

**ARIZONA DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING GROUP
OFFICE MEMO**

April 25, 1997

TO: All Users of Construction Standards

FROM: *THO* Terry H. Otterness, Design Program Manager, Roadway Engineering Group

RE: Revisions to Construction Standards - English Version

Several changes are being made to Construction Standard Drawings and the Construction Standards Index.

These revisions result from a Value Engineering Study on catch basins and affect Standards C-15.10 through C-15.81; Std. C-15.60 is deleted and Std. C-15.75 remains unchanged.

The Catch Basin Standards reflect significant changes including using only one type (EF) and size of grate and frame, placing the grate against the pavement edge to increase the amount of grate opening without encroaching into the pavement, changing the nose angle to a bent plate for curb opening catch basins to decrease and simplify forming, changing the access cover to the round cover used by the City of Phoenix, clarifying the use of catch basins with wide gutters, clarifying notes, and changing depth of wing walls to simplify forming. Revisions are indicated on each specific drawing.

Std. C-10.67 is a new standard for Concrete Median Barrier, Tall Type 'F', Cast in Place.

May, 1997

TO: ALL USERS OF THE CONSTRUCTION STANDARD DRAWINGS
FROM: THOMAS H. SCHECK, STANDARDS ENGINEER *THO*
RE: ERRATA SHEET - ENGLISH

ERRATA

The following revisions should be made to the Construction Standards dated July, 1994 (English). These revisions will remain in effect until new Standard Sheets are revised and distributed.

REVISED DRAWING

REVISION

C-05.20 Sheet 1	Only one expansion joint is required on each side of the driveway as shown on "DRIVEWAY WITH SIDEWALK ADJACENT TO CURB" these are the exterior joints, only. When the driveway is concrete, another expansion joint is needed along the backside of the sidewalk between the sidewalk and the driveway in all cases where the sidewalk crosses the driveway.
C-05.50	All references to "Class 2 AB" should be changed to read "Cement-Treated Slurry" on "SECTION B-B".
C-07.01 Sheet 1	Delete drawing "TRANSVERSE CONSTRUCTION JOINT, TC Joint Non-Skewed Joint". The drawing "TRANSVERSE CONSTRUCTION JOINT, TC Skewed Joint" shall apply to both skewed and non-skewed joints.
C-07.04	Under "GENERAL NOTES" change the "Minimum" to "Maximum" at "varies - 18' Minimum".
C-07.05	Under "GENERAL NOTES" change the "Minimum" to "Maximum" at "varies - 18' Minimum".
C-07.10	As shown on "CROSSROAD AT RAMP TERMINAL" delete the note "Expansion Joint Spacing (60' Max) (Typical)".

REVISED
DRAWING

REVISION

- C-10.22
Sheet 1 As shown on “SECTION” change the note on structural shape block to read “M14x17.2x14”, M14x18x14” or W14x22x14” Structural Shape Block”.
- C-10.31
Sheet 2 and 3 As shown on “Guard Rail Transition (Timber Post)/(Steel Post) under “ELEVATION” delete the notes about “Rectangular Plate Washers”. This type washer should not be used on these two large posts.
- C-10.44
Sheet 1 Under “SOIL PLATE DETAIL” the reference to “3/4” Hole” change it to read “13/16” Hole”.
- C-10.45 Under “GENERAL NOTES” add this note as 5. - Bearing plate shall conform to ARTBA Standard F-41-79 except that the dimension from the bottom of the plate to the center of the hole shall be 2 1/4”.
- C-10.66 Under “GENERAL NOTES” in note 1. change “Half” to “Median”.
- C-13.10
Sheet 2 of 2 Change note 1. to read “Minimum cover over pipe culverts shall be 12”, measured from the top of pipe”
- C-13.25 Do not use “TYPE 1, RIVITED OR BOLTED CONNECTIONS” or “TYPE 5, SLIP SEAM CONNECTIONS”. This standard applies to both round or arch pipes, however only the round are shown. This drawing is still applicable for “L” on end sections.
- C-13.30 Under “GENERAL NOTES” in note 7. change “Std. C-14.20” to “Std. B-11.12”.
- C-13.60 All references to “AB Class 2” should be changed to read “Cement-Treated Slurry” on “TYPE D & G CURB AND GUTTER WITH SLOTTED DRAIN” and “TYPE B OR C CURB AND GUTTER WITH SLOTTED DRAIN”.

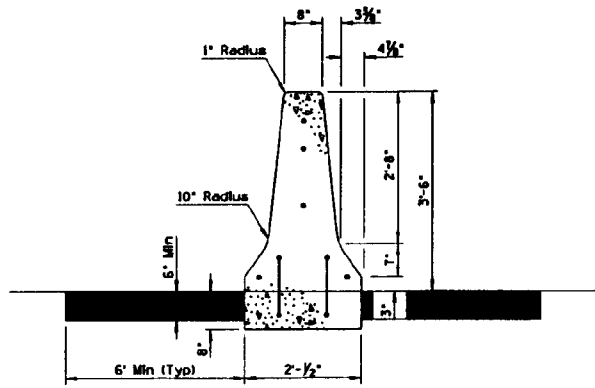
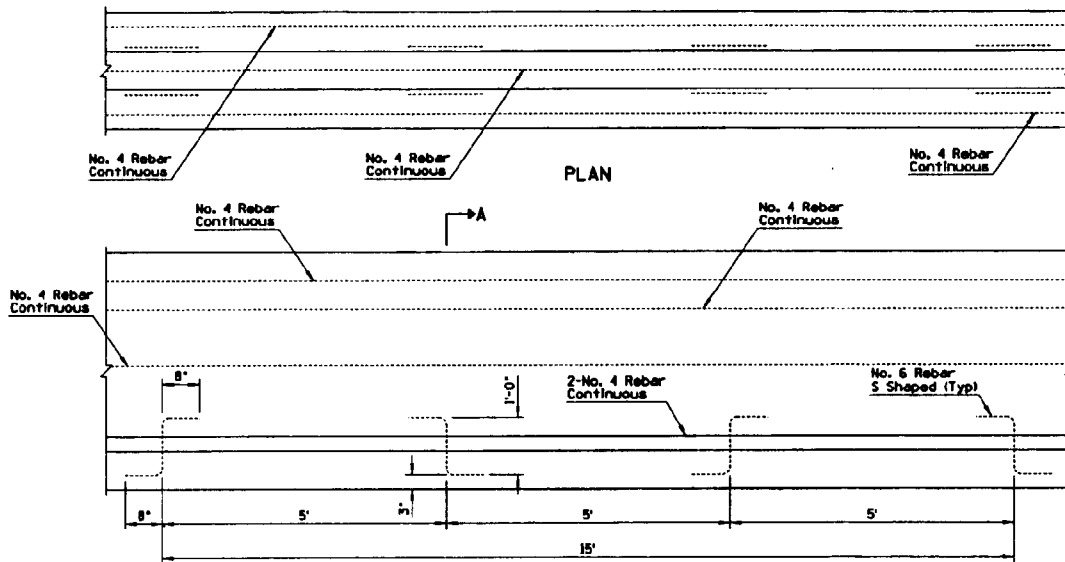
CONSTRUCTION STANDARD - INDEX

