



Arizona Department of Transportation

ROADWAY ENGINEERING GROUP

MEMORANDUM

To: All Users of the Construction Standard

Drawings- C-Standards

Date: July 19, 2001

From: John L. Louis

Assistant State Engineer

Roadway Engineering Group

Subject: C-Standards Revisions

Several revisions to the Construction Standard Drawings have been made and are included in a supplemental packet to be inserted into the April 2000 Construction Standard Drawings. Significant revisions included in the update are:

1. Standard C-15.92 Catch Basin frame has been modified to accept a revised Standard C-15.50 bicycle safe grate as an alternate for locations where bicycle traffic is allowed.
2. Guard rail height to top of rail has been revised from 27" to 28". This necessitates a corresponding 1" increase in the height of the thrie beam transition to concrete barrier.
3. Welding for catch basin frames and grates will conform to the requirements of Standard Specification 604-3.06 for structural steel.
4. PCCP joint details for transverse and longitudinal construction joints have been added to conform to current ADOT materials design practice. Weakened plane joints are revised to show only a single saw cut.
5. Standard Right of Way Markers have added a rebar to make them magnetically detectable. Brass caps require stamping with the surveyor's registration number to comply with state board regulations.

A listing of all the revised standards with a brief description of the revisions is shown on the following page.

Design personnel should review the revised drawings and incorporate the updates into their design plans as appropriate. Construction personnel should review the drawings for possible implementation with ongoing construction. Please arrange for additional copies for all users within your Group or District. Additional copies (8 1/2"x 11" or 11"x 17") may be obtained from Engineering Records at 602-712-8216.

An updated 1A sheet (List of Standards) is available at the Roadway Support Desk at 602-712-8667 or 8491.

Questions regarding the revisions may be directed to Tom Scheck (602-712-8674), Bob Trujillo (602-712-7383) or Terry Otterness (602-712-4285).

JLL/THO

C:	
Roadway Engineering Group	Regional Traffic Engineers (4)
Traffic Group	Materials Group
Valley Freeway Group	Local Government Section
Statewide Project Management Group	Engineering Consultant Services
Districts (10)	Central Maintenance Group
FHWA	District Permits (9)
Bridge Group	Contracts and Specifications Section
Construction Group	Engineering Records

Standard -- Revision

6.10 - eliminate old Type B turnout
7.01 - Sh. 1- PCCP Joint Updates
10.01,10.02- revised general note
10.03 - Sh. 1 - complete update of drawing
10.03 - Sh. 2 – deleted
10.06 - update transition
10.20, 10.21, 10.22 2 Sh.-raise guard rail height
10.23 - deleted
10.24 - update thrie beam transition
10.28 2 Sh.- clarify posts, add note for application
10.29 2 Sh – clarify posts, increase guard rail height
10.30,10.31- raise thrie beam transition, add special block
10.32 – raise thrie beam, change sleeve requirement
10.45 – raise guard rail height
10.62, 10.63 – revised general note 8
10.65 – delete previous note 4
10.70, 10.71, 10.72, 10.73 (2 sh. each) – raise thrie beam 1”, revise sleeve
13.60, 13.75, 15.10, 15.20, 15.40- new welding specification
15.50 – revise grate dimensions
15.80, 15.81, 15.90, 15.91 (2 sh) – new welding specification
15.92 – revised catch basin frame
21.10 – add rebar for magnetic detection


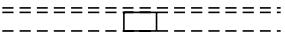
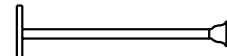
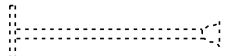

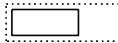
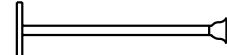
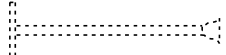


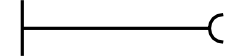
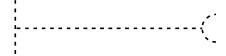


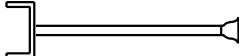
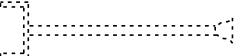


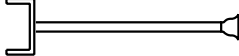
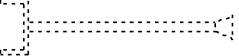
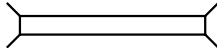
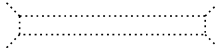
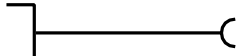

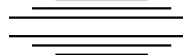
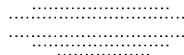
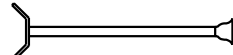
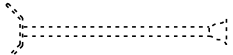
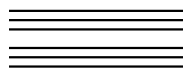
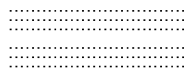
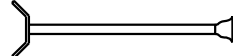
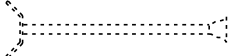
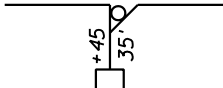
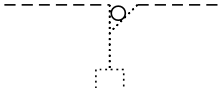
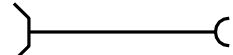
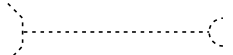
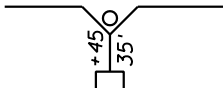
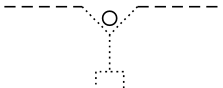
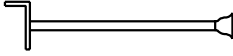
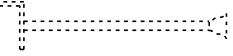


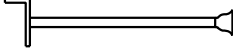
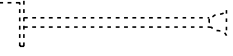


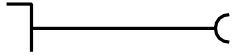
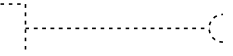


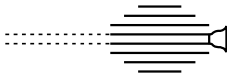



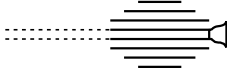

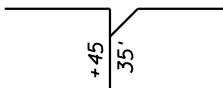
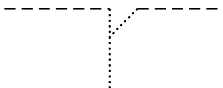
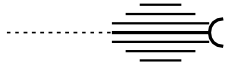

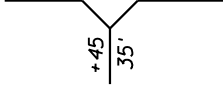

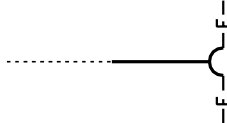

21.20 – add notes for surveyor ID stamp

2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

	CONSTRUCTION DRAWING SYMBOLS			CONSTRUCTION DRAWING SYMBOLS	
	NEW FEATURES	EXISTING FEATURES		NEW FEATURES	EXISTING FEATURES
City Limits			Section Corner		
County Line			Survey Control Point		
Forest or Reservation Boundry			Bench Mark		
Property Line			Access Control		
Mid Section or Quarter Section Line			Sidewalk, Curb & Gutter w/Depressed Curb (l"=50' or larger)		
Right of Way Line			Curb & Gutter with Depressed Curb (l"=100')		
Section Line			Curb, Single with Depressed Area		
Sixteenth Line			Pavement and Sidewalk Edge		
National, State Boundry			Turnout		
Township or Range Line			Top of Cut		
Temporary Construction Easement			Toe of Fill		
Mile Post Marker			Transition, Cut to Fill		
Right of Way Marker			Railroad Track (l"=50' or larger)		
Survey Monument			Railroad Track (l"=100')		
Angle Point or PI			Bank Protection		
Centerline, Station Marks			Bridge		
Quarter Corner			Building		
			<div><div>DESIGN APPROVED </div><div>APPROVED FOR DISTRIBUTION </div></div>		
			<div>STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS</div>		
			<div><div>1 SYMBOL LEGEND</div><div>REV. 7/94 DRAWING NO. C-01.10</div></div>		

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

	CONSTRUCTION DRAWING SYMBOLS			CONSTRUCTION DRAWING SYMBOLS	
	NEW FEATURES	EXISTING FEATURES		NEW FEATURES	EXISTING FEATURES
Catch Basin, Curb & Gutter -----			Straight Hdwl w/End Sct, Pipe (I"=20') (All Dia) -----		
Catch Basin, Median Dike -----			Straight Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=42" and larger) -----		
Catch Basin, Off Roadway, Flush -----			Straight Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=36" and smaller) -----		
Catch Basin, Single Curb -----			"U" Hdwl w/End Sct, Pipe (I"=20') (All Dia) -----		
Cattle Guard -----			"U" Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=42" and larger) -----		
Concrete Box Culvert -----			"U" Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=36" and smaller) -----		
Dike, Median -----			Wing Hdwl w/End Sct, Pipe (I"=20') (All Dia) -----		
Dike -----			Wing Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=42" and larger) -----		
Downdrain, one way -----			Wing Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=36" and smaller) -----		
Downdrain, two way -----			"L" Hdwl w/End Sct, Pipe (I"=20') (All Dia) -----		
Manhole -----			"L" Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=42" and larger) -----		
Manhole, Frame & Cover, Reset -----			"L" Hdwl w/End Sct, Pipe (I"=50' or smaller) (Dia=36" and smaller) -----		
Retaining Wall -----			Pipe Ext W/End Sct & Berm (I"=20') (All Dia) -----		
Rock Riprap -----			Pipe Ext W/End Sct & Berm (I"=20') (I"=50' or smaller) (Dia=42" and larger) -----		
Spillway, one way -----			Pipe Ext W/End Sct & Berm (I"=20') (I"=50' or smaller) (Dia=36" and smaller) -----		
Spillway, two way -----			Pipe Ext W/End Sct Roadway Widening (I"=20') -----		

			DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
			APPROVED FOR DISTRIBUTION 	① SYMBOL LEGEND	DRAWING NO. C-01.11	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED SYMBOL FOR GUARD RAIL EXTRUDER TERMINAL	PNB	10/95
2			
3			
4			

CONSTRUCTION DRAWING SYMBOLS			CONSTRUCTION DRAWING SYMBOLS		
NEW FEATURES		EXISTING FEATURES	NEW FEATURES		EXISTING FEATURES
Plan View, Bituminous Pavement			Irrigation Ditch, Concrete		
Plan View, Concrete Pavement			Irrigation Ditch, Earth		
Plan View, Graded Surface			Irrigation Line (I"=20')		
Plan View, Obliterate Pavement			Irrigation Line (I"=100')		
Plan View, Wood			Overhead Power/Joint Use Line		
Section, Asphaltic Concrete Friction Course			Overhead Telephone Line		
Section, Bituminous Pavement			Sanitary Sewer (I"=20')		
Section, Concrete			Sanitary Sewer (I"=100')		
Section, Metal			Storm Drain (I"=20') & (I"=50')		
Section, Wood			Storm Drain (I"=100')		
Section, Aggregate Base			Street Light and With Mast Arm		
Section, Ground Line			Telephone/Power Pedestal		
Ground Line Profile			Utility Pole with Down Guy and Anchor		
Barbed Wire Fence & Gate			Underground Power/Joint Use Line		
Chain Link Fence & Gate			Underground Telephone Line		
Guard Rail & Breakaway Cable Terminal			Water/Gas Meter Box		
① Guard Rail & Guard Rail Extruder Terminal			Water/Gas Valve		
Gas Line					

DESIGN APPROVED

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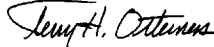
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS
SYMBOL LEGEND
REV. 10/95
DRAWING NO. C-01.12


NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED SYMBOL	PNB	10/95
2			
3			
4			

	CONSTRUCTION DRAWING SYMBOLS			CONSTRUCTION DRAWING SYMBOLS	
	NEW FEATURES	EXISTING FEATURES		NEW FEATURES	EXISTING FEATURES
Water Line			① Depressed Index Contour Line		
Drainage Channel			Depressed Intermediate Contour Line		
Drainage Ditch			Block Wall (1"=20')		
Major Wash			Median Barrier		
Minor Wash			Fire Hydrant		
℄ Grade, Profile			Standpipe		
Hedge			Transmission Tower		
Palm Tree			Windmill		
Shrubbery			Mail Box		
Unclassified Tree			Flag Pole		
Sign, Single Post			North Arrow		
Sign, Multiple Post					
Dimensions					
Visible Outlines, Sections, etc...					
Index Contour Line					
① Intermediate Contour Line					

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CORRECTED SPELLING	PNB	10/95
2	DELETED ABBREVIATION	PNB	10/95
3	REVISED ABBREVIATION	PNB	10/95
4	ADDED ABBREVIATION	PNB	10/95

WORDS	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION
A		B (cont)		C (cont)	
Abutment	Abt	Bituminous Surface Treatment	BST	④ Corrugated High Density Polyethylene Plastic Pipe	CHDPEPP
Acceleration	Acc	Bituminous Treated Base	BTB	Corrugated Steel Pipe	CSP
Acres	Ac	Black Steel Pipe	BSP	Corrugated Steel Pipe Arch	CSPA
Aggregate	Agg	Borrow	Bor	County	Co
Aggregate Base	AB	Boulevard	BLVD, Blvd	Crossing	X-ING
Ahead	AHD, Ahd	Boundary	③ Bdry	Cross Section	X-SECT
Alternate	Alt	Brass Cap	BC	Crown	Cr
Aluminum	Al	Breakaway Cable Terminal	BCT	Cubic	Cu
American Association of State Highway and Transportation Officials	AASHTO	Bridge	Br	Cubic Feet Per Second	CFS
American Concrete Institute	ACI	Building	Bldg	Cubic Yard or Cubic Yards	CY, Cu Yd
American Institute of Steel Construction	AISC	C		Culvert	③ Culv
① American Road and Transportation Builders Association	ARTBA	Calculated	Calc	Curb and Gutter	C&G
American Society for Testing Materials	ASTM	Cast-In-Place	C-I-P	Curve to Spiral	CS
Amount	Amt	Cast Iron	CI	D	
Approach	Appr	Cast Iron Pipe	CIP	Deceleration	Dcl
Approximate	Approx	Catch Basin	CB	Deflection	Def
Asphalt	Asph	Cattle Guard	CG	Deflection of Total Curve	I
Asphalt Rubber	AR	Cement	Cem	Degree of Curve	D
Asphalt Rubber ACFC	ARACFC	Cement Treated Base	CTB	Delineator	Del
Asphaltic Concrete	AC	Center	Ctr	Delta	Δ
Asphaltic Concrete Base	ABC	Center Line	℄	Depressed Curb	DC
Asphaltic Concrete Friction Course	ACFC	Center to Center	C to C	Design Speed	Des Spd
Asphaltic Concrete Surface Course	ACSC	Channel	Chan	Detail	Dtl
Avenue	AVE, Ave	Class	Cl	Diameter	Dia
Average Daily Traffic	ADT	Clear	Clr	Distance	Dist
B		Column	Col	Division	Div
Back	BK, Bk	Compact or Compaction	Comp	Double	Dbl
Backfill	Bkfl	Complete In Place	C in P	Drain or Drainage	Drn
② Balance	Bal	Concrete	Conc	Drainage Area	DA
Bank Protection	Bank Prt	Concrete Box Culvert	CBC	Drawing	Dwg
Barbed Wire	BW	Concrete Treated Base	CTB	Drive	Dr
Bearing	Brg	Connection	Conn	Driveway	Dwy
Begin	Bgn	Conduit	Cond	Ductile Iron Pipe	DIP
Begin Curb Return	BCR	Construct or Construction	Cst	E	
Begin Full Super	BFS	Continous	Cont	Each	Ea
Bench Mark	BM	Coordinate	Coord	Easement	Esmt
Bevel or Beveled	Bev	Corner	Cor	East	E
Bituminous	Bit	Correction	Corr	Eastbound	EB
Bituminous Mixture	Bit Mix	Corrugated Aluminum Pipe	CAP		
		Corrugated Aluminum Pipe Arch	CAPA		

DESIGN APPROVED


APPROVED FOR DISTRIBUTION


STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

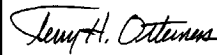
REV.
10/95


GENERAL ABBREVIATIONS

DRAWING NO.
C-01.30

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SPELLING	PNB	10/95
2	REVISED ABBREVIATION	PNB	10/95
3	ADDED ABBREVIATION	PNB	10/95
4			

WORDS	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION
E (cont)		G (cont)		M (cont)	
Edge of Pavement	EP	Ground	Gnd	Mile or Miles	MI
Electric, Electricity	Elec, E	③ Ground Compaction	Gnd Comp	Mile Post	MP
Elevation	Elev	Grubbing	Grb	Miles Per Hour	MPH
Embankment	Emb	Guard	Grd	Mineral Aggregate	MA
End Curb Return	ECR	Guard Rail	GR	Minimum	Min
① End Full Superelevation	EFS	③ Guard Rail Extruder Terminal	GET	Miscellaneous	Misc
Engineer	Engr	H		Modify or Modified	Mod
Entrance	Ent	Headwall	Hdwl	Monument	Mon
Equation	EQ, Eq	Height	Ht, H, h	Mountain	Mt
Estimate	Est	Height of Instrument	HI	N	
Excavation	② Exc	Head Water	HW	National	Natl
Existing	Exst	Highway	Hwy	Non-Reinforced Cast-In-Place	NRCIPCP
Expansion Joint	Exp Jt	Horizontal	② Horz	Concrete Pipe	
Extend or Extension	Ext	Horizontal Elliptical Reinforced	HERCP	Normal Crown	NC
External	Ext	Concrete Pipe		North	N
F		I		Northbound	NB
Federal	Fed	Improvement	Impr	Number	No
Feet or Foot	Ft	Inch or Inches	In	O	
Feet per Foot	$\frac{ft}{ft}$	Include, Included or Inclusive	Incl	Obliterate	Obl
Feet Per Second	FPS	Inside Diameter	ID	Original	Orig
Figure	Fig	Invert	Inv	Outside Diameter	OD
Finish	Fin	Irrigation	Irr	Overhead	OH
Floor	Fl	J		Overpass	OP
Flow Line	FL	Joint	Jt	P	
Footing	Ftg	Junction	Jct	Parkway	Pkwy
Forest	Fst	L		Pavement	Pvmt
Found	Fnd	Laboratory	Lab	Pedestrian	Ped
Frame	Fr	Lateral	Lat	Place	Pl
Freeway	Fwy	Left	Lt	Point	Pt
Frontage	Frt	Length or Length of Curve	L	Point of Compound Curvature	PCC
Furnish or Furnished	Furn	③ Length of Normal Crown Removal	L _C	Point of Curvature	PC
Future	Fut	③ Length of Spiral	L _S	Point of Intersection	PI
G		③ Length of Superelevation Runoff	L _S	Point of Reverse Curvature	PRC
Gas	G	Line	Ln	Point of Tangency	PT
Gas Meter	GM	Linear or Lineal	Lin	Point on Curve	POC
Gas Valve	GV	Linear Feet	Lin Ft	① Point on Semi-Tangent	POST
Galvanize or galvanized	Galv	Location	Loc	Point on Spiral	POS
Gauge	Ga	M		Point on Tangent	POT
Government	② Gov't	Manhole	MH	Polyethylene	PE
Grade	Gr	Material	Mtl		
Grade Separation	GS	Maximum	Max		
		Median	Med		

DESIGN APPROVED


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STATE OF ARIZONA
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DIVISION OF HIGHWAYS
STANDARD DRAWINGS

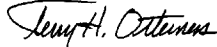
REV.
10/95


GENERAL ABBREVIATIONS

DRAWING NO.
C-01.31

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SPELLING	PNB	10/95
2	DELETED TWO ABBREVIATIONS	PNB	10/95
3	REVISED ABBREVIATION	PNB	10/95
4			

WORDS	ABBREVIATION	WORDS	ABBREVIATION	WORDS	ABBREVIATION
P (cont)		S		T (cont)	
Polyvinyl Chloride	PVC	Salvage	Salv	Telephone	Tel
Portland Cement Concrete	PCC	Section	Sct	Temporary	Temp
Portland Cement Concrete Pavement	PCCP	Select Material	SM	Temporary Construction Easement	TCE
Pounds	Lbs	Sheet	Sh	Timber	Tbr
Pounds Per Square Inch	PSI	Shoulder	Shldr	Top of Curb	TC
Preliminary	Prelim	Shrinkage	Shr	Topography	Topo
① Prestress, Prestressed or Prestressing	PS	② Sidewalk	Swk	Township	T
Project	Prj	Sight Distance-Stopping	SDs	Traffic Interchange	TI
Property Line	P/L	Single	Sgl	Transition	Trns
Proposed	Prop	Skew	Sk	Turning Point	TP
Protection	Prt	South	S	Turnout	TO
Provision or Provide	Prv	Southbound	SB	Typical	Typ
Q		Special	Spcl	U	
Quadrant	Quad	Specification	Spec	Underground	Ugnd
Quantity or Quantities	Quan	Spiral Rate of Change	a	Underpass	UP
Quantity of Drainage Runoff	Q	Spiral To Curve	SC	V	
R		Spiral To Tangent	ST	Variable	Var
Radius	R	Square	Sq	Vertical	Vert
Railroad	RR	Square Feet	Sq Ft	Vertical Curve	VC
Range	R	Square Yard	Sq Yd	Vertical Elliptical Reinforced	VERCP
Reconstruct	Recst	Standard	Std	Concrete Pipe	
Reference	Ref	State Route	SR	Vertical Point of Intersection	VPI
Reinforced or Reinforcing	Reinf	Station	Sta	Viaduct	Via
Reinforced Concrete	RC	Street	St	Vitrified Clay Pipe	VCP
Reinforced Concrete Pipe	RCP	Structure or Structural	Str	Volume	Vol
Reinforced Concrete Pipe Arch	RCPA	Subdivision	Subdiv	W	
Reinforcing Bar	Rebar	Subgrade	SG	Water	W
Relocate, Relocation or Relocated	Reloc	Subgrade Seal	SS	Water Meter	WM
Remove	Rem	Superelevation	③ e or Super	Water Valve	WV
Required	Reqd	Surface	Surf	Welded Wire Fabric	WWF
Reservation	Resv	Survey	Sur	West	W
Residence	Res	Swell	Sw	Westbound	WB
Retain or Retaining	Ret	① Symmetrical	Sym	Western Wood Products Association	WWPA
Revised or Revision	Rev	T		Wide or Width	W
Right	Rt	Tangent	Tan	Wood	Wd
Right of Way	R/W	Tangent Length	T	Y	
Road	Rd	Tangent to Spiral	TS	Yard	Yd
Roadway	Rdwy	Telegraph	Tig		
Route	Rte				
Rubber Gasket Reinforced Concrete Pipe	RGRCP				

DESIGN APPROVED


APPROVED FOR DISTRIBUTION


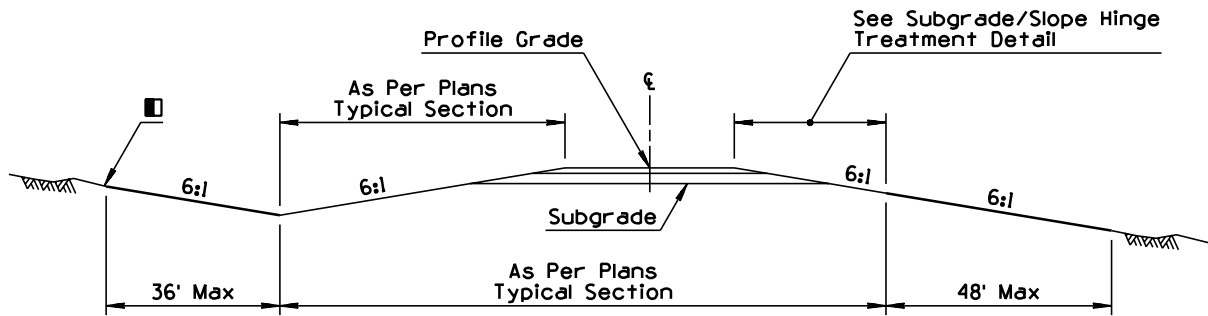
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

REV.
10/95

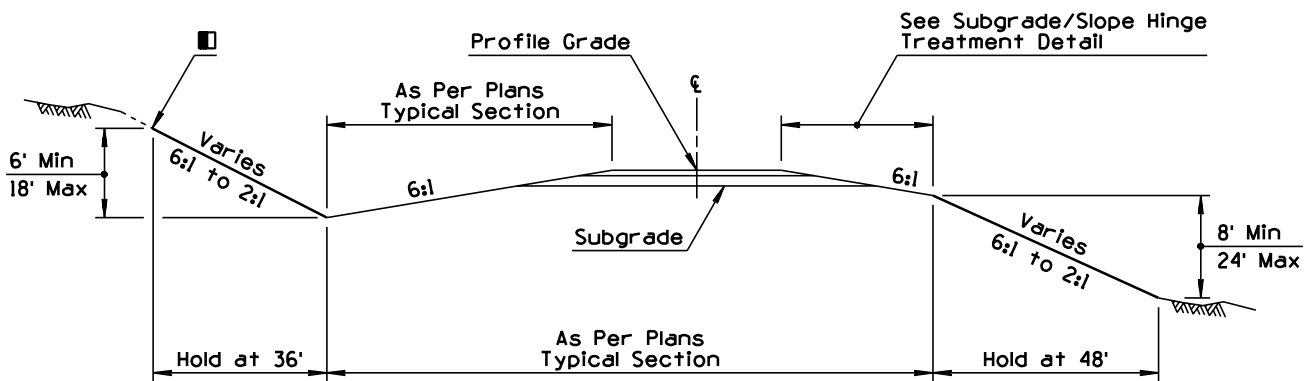
GENERAL ABBREVIATIONS

DRAWING NO.
C-01.32

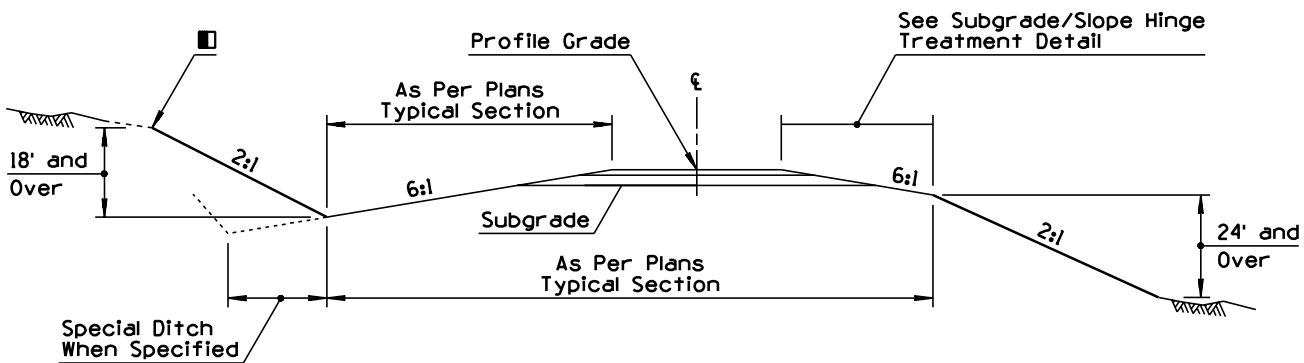
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED SLOPE ROUNDING DETAIL	PNB	1/93
2	MODIFIED SHOULDER WEDGE DETAIL	TC	1/93
3			
4			



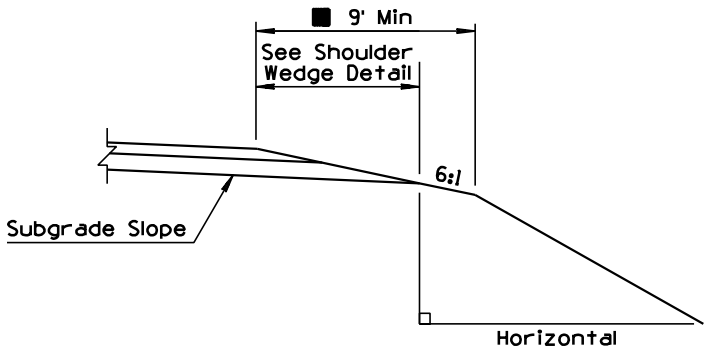
MINIMUM SLOPES



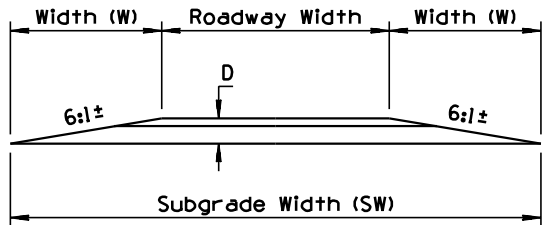
INTERMEDIATE SLOPES



MAXIMUM SLOPES



SUBGRADE/SLOPE HINGE
TREATMENT DETAIL

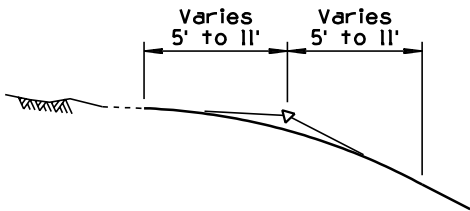


$$W = D \times \text{Slope (6:1)}$$

$$D = \text{Str Sec Depth (ft) excluding ACFC}$$

$$SW = 2 \times W + \text{Roadway Width}$$

② SHOULDER WEDGE DETAIL



① SLOPE ROUNDING DETAIL

Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded. For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut add 1' to semi-tangent to 11' maximum.

①

SLOPES
INTERSTATE

REV.

1/93

DRAWING NO.

C-02.10

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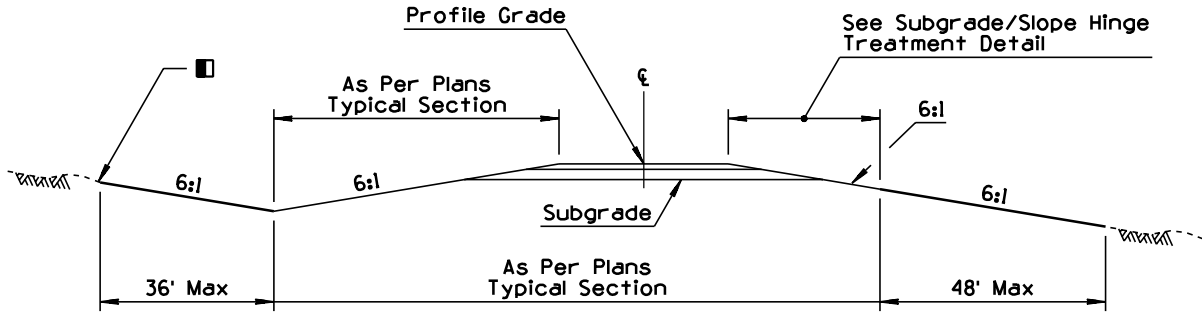
Ronald C. Williams

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

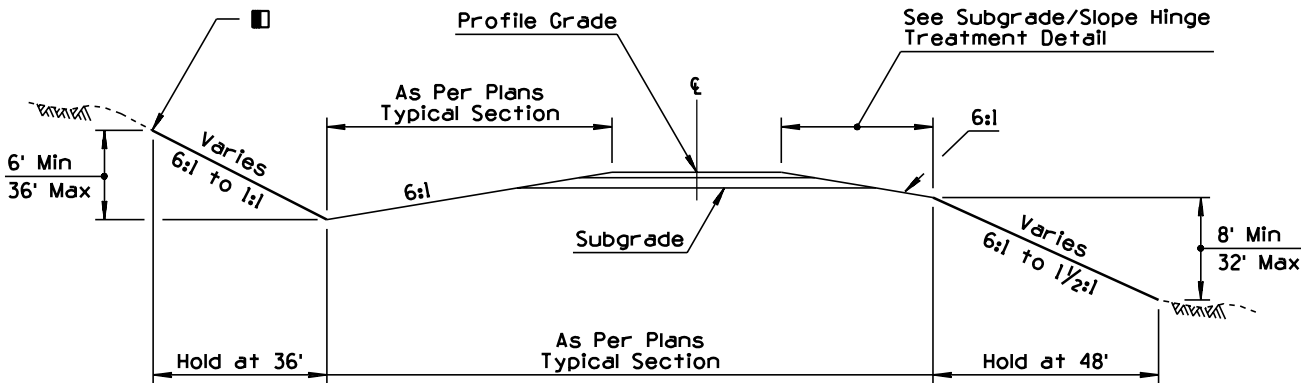
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED SLOPE ROUNDING DETAIL	PNB	1/93
2	CORRECTED FILL HEIGHT CALLOUT	TC	1/93
3	MODIFIED SHOULDER WEDGE DETAIL	TC	1/93
4			

GENERAL NOTES

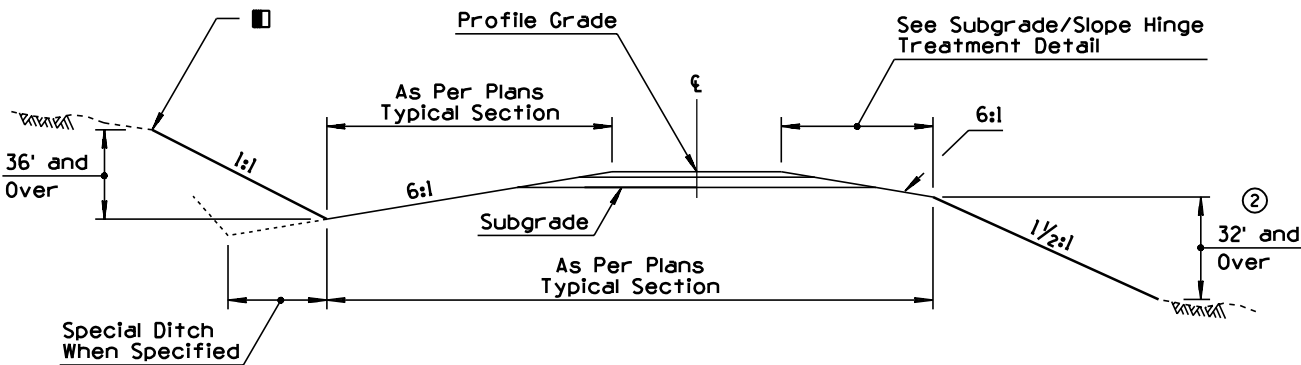
- Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.
 - Design highwater should not be located above the subgrade in unpaved ditch.
 - Pavement structure slope is nominal. Actual slope is controlled by (D). See Shoulder Wedge Detail.
 - Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.
 - When median slopes intersect, see project plans for controls.
 - These slopes are intended to be used with new or reconstructed roadways.
- The 9' min is required when guard rail is utilized on the project. Treatment shall be uniform throughout the project length. The 9' requirement may be waived under special conditions where guard rail is not utilized. The 9' min shall not be waived when the thickness of structure section has not been finalized.



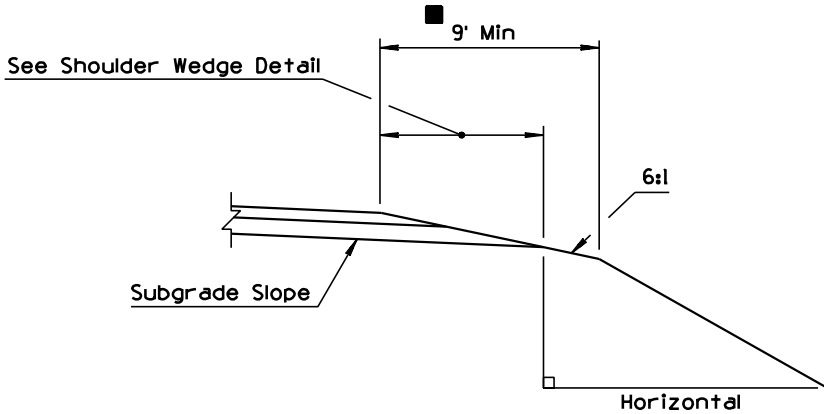
MINIMUM SLOPES



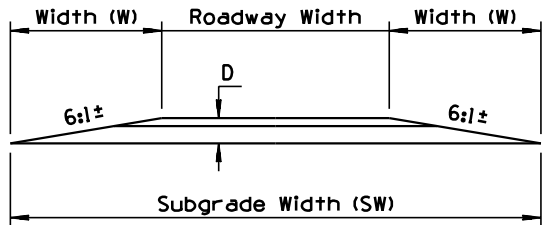
INTERMEDIATE SLOPES



MAXIMUM SLOPES



SUBGRADE/SLOPE HINGE TREATMENT DETAIL

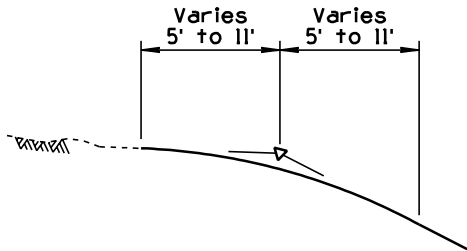


$$W = D \times \text{Slope (6:1)}$$

$$D = \text{Str Sec Depth (ft) excluding ACFC}$$

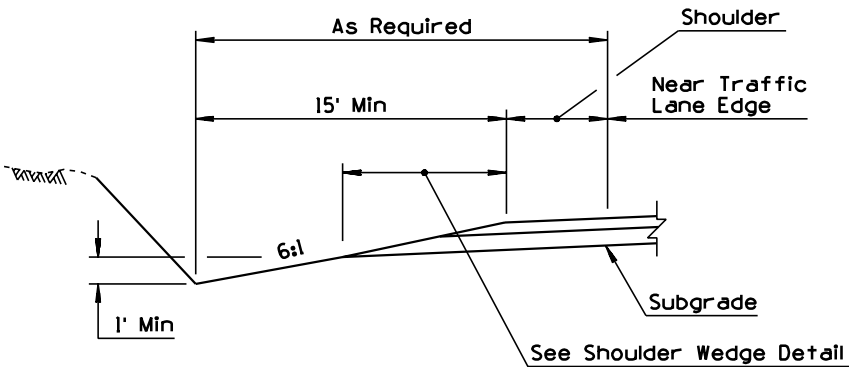
$$SW = 2 \times W + \text{Roadway Width}$$

③ SHOULDER WEDGE DETAIL



① ■ SLOPE ROUNDING DETAIL

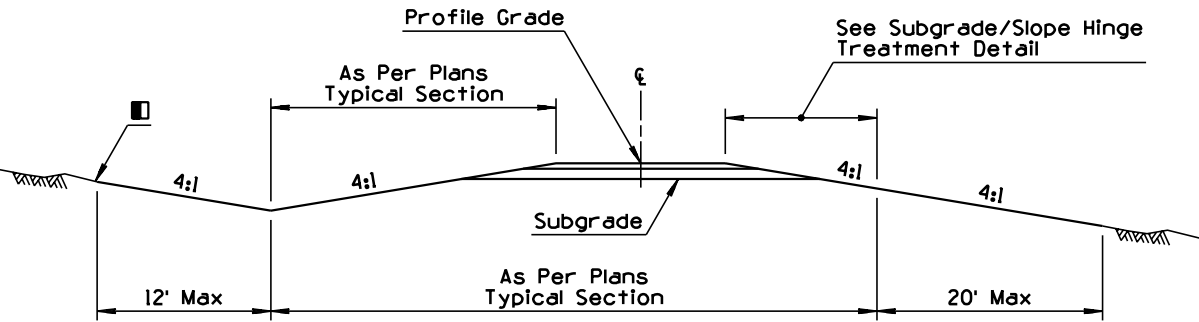
Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded. For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut add 1' to semi-tangent to 11' maximum.



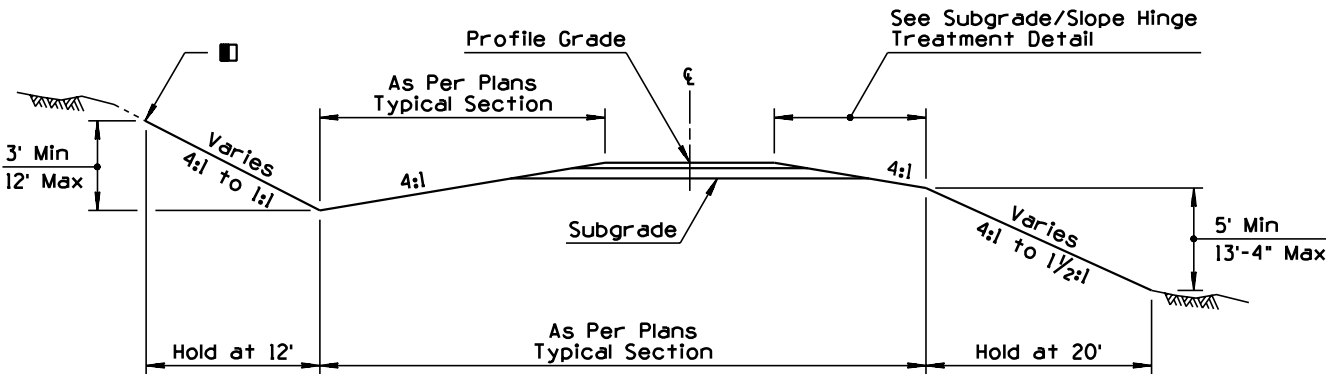
MINIMUM DITCH CONDITIONS DETAIL

DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 1/93
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SLOPES PRIMARY ROADWAYS	DRAWING NO. C-02.20

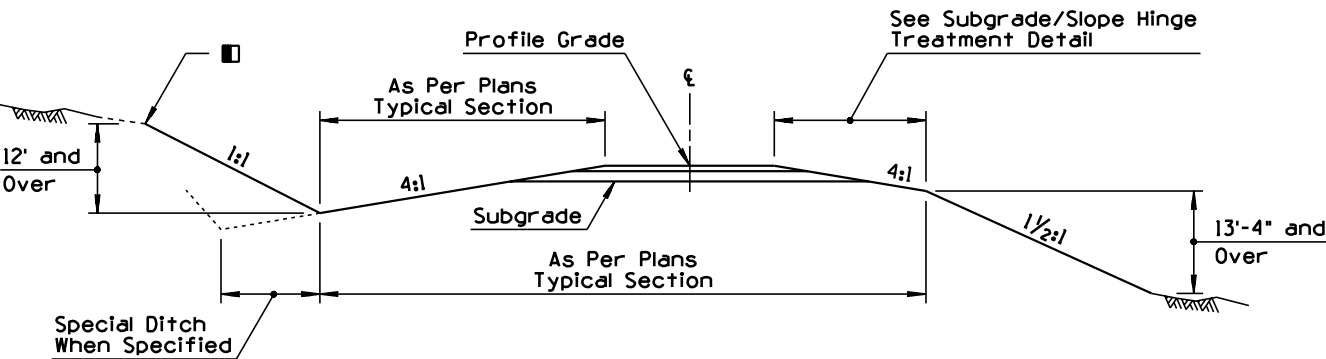
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED 9' DIMENSION TO 6'	PNB	10/95
2			
3			
4			



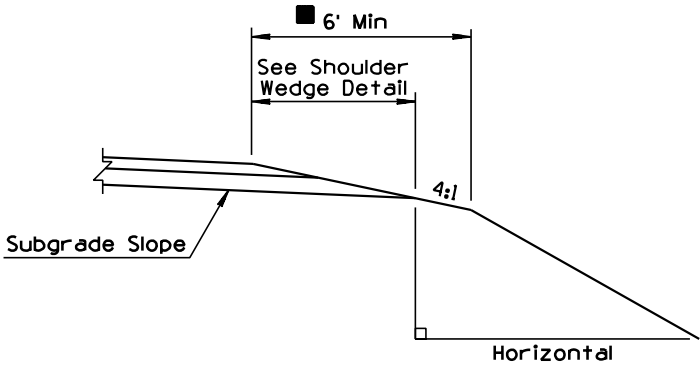
MINIMUM SLOPES



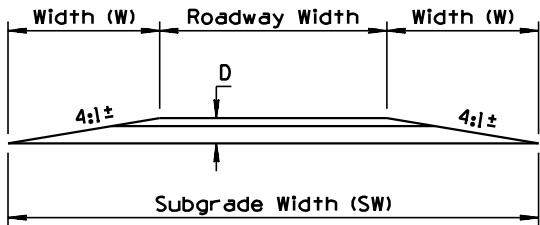
INTERMEDIATE SLOPES



MAXIMUM SLOPES



SUBGRADE/SLOPE HINGE TREATMENT DETAIL

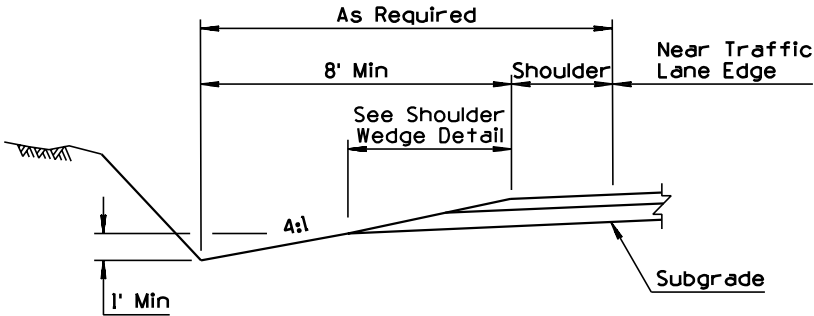


$$W = D \times \text{Slope (4:1)}$$

$$D = \text{Str Sec Depth (ft) excluding ACFC}$$

$$SW = 2 \times W + \text{Roadway Width}$$

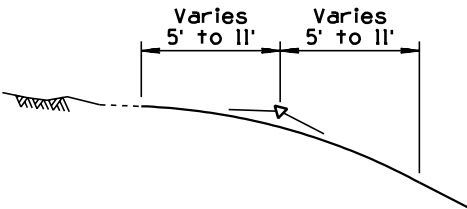
SHOULDER WEDGE DETAIL



MINIMUM DITCH CONDITIONS DETAIL

GENERAL NOTES

- Roadway width, cut ditch width, cross slope, and pavement structure section will be shown on project plans.
 - Design highwater should not be located above the subgrade in unpaved ditch.
 - Pavement structure slope is nominal. Actual slope is controlled by (D). See Shoulder Wedge Detail.
 - Slopes beyond the pavement structure, such as embankment and cut slopes, are relative to horizontal.
 - These slopes are intended to be used with new or reconstructed roadways.
- ① ■ The 6' min is required when guard rail is utilized on the project. Treatment shall be uniform throughout the project length. The 6' requirement may be waived under special conditions where guard rail is not utilized. The 6' min shall not be waived when the thickness of structure section has not been finalized.

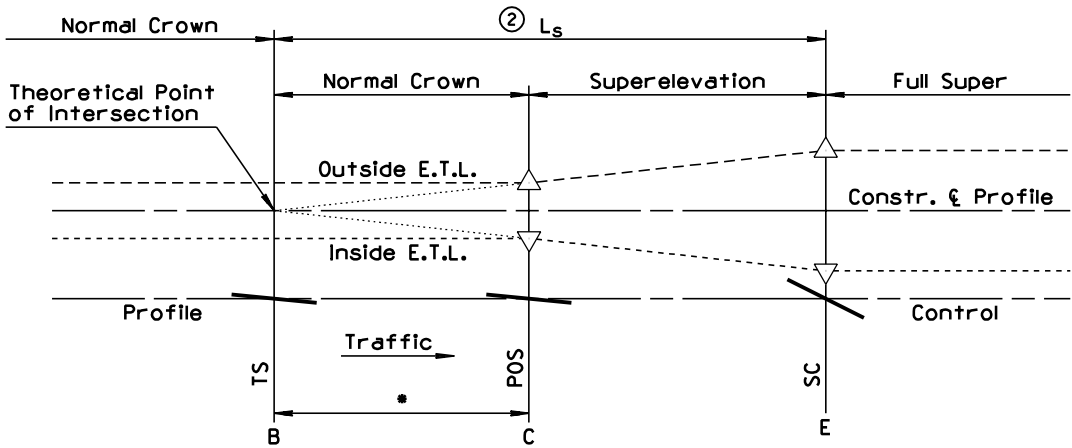


■ SLOPE ROUNDING DETAIL

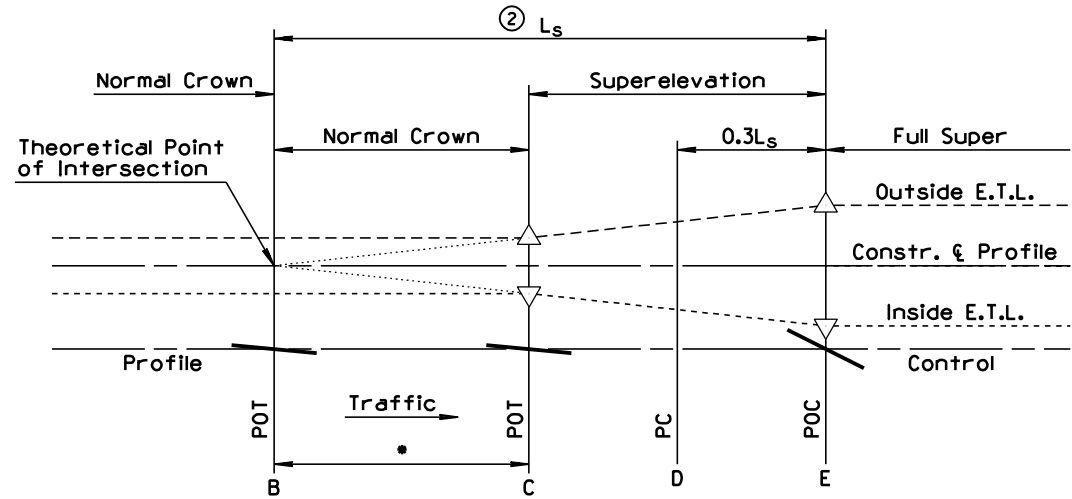
Except in solid rock, or as directed by the Engineer, the intersection of roadway cut slopes with the ground surfaces shall be rounded. For cuts up to 6', use 5' semi-tangents for slope rounding. For each additional foot of cut add 1' to semi-tangent to 11' maximum.

DESIGN APPROVED <i>Terry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SLOPES SECONDARY/MISC ROADWAYS	DRAWING NO. C-02.30

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED ABBREVIATION TO LEGEND	PNB	10/95
2	REPLACED TEXT WITH ABBREVIATION	PNB	10/95
3			
4			

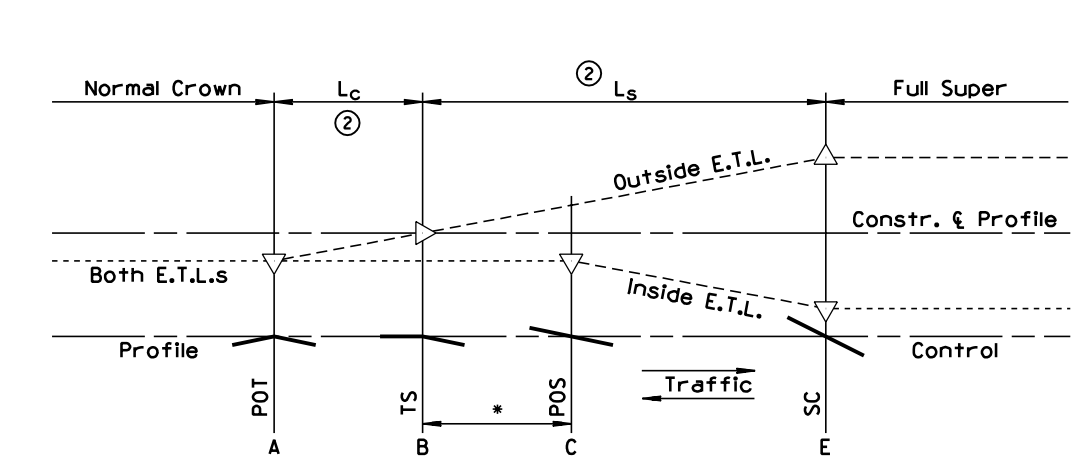


SPIRAL CURVE TRANSITION



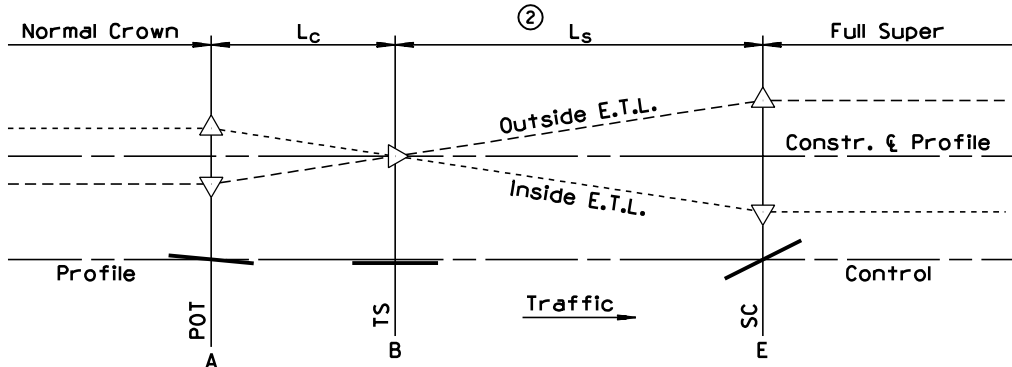
CIRCULAR CURVE TRANSITION

1-WAY ROADWAY-AXIS OF ROTATION AT CONSTR. & HIGH POINT OF NORMAL CROWN ON OUTSIDE OF CURVE RIGHT TURNING ROADWAY

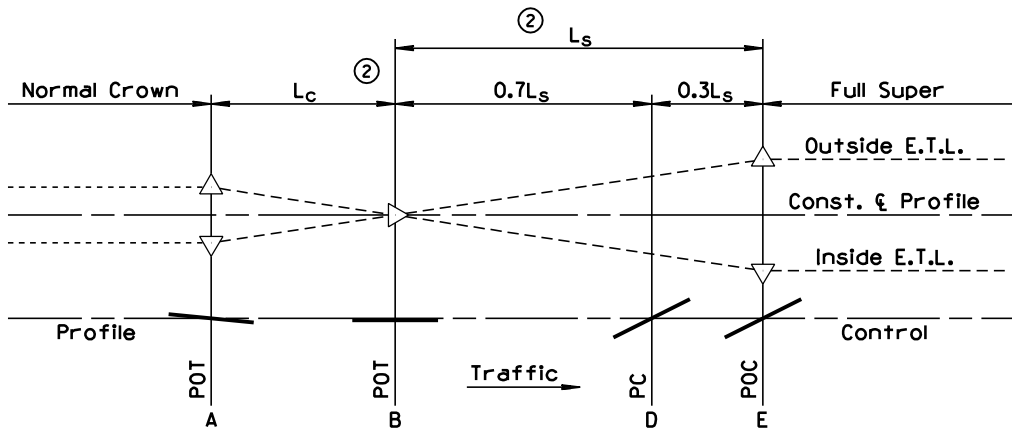


SPIRAL CURVE TRANSITION

2-WAY ROADWAY-AXIS OF ROTATION AT & (FOR OPPOSITE DEFLECTING CURVE, E.T.L. PROFILES ARE REVERSED)

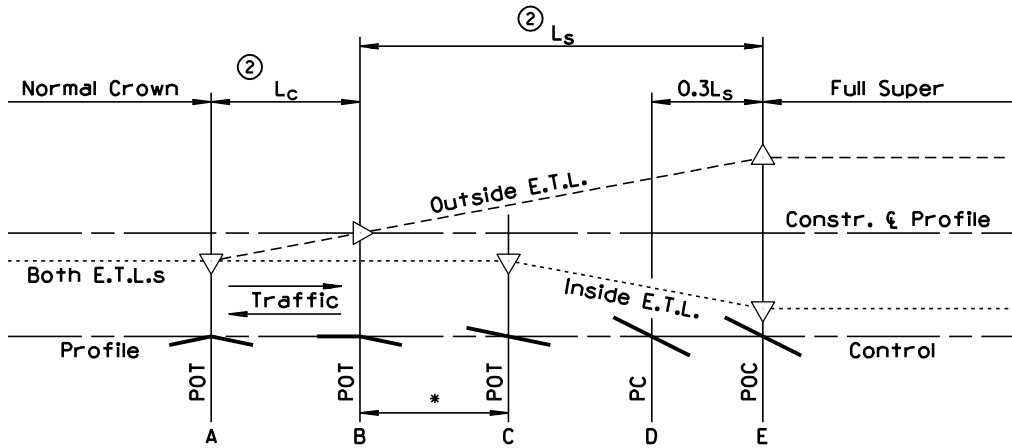


SPIRAL CURVE TRANSITION



CIRCULAR CURVE TRANSITION

1-WAY ROADWAY-AXIS OF ROTATION AT CONSTR. & HIGH POINT OF NORMAL CROWN ON INSIDE OF CURVE LEFT TURNING ROADWAY



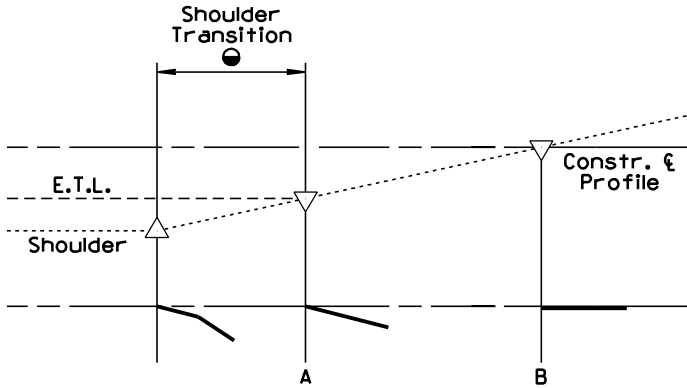
CIRCULAR CURVE TRANSITION

GENERAL NOTES

1. Round edge profile intersections with vertical curves having an approximate length in feet equal to the design speed in m.p.h.
2. For main roadway curves without spirals, L_s is the same as for spiraled curves but with $0.7 L_s$ on tangent and $0.3L_s$ on curve.
3. Shoulders transition with the adjacent travel lane when their normal cross slopes are the same.
4. If shoulders have a normal cross slope steeper than the adjacent lane, the shoulder transition will begin at a different point than that of the adjacent lane. See shoulder transition detail.

LEGEND

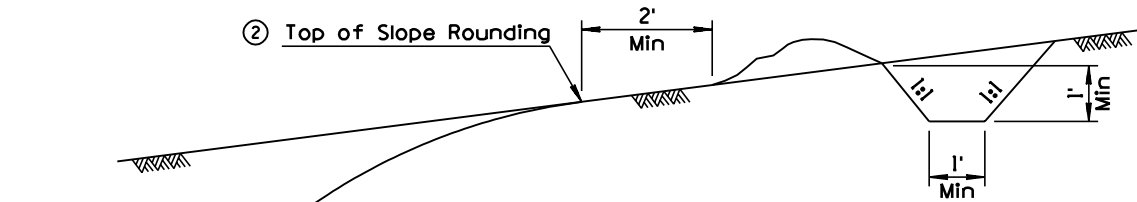
- A - Point at which adverse crown removal begins.
- B - Point at which superelevation transition begins.
- C - Point of equality between superelevation and normal crown
- D - P.C. location for circular curve transition.
- E - Point at which full superelevation is reached.
- ① L_c - Length of Normal Crown Removal
- ① L_s - Length of Superelevation Runoff
- E.T.L. - Edge of traveled lane
- * - Distance $BC = (NC) (L_s)/e$
- - Length of Shoulder Transition = $(NC) (L_s)/(NC \text{ of shoulder})$



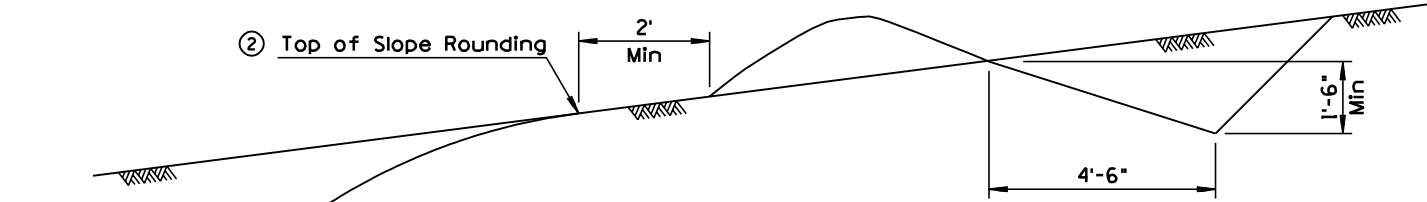
SHOULDER TRANSITION DETAIL

DESIGN APPROVED <i>Henry H. Ottum</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SUPERELEVATION DISTRIBUTION	DRAWING NO. C-02.50

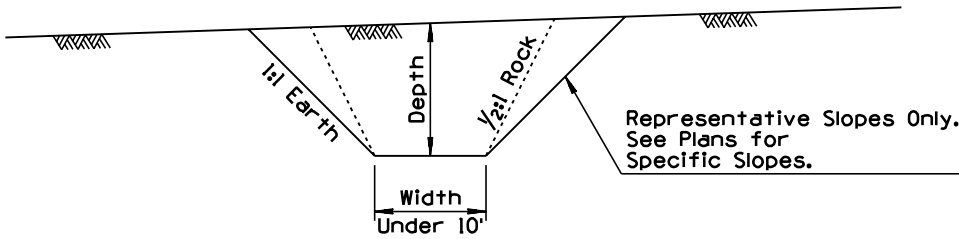
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REMOVED NOTE	PNB	3/94
2	ADDED SLOPE ROUNDING	PNB	3/94
3			
4			



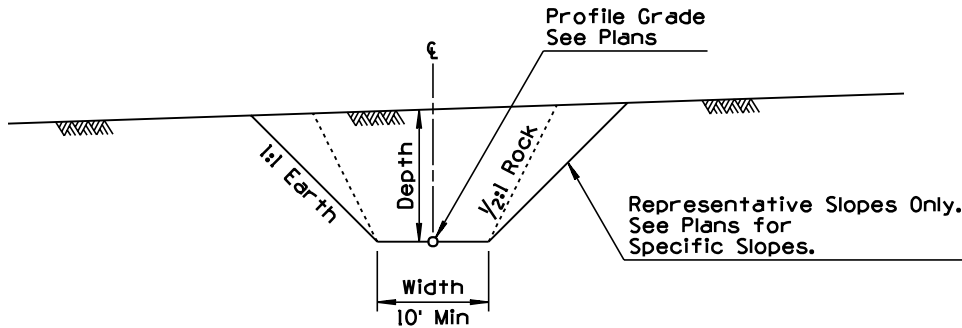
CROWN DITCH



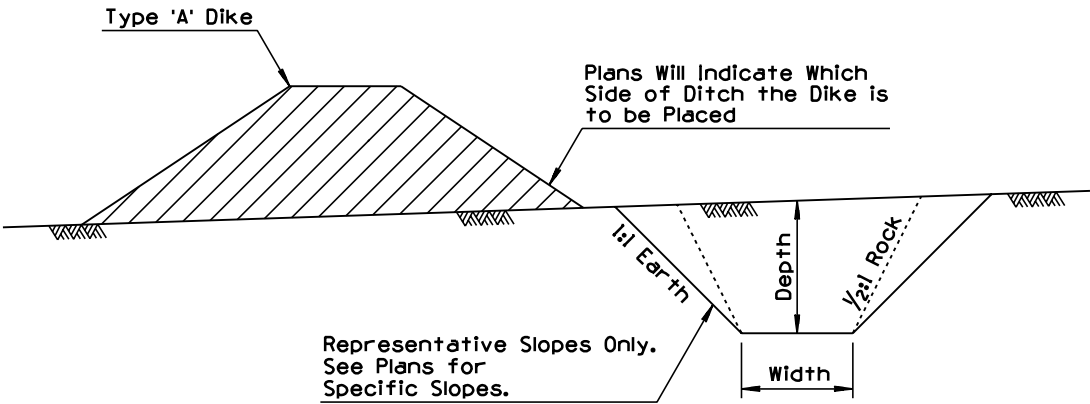
GRADER DITCH



DITCH



CHANNEL



DITCH AND DIKE

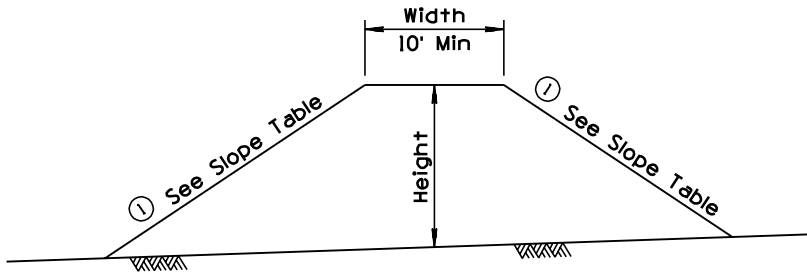
GENERAL NOTES

1. Dimensions of ditches shall be shown on the plans, as bottom width, depth and length.
2. Ditches shall be constructed with a minimum grade to prevent erosion. Ditch outlet treatment shall be as provided on plans.

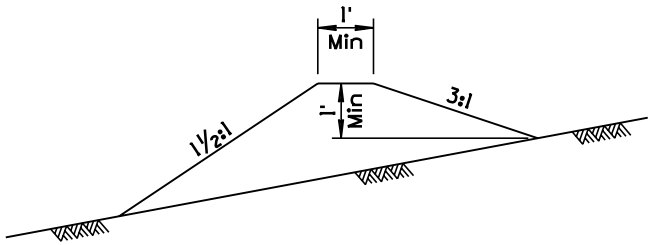
①

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 3/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	DITCHES, CHANNELS, DIKES AND BERMS DITCHES AND CHANNELS	DRAWING NO. C-03.10 Sheet 1 of 5

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED SLOPE	PNB	3/94
2	MODIFIED INSTALLATION DETAIL	PNB	3/94
3	ADDED PERSPECTIVE VIEW	PNB	3/94
4			

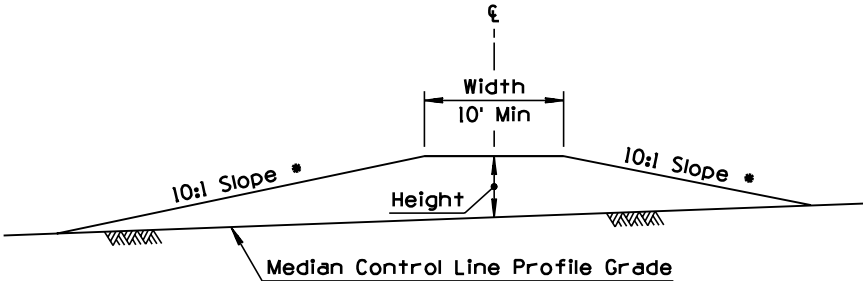


TYPE A DIKE



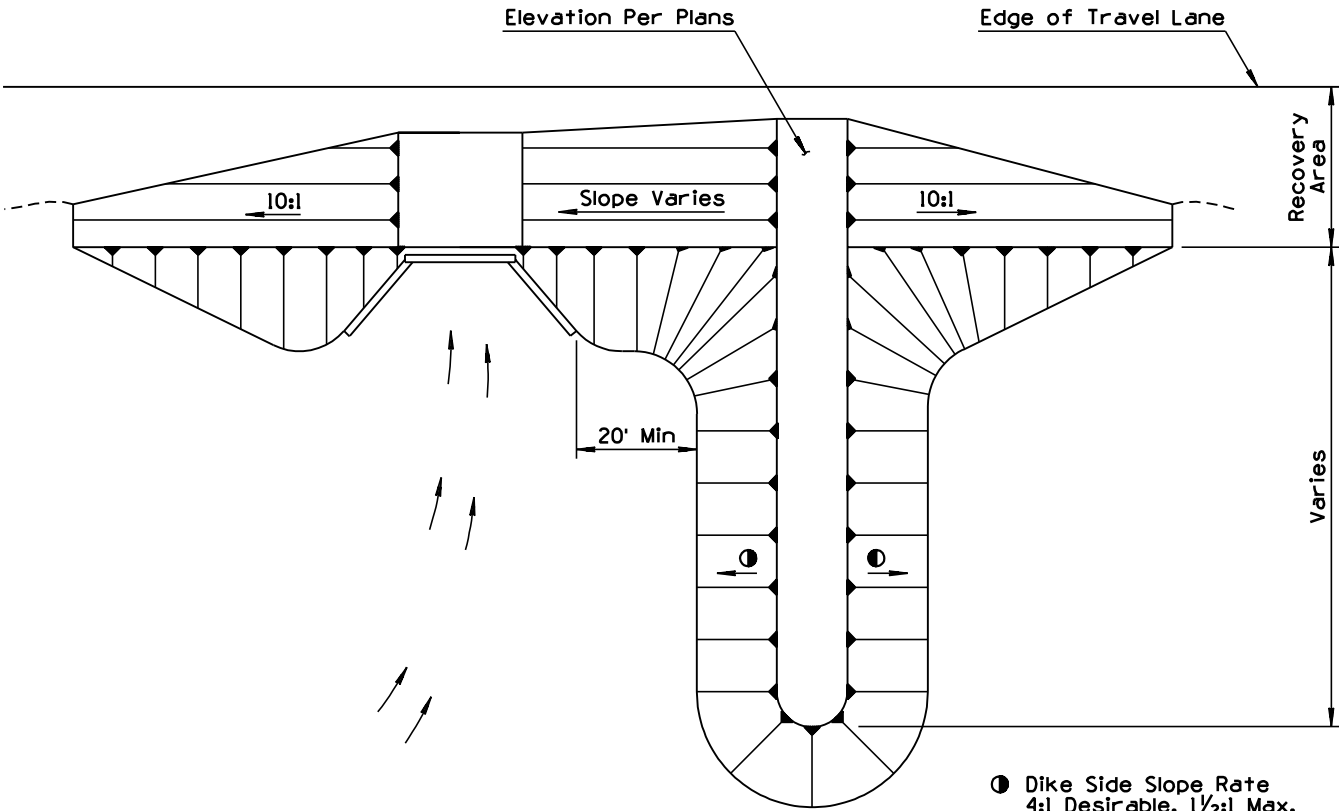
CROWN DIKE

SLOPE TABLE		
Inside Recovery Area	Outside Recovery Area	
	Desirable	Maximum
10:1	4:1	1 1/2:1



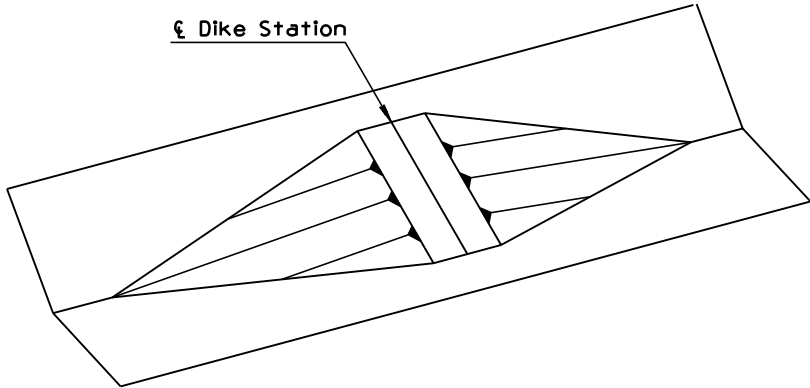
TYPE B TRANSVERSE MEDIAN DIKE

- * Slope relative to grade of median at intersection with toe



② TYPICAL DIKE INSTALLATION AT STRUCTURE

Place dikes at structures to create water cushion.



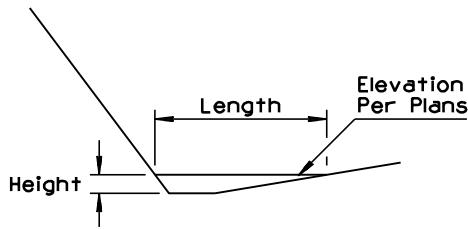
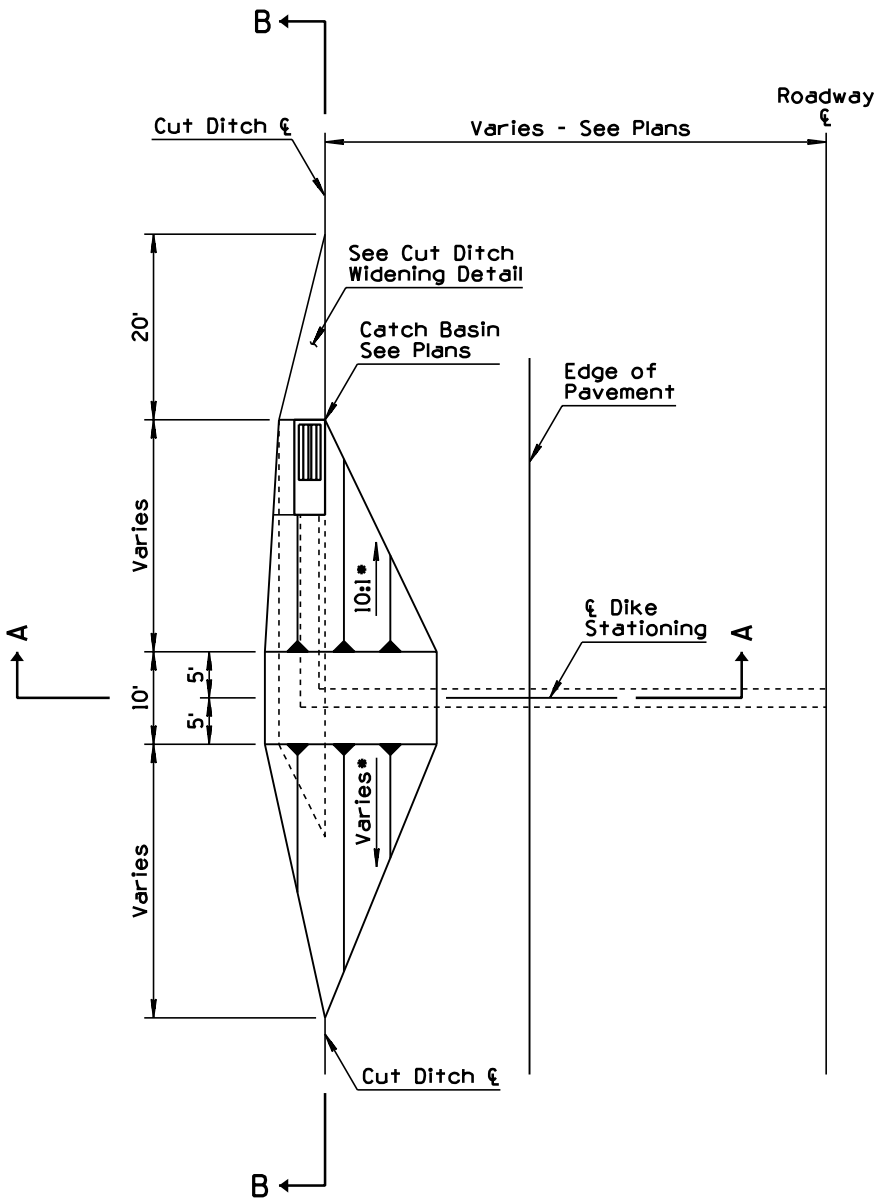
③ TYPICAL TRANSVERSE MEDIAN DIKE INSTALLATION

GENERAL NOTES

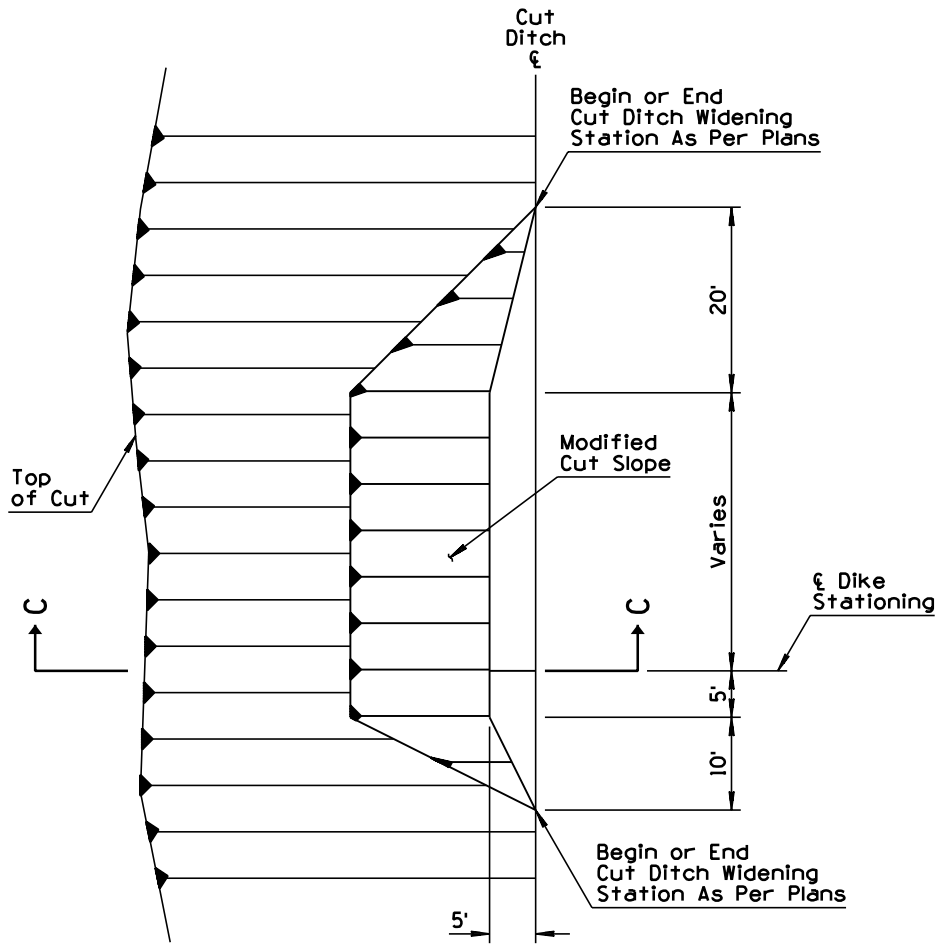
1. Dimensions of dikes shall be shown on the plans as top width, length and top of dike elevation.
2. Dike side slopes outside the recovery area shall be shown on the plans.

DESIGN APPROVED <i>Terry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 3/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	DITCHES, CHANNELS, DIKES AND BERMS DIKES	DRAWING NO. C-03.10 Sheet 2 of 5

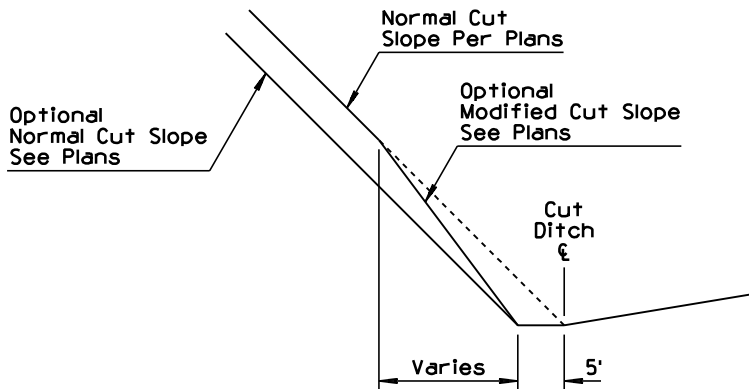
NO.	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
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3			
4			



SECTION A-A



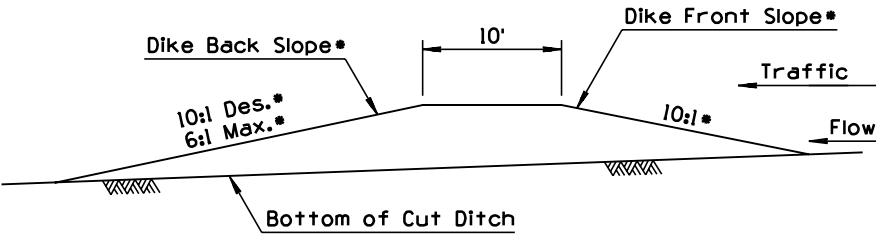
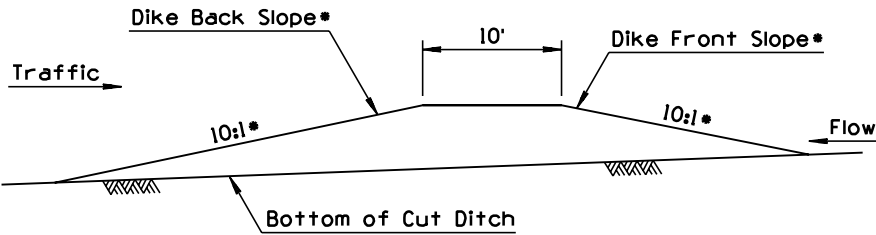
CUT DITCH WIDENING DETAIL



SECTION C-C

GENERAL NOTES

1. Dimensions for ditch dikes shall be shown on the plans as dike stationing, height, length, dike back slope and top of dike elevation.
2. Dimensions for cut ditch widening shall be shown on the plans as beginning and ending stations.

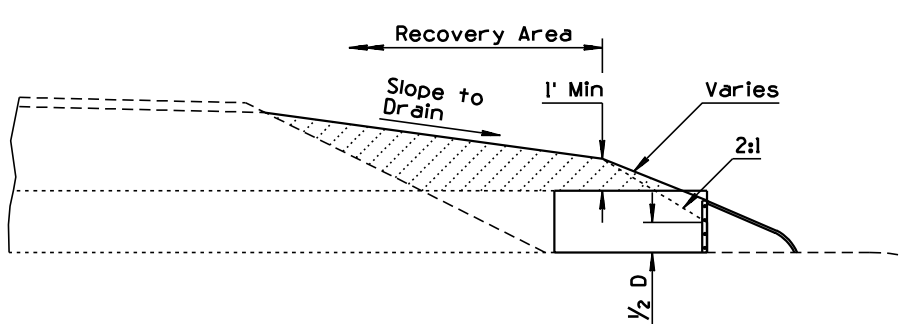


SECTION B-B

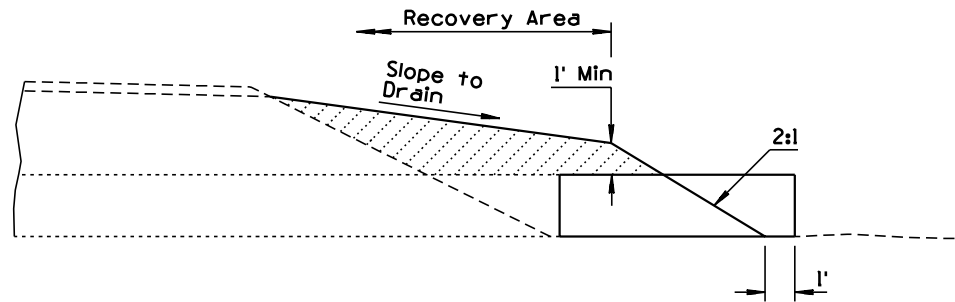
* Slope relative to grade of cut ditch at intersection with toe

DESIGN APPROVED <i>Terry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	3/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	DITCHES, CHANNELS, DIKES AND BERMS DITCH DIKE	DRAWING NO. C-03.10 Sheet 3 of 5

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
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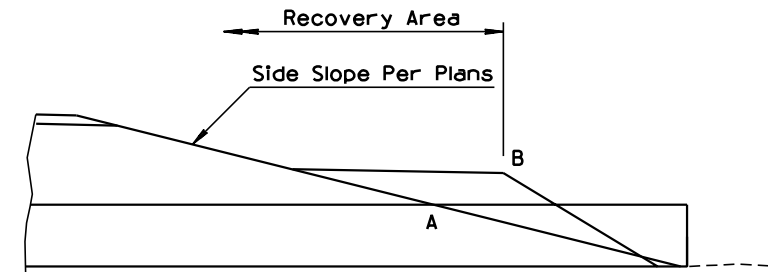


SECTION A-A (WITH END SECTION)

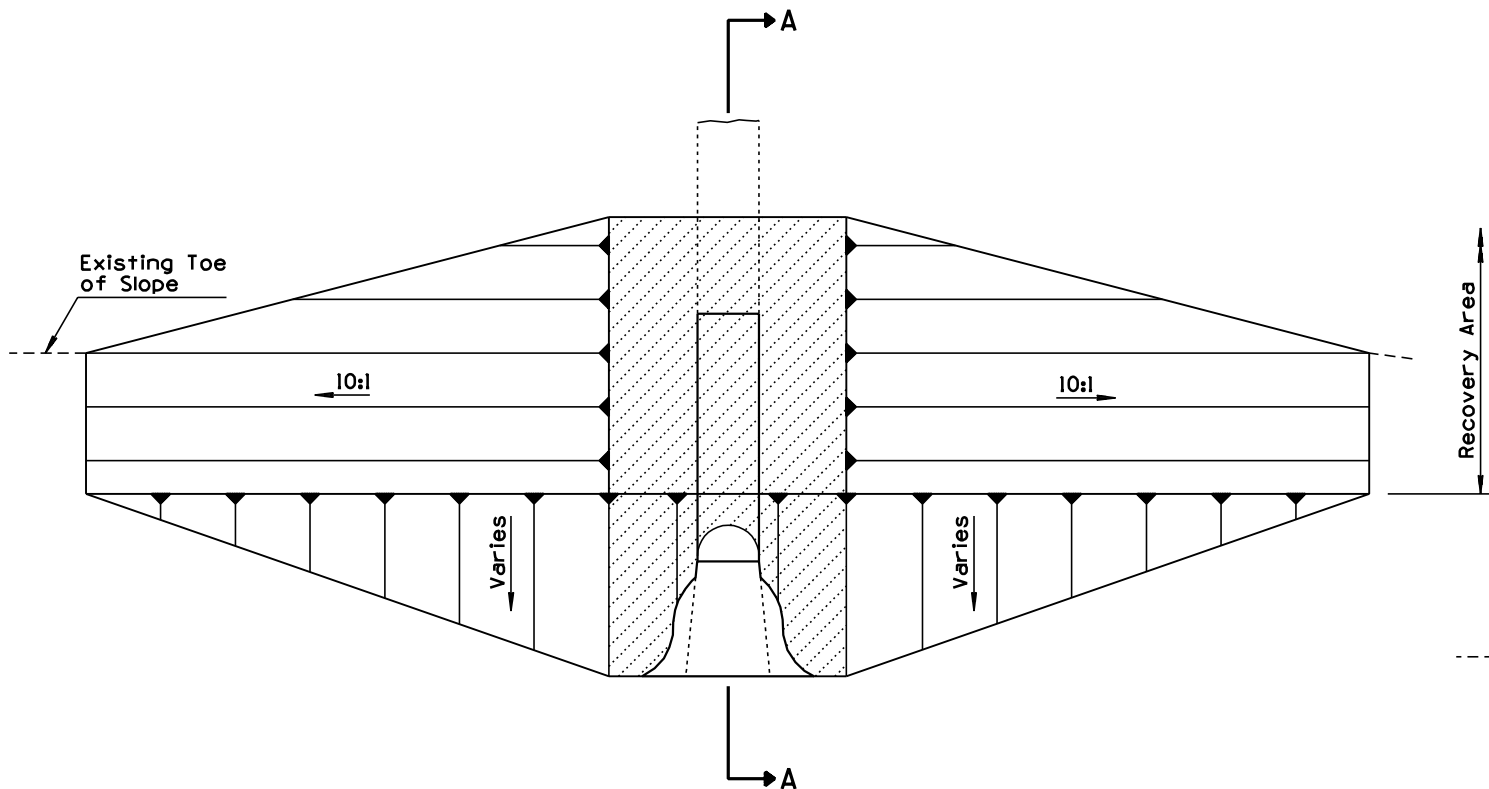


SECTION A-A (WITHOUT END SECTION)

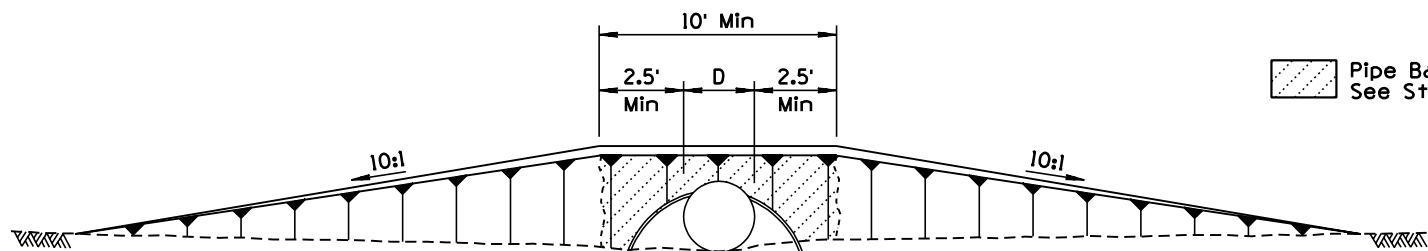
- ### GENERAL NOTES
1. Pipe berms not required when pipe projection is protected by guard rail.
 2. Berm construction similar for multiple pipe installation and for pipes without end sections.
 3. Berm construction shown is for pipe extensions. Berm construction similar for new pipe installation. See Pipe Berm Requirement Detail. If Point A is within the recovery area, then a pipe berm is required and Point B is set at the edge of the recovery area.




PIPE BERM REQUIREMENT DETAIL



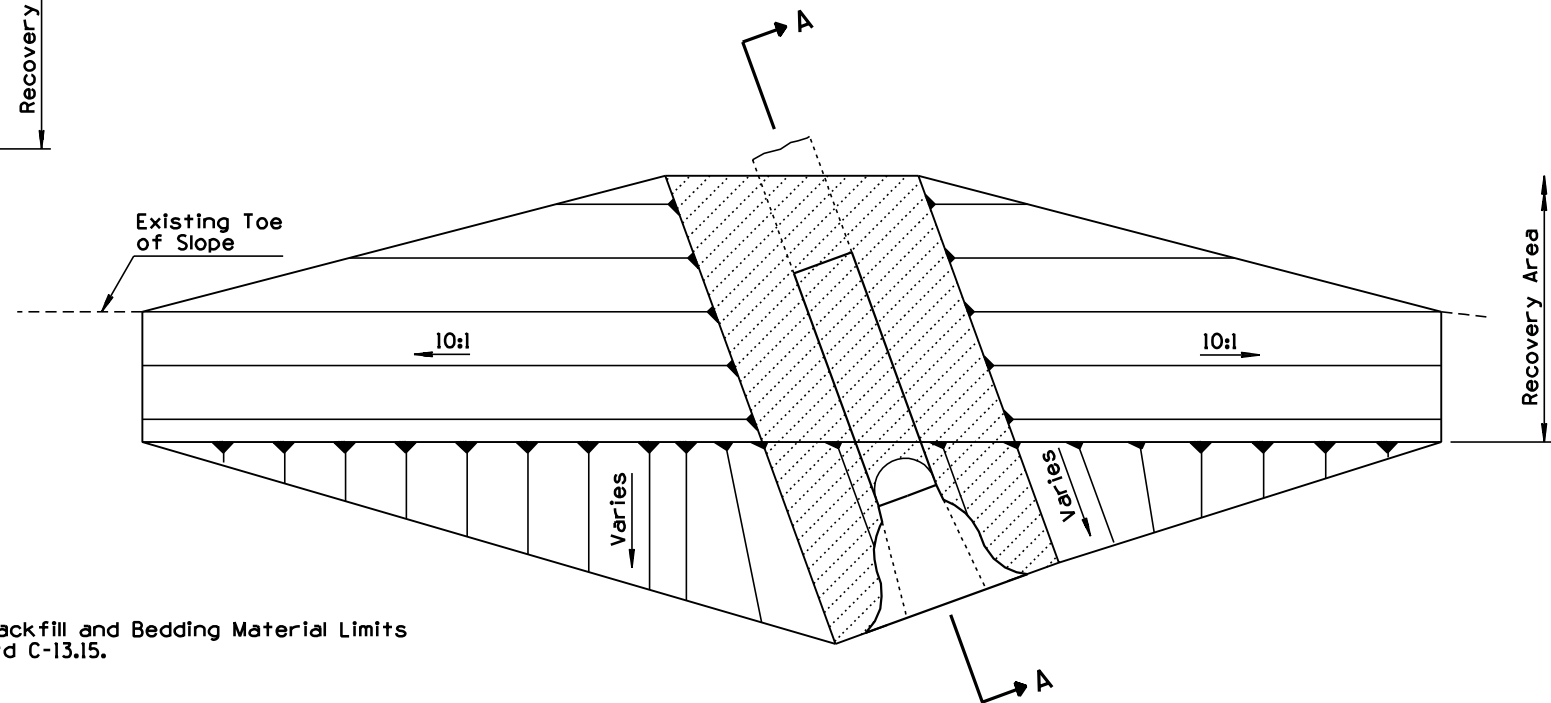
STRAIGHT PIPE PLAN





ELEVATION

 Pipe Backfill and Bedding Material Limits
See Std C-13.15.

NOTE:
Single Pipe Installation: D = Outside Diameter of Pipe
Multiple Pipe Installation: D = Outside Edge to Outside Edge of Pipes



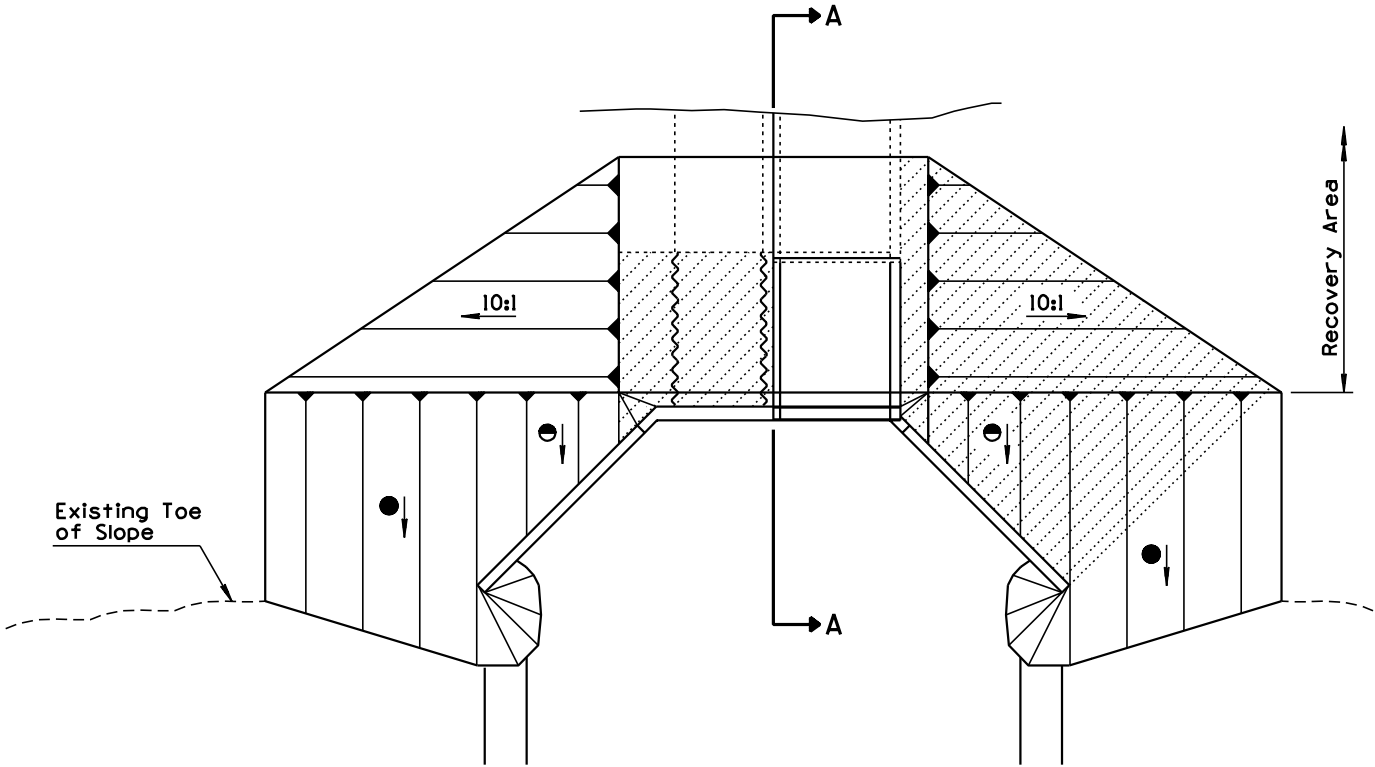
SKEWED PIPE PLAN

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APPROVED FOR DISTRIBUTION 	DITCHES, CHANNELS, DIKES AND BERMS PIPE BERMS	DRAWING NO. C-03.10 Sheet 4 of 5

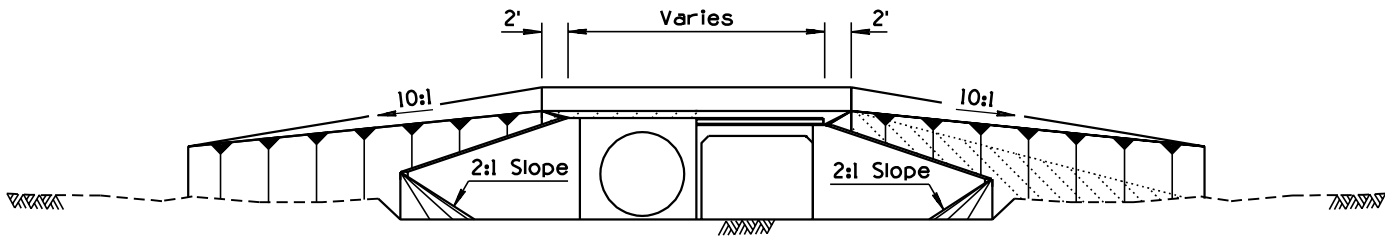
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			

GENERAL NOTES

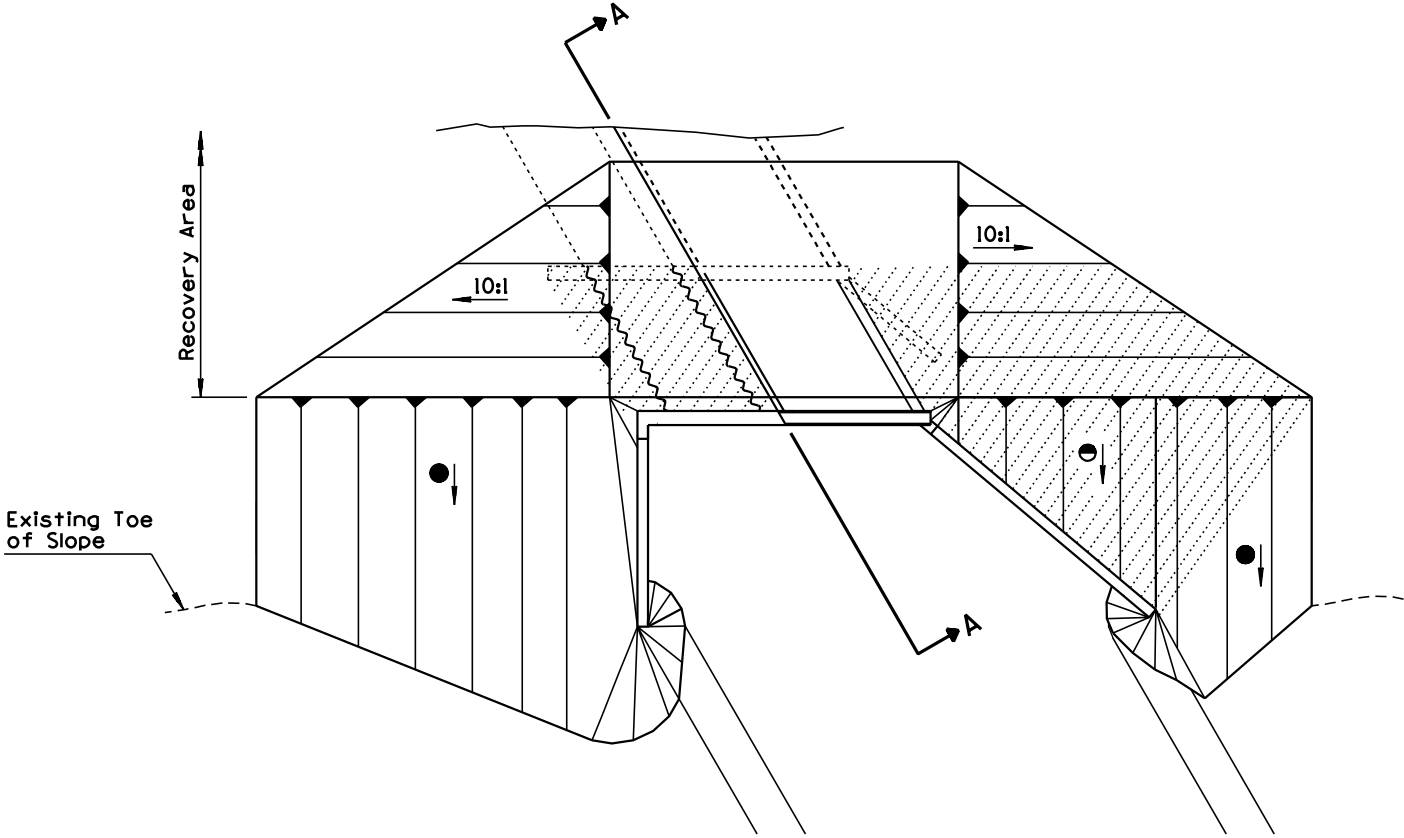
1. Berm construction similar for box culvert and pipe with headwall.
2. Berm construction shown is for extension of existing facilities. Berm construction similar for new facilities.



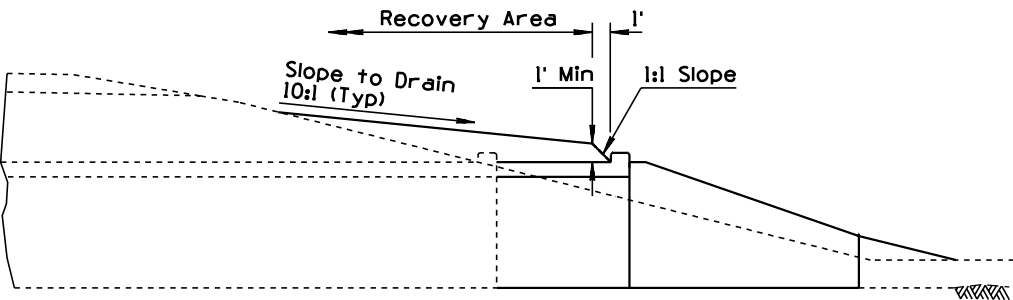
STRAIGHT HEADWALL PLAN



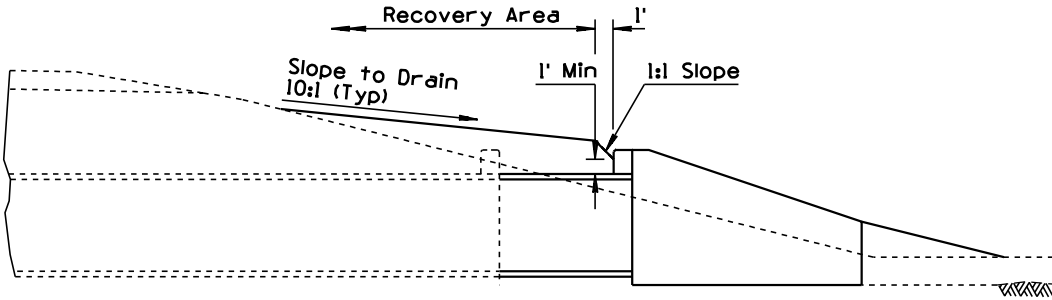
ELEVATION



SKewed HEADWALL PLAN


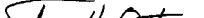


SECTION A-A (FOR CBC)



SECTION A-A (FOR PIPE WITH HEADWALL)

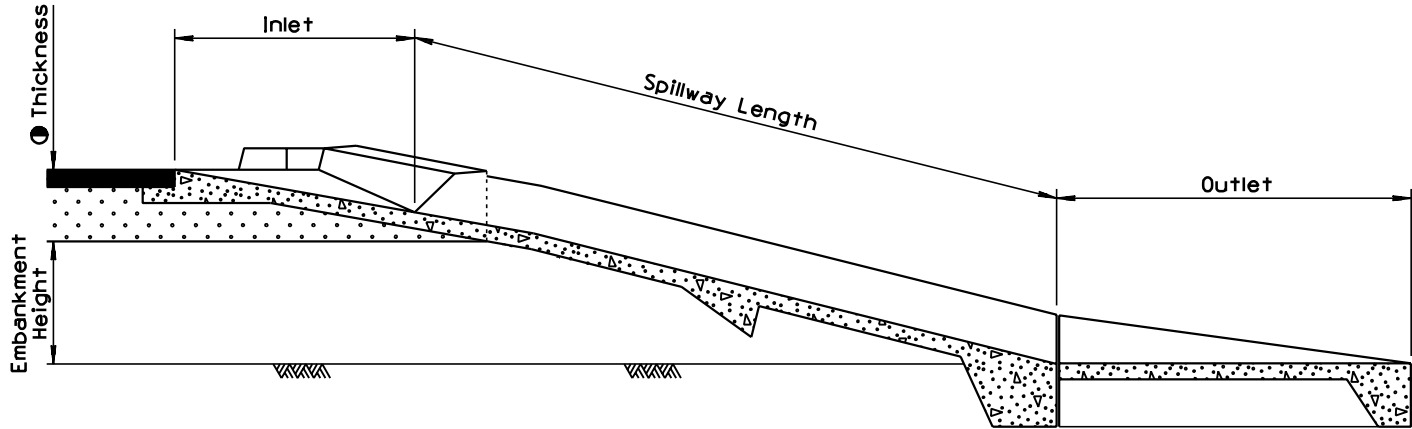
- ① Vary slope. Slope shall match to top of wing wall.
- Slope shall match wing wall design slope (2:1, 4:1, or 6:1).
- ▨ Structure Backfill Limits See Std B-19.50

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		3/94
APPROVED FOR DISTRIBUTION 	DITCHES, CHANNELS, DIKES AND BERMS HEADWALL BERMS	DRAWING NO. C-03.10 Sheet 5 of 5	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

LENGTH OF SPILLWAY																																	
Thickness ●	Embankment Height																																
	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'					
12"	32'	37'	43'	49'	50'	50'	51'	52'	52'	52'	52'	53'	53'	54'	54'	54'	55'	55'	56'	56'	57'	57'	58'	58'	59'	59'	60'	60'	60'				
13"	33'	38'	44'	50'	50'	51'	51'	52'	52'	52'	53'	53'	53'	54'	54'	55'	55'	56'	56'	57'	57'	58'	58'	59'	59'	60'	60'	61'	61'				
14"	33'	38'	44'	50'	51'	51'	52'	52'	53'	53'	53'	54'	54'	54'	55'	55'	56'	56'	57'	57'	58'	58'	59'	59'	60'	60'	61'	61'					
15"	34'	39'	45'	51'	51'	52'	52'	53'	53'	54'	54'	54'	55'	55'	55'	56'	56'	57'	57'	58'	58'	59'	59'	60'	60'	61'	61'	62'					
16"	34'	39'	45'	51'	52'	52'	53'	53'	54'	54'	54'	55'	55'	56'	56'	56'	57'	57'	58'	58'	59'	59'	60'	60'	61'	61'	62'	62'					
17"	35'	40'	46'	52'	52'	53'	53'	54'	54'	55'	55'	55'	56'	56'	57'	57'	57'	58'	58'	59'	59'	60'	60'	61'	61'	62'	62'	63'					
18"	35'	40'	46'	52'	53'	53'	54'	54'	55'	55'	55'	56'	56'	57'	57'	57'	58'	58'	59'	59'	60'	60'	61'	61'	62'	62'	63'	63'					
19"	36'	41'	47'	53'	53'	54'	54'	55'	55'	56'	56'	56'	57'	57'	58'	58'	58'	59'	59'	60'	60'	61'	61'	62'	62'	63'	63'	64'					
20"	36'	41'	47'	53'	54'	54'	55'	55'	56'	56'	56'	57'	57'	58'	58'	58'	59'	59'	60'	60'	61'	61'	62'	62'	63'	63'	64'	64'					
21"	37'	42'	48'	54'	54'	55'	55'	56'	56'	57'	57'	57'	58'	58'	59'	59'	59'	60'	60'	61'	61'	62'	62'	63'	63'	64'	64'	65'					
22"	37'	42'	48'	54'	55'	55'	56'	56'	57'	57'	57'	58'	58'	59'	59'	59'	60'	60'	61'	61'	62'	62'	63'	63'	64'	64'	65'	65'					
23"	38'	43'	49'	55'	55'	56'	56'	57'	57'	58'	58'	58'	59'	59'	60'	60'	60'	61'	61'	62'	62'	63'	63'	64'	64'	65'	65'	66'					
24"	38'	43'	49'	55'	56'	56'	57'	57'	58'	58'	58'	59'	59'	60'	60'	60'	61'	61'	62'	62'	63'	63'	64'	64'	65'	65'	66'	66'					
25"	39'	44'	50'	56'	56'	57'	57'	58'	58'	59'	59'	59'	60'	60'	61'	61'	61'	62'	62'	63'	63'	64'	64'	65'	65'	66'	66'	67'					
26"	39'	44'	50'	56'	57'	57'	58'	58'	59'	59'	59'	60'	60'	61'	61'	61'	62'	62'	63'	63'	64'	64'	65'	65'	66'	66'	67'	67'					
27"	40'	45'	51'	57'	57'	58'	58'	59'	59'	60'	60'	60'	61'	61'	62'	62'	62'	63'	63'	64'	64'	65'	65'	66'	66'	67'	67'	68'					
28"	40'	45'	51'	57'	58'	58'	59'	59'	60'	60'	60'	61'	61'	62'	62'	62'	63'	63'	64'	64'	65'	65'	66'	66'	67'	67'	68'	68'					
29"	41'	46'	52'	58'	58'	59'	59'	60'	60'	61'	61'	61'	62'	62'	63'	63'	63'	64'	64'	65'	65'	66'	66'	67'	67'	68'	68'	69'					
30"	41'	46'	52'	58'	59'	59'	60'	60'	61'	61'	61'	62'	62'	63'	63'	63'	64'	64'	65'	65'	66'	66'	67'	67'	68'	68'	69'	69'					
31"	42'	47'	53'	59'	59'	60'	60'	61'	61'	62'	62'	62'	63'	63'	64'	64'	64'	65'	65'	66'	66'	67'	67'	68'	68'	69'	69'	70'					
32"	42'	47'	53'	59'	60'	60'	61'	61'	62'	62'	62'	63'	63'	64'	64'	64'	65'	65'	66'	66'	67'	67'	68'	68'	69'	69'	70'	70'					
33"	43'	48'	54'	60'	60'	61'	61'	62'	62'	63'	63'	63'	64'	64'	65'	65'	65'	66'	66'	67'	67'	68'	68'	69'	69'	70'	70'	71'					
34"	43'	48'	54'	60'	61'	61'	62'	62'	63'	63'	63'	64'	64'	65'	65'	65'	66'	66'	67'	67'	68'	68'	69'	69'	70'	70'	71'	71'					
35"	44'	49'	55'	61'	61'	62'	62'	63'	63'	64'	64'	64'	65'	65'	66'	66'	66'	67'	67'	68'	68'	69'	69'	70'	70'	71'	71'	72'					
36"	44'	49'	55'	61'	62'	62'	63'	63'	64'	64'	64'	65'	65'	66'	66'	66'	67'	67'	68'	68'	69'	69'	70'	70'	71'	71'	72'	72'					

C-02.10 AND C-02.20 SLOPES



LENGTH OF SPILLWAY													
Thickness ●	Embankment Height												
	5'	6'	7'	8'	9'	10'	11'	12'	13'				
12"	22'	22'	22'	23'	23'	24'	24'	24'	25'				
13"	22'	22'	23'	23'	23'	24'	24'	25'	25'				
14"	22'	23'	23'	23'	24'	24'	25'	25'	26'				
15"	23'	23'	23'	24'	24'	25'	25'	25'	26'				
16"	23'	23'	24'	24'	24'	25'	25'	26'	26'				
17"	23'	24'	24'	24'	25'	25'	26'	26'	27'				
18"	24'	24'	25'	25'	25'	26'	26'	27'	27'				
19"	24'	24'	25'	25'	25'	26'	26'	27'	27'				
20"	25'	25'	25'	25'	26'	26'	27'	27'	28'				
21"	25'	25'	25'	26'	26'	27'	27'	28'	28'				
22"	25'	25'	26'	26'	27'	27'	27'	28'	28'				
23"	26'	26'	26'	26'	27'	27'	28'	28'	29'				
24"	26'	26'	26'	27'	27'	28'	28'	29'	29'				
25"	26'	27'	27'	27'	28'	28'	28'	29'	29'				
26"	27'	27'	27'	28'	28'	28'	29'	29'	30'				
27"	27'	27'	28'	28'	28'	29'	29'	30'	30'				
28"	27'	28'	28'	28'	29'	29'	29'	30'	30'				
29"	28'	28'	28'	29'	29'	29'	30'	30'	31'				
30"	28'	28'	29'	29'	29'	30'	30'	31'	31'				
31"	28'	29'	29'	29'	30'	30'	31'	31'	32'				
32"	29'	29'	29'	30'	30'	30'	31'	31'	32'				
33"	29'	29'	30'	30'	30'	31'	31'	32'	32'				
34"	29'	30'	30'	30'	31'	31'	32'	32'	33'				
35"	30'	30'	30'	31'	31'	31'	32'	32'	33'				
36"	30'	30'	31'	31'	31'	32'	32'	33'	33'				

C-02.30 SLOPES

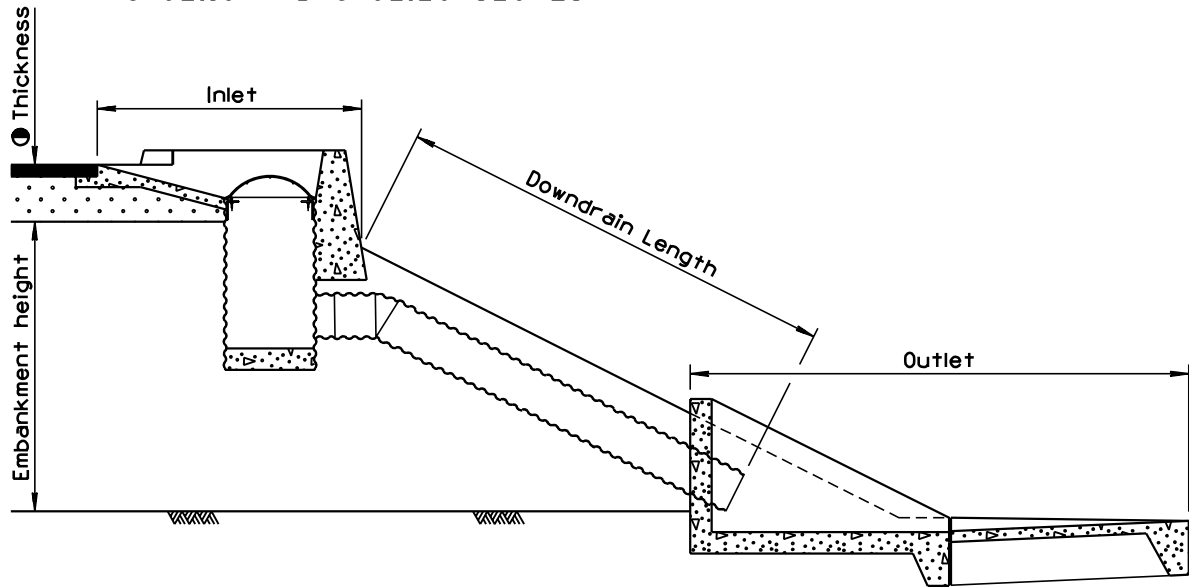
GENERAL NOTES

- 1. For C-02.10 slopes with embankment height over 24', use length for 24' embankment height from table + 2.24.
- 2. For C-02.20 slopes with embankment height over 32', use length for 32' embankment height from table + 1.8.
- 3. For C-02.30 slopes with embankment height over 13', use length for 13' embankment height from table + 1.8.
- 4. For spillway details, see Std C-04.10.

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

LENGTH OF DOWNDRAIN																																	
Thickness ●	Embankment Height																																
	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'							
12"	32'	38'	46'	46'	46'	46'	48'	48'	48'	50'	50'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	58'	58'	58'	58'
13"	32'	40'	46'	46'	48'	48'	48'	48'	50'	50'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	58'	58'	58'	58'	58'
14"	34'	40'	46'	46'	48'	48'	50'	50'	50'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	58'	58'	58'	58'	58'	58'
15"	34'	40'	46'	46'	48'	48'	50'	50'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	58'	58'	58'	58'	58'	58'	58'
16"	34'	40'	48'	48'	48'	48'	50'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	60'	60'	60'	60'
17"	34'	42'	48'	48'	50'	50'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	60'	60'	60'	60'	60'
18"	36'	42'	48'	48'	50'	50'	52'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	60'	60'	60'	60'	60'	60'
19"	36'	42'	48'	48'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	60'	60'	60'	60'	60'	60'	60'
20"	36'	42'	50'	50'	50'	50'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	62'	62'	62'	62'
21"	36'	44'	50'	50'	52'	52'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	62'	62'	62'	62'	62'
22"	38'	44'	50'	50'	52'	52'	54'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	62'	62'	62'	62'	62'	62'
23"	38'	44'	50'	50'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	62'	62'	62'	62'	62'	62'	64'
24"	38'	44'	52'	52'	52'	52'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	62'	62'	62'	62'	62'	62'	64'	64'
25"	38'	46'	52'	52'	54'	54'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	64'	64'	64'	64'	64'
26"	40'	46'	52'	52'	54'	54'	56'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	64'	64'	64'	64'	64'	64'
27"	40'	46'	52'	52'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	64'	64'	64'	64'	64'	64'	66'
28"	40'	46'	54'	54'	54'	54'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	66'	66'	66'
29"	40'	48'	54'	54'	56'	56'	56'	56'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	66'	66'	66'	66'	66'
30"	42'	48'	54'	54'	56'	56'	58'	58'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	66'	66'	66'	66'	66'	66'
31"	42'	48'	54'	54'	56'	56'	58'	58'	58'	60'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	66'	66'	66'	66'	66'	66'	68'
32"	42'	48'	56'	56'	56'	56'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	68'	68'	68'	68'	68'	68'	68'	68'
33"	42'	50'	56'	56'	58'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	68'	68'	68'	68'	68'	68'	68'	68'	68'	68'
34"	44'	50'	56'	56'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	68'	68'	68'	68'	68'	68'	68'	68'	68'	68'	70'
35"	44'	50'	58'	58'	58'	58'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	68'	68'	68'	68'	68'	68'	68'	68'	68'	68'	68'	70'
36"	44'	50'	58'	58'	60'	60'	60'	60'	62'	62'	62'	62'	64'	64'	64'	64'	66'	66'	66'	66'	68'	68'	68'	68'	68'	68'	68'	68'	68'	68'	68'	68'	70'

C-02.10 AND C-02.20 SLOPES



LENGTH OF DOWNDRAIN													
Thickness ①	Embankment Height												
	5'	6'	7'	8'	9'	10'	11'	12'	13'				
12"	14'	16'	16'	16'	20'	20'	20'	20'	20'				
13"	14'	16'	16'	18'	20'	20'	20'	20'	22'				
14"	14'	16'	18'	18'	20'	20'	20'	20'	22'				
15"	14'	18'	18'	18'	20'	20'	20'	22'	22'				
16"	16'	18'	18'	18'	20'	20'	22'	22'	22'				
17"	16'	18'	18'	18'	20'	22'	22'	22'	22'				
18"	16'	18'	18'	18'	22'	22'	22'	22'	22'				
19"	16'	18'	18'	20'	22'	22'	22'	22'	24'				
20"	16'	18'	20'	20'	22'	22'	22'	24'	24'				
21"	16'	20'	20'	20'	22'	22'	24'	24'	24'				
22"	18'	20'	20'	20'	22'	22'	24'	24'	24'				
23"	18'	20'	20'	20'	22'	24'	24'	24'	24'				
24"	18'	20'	20'	20'	24'	24'	24'	24'	26'				
25"	18'	20'	20'	22'	24'	24'	24'	24'	26'				
26"	18'	20'	22'	22'	24'	24'	24'	26'	26'				
27"	18'	22'	22'	22'	24'	24'	26'	26'	26'				
28"	20'	22'	22'	22'	24'	26'	26'	26'	26'				
29"	20'	22'	22'	22'	26'	26'	26'	26'	26'				
30"	20'	22'	22'	24'	26'	26'	26'	26'	28'				
31"	20'	22'	24'	24'	26'	26'	26'	28'	28'				
32"	20'	24'	24'	24'	26'	26'	26'	28'	28'				
33"	22'	24'	24'	24'	26'	26'	28'	28'	28'				
34"	22'	24'	24'	24'	26'	28'	28'	28'	28'				
35"	22'	24'	24'	24'	28'	28'	28'	28'	28'				
36"	22'	24'	24'	26'	28'	28'	28'	28'	30'				

C-02.30 SLOPES

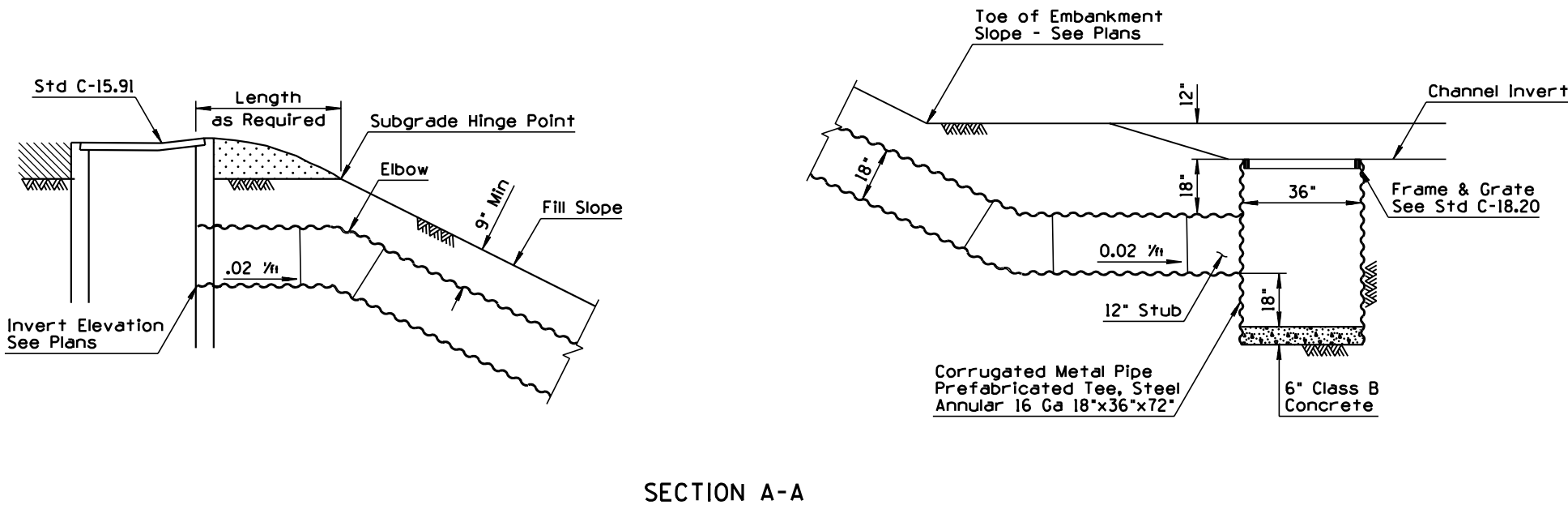
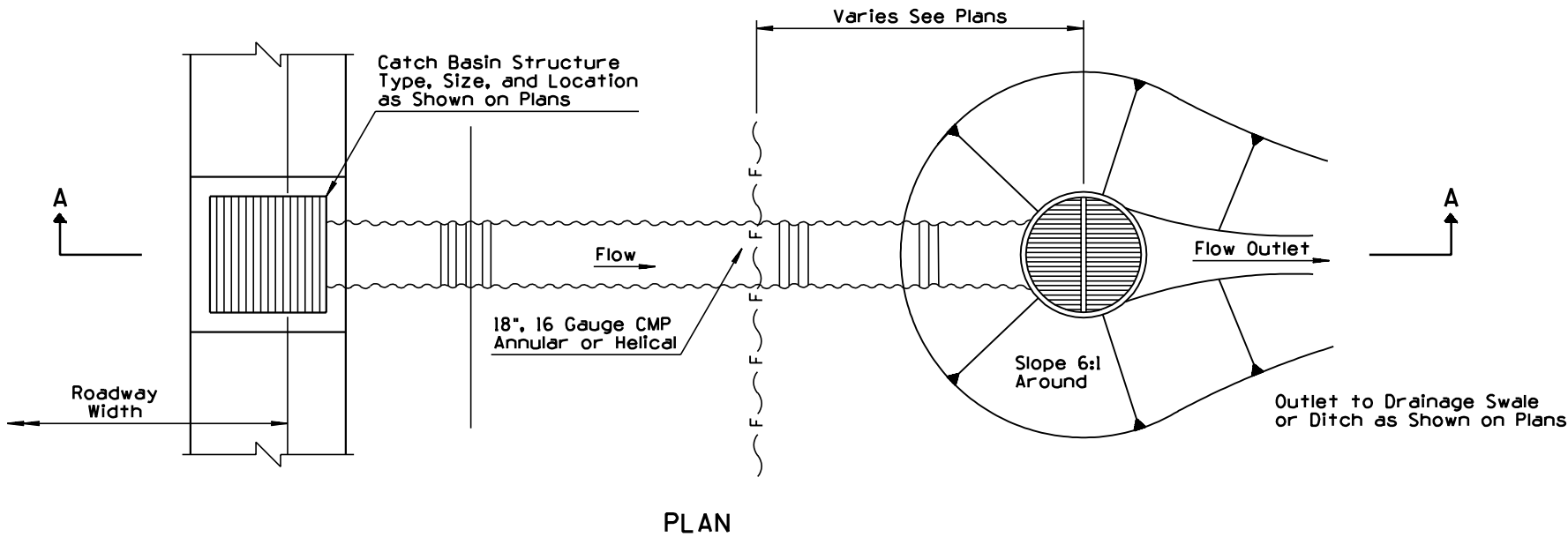
GENERAL NOTES

1. For C-02.10 slopes with embankment height over 24', use length for 24' embankment height from table + 2.24.
2. For C-02.20 slopes with embankment height over 32', use length for 32' embankment height from table + 1.8.
3. For C-02.30 slopes with embankment height over 13', use length for 13' embankment height from table +1.8.
4. For down drain details, see Std C-04.20.

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

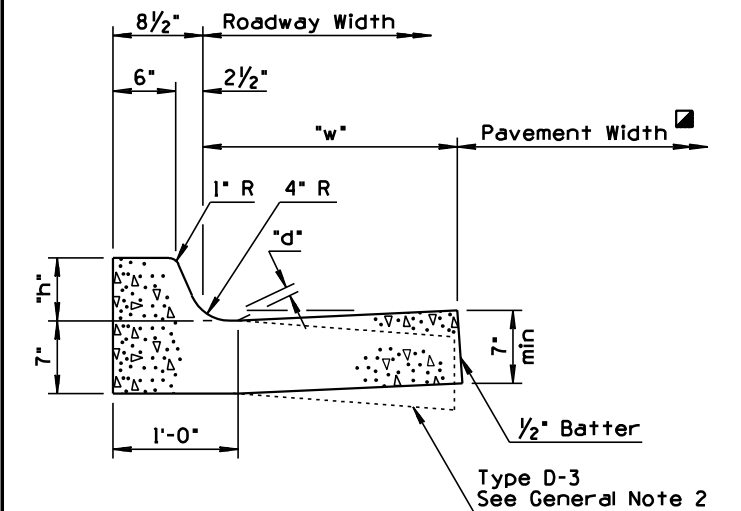
GENERAL NOTES

- Stub shall have annular corrugation. Downdrain piping beyond stub may be either annular or helical.
- Couplings shall be mechanical heat-shrinkable polyolatin sheet; one piece lap type neoprene sheet or slip seam; all 12": min width and 18 ga min.
- Maximum Q Allowable = 8 cfs
Minimum V Allowable = 1 fps

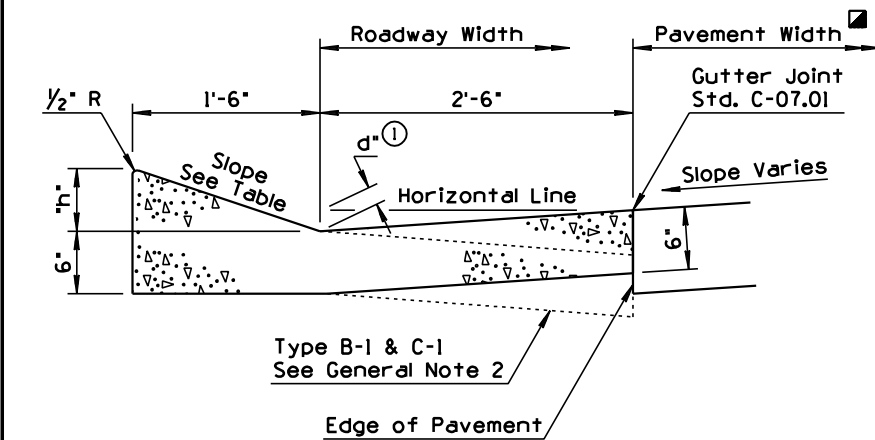


DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. C-04.50

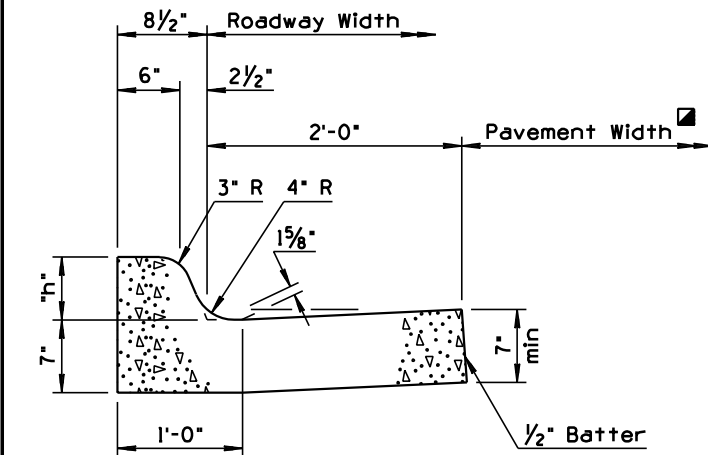
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TYPE C GUTTER DEPRESSION TO $\frac{5}{8}"$	JNP	8/99
2			
3			
4			



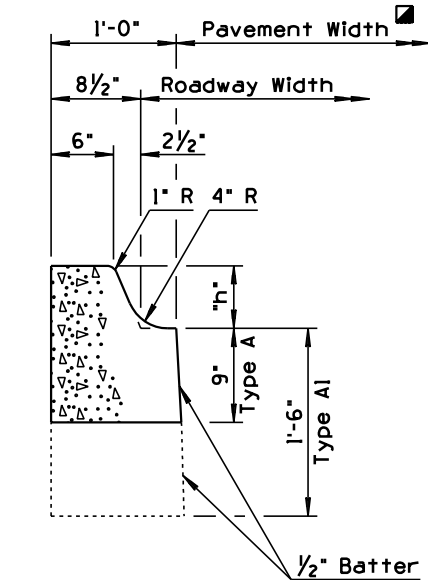
CURB AND GUTTER
TYPE D, D-1, D-2 & D-3



CURB AND GUTTER
TYPE B, C, B-1 & C-1

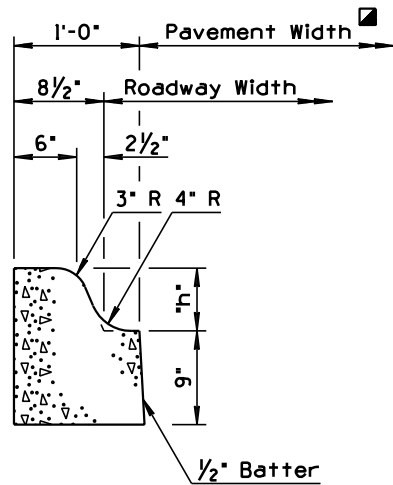


CURB AND GUTTER
TYPE G



SINGLE CURB
TYPE A & A1

FREEWAY CURB & GUTTER			
C & G TYPE	CURB HEIGHT "h"	SLOPE	GUTTER DEPRESSION "d"
B	6"	3:1	2"
B-1	6"	3:1	N/A
C	3"	6:1	$\frac{5}{8}"$ ①
C-1	3"	6:1	N/A

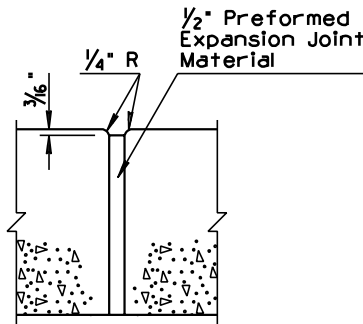


SINGLE CURB
TYPE G

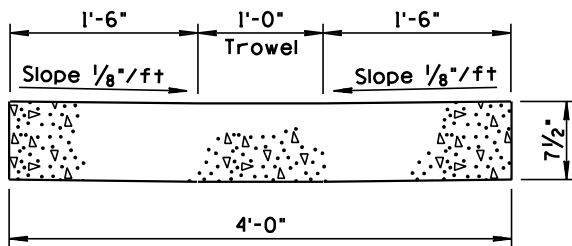
C & G TYPE	CURB HEIGHT "h"	GUTTER WIDTH "w"	GUTTER DEPRESSION "d"
A	①	N/A	N/A
A-1	①	N/A	N/A
D	①	2'-0"	$1\frac{5}{8}"$
D-1	①	2'-6"	$1\frac{3}{4}"$
D-2	①	4'-6"	$1\frac{3}{4}"$
D-3	①	2'-0"	N/A
G	①	2'-0"	N/A

■ See Plans

① See Plans (6 or 7 Inch Typical)



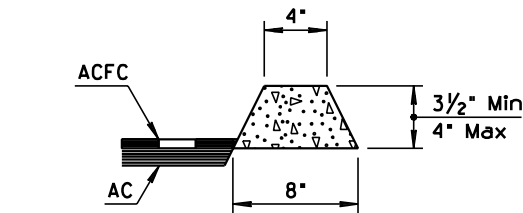
EXPANSION JOINT DETAIL



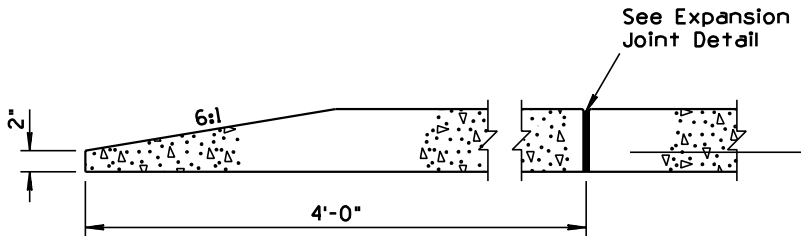
VALLEY GUTTER

- ### GENERAL NOTES
- #### SINGLE CURB AND CURB AND GUTTER
1. Single curb, and curb and gutter may be constructed by the use of forms or the concrete may be extruded.
 2. When the pavement section slopes away from the gutter, the slope of the gutter shall match the pavement cross slope. Therefore, the gutter depression is not applicable.
 3. Two inch deep contraction joints shall be placed in the curb and the gutter at locations which match the joints in adjacent portland cement concrete pavement and at approximate 15 foot centers when adjacent to asphaltic concrete pavement. Joints shall be either hand tooled or sawed.
 4. Expansion joints shall be located at tangent points in curb returns, at structures and at maximum 60 foot intervals. The one-half inch joint filler shall extend the full depth at the concrete.
 5. Concrete shall be finished with a steel trowel followed by brushing with a fine brush along the length of the curb and gutter.
 6. All exposed edges and hand tooled joints shall be finished with a tool having a one-fourth inch radius unless a larger radius is indicated.

- #### EMBANKMENT CURB
1. No additional finishing will be required after extrusion or removal of the forms when the curb presents a neat appearance and the surface is uniform in texture and color.
 2. The curb shall conform to the cross section as shown except that the horizontal dimensions shall not vary more than one-half inch.



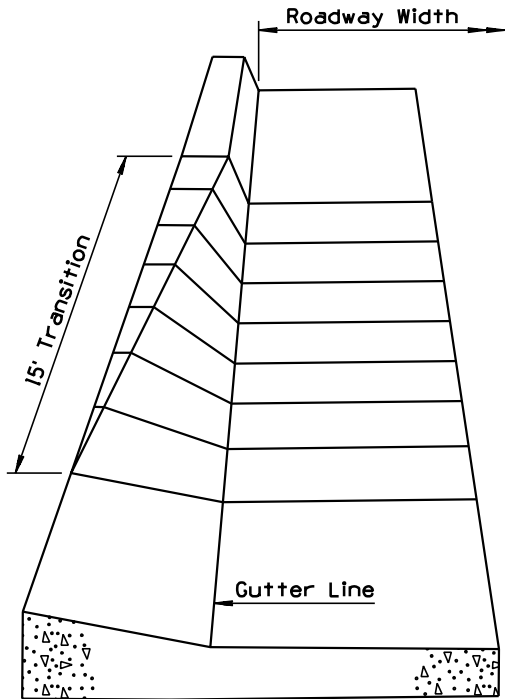
EMBANKMENT CURB



CURB TERMINAL SECTION

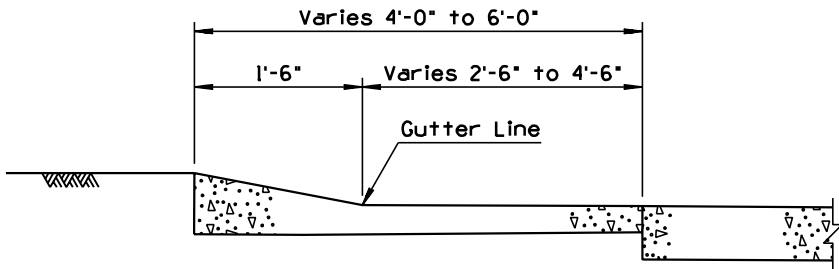
DESIGN APPROVED <i>Sam H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/99
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SINGLE CURB, CURB & GUTTER, EMBANKMENT CURB	DRAWING NO. C-05.10

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED VIEW	PNB	7/94
2	ADDED NOTE	PNB	7/94
3	REVISED NOTE	PNB	7/94
4			

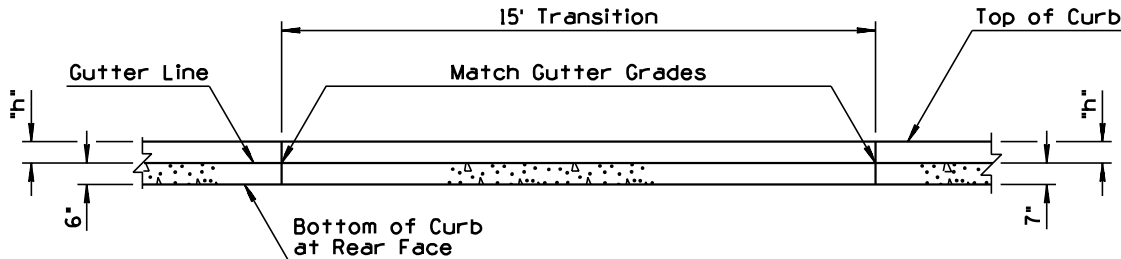


- ③ 1. All gutter flow lines shall be constructed to an accurate grade.
2. See Slotted Drain Stds., C-13.60 and C-15.91, for curb and gutter with slotted drain.
3. See Std. C-05.10 for additional general notes and dimensions.

