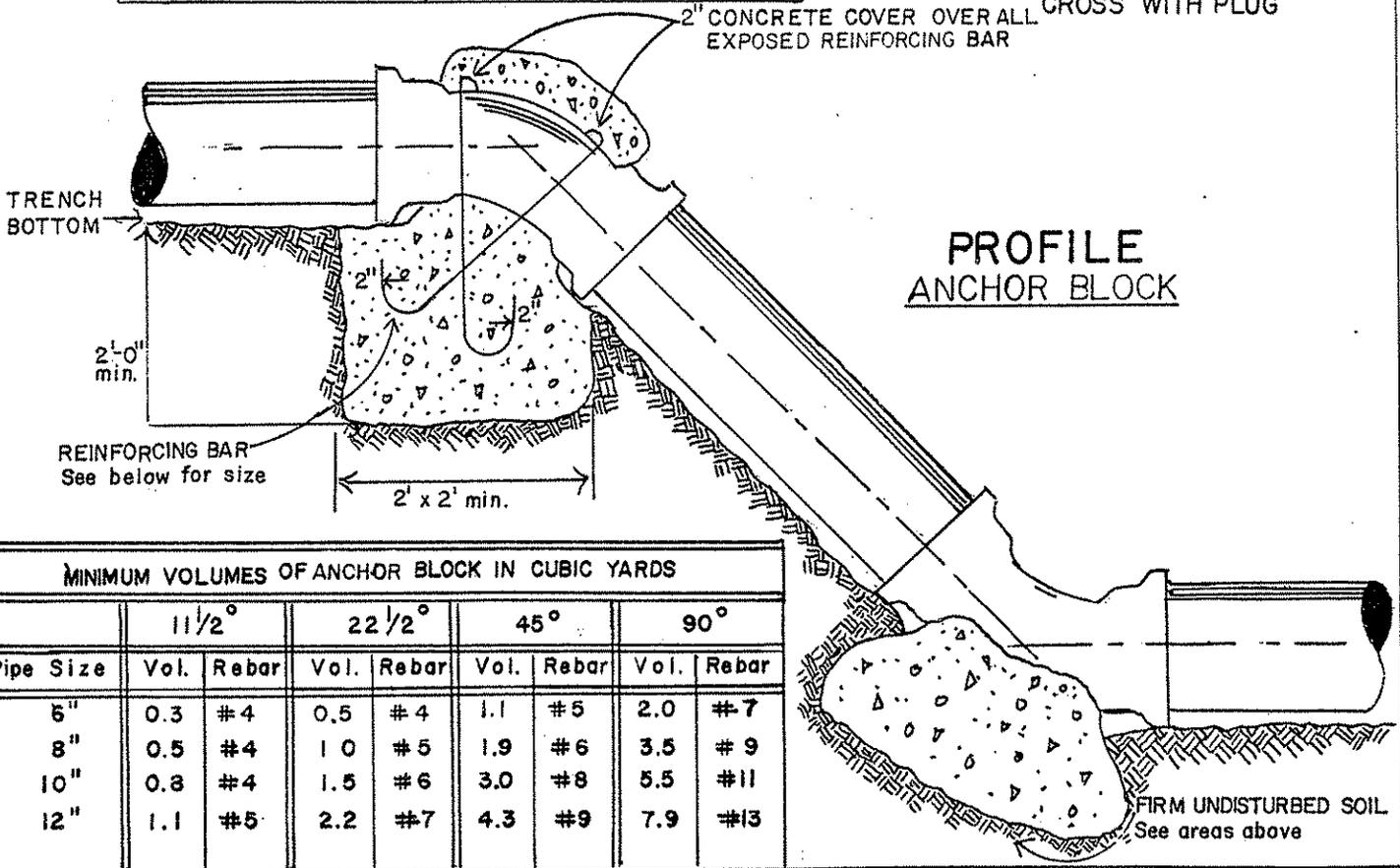
W - 2

PLAN THRUST BLOCKS

USE ALL MUELLER FITTINGS OR APPROVED EQUAL



MAIN SIZE	BEARING AREAS SQ. FT.			
	6"	8"	10"	12"
TEE	5	9	14	18
90° ELL	6	10	15	21
45° ELL	3	5	9	12
22 1/2° ELL	2	3	5	6
CROSS	6	10	15	21



MINIMUM VOLUMES OF ANCHOR BLOCK IN CUBIC YARDS

Pipe Size	11 1/2°		22 1/2°		45°		90°	
	Vol.	Rebar	Vol.	Rebar	Vol.	Rebar	Vol.	Rebar
6"	0.3	#4	0.5	#4	1.1	#5	2.0	#7
8"	0.5	#4	1.0	#5	1.9	#6	3.5	#9
10"	0.8	#4	1.5	#6	3.0	#8	5.5	#11
12"	1.1	#5	2.2	#7	4.3	#9	7.9	#13

DWG. NO. W - 3

DRAWN BY GINIA

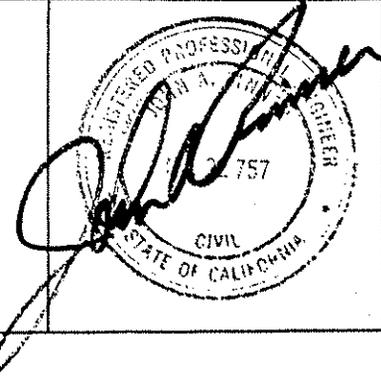
CHECK BY CHESTER

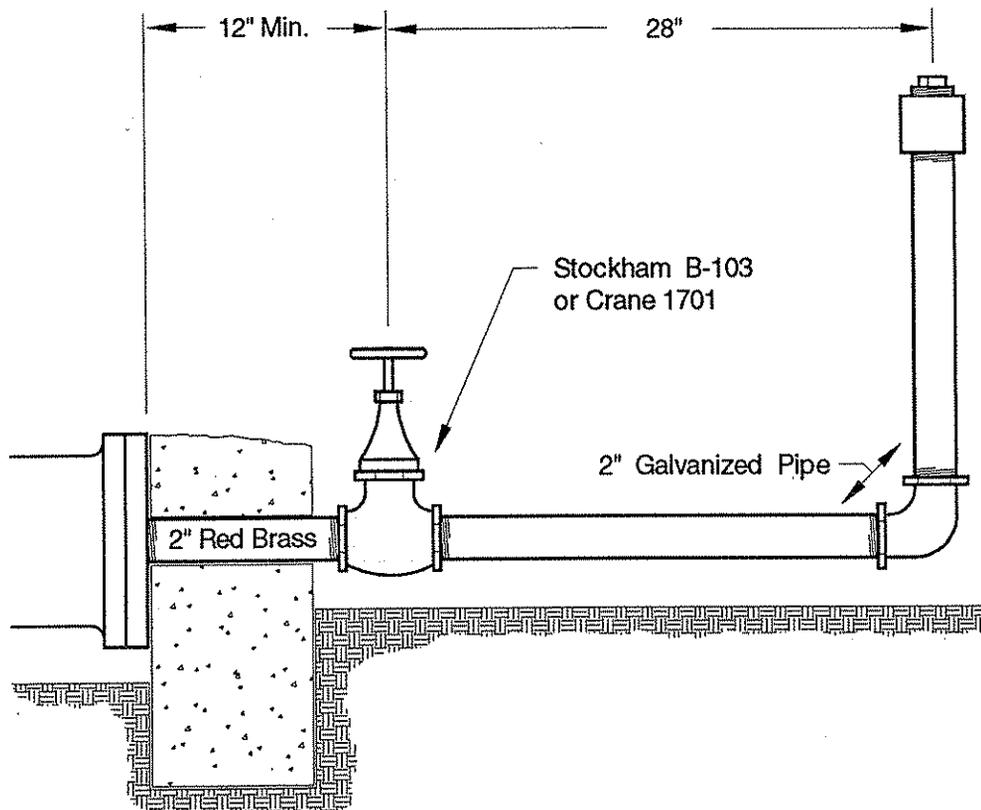
DATE DEC. 1974
FEB. 1981 (REV.)

SCALE NONE

CITY OF BENICIA DEPARTMENT OF PUBLIC WORKS CONCRETE THRUST BLOCKS AND ANCHOR BLOCKS FOR WATER MAINS

JOHN A. PINNER CITY ENGINEER





NOTES:

1. Valve and blow-off to be in valve boxes, See W-9 for details.
2. Thrust block shall extend into firm ground cut into bottom and sides of trench walls.

CITY OF BENICIA

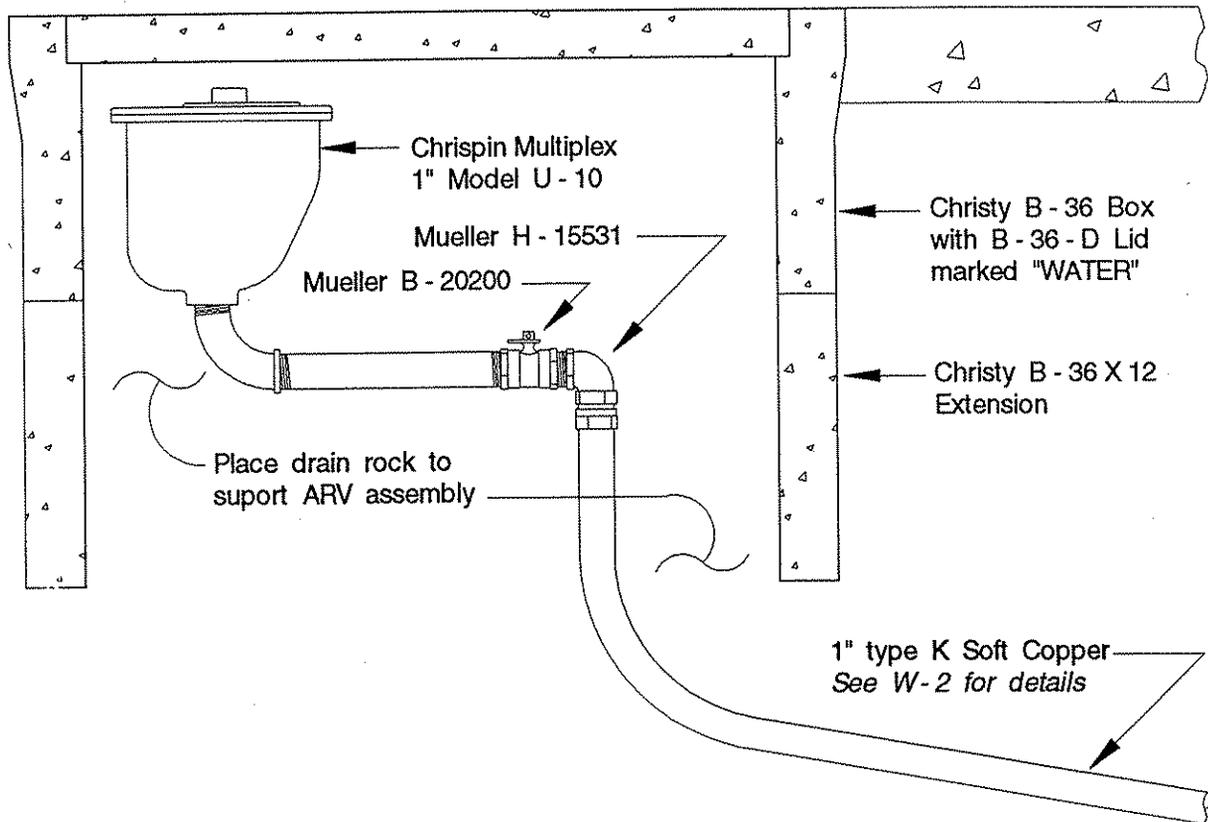
**DEPARTMENT OF
PUBLIC WORKS**

BLOW - OFF ASSEMBLY

A. M. Bertolero
ANTOINETTE M. BERTOLERO, CITY ENGINEER

DATE: MARCH 1992
REVISED:

W - 4



NOTES:

1. In areas with sidewalk the box shall be placed at the back of the walk. In all cases the box shall be surrounded by a minimum of 12" of concrete.
2. The piping between the ball valve and the Air Release Valve shall be brass.
3. The Air Release Valve shall be oriented so that it's drain valve is accessible.