DRAWING NO.	TITLE	DRAWING NO.	TITLE
C-01.10	SYMBOL LEGEND	C-10.01	TYPE A GUARD RAIL INSTALLATION, REFLECTOR TAB
C-01.11	SYMBOL LEGEND	C-10.02	TYPE B GUARD RAIL INSTALLATION, REFLECTOR TAB
C-01.12	SYMBOL LEGEND	C-10.03	MEASUREMENT LIMITS FOR W BEAM AND THRIE BEAM SYSTEM (2 SHEETS)
C-01.13	SYMBOL LEGEND	C-10.06	HALF BARRIER TERMINAL W/TYPE B OR C CURB & GUTTER
C-01.30	GENERAL ABBREVIATIONS	C-10.15	BARRIER DETAILS AT PIERS
C-01.31	GENERAL ABBREVIATIONS	C-10.20	G4(1W) AND G4(2W) BLOCKED OUT W BEAM (TIMBER POST)
C-01.32	GENERAL ABBREVIATIONS	C-10.21	G4(1S) AND G4(2S) BLOCKED OUT W BEAM (STEEL POST)
		C-10.22	G4(MODIFIED) BLOCKED OUT W BEAM WITH SPECIAL CURB AND GUTTER (2 SHEETS)
C-02.10	SLOPES, INTERSTATE	C-10.23	G9(A) AND G9(B) BLOCKED OUT THRIE BEAM (STEEL POST)
C-02.20	SLOPES, PRIMARY ROADWAYS	C-10.24	G9(C) BLOCKED OUT THRIE BEAM (STEEL POST)
C-02.30	SLOPES, SECONDARY/MISC ROADWAYS	C-10.28	NESTED STEEL W BEAM (2 SHEETS)
C-02.50	SUPERELEVATION DISTRIBUTION	C-10.29	BOLTED ANCHOR GUARD RAIL (2 SHEETS)
C-03.10	DITCHES, CHANNELS, DIKES AND BERMS (5 SHEETS)	C-10.30	GUARD RAIL TRANSITION, W BEAM TO CONCRETE HALF BARRIER (APPROACH) (3 SHEETS)
C-04.10	SPILLWAY, EMBANKMENT	C-10.31	GUARD RAIL TRANSITION, W BEAM TO CONCRETE HALF BARRIER (APPROACH) (WITH CURB) (3 SHEETS)
C-04.20	DOWNDRAIN, EMBANKMENT	C-10.32	GUARD RAIL TRANSITION, W BEAM TO CONCRETE HALF BARRIER (DEPARTURE) (3 SHEETS)
C-04.30	SPILLWAY LENGTH TABLE	C-10.39	HARDWARE FOR W BEAM TRANSITION TO CONCRETE BARRIER
C-04.40	DOWNDRAIN LENGTH TABLE	C-10.40	GUARD RAIL EXTRUDER TERMINAL, GET-1 (2 SHEETS)
C-04.50	DOWNDRAIN ENERGY DISSIPATOR	C-10.41	GUARD RAIL EXTRUDER TERMINAL, GET-2 (2 SHEETS)
C-05.10	SINGLE CURB, CURB & GUTTER EMBANKMENT CURB	C-10.44	HARDWARE FOR GUARD RAIL EXTRUDER TERMINAL (3 SHEETS)
C-05.11	RAMP CURB & GUTTER LAYOUT (2 SHEETS)	C-10.45	GUARD RAIL ANCHOR ASSEMBLY STEEL TERMINAL POST
C-05.12	CURB & GUTTER TRANSITIONS (3 SHEETS)	C-10.60	HALF BARRIER, CAST IN PLACE, SLIP FORM & FIXED FORM
C-05.20	CONCRETE DRIVEWAYS & SIDEWALKS (2 SHEETS)	C-10.61	HALF BARRIER, PRECAST
C-05.30	SIDEWALK RAMP (4 SHEETS)	C-10.62	CONCRETE HALF BARRIER WITH GUTTER
C-05.40	MEDIAN PAVING AND NOSE TRANSITION	C-10.64	HALF BARRIER (AT PIERS) (2 SHEETS)
C-05.50	CONCRETE BUS BAY	C-10.65	HALF BARRIER WITH SIDEWALK
C-06.10	DRIVEWAY & TURNOUT LAYOUTS (2 SHEETS)	C-10.66	MEDIAN BARRIER, CAST IN PLACE, SLIP FORM & FIXED FORM
C-07.01	PCCP JOINTS (2 SHEETS)	C-10.67	CONCRETE MEDIAN BARRIER, TALL TYPE 'F', CAST IN PLACE
C-07.02	LOAD TRANSFER DOWEL ASSEMBLY	C-10.68	MEDIAN BARRIER, PRECAST
C-07.03	MAINLINE PCCP JOINT LOCATIONS (8 SHEETS)	C-10.70	CONCRETE HALF BARRIER TRANSITION (4 SHEETS)
C-07.04	ENTRANCE RAMP PCCP JOINTS	C-10.71	CONCRETE HALF BARRIER TRANSITION (3 SHEETS)
C-07.05	EXIT RAMP PCCP JOINTS	C-10.74	HARDWARE FOR CONCRETE BARRIER TRANSITIONS
C-07.06	TRENCH BACKFILL AND PAVEMENT REPLACEMENT	C-10.75	BARRIER TRANSITION-TANGENT-DEPARTURE TYPES 1, 2, AND 3 (3 SHEETS)
C-07.10	CROSSROAD PCCP JOINTS	C-10.76	BARRIER TRANSITION-CURVE
C-08.10	RAMP GEOMETRICS	C-10.80	RUB RAIL (2 SHEETS)
C-08.20	PAVED GORE AREA	C-10.83	HARDWARE FOR RUB RAIL
C-09.10	GROOVING FOR BITUMINOUS SHOULDERS	C-10.97	GLARE SCREEN, CONCRETE MEDIAN BARRIER (3 SHEETS)
		C-11.10	ROADWAY CATTLE GUARD (3 SHEETS)
		C-11.20	CATTLE GUARD, DRAINAGE
		C-11.30	CATTLE GUARD, RAILROAD
		C-12.10	FENCE, WOVEN AND BARBED WIRE WITH GATES (5 SHEETS)
		C-12.20	FENCE, CHAIN LINK TYPES 1 AND 2 WITH GATES (3 SHEETS)
		C-12.30	CHAIN LINK CABLE BARRIER (3 SHEETS)

CONSTRUCTION STANDARD - INDEX

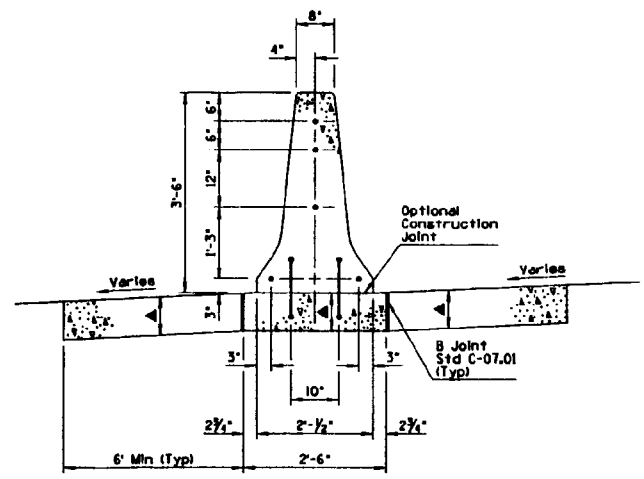
DRAWING NO.	TITLE	DRAWING NO.	TITLE
C-13.10	PIPE CULVERT INSTALLATION (2 SHEETS)	C-18.10	MANHOLE DETAILS
C-13.15	TYPICAL PIPE INSTALLATION	C-18.20	MANHOLE FRAME & COVER DETAILS
C-13.20	PIPE, REINFORCED CONCRETE END SECTION	C-18.30	MISCELLANEOUS MANHOLE DETAILS
C-13.25	PIPE, CORRUGATED METAL, END SECTION	C-18.40	MANHOLE RISER DETAILS
C-13.30	PIPE & PIPE ARCH, CORRUGATED METAL CONCRETE INVERT PAVING		
C-13.55	PIPE, CATTLE-VEHICLE PASS, MITERED END TREATMENT	C-19.10	FORD - CONCRETE WALLS
C-13.60	SLOTTED DRAIN DETAILS	C-19.20	FORDS - TYPES 1 & 2
C-13.65	SLOTTED DRAIN INSTALLATION DETAILS		
C-13.70	STORM DRAIN CONNECTION DETAILS	C-21.10	SURVEY MONUMENT, FRAME AND COVER, RIGHT OF WAY MARKER
C-13.75	STORM DRAIN OUTLET DETAILS (2 SHEETS)	C-21.20	STANDARD MARKER
C-13.80	PIPE COLLAR DETAILS		
C-15.10	CATCH BASIN, TYPE 1	C-22.10	UTILITY LINE, PROTECTIVE CONCRETE SLAB
C-15.20	CATCH BASIN, TYPE 3 (2 SHEETS)	C-22.15	SANITARY SEWER ENCASEMENT
C-15.30	CATCH BASIN, TYPE 4	C-22.20	PIPE SUPPORT ACROSS TRENCHES (3 SHEETS)
C-15.40	CATCH BASIN, TYPE 5 (2 SHEETS)	C-22.25	PRECAST SANITARY SEWER MANHOLES
C-15.50	CATCH BASIN, GRATES	C-22.30	STUB OUT AND PLUG
C-15.60	DELETED	C-22.35	DROP SEWER CONNECTIONS
C-15.65	CATCH BASIN ACCESS, FRAME AND COVER DETAILS	C-22.40	SEWER CLEANOUT
C-15.70	CATCH BASIN MISC. DETAILS (2 SHEETS)		
C-15.75	CATCH BASIN, DROP INLET	C-23.10	THRUST BLOCKS FOR WATER LINES
C-15.80	CATCH BASIN, MEDIAN FLUSH	C-23.15	BLOCKING FOR WATER VALVES GATE AND BUTTERFLY
C-15.81	CATCH BASIN, MEDIAN, SIDE SLOPE	C-23.20	ANCHOR BLOCK FOR VERTICAL BENDS
C-15.90	CATCH BASIN, MEDIAN DIKE, PRECAST	C-23.25	VERTICAL REALIGNMENT FOR WATER MAINS
C-15.91	FREEWAY CATCH BASIN DETAILS (2 SHEETS)	C-23.30	VALVE BOX INSTALLATION (2 SHEETS)
C-15.92	SPECIAL CATCH BASIN WITH HALF BARRIER	C-23.35	TAPPING SLEEVE AND VALVE INSTALLATION
		C-23.40	JOINT RESTRAINT WITH TIE RODS
C-16.10	IRRIGATION HEADWALLS 18" TO 60" DIAMETER PIPES	C-23.45	CONCRETE WATER METER BOX
C-16.20	IRRIGATION STANDPIPES	C-23.50	STEEL COVER FOR WATER METER BOX
C-16.30	IRRIGATION VALVE AND GATE	C-23.55	WATERLINE-CUT AND PLUG 12" DIA. MAIN AND SMALLER
C-16.40	IRRIGATION SLEEVES	C-23.60	HYDRANT INSTALLATION
		C-23.65	FIRE HYDRANT LOCATIONS
C-17.10	BANK PROTECTION, RAIL TYPES 1, 2 & 3		
C-17.20	BANK PROTECTION, RAIL TYPES 4, 5 & 6		

NO.	DESCRIPTION	DATE	BY



WITH AC PAVEMENT
SECTION A-A

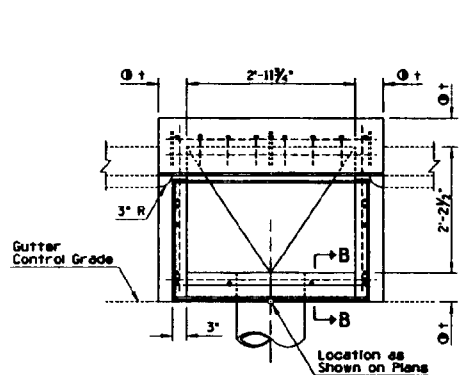
- ### GENERAL NOTES
1. Median Barrier shall be constructed by the slip form or by the formed Cast-In-Place method.
 2. When obstacles are encountered which prevent the use of slip form equipment, the closure shall be accomplished by the use of stationary forms.
 3. Concrete shall be Class S, design strength $f'_c = 3000$ PSI.
 4. If the footing and barrier are cast monolithically, No. 6 S shaped rebar will not be required.
 5. In no case shall the width of barrier exceed the width of the barrier footing or overhang the adjacent pavement.
 6. No. 4 Rebar shall extend 12" past the construction joint at the completion of the day's pour.
- ▲ Depth to match adjacent PCCP thickness (8" Min).