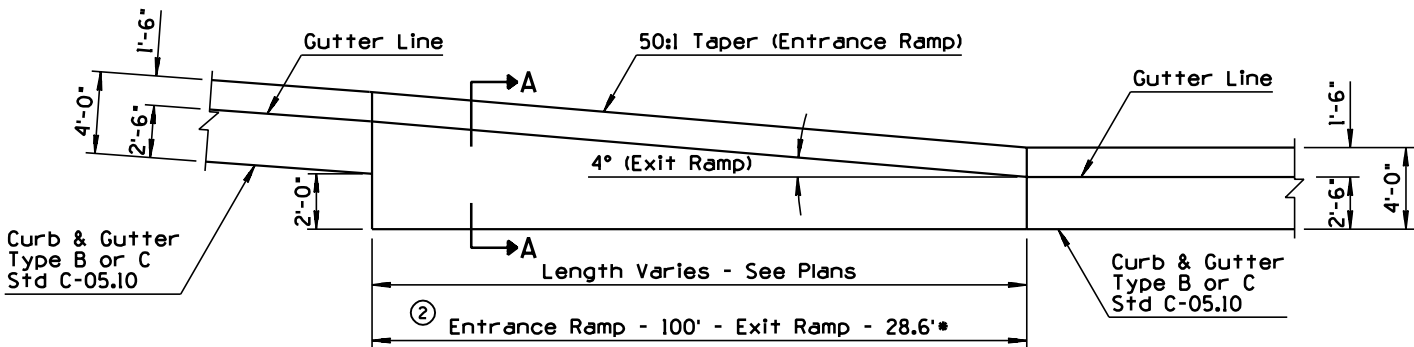
① PERSPECTIVE VIEW



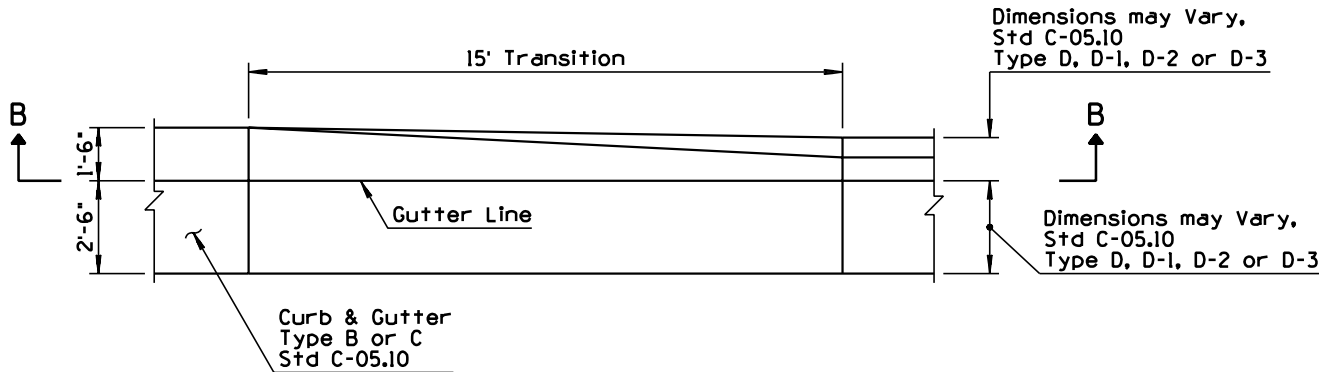
SECTION A-A



SECTION B-B



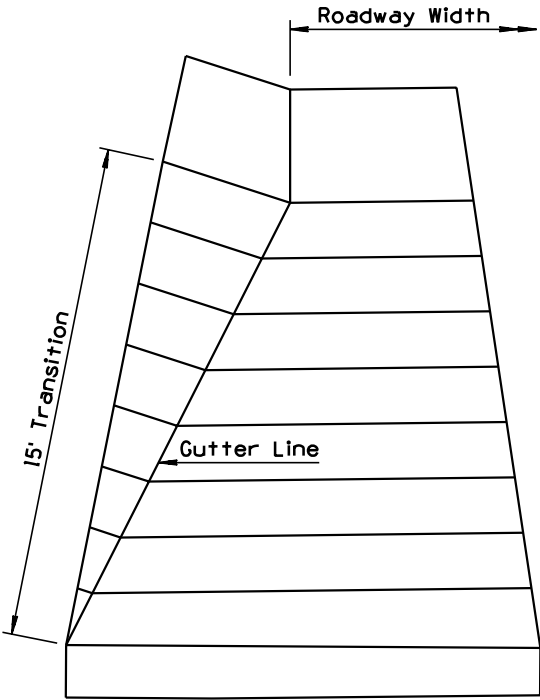
TYPE 1 - CURB & GUTTER TRANSITION - AT RAMP TAPERS
* Dimension may vary where exit occurs on curves, see plans



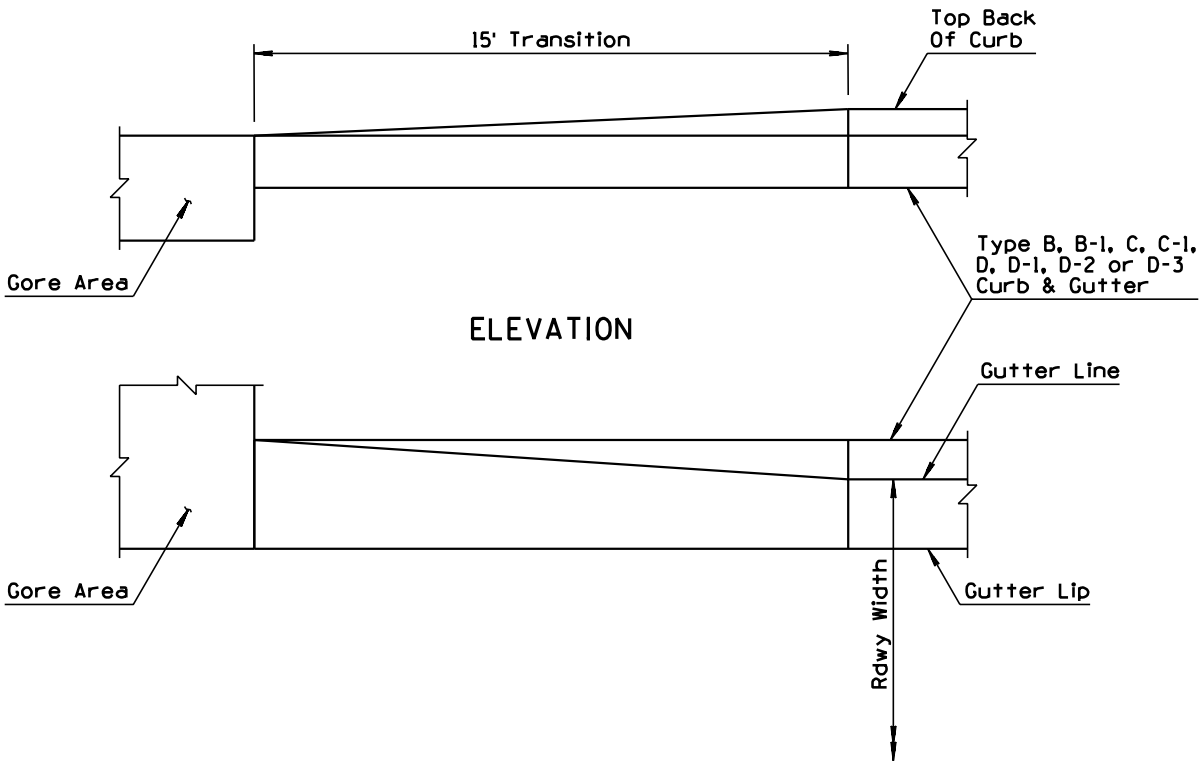
TYPE 2 - CURB & GUTTER TRANSITION

DESIGN APPROVED <i>Terry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CURB & GUTTER TRANSITIONS	DRAWING NO. C-05.12 Sheet 1 of 3

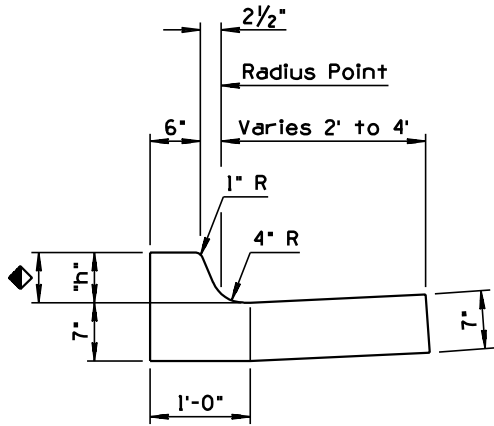
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
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2	ADDED TYPE 4 TRANSITION	PNB	7/94
3			
4			



① PERSPECTIVE VIEW

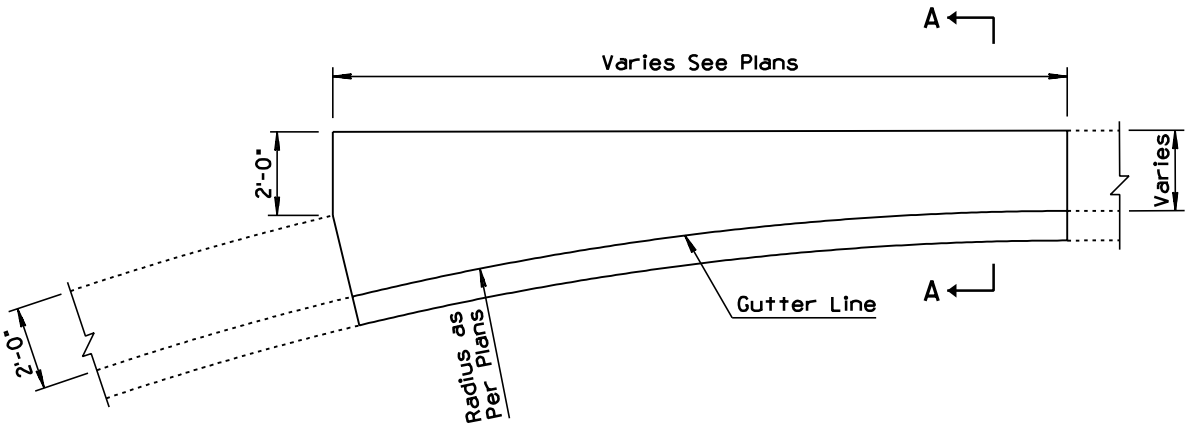


PLAN VIEW
TYPE 3 - CURB & GUTTER TRANSITION AT PAVED GORE



◆ Curb height varies 0" to 7" max in depressed curb area beyond the end of barrier. See Plans for curb height.

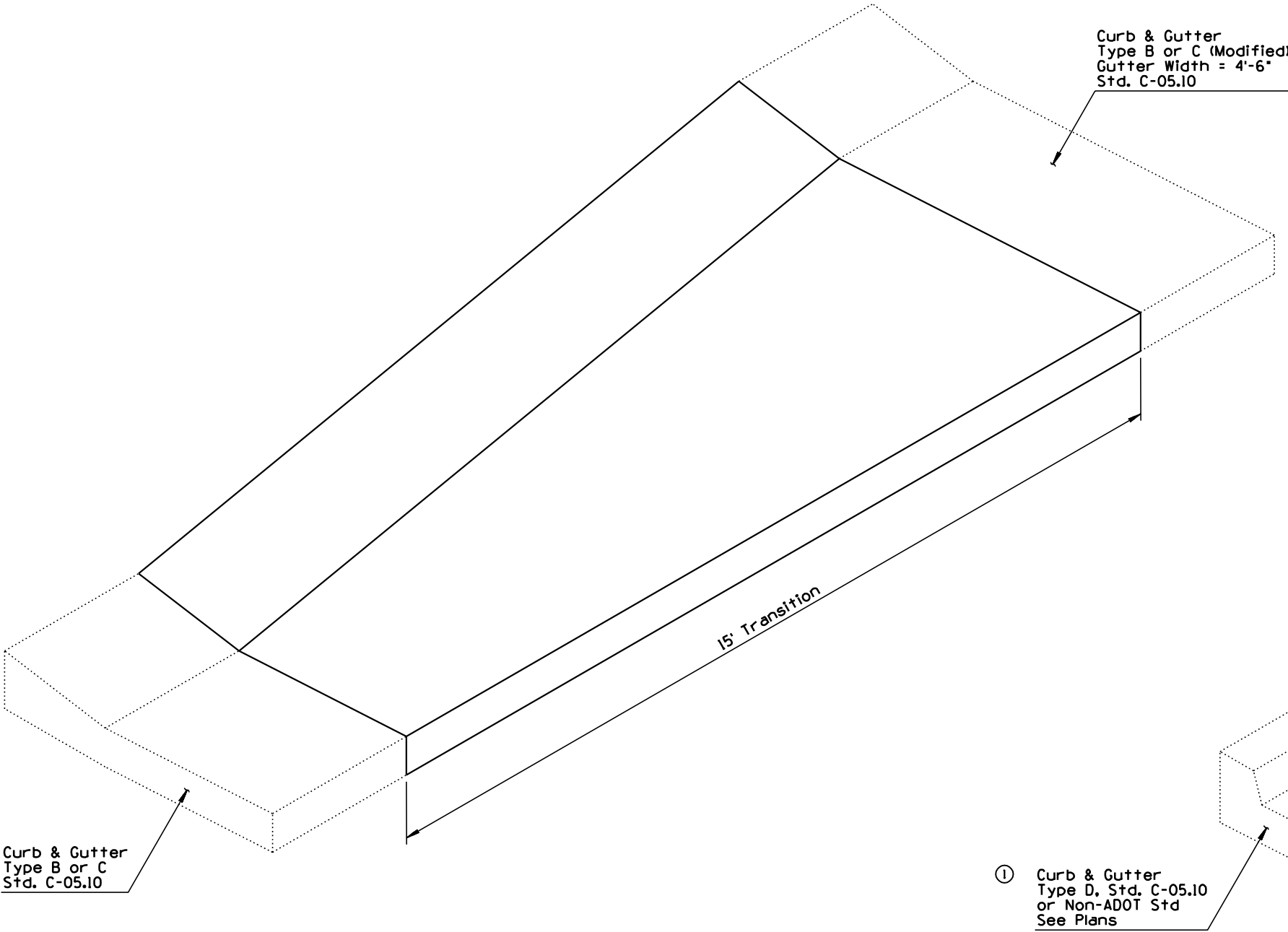
SECTION A-A



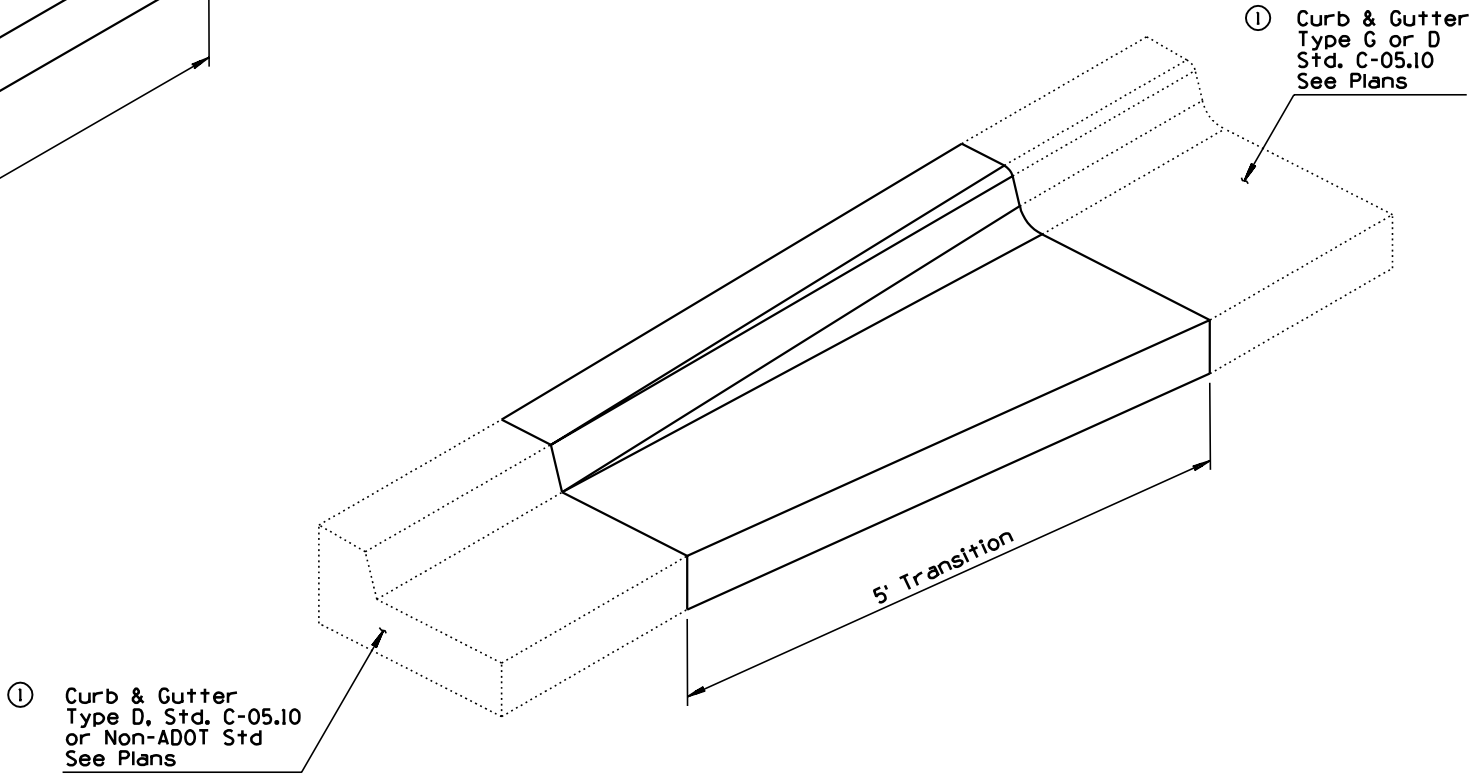
② TYPE 4 - CURB & GUTTER TRANSITION

DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. CURB & GUTTER TRANSITIONS C-05.12 Sheet 2 of 3

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CHANGED TYPE A C&G TO TYPE D C&G	PNB	10/95
2			
3			
4			



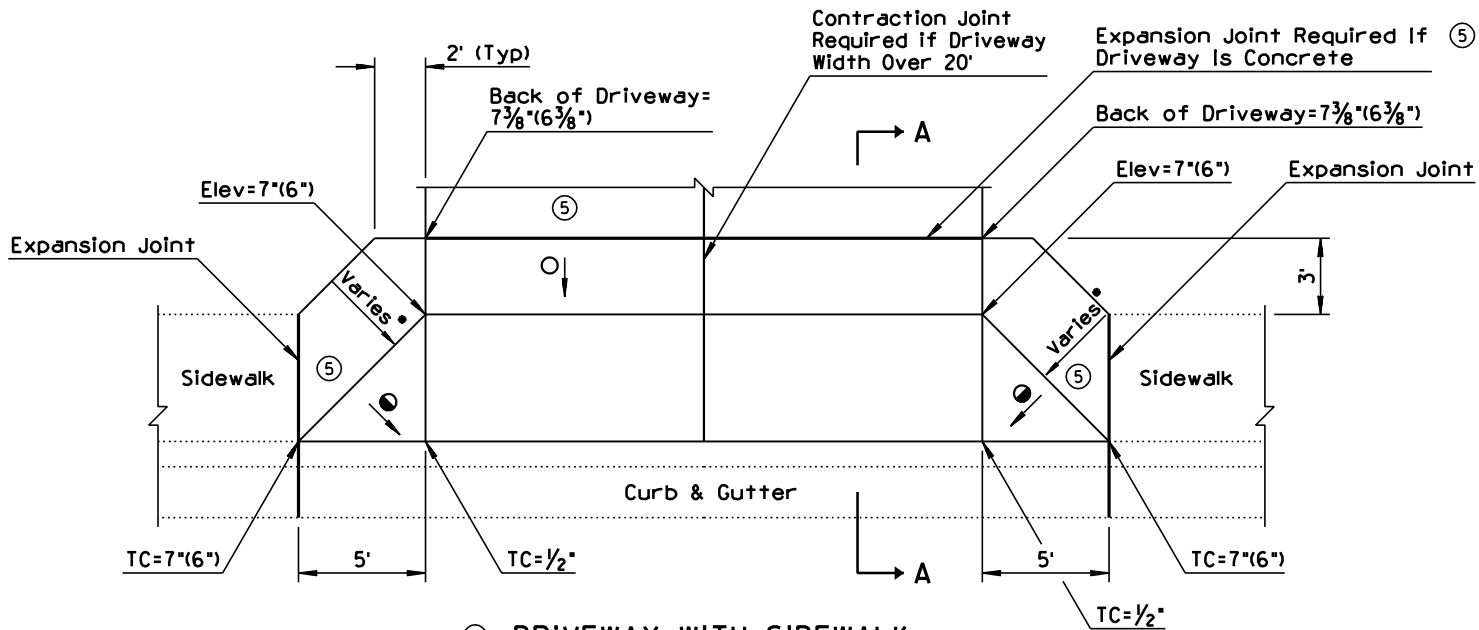
TYPE 5 - CURB & GUTTER TRANSITION



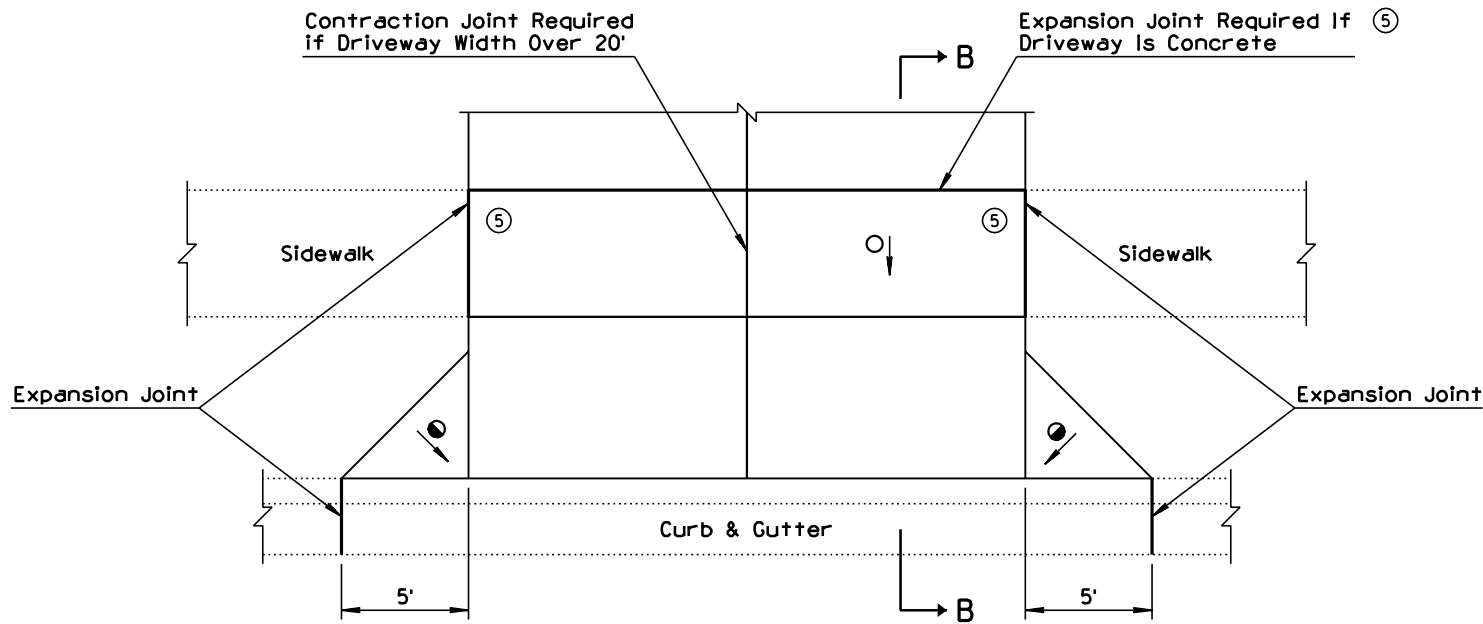
TYPE 6 - CURB & GUTTER TRANSITION

DESIGN APPROVED <i>[Signature]</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>[Signature]</i>		DRAWING NO. C-05.12 Sheet 3 of 3

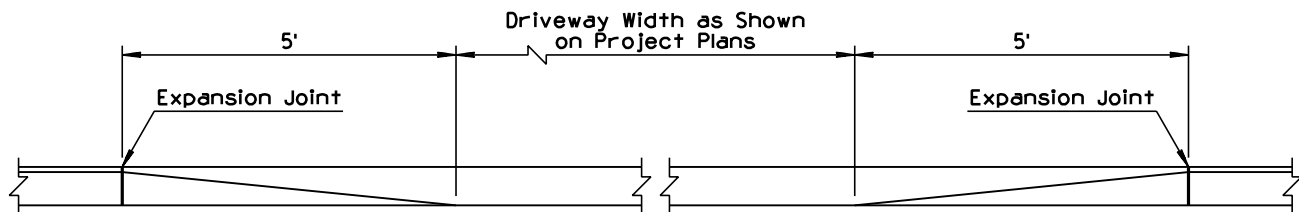
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE	NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTE	PNB	7/94	5	ALTERED EXPANSION JOINT PLACEMENT AND NOTE	BAF	7/97
2	REVISED SECTION	PNB	7/94	6			
3	REVISED DETAIL	PNB	7/94	7			
4	ADDED NOTE	PNB	7/94	8			



③ DRIVEWAY WITH SIDEWALK
ADJACENT TO CURB



DRIVEWAY WITH SIDEWALK SETBACK



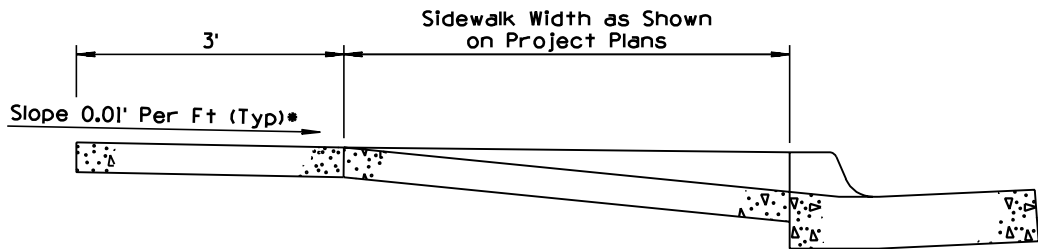
DEPRESSED CURB AT DRIVEWAY ENTRANCE

GENERAL NOTES

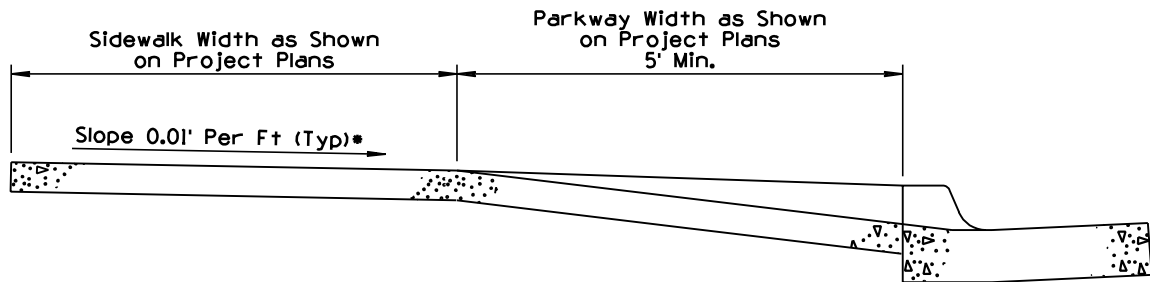
1. Unless otherwise specified, driveways shall be 6 inches in depth.
- ① 2. Two inch deep transverse contraction joints shall be placed in driveways if the driveway width is over 20 feet. If the driveway thickness is greater than 6 inches, then the contraction joint depth shall be $T/3$, where T is the thickness of the driveway. Joints shall be either formed or sawed. Formed joints shall be finished with a tool having a $1/4$ " radius. See sheet 2 of 2 for the Contraction Joint Detail.
- ① 3. Expansion joints shall be located between driveways and sidewalks and all abutting structures. The one-half inch joint filler shall extend the full depth of the concrete. See sheet 2 of 2 for the Expansion Joint Detail.
4. Concrete shall be finished by means of a float, then steel trowelled and then broomed with a fine brush in a transverse direction.
- ④ 5. Top of curb (TC) and driveway elevations shown are in relation to the gutter. Gutter=0".
- ④ 6. When curb heights of 6" or less are shown on plans, use dimensions shown in ()'s.
- ④ 7. When curb heights of 7" or more are shown on plans, see plans.

LEGEND

- → Cross slope (0.01' Per Ft (Typ))*
- → Straight grade with downward slope.
- * Maximum slope = 0.02' Per Ft.



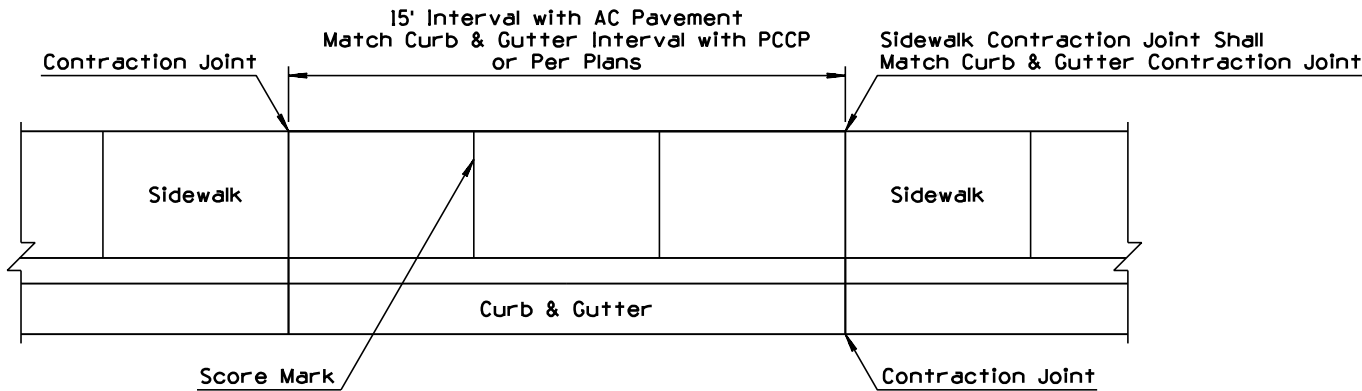
② SECTION A-A



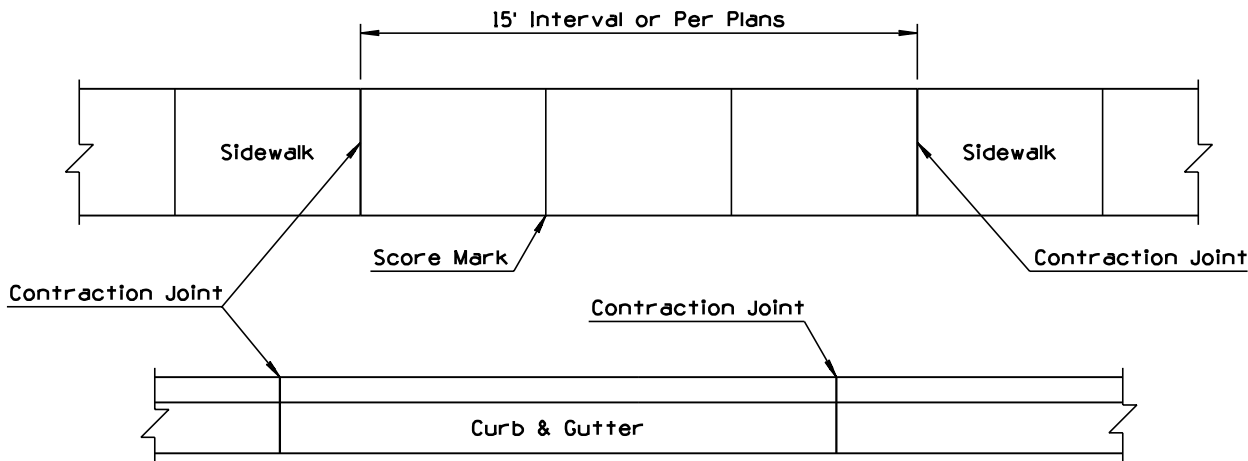
② SECTION B-B

DESIGN APPROVED <i>Henry H. Cotten</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/98
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE DRIVEWAYS & SIDEWALKS DRIVEWAYS	DRAWING NO. C-05.20 Sheet 1 of 2

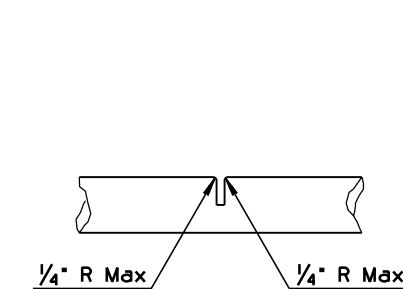
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			



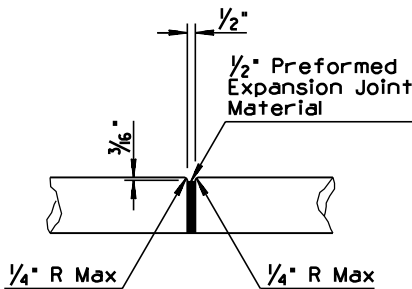
SIDEWALK ADJACENT TO CURB



SIDEWALK SETBACK FROM CURB



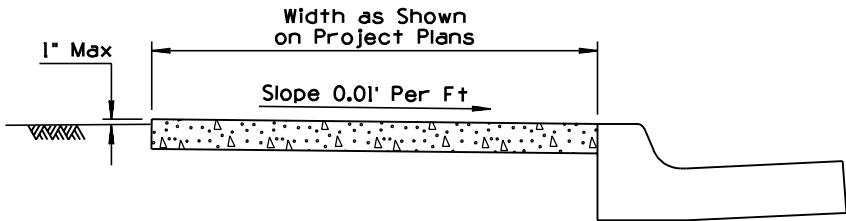
CONTRACTION JOINT DETAIL



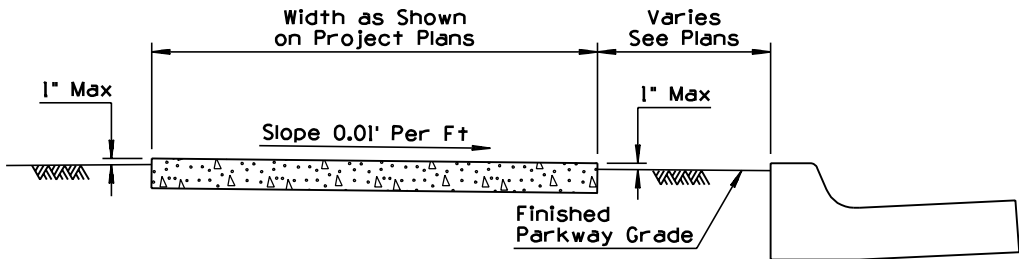
EXPANSION JOINT DETAIL

GENERAL NOTES



1. Unless otherwise specified, sidewalks shall be 4 inches in depth.
2. One inch deep transverse contraction joints shall be placed in sidewalks at intervals of approximately 15 feet or at a spacing that matches adjacent curb and gutter. If the sidewalk is over 7 feet in width, a 2 inch deep longitudinal contraction joint shall be placed in the center of the sidewalk. The maximum area of sidewalk without contraction joints or scoring lines shall be approximately 36 square feet. Joints shall be either formed or sawed. Formed joints shall be finished with a tool having a 1/4" radius.
3. Expansion joints shall be located between sidewalks and driveways and all abutting structures. Expansion joints shall match the joints in the adjacent concrete pavement or existing concrete curb and sidewalk. Maximum length of sidewalk without an expansion joint shall be 60 transverse feet. The one-half inch joint filler shall extend the full depth of the concrete.
4. Concrete shall be finished by means of a float, then steel trowelled and then broomed with a fine brush in a transverse direction.
5. Sidewalks shall be constructed to a desirable width of 5 feet on major streets, a minimum width of 4 feet on residential streets or as shown on the plans.
6. Scoring lines shall be 1/4 inch in depth. They shall be placed at 5 foot spacing when the contraction joint interval is 15 feet and at 6 foot spacing when the contraction joint interval is 12 feet.



CONCRETE SIDEWALK ADJACENT TO CURB

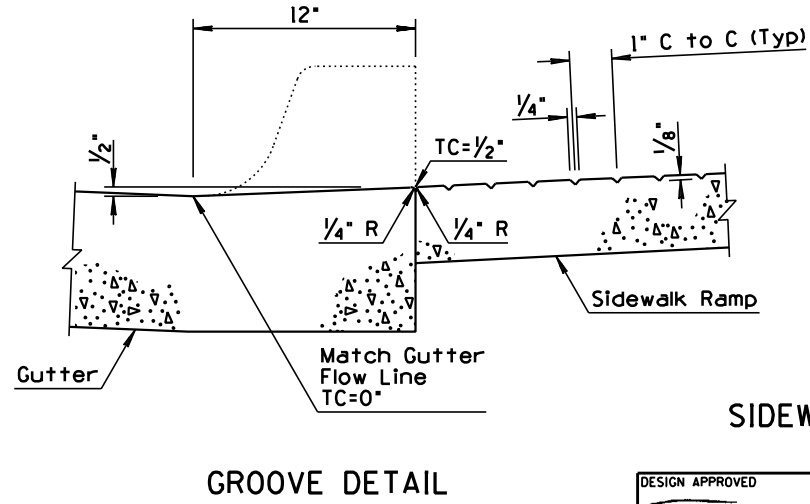
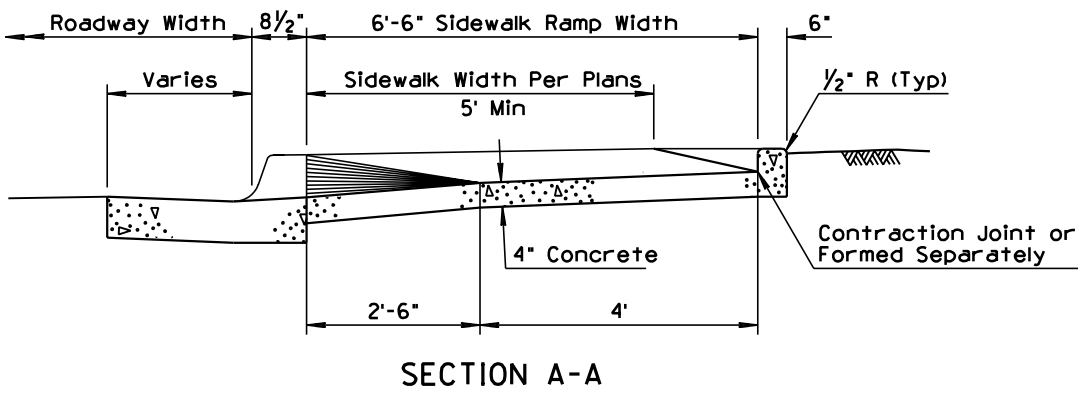
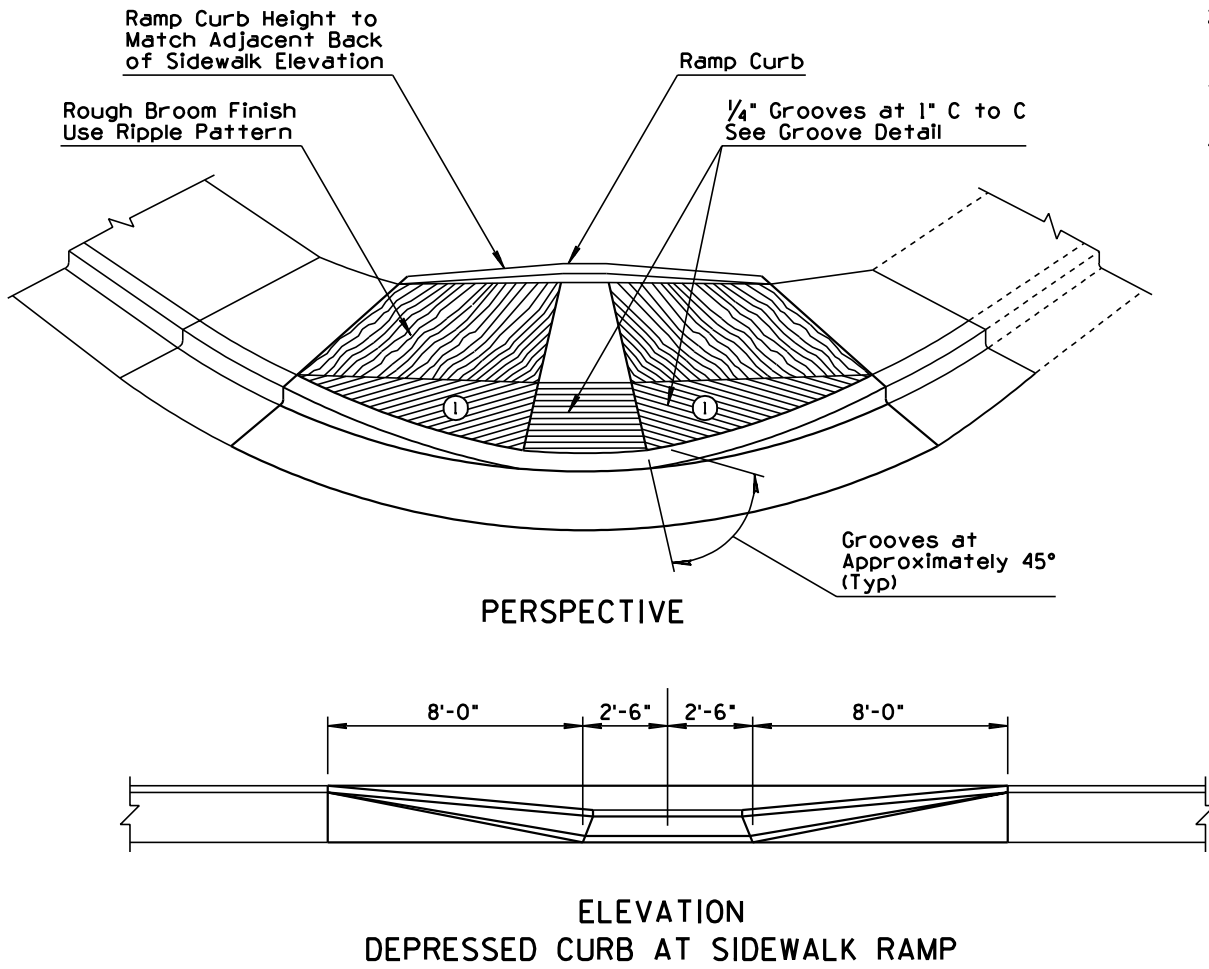
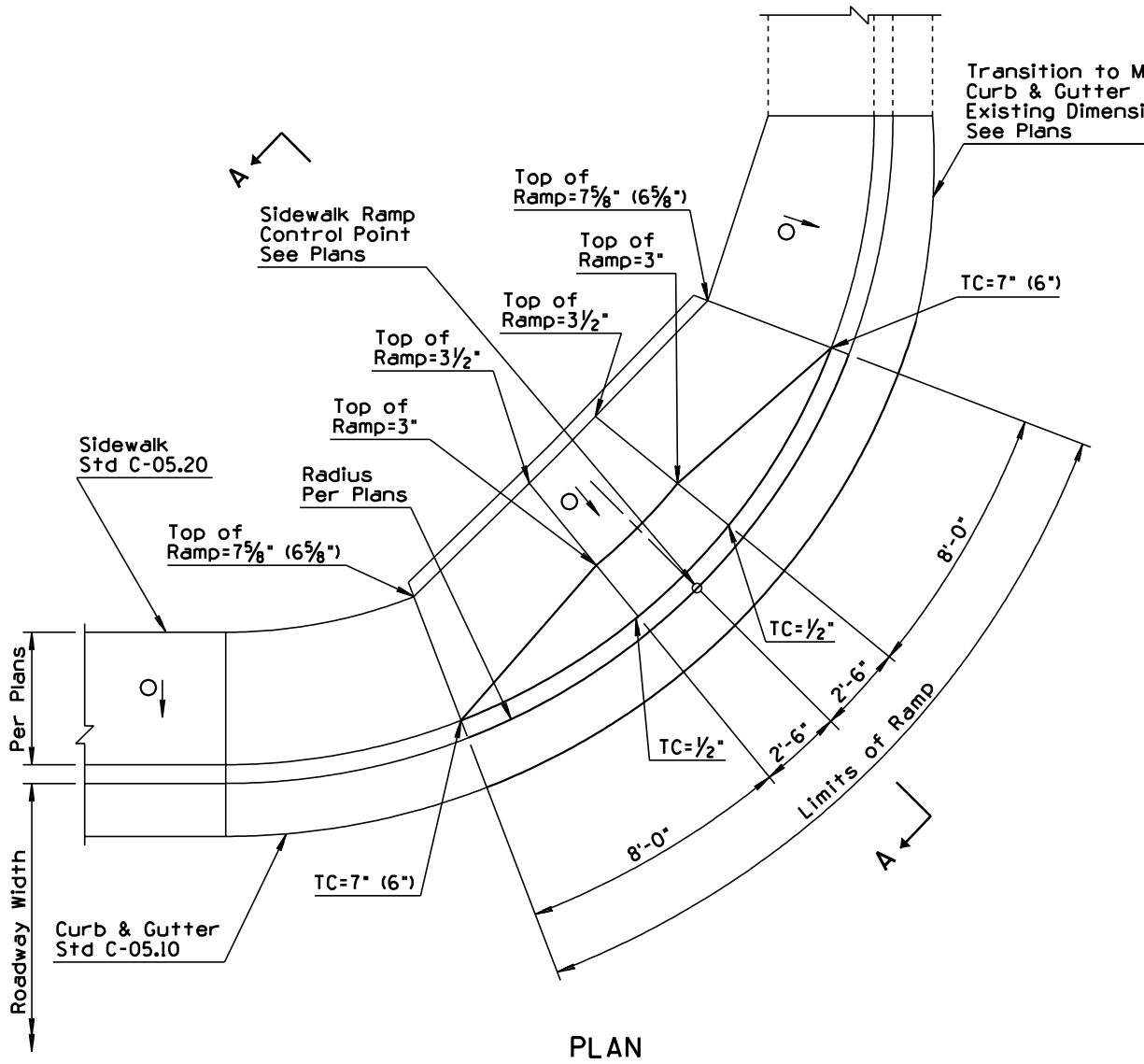


CONCRETE SIDEWALK SETBACK FROM CURB

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		7/94
APPROVED FOR DISTRIBUTION 	CONCRETE DRIVEWAYS & SIDEWALKS SIDEWALKS	DRAWING NO. C-05.20 Sheet 2 of 2	

Note to Designer:
The sidewalk standard drawing series C-05.30 has been developed for new construction. Where retrofits to existing sidewalks are needed or other special site conditions apply such that these standards cannot be used, separate plans detailing the ADA guidelines shall be provided.

NO.	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TO SHOW CORRECT ORIENTATION OF THE GROOVING	JNP	4/00
2			
3			
4			



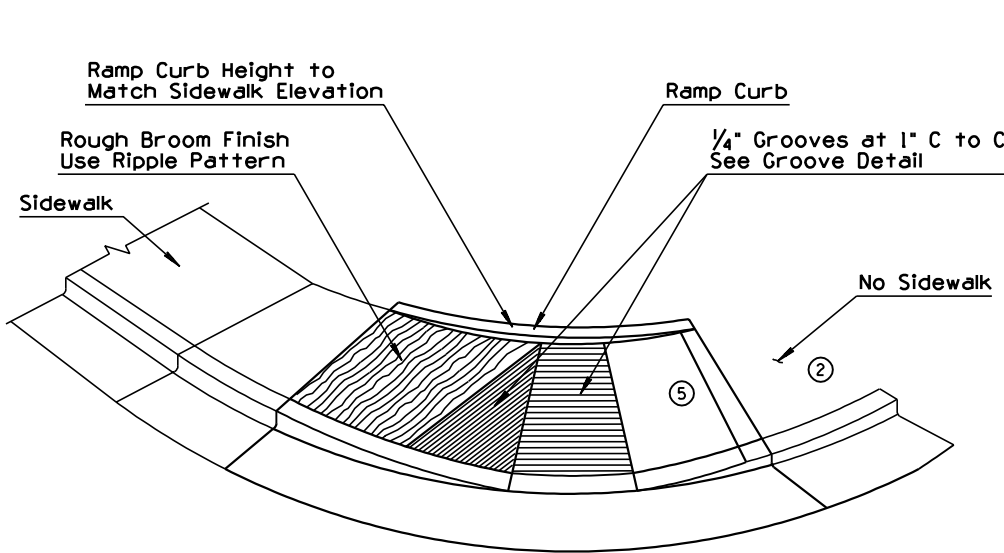
- ### GENERAL NOTES
1. Top of curb (TC) and top of ramp elevations shown are in relation to the gutter and are located radially. Gutter=0".
 2. See Std C-05.10 and C-05.20 for joint requirements.
 3. When curb heights of 6" or less are shown on plans, use dimensions shown in ()'s.
 4. When curb heights of greater than 7" are shown on plans, see plans and ADA requirements.
- ### LEGEND
- Cross slope (0.01' Per Ft (Typ))*
- * Maximum slope = 0.02' Per Ft.

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION 	SIDEWALK RAMP TYPE I	DRAWING NO. C-05.30 Sheet 1 of 6

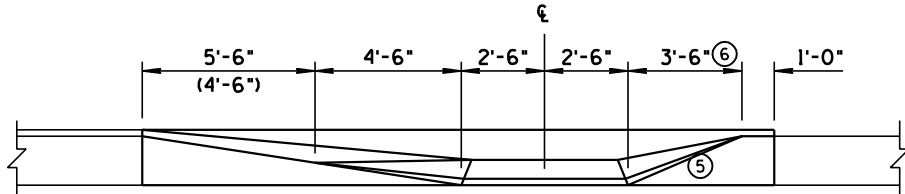
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1	REVISED SHEET NUMBER	JNP	8/99	5	REVISED DRAWING	JNP	8/99
2	REVISED TO SHOW THAT SIDEWALK IS NOT CONTINUED	JNP	8/99	6	REVISED DIMENSION	JNP	8/99
3	ADDED TITLE	JNP	8/99	7			
4	ADDED NOTE	JNP	8/99	8			

GENERAL NOTES

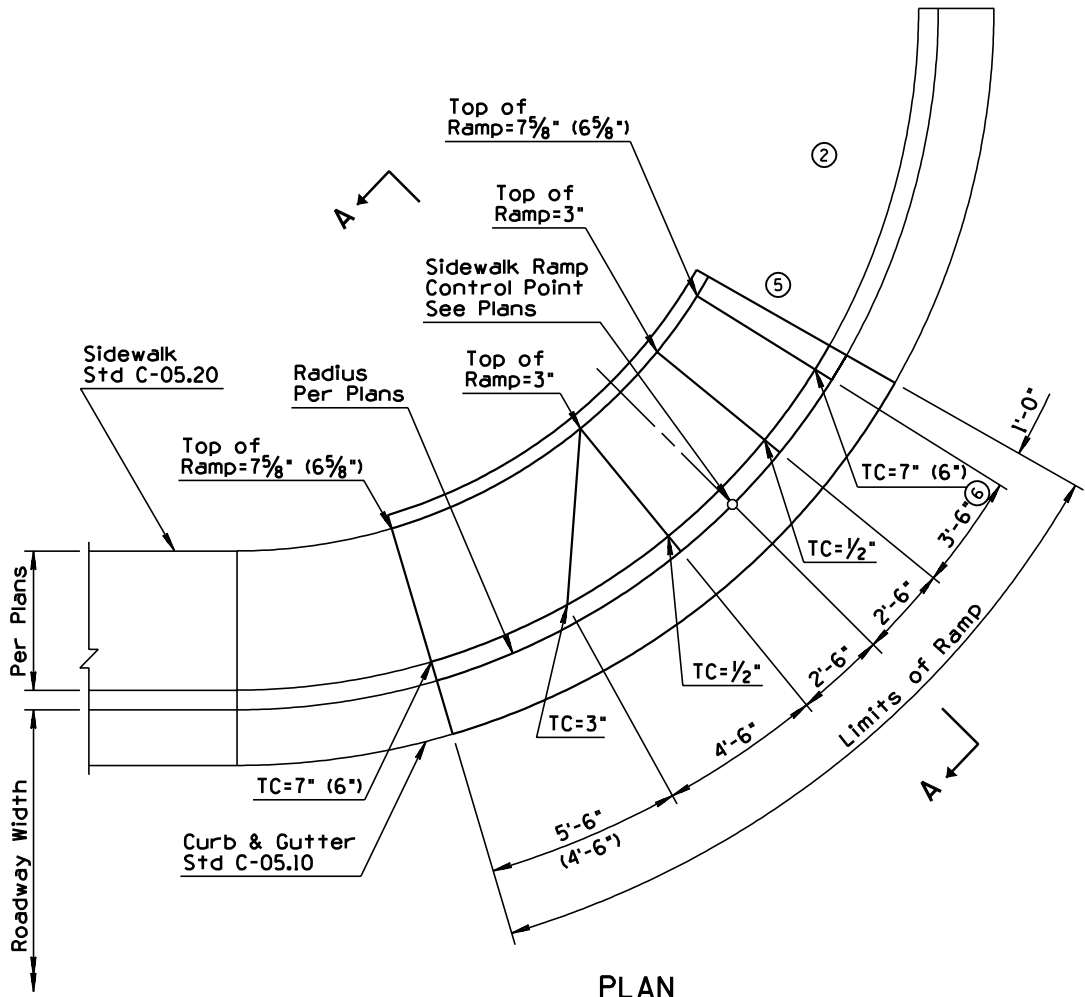
- ④ 1. For use when sidewalk is not continuous both sides. If sidewalk is anticipated in the future, utilize Type 1 or Type 6 Ramp.
2. Top of curb (TC) and top of ramp elevations shown are in relation to the gutter and are located radially. Gutter=0".
3. See Std C-05.10 and C-05.20 for joint requirements.
4. When curb heights of 6" or less are shown on plans, use dimensions shown in ()'s.
5. When curb heights of greater than 7" are shown on plans, see plans and ADA requirements.



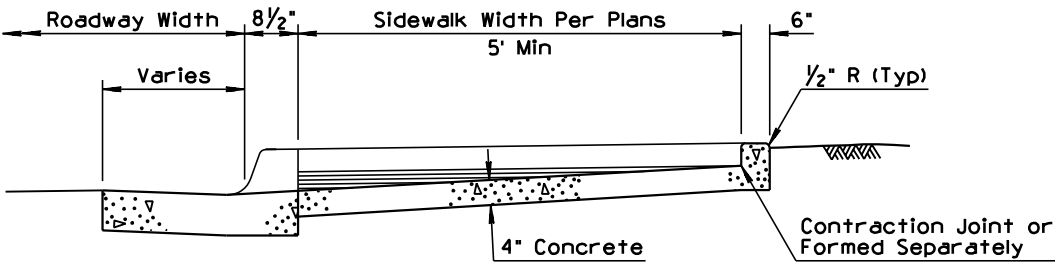
PERSPECTIVE



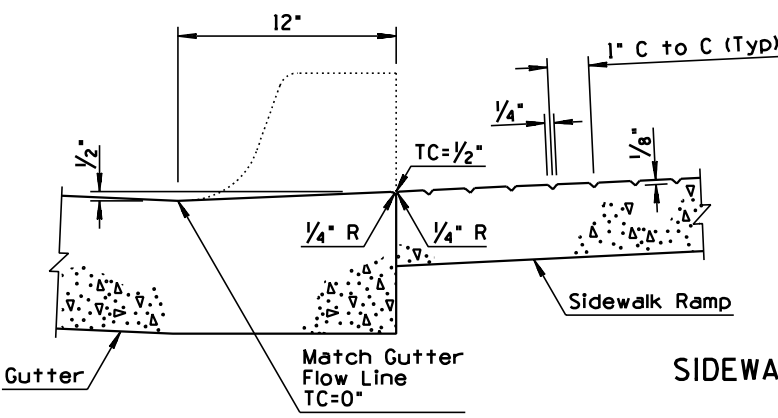
ELEVATION
DEPRESSED CURB AT SIDEWALK RAMP



PLAN



SECTION A-A



GROOVE DETAIL

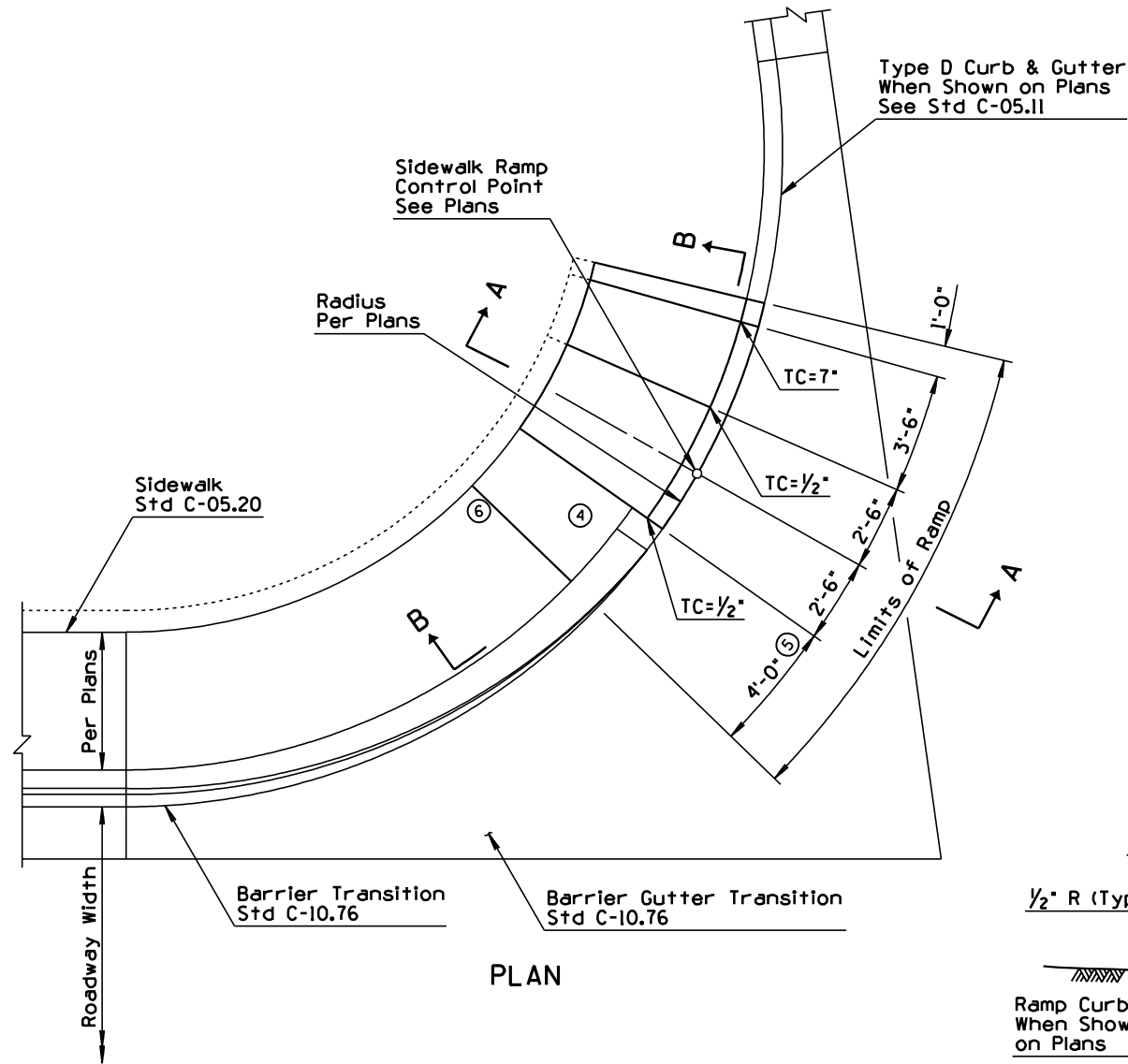
SIDEWALK RAMP WITHOUT PEDESTRIAN BYPASS ③

DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/99
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SIDEWALK RAMP TYPE 2	DRAWING NO. C-05.30 ① Sheet 2 of 6

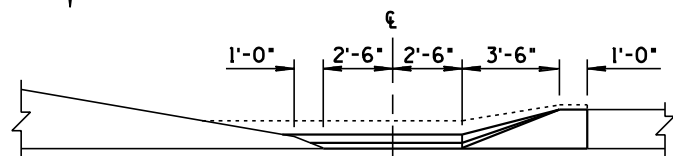
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1	REVISED SHEET NUMBER	JNP	8/99	5	REVISED DIMENSION	JNP	8/99
2	ADDED TITLE	JNP	8/99	6	REVISED DRAWING	JNP	8/99
3	ADDED NOTE	JNP	8/99	7			
4	DELETED NOTE	JNP	8/99	8			

Note to Designer: The sidewalk standard drawing series C-05.30 has been developed for new construction. Where retrofits to existing sidewalks are needed or other special site conditions apply such that these standards cannot be used, separate plans detailing the ADA guidelines shall be provided.

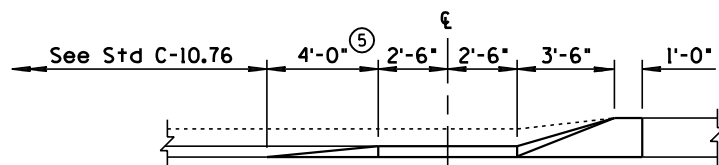
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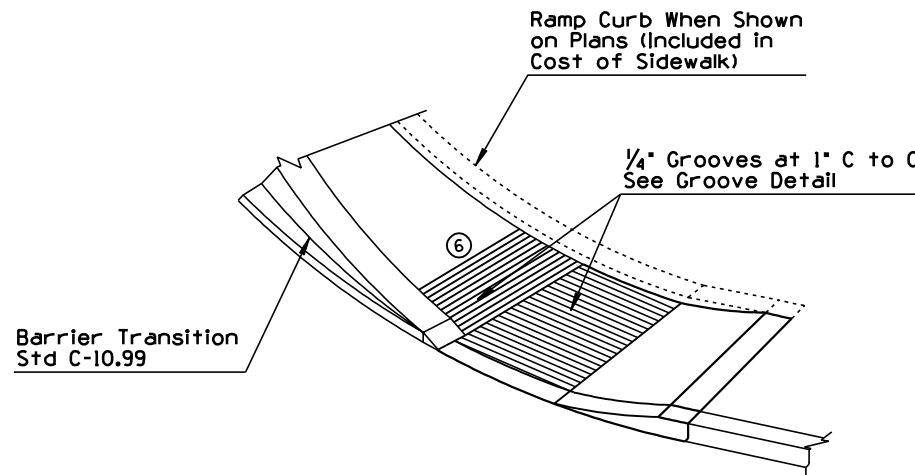
PLAN



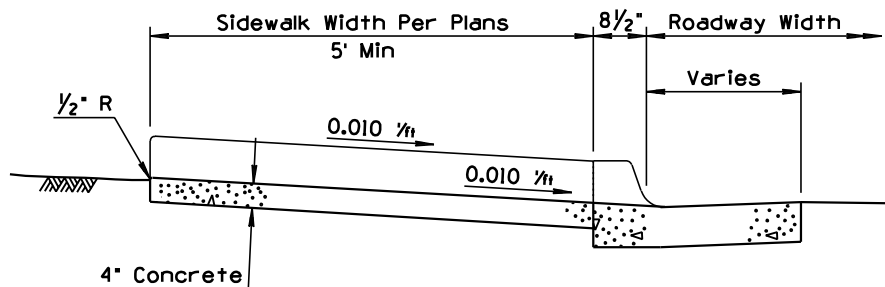
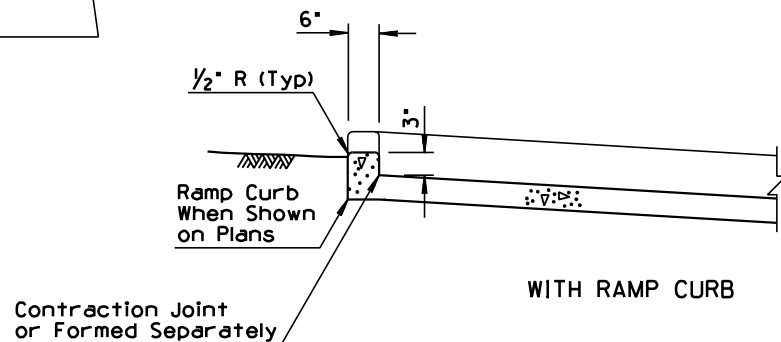
ELEVATION
DEPRESSED CURB AT SIDEWALK RAMP



SECTION B-B



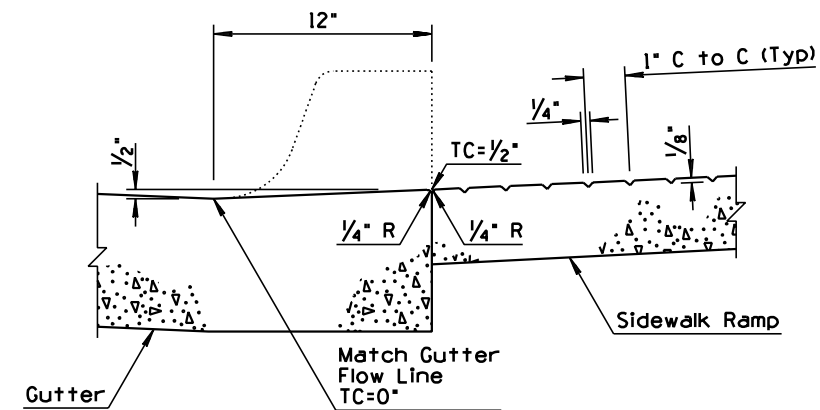
PERSPECTIVE



SECTION A-A

- ### GENERAL NOTES
- Top of curb (TC) elevations shown are in relation to the gutter and are located radially. Gutter=0".
 - See Std C-05.10 and C-05.20 for joint requirements.

4



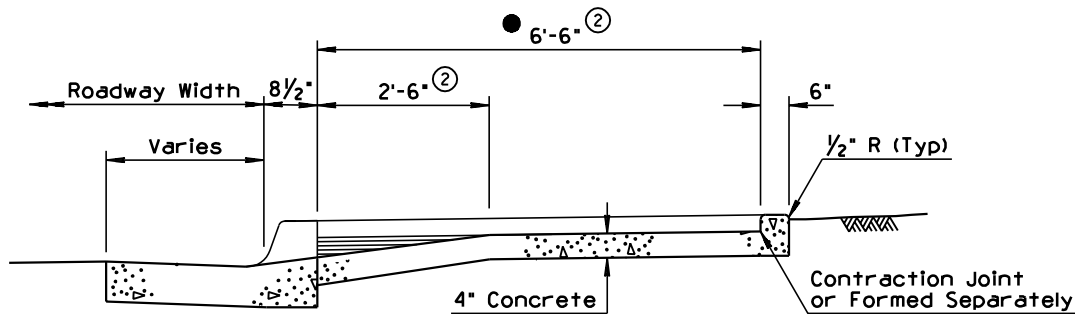
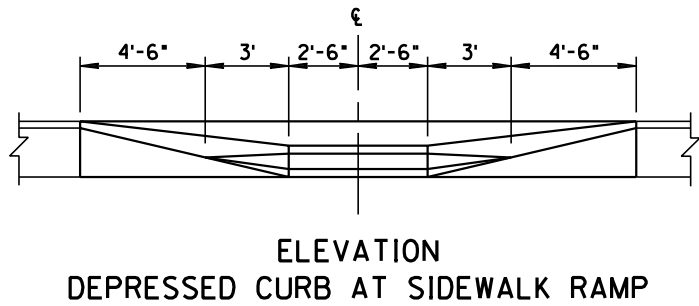
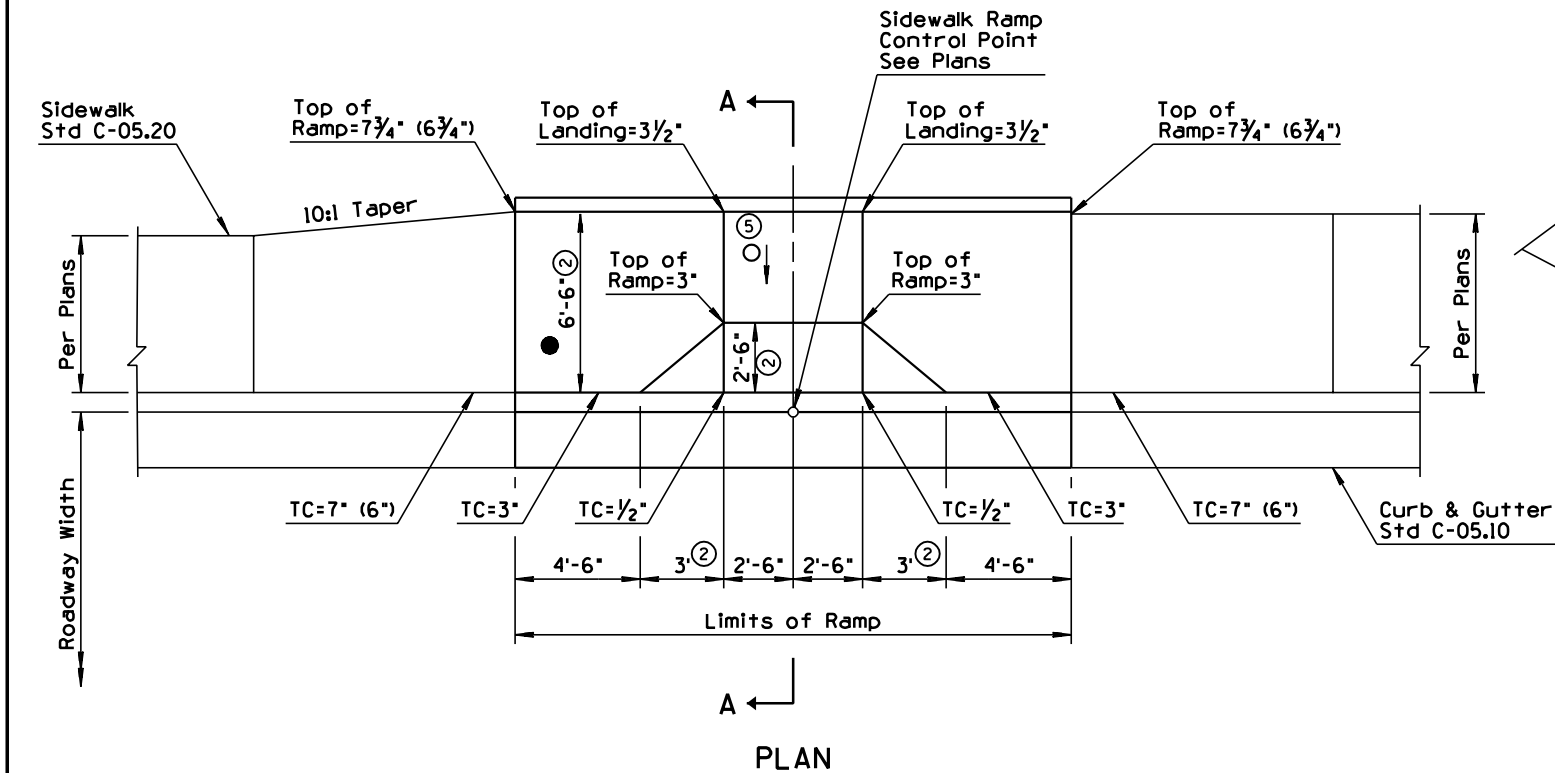
GROOVE DETAIL

SIDEWALK RAMP AT BARRIER TERMINUS 2
SIDEWALK BEHIND BARRIER

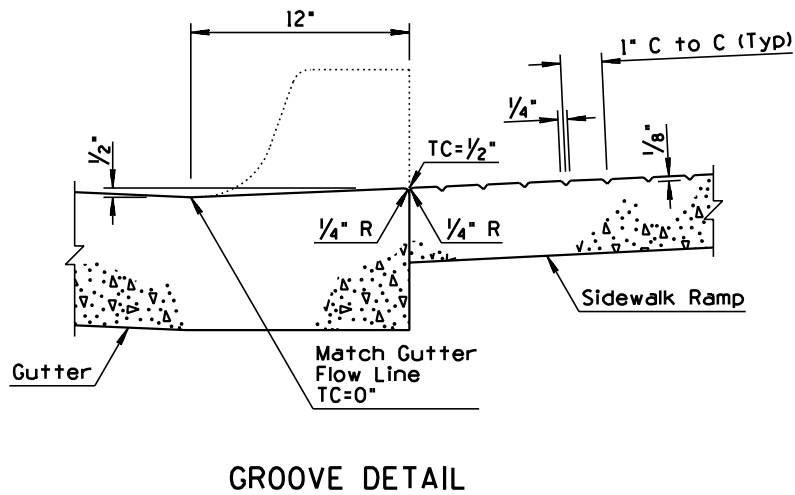
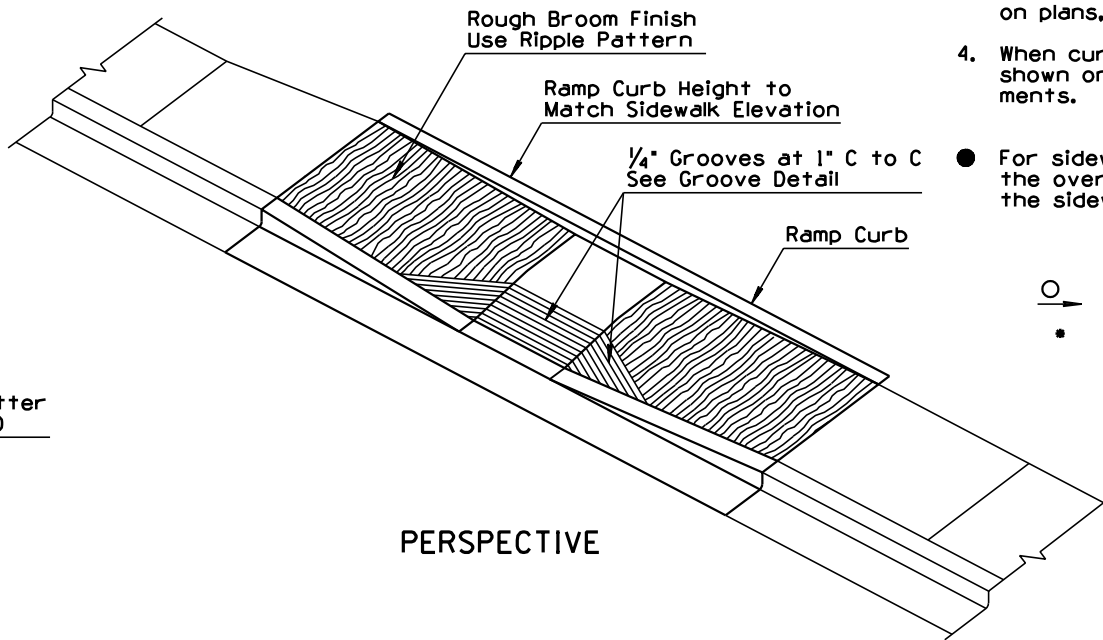
DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/99
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SIDEWALK RAMP TYPE 3	DRAWING NO. C-05.30 1 Sheet 3 of 6

4) Note to Designer: The sidewalk standard drawing series C-05.30 has been developed for new construction. Where retrofits to existing sidewalks are needed or other special site conditions apply such that these standards cannot be used, separate plans details considering the ADA guidelines shall be provided.

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE	NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SHEET NUMBER	JNP	8/99	5	ADDED SYMBOL	JNP	8/99
2	REVISED DIMENSION	JNP	8/99	6			
3	ADDED TITLE	JNP	8/99	7			
4	ADDED NOTE	JNP	8/99	8			



SECTION A-A



GENERAL NOTES

1. Top of curb (TC) and top of ramp elevations shown are in relation to the gutter. Gutter=0".
 2. See Std C-05.10 and C-05.20 for joint requirements
 3. When curb heights of 6" or less are shown on plans, use dimensions shown in ()'s.
 4. When curb heights of greater than 7" are shown on plans, see plans and ADA requirements.
- For sidewalk widths greater than 6'-6" ^②, the overall sidewalk ramp width shall match the sidewalk width.

④ LEGEND

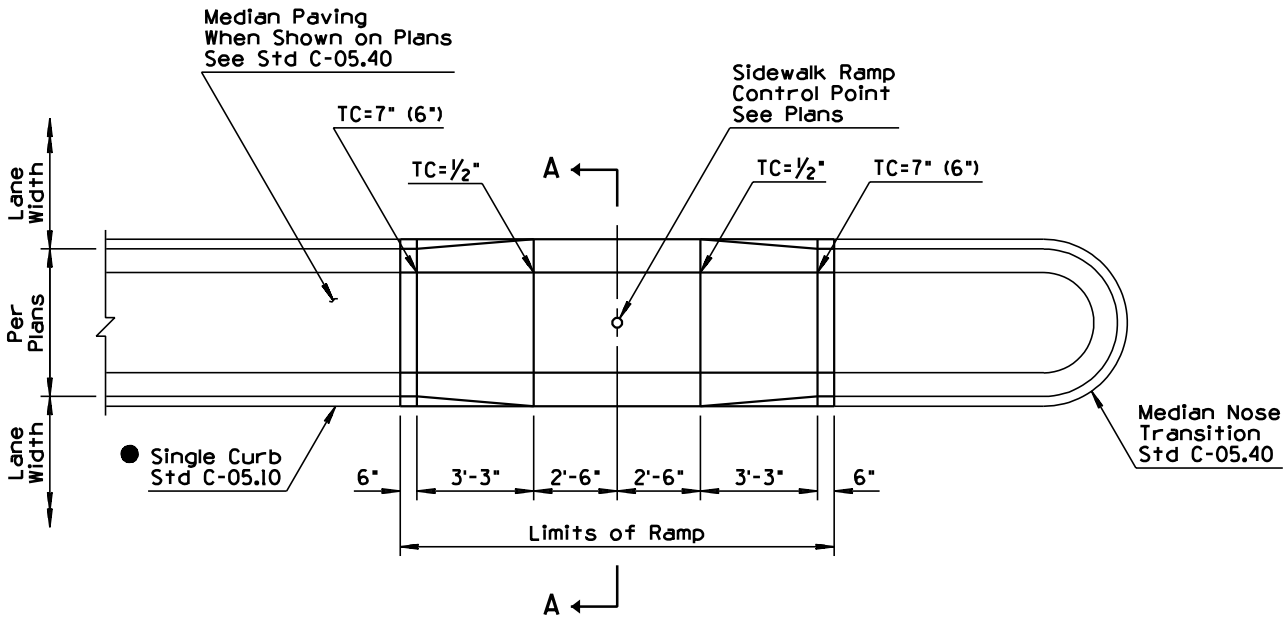
- → Cross slope (0.01' Per Ft (Typ))*
- Maximum slope = 0.02' Per Ft.

SIDEWALK RAMP AT MIDBLOCK ^③

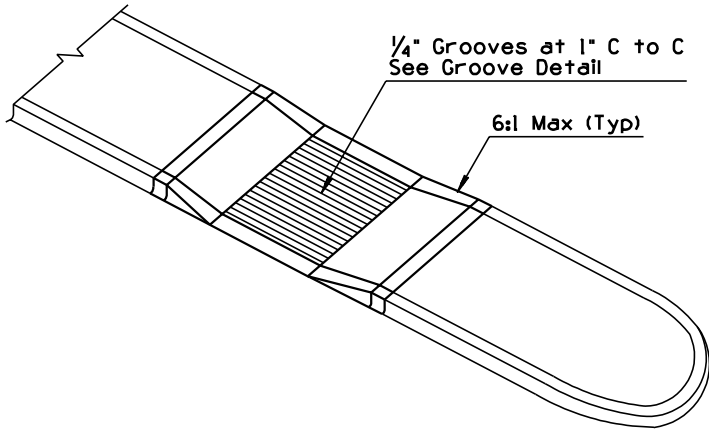
DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/99
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SIDEWALK RAMP TYPE 4	DRAWING NO. C-05.30 ^① Sheet 4 of 6

4) Note to Designer: The sidewalk standard drawing series C-05.30 has been developed for new construction. Where retrofits to existing sidewalks are needed or other special site conditions apply such that these standards cannot be used, separate plans details considering the ADA guidelines shall be provided.

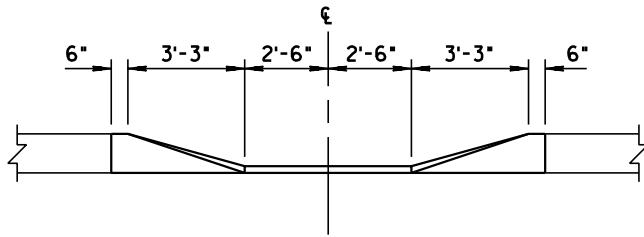
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SHEET NUMBER; CHANGED TO TYPE 5 FROM TYPE 1	JNP	8/99
2	REVISED TITLE	JNP	8/99
3	ADDED TITLE	JNP	8/99
4	ADDED NOTE	JNP	8/99



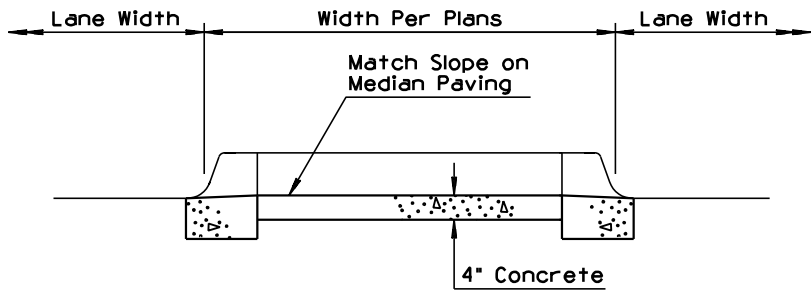
PLAN



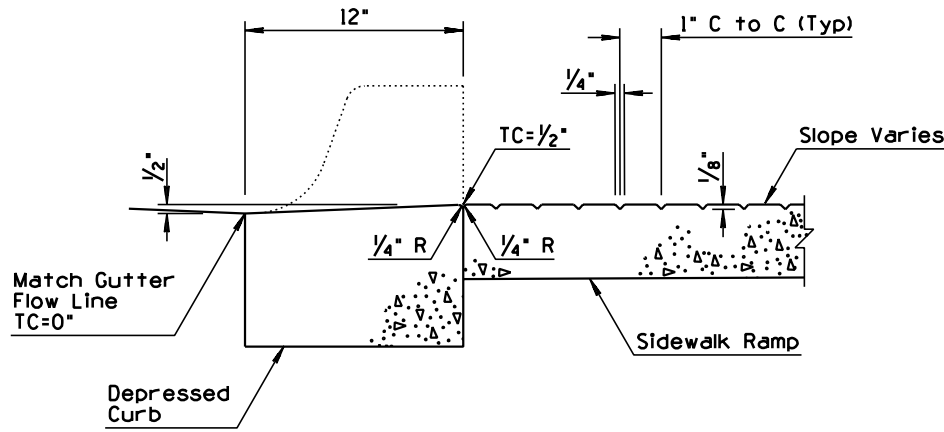
PERSPECTIVE



ELEVATION
DEPRESSED CURB AT SIDEWALK RAMP



SECTION A-A



GROOVE DETAIL

GENERAL NOTES

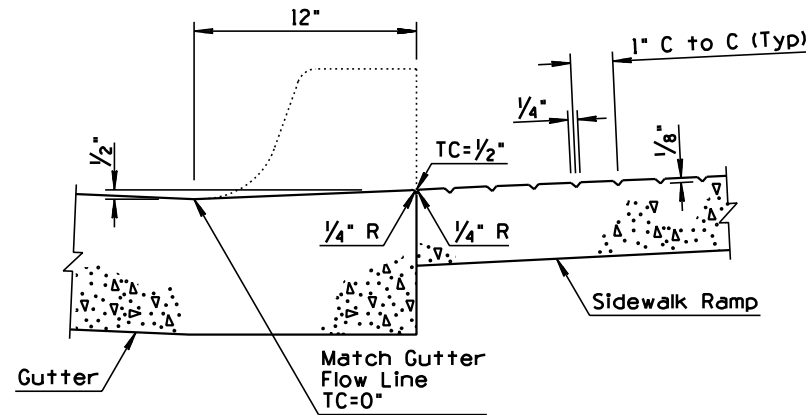
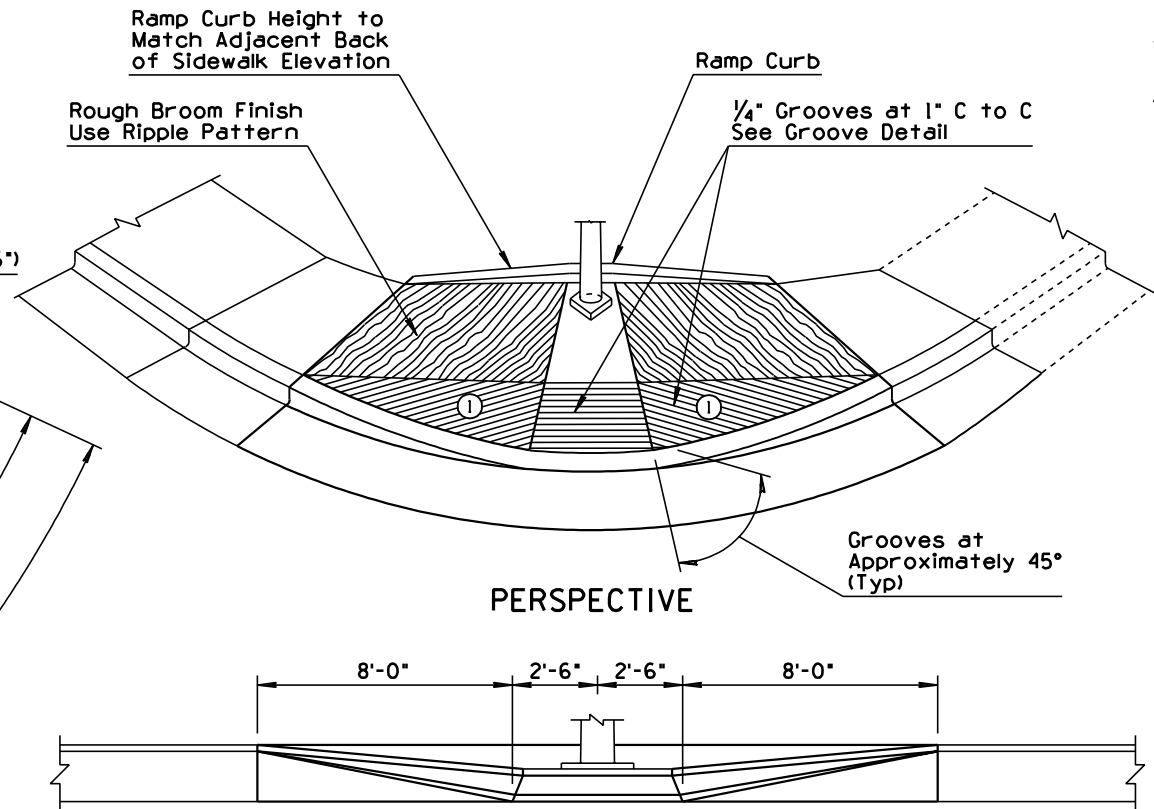
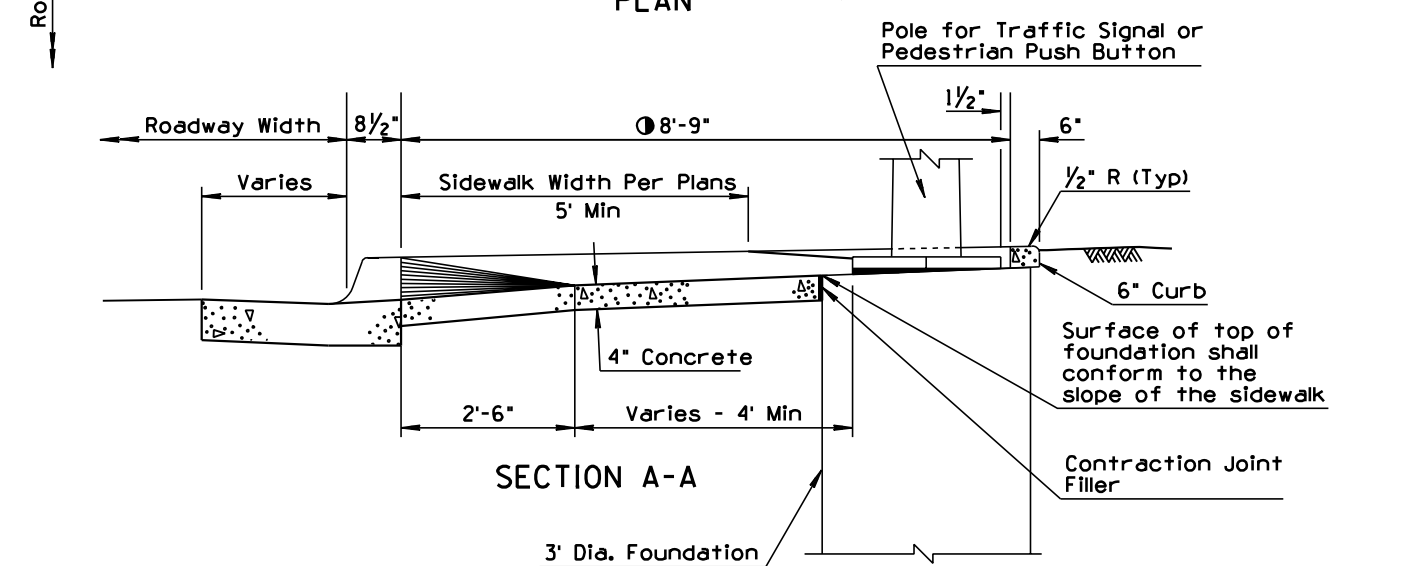
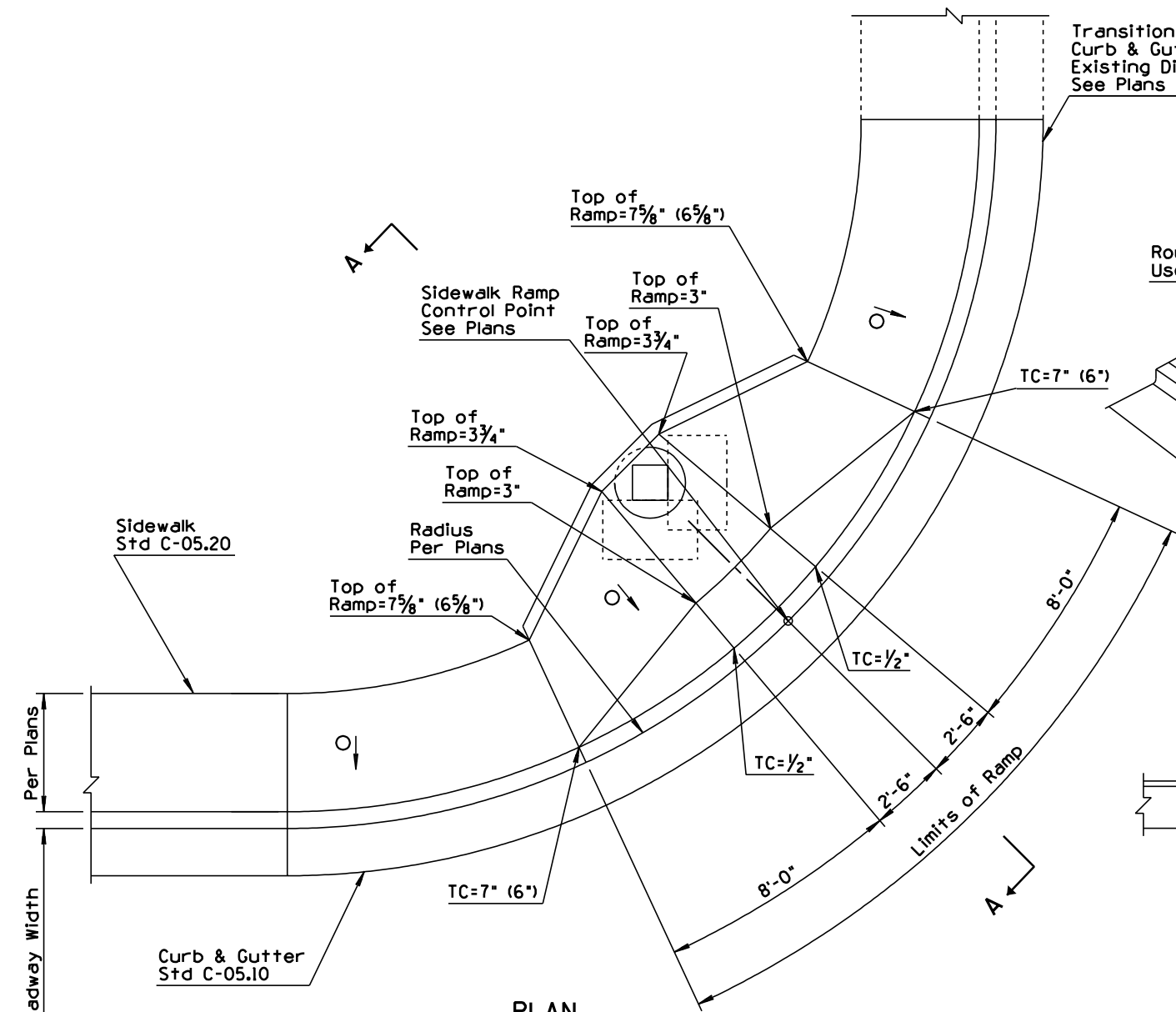
1. Top of curb (TC) and top of ramp elevations shown are in relation to the gutter. Gutter=0".
 2. See Std C-05.10 and C-05.20 for joint requirements.
 3. When curb heights of 6" are shown on plans, use dimensions shown in ()'s.
 4. If field modification is required, bottom width shall be 4' minimum, as per ADA requirements.
- Use type A1 curb if median is to be landscaped.

SIDEWALK RAMP AT MEDIAN ISLAND CROSSING ③

DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/99
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	SIDEWALK RAMP TYPE 5 ②	DRAWING NO. C-05.30 ① Sheet 5 of 6

Note to Designer:
The sidewalk standard drawing series C-05.30 has been developed for new construction. Where retrofits to existing sidewalks are needed or other special site conditions apply such that these standards cannot be used, separate plans detailing the ADA guidelines shall be provided.

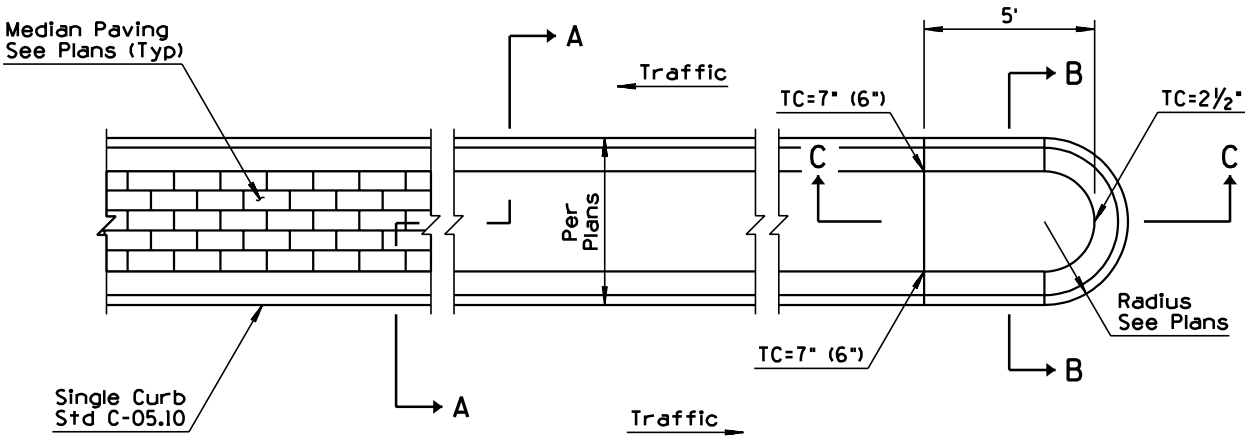
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1	REVISED TO SHOW CORRECT ORIENTATION OF THE GROOVING	JNP	4/00
2			
3			
4			



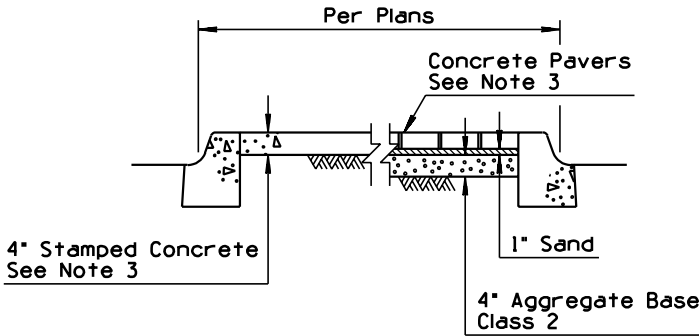
- ### GENERAL NOTES
1. Top of curb (TC) and top of ramp elevations shown are in relation to the gutter and are located radially. Gutter=0".
 2. See Std C-05.10 and C-05.20 for joint requirements.
 3. When curb heights of 6" or less are shown on plans, use dimensions shown in ()'s.
 4. When curb heights of greater than 7" are shown on plans, see plans and ADA requirements.
- ### LEGEND
- Cross slope (0.01' Per Ft (Typ))*
 - * Maximum slope = 0.02' Per Ft.
 -

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 4/00
	SIDEWALK RAMP TYPE 6	DRAWING NO. C-05.30 Sheet 6 of 6	

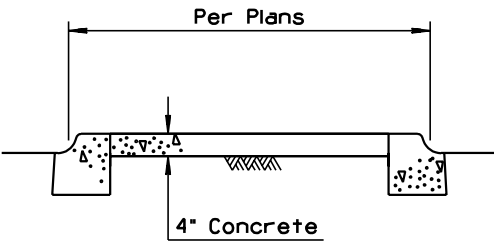
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	DELETED CONC MEDIAN ON STRUCTURE DETAIL/ADDED NOTE	TC	1/93
2			
3			
4			



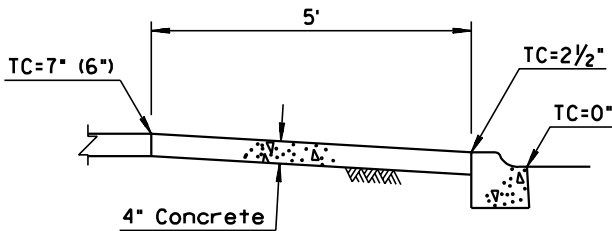
PLAN



SECTION A-A



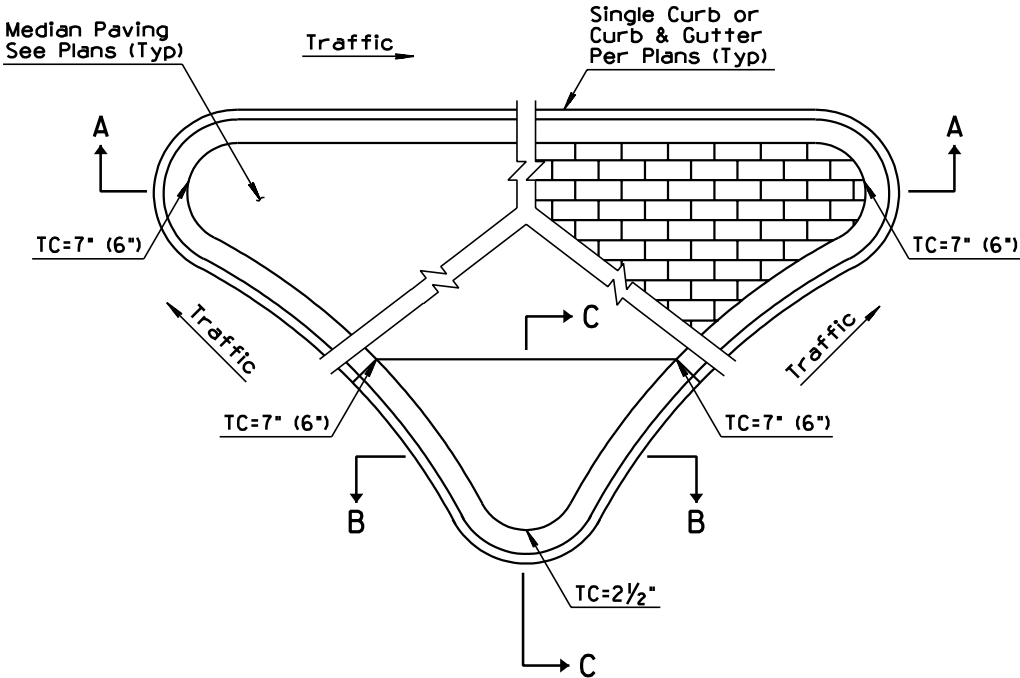
SECTION B-B



SECTION C-C

GENERAL NOTES

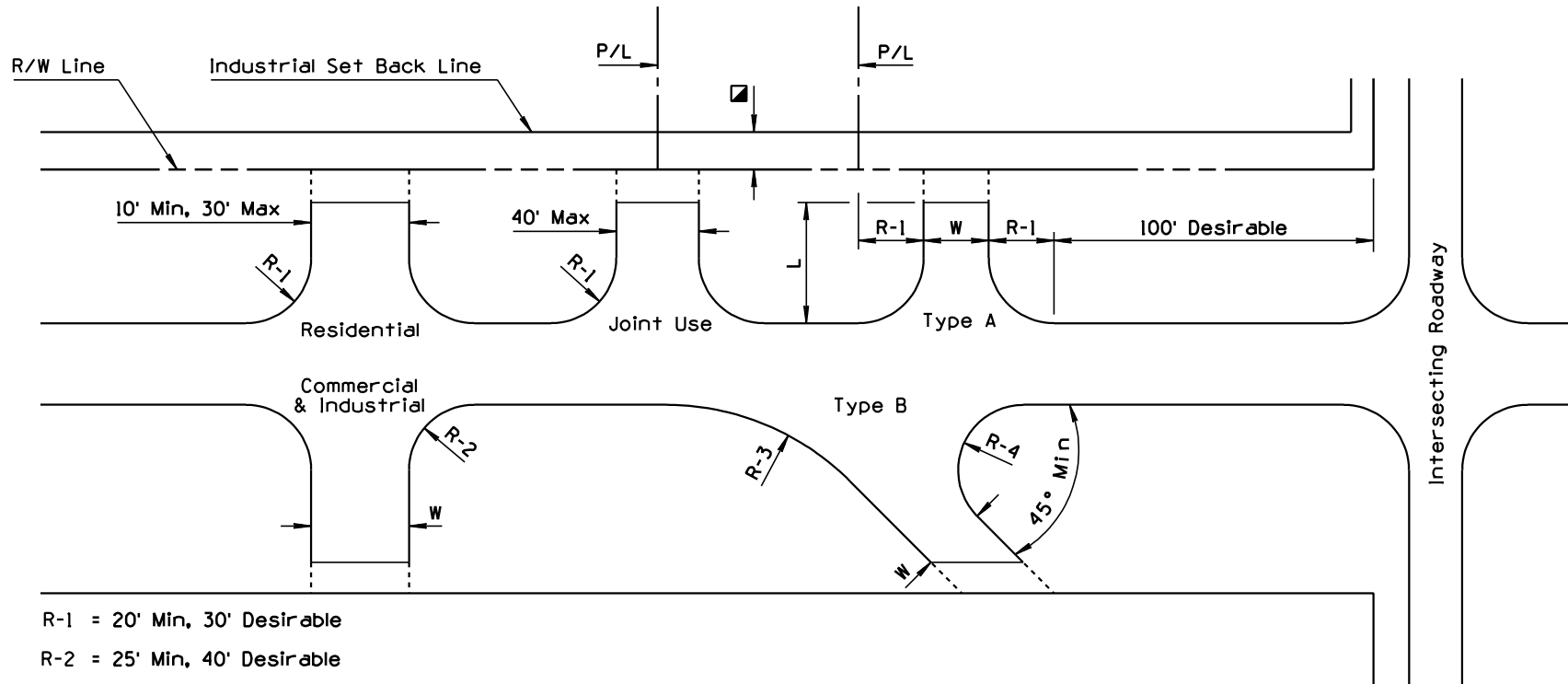
1. Traffic signal foundations, traffic sign foundations and pull boxes for traffic signs and traffic signals shall be installed prior to placement of median paving.
2. See Std C-05.10, C-05.11 and C-05.20 for joint requirements.
3. Decorative median paving shall be stamped concrete, concrete pavers or as specified on the project plans.
4. Decorative median paving shall not be placed on a median nose transition or on a median island on a structure.
5. A 4" x 6" concrete header shall be used to end decorative paving at locations when concrete sidewalk ramps are not present.
6. Median nose transitions shall not be placed on departure ends of raised medians.
7. Top of curb (TC) and top of ramp elevations shown are in relation to the gutter. Gutter=0".
8. When curb heights of 6" are shown on plans, use dimensions shown in ()'s.
9. See Structure Plans for raised median on structures.



NOSE TRANSITION LAYOUT

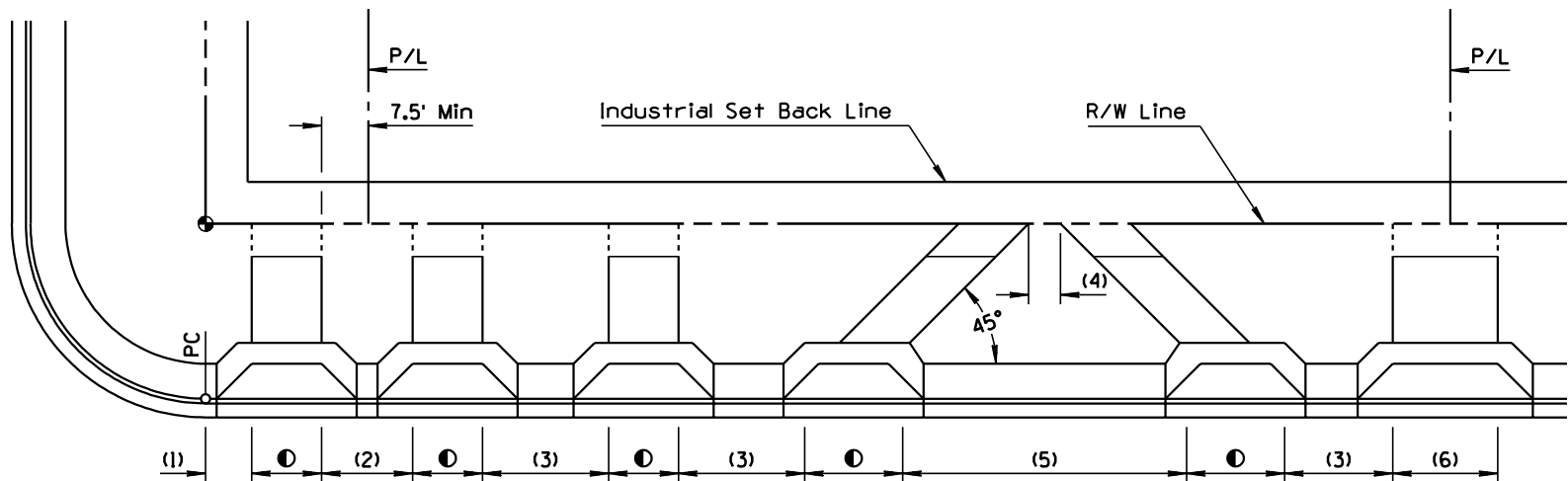
DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 1/93
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	MEDIAN PAVING AND NOSE TRANSITION	DRAWING NO. C-05.40

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED NOTE	JNP	8/99
2	REVISED NOTE & REMOVED PREVIOUS TYPE B TURNOUT	RLF	7/01
3			
4			



- R-1 = 20' Min, 30' Desirable
R-2 = 25' Min, 40' Desirable
R-3 = 80'
R-4 = 20' Min
W = 25' Min, 40' Max
■ - See Proper City or County Regulation

RURAL DEVELOPMENTS



- (1) 10' Min, 20' Desirable
(2) 15' Min
(3) 25' Min, 40' Desirable
(4) 40' Min
(5) One Way Couplet for Use Only on One Way Roadways
(6) 40' Max Joint Use Driveways
● Residential - 10' Min, 30' Max
● Commercial - One Way: 15' Min, 30' Max
Two Way: 25' Min, 40' Max
● Industrial - 20' Min, 40' Max

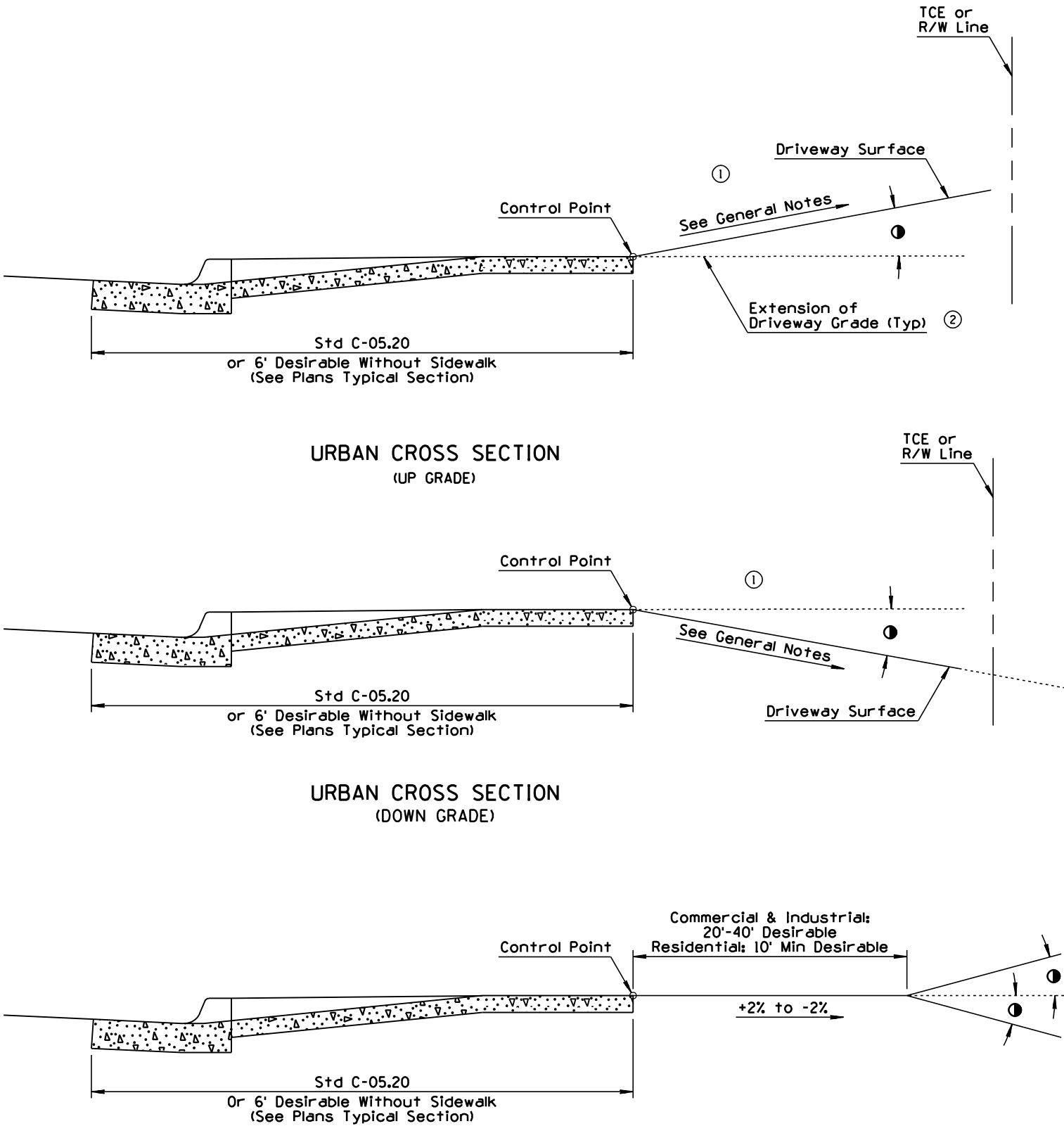
URBAN DEVELOPMENTS

GENERAL NOTES

- Driveway types:
 - Residential - one providing access to a single family residence, to a duplex, or to an apartment building containing five or fewer dwelling units.
 - Commercial - one providing access to an office, retail or institutional building or to an apartment building having more than five dwelling units.
 - Industrial - one directly serving a substantial number of truck movements to and from loading docks of an industrial facility, warehouse or truck terminal.
- Joint use driveways may become desirable for landowners of adjacent properties to service both properties. If this is the case, only one of the two adjacent landowners need apply for the access permit, but a notarized written mutual agreement, signed by all parties involved, must accompany the application form. The property line can be located anywhere, in reference to the driveway, depending on mutual agreement.
- Driveways for high volume traffic generators shall be approved individually by Traffic Engineering section.
- Driveways with curb returns in urban areas shall be installed only with the approval of Traffic Engineering section.
- Driveways and depressed curbs shall be located as noted on plans or as directed by the Engineer.
- Drainage structures shall be provided under driveways where necessary.
- Dimensions indicated as minimum shall be avoided whenever possible in favor of those indicated as desirable.
- The Type "A" turnout is the preferable turnout design. Type "B" shall only be used when absolutely necessary.
- Paved turnouts, plans notation, will be W X L, surface material, type and standard. Example: 20" X 30" ACTO, Type A, Std C-06.10. Show radius (R) graphically.
- Construction of curb, gutter, sidewalk and drainage facilities in urban areas by the permittee along that portion of the highway frontage under permit application, may be a stipulation of the permit approval if there appears to be reasonable need.
- Excavation or embankment for turnouts shall be included in quantities for main roadways.
- Base material shall be the same as that shown for main roadway, unless otherwise noted.
- Desirable sideslope rates for rural turnouts are 6:1.

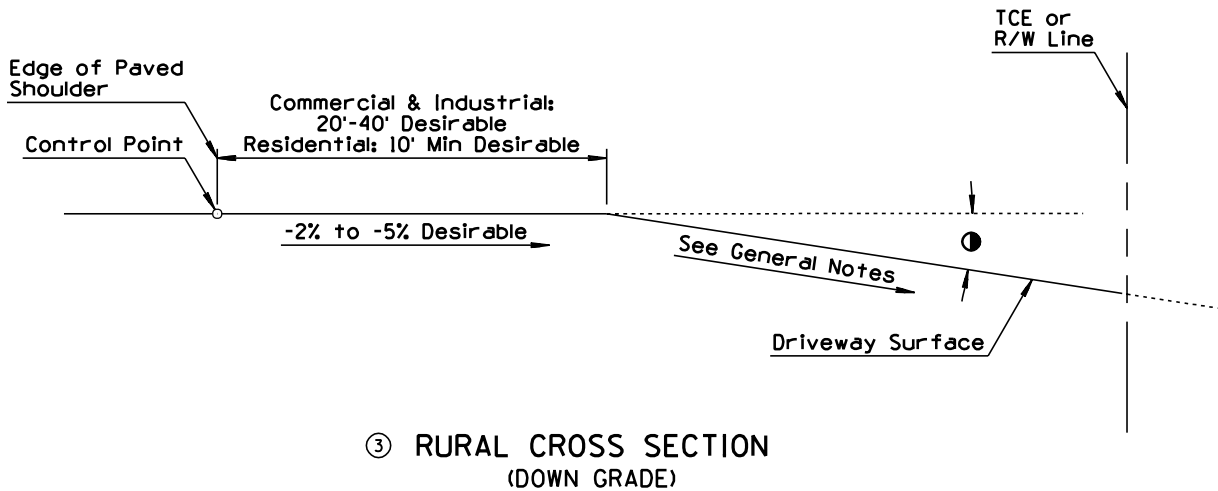
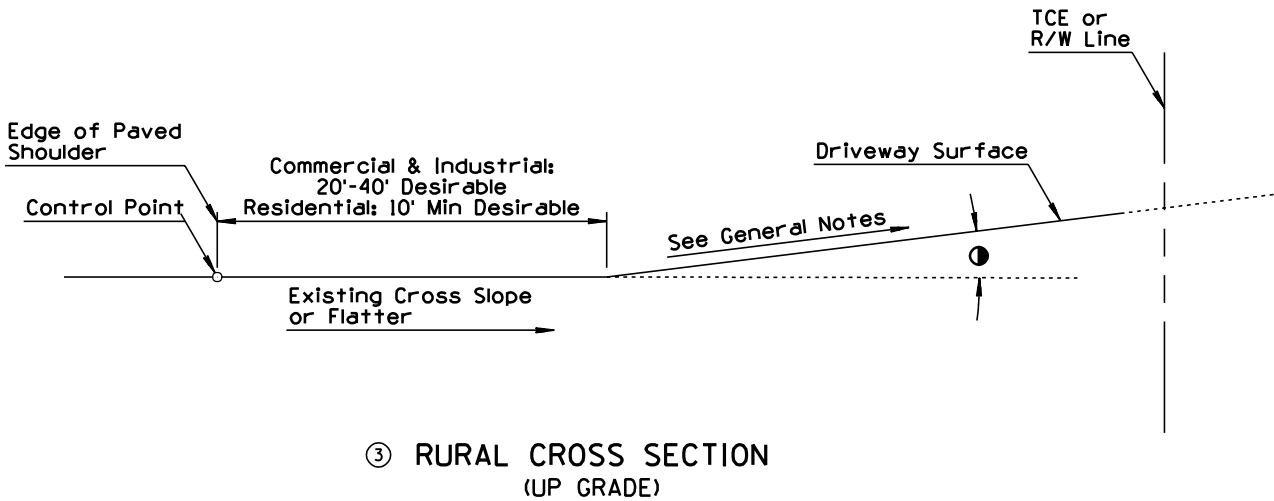
DESIGN APPROVED <i>John L. Law</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	DRIVEWAY & TURNOUT LAYOUTS	DRAWING NO. C-06.10 Sheet 1 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ROTATED DRIVEWAY BEYOND SIDEWALK	PNB	10/95
2	ADDED NOTE	PNB	10/95
3	MODIFIED TITLE	BAF	8/98
4			



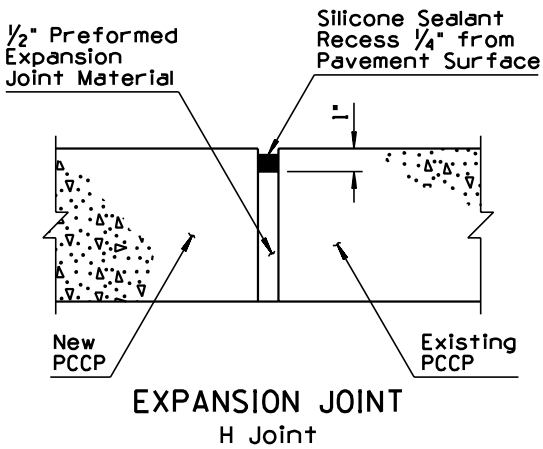
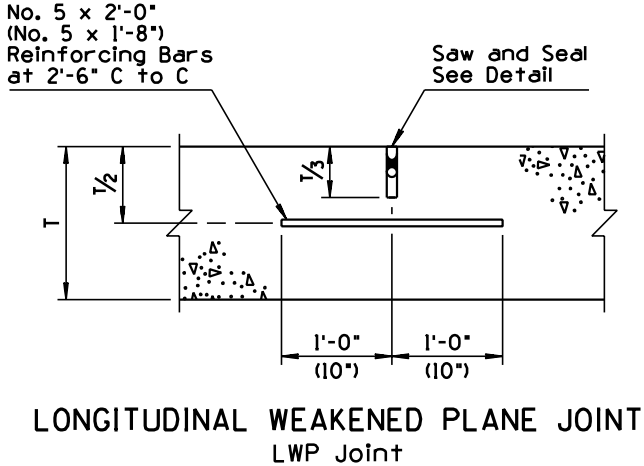
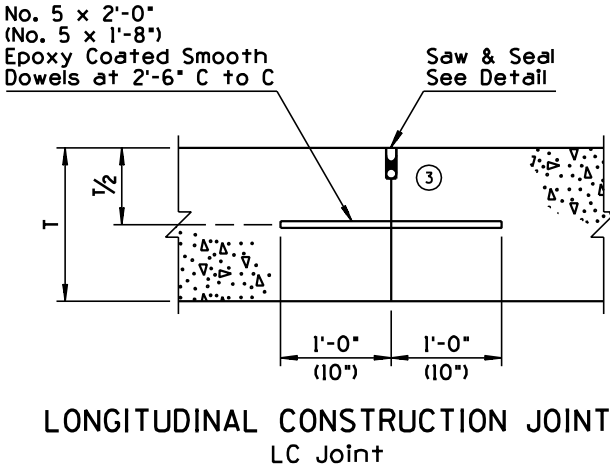
GENERAL NOTES

- Grade as shown on plans or as negotiated between Property Owner and Engineer.
 - When field conditions require modifications to plans, contact Design Engineer for assistance.
 - See Sheet 1 of 2 for all other General Notes.
- ① Breakangle greater than 6% requires a vertical curve, L=(10' Min). Vertical curve shall not encroach on roadway or sidewalk.



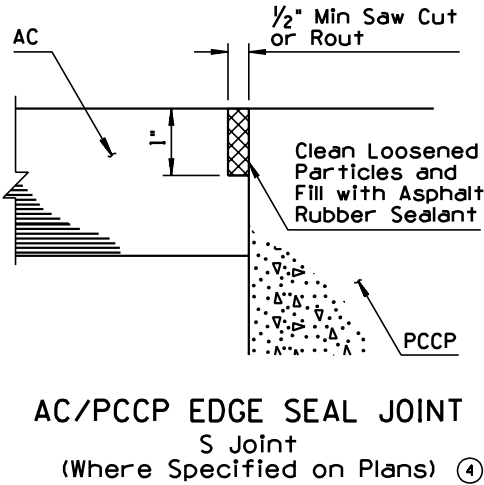
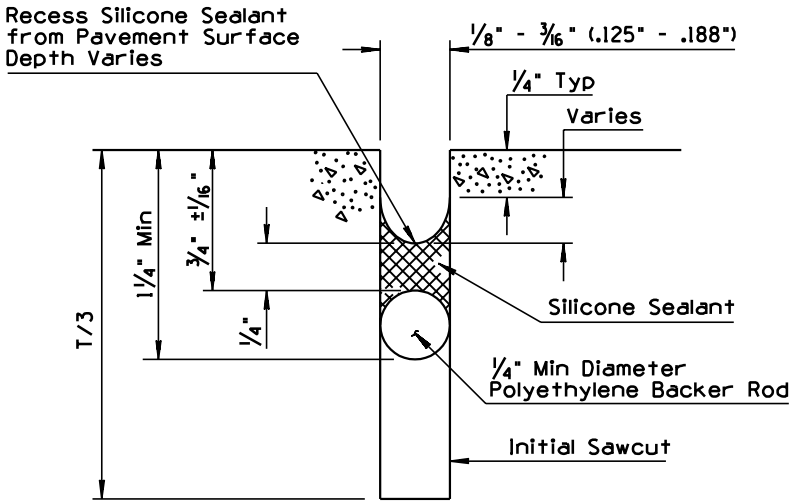
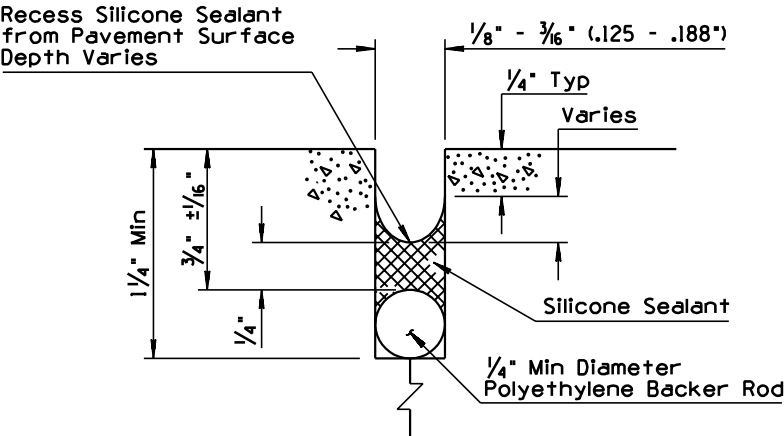
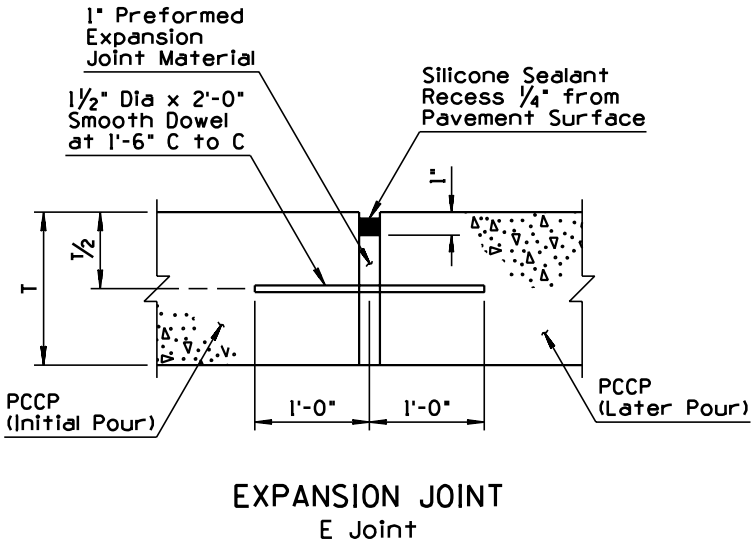
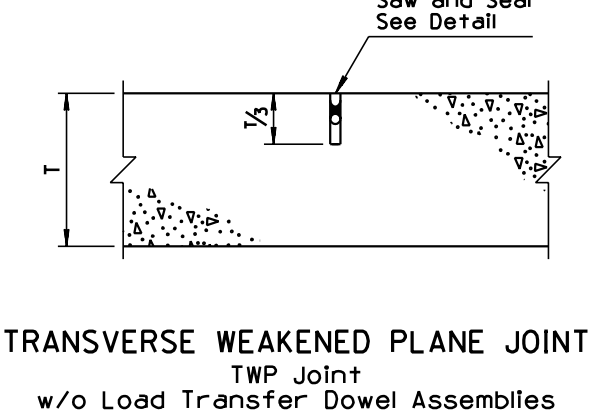
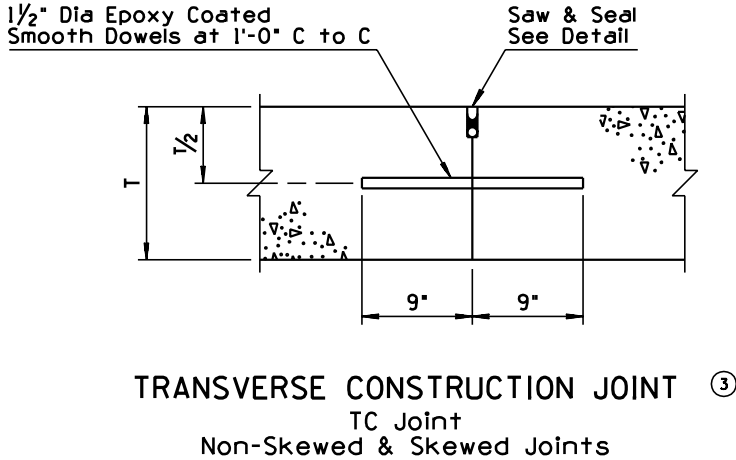
DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/98
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	DRIVEWAY & TURNOUT LAYOUTS	DRAWING NO. C-06.10 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DETAIL	RLF	7/01
2	ADDED DETAIL	RLF	7/01
3	SHOW SAW AND SEAL AND REVISED BAR	RLF	7/01
4	ADDED NOTE	RLF	7/01



- GENERAL NOTES**
- When load transfer dowel assemblies are required, use dimensions shown in ()'s. See Assembly Placement and Edge Clearance Detail, Std C-07.02.
 - In slip form type pavement construction, LWP joints shall be used. In fixed form construction either LWP or LC joints may be used.

- JOINT ABBREVIATIONS**
- LWP - Longitudinal Weakened Plane Joint
 - TWP - Transverse Weakened Plane Joint
 - LC - Longitudinal Construction Joint
 - TC - Transverse Construction Joint
 - E, H - Expansion Joints
 - S - AC/PCC Pavement Edge Seal Joint
 - T - PCCP Thickness

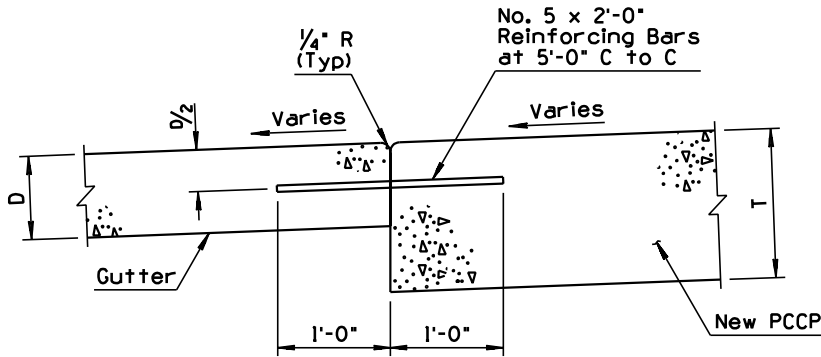


DESIGN APPROVED <i>John L. Lane</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	PCCP JOINTS		DRAWING NO. C-07.01 Sheet 1 of 2

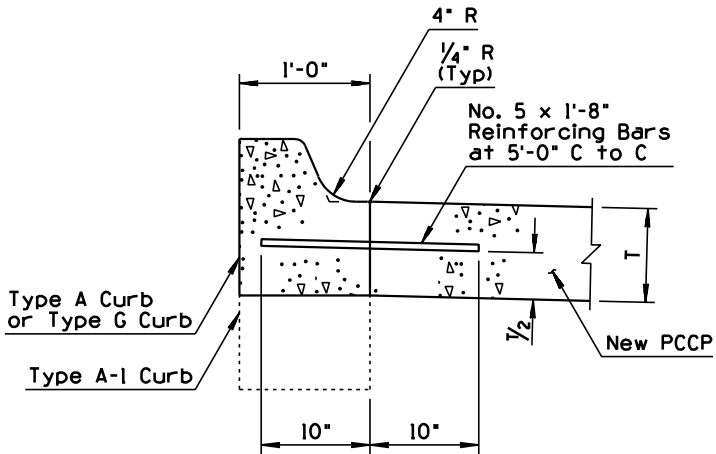
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE	NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DETAIL TO SHOW ALL PCCP	PNB	3/94	5	ADDED DETAIL	BAF	8/98
2	REVISED DETAIL TO SHOW AC & PCCP	PNB	3/94	6	ADDED NOTE	BAF	8/98
3	DELETED EXPANSION MATERIAL	PNB	3/94	7	MODIFIED NOTE	BAF	8/98
4	ADDED NOTE ON PAVEMENT SLOPE	PNB	3/94	8			

GENERAL NOTES

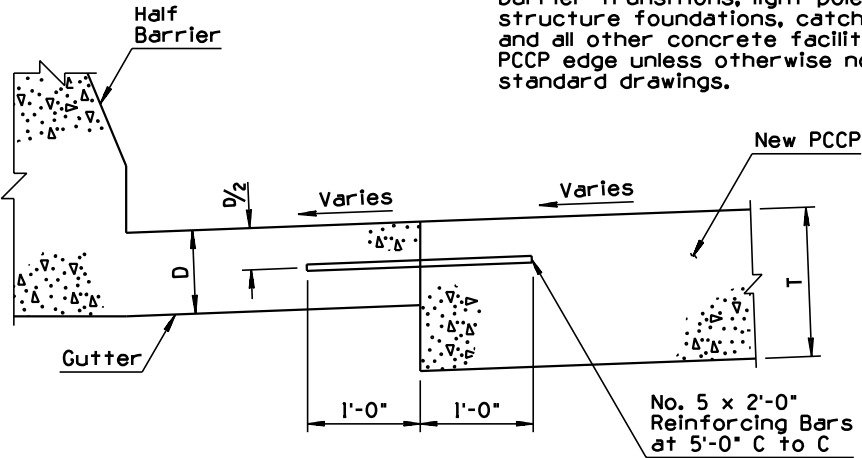
1. Joints are generally shown with pavement sloping toward the joint. Joints are similar with pavement sloping away from the joint.
2. A "B" joint shall be placed where piers, abutments, barrier transitions, light pole foundations, sign structure foundations, catch basins, slotted drains and all other concrete facilities abut up against the PCCP edge unless otherwise noted in the plans or the standard drawings.



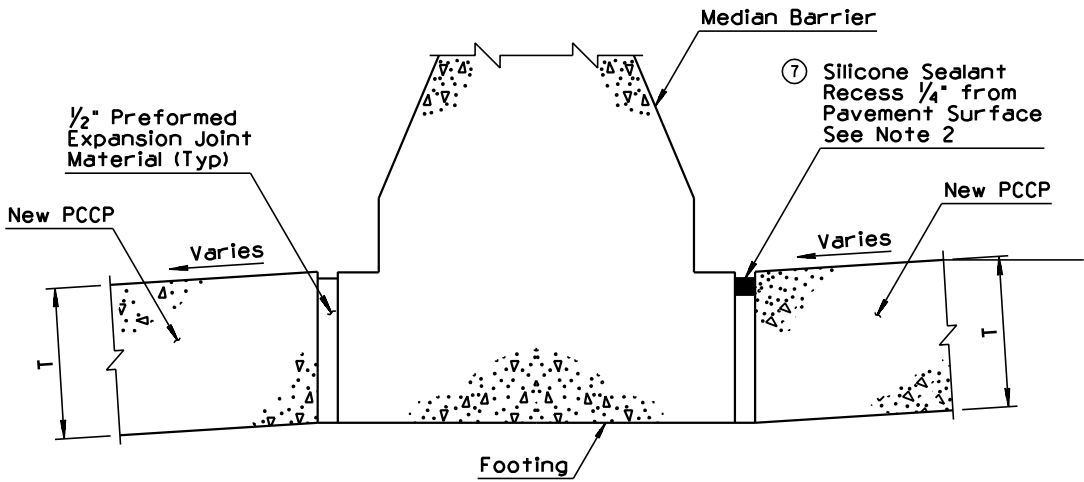
CURB & GUTTER JOINT
G Joint



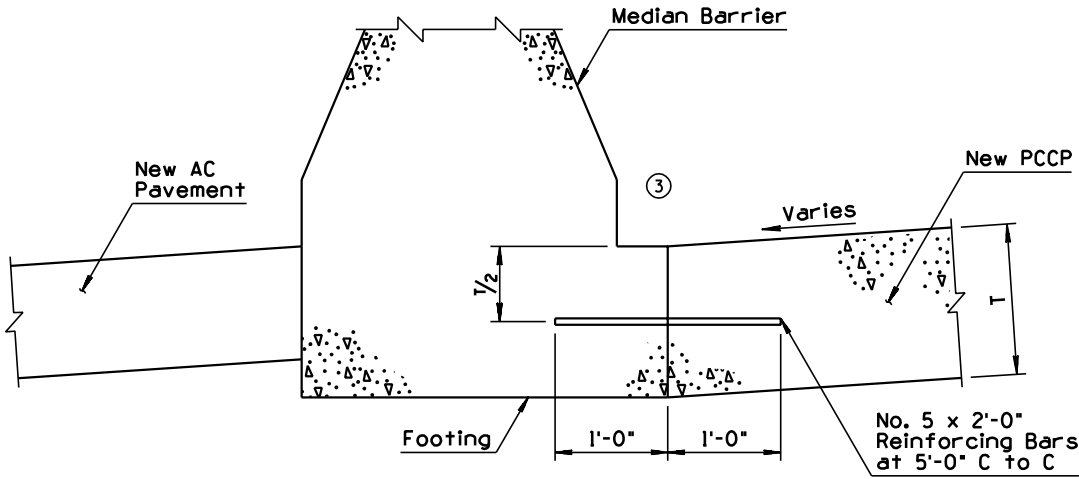
SINGLE CURB JOINT
A Joint



HALF BARRIER JOINT
B Joint



MEDIAN BARRIER JOINT
B Joint
PCCP On Both Sides of Barrier



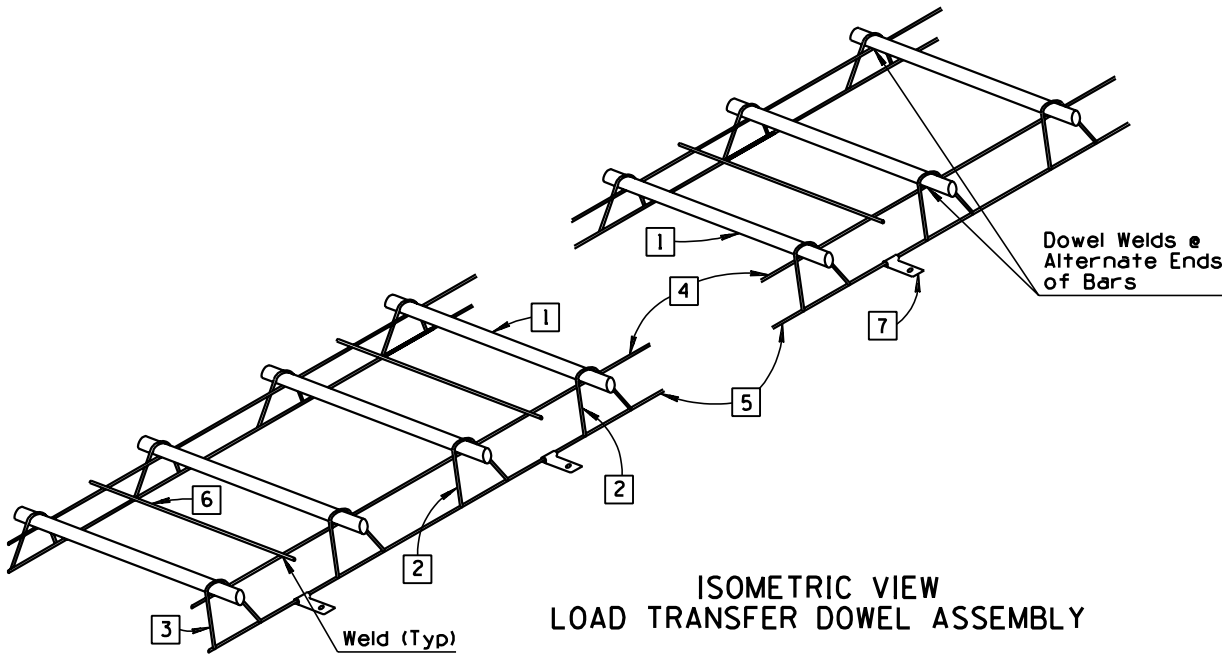
MEDIAN BARRIER JOINT
B Joint
AC Pavement On Back Side of Barrier

JOINT ABBREVIATIONS

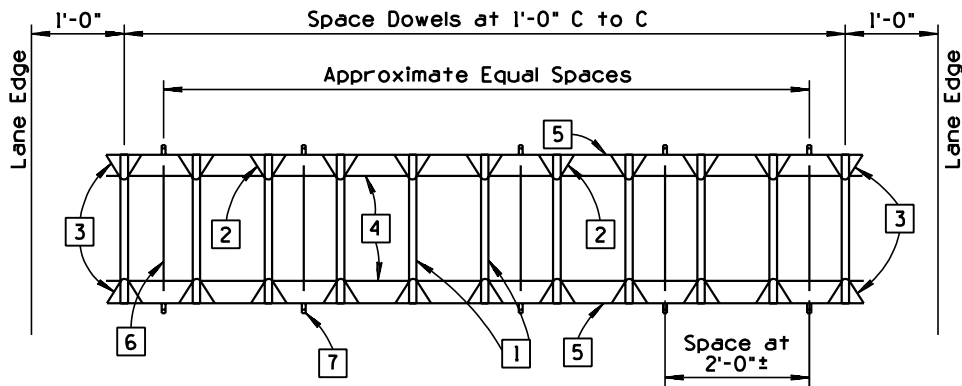
- G - Gutter Joint
- T - PCCP Thickness
- D - Gutter Thickness
- B - Barrier Joint

DESIGN APPROVED <i>Terry H. Ottum</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	8/98
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	PCCP JOINTS	DRAWING NO. C-07.01 Sheet 2 of 2

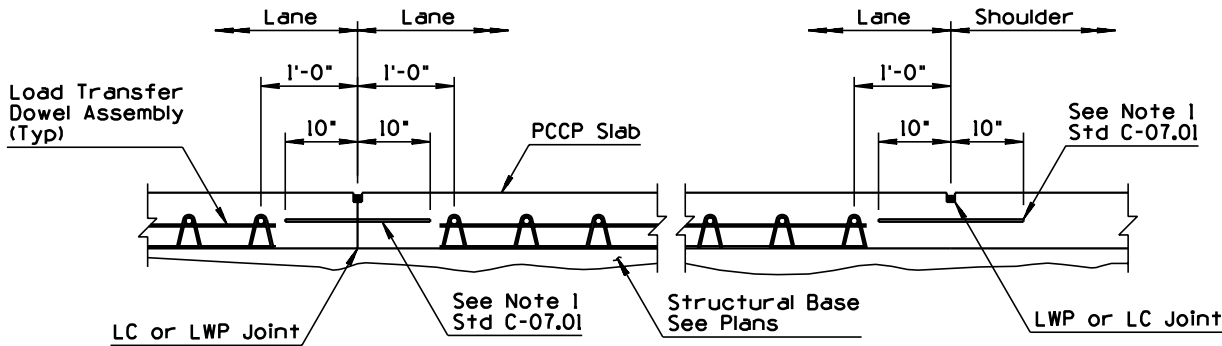
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CHANGED FROM SKEWED TO NON-SKEWED	TC	1/93
2	MODIFIED DIMENSIONS/CREATED QUANTITY TABLE	TC	1/93
3	MODIFIED DIMENSION	TC	1/93
4			



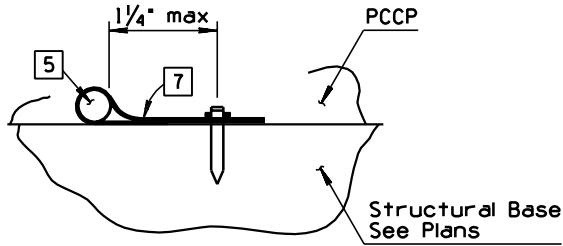
ISOMETRIC VIEW
LOAD TRANSFER DOWEL ASSEMBLY



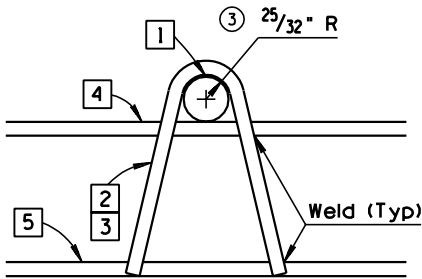
PLAN VIEW
① LOAD TRANSFER DOWEL ASSEMBLY



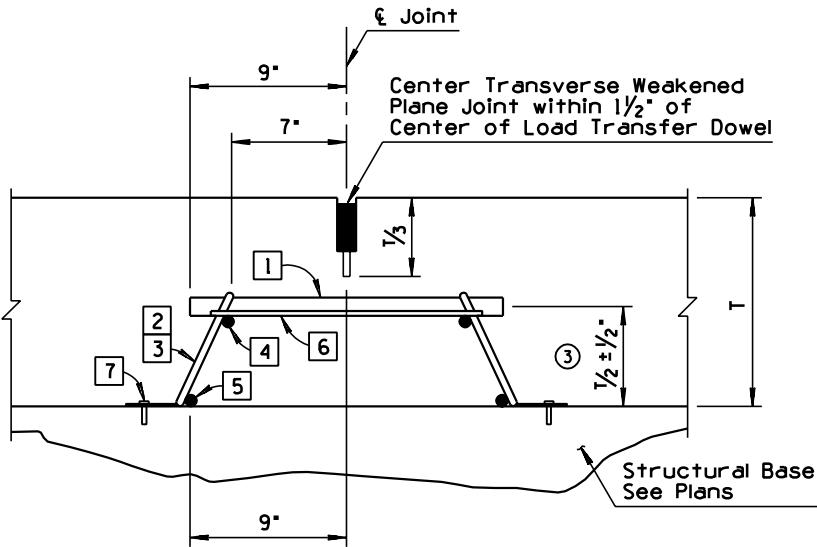
ASSEMBLY PLACEMENT AND EDGE CLEARANCE DETAIL



ANCHOR STRAP DETAIL



END AND INTERMEDIATE LEG DETAIL



TRANSVERSE WEAKENED PLANE JOINT WITH
LOAD TRANSFER DOWEL ASSEMBLY



	DIMENSION TABLE		
	Lane Width		
	12'	14'	16'
①	10'-4"	12'-4"	14'-4"

GENERAL NOTES

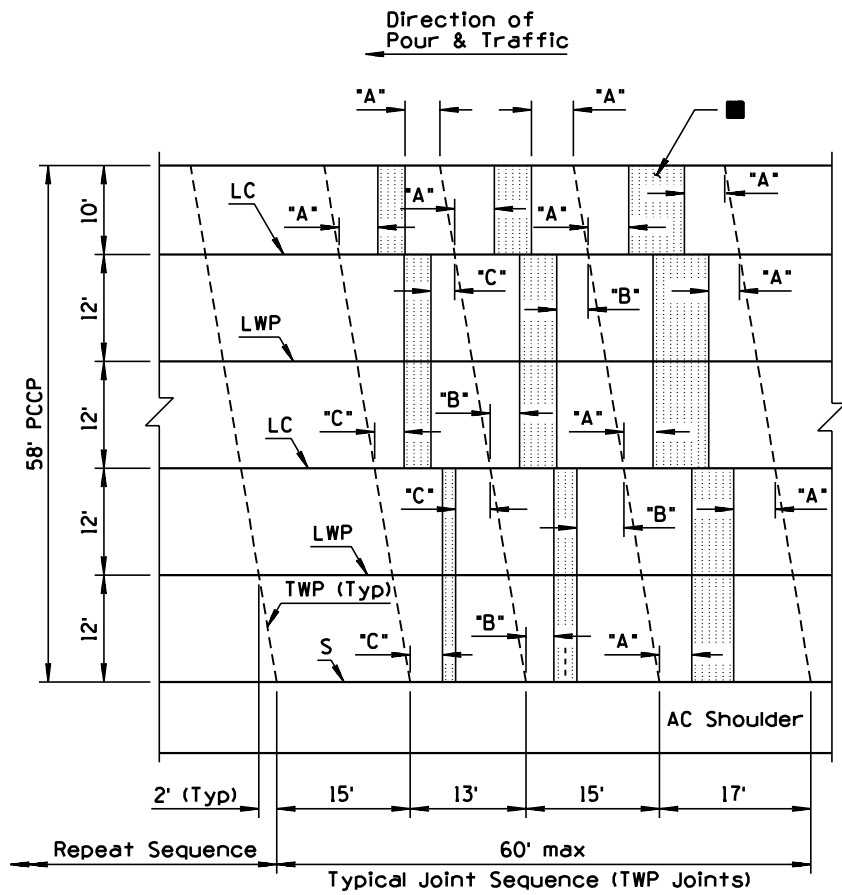
- Load transfer dowel assemblies shall be used with non-skewed PCCP joints.
 - Load transfer dowel assemblies are to be placed at each transverse weakened plane joint on the traveled lanes as shown on the plans.
 - See Std C-07.01 thru C-07.05 for additional information.
 - See plans or Std C-07.03 thru C-07.05 for transverse joint spacing.
 - See plans for pavement thickness less than 12" or greater than 14".
- Load transfer dowel assembly shall be assembled from the following materials.
(See Quantity Table)
- Dowel bars - 1/2" dia x 1'-6" plain round bars w/coating. See Special Provisions.
 - Intermediate legs - 2 Ga or W-5.5 wire.
 - End legs - 2 Ga or W-5.5 wire.
 - Upper space bar - 2 Ga or W-5.5 wire x ①. (See Dimension Table)
 - Lower space bar - 2 Ga or W-5.5 wire x ①. (See Dimension Table)
 - Tie bars - W-1.5 wire x 16".
 - Anchor straps - 1"x3" steel strap, 0.079 thick. Place with 1-1/2" min steel nail for LCB, 4" min steel nail for ACB or AB, 0.145 dia ASTM A227 Class I w/1/4" head or washer to be power driven.

