GUIDE FOR GDOT CORED SLAB BASIC DRAWINGS AND DESIGN

Date Created: July 14, 2016

Last updated: April 26, 2021

Contents

Introduction and Assumptions

Design drawings have been supplied by the Bridge Office to aid in the design and drafting of Cored Slab bridges. The following Microstation .dgn files can be found on the GDOT Bridge Design Website:

- Cored Slab - Deck Plans.dgn
- Cored Slab - Deck Sections.dgn
- Cored Slab - Beams.dgn
- Cored Slab - Bearing Pads.dgn
- Cored Slab - End Bents.dgn
- Cored Slab - Intermediate Bents.dgn

Superstructure Design Assumptions:

- Designed according to LRFD 7th Edition, and meets all LRFD 8th Edition requirements.

Live Loads (HL-93)

- Live load moment and shear distribution factors are calculated for the case of individual cored slab members being connected sufficiently to prevent relative vertical displacement at the interface, but not sufficiently to act as a unit.

Dead Loads

DC Loads: (There is no structural deck, so all loads are non-composite)

- 1 ½" uniform depth asphalt coping is assumed in the design to compensate for camber of the cored slabs longer than 40'. This additional load was also used in the design of the shorter spans to prevent the need of a riser in the intermediate bents in the case of adjacent spans of varying lengths.
- Additional asphalt load is assumed by calculating the theoretical thickness at the center of the bridge using 3 ½" deep asphalt at the barrier face and increasing the depth at a 2.5% grade to the center of the bridge. (Note: the drawings only use a normal crown of 2%).
- The dead load from the barrier is assumed to be distributed evenly between the 3 exterior beams.

DW Loads: (There is no structural deck, so all loads are non-composite)

- An additional .030 ksf load is applied to the beam to account for overlays that may be done in the future.
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P&E Sheet

The P&E Sheet will be created from the preliminary layout sheet for each individual bridge by the design engineer. Establish locations for expansions of each span. Each span shall be set as Fixed at one end and Expansion on the opposite. End bents shall be set as fixed except in the case of a single span bridge. Use engineering judgement to determine fixed and expansion locations for intermediate spans.

General Notes Sheet

General Notes will be generated and placed on sheet for each individual bridge by the design engineer.

Include the following entries in the section BRIDGE CONSISTS OF:

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* - **'-*" PSC, 21 IN, CORED SLAB SPANS ---------------------- SPECIAL DESIGN

4 - END POST AND GUARDRAIL ATTACHMENT DETAIL ------GA. STD. 3054 (9-30-02)
       (L = 4'-0"; W = 1'-1"; H = 3'-6")
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Note: Currently all standard designs are for the 21" Cored Slab

Include the following in GENERAL NOTES:

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JOINTS IN OVERLAY - WITHIN 24 HOURS AFTER OVERLAY IS PLACED MAKE A 1/2 INCH
    WIDE BY 3/4 INCH DEEP SAW CUT OVER EACH EXPANSION JOINT LOCATION AND
    SEAL WITH RUBBERIZED ASPHALT IN ACCORDANCE WITH SECTION 407 OF THE
    GEORGIA DOT SPECIFICATIONS.  INCLUDE COST OF RUBBERIZED ASPHALT IN THE
    OVERALL BID SUBMITTED.

WATERPROOFING MEMBRANE - INSTALL APPROVED BRIDGE DECK WATERPROOFING MEMBRANE
    IN ACCORDANCE WITH SECTION 533 OF THE GEORGIA DOT SPECIFICATIONS AND
    THE MANUFACTURER'S RECOMMENDATIONS.  TURN MEMBRANE 4 INCHES UP AT FACE
    OF EACH BARRIER AND EXTEND MEMBRANE 18 INCHES PAST BEGINNING AND END OF
    BRIDGE. SEE QPL-22 FOR APPROVED WATERPROOFING MATERIALS.

