

EQUIVALENT STEEL AREA TABLE								
SCHEDULE	GRADE 60 REINFORCING BAR		EQUIVALENT GRADE 40 REINFORCING BAR		EQUIVALENT 65 KSI SMOOTH WELDED WIRE FABRIC		EQUIVALENT 70 KSI DEFORMED WELDED WIRE FABRIC	
	Bar Size & Spacing	Steel Area (in ² /ft)	Bar Size & Spacing	Min. Steel Area (in ² /ft)	Style Designation	Min. Steel Area (in ² /ft)	Style Designation	Min. Steel Area (in ² /ft)
A	#3 @ 6 1/2" Ctrs. #4 @ 12" Ctrs.	0.20	#3 @ 4 1/2" Ctrs. #4 @ 8" Ctrs. #5 @ 12" Ctrs.	0.30	3" x 3" - W4.6 x W4.6 4" x 4" - W6.2 x W6.2 6" x 6" - W9.2 x W9.2	0.1846	3" x 3" - D4.3 x D4.3 4" x 4" - D5.7 x D5.7 6" x 6" - D8.6 x D8.6	0.1714
B	#3 @ 5 1/2" Ctrs. #4 @ 10" Ctrs.	0.24	#3 @ 3 1/2" Ctrs. #4 @ 6 1/2" Ctrs. #5 @ 10" Ctrs.	0.36	3" x 3" - W5.5 x W5.5 4" x 4" - W7.4 x W7.4 6" x 6" - W11.1 x W11.1	0.2215	3" x 3" - D5.1 x D5.1 4" x 4" - D6.9 x D6.9 6" x 6" - D10.3 x D10.3	0.2057
Special 1	#3 @ 5" Ctrs. #4 @ 9" Ctrs.	0.267	#3 @ 3" Ctrs. #4 @ 6" Ctrs. #5 @ 9" Ctrs.	0.40	3" x 3" - W6.2 x W6.2 4" x 4" - W8.2 x W8.2 6" x 6" - W12.3 x W12.3	0.2465	3" x 3" - D5.7 x D5.7 4" x 4" - D7.6 x D7.6 6" x 6" - D11.4 x D11.4	0.2289
C	#3 @ 3 1/2" Ctrs. #4 @ 6 1/2" Ctrs. #5 @ 10" Ctrs.	0.37	#4 @ 4" Ctrs. #5 @ 6 1/2" Ctrs. #6 @ 9 1/2" Ctrs.	0.555	3" x 3" - W8.5 x W8.5 4" x 4" - W11.4 x W11.4 6" x 6" - W17.1 x W17.1	0.3415	3" x 3" - D7.9 x D7.9 4" x 4" - D10.6 x D10.6 6" x 6" - D15.9 x D15.9	0.3171
D	#4 @ 4 1/2" Ctrs. #5 @ 7" Ctrs. #6 @ 10" Ctrs.	0.53	#4 @ 3" Ctrs. #5 @ 4 1/2" Ctrs. #6 @ 6 1/2" Ctrs.	0.795	3" x 3" - W12.2 x W12.2 4" x 4" - W16.3 x W16.3 6" x 6" - W24.5 x W24.5	0.4892	3" x 3" - D11.4 x D11.4 4" x 4" - D15.1 x D15.1 6" x 6" - D22.7 x D22.7	0.4543
E	#4 @ 3" Ctrs. #5 @ 5" Ctrs. #6 @ 7" Ctrs.	0.73	#5 @ 3 1/2" Ctrs. #6 @ 4 1/2" Ctrs. #7 @ 6 1/2" Ctrs.	1.095	3" x 3" - W16.8 x W16.8 4" x 4" - W22.5 x W22.5 6" x 6" - W33.7 x W33.7	0.6738	3" x 3" - D15.6 x D15.6 4" x 4" - D20.9 x D20.9 6" x 6" - D31.3 x D31.3	0.6257
F	#5 @ 3 1/2" Ctrs. #6 @ 5" Ctrs. #7 @ 7" Ctrs.	1.06	#6 @ 3" Ctrs. #7 @ 4 1/2" Ctrs. #8 @ 6" Ctrs.	1.59	3" x 3" - W24.5 x W24.5 4" x 4" - W32.6 x W32.6 6" x 6" - W48.9 x W48.9	0.9785	3" x 3" - D22.7 x D22.7 4" x 4" - D30.3 x D30.3 6" x 6" - D45.4 x D45.4	0.9086
Special 2	#5 @ 3" Ctrs. #6 @ 4" Ctrs. #7 @ 5 1/2" Ctrs.	1.24	#7 @ 4" Ctrs. #8 @ 5" Ctrs.	1.86	3" x 3" - W28.6 x W28.6 4" x 4" - W38.2 x W38.2 6" x 6" - W57.2 x W57.2	1.1446	3" x 3" - D26.6 x D26.6 4" x 4" - D35.4 x D35.4 6" x 6" - D53.1 x D53.1	1.0629
G	#6 @ 3 1/2" Ctrs. #7 @ 5" Ctrs.	1.46	#7 @ 3" Ctrs. #8 @ 4" Ctrs.	2.19	3" x 3" - W33.7 x W33.7 4" x 4" - W44.9 x W44.9	1.3477	3" x 3" - D31.3 x D31.3 4" x 4" - D41.7 x D41.7	1.2514