②

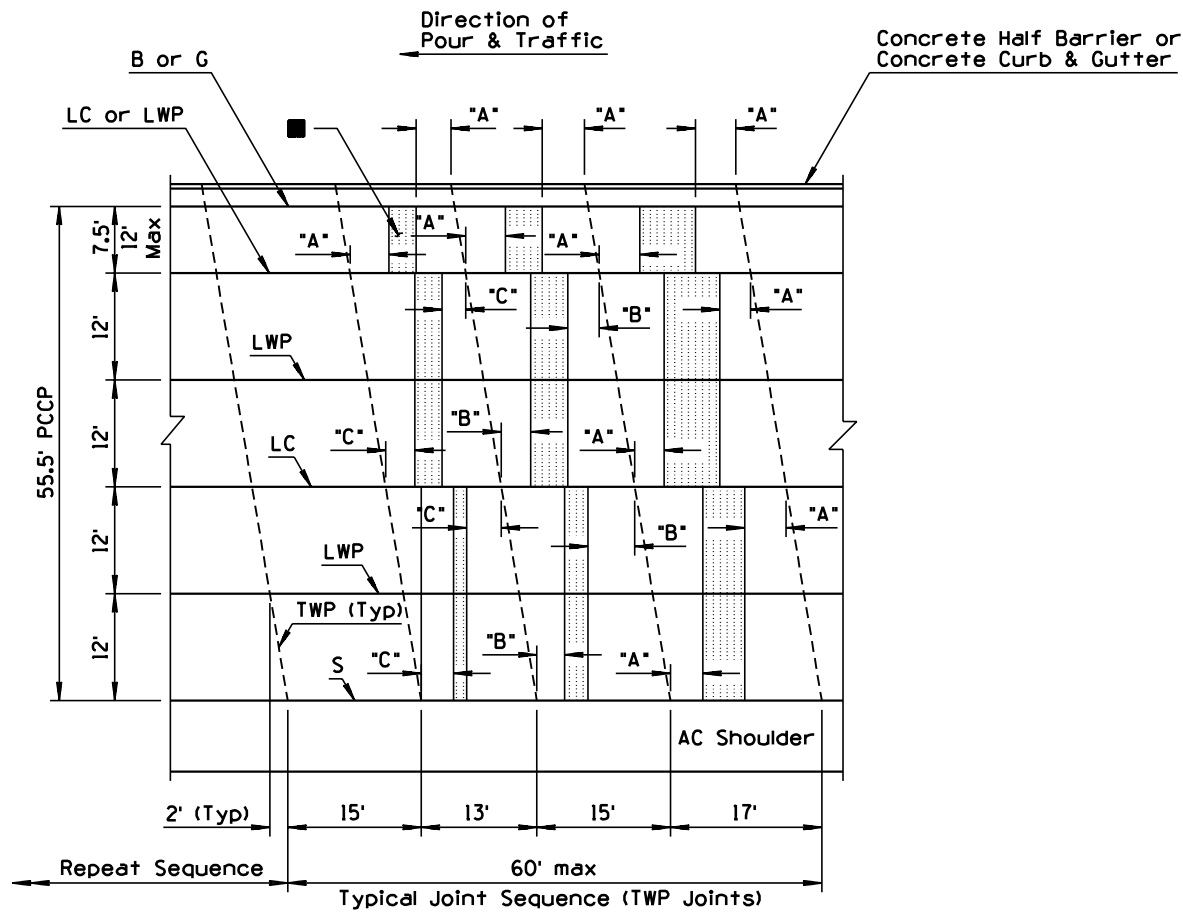
QUANTITY TABLE			
Item No.	Lane Width		
	12'	14'	16'
①	11	13	15
②	18	22	26
③	4	4	4
④	2	2	2
⑤	2	2	2
⑥	5	6	7
⑦	10	12	14

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 1/93
APPROVED FOR DISTRIBUTION 	LOAD TRANSFER DOWEL ASSEMBLY	DRAWING NO. C-07.02	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			




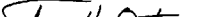
PLAN
58' PCCP



PLAN
55.5' PCCP

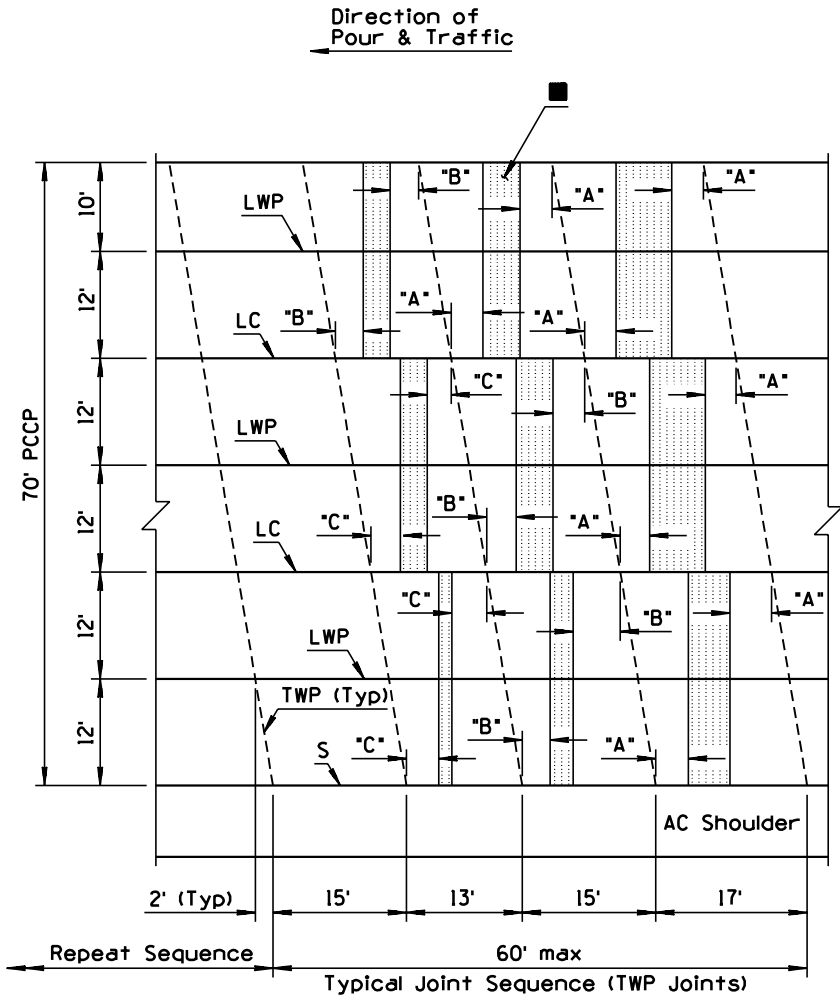
GENERAL NOTES

- Skewed PCCP joints shall be used when load transfer dowel assemblies are not required.
 - "A" shall equal 4' minimum (typical).
"B" shall equal 3' minimum (typical).
"C" shall equal 2' minimum (typical).
 - See Std C-07.01 for PCCP joints and additional notes.
 - All transverse joints shall be in line with joints in adjacent slabs.
 - See Std C-05.10 for curb and gutter joint requirements.
 - At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
 - The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.
- Transverse Construction Joint (TC) allowable limits (Typ).

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		1/93
APPROVED FOR DISTRIBUTION 	MAINLINE PCCP JOINT LOCATIONS SKEWED JOINTS	DRAWING NO. C-07.03 Sheet 2 of 8	

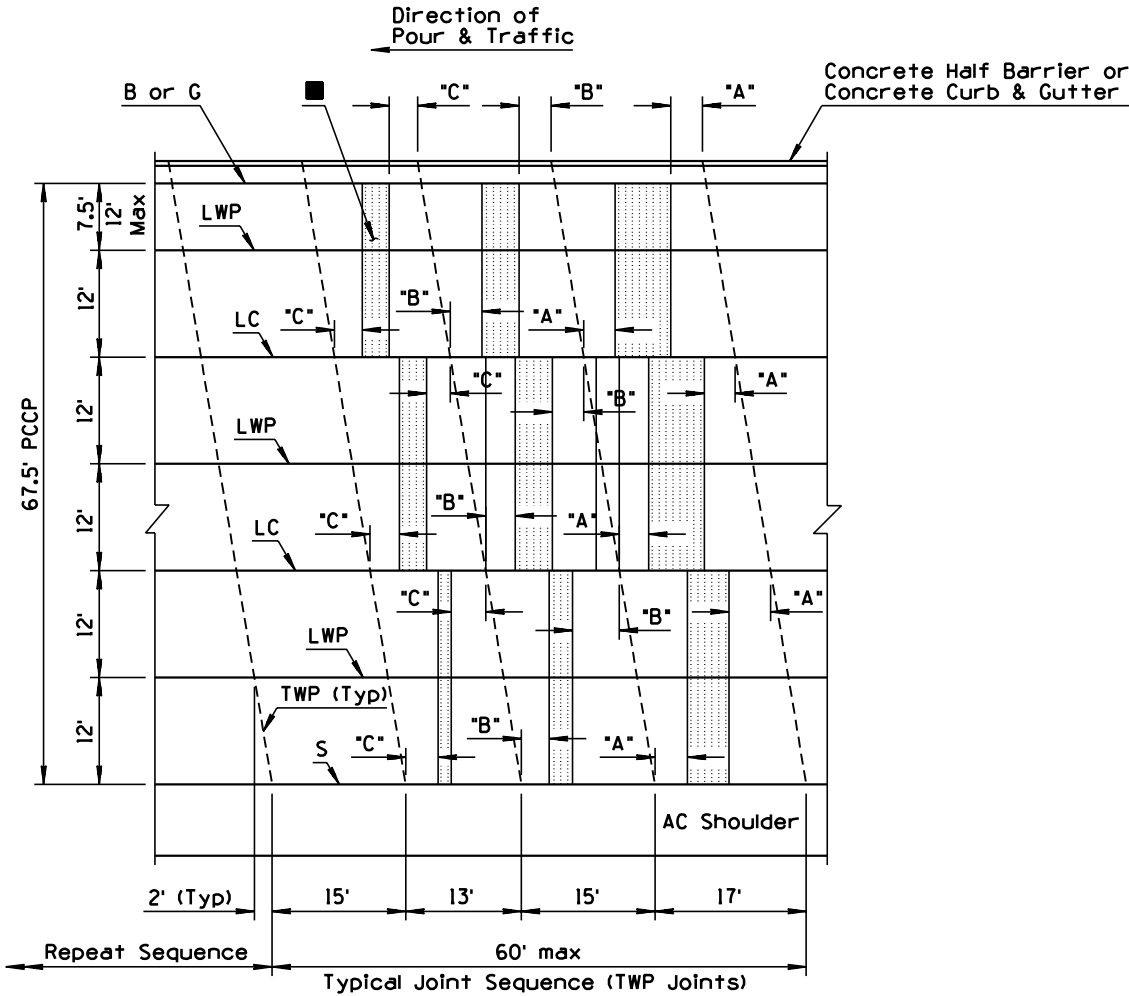
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			

- GENERAL NOTES
- Skewed PCCP joints shall be used when load transfer dowel assemblies are not required.
 - "A" shall equal 4' minimum (typical).
"B" shall equal 3' minimum (typical)
"C" shall equal 2' minimum (typical)
 - See Std C-07.01 for PCCP joints and additional notes.
 - All transverse joints shall be in line with joints in adjacent slabs.
 - See Std C-05.10 for curb and gutter joint requirements.
 - At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
 - The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.
- Transverse Construction Joint (TC) allowable limits (Typ).



PLAN

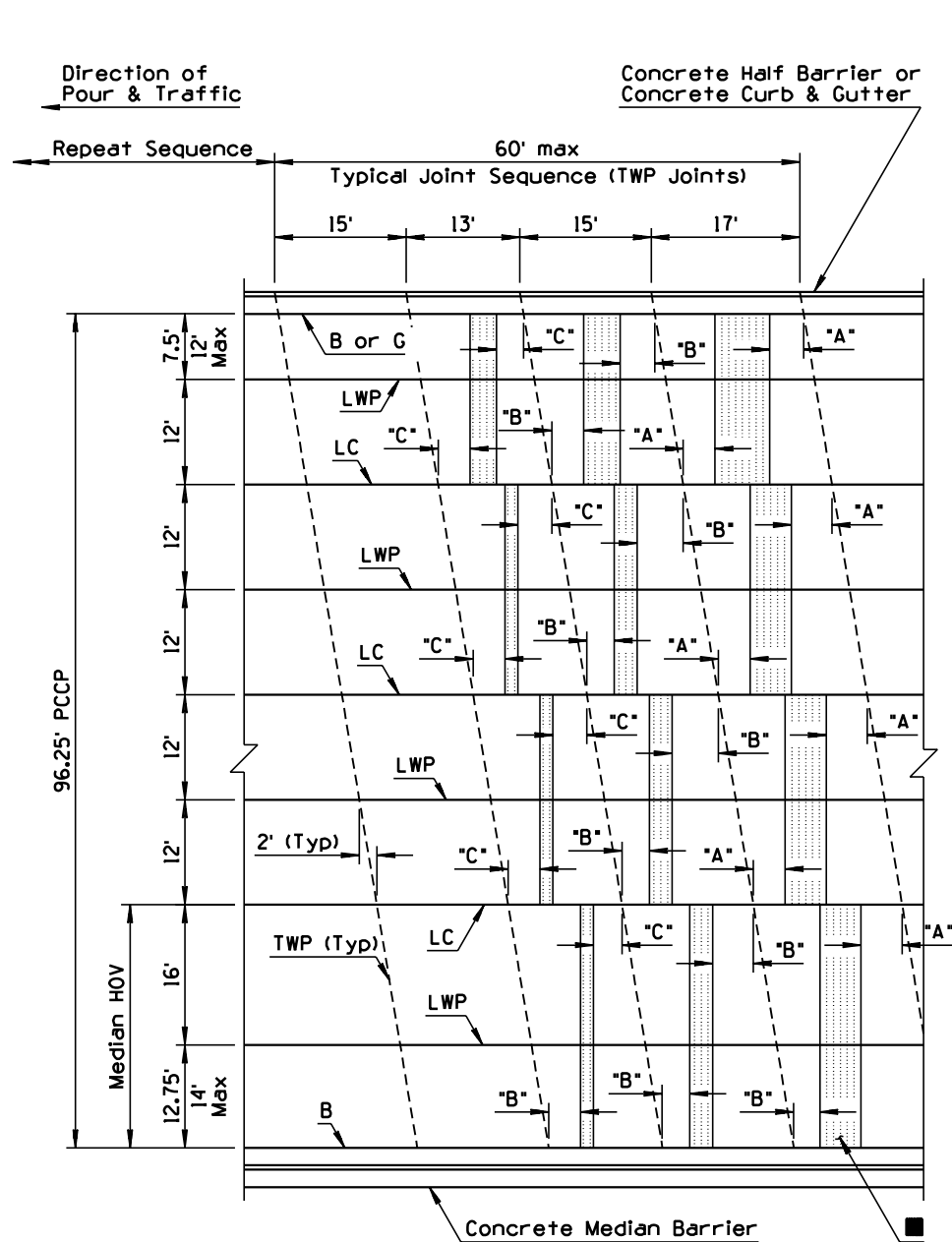
70' PCCP



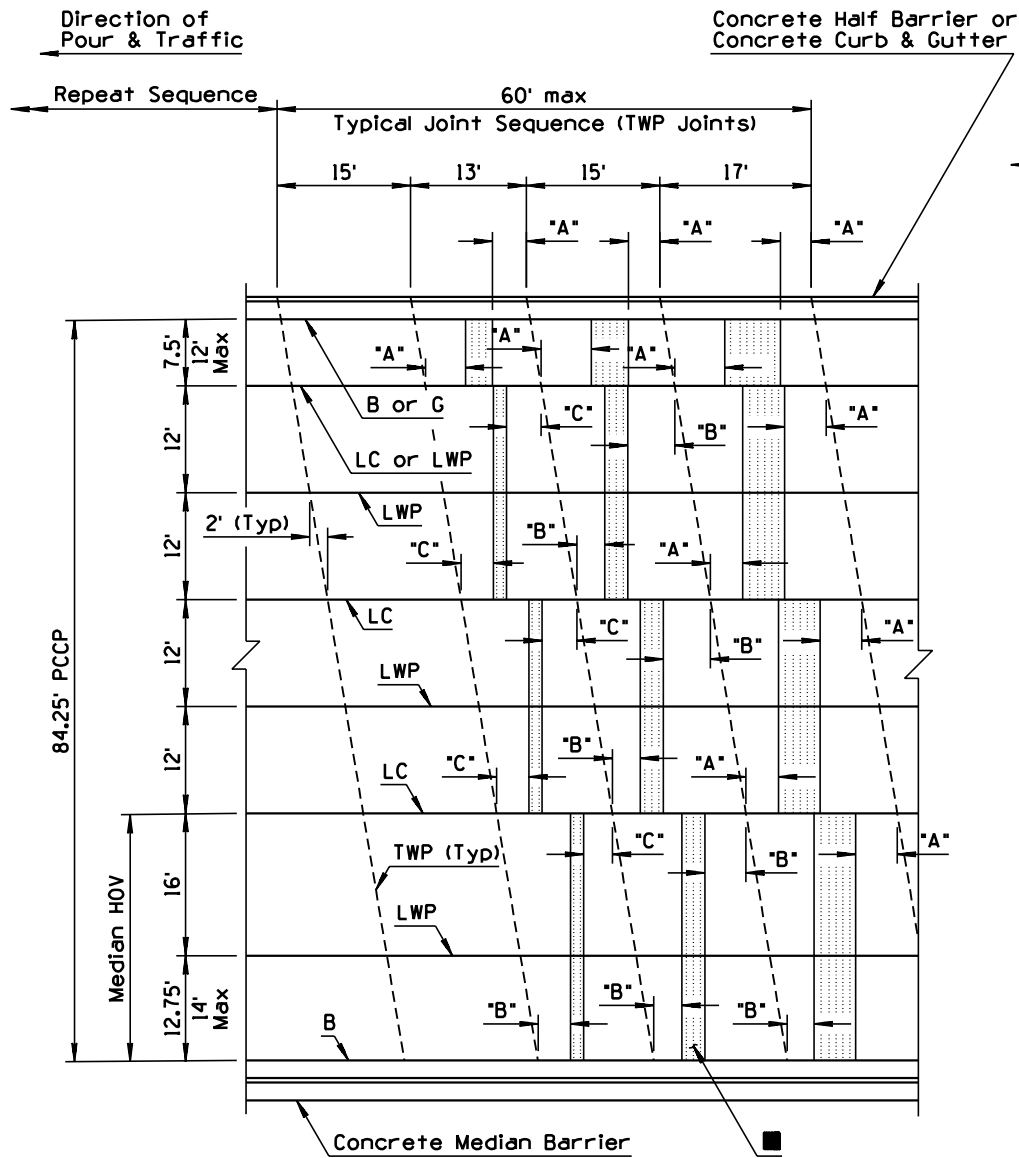
PLAN

67.5' PCCP

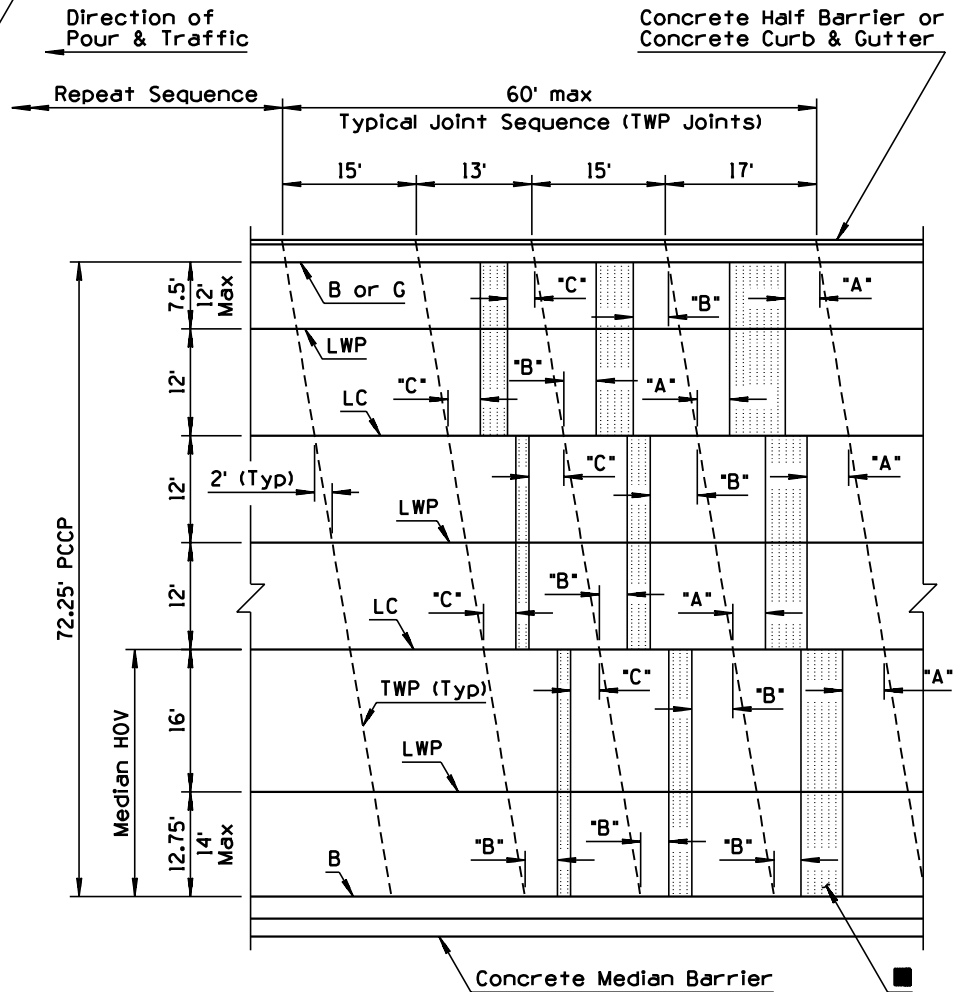
NO.	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			



PLAN
96.25' PCCP



PLAN
84.25' PCCP



PLAN
72.25' PCCP

GENERAL NOTES

- Skewed PCCP joints shall be used when load transfer dowel assemblies are not required.
- "A" shall equal 4' minimum (typical).
"B" shall equal 3' minimum (typical)
"C" shall equal 2' minimum (typical)
- See Std C-07.01 for PCCP joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs.
- See Std C-05.10 for curb and gutter joint requirements.
- At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.

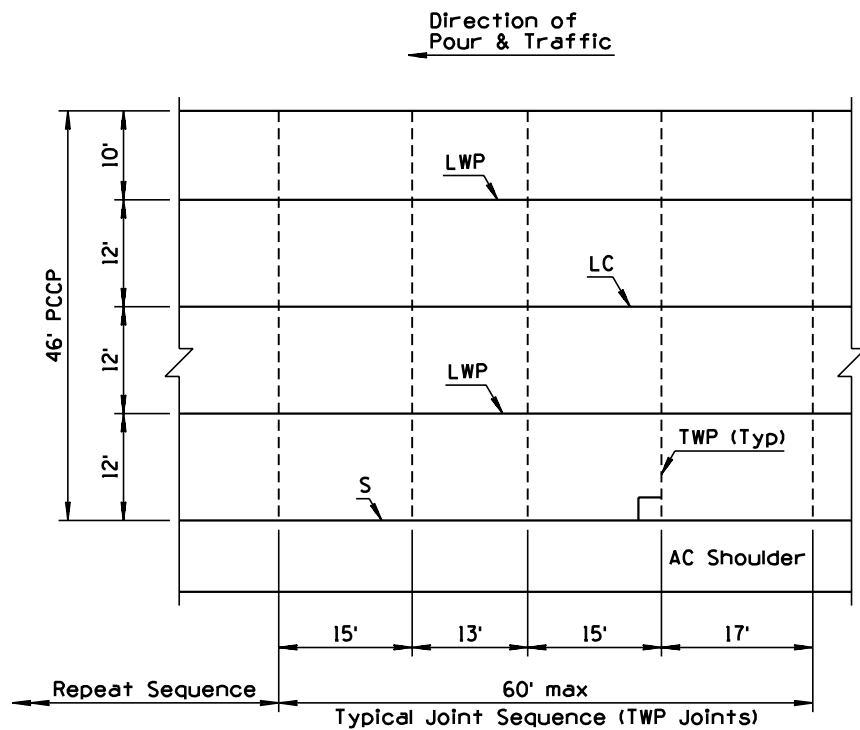
■ Transverse Construction Joint (TC) allowable limits (Typ).

DESIGN APPROVED
Terry H. Ottensm
APPROVED FOR DISTRIBUTION
Ronald Williams

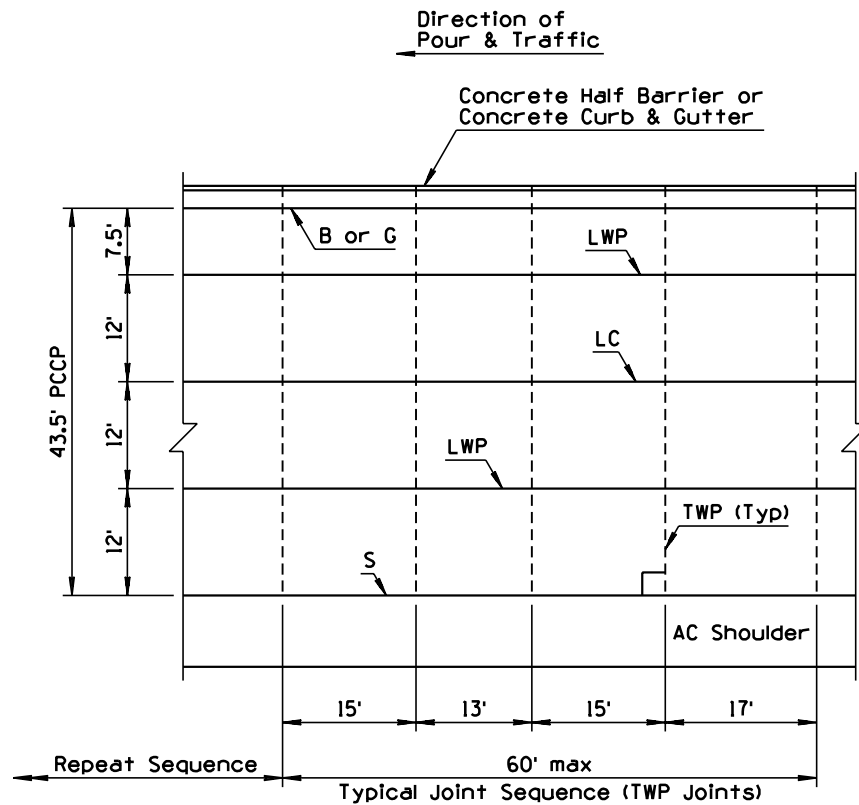
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS
MAINLINE PCCP JOINT LOCATIONS
SKEWED JOINTS

1/93
DRAWING NO.
C-07.03
Sheet 4 of 8

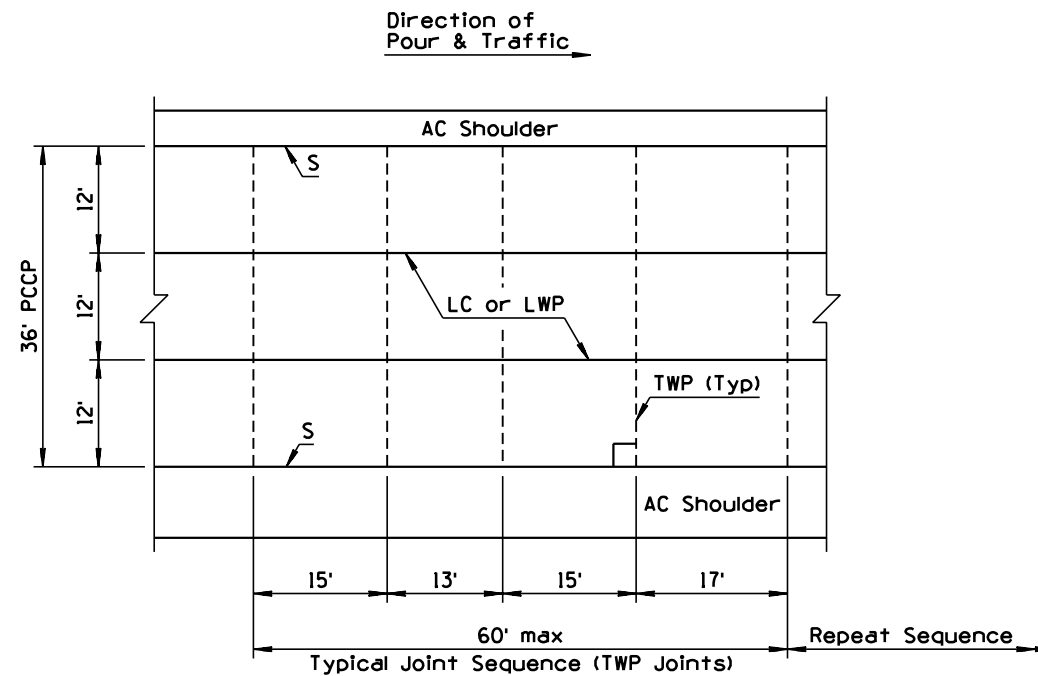
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			



PLAN
46' PCCP



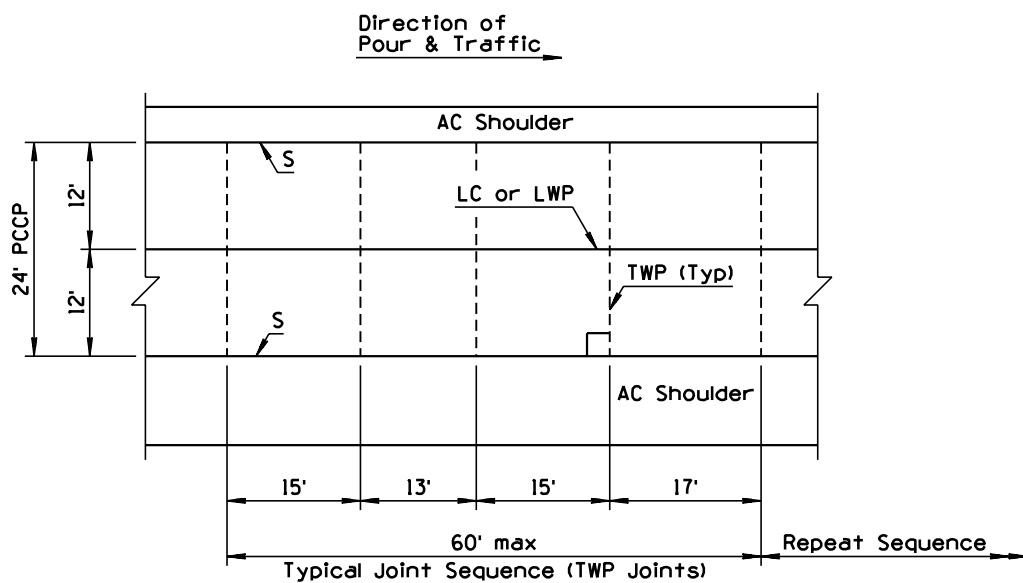
PLAN
43.5' PCCP



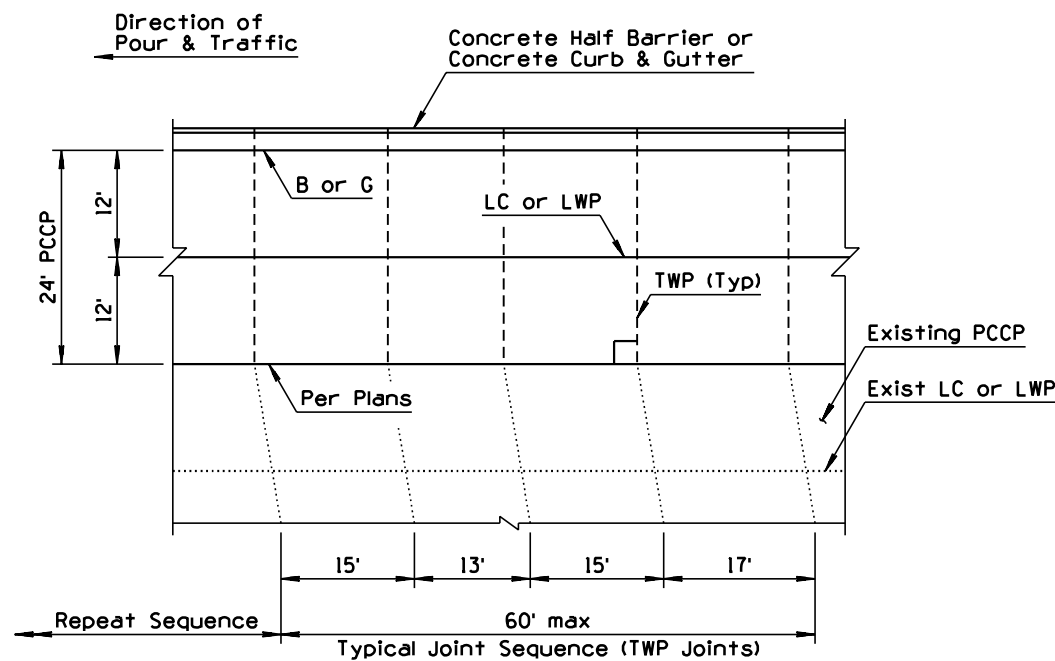
PLAN
36' PCCP

GENERAL NOTES

1. Non-skewed PCCP joints shall be used with load transfer dowel assemblies.
2. See Std C-07.01 for PCCP joints and additional notes.
3. All transverse joints shall be in line with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.
4. At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
5. See Std C-05.10 for curb and gutter joint requirements.
6. The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.
7. Transverse weakened plane joint shall be constructed at least 6'-0" from a transverse construction joint.



PLAN
24' PCCP



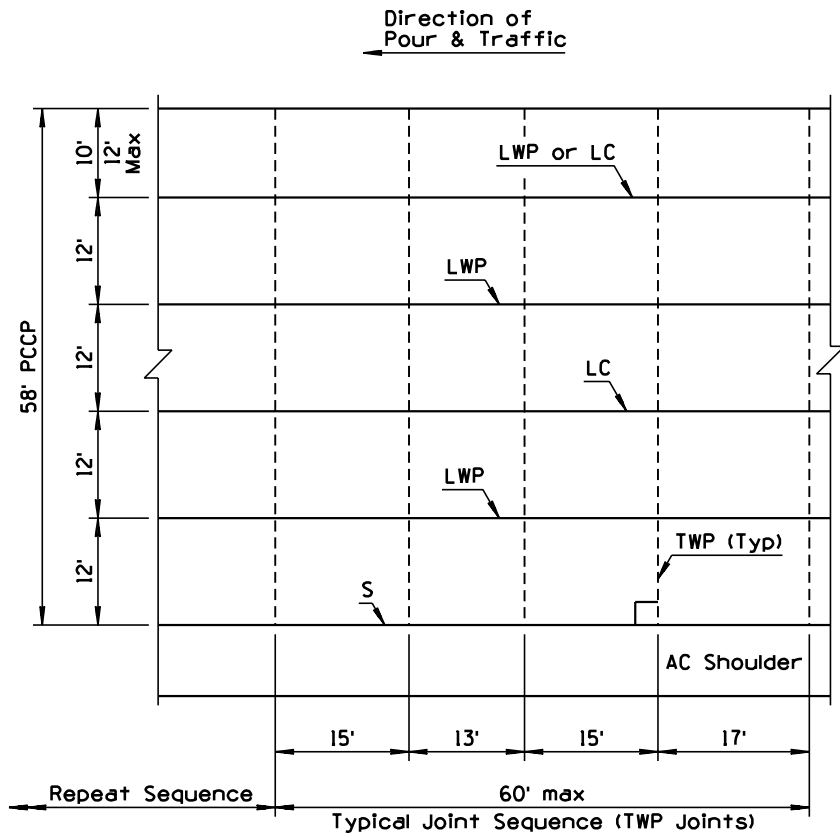
PLAN
24' PCCP
(Widening)

DESIGN APPROVED <i>Terry H. Ottum</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	1/93
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	MAINLINE PCCP JOINT LOCATIONS NON-SKEWED JOINTS	DRAWING NO. C-07.03 Sheet 5 of 8

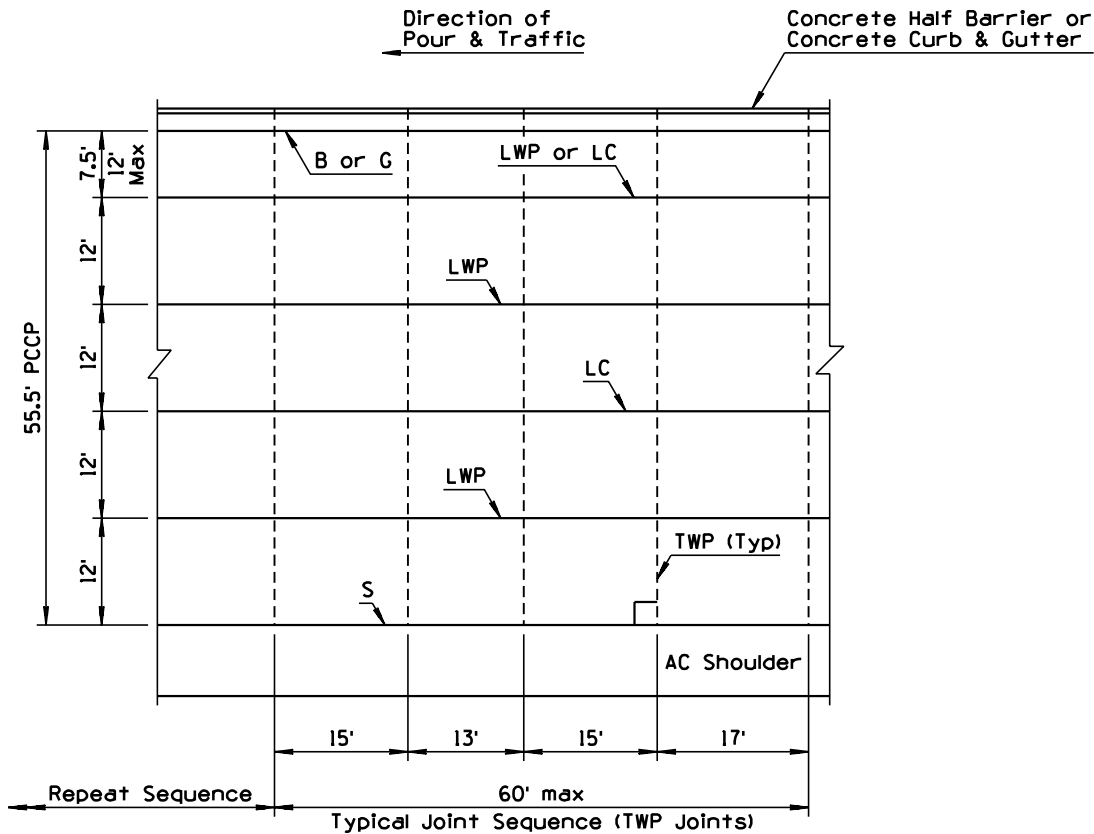
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			

GENERAL NOTES

1. Non-skewed PCCP joints shall be used with load transfer dowel assemblies.
2. See Std C-07.01 for PCCP joints and additional notes.
3. All transverse joints shall be in line with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.
4. At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
5. See Std C-05.10 for curb and gutter joint requirements.
6. The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.
7. Transverse weakened plane joint shall be constructed at least 6'-0" from a transverse construction joint.

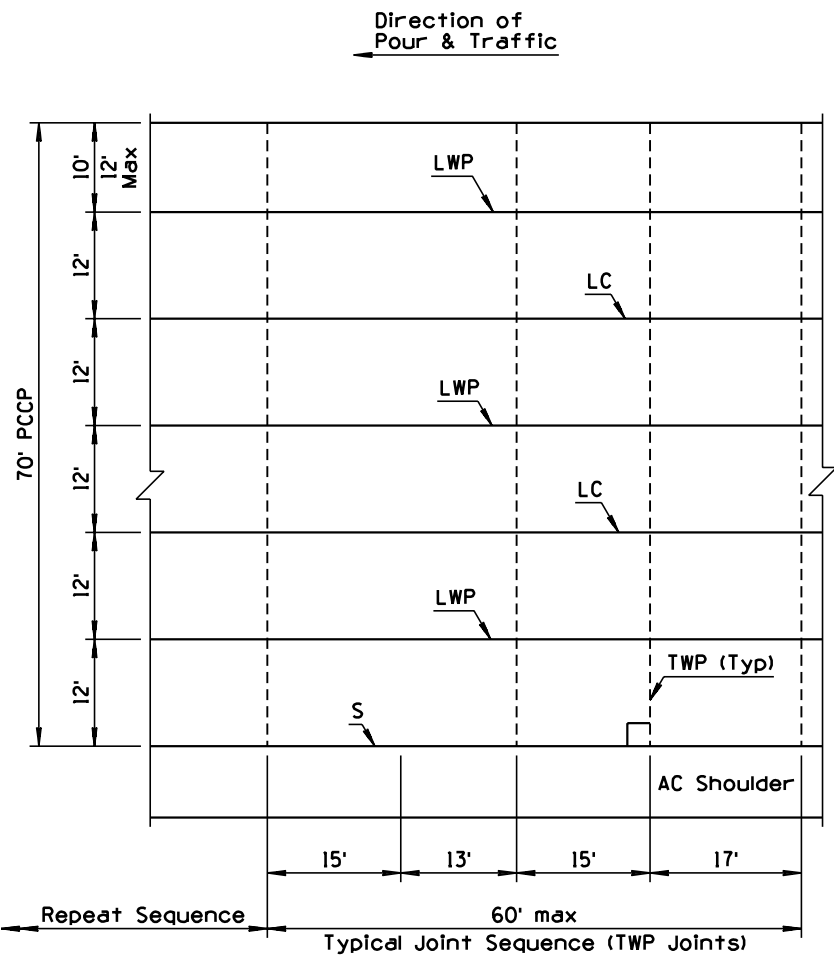


PLAN
58' PCCP

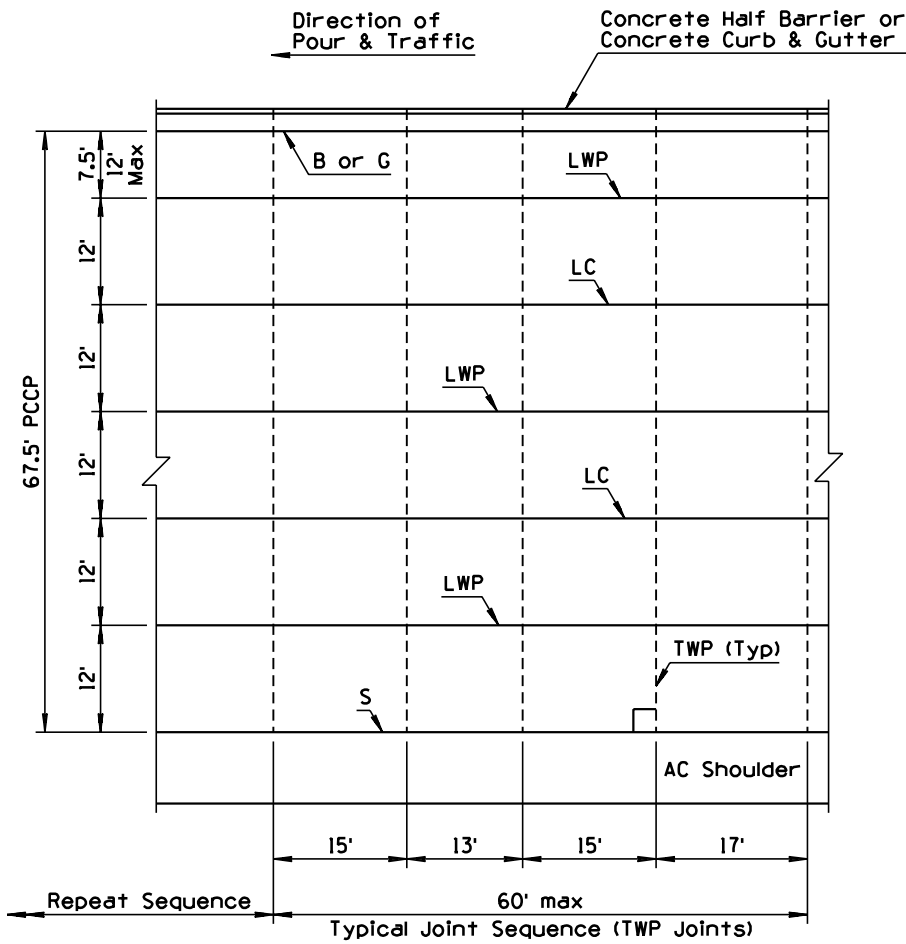


PLAN
55.5' PCCP

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			



PLAN
70' PCCP



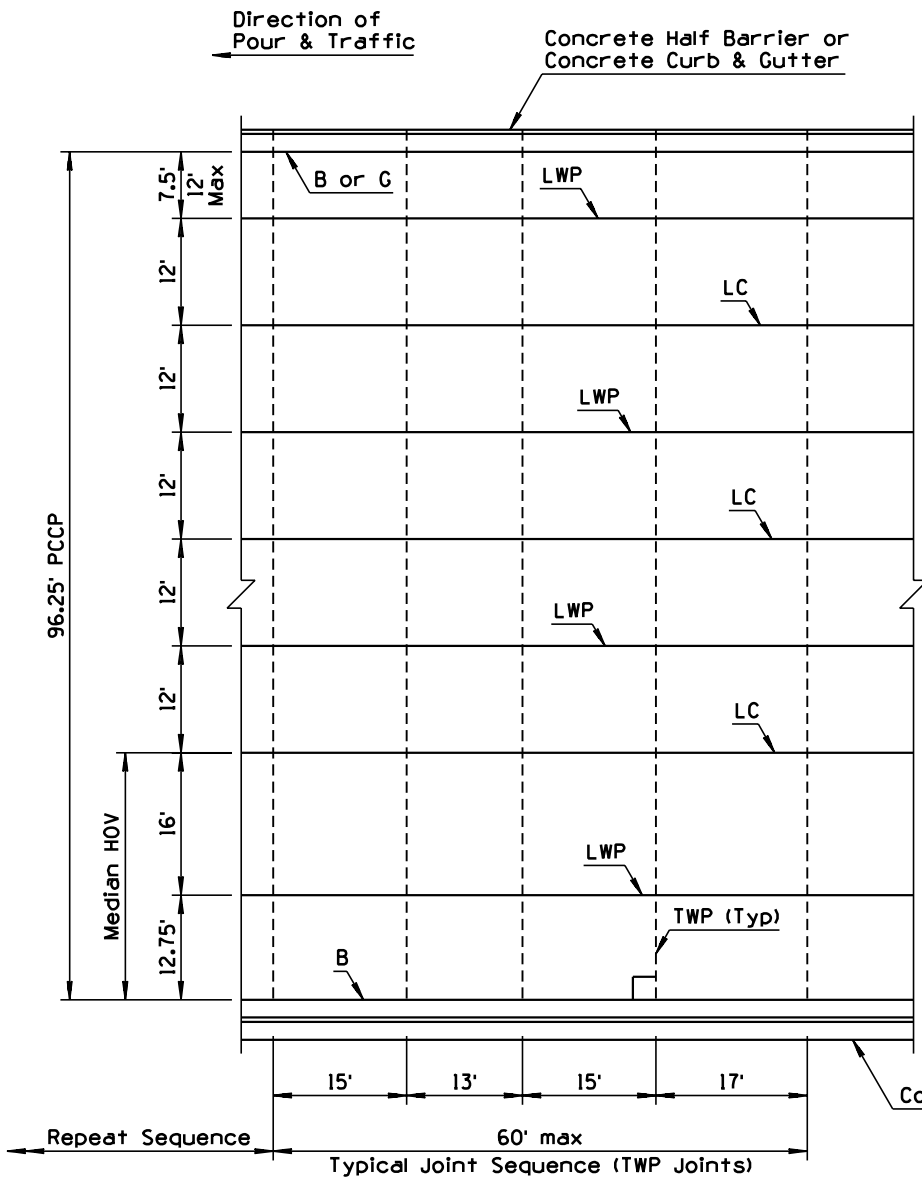
PLAN
67.5' PCCP

GENERAL NOTES

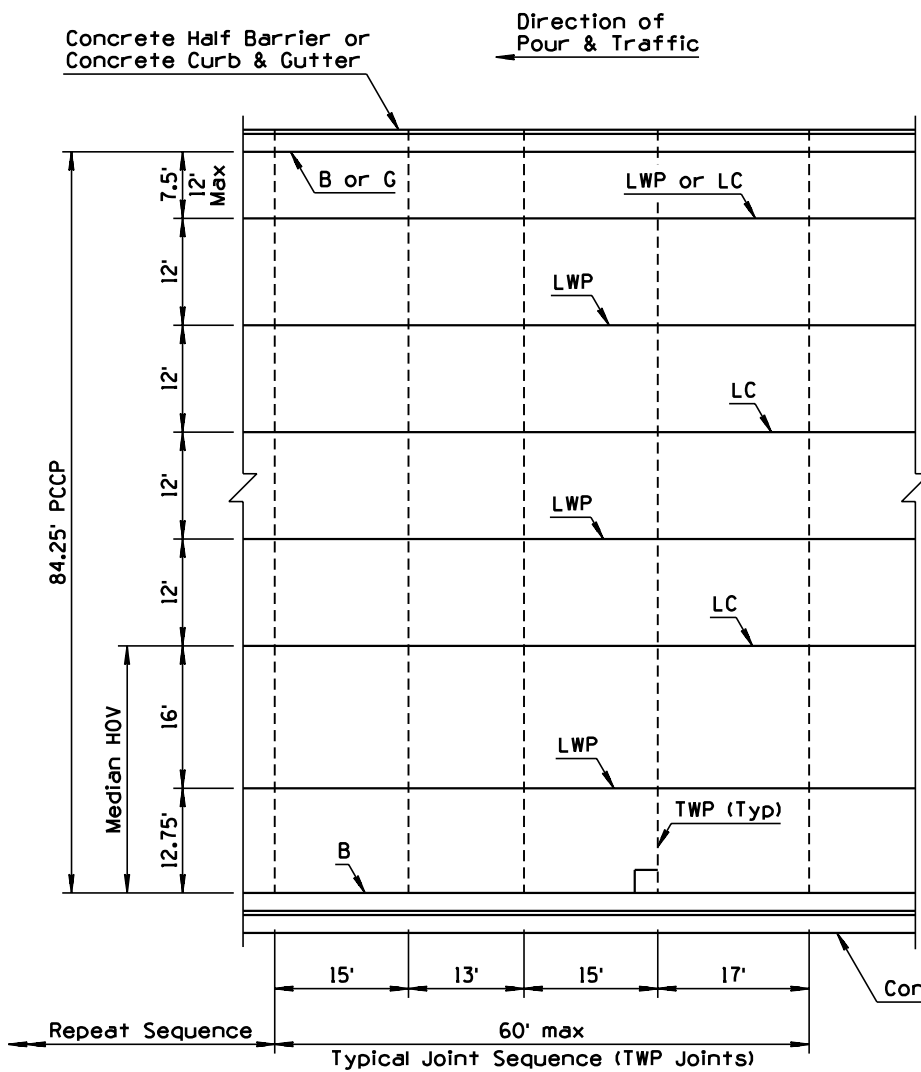
1. Non-skewed PCCP joints shall be used with load transfer dowel assemblies.
2. See Std C-07.01 for PCCP joints and additional notes.
3. All transverse joints shall be in line with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.
4. At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
5. See Std C-05.10 for curb and gutter joint requirements.
6. The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.
7. Transverse weakened plane joint shall be constructed at least 6'-0" from a transverse construction joint.

DESIGN APPROVED <i>Terry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	1/93
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	MAINLINE PCCP JOINT LOCATIONS NON-SKEWED JOINTS	DRAWING NO. C-07.03 Sheet 7 of 8

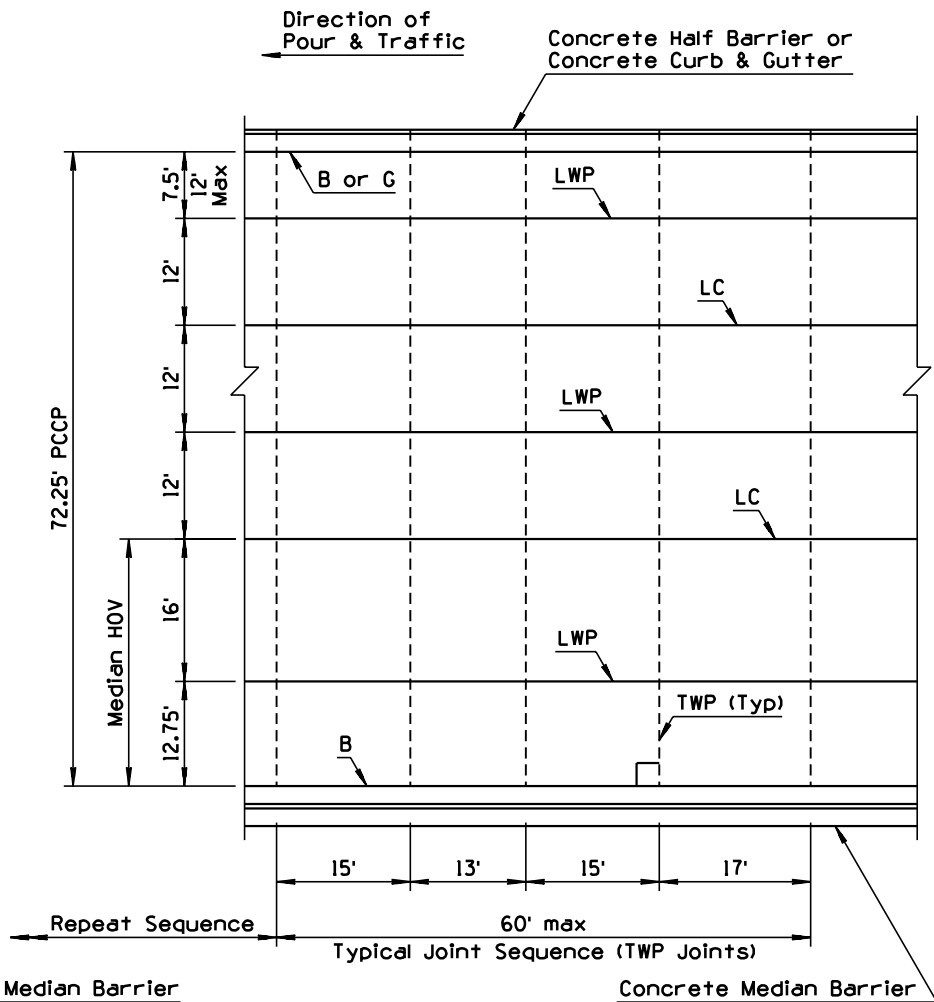
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			



PLAN
96.25' PCCP




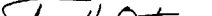
PLAN
84.25' PCCP



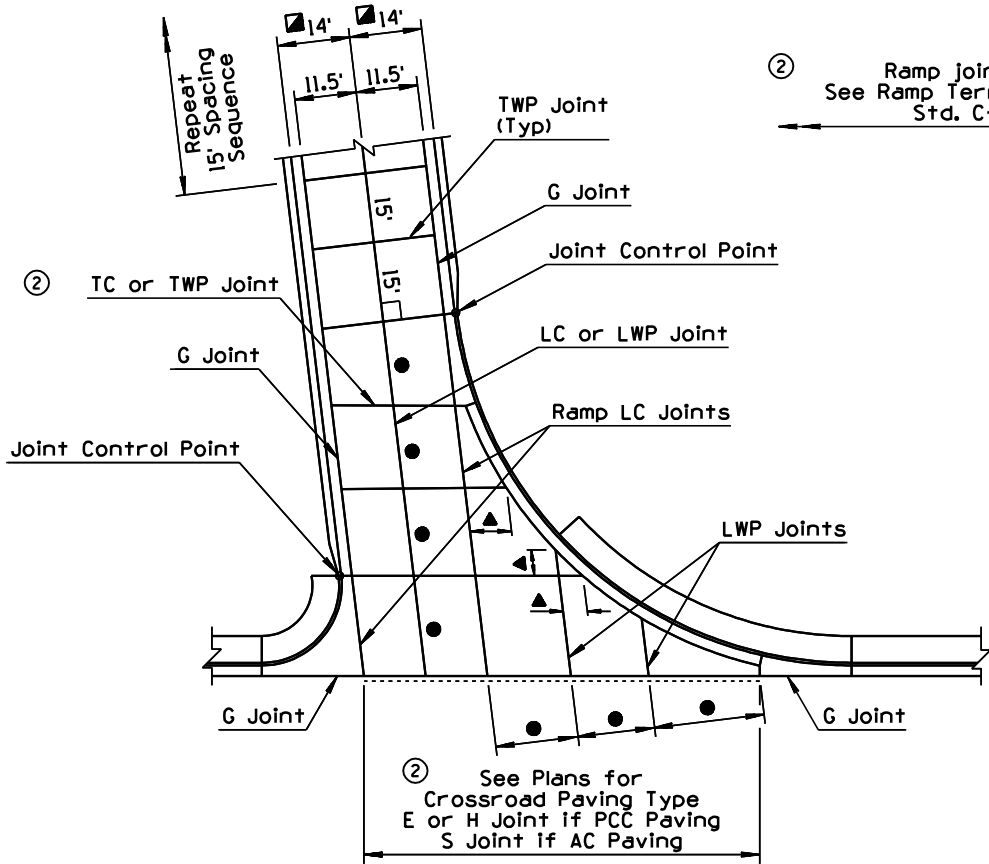
PLAN
72.25' PCCP

GENERAL NOTES

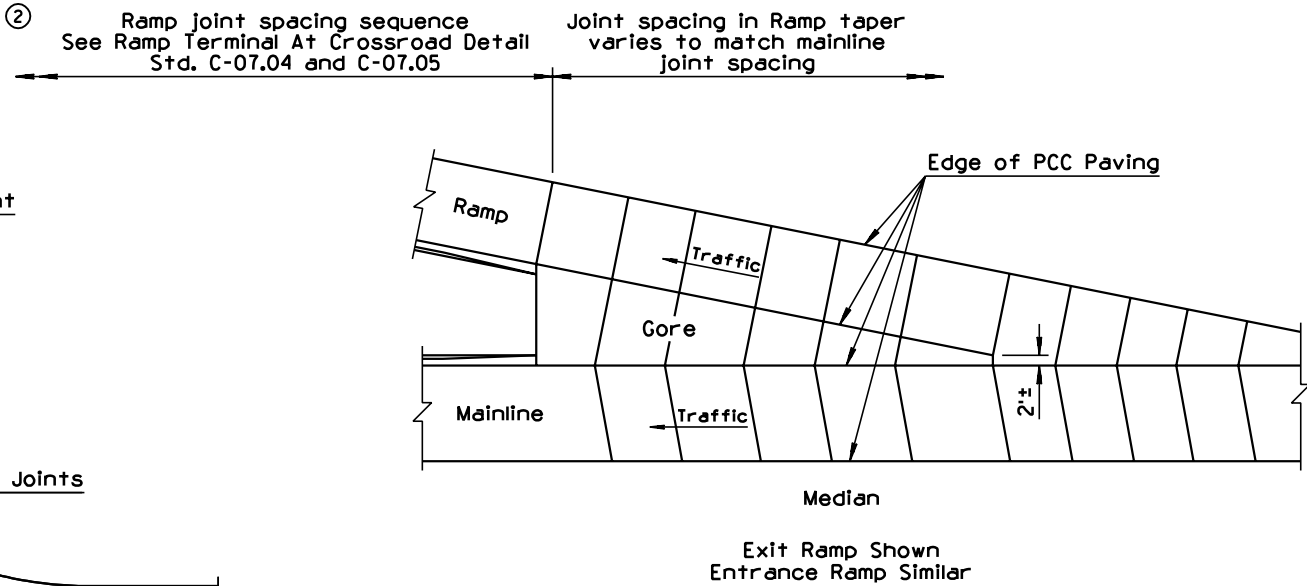
- Non-skewed PCCP joints shall be used with load transfer dowel assemblies.
- See Std C-07.01 for PCCP joints and additional notes.
- All transverse joints shall be in line with joints in adjacent slabs and are perpendicular (90°) to the longitudinal joints.
- At intersection of side roads or streets, joints shall be placed to give the intersection a symmetrical appearance while conforming to the cross section of the intersecting road or street.
- See Std C-05.10 for curb and gutter joint requirements.
- The reinforcing bars in the LWP & LC joints shall be placed no greater than 1'-3" from the TC joint.
- Transverse weakened plane joint shall be constructed at least 6'-0" from a transverse construction joint.

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		1/93
APPROVED FOR DISTRIBUTION 	MAINLINE PCCP JOINT LOCATIONS NON-SKEWED JOINTS		DRAWING NO. C-07.03 Sheet 8 of 8

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DISTANCE ACROSS BACK OF GORE	PNB	10/95
2	MODIFIED NOTE	PNB	10/95
3	DELETED REFERENCE TO RAMP CONTROL POINT	PNB	10/95
4	MODIFIED NOTE	BAF	7/97

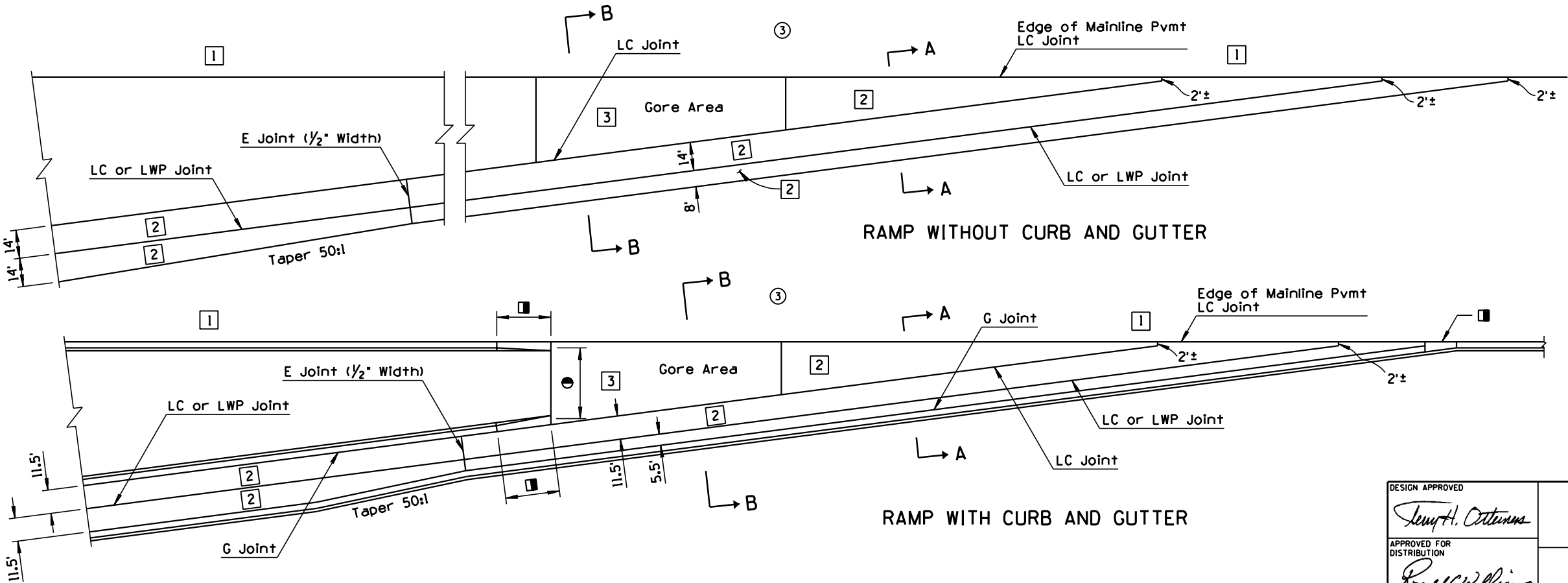


RAMP TERMINAL AT CROSSROAD



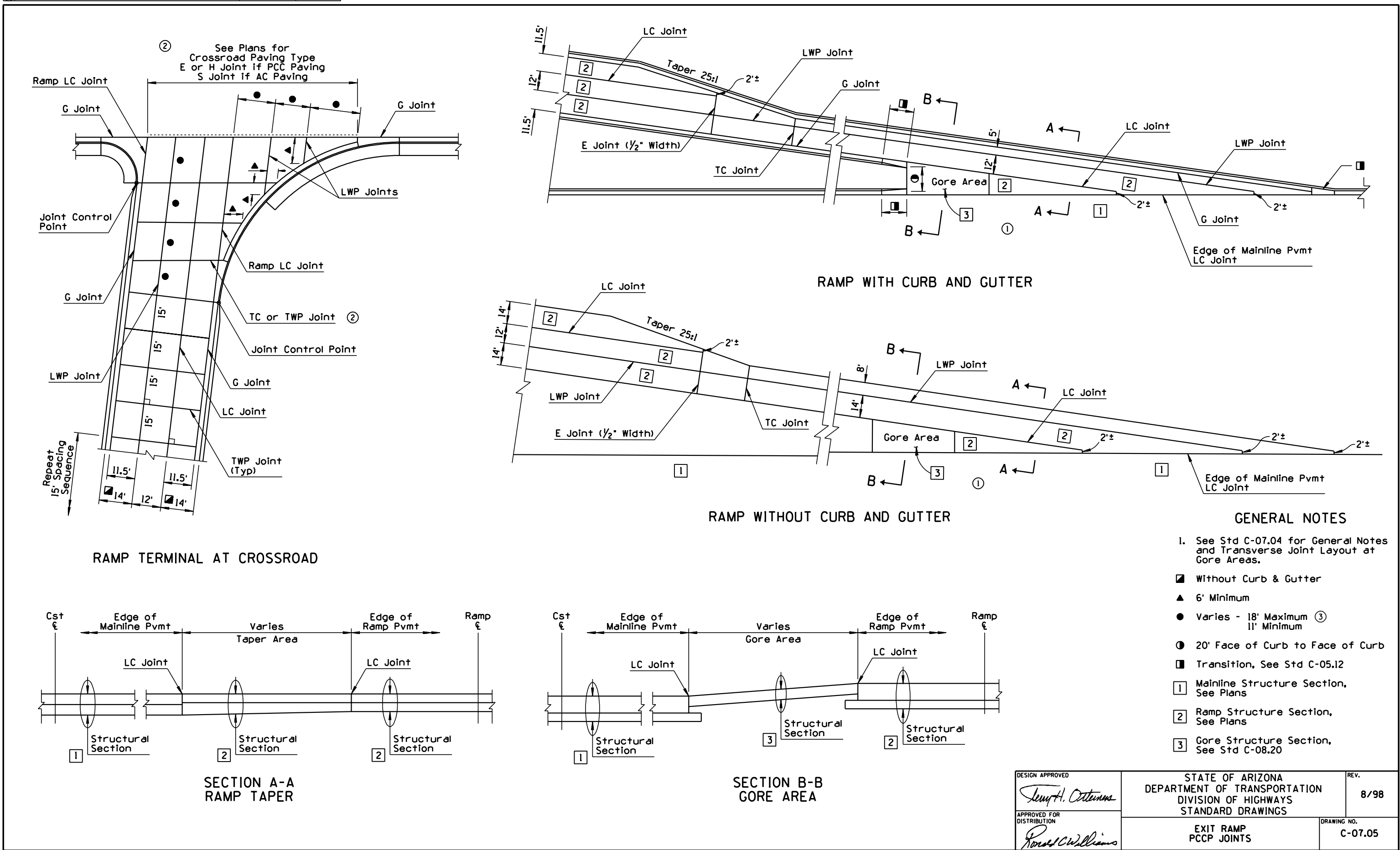
TYPICAL TRANSVERSE WEAKENED PLANE
JOINT LAYOUT AT GORE AREAS

- GENERAL NOTES**
1. Dimensions with a tolerance may be adjusted to align to the nearest transverse weakened plane construction joint as directed.
 2. See Std C-07.01 for joint information.
 3. See plans for ramp dimensions.
 4. See Std C-07.05 for Sections A-A and B-B.
 5. The ratio of transverse to longitudinal joint spacing shall be greater than $\frac{2}{3}$ but not more than $1\frac{1}{2}$.
 6. Ramp transverse joints shall be perpendicular (90°) to the ramp longitudinal joints, except as shown at the ramp terminal.
- ▲ 6' Minimum
 - Varies - 18' Maximum ④
11' Minimum
 - Transition, See Std C-05.12
 - ▣ Without Curb & Gutter
- ① 12' Face of Curb to Face of Curb
- 1 Mainline Structure Section, See Plans
- 2 Ramp Structure Section, See Plans
- 3 Gore Structure Section, See Std C-08.20

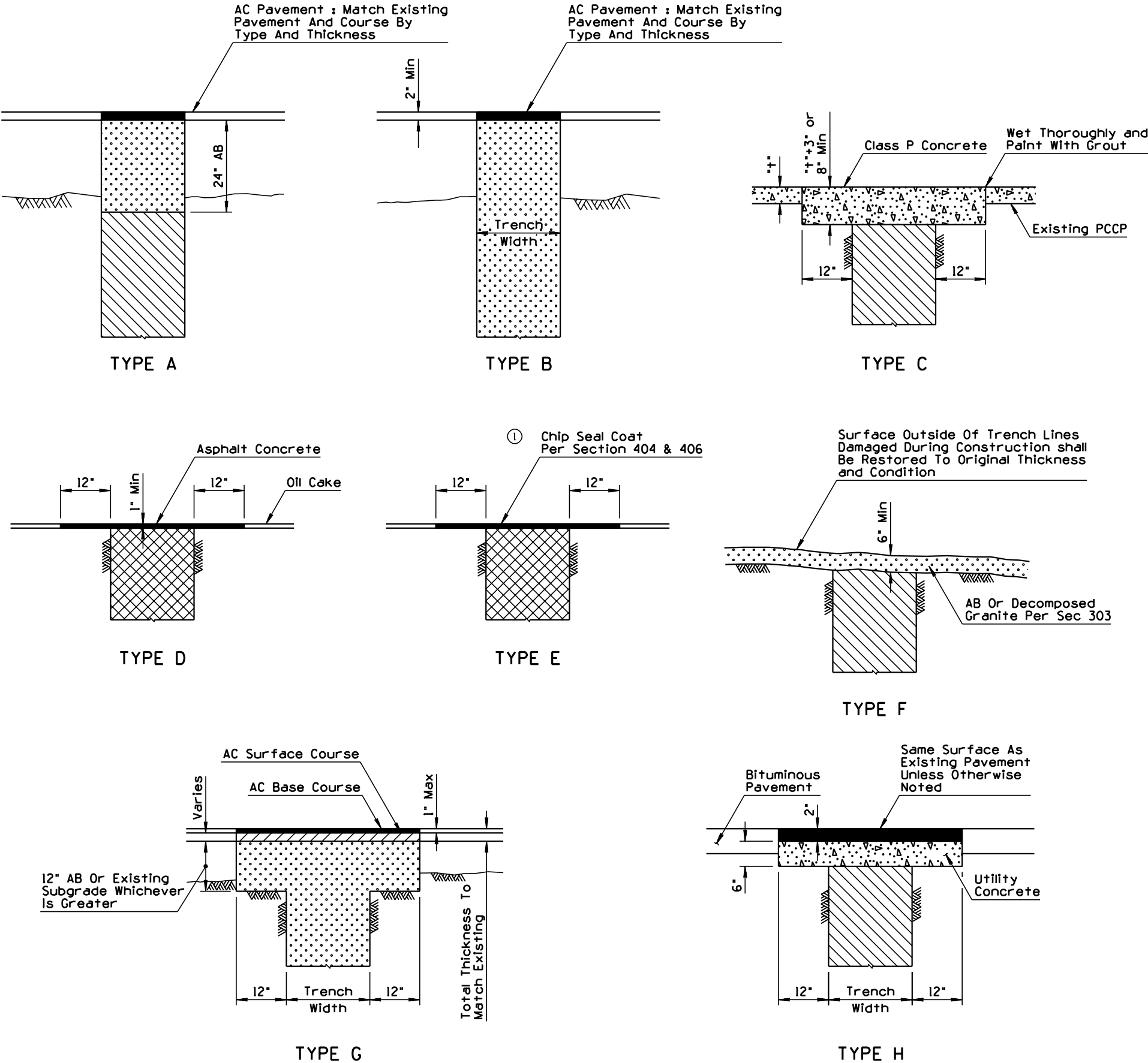


DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/98
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	ENTRANCE RAMP PCCP JOINTS	DRAWING NO. C-07.04

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	DELETED REFERENCE TO RAMP CONTROL POINT	PNB	10/95
2	MODIFIED NOTE	PNB	10/95
3	MODIFIED NOTE	BAF	7/97
4			



NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTE	PNB	10/95
2			
3			
4			



GENERAL NOTES

1. Bedding per Section 501 of the Standard Specifications.
2. Asphalt concrete shall be in accordance with the requirements of the Standard Specifications.
3. 12" lip is required on the sides of trenches that are not parallel at the center line of the street.
4. Types D & E require 9" of AB at top of trench when there is an existing base.
5. See Standard Drawing C-13.15 for Typical pipe installation.

LEGEND

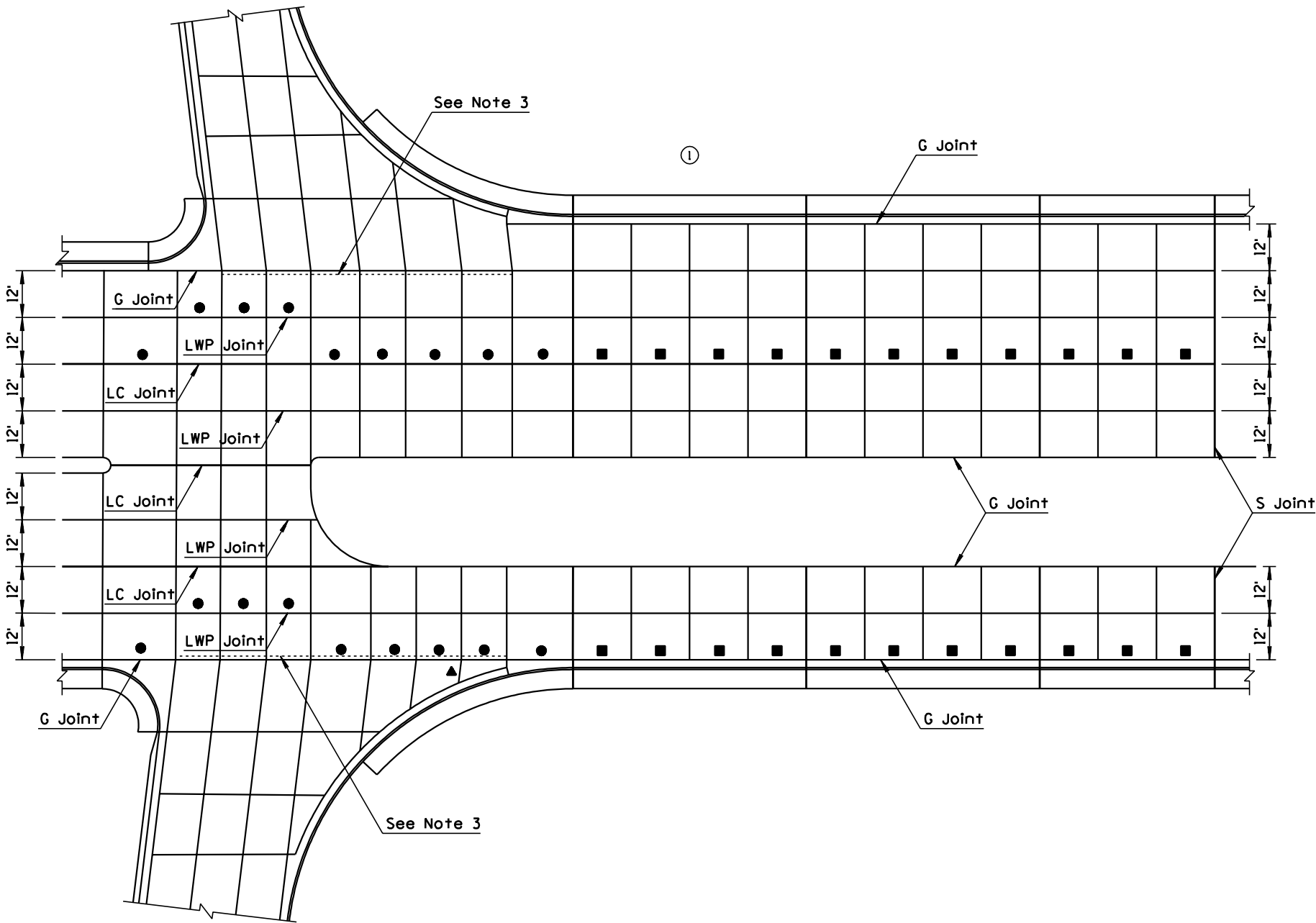
	Compacted Backfill Density Per Section 501
	AB, Granular Backfill or Native Backfill Per Section 302-2 and 501
	AB Per Section 303-2 and 501

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION 	TRENCH BACKFILL AND PAVEMENT REPLACEMENT	DRAWING NO. C-07.06

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	DELETED NOTE & DIMENSION	BAF	7/97
2			
3			
4			

GENERAL NOTES

- See Std C-07.01 for joint information.
 - See plans for crossroad dimensions.
 - See Std C-07.04 and C-07.05 for ramp joints.
 - The ratio of transverse to longitudinal joint spacing shall be greater than $\frac{2}{3}$ but not more than $1\frac{1}{2}$.
 - Transverse joints shall be perpendicular (90°) to the longitudinal joints, except as shown at the ramp terminal.
- ▲ 6' Minimum
- Varies - 18' Maximum
8' Minimum
- Varies - 12' when adjacent gutter widths are 2' or less.
- 15' when adjacent gutter widths are greater than 2'.



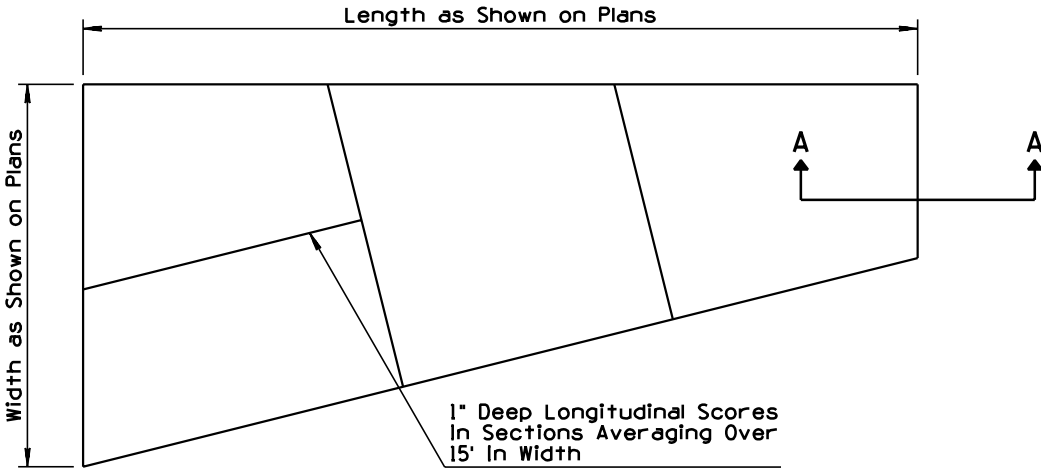
CROSSROAD AT RAMP TERMINAL

DESIGN APPROVED <i>Terry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		8/98
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CROSSROAD PCCP JOINTS		DRAWING NO. C-07.10

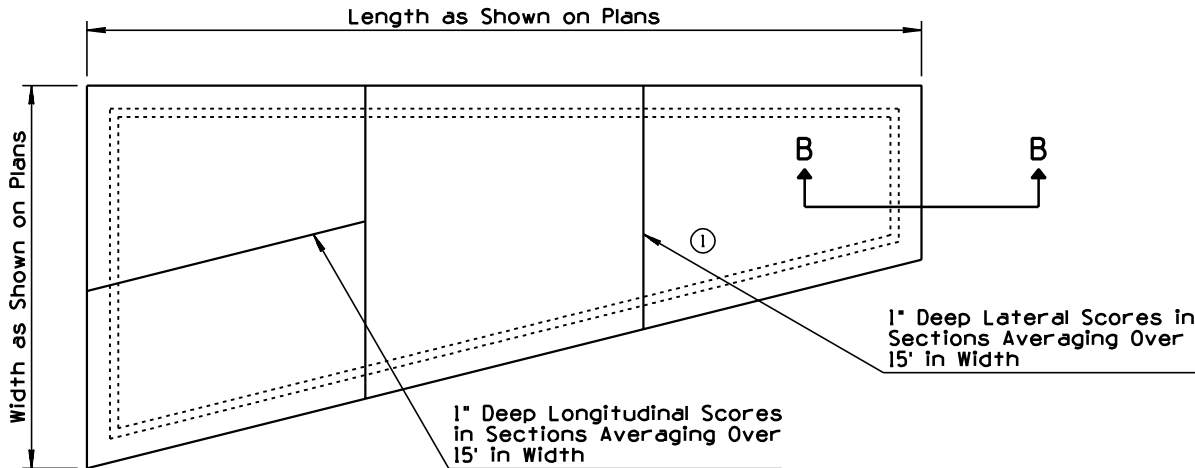
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CORRECTED LEADER LINE	PNB	10/95
2			
3			
4			

GENERAL NOTES

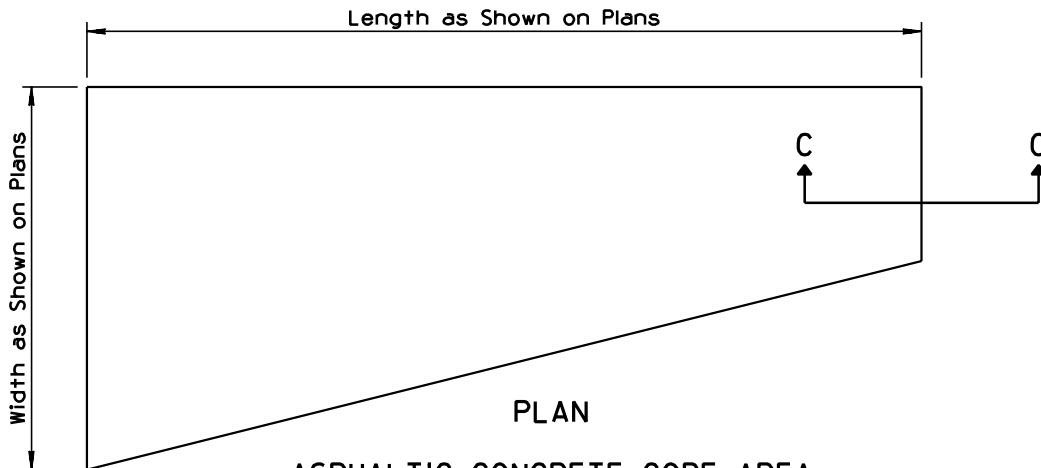
1. Paved gore area shall be Class S Concrete, $f'_c = 4000$ psi or asphaltic concrete as called for on plans.
2. See Std. C-07.01 and C-07.04 for joint layout and details.



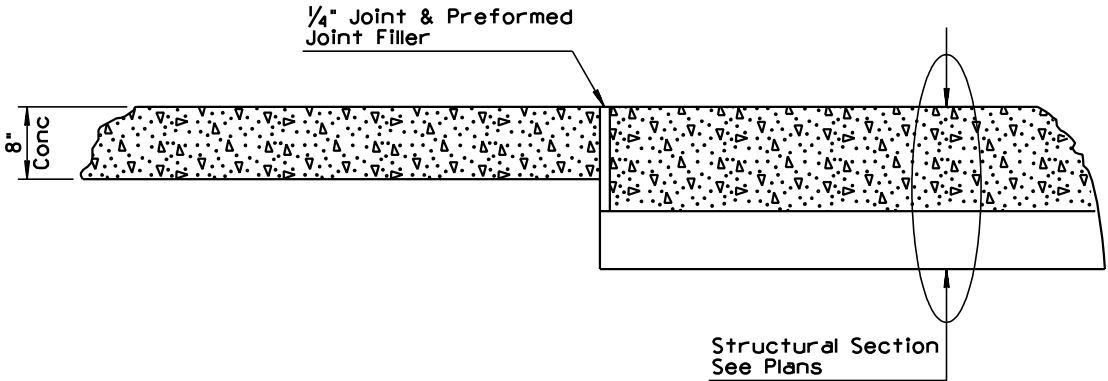
PLAN
CONCRETE GORE AREA
WITH ABUTTING CONCRETE PAVEMENT



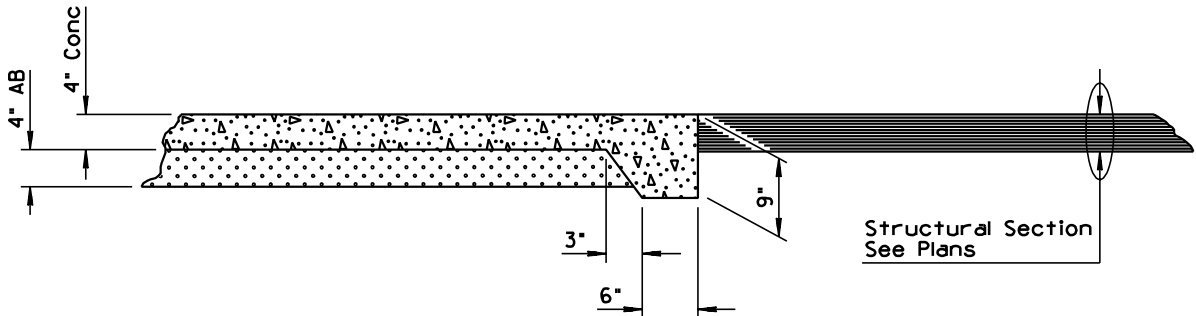
PLAN
CONCRETE GORE AREA
WITH ABUTTING AC PAVEMENT



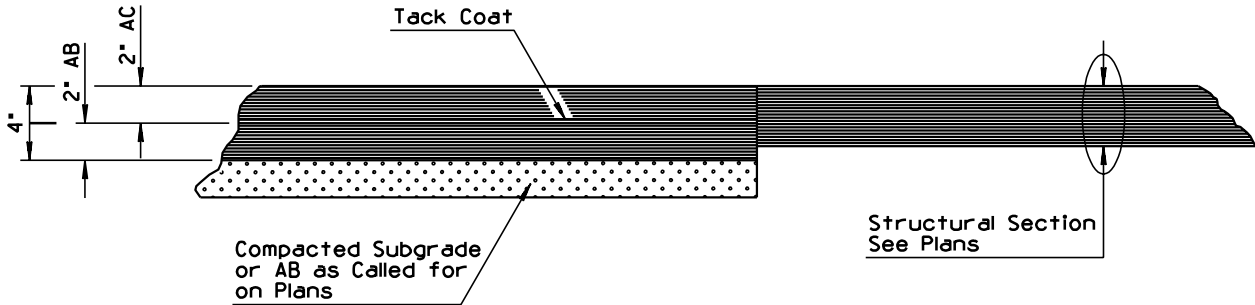
PLAN
ASPHALTIC CONCRETE GORE AREA
WITH ABUTTING AC PAVEMENT



SECTION A-A



SECTION B-B

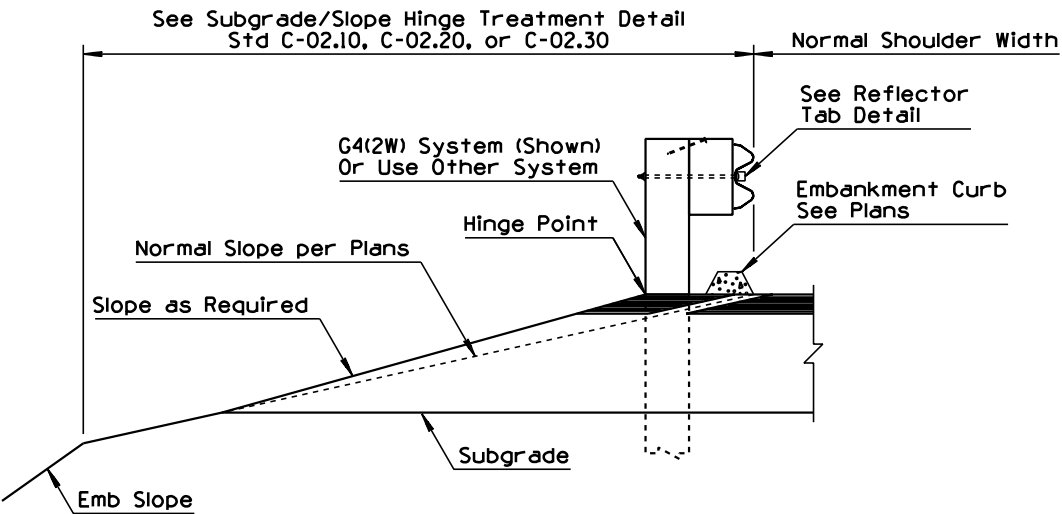
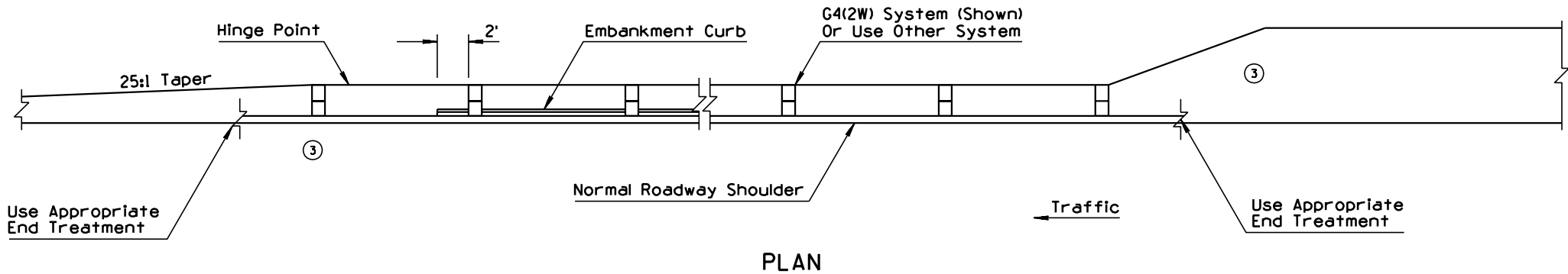


SECTION C-C

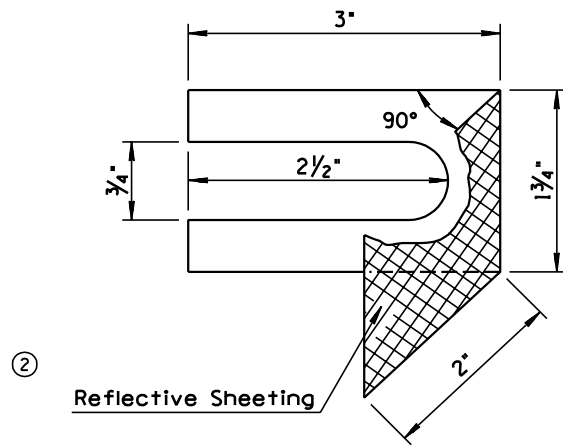
DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>		DRAWING NO. C-08.20

PAVED GORE AREA

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTE	RLF	7/01
2	REVISED CALLOUT	RLF	7/01
3	REVISED PLAN	RLF	7/01
4			



- ### GENERAL NOTES
1. All embankment curb shall be protected by guard rail.
 2. Guard rail shall extend beyond the limits of embankment curb.
 3. See Std. C-10.03 for measurement limits.
 - ① 4. See Standard Specifications for reflector tab materials, reflective sheeting, and spacing requirements.



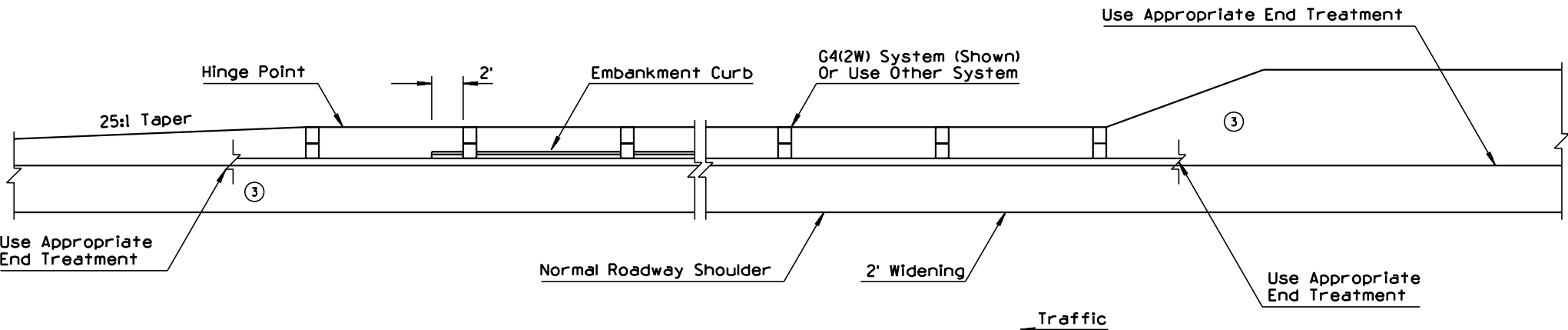
TYPE A GUARD RAIL INSTALLATION

DESIGN APPROVED <i>John L. Lane</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	TYPE A GUARD RAIL INSTALLATION, REFLECTOR TAB	DRAWING NO. C-10.01

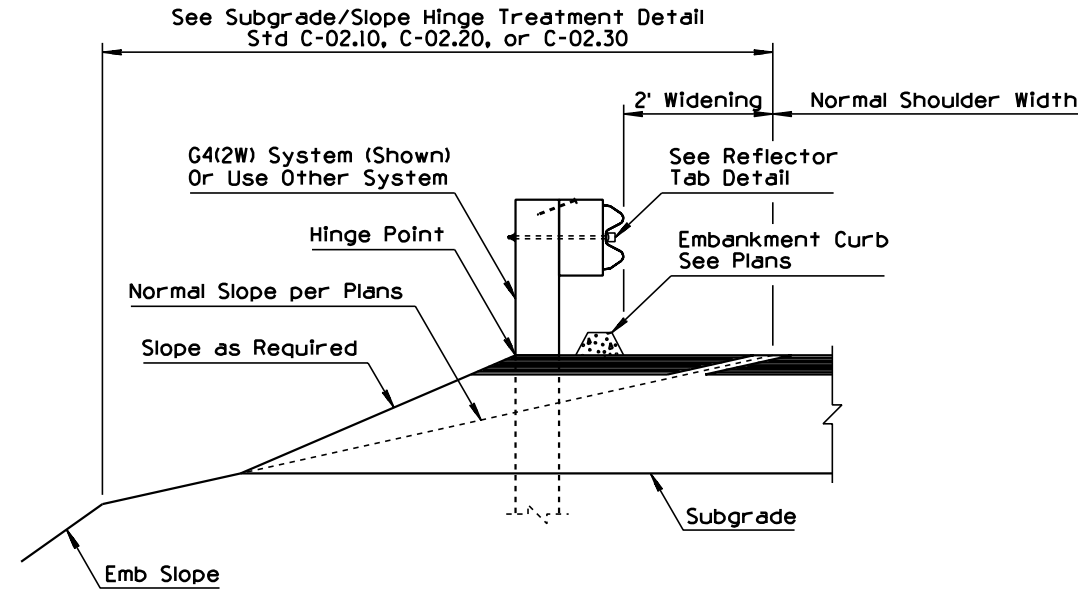
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTE	RLF	7/01
2	REVISED CALLOUT	RLF	7/01
3	REVISED PLAN	RLF	7/01
4			

GENERAL NOTES

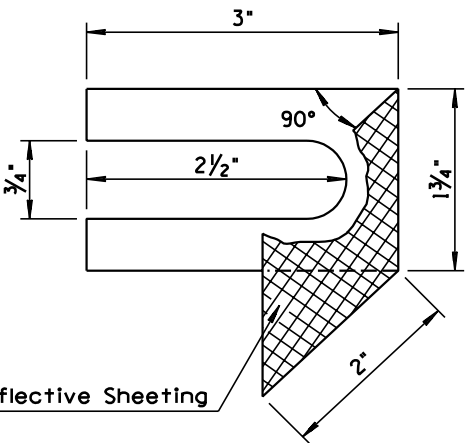
- 1. All embankment curb shall be protected by guard rail.
- 2. Guard rail shall extend beyond the limits of embankment curb.
- 3. See Std. C-10.03 for measurement limits.
- ① 4. See Standard Specifications for reflector tab materials, reflective sheeting, and spacing requirements.



PLAN



SECTION



REFLECTOR TAB DETAIL

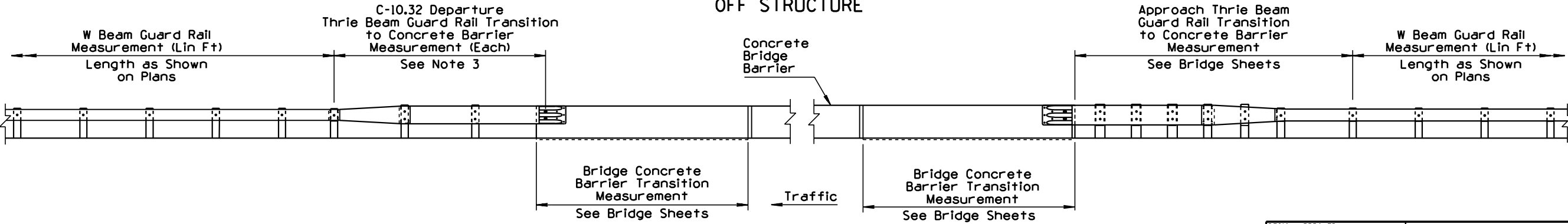
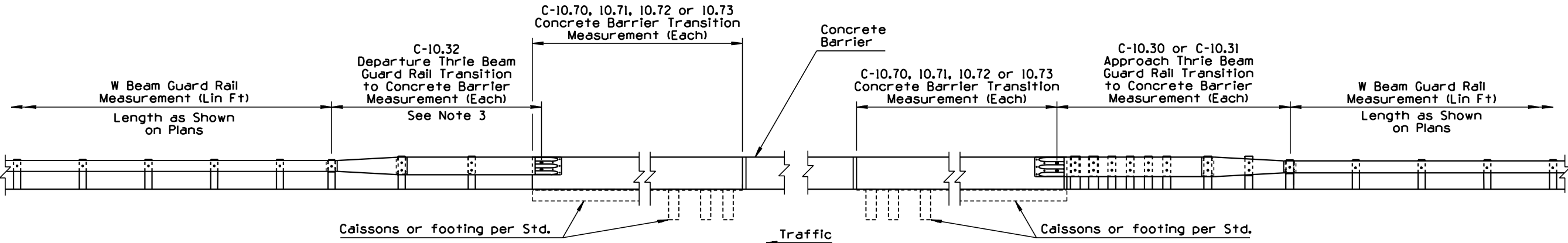
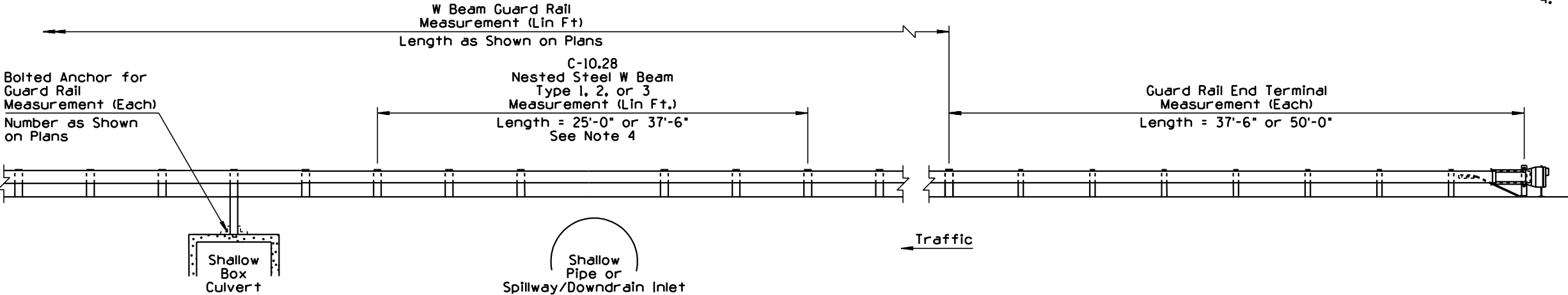
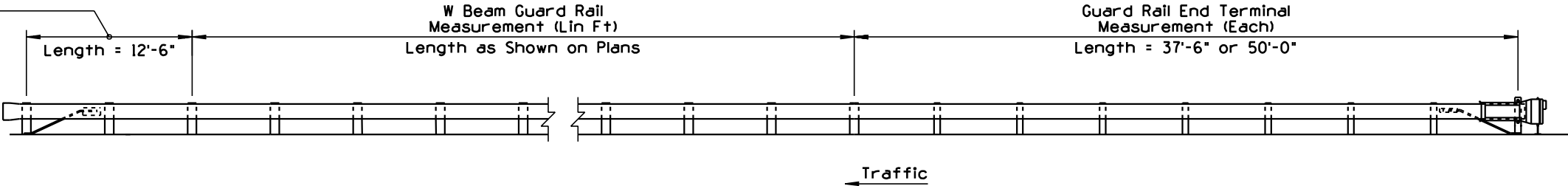
TYPE B GUARD RAIL INSTALLATION

DESIGN APPROVED <i>John L. Lamm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	TYPE B GUARD RAIL INSTALLATION, REFLECTOR TAB	DRAWING NO. C-10.02

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUED STANDARD	RLF	7/01
2			
3			
4			

Guard Rail End Terminal Assembly
C-10.45 (when called for on plans)
Measurement (Each)

See Note 3



GENERAL NOTES

- Length shall be as shown unless otherwise indicated on project plans.
- Post type (Timber or Steel) for transitions shall match post type of adjoining guard rail.
- Shown for one-way traffic. For two-way traffic, departure requires approach end treatment when located within the clear zone of opposing traffic.
- See Specifications for nested guard rail pay item.

CONCRETE BARRIER TRANSITION ON STRUCTURE

Concrete Barrier Transitions
Constructed on Top of Wingwalls

DESIGN APPROVED
John L. Lane
APPROVED FOR
DISTRIBUTION
Ronald Williams

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

MEASUREMENT LIMITS FOR
W BEAM SYSTEM

REV.
7/01

DRAWING NO.
C-10.03

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTE	RLF	7/01
2	REVISED NOTE	RLF	7/01
3	REVISED CALLOUT	RLF	7/01
4	REVISED SECTIONS	RLF	7/01

GENERAL NOTES

- ①
1.

See plans and barrier summary sheets for location and type of guardrail and end treatments. Timber post installation shown.
2.

See Construction Standard Drawings C-05.10, 05.12, 10.01, and 10.02 for dimensions and details not shown.
- ②

3.

Type B guard rail installation shown. For Type A guard rail installation, use Type D-1 Curb and Gutter instead of the Type D-2 Curb and Gutter shown.

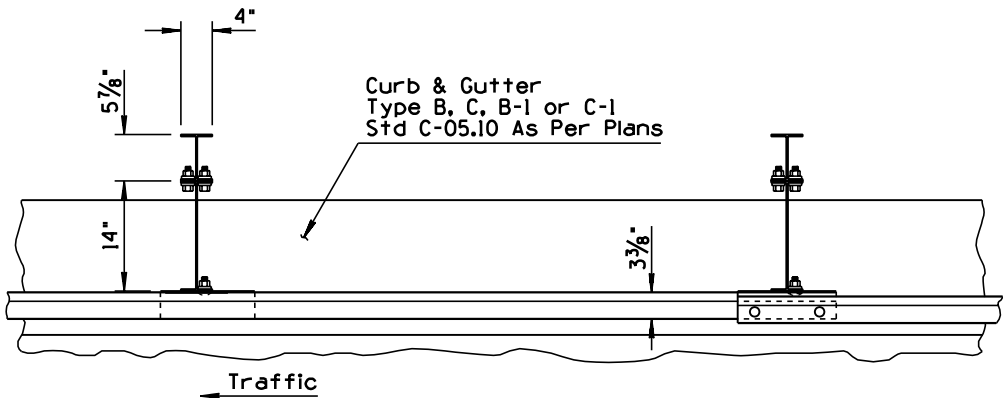
4.

See Plans for type and location of drainage facilities.

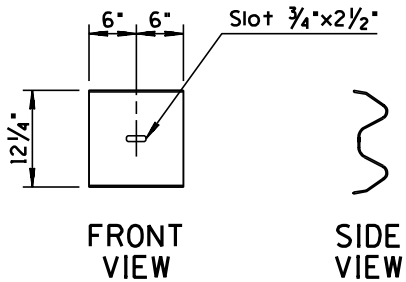
5.

Bituminous joint filler (1/2") shall be placed where the curb & gutter or concrete widening abuts slotted drains, catch basins, dados, barrier, etc. Scored joints, 2 inches in depth, shall be placed to match adjacent joints in PCCP or at 15 ft intervals where adjacent to AC or continuously reinforced concrete pavement.
-
- To top of W-beam rail
- ④ SECTION A-A
-
- ④ SECTION B-B
-
- PLAN
TYPICAL HALF BARRIER TERMINAL
W/TYPE B OR C CURB & GUTTER
- | | | | |
|---|---|--|------------------------|
| DESIGN APPROVED
<i>John L. Lamm</i> | STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS | | REV.
7/01 |
| APPROVED FOR DISTRIBUTION
<i>Ronald Williams</i> | HALF BARRIER TERMINAL
W/TYPE B OR C CURB & GUTTER | | DRAWING NO.
C-10.06 |

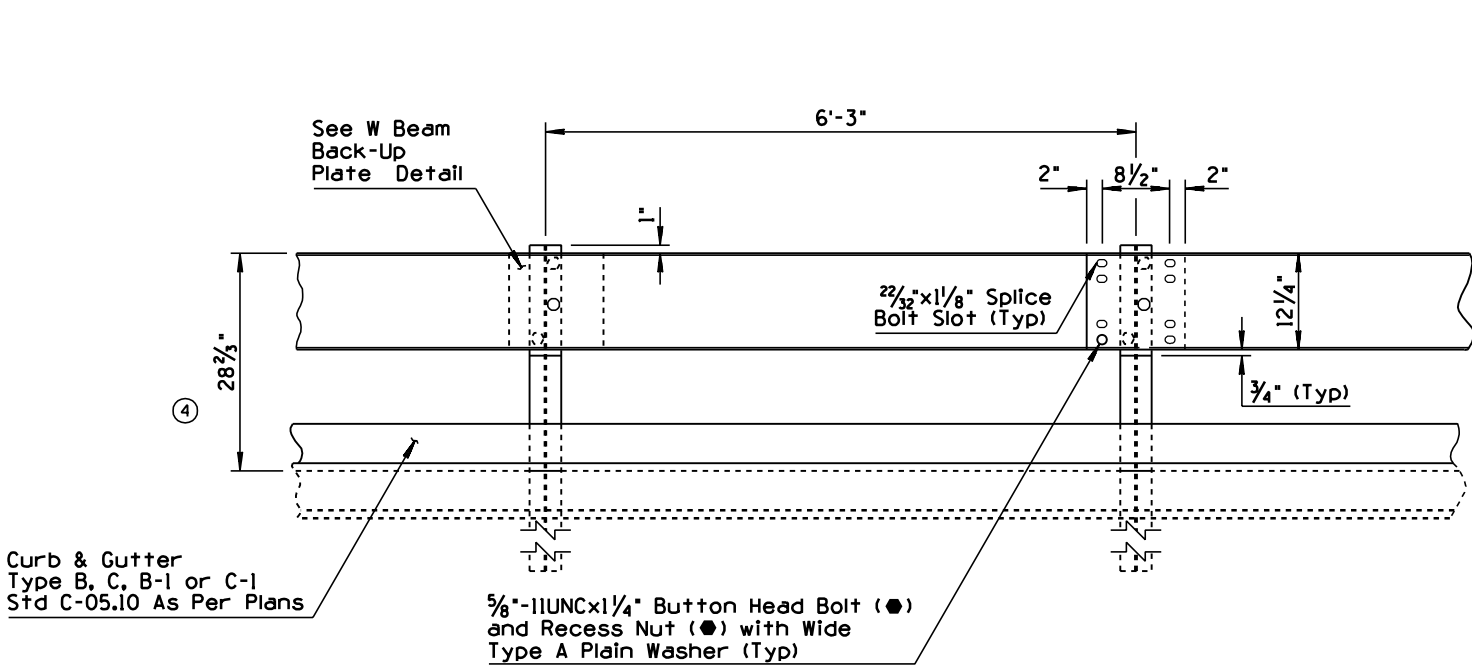
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED TIMBER POST OPTION ON SHEET 2	PNB	10/95
2	DELETED REFERENCES TO GUTTER CROSS SLOPE	PNB	10/95
3	MODIFIED NOTE	BAF	7/97
4	RAISED GUARD RAIL 1"	RLF	7/01



PLAN

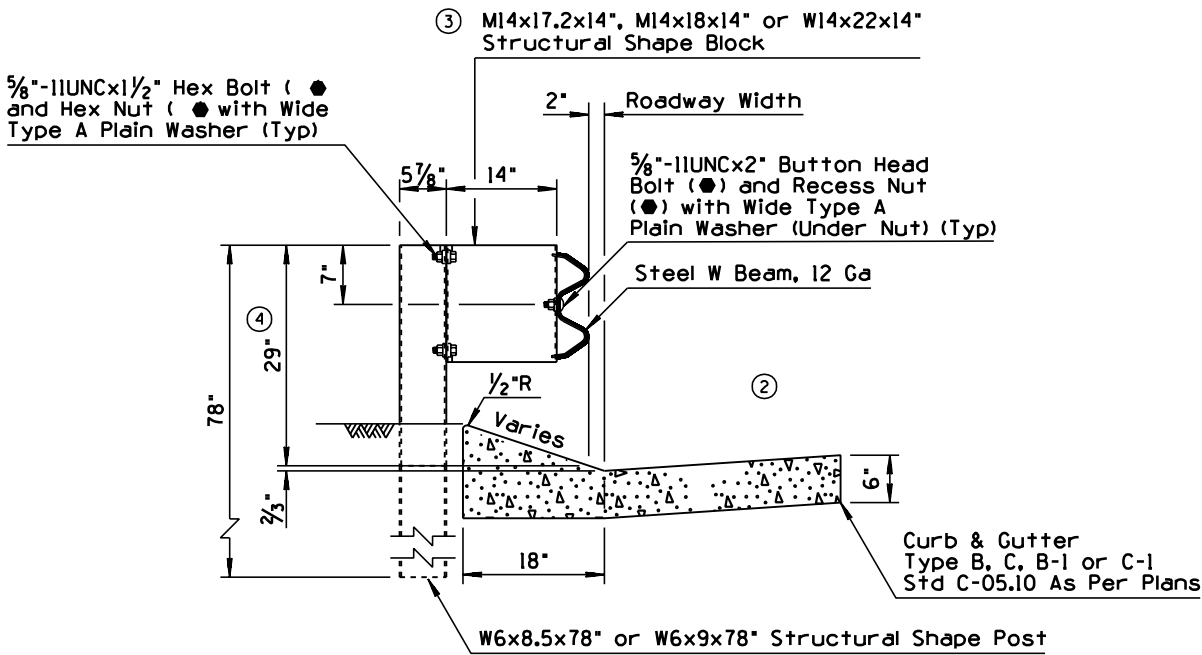


W BEAM BACK-UP PLATE DETAIL



ELEVATION

G4(1S-MODIFIED)



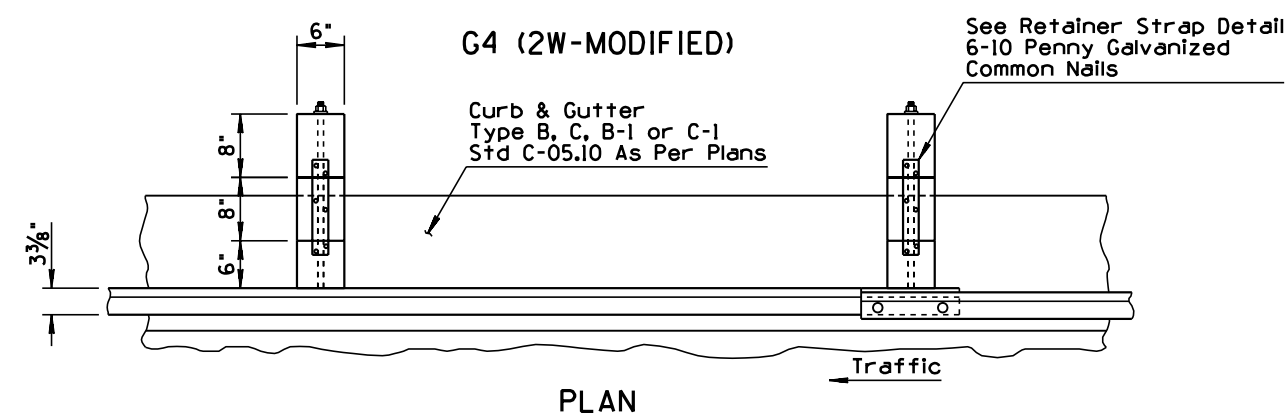
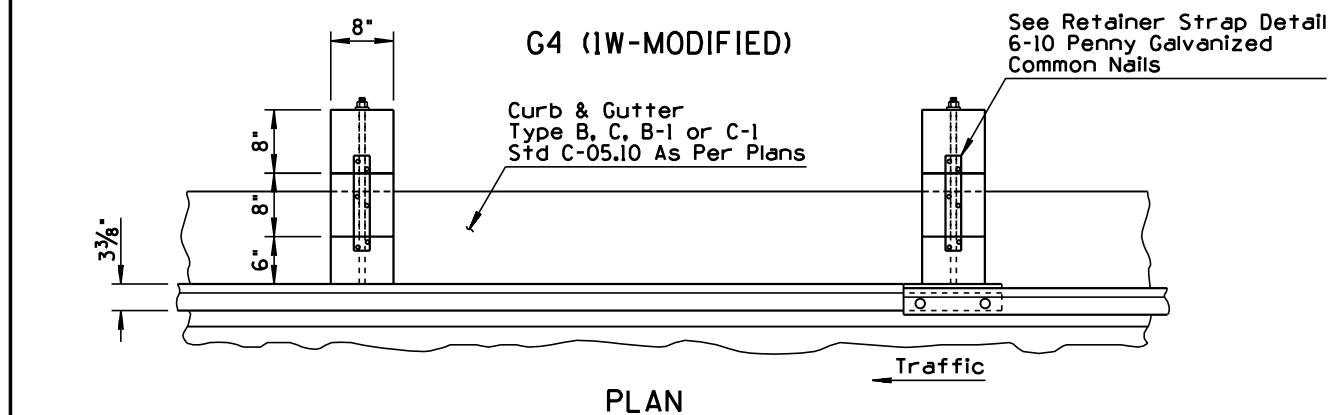
SECTION

GENERAL NOTES

- Height of curb shall not exceed 4 inches.
- - Indicates ARTBA designation

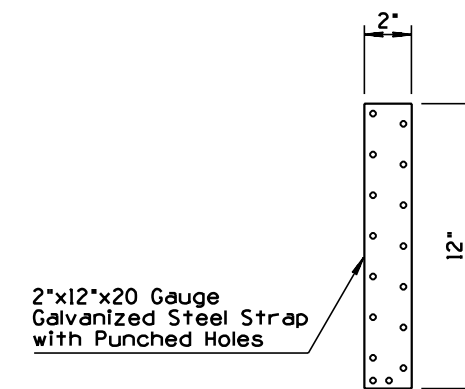
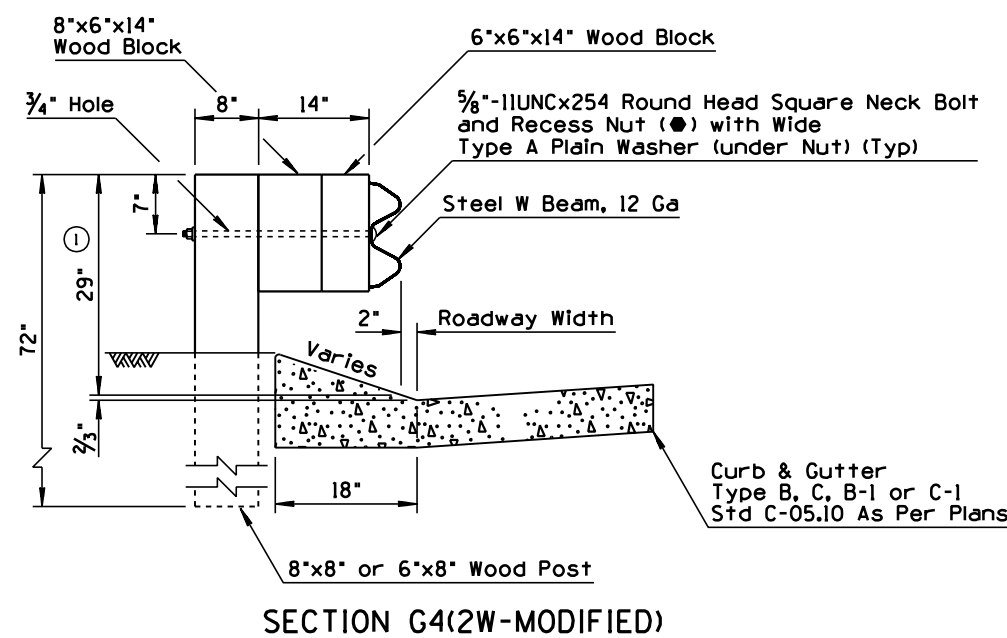
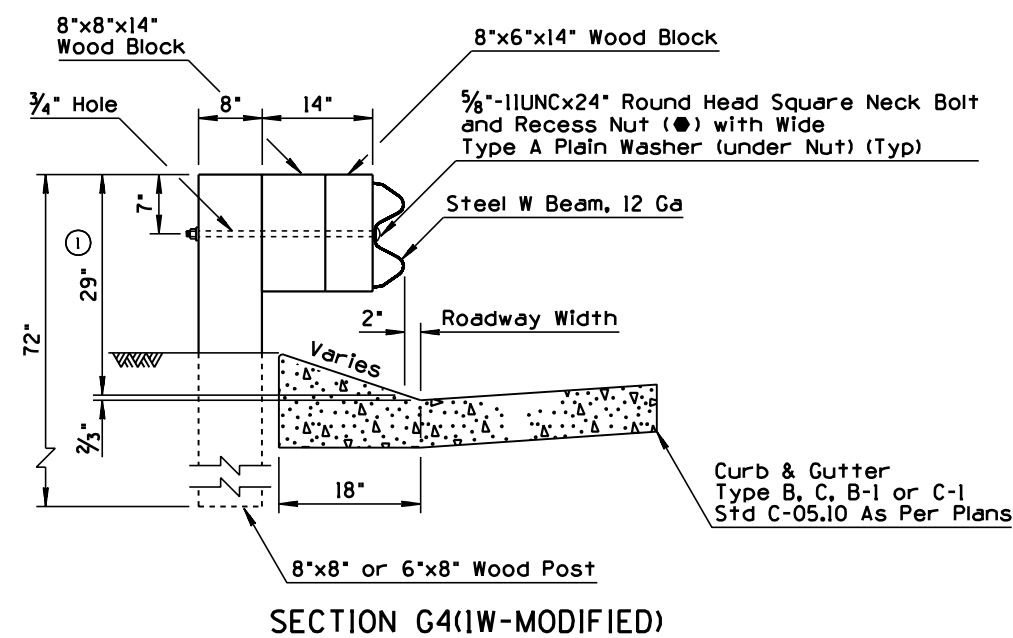
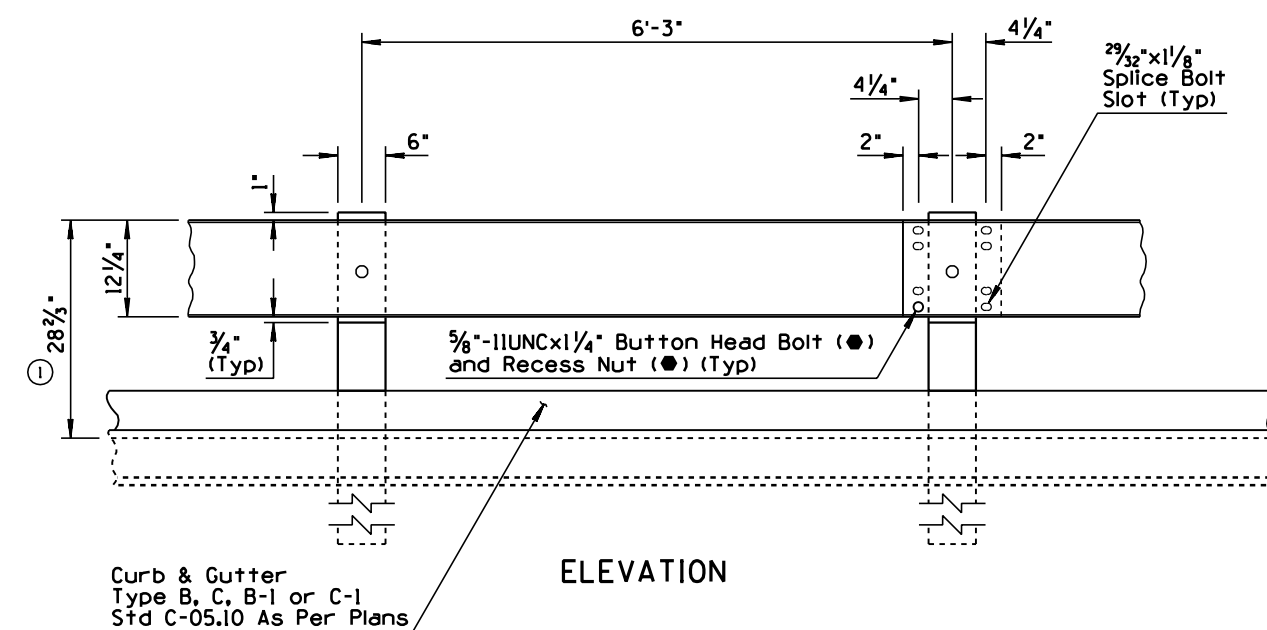
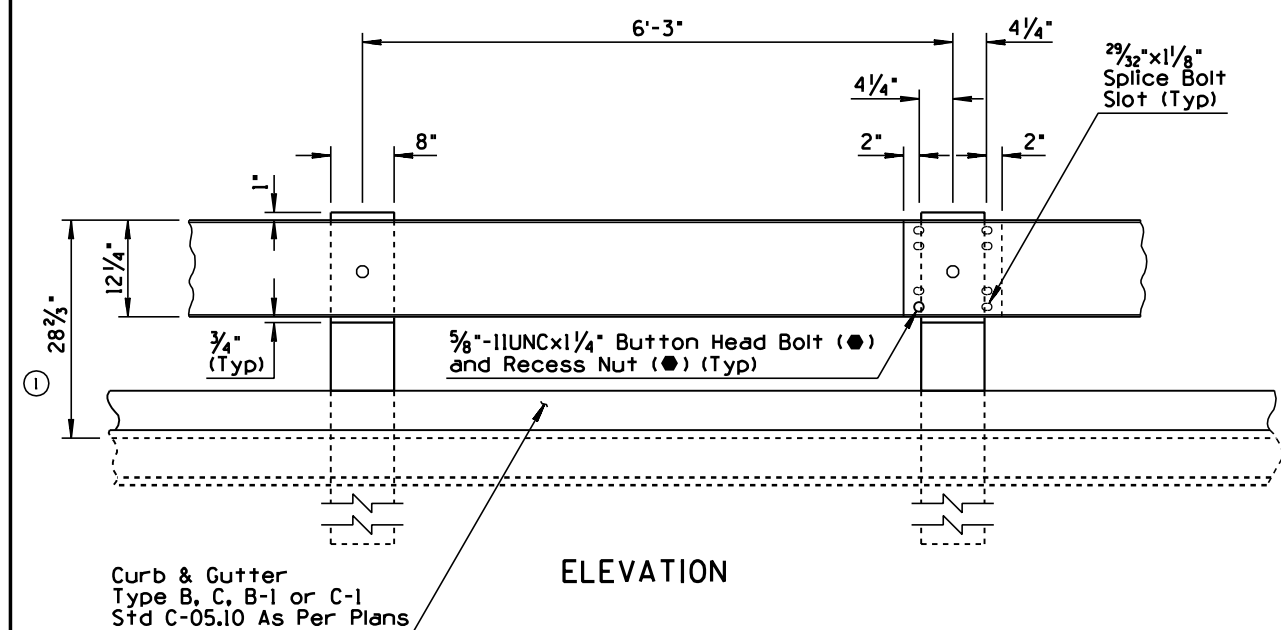
DESIGN APPROVED <i>John L. Law</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	G4(MODIFIED) BLOCKED OUT W BEAM WITH SPECIAL CURB AND GUTTER G4(1S-MODIFIED) (STEEL POST)	DRAWING NO. C-10.22 Sheet 1 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	RAISED GUARD RAIL 1"	RLF	7/01
2			
3			
4			

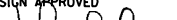



GENERAL NOTES

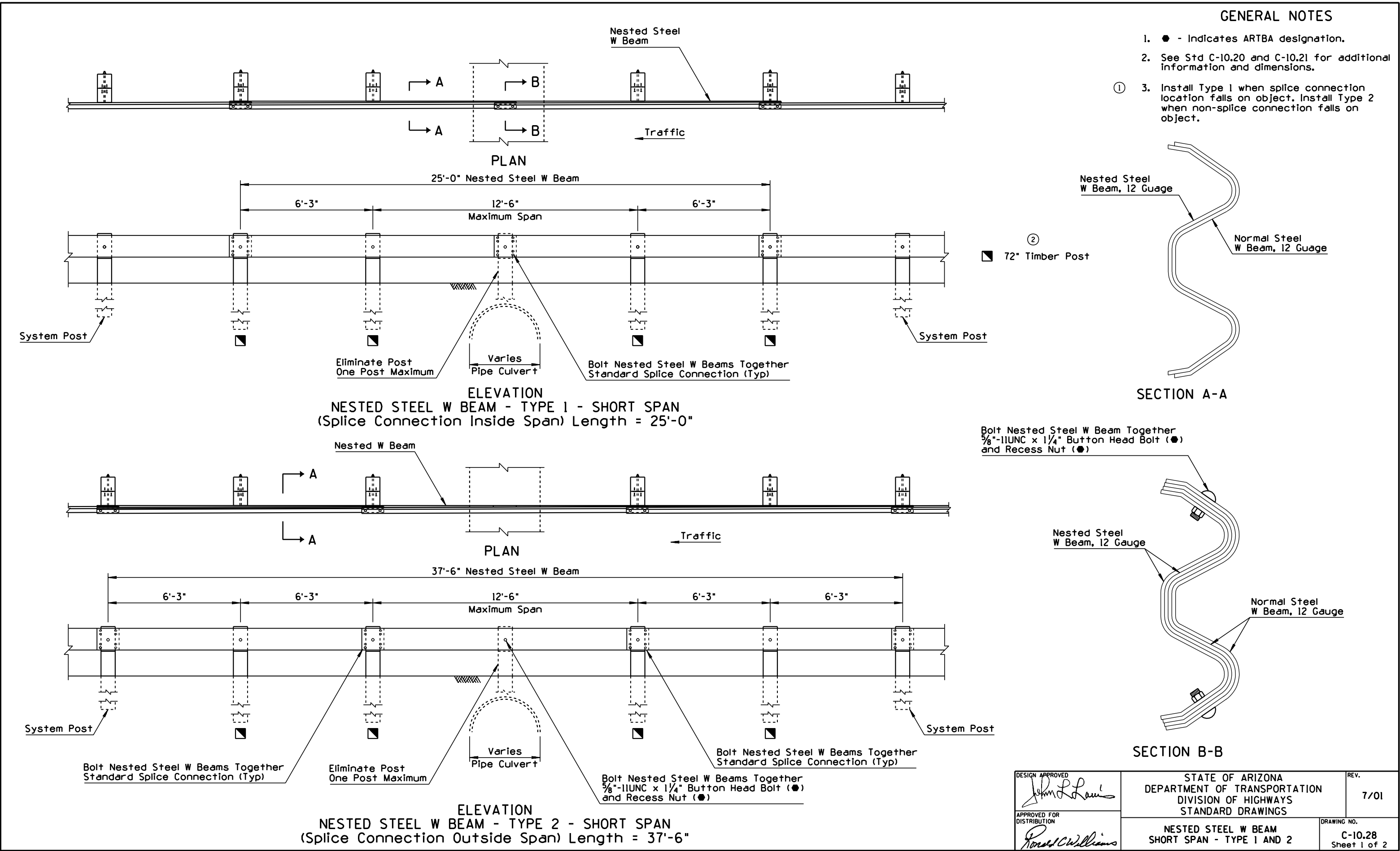
● - Indicates ARTBA designation



RETAINER STRAP DETAIL

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/01
APPROVED FOR DISTRIBUTION 	G4(MODIFIED) BLOCKED OUT W BEAM WITH SPECIAL CURB AND GUTTER G4(1W) AND G4(2W) (TIMBER POST)		DRAWING NO. C-10.22 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED NOTE	RLF	7/01
2	INDICATED LOCATION OF 72" POSTS	RLF	7/01
3			
4			

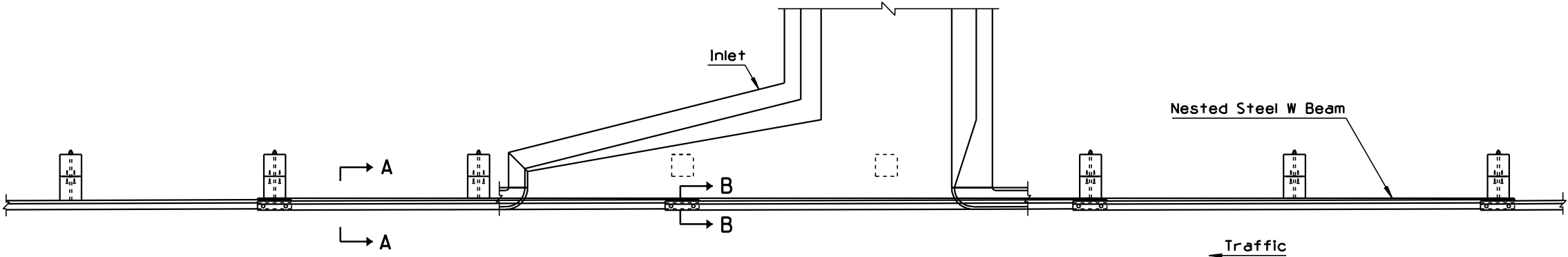


DESIGN APPROVED <i>John L. Law</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	NESTED STEEL W BEAM SHORT SPAN - TYPE 1 AND 2	DRAWING NO. C-10.28 Sheet 1 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED REFERENCE	RLF	7/01
2	INDICATED LOCATION OF 72" POSTS	RLF	7/01
3			
4			

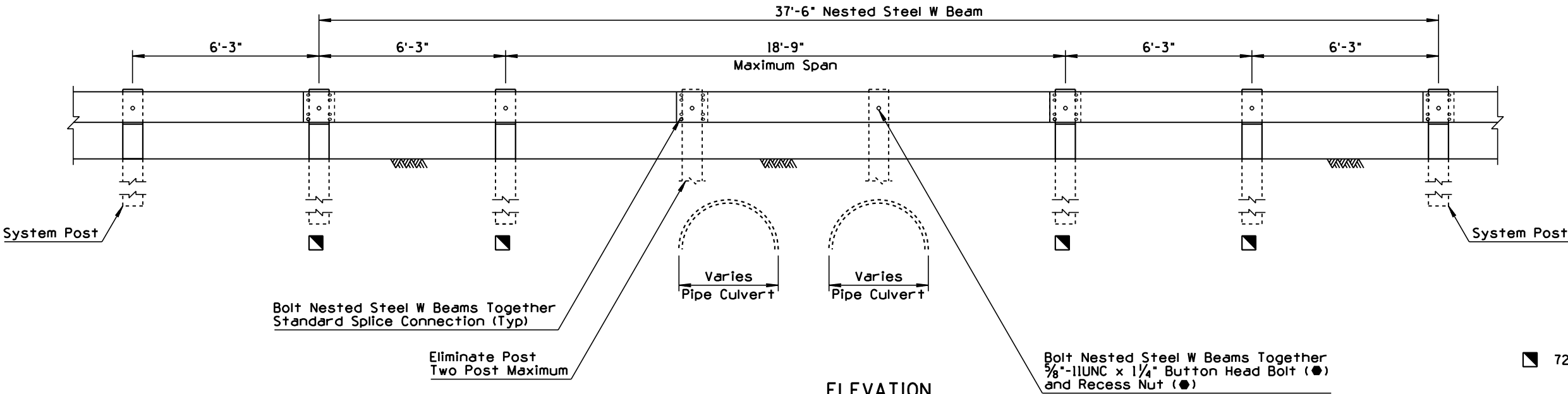
GENERAL NOTES

1. Use Type 3 Nested Steel W Beam to span downdrain or spillway inlets as shown in the plan view.
2. Use Type 3 to span multiple obstructions as shown in the elevation view.