WITH PCC PAVEMENT
SECTION A-A

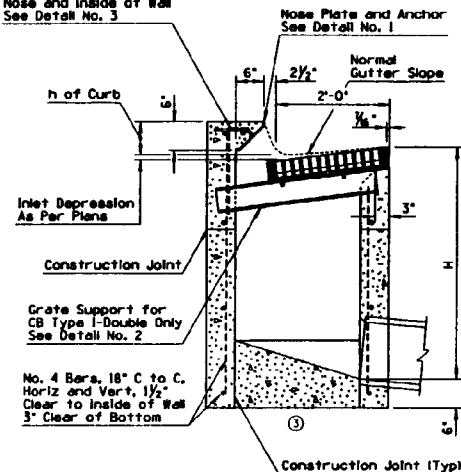
DESIGN APPROVED <i>Joseph H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	DATE 5/97
APPROVED FOR CONSTRUCTION <i>Paul Williams</i>	CONCRETE MEDIAN BARRIER TALL TYPE 'F' CAST IN PLACE	DRAWING NO. C-10.67

DESCRIPTION OF WORK	QUANTITY	UNIT
REINFORCING FOR CURB AND SIDE PLATE	1.00	LINEAL FEET
REINFORCING STEEL	1.00	LINEAL FEET
REINFORCING PLATE FOR CURB AND SIDE WALLS	1.00	LINEAL FEET
ADDED METAL ON CURB	1.00	LINEAL FEET

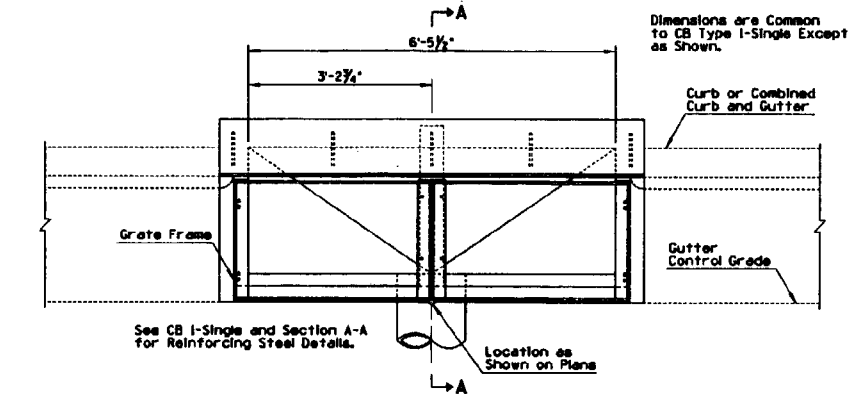


PLAN - CATCH BASIN TYPE I - SINGLE

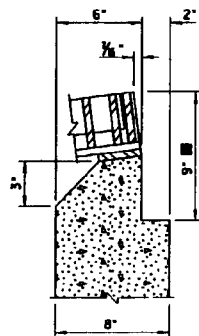
No. 3 Bars, 6" C to C, 1/2" Clear to Top of Nose and Inside of Wall See Detail No. 3



SECTION A-A



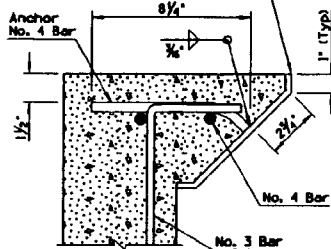
PLAN - CATCH BASIN TYPE I - DOUBLE



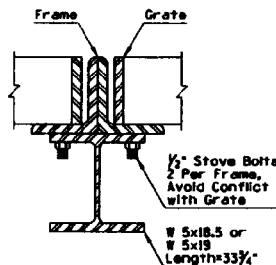
SECTION B-B

USE THIS SECTION WHEN 1=8' ②

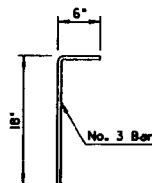
Nose Plate
8"x3/4" Bent Plate
Lengths 2'-11 1/4" + 2t for CB I-Single
6'-5 1/2" + 2t for CB I-Double



DETAIL NO. 1 ②

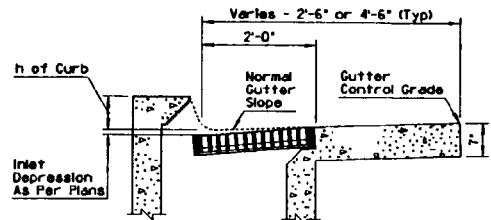


DETAIL NO. 2



DETAIL NO. 3

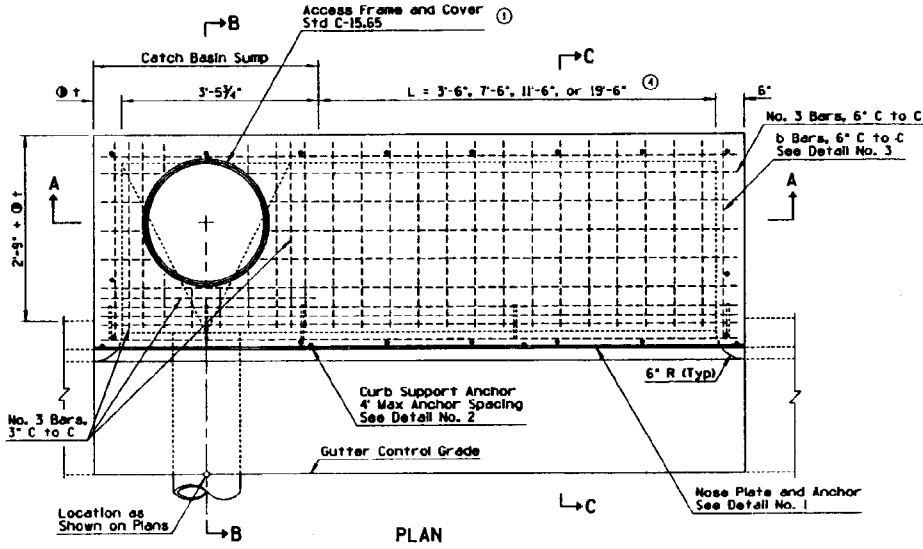
- GENERAL NOTES**
1. Catch basin used at roadway sag only.
 2. Pipes can be placed in any wall.
 3. Sump Floor shall have a wood trowel finish and a minimum 4ft slope in all directions to outlet.
 4. All structural steel shall be ASTM A36.
 5. Welding shall be in accordance with Standard Welding Specifications.
 6. Grate, frame, beam and nose plate shall be given one shop coat of No. 1 paint.
 7. All concrete shall be Class B.
 8. Construction joints and drains shall be placed to meet field conditions. See Std C-15.70.
 9. Any specified Inlet depression shall be warped to opening according to Std C-15.70.
 10. Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/4" from the pavement surface.
 11. Curb opening areas, sq. ft., for type I-single and type I-double equal 0.25 and 0.54, respectively, for each inch of "h" + Inlet depression - 2.35". See Std C-15.70.
 12. See Std C-15.50 for grate and frame details and grate opening areas.
 13. ① = 6" when H is 8' or less.
8" when H is greater than 8'. See Section B-B.
■ = 9" when pavement is AC.
Match pavement thickness when pavement is PCCP.



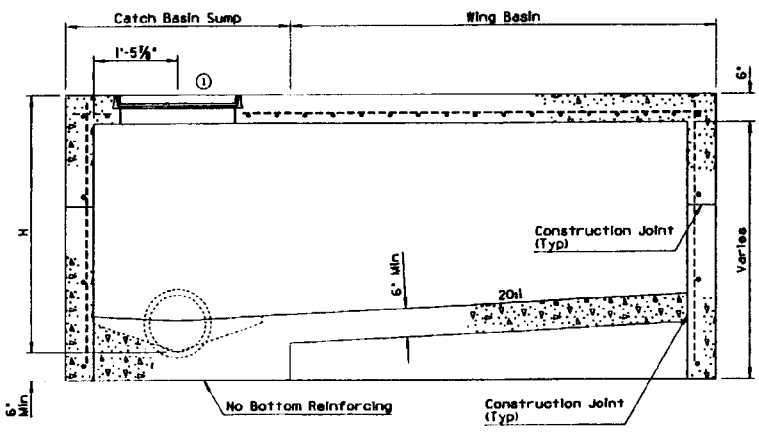
DETAIL NO. 4 ①

DESIGN APPROVED <i>Joseph A. Ottaviano</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR CONSTRUCTION <i>Robert...</i>	① CATCH BASIN, TYPE I	DRAWING NO. C-15.10