NOTES FOR PRECAST OPTIONS & WELDED WIRE FABRIC SUBSTITUTION FOR BAR REINFORCEMENT

1. Details for optional precast inlet construction up to depths of 15' are shown on the inlet indexes.
2. When precast units are used in conjunction with Alt. "B" Structure Bottoms, Index No. 200, the interior dimensions of an Alt. "B" Bottom can be adjusted to reflect these inlet interior dimensions.
3. Concrete which meets the requirements of ASTM C478 or Class IX must be used for precast structures constructed with 6" wall or slab thickness.
4. Reinforcement can be either deformed bar reinforcement or welded wire fabric. Bar reinforcement other than 60 ksi may be used, however only two grades are recognized; Grade 40 and Grade 60. Smooth welded wire fabric, will be recognized as having a design strength of 65 ksi and deformed welded wire fabric will be recognized as having a design strength of 70 ksi. The area of reinforcement required may be adjusted in accordance with the Equivalent Steel Area Table provided. For bars and spacings not given, the steel area required can be determined by the following equations:

$$\text{Grade 40 Steel Area} = A_{s40} = \frac{60}{40} \times A_{s60}$$

$$\text{Smooth Welded Wire Fabric Steel Area} = A_{s65} = \frac{60}{65} \times A_{s60}$$

$$\text{Deformed Welded Wire Fabric Steel Area} = A_{s70} = \frac{60}{70} \times A_{s60}$$

When a reduced area of reinforcement is provided, any maximum bar spacing shown must also be reduced as determined by the following equations, unless otherwise shown:

$$\text{Max. Grade 40 Bar Spacing} = \text{Grade 60 Bar Spacing}$$

$$\text{Max. Smooth Welded Wire Spacing} = \text{Grade 60 Bar Spacing} \times 0.86$$

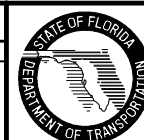
$$\text{Max. Deformed Welded Wire Spacing} = \text{Grade 60 Bar Spacing} \times 0.74$$

In no case will fabric with wires smaller than W3.1 or D3.1, or spacings greater than 8" be permitted. Bar reinforcement shall show the minimum yield designation grade mark or either the number 60 or one (1) grade mark line to be acceptable at the higher value. Maximum bar spacing shall not be greater than two (2) times the slab thickness with a maximum spacing of 12" or three (3) times the wall thickness, with a maximum spacing of 18" for vertical bars and 12" for horizontal bars.

The Precast Inlet Details For Index Nos. 217, 219, 220, 221, 231, 232, 233 And 234 Have Been Moved To Each Of The Referenced Indexes.

REVISIONS

Date	By	Description	Date	By	Description
01/01/06	SJN	Added 70 ksi Deformed WWF to Equivalent Steel Area Table and Notes, and maximum bar spacing reduction criteria to Note 4.			



2006 Interim Design Standard

SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS

Interim Date	Sheet No.
01/01/06	4 of 4
Index No.	
201	