① See Sheet 1 of 2 for Sections A-A and B-B

PLAN



ELEVATION

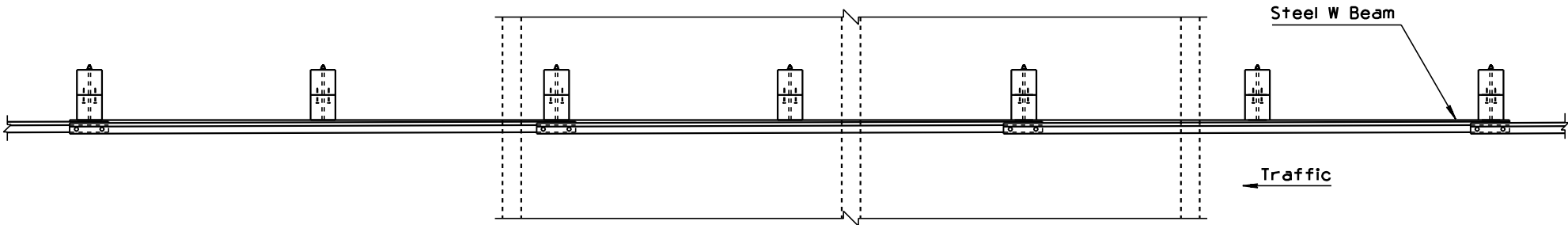
NESTED STEEL W BEAM - TYPE 3 - LONG SPAN
Length = 37'-6"

DESIGN APPROVED <i>John L. Law</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	NESTED STEEL W BEAM LONG SPAN - TYPE 3	DRAWING NO. C-10.28 Sheet 2 of 2

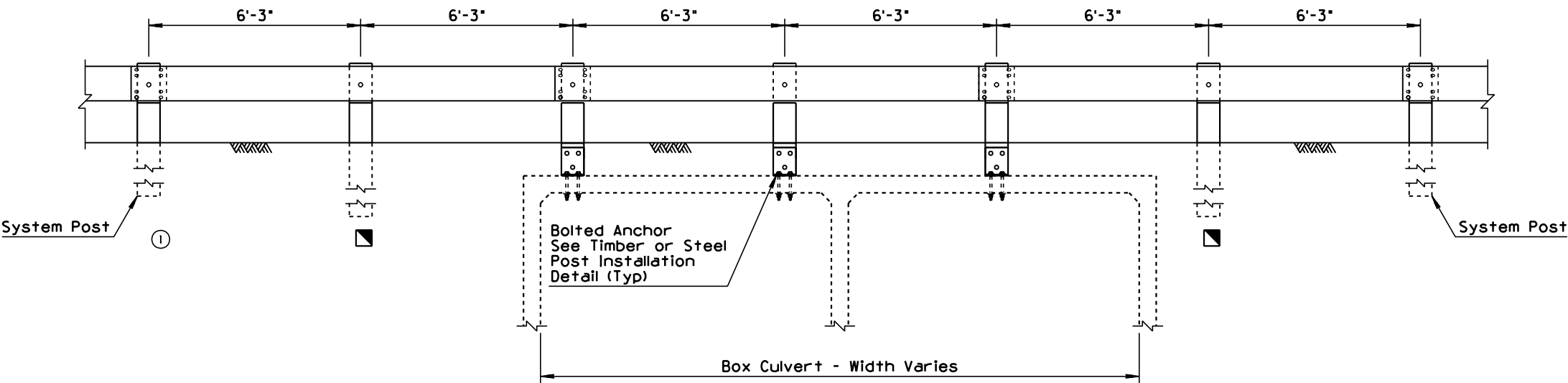
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DRAWING	RLF	7/01
2	INDICATED LOCATION OF 72" POSTS	RLF	7/01
3			
4			

GENERAL NOTES

1. See Std C-10.20 and C-10.21 for additional information and dimensions.



PLAN

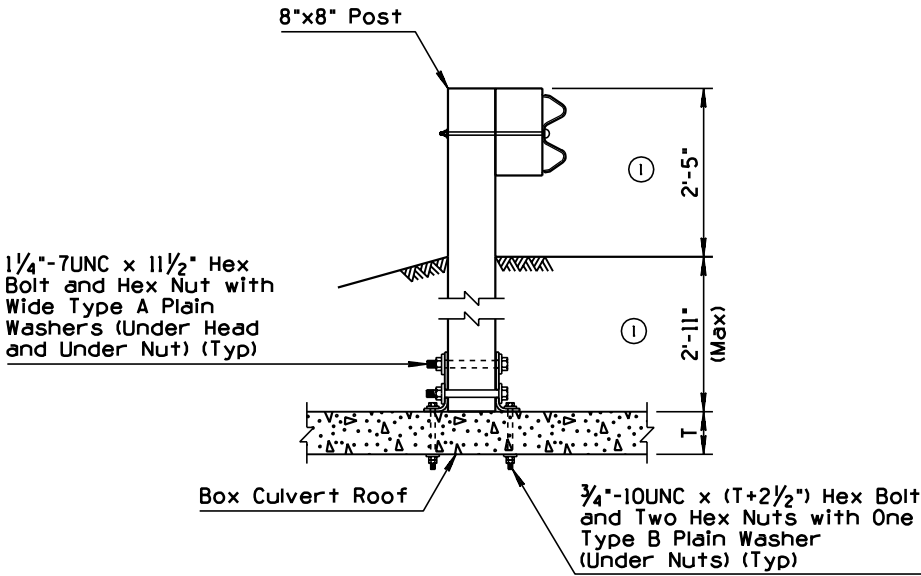


ELEVATION
BOLTED ANCHOR
BOX CULVERT INSTALLATION

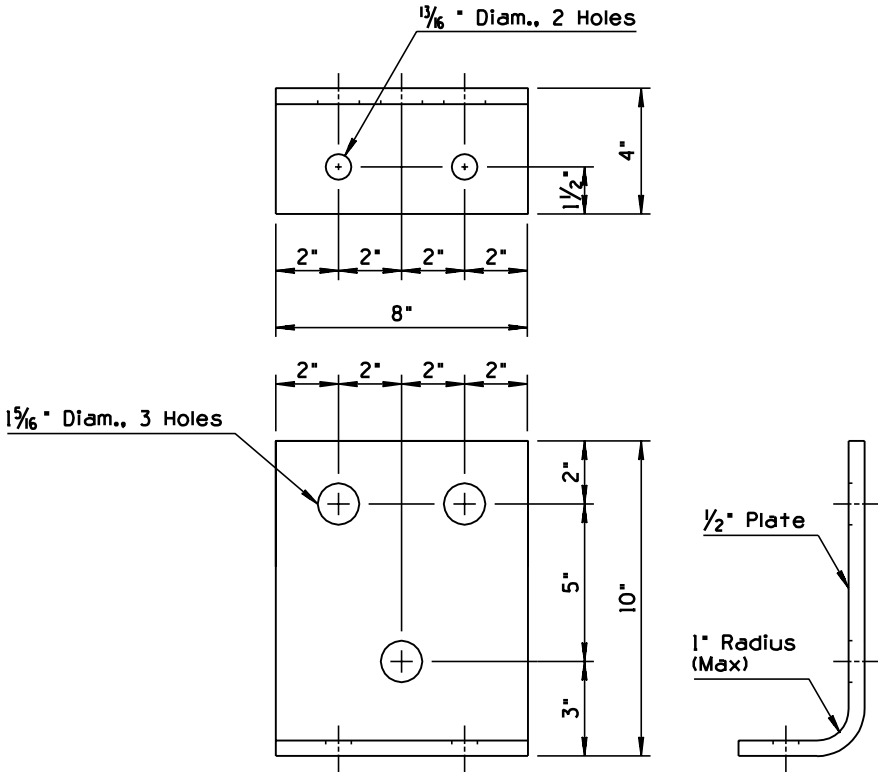
②
72" Timber Post

DESIGN APPROVED <i>John L. Law</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. C-10.29 Sheet 1 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	RAISED GUARD RAIL 1"	RLF	7/01
2			
3			
4			

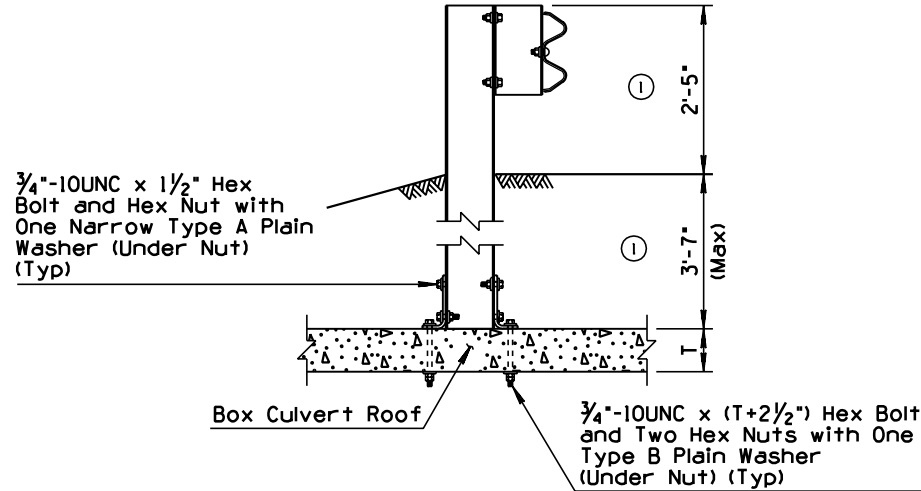


INSTALLATION DETAIL

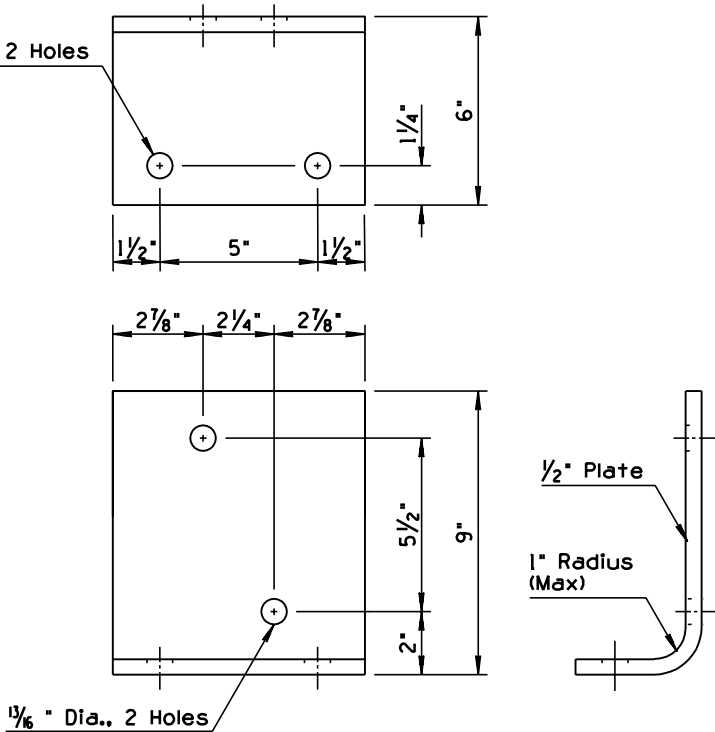


BRACKET DETAIL

BOLTED ANCHOR
TIMBER POST INSTALLATION DETAIL



INSTALLATION DETAIL



BRACKET DETAIL

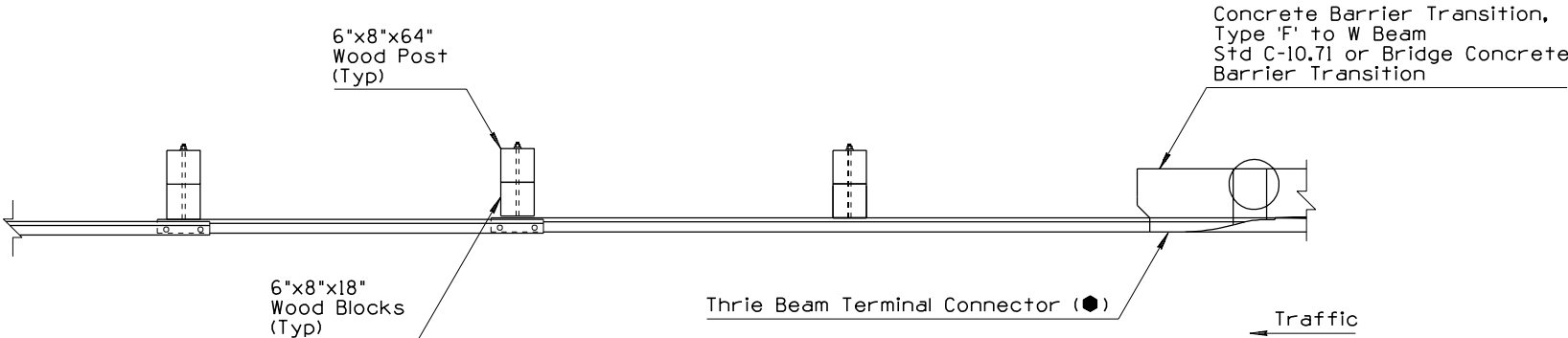
BOLTED ANCHOR
STEEL POST INSTALLATION DETAIL

GENERAL NOTES

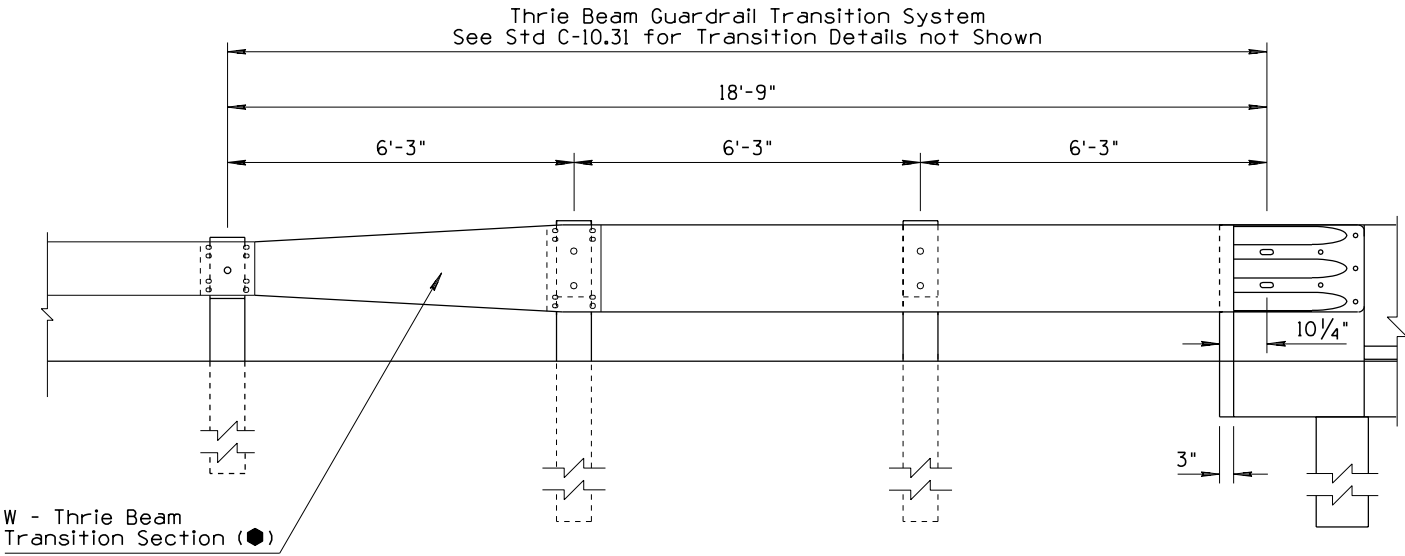
1. Drill through top of box culvert with rotary drill.
2. Bracket may be made of one piece hot bent, or two pieces welded together.
3. Short timber posts anchored to box culvert roof shall be 8" x 8" only.

DESIGN APPROVED <i>John L. Lane</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	BOLTED ANCHOR GUARD RAIL	DRAWING NO. C-10.29 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	RAISED THRIE BEAM 1"	RLF	7/01
2	REVISED FROM PIPE TO SLEEVE	RLF	7/01
3			
4			



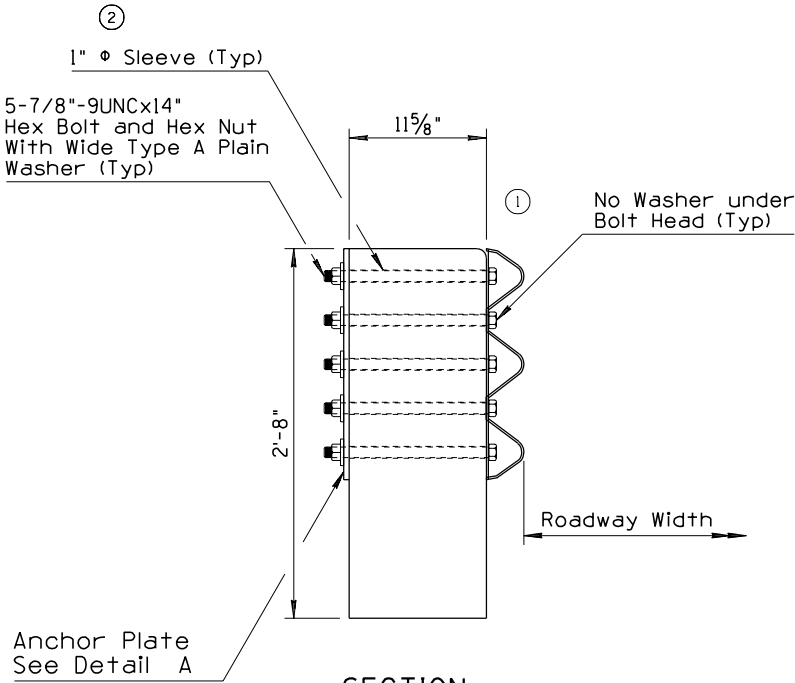
PLAN



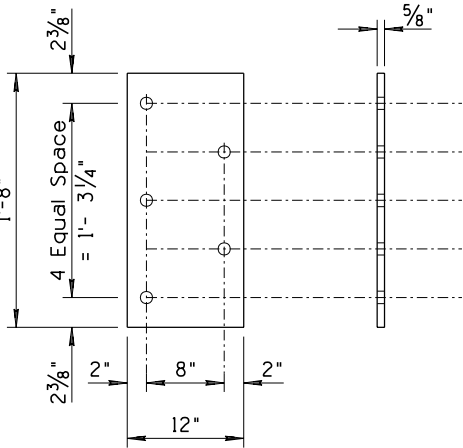
ELEVATION

GENERAL NOTES

- For use with one-way traffic or with two-way traffic outside the clear zone.
- - Indicate ARTBA designation.



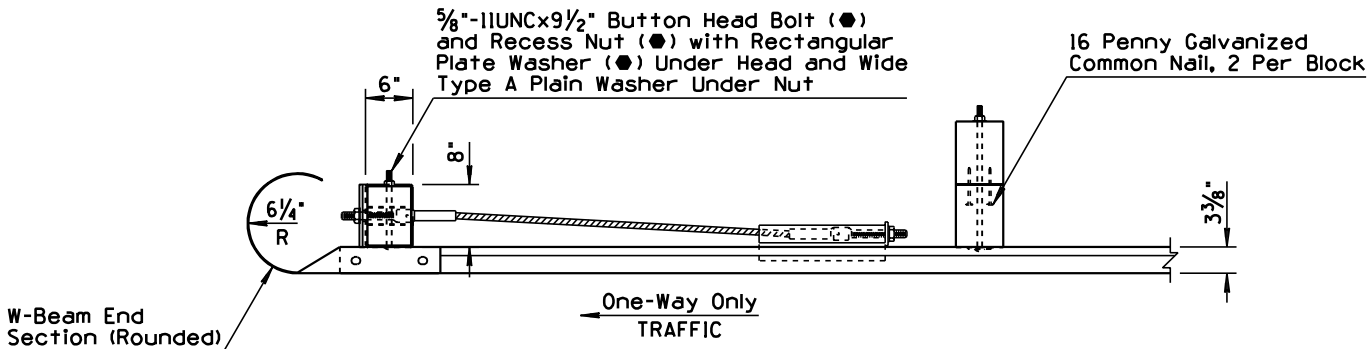
SECTION



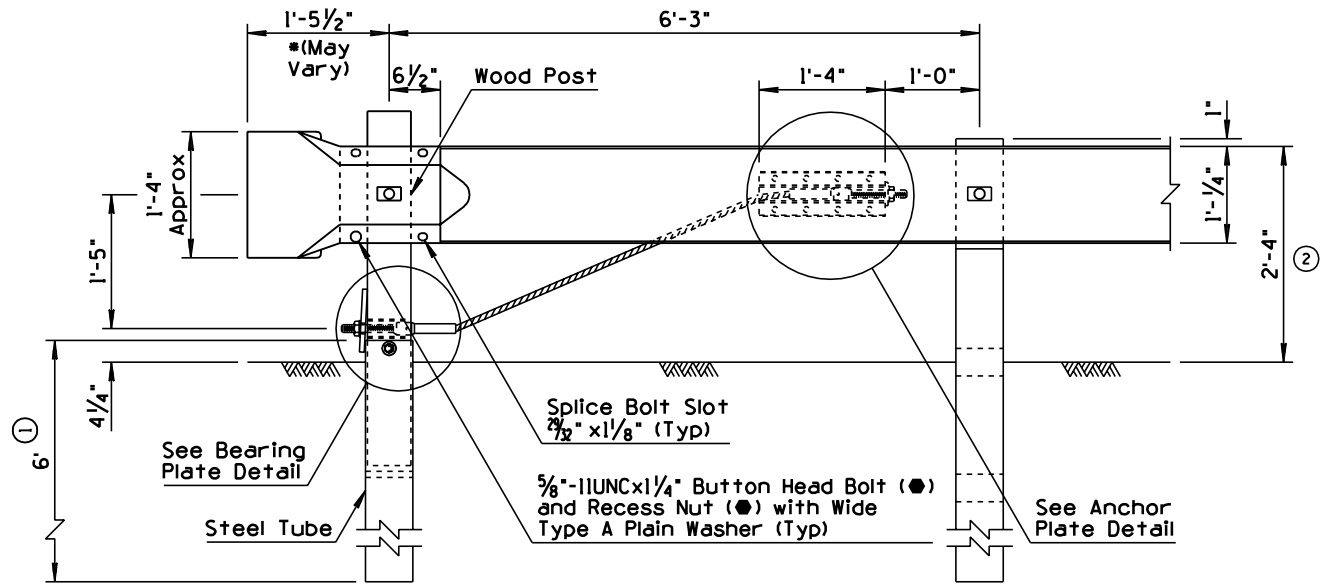
ANCHOR PLATE - DETAIL A

DESIGN APPROVED <i>John L. Laine</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	GUARD RAIL TRANSITION W BEAM TO 'F' SHAPED CONCRETE HALF BARRIER 32" (DEPARTURE)	DRAWING NO. C-10.32

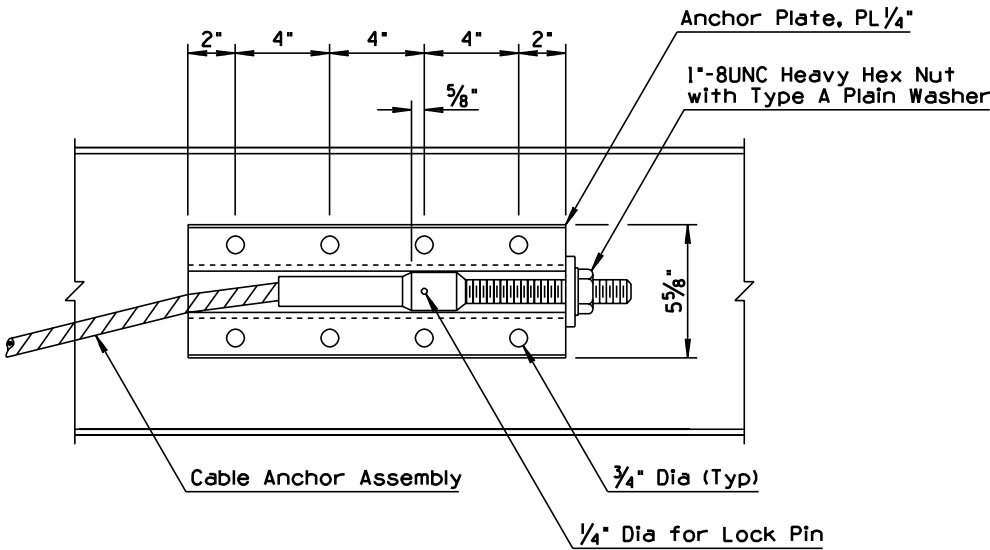
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFY LENGTH OF FOUNDATION TUBES	JNP	8/99
2	RAISED GUARD RAIL 1"	RLF	7/01
3			
4			



PLAN

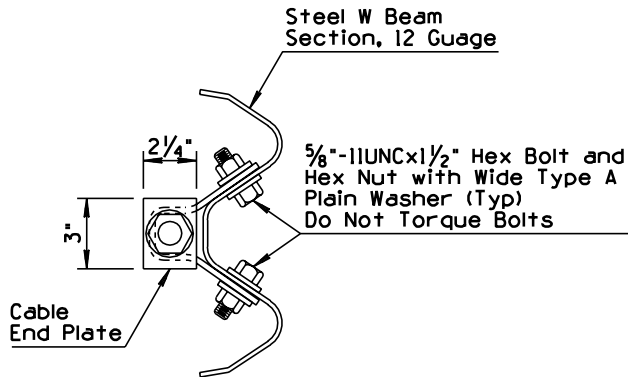


ELEVATION

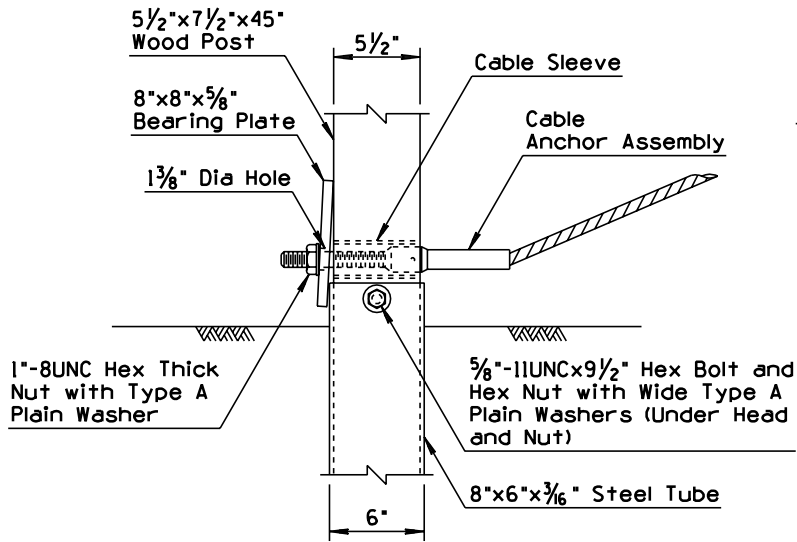


FRONT VIEW

ANCHOR PLATE DETAIL

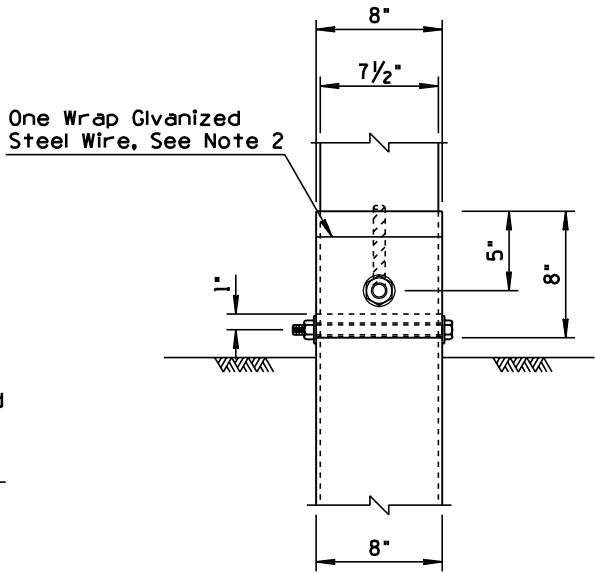


SIDE VIEW



FRONT VIEW

BEARING PLATE DETAIL



SIDE VIEW

GENERAL NOTES

- The cable assembly shall be tightened to remove slack.
 - To ensure that the bearing plate remains in position, one wrap of 14 gauge galvanized steel wire shall be wrapped around the terminal post near the top of the plate.
 - See Std. C-10.03 for measurement limits.
- See W-Beam End Section (Rounded), ARTBA Std. RE-6-79, for dimension variables.

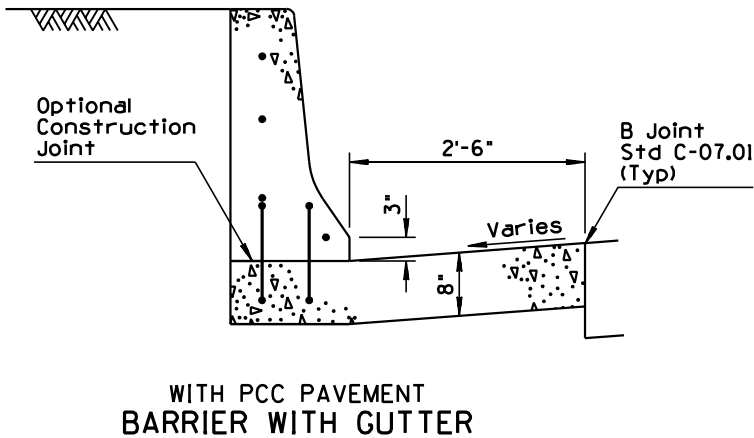
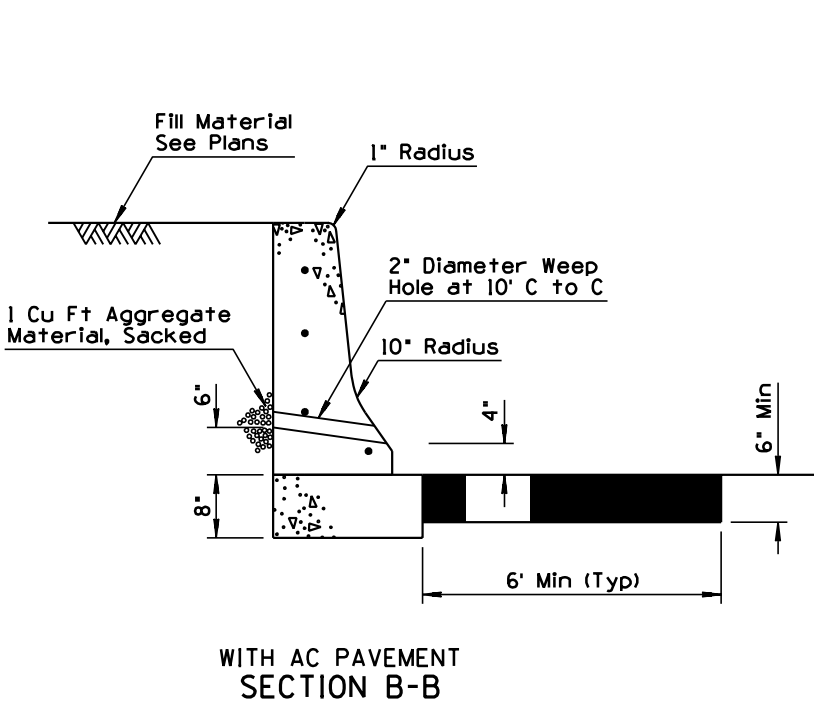
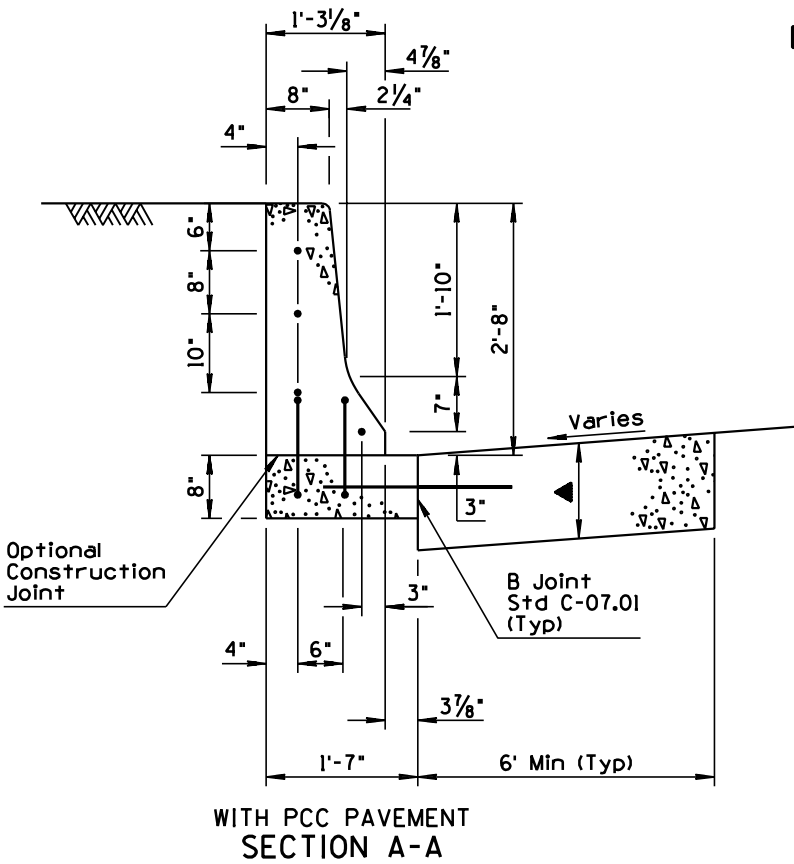
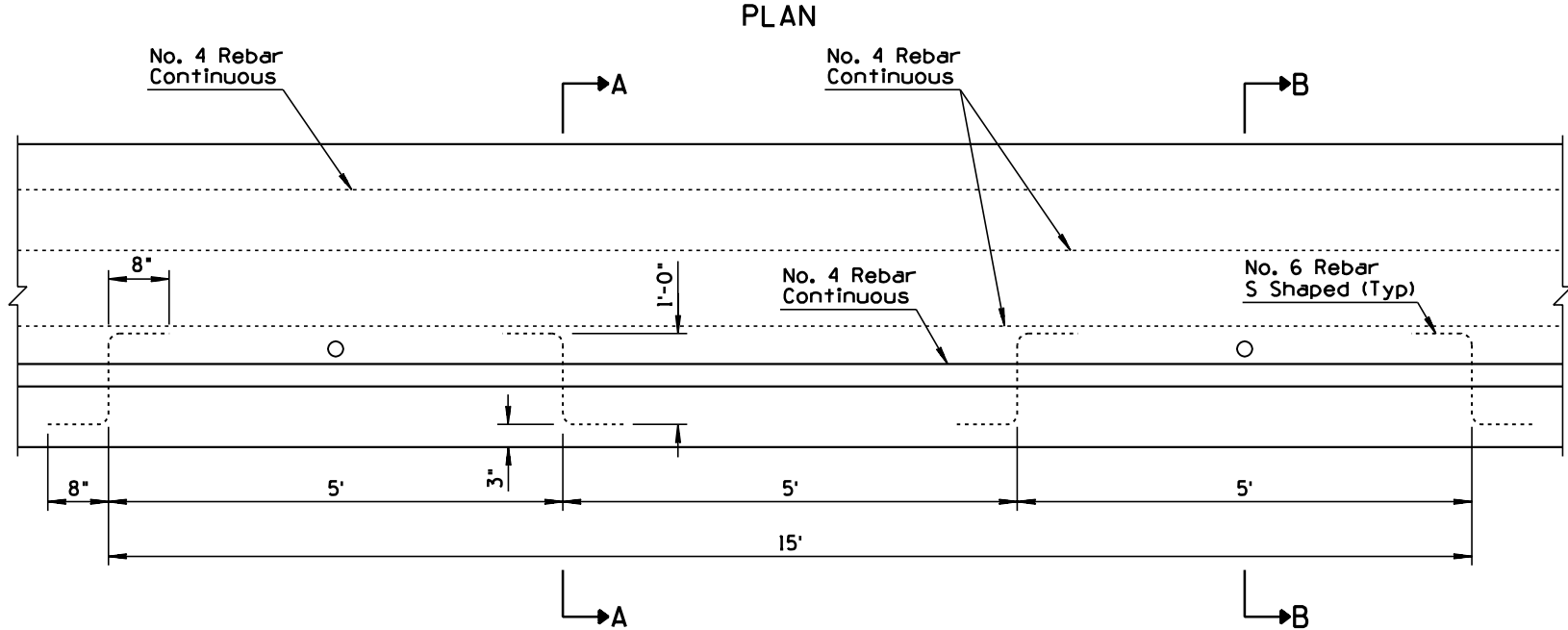
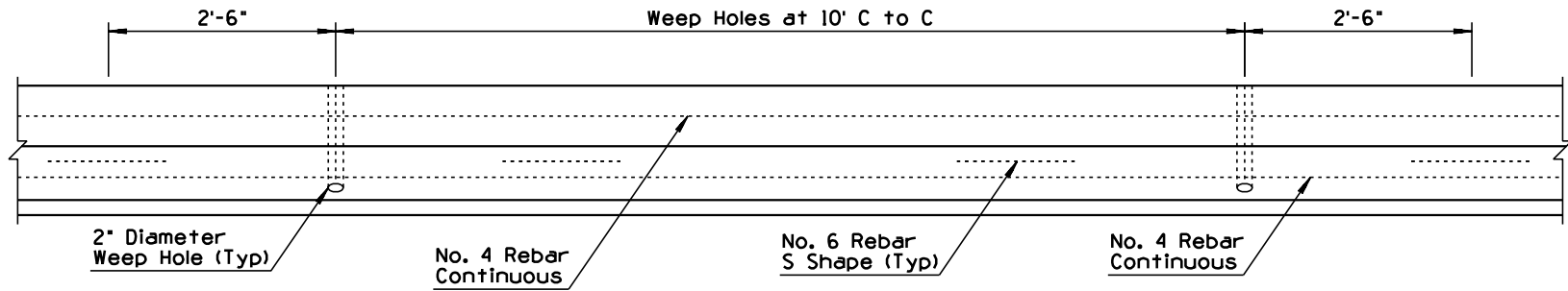
○ - Indicates ARTBA designation

DESIGN APPROVED	<i>John L. Lane</i>
APPROVED FOR DISTRIBUTION	<i>Ronald Williams</i>

STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS
GUARD RAIL END TERMINAL ASSEMBLY

REV.	7/01
DRAWING NO.	C-10.45

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TO REFLECT 'F' SHAPE BARRIER	JNP	4/00
2			
3			
4			



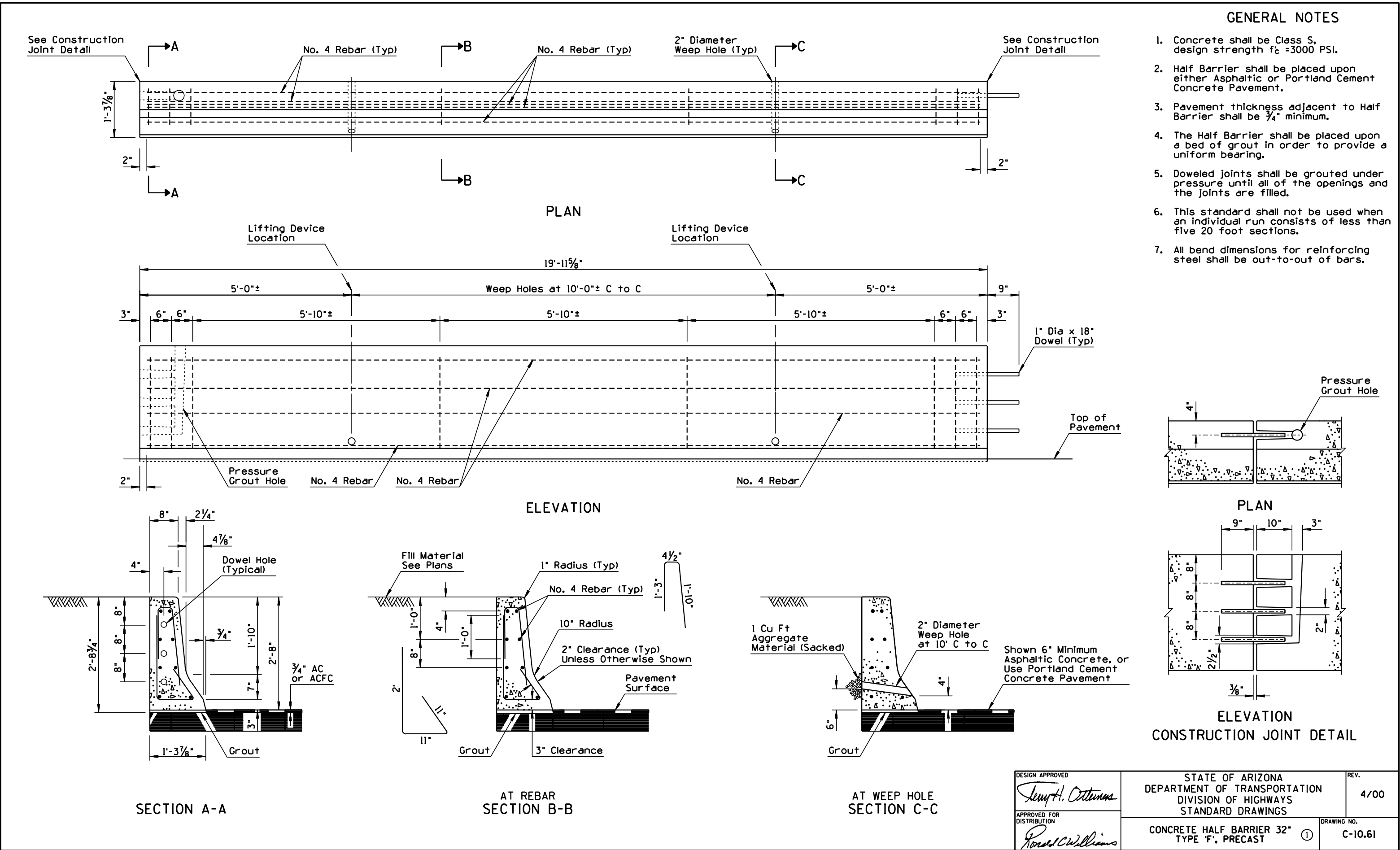
GENERAL NOTES

1. Half Barrier shall be constructed by the slip form or 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 rebars 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.

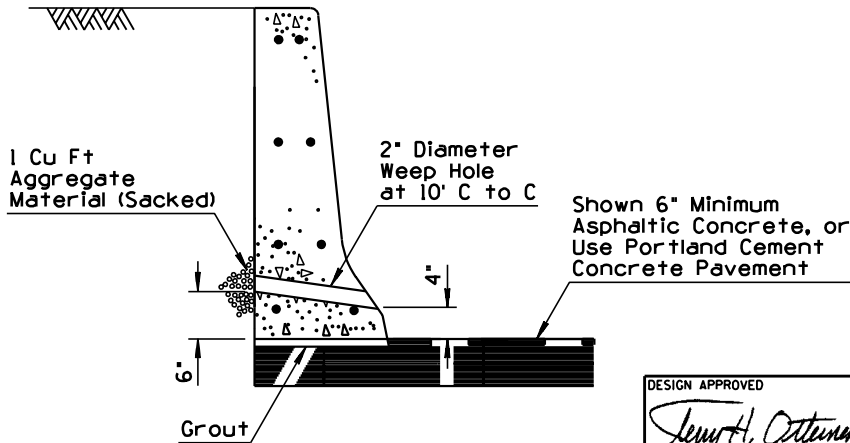
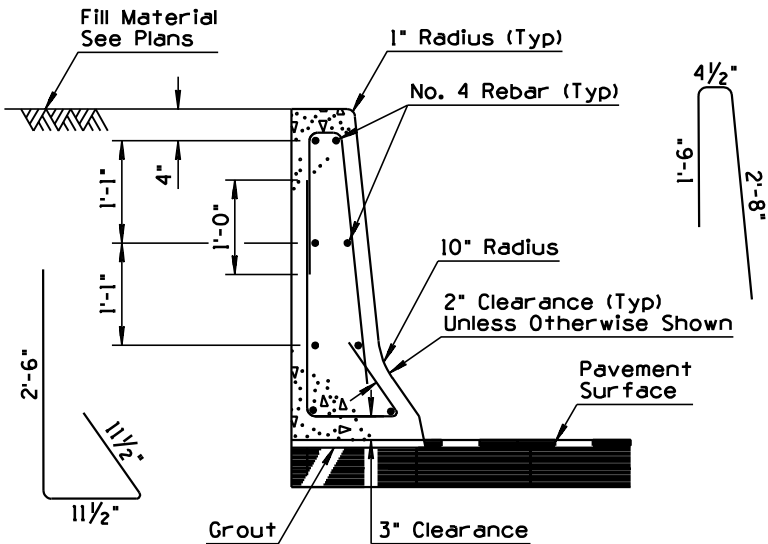
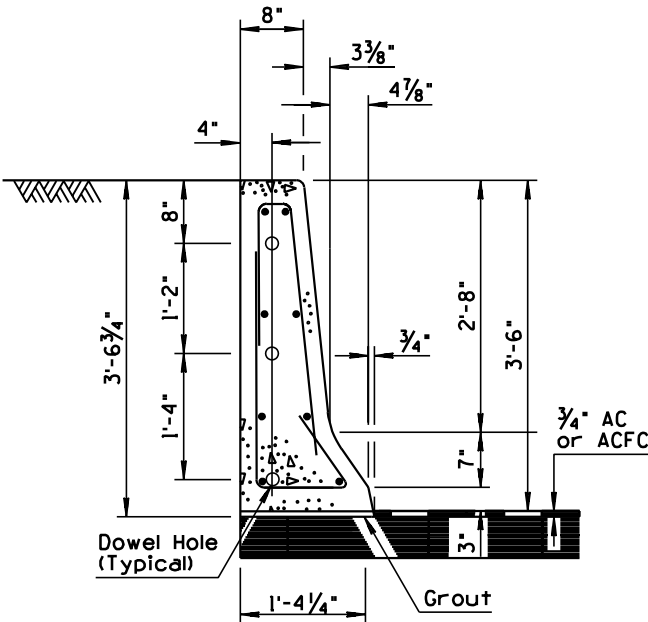
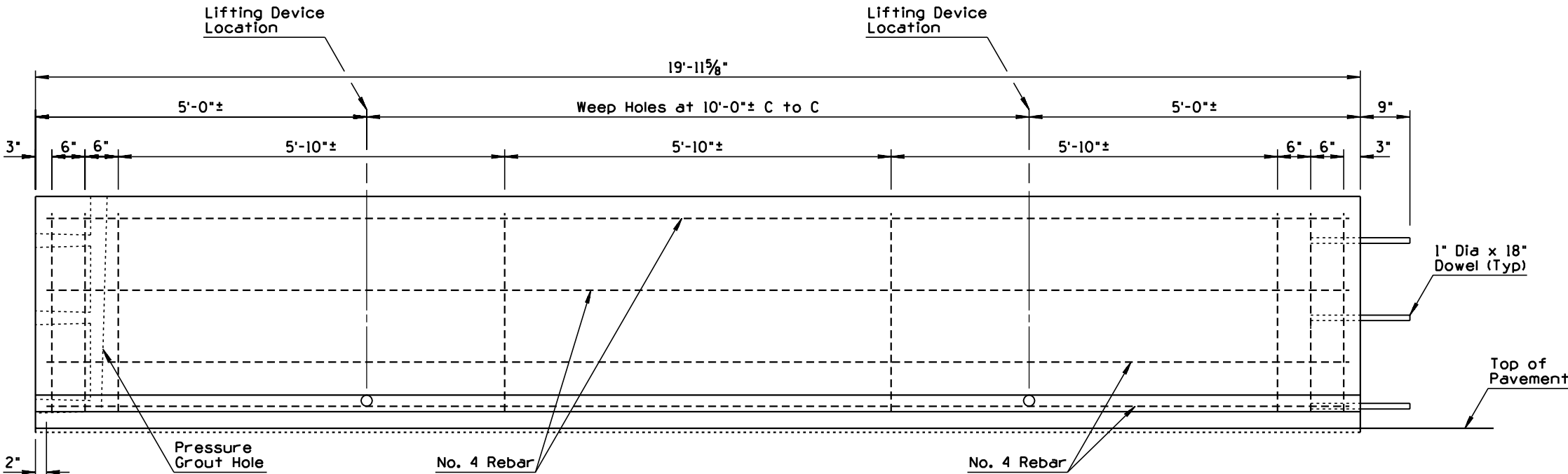
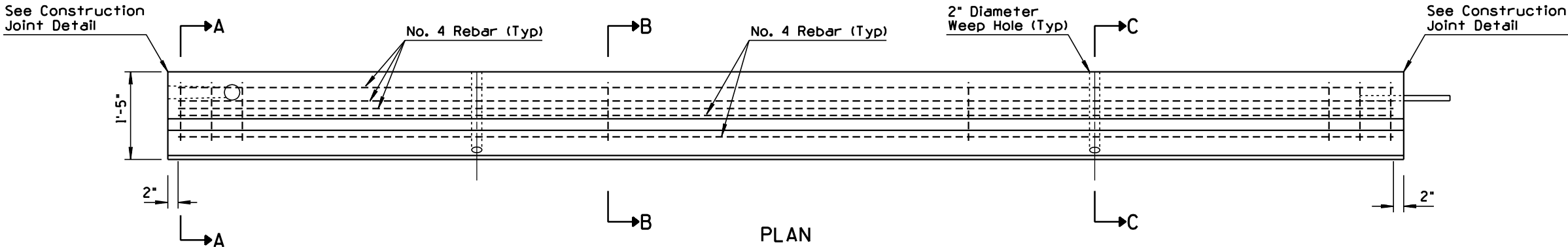
▲ Depth to match adjacent PCCP thickness (8" Min).

DESIGN APPROVED <i>Leah H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER 32" TYPE 'F' CAST IN PLACE SLIP FORM & FIXED FORM		DRAWING NO. C-10.60

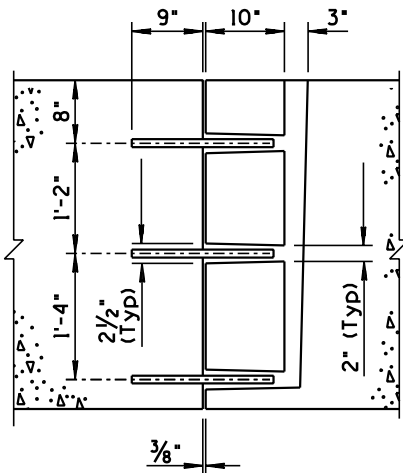
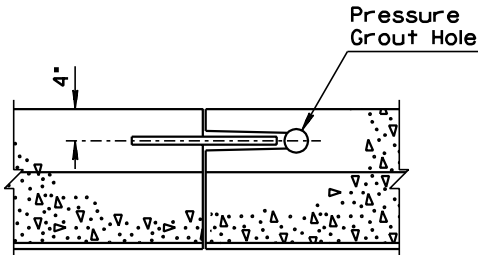
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1	REVISED TO REFLECT 'F' SHAPE BARRIER	JNP	4/00
2			
3			
4			



NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	NEW STANDARD DEVELOPED	JNP	4/00
2			
3			
4			



- ### GENERAL NOTES
- Concrete shall be Class S, design strength $f'_c = 3000$ PSI.
 - Half Barrier shall be placed upon either Asphaltic or Portland Cement Concrete Pavement.
 - Pavement thickness adjacent to Half Barrier shall be 7/4" minimum.
 - The Half Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
 - Doweled joints shall be grouted under pressure until all of the openings and the joints are filled.
 - This standard shall not be used when an individual run consists of less than five 20 foot sections.
 - All bend dimensions for reinforcing steel shall be out-to-out of bars.



ELEVATION
CONSTRUCTION JOINT DETAIL

DESIGN APPROVED
Henry H. Ottensm
APPROVED FOR
DISTRIBUTION
Ronald Williams

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

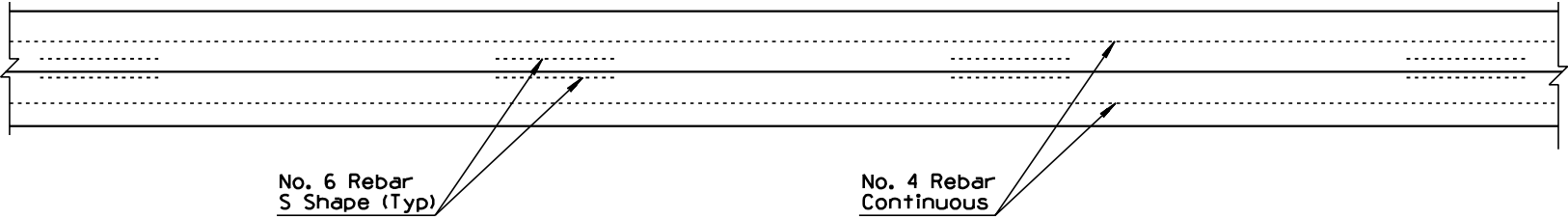
CONCRETE HALF BARRIER 42"
TYPE 'F', PRECAST

REV.
4/00
DRAWING NO.
C-10.61a

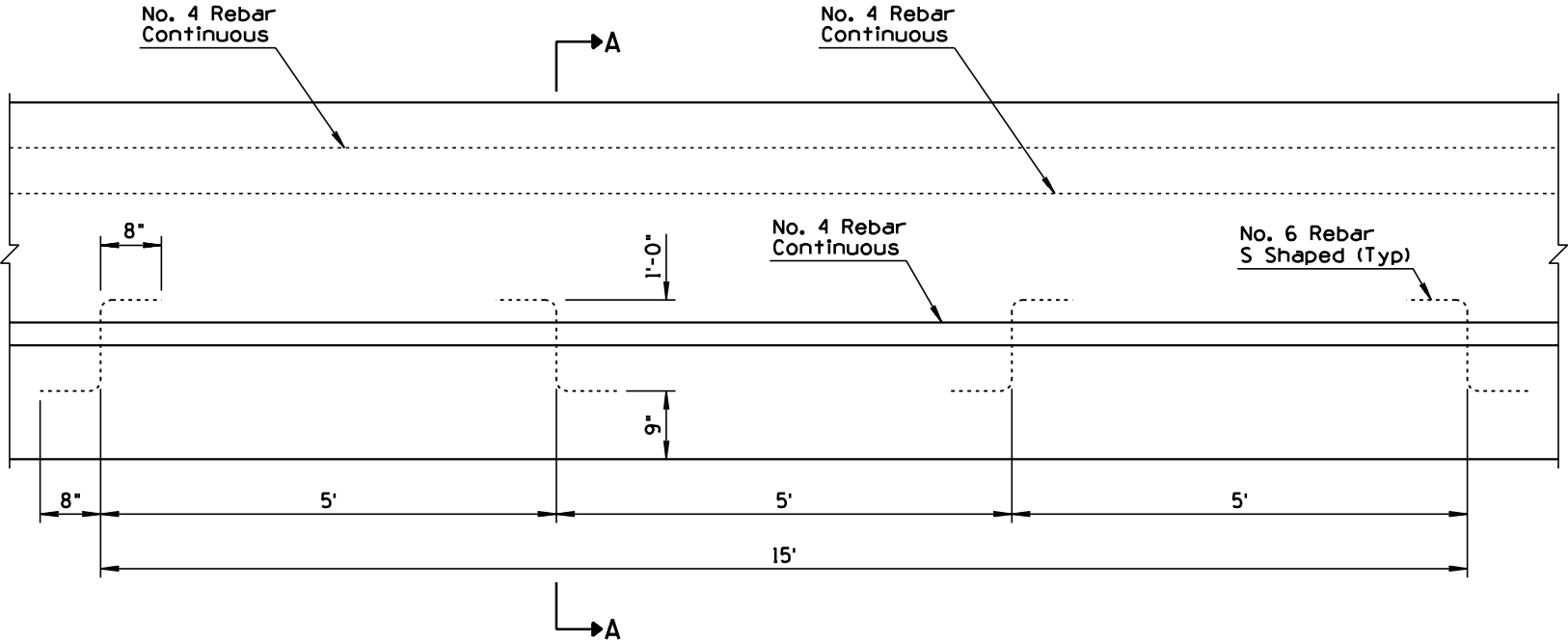
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1	REVISED TO REFLECT 'F' SHAPE BARRIER	JNP	4/00
2			
3			
4			

GENERAL NOTES

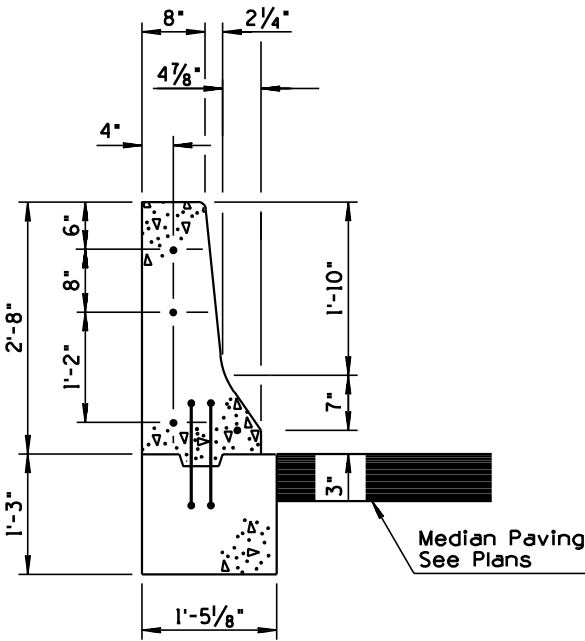
- Concrete shall be Class S, design strength $f'_c = 3000$ PSI.
- If the footing and barrier are cast monolithically, No. 6 S shaped rebars will not be required.
- In no case shall the width of barrier exceed the width of the barrier footing or overhang the adjacent pavement.
- No. 4 Rebar shall extend 12" past the construction joint at the completion of the day's pour.



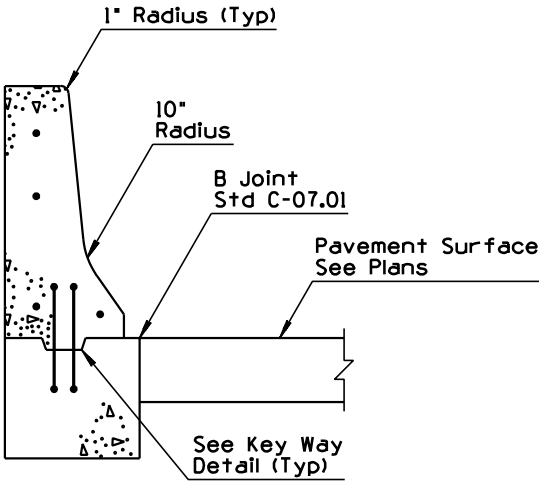
PLAN



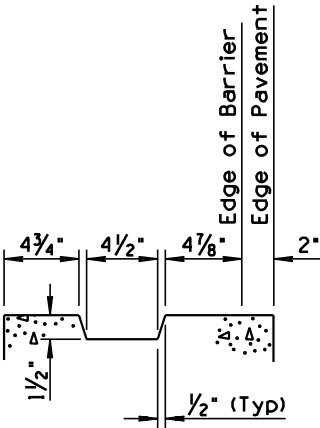
ELEVATION



WITH AC
SECTION A-A



WITH PCCP
SECTION A-A



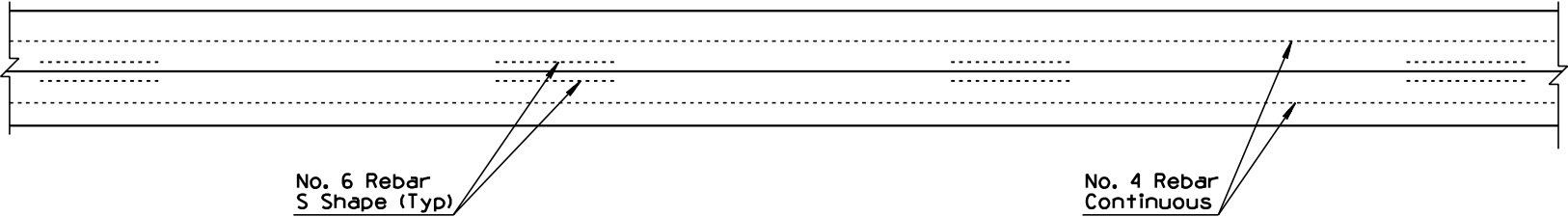
KEY WAY DETAIL

DESIGN APPROVED <i>Joseph H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER (AT PIERS) 32" TYPE 'F' CAST IN PLACE, FIXED FORM ①	DRAWING NO. C-10.64 Sheet 1 of 2

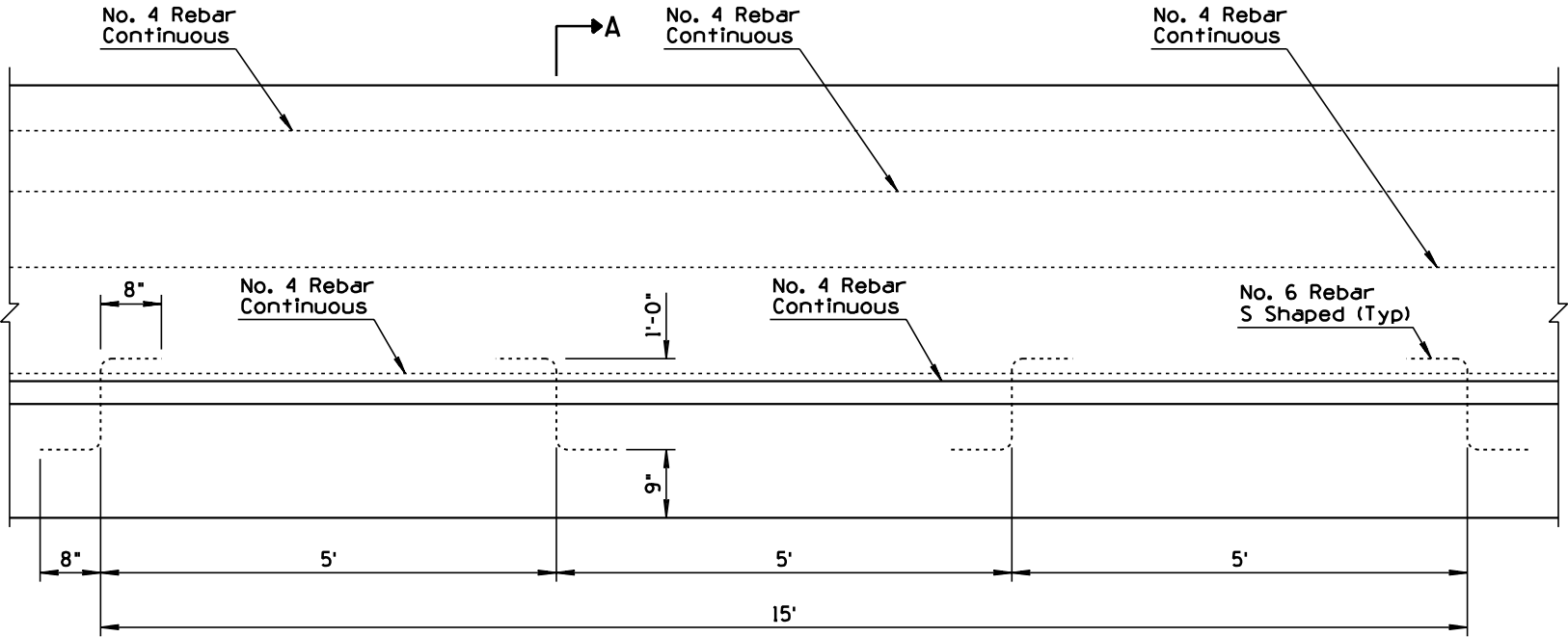
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	NEW STANDARD DEVELOPED	JNP	4/00
2			
3			
4			

GENERAL NOTES

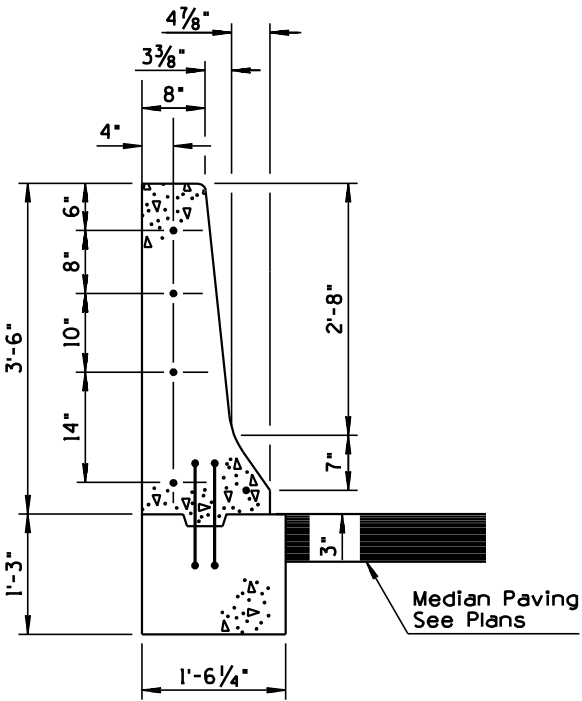
- Concrete shall be Class S, design strength $f'_c = 3000$ PSI.
- If the footing and barrier are cast monolithically, No. 6 S shaped rebars will not be required.
- In no case shall the width of barrier exceed the width of the barrier footing or overhang the adjacent pavement.
- No. 4 Rebar shall extend 12" past the construction joint at the completion of the day's pour.



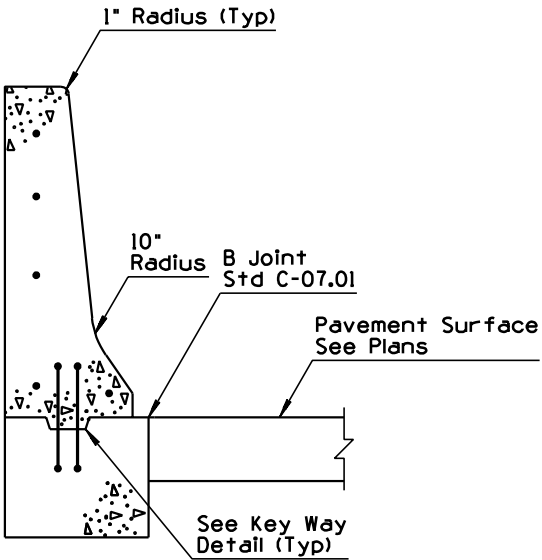
PLAN



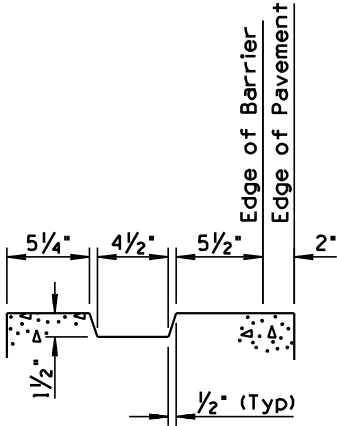
ELEVATION



WITH AC
SECTION A-A



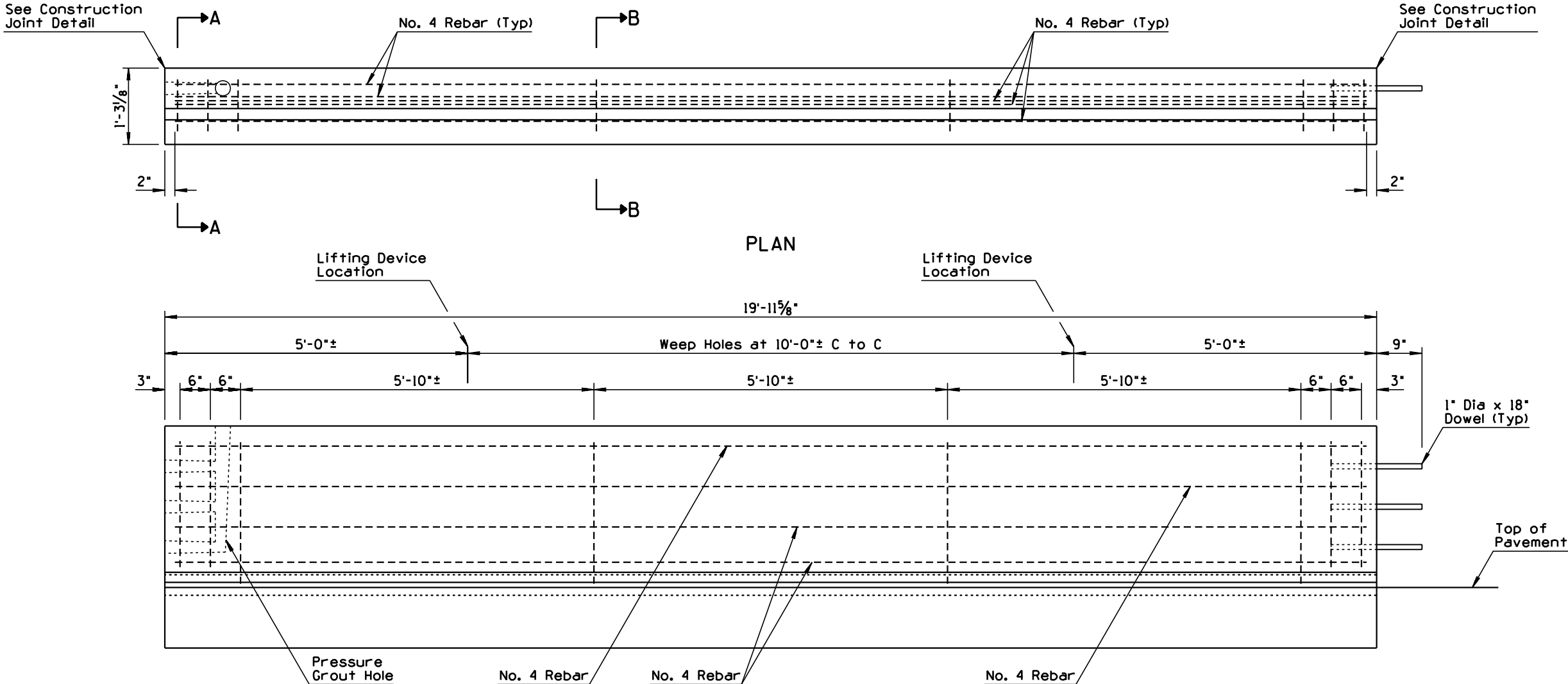
WITH PCCP
SECTION A-A



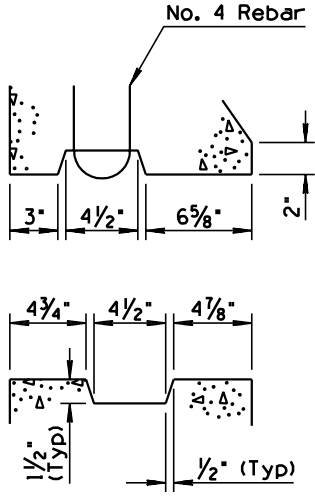
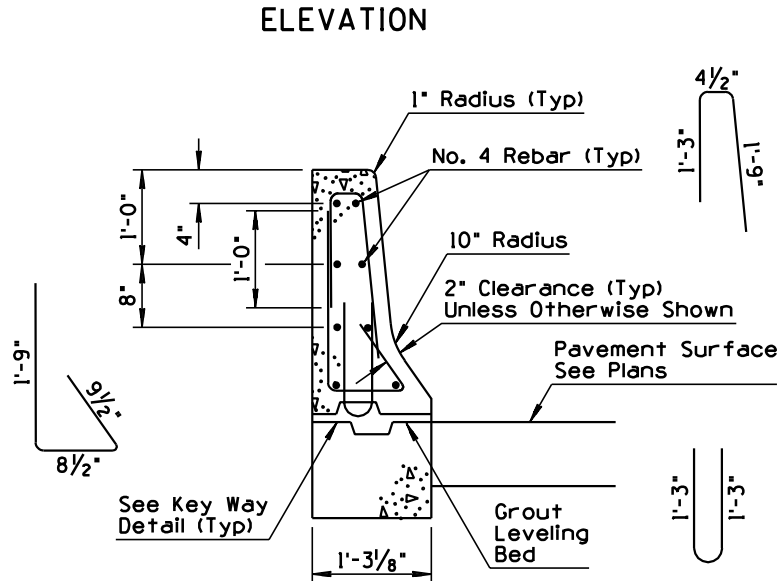
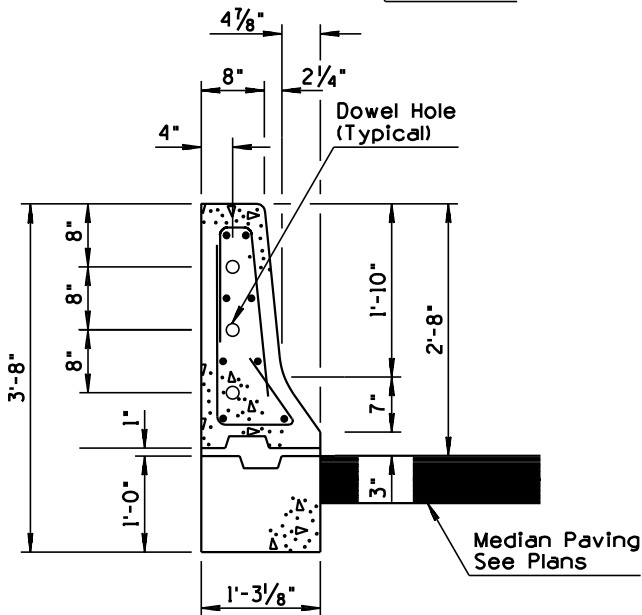
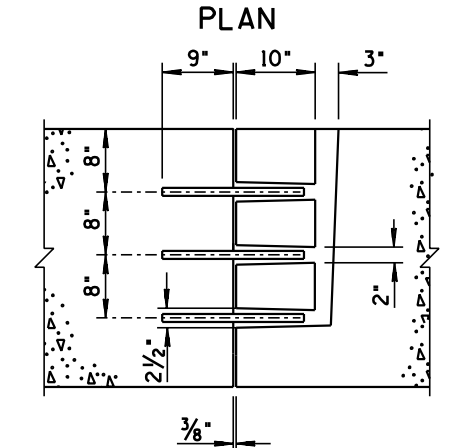
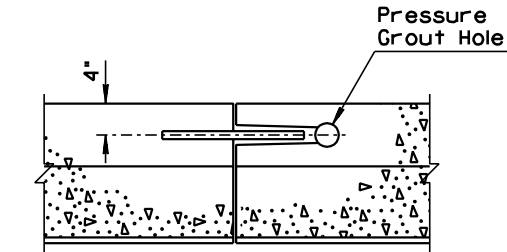
KEY WAY DETAIL

DESIGN APPROVED <i>Joseph H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER (AT PIERS) 42" TYPE 'F' CAST IN PLACE, FIXED FORM ①	DRAWING NO. C-10.64a Sheet 1 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TO REFLECT 'F' SHAPE BARRIER	JNP	4/00
2			
3			
4			

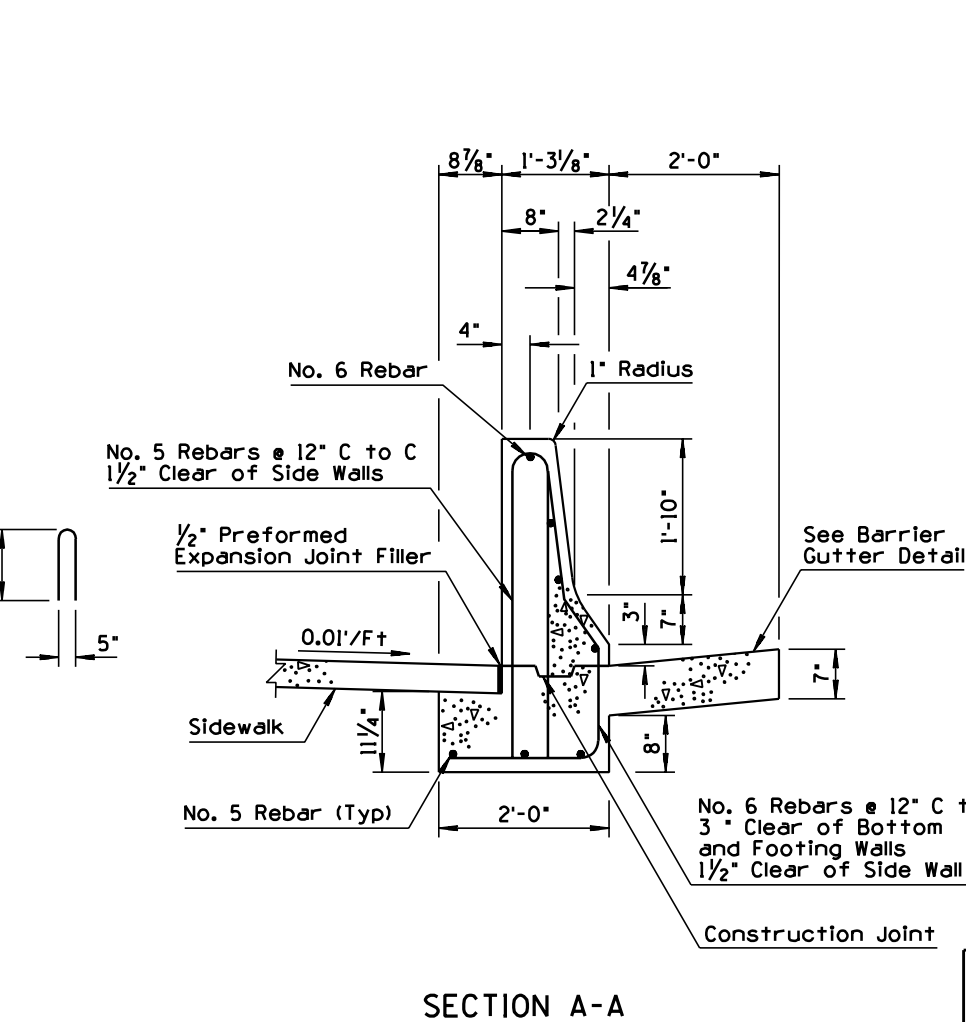
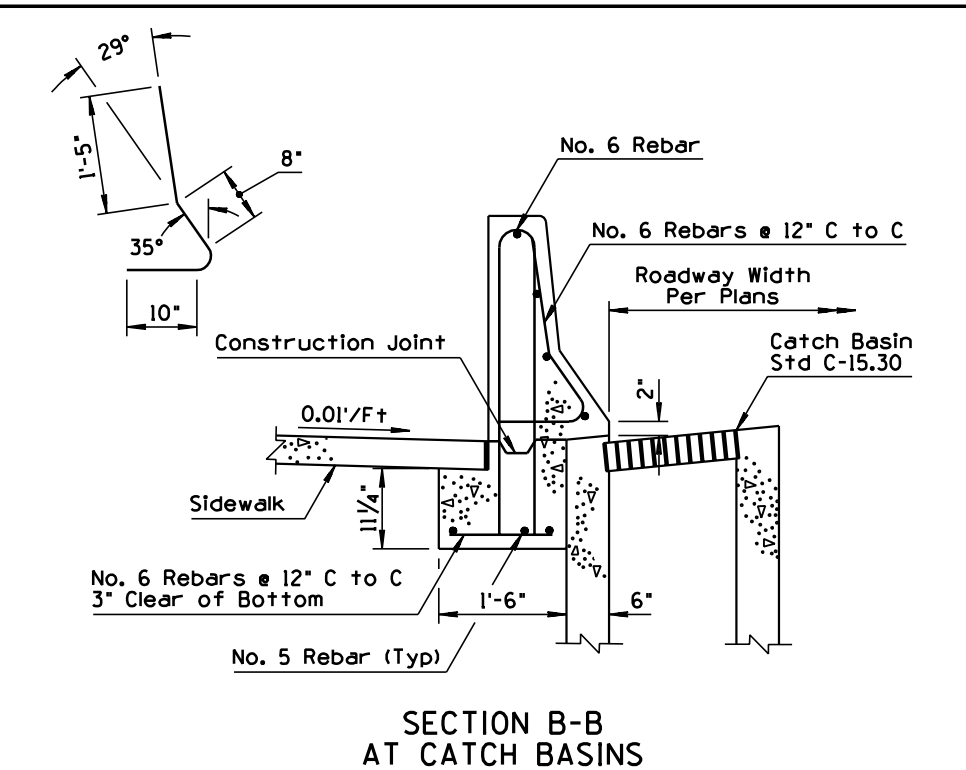
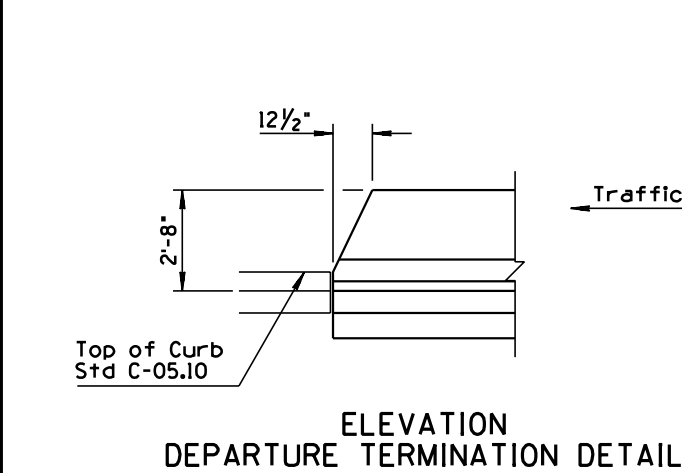
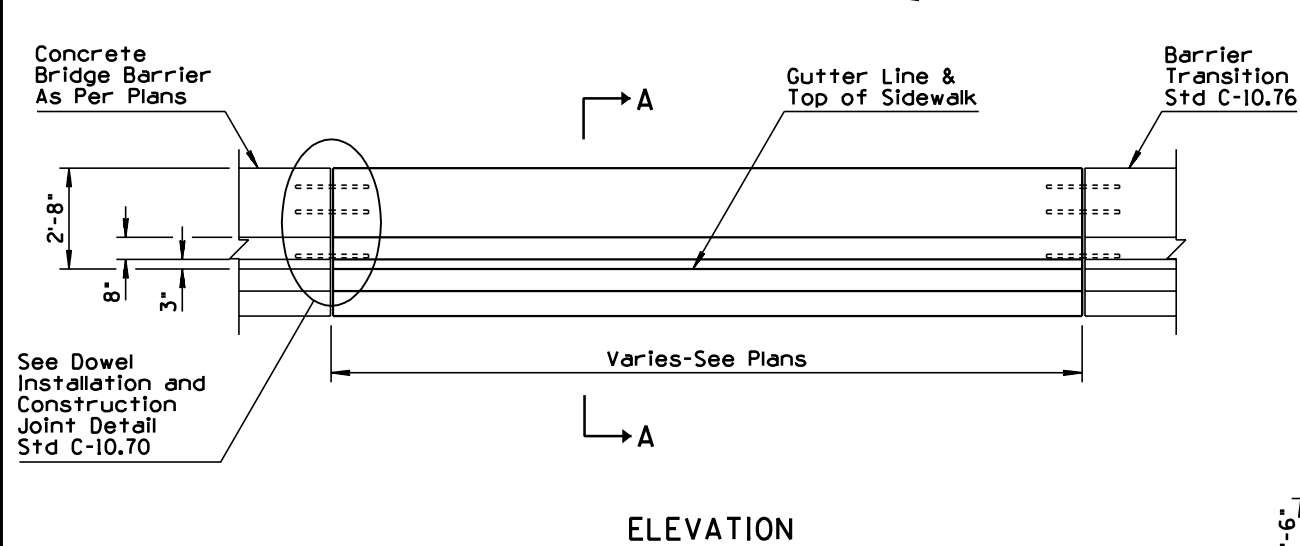
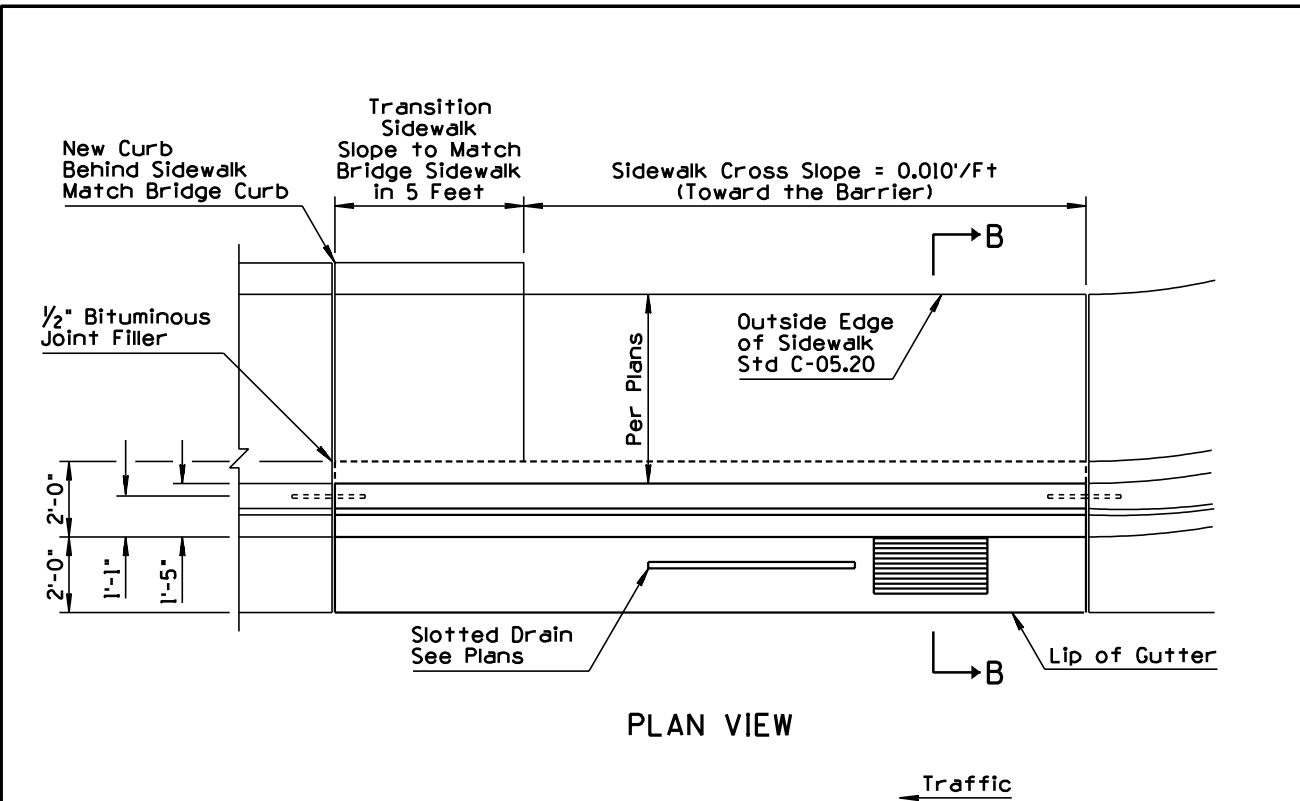


- ### GENERAL NOTES
- Concrete shall be Class S, design strength $f'_c = 4000$ PSI.
 - The Half Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
 - Doweled joints shall be grouted under pressure until all of the openings and the joints are filled.
 - This standard shall not be used when an individual run consists of less than five 20 foot sections.
 - All bend dimensions for reinforcing steel shall be out-to-out of bars.

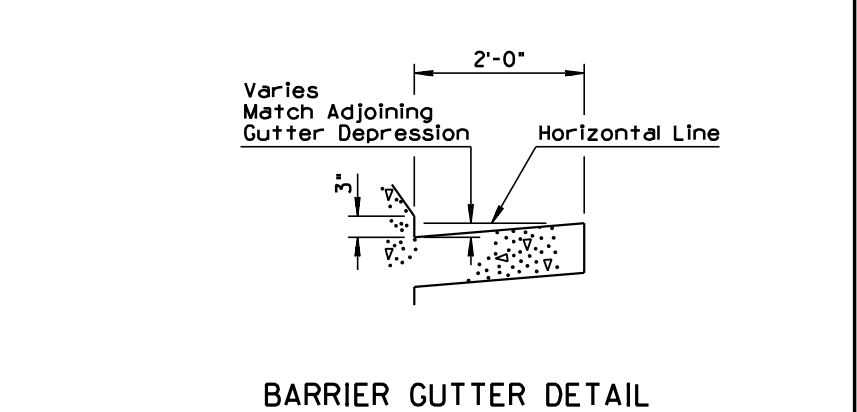


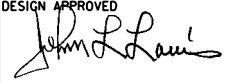
DESIGN APPROVED <i>Sam H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER (AT PIERS) 32" TYPE 'F' PRECAST ①	DRAWING NO. C-10.64 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TO REFLECT 'F' SHAPE	JNP	4/00
2	DELETED ORIGINAL NOTE #4	RLF	7/01
3			
4			




- ### GENERAL NOTES
1. All concrete shall be Class "S" (f'c = 3000 psi).
 2. All reinforcing steel shall conform to Section 1003.
 3. All reinforcing steel shall have 2" minimum clear cover unless otherwise noted.
 - ② 4. See drainage sheets for slotted drain and catch basin details.
 5. Departure termination may be substituted for the C-10.76 barrier transition under departure conditions.
 6. See Std. C-05.20 for sidewalk construction.
 7. All bend dimensions for reinforcing steel shall be out-to-out of bars.





DESIGN APPROVED



APPROVED FOR DISTRIBUTION

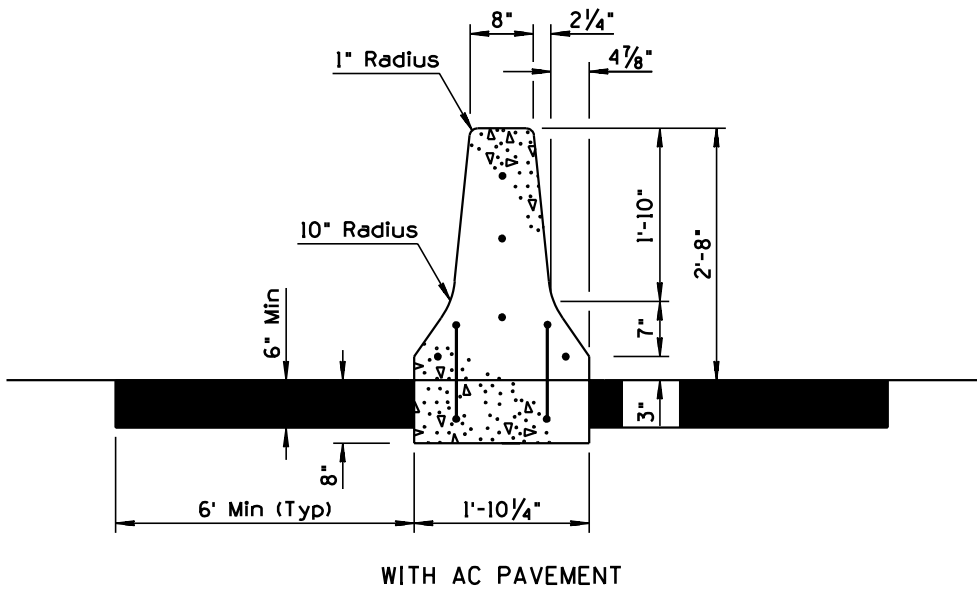
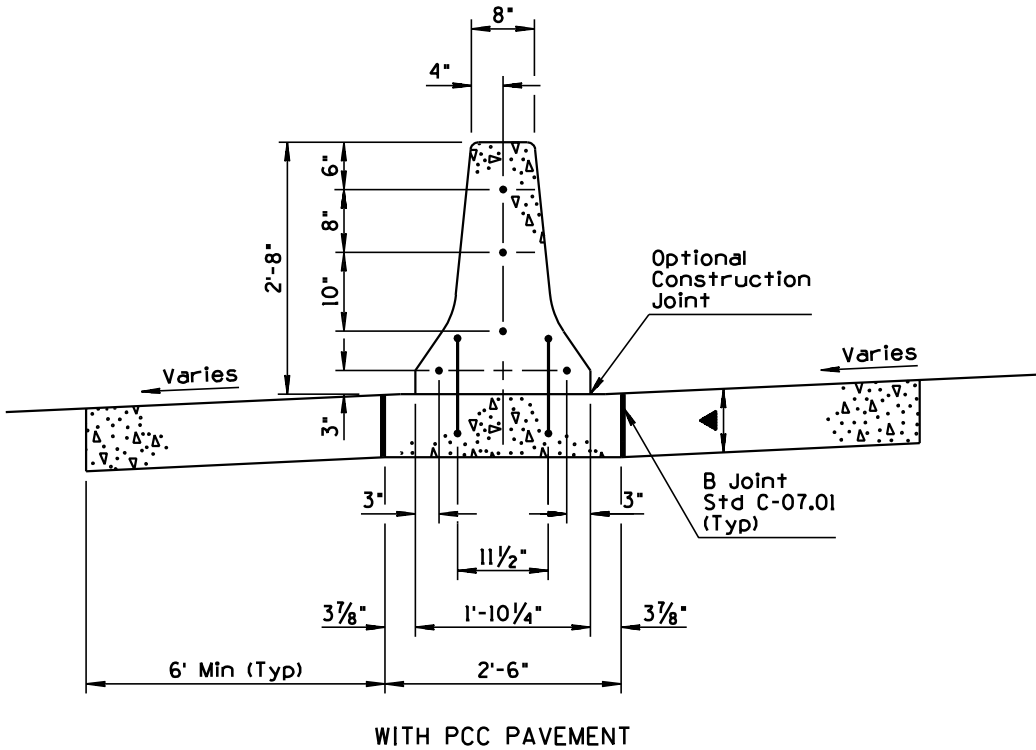
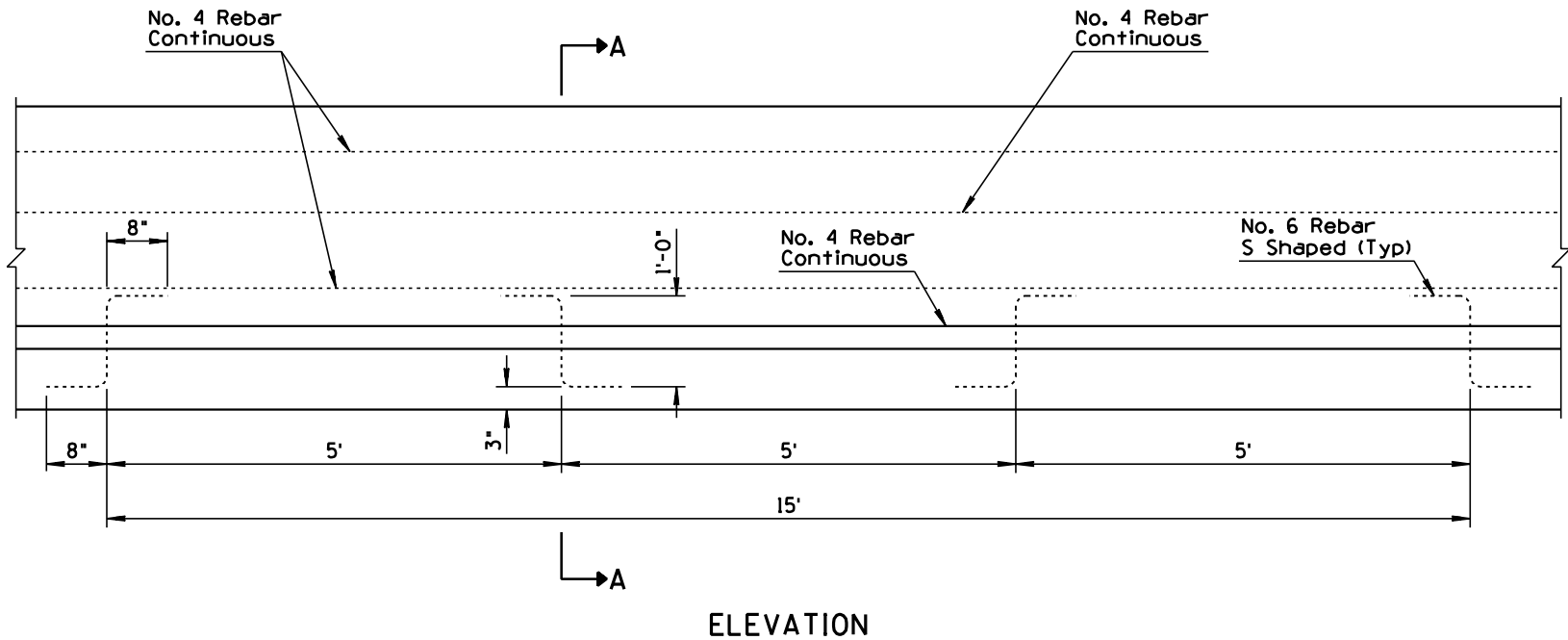
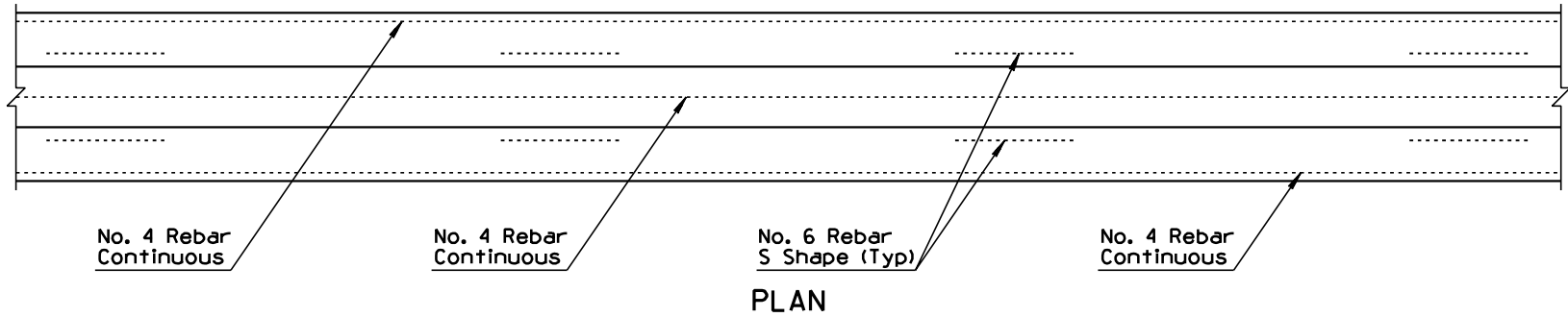
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

CONCRETE HALF BARRIER 32" WITH SIDEWALK ①

REV.
7/01

DRAWING NO.
C-10.65

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TO REFLECT 'F' SHAPE	JNP	4/00
2			
3			
4			



GENERAL NOTES

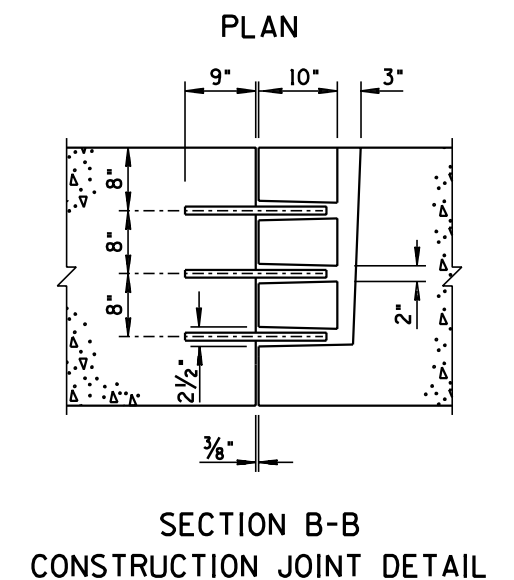
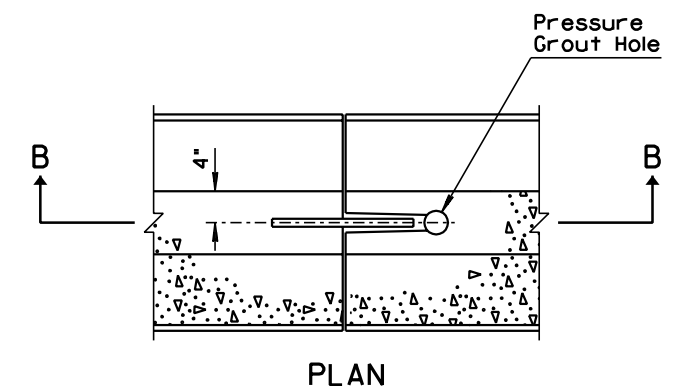
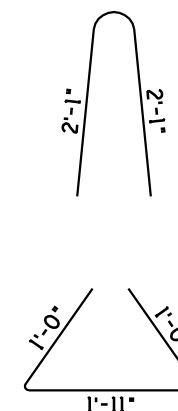
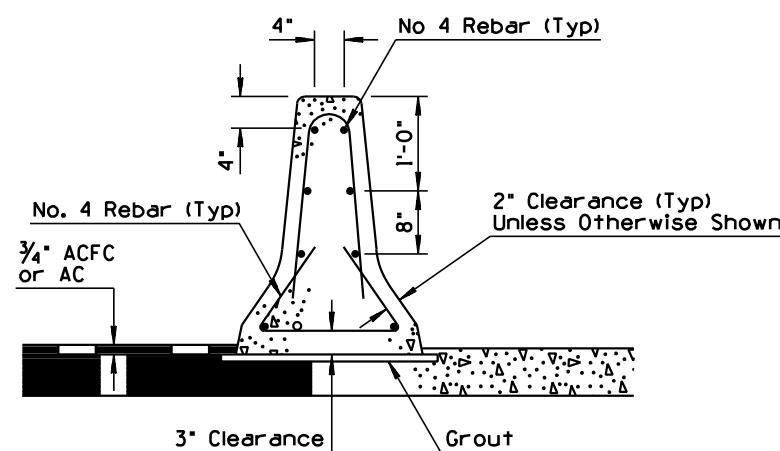
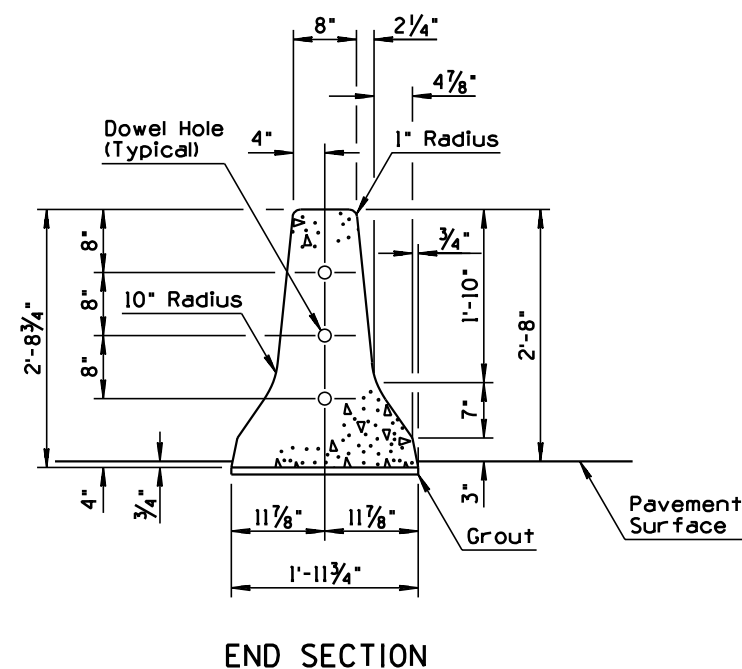
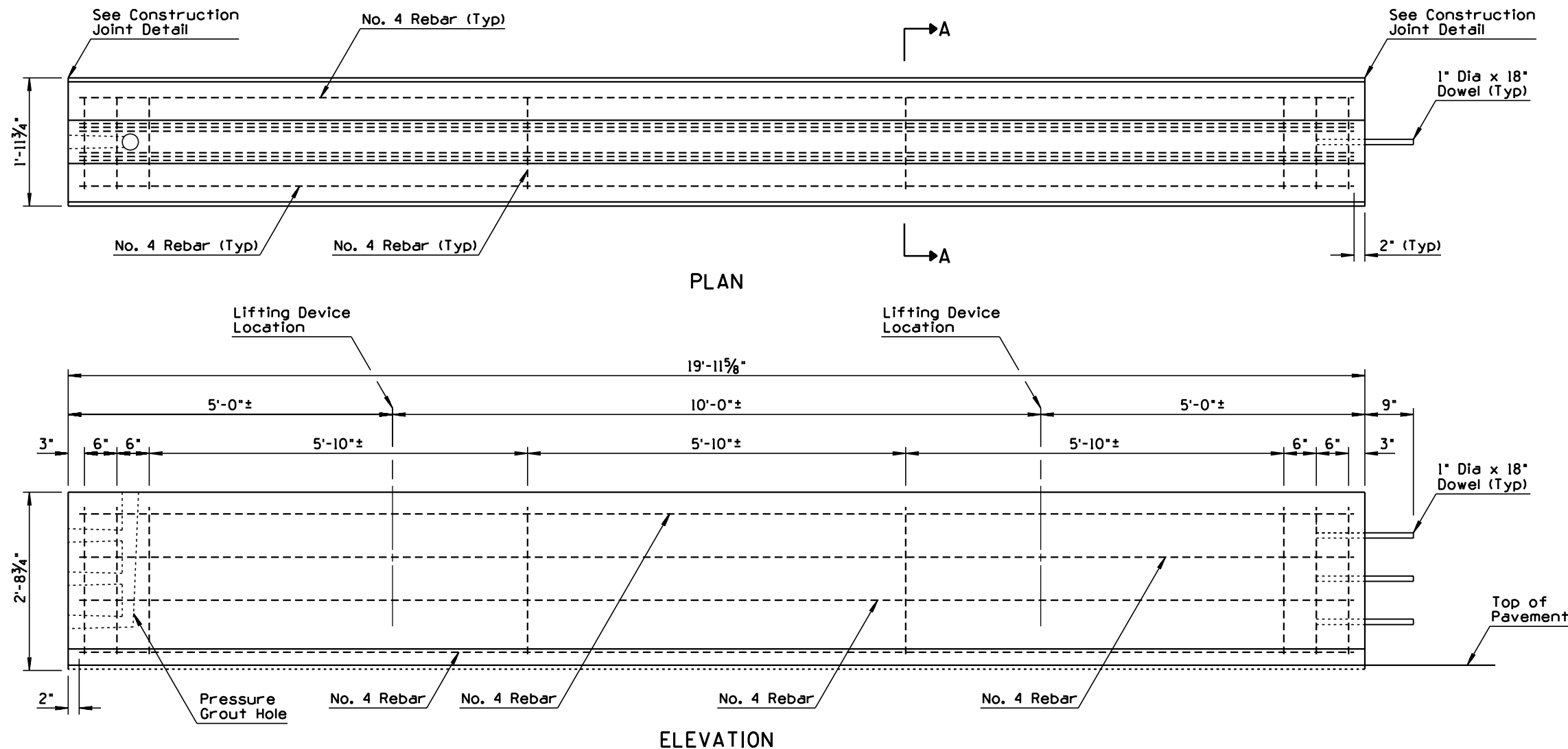
- Median Barrier shall be constructed by the slip form or formed Cast-in-Place method.
- When obstacles are encountered which prevent the use of slip form equipment, the closure shall be accomplished by the use of stationary forms.
- Concrete shall be Class S, design strength $f'_c = 3000$ PSI.
- If the footing and barrier are cast monolithically, No. 6 S shaped rebars will not be required.
- In no case shall the width of barrier exceed the width of the barrier footing or overhang the adjacent pavement.
- 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).

DESIGN APPROVED <i>Leah H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	MEDIAN BARRIER 32" TYPE 'F', CAST IN PLACE ① SLIP FORM & FIXED FORM	DRAWING NO. C-10.66

SECTION A-A

NO.	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TO REFLECT 'F' SHAPE BARRIER	JNP	4/00
2			
3			
4			

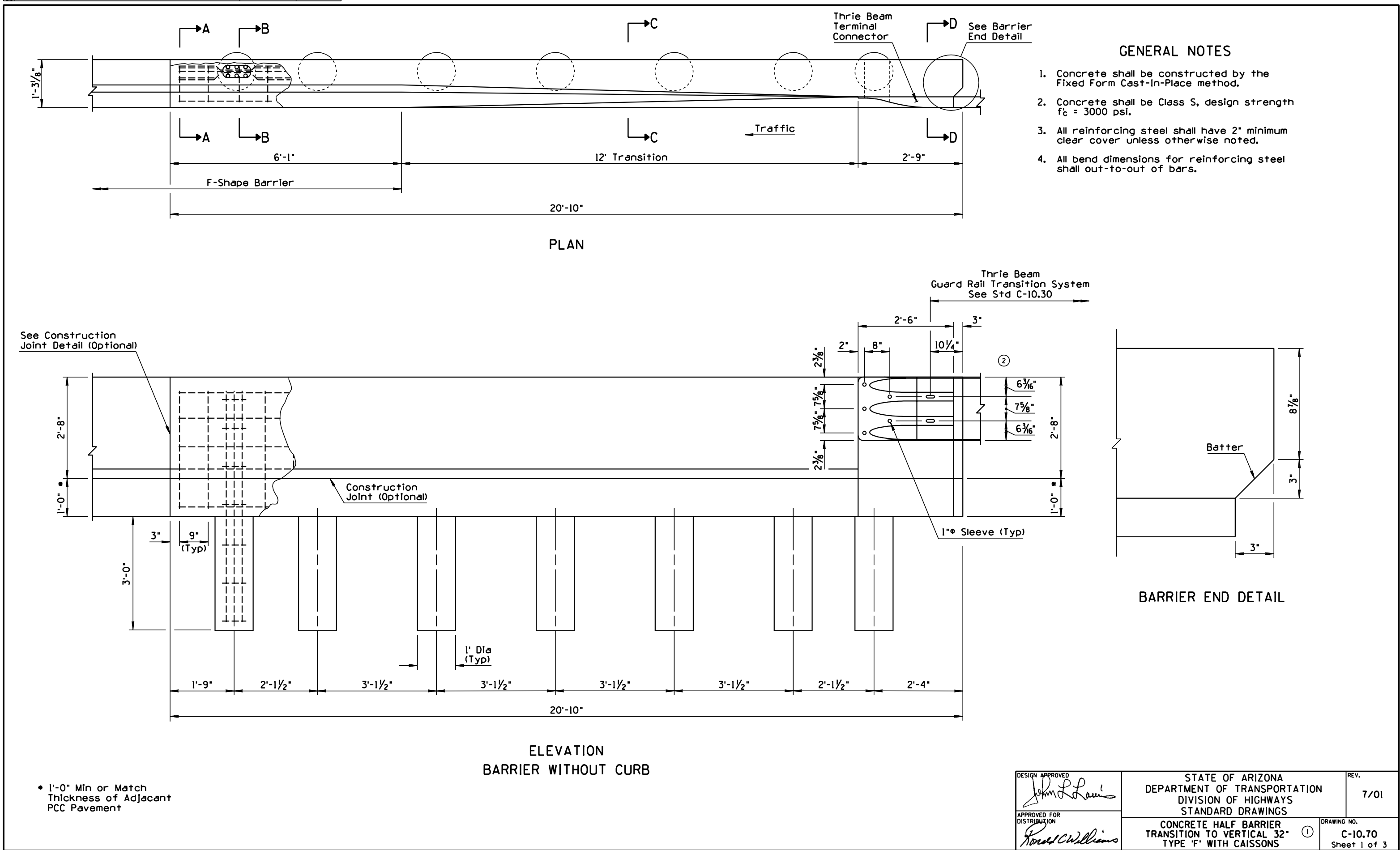


GENERAL NOTES

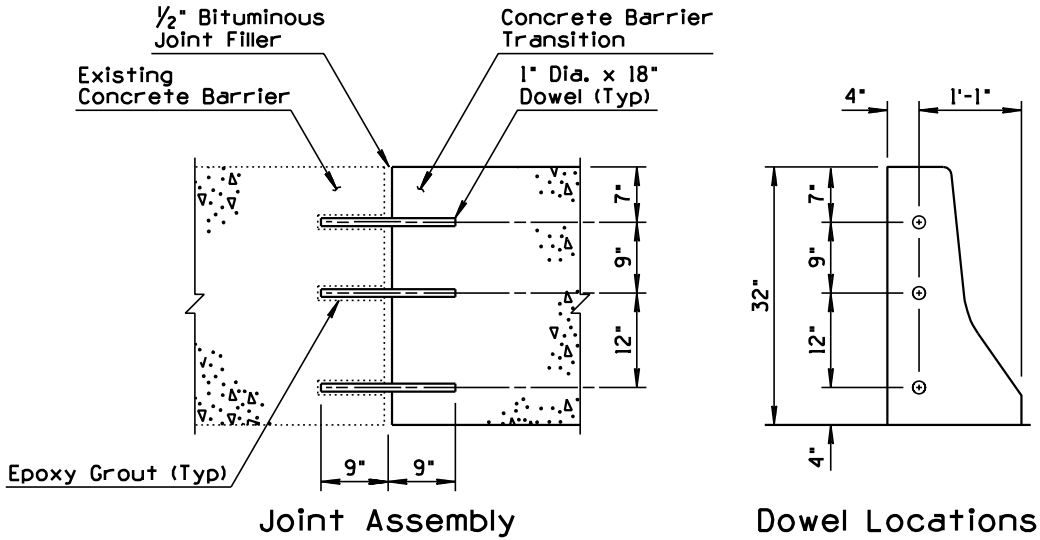
- Concrete shall be Class S, design strength $f'_c = 4000$ PSI.
- Half Barrier shall be placed upon either Asphaltic or Portland Cement Concrete Pavement.
- Pavement thickness adjacent to Half Barrier shall be $\frac{3}{4}$ " minimum.
- The Half Barrier shall be placed upon a bed of grout in order to provide a uniform bearing.
- Doweled joints shall be grouted under pressure until all of the openings and the joints are filled.
- This standard shall not be used when an individual run consists of less than five 20 foot sections.
- All bend dimensions for reinforcing steel shall be out-to-out of bars.

DESIGN APPROVED <i>Sam H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE MEDIAN BARRIER 32" TYPE 'F' PRECAST ①	DRAWING NO. C-10.68

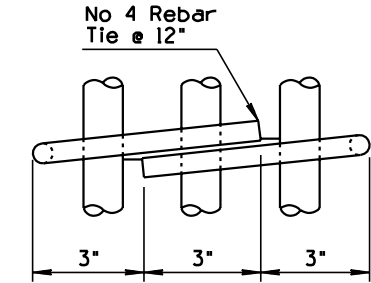
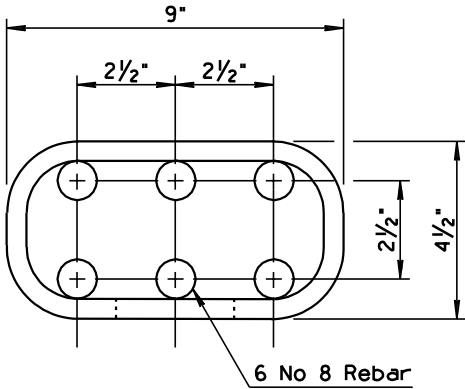
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
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2	RAISED THRIE BEAM 1"	RLF	7/01
3			
4			



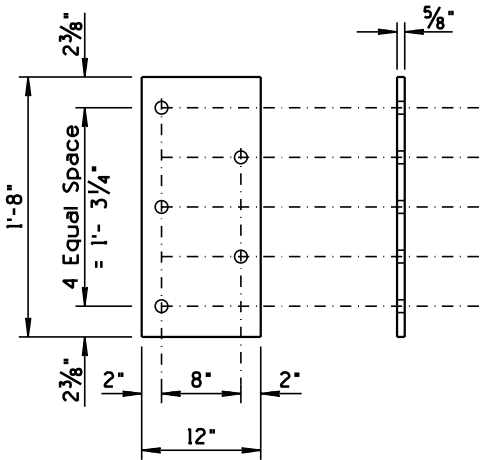
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DRAWING & DIMENSIONS	JNP	4/00
2			
3			
4			



CONSTRUCTION JOINT DETAIL
(OPTIONAL)



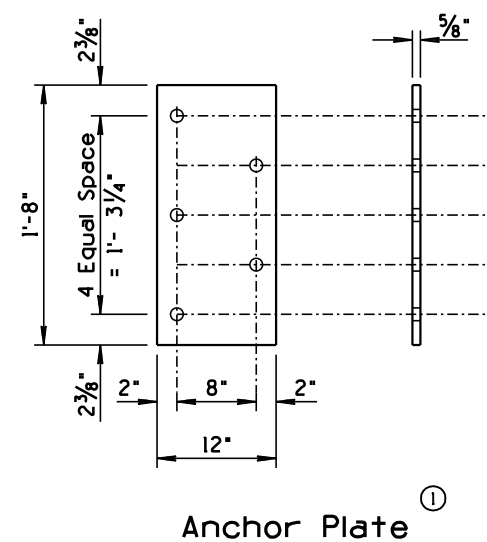
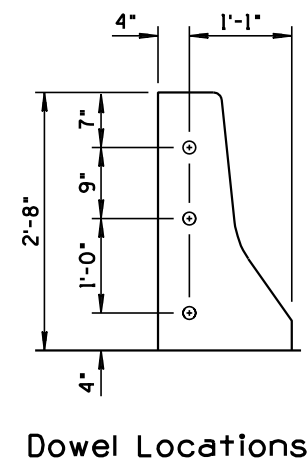
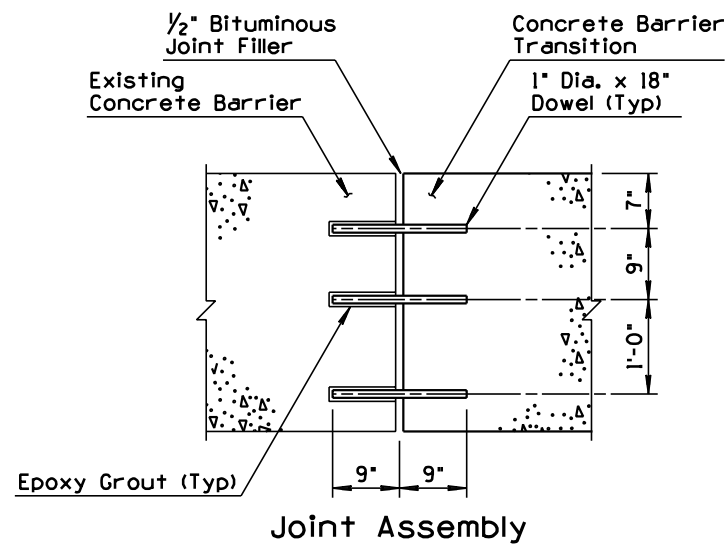
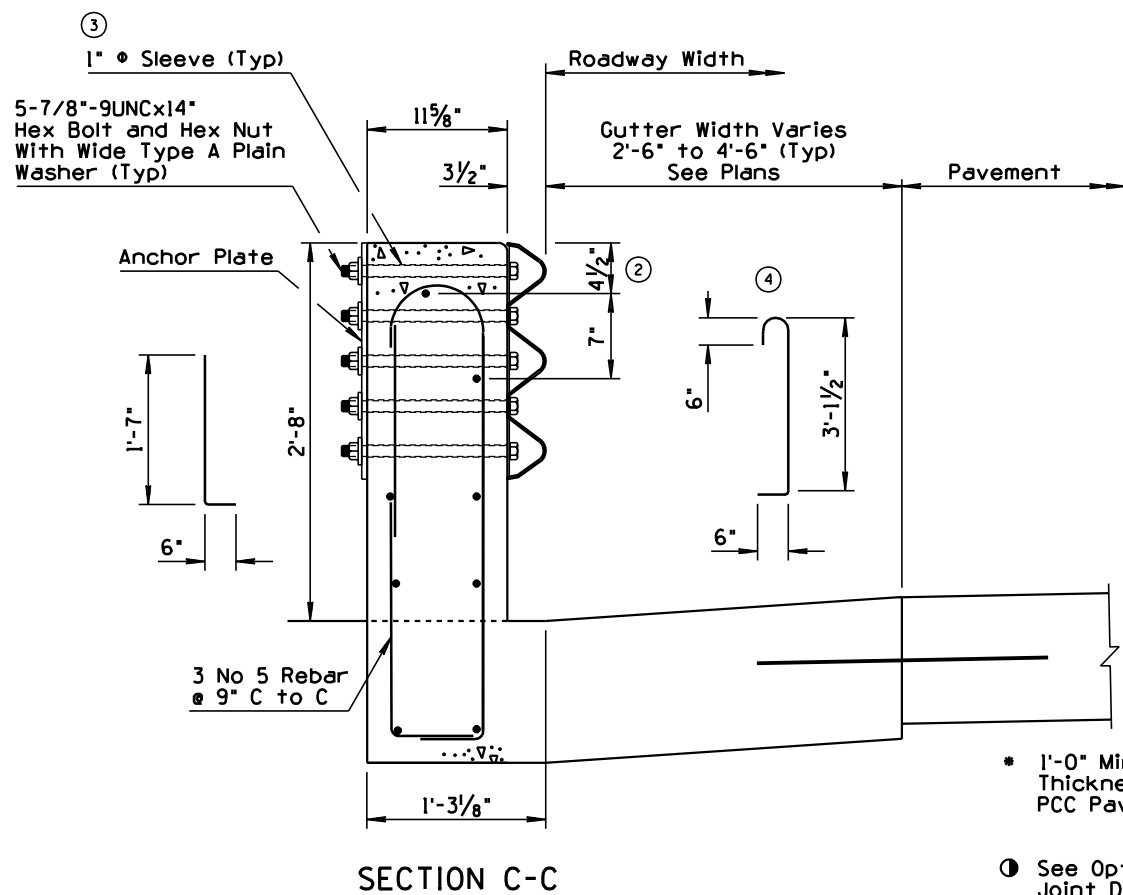
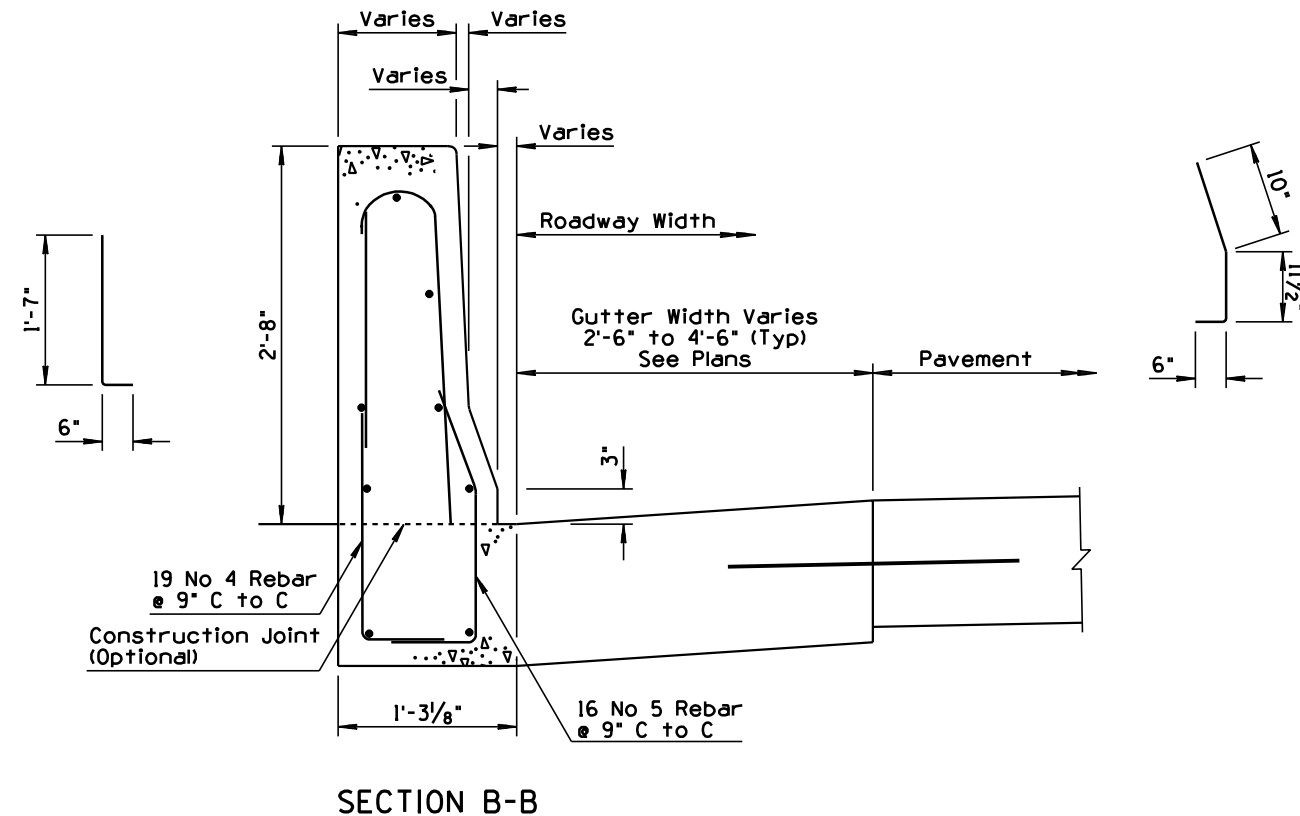
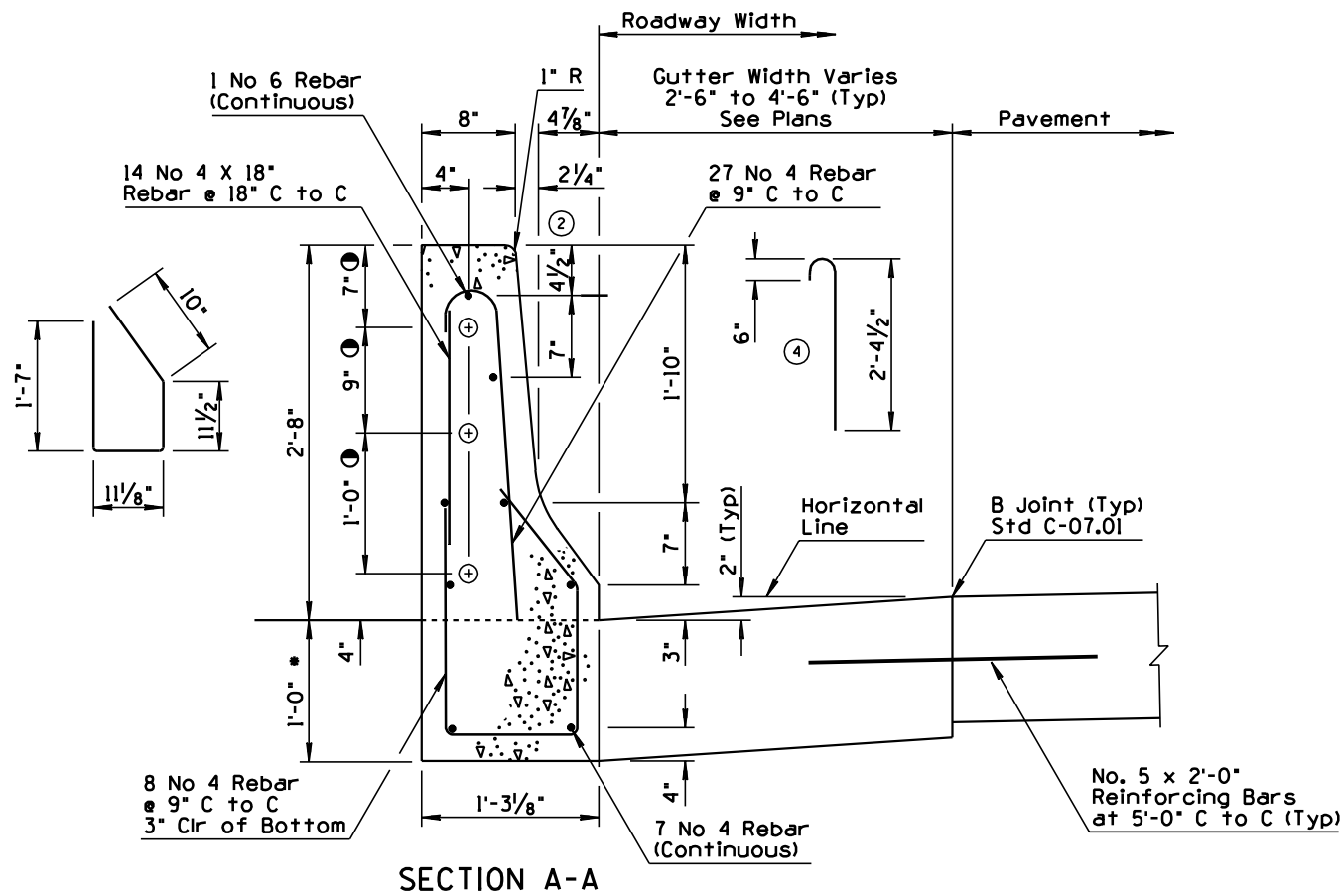
CAISSON REINFORCEMENT



Anchor Plate ①

DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER TRANSITION TO VERTICAL 32" TYPE 'F' WITH CAISSONS	DRAWING NO. C-10.70 Sheet 3 of 3

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DRAWING & DIMENSIONS	JNP	4/00
2	RAISED THRIE BEAM 1" & REPOSITIONED TOP REBAR	RLF	7/01
3	REVISED FROM PIPE TO SLEEVE	RLF	7/01
4	REVISED REBAR DIMENSIONS	RLF	7/01



* 1'-0" Min or Match Thickness of Adjacent PCC Pavement

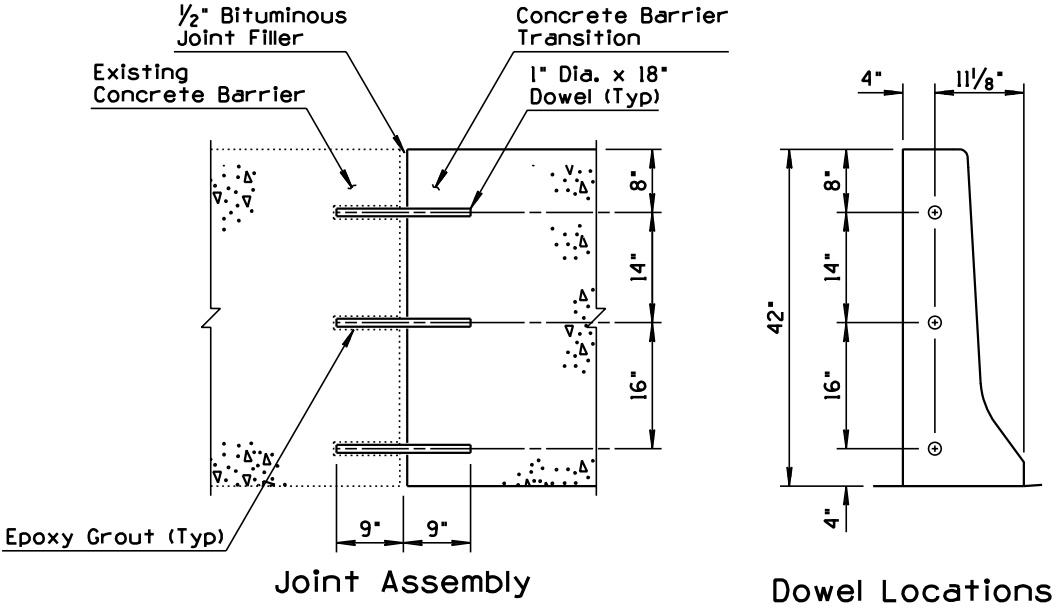
1 See Optional Construction Joint Detail

DESIGN APPROVED
John L. Lamm
APPROVED FOR DISTRIBUTION
Ronald Williams

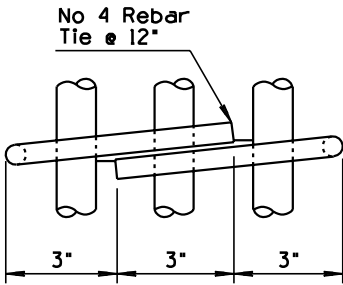
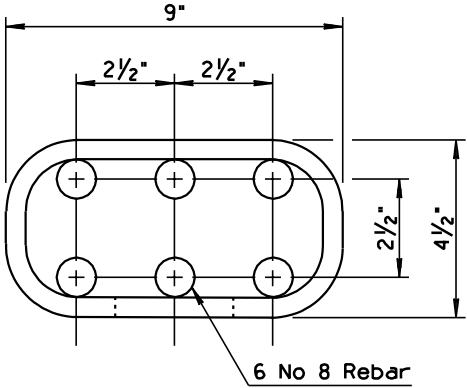
STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS
CONCRETE HALF BARRIER
TRANSITION TO VERTICAL 32"
TYPE 'F' WITH GUTTER

REV.
7/01
DRAWING NO.
C-10.71
Sheet 2 of 2

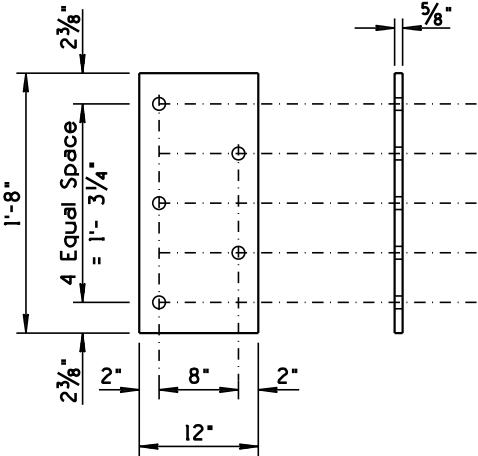
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DRAWING & DIMENSIONS	JNP	4/00
2			
3			
4			



CONSTRUCTION JOINT DETAIL
(OPTIONAL)



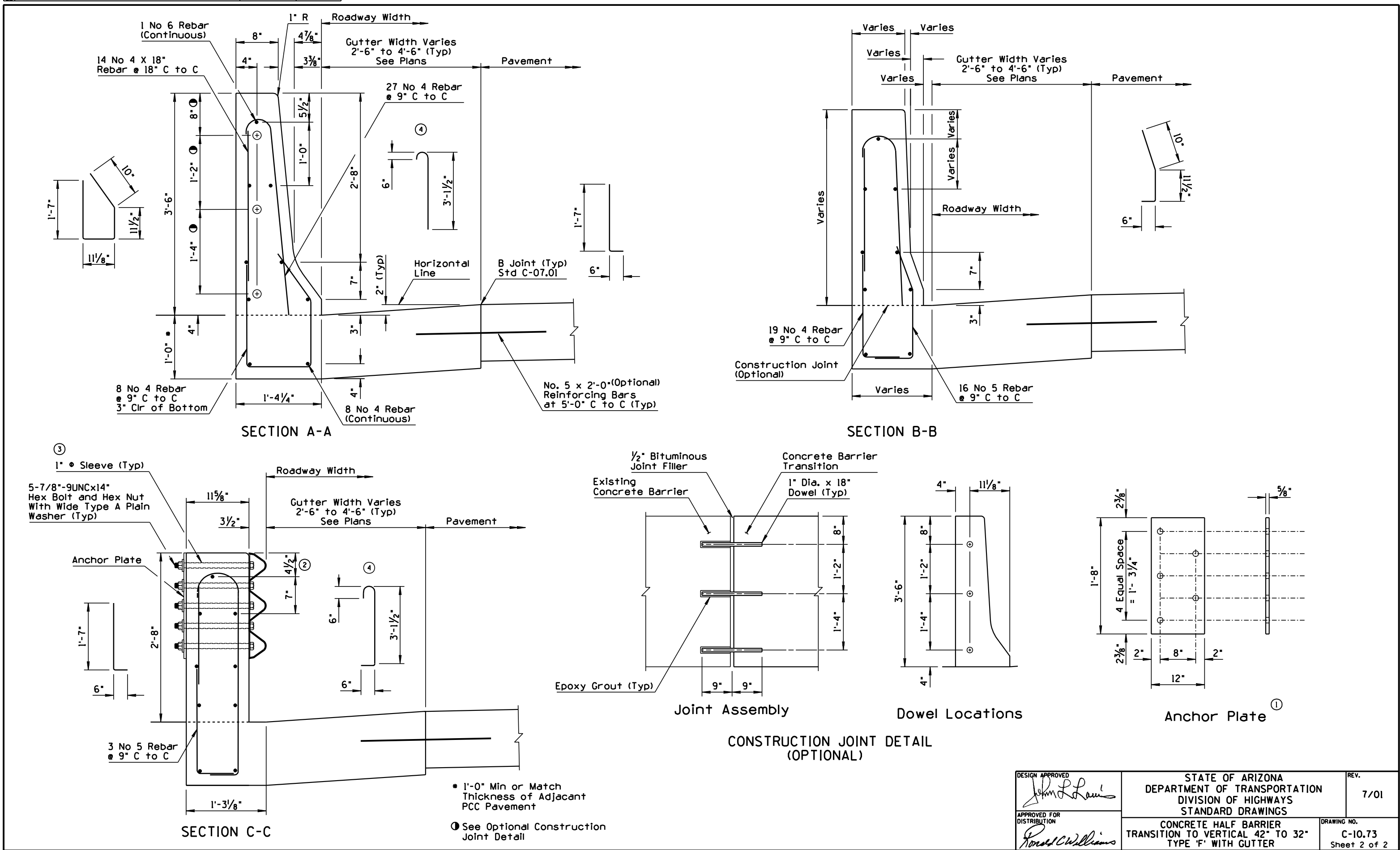
CAISSON REINFORCEMENT



Anchor Plate ①

DESIGN APPROVED <i>Larry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 4/00
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER TRANSITION TO VERTICAL 42" TO 32" TYPE 'F' WITH CAISSONS	DRAWING NO. C-10.72 Sheet 3 of 3

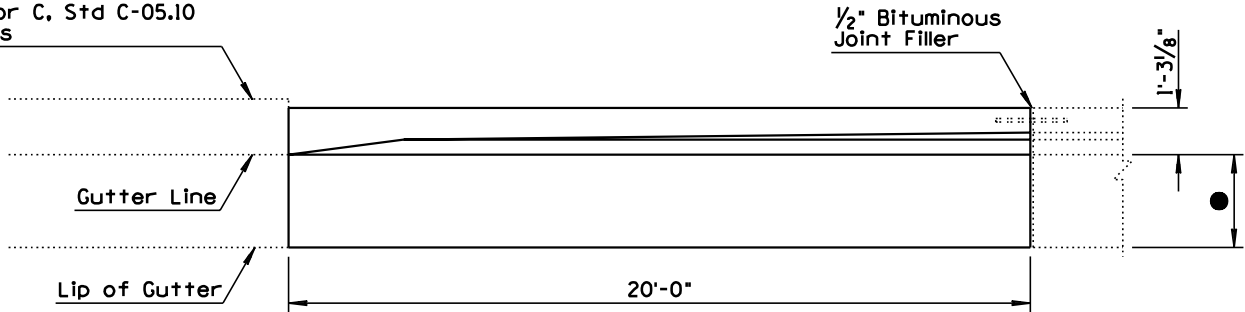
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DRAWING & DIMENSIONS	JNP	4/00
2	RAISED THREE BEAM 1" & RAISED TOP REBAR	RLF	7/01
3	REVISED FROM PIPE TO SLEEVE	RLF	7/01
4	REVISED REBAR DIMENSIONS	RLF	7/01



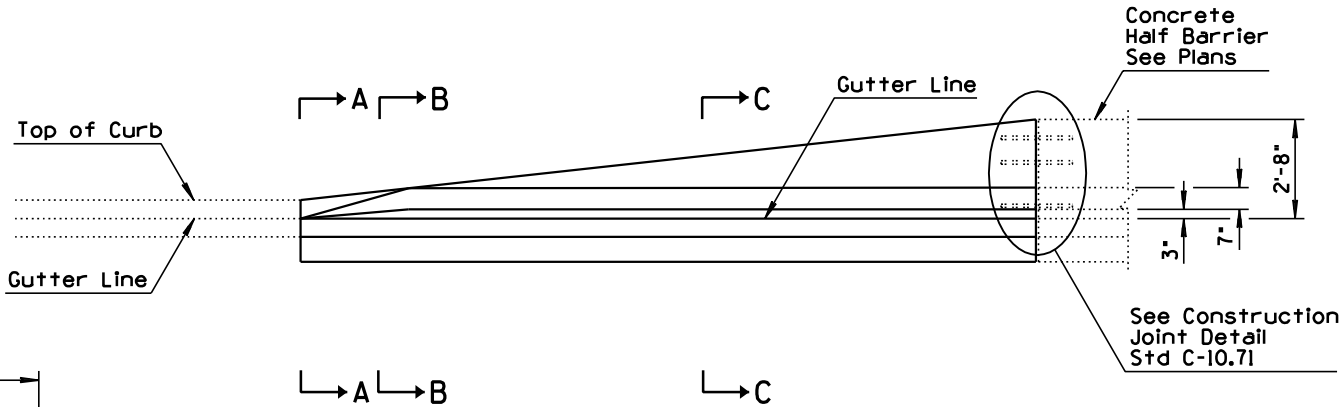
DESIGN APPROVED <i>John L. Law</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER TRANSITION TO VERTICAL 42" TO 32" TYPE 'F' WITH GUTTER	DRAWING NO. C-10.73 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TO REFLECT 'F' SHAPE BARRIER	JNP	8/99
2			
3			
4			

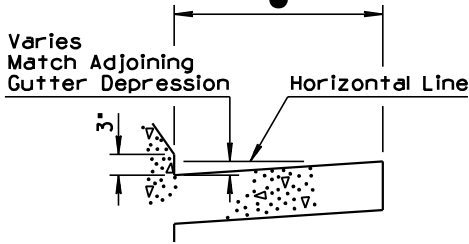
Concrete Curb and Gutter
Type B or C, Std C-05.10
See Plans



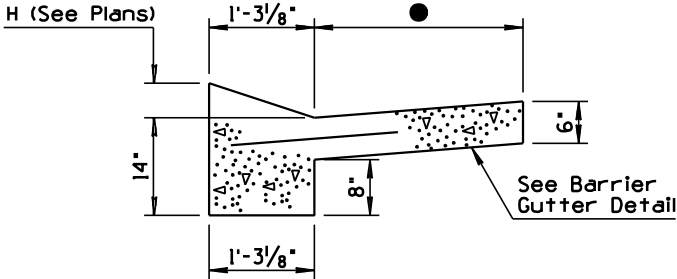
PLAN VIEW



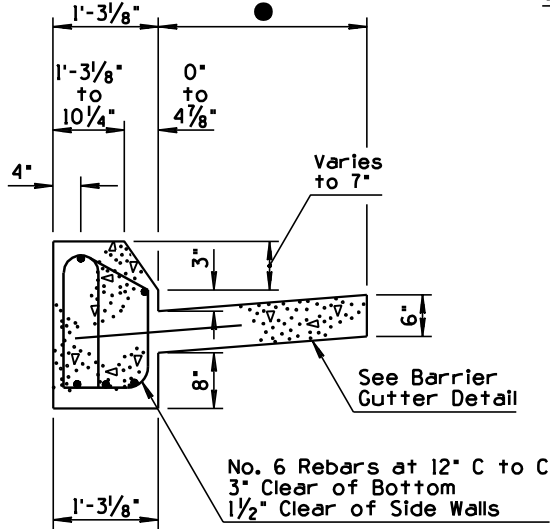
ELEVATION



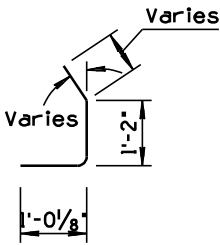
BARRIER GUTTER DETAIL



SECTION A-A



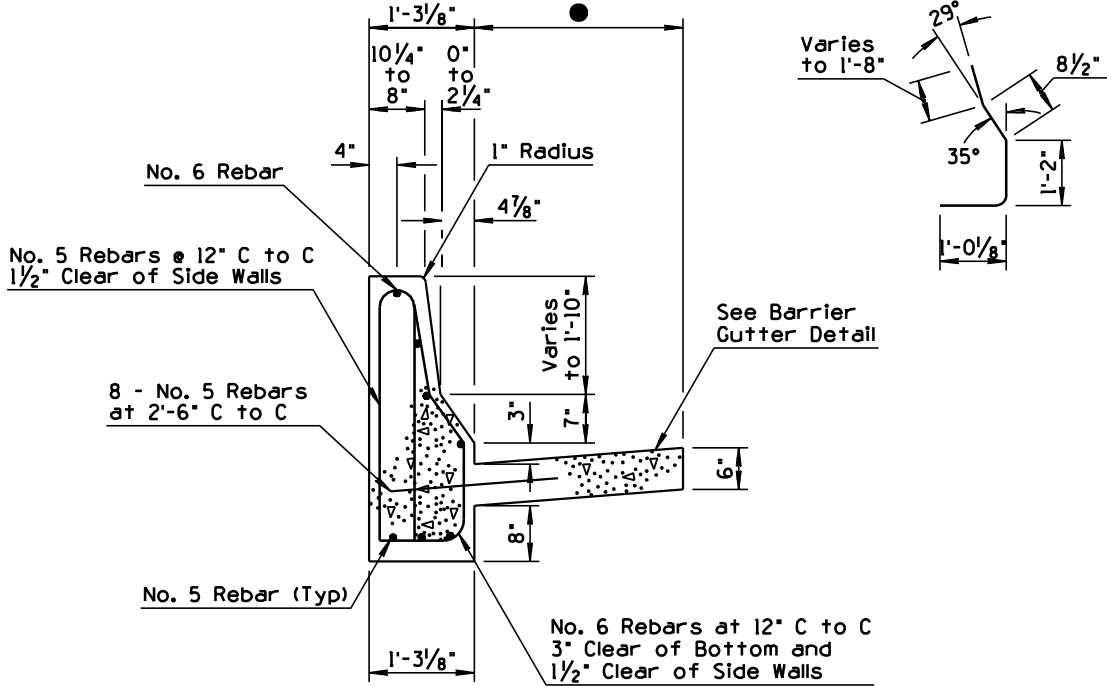
SECTION B-B



GENERAL NOTES

1. All concrete shall be Class "S" (f'c =3000 psi).
2. All reinforcing steel shall conform to Section 1003.
3. All reinforcing steel shall have 2" minimum clear cover unless otherwise noted.
4. See drainage sheets for slotted drain and catch basin details.
5. Barrier transition shall match both adjoining curb and gutter and concrete half barrier.
6. All bend dimensions for reinforcing steel shall be out-to-out of bars.
7. Two inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent portland cement concrete pavement and at approximate 15 foot centers when adjacent to asphaltic concrete pavement. Joints shall be either hand tooled or sawed.

● Varies - 2'-6", 4'-6" or width as per plans.