CITY OF BENICIA

**DEPARTMENT OF
PUBLIC WORKS**

AIR RELEASE VALVE

A.M. Bertolero
ANTOINETTE M. BERTOLERO, CITY ENGINEER

DATE: MARCH 1992
REVISED:

W - 5

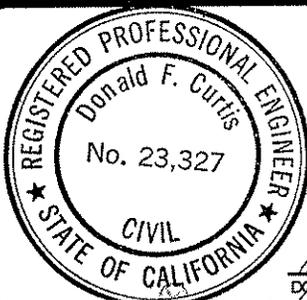
RESILIENT SEAT GATE VALVES

FOR 4" THROUGH 12" VALVES

1. Valves shall meet or exceed the requirements of AWWA C-509.
2. Valves shall open left with a 2" operating nut.
3. Valve stems shall be from rolled bar stock bronze with a minimum yield strength of 30,000 p.s.i. No cast stems allowed.
4. Valve stems shall have O-ring seals above and below the thrust collar.
5. Valve bodies shall have a machined seating area. No cast seating areas allowed.
6. Valve disk shall have integral stem nut. No loose stem nuts. Valve disk shall have an open back, no solid wedge disks allowed.
7. Valve seat shall be made from natural rubber and shall be bonded to a steel seat ring and attached to the disk with stainless steel screws.
8. Valve bonnet shall be attached to the valve body with bolts and nuts. No tapped valve bodies.
9. Valve body, bonnet, and thrust collar shall be all be made from cast iron.
10. Valves shall be epoxy lined with a liquid repairable epoxy. Valve exteriors shall be standard black varnish. Valves with exterior epoxy must have stainless steel bonnet and stuffing box bolts.

NOTE:

Mueller brand valves meet these specs. Valves from any other manufacturer must be preapproved by the City.



CITY OF BENICIA

**DEPARTMENT OF
PUBLIC WORKS**

4" - 12" GATE VALVE

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: MAY 1989
REVISED:

W - 6

BUTTERFLY VALVE SPECIFICATIONS

All butterfly valves shall conform to the latest revision of AWWA Standard C-504, Class 150-B, and comply with the following:

1. Valve bodies shall be cast iron, ASTM A-126 Class B. Body ends shall be flanged with facing and drilling in accordance with ANSI B16.1, Class 125; or mechanical joint in accordance with AWWA C-111. All mechanical joint end valves shall be furnished complete with joint accessories (bolts, nuts, gaskets, and glands). All valves shall conform with AWWA Standard C-504, Table 3, Laying Lengths for Flanged Valves and Minimum Body Shell Thickness for all Body Types.
2. Valve discs shall be ductile iron ASTM A-536, grade 65-45-12. Valve disc shall be of the offset design providing 360 degree uninterrupted seating, and for sizes 30" and larger shall be of the flow through type.
3. The resilient seat shall be natural rubber bonded to an 18-8, Type 304 stainless steel retaining ring secured to the disc by 18-8, Type 304 stainless steel screws. The seat shall be capable of mechanical adjustment in the field and field replaceable without the need for special tools. Valve body seat shall be 18-8, Type 304 stainless steel.
4. Valve shafts shall be 18-8, Type 304 stainless steel. Shafts shall be of the two piece stub design and attached to the disc by means of "O" ring sealed taper pins with lock nuts.
5. The valve assembly shall be furnished with a non-adjustable, factory set, thrust bearing designed to center the valve disc at all times.
6. Shaft bearings shall be contained in the integral hubs of the valve body and shall be self-lubricated sleeve type.
7. Valve shaft seal shall consist of "O" rings. Where the valve shaft projects through the valve body for actuator connection, the "O" ring packing seal shall be field replaceable as a part of a removable bronze cartridge.
8. When manual actuators are required they shall be of the traveling nut design amply sized for the line conditions. All 12" through 24" butterfly valve manual actuators shall be capable of withstanding 450 foot pounds of input torque against open and closed stops. All actuators shall have adjustable mechanical stop limits. The closed position stop shall be externally adjustable.
9. All valves shall be coated with Mueller HP Epoxy or equal, in conformance to AWWA Standard C-550, latest revision. Interior wetted ferrous surfaces shall be coated a nominal 10 mils thick for long life; asphalt varnish on exterior.
10. Provide 2" operating nut, open counter clockwise, unless a handwheel is specified by the City Engineer.
11. Mueller Lineseal III valves meet these specifications. Alternatives to any portion of these specifications must be approved in writing at least 48 hours before bid date.



CITY OF BENICIA

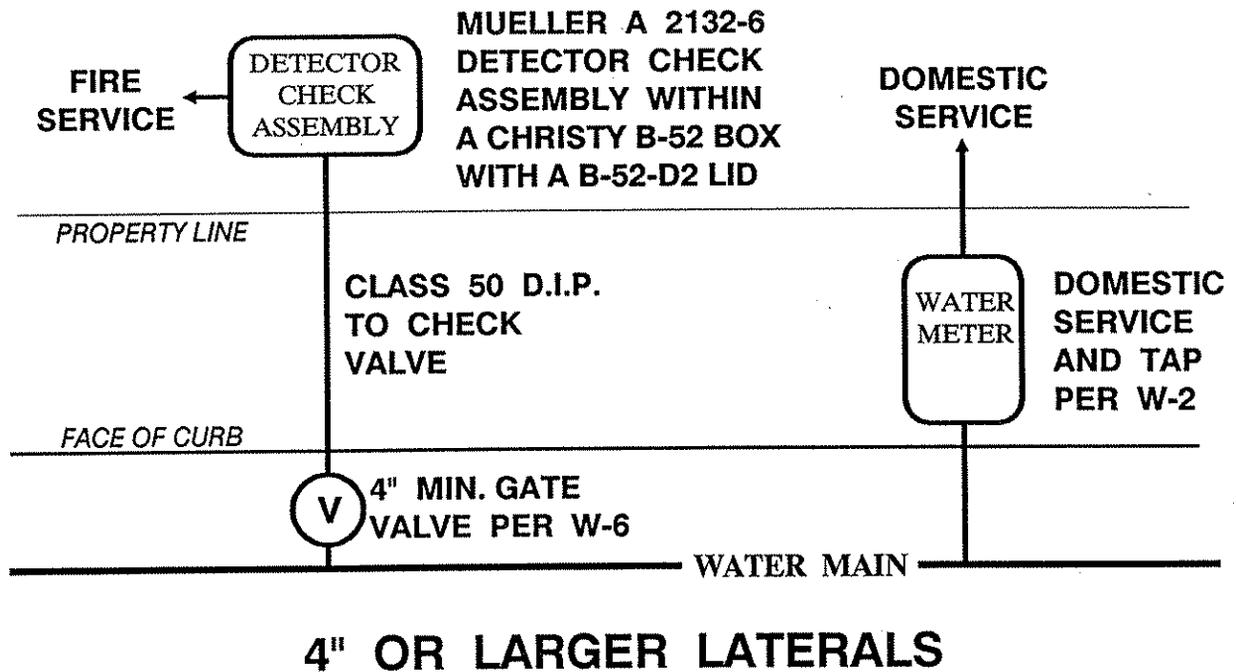
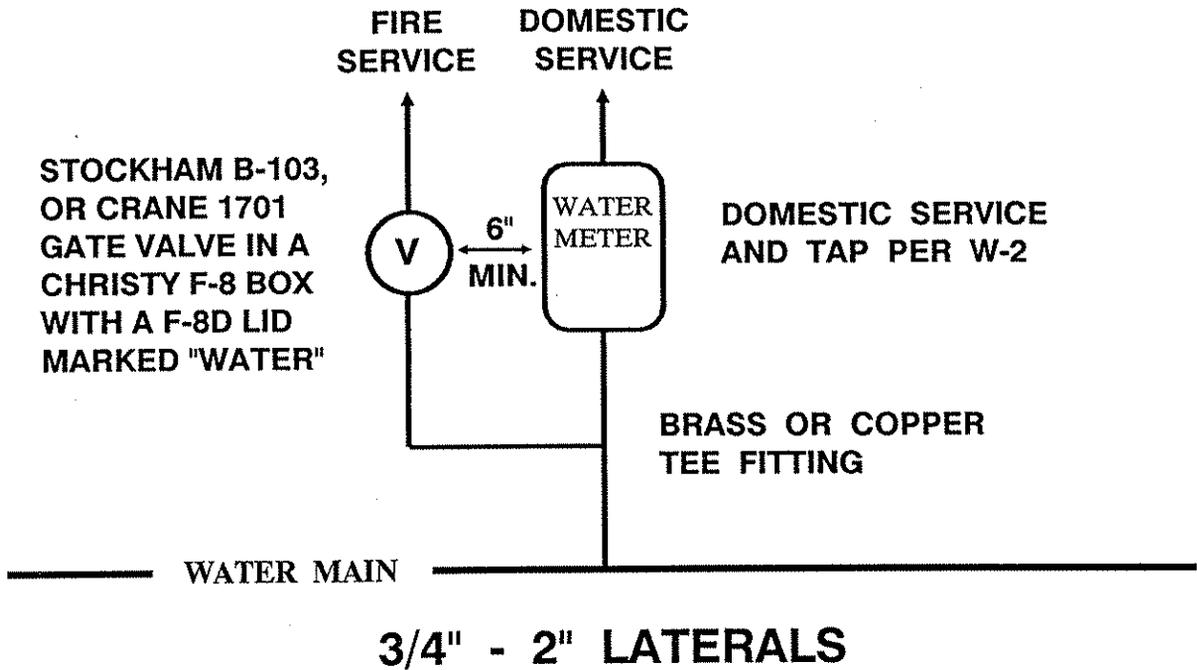
**DEPARTMENT OF
PUBLIC WORKS**

12" - 48" BUTTERFLY VALVES

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: AUGUST 1990
REVISED:

W - 7



CITY OF BENICIA

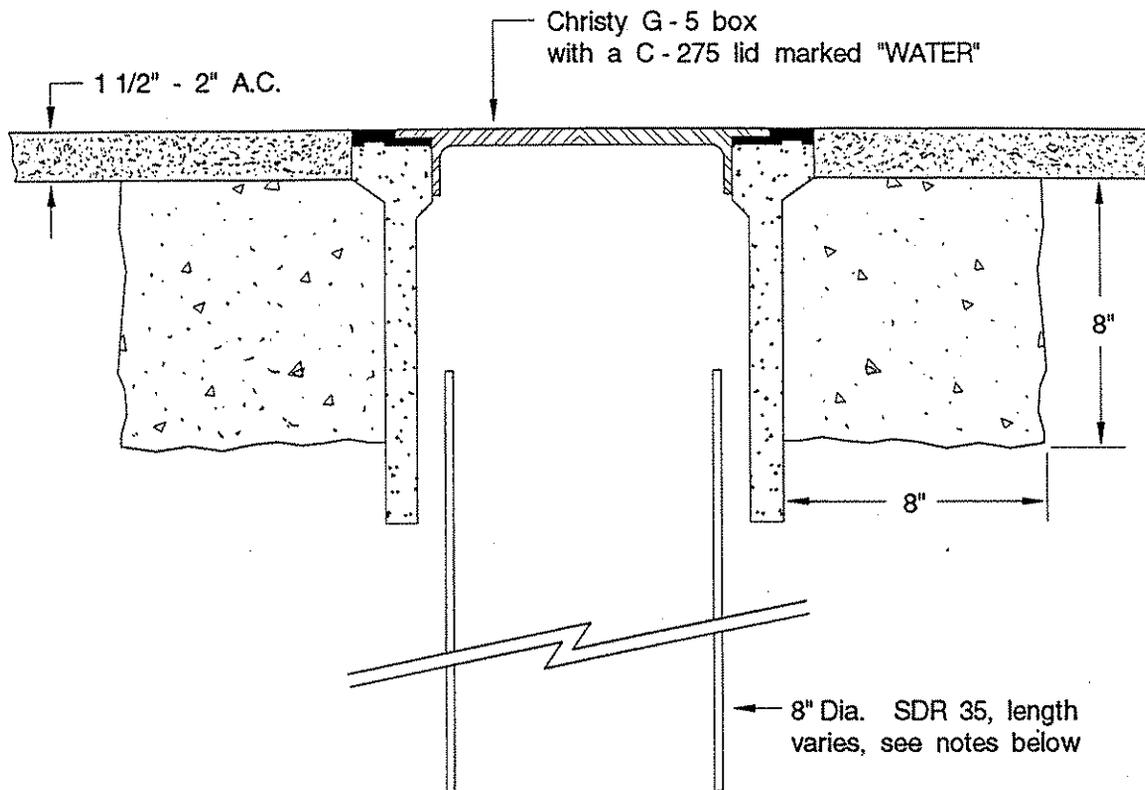
DEPARTMENT OF
PUBLIC WORKS

FIRE SERVICE CONNECTIONS

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: AUGUST 1990
REVISED:

W - 8



NOTES:

1. Distance between the valve box lid and the water valve nut shall be 24" - 36".
2. Distance between the valve box lid and blow-off plug shall be 16" - 18".
3. Valve nut or blow-off plug shall extend into the SDR 35 a minimum of 6".

