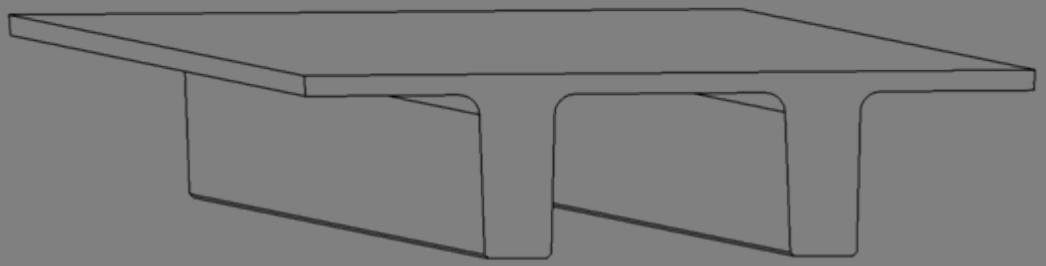
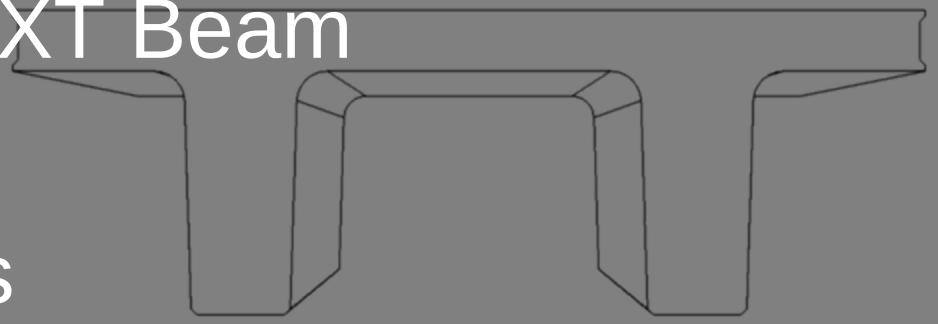
The NEXT Beam

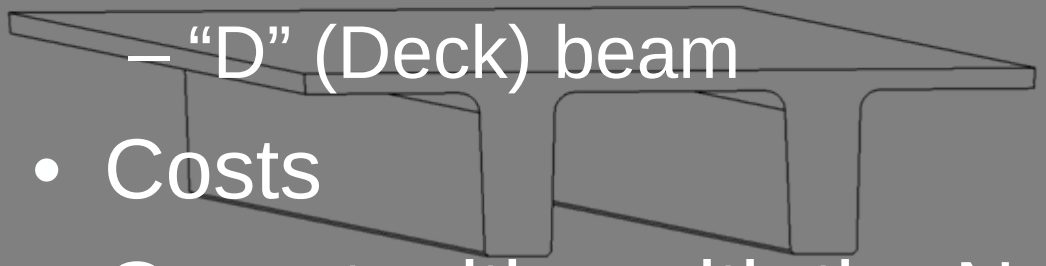
A Superior Alternative to Concrete Box Beams for 30’ – 90’ Spans



Presentation Overview

- The High Bridge Team
- Development of NEXT Beam
- Current Projects
- NEXT Beam Details
  - “F” (Form) beam
  - “D” (Deck) beam
- Costs
- Opportunities with the Next Beam



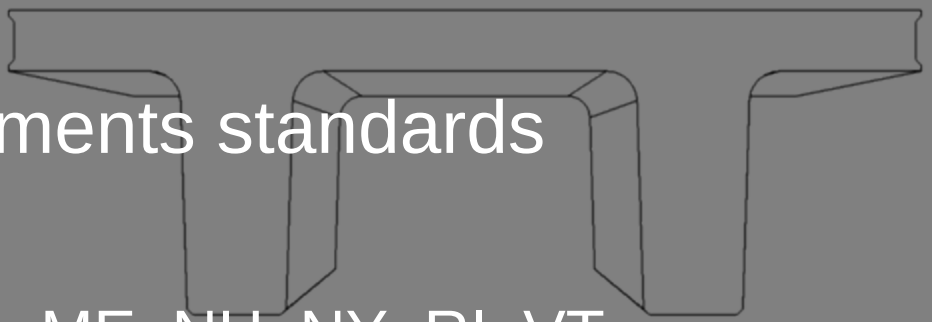


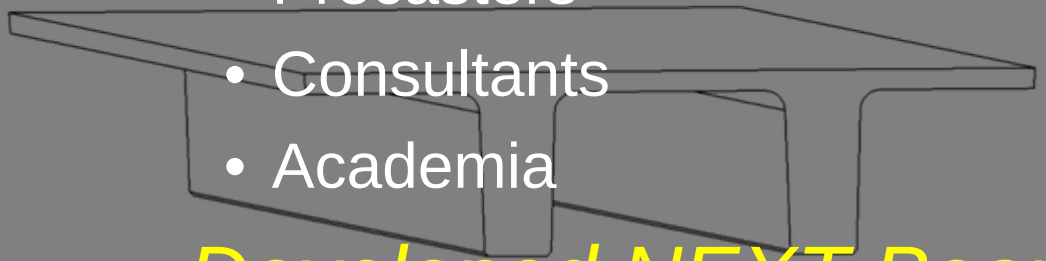
The High Bridge Team

- Joint Venture between:
  - High Steel Structures Inc.
    - Bridge Industry Leader
    - Lancaster, PA
  - High Concrete Group LLC
    - Precast Industry Leader
    - Denver, PA

NEXT Beam Development

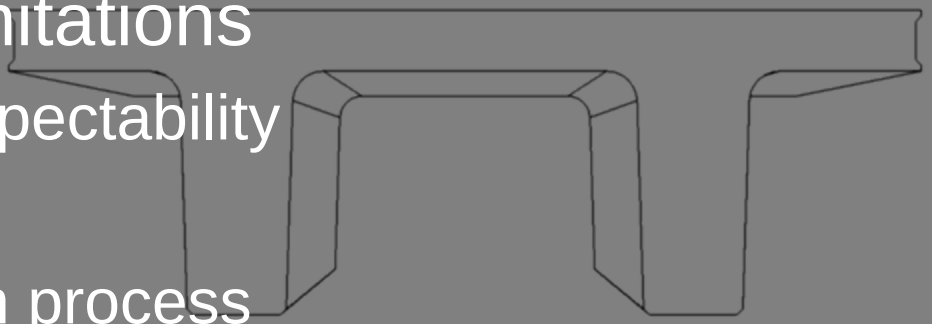
- PCINE Bridge Technical Committee
  - Established 1990
  - Develops and implements standards
  - Members
    - State DOTs: CT, MA, ME, NH, NY, RI, VT
    - Precasters
    - Consultants
    - Academia
  - *Developed NEXT Beam*

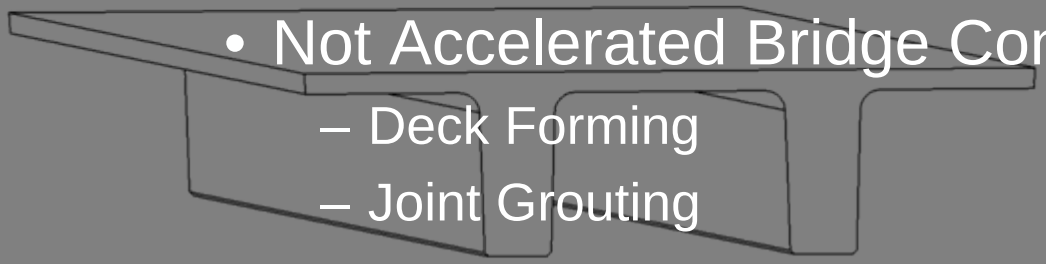




NEXT Beam Development

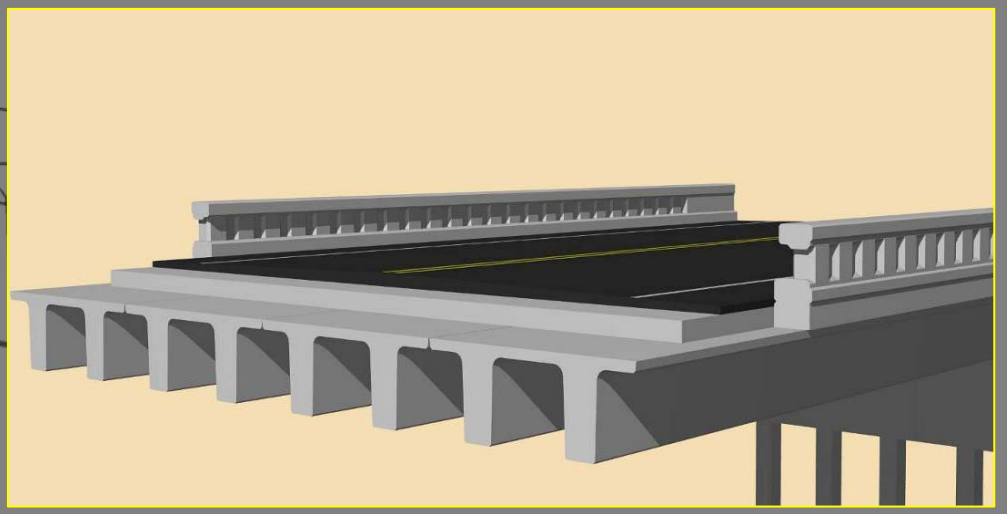
- Why Develop a New Bridge Section?
  - Box Beams have limitations
    - Closed cells limit inspectability
    - Durability concerns
    - Multi-step fabrication process
    - Difficult to accommodate utilities (adjacent boxes)
    - Not Accelerated Bridge Construction friendly
      - Deck Forming
      - Joint Grouting





NEXT Beam Development

- NEXT Beam Characteristics:
  - Open Double Tee, Single Pour Production
  - Depths 24” – 36” in 4” increments
  - Width will vary 8’-0” – 12’-0”
  - Accommodates utilities
  - Suited for ABC
  - Spans: 30’ – 90’