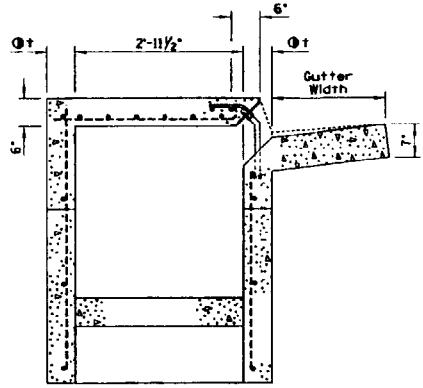
REVISIONS		DATE		DESCRIPTION OF REVISION	
1	REVISED FOR NEW ACCESS FRAME AND COVER	PHB	1/1/77	1	ADDED SECTION
2	ADDED SHEETS FOR REVISION DETAILS	PHB	1/1/77	2	CONSIDERED NOTES
3	REVISED SECTION	PHB	5/1/77	3	ADDED NOTE
4	REVISED SECTION	PHB	5/1/77	4	ADDED NOTE
5	REVISED LINEING OF WALLS	PHB	5/1/77	5	ADDED NOTE



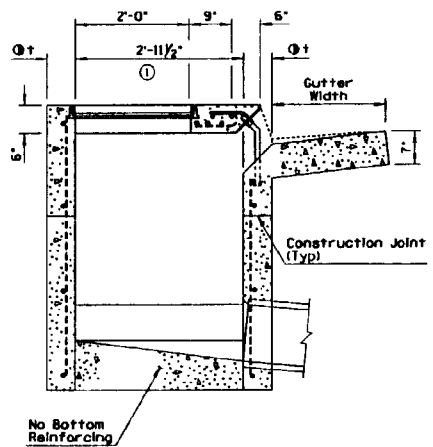
PLAN



SECTION A-A
USE THIS SECTION WHEN H=5' OR LESS ③



SECTION C-C ③



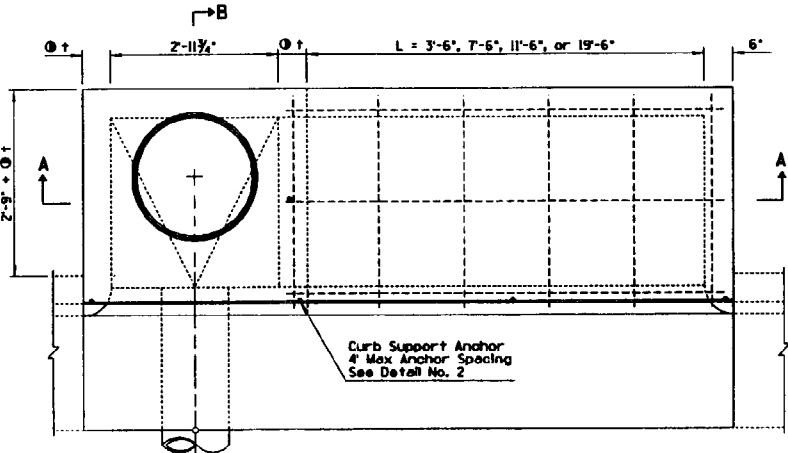
SECTION B-B ③

GENERAL NOTES

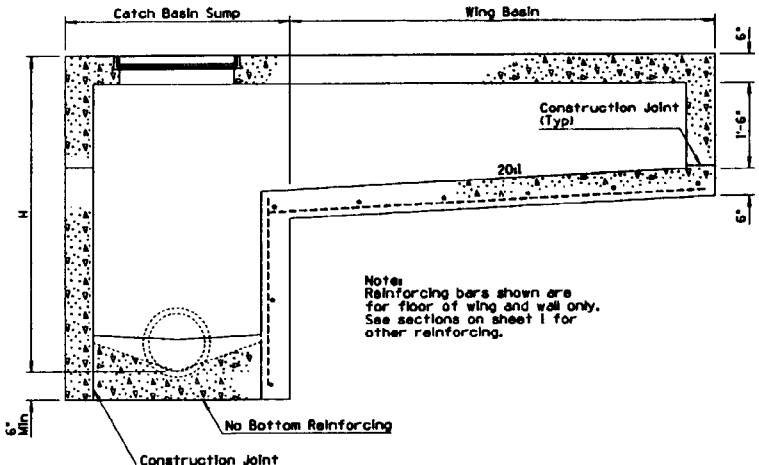
- ① 1. Catch basin can be used on grade or at roadway sag.
- ② 2. Catch basin has three configurations:
Sump Only-Sump portion of catch basin (See Detail No. 4).
Single Wing (Illustrated)-Sump with wing basin upstream.
Double Wing-Sump with symmetrical wing basins each side.
3. Pipes can be placed in any wall except wall adjacent to wing basin.
4. Floor shall have a wood trowel finish. Slope of the sump portion of the catch basin along the axis of the pipe shall be 4:1.
5. Any specified inlet depression shall be warped to opening according to Std C-15.70.
6. All structural steel shall be ASTM A36.
7. Nose plate, access frame and cover shall be given one shop coat of No. 1 paint.
8. All concrete shall be Class B.
9. All reinforcing bars shall be #4, 1'-6" C to C both ways and 1/2' clear to inside of walls and outside of wing basin floor except as shown.
10. Curb opening area (sq ft) per inch of curb "h" + gutter depression = curb opening length (ft) x 0.0833.
11. Welding shall be in accordance with Standard Welding Specifications.
12. Construction joints and drains shall be placed to meet field conditions. See Std C-15.70.
13. ① = 6' when H is 8' or less.
8' when H is greater than 8'.

DESIGN APPROVED <i>Joseph H. Ottomano</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR DISTRIBUTION <i>Paul Wall</i>	① ② CATCH BASIN, TYPE 3	DRAWING NO. C-15-20 Sheet 1 of 2

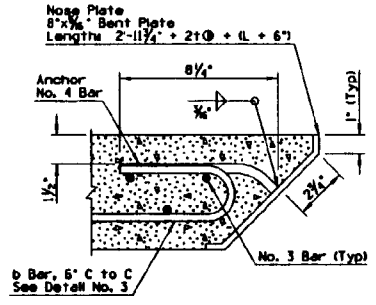
DATE	BY	CHK



PLAN

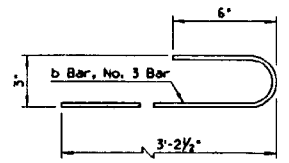


SECTION A-A
USE THIS SECTION WHEN H IS GREATER THAN 5'

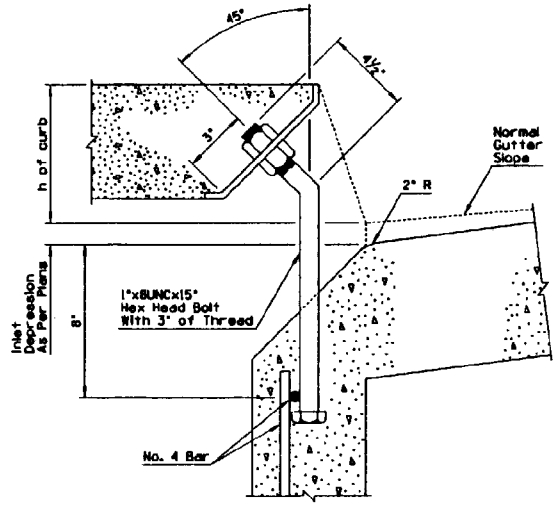


DETAIL NO. 1

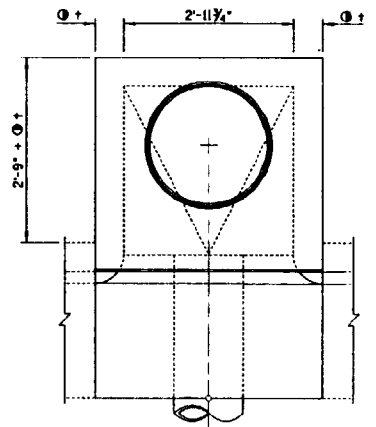
- GENERAL NOTES**
1. See sheet 1 of 2 for other dimensions, notes and reinforcing steel.
 2. $0 t = 6"$ when H is 8' or less.
 $8"$ when H is greater than 8'.



DETAIL NO. 3



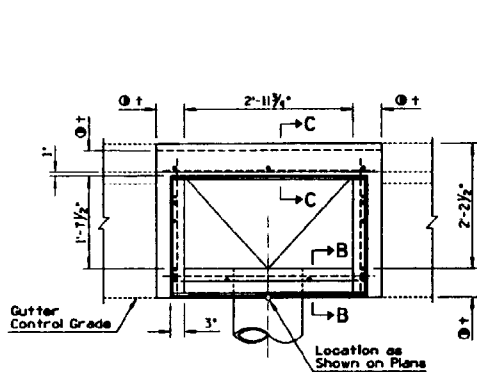
DETAIL NO. 2
CURB SUPPORT ANCHOR



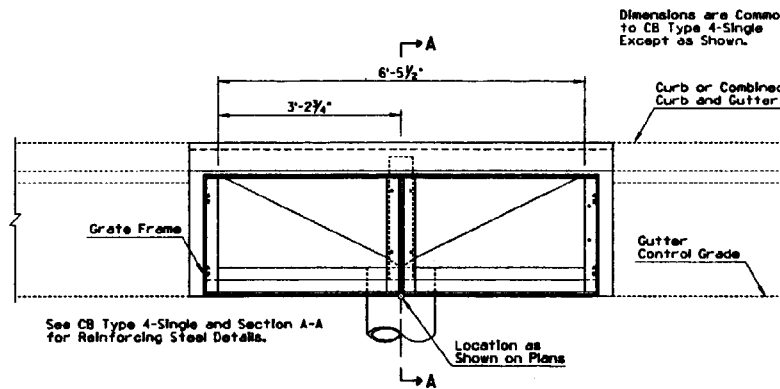
DETAIL NO. 4

DESIGN APPROVED <i>Joseph C. ...</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	DATE 5/97
APPROVED FOR DISTRIBUTION <i>Ronald ...</i>	CATCH BASIN, TYPE 3	DRAWING NO. C-15.20 Sheet 2 of 2