GROUT - FILL ALL SHEAR KEYS WITH 5,000 PSI 3 DAY STRENGTH GROUT AS PER
    SECTION 506 OF THE GEORGIA DOT SPECIFICATIONS.  CURE GROUT A MINIMUM OF
    5 DAYS BEFORE CASTING CONCRETE BARRIERS.  IN LIEU OF MIXING MORTAR ON
    SITE, PRE-MIXED BAG MORTAR MEETING THE REQUIREMENTS IN SECTION 506 MAY
    BE USED. PREPACKAGED MATERIAL MUST MEET THE REQUIREMENTS OF ASTM
    C1107/C1107M-14A AND INCLUDE ALUMINUM POWDER. INCLUDE COST OF GROUT IN
    THE PRICE BID FOR 'PSC CORED SLABS."
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Include the following Pay items in the SUMMARY OF QUANTITIES:

PAY ITEM NO	QUANTITY	UNIT	PAY ITEM
507-1021	****	LF	PSC CORED SLAB BEAMS, 21 IN, BR NO - 1
533-0010	****	SY	BRIDGE DECK WATERPROOFING MEMBRANE, METHOD A

For Waterproofing Quantity: Calculate based on a width equal to Gutter to Gutter measurement, and a Length equal to the length of the bridge plus 3'-0" (extending 1'-6" beyond both the beginning and end of bridge, per general note).

Deck Plan Sheet

Select the appropriate sheet(s) from the file, Cored Slab - Deck Plans.dgn, based on gutter to gutter width and span length, and type of span (multi span or single span). If necessary, use multiple sheets to account for different span lengths. The available gutter to gutter widths are:

26'-9"	29'-9"	32'-9"	35'-9"	38'-9"	41'-9"

The sheets are spilt into the following span length ranges:

25'-40'	41'-50'

Make the following changes to the deck plan sheet(s):

- If necessary, delete spans from sheets that do not represent the bridge
- Where possible, combine details from multiple sheets to reduce the total number of sheets in the plan set. (e.g. Combine a 30' end span with a 50' intermediate span onto one sheet.)
- Use the equations provided on the sheets to replace variables with actual dimensions of span lengths and barrier joint spacing. (Ex. Instead of B and B/2, your sheet should read 40'-0" and 20'-0" respectively)
- Edit the title block and sheet appropriately for the project

Deck Section Sheet

Select the appropriate sheet from the file, Cored Slab - Deck Sections.dgn, based on the gutter to gutter width of the bridge. Make the following changes to the deck section sheet:

- Edit the title block and sheet appropriately for the project

Beam Sheet

Select the appropriate sheet(s) from the file, Cored Slab - Beams.dgn . If necessary, use multiple sheets to account for different span lengths. It is permissible to use the same beam sheet to describe both an intermediate and an end span as long as they fall in the same span range. Beam sheets are split into the following ranges:

25'-40'	41'-50'

Make the following changes to the sheet(s):

- Edit the title block and sheet appropriately for the project
- Enter the dimension and stirrup spacing values from the charts found in Appendix A into the "Beam Dimensions" table found on the beam sheets. Add or remove rows to the table as necessary.
- Enter the Camber and Deflection Values from the charts in Appendix B into the "Dead Load Deflection and Camber" table found on the beam sheets. Add or remove columns to the table as necessary. (DC and DW will be used to design the substructure, *current values assume a 3.5" minimum asphalt thickness and standard 42" S-Barrier*).

Bearing Pad Sheet

Select the appropriate sheet(s) from the file, Cored Slab - Bearing Pad.dgn. Multiple sheets can be found in this file: 1- with shim plates 2- without shim plates.

- Edit the title block and sheet appropriately for the project

Substructure

The top of cap should be level, and the can be calculated by considering all the following: roadway profile, vertical curve, asphalt thickness, predicted beam camber, predicted beam deflection, precast beam depth, average shim thickness, and bearing thickness. When two unequal spans meet at an intermediate bent, the calculated cap elevation will not be equal. In this case use the lower elevation. Additional asphalt will be placed to level the roadway profile. The resulting additional load has been accounted for up to 1 ½" difference in top of cap elevations.

Example Top of Cap Calculation:

Gutterline Elevation at CL Bearing (ft)	413.971
Vertical Curve Affect (in)	-.264
Asphalt Thickness (in)	-3.50
Predicted Beam Camber (in)	-0.375
Predicted Beam Deflection (in)	0.1875
Beam Depth (in)	-21.00
Average Shim Thickness (in)	-0.375
Bearing Pad Thickness (in)	-1.00
Cap Elevation (ft)	**411.78**

For bridges with a superelevated cross section, slope the top of the cap to match the roadway surface and keep the asphalt thickness constant across the section (elevations calculation remains the same, but both sides must be calculated).

When accounting for shrinkage and creep effects of the cored slab on the substructure, use an assumed strain value of 0.0003.