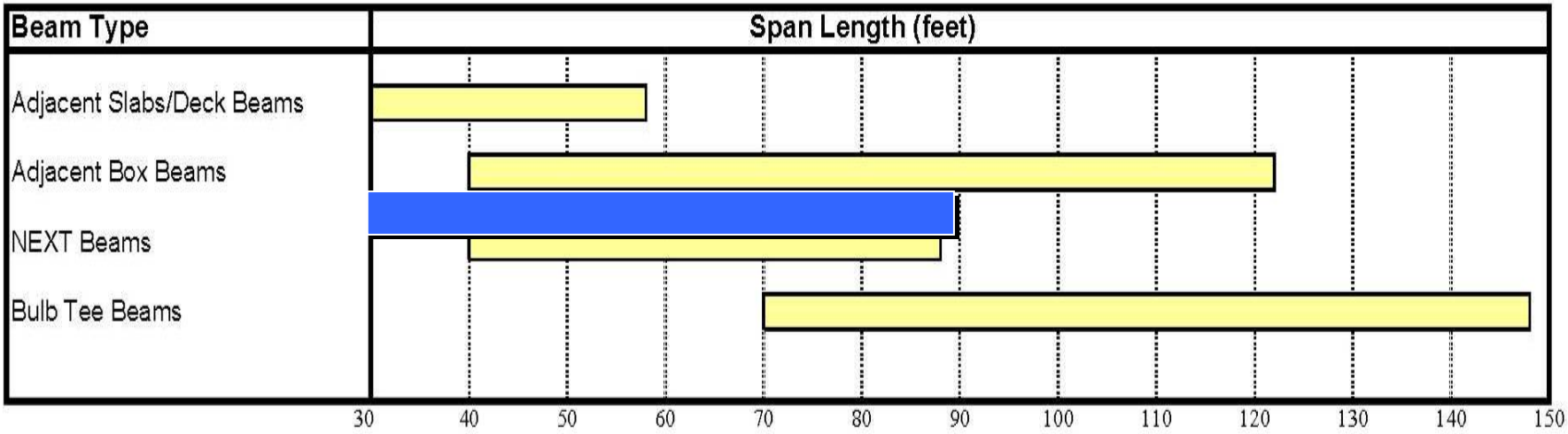


NEXT Beam Development

Precast/Prestressed Concrete Institute Northeast Covering New England and New York

PCI

PCI Northeast Bridge Beam Sections
Common Span Ranges

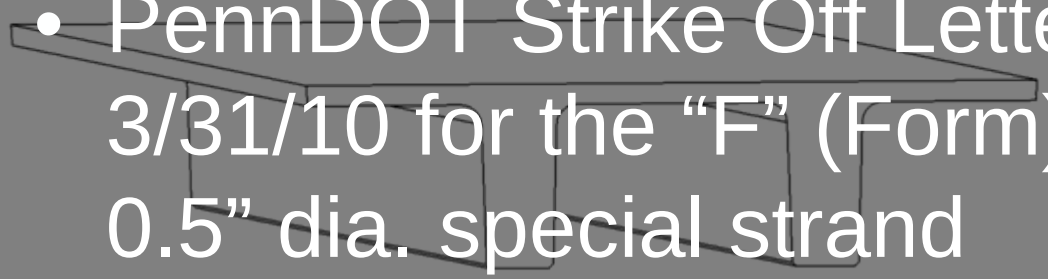


NEXT Beam is a superior alternative to longer slab/deck beam bridges and short box beam bridges

NEXT Beam Approved States

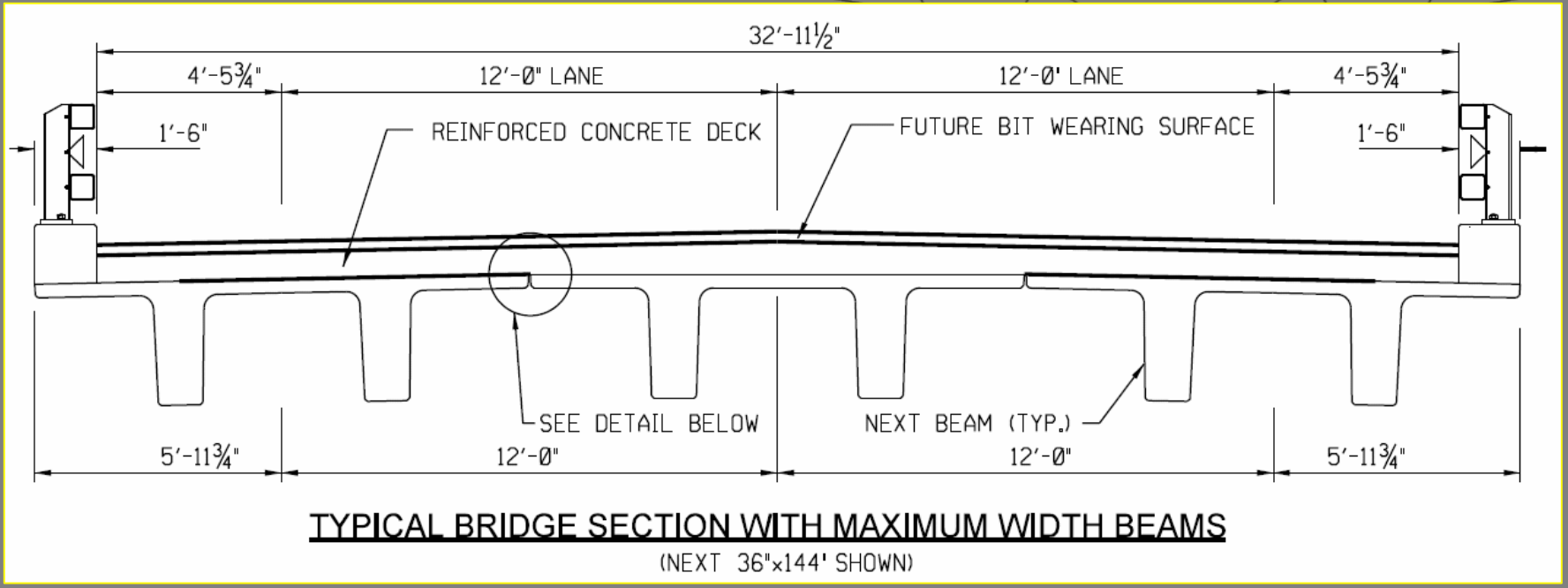
- The NEXT Beam is approved for use in the following states:
  - CT, MA, ME, NH, NY, RI, VT
  - DE, MD, NJ open to use of NEXT Beams

- PennDOT Strike Off Letter released 3/31/10 for the “F” (Form) beam, using 0.5” dia. special strand



NEXT Beam Types

- F (Form) Beam - Partial flange thickness serving a form for CIP deck

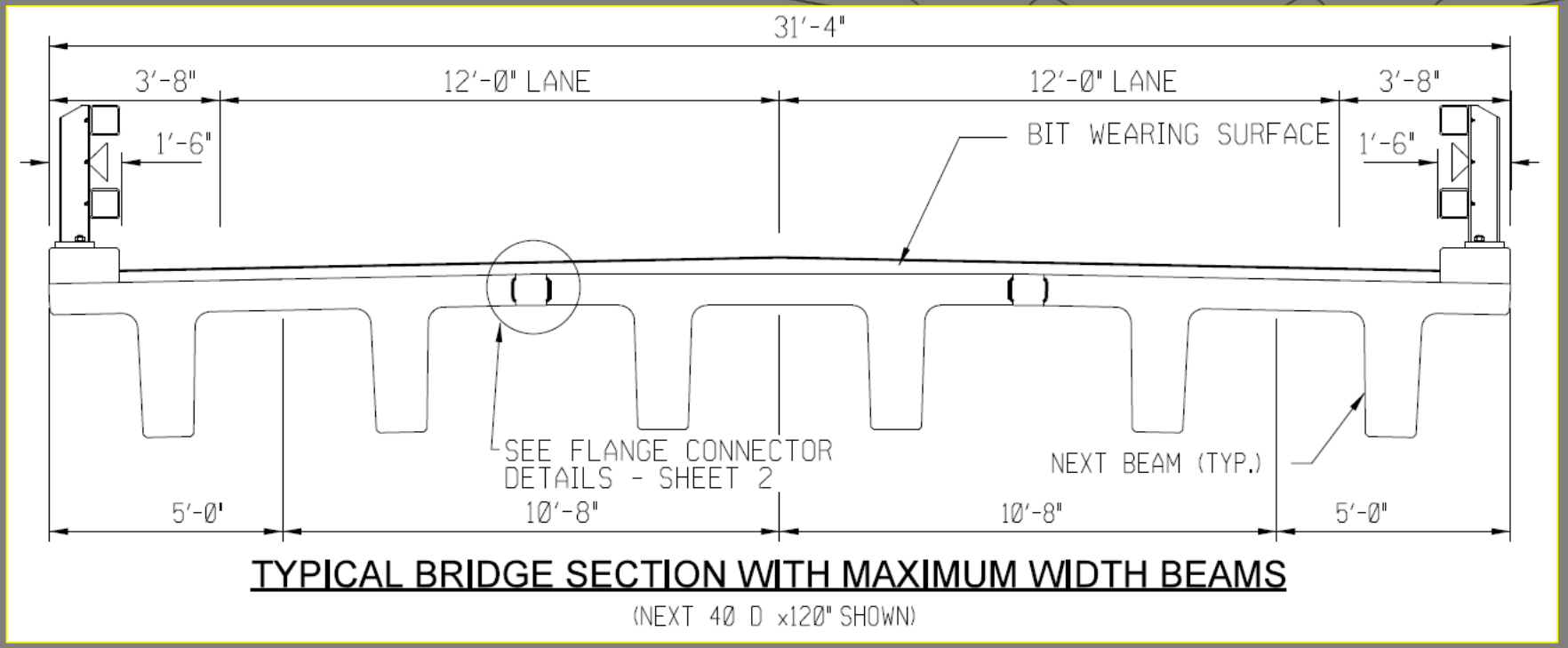


TYPICAL BRIDGE SECTION WITH MAXIMUM WIDTH BEAMS

(NEXT 36"x144' SHOWN)