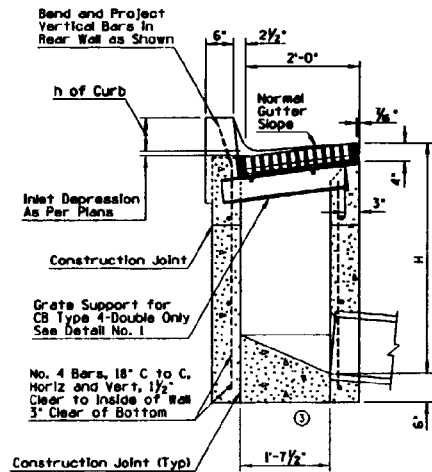
REVISIONS BY REVISION			REVISIONS BY REVISION		
NO.	DESCRIPTION	DATE	NO.	DESCRIPTION	DATE
1	REVISED STD FOR NEW FRAME	PMB 5/97	1	REVISED DATE	PMB 5/97
2	REVISED METAL	PMB 5/97	2	ADDED NOTE	PMB 5/97
3	REVISED PLAN FOR FORMING UPON WALLS	PMB 5/97			
4	ADDED SECTION ON METAL	PMB 5/97			



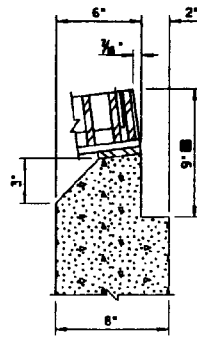
PLAN - CATCH BASIN TYPE 4 - SINGLE



PLAN - CATCH BASIN TYPE 4 - DOUBLE

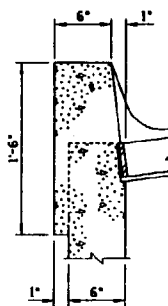


SECTION A-A

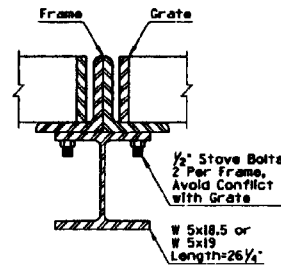


USE THIS SECTION WHEN t=8"

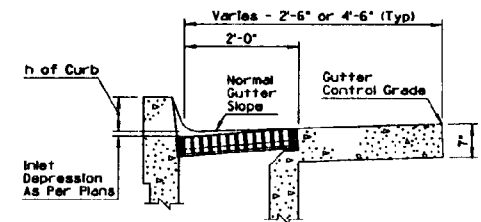
SECTION B-B ②



SECTION C-C ④



DETAIL NO. 1



DETAIL NO. 2 ①

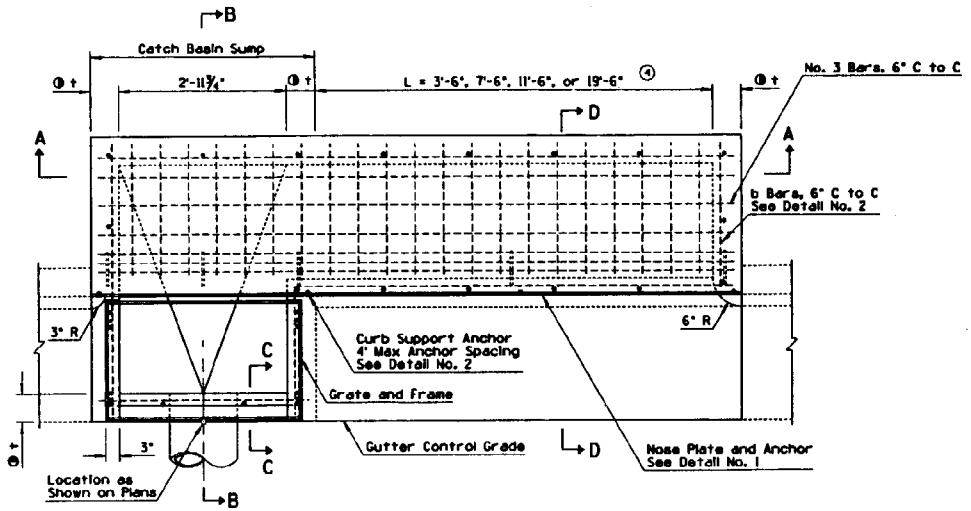
Dimensions are Common to CB Type 4-Single Except as Shown.

GENERAL NOTES

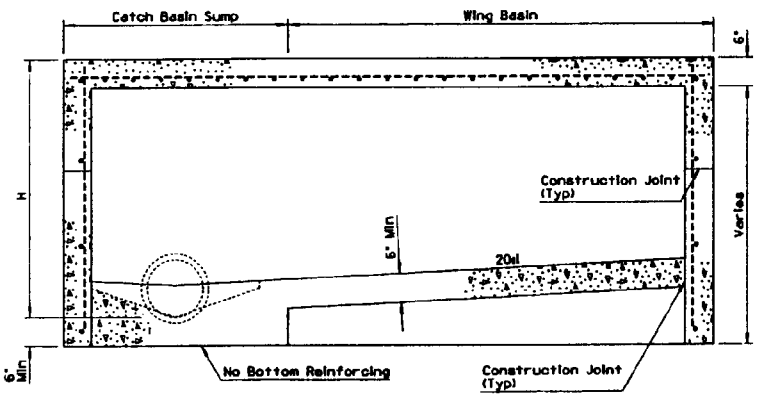
- ⑥ 1. Catch basin can be used on grade or at roadway sag.
2. Pipes can be placed in any wall.
- ③ 3. Floor shall have a wood trowel finish and a minimum 4:1 slope along the axis of the pipe toward the pipe.
4. Curb over catch basin shall not be constructed until catch basin concrete has set for a minimum of 24 hours.
- ⑥ 5. Catch basin can be used with curb and gutter (as shown) or without.
6. See Stds C-15.50 for grate and frame details and opening areas.
7. Any specified inlet depression shall be warped to opening according to Std C-15.70.
8. All structural steel shall be ASTM A36.
9. Grate, frame and beam shall be given one shop coat of No. 1 paint.
10. All concrete shall be Class B.
11. Construction joints and drains shall be placed to meet field conditions. See Std C-15.70.
- ⑥ 12. Silicone sealant shall be placed between the grate frame and PCPP, recessed 1/4" from the pavement surface.
- ⑥ 13. See Detail No. 2 for catch basin with wide gutter.
14. ① t = 6" when H is 8" or less,
8" when H is greater than 8".
See Section 6-B.
■ 9" when pavement is AC.
Match pavement thickness when pavement is PCPP.

DESIGN APPROVED <i>Joseph A. Ottaviano</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR CONSTRUCTION <i>Paul Wallen</i>	① CATCH BASIN, TYPE 4	DRAWING NO. C-15.30

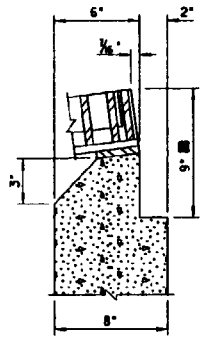
REVISIONS TO THIS DRAWING			REVISIONS TO THIS DRAWING		
NO.	DESCRIPTION	DATE	NO.	DESCRIPTION	DATE
1	REVISED STD FOR NEW FRAME AND NOSE PLATE	FWB 5/97	1	ADDED SECTION	FWB 5/97
2	ADDED SHEET # FOR REVISION DETAILS	FWB 5/97	2	REVISED NOTES	FWB 5/97
3	REVISED SECTION	FWB 5/97	3	CONCRETE FINISH NOTES	FWB 5/97
4	REVISED SECTION	FWB 5/97	4	ADDED NOTE	FWB 5/97
5	REVISED LISTING OF NOTES				