End Bent Sheet

The End Bent sheet will be designed and detailed for each individual bridge by the design engineer. Use the DC and DW Loads found in Appendix B for loads from the superstructure. Other dead loads are not included in these values and should be accounted for by the engineer, for example:

- Approach slab and associated asphalt (DC) and future paving load (DW)
- Backwall
- Wingwalls
- Endposts

A typical drawing of an end bent can be found on GDOT Bridge Design Website

Intermediate Bent Sheet

The Intermediate Bent sheet will be designed and detailed for each individual bridge by the design engineer. Use the DC and DW Loads found in Appendix B. No additional load is needed for "edge beams".

A typical drawing of an intermediate bent can be found on the GDOT Bridge Design Website

As-Built Sheet

The As-Built sheet will be created for each individual bridge by the bridge designer. This As-Built sheet does not require a schematic of the bridge substructure, but all proposed piles should be tabulated with an empty space for construction personnel to fill in the actual pile tips reached during construction. Include the instructions to field personnel concerning the as built sheet by using the cell in the Bridge Cell library.

Reinforcing Bar Details Sheet

A "Reinforcing Bar Details" sheet will be created for each individual bridge by the bridge designer. Bar bending details should follow current GDOT Standard 3901. The empty table to be populated by reinforcement dimensions can be found in the Bridge Cell Library.

Reinforcement in the superstructure is typically limited to steel located in the barriers.

Appendix A – Beam Stirrup Spacing

This appendix contains 3 tables specifying the spacing or dimension required for stirrups on a range of beam lengths. Use the appropriate table based on the design of either an intermediate span, an end span, or the case of a single span bridge. The letter designations match the provided drawings and can be used to satisfy shear requirements according to the AASHTO LRFD Bridge Design Specifications, 7th Edition. These variables should be populated in the bridge plans.

Intermediate Spans

A	B	C	D	E	F	X	Y	Z
25'- 0"	24'- 11"	23'- 11"	12'- 5 1/2"	NA	NA	7	7	0'- 9 1/2"
26'- 0"	25'- 11"	24'- 11"	12'- 11 1/2"	NA	NA	8	7	0'- 9 1/2"
27'- 0"	26'- 11"	25'- 11"	13'- 5 1/2"	NA	NA	7	8	0'- 9 1/2"
28'- 0"	27'- 11"	26'- 11"	13'- 11 1/2"	NA	NA	8	8	0'- 9 1/2"
29'- 0"	28'- 11"	27'- 11"	14'- 5 1/2"	NA	NA	7	9	0'- 9 1/2"
30'- 0"	29'- 11"	28'- 11"	14'- 11 1/2"	NA	NA	8	9	0'- 9 1/2"
31'- 0"	30'- 11"	29'- 11"	15'- 5 1/2"	NA	NA	7	10	0'- 9 1/2"
32'- 0"	31'- 11"	30'- 11"	15'- 11 1/2"	NA	NA	8	10	0'- 9 1/2"
33'- 0"	32'- 11"	31'- 11"	16'- 5 1/2"	NA	NA	7	11	0'- 9 1/2"
34'- 0"	33'- 11"	32'- 11"	16'- 11 1/2"	NA	NA	8	11	0'- 9 1/2"
35'- 0"	34'- 11"	33'- 11"	17'- 5 1/2"	NA	NA	7	12	0'- 9 1/2"
36'- 0"	35'- 11"	34'- 11"	17'- 11 1/2"	NA	NA	8	12	0'- 9 1/2"
37'- 0"	36'- 11"	35'- 11"	18'- 5 1/2"	NA	NA	7	13	0'- 9 1/2"
38'- 0"	37'- 11"	36'- 11"	18'- 11 1/2"	NA	NA	8	13	0'- 9 1/2"
39'- 0"	38'- 11"	37'- 11"	19'- 5 1/2"	NA	NA	9	13	0'- 9 1/2"
40'- 0"	39'- 11"	38'- 11"	19'- 11 1/2"	NA	NA	8	14	0'- 9 1/2"
41'- 0"	40'- 11"	39'- 11"	20'- 5 1/2"	13'- 5 1/2"	14'- -0"	9	14	0'- 9 1/2"
42'- 0"	41'- 11"	40'- 11"	20'- 11 1/2"	13'- 11 1/2"	14'- -0"	8	15	0'- 9 1/2"
43'- 0"	42'- 11"	41'- 11"	21'- 5 1/2"	14'- 5 1/2"	14'- -0"	9	15	0'- 9 1/2"
44'- 0"	43'- 11"	42'- 11"	21'- 11 1/2"	14'- 11 1/2"	14'- -0"	10	15	0'- 9 1/2"
45'- 0"	44'- 11"	43'- 11"	22'- 5 1/2"	13'- 5 1/2"	18'- -0"	9	16	0'- 9 1/2"
46'- 0"	45'- 11"	44'- 11"	22'- 11 1/2"	14'- 11 1/2"	16'- -0"	10	16	0'- 9 1/2"
47'- 0"	46'- 11"	45'- 11"	23'- 5 1/2"	15'- 5 1/2"	16'- -0"	11	16	0'- 9 1/2"
48'- 0"	47'- 11"	46'- 11"	23'- 11 1/2"	14'- 11 1/2"	18'- -0"	10	17	0'- 9 1/2"
49'- 0"	48'- 11"	47'- 11"	24'- 5 1/2"	15'- 5 1/2"	18'- -0"	11	17	0'- 9 1/2"
50'- 0"	49'- 11"	48'- 11"	24'- 11 1/2"	15'- 11 1/2"	18'- -0"	10	18	0'- 9 1/2"