NEXT Beam Types

- D (Deck) Beam - Full flange thickness serving as riding surface, with overlay

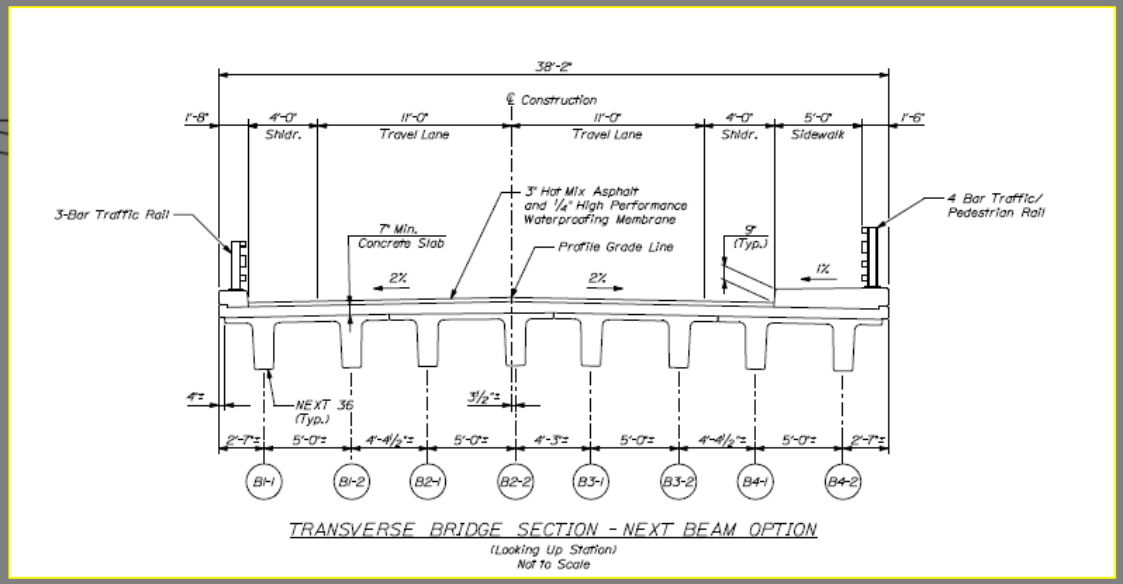


TYPICAL BRIDGE SECTION WITH MAXIMUM WIDTH BEAMS

(NEXT 40 D x120" SHOWN)

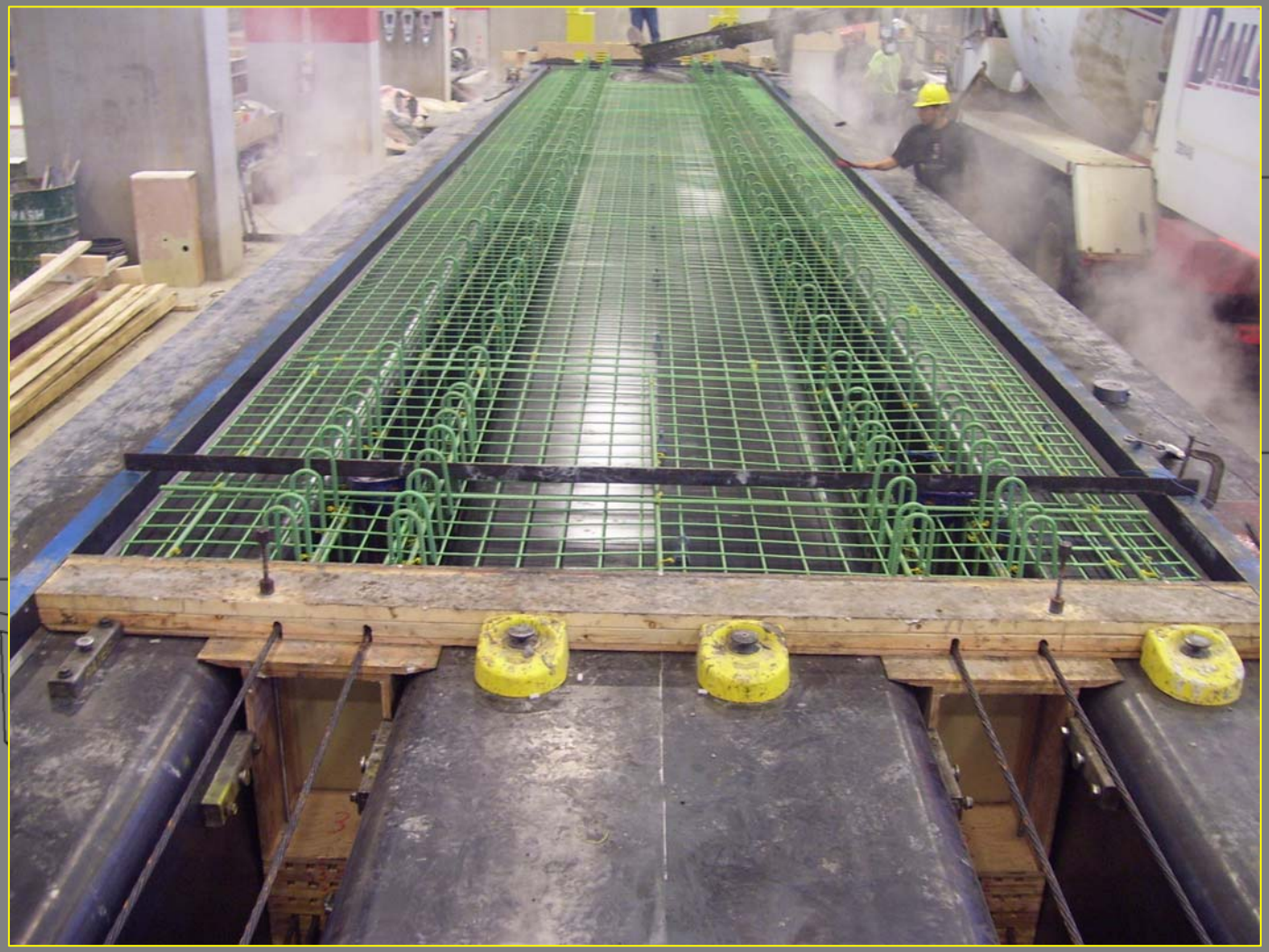
NEXT Beam Projects

- ME New Bridge over York River
  - 7-span, 510’ bridge, 38’-2” deck width, Int. Abuts.
  - 28 NEXT F Beams, 55’ or 80’ long
  - 7” NWC CIP Deck with 3-1/4” Bit. Wrg Surface
  - Designer: Vanasse Hangen Brustlin, Inc.



