



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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SECRETARY

MEMORANDUM TO: Project Engineers  
Project Design Engineers

FROM: G. R. Perfetti, P. E.  
State Bridge Design Engineer

DATE: July 28, 2005

SUBJECT: DESIGN MANUAL FIGURE 11-3

Design Manual Figure 11-3 has been updated to include Box Beam girders. The figure is attached for immediate use.

The Design Manual will be updated at a later date.

GRP/DAS/snj

Attachments

[Fig. 11-3 \(English\)](#)  
[Fig. 11-3 \(Metric\)](#)

cc: R. V. Keith, P. E., with attachments  
R. A. Raynor, P. E., with attachments  
E. C. Powell, Jr., P. E., Attn: R. A. Hancock, P. E., with attachments  
J. H. Emerson, P. E., with attachments  
T. S. Drda, P. E., FHWA, with attachments  
D. R. Henderson, P. E., with attachments  
J. A. Bennett, P. E., with attachments

SPAN TYPE		SPAN LENGTH	DIM. B	DIM. A	DIM. C
PRESTRESSED	18" CORED SLAB	< 42'	2'-9"	+ 0.4'	- 3.2'
	21" CORED SLAB	< 49'	↑	+ 0.0'	- 3.6'
	27" BOX BEAM*	≤ 75'	↑	- 1.2'	- 4.8'
	33" BOX BEAM*	≤ 90'	↑	- 1.9'	- 5.5'
	39" BOX BEAM*	≤ 100'	↑	- 2.7'	- 6.3'
	36" GIRDER	≤ 45'	↑	- 3.4'	- 7.0'
	45" GIRDER	≤ 65'	↓	- 4.4'	- 8.0'
	54" GIRDER	< 90'	2'-9"	- 5.6'	- 9.2'
	63" MBT	< 105'	4'-0"	- 5.8'	- 9.4'
	72" MBT	≤ 118'	↑	- 6.9'	- 10.5'
	63" GIRDER	< 125'	↓	- 5.8'	- 9.4'
	72" GIRDER	≤ 141'	4'-0"	- 6.9'	- 10.5'
	I-BEAM	40'	40'	2'-9"	- 2.5'
45'		45'	↑	- 2.9'	- 6.5'
50'		50'	↑	- 3.1'	- 6.7'
55'		55'	↑	- 3.2'	- 6.8'
60'		60'	↑	- 3.4'	- 7.0'
65'		65'	↑	- 3.6'	- 7.2'
70'		70'	↑	- 3.7'	- 7.3'
75'		75'	↑	- 3.9'	- 7.5'
80'		80'	↓	- 3.9'	- 7.5'
PLATE GIRDER	85'	85'	2'-9"	- 4.0'	- 7.6'
	90'	90'	4'-0"	- 4.3'	- 7.9'
	100'	100'	↑	- 4.8'	- 8.4'
	110'	110'	↑	- 5.4'	- 9.0'
	120'	120'	↑	- 5.8'	- 9.4'
	130'	130'	↑	- 6.4'	- 10.0'
	140'	140'	↑	- 6.9'	- 10.5'
	150'	150'	↓	- 7.5'	- 11.1'
160'	160'	4'-0"	- 8.0'	- 11.6'	

+VALUES INCREASE BRIDGE LENGTH

- VALUES DECREASE BRIDGE LENGTH

DIM.A- FOR HYDRAULICS UNIT'S USE IN SETTING BRIDGE LENGTH

DIM.A OR C- FOR STRUCTURE DESIGN UNIT'S USE IN SETTING STATION OF FRONT SLOPE

\* IF PROPOSED SPAN LENGTH EXCEEDS SPAN LENGTH SHOWN BY 5 FEET OR LESS, CONSULT WITH SDU PROJECT ENGINEER.

## STREAM CROSSING DETAILS FOR 1'-0" MIN. BERM

**FIGURE 11 - 3**

SPAN TYPE		SPAN LENGTH	DIM. B	DIM. A	DIM. C
PRESTRESSED	457mm CORED SLAB	< 13m	840mm	+ 160mm	- 980mm
	533mm CORED SLAB	< 15m	↑	+ 0.0mm	- 1080mm
	686mm BOX BEAM <sup>o</sup>	≤ 23m		- 370mm	- 1470mm
	838mm BOX BEAM <sup>o</sup>	≤ 27m		- 580mm	- 1680mm
	991mm BOX BEAM <sup>o</sup>	≤ 30m		- 820mm	- 1920mm
	914mm GIRDER	≤ 14m		- 1040mm	- 2120mm
	1143mm GIRDER	≤ 20m	↓	- 1400mm	- 2480mm
	1372mm GIRDER	< 30m	840mm	- 1730mm	- 2810mm
	1600mm MBT	< 32m	1220mm	- 1760mm	- 2860mm
	1829mm MBT	≤ 36m	1220mm	- 2100mm	- 3200mm
	1600mm GIRDER	< 38m	1220mm	- 1760mm	- 2860mm
	1829mm GIRDER	≤ 43m	1220mm	- 2100mm	- 3200mm
	I-BEAM		12.2m	840mm	- 790mm
		13.7m	↑	- 930mm	- 2010mm
		15.2m		- 990mm	- 2070mm
		16.8m		- 1020mm	- 2100mm
		18.3m		- 1060mm	- 2140mm
		19.8m		- 1110mm	- 2190mm
		21.3m		- 1170mm	- 2250mm
		22.9m		- 1200mm	- 2280mm
		24.4m	↓	- 1200mm	- 2280mm
PLATE GIRDER		25.9m	840mm	- 1240mm	- 2320mm
		27.4m	1220mm	- 1330mm	- 2410mm
		30.5m	↑	- 1480mm	- 2560mm
		33.5m		- 1660mm	- 2740mm
		36.6m		- 1800mm	- 2880mm
		39.6m		- 1980mm	- 3060mm
		42.7m		- 2110mm	- 3190mm
		45.7m	↓	- 2300mm	- 3380mm
	48.8m	1220mm	- 2440mm	- 3520mm	

+VALUES INCREASE BRIDGE LENGTH  
 - VALUES DECREASE BRIDGE LENGTH  
 DIM.A- FOR HYDRAULICS UNIT'S USE IN SETTING BRIDGE LENGTH  
 DIM.A OR C- FOR STRUCTURE DESIGN UNIT'S USE IN SETTING STATION OF FRONT SLOPE  
 • IF PROPOSED SPAN LENGTH EXCEEDS SPAN LENGTH SHOWN BY 1.520 METERS OR LESS,  
 CONSULT WITH SDU PROJECT ENGINEER.

STREAM CROSSING  
DETAILS FOR 300mm MIN. BERM

**FIGURE 11 - 3**