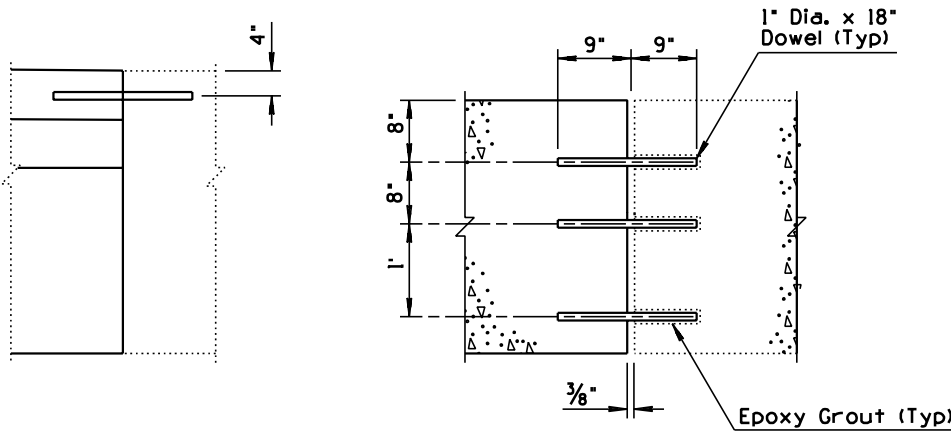
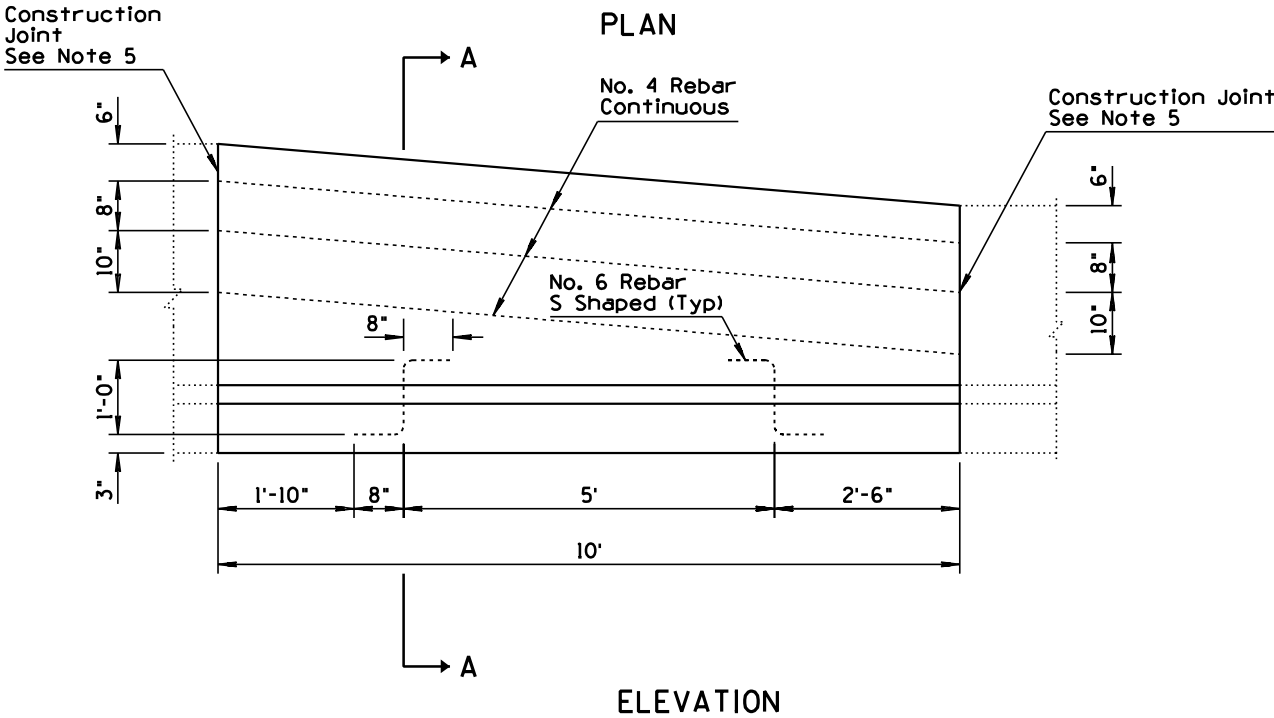
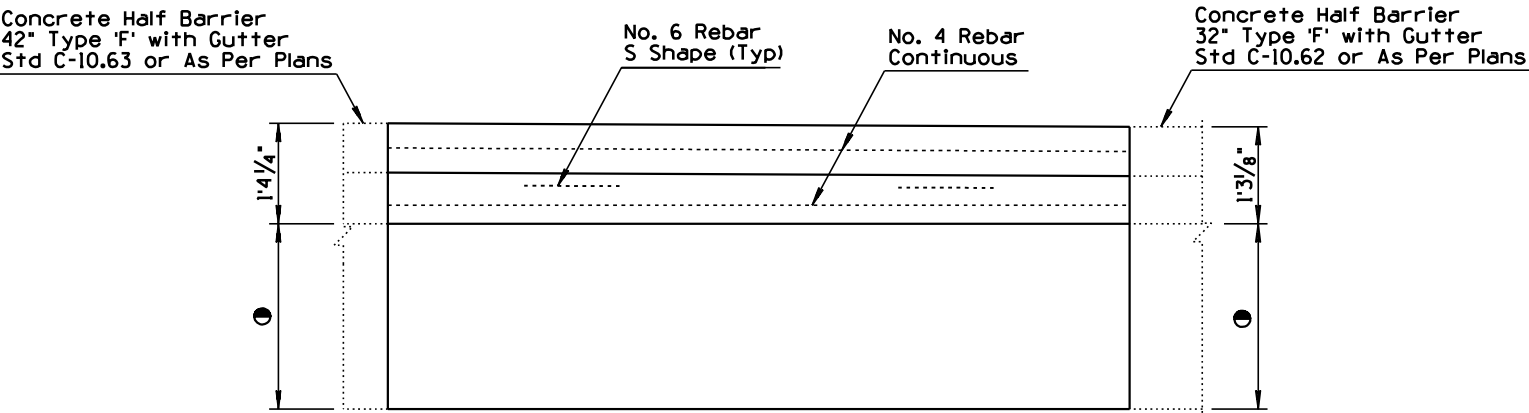


SECTION C-C

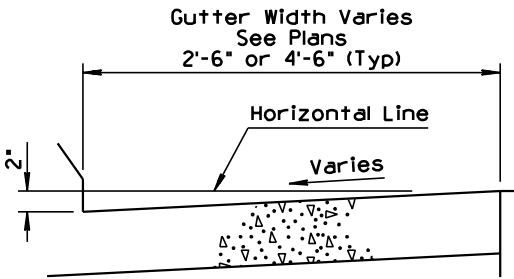
TRANSITION TO FREEWAY CURB

DESIGN APPROVED <i>James H. Ottum</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/99
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	BARRIER TRANSITION 32" TYPE 'F' TANGENT DEPARTURE TYPE 2	DRAWING NO. C-10.75 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	NEW STANDARD DEVELOPED	JNP	8/99
2			
3			
4			

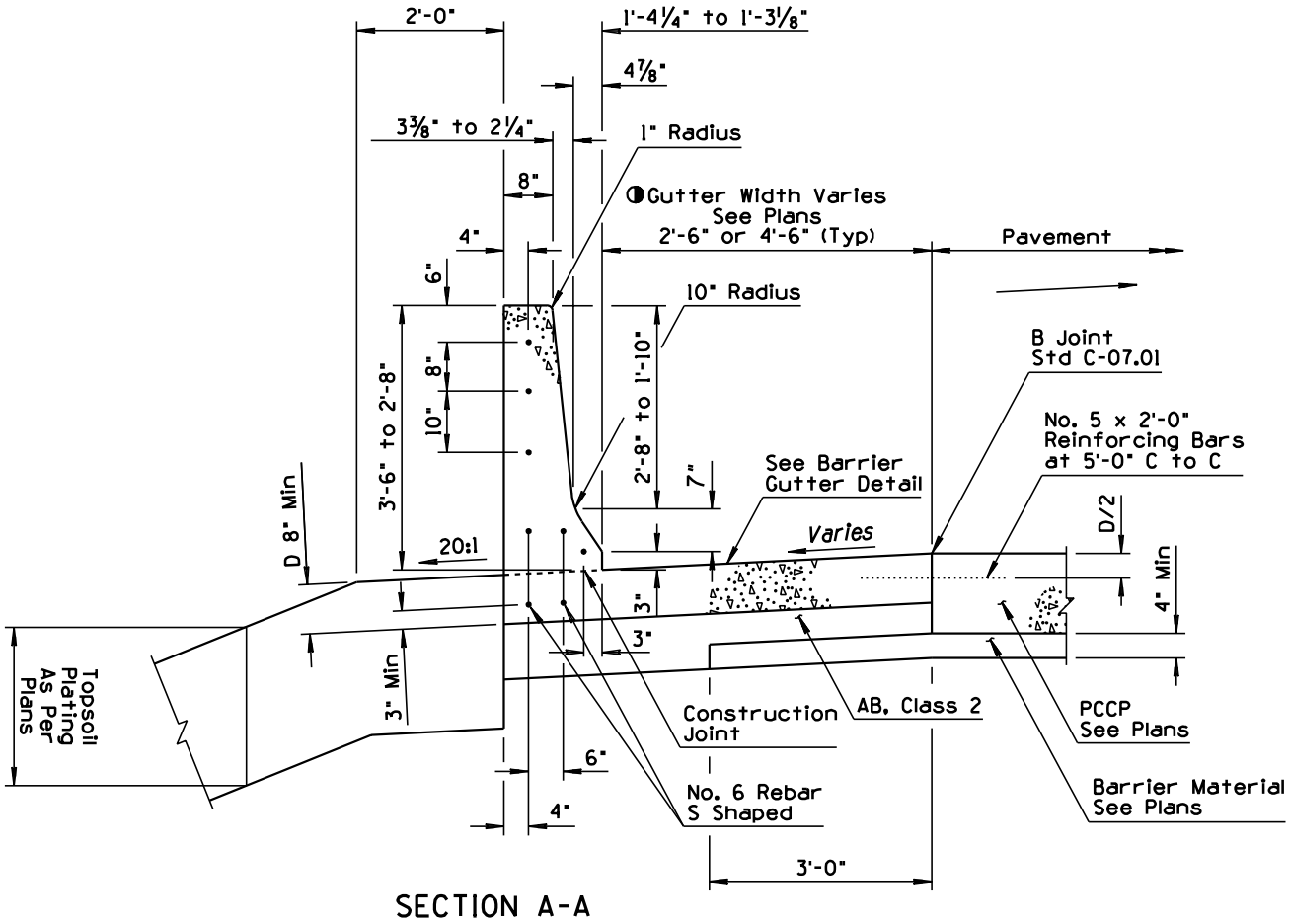


CONSTRUCTION JOINT DETAIL
(OPTIONAL)



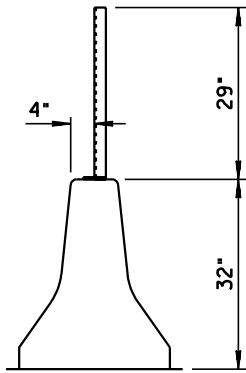
GENERAL NOTES

- Half Barrier Transition shall be constructed by the formed Cast-In-Place method.
- Concrete shall be Class S, design strength $f'_c = 3000$ PSI.
- If the footing and barrier are cast monolithically, No. 6 S shaped rebars will not be required.
- In no case shall the width of barrier exceed the width of the barrier footing or overhang the adjacent pavement.
- No. 4 Rebar shall extend 12" past the construction joint at the completion of the day's pour.
- Thickness of footing, "D" can be adjusted to match the PCCP thickness, as approved by the Engineer.
- Two inch deep contraction joints shall be placed in the gutter at locations which match the joints in adjacent portland cement concrete pavement and at approximate 15 foot centers when adjacent to asphaltic concrete pavement. Joints shall be either hand tooled or sawed.

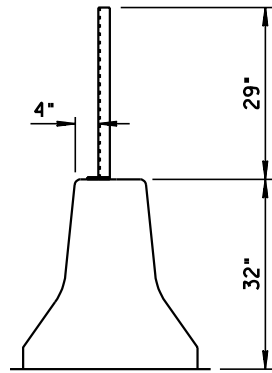


DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/99
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CONCRETE HALF BARRIER TRANSITION TYPE 'F' TO TYPE 'F' 42" TO 32"	DRAWING NO. C-10.86

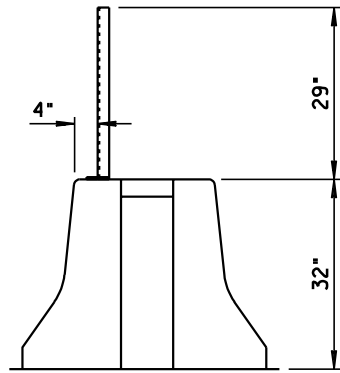
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED STANDARD	PNB	3/94
2			
3			
4			



Glare Screen
Installation on
Standard Median Barrier



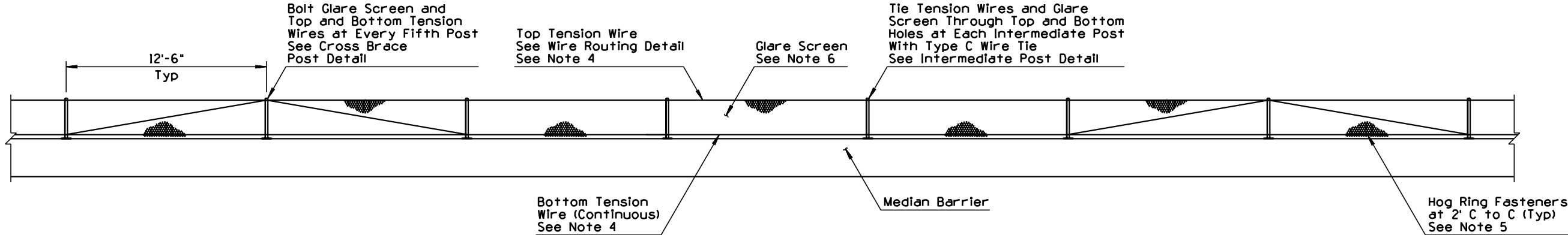
Glare Screen
Installation on
Median Barrier Transition



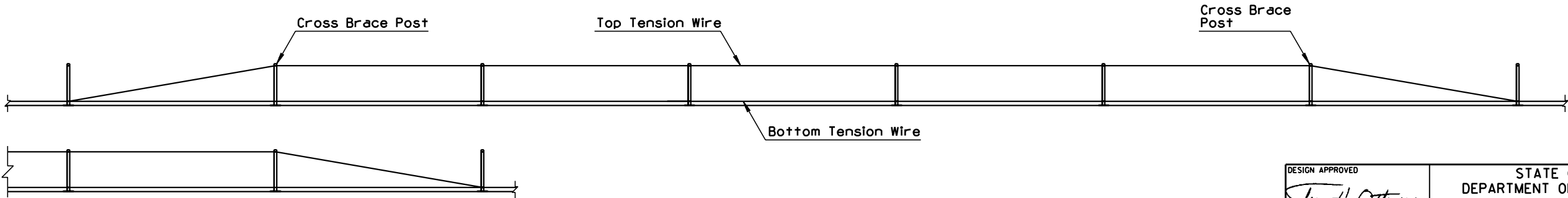
Glare Screen
Installation on
Half Barrier at Bridge Pier

GENERAL NOTES

1. Posts shall be 12'-6" C to C. Structural steel shall conform to ASTM-A-36, galvanized ASTM-A-123.
2. Hex head bolt shall conform to ASTM-A-307, galvanized ASTM-A-153 Class C.
3. Helical spring lock washer shall conform to ASTM-A-313, galvanized ASTM-A-153 Class C.
4. Tension wire: AWG No 9(0.148") galvanized to conform to ASTM-A-116 Class 2.
5. Hog ring: AWG No 12 (0.105") galvanized ASTM-A-116 Class 2. Fasten glare screen to top and bottom tension wire spaced approximately 2' apart.
6. Glare Screen: 18 Gauge steel, ASTM-A-526, galvanized ASTM-A-525/(G235), expanded to the following dimensions: 1.33" shortway of diamond and 4.0" longway of diamond (center to center of bridges) with a strand width of 0.250" angled at approximately 20° to the plane of the original sheet. Top edge to be shop curled and crimped on 12" centers. Glare screen shall be installed such that flat portion of screen blocks light from headlights. See Direction Detail.
7. Splices allowed in glare screen at posts only, with one full diamond overlap.
8. Glare screen shall be constructed without interruption to the greatest degree possible.



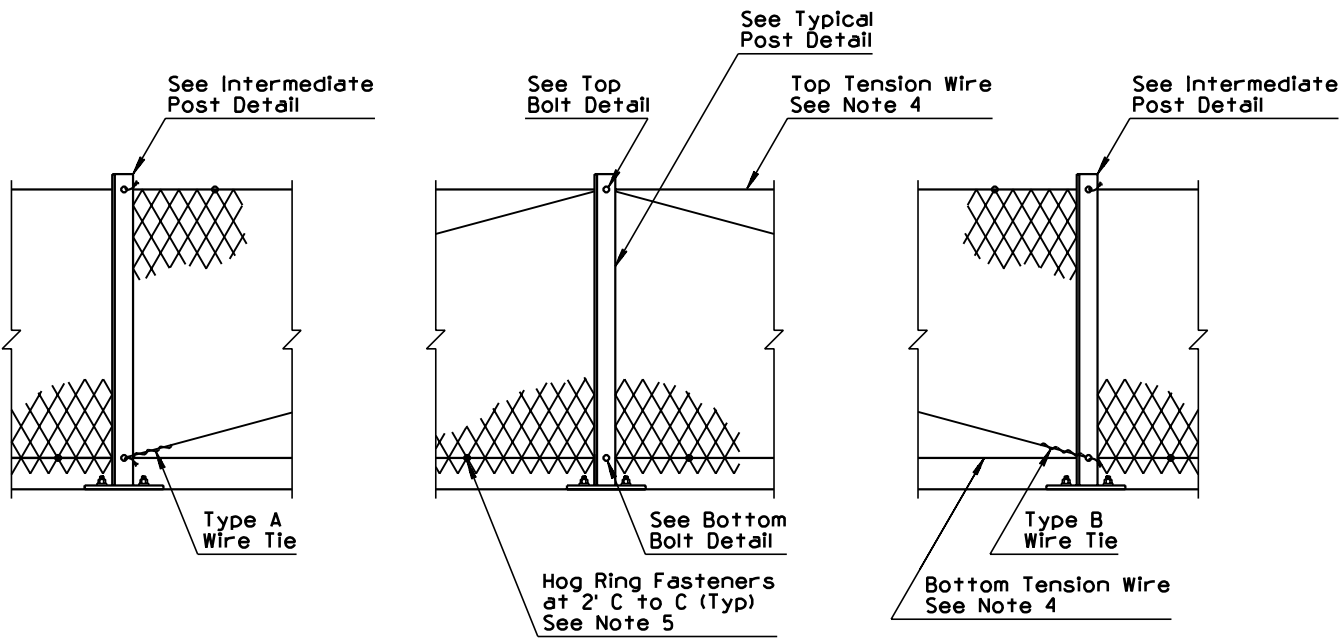
ELEVATION



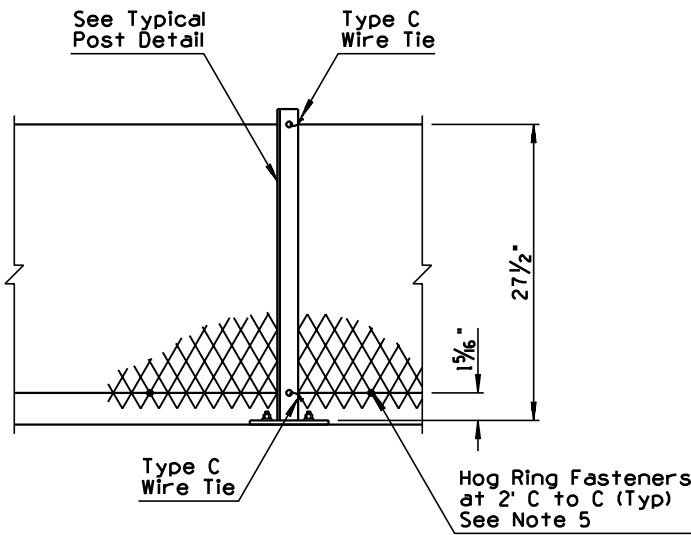
TENSION WIRE ROUTING DETAIL

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 3/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① GLARE SCREEN CONCRETE MEDIAN BARRIER	DRAWING NO. C-10.97 Sheet 1 of 3

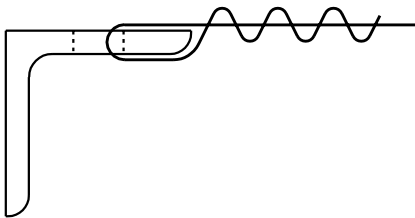
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED STANDARD & ADDED SHT 2	PNB	3/94
2			
3			
4			



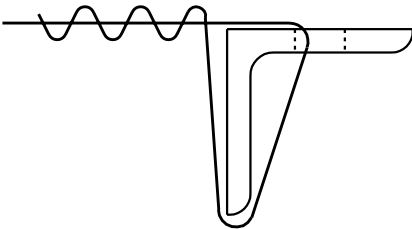
CROSS BRACE POST DETAIL



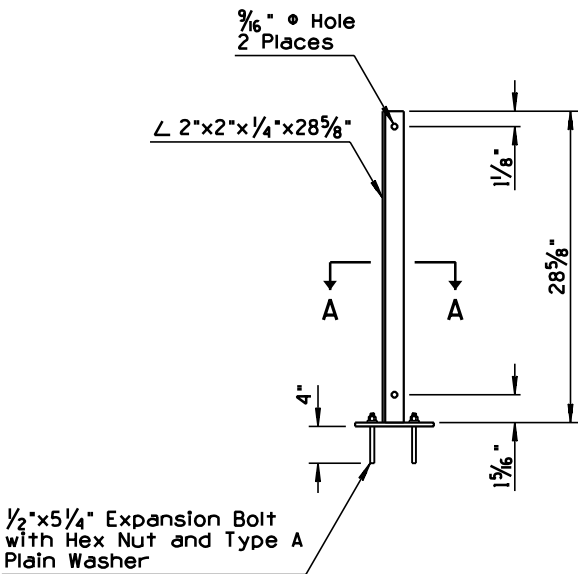
INTERMEDIATE POST DETAIL



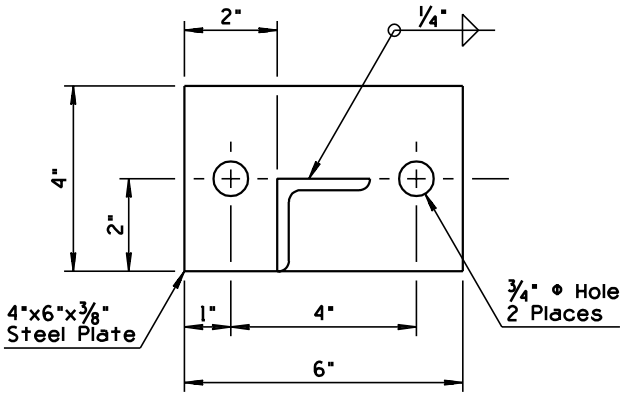
TYPE A WIRE TIE



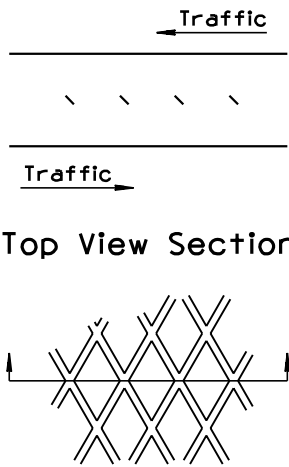
TYPE B WIRE TIE



TYPICAL POST DETAIL

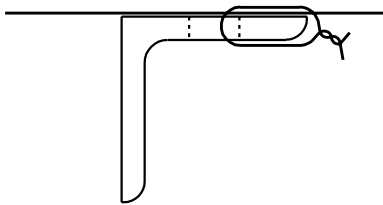


SECTION A-A



Elevation

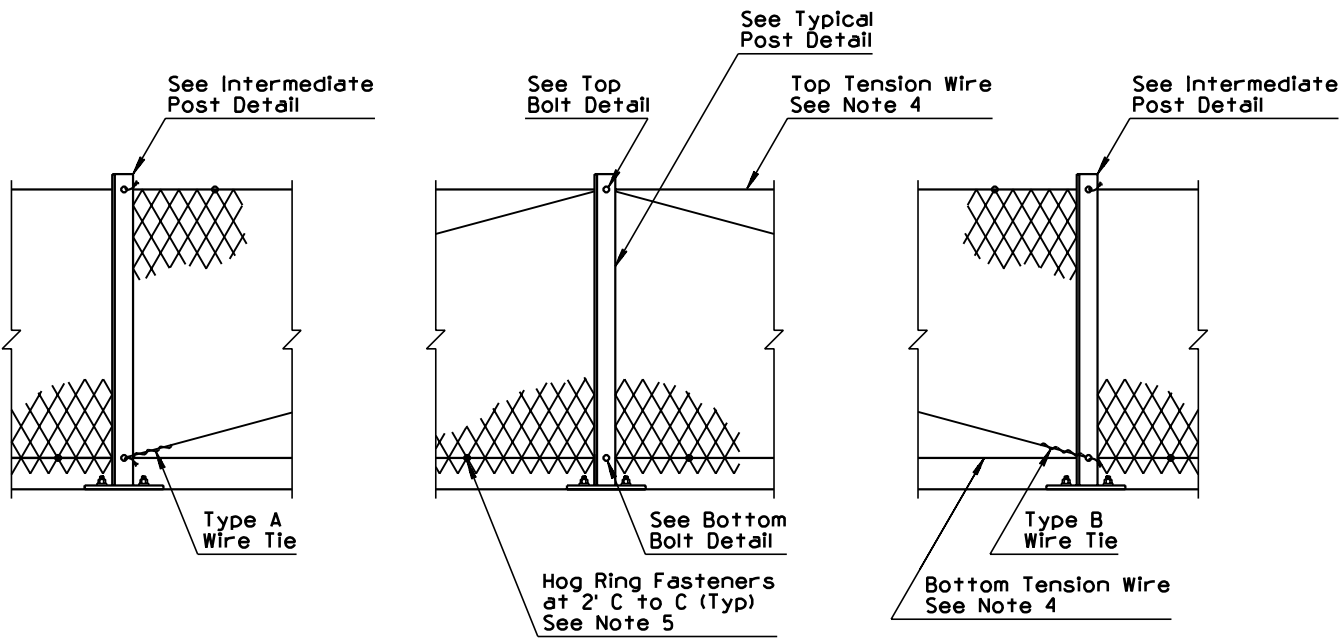
DIRECTION DETAIL



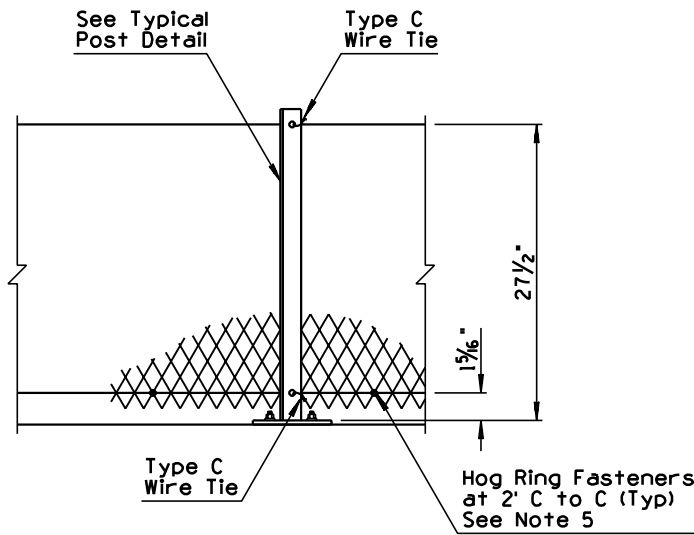
TYPE C WIRE TIE

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 3/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① GLARE SCREEN CONCRETE MEDIAN BARRIER	DRAWING NO. C-10.97 Sheet 2 of 3

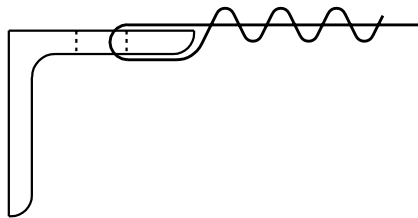
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED STANDARD & ADDED SHT 2	PNB	3/94
2			
3			
4			



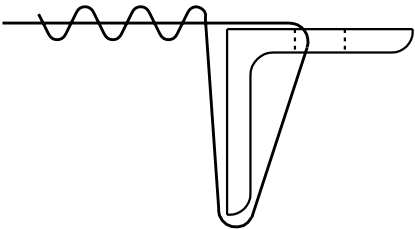
CROSS BRACE POST DETAIL



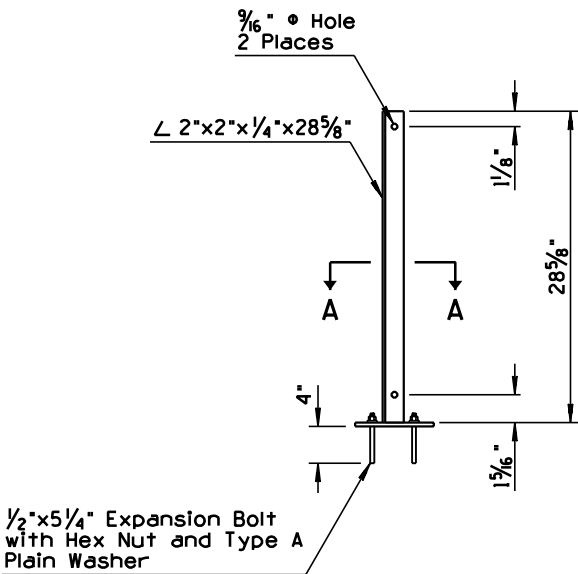
INTERMEDIATE POST DETAIL



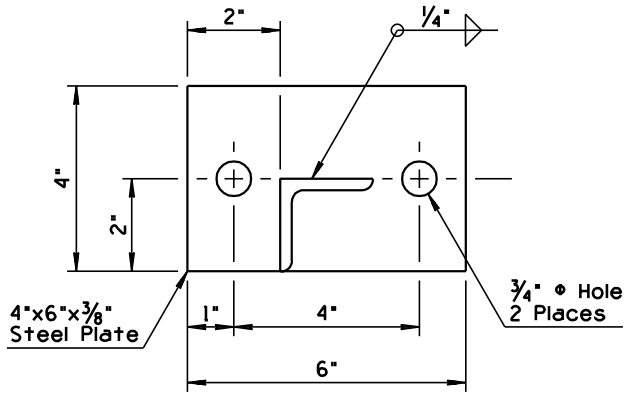
TYPE A WIRE TIE



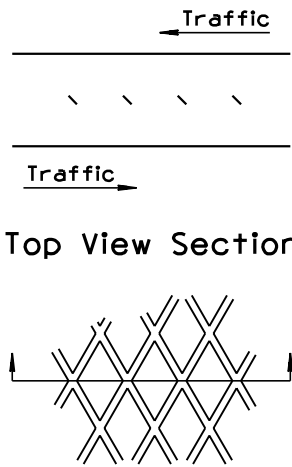
TYPE B WIRE TIE



TYPICAL POST DETAIL



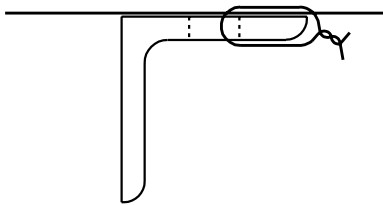
SECTION A-A



Top View Section

Elevation

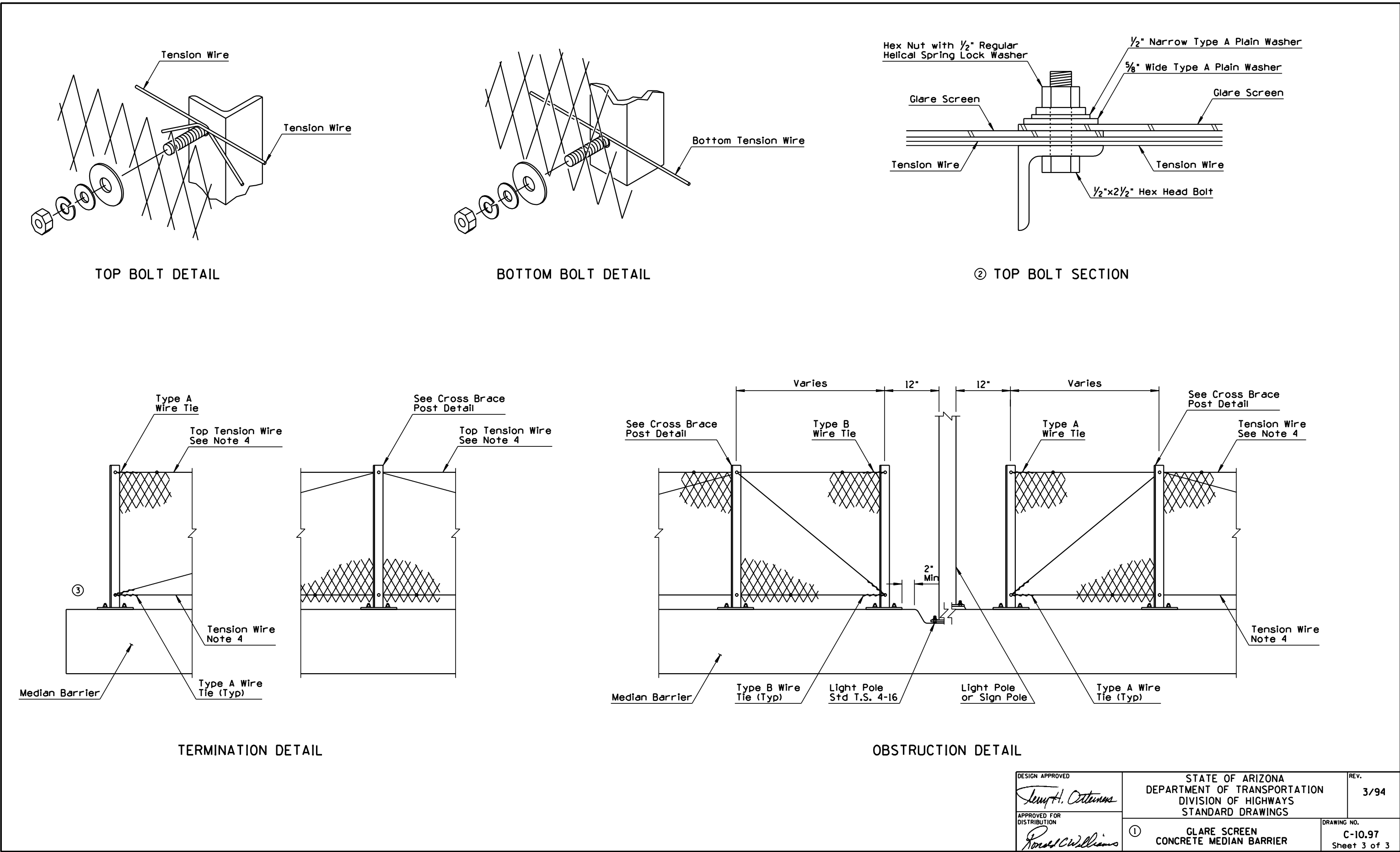
DIRECTION DETAIL



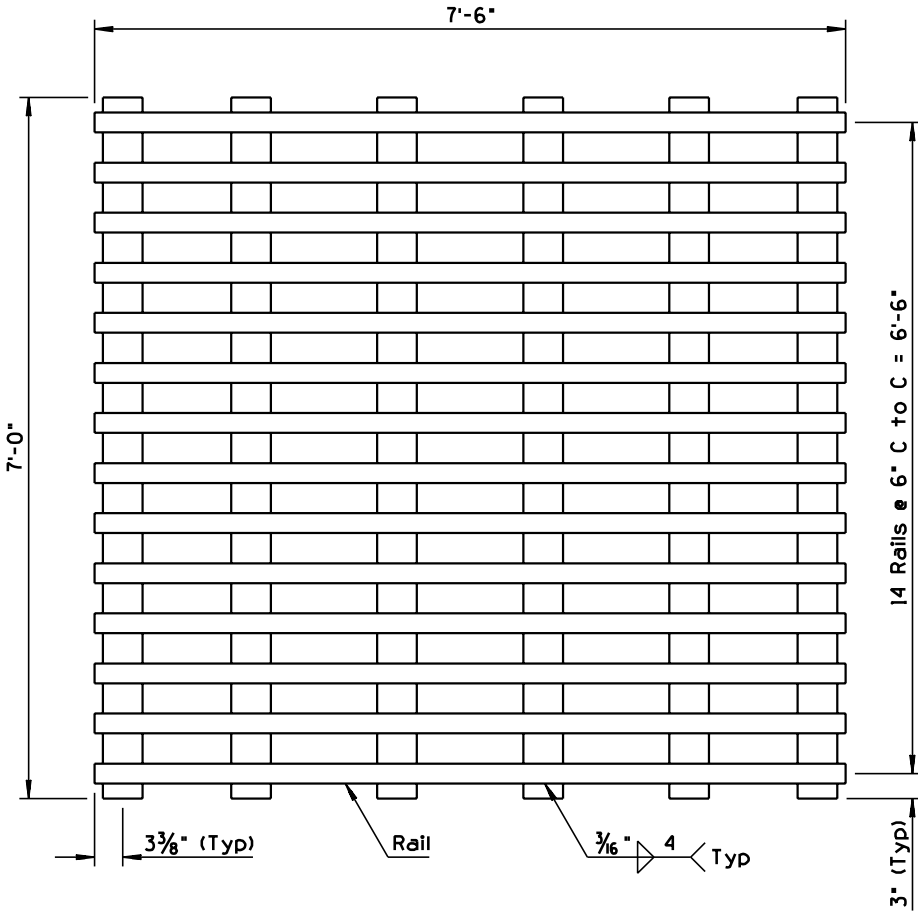
TYPE C WIRE TIE

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 3/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① GLARE SCREEN CONCRETE MEDIAN BARRIER	DRAWING NO. C-10.97 Sheet 2 of 3

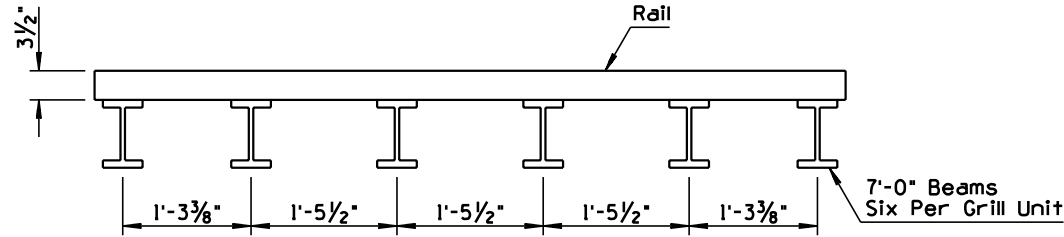
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED STANDARD & ADDED SHT 3	PNB	3/94
2	REVERSED BOLT	PNB	3/94
3	MOVED END GUY WIRE	PNB	3/94
4			



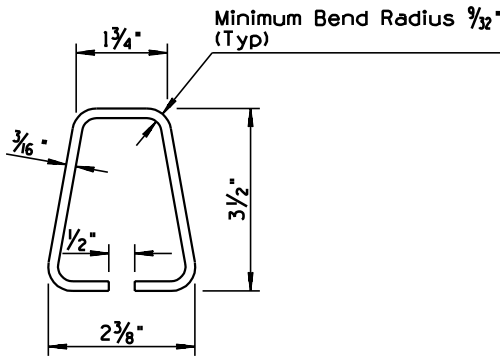
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1	FROM OLD STD C-11.11	PNB	7/94
2			
3			
4			



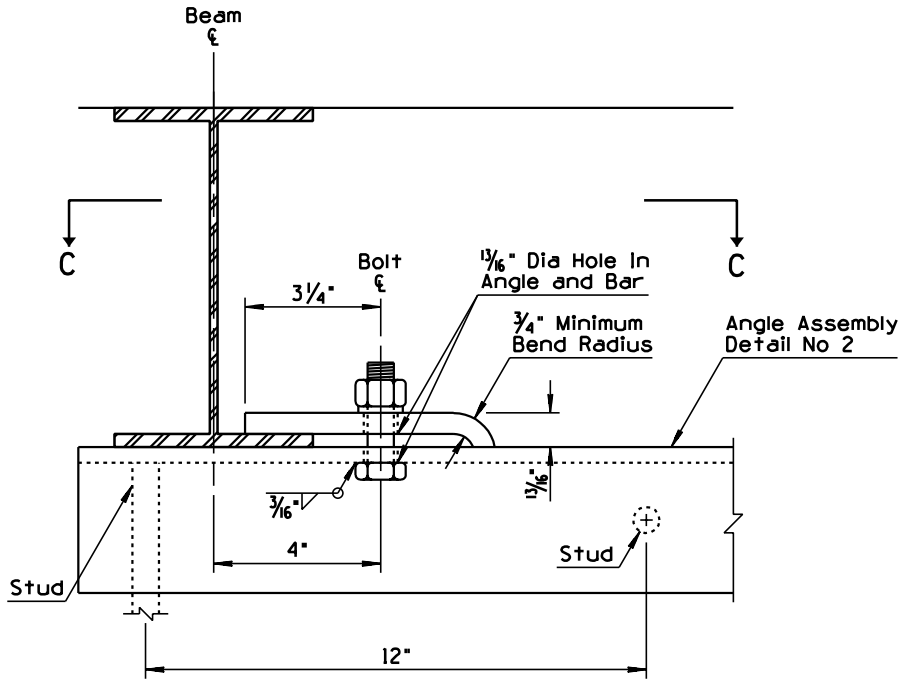
PLAN



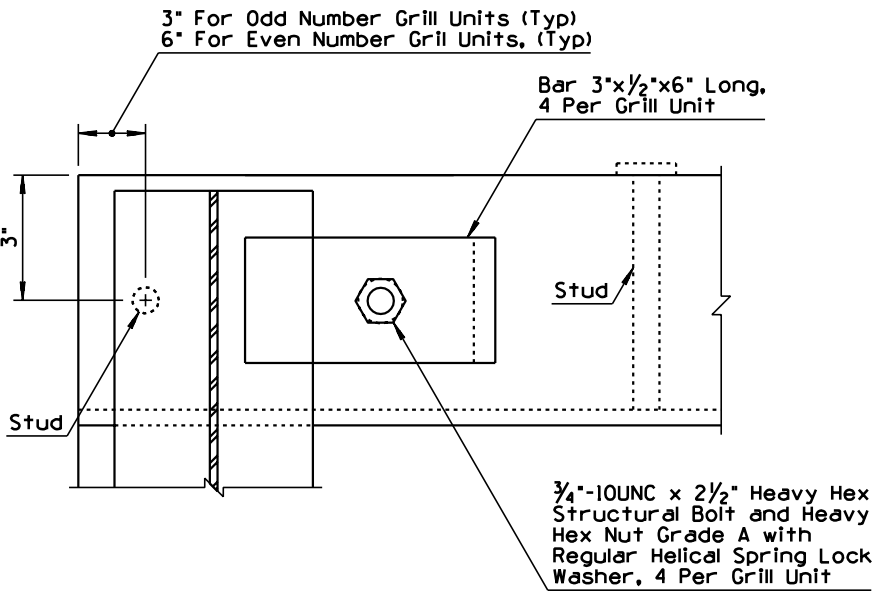
ELEVATION



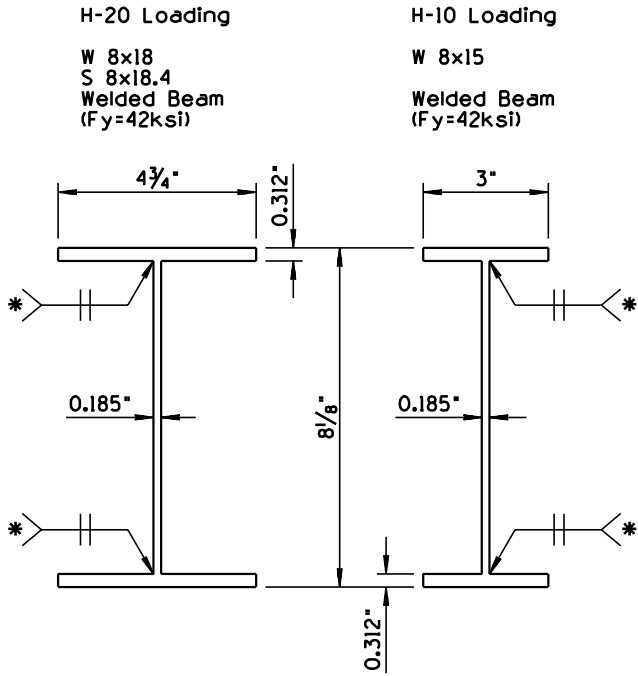
RAIL
GRILL UNIT



GRILL CLAMP



SECTION C-C

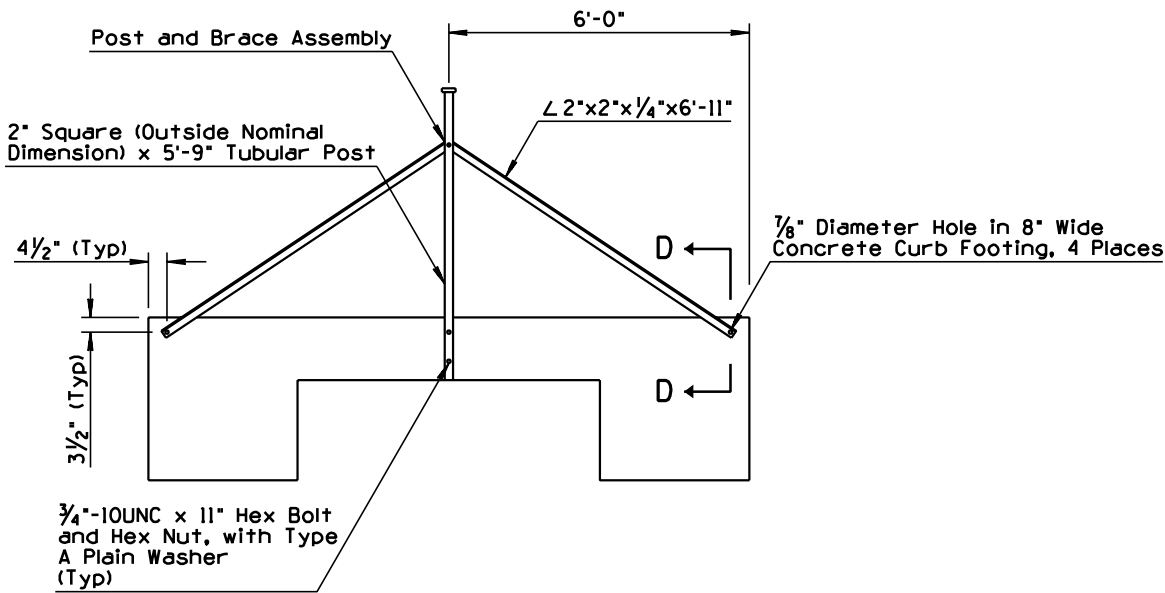


*F.P. flow thru high frequency
electrical resistance weld

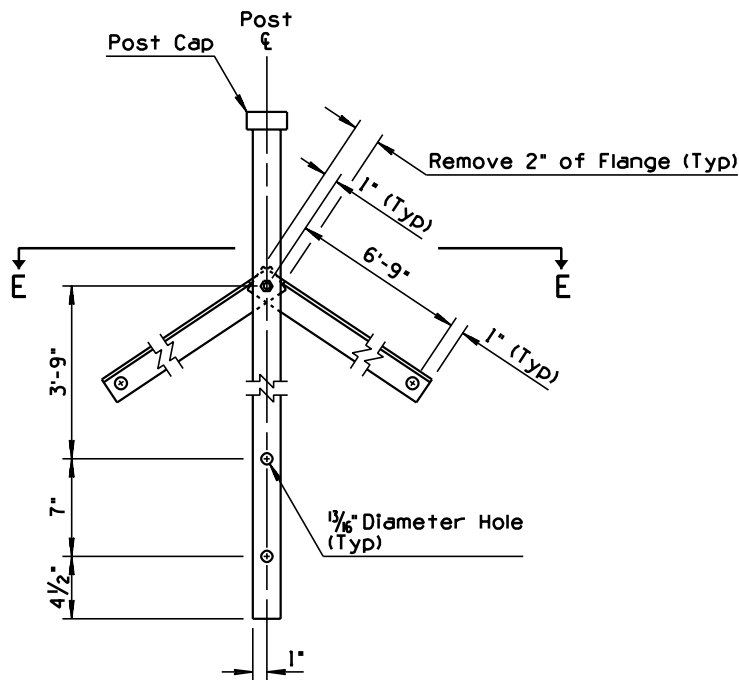
BEAMS

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① ROADWAY CATTLE GUARD	DRAWING NO. C-11.10 Sheet 2 of 3

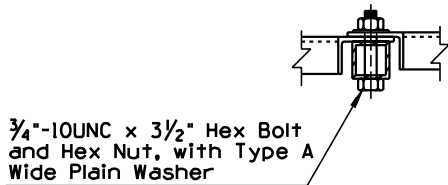
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CORRECTED SPELLING OF "SUBBASE"	PNB	10/95
2			
3			
4			



END VIEW



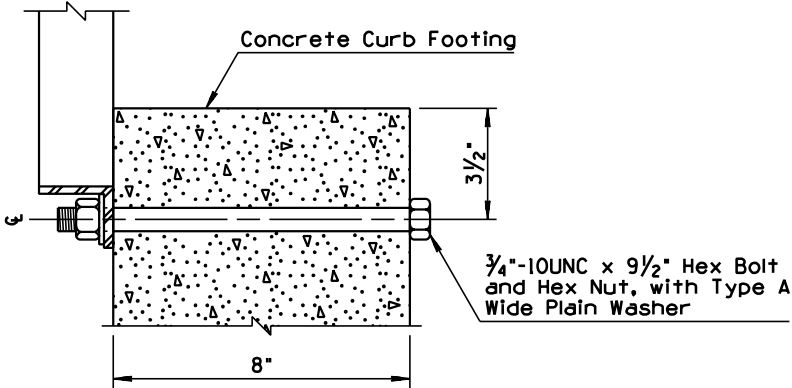
POST AND BRACE ASSEMBLY



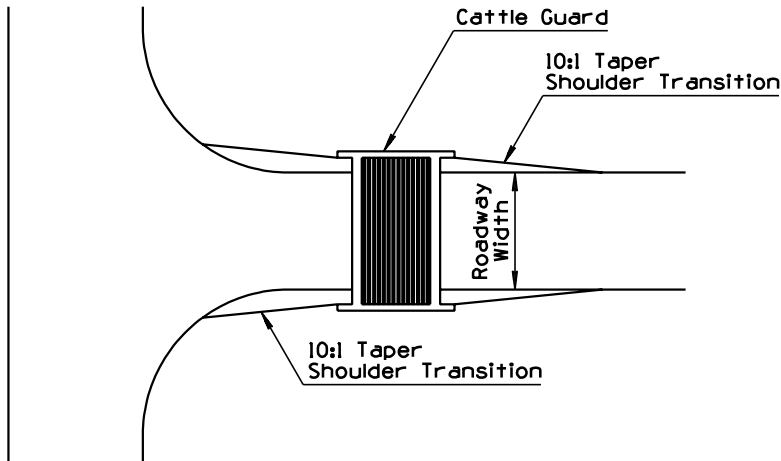
SECTION E-E

GENERAL NOTES

1. Material for shoulder transition shall be placed to the finished roadway elevation for the entire length of the transition. When the roadway is paved, Aggregate Subbase or Aggregate Base shall be used. When Roadway is unpaved, a material equivalent to the existing roadway shall be used.



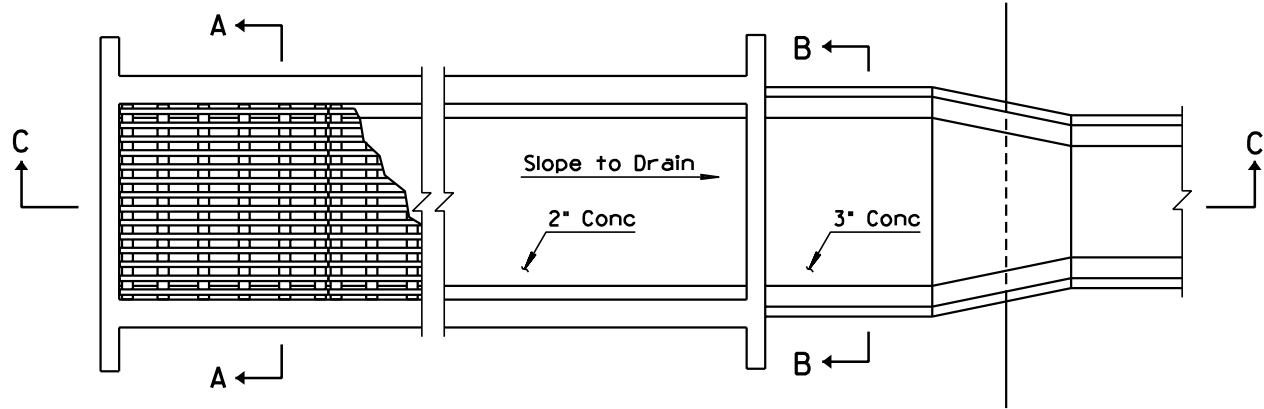
SECTION D-D



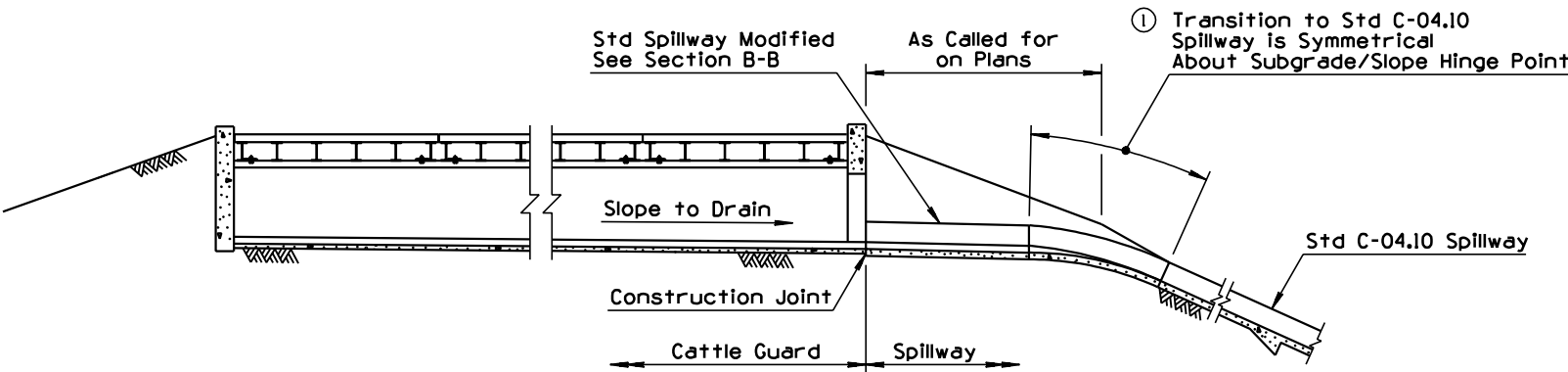
SHOULDER TRANSITION AT CATTLE GUARDS

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	ROADWAY CATTLE GUARD	DRAWING NO. C-11.10 Sheet 3 of 3

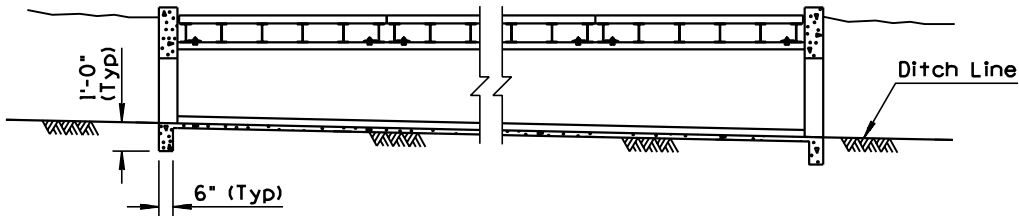
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED NOTE	PNB	7/94
2			
3			
4			



PLAN



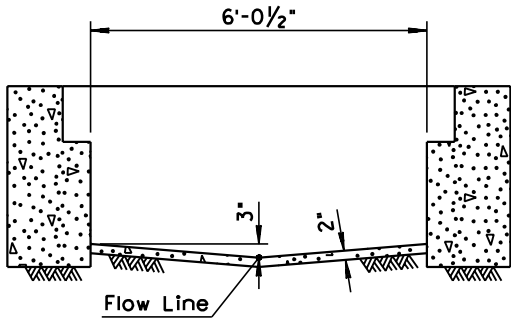
SECTION C-C
IN EMBANKMENT



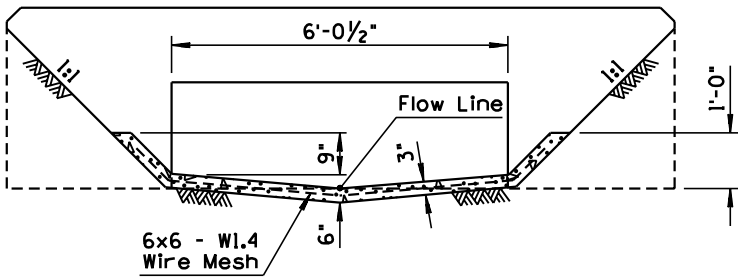
SECTION C-C
WHERE USED FOR THRU DRAINAGE-
CATTLE GUARD OPEN BOTH ENDS

GENERAL NOTES

1. See Std C-11.10 for all other Cattle Guard details.
2. This standard shall be used in embankment or where highly erodable soil is found.
3. All concrete shall be Class B.



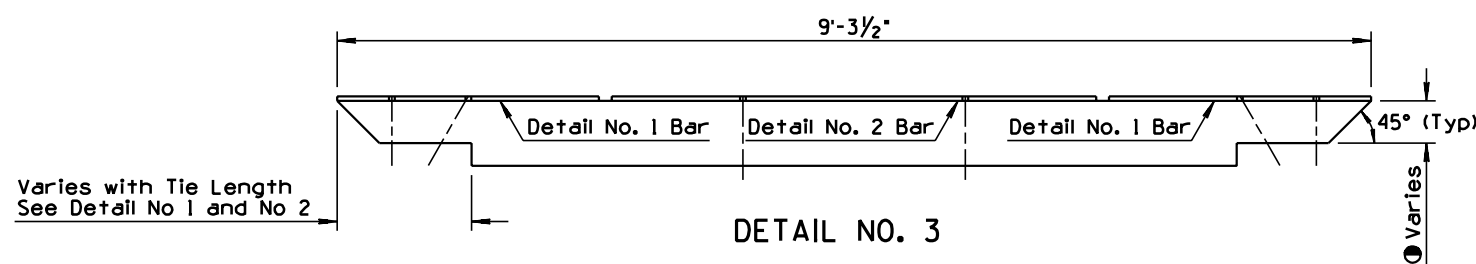
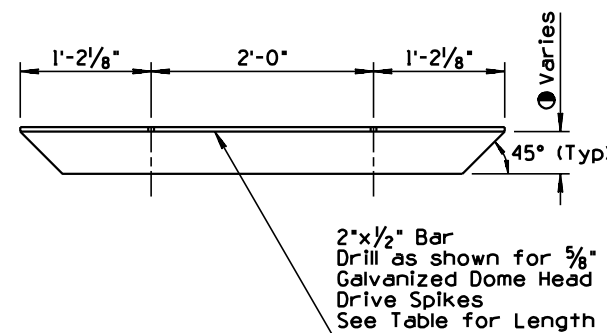
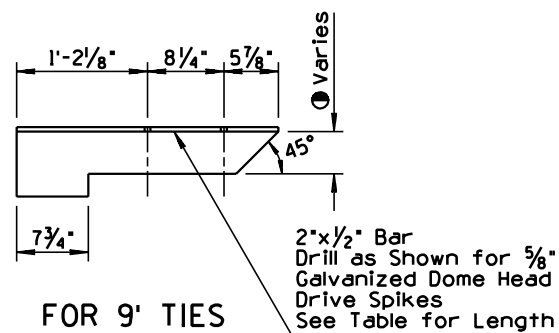
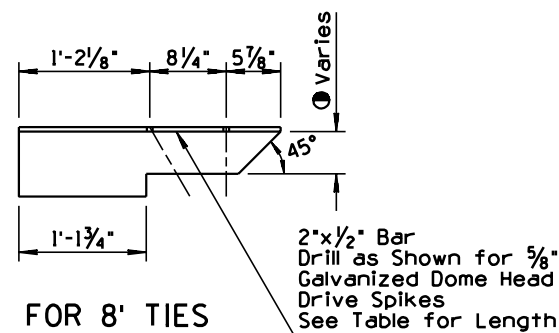
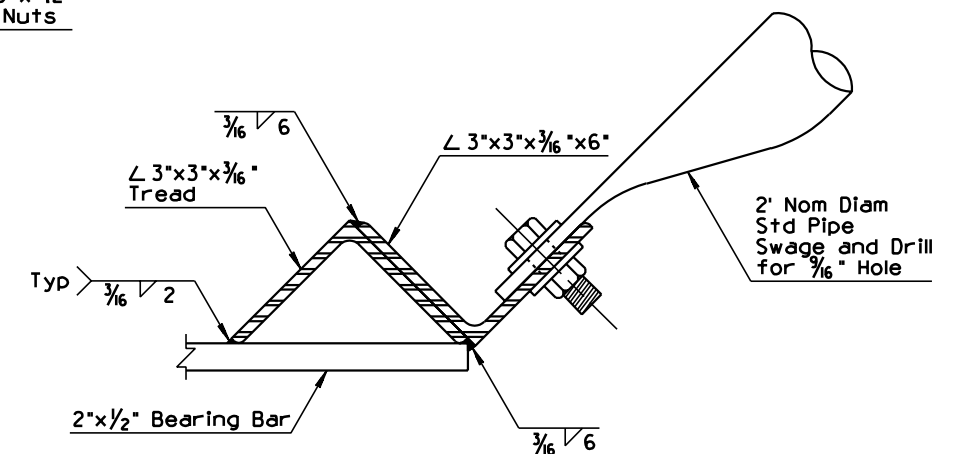
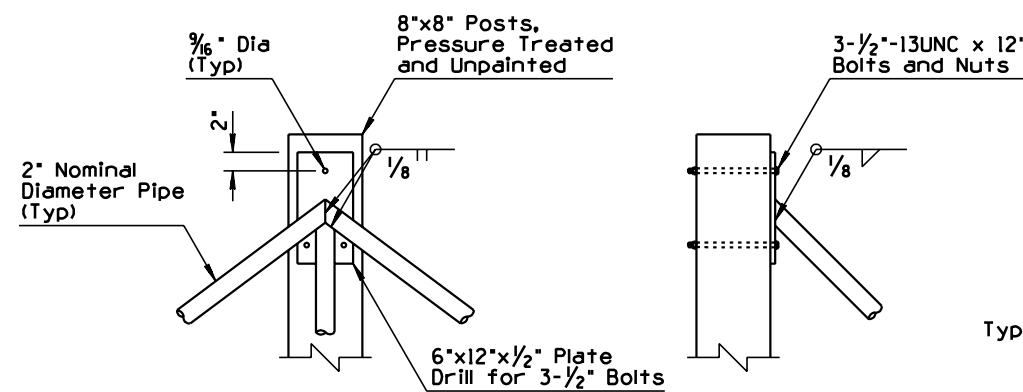
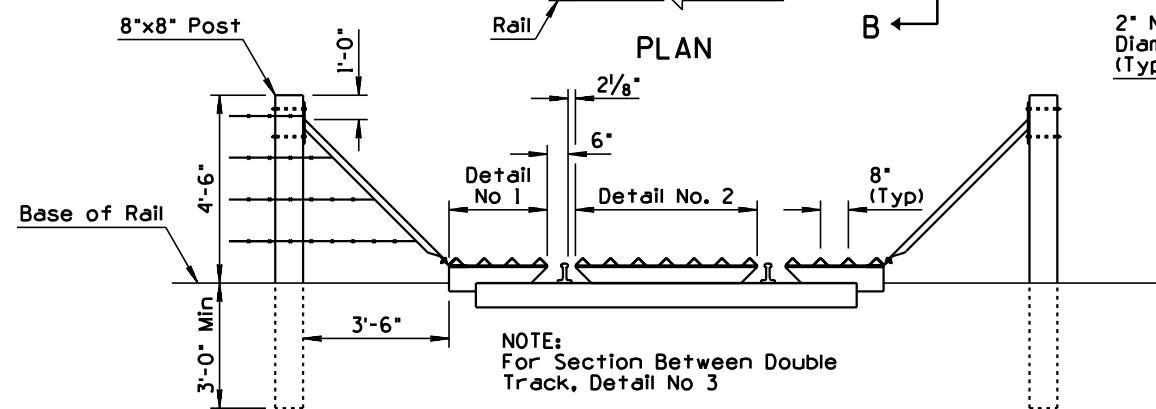
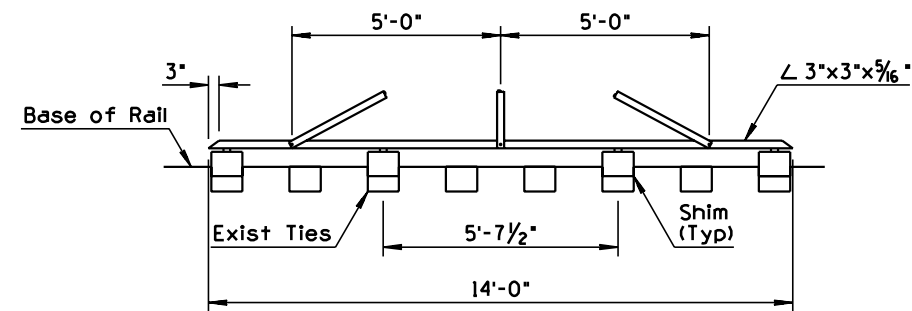
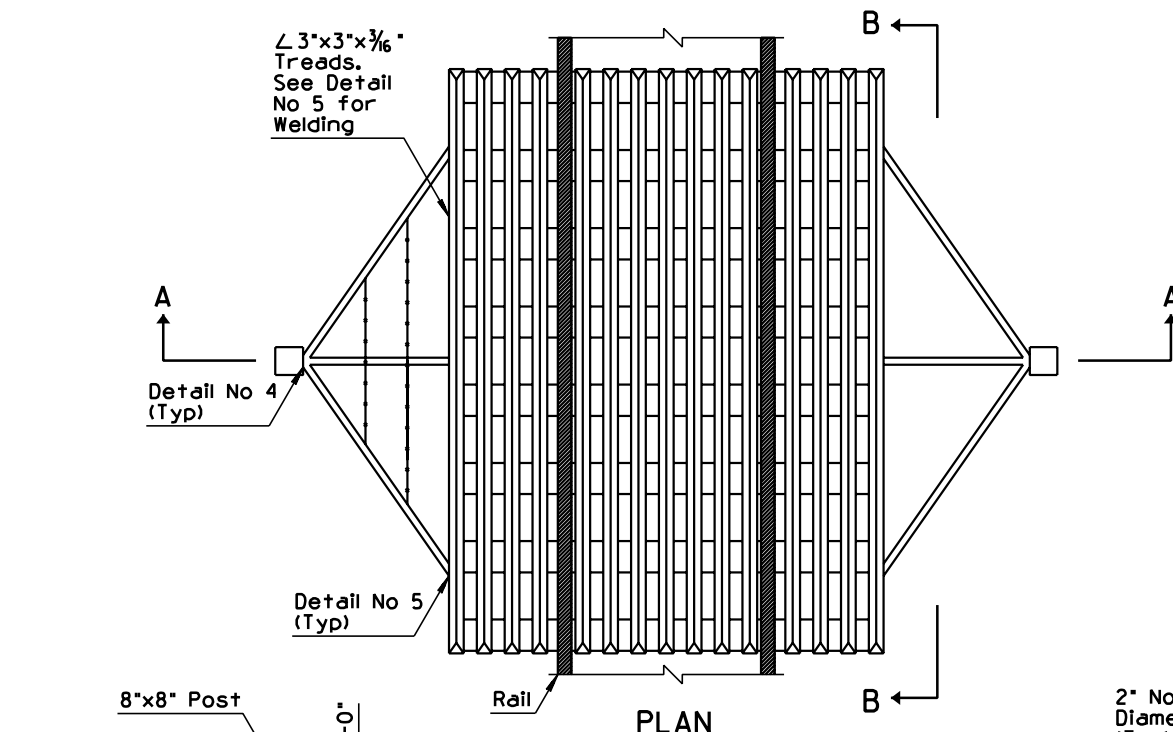
SECTION A-A



SECTION B-B

DESIGN APPROVED <i>Larry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CATTLE GUARD, DRAINAGE	DRAWING NO. C-11.20	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			

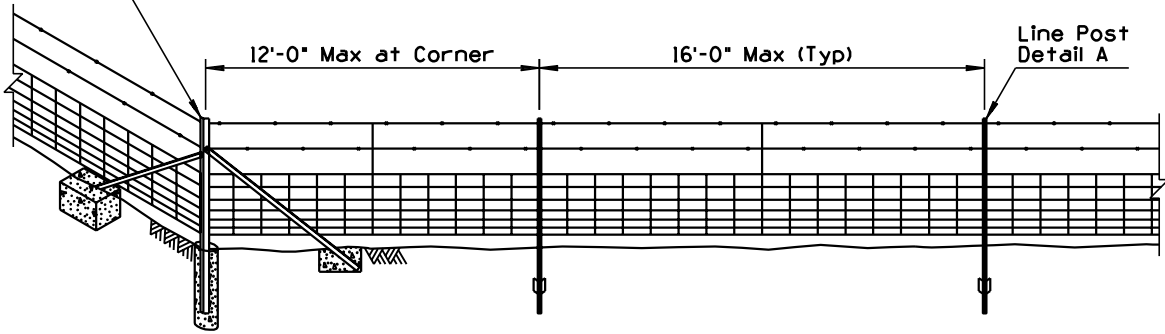


- ## GENERAL NOTES
1. This design applicable only to wood tie track construction. Wood shims shall be unpainted and cut from material meeting the specifications of the existing ties.
 2. 3"x3"x $\frac{3}{16}$ " treads, 2"x $\frac{1}{2}$ " bearing bars and 2" nominal diameter pipe wing assemblies shall be primed with one coat of No. 1 paint and finished with two coats of yellow enamel paint.

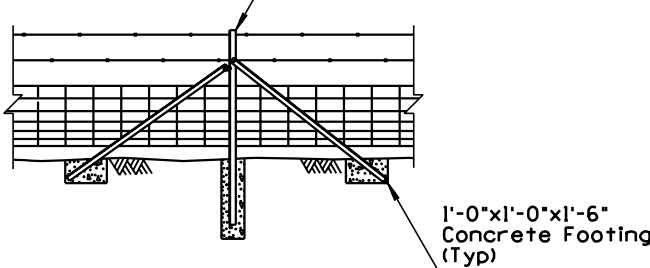
● SHIM HEIGHT						
RAIL LBS/YD						
80	90	110	115	119	131	150
2 1/4"	2 3/8"	3 1/2"	3 7/8"	4 1/16"	4 3/8"	4 9/16"
5/8" DIAMETER GALVANIZED DOME HEAD SPIKE LENGTH						
11"	11"	11"	11"	13"	13"	13"

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED ASTM CALLOUT	PNB	7/94
2			
3			
4			

Corner Post Assembly
Detail D

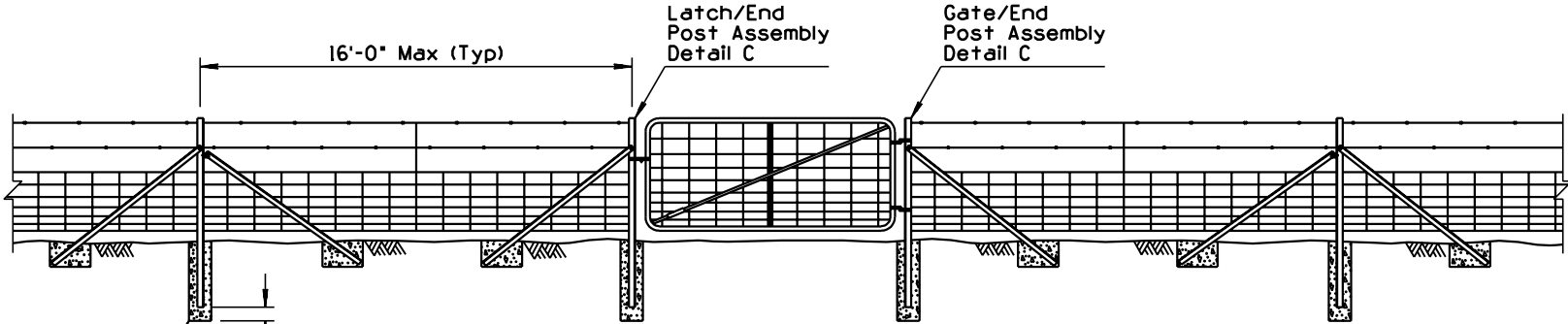


Intermediate Post Assembly
Detail B



Latch/End Post Assembly
Detail C

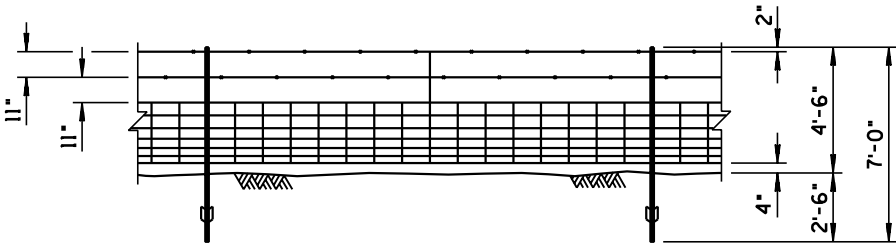
Gate/End Post Assembly
Detail C



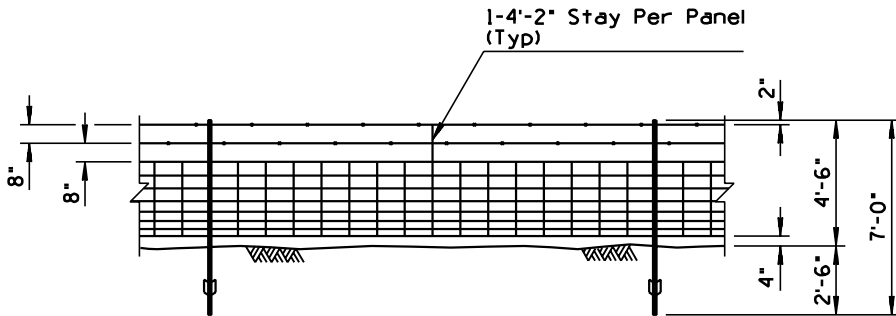
10" Diameter x 3'-0"
Concrete Footing
(Typ)

6" Typ

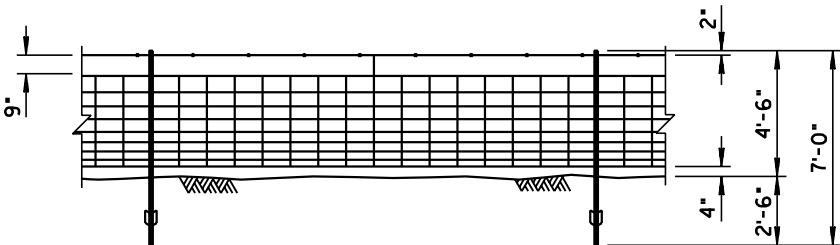
TYPICAL WOVEN WIRE FENCE INSTALLATION-TYPE 1 WW SHOWN



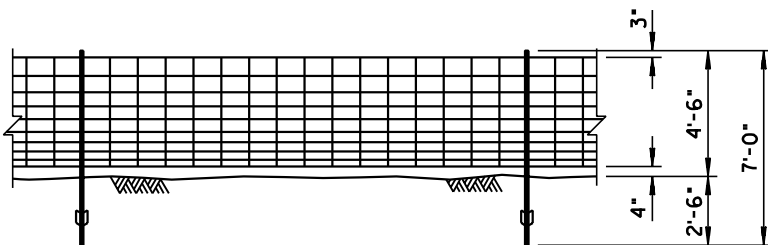
TYPE 1 WOVEN WIRE (WW)



TYPE 2 WOVEN WIRE (WW)



TYPE 3 WOVEN WIRE (WW)

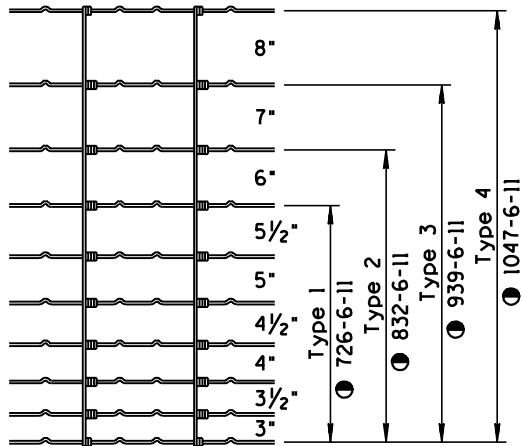


TYPE 4 WOVEN WIRE (WW)

GENERAL NOTES

- Length of post and braces shall not be less than 7'-0".
- Woven wire fence fabric shall be attached to the post at the top, bottom, and intermediate wires.
- Intermediate Post Assemblies shall be located as shown and at intervals to utilize standard rolls to minimize cutting and waste.
- A twisted wire stay shall be centered between posts.

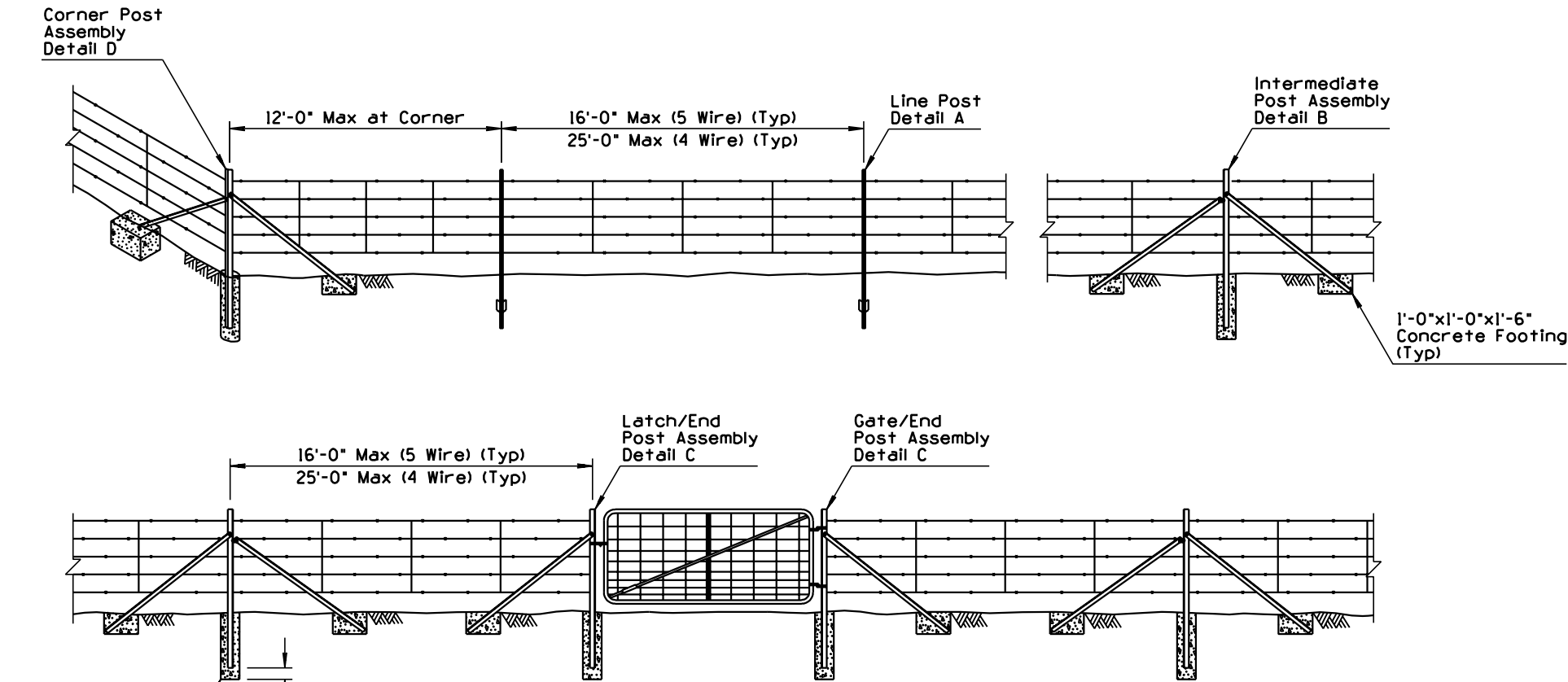
① ● ASTM design number



FENCE FABRIC DIMENSIONS AND DESIGN NUMBERS

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	FENCE, WOVEN WIRE	DRAWING NO. C-12.10 Sheet 1 of 5

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			



10" Diameter x 3'-0" Concrete Footing (Typ)

6" Typ

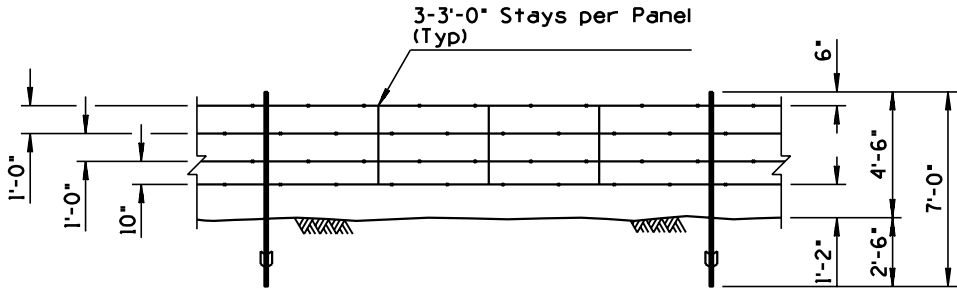
16'-0" Max (5 Wire) (Typ)
25'-0" Max (4 Wire) (Typ)

Latch/End Post Assembly Detail C

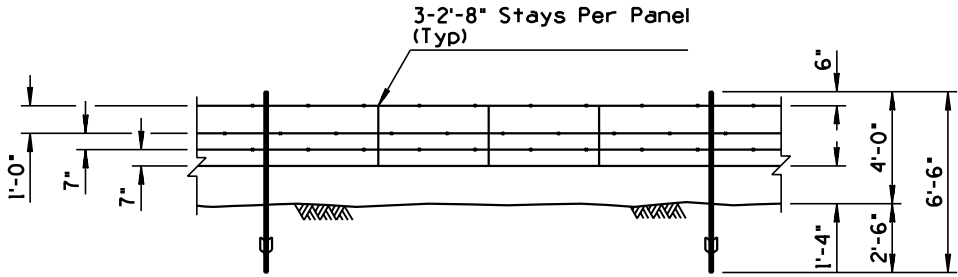
Gate/End Post Assembly Detail C

1'-0" x 1'-0" x 1'-6" Concrete Footing (Typ)

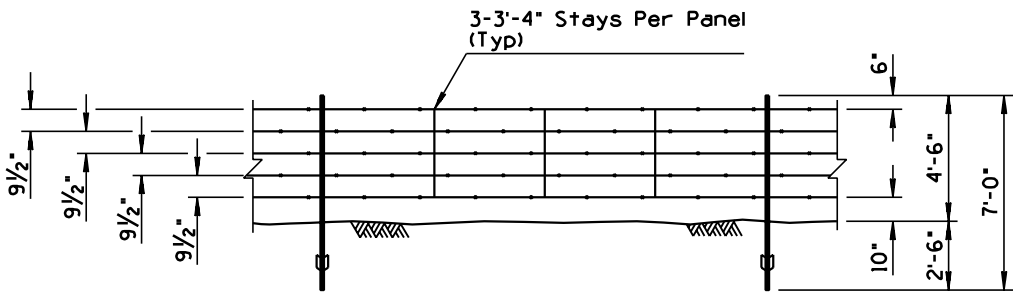
TYPICAL BARBED WIRE FENCE INSTALLATION-TYPE 2 BW SHOWN



TYPE 1 BARBED WIRE (BW) (4 WIRE)



BARBED WIRE GAME FENCE (GF)



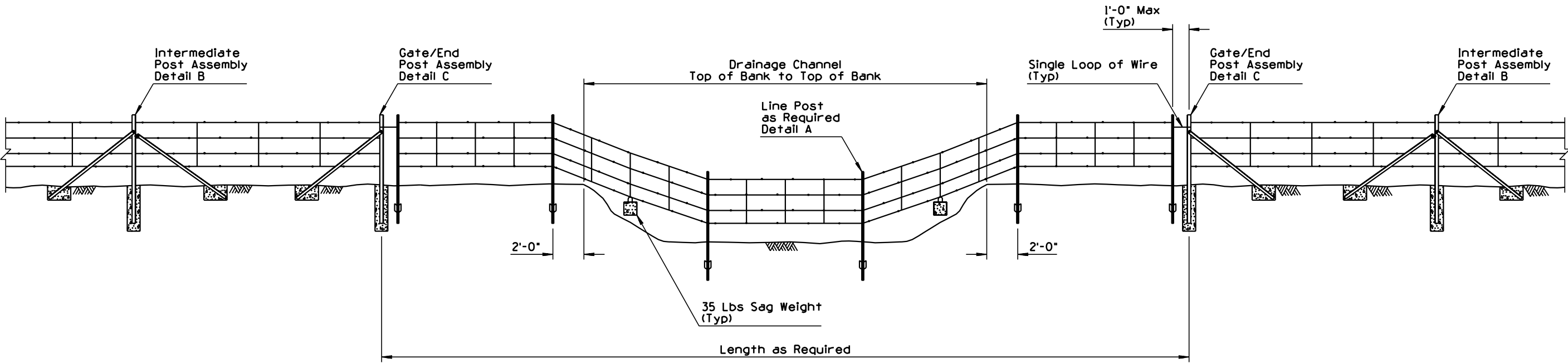
TYPE 2 BARBED WIRE (BW) (5 WIRE)

GENERAL NOTES

1. Intermediate Post Assemblies shall be located as shown and at intervals not to exceed 650', or midway between all braced posts.
2. For game fence the bottom wire shall be barbless.
3. The stays on game fence shall have their ends turned up, to prevent injuries to game.

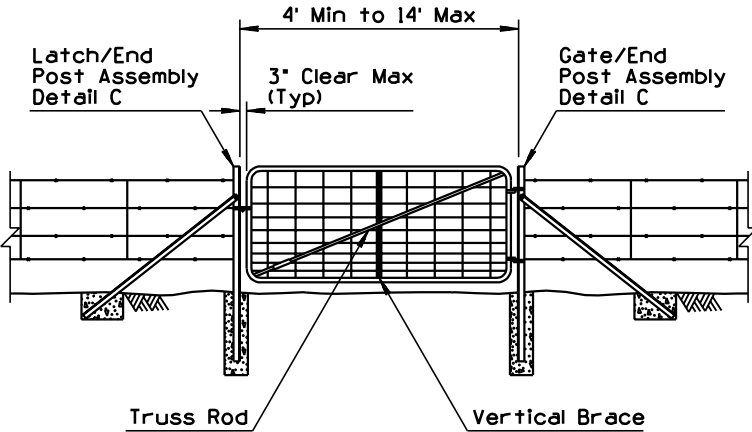
DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① FENCE, BARBED WIRE	DRAWING NO. C-12.10 Sheet 2 of 5

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

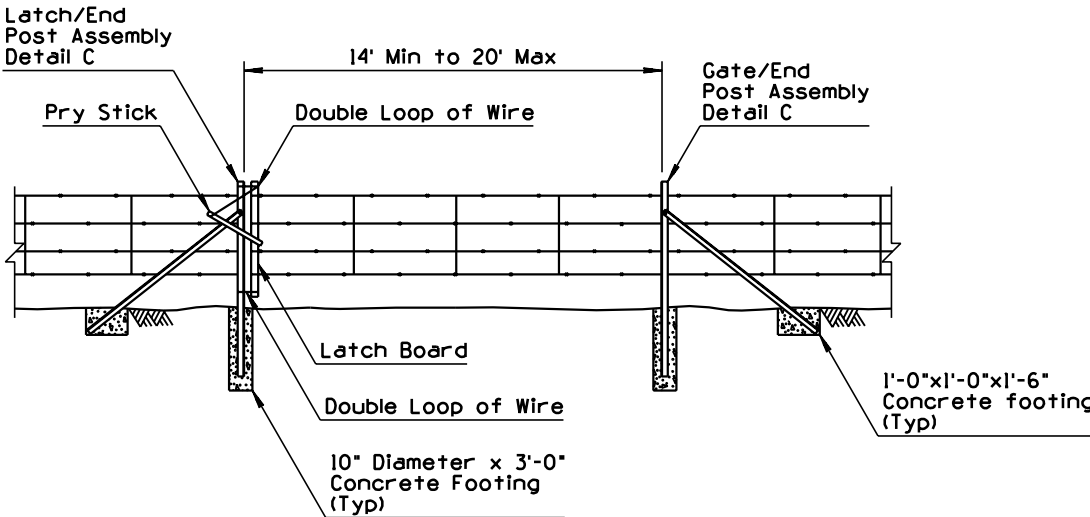
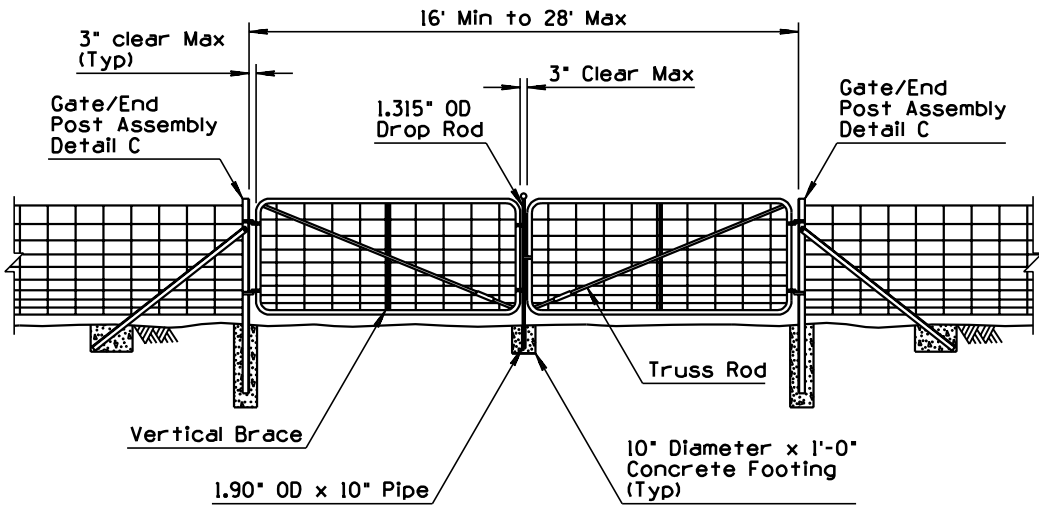


TYPE 1 DOUBLE GATE

FLOOD GATE



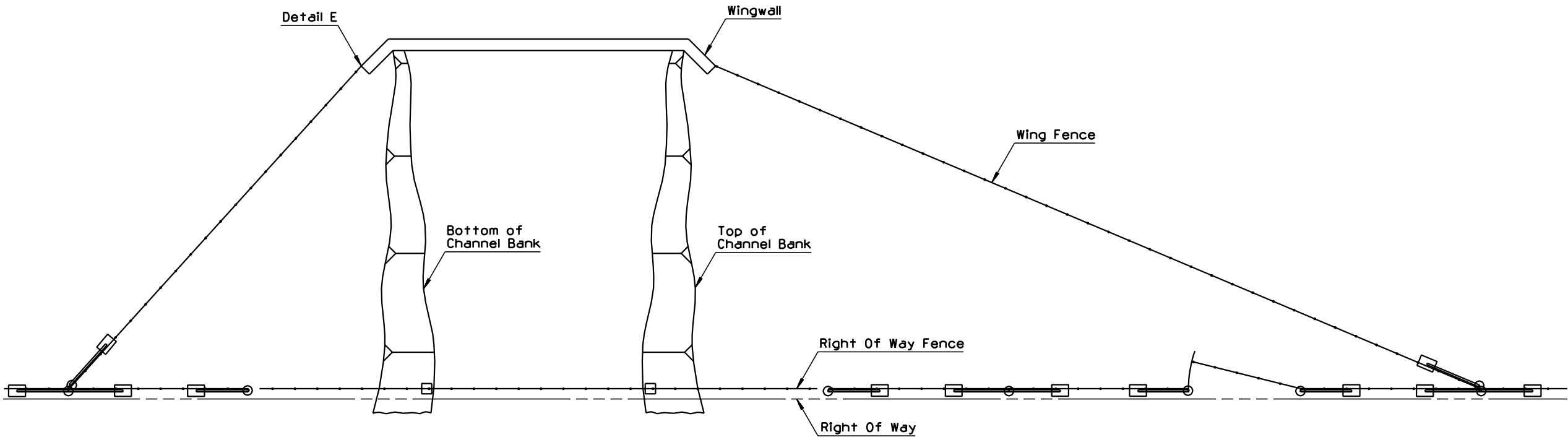
TYPE 1 SINGLE GATE



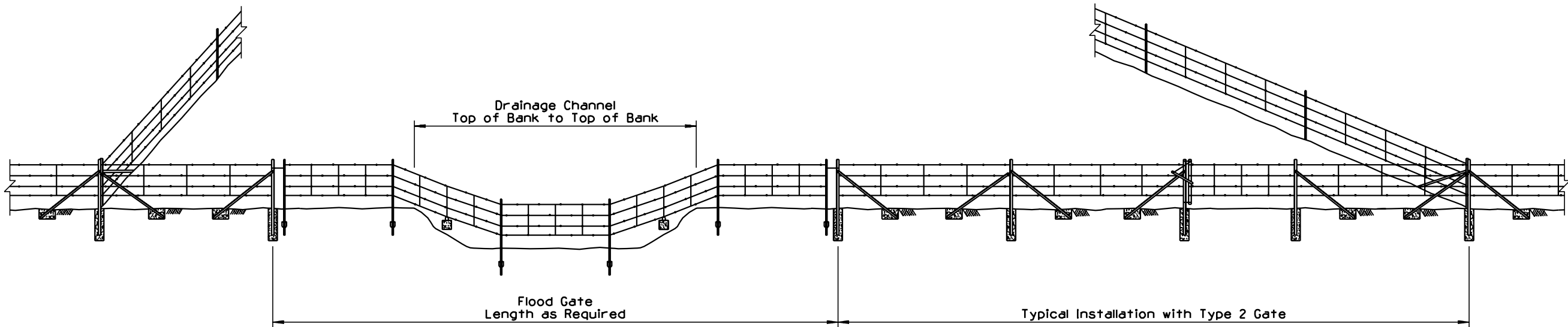
TYPE 2 GATE

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① FENCE, GATE, TYPE 1 AND 2 FLOOD GATE	DRAWING NO. C-12.10 Sheet 3 of 5

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			



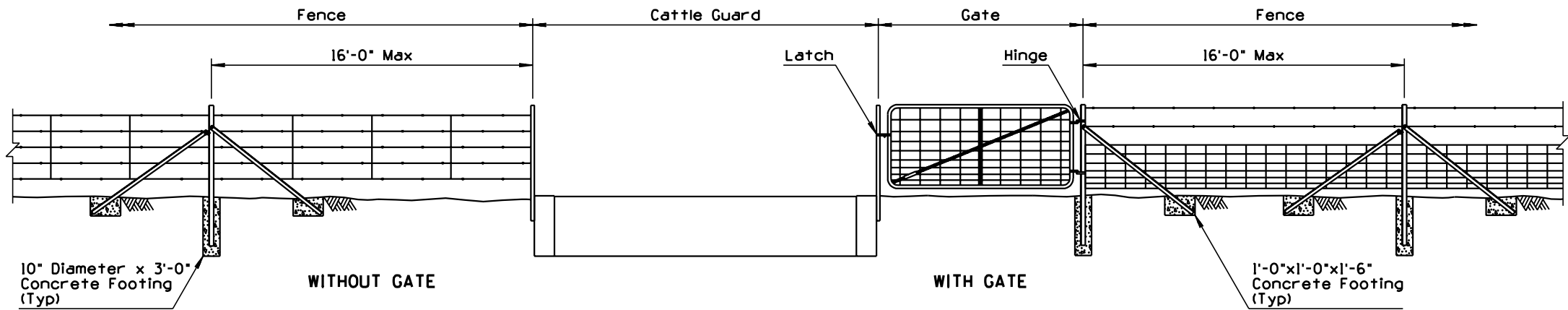
PLAN



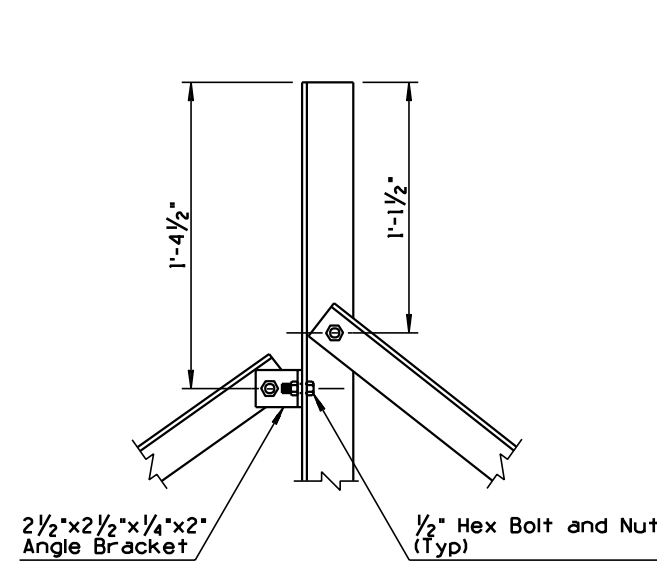
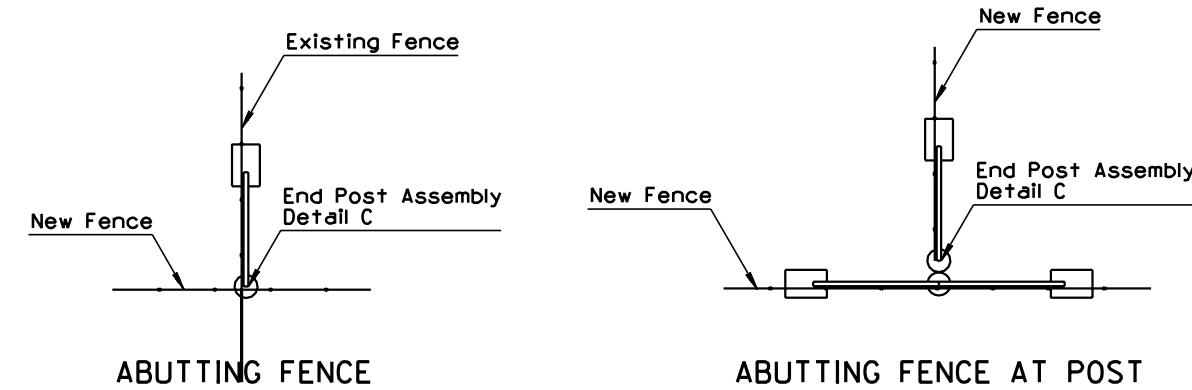
ELEVATION
TYPICAL FLOOD GATE INSTALLATION

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① FENCE, FLOOD GATE INSTALLATION	DRAWING NO. C-12.10 Sheet 4 of 5

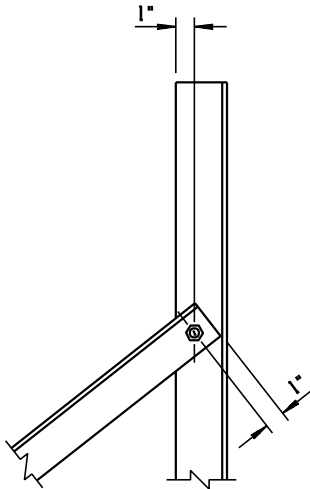
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			



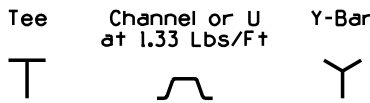
TYPICAL FENCE LOCATION AT CATTLE GUARD



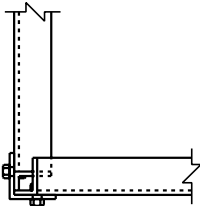
DETAIL B
INTERMEDIATE POST ASSEMBLY



DETAIL C
END POST ASSEMBLY

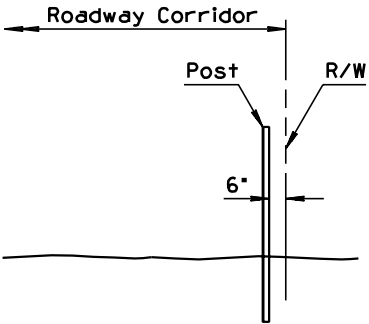


DETAIL A
TYPICAL CROSS SECTIONS
OF LINE POST SHAPES

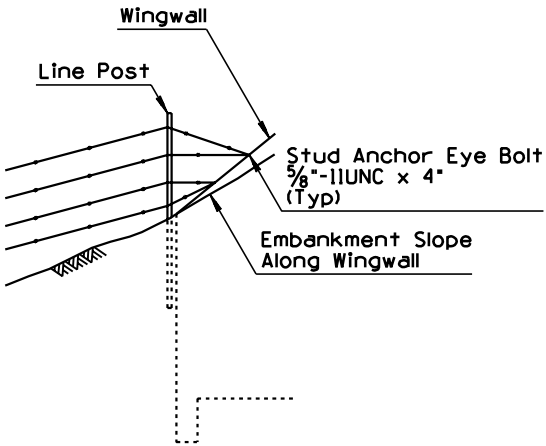


DETAIL D
CORNER POST ASSEMBLY

- GENERAL NOTES
- Post assemblies shall consist of an upright angle $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$ at 4.10 lbs/ft, and brace angles $2 \times 2 \times \frac{1}{4}$ at 3.19 lbs/ft.



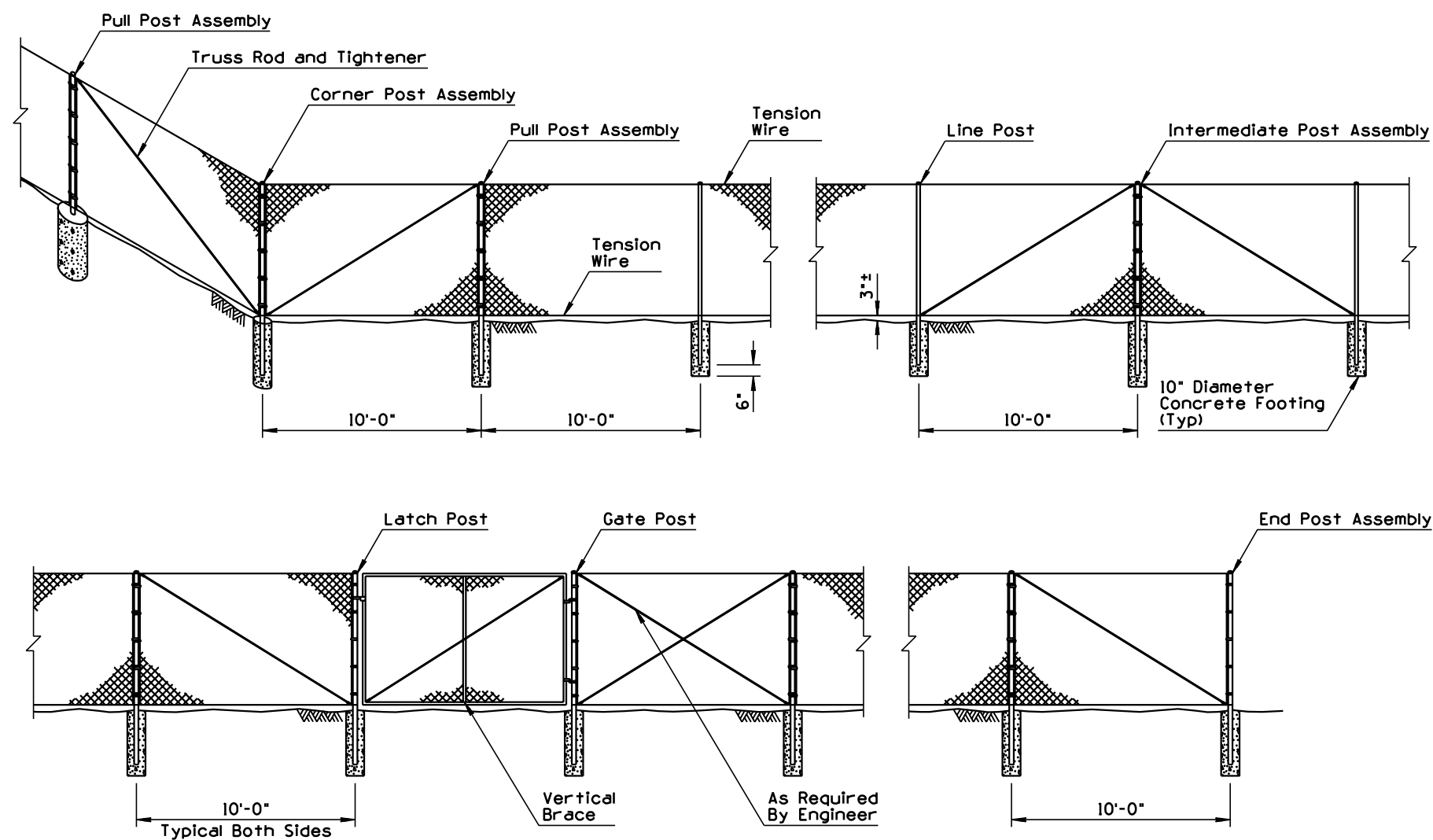
TYPICAL FENCE LOCATION



DETAIL E
FENCE CONNECTION TO WINGWALL

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① FENCE, MISCELLANEOUS DETAILS	DRAWING NO. C-12.10 Sheet 5 of 5

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED DIMENSION	PNB	3/94
2			
3			
4			



TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 1 SHOWN

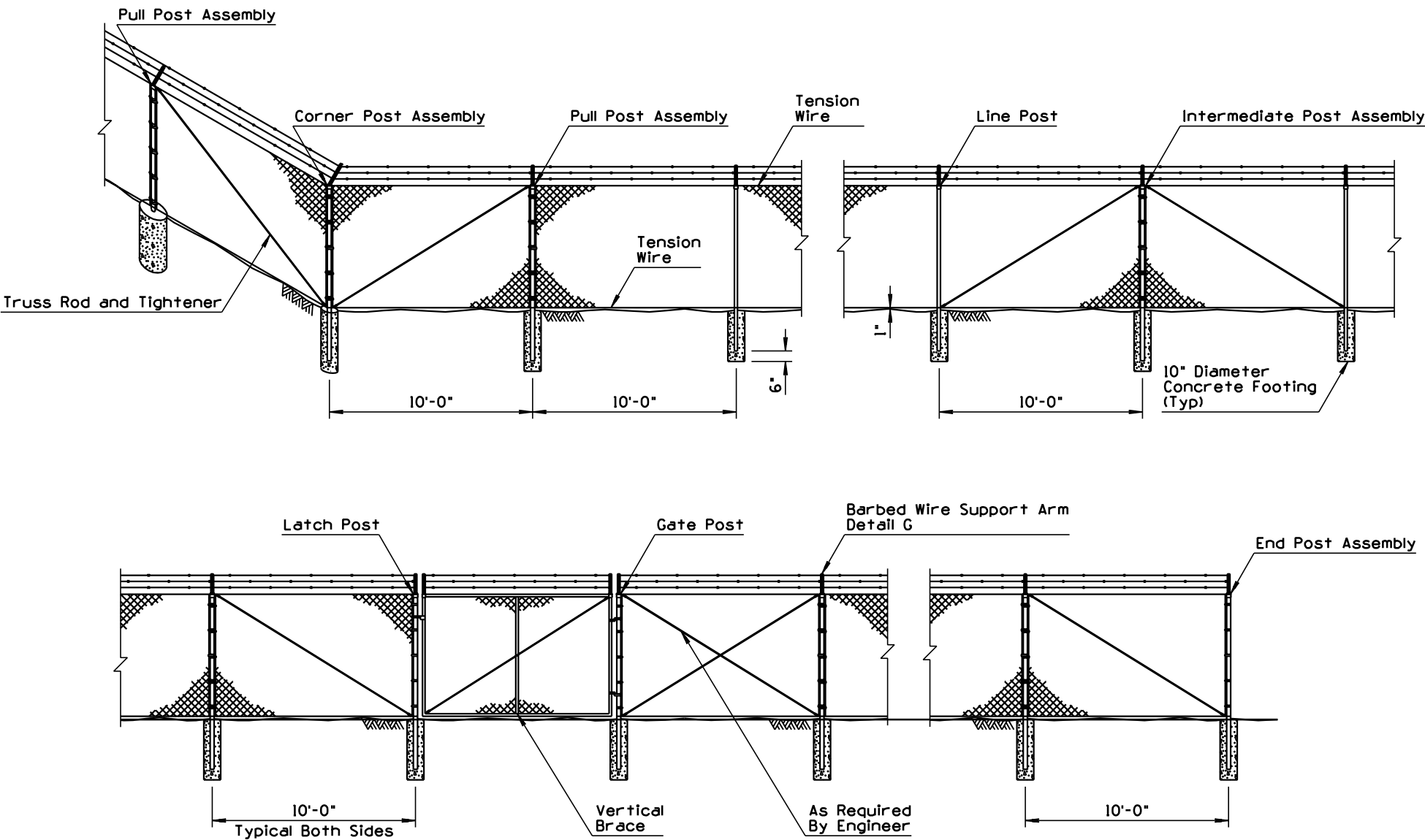
TYPICAL POST DIMENSIONS								
Fabric Height	Corner, End, Intermediate, Gate, Latch and Pull Posts					Line Posts		
	Length	Round	Roll Formed		Length	Round	Roll Formed	
		(OD)	L	□		(OD)	H-Section	□
36"	6'-0"	2.375"	3.50"x3.50"	2.25"x1.70"	5'-6"	1.900"	1.875"x1.625"	1.875"x1.625"
48"	7'-0"	2.375"	3.50"x3.50"	2.25"x1.70"	6'-6"	1.900"	1.875"x1.625"	1.875"x1.625"
60"	8'-0"	2.375"	3.50"x3.50"	2.25"x1.70"	7'-6"	1.900"	1.875"x1.625"	1.875"x1.625"
72"	9'-0"	2.375"	3.50"x3.50"	2.25"x1.70"	8'-6"	1.900"	1.875"x1.625"	1.875"x1.625"
Over 72"	Height +3'-0"	2.875"	3.50"x3.50"	2.50"x2.50"	Height +2'-6"	2.375"	2.250"x2.000"	1.875"x1.625"

GENERAL NOTES

1. Posts shall be round, H-section, or roll-formed and shall conform to the nominal dimensional requirements shown on the plans. Dimensional tolerances for all shapes shall be according to ASTM A-500. In addition, the material of which posts are fabricated shall have a nominal thickness, before galvanizing, of not less than 0.111" for line posts and 0.130" for terminal posts.
2. Chain link fabric shall be either zinc-coated or aluminum-coated steel wire fence fabric. Zinc-coated steel fabric shall conform to the requirements of ASTM A392, Class 1 coating. Aluminum-coated steel fabric shall conform to the requirements of ASTM A491, with a minimum weight of coating of 0.40 ounce per square foot of wire surface area. Fabric shall be 11 gauge for all fence fabric 60 inches or less in height and shall be 9 gauge for fabrics greater than 60 inches in height.
3. Tension wires shall be 7 gauge (0.177 inch diameter) coil spring steel wire with a minimum tensile strength of 75,000 pounds per square inch and shall be zinc-coated or aluminum-coated.
4. Truss rods shall be 3/8 inch diameter adjustable rods. Truss tighteners shall have a strap thickness of not less than 1/4 inch.
5. Stretcher bars shall be 3/16 inch by 3/4 inch steel flat bars. Stretcher bar bands shall be 1/8 inch by one inch preformed steel bands.
- ① 6. Bottom tension wire shall be 3 inches from top of crown on concrete footings.
7. Intermediate post assemblies shall be spaced at 500 foot intervals or midway between pull posts when the distance between such posts is less than 1,000 feet and more than 500 feet.
8. See sheet 3 of 3 for typical fence location.

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 3/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	FENCE, CHAIN LINK TYPE 1	DRAWING NO. C-12.20 Sheet 1 of 3

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED DIMENSION	PNB	3/94
2			
3			
4			

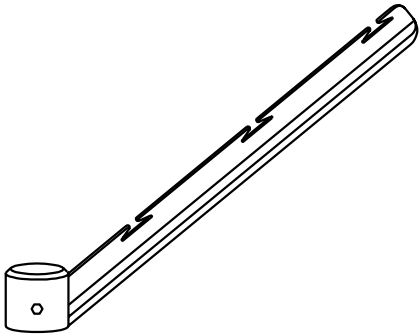


TYPICAL CHAIN LINK FENCE INSTALLATION - TYPE 2 SHOWN

TYPICAL POST DIMENSIONS								
Fabric Height	Corner, End, Intermediate, Gate, Latch and Pull Posts				Line Posts			
		Round	Roll Formed			Round	Roll Formed	
	Length	(OD)	⌒	□	Length	(OD)	H-Section	□
72"	① 8'-6"	2.375"	3.50"x3.50"	2.50"x2.50"	8'-0"	1.900"	1.875"x1.625"	1.875"x1.625"

GENERAL NOTES

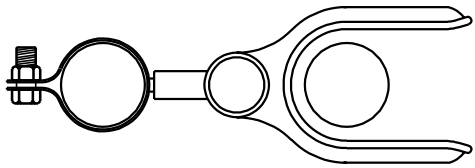
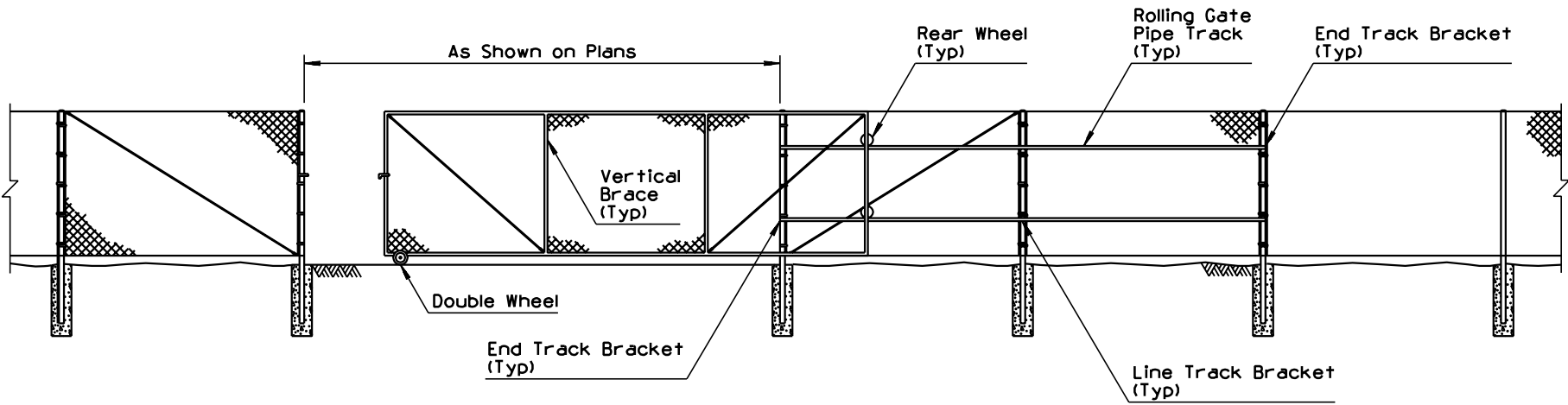
1. Barbed wire for use with Type 2 chain link fence shall be 12 guage steel wire with 4 point 14 guage barbs spaced five inches apart and shall be either zinc-coated or aluminum-coated. Zinc-coated steel wire shall conform to the requirements of ASTM A121, Class 1 coating. Aluminum-coated steel wire shall conform to the requirements of ASTM 1585, Type 1, Class 1 coating.
2. Barbed wire support arm shall be of the type shown on the plans, shall be fabricated from commercial quality steel, and shall be zinc-coated in accordance with the requirements of AASHTO M111.
3. Bottom tension wire shall just clear top of crown on concrete footings.
4. For details and notes not shown - see chain link fence Type 1, sheet 1 of 3.
5. See sheet 3 of 3 for typical fence location.



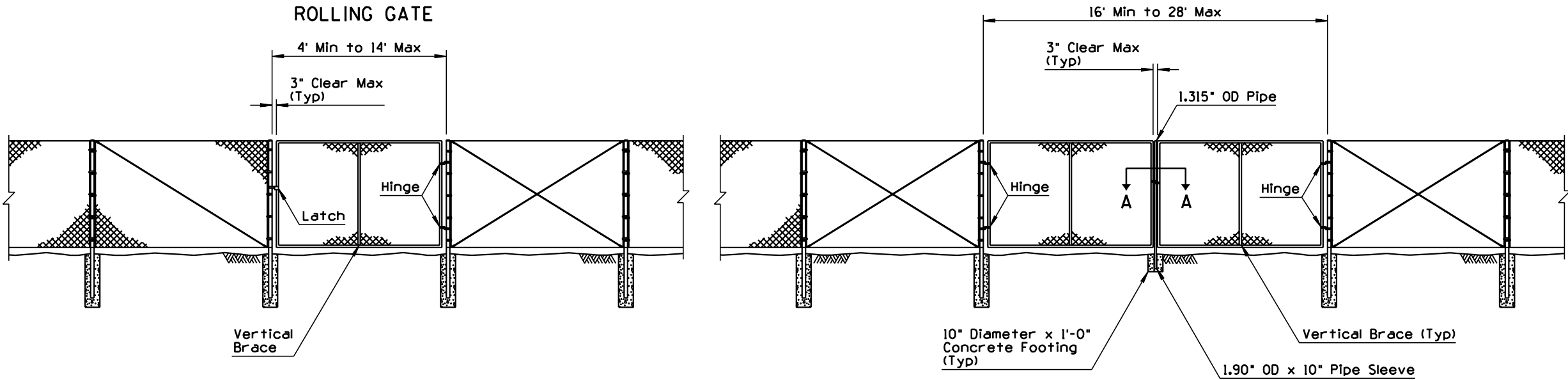
DETAIL G
BARBED WIRE SUPPORT ARM

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 3/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. FENCE, CHAIN LINK TYPE 2 C-12.20 Sheet 2 of 3

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED DRAWING	PNB	3/94
2			
3			
4			



SECTION A-A
DOUBLE GATE LATCH ASSEMBLY

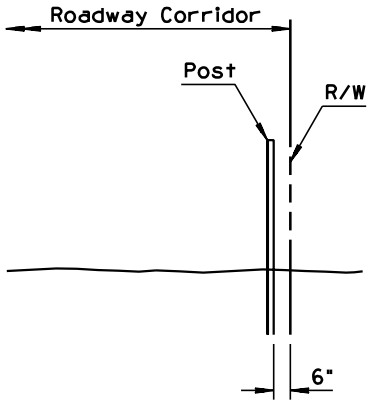


SINGLE GATE



DOUBLE GATE

TYPICAL GATE DIMENSIONS									
SINGLE AND DOUBLE SWING GATES						ROLLING GATES			
Gate Leaf Width	Vertical Braces	Gate Post Size	Gate Leaf Width	Vertical Braces	Gate Post Size	Gate Leaf Width	No of Equally Spaced Vertical Braces	Tension Rods Per Braced Panel	Gate Post Size
6' H or Less		OD	Over 6' H		OD				OD
3' to 8'	0	2.8750"	3' to 8'	0	2.8750"	6' to 13'	1	0	2.8750"
8' to 16'	1	4.0000"	8' to 16'	1	4.0000"	13' to 16'	1	1	2.8750"
16' to 18'	2	4.0000"				16' to 21'	2	1	2.8750"
						21' to 27'	2	1	2.8750"
						28' and Larger	3	1	2.8750"

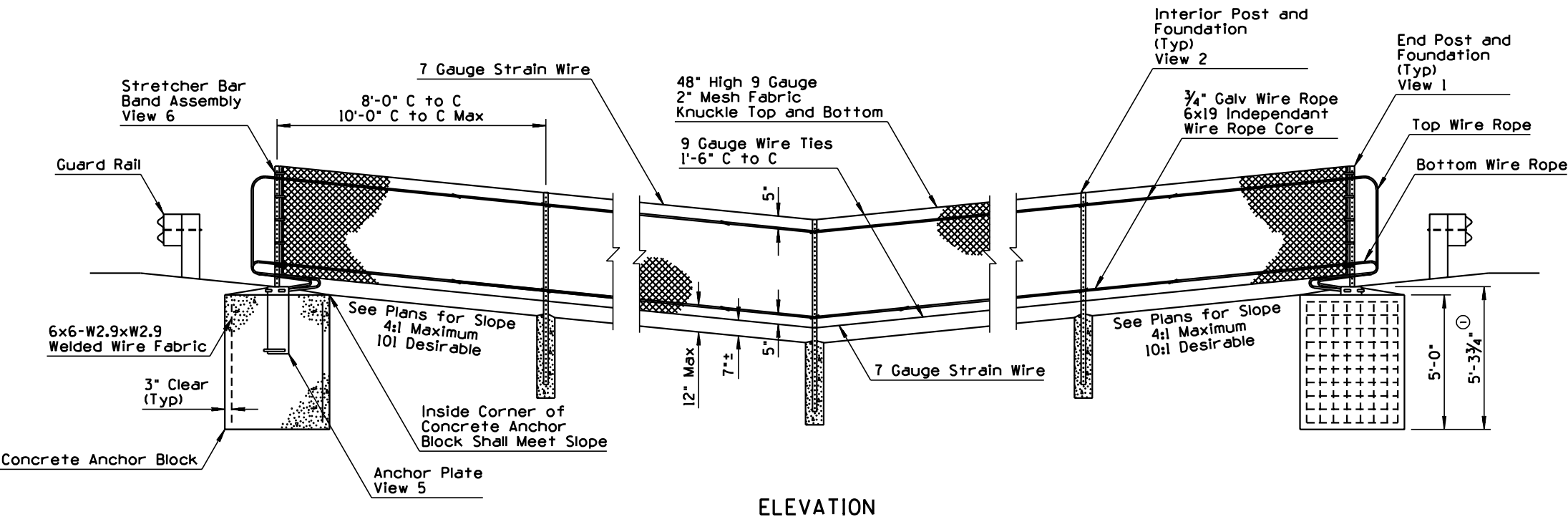
GATES FOR CHAIN LINK FENCE - TYPE 1 SHOWN
(Type 2, With Barbed Wire Typical)



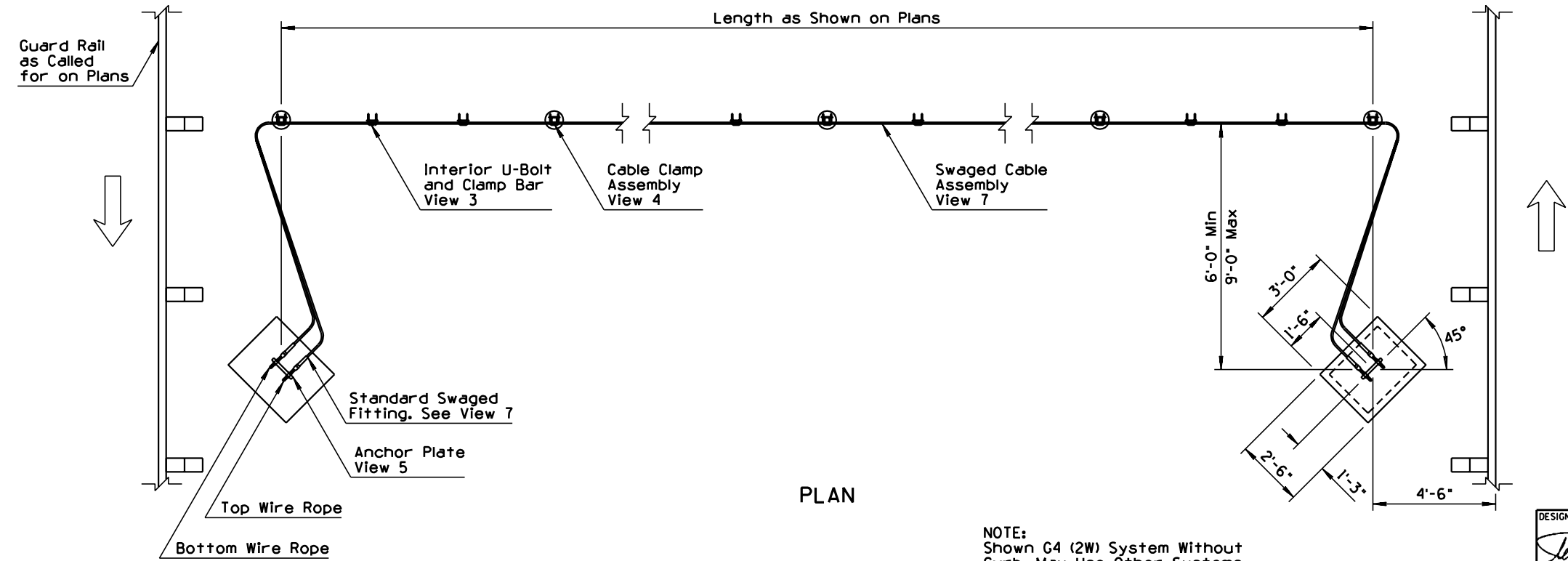
① TYPICAL FENCE LOCATION

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 3/94
APPROVED FOR DISTRIBUTION 	FENCE, CHAIN LINK GATES	DRAWING NO. C-12.20 Sheet 3 of 3	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SPECIFICATION REFERENCE	PNB	10/95
2			
3			
4			



ELEVATION



PLAN

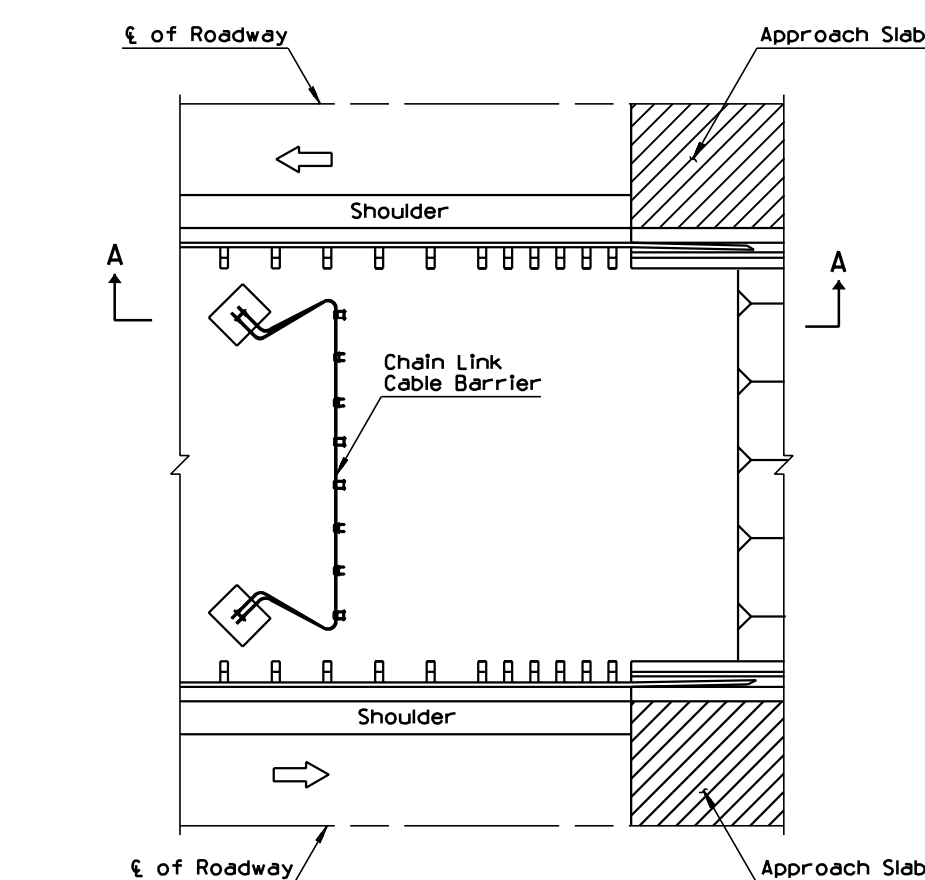
NOTE:
Shown G4 (2W) System Without
Curb. May Use Other Systems
With or Without Curb.

GENERAL NOTES

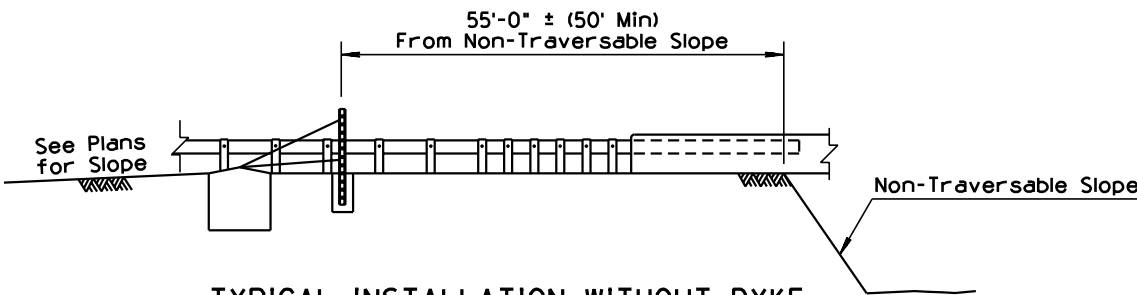
1. All concrete shall be Class S, 4000 psi.
2. All bolts, nuts, washers and fittings shall meet the dimensional requirements of the American National Standards Insittute, unless otherwise designated and shall be galvanized in accordance with ASTM A153.
3. Galvanized swaged fitting and U-Bolt shall conform to ASTM A449.
4. The 3/4" galvanized wire rope shall conform to AASHTO M30 Class B, Type 2.
5. The wire fabric, ties, bands, stretcher bars, and other fittings and hardware shall conform to AASHTO M181.
6. The wire fabric fence shall follow contour of the graded median.
7. The excavation for the concrete anchor blocks shall be to neat lines. Maximum excess shall be 3".
- ① 8. Perforated posts shall be square tube formed from 0.105" USS guage ASTM A 366/A 366M cold rolled carbon steel. The square tubes shall be welded directly in the corner by high frequency resistance welding or equal. The posts to be externally scarfed to agree with standard corner radii of 5/32" ± 1/16".
- ① 9. Perforated posts shall be galvanized to the requirements of ASTM A 653/A 653M. Coating Designator shall be Z275.
10. The cables shall have enough tension to prevent sagging. The location of the concrete anchor blocks may also be varied to provide enough tension to help prevent sagging.
11. Two interior U-bolt and clamp bars shall be spaced at 1/3 of the distance between posts.
12. See Standard C-12.20 for 48" fabric details.
13. An alternate to rectangular concrete anchor block shall be a 36" diameter round footing with an additional depth of 4".
14. The median approach grade within 100'± of the Chain Link Cable Barrier should not exceed a grade break of 10 percent.