TRANSVERSE BRIDGE SECTION - NEXT BEAM OPTION
(Looking Up Station)
Not to Scale

ME New Bridge over York River



ME New Bridge over York River

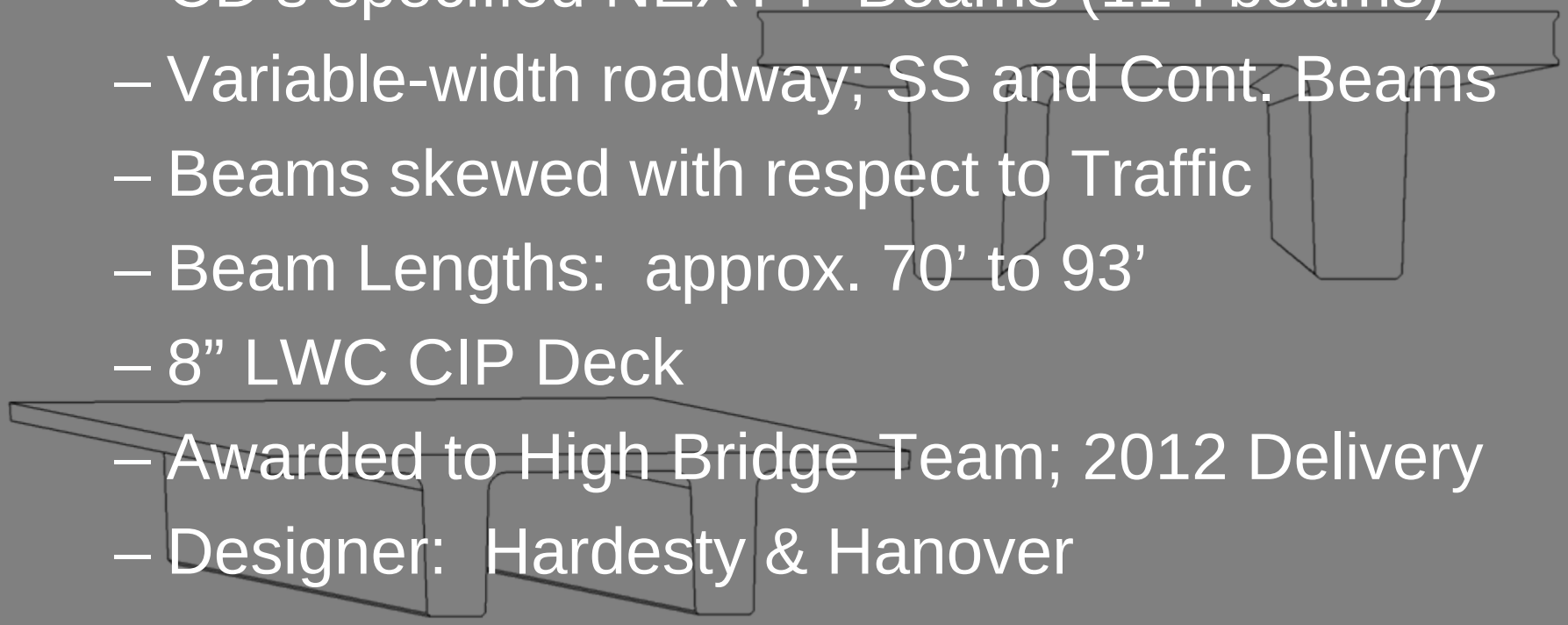
ME New Bridge over York River

ME New Bridge over York River

ME New Bridge over York River

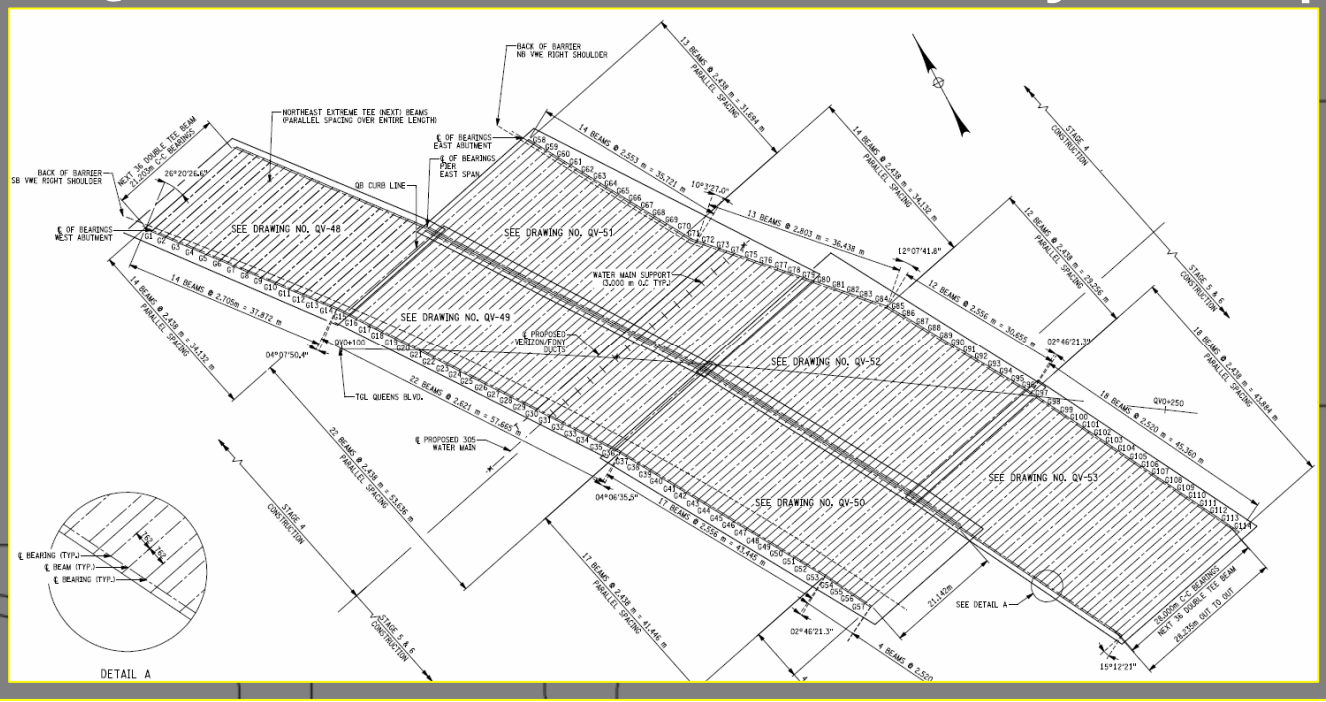
NEXT Beam Projects

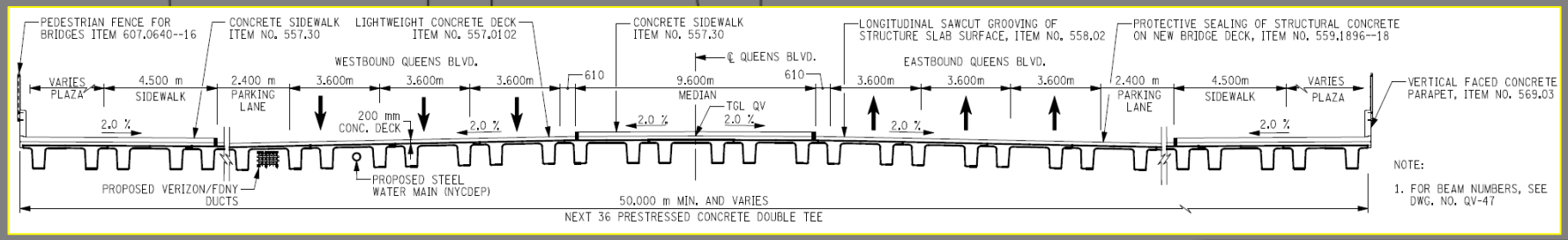
- NYC Queen's Blvd over Van Wyck Exprway
  - CD's specified NEXT F Beams (114 beams)
  - Variable-width roadway; SS and Cont. Beams
  - Beams skewed with respect to Traffic
  - Beam Lengths: approx. 70' to 93'
  - 8" LWC CIP Deck
  - Awarded to High Bridge Team; 2012 Delivery
  - Designer: Hardesty & Hanover



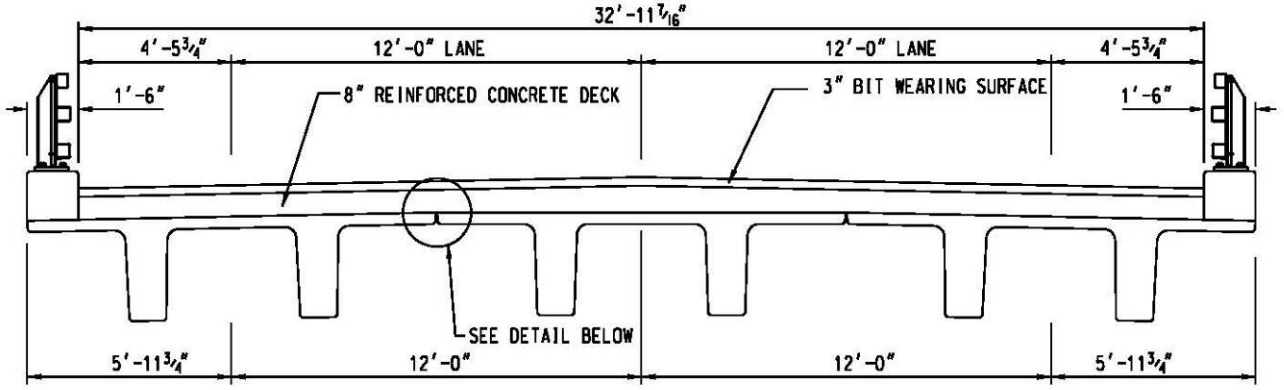
NEXT Beam Projects

- NYC Queen's Blvd over Van Wyck Exprway



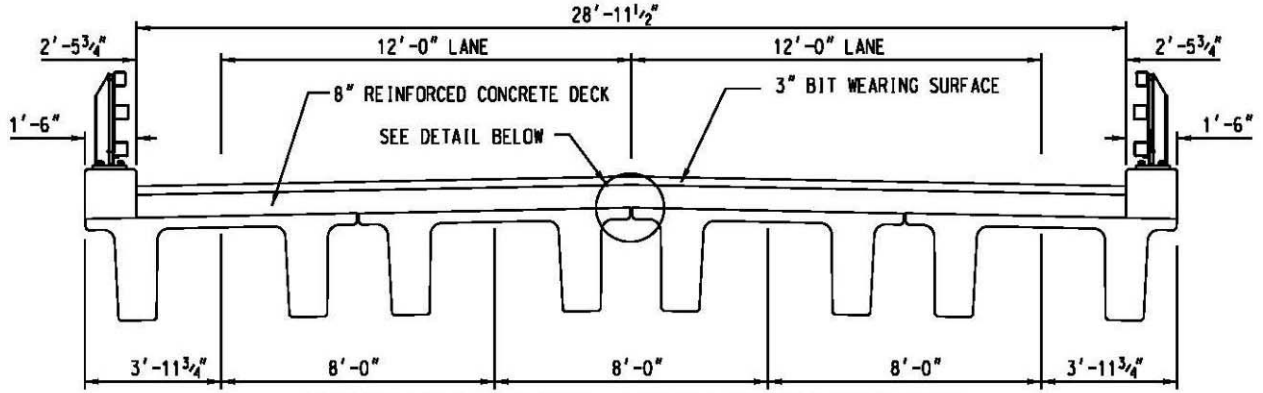


Form Beam Details



BRIDGE SECTION WITH MAXIMUM WIDTH BEAMS

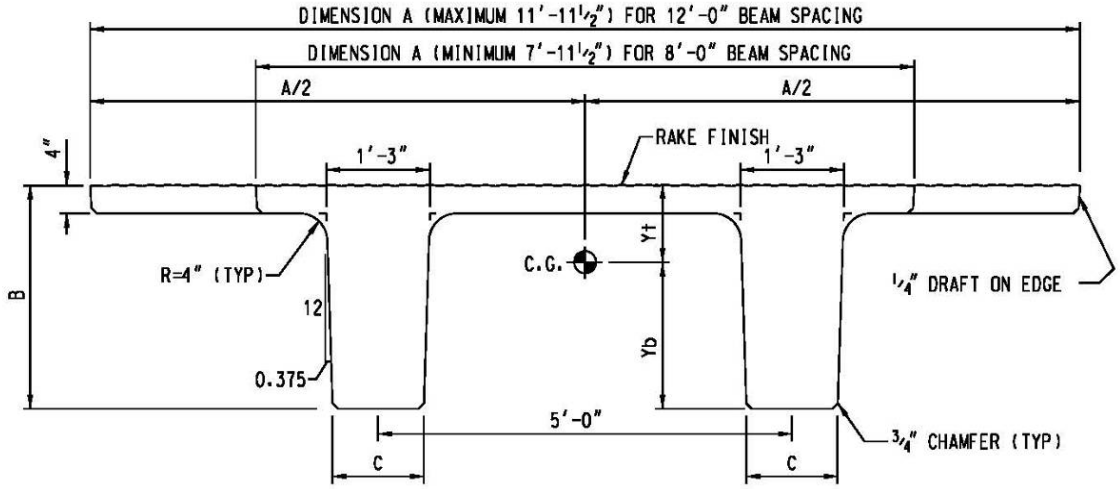
TRIAL MAXIMUM SPAN DESIGN - NEXT 36"x144"
MAXIMUM SPAN = APPROX. 74 FEET (f'c = 8 KSI)



BRIDGE SECTION WITH MINIMUM WIDTH BEAMS

TRIAL MAXIMUM SPAN DESIGN - NEXT 36"x96"
MAXIMUM SPAN = APPROX. 85 FEET (f'c = 8 KSI)