End Spans

A	B	C	D	E	F	X	Y	Z
25'- 0"	24'- 1/2"	23'- 1/2"	12'- 1/4"	NA	NA	8	6	0'- 10 1/4"
26'- 0"	25'- 1/2"	24'- 1/2"	12'- 6 1/4"	NA	NA	7	7	0'- 10 1/4"
27'- 0"	26'- 1/2"	25'- 1/2"	13'- 1/4"	NA	NA	8	7	0'- 10 1/4"
28'- 0"	27'- 1/2"	26'- 1/2"	13'- 6 1/4"	NA	NA	7	8	0'- 10 1/4"
29'- 0"	28'- 1/2"	27'- 1/2"	14'- 1/4"	NA	NA	8	8	0'- 10 1/4"
30'- 0"	29'- 1/2"	28'- 1/2"	14'- 6 1/4"	NA	NA	7	9	0'- 10 1/4"
31'- 0"	30'- 1/2"	29'- 1/2"	15'- 1/4"	NA	NA	8	9	0'- 10 1/4"
32'- 0"	31'- 1/2"	30'- 1/2"	15'- 6 1/4"	NA	NA	7	10	0'- 10 1/4"
33'- 0"	32'- 1/2"	31'- 1/2"	16'- 1/4"	NA	NA	8	10	0'- 10 1/4"
34'- 0"	33'- 1/2"	32'- 1/2"	16'- 6 1/4"	NA	NA	7	11	0'- 10 1/4"
35'- 0"	34'- 1/2"	33'- 1/2"	17'- 1/4"	NA	NA	8	11	0'- 10 1/4"
36'- 0"	35'- 1/2"	34'- 1/2"	17'- 6 1/4"	NA	NA	7	12	0'- 10 1/4"
37'- 0"	36'- 1/2"	35'- 1/2"	18'- 1/4"	NA	NA	8	12	0'- 10 1/4"
38'- 0"	37'- 1/2"	36'- 1/2"	18'- 6 1/4"	NA	NA	9	12	0'- 10 1/4"
39'- 0"	38'- 1/2"	37'- 1/2"	19'- 1/4"	NA	NA	8	13	0'- 10 1/4"
40'- 0"	39'- 1/2"	38'- 1/2"	19'- 6 1/4"	NA	NA	9	13	0'- 10 1/4"
41'- 0"	40'- 1/2"	39'- 1/2"	20'- 1/4"	13'- 1/4"	14'- -0"	8	14	0'- 10 1/4"
42'- 0"	41'- 1/2"	40'- 1/2"	20'- 6 1/4"	13'- 6 1/4"	14'- -0"	9	14	0'- 10 1/4"
43'- 0"	42'- 1/2"	41'- 1/2"	21'- 1/4"	14'- 1/4"	14'- -0"	10	14	0'- 10 1/4"
44'- 0"	43'- 1/2"	42'- 1/2"	21'- 6 1/4"	14'- 6 1/4"	14'- -0"	9	15	0'- 10 1/4"
45'- 0"	44'- 1/2"	43'- 1/2"	22'- 1/4"	14'- 1/4"	16'- -0"	10	15	0'- 10 1/4"
46'- 0"	45'- 1/2"	44'- 1/2"	22'- 6 1/4"	14'- 6 1/4"	16'- -0"	9	16	0'- 10 1/4"
47'- 0"	46'- 1/2"	45'- 1/2"	23'- 1/4"	15'- 1/4"	16'- -0"	10	16	0'- 10 1/4"
48'- 0"	47'- 1/2"	46'- 1/2"	23'- 6 1/4"	15'- 6 1/4"	16'- -0"	11	16	0'- 10 1/4"
49'- 0"	48'- 1/2"	47'- 1/2"	24'- 1/4"	16'- 1/4"	16'- 0"	10	17	0'- 10 1/4"
50'- 0"	49'- 1/2"	48'- 1/2"	24'- 6 1/4"	17'- 6 1/4"	14'- 0"	11	17	0'- 10 1/4"