CITY OF BENICIA

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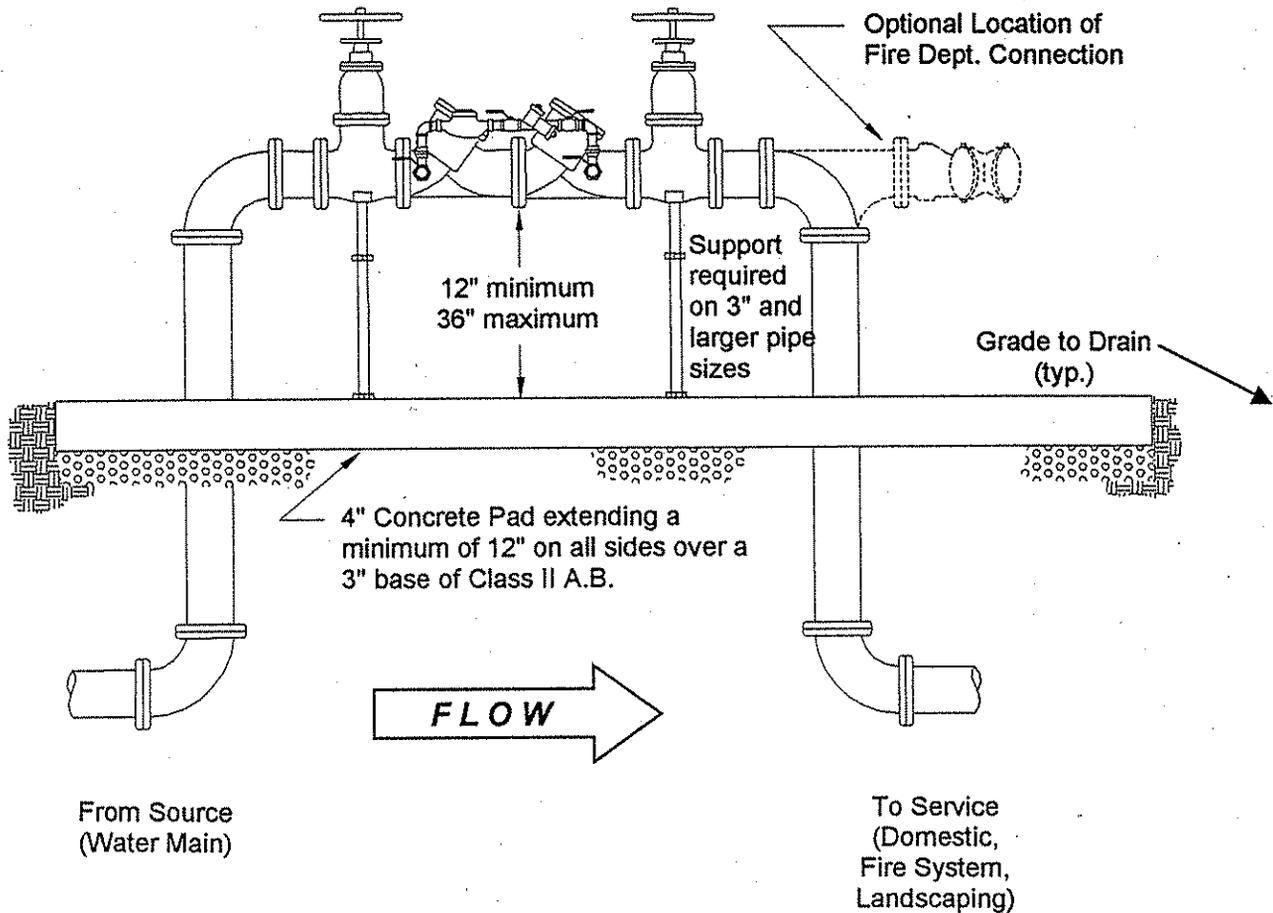
VALVE BOX INSTALLATION

Antoinette M. Bertolero
ANTOINETTE M. BERTOLERO, CITY ENGINEER

DATE: MARCH 1992

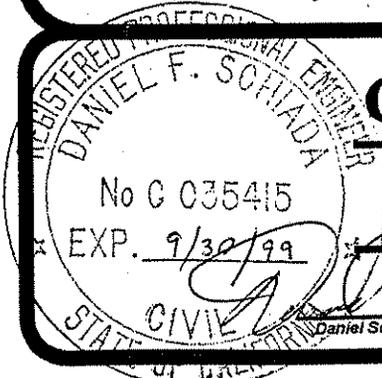
REVISED:

W - 9



Notes:

1. The use of a specific make and model shall be in accordance with the approved list from the State Department of Health Services.
2. Install bollards when located in areas subject to damage by vehicles.
3. After installation, testing by an AWWA-certified backflow prevention assembly tester is required.



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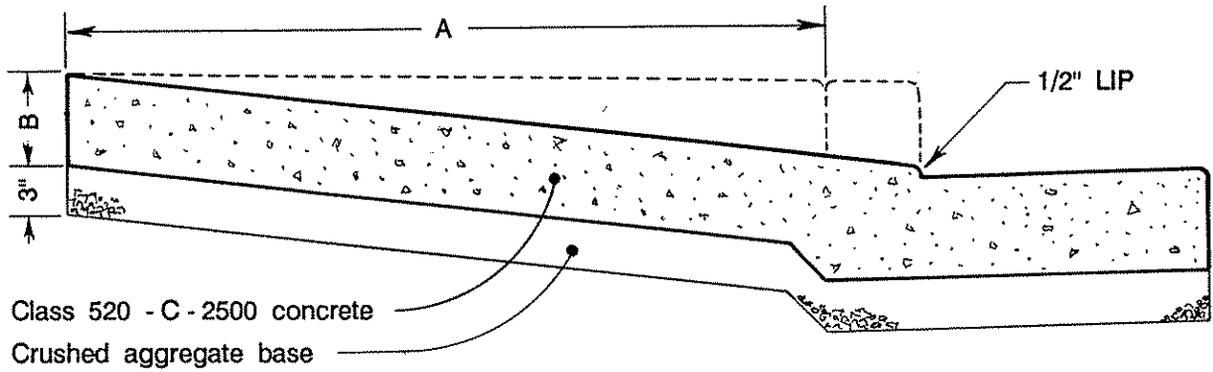
BACKFLOW ASSEMBLY

Date: April 1999

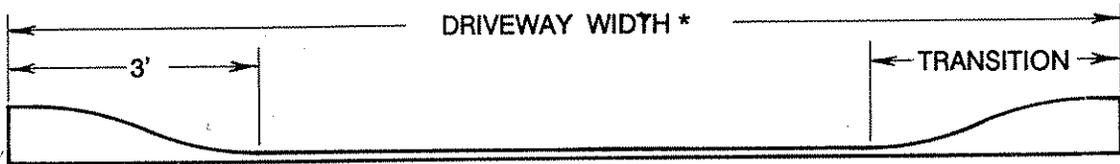
Revised:

W - 10

Daniel Schiada City Engineer 5/25/99



ZONE	A	B
RESIDENTIAL	To back of walk, 4' min.	6"
COMMERCIAL	To back of walk, 6' min.	6" with #4 rebar @ 24" O.C. each way
INDUSTRIAL	4' min.	8" with #4 rebar @ 24" O.C. each way



* Min. = 14'
Max. = 50% of frontage, (total of all driveways)

NOTES:

1. Min. distance from return shall be 20'.
2. Full depth expansion joints at rear and both sides of driveway.

Also see ST - 3, Concrete Related Notes



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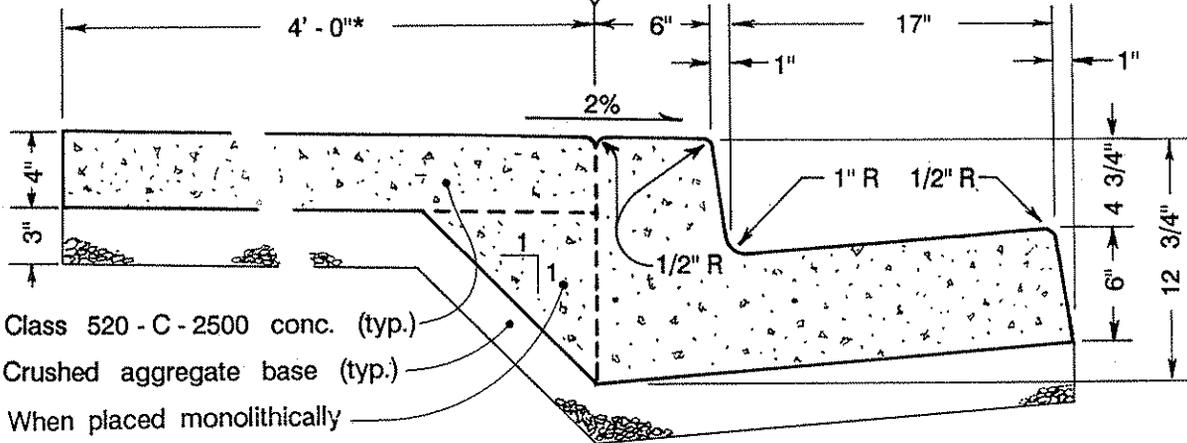
DRIVEWAY DETAIL

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: JULY 1988
REVISED:

ST - 1

In areas with planter strips, this distance will match the adjacent strip



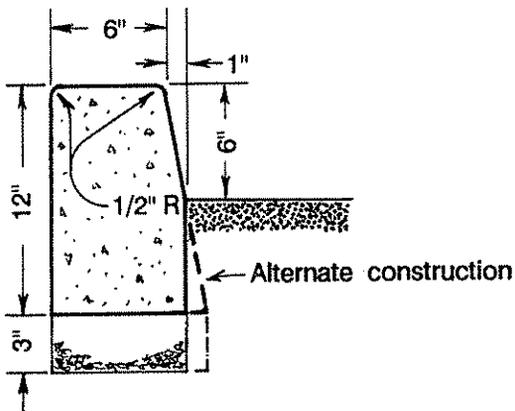
Class 520 - C - 2500 conc. (typ.)

Crushed aggregate base (typ.)

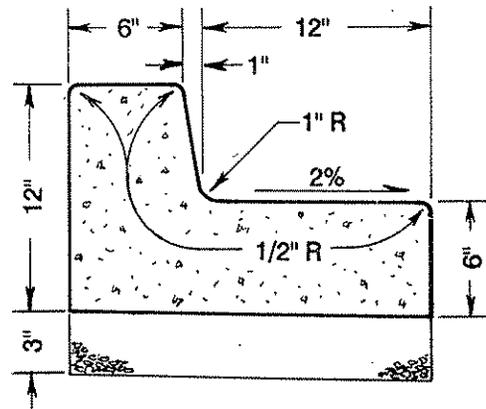
When placed monolithically

* Or as directed by the City Engineer

TYPE "A"



TYPE "C"



TYPE "B"

Also see ST - 3, Concrete Related Notes



CITY OF BENICIA

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PUBLIC WORKS

CURB, GUTTER & SIDEWALK

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: APRIL 1988

REVISED:

ST - 2

**GENERAL NOTES APPLICABLE TO STANDARD DETAILS:
ST-1, ST-2, ST-12, ST-20, and W-1**

REPAIR / REPLACEMENT

Concrete to be removed shall be saw cut at score lines or broken out to deep joints or expansion joints. In all cases the entire square will be removed and the surrounding concrete shall be free from defects. Curb and gutter will be saw cut opposite sidewalk score lines to provide for driveways.