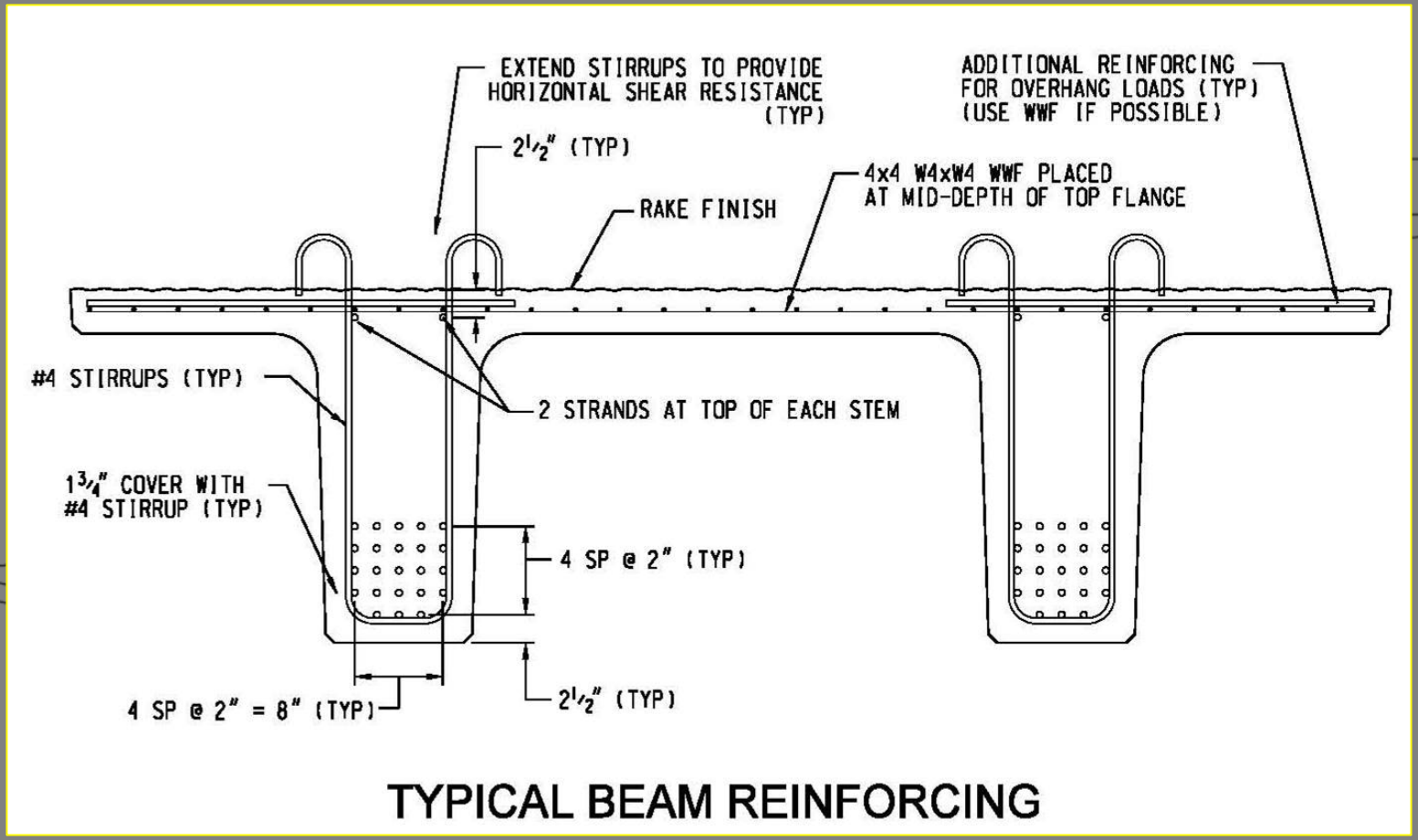
Form Beam Details



NEXT BEAM - SECTION PROPERTIES

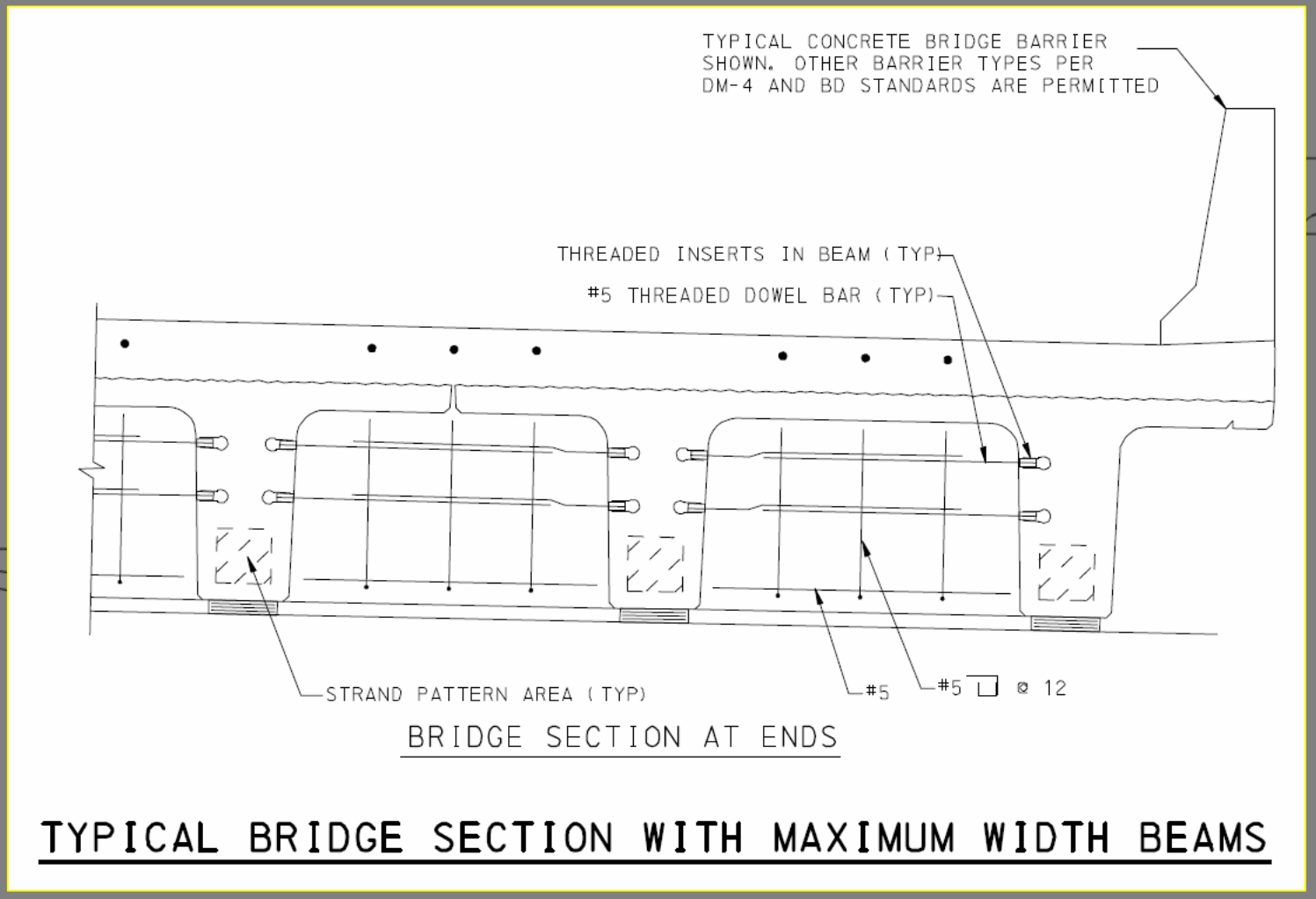
BEAM DESIGNATION	BEAM WIDTH INCHES	BEAM DEPTH INCHES	BASE STEM WIDTH INCHES	AREA IN²	I IN⁴	Yb INCHES	Yt INCHES	St IN³	Sb IN³	WEIGHT PLF
	A	B	C			D	E			
MINIMUM WIDTH BEAMS										
NEXT 36 F	95.50	36.00	13.00	1287	160240	21.77	14.23	11261	7361	1341
NEXT 32 F	95.50	32.00	13.25	1182	115813	19.51	12.49	9272	5936	1231
NEXT 28 F	95.50	28.00	13.50	1075	79901	17.24	10.76	7426	4635	1120
NEXT 24 F	95.50	24.00	13.75	966	51823	14.95	9.05	5726	3466	1006
MAXIMUM WIDTH BEAMS										
NEXT 36 F	143.50	36.00	13.00	1479	185525	23.36	12.64	14678	7942	1541
NEXT 32 F	143.50	32.00	13.25	1374	134258	20.98	11.02	12183	6399	1431
NEXT 28 F	143.50	28.00	13.50	1267	92661	18.57	9.43	9826	4990	1320
NEXT 24 F	143.50	24.00	13.75	1158	60045	16.12	7.88	7620	3725	1206