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CHAIN LINK CABLE BARRIER	DRAWING NO. C-12.30 Sheet 1 of 3

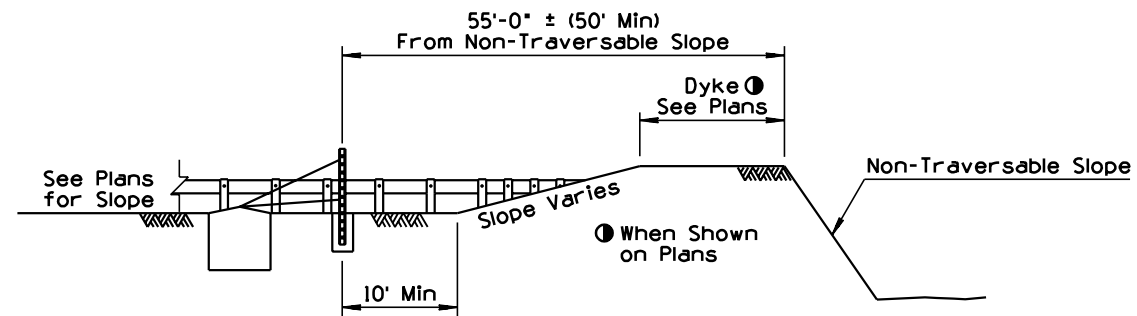
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
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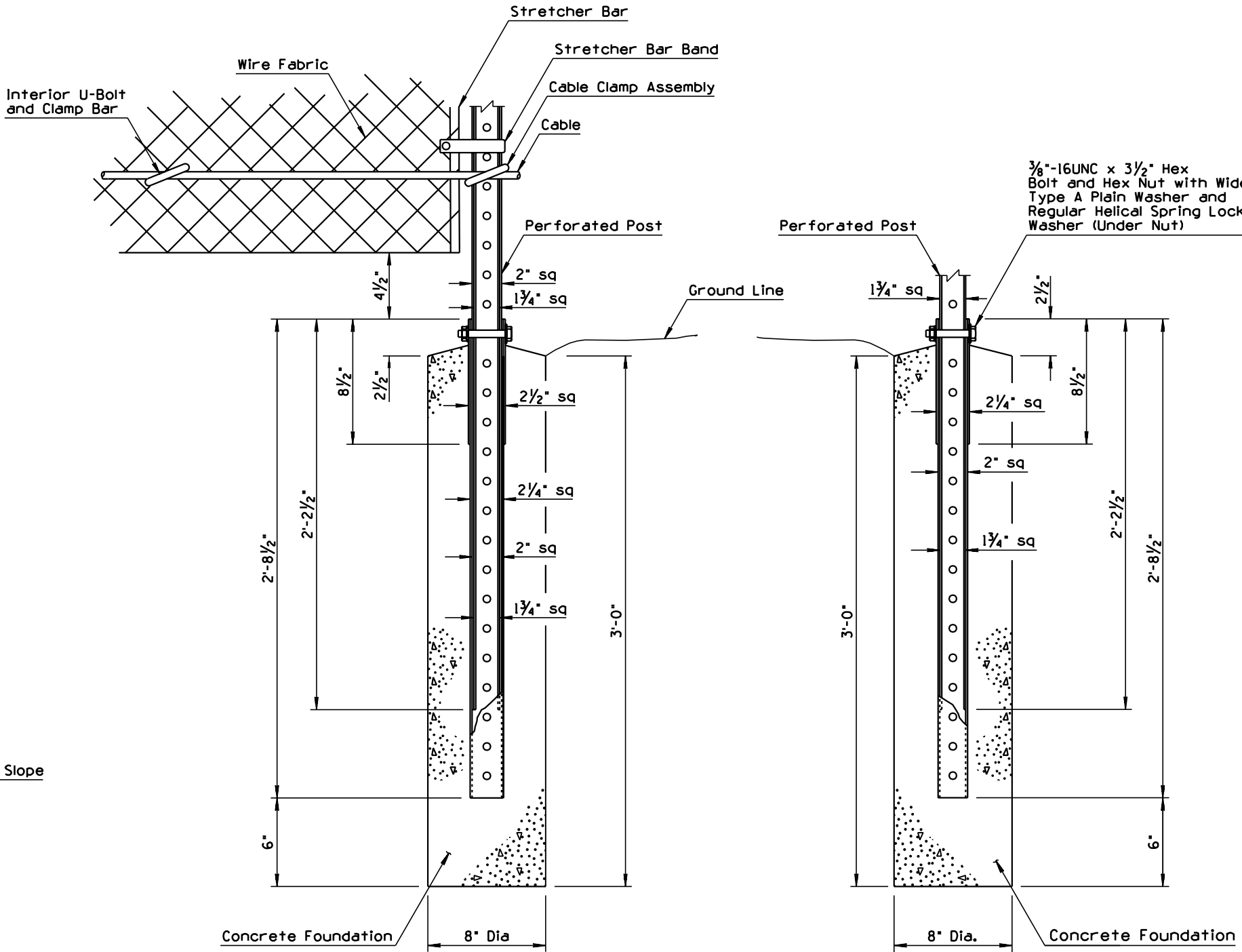
PLAN



TYPICAL INSTALLATION WITHOUT DYKE



SECTION A-A
TYPICAL INSTALLATION WITH DYKE

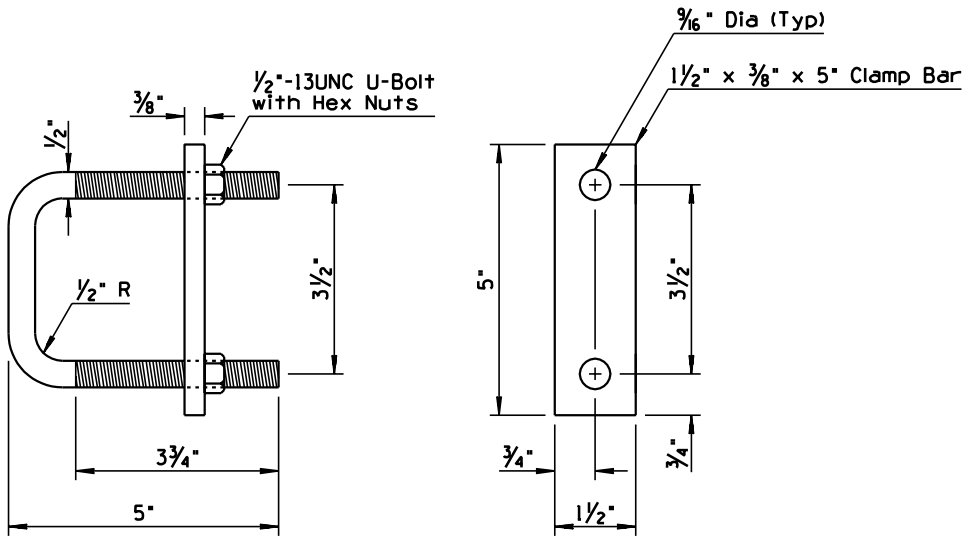


VIEW 1
END POST AND FOUNDATION

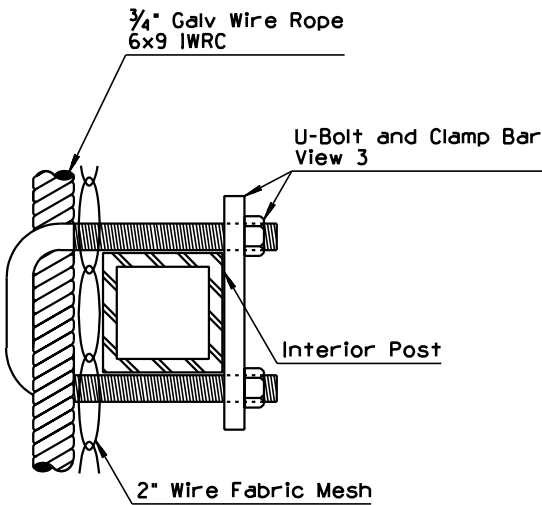
VIEW 2
INTERIOR POST AND FOUNDATION

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① CHAIN LINK CABLE BARRIER	DRAWING NO. C-12.30 Sheet 2 of 3

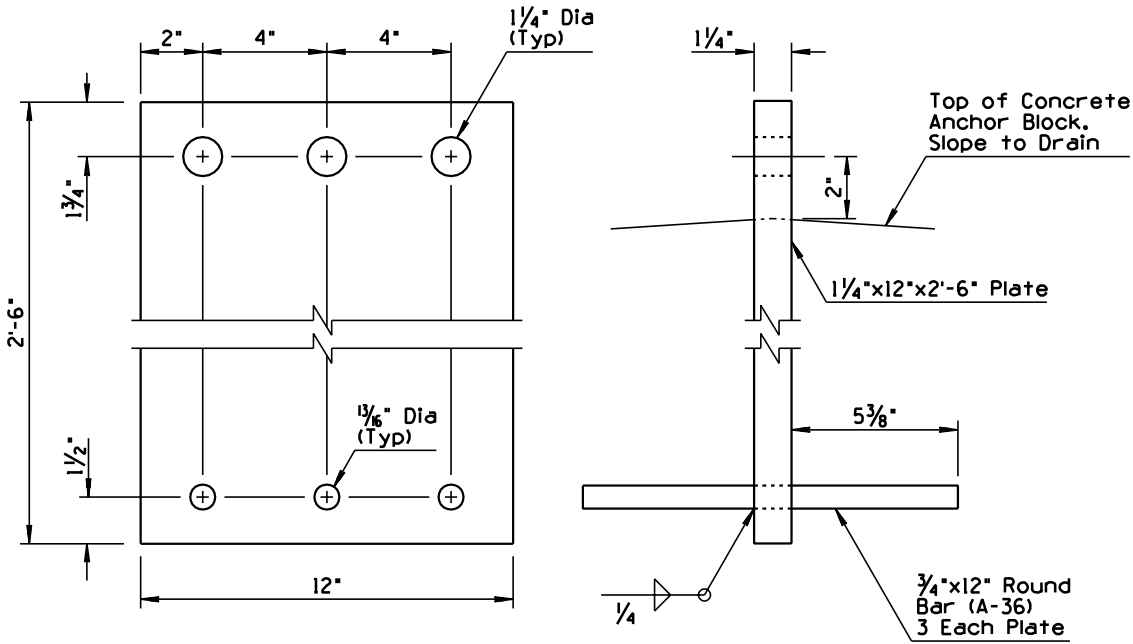
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			



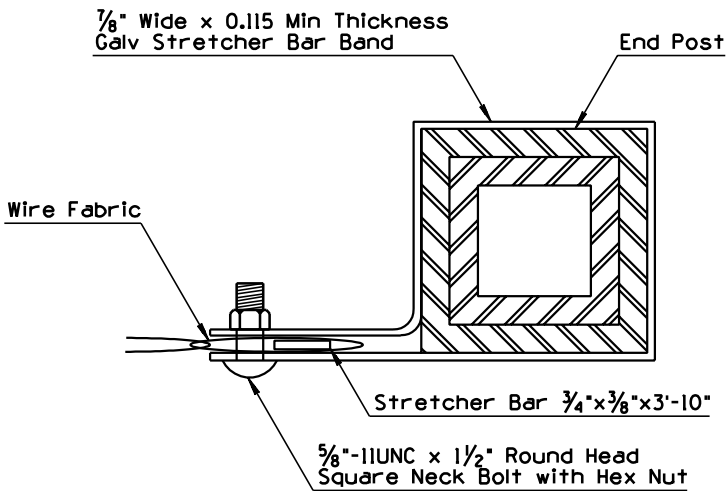
VIEW 3
U-BOLT AND CLAMP BAR



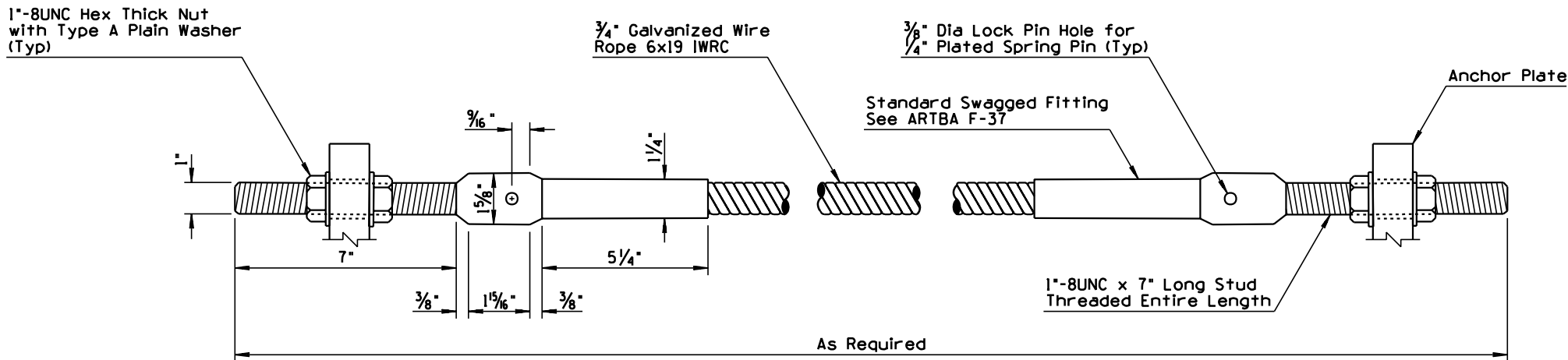
VIEW 4
CABLE CLAMP ASSEMBLY



VIEW 5
ANCHOR PLATE



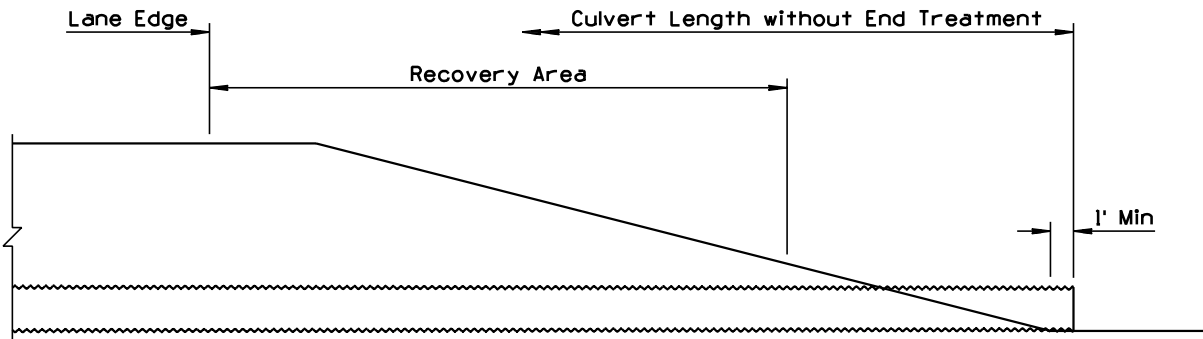
VIEW 6
STRETCHER BAR BAND ASSEMBLY



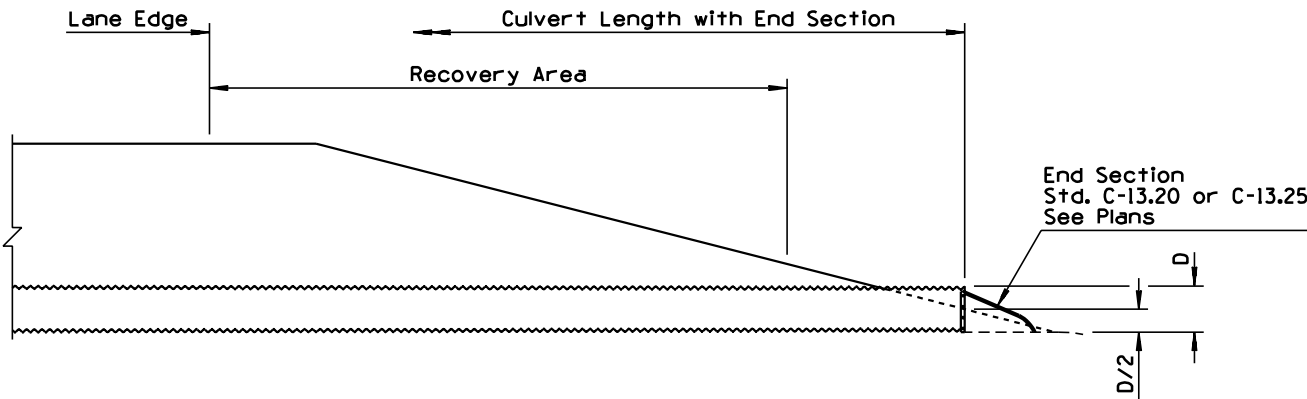
VIEW 7
SWAGED CABLE ASSEMBLY

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① CHAIN LINK CABLE BARRIER	DRAWING NO. C-12.30 Sheet 3 of 3

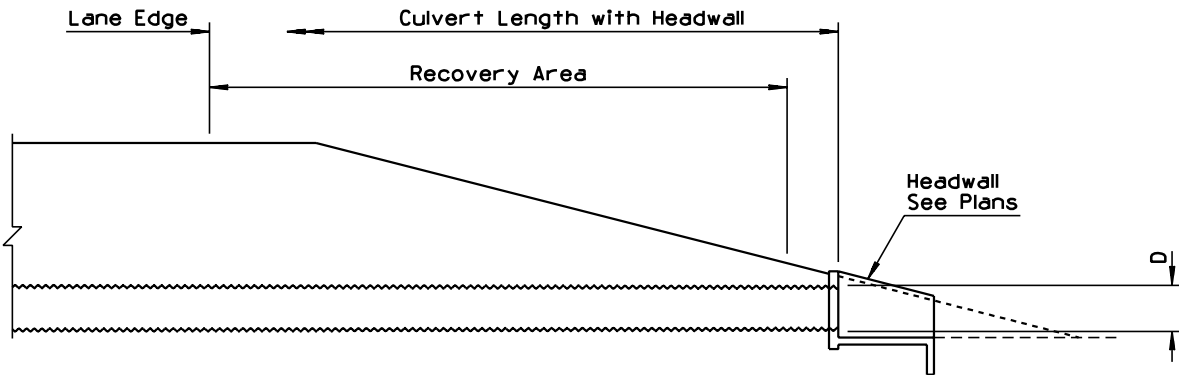
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTE	PNB	10/95
2			
3			
4			



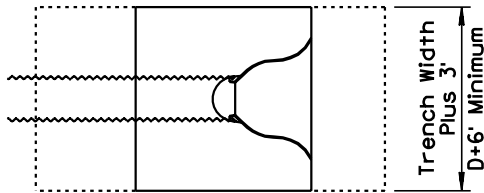
CULVERT INSTALLATION WITHOUT END TREATMENT



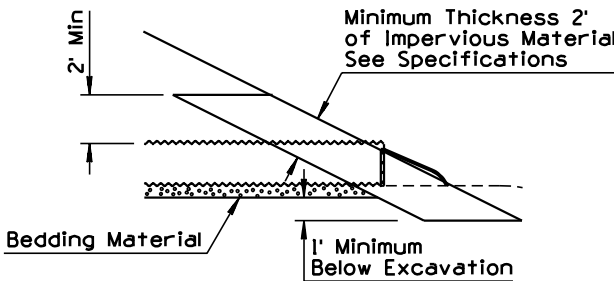
CULVERT INSTALLATION WITH END SECTION



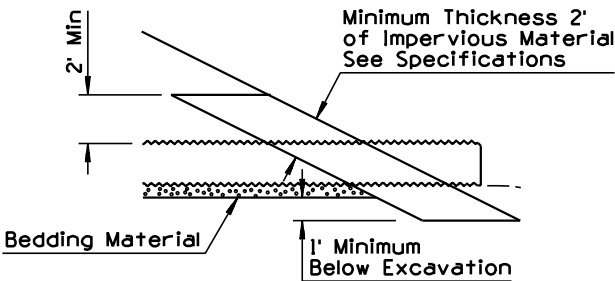
CULVERT INSTALLATION WITH HEADWALL



PLAN

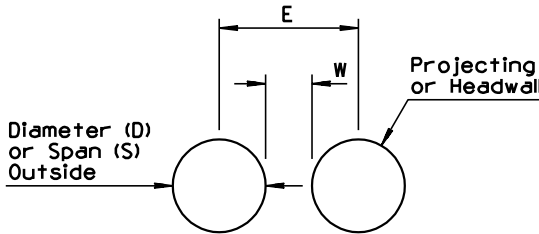


ELEVATION WITH END SECTION



ELEVATION

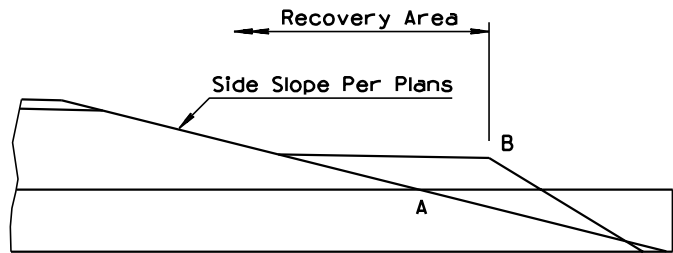
PLATING SLOPES AT PIPE LOCATIONS



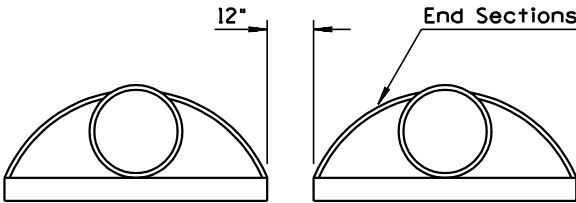
MINIMUM SPACING FOR MULTIPLE INSTALLATIONS

Diameter or Span	Installation Type	
	Projecting (W)	Headwall (E)
18"	12"	2'-6"
24"	12"	3'-0"
30"	15"	3'-9"
36"	18"	4'-6"
42"	21"	5'-3"
48" to 66"	(D or S)/2	D + 36"
72" and Over	36"	D + 36"

MULTIPLE INSTALLATIONS WITHOUT END SECTIONS



PIPE BERM REQUIREMENT DETAIL

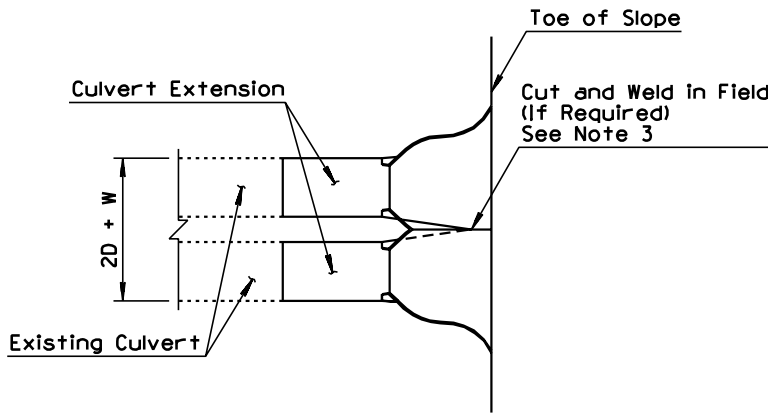


MULTIPLE INSTALLATIONS WITH END SECTIONS

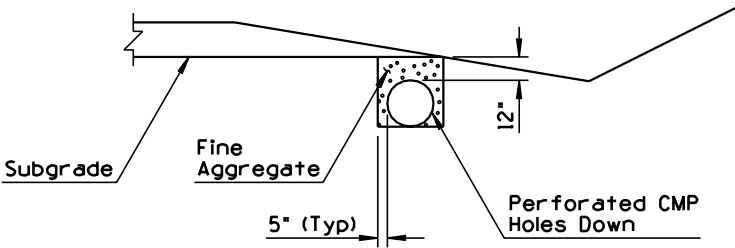
- See plans for any required inlet and/or outlet protection.
- See remaining C-13 Series standards, Std B-11.11 and Std B-11.14.
- Dimensions W and E apply to both non-trench and trench conditions.
- Minimum cover over pipe culverts shall be 12", measured from the top of pipe.
- See Pipe Berm Requirement Detail for pipe berm requirements and Std C-03.10 for installation. If Point A is within the recovery area, then a pipe berm is required and Point B is set at the edge of the recovery area.
- Plating of slopes at pipe locations similar for pipes without end sections and for multiple pipe installations.

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	PIPE CULVERT INSTALLATION	DRAWING NO. C-13.10 Sheet 1 of 2

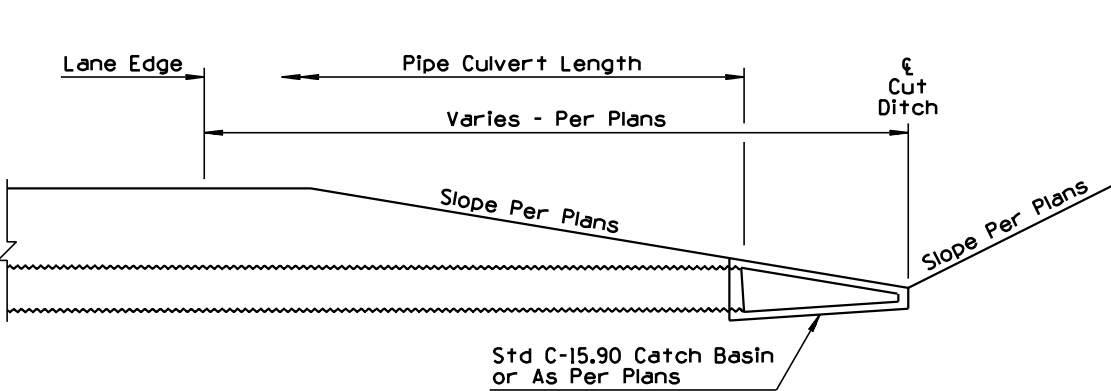
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MODIFIED DETAIL	PNB	7/94
2	ADDED DETAIL	PNB	7/94
3	ADDED NOTE	PNB	7/94
4	MODIFIED NOTE	BAF	7/97



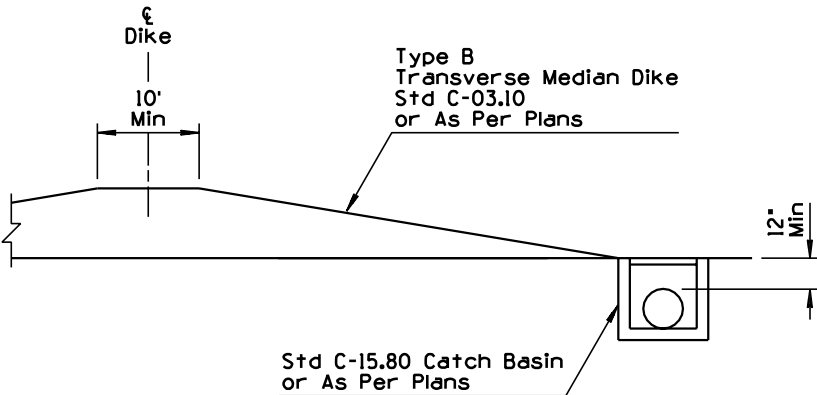
② SPECIAL MULTIPLE PIPE END SECTION DETAIL FOR PIPE CULVERT EXTENSIONS ONLY



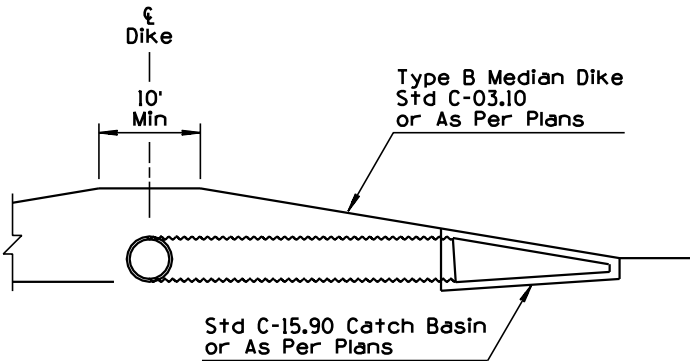
① PERFORATED CMP INSTALLATION



① PIPE AND CATCH BASIN INSTALLATION AT SAG CONDITION OF CUT DITCH



① PIPE AND CATCH BASIN INSTALLATION AT BASE OF TRANSVERSE DIKE



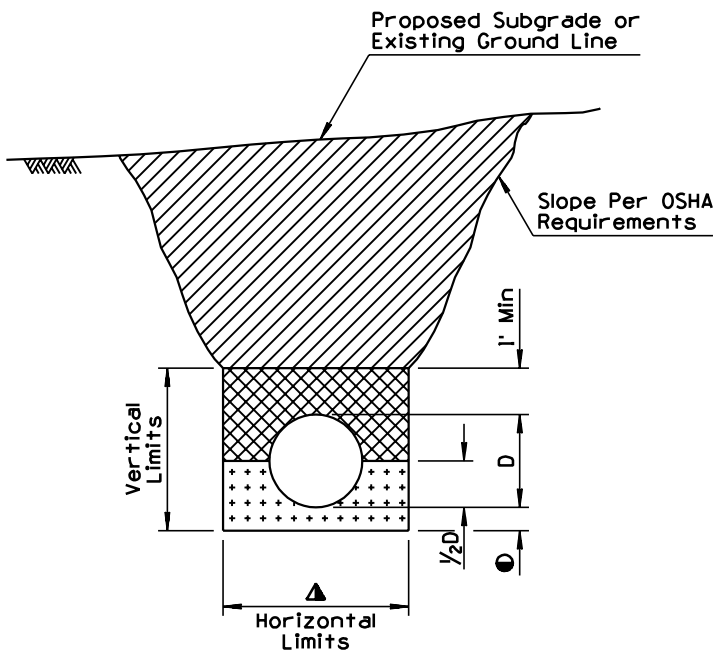
① PIPE AND CATCH BASIN INSTALLATION AT FACE OF TRANSVERSE DIKE

GENERAL NOTES

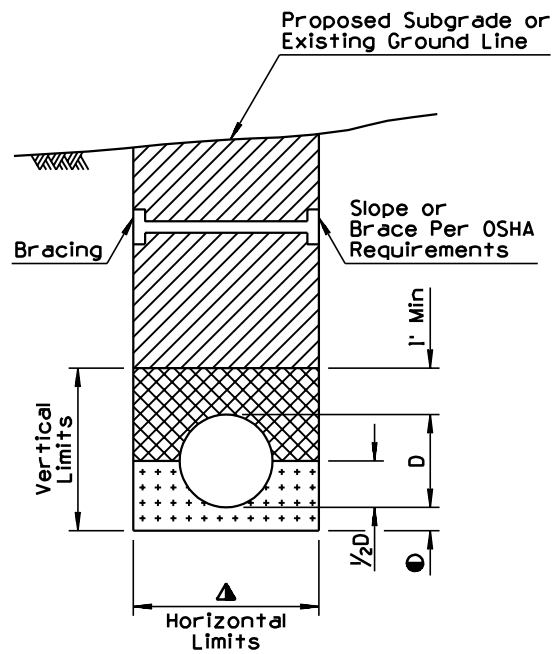
- ④ 1. Minimum cover over pipe culverts shall be 12", measured from the top of pipe.
2. See remaining C-13 Series standards for other pipe details.
- ③ 3. After welding, the damaged coating shall be cleaned by a wire brush and painted with at least one full coat of Paint No. 4, or given two coats of an approved hot asphalt paint, as directed by the Engineer.

DESIGN APPROVED <i>Larry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/98
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	PIPE CULVERT INSTALLATION	DRAWING NO. C-13.10 Sheet 2 of 2

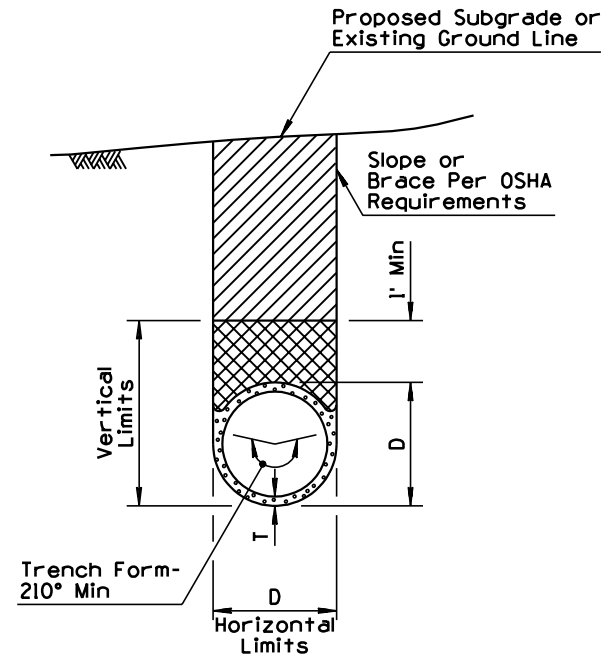
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED NOTE	PNB	7/94
2	REARRANGED STD	PNB	7/94
3	MODIFIED NOTE	BAF	8/98
4			



TRENCH CONDITION
IN NATURAL GROUND OR IN EMBANKMENT
WITHOUT BRACING



TRENCH CONDITION
IN NATURAL GROUND OR IN EMBANKMENT
WITH BRACING SHOWN

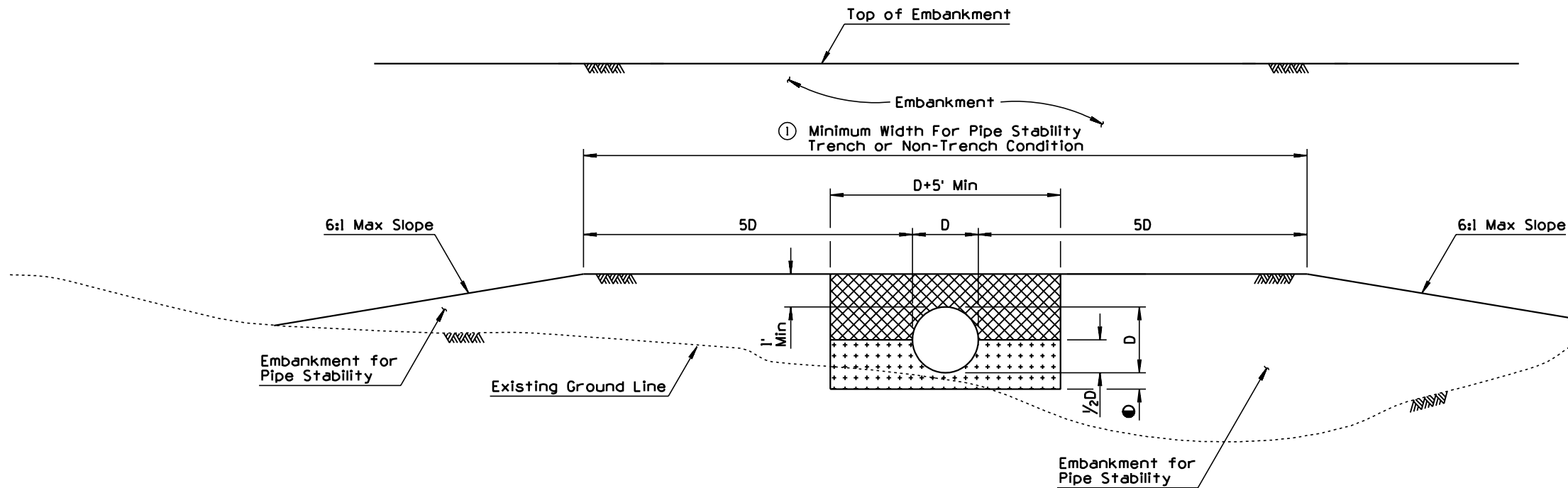


TRENCH CONDITION
NRCIPCP IN NATURAL GROUND
OR IN EMBANKMENT

GENERAL NOTES

1. Pipes shall be installed either in a trench condition or in a non-trench condition in natural ground or in embankment.
2. In a trench condition, the vertical and horizontal limits shall be maintained. If horizontal limits are exceeded or the vertical limits are not maintained, a non-trench condition exists.
3. Bracing and sloping shall conform to OSHA requirements.
4. Pipe backfill may be bedding material.
- ① 5. In a non-trench condition, the embankment for pipe stability shall be constructed in lifts to the limits shown in the detail simultaneously with the bedding material and pipe backfill. If the contractor chooses to construct it as a trench condition, the embankment shall be constructed before excavating the trench.
- D - Outside diameter of full circle pipe or outside dimension (span or rise) of arch, arch pipe, elliptical pipe.
- T - Minimum wall thickness for NRCIPCP. See Plans.
- ③ ④ - D+6 inches each side minimum for diameters less than 4 feet.
D+2 feet maximum for diameters up to 4 feet.
D+1 foot each side minimum for diameters equal to or over 4 feet.
D+3 feet maximum for diameters 4 feet or over.
- ⑤ - 6 inches except when on unyielding or unstable material. See standard specifications.

	TRENCH BACKFILL
	PIPE BACKFILL
	BEDDING



NON-TRENCH CONDITION

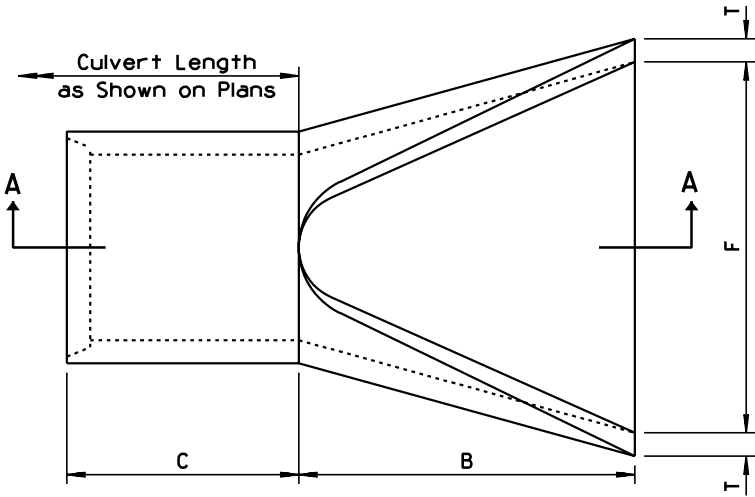
DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 8/98
APPROVED FOR DISTRIBUTION 	② TYPICAL PIPE INSTALLATION	DRAWING NO. C-13.15

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
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2			
3			
4			

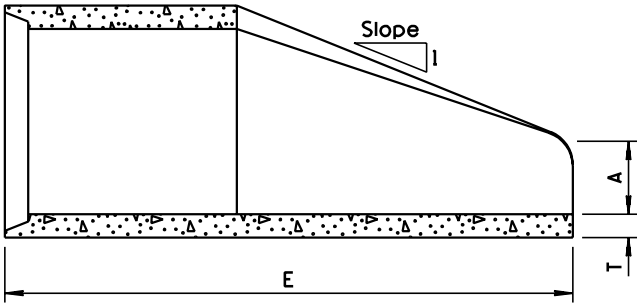
GENERAL NOTES

- Design of end section shall conform to standards.
- End section joint conformation shall match the pipe joints.
- Embankment slope shall be warped to match slope of end section.

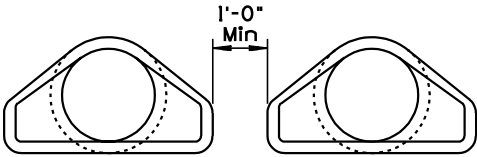
Pipe Dia	Approx Weight	Dimensions - Inches						Approx Slope
		T	A	B	C	E	F	
24"	1520*	3	9½	43½	30	73½	48	3
27"	1930*	3¼	10½	49½	24	73½	54	3
30"	2190*	3½	12	54	19¾	73¾	60	3
36"	4100*	4	15	63	34¾	97¾	72	3
42"	5380*	4½	21	63	35	98	78	3



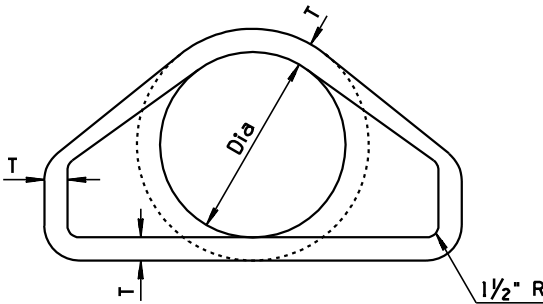
PLAN



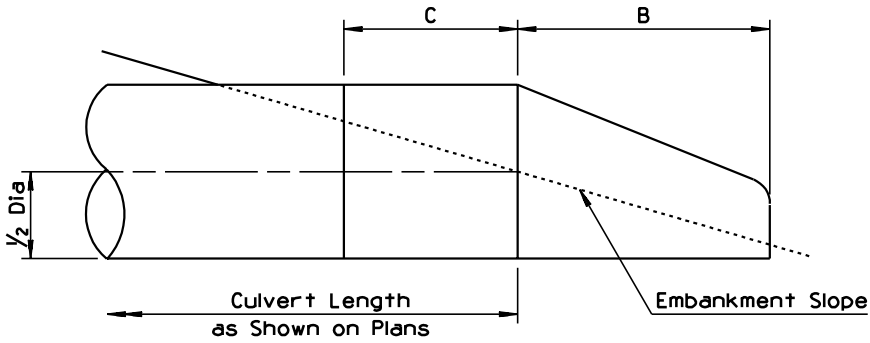
SECTION A-A



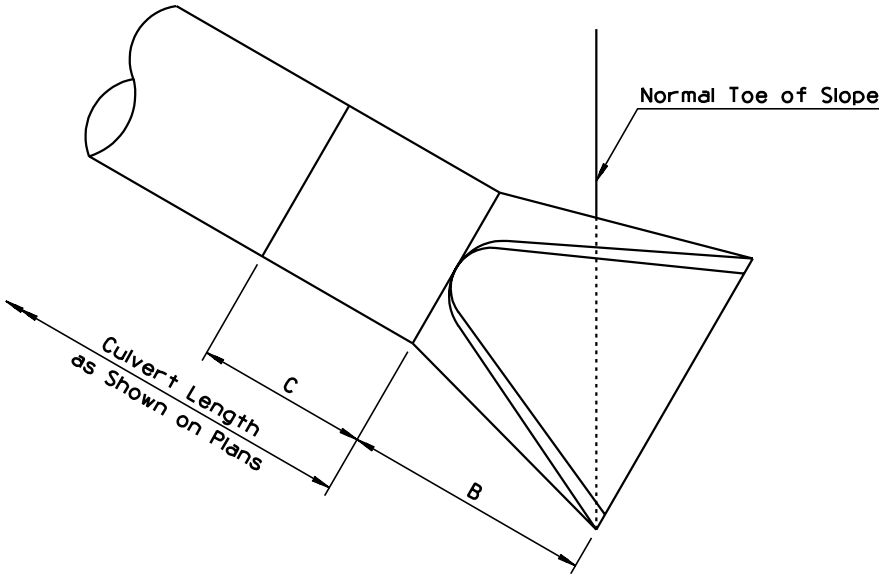
SPACING FOR MULTIPLE
INSTALLATION



FRONT ELEVATION



RIGHT ANGLE CULVERT

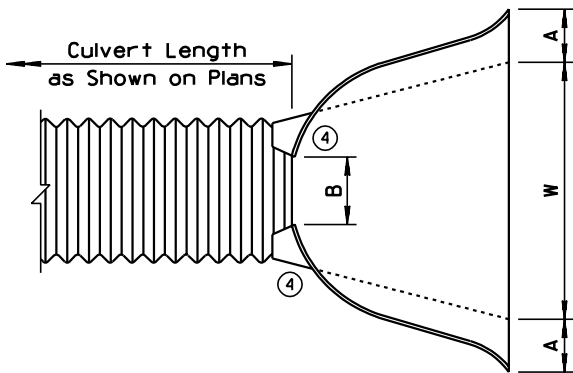


SKewed CULVERT

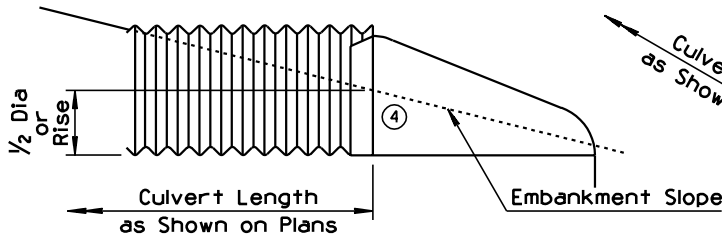
DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. C-13.20

① PIPE, REINFORCED CONCRETE
END SECTION

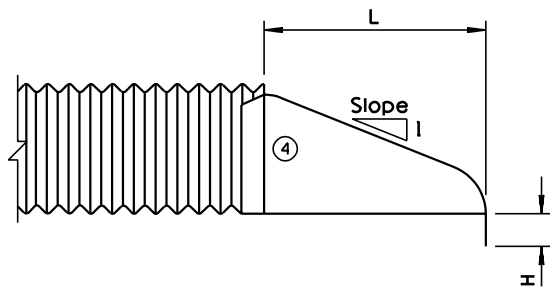
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2	DELETED DETAIL	BAF	7/97	6			
3	DELETED TITLE AND SUBTITLE	BAF	7/97	7			
4	DELETED RIVETS	BAF	7/97	8			



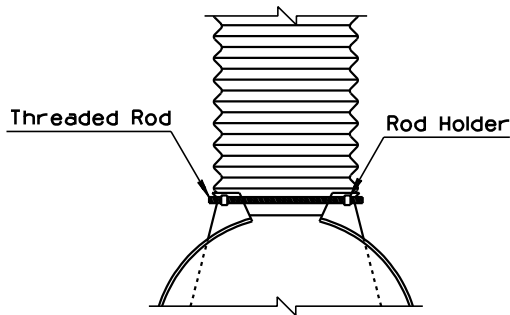
RIGHT ANGLE CULVERT



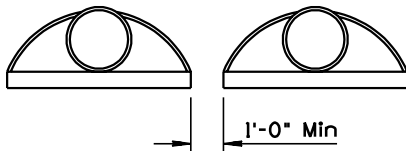
SKewed CULVERT



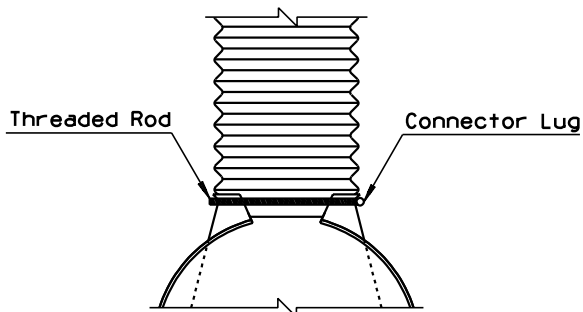
③



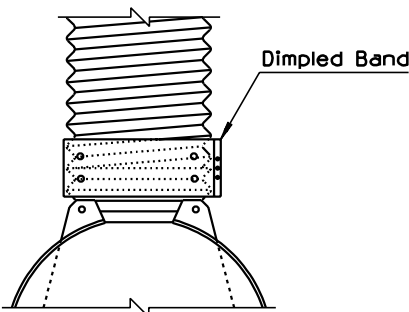
TYPE 2
THREADED ROD CONNECTIONS



SPACING FOR MULTIPLE
INSTALLATION



TYPE 3
THREADED ROD CONNECTIONS



TYPE 4
DIMPLED BAND CONNECTIONS

GENERAL NOTES

1. The end section may be joined to the pipe or connector section by bolts, rivets, dimpled bands, slip-seam bands or threaded rod type fasteners. For allowable connector types, see table.
2. The type 1 connector is by means of bolts or rivets. Maximum circumferential fastener spacing shall be 12" and with a minimum of 8 fasteners per joint. The type 1 joint may be used with either annular or helical corrugations.
3. Type 2 and 3 connectors shall be used only with annular or helical pipe with a requisite number of annular corrugations.
4. Type 4 and 5 connectors shall be only used with helical pipe.
5. All steel end section components shall be galvanized.
- ① 6. Toe of embankment shall be warped to match toe of skewed end section.
7. A berm shall be added to abnormal projections per Std C-13.10.
8. The foregoing applies to all cross section configurations.

		Dimensions - Inches						
Pipe Dia	Ga	A ±1	B Max	H ±1	L ±1½	W ±2	Approx Slope	Connection Type
18"	16	8	8	6	31	36	2½	2, 3, 4
24"	16	10	13	6	41	48	2½	2, 3, 4
30"	14	12¼	12½	8	51	57	2½	2, 4
36"	14	14½	12	9	60	72	2½	2, 4
42"	12	17	11	10½	69	84	2½	3

⑤

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⑤

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⑤

		Dimensions - Inches							
Pipe Arch		Ga	A ±1	B Max	H ±1	L ±1½	W ±2	Approx Slope	Connection Type
Span	Rise								
21"	15"	16	7½	11	6	24	36	2½	2, 3, 4
28"	20"	16	8	16	6	32	48	2½	2, 3, 4
35"	24"	14	10	16	6	39	60	2½	2, 4
42"	29"	14	12	12	7½	46	75	2½	2, 4
49"	33"	12	13½	20	9	53	84	2½	3

⑤

⑤

⑤

⑤

⑤

DESIGN APPROVED

Henry H. Ottens

APPROVED FOR DISTRIBUTION

Ronald Williams

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

PIPE, CORRUGATED METAL
END SECTION

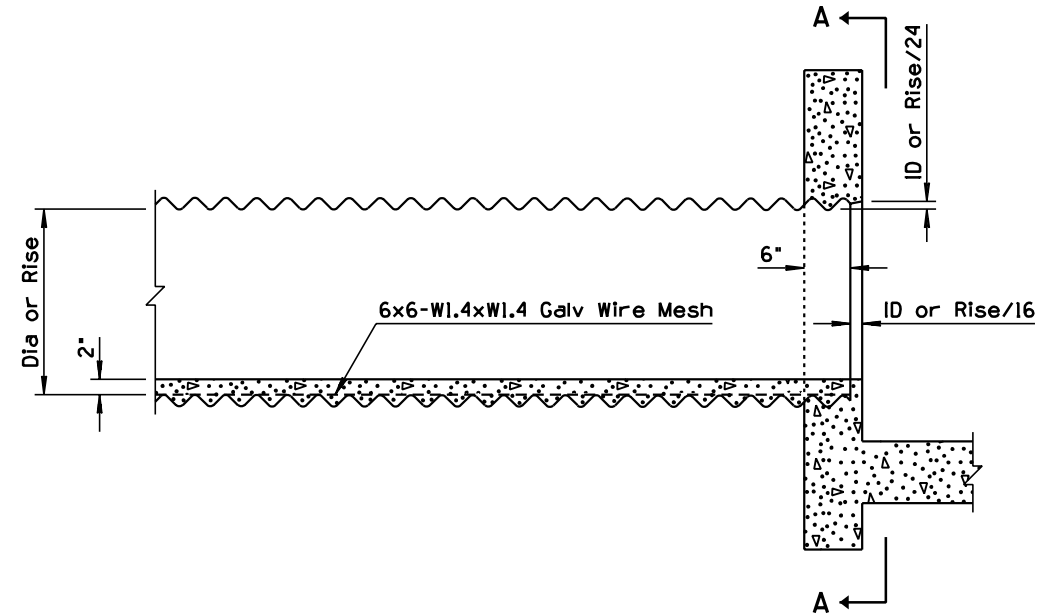
REV.

8/98

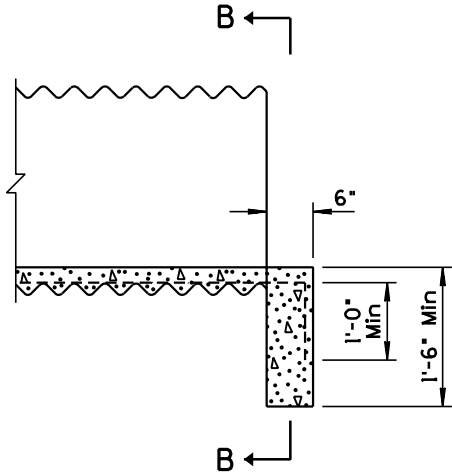
DRAWING NO.

C-13.25

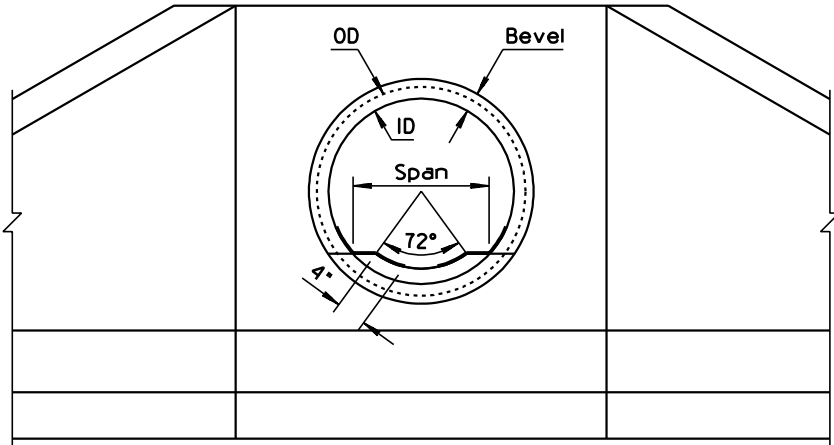
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1	REVISED GENERAL NOTE	PNB	10/95
2	REVISED GENERAL NOTE	BAF	7/97
3			
4			



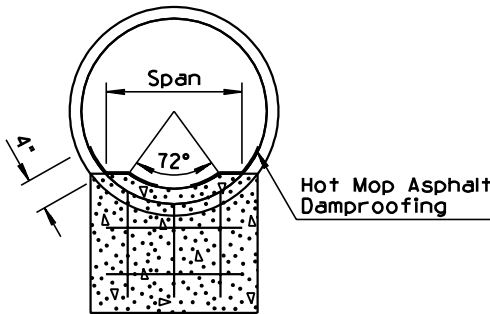
HEADWALL INSTALLATION



PROJECTING INSTALLATION



SECTION A-A



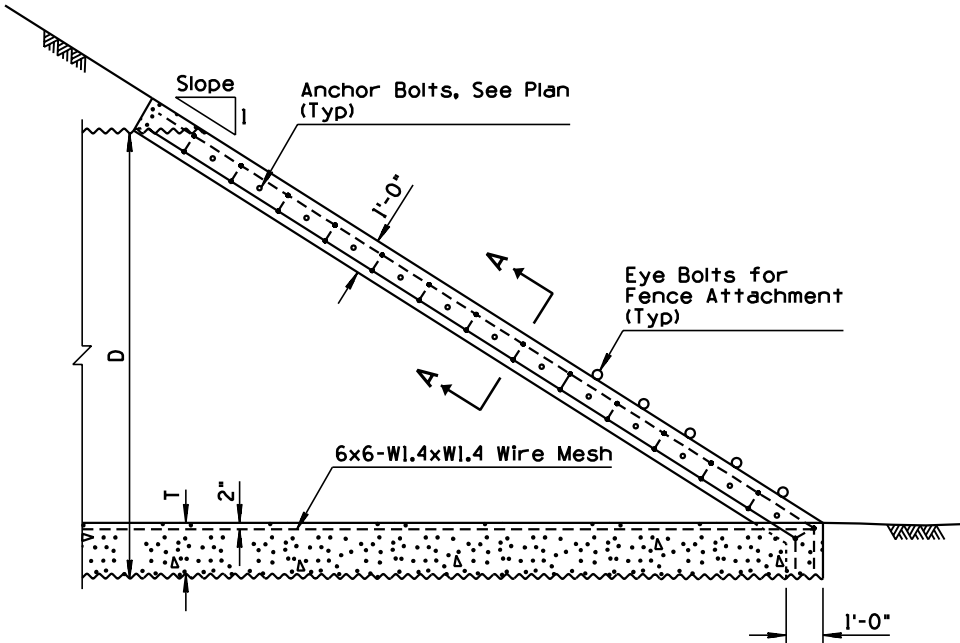
SECTION B-B

GENERAL NOTES

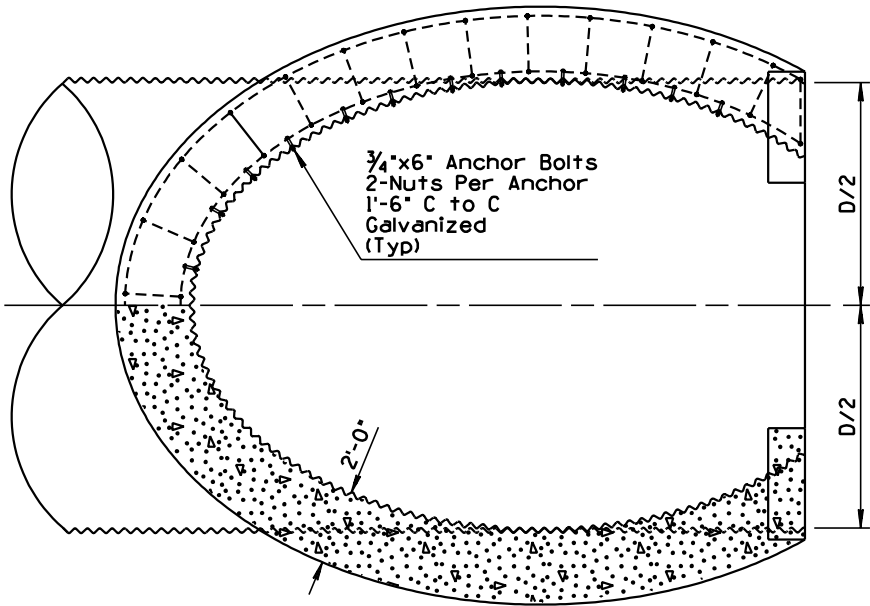
- For lateral dimensions of invert paving, use 72° control for CMP and span for CMPA.
- Paving shall be scored laterally at 1'-6" minimum intervals along the length of the pipe.
- Use bevel on inlet headwall only.
- Wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer. Laps shall be 6" minimum.
- Paving shall not be placed until backfilling is completed.
- Concrete shall be Class B.
- See Std B-11.12 for headwall and bevel dimensions not shown.

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	PIPE AND PIPE ARCH, CORRUGATED METAL CONCRETE INVERT PAVING	DRAWING NO. C-13.30

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			

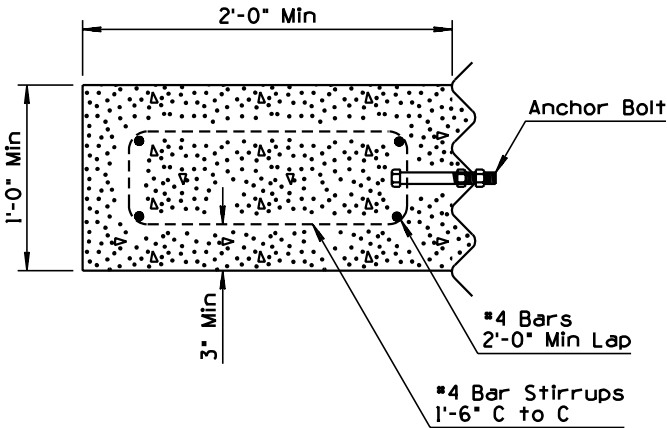


LONGITUDINAL SECTION

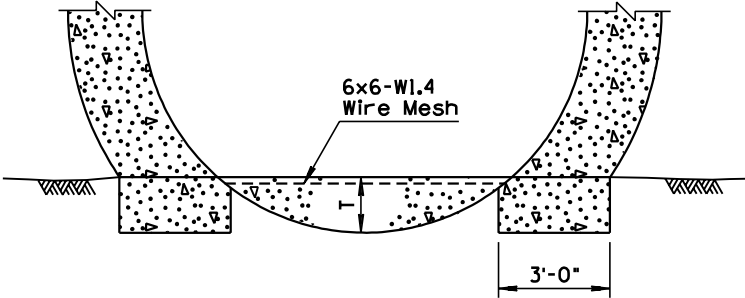


PLAN NORMAL TO SLOPE

	D	T	S
Combination Vehicle and Cattle Pass	144"	1'-6"	Varies
Cattle Pass Only	120"	6"	Varies



SECTION A-A



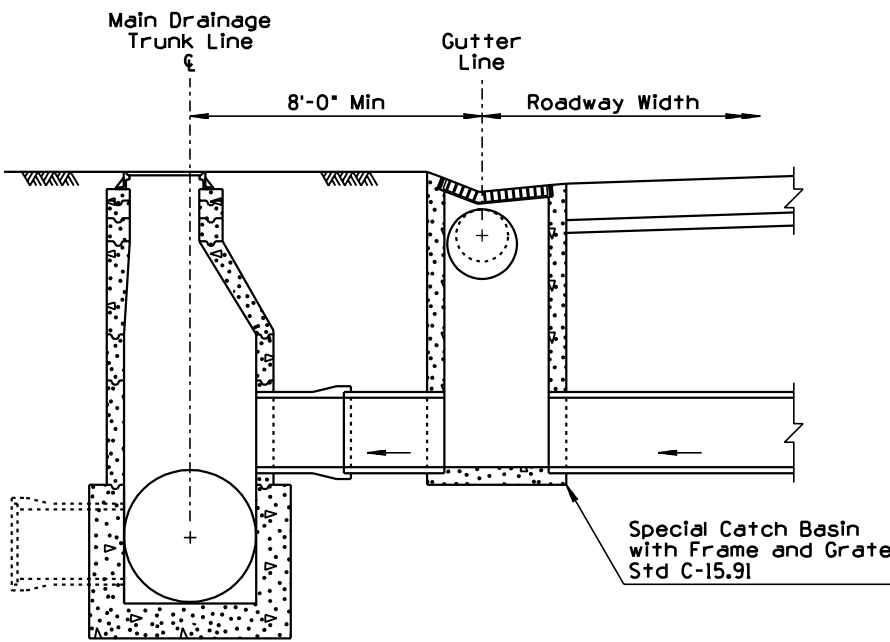
END ELEVATION

GENERAL NOTES

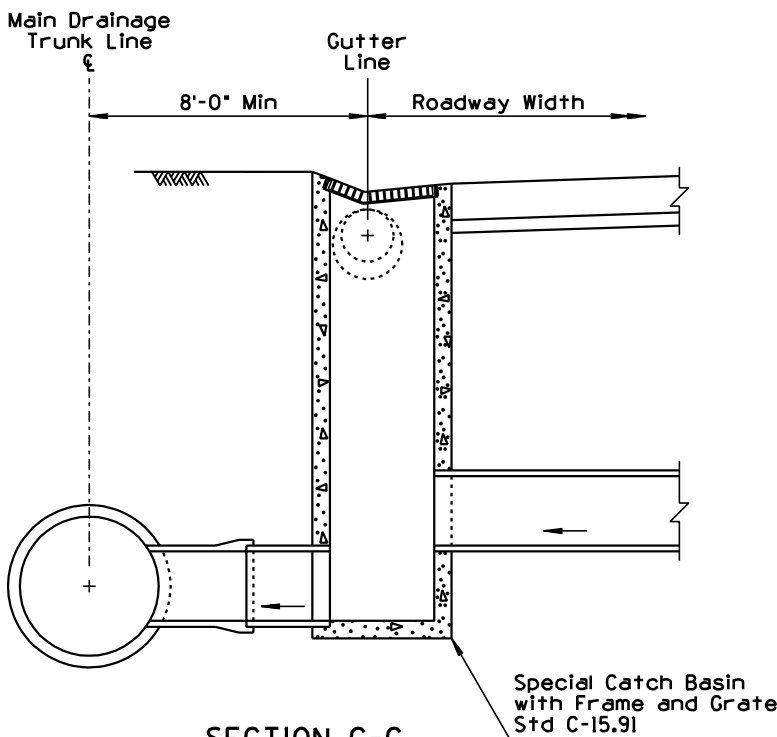
1. This end treatment is to be used only for those cattle and/or vehicle passes not used for drainage.
2. All concrete shall be Class B. An optional 12" AB invert paving base course and 6" of concrete may be used in the 144" diameter pipe.
3. Anchor bolts shall be retained in a horizontal position during pour with final tightening a minimum of 7 days after pour.
4. Pipe shall be backfilled before concrete bond beam is constructed. Minimum forming may be used.
5. Edges of wire mesh shall be fastened or welded to corrugation crests at intervals and in a manner approved by the Engineer. Laps shall be a minimum of 6".
6. For installation normal to roadway centerline only.

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① PIPE, CATTLE-VEHICLE PASS, MITERED END TREATMENT	DRAWING NO. C-13.55

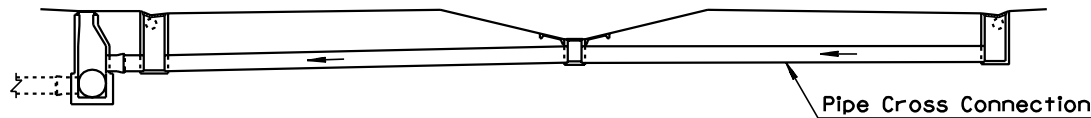
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
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2			
3			
4			



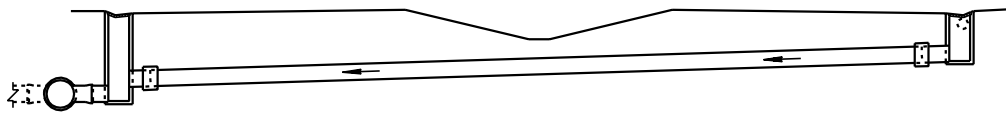
SECTION A-A
TYPICAL CONNECTION BETWEEN
CATCH BASIN AND MANHOLE



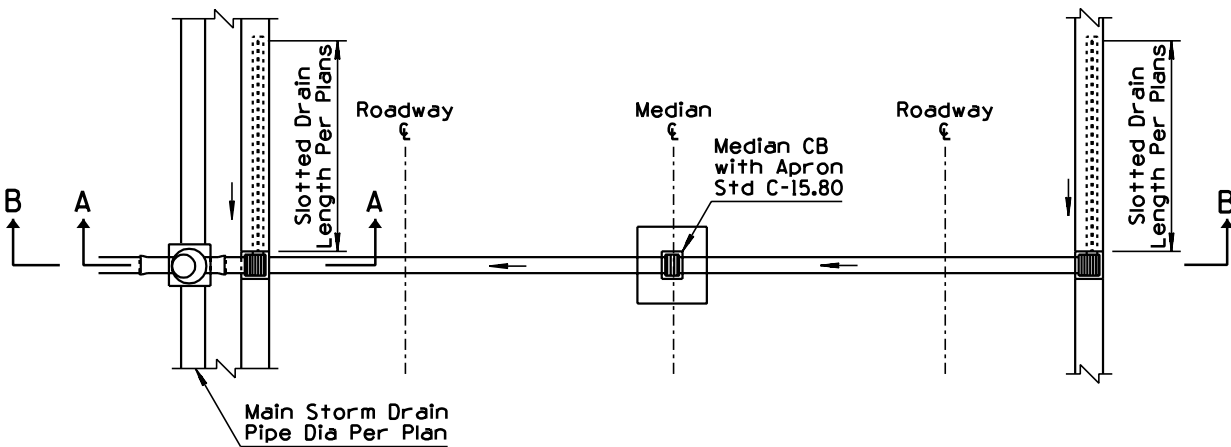
SECTION C-C
TYPICAL CONNECTION BETWEEN
CATCH BASIN AND MAIN STORM DRAIN



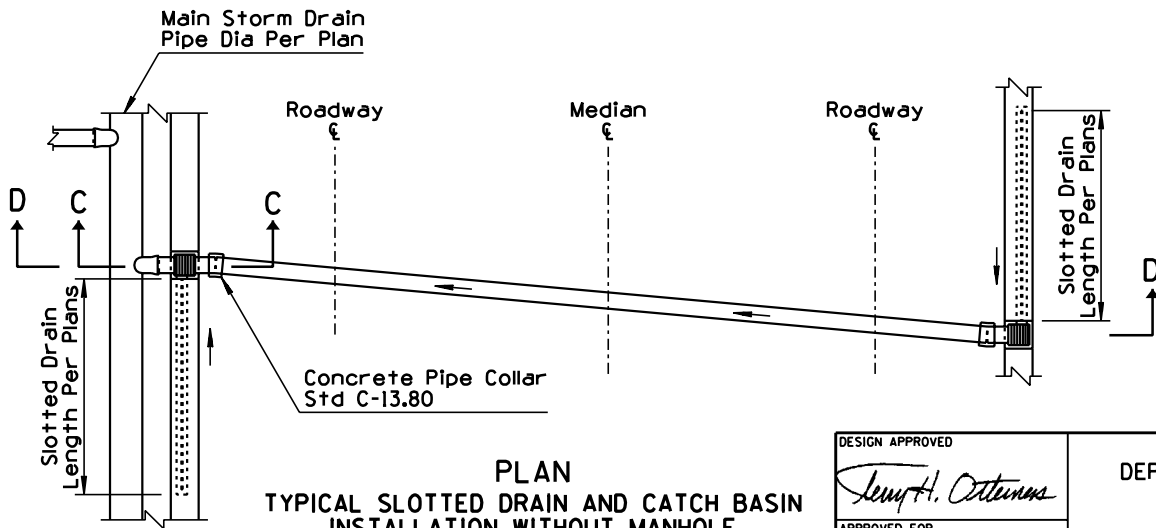
SECTION B-B



SECTION D-D



PLAN
TYPICAL SLOTTED DRAIN AND CATCH BASIN
INSTALLATION WITH MANHOLE



PLAN
TYPICAL SLOTTED DRAIN AND CATCH BASIN
INSTALLATION WITHOUT MANHOLE

GENERAL NOTES

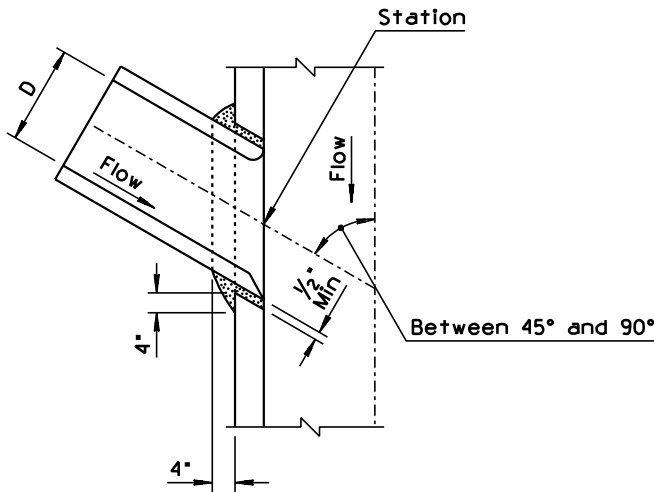
1. Pipe collars not required where direct catch basins connections can be made within 7° of a normal 90° installation, either horizontally or vertically.
2. "T" connections direct to the main drainage trunk line should be avoided and used only where manhole connections are impractical.

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① SLOTTED DRAIN INSTALLATION DETAILS	DRAWING NO. C-13.65

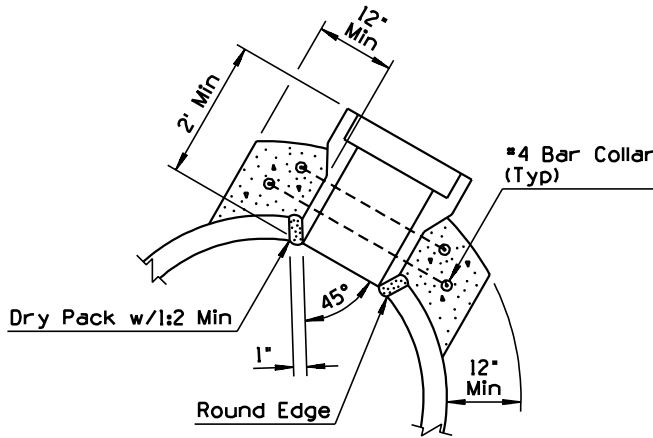
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			

GENERAL NOTES

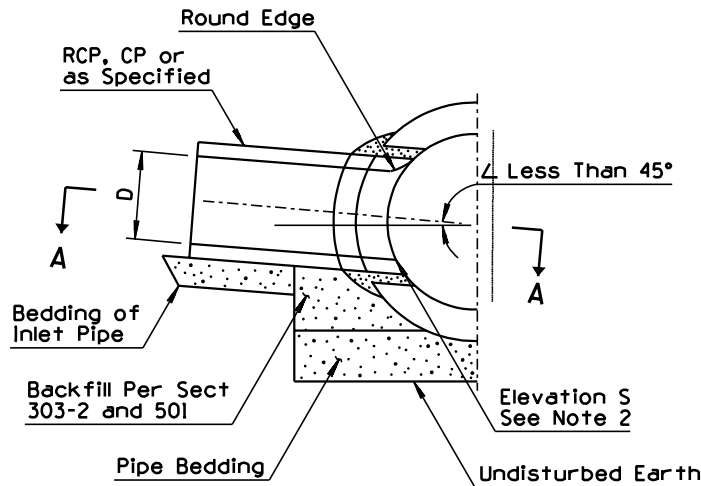
1. Prefabricated tees shall be used when the outside diameter of the inlet pipe exceeds one half of the inside diameter of the main storm drain, except when the manholes are shown on plans.
2. Centerline of the inlet pipe shall intersect the centerline of the main storm drain except when elevation "S" is shown on plans.
3. If \angle is 45° or less, type 1 shall be used.
4. All concrete shall be class B.
5. All reinforcing steel shall conform to 1003-1, 2, grade 40.
6. Reinforcing steel shall have 2" minimum cover.



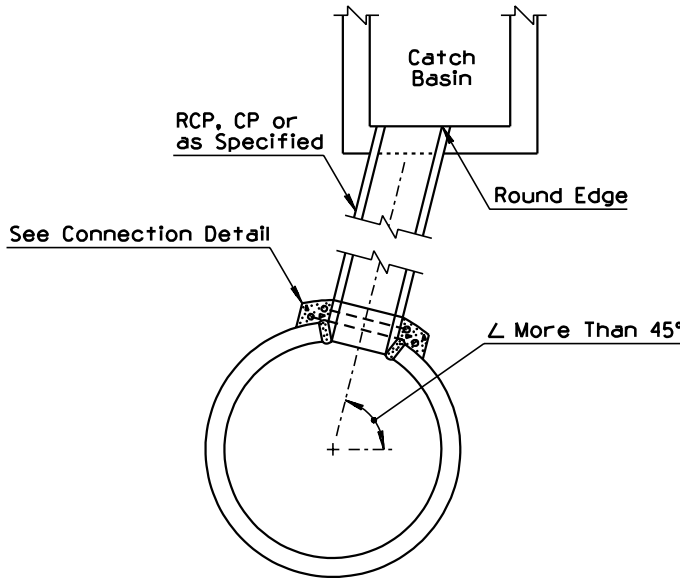
SECTION A-A



CONNECTION DETAIL
TYPE 2



SIDE INLET
TYPE 1

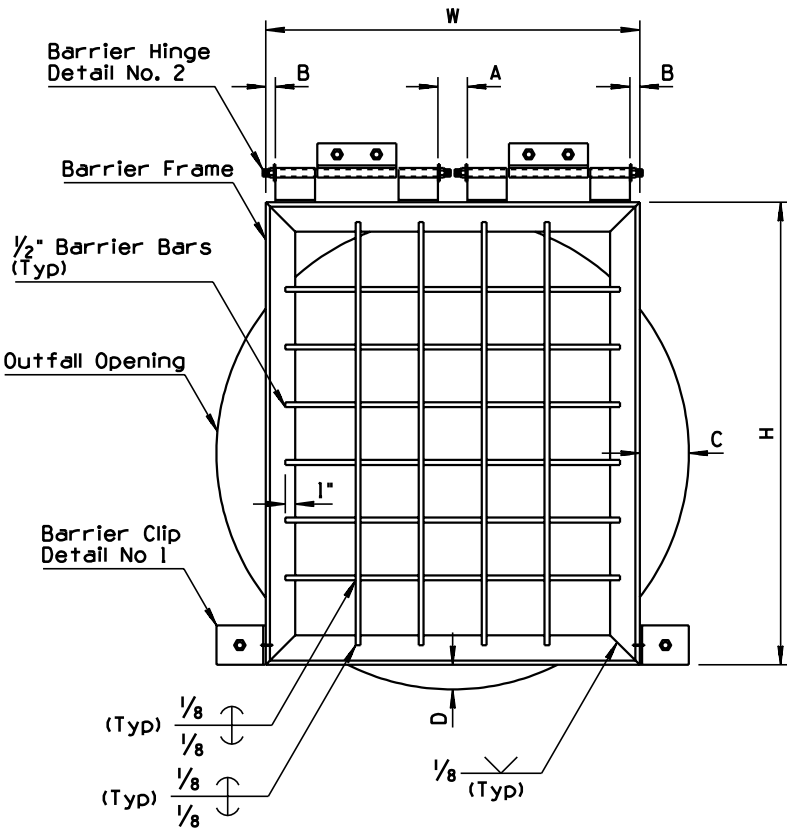


CATCH BASIN ABOVE STORM DRAIN
TYPE 2

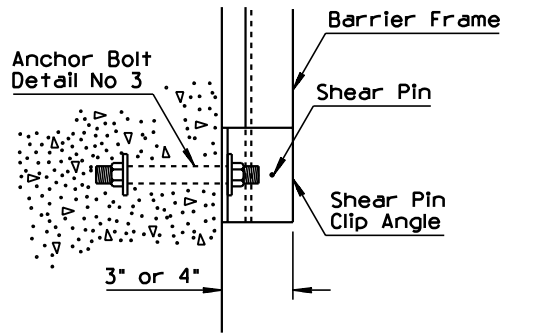
DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>		DRAWING NO. C-13.70

① STORM DRAIN
CONNECTION DETAILS

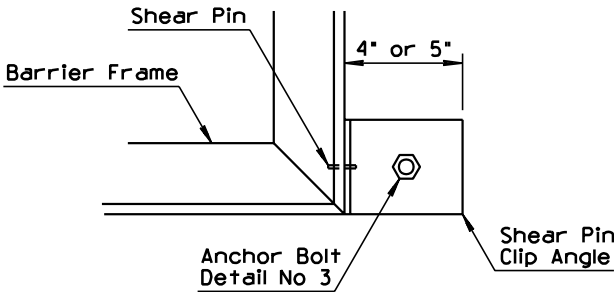
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1	ADDED NOTE	RLF	7/01
2			
3			
4			



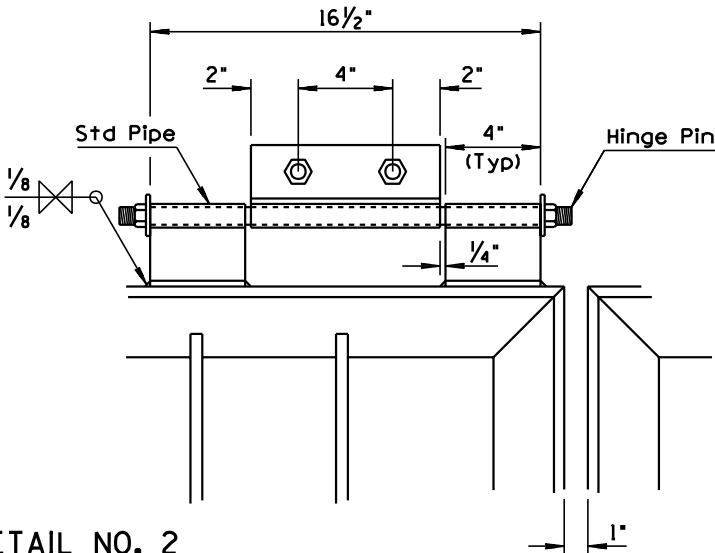
PIPE ACCESS BARRIER FRONT ELEVATION



DETAIL NO. 1

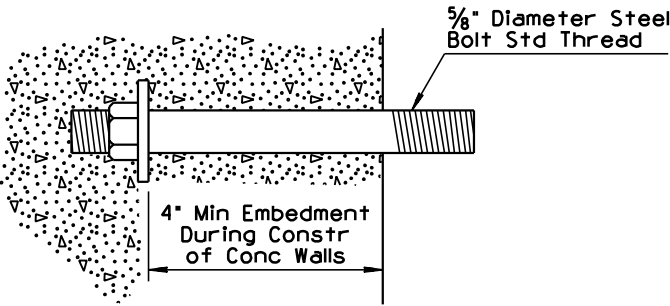


DETAIL NO. 2



GENERAL NOTES

- All Shear pin angles shall fit snug and true to face. Cover with waterproof grease prior to installation of pin.
- Shear pin holes in the angle shall be drilled for a tight fit of the pins.
- Both ends of the shear pins shall be peened after installation.
- Shear pin material shall be commercially pure aluminum wire alloy 1100, Temper 0, Federal Spec. 00-A-411.
- Galvanize all ferrous parts after fabrication.
- Frame and hinge angles shall have the outstanding legs out.
- All steel shall be in accordance with ASTM A36.
- Barrier bars shall be equally spaced.
- Hinge pin material shall be bolt stock and threaded on both ends so nut and lock washer are flush with the lower angle. Cover pin with waterproof grease prior to installation. Upset or damage exposed threads after installation.
- All welding shall be in accordance with Standard Specification 604-3.06.

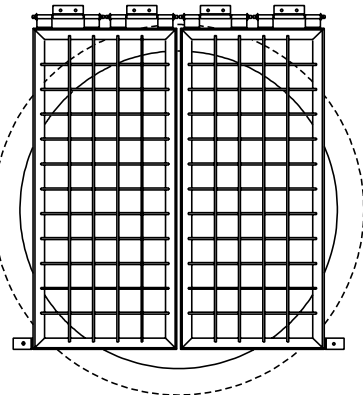


DETAIL NO. 3

ACCESS BARRIER GATE DIMENSION SCHEDULE

Size of Outfall Pipe	No. of Barrier Gates	Frame Angles	Shear Pin Clip Angles	Shear Pins	Hinge Pins	Hinge Angles	Hinge Standard Pipe	No. & Length Of Vert. Bars	No. & Length Of Horz. Bars	H (Out to Out of Frame Angles)	W (Out to Out of Frame Angles)	A	B	C	D	Str. Steel (lbs)
30"	1	2"x2"x 1/4"	4"x4"x 1/4"	2-1/8"	1/2"	2"x2"x 1/4"	3/4"	4-31"	4-34"	33"	36"	3"	0"	-3"	2"	78.0
36"	1	2"x2"x 1/4"	4"x4"x 1/4"	2-1/8"	1/2"	2"x2"x 1/4"	3/4"	4-31"	4-34"	33"	36"	3"	0"	0"	3.5"	78.0
42"	1	2"x2"x 1/4"	4"x4"x 1/4"	2-1/8"	1/2"	2"x2"x 1/4"	3/4"	4-41"	5-34"	43"	36"	3"	0"	3"	0.5"	88.6
48"	1	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	4-46"	6-34"	50"	38"	3"	1"	5"	1"	179.2
54"	1	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	5-52"	7-40"	56"	44"	5"	3"	5"	2"	206.5
60"	1	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	6-58"	8-46"	62"	50"	9"	4"	5"	3"	235.6
66"	1	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	7-64"	9-52"	68"	56"	11"	6"	5"	4"	266.4
72"	2	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	4-69"	9-34"	73"	38"	3"	1"	-2.5"	5"	443.6
78"	2	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	4-75"	10-34"	79"	38"	3"	1"	0.5"	5"	468.4
84"	2	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	4-81"	11-34"	85"	38"	3"	1"	3.5"	5"	493.2
90"	2	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	4-87"	12-36"	91"	40"	3"	2"	4.5"	5"	527.0
96"	2	3"x3"x 1/16"	5"x3"x 1/4"	2-1/8"	3/4"	2 1/2"x2 1/2"x 1/4"	1"	5-93"	13-39"	97"	43"	4"	3"	4.5"	5"	579.0

* Per Gate



INSTALLATION DETAIL FOR DOUBLE GATES

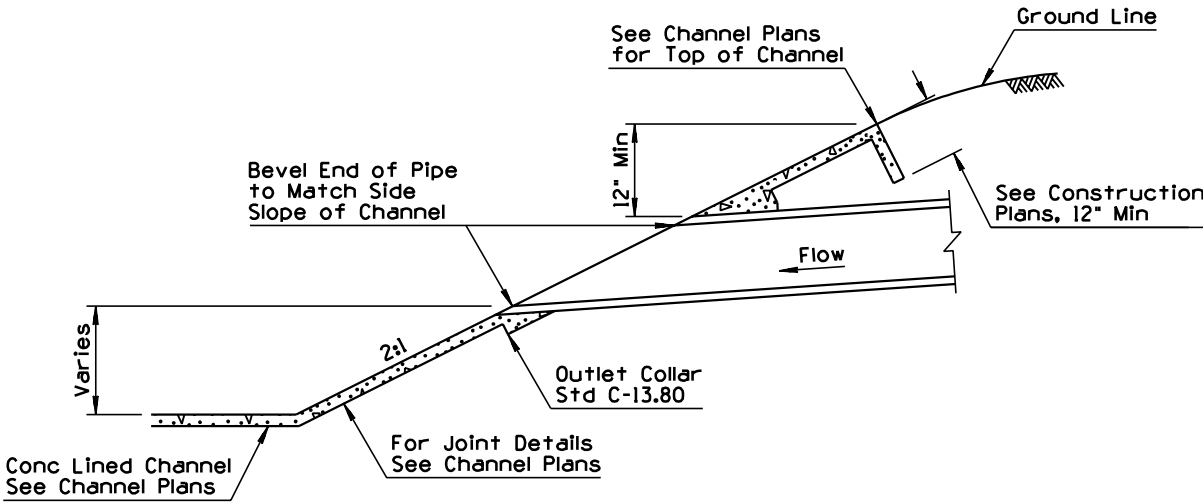
DESIGN APPROVED <i>John L. Lamm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	STORM DRAIN OUTLET DETAILS	DRAWING NO. C-13.75 Sheet 1 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
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2	DELETED DETAIL	PNB	7/94
3			
4			

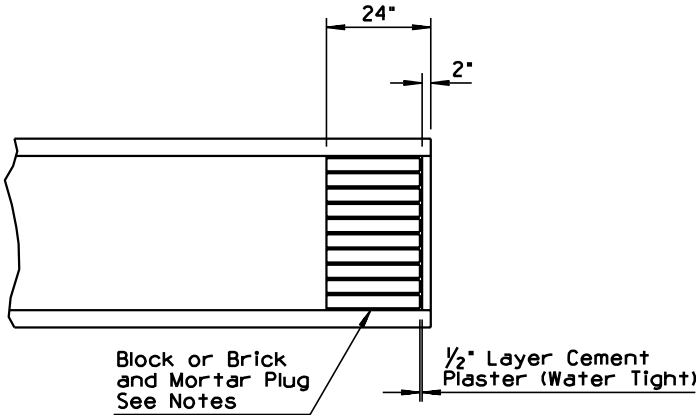
GENERAL NOTES

- 1. Compact soil at end of pipe plug to 95% of maximum density.
- 2. If depth of cover is less than 5' or greater than 10', increase plug thickness a minimum of 4".

①
①
①



DRAINAGE OUTLET INTO CHANNEL

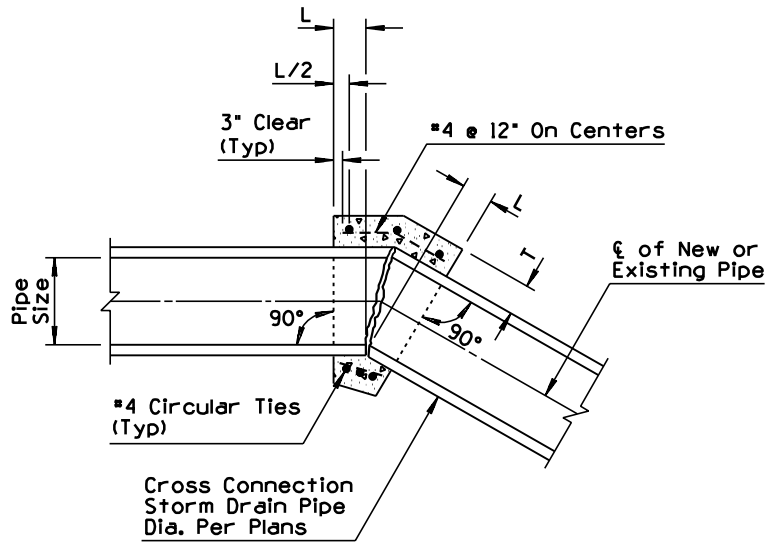


STORM DRAIN PLUG

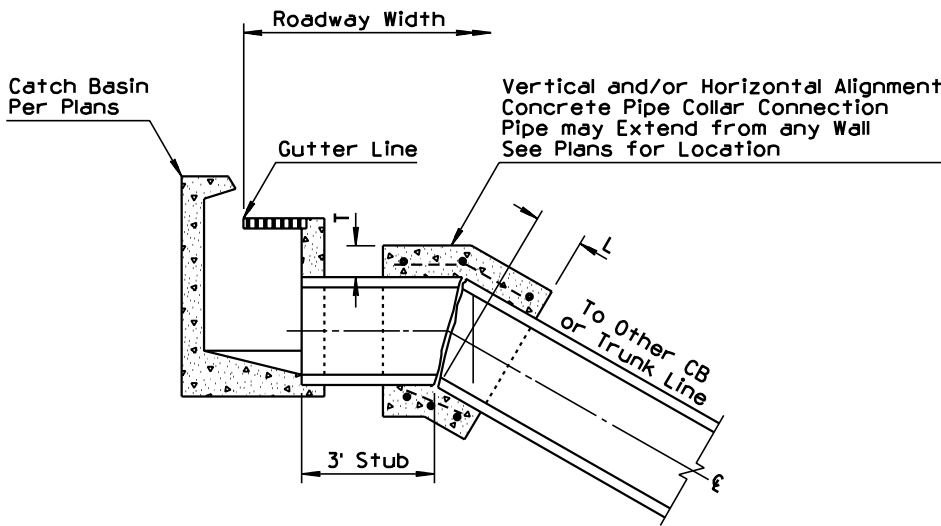
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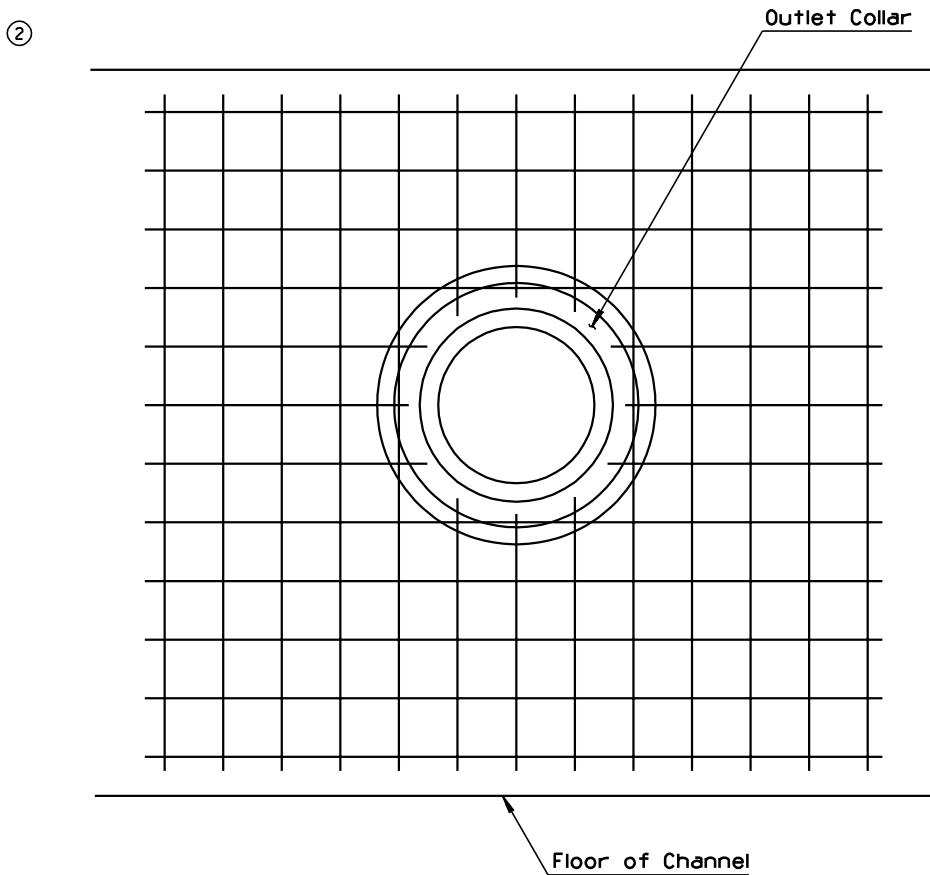
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3	REARRANGED STD	PNB	7/94
4			



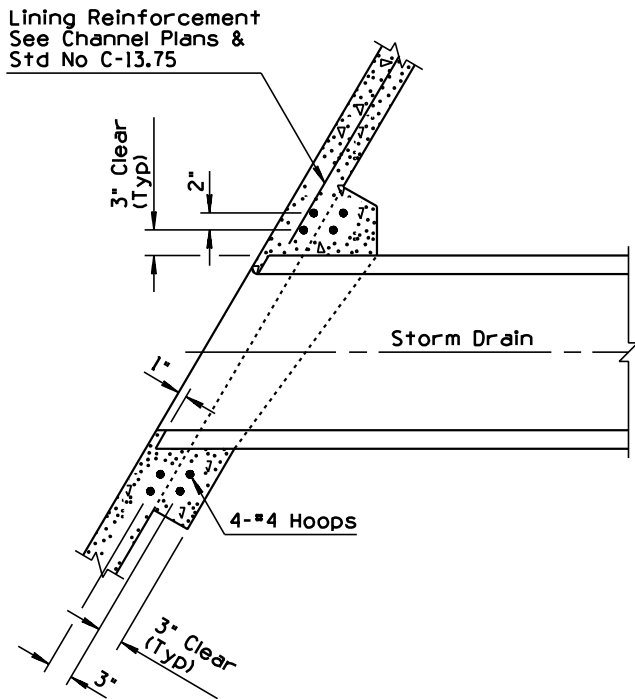
CONCRETE PIPE COLLAR



TYPICAL LATERAL CONNECTIONS TO CATCH BASINS WITH CONCRETE COLLARS



OUTLET COLLAR DETAIL



GENERAL NOTES

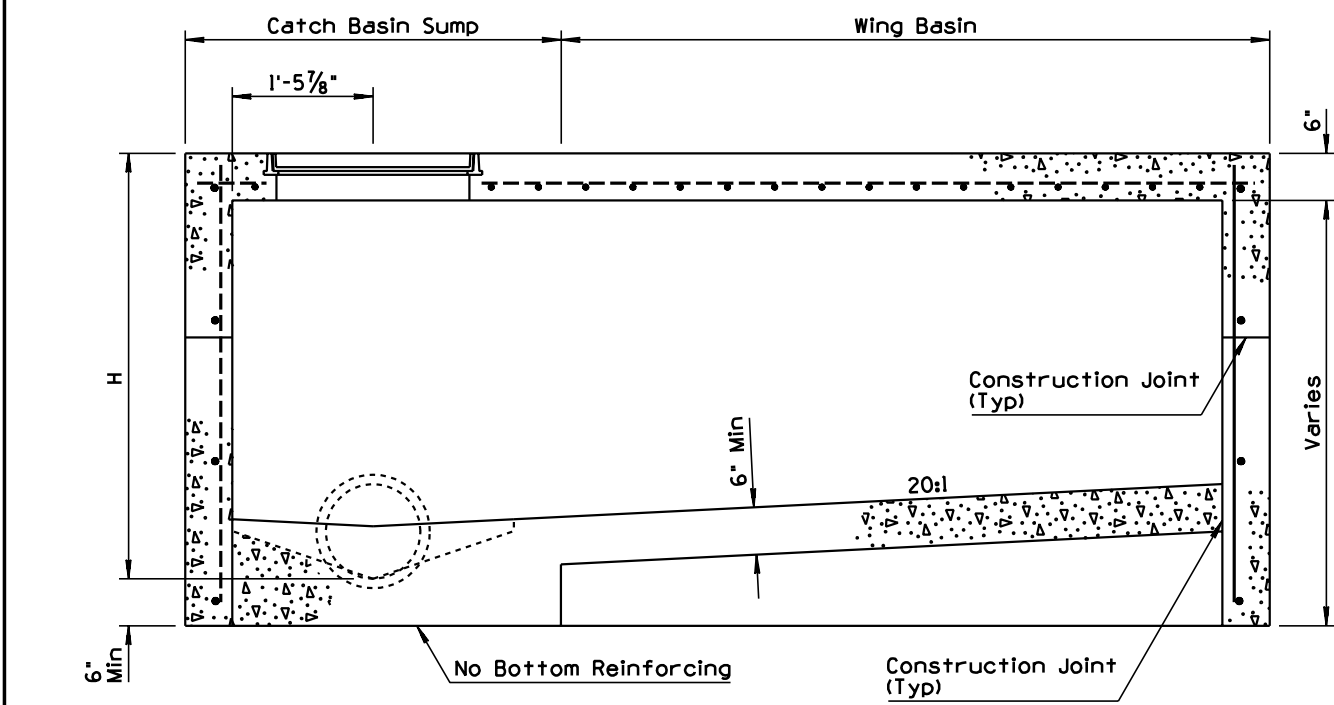
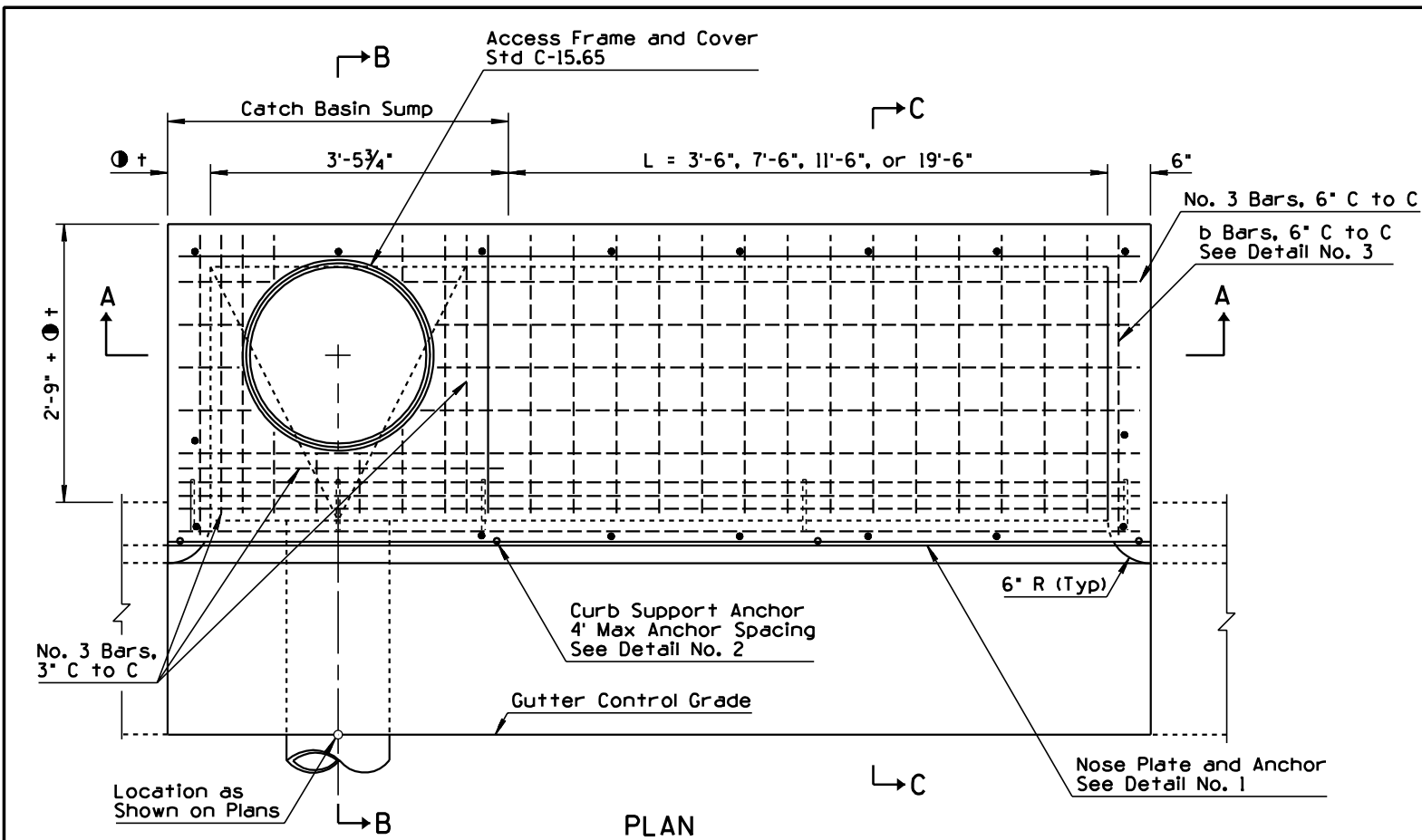
1. All Concrete shall be Class B.
2. All reinforcing steel shall conform to 1003-1, 2, Grade 40.
- ① 3. All reinforcing steel shall have 3" minimum clear cover.
4. A concrete collar shall be required where pipes of different diameters or materials are joined or where the design change in alignment or grade exceeds that allowed for a standard joint.
5. When pipes of different diameters are joined with a concrete collar, "I" & "T" shall be those of the larger diameter.
6. The diameter of the circular ties shall be the outside diameter of pipe + T.
7. Pipe ends to be trimmed such that the maximum distance between pipes at any point is 2".

PIPE COLLAR TABLE			
Pipe Size	L	T	#4 Ties
12"	1.00'	4"	3
18"	1.00'	5"	3
24"	1.00'	6"	3
30"	1.50'	8"	3
36"	1.50'	8"	3
42"	1.75'	10"	4
48"	1.75'	10"	4
52"	1.75'	10"	4
60"	1.75'	11"	4
66"	2.00'	11"	5
72"	2.00'	14"	5
78"	2.00'	14"	5
84"	2.25'	16"	5
96"	2.25'	16"	5

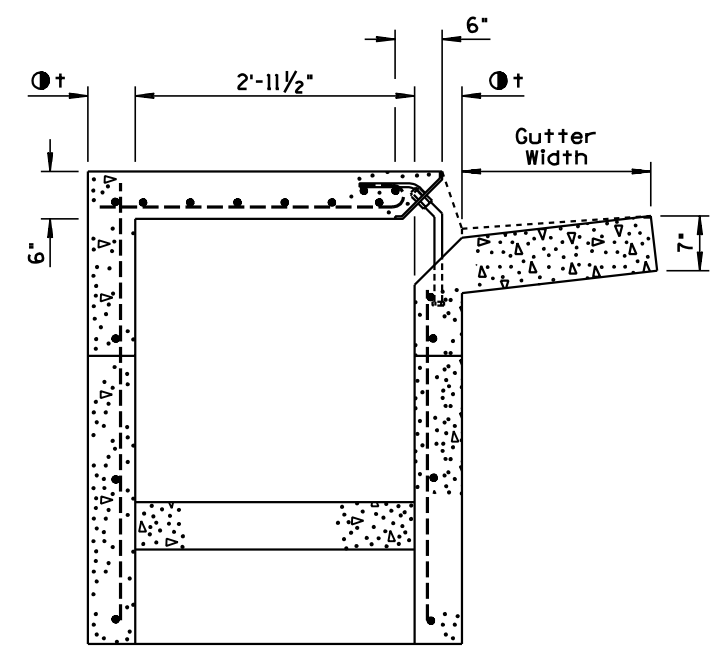
DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
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③ PIPE COLLAR DETAILS

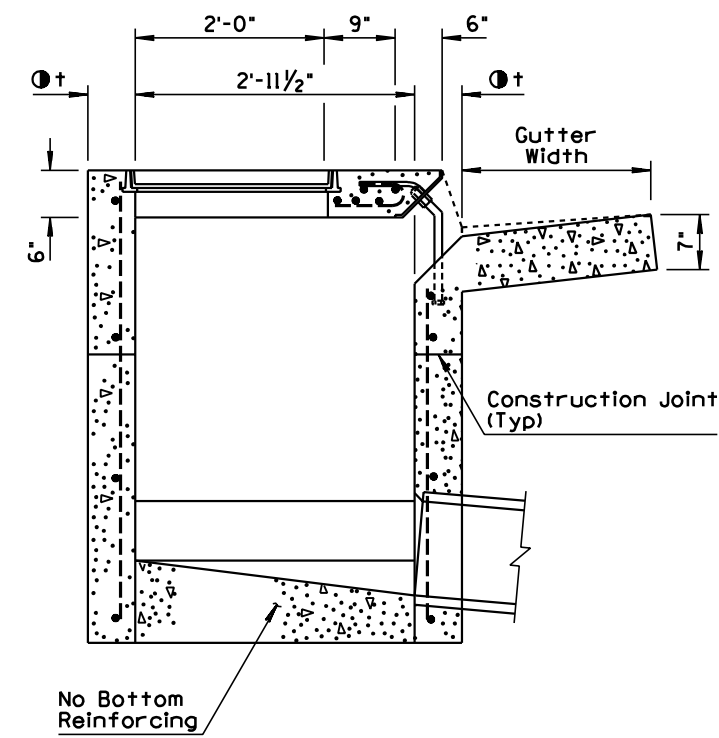
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2			
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SECTION A-A
USE THIS SECTION WHEN H=5' OR LESS



SECTION C-C



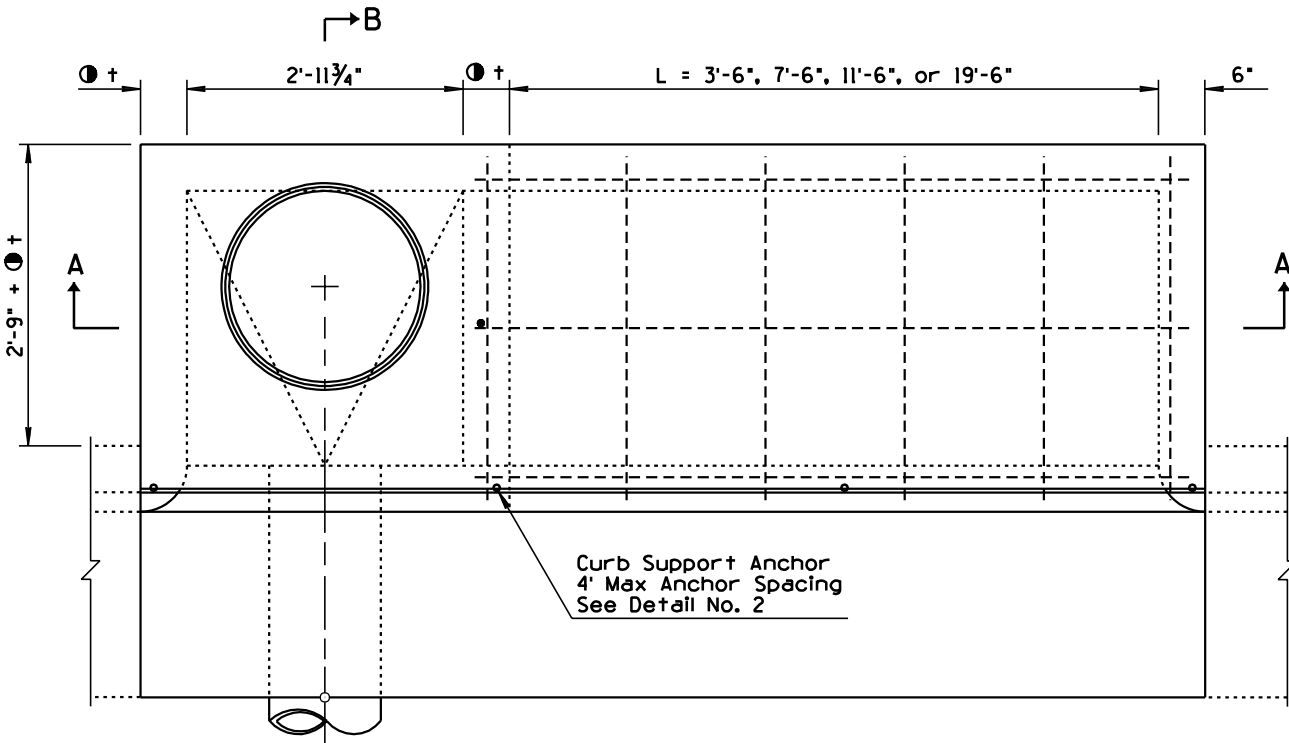
SECTION B-B

GENERAL NOTES

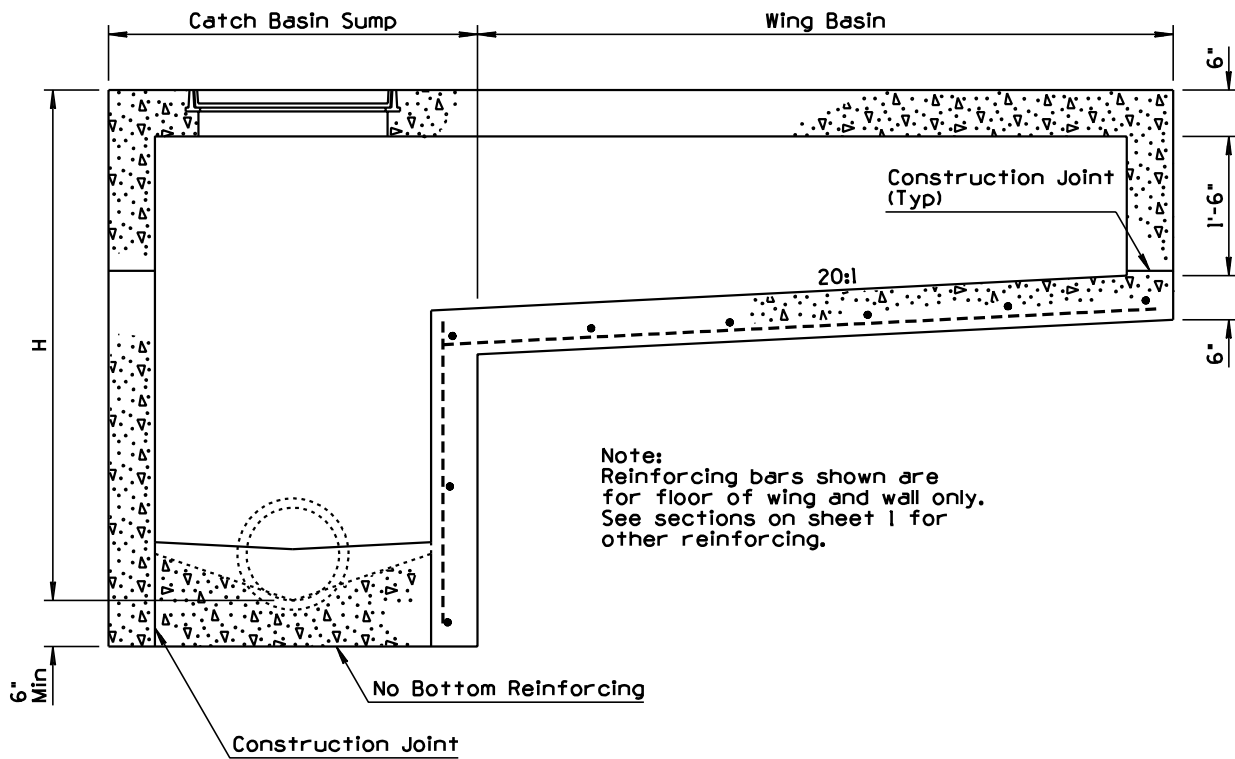
- Catch basin can be used on grade or at roadway sag.
- Catch basin has three configurations:
Sump Only-Sump portion of catch basin (See Detail No. 4).
Single Wing (Illustrated)-Sump with wing basin upstream.
Double Wing-Sump with symmetrical wing basins each side.
- Pipes can be placed in any wall except wall adjacent to wing basin.
- 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.
- Any specified inlet depression shall be warped to opening according to Std C-15.70.
- All structural steel shall be ASTM A36.
- Nose plate, access frame and cover shall be given one shop coat of No. 1 paint.
- All concrete shall be Class B.
- All reinforcing bars shall be #4, 1'-6" C to C both ways and 1 $\frac{1}{2}$ " clear to inside of walls and outside of wing basin floor except as shown.
- Curb opening area (sq ft) per inch of curb "h" + gutter depression = curb opening length (ft) x 0.0833.
- ① All welding shall be in accordance with Standard Specification 604-3.06.
- Construction joints and drains shall be placed to meet field conditions. See Std C-15.70.
- ① + = 6" when H is 8' or less.
8" when H is greater than 8'.

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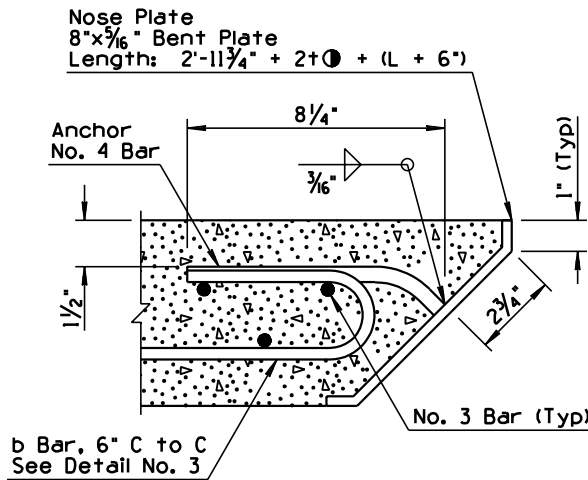
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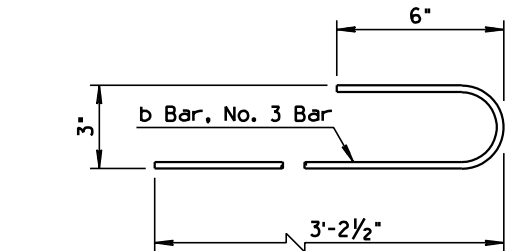
PLAN



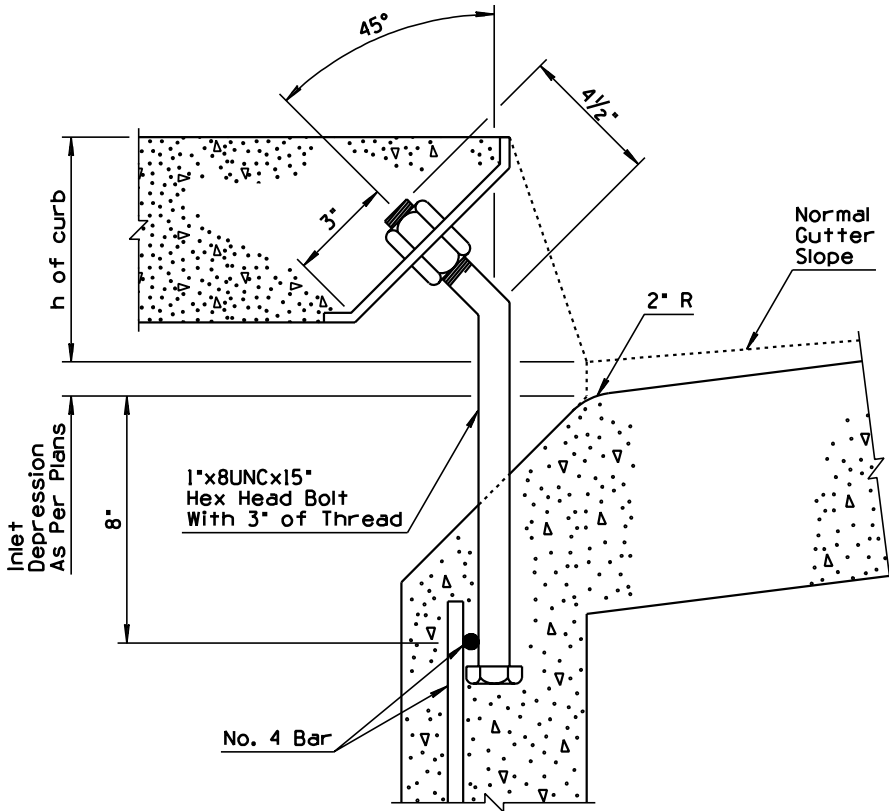
SECTION A-A
USE THIS SECTION WHEN H IS GREATER THAN 5'



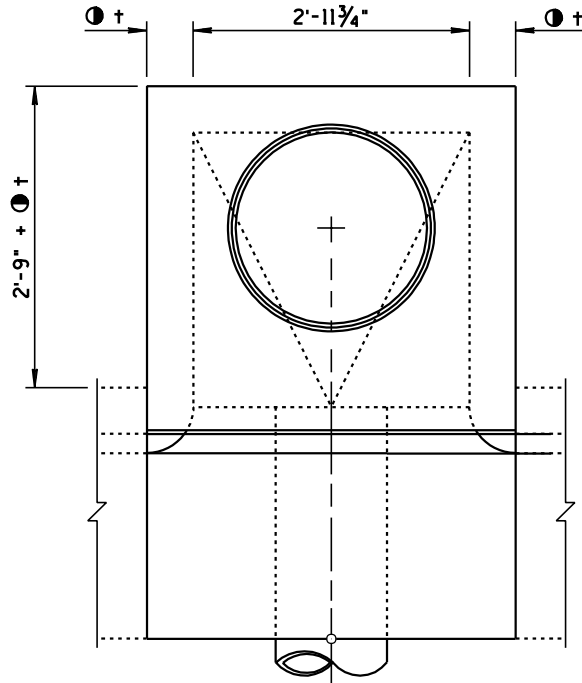
DETAIL NO. 1



DETAIL NO. 3



DETAIL NO. 2
CURB SUPPORT ANCHOR

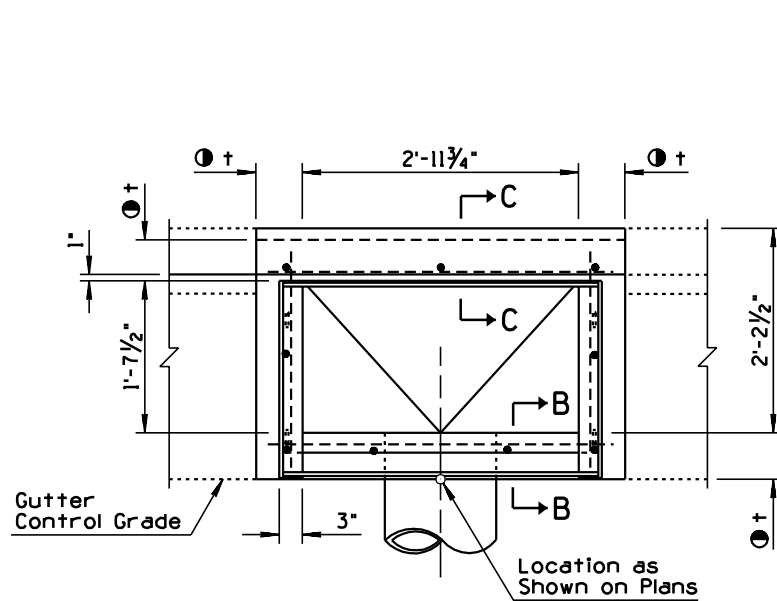


DETAIL NO. 4

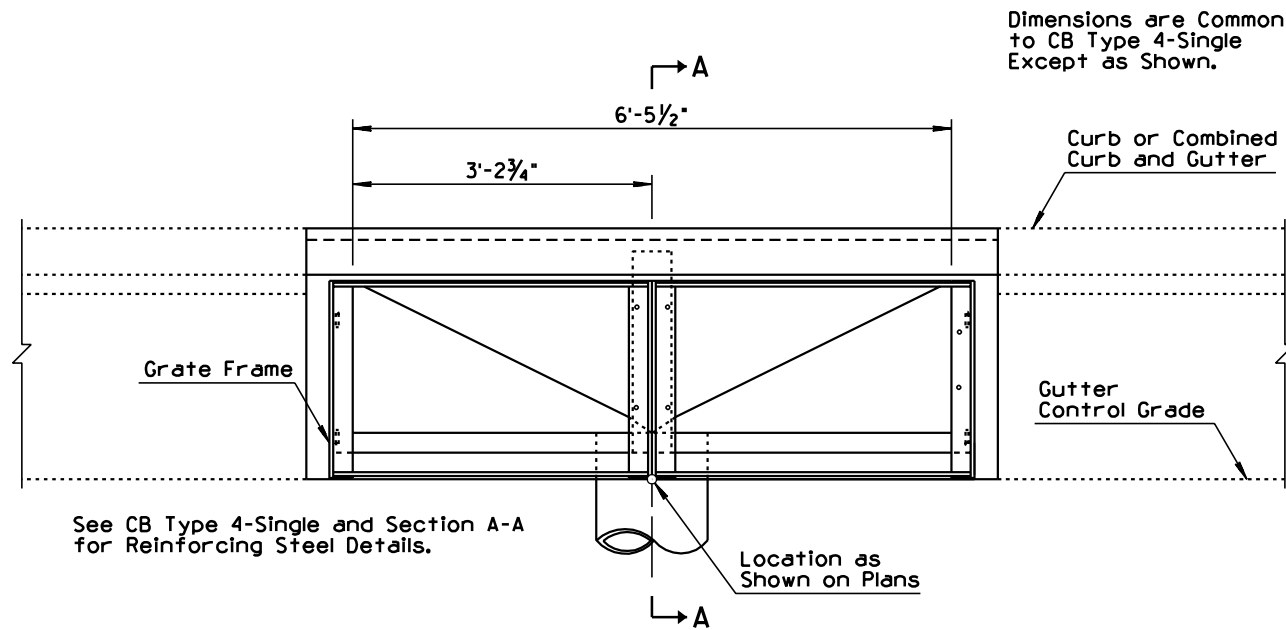
- GENERAL NOTES
- See sheet 1 of 2 for other dimensions, notes and reinforcing steel.
 - $\textcircled{1} + = 6"$ when H is 8' or less.
 $8"$ when H is greater than 8'.

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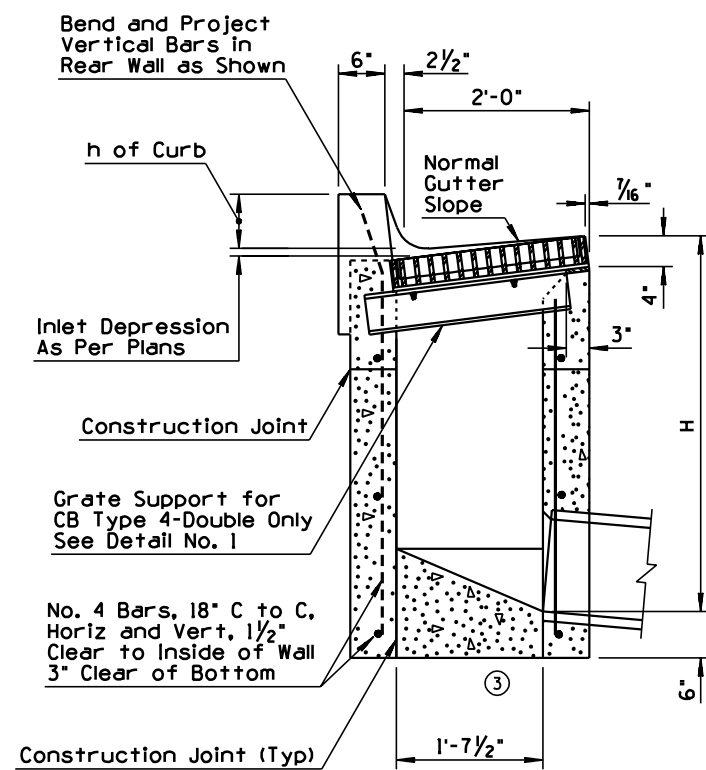
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2	REVISED DETAIL	PNB	5/97	6	ADDED NOTE	PNB	5/97
3	REVISED FLOOR FOR POURING AFTER WALLS	PNB	5/97	7			
4	ADDED SECTION OR DETAIL	PNB	5/97	8			



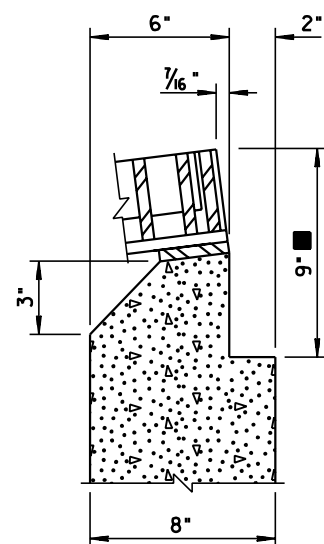
PLAN - CATCH BASIN TYPE 4 - SINGLE



PLAN - CATCH BASIN TYPE 4 - DOUBLE

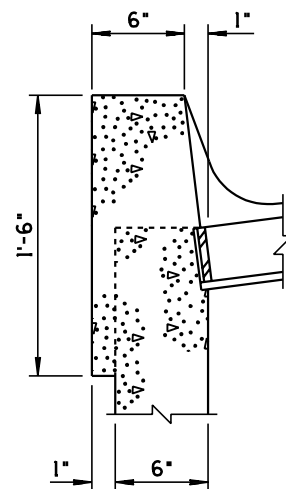


SECTION A-A

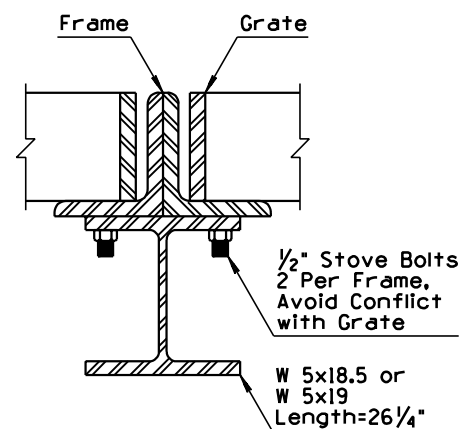


USE THIS SECTION
WHEN t=8"

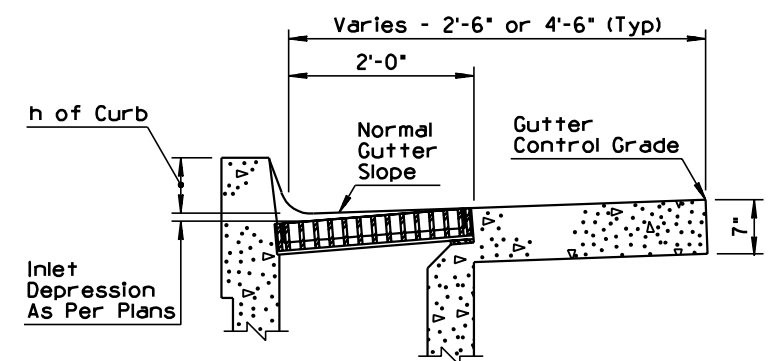
SECTION B-B ②



SECTION C-C ④



DETAIL NO. 1



DETAIL NO. 2 ④

GENERAL NOTES

- ⑥ 1. Catch basin can be used on grade or at roadway sag.
2. Pipes can be placed in any wall.
- ⑤ 3. Floor shall have a wood trowel finish and a minimum 4:l 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 PCCP, 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 B-B.
■ 9" when pavement is AC.
Match pavement thickness
when pavement is PCCP.

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Catch Basin Sump

Wing Basin

Construction Joint (Typ)

No Bottom Reinforcing

Construction Joint (Typ)

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

SECTION B-B
USE THIS SECTION WHEN t=8"

SECTION D-D

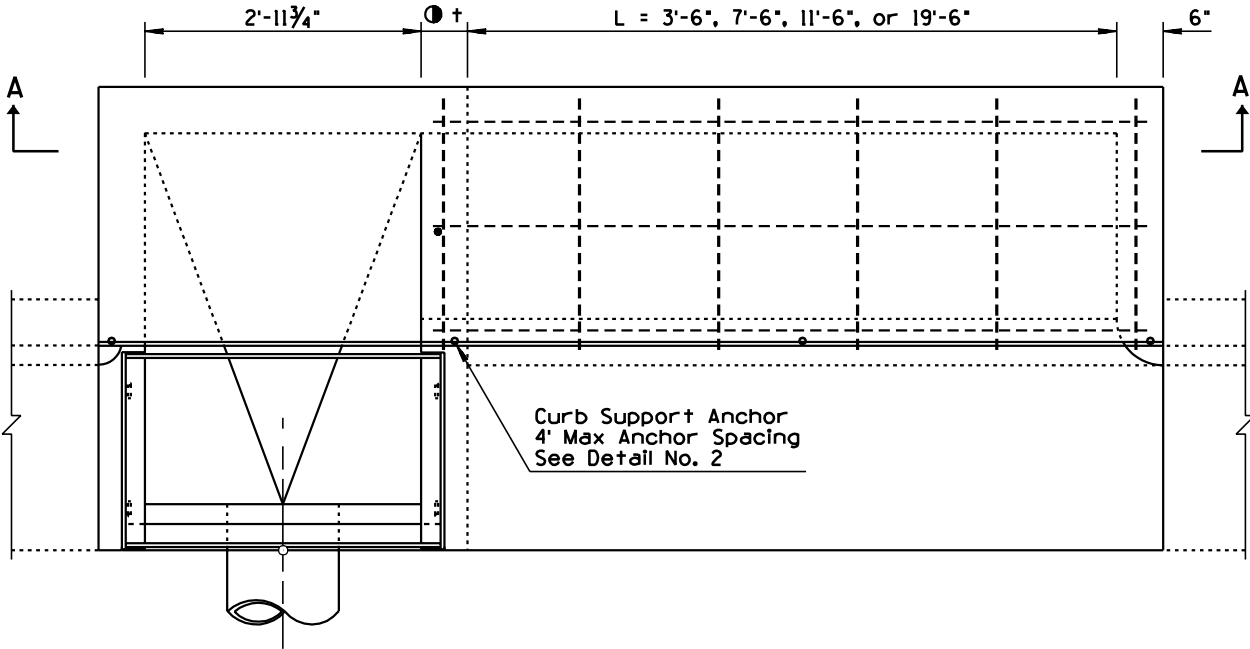
GENERAL NOTES

- Catch basin can be used on grade or at roadway sag.
- 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.
- Pipes can be placed in any wall except wall adjacent to a wing basin.
- 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:l.
- Any specified inlet depression shall be warped to opening according to Std C-15.70.
- All structural steel shall be ASTM A36.
- Nose plate shall be given one shop coat of No. 1 paint.
- All concrete shall be Class B.
- 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.
- Curb opening area (sq ft) per inch of curb "h" + inlet depression = curb opening length (ft) x 0.0834.
- All welding shall be in accordance with Standard Specification 604-3.06.
- See Std C-15.50 for grate and frame details and opening areas.
- Construction joints and drains shall be placed to meet field conditions. Std C-15.70.
- Silicone sealant shall be placed between the grate frame and PCCP, recessed 1/4" from the pavement surface.
- t = 6" when H is 8' or less.
8" when H is greater than 8'.
See Section C-C.
- = 9" when pavement is AC.
Match pavement thickness when pavement is PCCP.

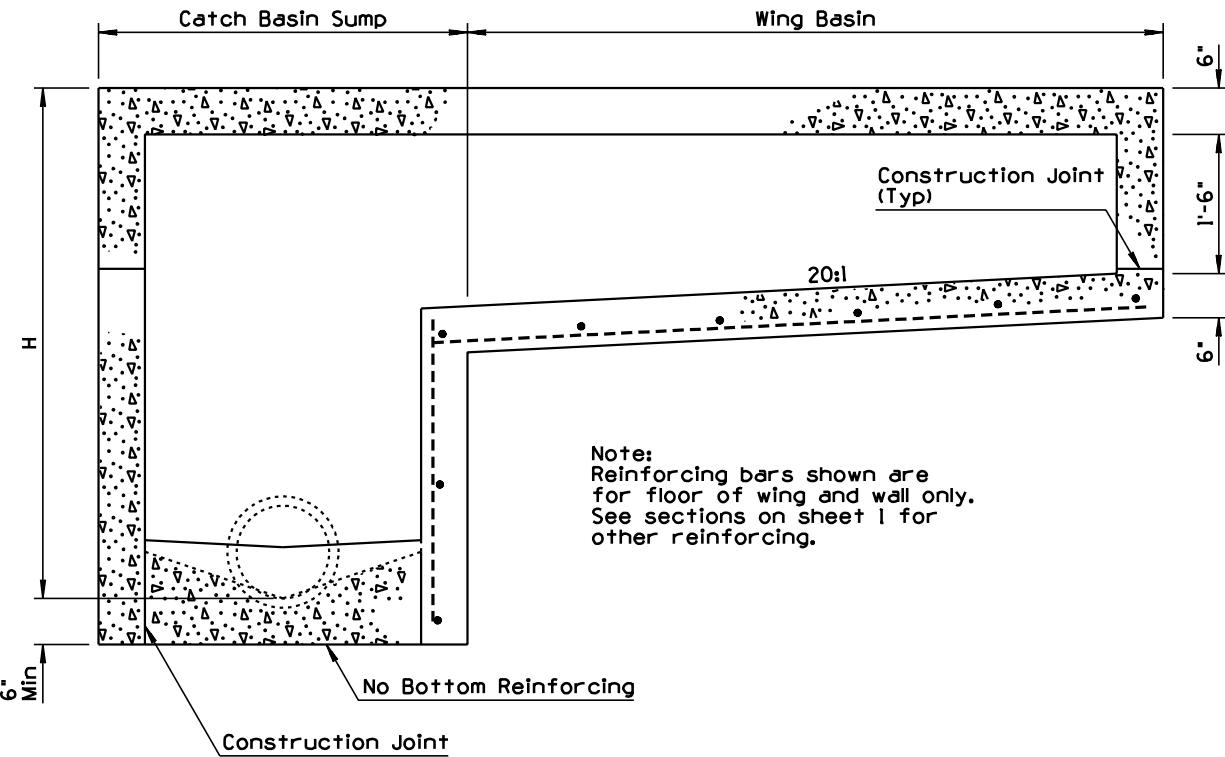
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APPROVED FOR DISTRIBUTION <i>[Signature]</i>	CATCH BASIN, TYPE 5	DRAWING NO. C-15.40 Sheet 1 of 2

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

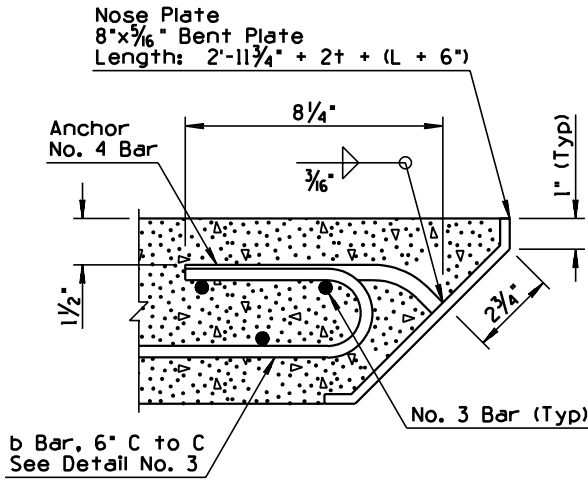
NO.	DESCRIPTION OF REVISIONS	MADE BY	DATE
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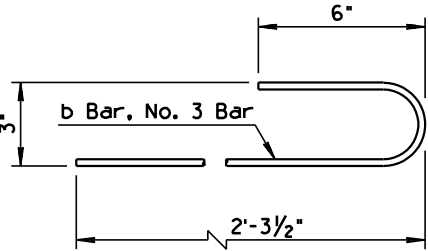
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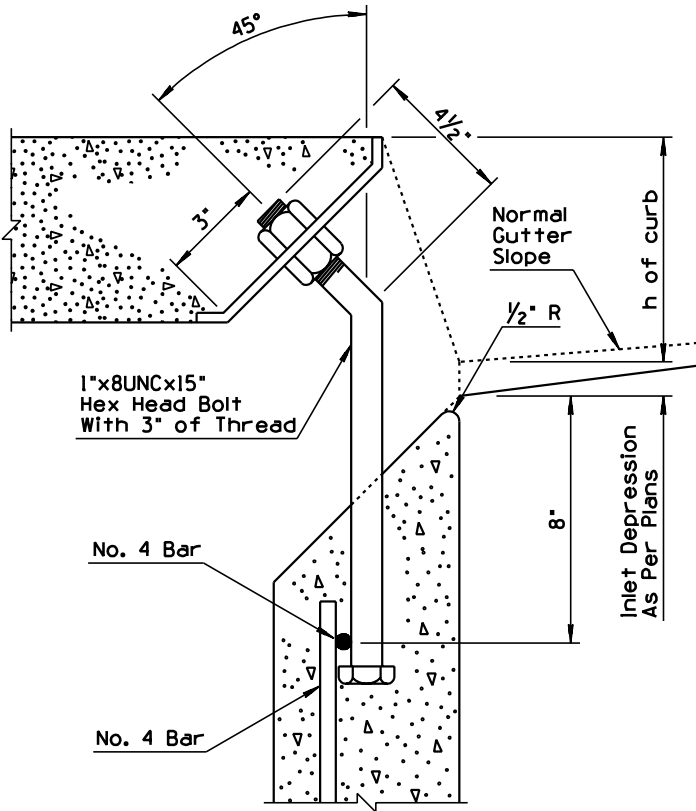
SECTION A-A
USE THIS SECTION WHEN H IS GREATER THAN 5'



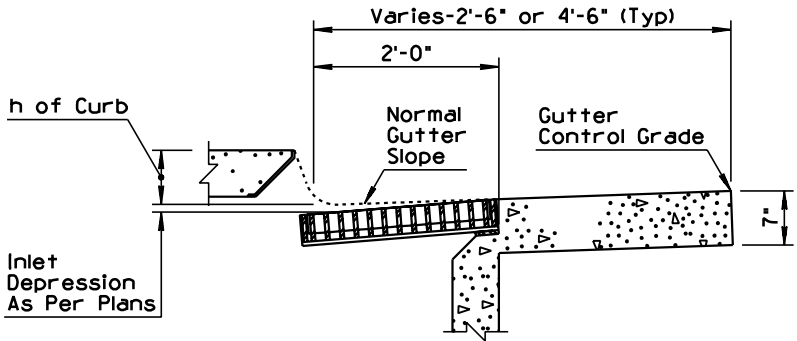
DETAIL NO. 1



DETAIL NO. 3



DETAIL NO. 2
CURB SUPPORT ANCHOR



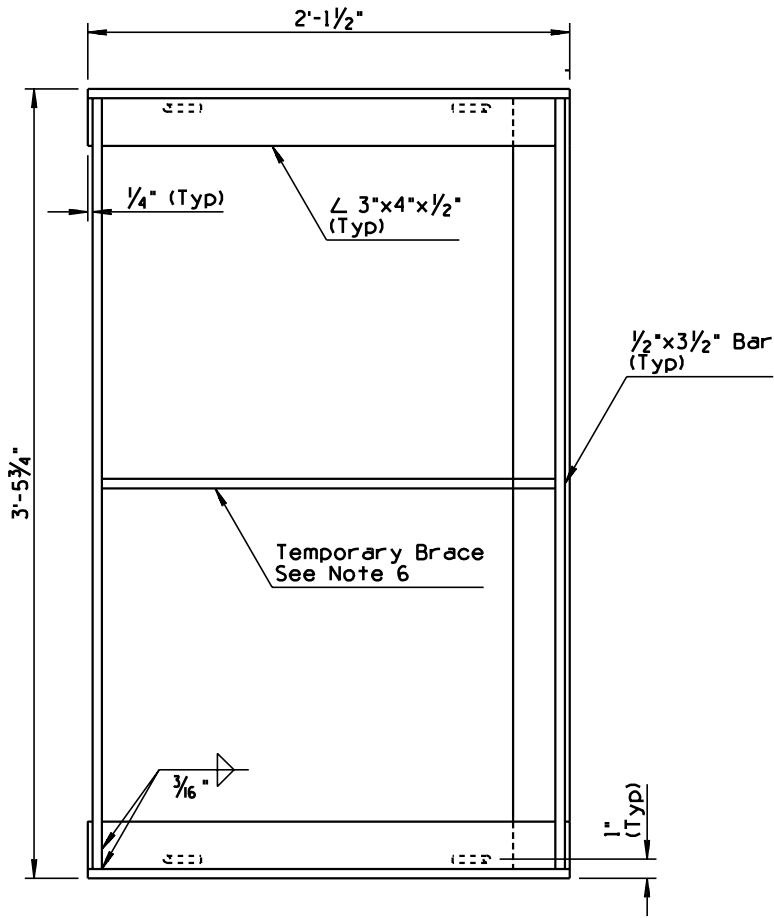
DETAIL NO. 4

GENERAL NOTES

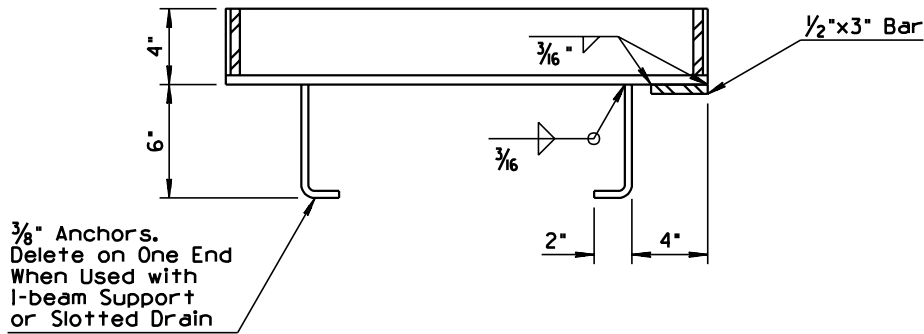
- See sheet 1 of 2 for other dimensions, notes and reinforcing steel.
- $\phi t = 6"$ when H is 8' or less.
 $8"$ when H is greater than 8'.

DESIGN APPROVED <i>Henry H. Ottewill</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	ISSUE 5/97
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	CATCH BASIN, TYPE 5	DRAWING NO. C-15.40 Sheet 2 of 2

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE	NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED GRATE DIMENSIONS	RT/RLF	7/01	5	ADDED GENERAL NOTES NO. 6, 7 & 8	RT/RLF	7/01
2	ADDED SECTION B-B	RT/RLF	7/01	6			
3	REVISED GENERAL NOTE NO. 2	RT/RLF	7/01	7			
4	REVISED GRATE OPENING AREA	RT/RLF	7/01	8			

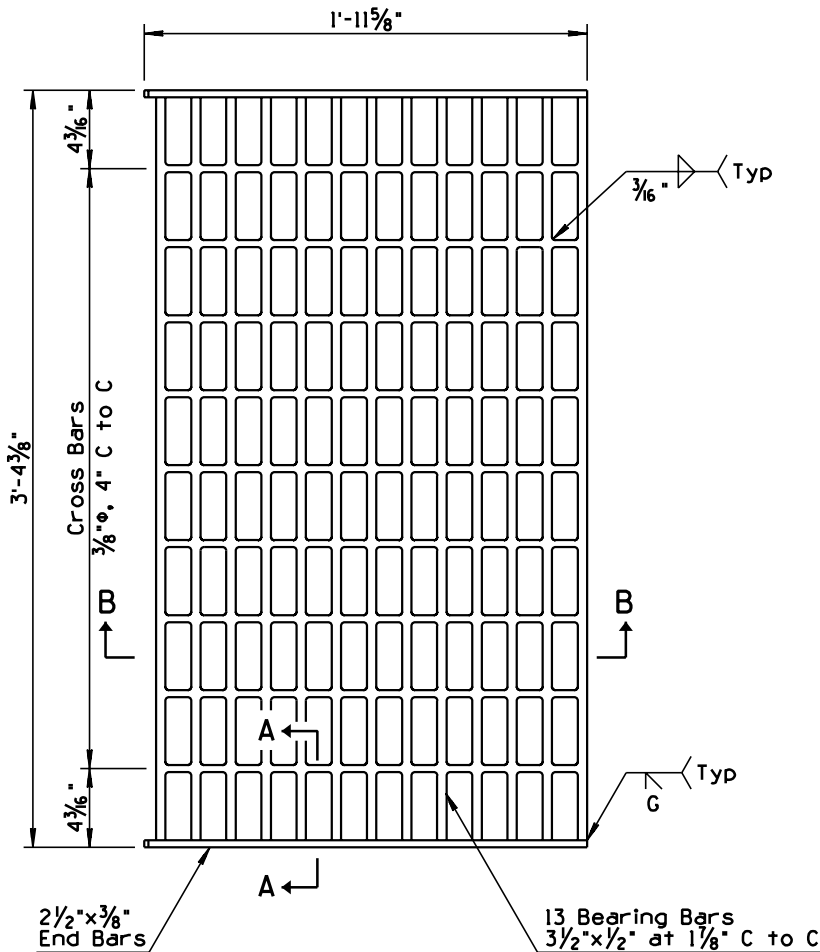


PLAN

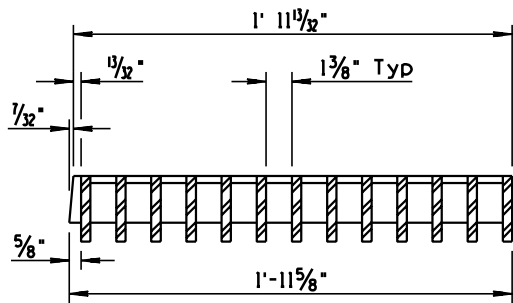


SECTION

FRAME



PLAN

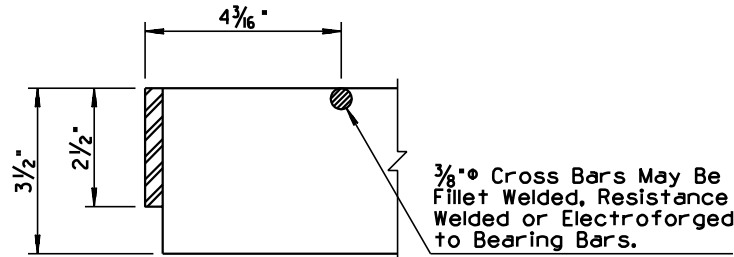


SECTION B-B ②

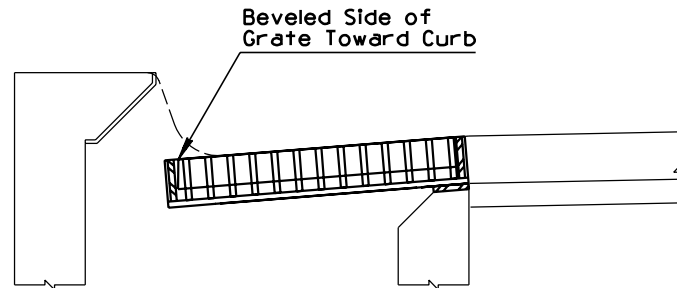
GRATE ①

GENERAL NOTES

1. Grating units and frames shall be fabricated from structural steel ASTM A36 except as noted.
2. All welding shall be in accordance with Standard Specification 604-3.06.
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.
5. Grate opening is 3.60 Sq. Ft.
6. Bracing of frame is recommended for handling and placement purposes.
7. Frame and Grate to be used with Stds C-15.10, C-15.30 and C-15.40 .
8. Grate may be used with Std C-15.92 Frame.



SECTION A-A



TYPICAL INSTALLATION

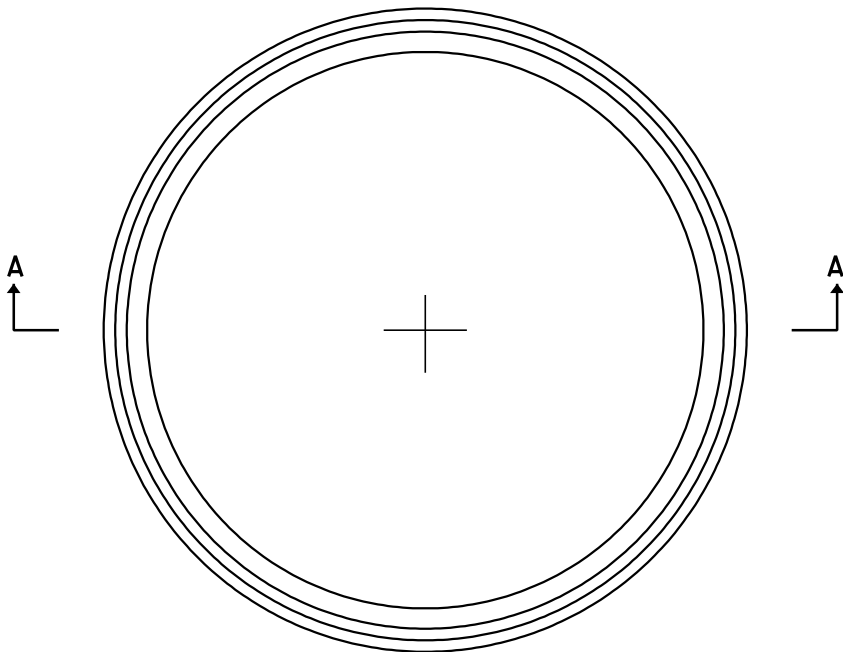
C-15.10 Catch Basin Shown
Similar for C-15.30 and C-15.40

DESIGN APPROVED <i>John L. Law</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CATCH BASIN FRAME AND GRATE	DRAWING NO. C-15.50

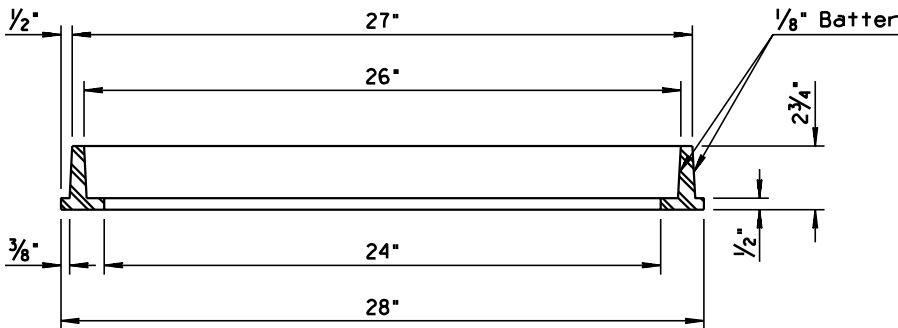
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			

GENERAL NOTES

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

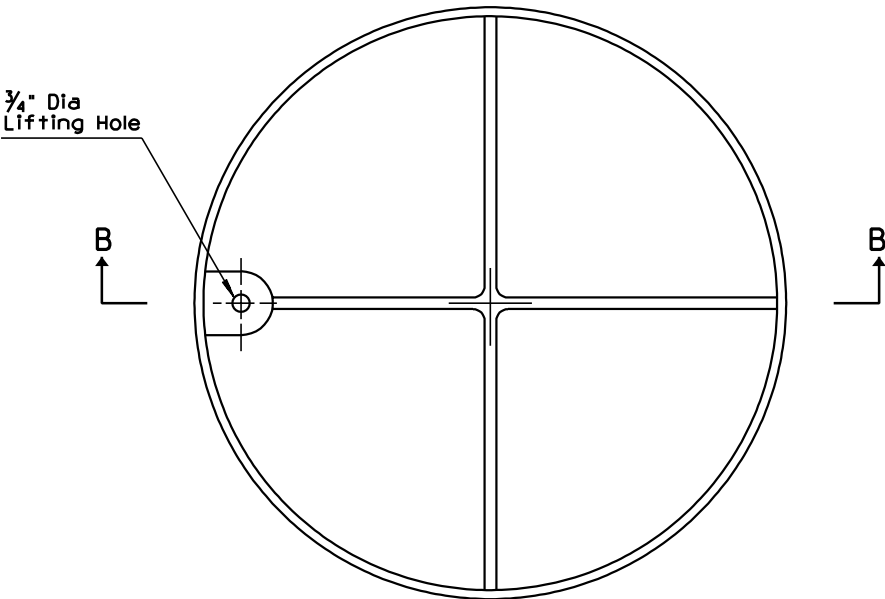


PLAN

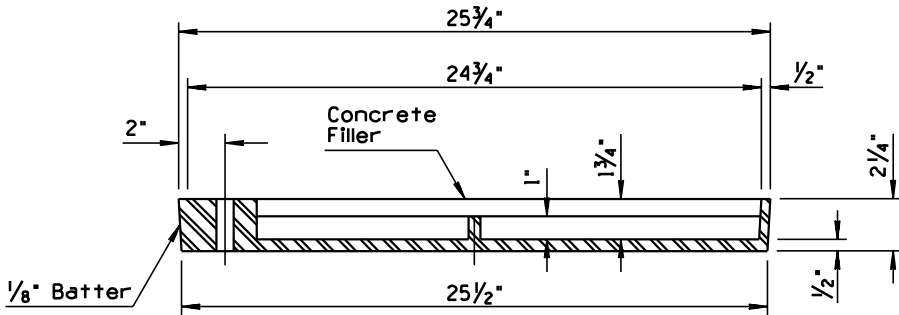


SECTION A-A

FRAME



PLAN



SECTION B-B

COVER

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

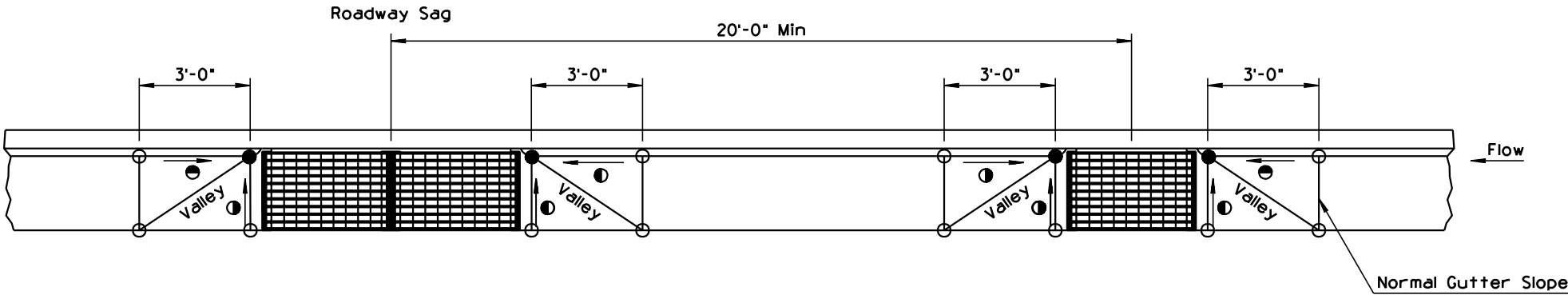
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED STD FOR NEW FRAME	PNB	5/97
2	ADDED DETAIL TO SHOW WIDE GUTTER	PNB	5/97
3	REVISED NOTE	PNB	5/97
4			

GENERAL NOTES

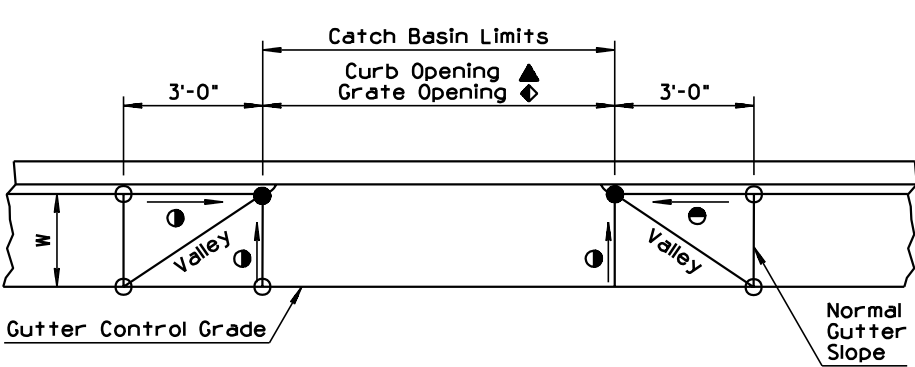
1. No inlet depression shall extend into a traffic lane.
2. Maximum combined inlet and gutter depression is 3 inches. See Detail No. 1.
3. Maximum distance along curb between catch basins where full gutter depression is used is 10 feet.
4. See Std. C-15.80 for aprons used with C-15.80 Catch Basin.
5.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

LEGEND

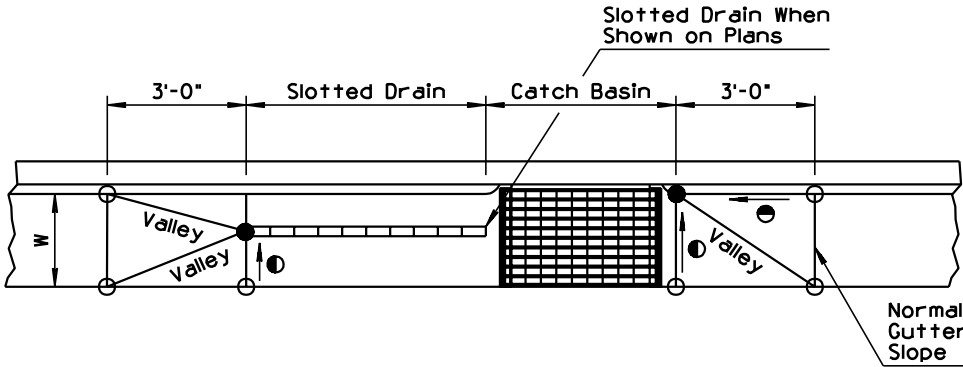
- - Normal pavement or gutter flow line elevation.
- - Depressed elevation.
- ⦿ - Straight grade with downward slope.
- W - Normal gutter width per Std. C-05.10.
- ▲ - Types 1, 3, & 5.
- ◆ - Type 4 & C-15.91.