Replacement concrete will be dowelled into all existing, adjacent concrete except at expansion joints. Dowels will be of #4 rebar set 36" O.C. into 1/2" diameter holes drilled 4" into existing concrete and extending 8" into the new work.

CONTROL JOINTS

All joints shall be laid out uniformly and neatly. The following is a description of the joints required along with general guidelines as to their placement. Variations shall be as directed by the City Engineer or his authorized representative.

Expansion joints shall be 1/2" inch wide, extend the full depth of the concrete and be filled with expansion joint material. They shall be constructed in curb, gutter, and sidewalk every 24' and at curb returns, driveways, and around all utility poles which project into the concrete.

Deep score joints are required centered between expansion joints where such joints are 24' apart. After preliminary trowelling, the concrete shall be parted to a depth of 2" with a straightedge to create a division in the coarse aggregate. The concrete shall then be refloatated to fill the parted joint with mortar to within 1/2" of the surface. The finished joint will appear to be 1/4" wide and 1/2" deep.

Score lines shall be 1/4" wide and 1/4" in depth. They shall be placed at regular intervals not to exceed 4'.

BASE MATERIAL

All base material is to be "crushed aggregate base" in conformance with subsections 200-2.2.2 and 200-2.3.2 of the 1985 edition of "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".

Base material will be compacted to a relative compaction of 95%.



CITY OF BENICIA

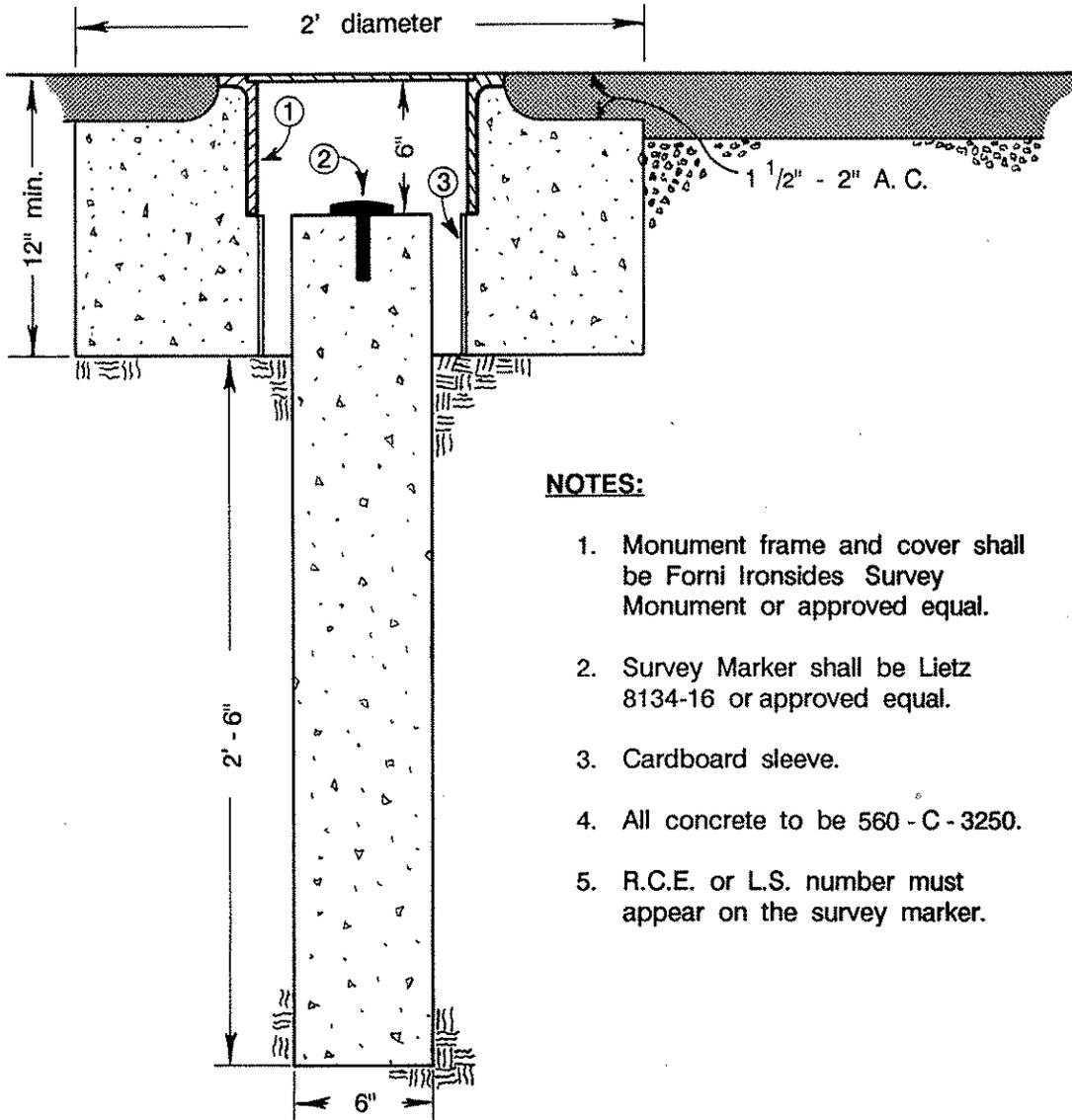
DEPARTMENT OF
PUBLIC WORKS

CONCRETE RELATED NOTES

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: JULY 1988
REVISED:

ST - 3



NOTES:

1. Monument frame and cover shall be Forni Ironsides Survey Monument or approved equal.
2. Survey Marker shall be Lietz 8134-16 or approved equal.
3. Cardboard sleeve.
4. All concrete to be 560 - C - 3250.
5. R.C.E. or L.S. number must appear on the survey marker.



CITY OF BENICIA

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SURVEY MONUMENT

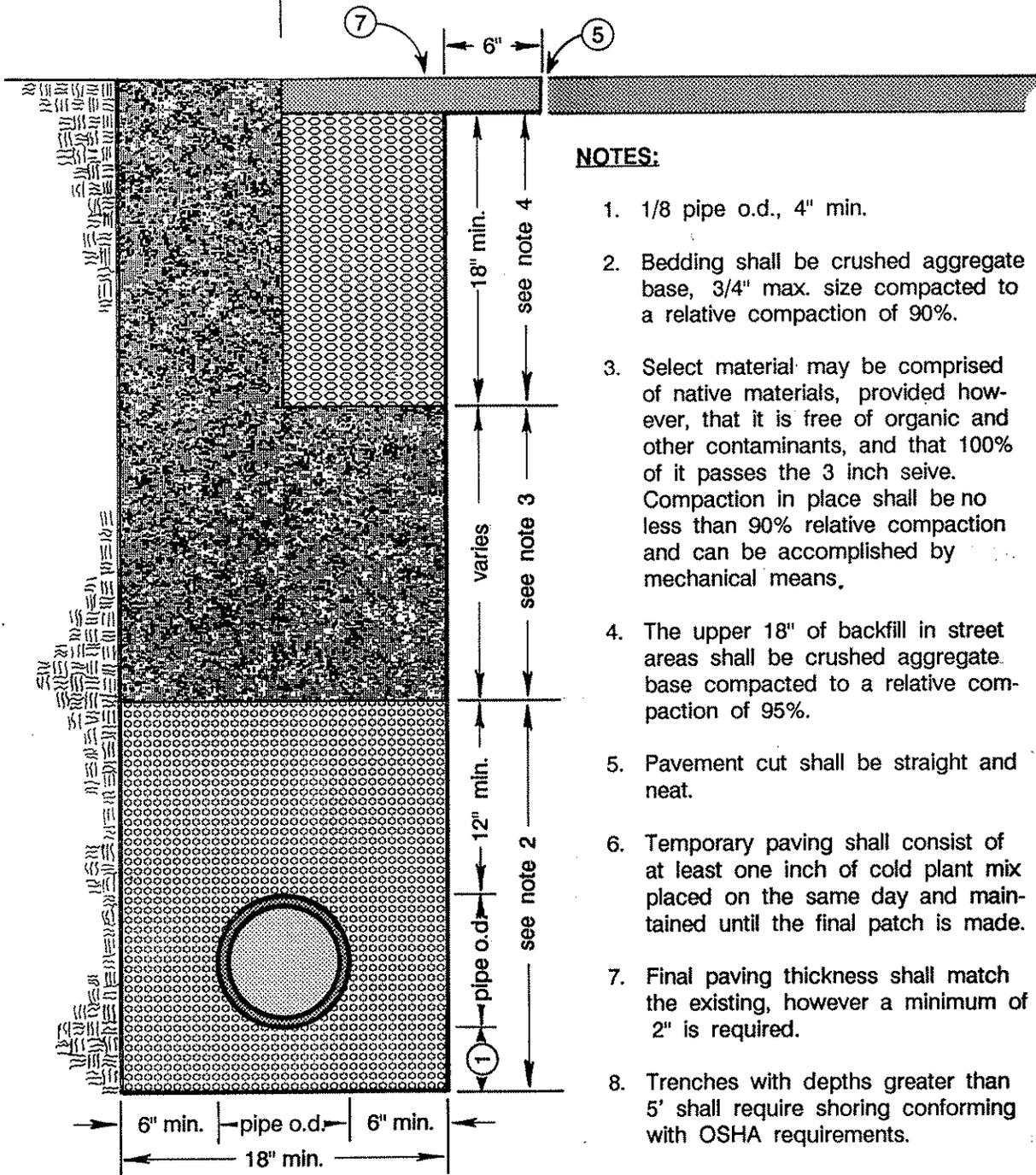
Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: AUGUST 1988
REVISED:

ST - 6

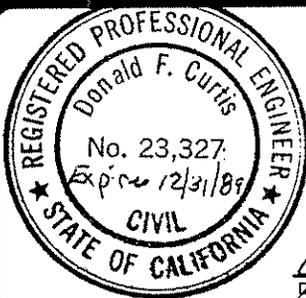
OPEN AREAS /
NEW CONSTRUCTION

EXISTING STREETS



NOTES:

1. 1/8 pipe o.d., 4" min.
2. Bedding shall be crushed aggregate base, 3/4" max. size compacted to a relative compaction of 90%.
3. Select material may be comprised of native materials, provided however, that it is free of organic and other contaminants, and that 100% of it passes the 3 inch sieve. Compaction in place shall be no less than 90% relative compaction and can be accomplished by mechanical means.
4. The upper 18" of backfill in street areas shall be crushed aggregate base compacted to a relative compaction of 95%.
5. Pavement cut shall be straight and neat.
6. Temporary paving shall consist of at least one inch of cold plant mix placed on the same day and maintained until the final patch is made.
7. Final paving thickness shall match the existing, however a minimum of 2" is required.
8. Trenches with depths greater than 5' shall require shoring conforming with OSHA requirements.