Form Beam Details

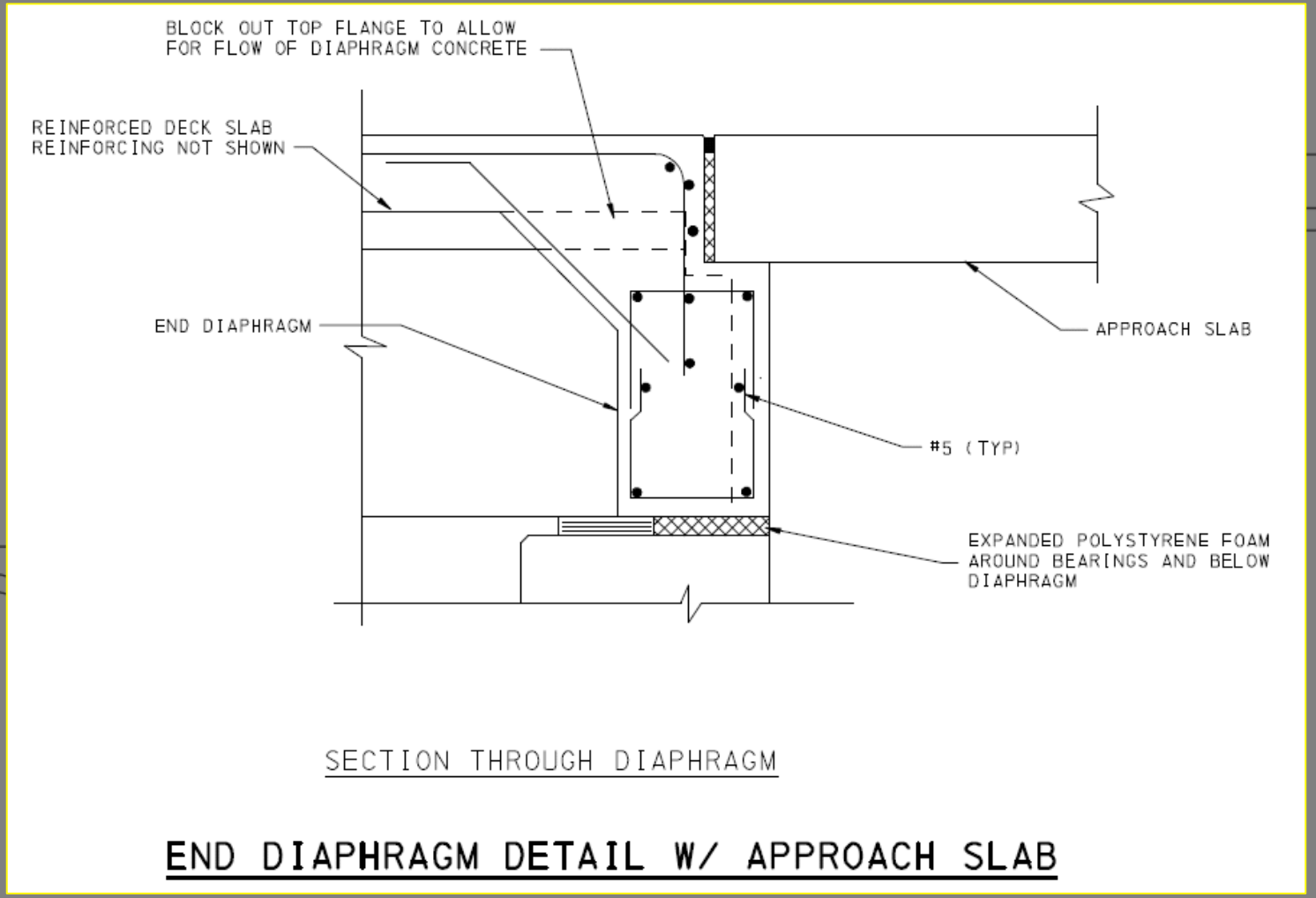


TYPICAL BEAM REINFORCING

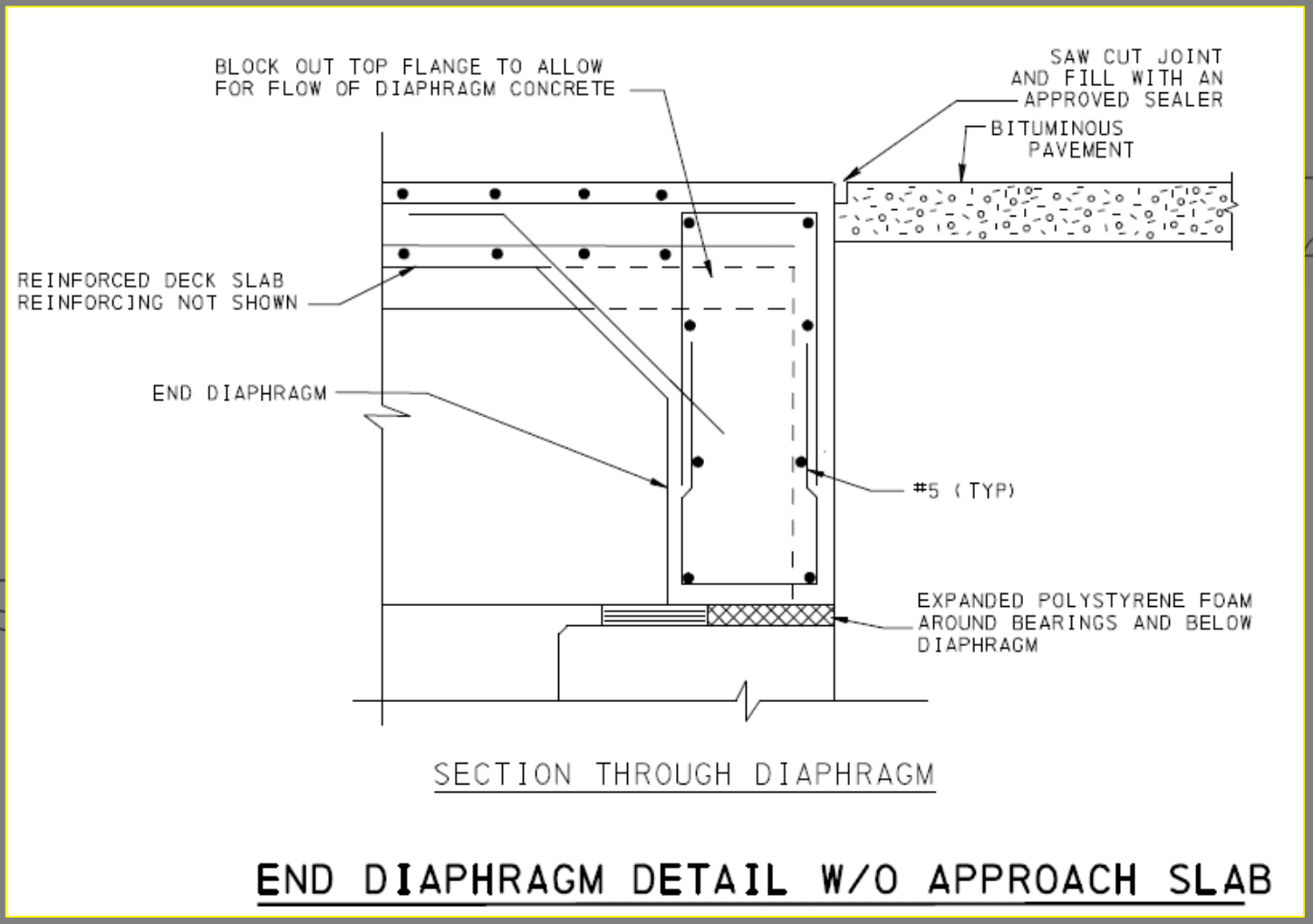
Form Beam Details



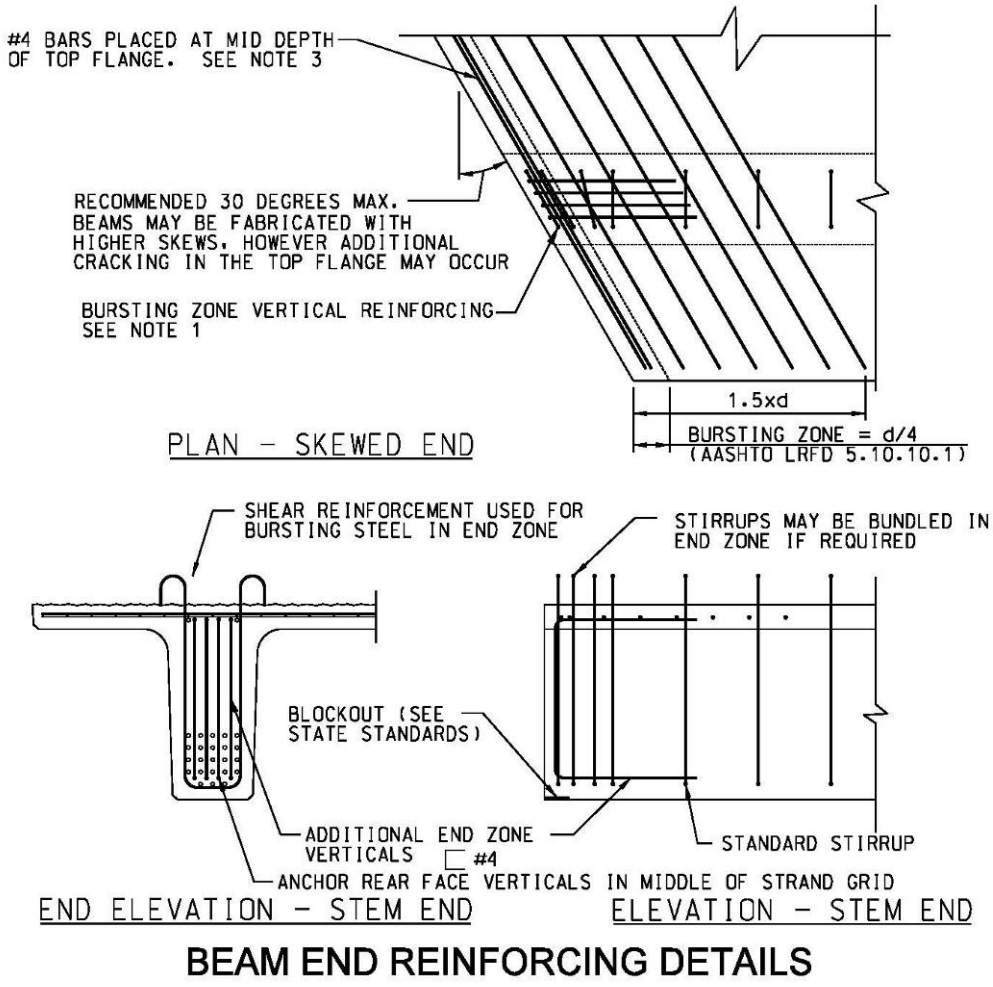
Form Beam Details



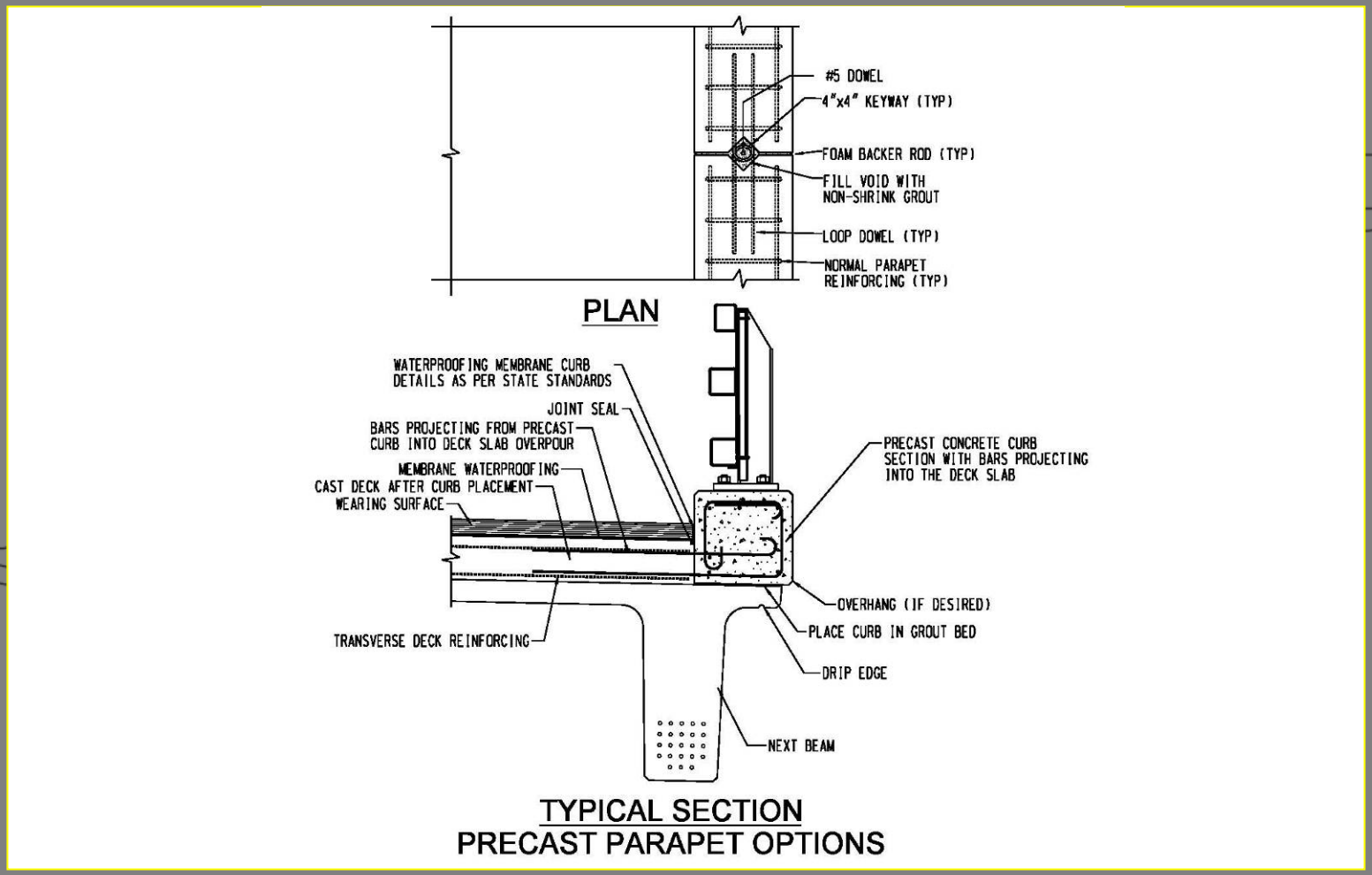
Form Beam Details



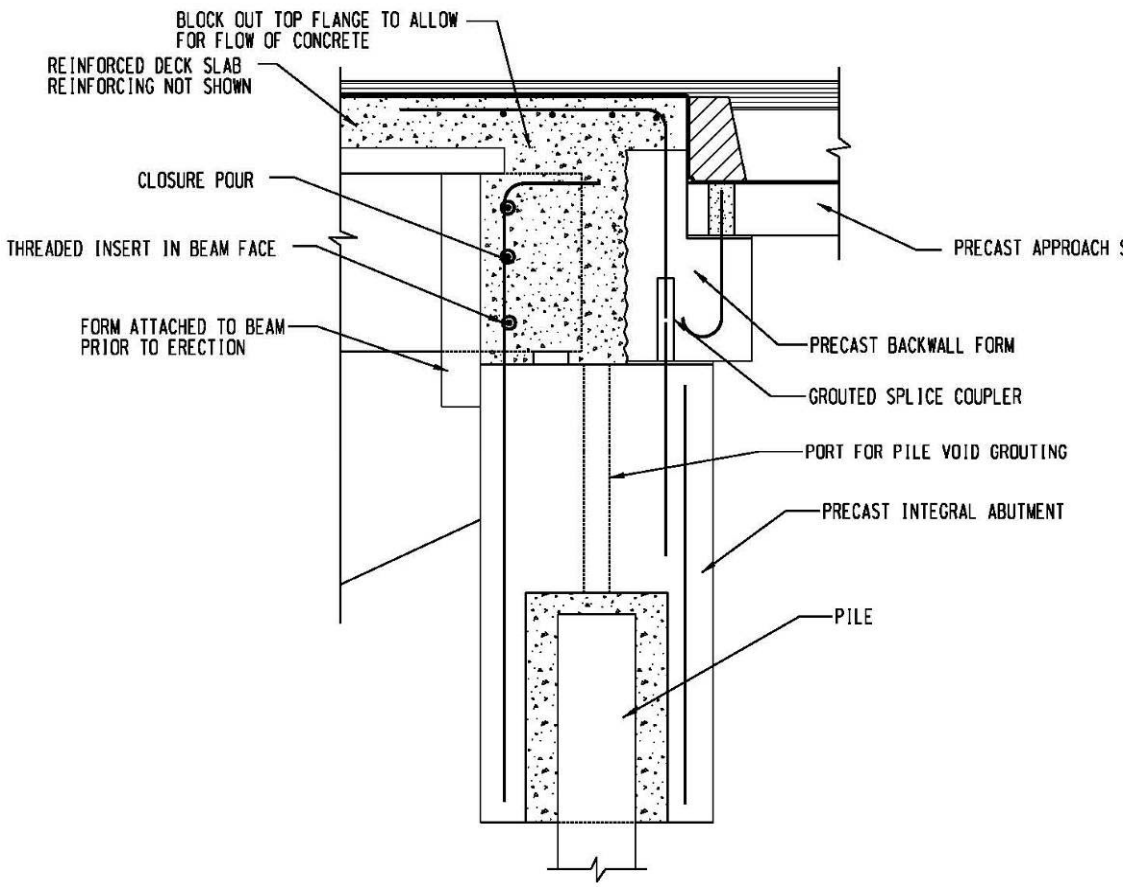
Form Beam Details



Form Beam Details

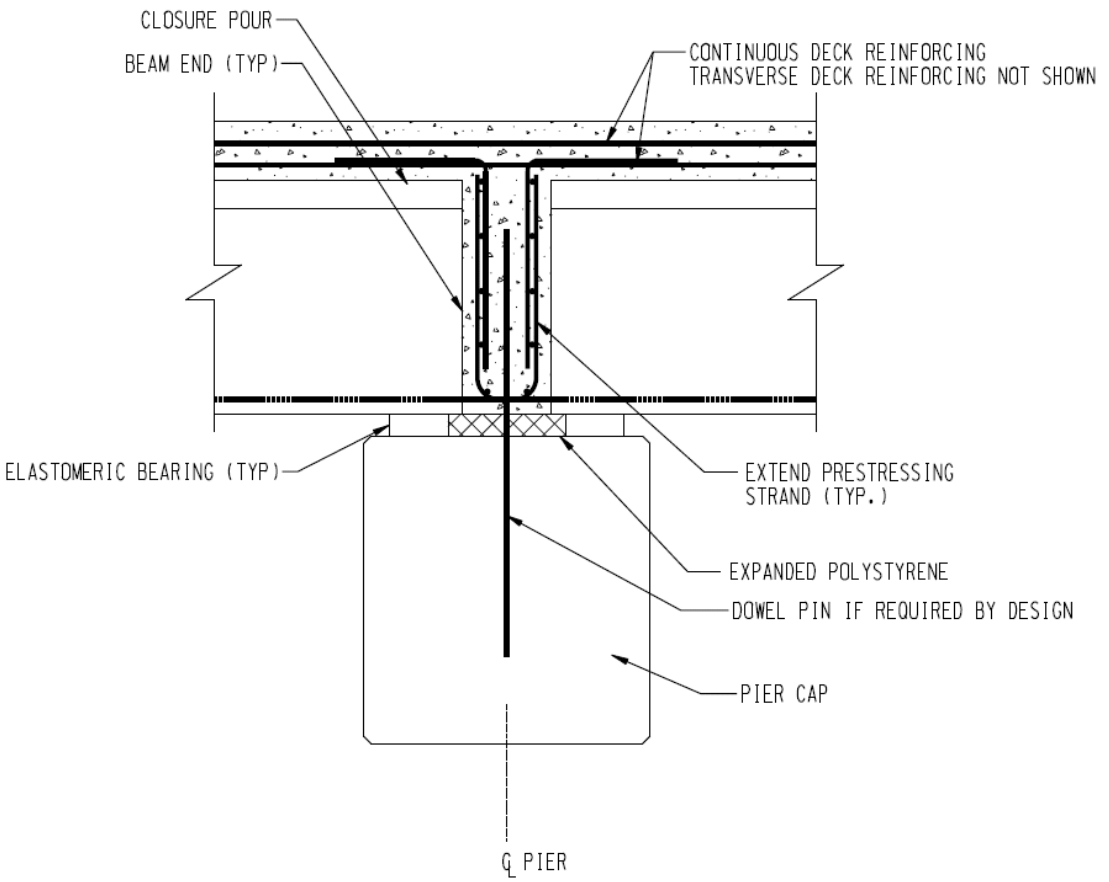


Form Beam Details



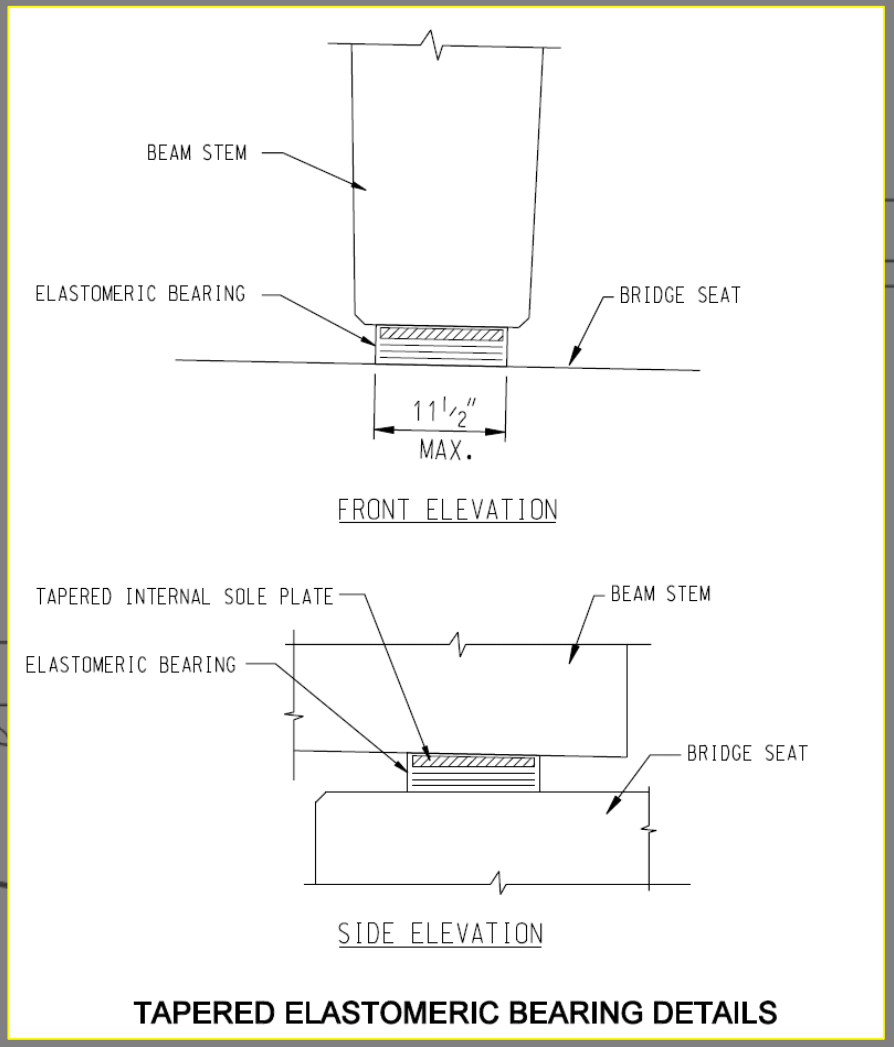