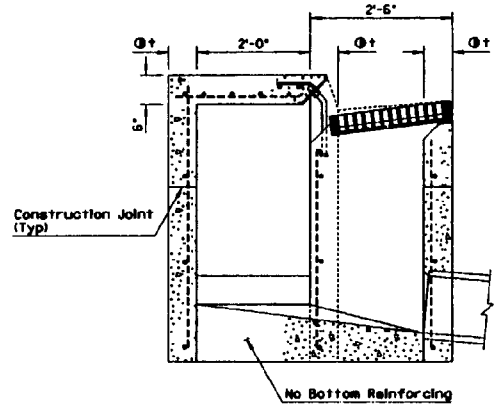
PLAN



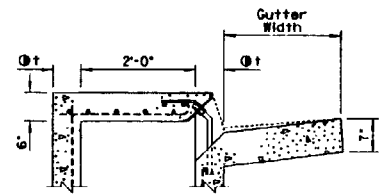
SECTION A-A
USE THIS SECTION WHEN H=5' OR LESS ③



SECTION C-C
USE THIS SECTION WHEN $\uparrow=8''$ ③



SECTION B-B ③

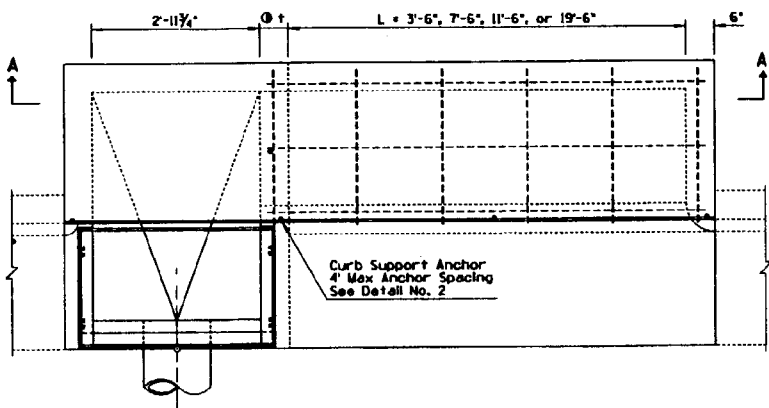


SECTION D-D ③

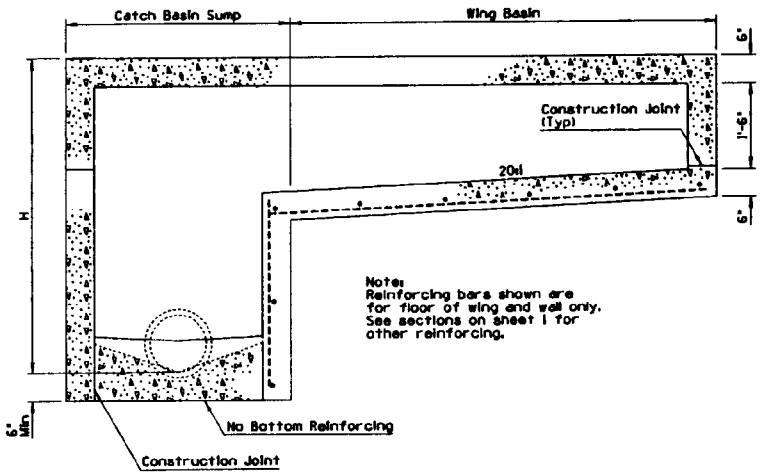
GENERAL NOTES

- ③ 1. Catch basin can be used on grade or at roadway seg.
- ① 2. Catch basin has three configurations:
Sump Only-Sump portion of catch basin
Single Wing (Illustrated)-Sump with wing basin upstream.
Double Wing-Sump with symmetrical wing basins each side.
3. Pipes can be placed in any wall except wall adjacent to a wing basin.
- ④ 4. Floor shall have a wood trowel finish. Slope of the sump portion of the catch basin along the axis of the pipe shall be 4:1.
5. Any specified inlet depression shall be warped to opening according to Std C-15.70.
6. All structural steel shall be ASTM A36.
7. Nose plate shall be given one shop coat of No. 1 paint.
8. All concrete shall be Class B.
9. All reinforcing bars shall be No. 4, 1'-6" C to C both ways and 1/2" clear to inside of walls and outside of wing basin floor except as shown.
10. Curb opening area (sq ft) per inch of curb 'h' + Inlet depression = curb opening length (ft) x 0.0834.
11. Welding shall be in accordance with Standard Welding Specifications.
12. See Std E-15.50 for grate and frame details and opening areas.
13. Construction joints and drains shall be placed to meet field conditions. Std C-15.70.
- ⑤ 14. Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/4" from the pavement surface.
15. $\phi \uparrow$ = 6" when H is 8' or less.
8" when H is greater than 8'.
See Section C-C.
16. \blacksquare = 9" when pavement is AC.
Match pavement thickness when pavement is PCCP.

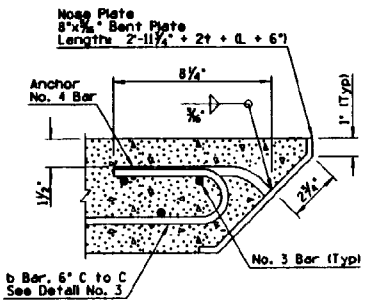
REVISION	DATE	BY



PLAN

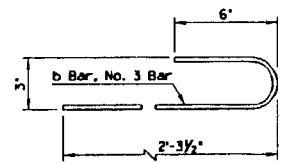


SECTION A-A
USE THIS SECTION WHEN H IS GREATER THAN 5'

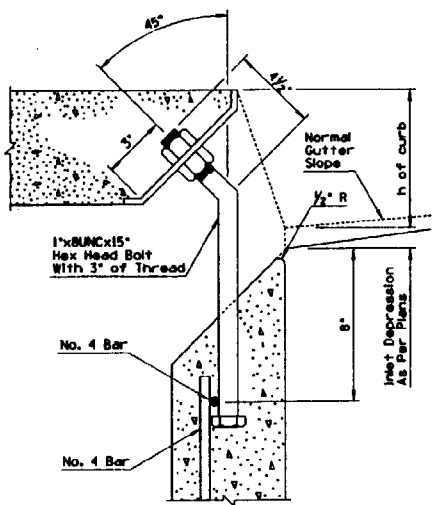


DETAIL NO. 1

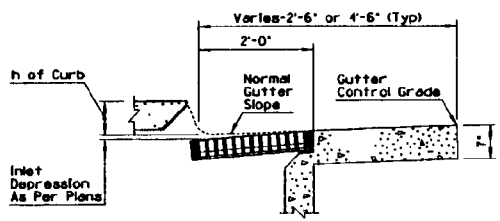
- GENERAL NOTES**
- See sheet 1 of 2 for other dimensions, notes and reinforcing steel.
 - $\text{Øt} = 6'$ when H is 8' or less, 8' when H is greater than 8'.



DETAIL NO. 3



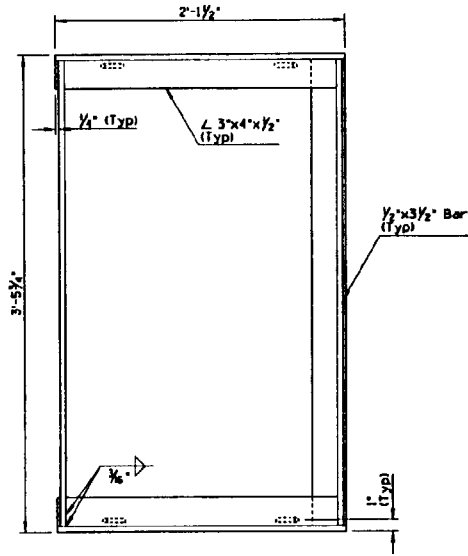
DETAIL NO. 2
CURB SUPPORT ANCHOR



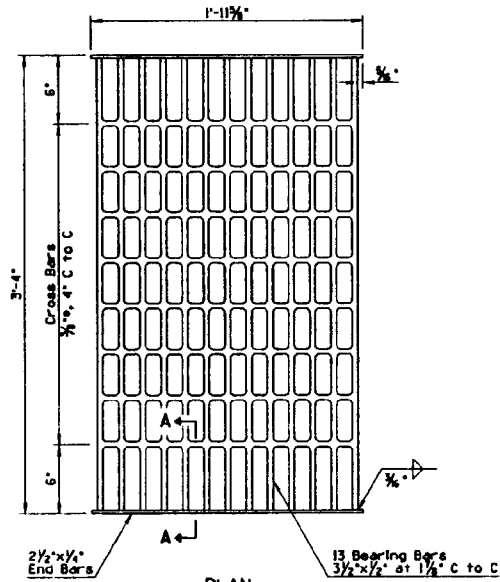
DETAIL NO. 4

DESIGN APPROVED <i>Joseph H. Ottomano</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	ISSUE 5/97
APPROVED FOR CONSTRUCTION <i>Russell</i>	CATCH BASIN, TYPE 5	DRAWING NO. C-15.40 Sheet 2 of 2

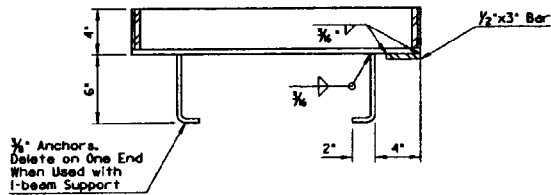
REVISION	DESCRIPTION	DATE	BY
1	SELECTED ALL GRATES EXCEPT ONE (P-1)	7/97	VJM
2	SELECTED SHOWER FRAME	7/97	VJM
3	REVIEW THESE GENERAL NOTES	7/97	VJM
4	ADDED GENERAL NOTE	7/97	VJM



PLAN



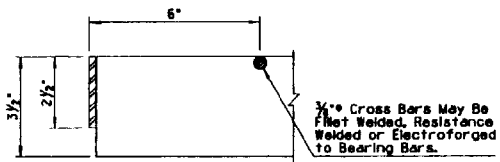
PLAN



3/8" Anchors. Delete on One End When Used with I-beam Support

SECTION

FRAME ②



SECTION A-A

GRATE ①

GENERAL NOTES

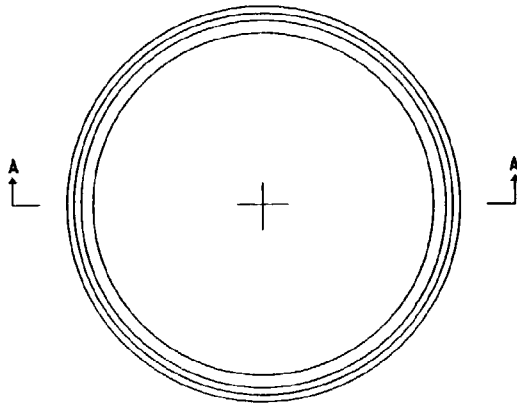
1. Grating units and frames shall be fabricated from structural steel ASTM A36 except as noted.
- ② 2. All welding shall be in accordance with Standard Welding Specifications.
3. The completed assembly shall be given one shop coat of No. 1 paint.
4. Frames and grates shall fit to a maximum rock of 0.093" at any point.
- ④ 5. Grate opening is 3.97 Sq. Ft.