CITY OF BENICIA

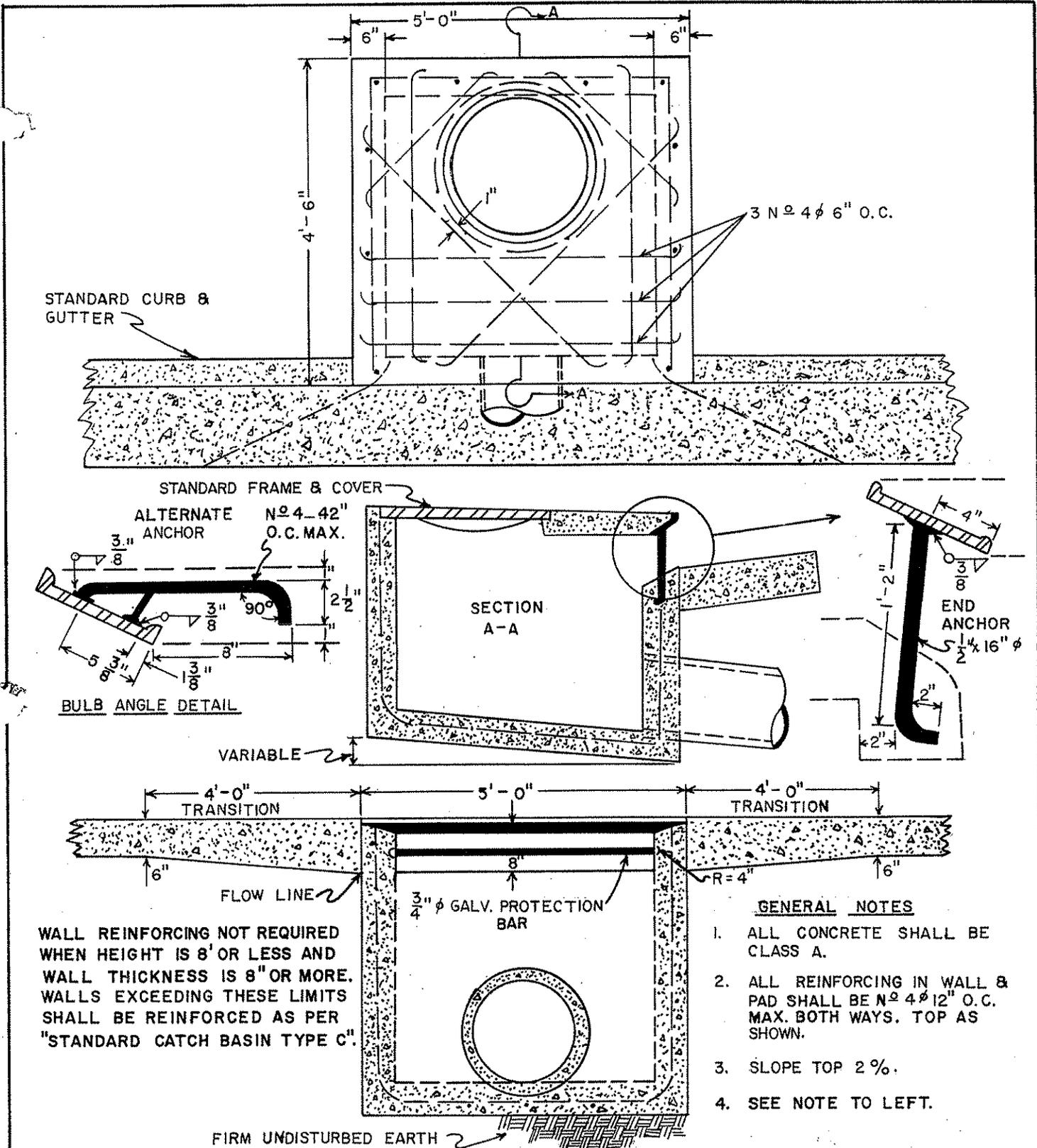
DEPARTMENT OF
PUBLIC WORKS

TRENCH BACKFILL

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: AUGUST 1988
REVISED: 4/92

ST - 7



WALL REINFORCING NOT REQUIRED WHEN HEIGHT IS 8' OR LESS AND WALL THICKNESS IS 8" OR MORE. WALLS EXCEEDING THESE LIMITS SHALL BE REINFORCED AS PER "STANDARD CATCH BASIN TYPE C".

- GENERAL NOTES**
1. ALL CONCRETE SHALL BE CLASS A.
 2. ALL REINFORCING IN WALL & PAD SHALL BE N^o 4 ϕ 12" O.C. MAX. BOTH WAYS. TOP AS SHOWN.
 3. SLOPE TOP 2%.
 4. SEE NOTE TO LEFT.

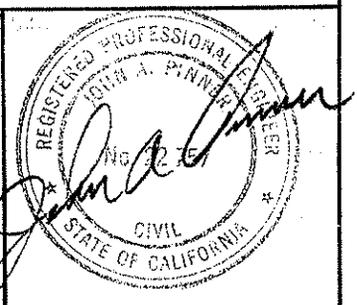
DWG. NO. ST-9
 DWN. BY KANDIE
 CK. BY JIM
 DATE JUNE 1977
 SCALE NONE

CITY OF BENICIA
 DEPARTMENT OF PUBLIC WORKS

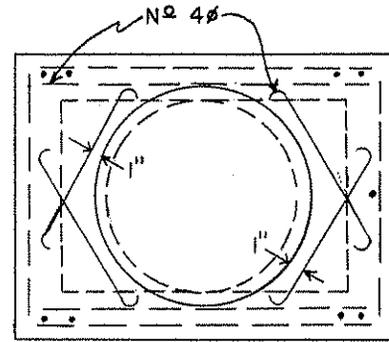
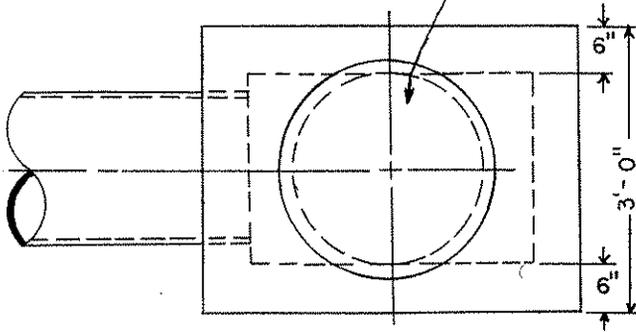
STANDARD CATCH BASIN TYPE B

JOHN A. PINNER

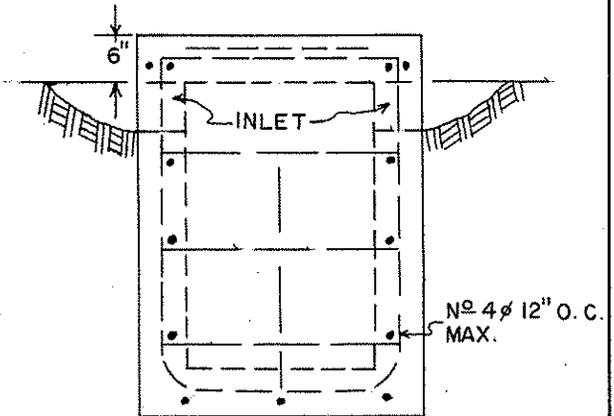
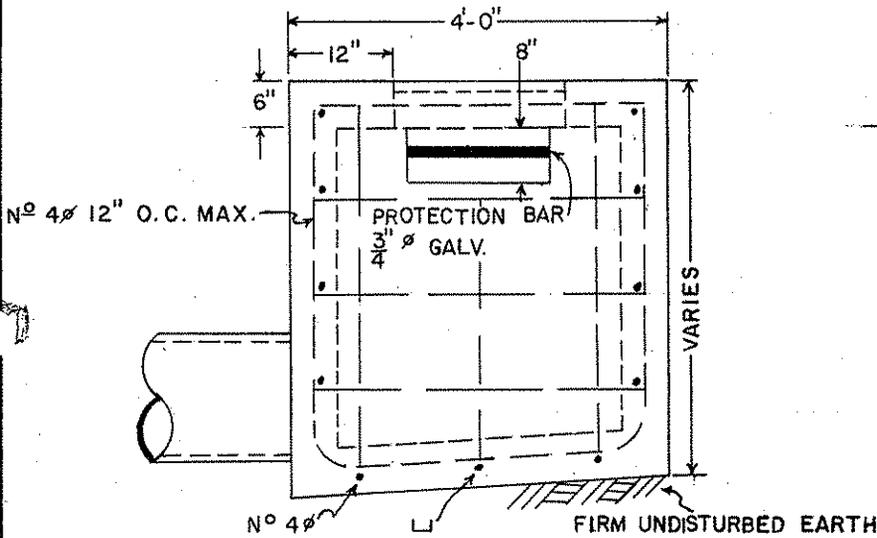
CITY ENGINEER



STANDARD MANHOLE COVER & FRAME



TOP STEEL DETAIL



ALTERNATE TOP ASSEMBLY

1. STANDARD FRAME & COVER AS SHOWN.
2. STANDARD GRATE & FRAME.

NOTE

CATCH BASIN SHOWN MAY BE MODIFIED TO RECEIVE LARGER CONDUIT. REINFORCING MUST BE ADJUSTED ACCORDINGLY. ALL STEEL No 4 12" O.C. MAX. 1 1/2" CLEARANCE, INSIDE OR OUTSIDE OF WALLS, TOP OR PAD. ALL CONC. SHALL BE CLASS A.

ADD'L NOTE

WALL REINFORCING NOT REQUIRED WHEN HEIGHT IS 8' OR LESS AND WALL THICKNESS IS 8" OR MORE. WALLS EXCEEDING THESE LIMITS SHALL BE REINFORCED AS SHOWN.

DWG. NO.	ST-10
DWN. BY	KANDIE
CK. BY	JIM
DATE	MAY 1977
SCALE	NONE

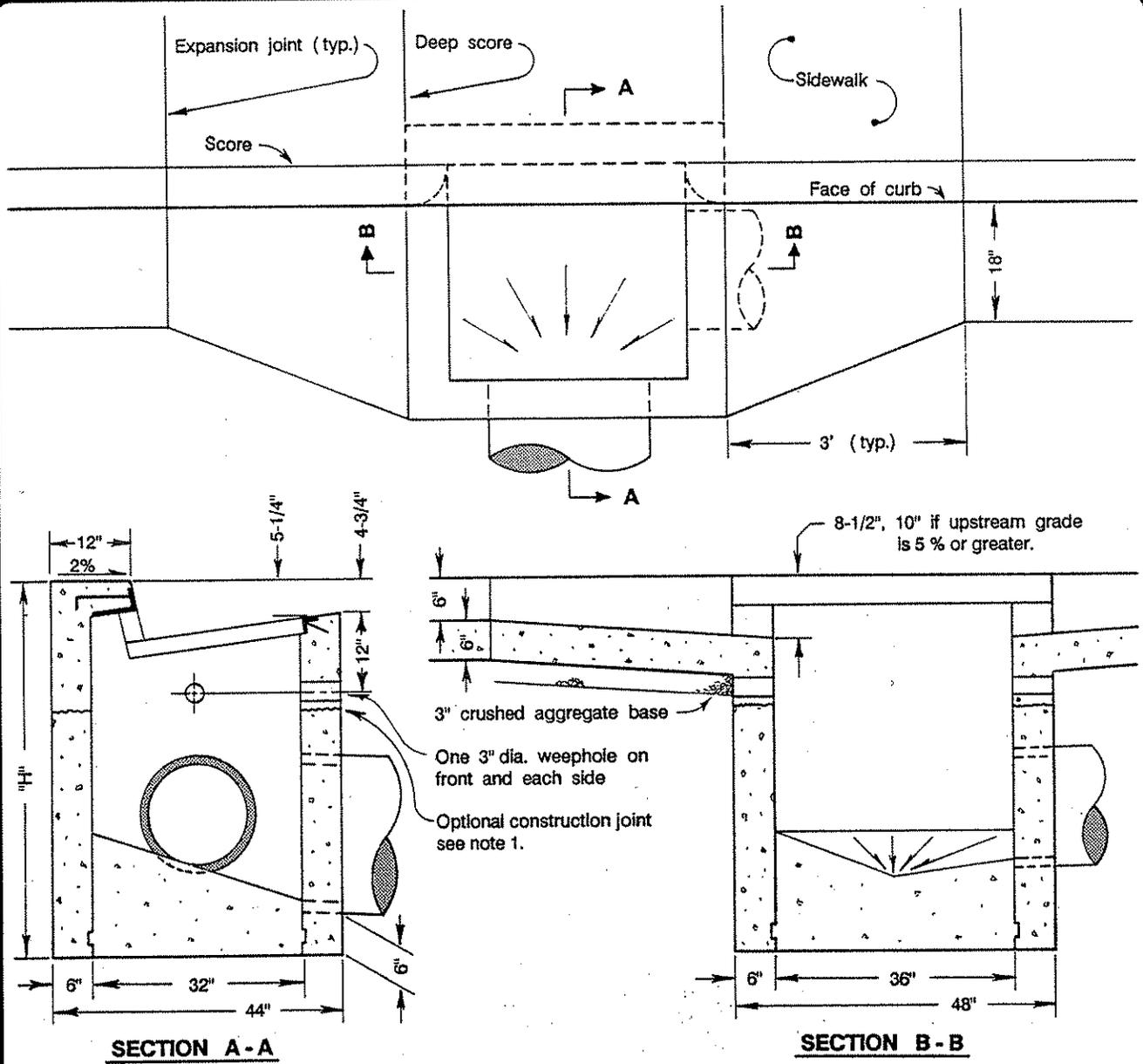
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DEPARTMENT OF PUBLIC WORKS

STANDARD CATCH BASIN TYPE C

JOHN A. PINNER

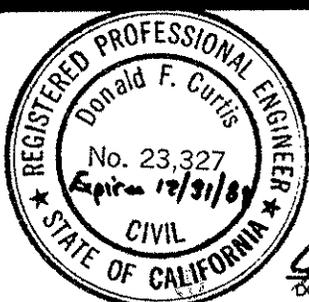
CITY ENGINEER





NOTES:

1. Construction joints shown are permitted where the top of the inlet is to be constructed monolithically with the curb and sidewalk, in which case the concrete above the joint shall be class 520 - C - 2500, and class 520 - C - 3250 below. This joint must be doweled with #4 rebar.
2. Construction joints are optional where shown. Other locations are subject to the approval of the City Engineer. Key dimensions are 3/4" X 2-1/2".
3. When "H" exceeds 8', reinforce walls with #4 rebar 12" o.c. each way.
4. Inlet and outlet pipes shall not intercept a box through a corner. If the pipe is too large, or if the skew too great to permit the opening to be made in a single wall, build the inlet as a large diameter manhole base.
5. Invert shall be rounded to drain.
6. Frame and grate to be Donico D-14, or approved equal.