SAMPLE INTEGRAL ABUTMENT SECTION

Form Beam Details



SAMPLE PIER CONTINUITY DETAIL

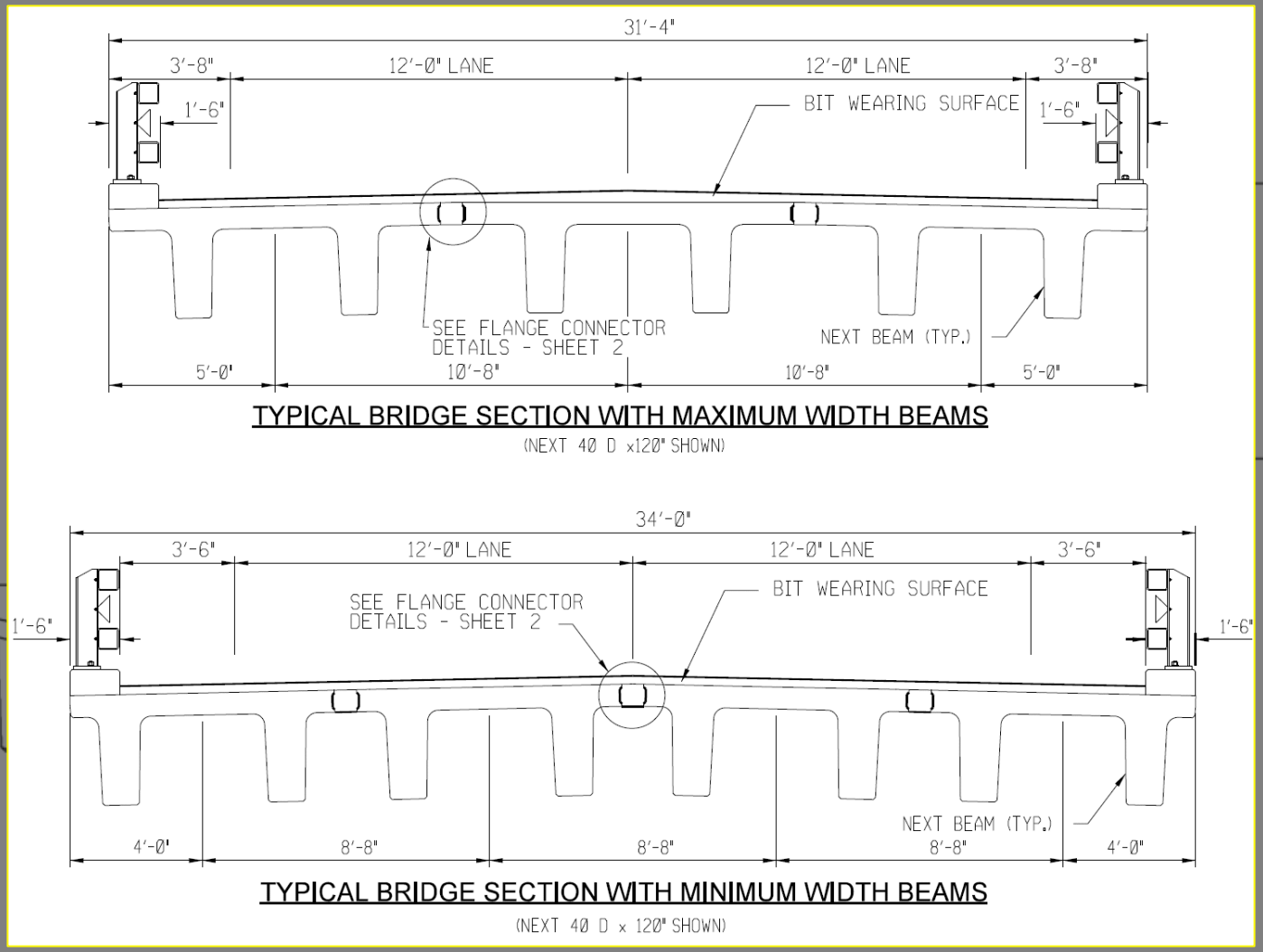
Form Beam Details



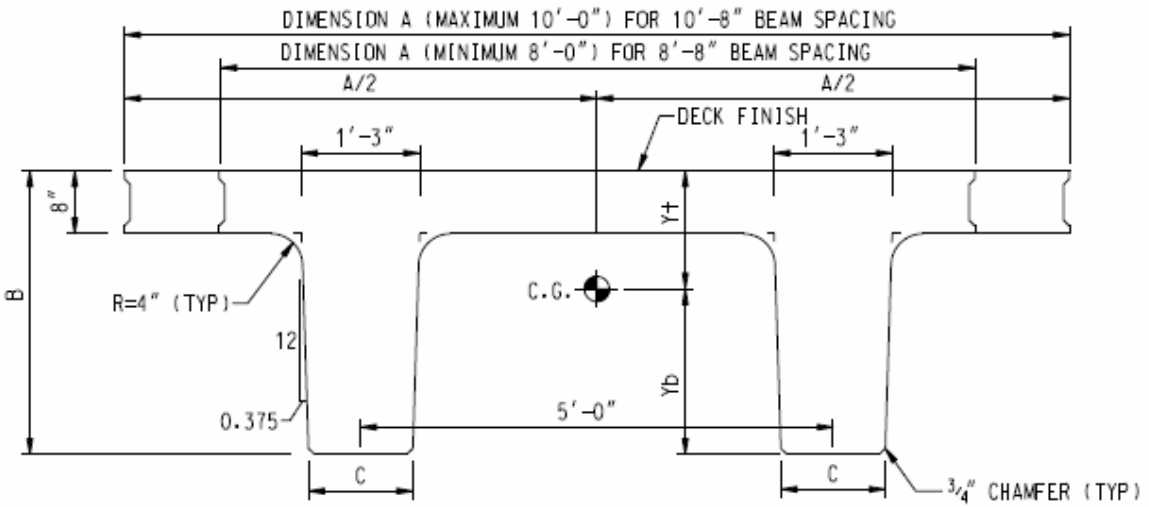
Form Beam Design

F Beam Design Table 1/2" Dia. Special 270ksi Low-Lax Strand								
Span	F24x8ft	F28x8ft	F32x8ft	F36x8ft	F24x12ft	F28x12ft	F32x12ft	F36x12ft
30 ft	8 0.22 0.17				10 0.33 0.27			
35 ft	10 0.40 0.31				13[E] 0.58 0.47			
40 ft	13 0.69 0.53				17[E] 0.97 0.76	14[E] 0.62 0.49		