DESIGN APPROVED <i>Joseph H. Ottman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR CONSTRUCTION <i>Paula</i>	CATCH BASIN, GRATES	DRAWING NO. C-15.50

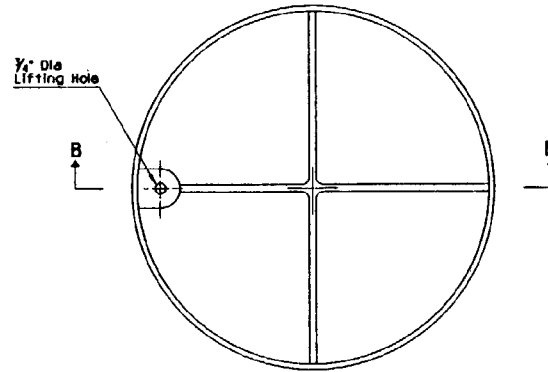
REVISIONS	DATE	BY

GENERAL NOTES

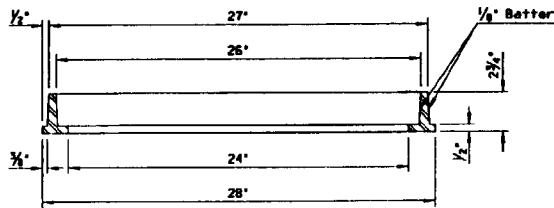
1. Cover shall be non-locking.
2. Frame and cover shall be cast iron or structural steel.
3. Catch basin access frame and cover is for use in sidewalk area only.
4. Cover shall be filled with concrete and broom finished.



PLAN

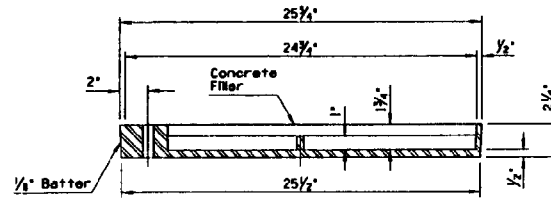


PLAN



SECTION A-A

FRAME

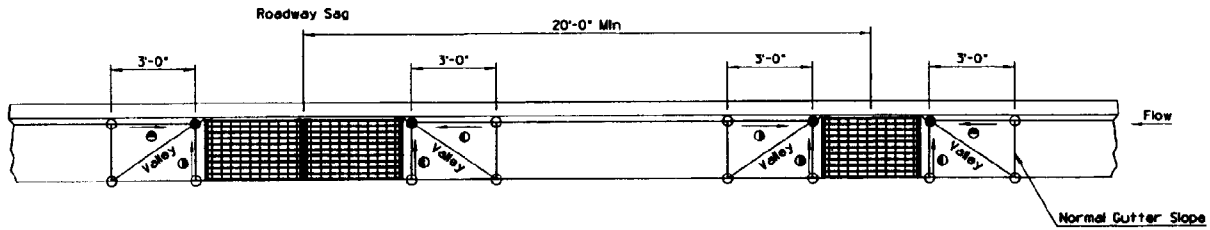


SECTION B-B

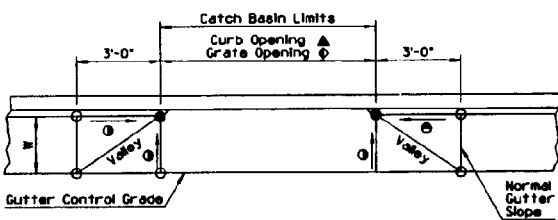
COVER

DESIGN APPROVED <i>Joseph H. Ottman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	ISSUE 5/97
APPROVED FOR DISTRIBUTION <i>R. ...</i>	CATCH BASIN ACCESS FRAME AND COVER DETAILS	DRAWING NO. C-15.65

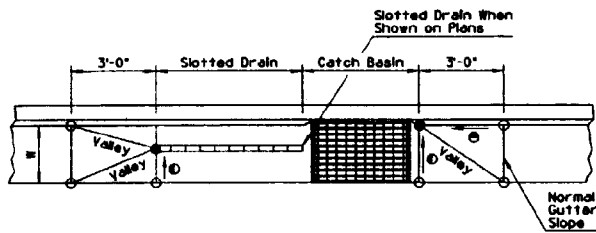
REVISION OR CHANGE	DATE	BY
1. REVISED STD FOR NEW FRAME	Feb	L/P/2
2. ADDED METAL TO SHOW INLET BUTTER	Feb	L/P/2
3. REVISED DATE	Feb	L/P/2



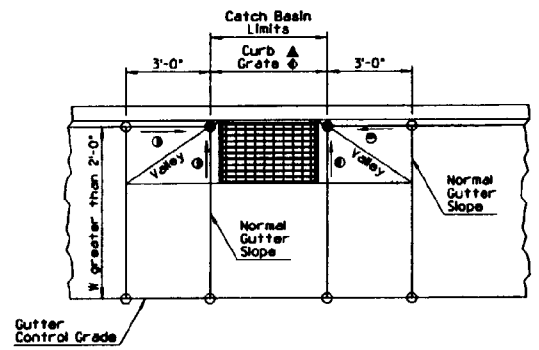
CATCH BASIN SPACING AT ROADWAY SAG CONDITION



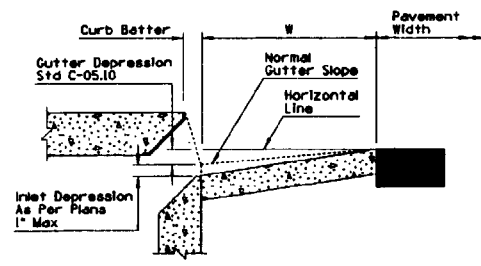
INLET DEPRESSION



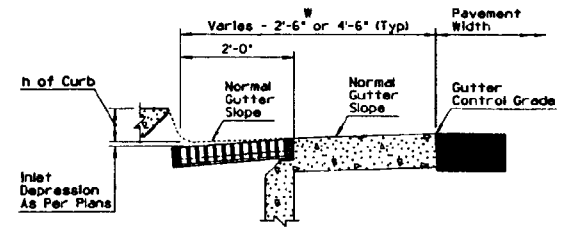
INLET DEPRESSION
CATCH BASIN WITH SLOTTED DRAIN



INLET DEPRESSION
CATCH BASIN WITH WIDE GUTTER



DETAIL NO. 1



DETAIL NO. 2

GENERAL NOTES

1. No inlet depression shall extend into a traffic lane.
2. Maximum combined inlet and gutter depression is 3 inches. See Detail No. 1.
3. Maximum distance along curb between catch basins where full gutter depression is used is 10 feet.
4. See Std. C-15.80 for aprons used with C-15.80 Catch Basin.
5. See Detail No. 2 for grate type catch basins with wide gutter.

LEGEND

- - Normal pavement or gutter flow line elevation.
- - Depressed elevation.
- ◐ - Straight grade with downward slope.
- W - Normal gutter width per Std. C-05.10.
- ▲ - Types 1, 3, & 5.
- ◊ - Type 4 & C-15.9L.

DESIGN APPROVED <i>Jerry H. Ottman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR CONSTRUCTION <i>[Signature]</i>	① CATCH BASIN MISC. DETAILS	DRAWING NO. C-15.70 Sheet 1 of 2

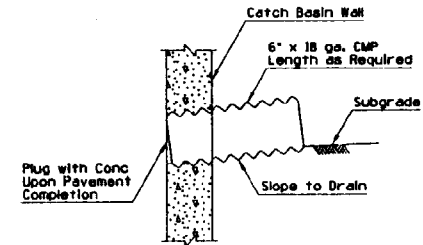
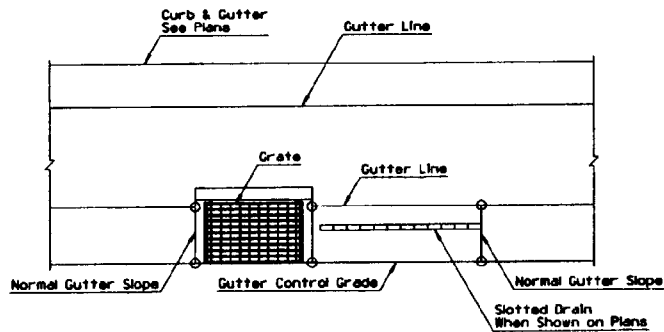
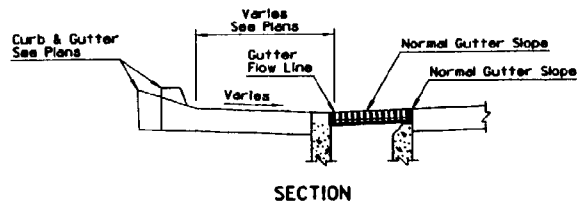
NO.	REVISION / DATE	BY

GENERAL NOTES

- Construction drain may be deleted at the option of the Engineer.