CITY OF BENICIA

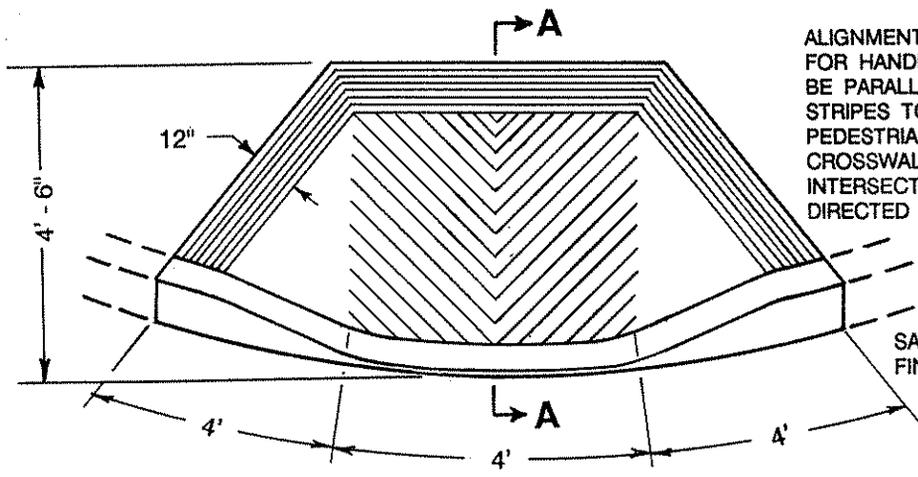
DEPARTMENT OF PUBLIC WORKS

TYPE "D" CATCH BASIN

Donald Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: NOVEMBER 1988
REVISED:

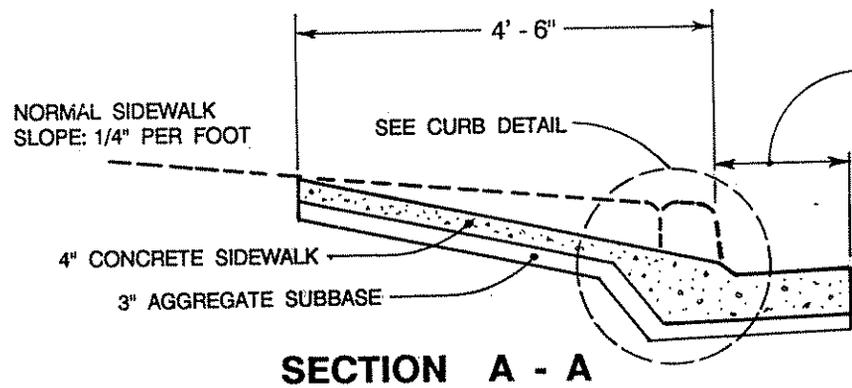
ST - 11



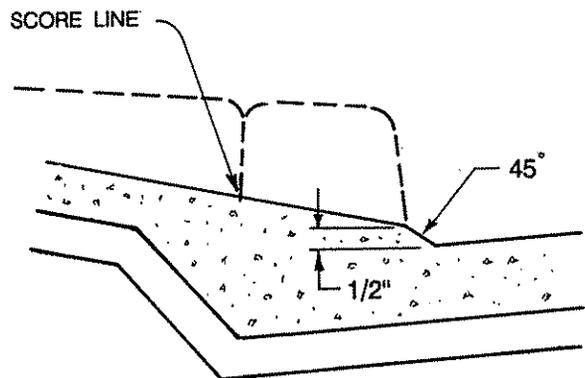
ALIGNMENT OF SAFETY GROOVES FOR HANDICAP RAMPS SHALL BE PARALLEL TO CROSSWALK STRIPES TO DIRECT BLIND PEDESTRIANS INTO APPROPRIATE CROSSWALK. GROOVES AT TEE INTERSECTIONS WILL BE AS DIRECTED BY THE CITY ENGINEER

NO GROOVES WITHIN THE TRANSITION AREA

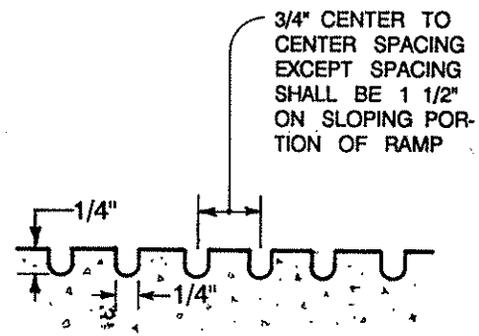
SAFETY GROOVES, LIGHT BROOM FINISH WITHIN GROOVED AREAS



GUTTER SAME WIDTH AND THICKNESS AS ADJACENT GUTTER

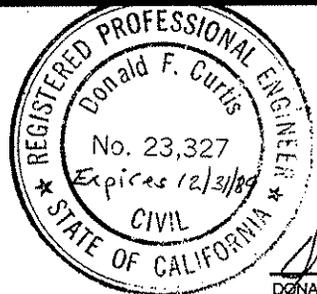


CURB DETAIL



SAFETY GROOVE DETAIL

Also see ST - 3, Concrete Related Notes



CITY OF BENICIA

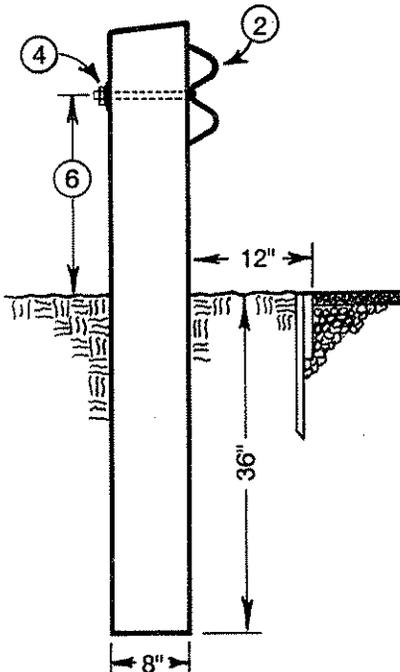
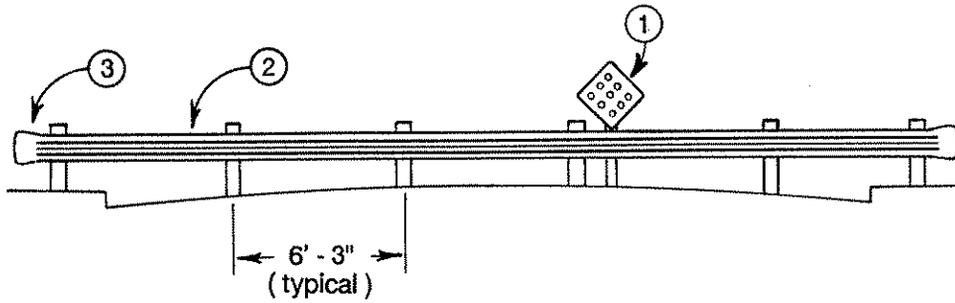
DEPARTMENT OF PUBLIC WORKS

HANDICAP RAMP

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

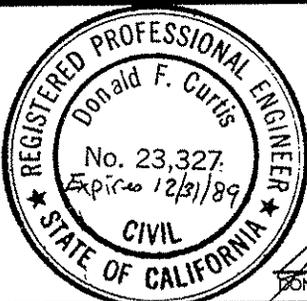
DATE: APRIL 1988
REVISED:

ST - 12



NOTES:

1. Type N-5 reflector on a 4" X 4" X 8' redwood post, located just behind the barricade and on centerline of the approaching travelway. Bottom of sign to be even with the top of the guard rail.
2. Metal beam guard rail conforming with sec. 206 - 5.7 of the 1985 edition of The Standard Specifications For Public Works Construction.
3. Type B terminal section, (typical).
4. 5/8" galvanized carriage bolt with hex nut and flat washer.
5. 6" X 8" pressure treated douglas fir posts, painted white.
6. 21" measured at centerline of roadway.



CITY OF BENICIA

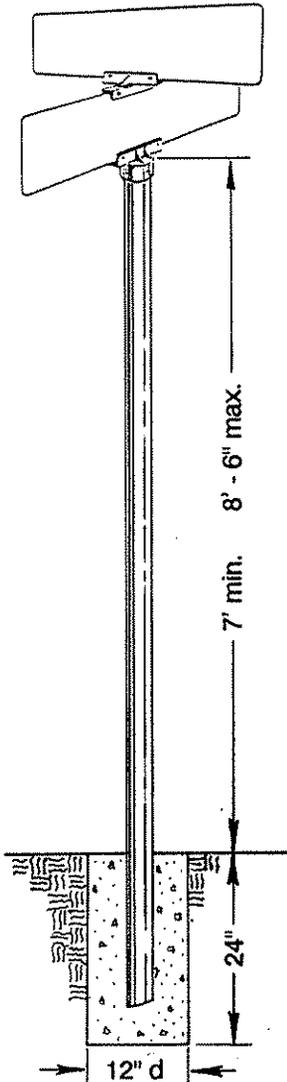
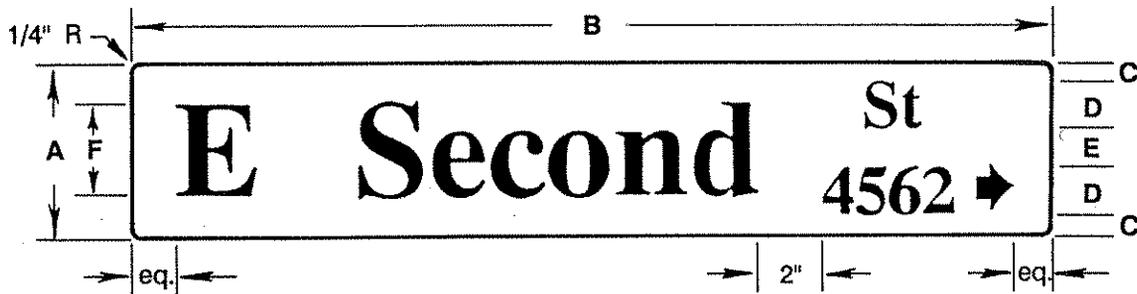
DEPARTMENT OF
PUBLIC WORKS

STREET BARRICADE

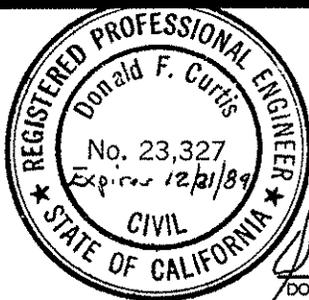
Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: AUGUST 1988
REVISED:

ST - 14



	RESIDENTIAL	INDUSTRIAL	OLD ARSENAL
A	6 - 3/4"	9"	6 - 3/4"
B	24"	30" min. 42" max.	24" min. 36" max.
C	15/16"	1 - 1/8"	15/16"
D	2"	2 - 1/2"	2"
E	7/8"	1 - 1/4"	7/8"
F	4"	5"	4"
PLATE	.125" aluminum, heat applied white reflective sheeting, Scotchlite No. 2290		
LEGEND	Black, non-reflective Type "C", heat applied letters, all upper case.	White, reflective, Times New Roman. Silk screened main copy and suffix, upper and lower case letters. Die cut block numbers and arrow.	
X-PIECE	V14F - (HD) SL - 105 (90) S125 with V14F - (HD) SL - 110S set screws		
CAP	V14F - (HD) SL - 107 (2C) S125		V14F - (HD) SL - 4WPC S125
POST	2" i.d. galvanized iron pipe		4"X4" S4S redwood heart post stained white.