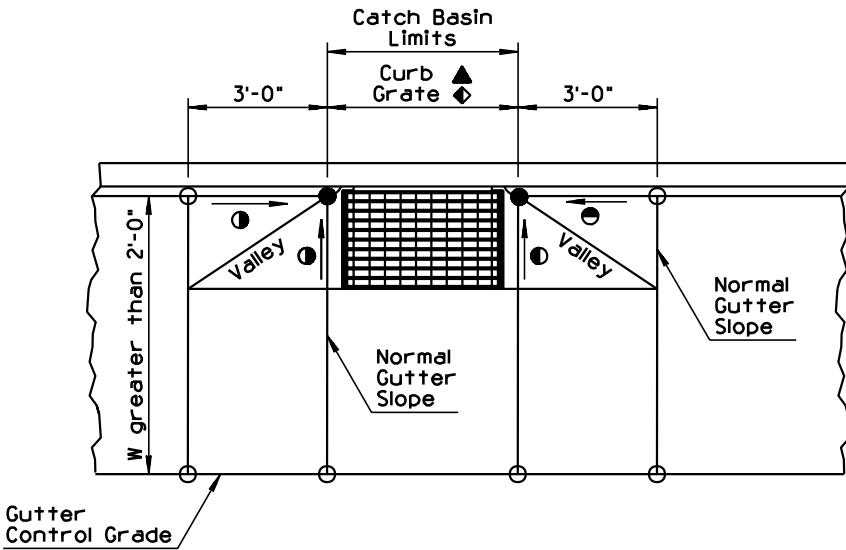
CATCH BASIN SPACING AT ROADWAY SAG CONDITION



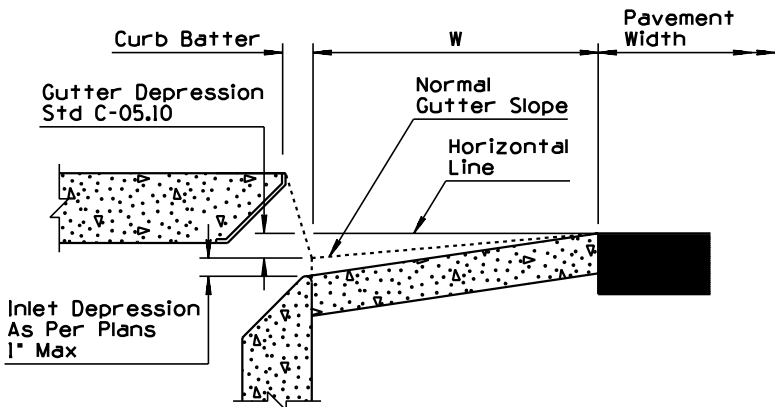
INLET DEPRESSION



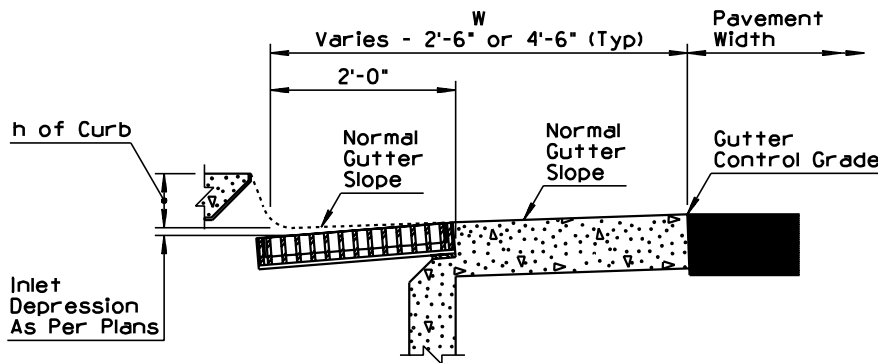
INLET DEPRESSION
CATCH BASIN WITH SLOTTED DRAIN



INLET DEPRESSION
CATCH BASIN WITH WIDE GUTTER



DETAIL NO. 1



DETAIL NO. 2

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 5/97
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① CATCH BASIN MISC. DETAILS	DRAWING NO. C-15.70 Sheet 1 of 2

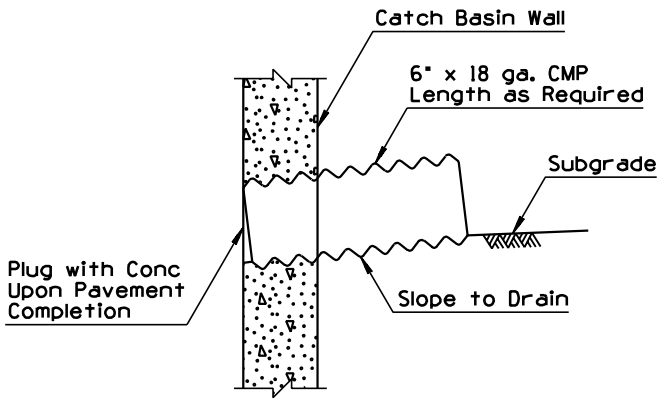
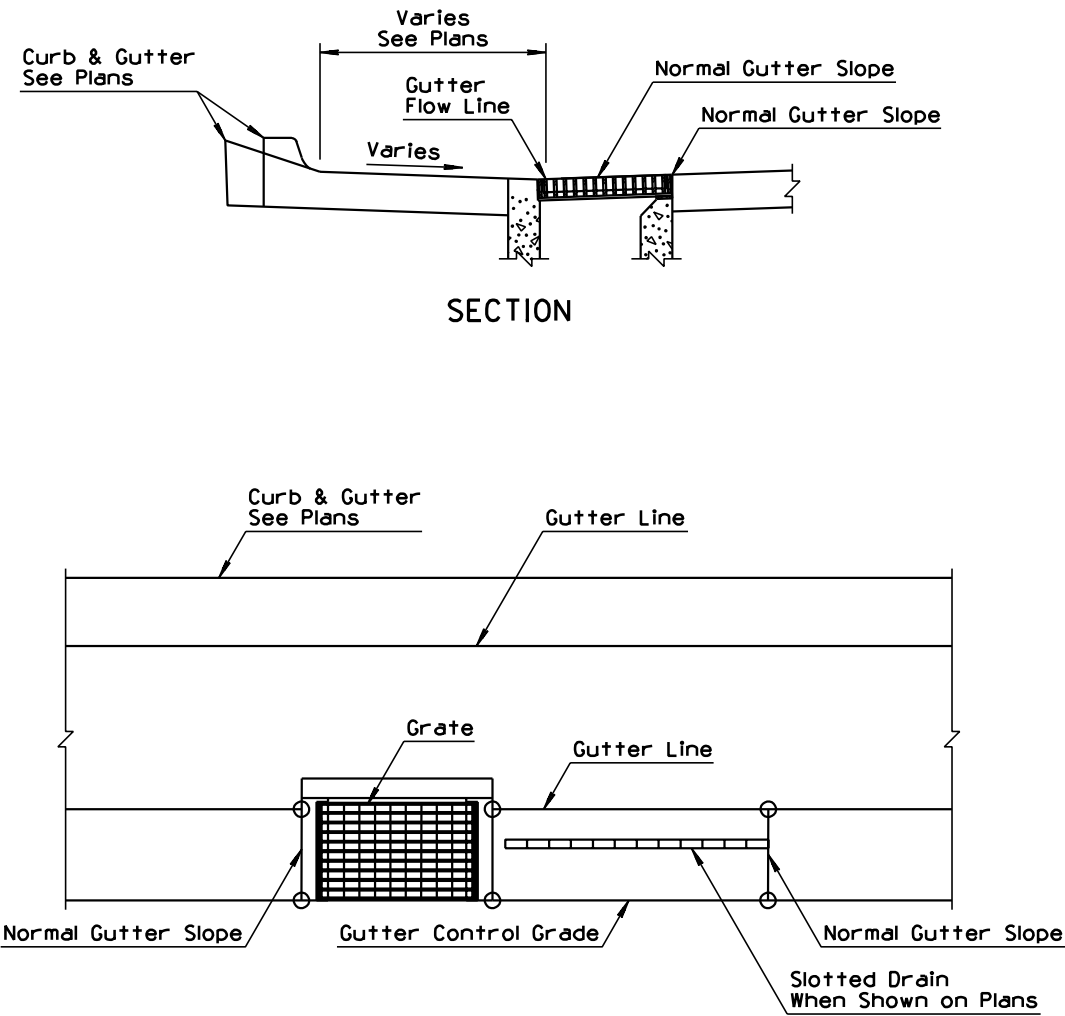
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1			
2			
3			
4			

GENERAL NOTES

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

LEGEND

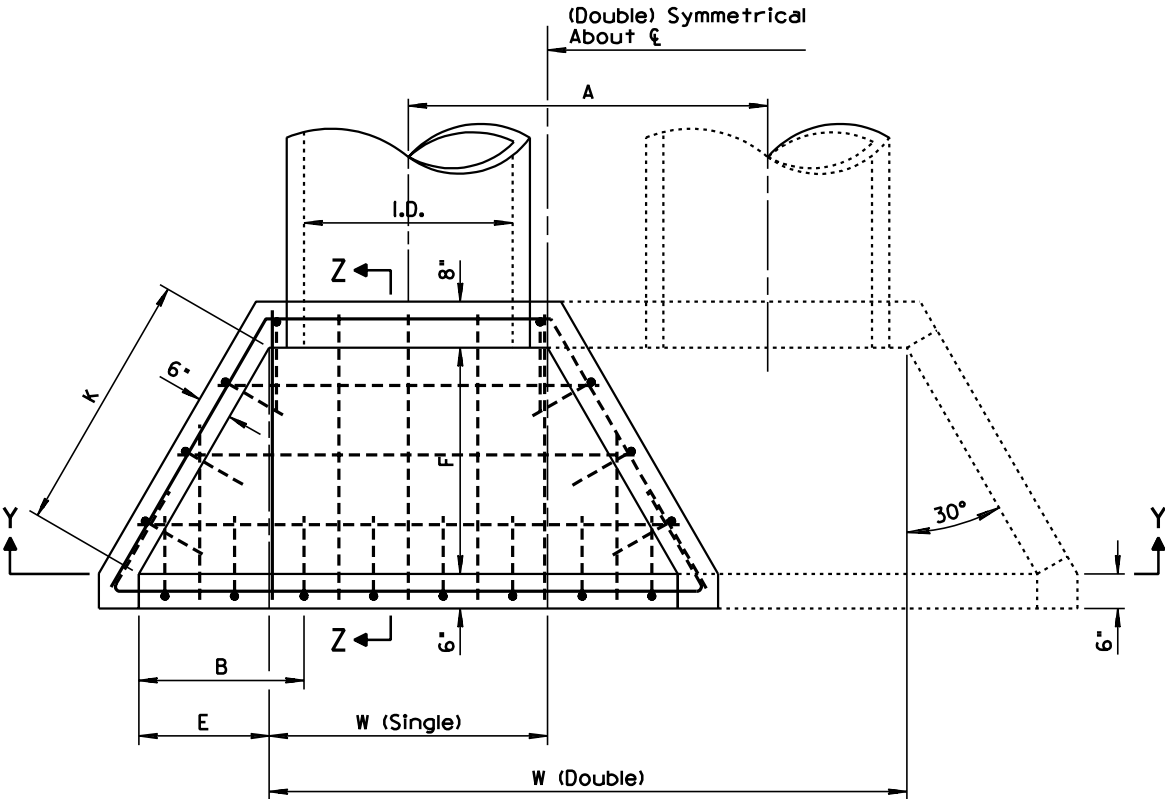
○ - Normal pavement or gutter flow line elevation.



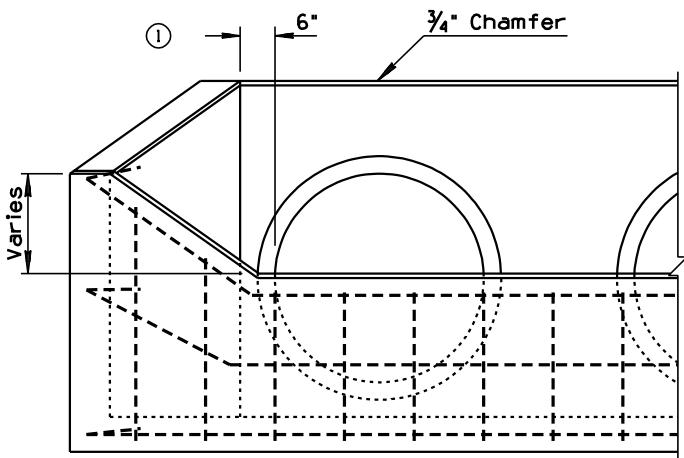
CATCH BASIN CONSTRUCTION DRAIN

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	ISSUE 5/97
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① CATCH BASIN MISC. DETAILS	DRAWING NO. C-15.70 Sheet 2 of 2

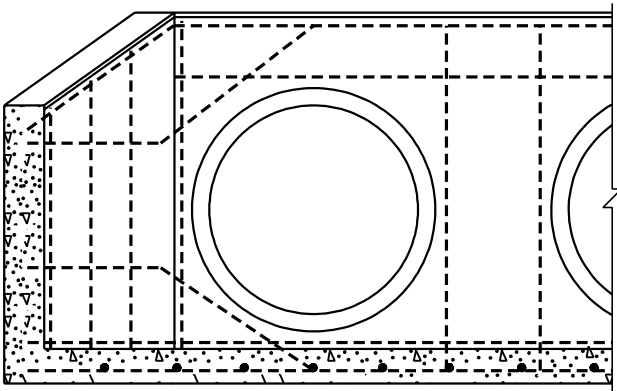
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MOVED DIMENSION FROM PLAN VIEW	PNB	10/95
2			
3			
4			



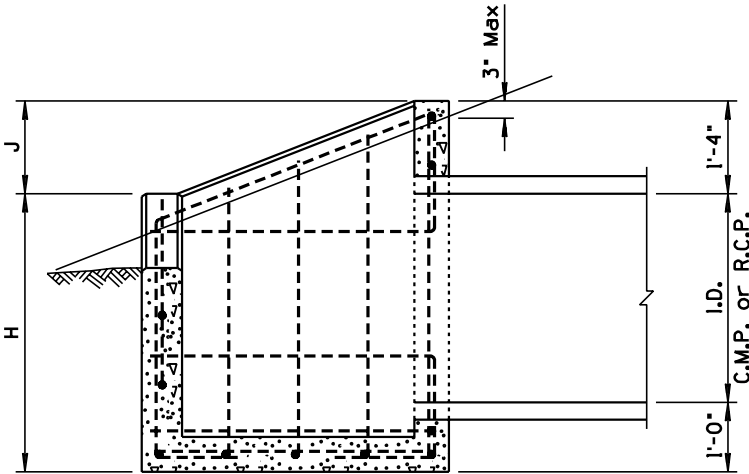
PLAN



ELEVATION



SECTION Y-Y



SECTION Z-Z

GENERAL NOTES

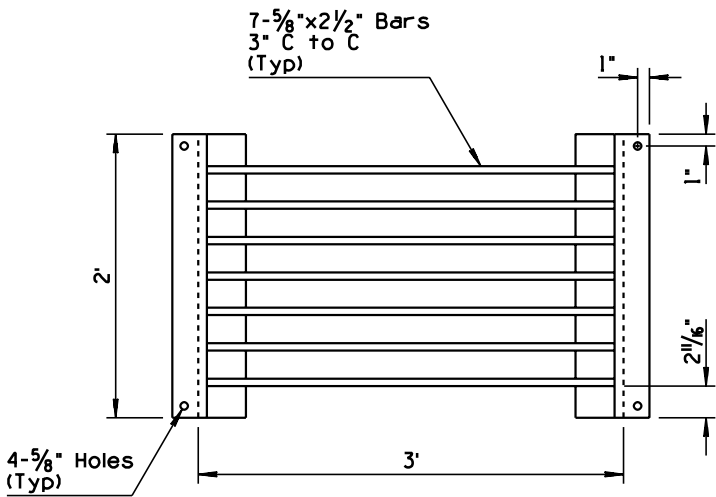
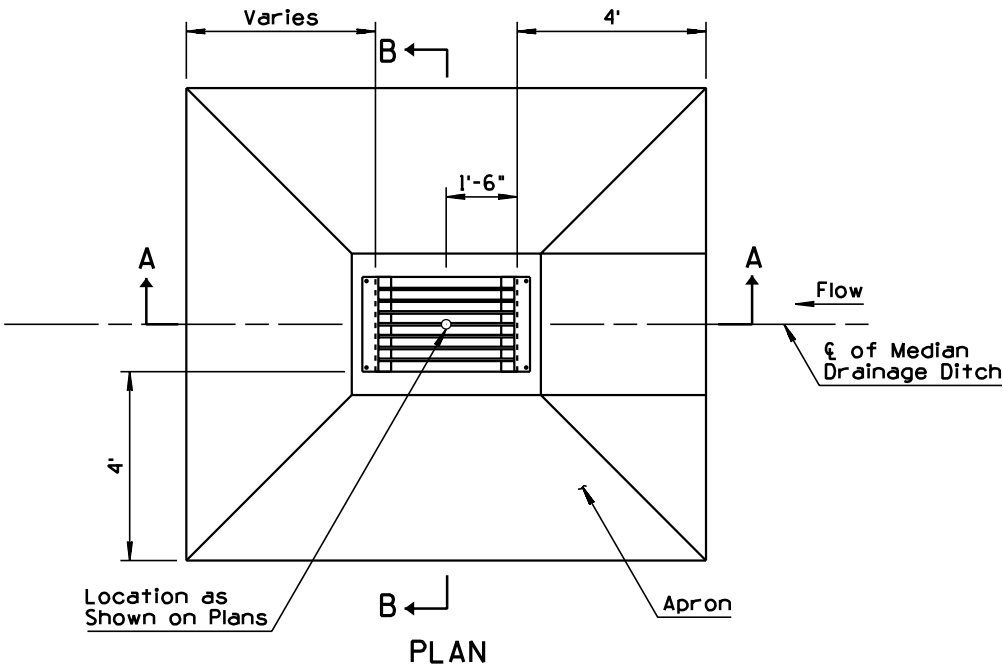
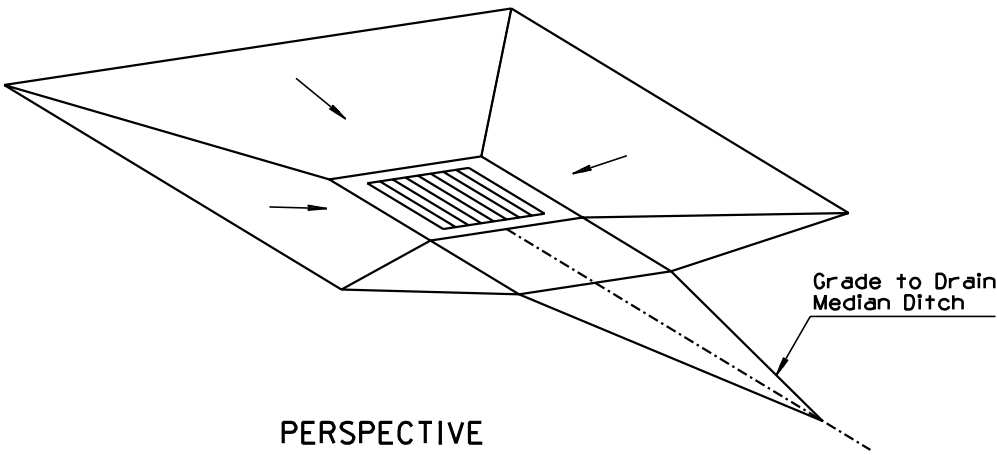
- See also Std. C-13.10.
- High point of headwall shall not project more than 3" above slope.
- All concrete shall be Class B.
- All reinforcing bars shall be Number 4, 1'-0" C to C and 3" clear to inside of walls and floor.

PIPE	DIMENSIONS									QUANTITIES					
	W		A	B	E	F	H	J	K	Concrete C.Y.				Reinforcing Steel	
										Single		Double		Lbs.	
										C.M.P.	For Concrete Pipe Deduct	C.M.P.	For Concrete Pipe Deduct	Single	Double
I.D.	Single	Double	A	B	E	F	H	J	K	C.M.P.	For Concrete Pipe Deduct	C.M.P.	For Concrete Pipe Deduct	Single	Double
18"	2'-6"	5'-2"	2'-8"	1'-3"	9"	1'-3 5/8"	3'-1"	9"	1'-6"	0.76	0.03	1.12	0.06	75	107
24"	3'-0"	6'-6"	3'-6"	1'-7 1/2"	1'-1 1/2"	1'-11 3/8"	3'-5"	11"	2'-3"	1.00	0.04	1.55	0.09	92	136
30"	3'-6"	7'-10"	4'-4"	2'-0"	1'-6"	2'-7 1/4"	3'-9"	1'-1"	3'-0"	1.50	0.06	2.29	0.13	112	166
36"	4'-0"	9'-2"	5'-2"	2'-4 1/2"	1'-10 1/2"	3'-3"	4'-0"	1'-4"	3'-9"	1.96	0.09	3.01	0.17	145	214
42"	4'-6"	10'-6"	6'-0"	2'-9"	2'-3"	3'-10 3/4"	4'-4"	1'-6"	4'-6"	2.49	0.11	3.85	0.23	189	279

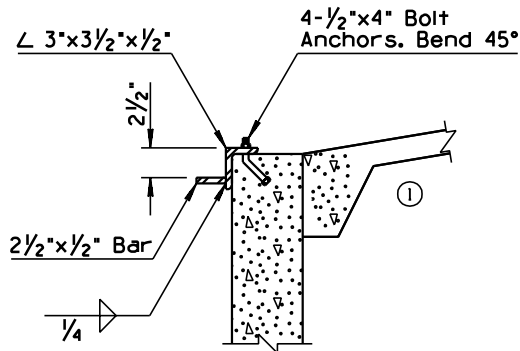
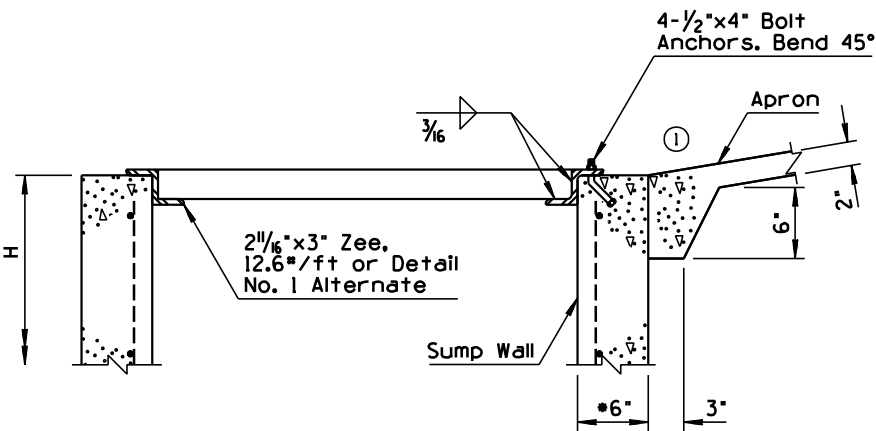
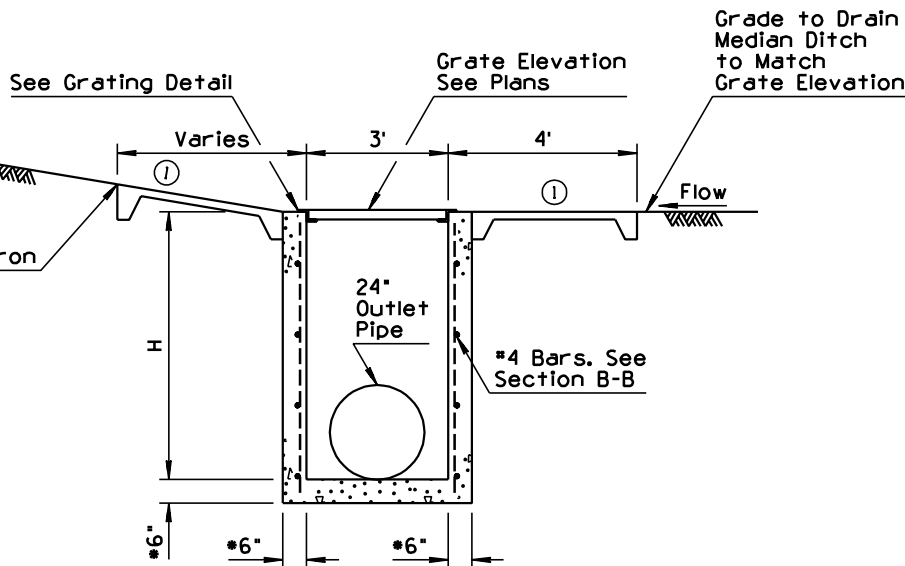
DESIGN APPROVED
[Signature]
 APPROVED FOR DISTRIBUTION
[Signature]

STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 10/95
CATCH BASIN, DROP INLET		DRAWING NO. C-15.75

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CHANGED APRON TO PORTLAND CEMENT CONCRETE ONLY	PNB	5/97
2	REVISED SLOPE	PNB	5/97
3	REVISED NOTE	RLF	7/01
4			

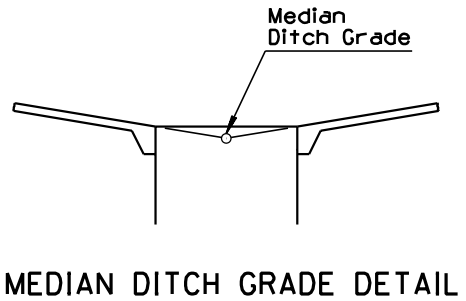
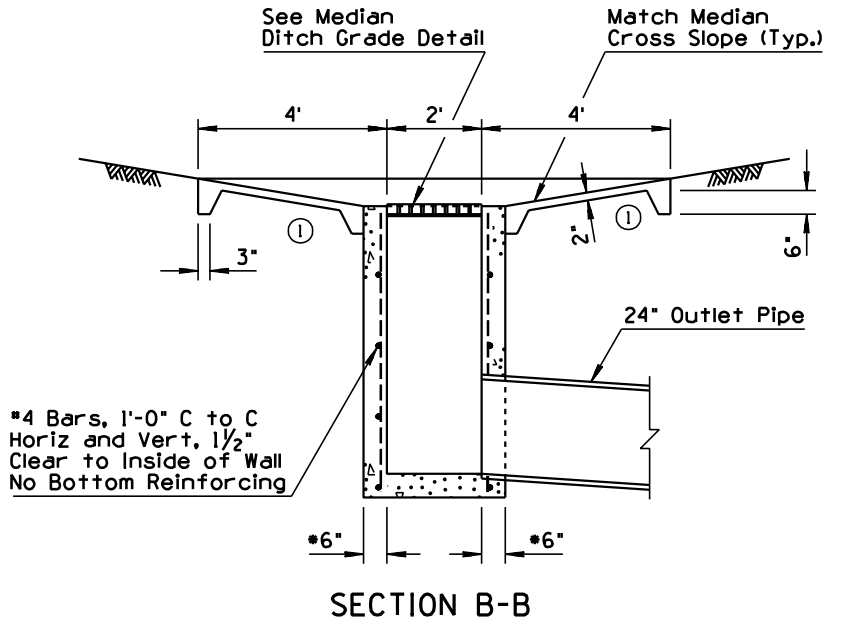


② Slope Varies
Median Dike - 10:1
Sump (2-Way Flow) -
Median Ditch Grade
Other - See Plans



GENERAL NOTES

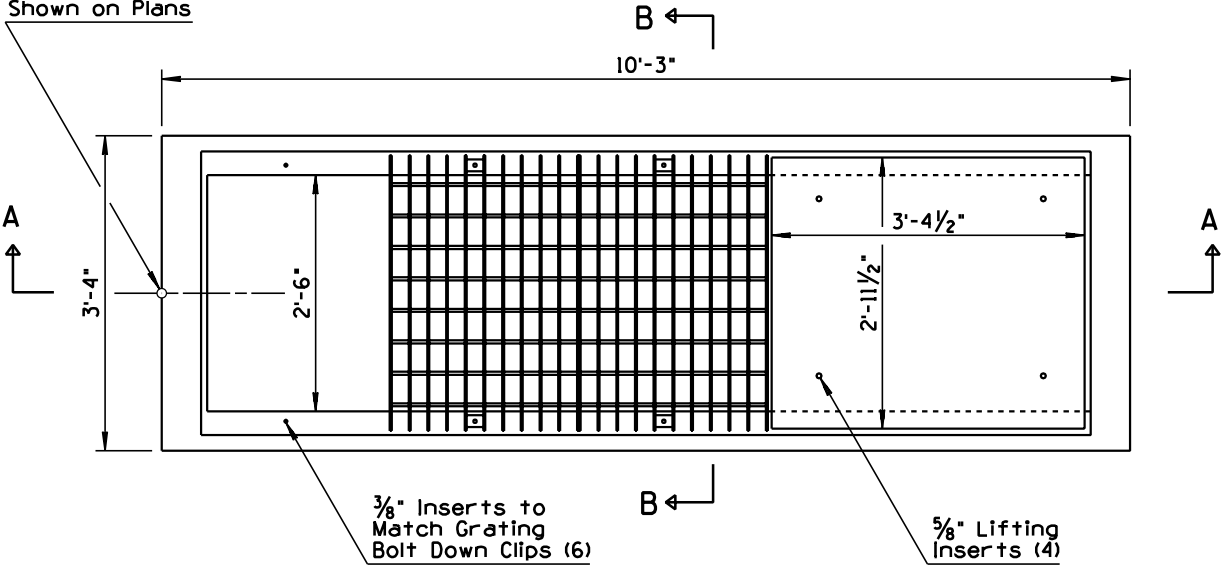
1. Apron shall be portland cement concrete.
2. All concrete shall be Class B.
3. Grating shall be fabricated of structural steel.
4. Structural steel shall be in accordance with ASTM A36.
5. All welding shall be in accordance with Standard Specification 604-3.06.
6. Grating assembly shall be given one shop coat of No. 1 paint.
7. 'H' indicated on plans.
 - * 8" When Wall Height Exceeds 8"



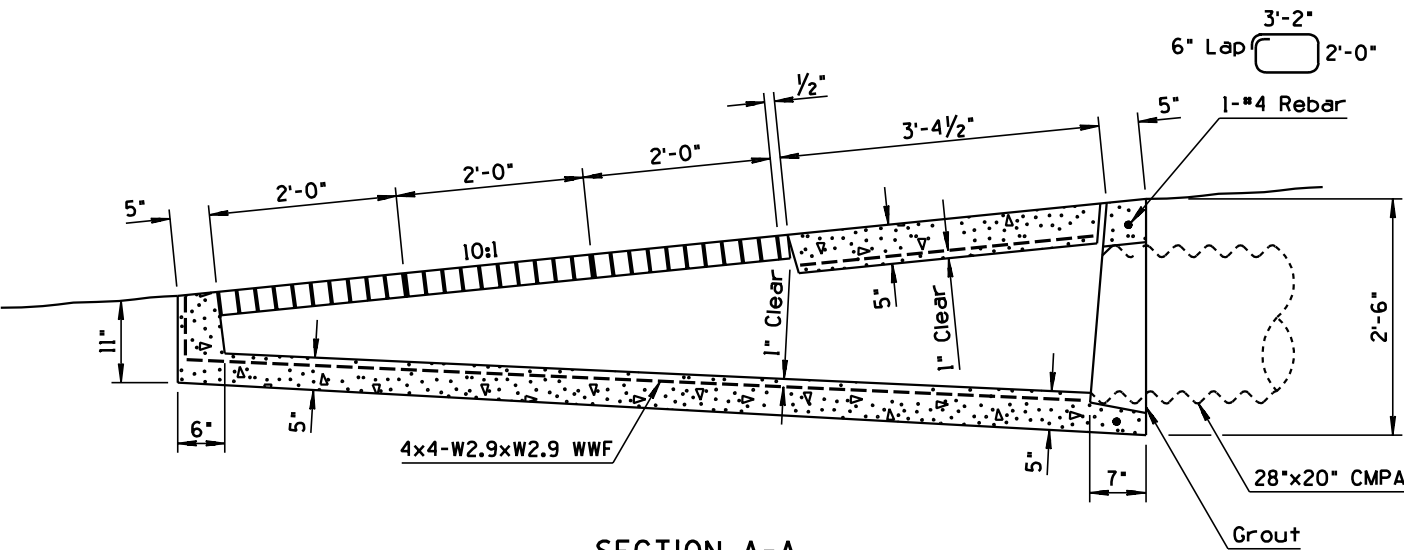
DESIGN APPROVED <i>John L. Lane</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CATCH BASIN, MEDIAN FLUSH	DRAWING NO. C-15.80

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED GENERAL NOTE	PNB	10/95
2	REVISED GENERAL NOTE	RLF	7/01
3	ADDED CALLOUT	RLF	7/01
4			

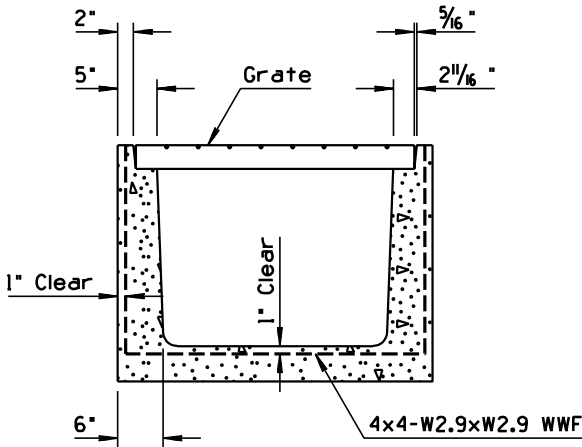
Location as
Shown on Plans



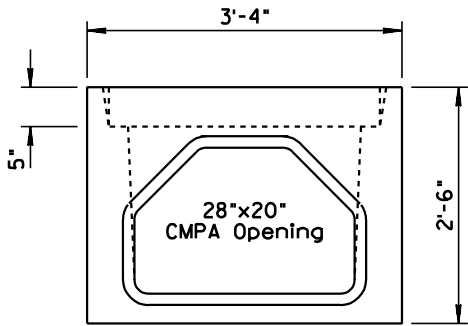
PLAN



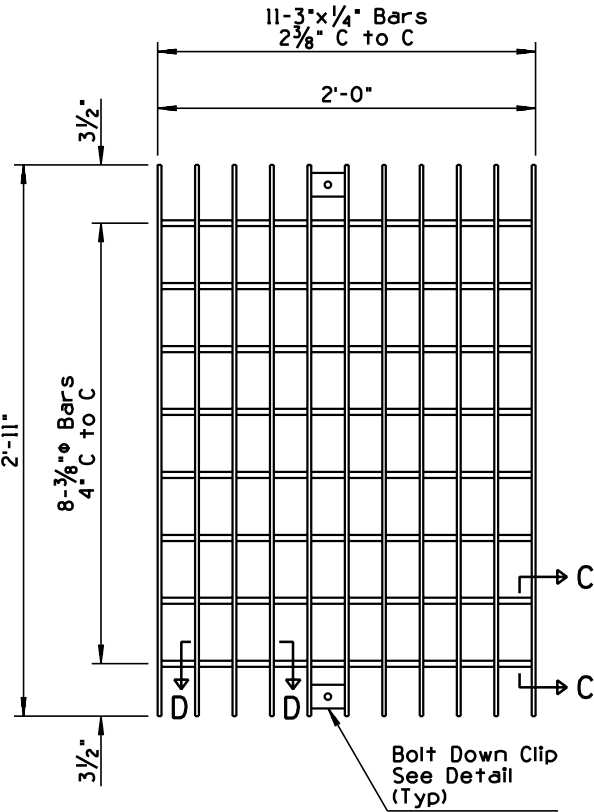
SECTION A-A



SECTION B-B

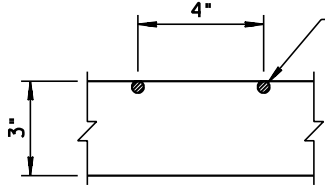


END VIEW

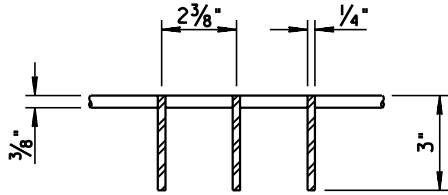


PLAN

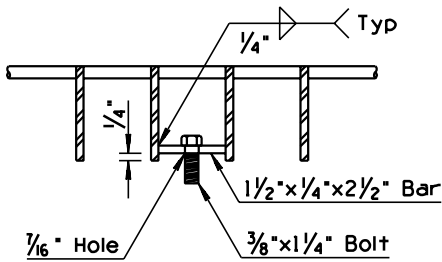
3/8" diameter cross bars may be fillet welded, resistance welded, or electro-forged to bearing bars. ③



SECTION C-C



SECTION D-D



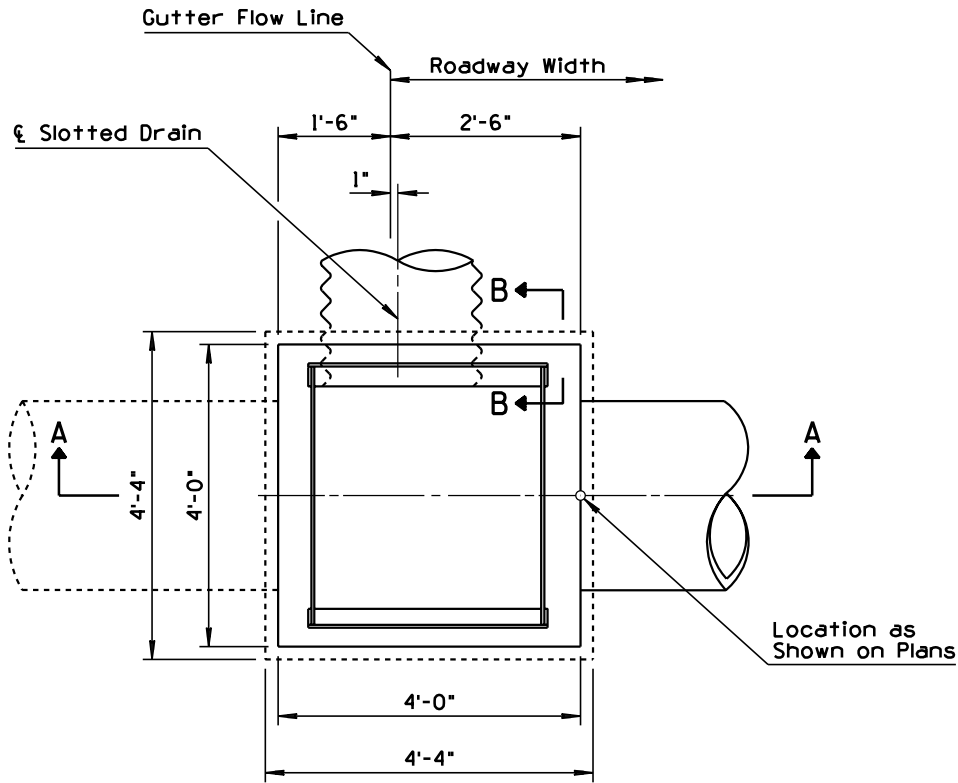
BOLT DOWN CLIP DETAIL

GENERAL NOTES

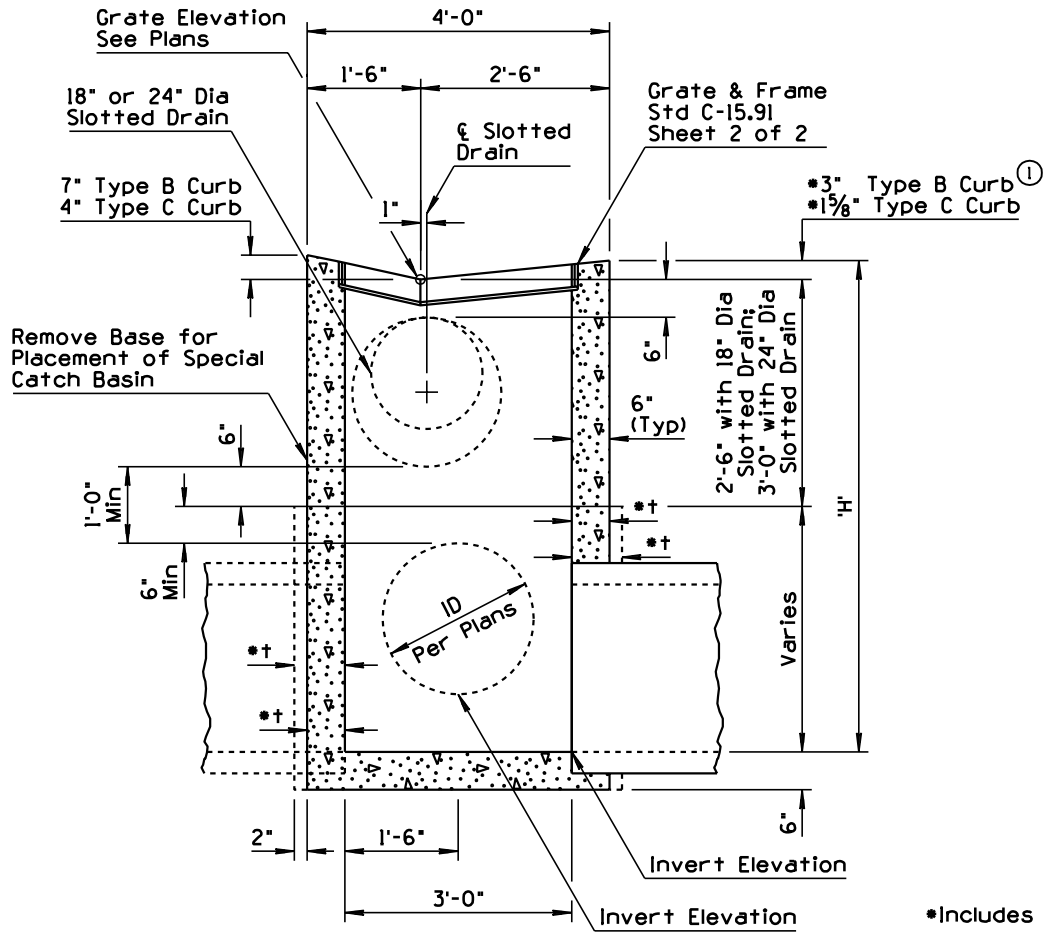
- Concrete shall conform to the requirements for Class S Concrete. The minimum strength shall be 4000 psi.
- Grout shall be in accordance with Standard Specifications except water content shall be such that the consistency is proper for smooth trowling.
- ② All welding shall be in accordance with Standard Specification 604-3.06.
- The completed grate shall be given one shop coat of No. 1 paint.
- ① Foundation soil and backfill shall be in accordance with Section 203-5 of the Standard Specifications.

DESIGN APPROVED <i>John L. L...</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	CATCH BASIN, MEDIAN DIKE PRECAST	DRAWING NO. C-15.90

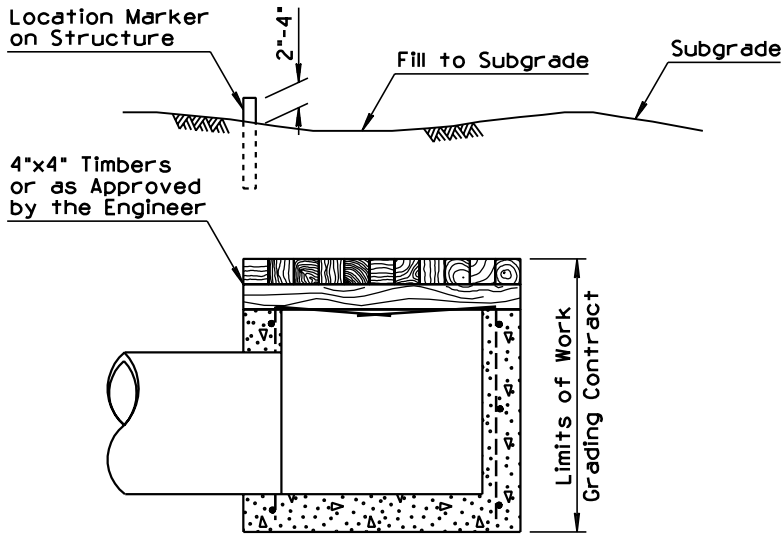
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED TYPE C GUTTER DEPRESSION TO 1 3/8"	JNP	8/99
2	DELETED PREVIOUS GENERAL NOTE* 2	RLF	7/01
3			
4			



PLAN

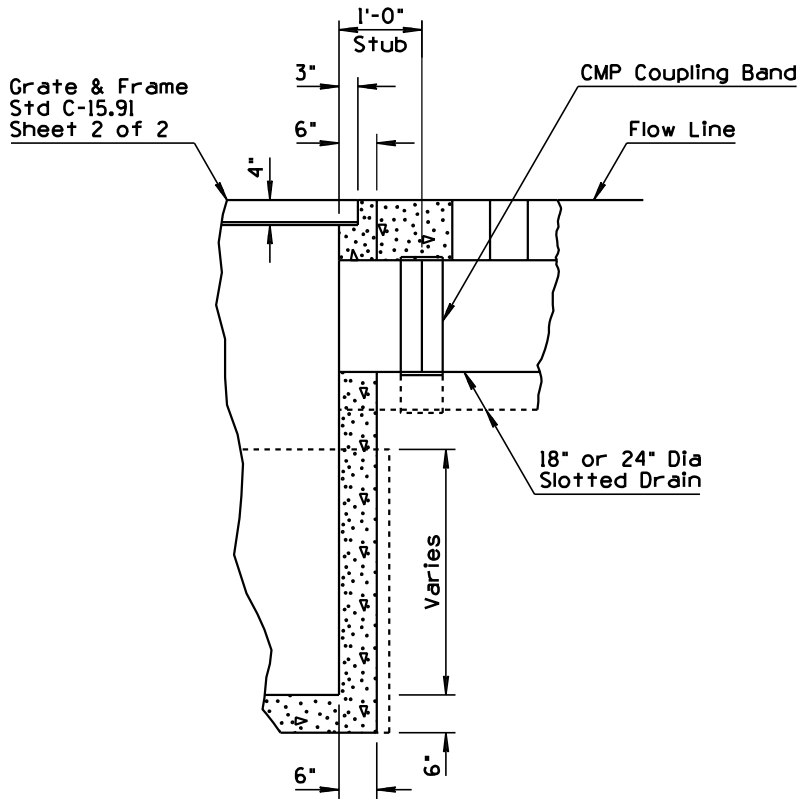


SECTION A-A



NOTE:
Bend Rebars and Cover with
Two Layers of 4"x4" Timbers

TEMPORARY TIMBER CAP DETAIL



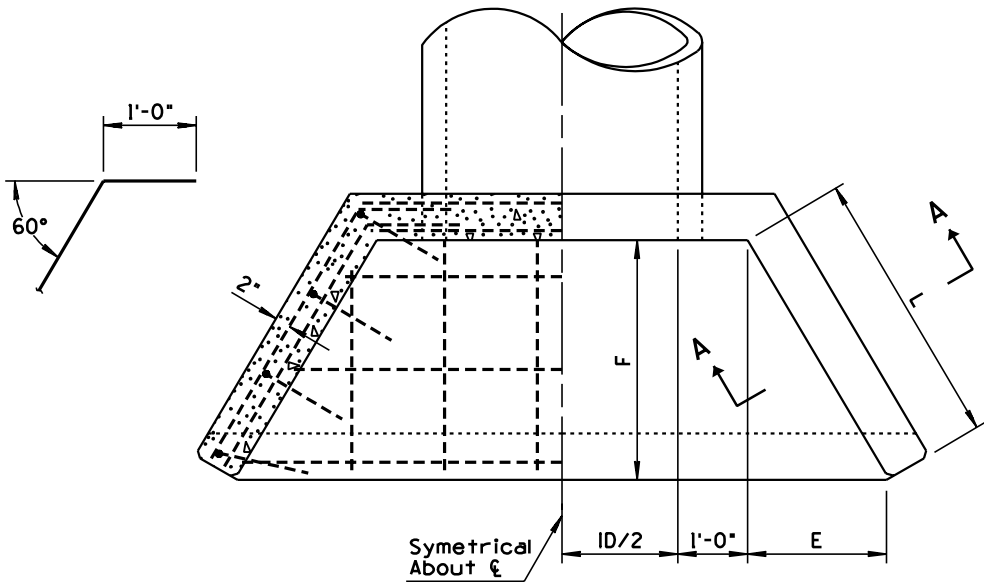
SECTION B-B

GENERAL NOTES

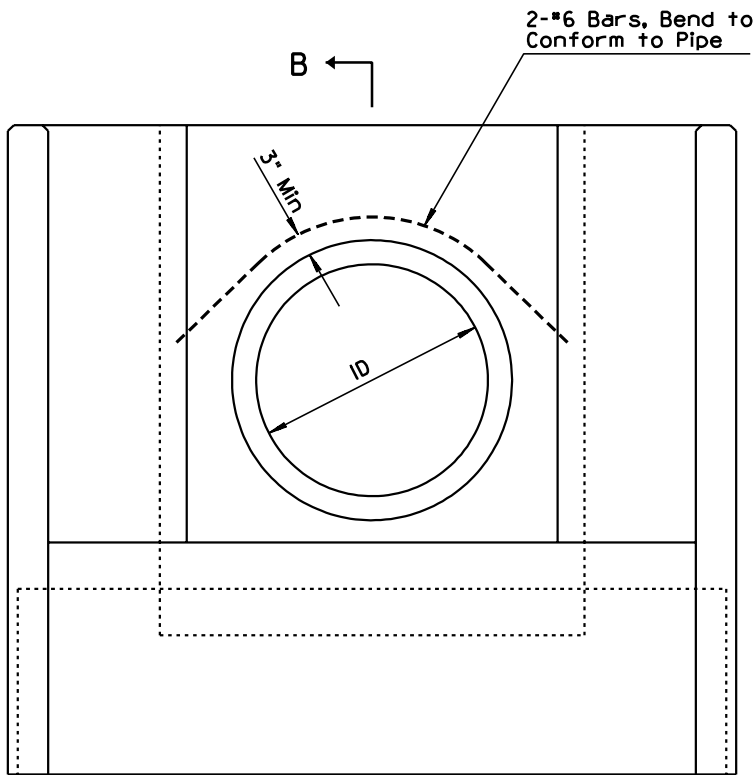
1. All concrete shall be Class B.
2. All reinforcing steel shall have 2" min clear cover unless otherwise noted.
3. Reinforcing steel shall be No. 4 rebar, 12" C to C horizontal & vertical in walls.
4. Pipe can be placed in any wall.
5. See Std C-13.60 and C-13.65 for more information and dimensions of slotted drains.
6. *t = 6" when H is less than 8'.
= 8" when H is greater than 8'.

DESIGN APPROVED <i>John L. L...</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/01
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	FREEWAY CATCH BASIN DETAILS	DRAWING NO. C-15.9I Sheet 1 of 2

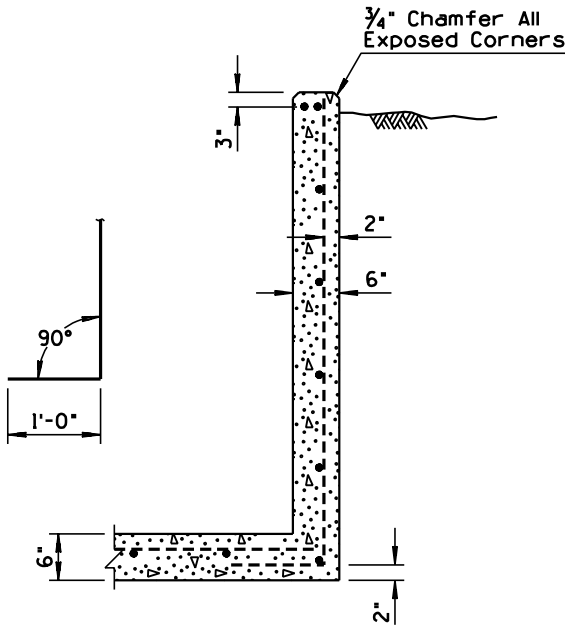
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CHANGED "DIVISIONS" TO "SECTIONS"	PNB	10/95
2			
3			
4			



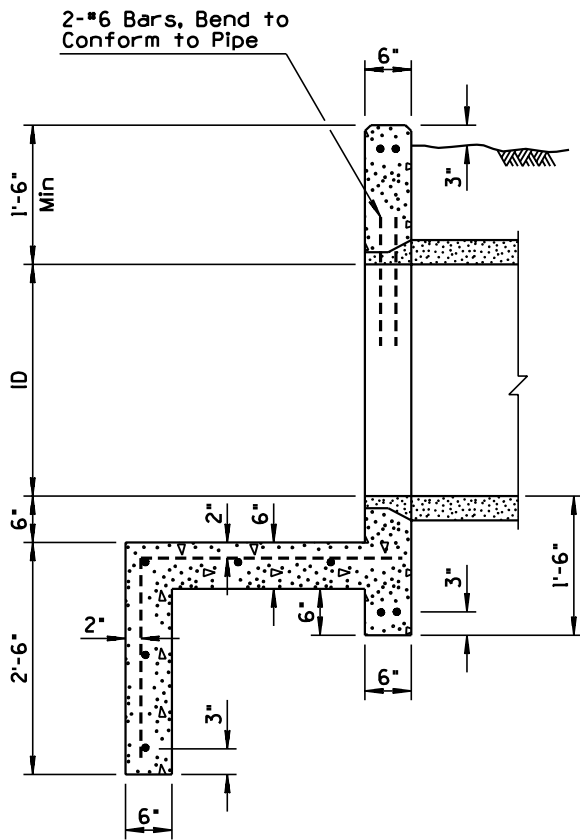
PLAN



ELEVATION



SECTION A-A



SECTION B-B

GENERAL NOTES

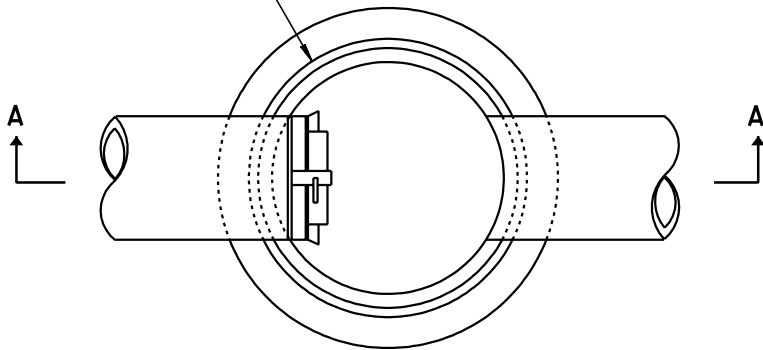
1. All concrete shall be Class B.
2. All reinforcing bars shall be #4 except two #6 bars over pipe. Bar spacing approximately 1'-0" center to center unless otherwise noted.
- ① 3. 30° wing wall flare shown; 45° normally desirable. See Hydraulics and Utility and Railroad Engineering Sections.

PIPE	DIMENSIONS			QUANTITIES		
	ID	L	E	F (Approx)	CY Concrete CMP RCP	Reinf Steel Lbs
18"	2'-0"	1'-0"	1'-9"	0.97	0.96	65
24"	2'-0"	1'-0"	1'-9"	1.11	1.07	78
30"	3'-0"	1'-6"	2'-7"	1.50	1.44	108
36"	4'-0"	2'-0"	3'-6"	2.08	2.01	150
42"	5'-0"	2'-6"	4'-4"	2.71	2.63	205
48"	6'-0"	3'-0"	5'-2"	3.39	3.30	270
54"	7'-0"	3'-6"	6'-1"	4.14	4.02	335
60"	8'-0"	4'-0"	6'-11"	4.96	4.80	410

DESIGN APPROVED <i>Larry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS IRRIGATION HEADWALLS 18" TO 60" DIAMETER PIPES	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. C-16.10

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	CHANGED "DIVISION" TO "SECTION"	PNB	10/95
2			
3			
4			

Reinforced Conc Pipe
Size as Shown on Plans

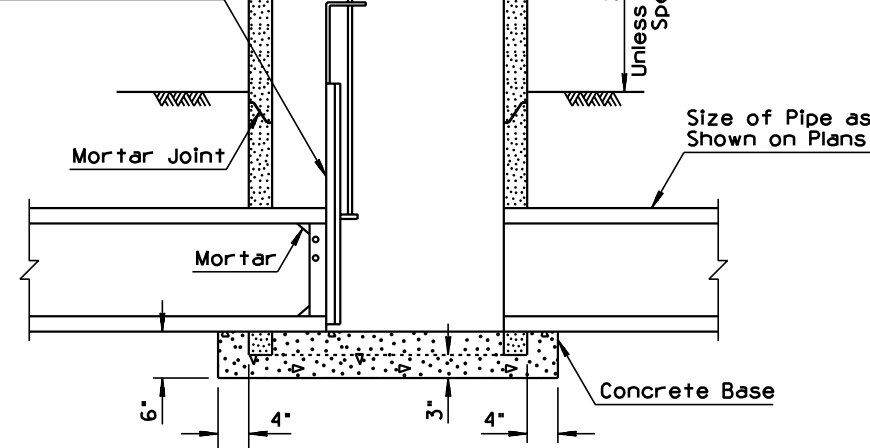


1/4" Locking Staple

PLAN

Cover

Gate as Per Std
C-16.30 Type 2
If Called for on Plans

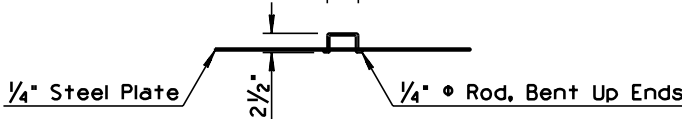
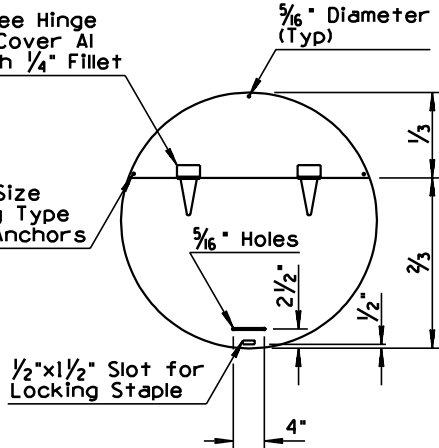


SECTION A-A

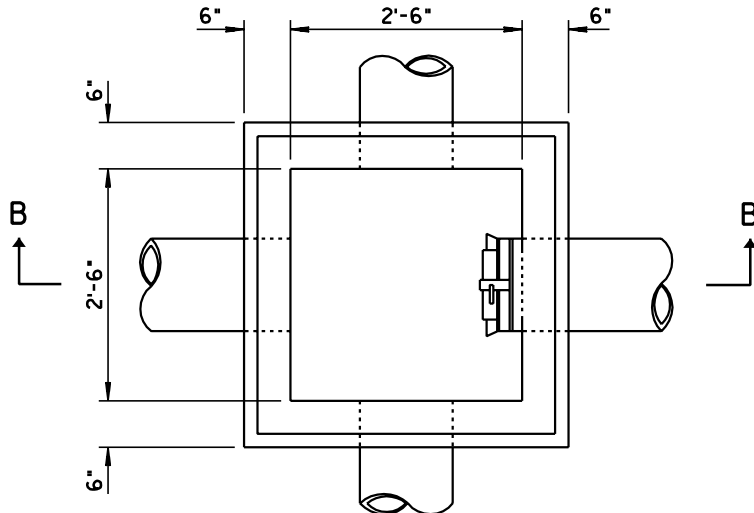
1/4" Steel Tee Hinge
Welded to Cover All
Around with 1/4" Fillet

5/16" Diameter
(Typ)

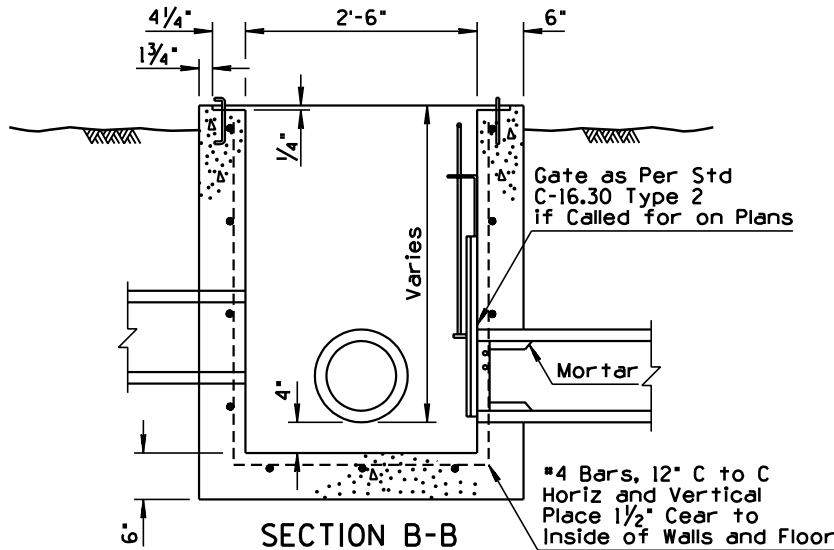
3-1/4" Bolt Size
Self Drilling Type
Concrete Anchors



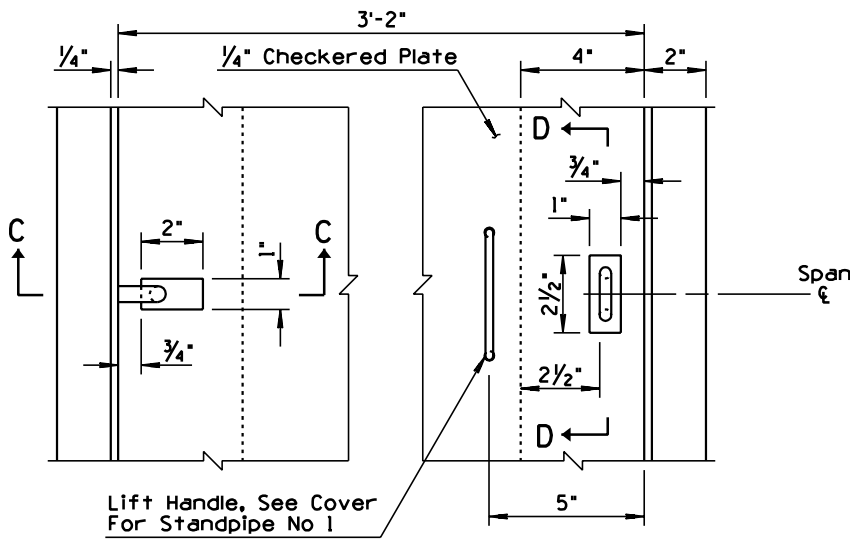
COVER
IRRIGATION STANDPIPE NO. 1



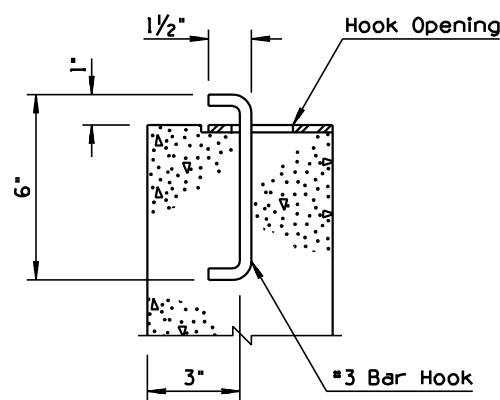
PLAN



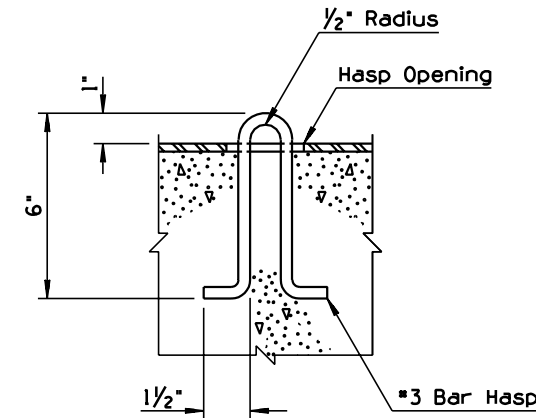
SECTION B-B



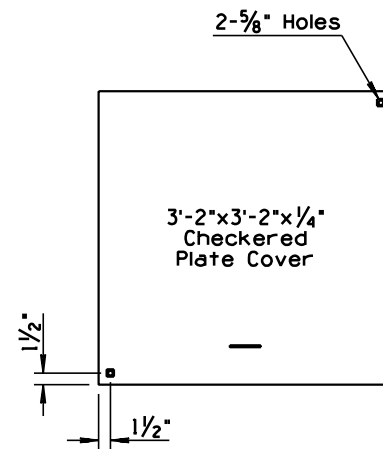
LOCKING COVER
IRRIGATION STANDPIPE NO. 2



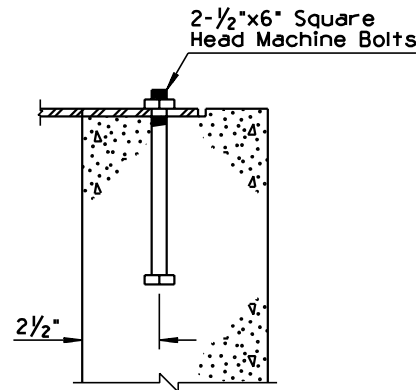
SECTION C-C



SECTION D-D



BOLTED COVER FOR
STANDPIPE NO. 2



GENERAL NOTES

1. All concrete shall be Class B.
2. Structural steel shall be in accordance with ASTM A36.
3. All cover steel and exposed appurtenances shall be given one shop coat of No. 1 paint.
4. Plans shall specify locked or bolted cover for standpipe No. 2.
- ① 5. For specific details of a flush pavement or sidewalk installation, see Utility and Railroad Engineering Section.

DESIGN APPROVED

Henry H. Ottens

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DISTRIBUTION

Ronald Williams

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DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

IRRIGATION STANDPIPES

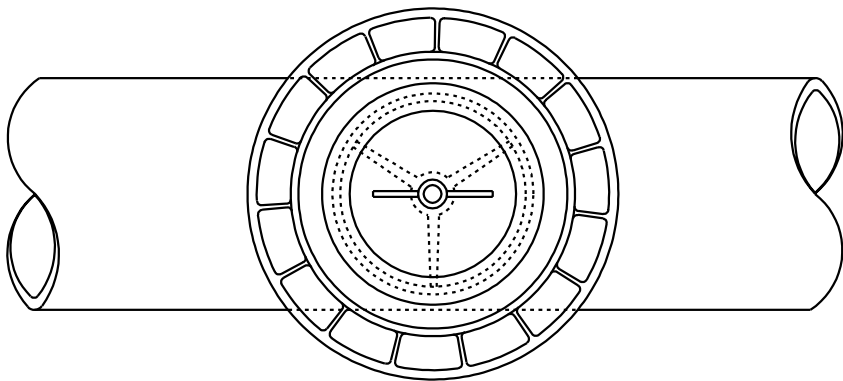
REV.

10/95

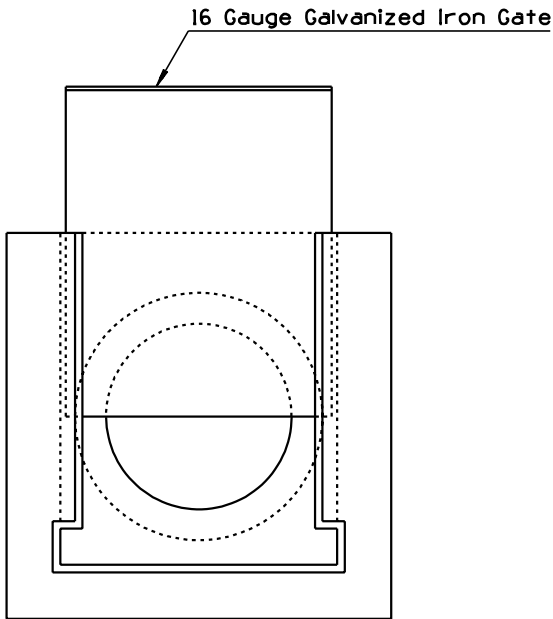
DRAWING NO.

C-16.20

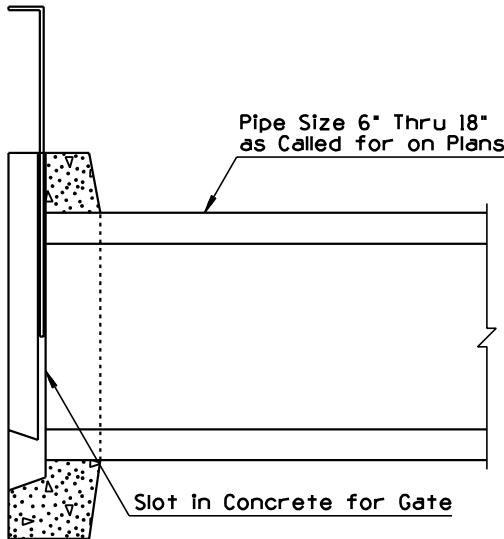
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			



PLAN

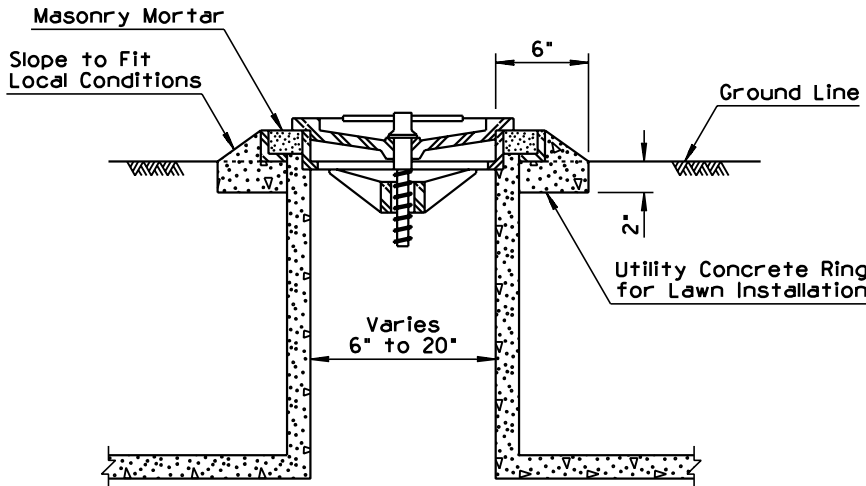


ELEVATION



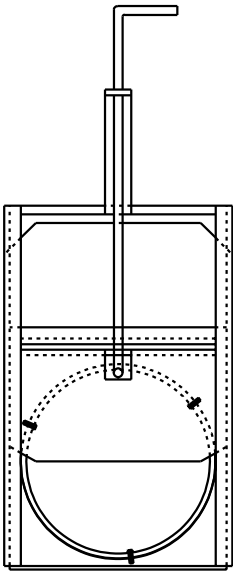
SECTION

PRECAST IRRIGATION GATE
For Open Ditch Installation
TYPE 1

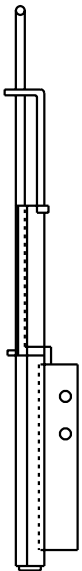


Irrigation Valve Number of Valve
Shall Correspond to the Size of
Pipe in Inches. No 6 to No 20.

PART SECTION
FLUSH IRRIGATION VALVE



ELEVATION



SECTION

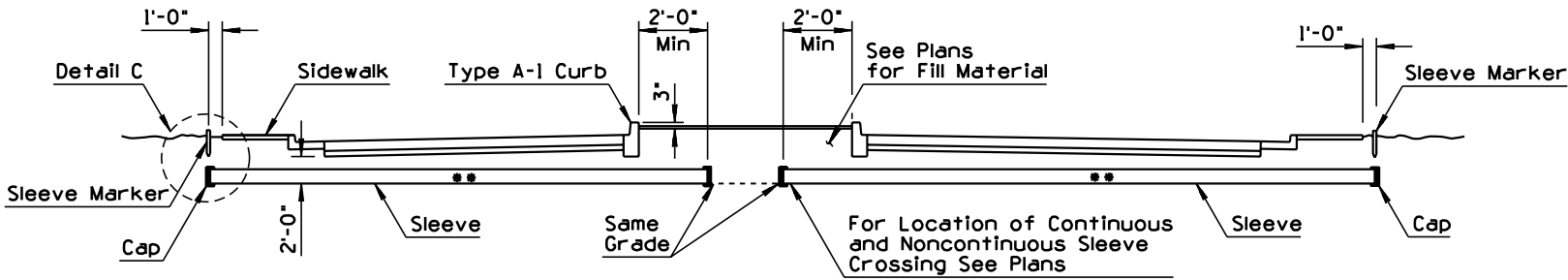
IRRIGATION GATE
For Standpipe Installation
TYPE 2

TYPE 2 IRRIGATION GATE

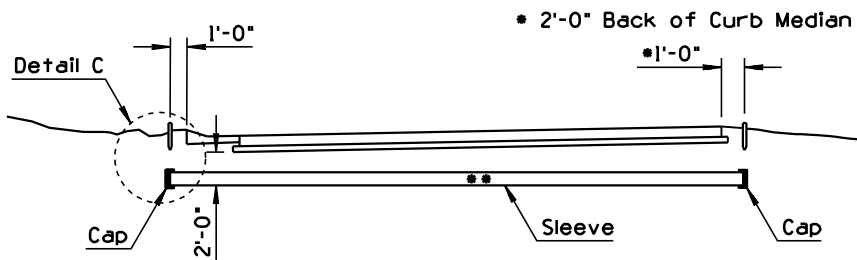
For pipes 6" through 24". Gate and frame shall be
galvanized iron. Type shown is for concrete pipe.
For CMP, external steel adjustable bend shall be used
in place of internal steel ring.

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① IRRIGATION VALVE AND GATE	DRAWING NO. C-16.30	

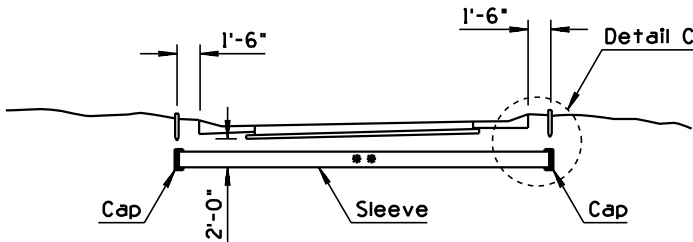
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2	ADDED NOTE	PNB	7/94
3			
4			



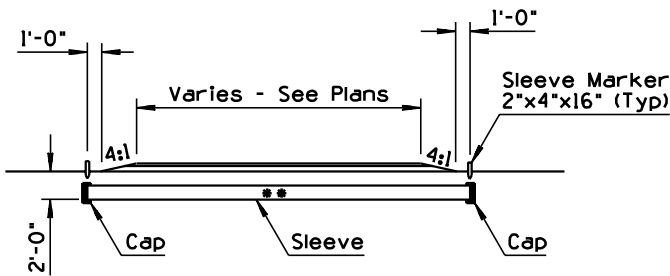
SLEEVE UNDER CROSSROAD



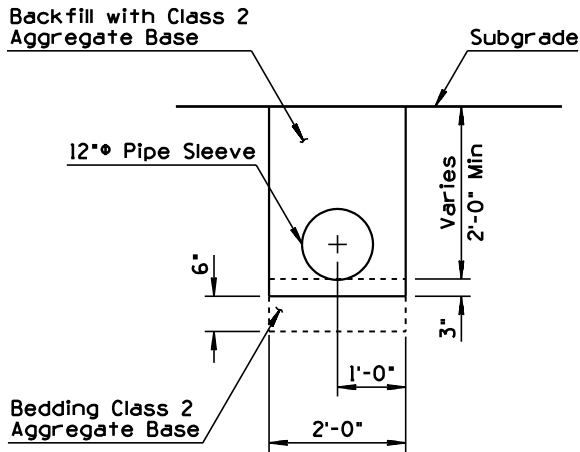
SLEEVE UNDER MAINLINE



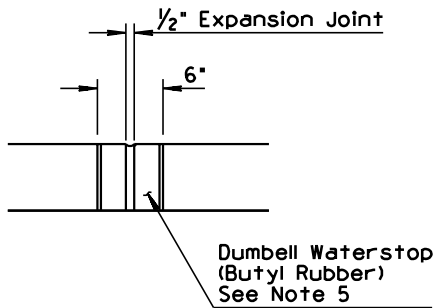
SLEEVE UNDER RAMP



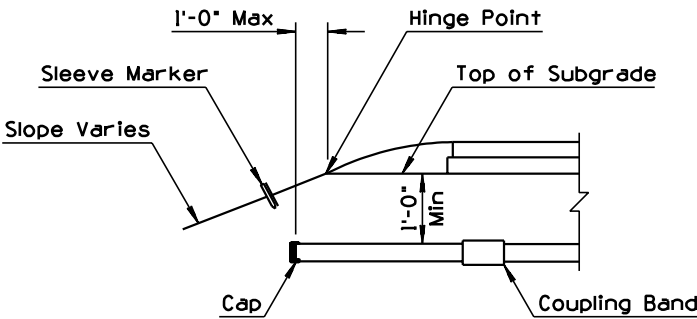
SLEEVE UNDER DRIVEWAYS AND PARKING AREAS



TYPICAL INSTALLATION



DUMBELL WATERSTOP



DETAIL C SLEEVE TERMINATION AT ELEVATED ROADWAY

GENERAL NOTES

- Irrigation sleeves shall be installed in a trench condition. See Std C-13.15 and Std C-7.06.
- Bedding and backfill material shall be Class 2 Aggregate Base.
- Pipe installation shall conform to Section 501 of Standard Specifications.
- The Contractor shall imprint a 4"± high letter "S" on the face of all curbs at sleeve locations. The width of the letter shall be 1/2" and shall penetrate the concrete surface 1/2".
- For non-continuous sleeves under crossroads, Std C-5.10 Type "A-1" curb shall be required where median is irrigated. See plans for locations. Dumbell waterstop shall be at all expansion joints.
- Materials used for caps or plugs shall be as recommended by the pipe supplier and approved by the Engineer.
- Generally, sleeves shall be installed parallel to the roadway subgrade. Slope may vary in superelevated sections. Minimum slope nominal to drain.

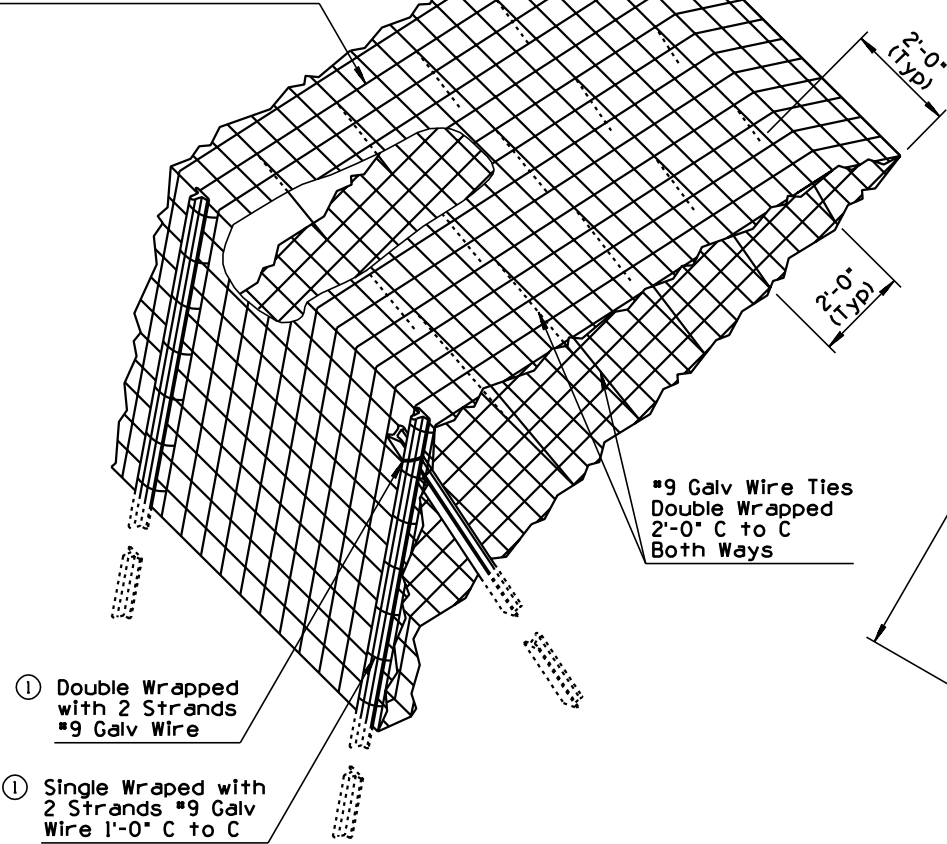
DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① IRRIGATION SLEEVES	DRAWING NO. C-16.40

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED NOTE	PNB	7/94
2	MODIFIED TABLE	PNB	7/94
3			
4			

GENERAL NOTES

1. Rock shall be sound and durable, of rounded or angular shape and with a nominal diameter of 8" minimum and 12" maximum. Flat or needle shapes are not acceptable.
2. Wire mesh splice shall have a 6" minimum lap vertically and horizontally.

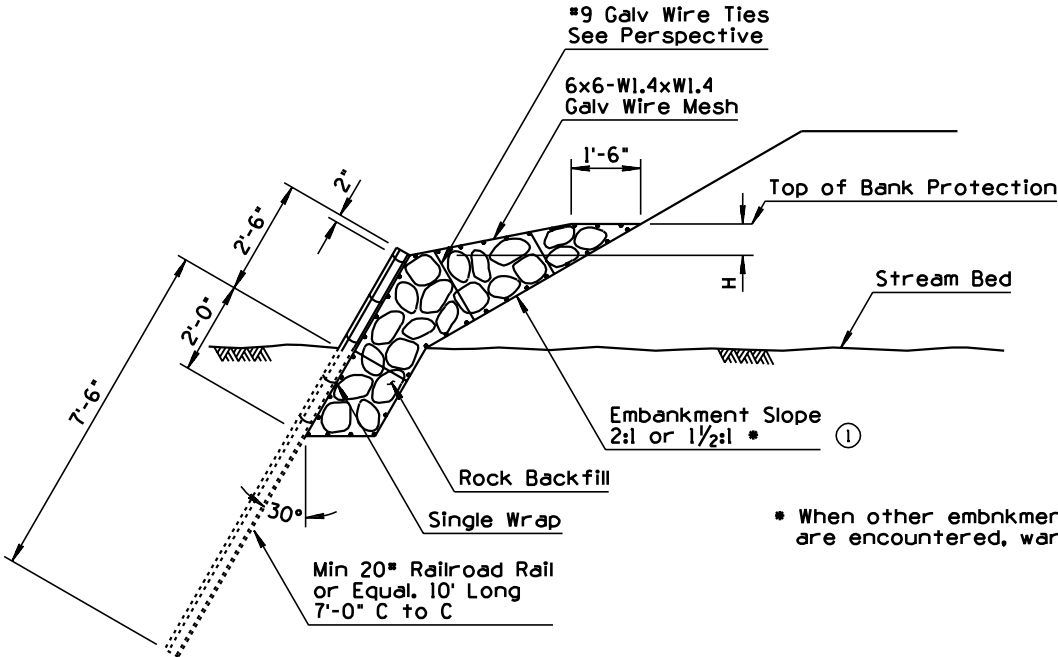
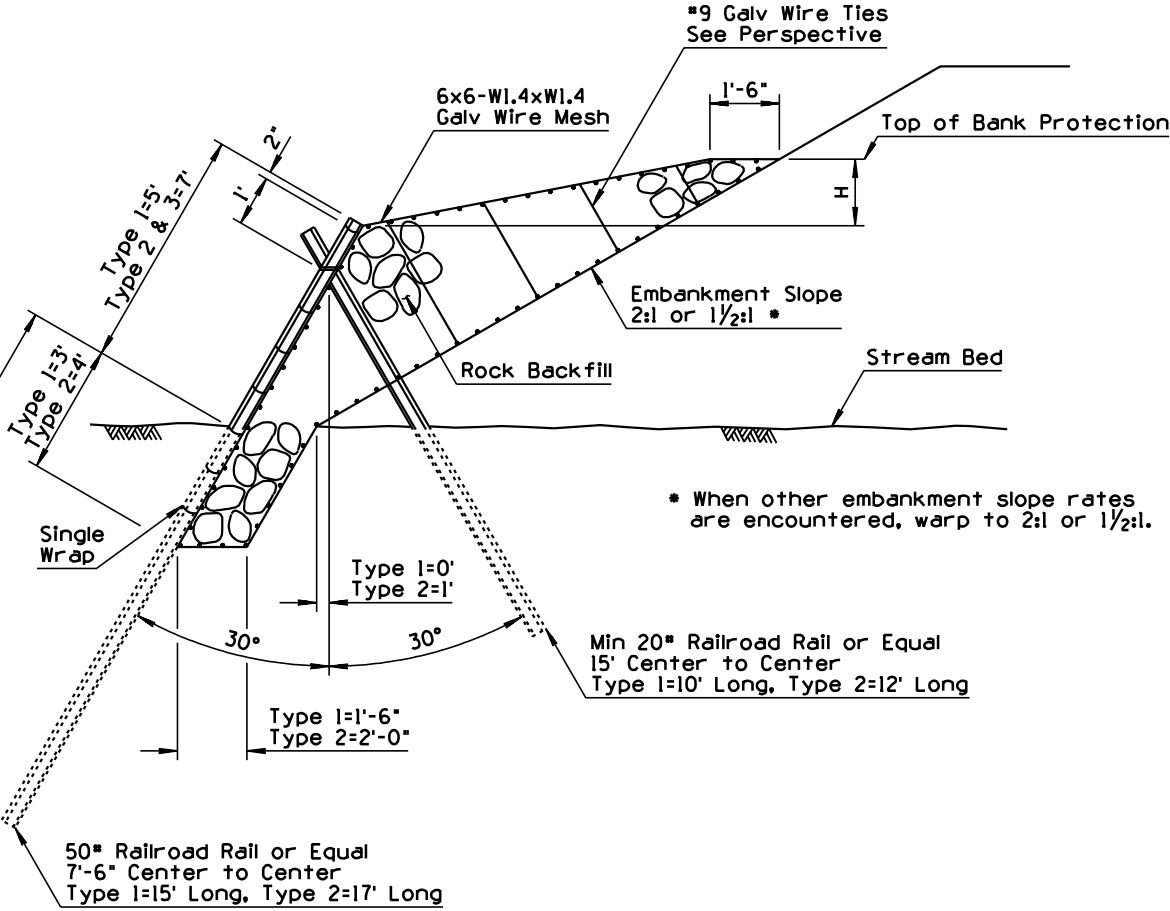
6x6-W1.4xW1.4 Galvanized Wire Mesh Entirely Enclosing Rock Backfill including Both Ends. Lace Laps with 2 Strands of #9 Galvanized Wire.



PERSPECTIVE

Drawn for types 1 and 2, Type 3 Similar

TYPE 1 AND 2 BANK PROTECTION



TYPE 3 BANK PROTECTION

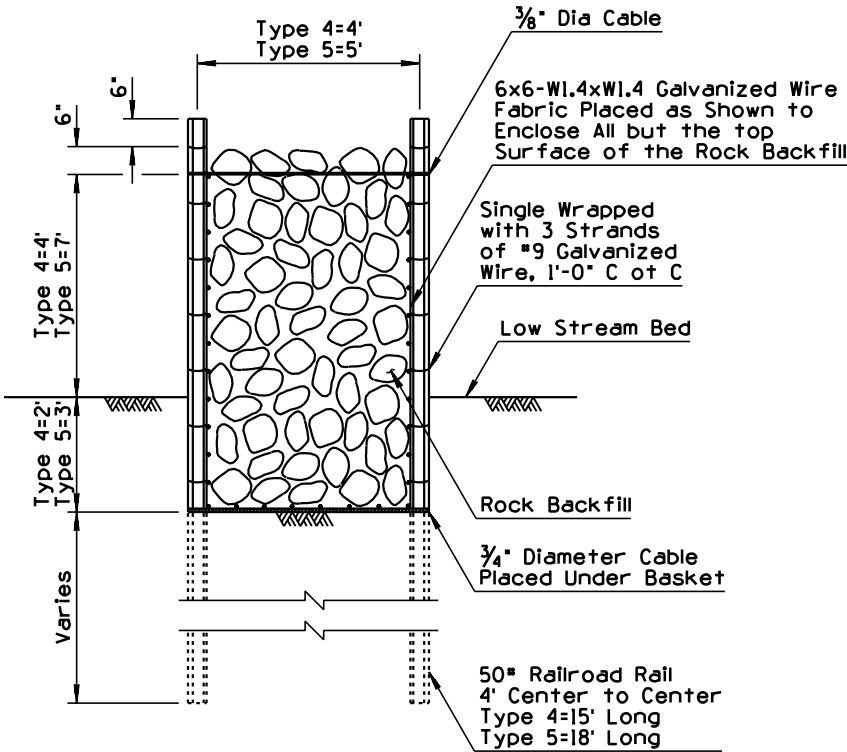
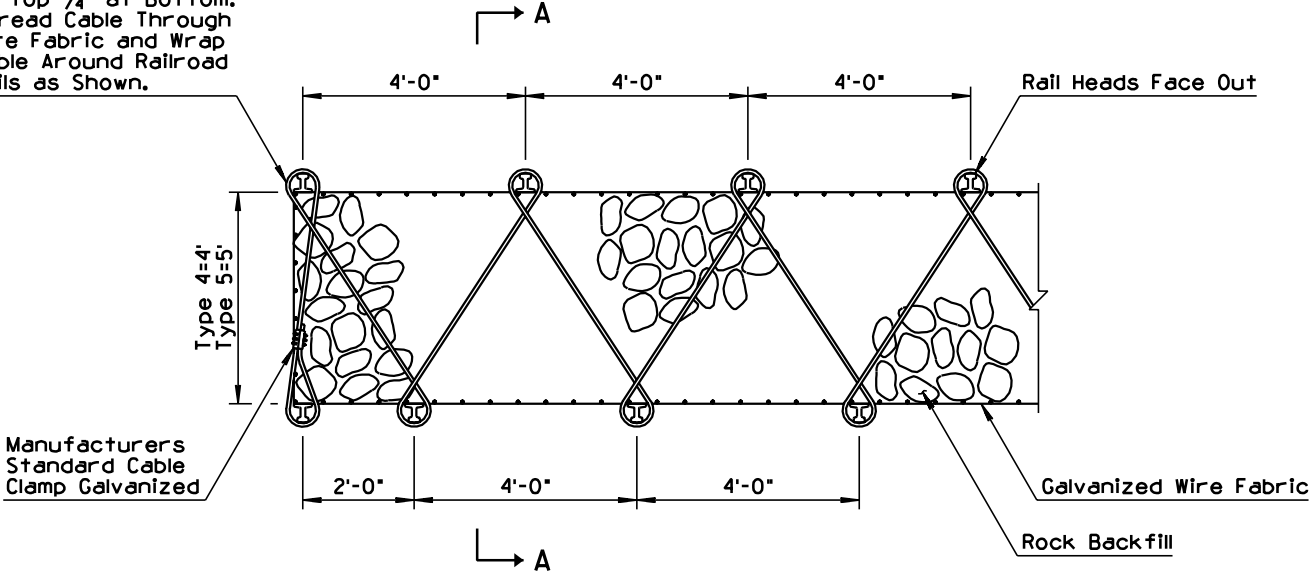
②

TYPE	H	TOP OF BANK PROTECTION ABOVE THE STREAM BED
3	0' to 2'	2' to 4'
1	0' to 3'	4' to 7'
2	0' to 6'	6' to 12'

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APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	BANK PROTECTION, RAIL TYPES 1, 2, 3	DRAWING NO. C-17.10

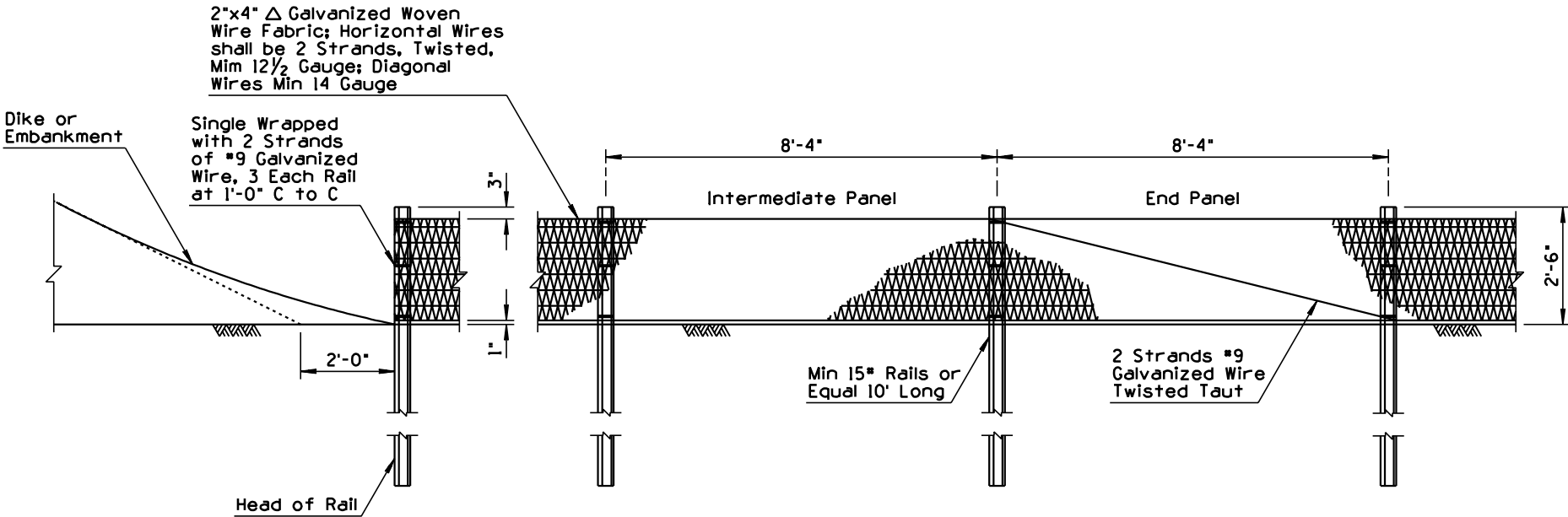
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

6x19 Galvanized Plow Steel, Preformed, Fibercore Cable $\frac{3}{8}$ " at Top $\frac{3}{4}$ " at Bottom. Thread Cable Through Wire Fabric and Wrap Cable Around Railroad Rails as Shown.



GENERAL NOTES

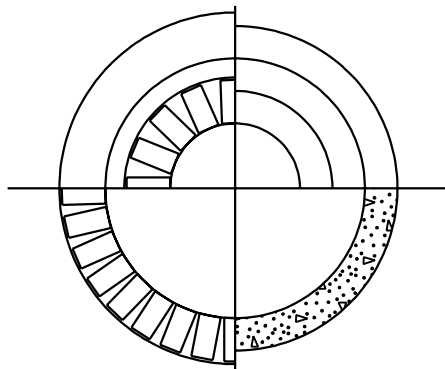
1. Rock shall be sound and durable, of rounded or angular shape and with a nominal diameter of 8" minimum and 21" maximum. Flat or needle shapes are not acceptable. Rock shall be comprised of 50% min 8" to 12" and 5% max 18" to 21".
2. Wire mesh splice shall have a 6" minimum lap vertically and horizontally.



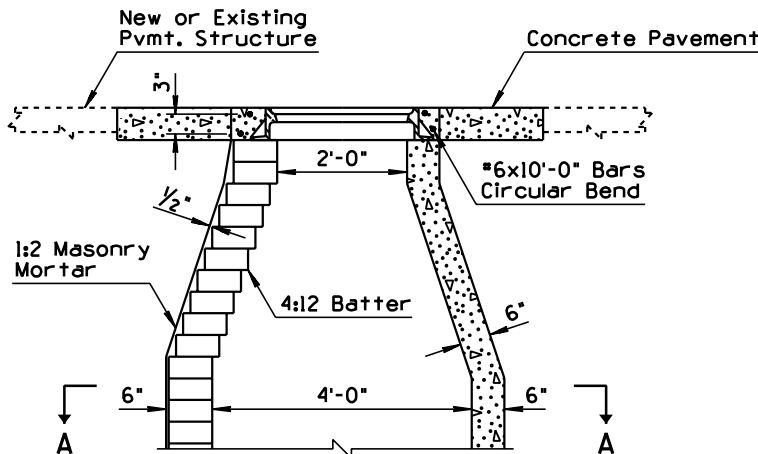
DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① BANK PROTECTION, RAIL TYPES 4,5 AND 6	DRAWING NO. C-17.20

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED NOTE	PNB	10/95
2	REVISED DETAIL	PNB	10/95
3			
4			

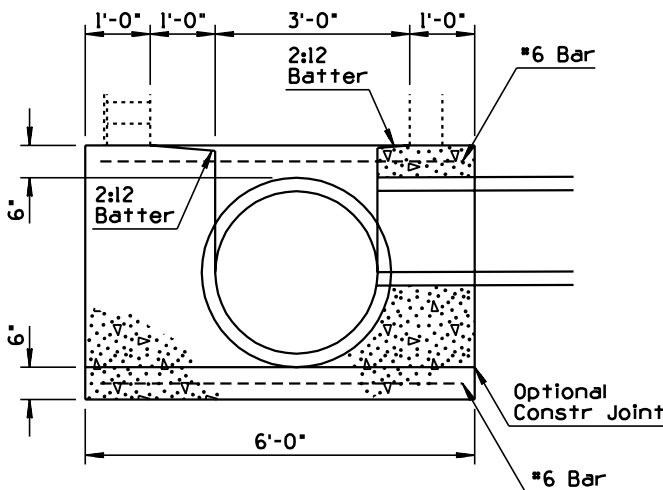
HALF PLAN
BRICK CONCRETE



SECTION A-A

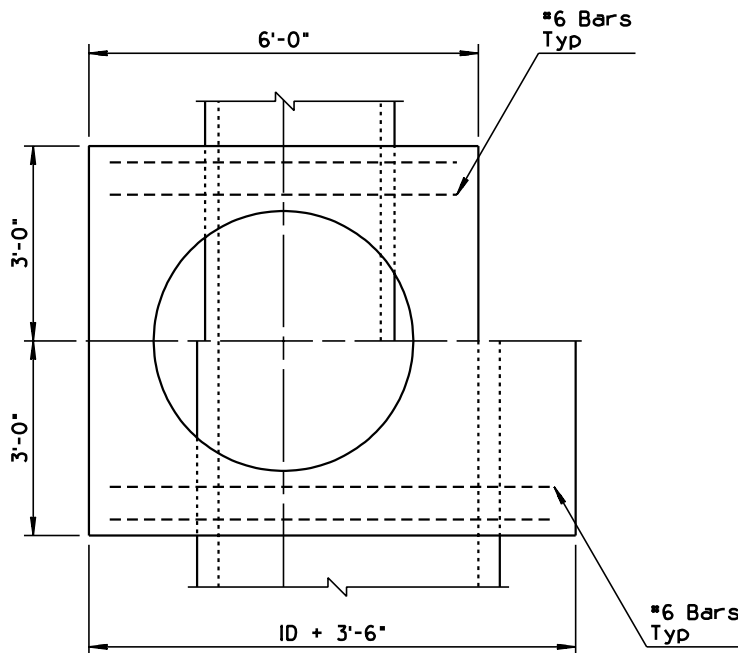


SECTION
BRICK MANHOLE NO. 1 CONCRETE MANHOLE NO. 2

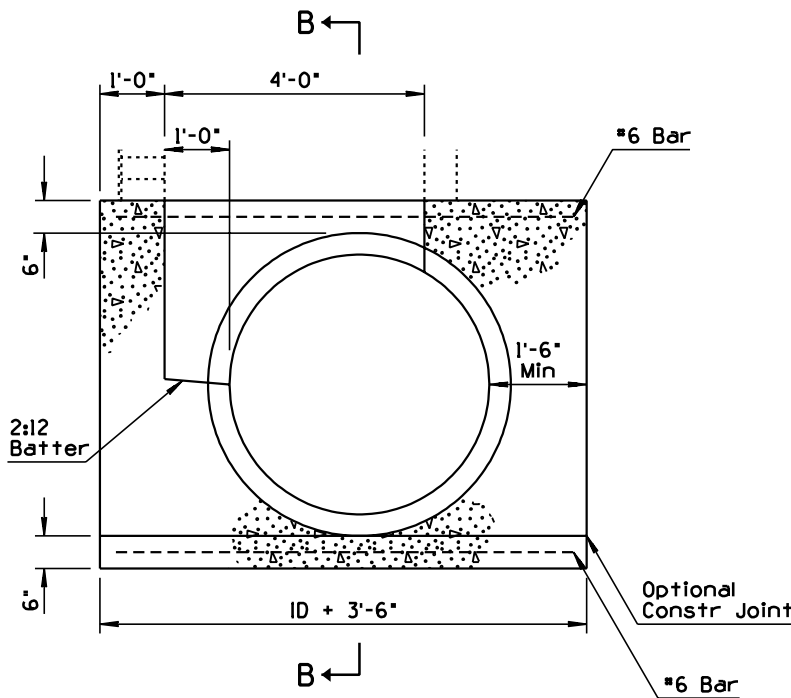


SECTION
STANDARD BASE STRUCTURE
FOR PIPES 6" TO 36" I.D.

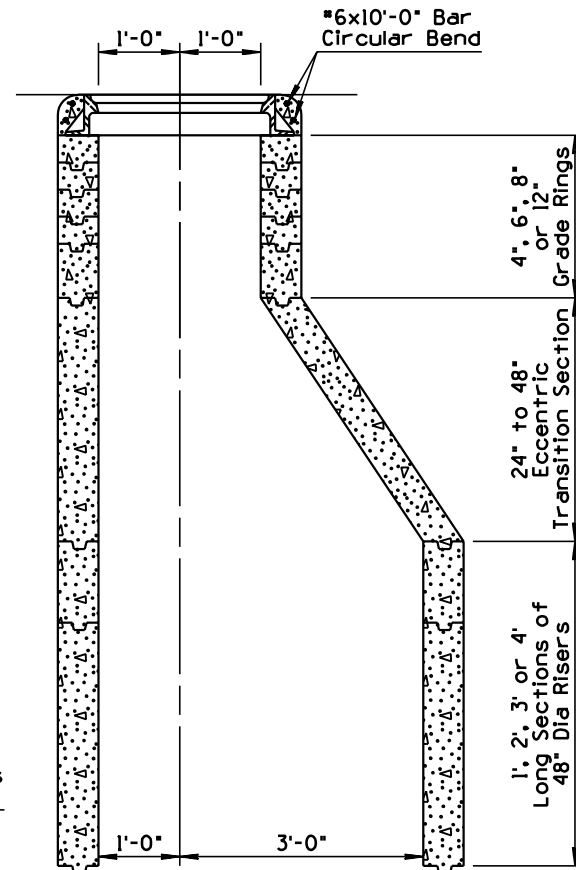
HALF PLAN
FOR PIPES 36" I.D. AND SMALLER



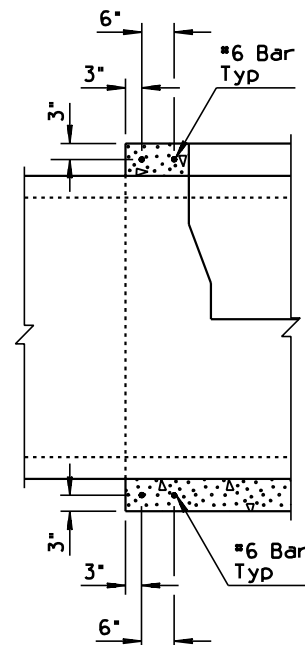
HALF PLAN
FOR PIPES OVER 36" I.D.



SECTION
STANDARD BASE STRUCTURE
FOR PIPES OVER 36" I.D.



SECTION
MANHOLE NO. 3
PRECAST REINFORCED CONCRETE ②



PART SECTION B-B

GENERAL NOTES

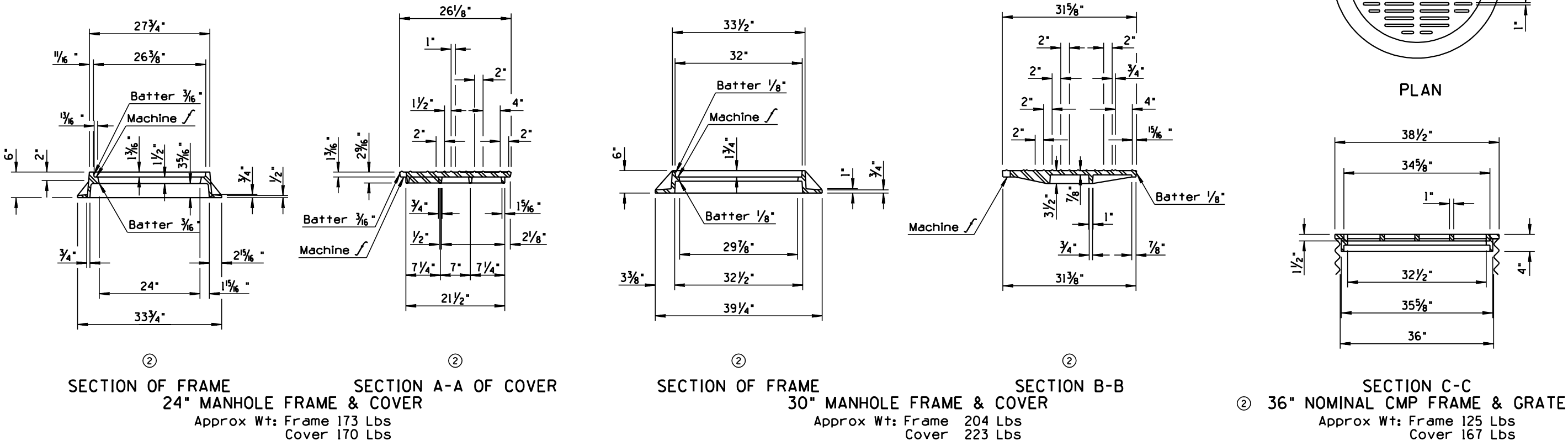
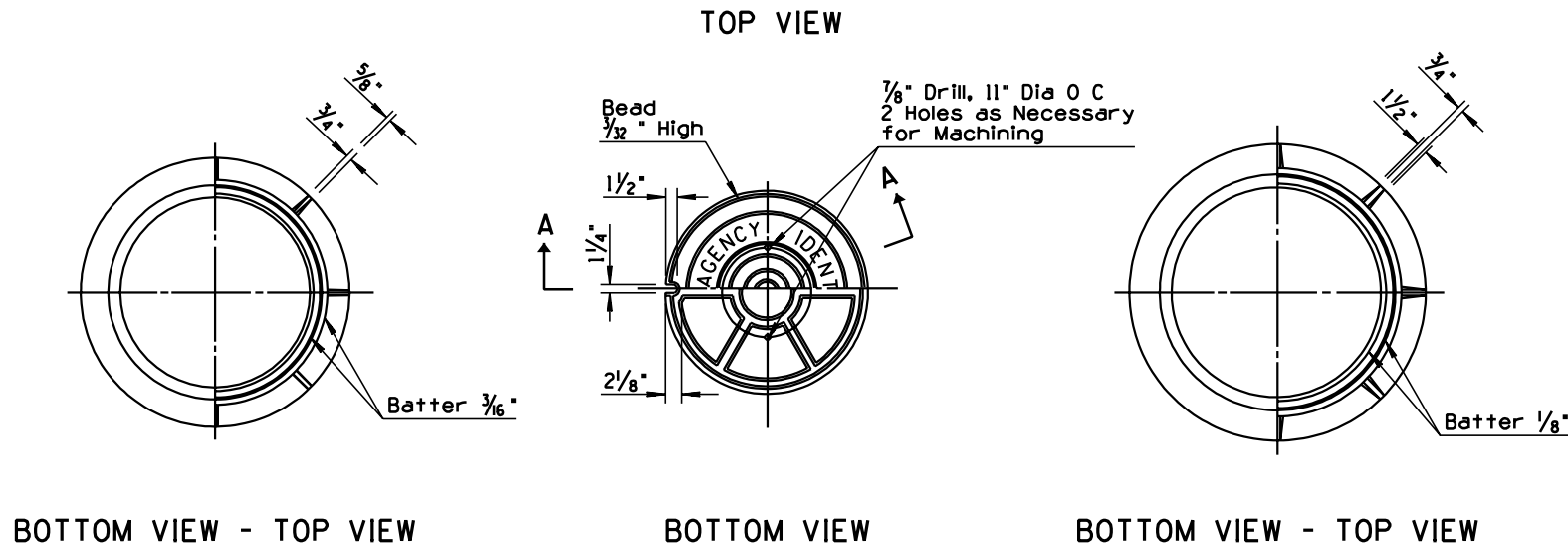
1. Precast Manholes shall conform to the requirements of AASHTO M199 except that the compressive strength of each unit will be determined and accepted in accordance with Section 1006.7 of the ADOT Specifications.
2. Concrete for all other manholes shall be Class B.
3. Every fifth course of bricks in Manhole No. 1 shall be laid as stretchers.
- ① 4. See Std C-18.30 and C-18.40 for additional information and dimensions.
5. See plans for Std C-18.20 frame and cover type.
6. Steps shall be placed in manholes in accordance with the requirements of AASHTO M199.
7. See Std C-18.40 for location of Station Location Reference Point.
8. Manhole height, "H", shall be measured from the lowest pipe invert to the top of the manhole frame.

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	MANHOLE DETAILS	DRAWING NO. C-18.10

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED DETAIL	PNB	10/95
2	REVISED SECTION	PNB	10/95
3	REVISED GENERAL NOTE	PNB	10/95
4			

GENERAL NOTES

- ③
1. When specified on the plans, the cover (excluding grates) shall include agency identification and conform to the following: Lettering on manhole cover to contain name of agency and utility as directed. Letters and words to be equally spaced. Letters to be 2" in height and raised 1/8" above level of cover. Type of letters and layout to be submitted for approval.
- ③
2. Casting weights shown are minimum weights and are for either cast iron or ductile iron castings. Maximum casting weights shall not exceed 105 percent of weights shown.
3. H20 loading minimum.
4. Details shown are typical.
5. Alternate designs of manhole frame and cover may be utilized with the approval of the engineer as long as minimum loading and weight are equivalent.

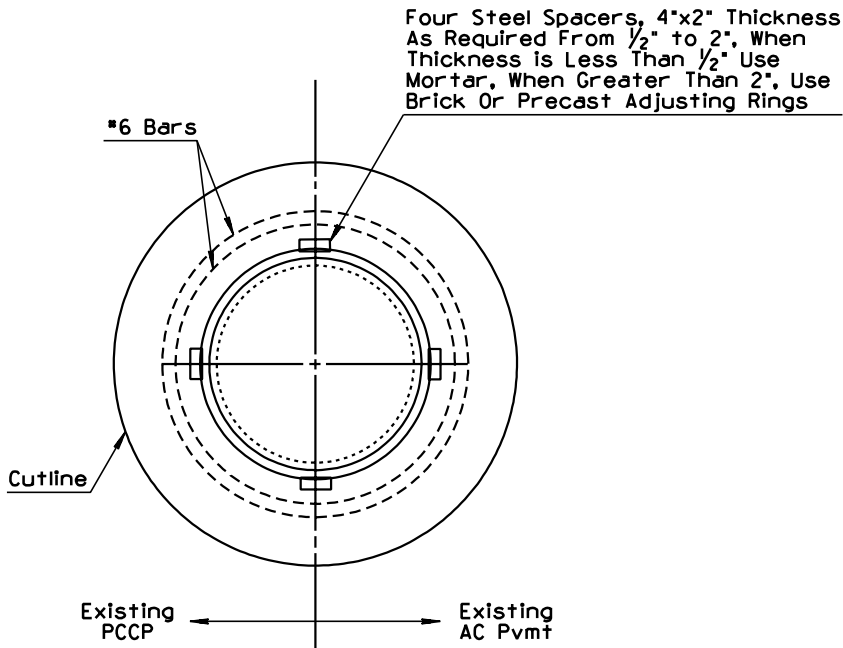


DESIGN APPROVED	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION	MANHOLE FRAME AND COVER DETAILS	DRAWING NO. C-18.20

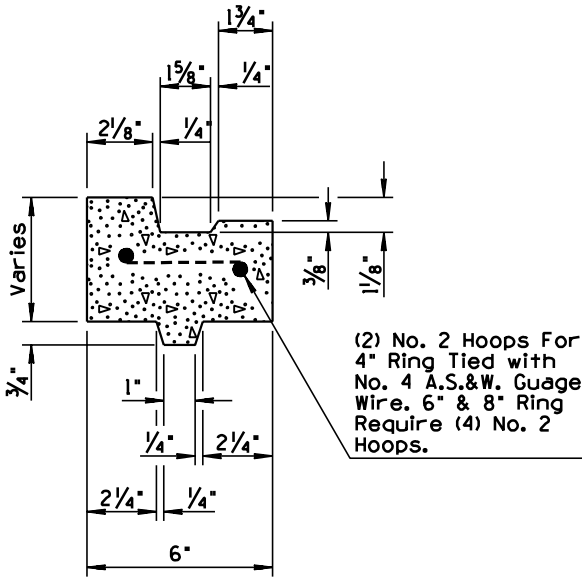
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

GENERAL NOTES

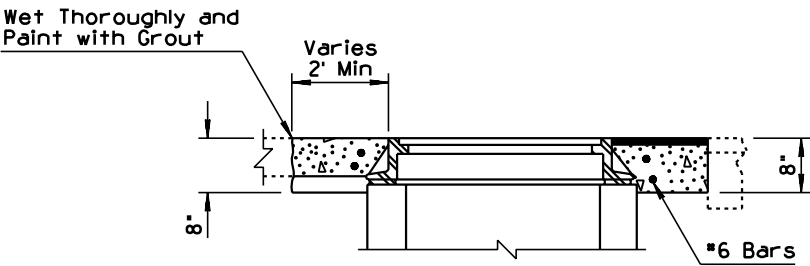
1. All dimensions are minimum except where noted.
2. Location & elevation shown on plans.
3. Compaction to conform to Sect. 303-2 or 501.





PLAN



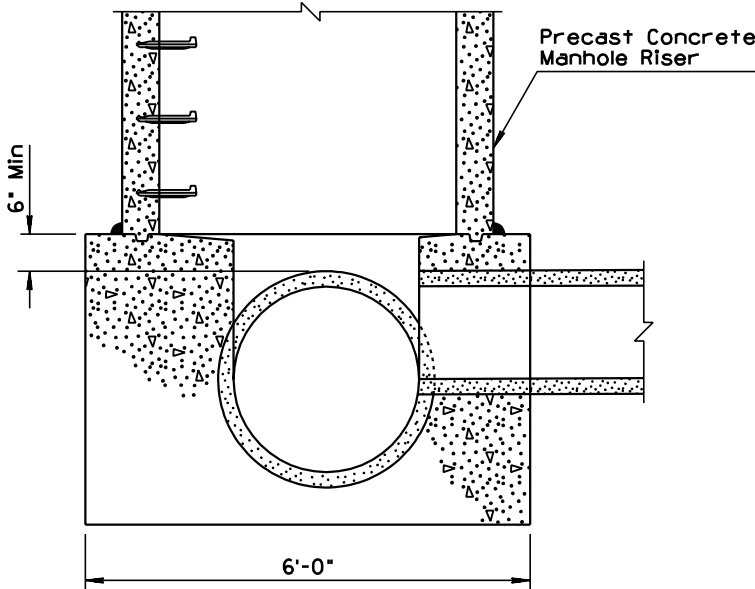
PRECAST ADJUSTING RING DETAIL



SECTION
MANHOLE COVER FRAME
ADJUSTMENT - PAVEMENT
CUT AND REPLACEMENT

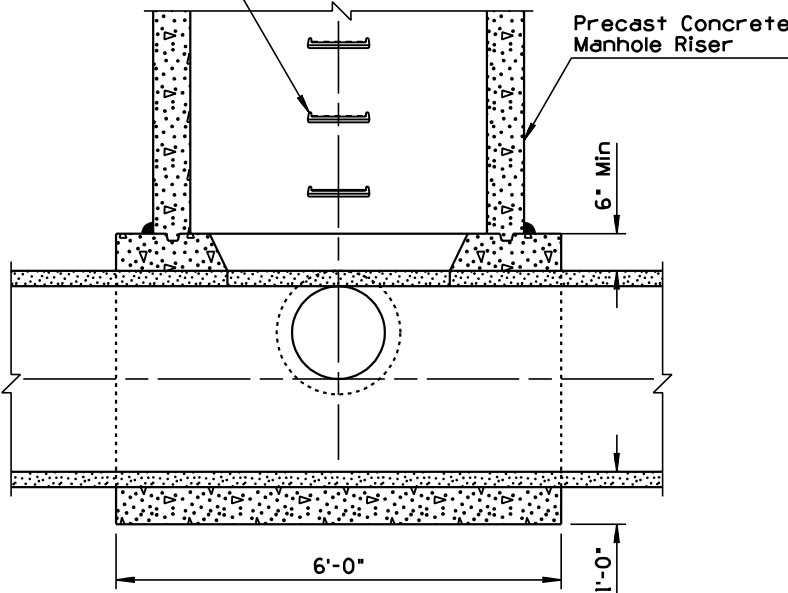
DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION 	① MISCELLANEOUS MANHOLE DETAILS	DRAWING NO. C-18.30	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

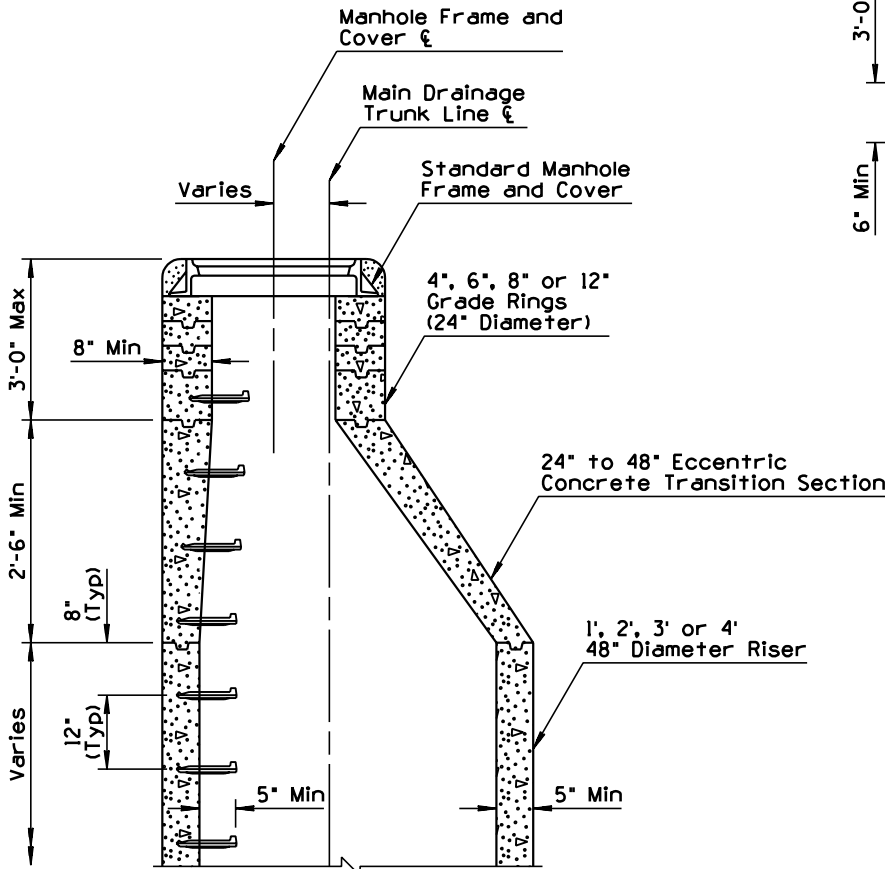


END VIEW

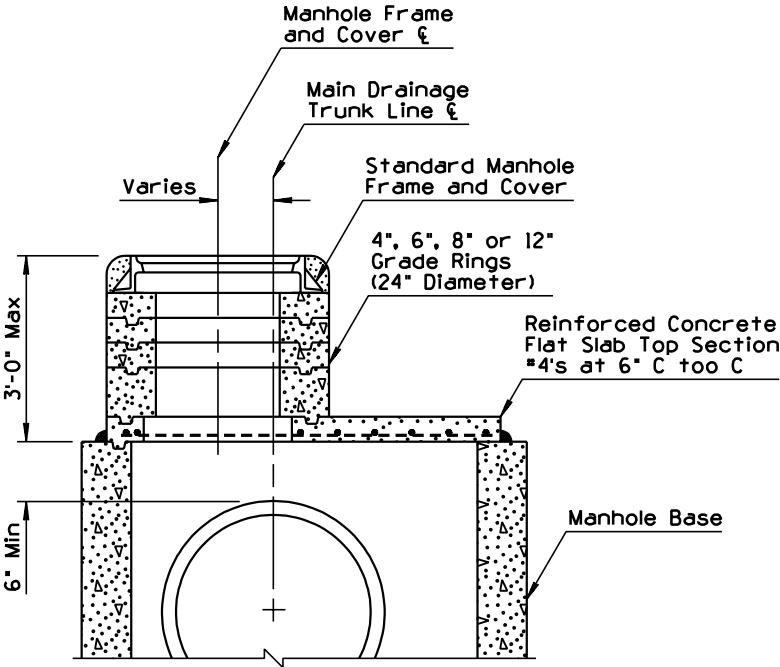
If Steps are Required
They shall Conform to
the Requirements of
AASHTO M199



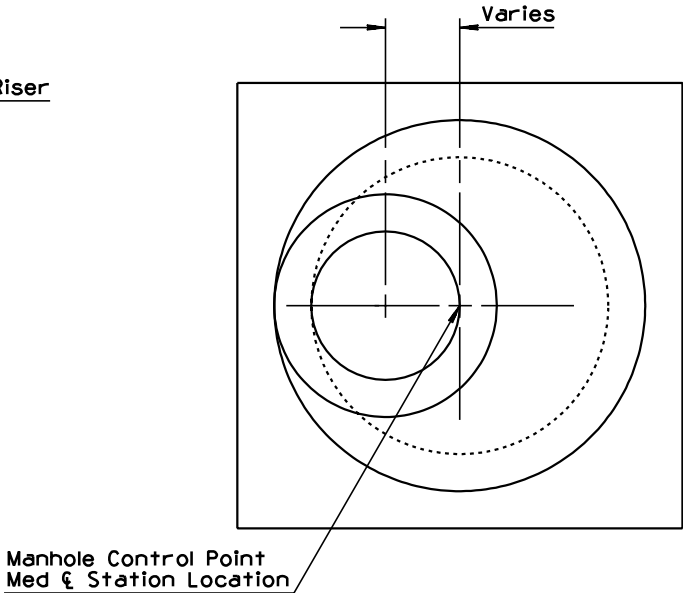
SIDE VIEW



NORMAL INSTALLATION



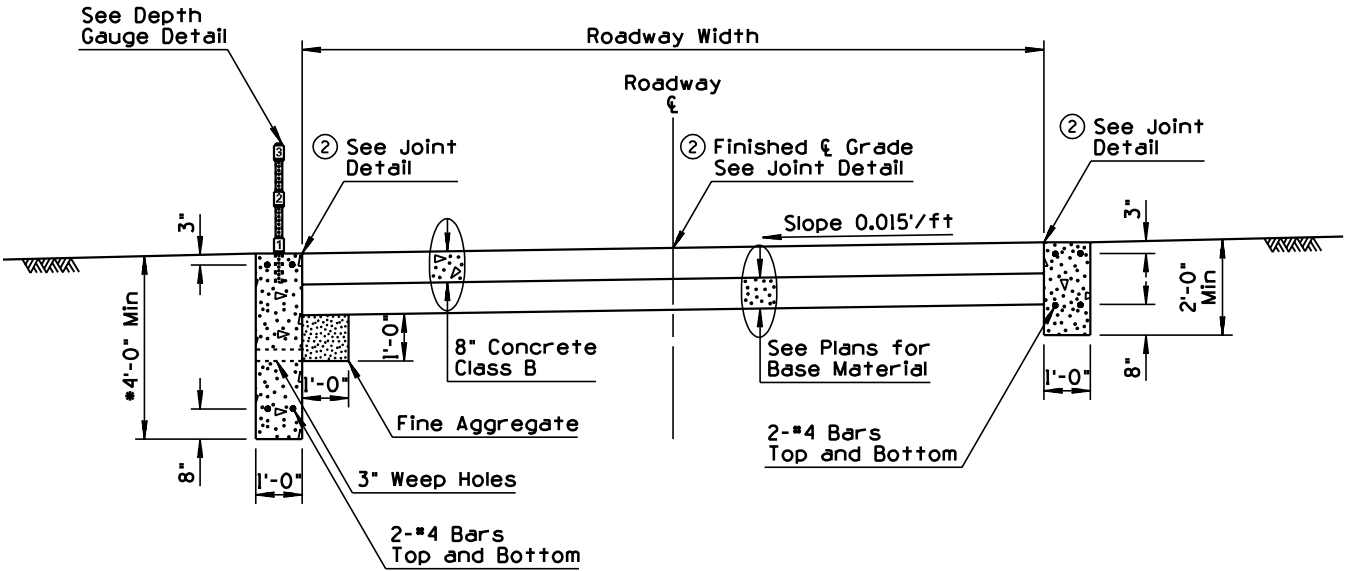
SHALLOW INSTALLATION



TOP VIEW

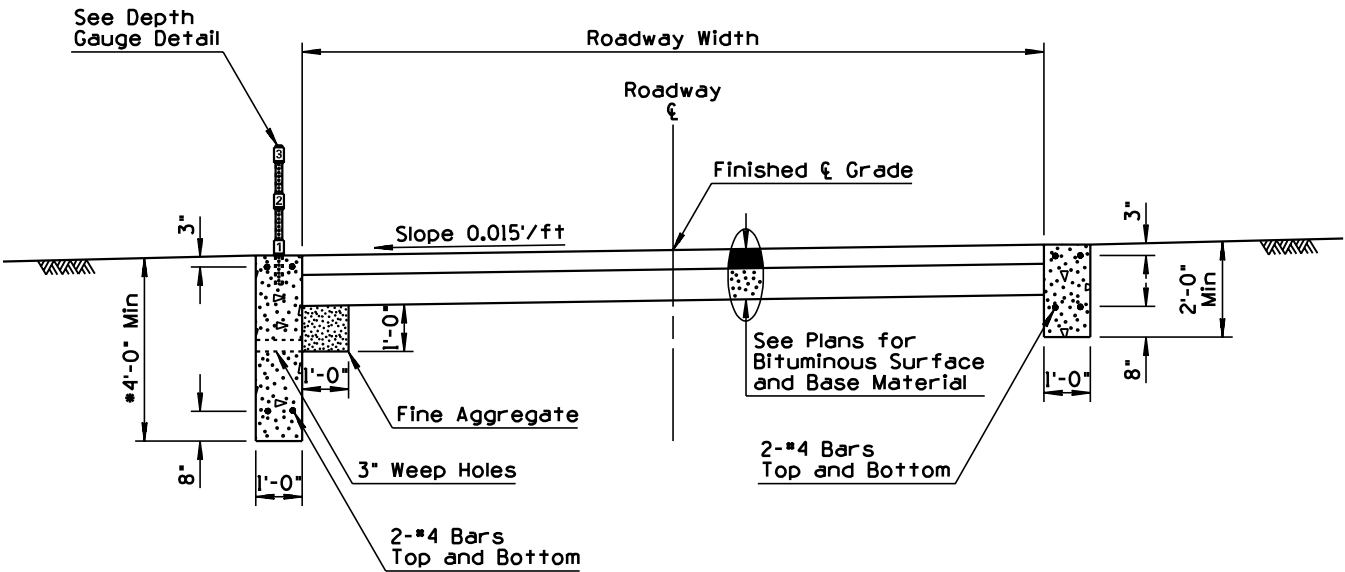
DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① MANHOLE RISER DETAILS	DRAWING NO. C-18.40

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2	REVISED NOTE	PNB	7/94
3	ADDED DETAIL	PNB	7/94
4			

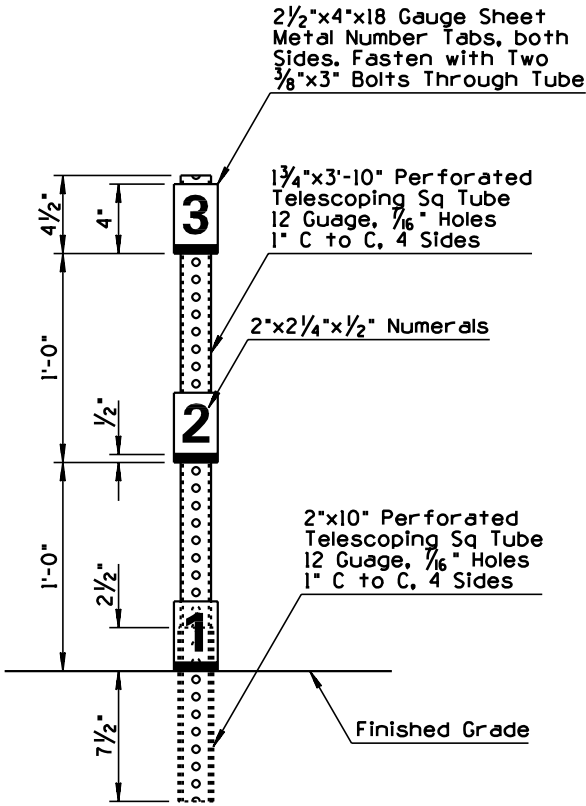


CONCRETE SURFACE ROAD
CONCRETE WALLS

* Min Distance Below Stream Bed



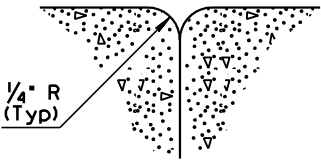
BITUMINOUS SURFACE ROAD
CONCRETE WALLS



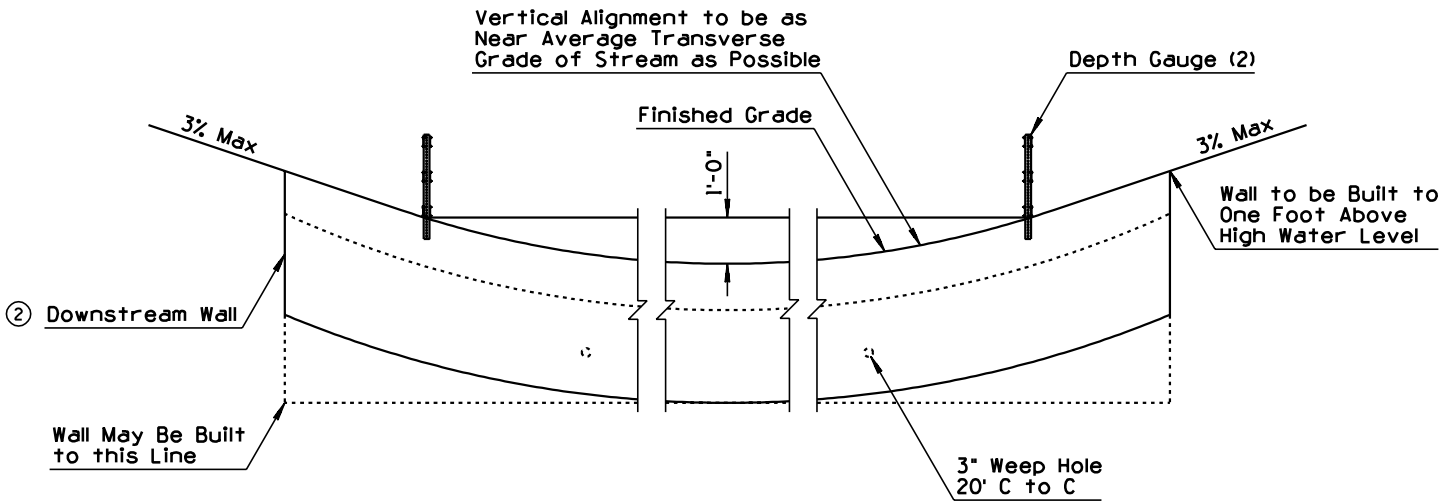
DEPTH GAUGE DETAIL

GENERAL NOTES

1. Ford walls shall be Class B concrete.
2. Depth gauge tubing shall be protected against concrete entering through bottom or perforations.
3. Depth gauge tubing and both sides of numeral tabs shall be painted with two coats of white enamel. Numerals and markers shall be painted with one coat of gloss black enamel.