Single Span

A	B	C	D	E	F	X	Y	Z
25'- 0"	23'- 2"	22'- 2"	11'- 7"	NA	NA	8	6	0'- 5"
26'- 0"	24'- 2"	23'- 2"	12'- 1"	NA	NA	7	7	0'- 5"
27'- 0"	25'- 2"	24'- 2"	12'- 7"	NA	NA	8	7	0'- 5"
28'- 0"	26'- 2"	25'- 2"	13'- 1"	NA	NA	7	8	0'- 5"
29'- 0"	27'- 2"	26'- 2"	13'- 7"	NA	NA	8	8	0'- 5"
30'- 0"	28'- 2"	27'- 2"	14'- 1"	NA	NA	7	9	0'- 5"
31'- 0"	29'- 2"	28'- 2"	14'- 7"	NA	NA	8	9	0'- 5"
32'- 0"	30'- 2"	29'- 2"	15'- 1"	NA	NA	7	10	0'- 5"
33'- 0"	31'- 2"	30'- 2"	15'- 7"	NA	NA	8	10	0'- 5"
34'- 0"	32'- 2"	31'- 2"	16'- 1"	NA	NA	7	11	0'- 5"
35'- 0"	33'- 2"	32'- 2"	16'- 7"	NA	NA	8	11	0'- 5"
36'- 0"	34'- 2"	33'- 2"	17'- 1"	NA	NA	7	12	0'- 5"
37'- 0"	35'- 2"	34'- 2"	17'- 7"	NA	NA	8	12	0'- 5"
38'- 0"	36'- 2"	35'- 2"	18'- 1"	NA	NA	9	12	0'- 5"
39'- 0"	37'- 2"	36'- 2"	18'- 7"	NA	NA	8	13	0'- 5"
40'- 0"	38'- 2"	37'- 2"	19'- 1"	NA	NA	9	13	0'- 5"
41'- 0"	39'- 2"	38'- 2"	19'- 7"	12'- 7"	14'- -0"	8	14	0'- 5"
42'- 0"	40'- 2"	39'- 2"	20'- 1"	13'- 1"	14'- -0"	9	14	0'- 5"
43'- 0"	41'- 2"	40'- 2"	20'- 7"	13'- 7"	14'- -0"	10	14	0'- 5"
44'- 0"	42'- 2"	41'- 2"	21'- 1"	14'- 1"	14'- -0"	9	15	0'- 5"
45'- 0"	43'- 2"	42'- 2"	21'- 7"	13'- 7"	16'- -0"	10	15	0'- 5"
46'- 0"	44'- 2"	43'- 2"	22'- 1"	14'- 1"	16'- -0"	9	16	0'- 5"
47'- 0"	45'- 2"	44'- 2"	22'- 7"	14'- 7"	16'- -0"	10	16	0'- 5"
48'- 0"	46'- 2"	45'- 2"	23'- 1"	15'- 1"	16'- -0"	11	16	0'- 5"
49'- 0"	47'- 2"	46'- 2"	23'- 7"	15'- 7"	16'- -0"	10	17	0'- 5"
50'- 0"	48'- 2"	47'- 2"	24'- 1"	16'- 1"	16'- 0"	11	17	0'- 5"

Appendix B – Loads, Cambers, and Deflections

The following tables provide information to be used in developing Cored Slab bridge plans. DC and DW loads are provided to aid in determining the bearing load of each beam. Camber and Deflection values are used in calculations of the top of cap and are directly recorded on the beam sheets for the benefit of the bridge contractor.

25' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	11.687	0.962	7/16	0
Intermediate	12.095	0.999	7/16	0
Single	11.279	0.925	6/16	0

26' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	12.151	1.004	7/16	0
Intermediate	12.559	1.040	7/16	1/16
Single	11.744	0.967	7/16	0

27' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	12.615	1.045	7/16	1/16
Intermediate	13.023	1.082	8/16	1/16
Single	12.208	1.009	7/16	0

28' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	13.079	1.087	8/16	1/16
Intermediate	13.487	1.124	8/16	1/16
Single	12.672	1.051	8/16	1/16

29' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	13.543	1.129	8/16	1/16
Intermediate	13.950	1.166	9/16	1/16
Single	13.136	1.092	8/16	1/16

30' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	14.007	1.171	9/16	1/16
Intermediate	14.414	1.207	9/16	1/16
Single	13.600	1.134	8/16	1/16

31' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	14.471	1.212	9/16	1/16
Intermediate	14.878	1.249	10/16	1/16
Single	14.064	1.176	9/16	1/16

32' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	14.934	1.254	10/16	1/16
Intermediate	15.341	1.291	10/16	1/16
Single	14.528	1.218	9/16	1/16

33' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	15.398	1.296	10/16	1/16
Intermediate	15.804	1.333	10/16	1/16
Single	14.991	1.259	10/16	1/16

34' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	15.861	1.338	10/16	1/16
Intermediate	16.268	1.374	11/16	2/16
Single	15.455	1.301	10/16	1/16

35' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	16.325	1.379	11/16	2/16
Intermediate	16.731	1.416	11/16	2/16
Single	15.918	1.343	11/16	1/16

36' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	16.788	1.421	11/16	2/16
Intermediate	17.194	1.458	12/16	2/16
Single	16.382	1.385	11/16	2/16

37' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	17.251	1.463	12/16	2/16
Intermediate	17.658	1.500	12/16	2/16
Single	16.845	1.426	11/16	2/16

38' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	17.714	1.505	12/16	2/16
Intermediate	18.121	1.541	12/16	3/16
Single	17.308	1.468	12/16	2/16

39' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	18.178	1.546	12/16	3/16
Intermediate	18.584	1.583	12/16	3/16
Single	17.771	1.510	12/16	2/16

40' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	18.641	1.588	12/16	3/16
Intermediate	19.047	1.625	13/16	3/16
Single	18.235	1.552	12/16	3/16

41' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	19.204	1.630	1 6/16	3/16
Intermediate	19.612	1.667	1 7/16	3/16
Single	18.797	1.593	1 5/16	3/16

42' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	19.668	1.672	1 7/16	3/16
Intermediate	20.075	1.708	1 7/16	4/16
Single	19.261	1.635	1 6/16	3/16

43' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	20.132	1.713	1 7/16	4/16
Intermediate	20.539	1.750	1 8/16	4/16
Single	19.725	1.677	1 7/16	3/16

44' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	20.596	1.755	1 8/16	4/16
Intermediate	21.003	1.792	1 8/16	4/16
Single	20.189	1.719	1 7/16	4/16

45' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	21.060	1.797	1 8/16	4/16
Intermediate	21.467	1.834	1 9/16	5/16
Single	20.653	1.760	1 8/16	4/16

46' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	21.524	1.839	1 9/16	5/16
Intermediate	21.931	1.875	1 9/16	5/16
Single	21.117	1.802	1 9/16	4/16

47' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	21.988	1.880	1 10/16	5/16
Intermediate	22.394	1.917	1 10/16	6/16
Single	21.581	1.844	1 9/16	5/16

48' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	22.451	1.922	1 10/16	6/16
Intermediate	22.858	1.959	1 10/16	6/16
Single	22.045	1.886	1 10/16	5/16

49' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	22.915	1.964	1 10/16	6/16
Intermediate	23.322	2.001	1 11/16	7/16
Single	22.508	1.927	1 10/16	6/16

50' Span Length				
Arrangement	**DC (kip)**	**DW (kip)**	**Camber (in)**	**Deflection (in)**
End	23.379	2.006	1 11/16	7/16
Intermediate	23.786	2.042	1 11/16	7/16
Single	22.972	1.969	1 10/16	6/16