CITY OF BENICIA

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STREET NAME SIGN

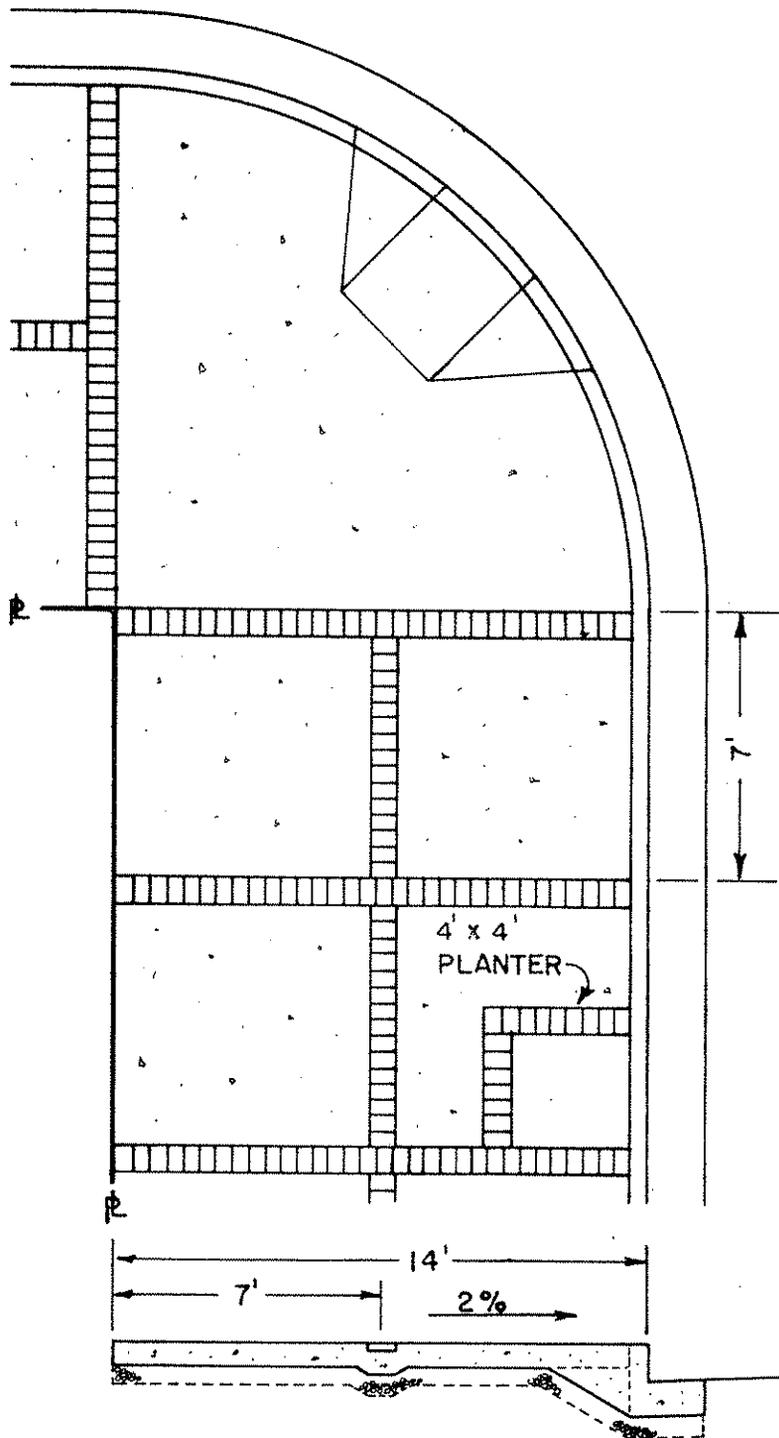
Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: AUGUST 1988
REVISED:

ST - 15

NOTES:

1. 2500 P.S.I. concrete.
2. Refer to ST-1 for curb and gutter.
3. Refer to ST-12 for standard handicap ramp.
4. Only new red brick is to be used. Either standard brick or half-brick (1" thickness), can be used.
5. Minimum concrete thickness is four inches throughout, except at driveways where minimum thickness is six inches.
6. Three inch thick class 2 aggregate base rock cushion below concrete.
7. Planter boxes shall have four foot minimum openings.
8. Brick rows may be adjusted slightly by the City Engineer
9. Score lines as directed by the City Engineer.



Also see ST - 3, Concrete Related Notes



CITY OF BENICIA

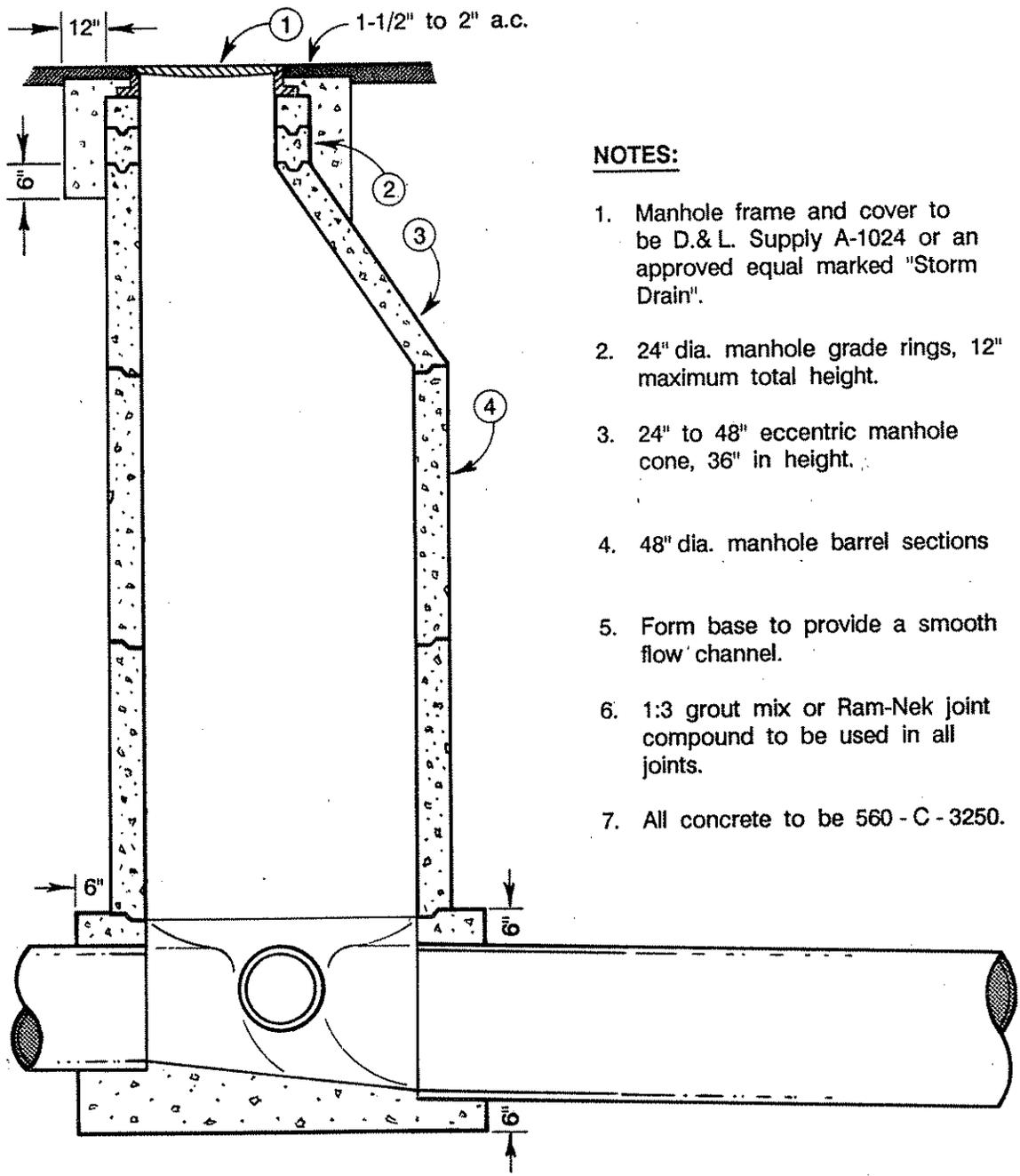
DEPARTMENT OF
PUBLIC WORKS

BRICK PATTERNED SIDEWALK

Donald F. Curtis
DONALD F. CURTIS R.C.E. 23327

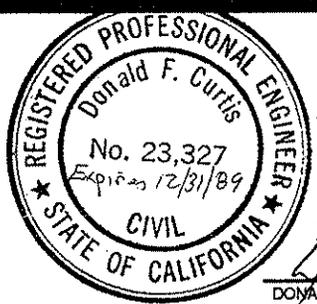
DATE: APRIL, 1988
REVISED:

ST - 20



NOTES:

1. Manhole frame and cover to be D.&L. Supply A-1024 or an approved equal marked "Storm Drain".
2. 24" dia. manhole grade rings, 12" maximum total height.
3. 24" to 48" eccentric manhole cone, 36" in height.
4. 48" dia. manhole barrel sections
5. Form base to provide a smooth flow channel.
6. 1:3 grout mix or Ram-Nek joint compound to be used in all joints.
7. All concrete to be 560 - C - 3250.



CITY OF BENICIA

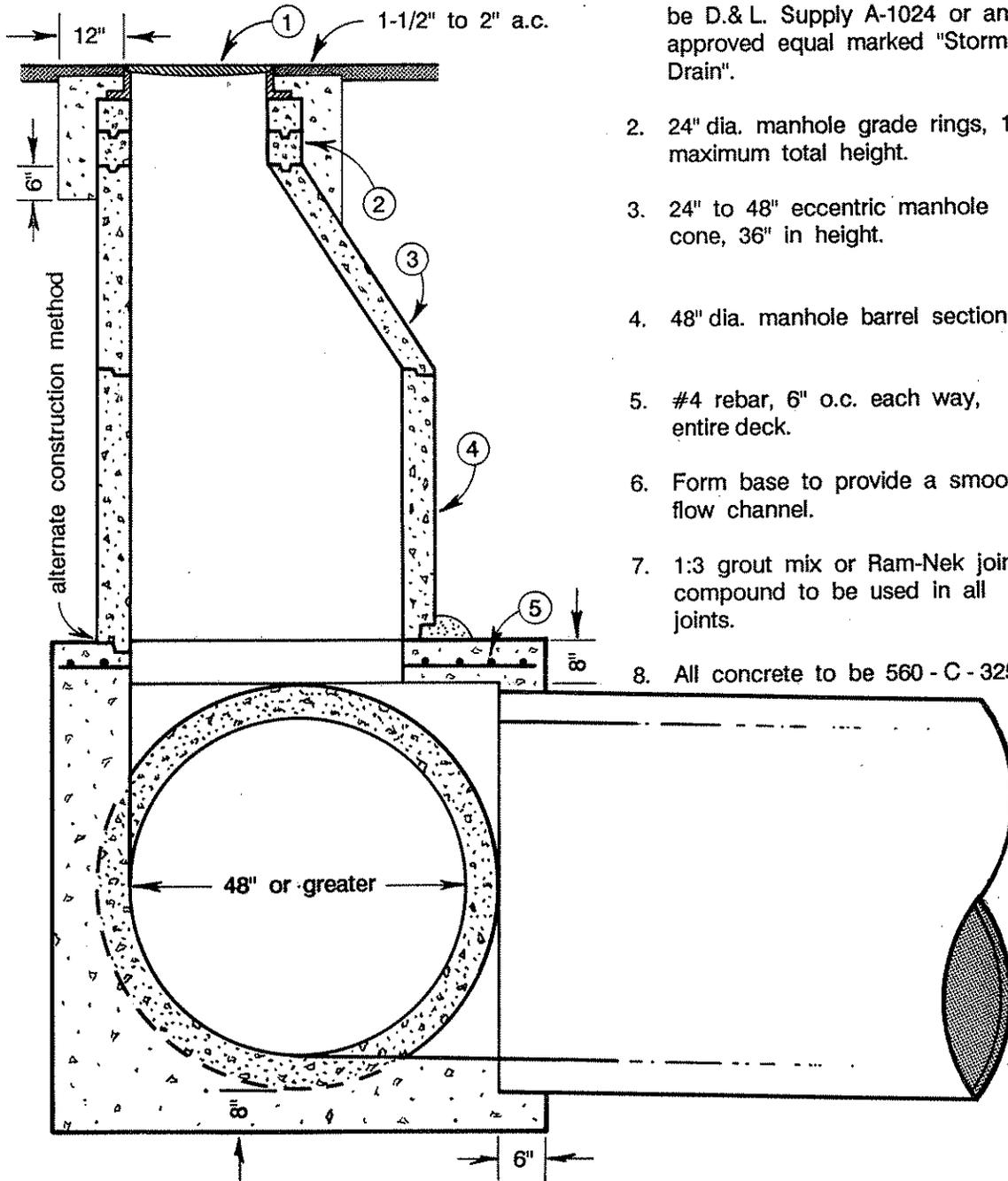
DEPARTMENT OF
PUBLIC WORKS

SMALL DIAMETER MANHOLE

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: SEPTEMBER 1988
REVISED: 10/91

SD - 1



NOTES:

1. Manhole frame and cover to be D.&L. Supply A-1024 or an approved equal marked "Storm Drain".
2. 24" dia. manhole grade rings, 12" maximum total height.
3. 24" to 48" eccentric manhole cone, 36" in height.
4. 48" dia. manhole barrel sections
5. #4 rebar, 6" o.c. each way, entire deck.
6. Form base to provide a smooth flow channel.
7. 1:3 grout mix or Ram-Nek joint compound to be used in all joints.
8. All concrete to be 560 - C - 3250.