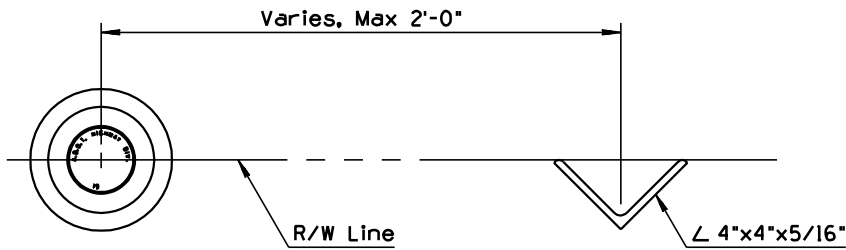
③ JOINT DETAIL



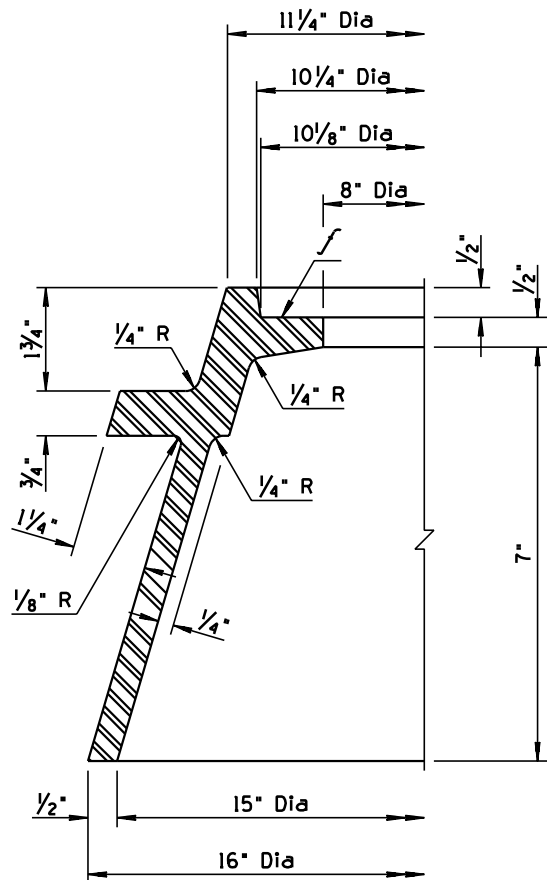
ELEVATION LOOKING UPSTREAM

DESIGN APPROVED <i>Larry H. Ottewill</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① FORD - CONCRETE WALLS	DRAWING NO. C-19.10	

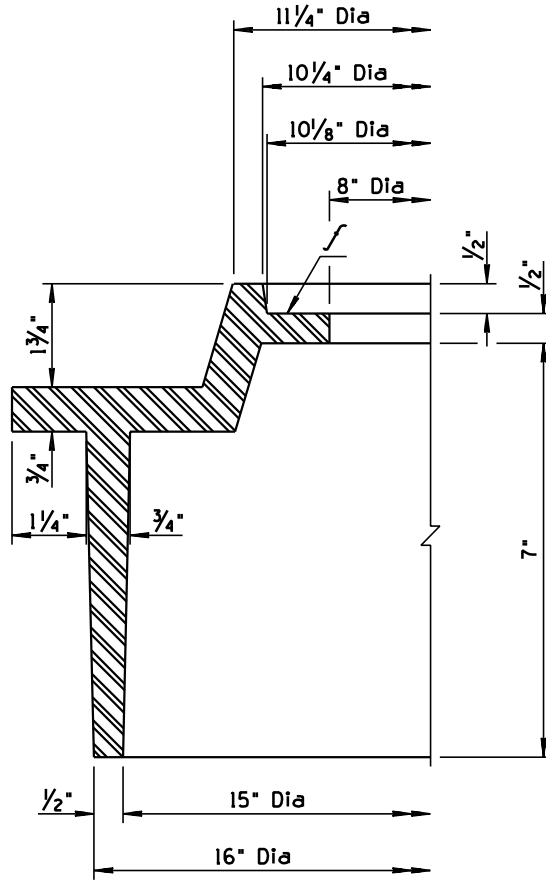
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED STATION TO DECIMAL PLACES	PNB	10/95
2	ADDED #4 REBAR AND NOTE 8	RLF	7/01
3			
4			



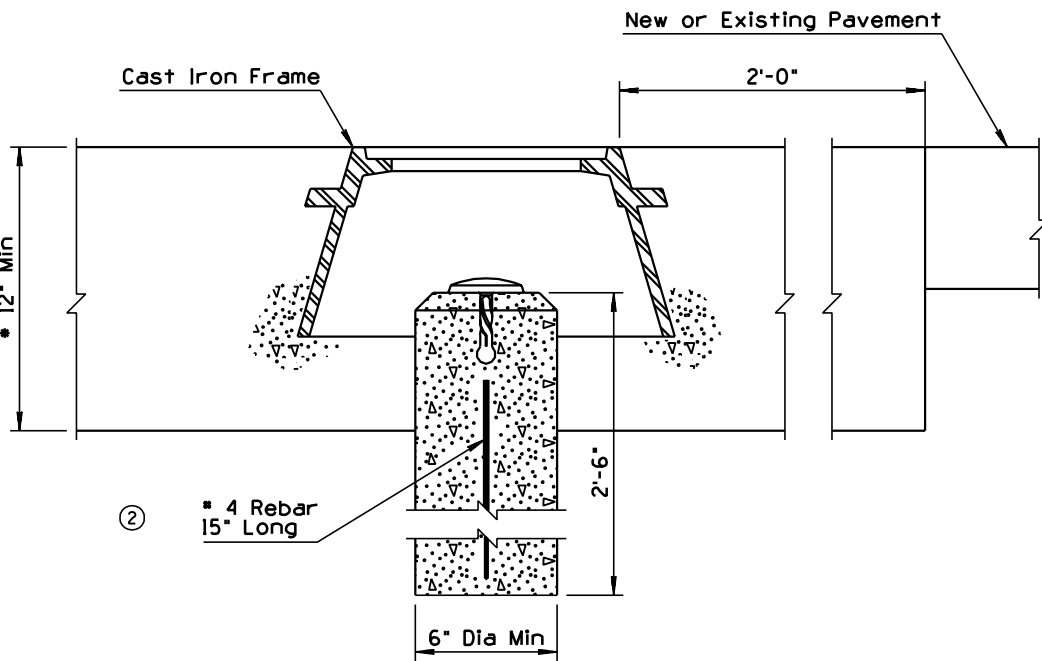
PLAN



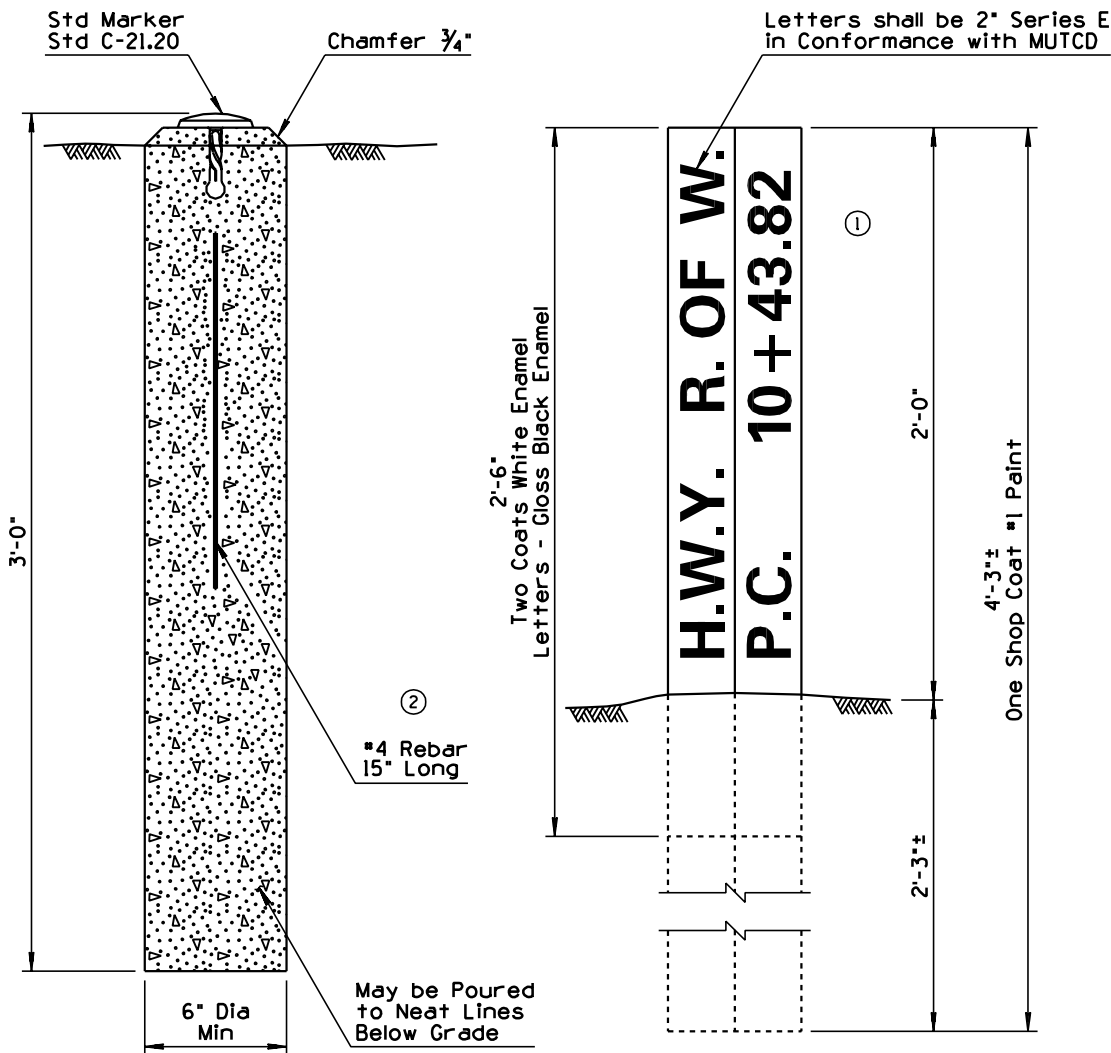
FRAME A



FRAME B

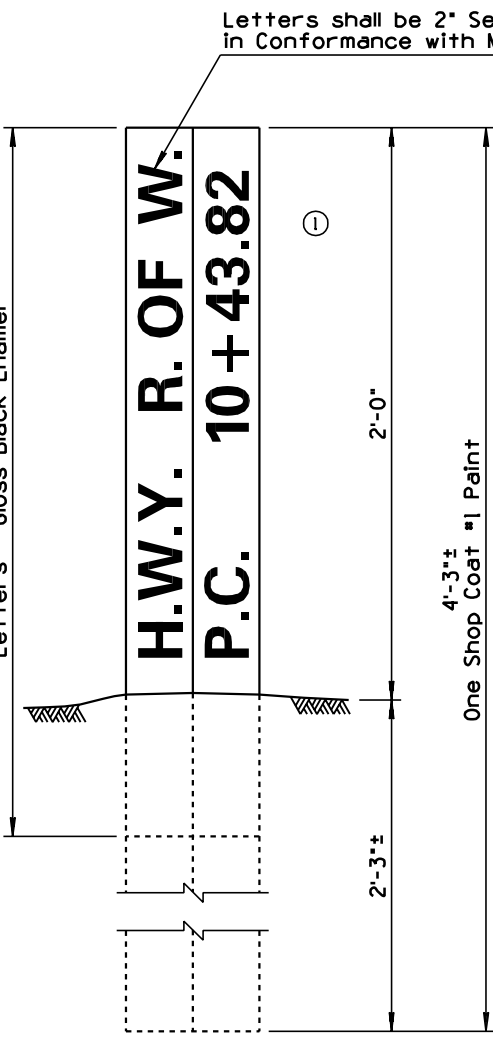


SURVEY MONUMENT
FRAME AND COVER

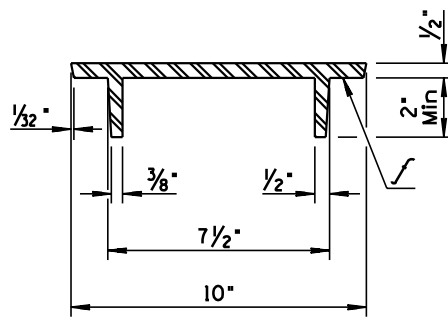
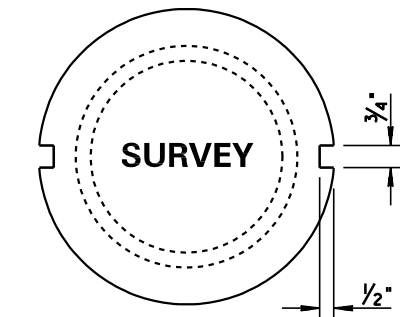


ELEVATION
SURVEY MONUMENT

RIGHT OF WAY MARKER



ELEVATION
REFERENCE MARKER



COVER SECTION

GENERAL NOTES

1. A survey monument, frame and cover, complete in place shall be considered a unit.
2. A right of way marker, consisting of a survey monument and a reference marker complete in place shall be considered a unit.
3. All markers shall be placed as shown on the plans or as directed by the engineer.
4. Frames may be either Type A or Type B.
5. Frames shall weigh at least 53 pounds.
6. Covers shall weigh at least 16 pounds.
7. Portions of the frame and cover to be machined is shown by the symbol "f". The allowable tolerance for machined areas shall be $\pm 1/64$ ". Concrete shall conform to the requirements of the specifications.
- ② 8. Survey monuments shall be magnetically detectable.
 - 12" or pavement structure thickness, whichever is greater.

DESIGN APPROVED

John L. Lamm

APPROVED FOR
DISTRIBUTION

Ronald C. Williams

STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STANDARD DRAWINGS

SURVEY MONUMENT, FRAME AND
COVER, RIGHT OF WAY MARKER

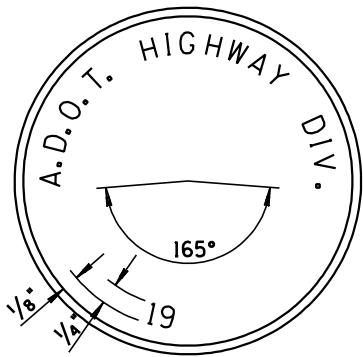
REV.

7/01

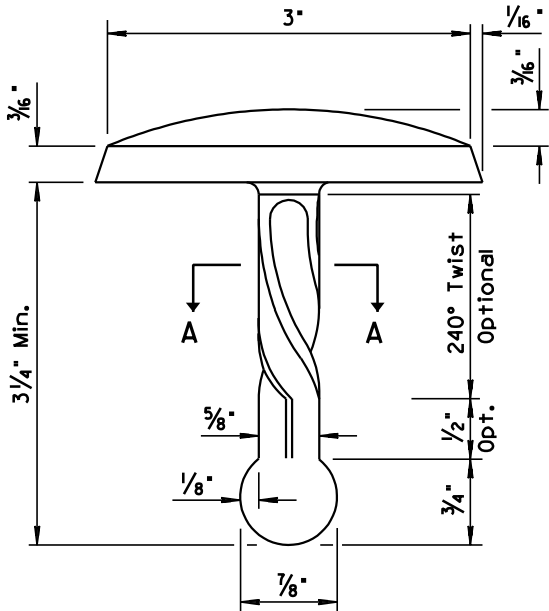
DRAWING NO.

C-21.10

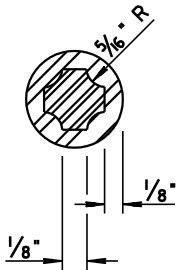
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2	ADDED NOTE	RLF	7/01
3	ADDED NOTE	RLF	7/01
4			



PLAN





ELEVATION
STANDARD MARKER



SECTION A-A

GENERAL NOTES

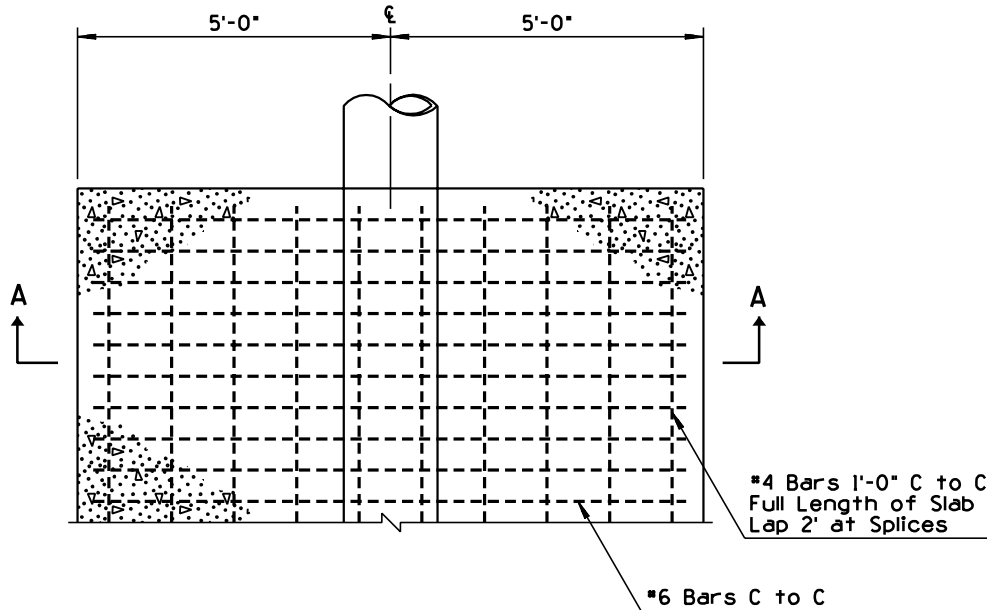
1. Standard Marker may be used as bench, survey monument or R/W markers.
2. Standard Marker shall be made of brass, bronze or aluminum.
3. Standard Marker will be furnished by the Department. Cast-in lettering format may vary.
4. Bench Marks shall be established on headwalls, bridge curbs or other permanent structures.
5. Surfaces of Aluminum Markers in contact with concrete shall be epoxy coated.
6. Fluted shank may be straight or twisted.
7. Station, Elevation, Year, or other information shall be hand stamped in field, as approved by the Engineer.
- ② 8. When used as a R/W Marker or on Section Lines, the Land Surveyor's registration number shall be stamped on the marker.
- ③ 9. When used to define Section Lines, the marker shall be stamped in accordance with the BLM "Manual of Surveying Instructions."

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/01
APPROVED FOR DISTRIBUTION 	① STANDARD MARKER	DRAWING NO. C-21.20	

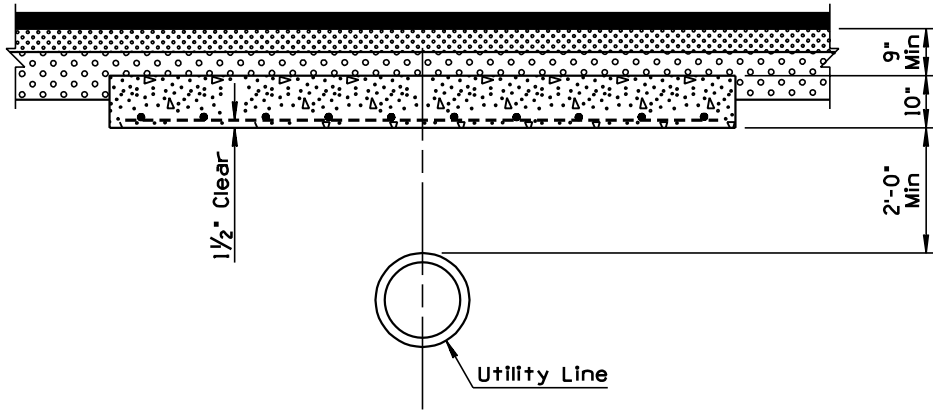
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			

GENERAL NOTES

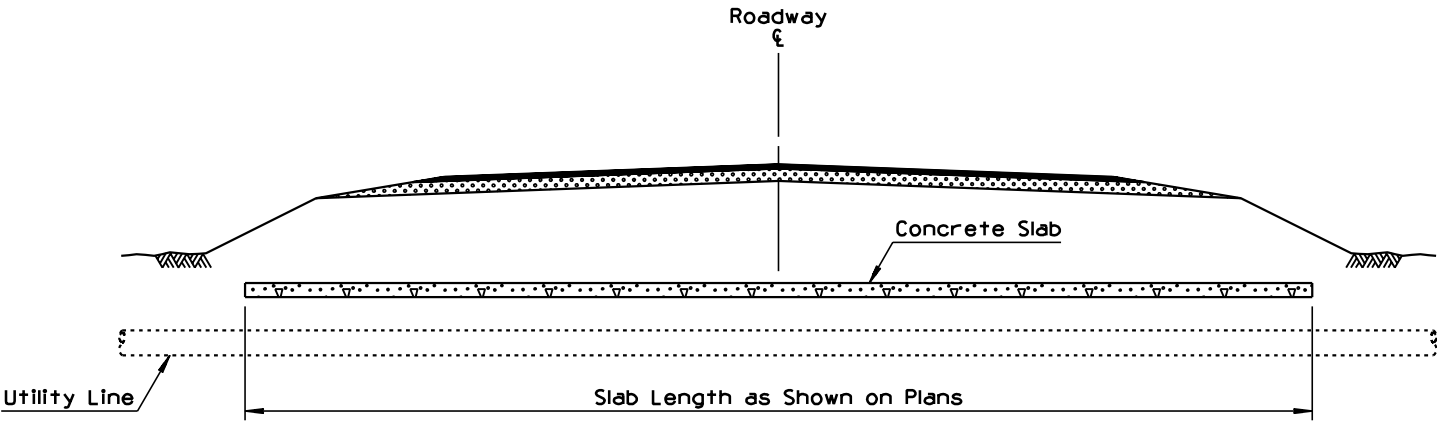
1. All concrete shall be Class B.





FOR SINGLE INSTALLATION	
QUANTITIES PER FT OF SLAB LENGTH	
CONCRETE	REINFORCING STEEL
0.31 CY	35.22 Lbs



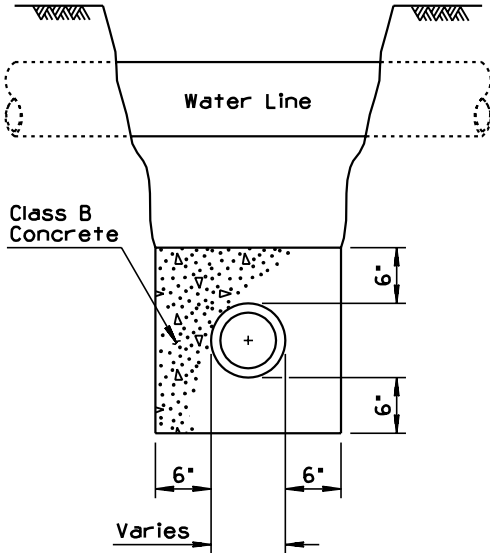
SECTION A-A



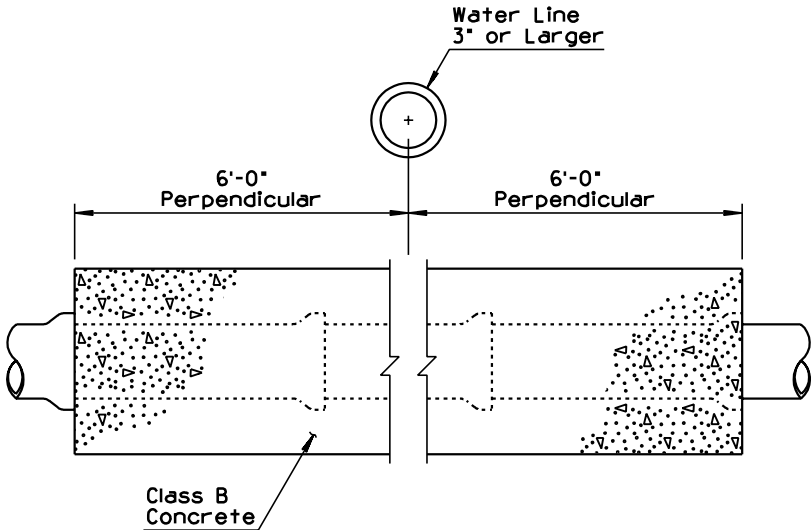
CROSS SECTION

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION 	① UTILITY LINE, PROTECTIVE CONCRETE SLAB	DRAWING NO. C-22.10	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED REBAR CLEARANCE FROM 2" TO 3"	PNB	10/95
2			
3			
4			

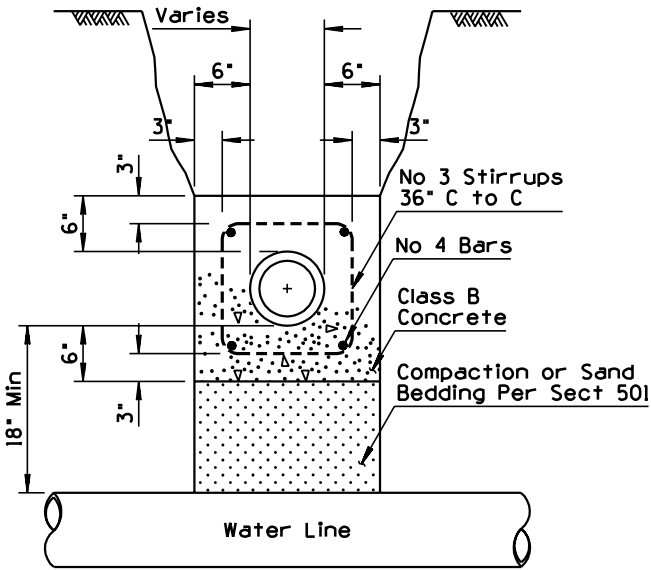


TYPE A ENCASEMENT

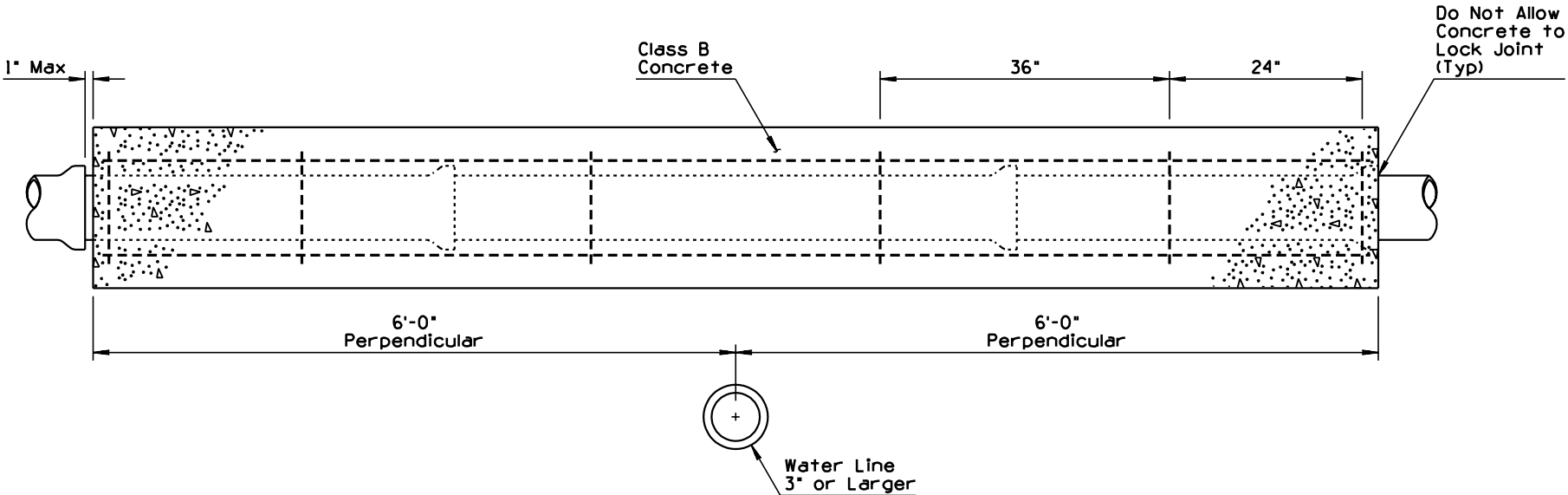


GENERAL NOTES

1. Type A encasement to be used for sewer laterals or house connections BELOW water lines.
2. Type B encasement to be used for sewer laterals or house connections ABOVE water lines.
3. The encasement shall extend at least 6' on each side of the water line and must include the nearest joint.
4. Protection for Type A required when distance from bottom of water to top of sewer line is 24" or less. When the sewer is a 4" or 6" house connection no protection is required if distance is more than 12".
5. For Type A crossings, Class 150 C.I.P. or ductile iron pipe may be used as an alternate. For Type B crossing reinforced encasement is always required.

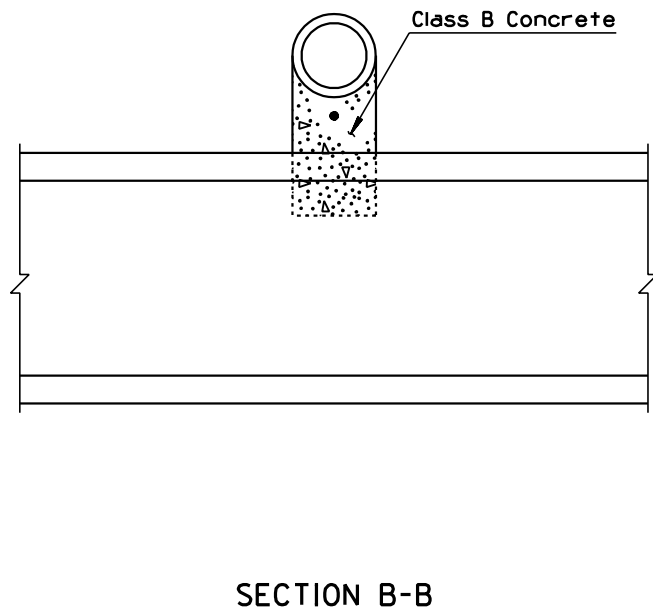
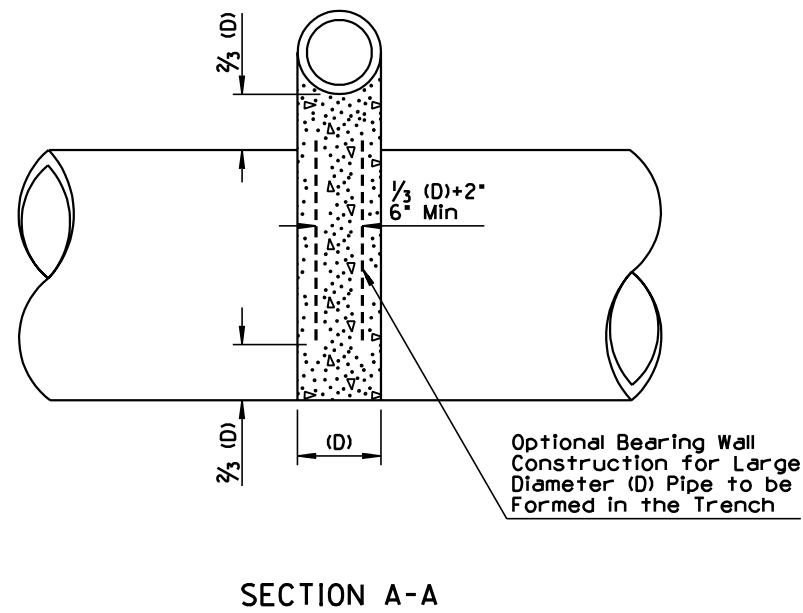
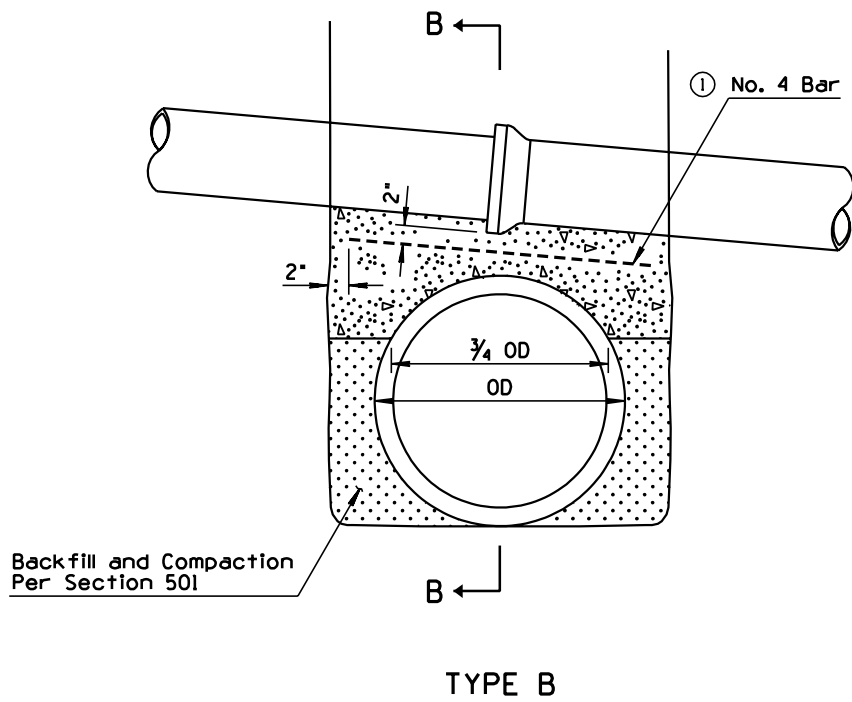
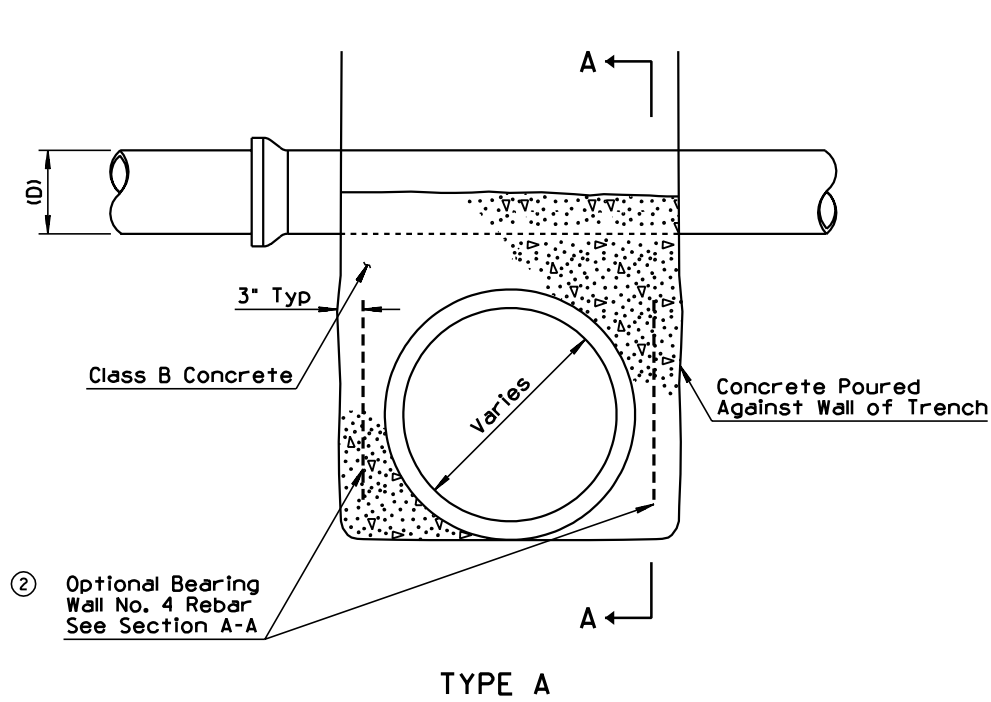


TYPE B ENCASEMENT ①



DESIGN APPROVED <i>[Signature]</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>[Signature]</i>	SANITARY SEWER ENCASEMENT	DRAWING NO. C-22.15

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	ADDED GENERAL NOTE	PNB	10/95
2	ADDED REBAR TO VIEW	PNB	10/95
3			
4			



GENERAL NOTES

1. Type A pipe support may be used for any Type crossing condition.
2. Type C pipe support may be used for crossing pipes with a bell diameter of 18" or less if sufficient clearance over storm sewer is available and total span is less than 34'.
3. Intermediate pipe support shall be used in conjunction with Type C pipe support if total span exceeds max. W in table.
4. The contractor shall be responsible for furnishing all supports both permanent and temporary. Temporary supports shall not be a separate pay item.
5. Permanent pipe supports may be decreased from plan quantities or extended to include some listed below as temporary supports if conditions warrant these changes at the time of construction. Decision shall be made by the engineer.
6. When Type A pipe support is used and whenever so directed by the engineer, the contractor shall pierce the wall with suitable openings to prevent unequal pressure resulting from flooding of the backfill. The volume of the pierced opening shall not exceed 1/2 the volume of the supporting wall.
7. Use Type B pipe support instead of Type C when clearance between pipes is less than Y in table.
- ① 8. Concrete cover for reinforcing steel shall be 3", minimum.

SCHEDULE OF REQUIRED SUPPORTS		
PERMANENT	TEMPORARY	
Sewer Lines	Cast Iron Pipe	Conc Storm Drain
	Conc Irrig Pipe	Conc Box Culvert
	Buried Telco	Traffic Control Conduit
	Gas Pipes	Water and Sewer Lines

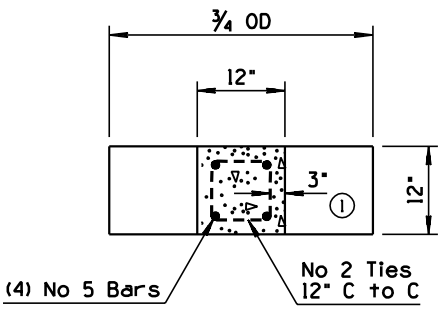
NOTE:
Other utilities as noted on the plans or as required by the engineer at time of construction.

DESIGN APPROVED <i>Henry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 10/95
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>		DRAWING NO. C-22.20 Sheet 1 of 3

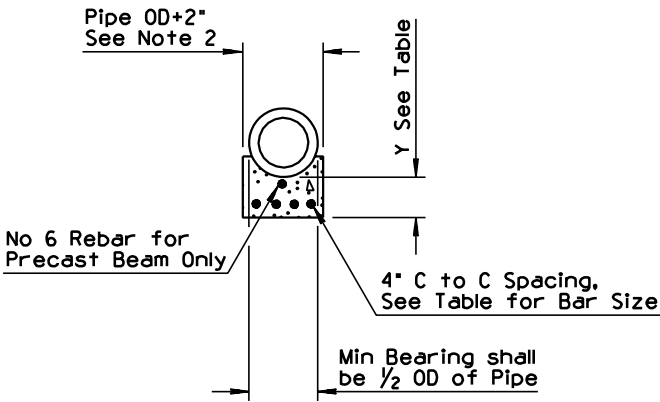
PIPE SUPPORT ACROSS TRENCHES

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED REBAR CLEARANCE	PNB	10/95
2			
3			
4			

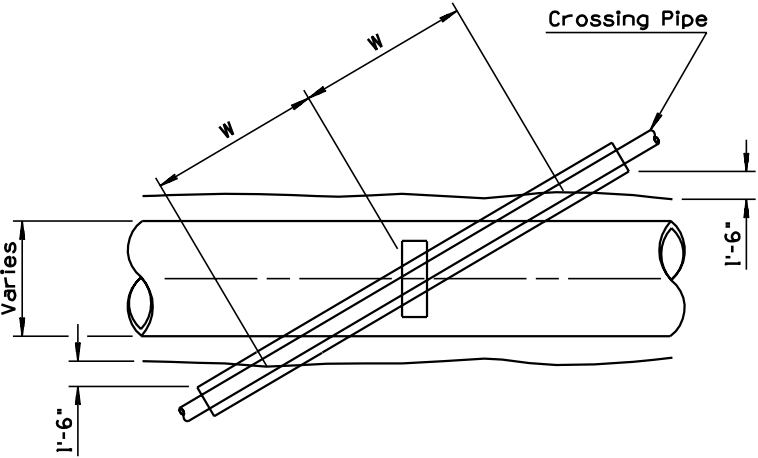
TABLE				
'W'	DEPTH OF COVER ON SUPPORTS			
	0' TO 8'		8' TO 16'	
	BAR NO.	Y	BAR NO.	Y
TO 6'	5	8"	6	11"
7'	5	9"	6	12"
8'	5	10"	6	13"
9'	6	11"	6	14"
10'	6	12"	7	15"
11'	6	13"	7	16"
12'	6	14"	7	17"
13'	7	15"	7	19"
14'	7	16"	8	20"
15'	7	17"	8	21"
16'	7	18"		
17'	8	19"		



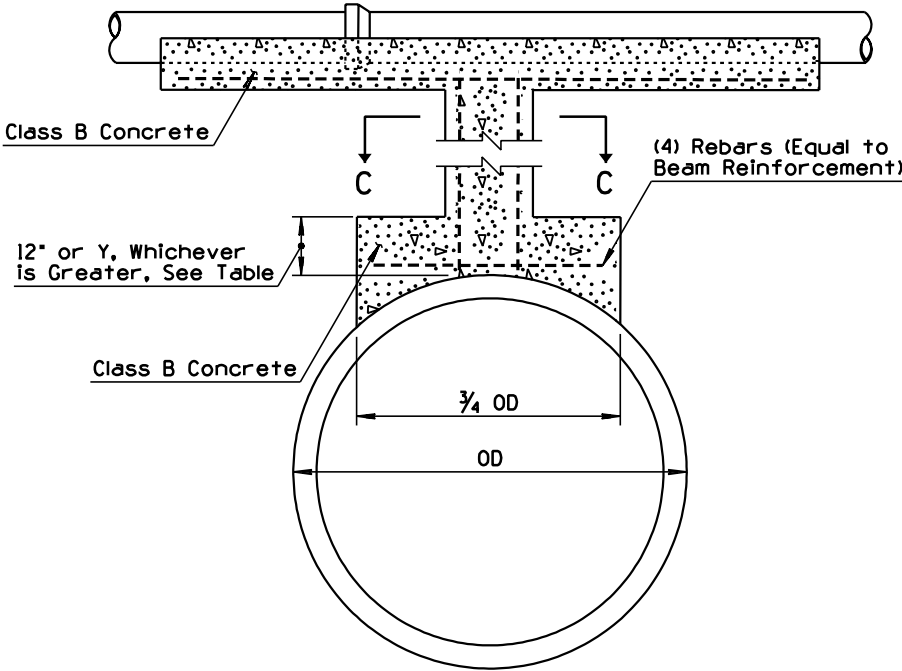
SECTION C-C



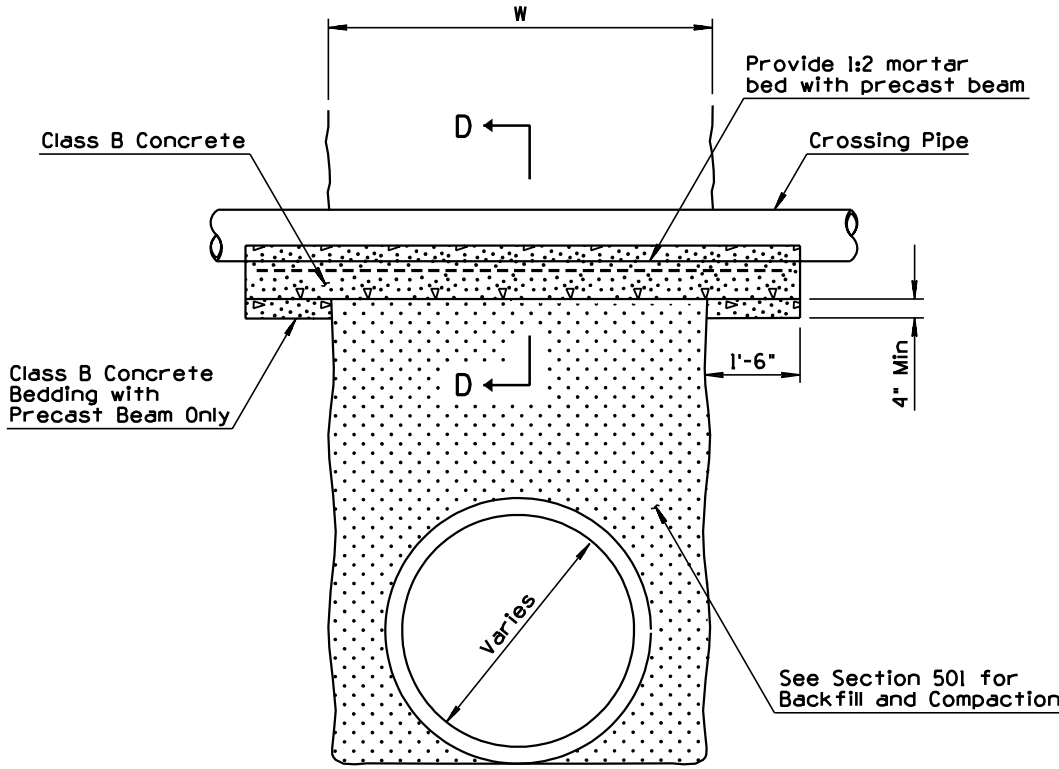
SECTION D-D



PLAN FOR TYPE B SUPPORT

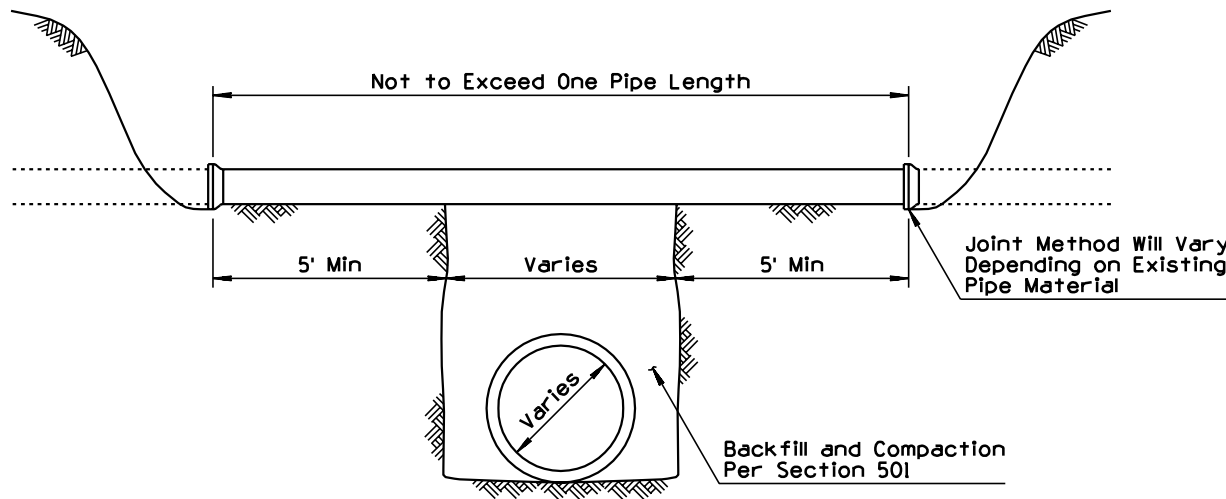
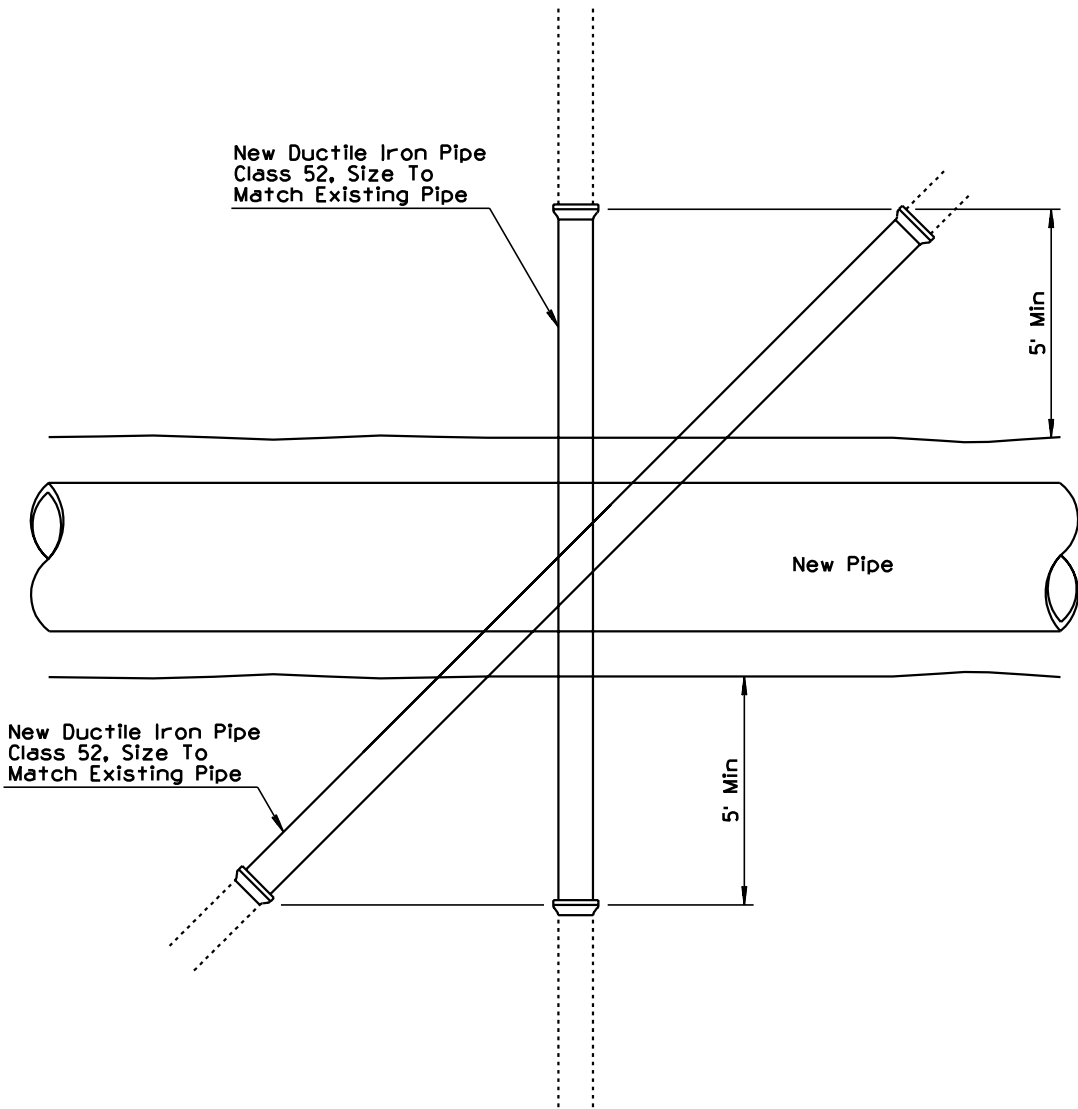


INTERMEDIATE SUPPORT FOR
TYPE B CROSSINGS



TYPE C

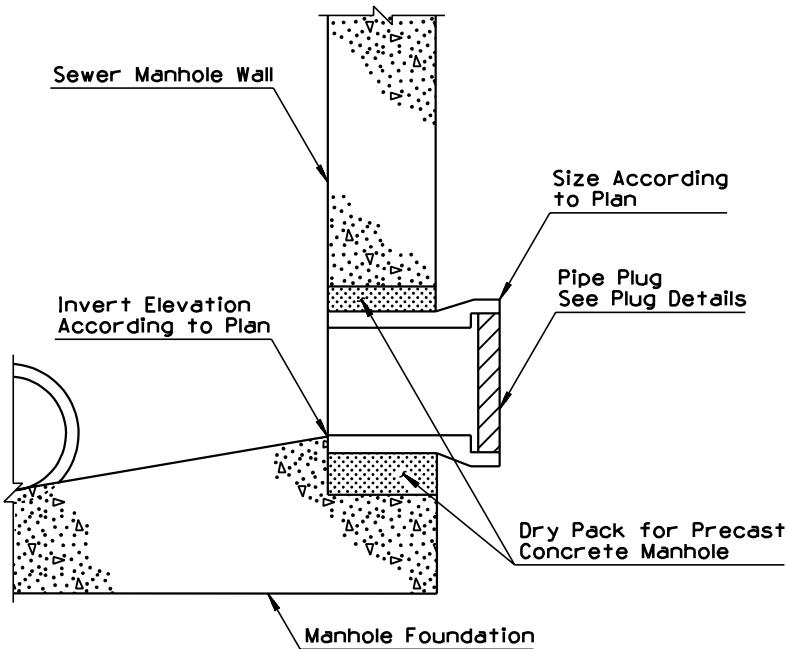
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			



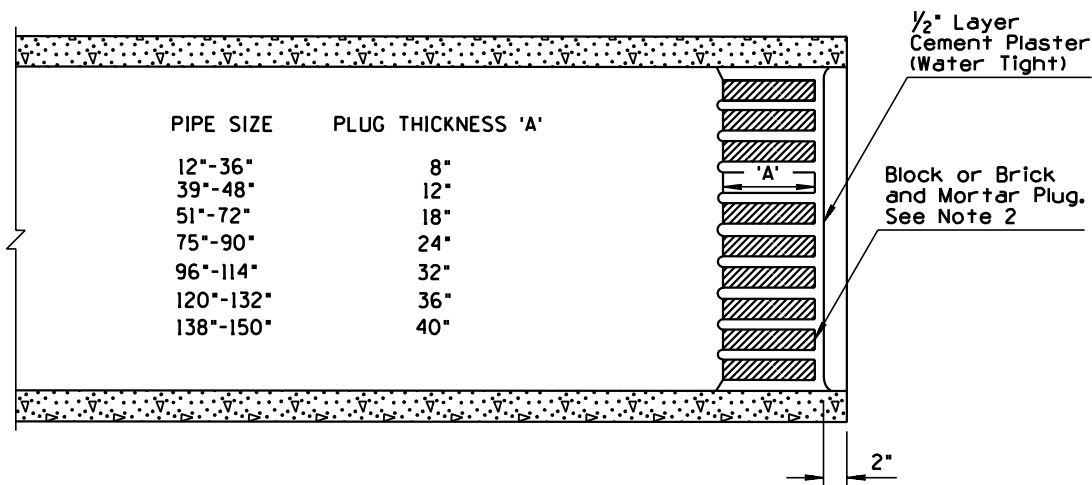
ALTERNATE TO PIPE SUPPORT

DESIGN APPROVED <i>Henry H. Ottens</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① PIPE SUPPORT ACROSS TRENCHES	DRAWING NO. C-22.20 Sheet 3 of 3	

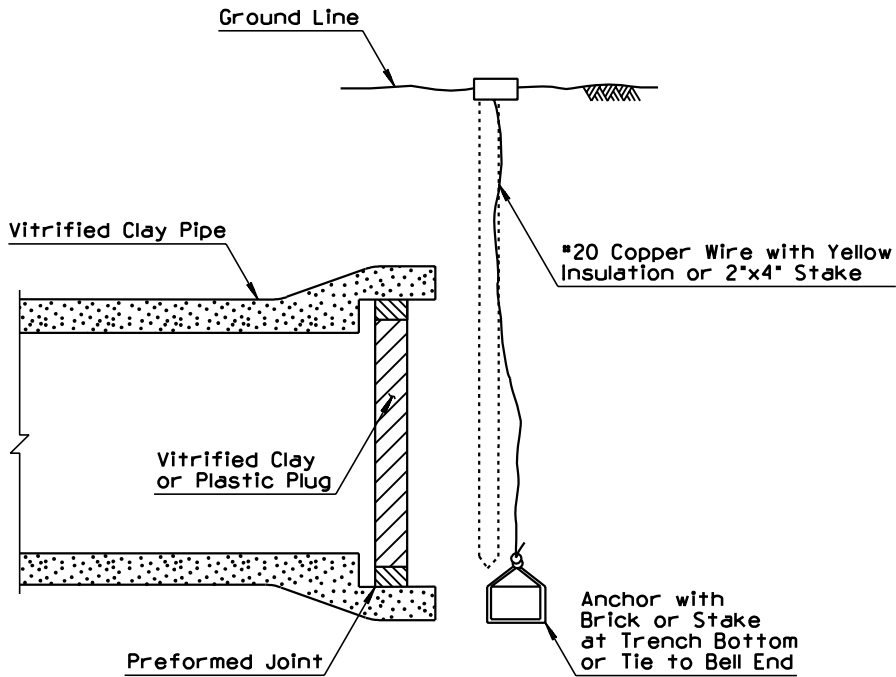
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			



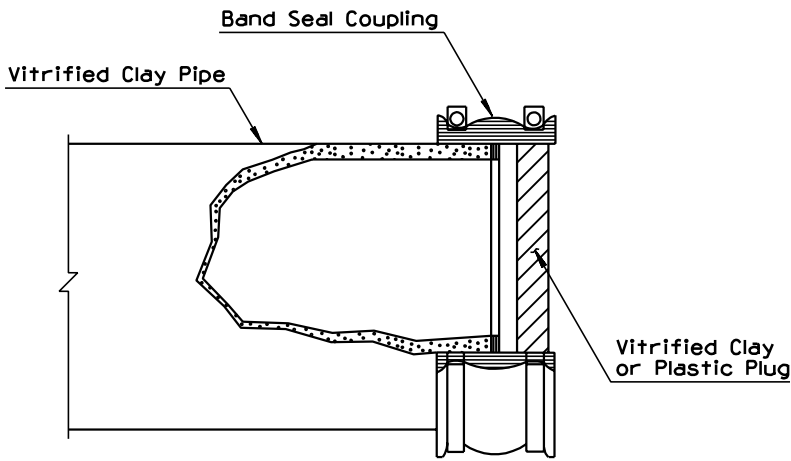
TYPICAL STUB OUT



STORM DRAIN LINE PLUG



PIPE PLUG MARKER



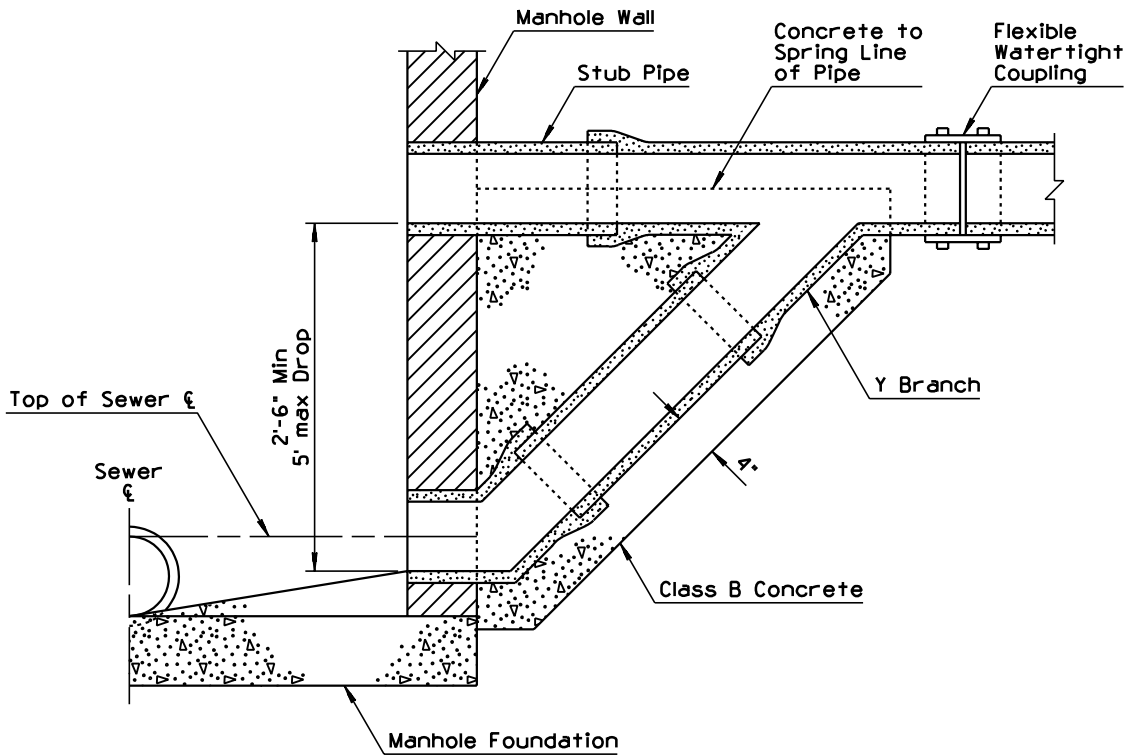
SEWER LINE PLUG

GENERAL NOTES

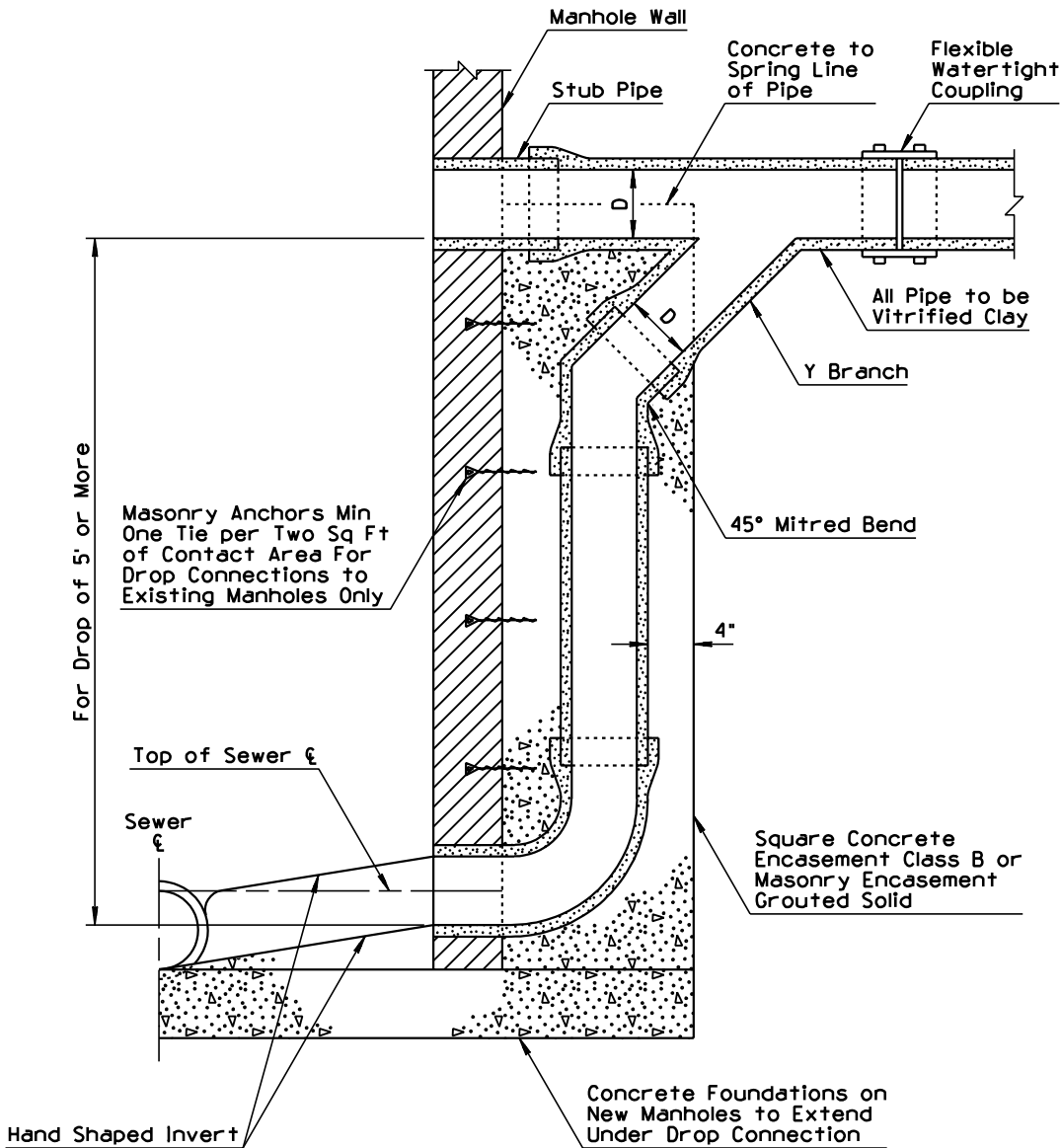
1. Compact soil at end of pipe to 95% of maximum density.
2. If depth of cover is less than 5' or greater than 10', increase plug thickness a minimum of 4".

DESIGN APPROVED <i>Larry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. C-22.30

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			



TYPE A
2.5' TO 5' DROP

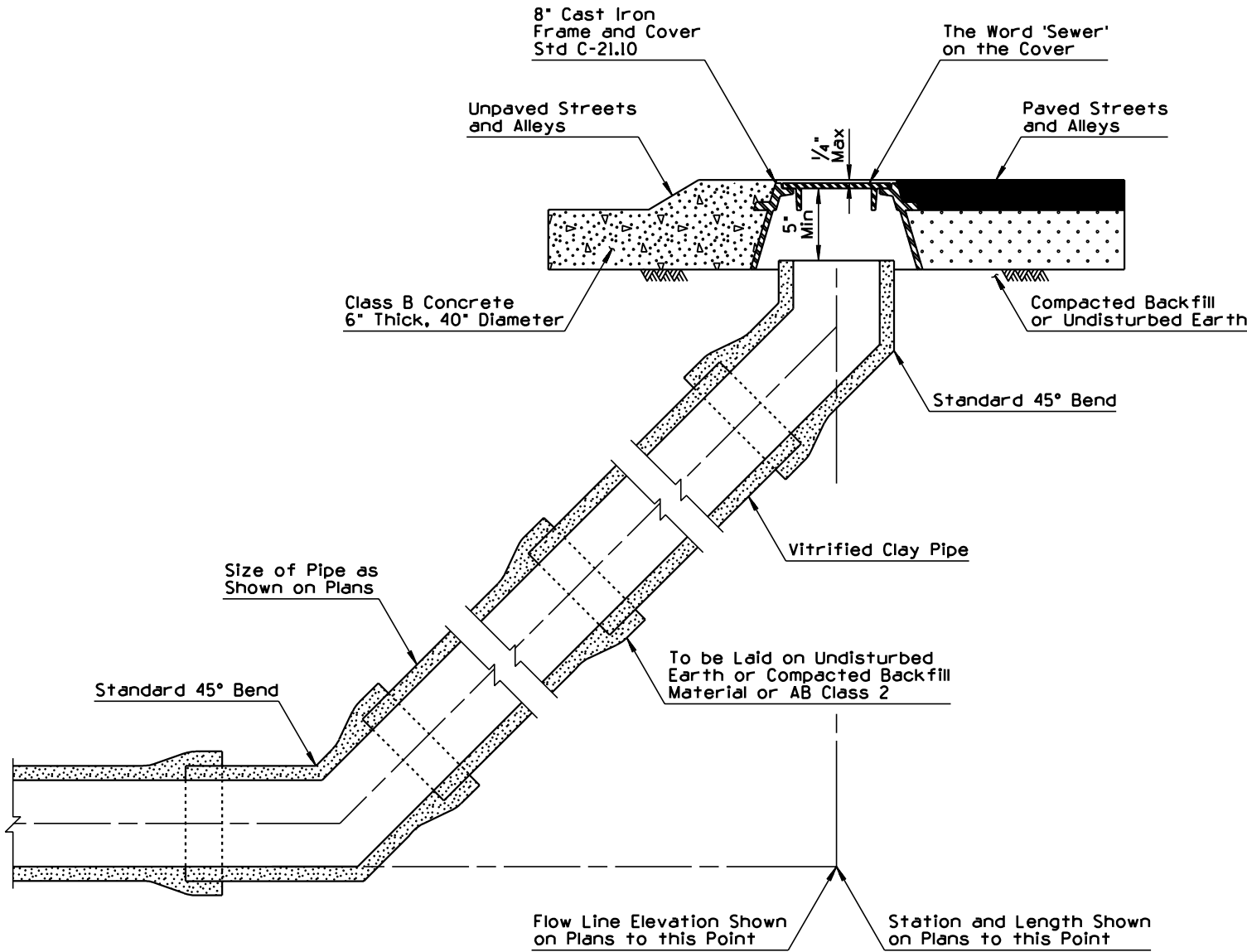


TYPE B
5' OR MORE DROP



NOTE:
D = Same Diameter Pipe

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① DROP SEWER CONNECTIONS	DRAWING NO. C-22.35	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REISSUE STD	PNB	7/94
2			
3			
4			

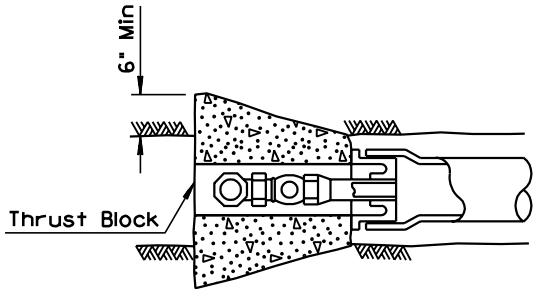
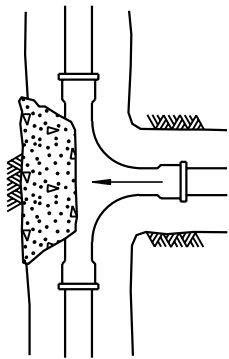
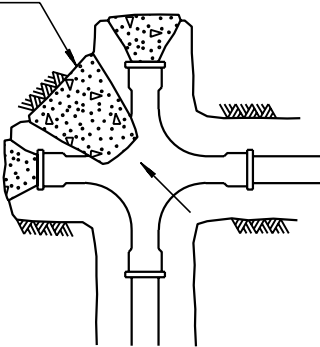


CLEANOUT INSTALLATION

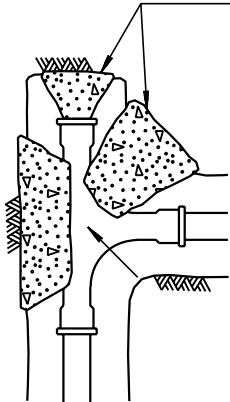
DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION 	① SEWER CLEANOUT	DRAWING NO. C-22.40	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			

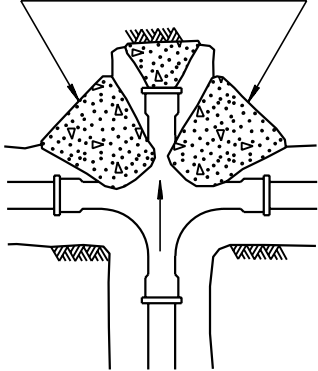
Area required for 90° Bend



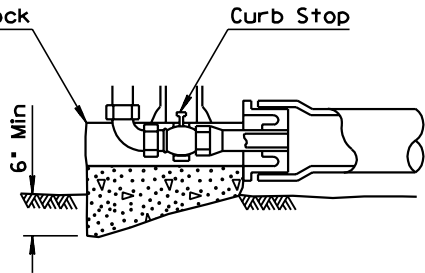
1/2 Area Required for 90° Bend



Total Area Equals Area Required for Tee



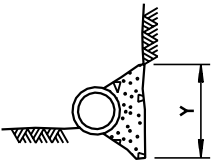
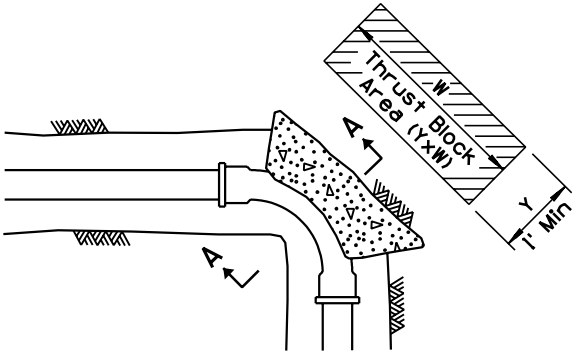
Thrust Block Curb Stop



GENERAL NOTES

1. Thrust blocks are to extend to undisturbed ground.
2. All concrete shall be class B.
3. Table is based on 3000#/sq. ft. soil. If conditions are found to indicate soil bearing less, the areas shall be increased accordingly.
4. Areas for pipe larger than 16" shall be calculated for each project.
5. Form all non bearing vertical surfaces.

MINIMUM THRUST BLOCK AREA REQUIRED (Y x W)		
PIPE SIZE	WATER PIPE	
	TEE, DEAD END, 90° BEND	45° & 22½° BENDS
4" & LESS	3 SQ. FEET	3 SQ. FEET
6"	4 " "	3 " "
8"	6 " "	3 " "
10"	9 " "	5 " "
12"	13 " "	7 " "
16"	23 " "	12 " "

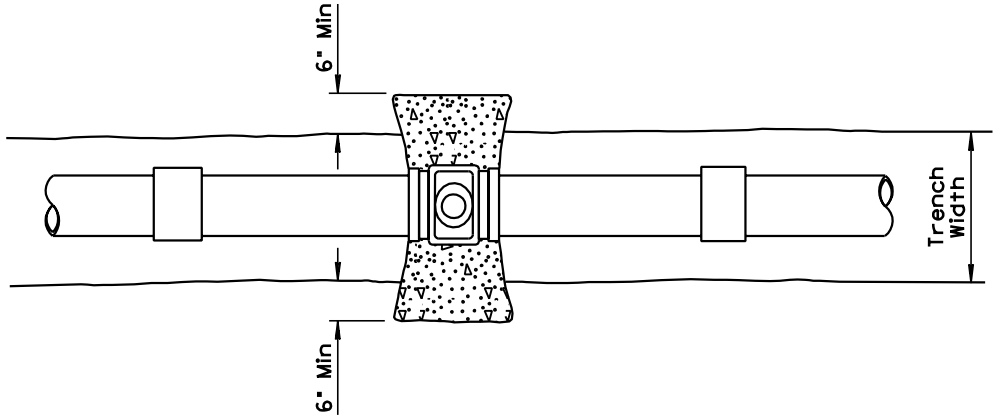


SECTION A-A

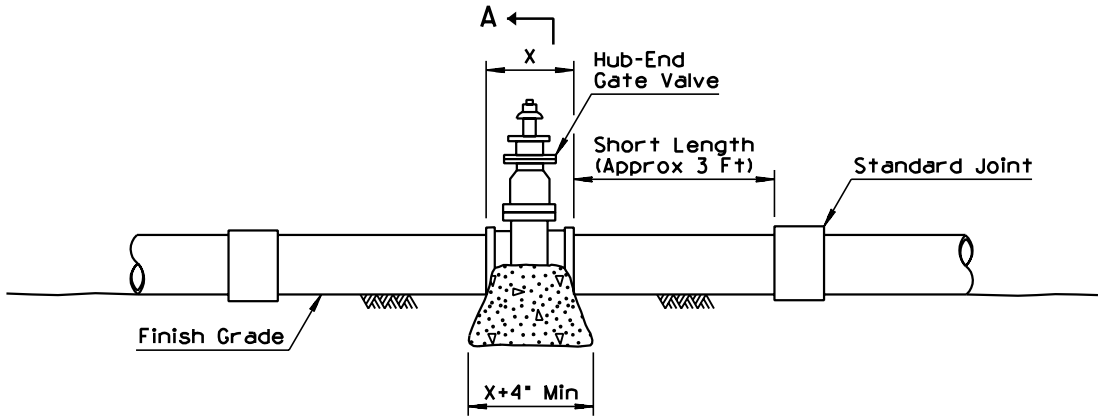
DESIGN APPROVED <i>Larry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. C-23.10

① THRUST BLOCKS FOR WATER LINES

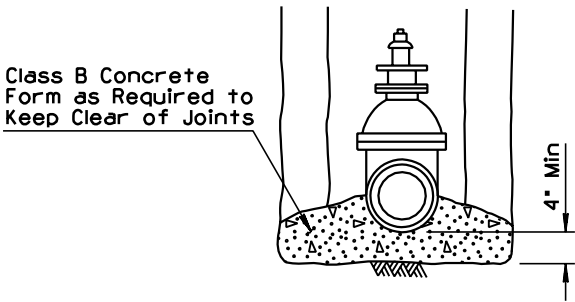
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			



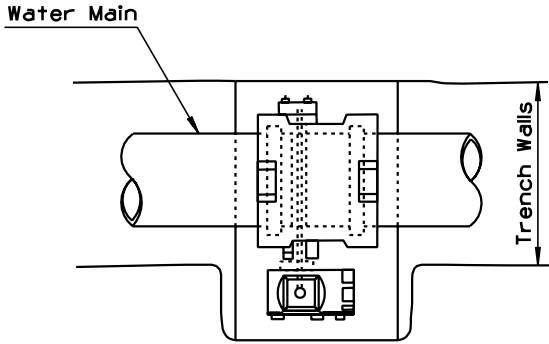
PLAN



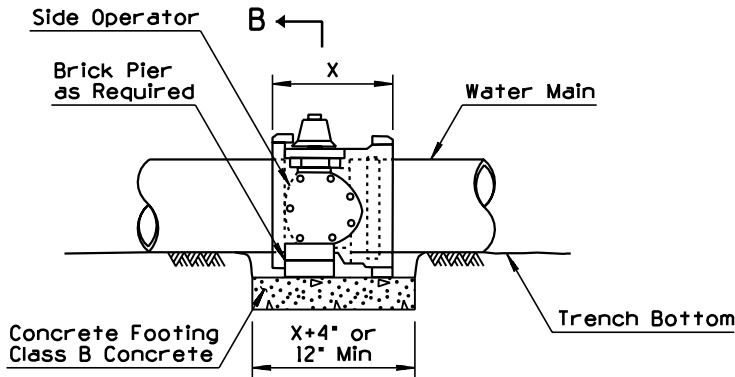
ELEVATION



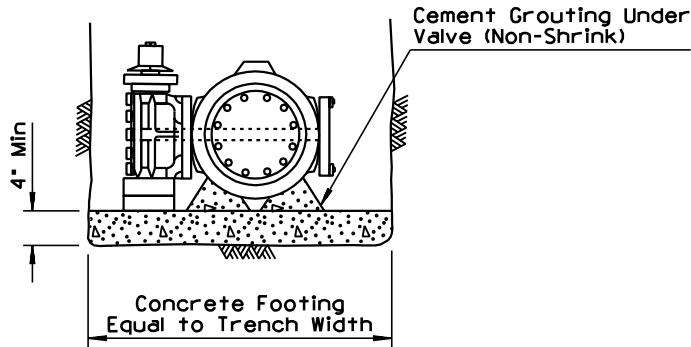
SECTION A-A
GATE VALVE



PLAN



ELEVATION



SECTION B-B
BUTTERFLY VALVE

GENERAL NOTES

- Gate valves 4" to 16" may be used with any type of pipe.
- Gate valves larger than 16" to be detailed on plans.
- Butterfly valves 3" to 12" may be used with any type of pipe.
- Butterfly valves larger than 12" to be detailed on plans.
- Valve box and cover required per Std C-23.30.

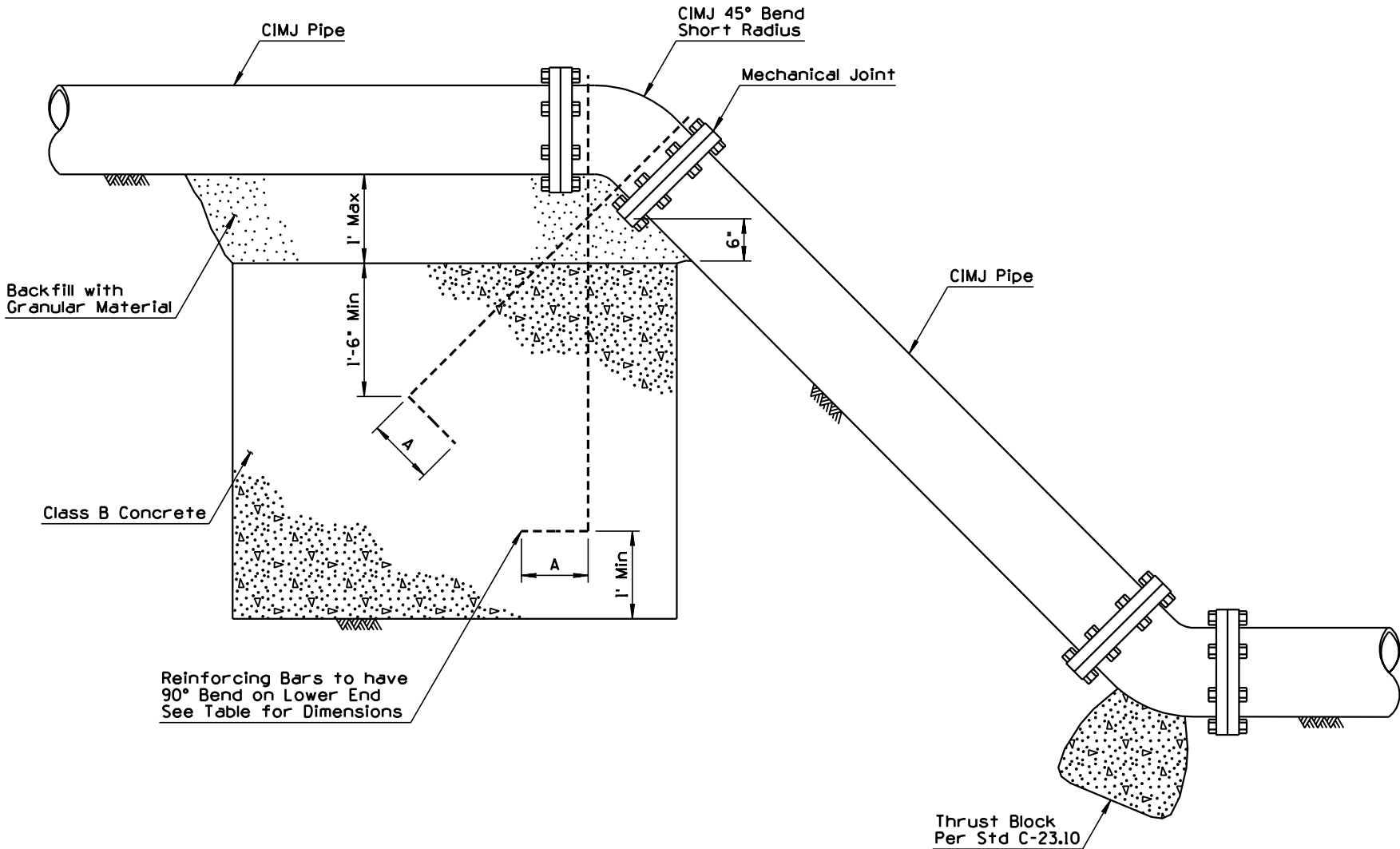
DESIGN APPROVED <i>Henry H. Ottensm</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS	REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>		DRAWING NO. C-23.15

① BLOCKING FOR WATER VALVES
GATE AND BUTTERFLY

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			



GENERAL NOTES

1. Either this detail or restraint rods may be used when allowed to relocate a water line upward to cross over a conflict.
2. Ductile iron pipe may be used.
3. Anchor blocks for pipe larger than 12" shall be calculated for each project.
4. Reinforcing bars to be coated with 2 coats of coal tar, epoxy, or by other approved methods.

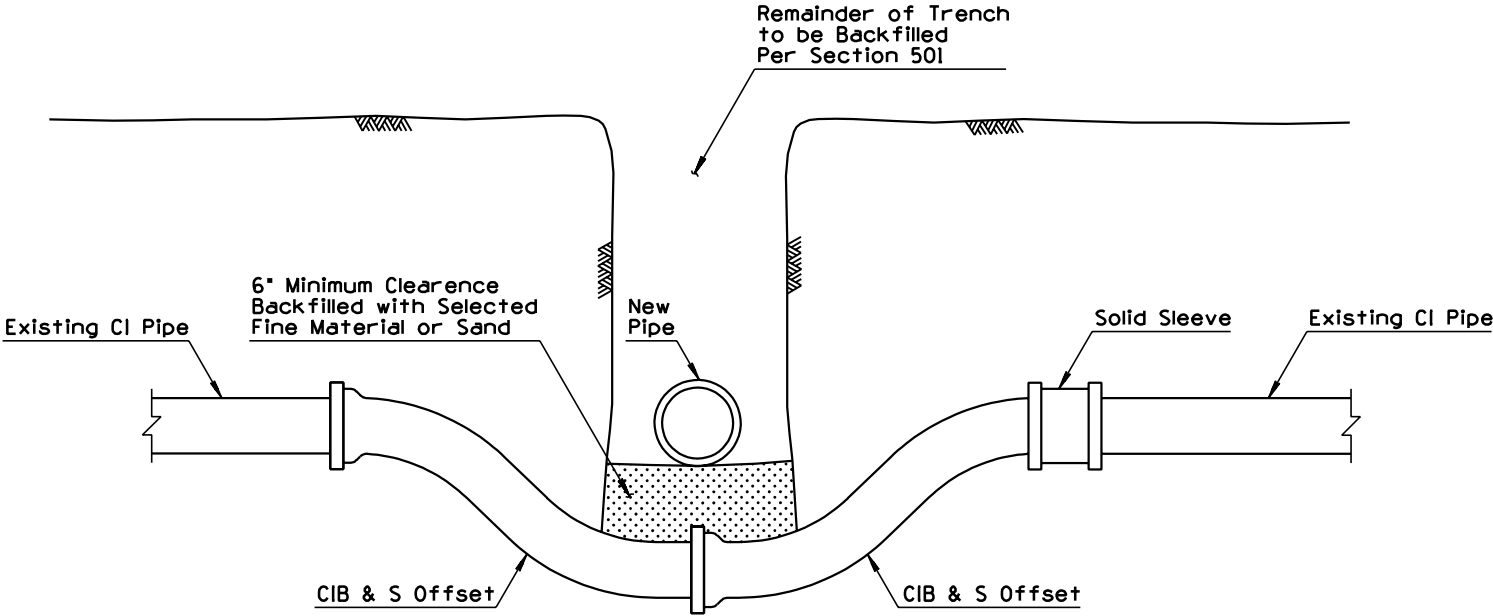


PIPE SIZE	MINIMUM BAR SIZE	A-DIMENSION (HOOK)	MINIMUM # BLOCK DIMENSION
6"	#6	6"	3'x3'x3'
8"	#6	9"	4'x4'x2.5'
12"	#8	9"	4'x5'x5'

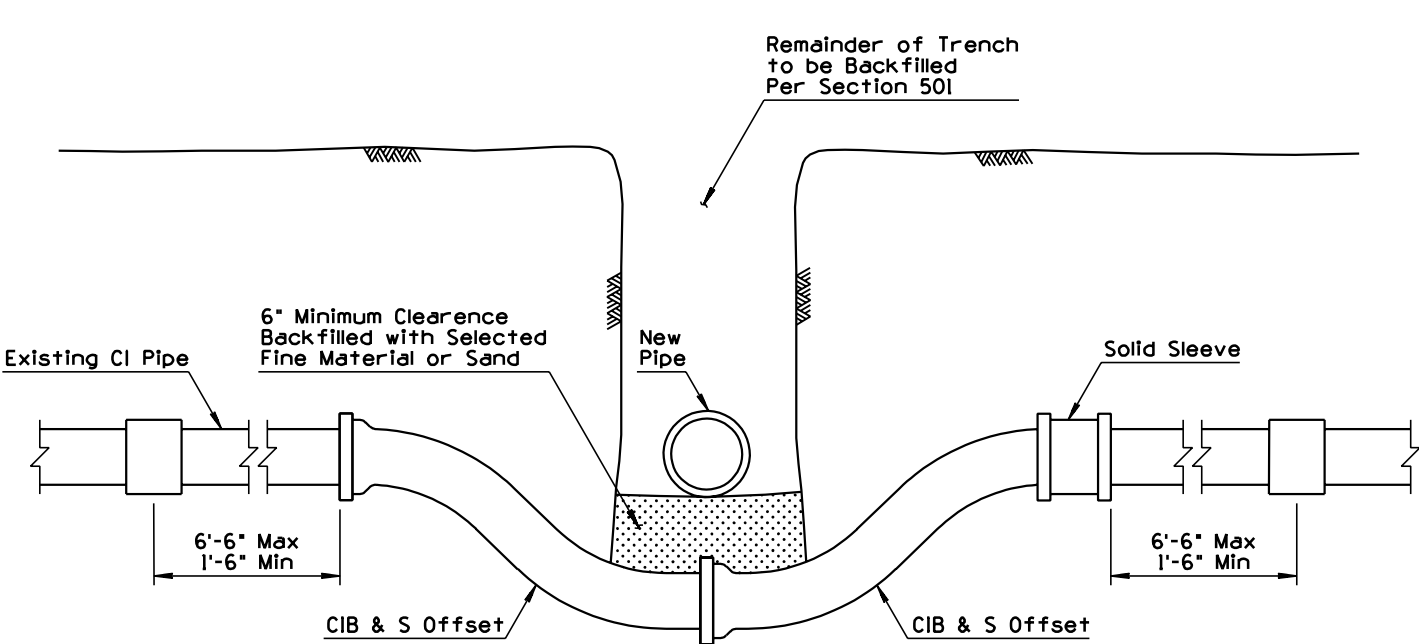
* For 125 psi Working Pressure

DESIGN APPROVED 	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION 	① ANCHOR BLOCK FOR VERTICAL BENDS	DRAWING NO. C-23.20	

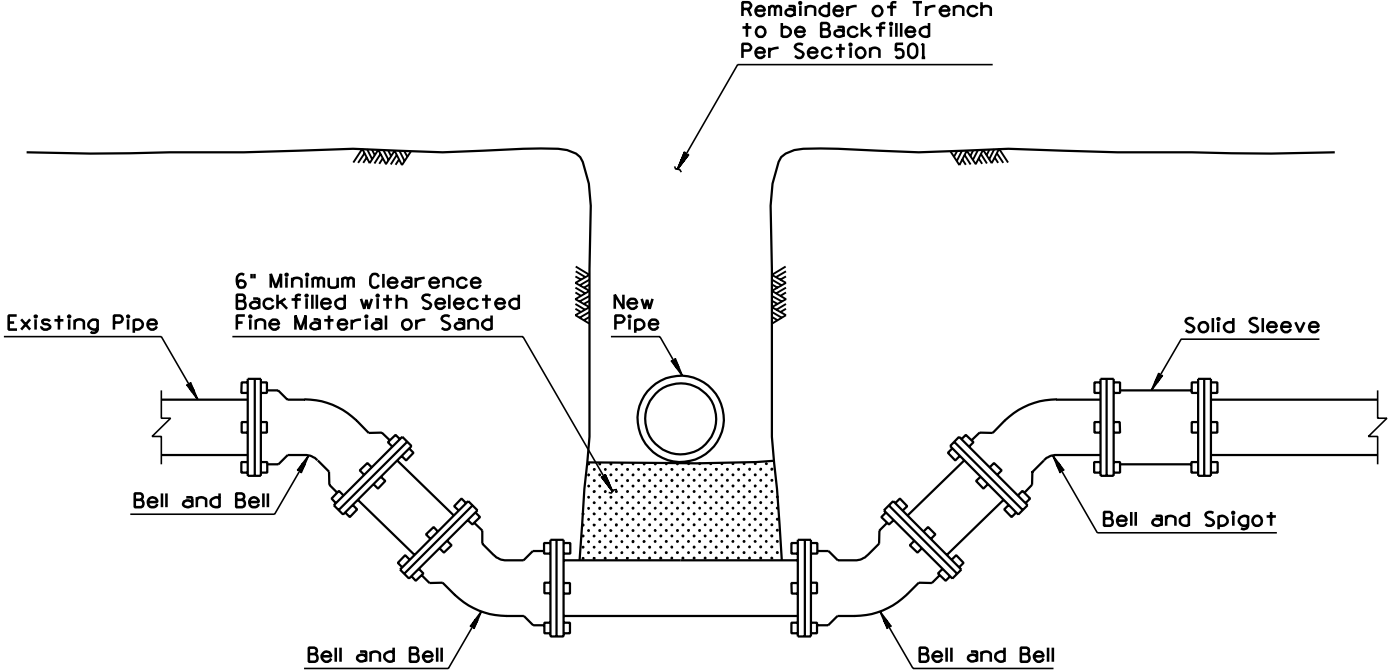
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
4			



CAST IRON



ASBESTOS CEMENT



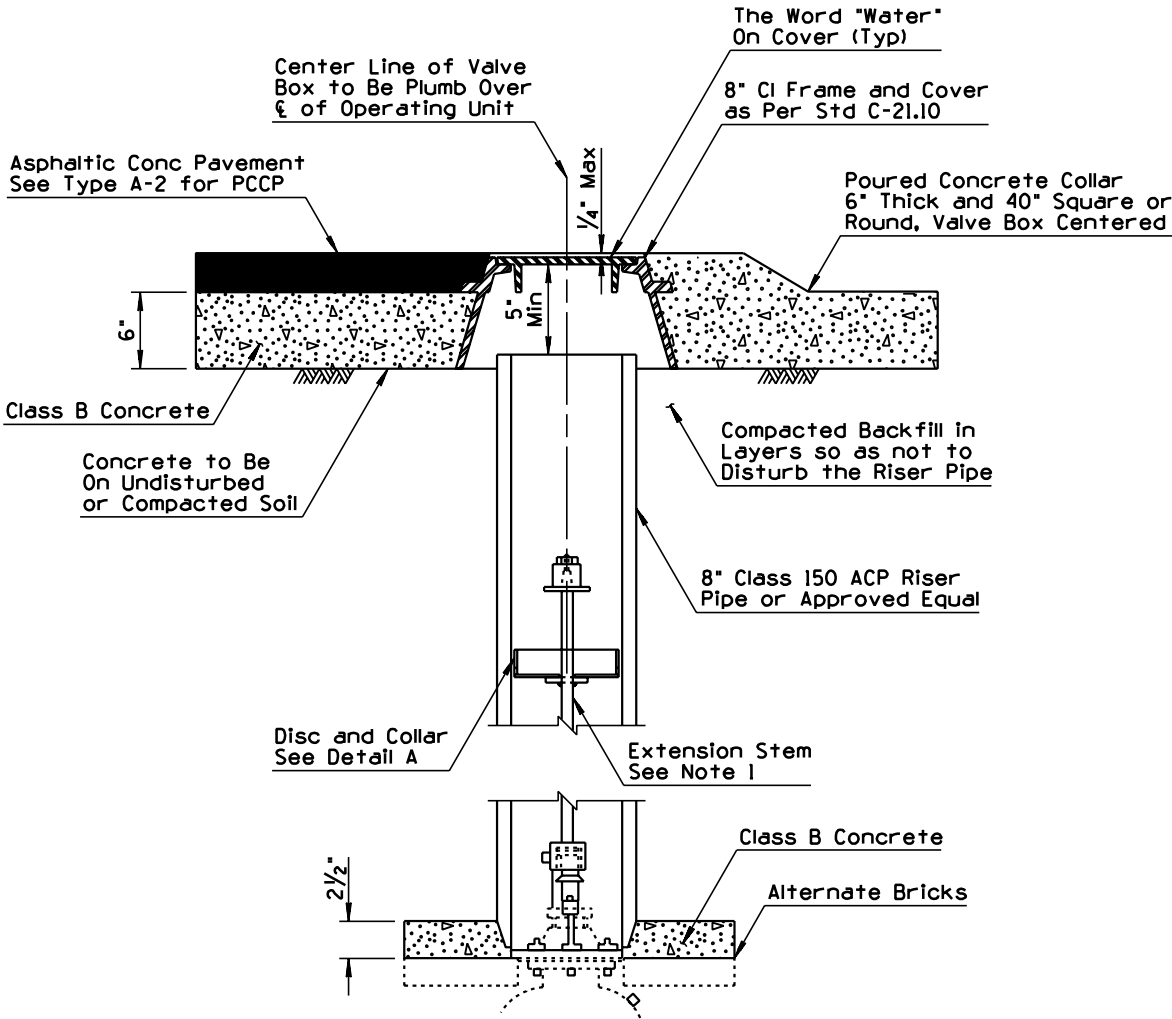
CAST IRON
MECHANICAL JOINT

GENERAL NOTES

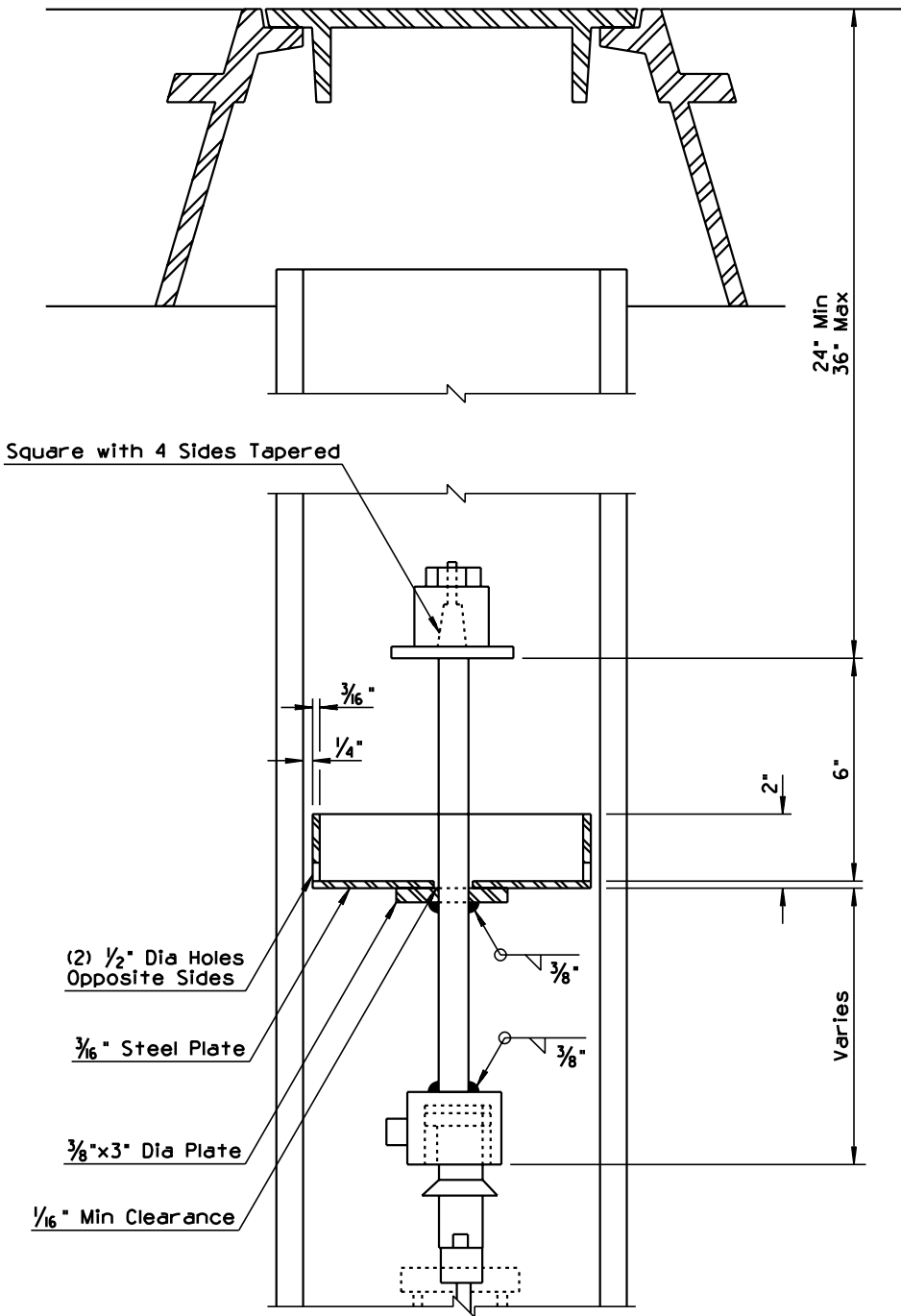
1. This detail covers moving of water mains, 2" to 12" only.
2. Thrust blocking per Std C-23.10 and C-23.20.
3. If offset is to go over obstruction, joint restraints must be used.
4. Pipe is to be cast iron or ductile iron.
5. 45° cast iron bends may be used in place of cast iron offsets.
6. Drop section is to be prefabricated and installed as a single unit for cast iron mechanical joints.

DESIGN APPROVED <i>Larry H. Osterman</i>	STATE OF ARIZONA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DRAWINGS		REV. 7/94
APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① VERTICAL REALIGNMENT OF WATER MAINS	DRAWING NO. C-23.25	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED GENERAL NOTE	PNB	10/95
2			
3			
4			



TYPE A-1
TO BE USED IN AREAS SUBJECT TO VEHICULAR TRAFFIC



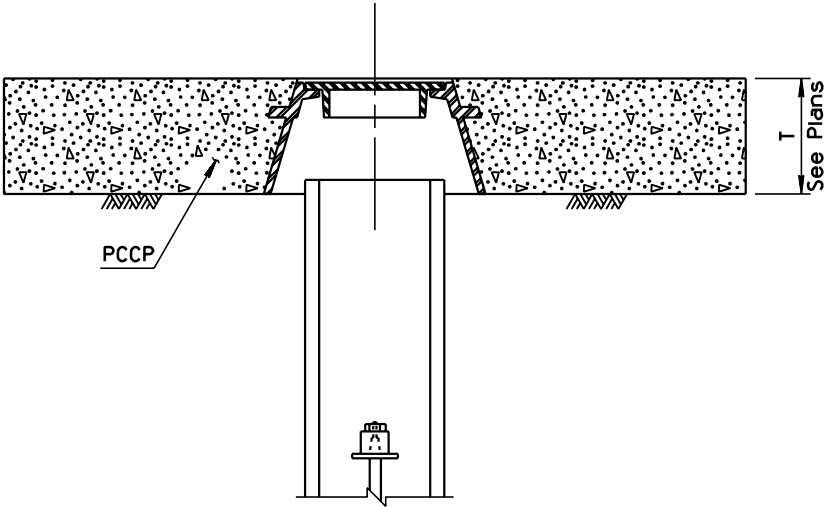
DETAIL A

GENERAL NOTES

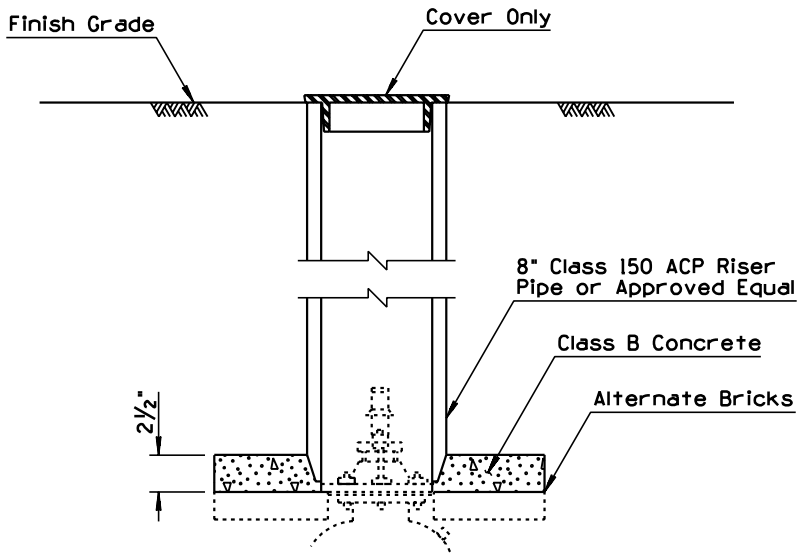
- Extension to valve stems required on all valves where operating nut is over 5' below surface. Extension stem shall be $\frac{1}{4}$ " minimum diameter steel designation A-15, with square socket on bottom to fit 2" square valve nut. Length to fit each installation. 2" square operating nut to be held on top of the extension stem with stop nut.
- If two or more joints of ACP are used to make riser, use standard AC pipe rubber gasket coupling to join pipe. Where riser pipe length exceeds 10', use 12" AC pipe.
- ① All steel to have prime coat of paint No. 4 and one heavy application (finish coat) of Light Grey Enamel paint as per section 1002-4.06.
- Valve box shall be adjusted to the finished grade prior to the placing of the asphaltic concrete surface or PCCP.
- Ground below the concrete pad or three bricks to be compacted to 95% of the maximum density.
- Use Parkson, Tyler Apco, or equal deep skirted cover (4" or more) type, sliding adjustable cast iron valve box, CI minimum TS 30,000 psi.

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APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	VALVE BOX INSTALLATION	DRAWING NO. C-23.30 Sheet 1 of 2	

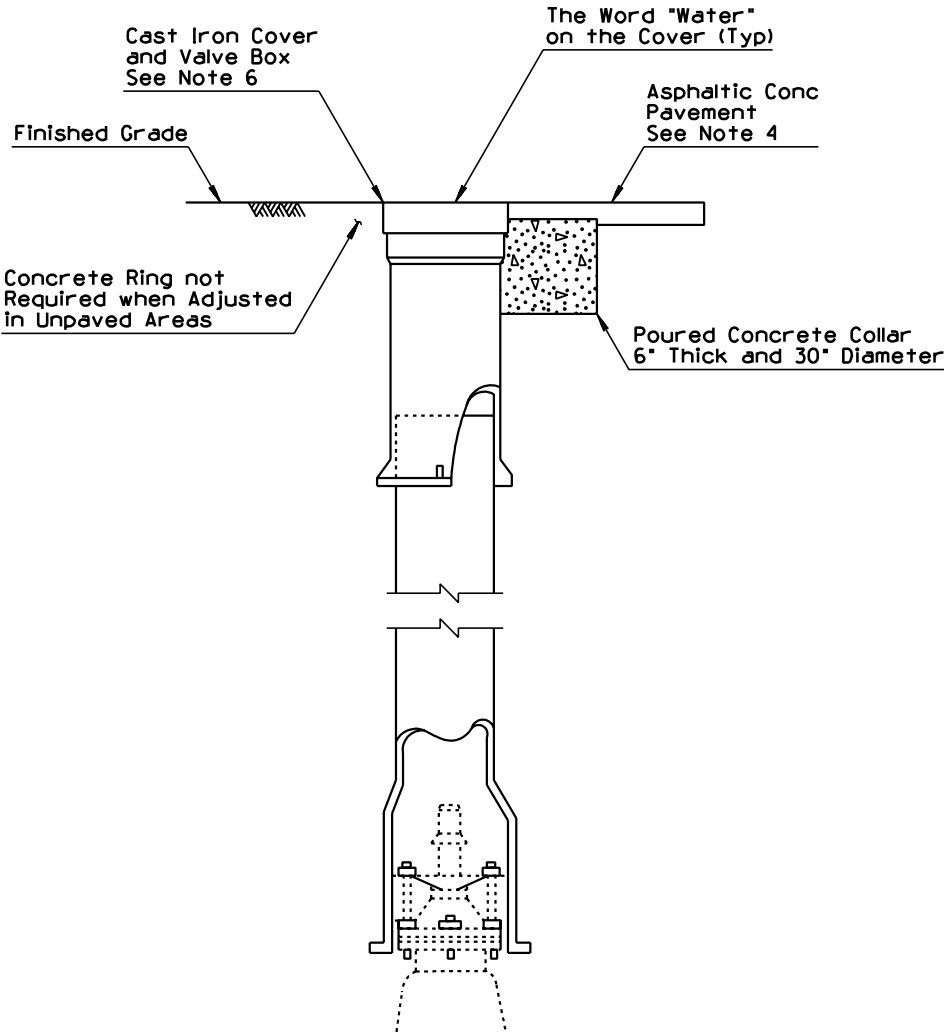
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	MOVED NOTE TO SHT 1	PNB	7/94
2	REARRANGED STD	PNB	7/94
3			
4			





TYPE A-2
TO BE USED WHEN VALVE BOX IS LOCATED WITHIN PCCP PAVEMENT



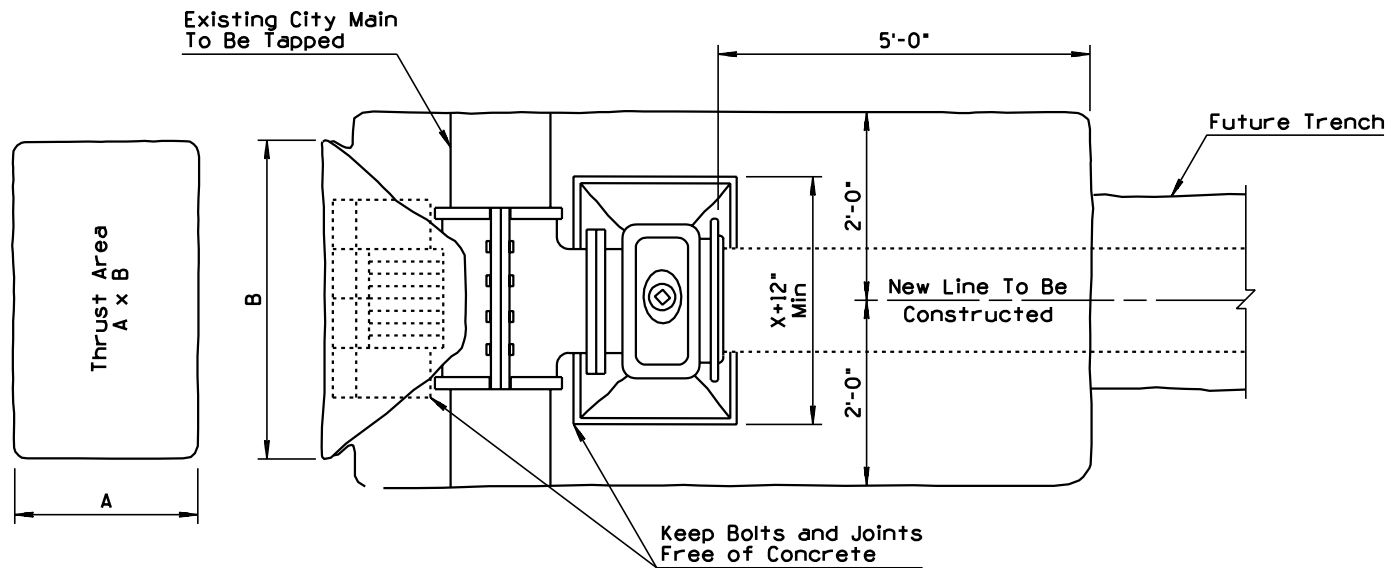
TYPE B
NOT SUBJECT TO VEHICULAR TRAFFIC



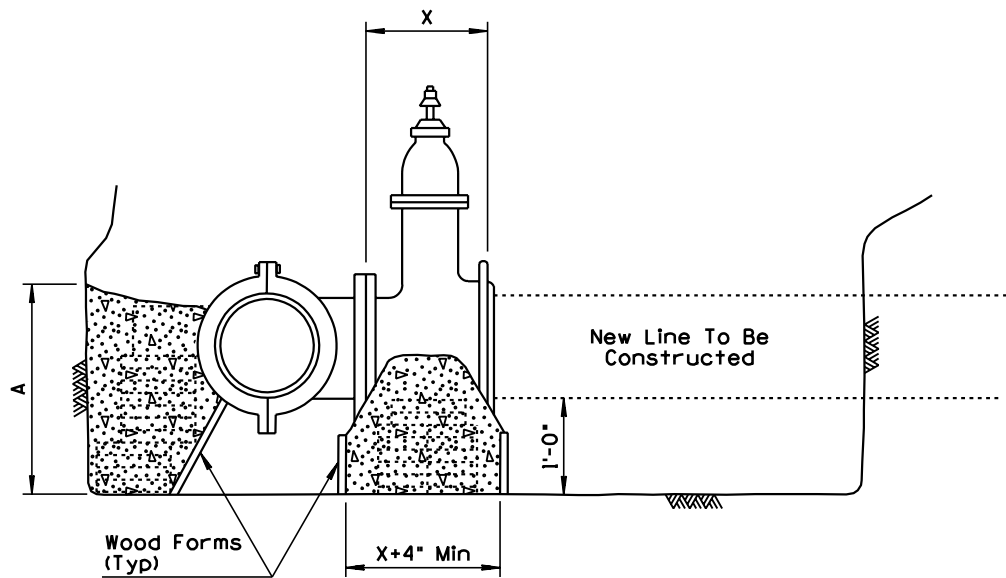
TYPE C

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APPROVED FOR DISTRIBUTION 	② VALVE BOX INSTALLATION	DRAWING NO. C-23.30 Sheet 2 of 2	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD, ESP. NOTES	PNB	7/94
2			
3			
4			



PLAN



ELEVATION

GENERAL NOTES

1. Thrust blocks are to extend to undisturbed ground.
2. Optional blocking of 2"x8"x12" solid concrete masonry units may be used as indicated.
3. All concrete shall be class B normally, cure 24 hours before backfilling, or use high, early strength concrete.
4. All taps shall be made by city crews at prevailing rates.
5. Install permanent blocking under valve before tap is made. All flange bolts shall be clear of footing.
6. All tapping sleeves must be pressure tested prior to request for tap by city.
7. Contractor shall excavate as shown and shall set tapping sleeve and valve, and tighten all bolts prior to requesting city to make tap.
8. Tapping sleeve to be placed a minimum of 18" from any bell, coupling, valve, or other obstruction.
9. Areas for pipe larger than 16" shall be calculated for each project.

SIZE OF PIPE BEING CONNECTED	MINIMUM THRUST AREA REQUIRED EQUALS (A x B)
4" & LESS	3 SQUARE FEET
6"	4 SQUARE FEET
8"	6 SQUARE FEET
10"	9 SQUARE FEET
12"	13 SQUARE FEET
16"	23 SQUARE FEET

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APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	① TAPPING SLEEVE AND VALVE INSTALLATION	DRAWING NO. C-23.35	

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REVISED SPECIFICATION CALLOUT	PNB	10/95
2			
3			
4			

CLAMP DETAIL

NOTE:
Rods are attached to lugs cast on bell of hydrant. If hydrant is not fitted with lugs, rods are attached as shown below by the dashed line.

Hydrant Anchor

GENERAL NOTES

- This detail is for use only on underground installations where the use of concrete thrust blocking per Std C-23.10 cannot be used because of obstructions, or requirements of the specifications.
- Washers may be cast iron or steel, and may be round or square. Holes shall be 1/8 inch larger than the rods.
- All tie rods, rod couplings, turnbuckles, bolts and nuts for these joints shall be of carbon steel equivalent to ASTM A-307, grade B, with cadmium plating in accordance with ASTM B 766, except that the minimum thickness of the plating shall be .0002 of an inch. Cadmium plated bolts shall have class 2A threads and the nuts, rod couplings and turnbuckles shall have 2B threads.
- High strength, heat treated cast iron tee-head bolts with hexagon nuts, all in accordance with the strength requirements of AWWA C-111, may be used in lieu of the cadmium plated bolts and nuts.
- The sketches in this series of figures show acceptable methods of providing anchorage. There is no particular significance to be attached to whether the sketch shows a bell and spigot joint or a standard mechanical joint. The anchoring procedure illustrated applies in most cases to either type of joint. In some cases, dimensions of the particular pipe or hub and space available for working around the particular joint will influence the choice of methods used.
- In certain assemblies of rod and clamps shown, rods run from a lug on the fitting (or a clamp behind the hub of a bell) to a clamp against a face of a bell. Note that this arrangement anchors only one joint. The stability of the joint where the clamp is against the face of the bell depends on having soil above a relatively long piece of pipe on both sides of the joint. Consequently, if the distance between the first and the second joint is less than 12 feet, the second joint shown shall be anchored by a clamp behind the hub of the bell and rods to a clamp at the face of the next bell.
- For pipe larger than 12 inch diameter, restraint details shall be submitted for approval prior to installation.
- All exposed metal shall be coated with asphaltic primer per subsection 907-2.02.
- Bolt holes in clamps shall be 1/16 inch larger than the bolts.

PIPE SIZE	A	B	C	D	CLAMP	ROD	BOLTS	WASHERS	
								CAST IRON	STEEL
4"	12 1/2"	10 7/8"	2 1/2"	1 3/4"	1/2"x2"	3/4"	5/8"	5/8"x3"	1/2"x3"
6"	14 1/2"	12 7/8"	3 9/16"	2 13/16"	1/2"x2"	3/4"	5/8"	5/8"x3"	1/2"x3"
8"	16 3/4"	14 3/8"	4 7/16"	3 7/16"	5/8"x2 1/2"	3/4"	5/8"	5/8"x3"	1/2"x3"
10"	19 1/16"	16 11/16"	5 3/4"	5"	5/8"x2 1/2"	7/8"	3/4"	5/8"x3"	1/2"x3"
12"	22 5/16"	19 3/16"	6 3/4"	5 7/8"	5/8"x3"	7/8"	7/8"	3/4"x3 1/2"	1/2"x3 1/2"

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DIVISION OF HIGHWAYS
STANDARD DRAWINGS

DRAWING NO.
C-23.40

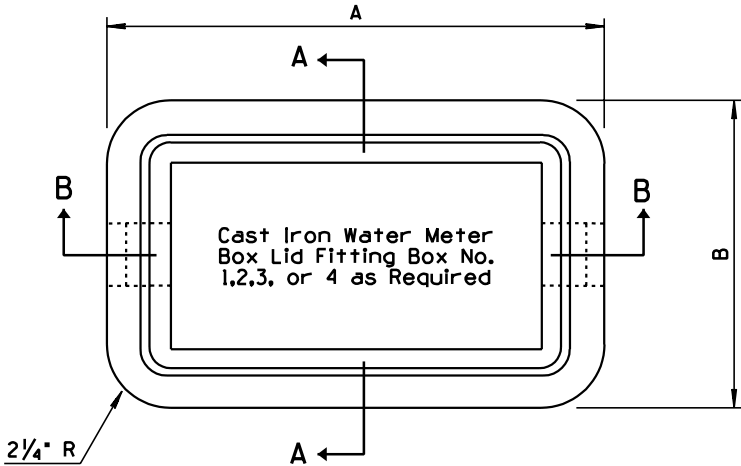
REV.
10/95

JOINT RESTRAINT WITH TIE RODS

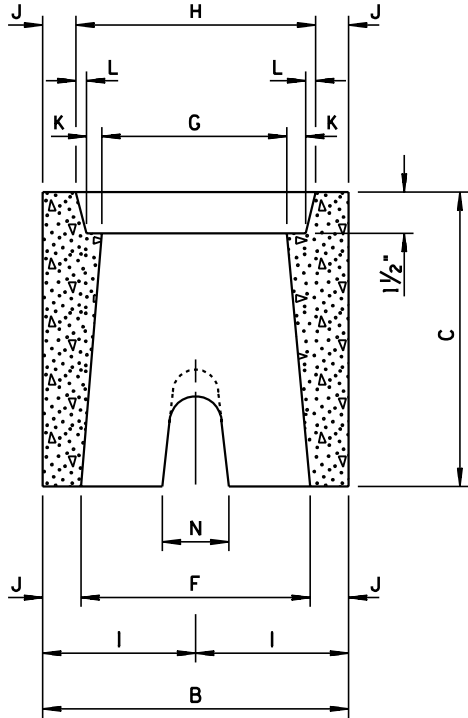
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1	REARRANGED STD	PNB	7/94
2			
3			
4			

GENERAL NOTES

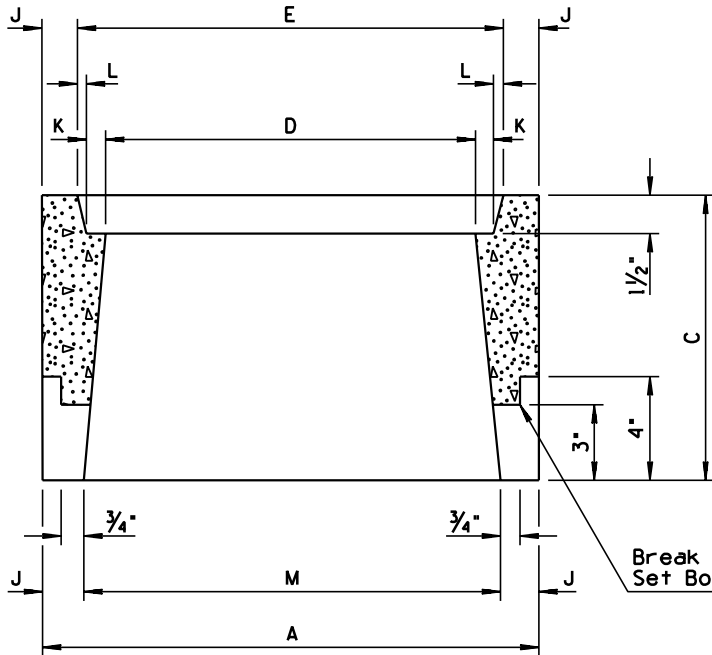
- The meter boxes shall conform to the dimensions as shown and shall be made of portland cement concrete poured and tamped (or vibrated) in true forms.
- Use Class S concrete, f'_c =4000 psi.



PLAN



SECTION A-A



SECTION B-B

METER BOX DIMENSIONS				
	BOX NUMBER			
DIM.	1	2	3	4
A	19"	24 1/2"	29 1/2"	33 1/2"
B	12"	16 3/4"	18 1/2"	22 3/4"
C	11"	12"	13"	12"
D	14"	19"	23 3/4"	27 3/4"
E	16"	22"	26 1/2"	30 1/2"
F	9"	13 1/4"	15"	19 3/4"
G	7"	11 1/4"	12 3/4"	17"
H	9"	14 1/4"	15 1/2"	19 3/4"
I	6"	8 3/8"	9 1/4"	11 3/8"
J	1 1/2"	1 3/4"	1 3/4"	1 1/2"
K	3/4"	1/8"	1"	1"
L	1/4"	3/8"	3/8"	3/8"
M	16"	21"	25 1/2"	30 1/2"
N	2 1/2"	3 1/2"	4"	4"
	5/8" OR 3/4" METER	1" METER	1 1/2" METER	2" METER

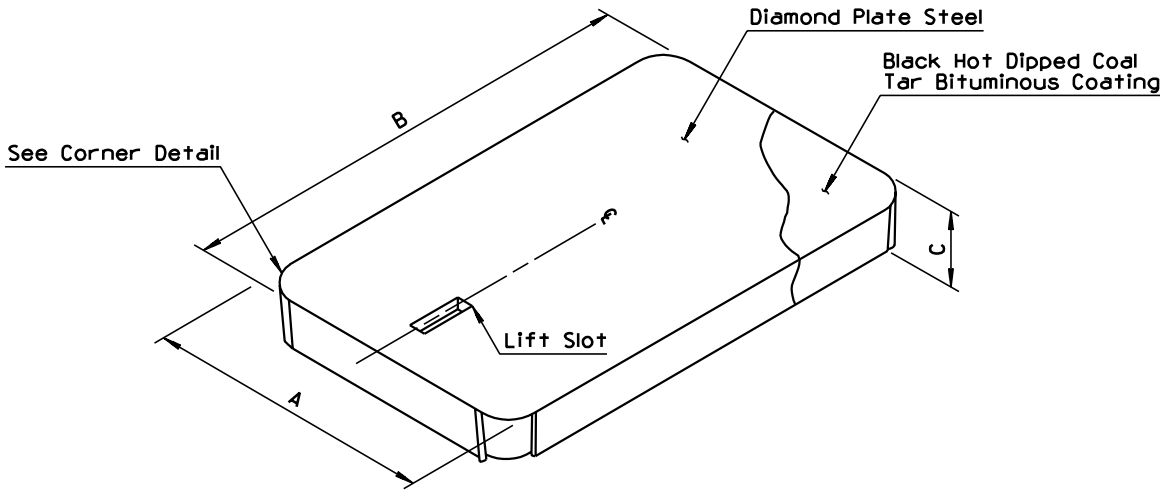
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① CONCRETE WATER METER BOX

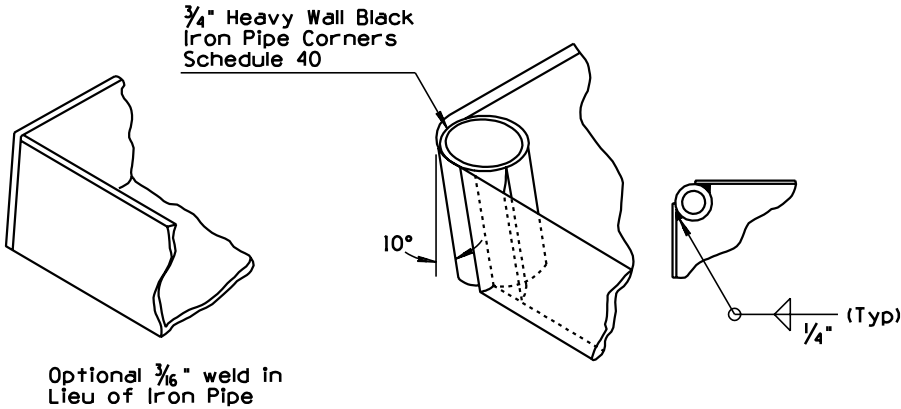
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
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GENERAL NOTES

1. All steel per section 1004-1 and 1004-2.



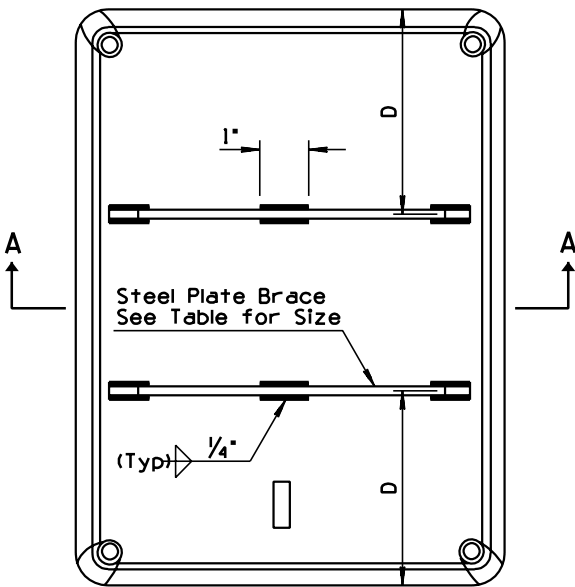
PERSPECTIVE



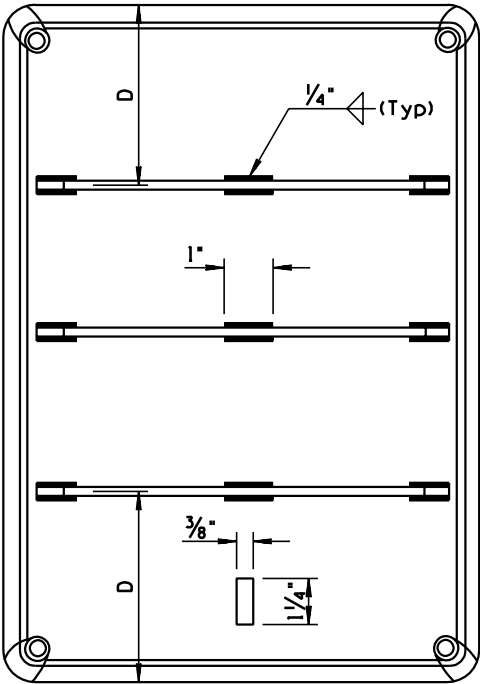
CORNER DETAIL



SECTION A-A



DETAIL 1



DETAIL 2

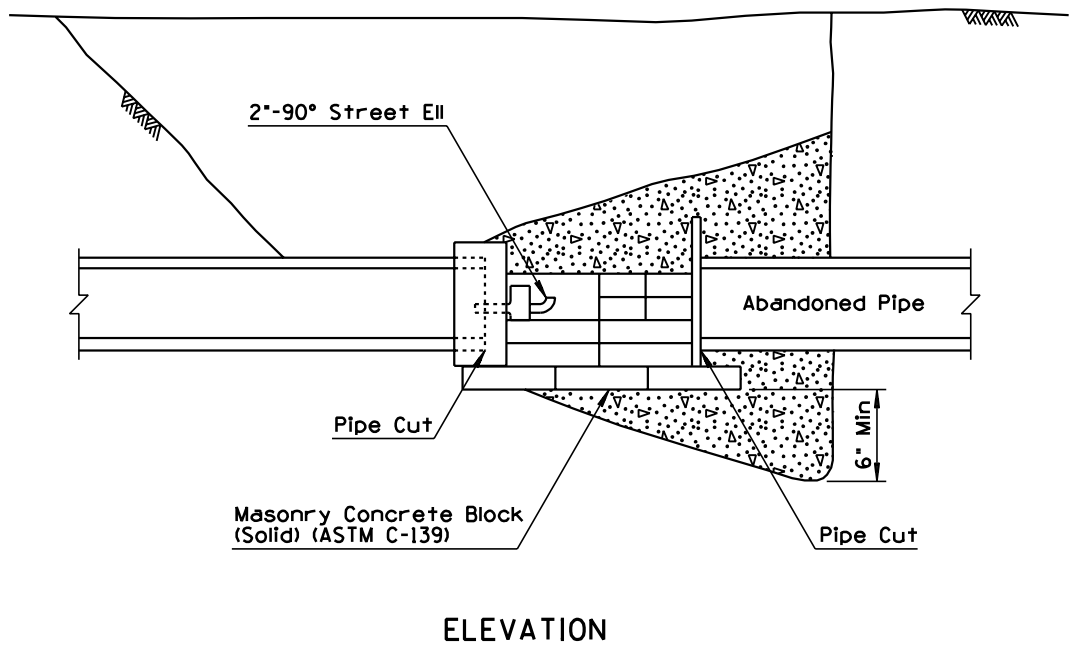
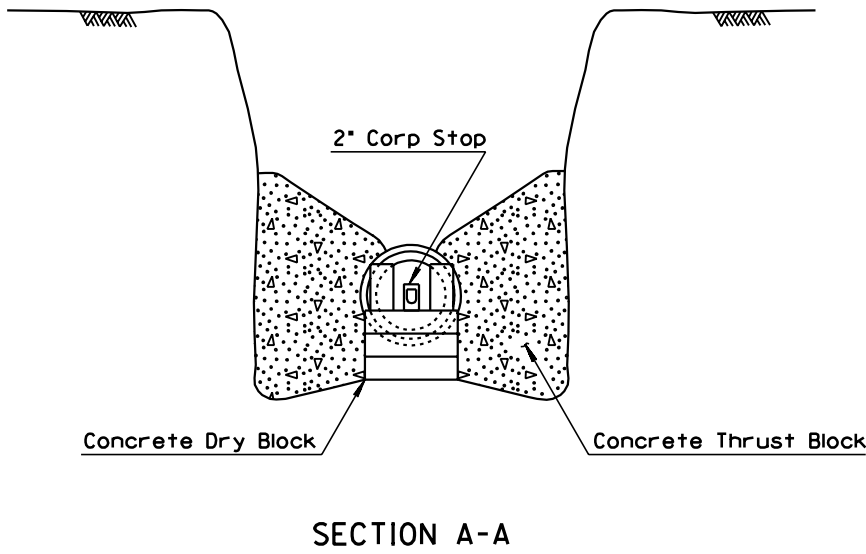
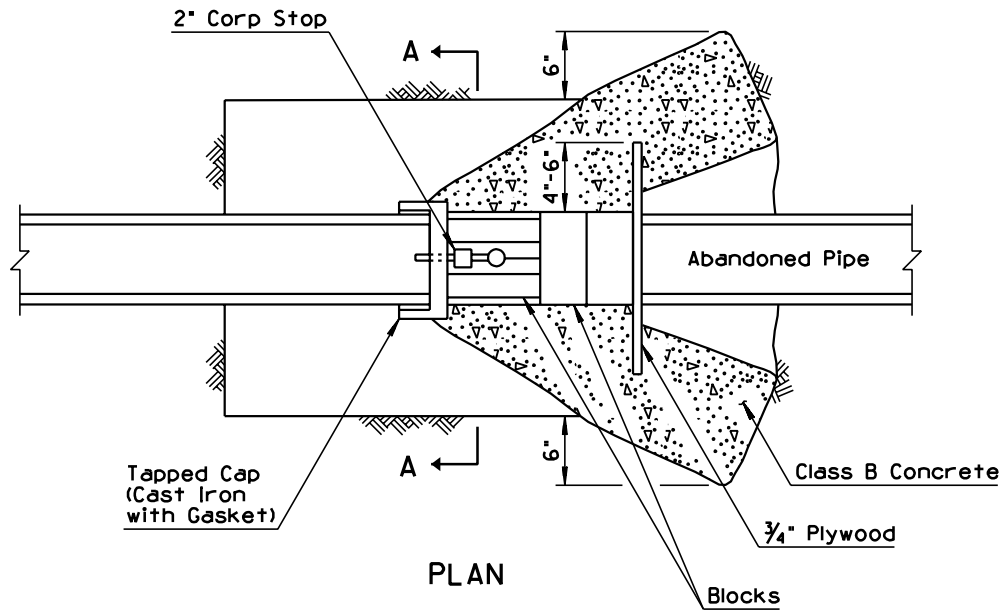
SPECIFICATIONS								
NO	A	B	C	D	STEEL PLATE BRACE		WEIGHT	MATERIAL
1	9"	15 7/8"	1 3/8"	None	None	None	5 1/4 Lbs	14 Gauge
2	14 1/8"	21 3/4"	1 1/2"	6 1/2"	3/16" x 1 1/4" x 13 1/8"	Detail 1	12 3/4 Lbs	12 Gauge
3	15 1/4"	26 1/4"	1 1/2"	8 1/4"	3/16" x 1 1/4" x 14 1/4"	Detail 1	19 1/4 Lbs	12 Gauge
4	19 1/2"	30"	1 1/2"	7 7/8"	3/16" x 1 1/4" x 18 3/4"	Detail 2	33 Lbs	11 Gauge

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APPROVED FOR DISTRIBUTION <i>[Signature]</i>	①	STEEL COVER FOR WATER METER BOX	DRAWING NO. C-23.50

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REMOVED NOTE	PNB	7/94
2			
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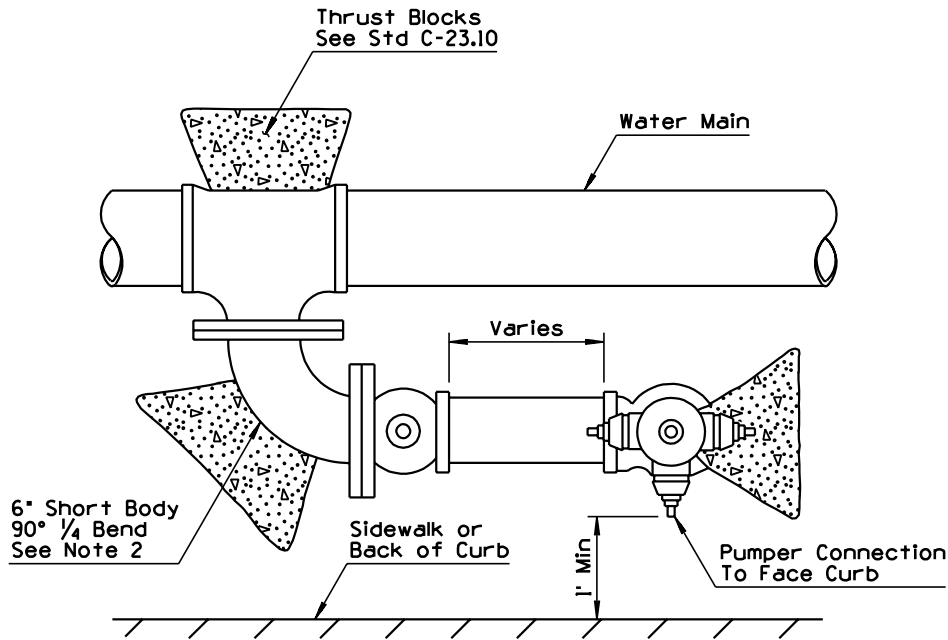
GENERAL NOTES

1. Cut and plugs must be adequately "dry blocked".
2. Dry blocks shall be standard size solid masonry concrete blocks, (ASTM C-139).
3. The quantity and arrangement of the blocking must withstand the line pressure by holding the cap or plug in position.
- ① 4. Concrete thrust blocks shall not be poured until line pressure is restored and the cap or plug is inspected for leakage.
5. Concrete shall not be poured over any portion of the abandoned pipe.
6. Minimum thrust block area per Std C-23.10.
7. Where a 4" or larger line is specified to be abandoned, the cut and plug should occur at the supply line main to avoid creating an unused deadend line.

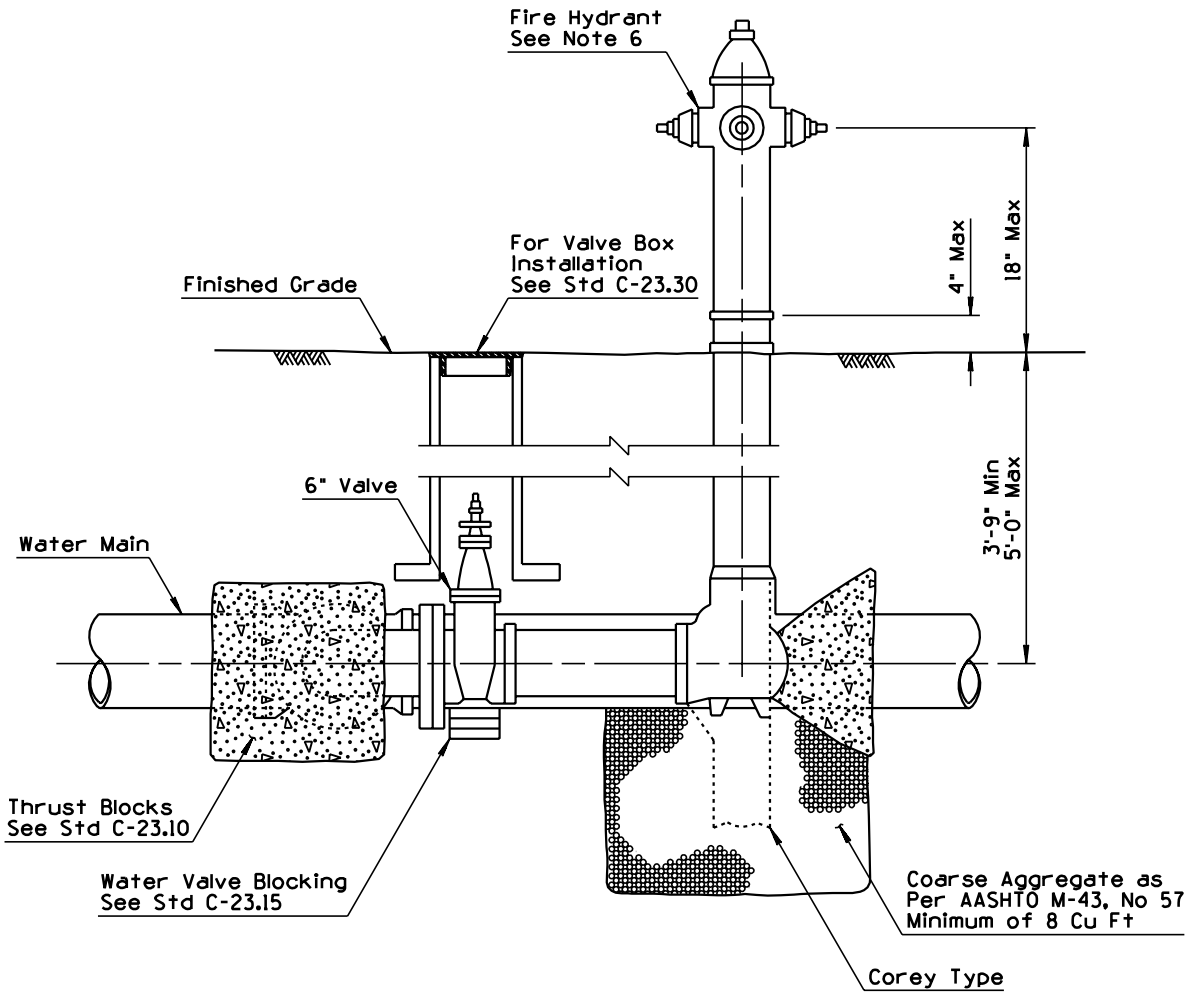


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APPROVED FOR DISTRIBUTION <i>Ronald Williams</i>	WATERLINE CUT AND PLUG FOR 12" DIAMETER MAIN AND SMALLER		DRAWING NO. C-23.55

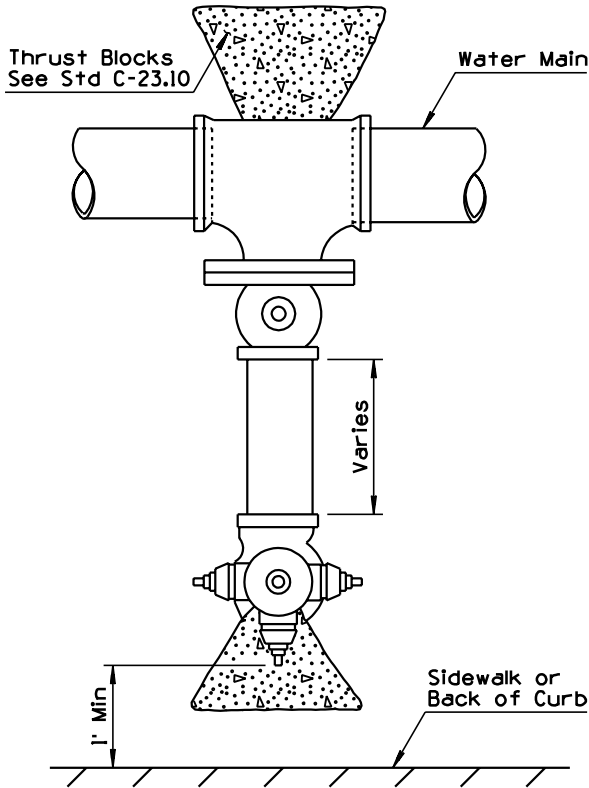
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
3			
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PLAN



ELEVATION



ALTERNATE PLAN
(SEE NOTE 3)

GENERAL NOTES

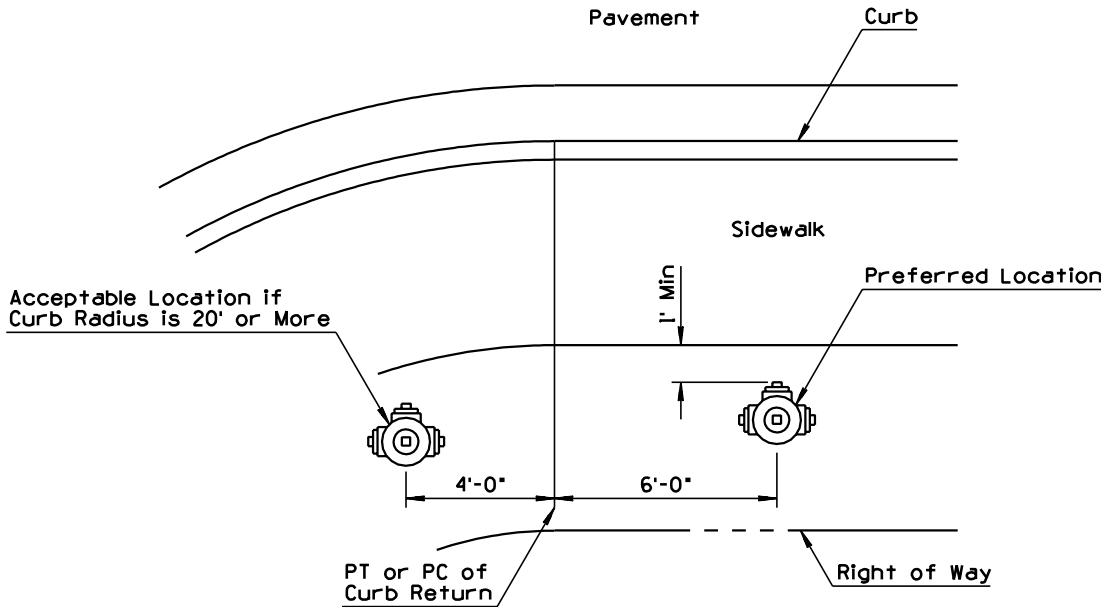
1. All joints in hydrant run-out to be mechanical joints.
2. Hydrant Tee: Clow or approved equal may be used in place of Tee and 90° bend.
3. 90° bend not required if sufficient room for perpendicular installation.
4. See Std C-23.10 and C-23.15 for concrete thrust blocks
5. A flange by mechanical joint shutoff valve, connecting directly to the Tee or below at the main shall be used.
6. Fire hydrant, fire hydrant threads, valve and valve boxes per municipality requirements.

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① HYDRANT INSTALLATION	DRAWING NO. C-23.60	

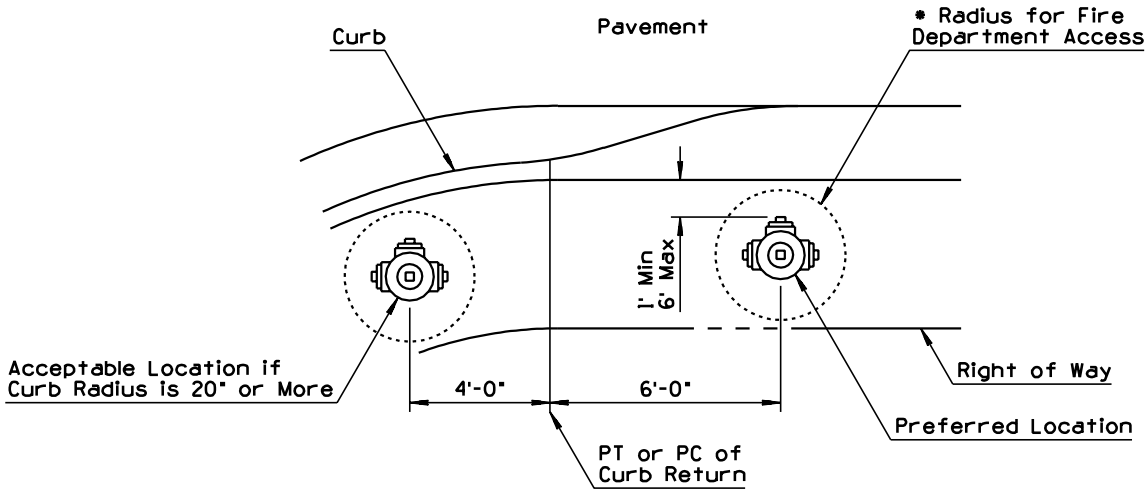
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	REARRANGED STD	PNB	7/94
2			
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GENERAL NOTES

- Obstructions such as utility poles, street signs, irrigation boxes, fences, etc., must not be placed between curb and hydrant.
- * Radius varies by municipality.
- Dimensions shown on plans supersede locations shown on this detail.
- On locations in midblock, the fire hydrant will be aligned with a property line.



AREA WITH SIDEWALK



PARKWAY AREA OR NO SIDEWALK

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APPROVED FOR DISTRIBUTION <i>Ronald C. Williams</i>	① FIRE HYDRANT LOCATIONS	DRAWING NO. C-23.65	