DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Caltrans Metric

REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Dallas Forester No. C37765 Exp. 12-31-04 CIVIL STATE OF CALIFORNIA

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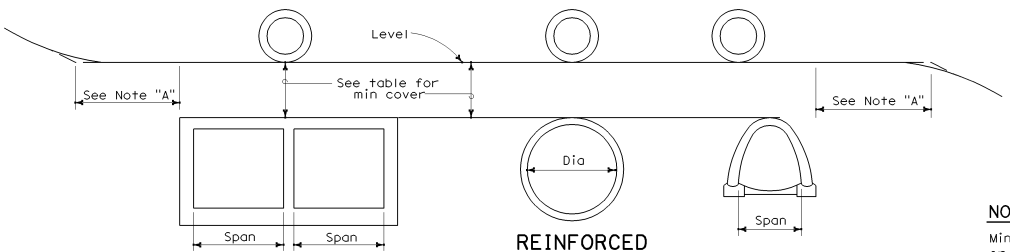
TABLE OF MINIMUM COVER AND STRUTTING REQUIREMENTS FOR CONSTRUCTION LOADS

TYPE					80-222 kN AXLE		222-334 kN AXLE		334-489 kN AXLE		489-667 kN AXLE	
	MAXIMUM DESIGN FILL	SPAN	CELLS	MIN COVER	STRUTS REQUIRED	STRUT SIZE AND SPACING	STRUTS REQUIRED	STRUT SIZE AND SPACING	STRUTS REQUIRED	STRUT SIZE AND SPACING	STRUTS REQUIRED	STRUT SIZE AND SPACING
BOX CULVERTS	3.0 m and 6.0 m	1.2 m to 2.4 m	Single and Multiple	1.5 m	———	———	———	———	———	———	———	———
	3.0 m	3.0 m to 4.3 m	Single and Multiple	1.5 m	———	———	1/3 Points	Struts 140x140 mm @ 1.0 m Sills 140x184 mm	1/3 Points	Struts 140x184 mm @ 1.0 m Sills 140x184 mm	1/3 Points	Struts 140x184 mm @ 1.0 m Sills 140x184 mm
	6.0 m	3.0 m to 4.3 m	Single and Multiple	1.5 m	———	———	———	———	———	———	———	———

TABLE OF MINIMUM COVER FOR CONSTRUCTION LOADS

TYPE		DIA OR SPAN	80-222kN AXLE	222-334 kN AXLE	334-489 kN AXLE	489-667 kN AXLE
REINFORCED CONCRETE CULVERTS	Pipes	Dia 300 mm to 1000 mm	600 mm	900 mm	900 mm	900 mm
		Dia 1050 mm to 2700 mm	$\frac{Dia}{1.75}$ or 900 mm	$\frac{Dia}{1.75}$ or 900 mm	$\frac{Dia}{1.75}$ or 900 mm	$\frac{Dia}{1.75}$ or 900 mm
	Arches	Spans to 4.3 m	$\frac{Span}{2.5}$ or 1.2 m	$\frac{Span}{2.5}$ or 1.2 m	$\frac{Span}{2.5}$ or 1.2 m	$\frac{Span}{2.5}$ or 1.2 m
		Spans 4.6 m to 6.7 m	$\frac{Span}{3.5}$ or 1.8 m	$\frac{Span}{3.5}$ or 1.8 m	$\frac{Span}{3.5}$ or 1.8 m	$\frac{Span}{3.5}$ or 1.8 m
METAL CULVERTS	Pipes	Dia to 3000 mm	$\frac{Dia}{1.75}$ or 1.2 m	$\frac{Dia}{1.75}$ or 1.2 m	$\frac{Dia}{1.75}$ or 1.2 m	$\frac{Dia}{1.75}$ or 1.2 m
		Dia over 3000 mm	$\frac{Dia}{3}$ or 1.8 m	$\frac{Dia}{3}$ or 1.8 m	$\frac{Dia}{3}$ or 1.8 m	$\frac{Dia}{3}$ or 1.8 m
	Pipe Arches	All Spans	$\frac{Span}{3}$ or 1.2 m	$\frac{Span}{3}$ or 1.2 m	$\frac{Span}{3}$ or 1.2 m	$\frac{Span}{3}$ or 1.2 m
	Structural Plate Pipe, Arches and Vehicular Undercrossings	All Spans	$\frac{Span}{3}$ or 1.5 m	$\frac{Span}{3}$ or 1.5 m	$\frac{Span}{3}$ or 1.5 m	$\frac{Span}{3}$ or 1.5 m
Plastic Pipe		Dia 300 mm to 1200 mm	$\frac{Dia}{1.75}$ or 1.2 m	$\frac{Dia}{1.75}$ or 1.2 m	$\frac{Dia}{1.75}$ or 1.2 m	$\frac{Dia}{1.75}$ or 1.2 m

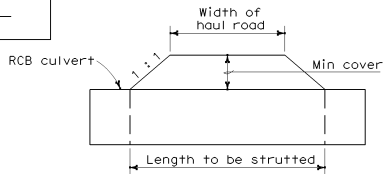
NOTE Minimum cover shall be the greater value of alternatives shown. The diameter and spans shown in the table to calculate the minimum cover (Example: $\frac{Dia}{1.75}$) are the diameter or span of the facility expressed in number of meters.



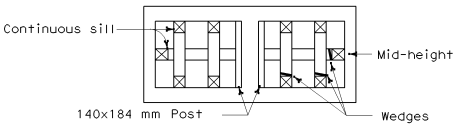
BOX CULVERTS

REINFORCED CONCRETE PIPES, PLASTIC PIPES AND METAL CULVERTS

REINFORCED CONCRETE ARCH CULVERTS



MINIMUM LENGTH OF STRUTTING



RCB STRUTTING DETAILS

NOTES

Length of strutting to be determined by the Engineer, but shall not be less than as shown in the sketch above.

Assumed tire patterns:

222 kN axle	610x460 mm
334 kN axle	910x610 mm
489 kN axle	910x760 mm
667 kN axle	910x910 mm

Impact = 10%

Sills to be glue-laminated or solid timber.

For strutting requirements of Structural Steel Plate Vehicular Undercrossing, Structural Steel Plate Arches and Structural Steel Plate Pipes during construction, see Standard Plans D88A.

NOTE "A"

Minimum distance equals 3 times the span or 3 times the diameter.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION LOADS ON CULVERTS

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

D88

2004 Std PLAN D88

04-01-04