CITY OF BENICIA

DEPARTMENT OF
PUBLIC WORKS

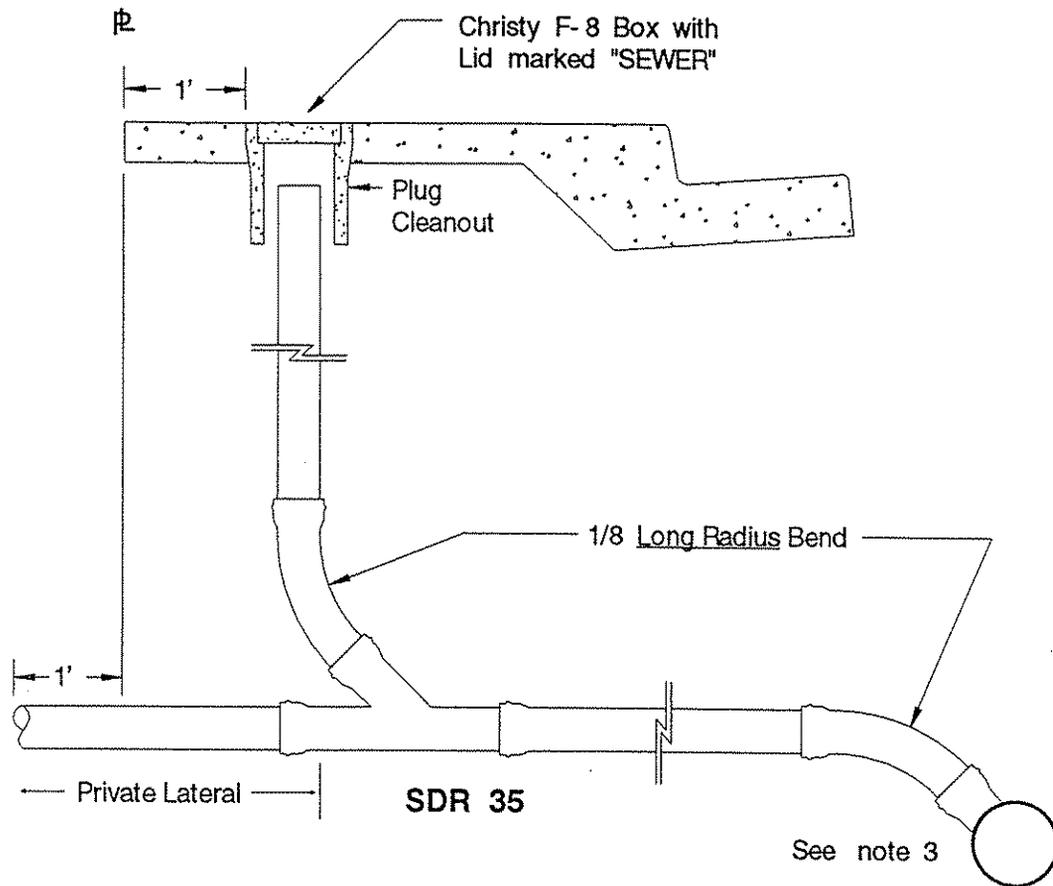
LARGE DIAMETER MANHOLE

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: SEPTEMBER 1988

REVISED: 4/92

SD - 2



NOTES:

1. Allowable minimum slopes for the following sewer lateral diameters: 4" - 2%, 6" - 1%, 8" - 0.5%.
2. Minimum cover shall be 30".
3. If the lateral is part of a main line construction use "wyes". If the lateral is to an existing main the connection shall be drill tapped.
4. In areas without sidewalk, the cleanout box shall be surrounded by a minimum of 12" of concrete.

CITY OF BENICIA

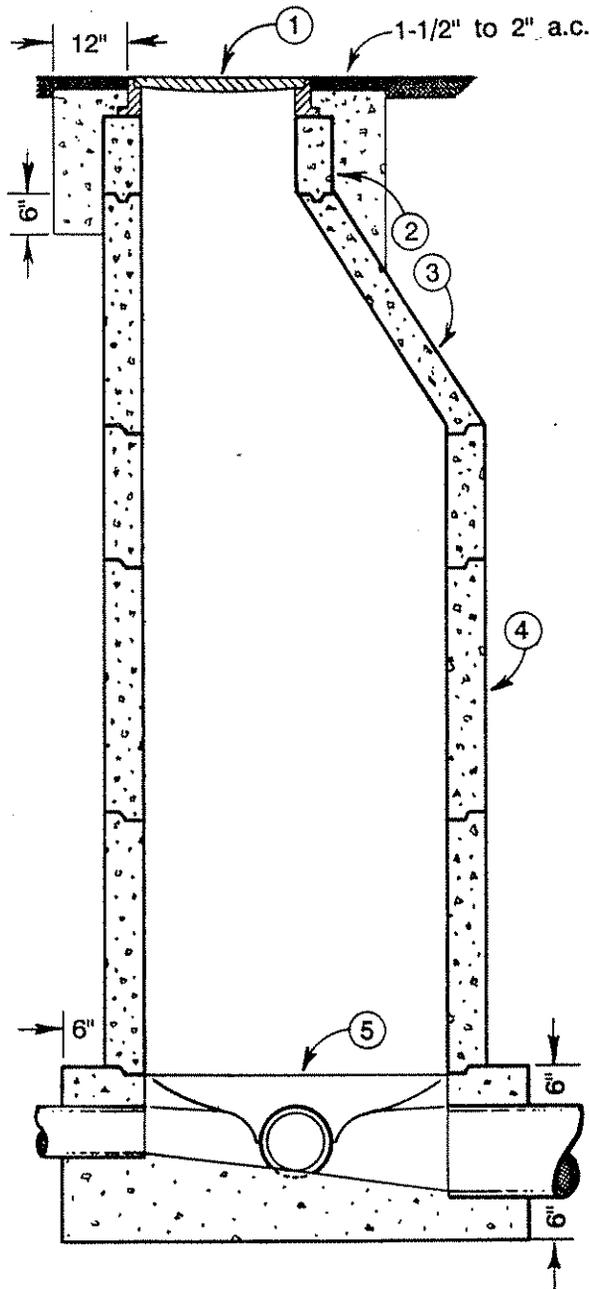
**DEPARTMENT OF
PUBLIC WORKS**

SEWER LATERAL

A.M. Bertolero
ANTOINETTE M. BERTOLERO, CITY ENGINEER

DATE: MARCH 1992
REVISED:

S - 1



NOTES:

1. Manhole frame and cover to be D. & L. Supply A-1024 or an approved equal marked "Sanitary Sewer".
2. 24" diameter manhole rings, 12" maximum total height.
3. 24" to 48" eccentric manhole cone, 36" in height.
4. 48" diameter manhole barrel sections.
5. Form base to provide a smooth flow channel.
6. 1:3 grout mix or Ram-Nek joint compound to be used in all joints.
7. All concrete to be 560 - C - 3250.



CITY OF BENICIA

DEPARTMENT OF
PUBLIC WORKS

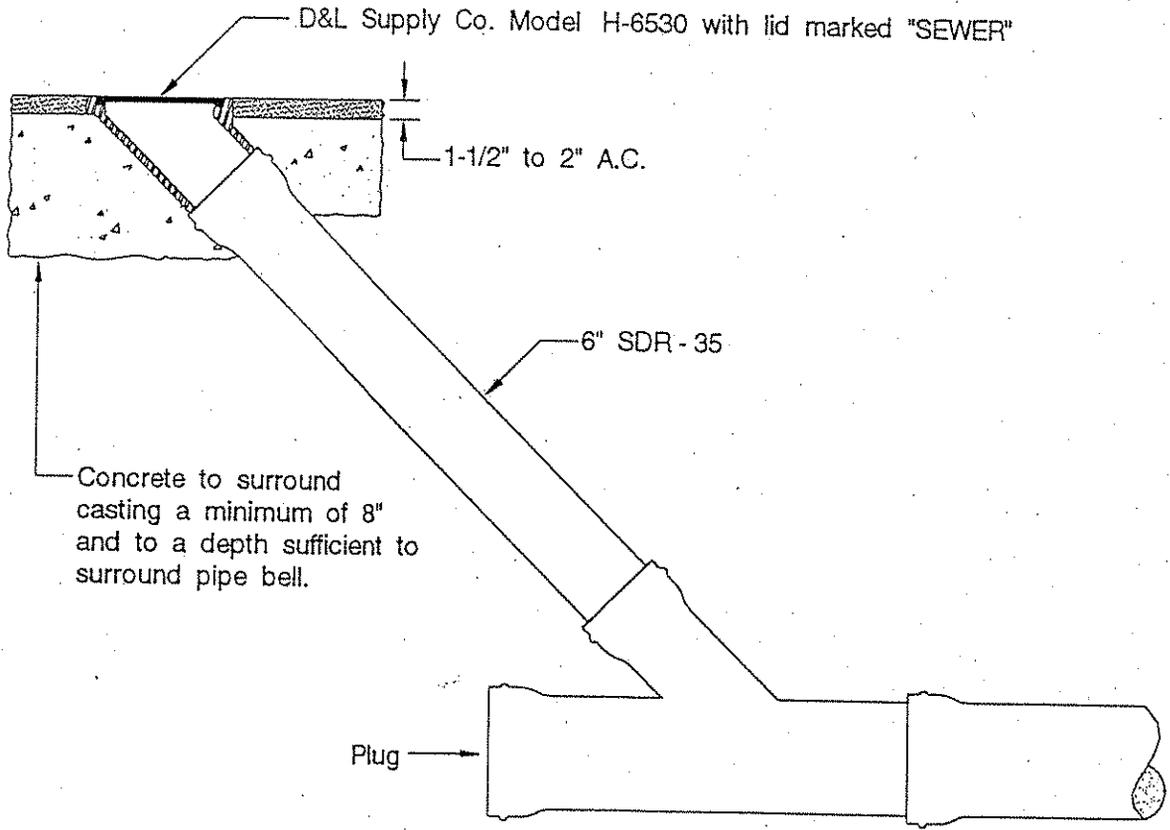
SEWER MANHOLE

Donald F. Curtis
DONALD F. CURTIS CITY ENGINEER

DATE: SEPTEMBER 1988

REVISED: 4/92

S - 2



CITY OF BENICIA

DEPARTMENT OF
PUBLIC WORKS

RODDING INLET

A. M. Bertolero
ANTOINETTE M. BERTOLERO, CITY ENGINEER

DATE: MARCH 1992
REVISED:

S - 4