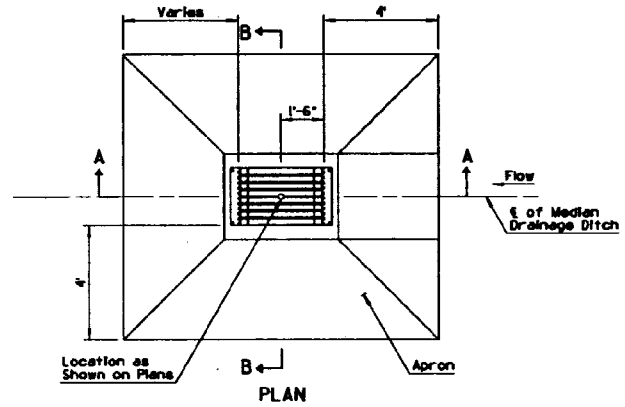
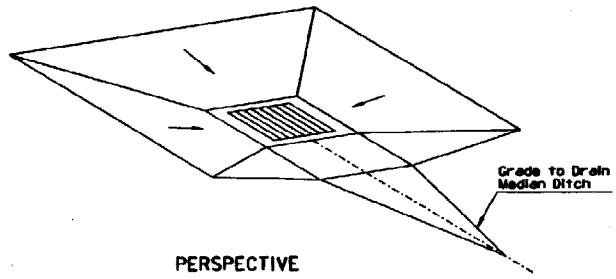
LEGEND

- - Normal pavement or gutter flow line elevation.



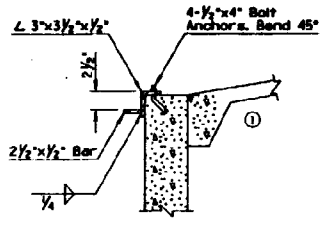
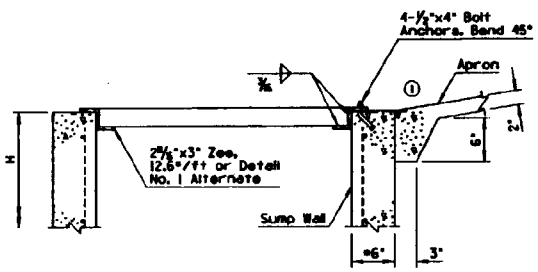
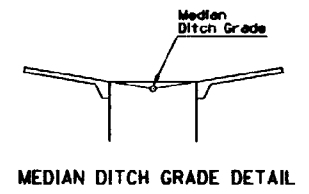
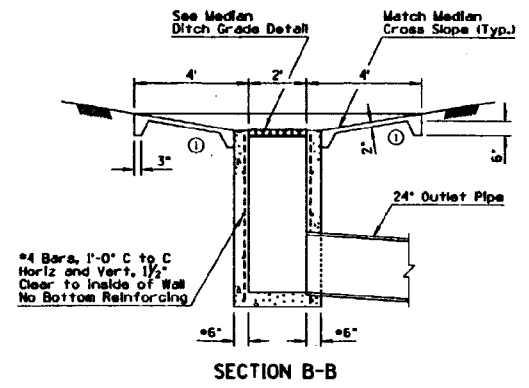
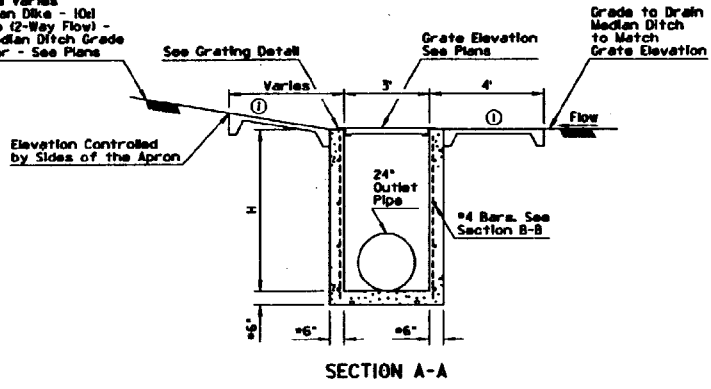
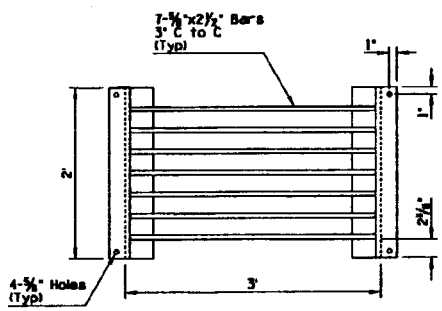
DESIGN APPROVED <i>Joseph H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	ISSUE 5/97
APPROVED FOR CONSTRUCTION <i>Paul Williams</i>	① CATCH BASIN MISC. DETAILS	DRAWING NO. C-15,70 Sheet 2 of 2

DESIGNED BY	DATE	REV.
1. DESIGN APPROVED TO PORTLAND CEMENT CONCRETE ONLY	7/97	5/97
2. REVISIONS	7/97	5/97
3.		
4.		



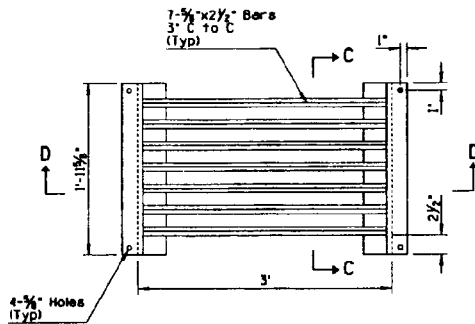
- ### GENERAL NOTES
1. Apron shall be portland cement concrete.
 2. All concrete shall be Class B.
 3. Grating shall be fabricated of structural steel.
 4. Structural steel shall be in accordance with ASTM A36.
 5. Welding shall be in accordance with Standard Welding Specifications.
 6. Grating assembly shall be given one shop coat of No. 1 paint.
 7. 'R' Indicated on plans.
 - 8" When Wall Height Exceeds 8"

2. Slope Varies Median Ditch - 10% Sump (2-Way Flow) - Median Ditch Grade Other - See Plans

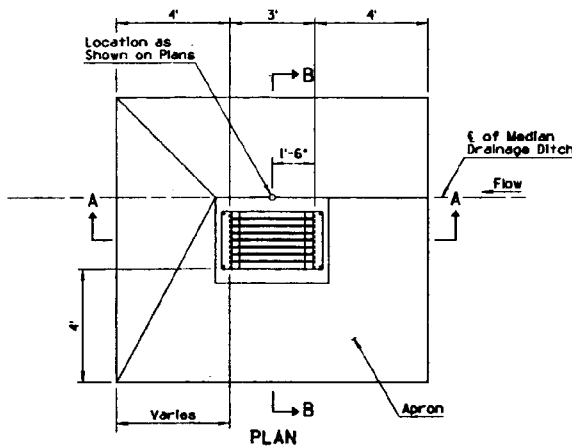


DESIGN APPROVED	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR CONSTRUCTION <i>Paul Miller</i>	CATCH BASIN, MEDIAN FLUSH	DRAWING NO. C-15.20

DESCRIPTION OR REVISION	DATE	BY
1 CHANGED APRON TO PORTLAND CEMENT CONCRETE ONLY	PHB	5/77
2 REVERSED SLOPE	PHB	5/77
3		
4		

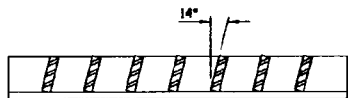


GRATING DETAIL

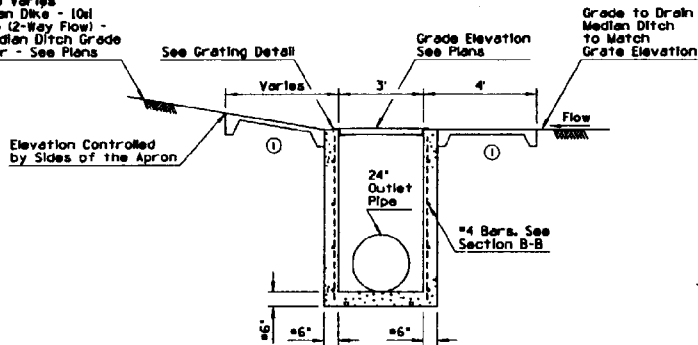


PLAN

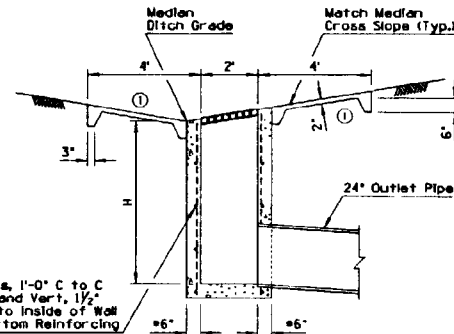
- ② Slope Varies Median Dike - 10ft Sump (2-Way Flow) - Median Ditch Grade Other - See Plans



SECTION C-C



SECTION A-A

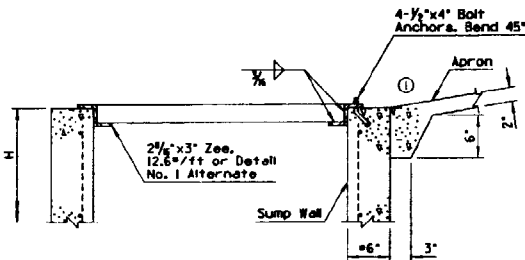


SECTION B-B

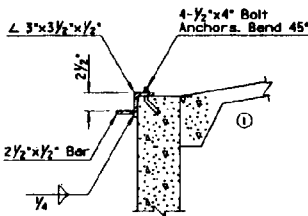
*4 Bars, 1'-0" C to C Horiz and Vert, 1 1/2" Clear to Inside of Wall No Bottom Reinforcing

Slope	A
6:1	0.50'
4:1	0.75'
3:1	1.00'
2:1	1.50'

WALL HEIGHT DETAIL



SECTION D-D



DETAIL NO. 1

DESIGN APPROVED <i>Lump A. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR DISTRIBUTION <i>Russell</i>	CATCH BASIN, MEDIAN SIDE SLOPE	DRAWING NO. C-15,81