

# PRECAST PRESTRESSED BOX BEAMS

## General Notes

**SPECIFICATIONS:** All references to the standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, with current supplemental specifications. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications, with interims.

**DESIGN LOADS:** Beam sections are designed for 1.25\*HL93 (KYHL93) Live Load.

**DESIGN LOAD DISTRIBUTION:** Contrary to AASHTO LRFD Bridge Design Specifications, the design moment and shear distribution for all beams is 0.5 lanes.

**FUTURE WEARING SURFACE:** These beams are designed for a 15 PSF future wearing surface load.

**SUBSTRUCTURE DESIGN LOADS:** Unfactored design reaction forces per beam end.

DC (kips): Beam, Slab (if applicable), and Type II railing dead loads.

DW (kips): Future wearing surface.

LL (kips): Beam Live Load reaction per lane x Design load distribution.

LL+I (kips): LL with Dynamic load allowance.

**DESIGN DEFLECTIONS:**

$\Delta_d$  (in.): Sum of the downwards deflections caused by the design 5' deck, railing, and future wearing surface. (Positive Downwards)

$\Delta_c$  (in.): Upwards midspan camber of the beam caused by prestressing minus the downward deflection of the beam due to self weight. (Positive Upwards)

**MATERIAL DESIGN SPECIFICATIONS:**

for Steel Reinforcement	FY = 60000 PSI
for Prestressed Girder Concrete	F'c = 7000 PSI
	F'cl = 5500 PSI
for Class "AA" Concrete	F'c = 4000 PSI
for Prestressing Steel	F'S = 270000 PSI

**DESIGN LENGTH:** Beam lengths shown in the Standards represent total beam length. Use the next greater designed section for non-Standard lengths.

**CONSTRUCTION METHOD:** Transferring bond stress to the concrete will not be allowed, nor releasing of end anchors until the concrete has attained a minimum compressive strength of 5500 PSI as shown by standard cylinders made and cured identically with the girders; attain 7000 PSI at or prior to 28 days. Apply an initial prestress force of 33817 lbs. per low relaxation strand. Beams with honeycomb of such extent as to affect the strength of resistance to deterioration will not be accepted. The allowance of .0005L (length) is made for shortening of beams due to shrinkage and elastic change. Furnish shop plans showing a detensioning plan by numbering, in sequence, the strand pattern.

**PRESTRESSING STRANDS:** Ensure prestressing strands to be 1/2" oversize (0.167 sq. in.) uncoated seven-wire stress relieved, low-relaxation strands conforming to AASHTO M 203, Grade 270. If an alternate strand arrangement or strand type is preferred by the Contractor, the designer that developed the original plans will provide the design and also revise the original plans to reflect the changes. These design and plan modifications will be done at the Contractor's expense.

**CORROSION INHIBITOR:** Provide a corrosion inhibitor for B-type (non-composite) beams in accordance with the current Special Note for Corrosion Inhibitors.

**BEVELED EDGES:** Bevel all exposed edges 3/4".

**REINFORCEMENT:** Dimensions shown from the face of concrete to reinforcement are clear distances. Spacing of reinforcement is from center to center of reinforcement. All steel reinforcement is to be epoxy coated in accordance with Section 811.10 of the Specifications. Consider bars marked 'C' to be a stirrup for purposes of bend diameters. Non-epoxy reinforcement may be used for fabrication purposes, only, provided that the steel is not used in the top 5/2" of the beam and the location of the steel is indicated on the shop drawings.

**FABRICATION:** Beams shall not be fabricated more than 120 days before the deck is to be poured.

**GROUT:** Provide non-shrink grout for anchor dowels, shear keys, and tensioning rod block-outs conforming with Section 601.03.03 of the Specifications. When side by side superstructure is utilized, grouting will be completed after lateral tension rods have been fully tightened and before leveling devices have been removed. Include the cost of furnishing and placing grout in the price of beam.

**RAILING SYSTEM TYPE II:** Furnish this material per these specifications.

ITEM	DESCRIPTION	MATERIAL SPECIFICATION	COATING SPECIFICATION
Post	W6x25	ASTM A36 or A572	A123
Channel	C7x9.8	ASTM A36 or A572	A123
Plate	1/2 "x 7 "	ASTM A36 or A572	A123
Tubing	8x4x0.1875	ASTM A500 or A501	A123
Bolts	3/8 "	ASTM A307	A153
Nuts	for 3/8 "	ASTM A563, Grade A or better	A153
Washers	for 3/8 "	ASTM A563, Grade A or better	A153
Stud	1/4 "	ASTM A108 (1045 C.D. Bar)	B633, Type II, Class 25
Ferrule	2 1/2 "x 5 "	ASTM A108 (11L17 Steel)	B633, Type II, Class 25
Wire	3/8 "	ASTM A510 (1018 Steel)	B633, Type II, Class 25
Nut	for 1/4 " Bolt	ASTM A108 (12L14 Steel)	B633, Type II, Class 25
Nut	for 1/4 " Stud	ASTM A325M	B633, Type II, Class 25
Washers	for 1/4 " Stud	ASTM A325M	B633, Type II, Class 25

Use the current edition of the references listed below with these standards.

### STANDARD DRAWINGS

BBP-003	Elastomeric Bearing Pads
BHS-007	Railing System Type II
BJE-001	Armored Edge & Neoprene Joints
RBR-001	Steel Beam Guardrail
RBR-005	Guardrail Components

### SPECIAL NOTES

for Corrosion Inhibitors

KENTUCKY  
DEPARTMENT OF HIGHWAYS

BOX BEAM  
GENERAL NOTES  
& REFERENCES

STANDARD DRAWING NO. BDP-001-04

SUBMITTED	<i>Mark Nite</i>	12-02-11
DIRECTOR DIVISION OF STRUCTURAL DESIGN		DATE
APPROVED	<i>[Signature]</i>	12-02-11
STATE HIGHWAY ENGINEER		DATE