45 ft	16 0.98 0.73	14 0.67 0.51			22[E] 1.45 1.13	18[E] 0.95 0.74	15[E] 0.66 0.52	
50 ft	20 1.29 0.91	17 0.90 0.65	14 0.54 0.37			23[E] 1.41 1.09	19[E] 1.02 0.79	16[E] 0.61 0.44
55 ft		20 1.24 0.87	17 0.83 0.58	15 0.58 0.40			24[E] 1.39 1.06	20[E] 0.95 0.71
60 ft		25 1.71 1.20	21 1.24 0.88	18 0.86 0.60				24[E] 1.31 0.98
65 ft			25 1.66 1.16	22 1.25 0.90				
70 ft				25 1.58 1.10				

Deck Beam Details



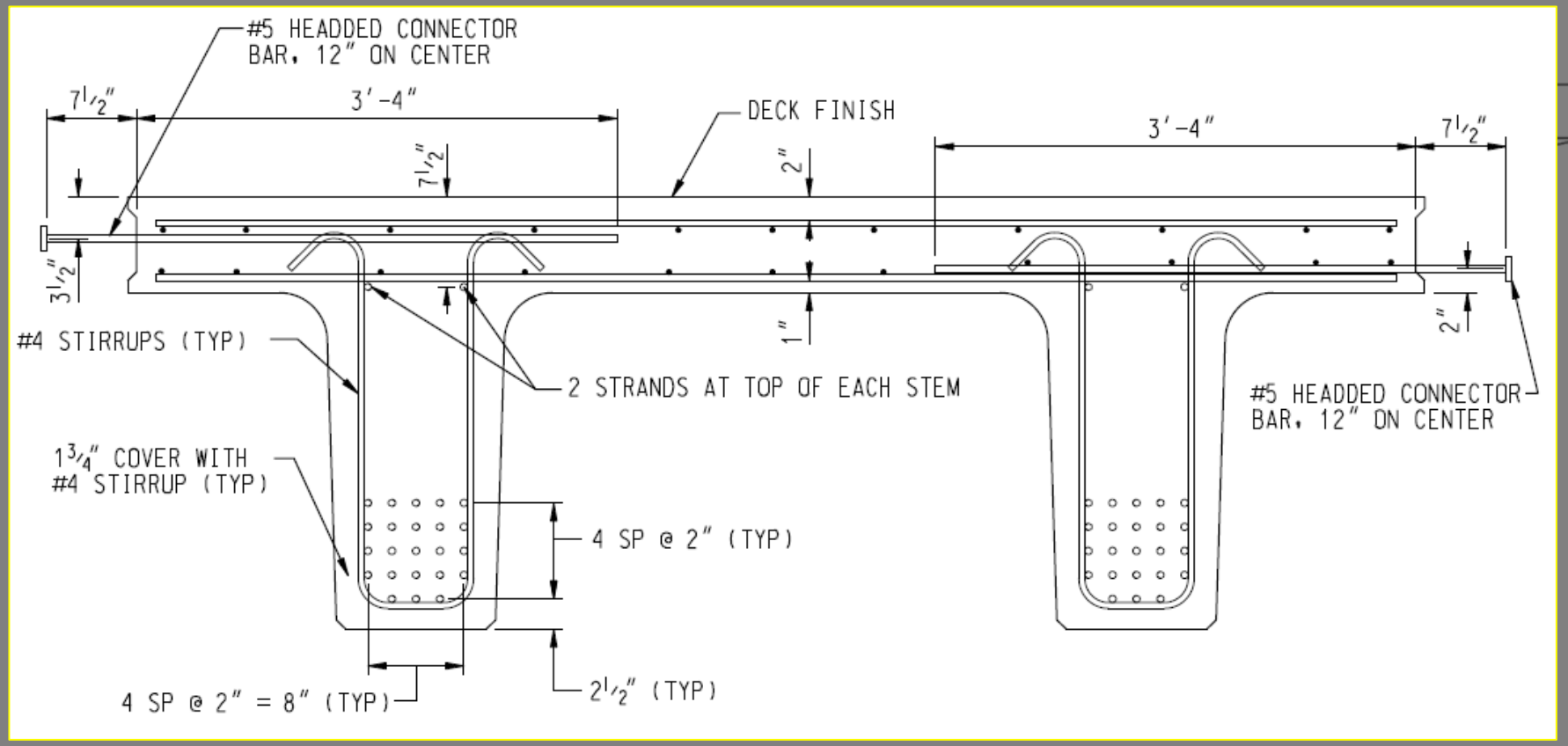
Deck Beam Details



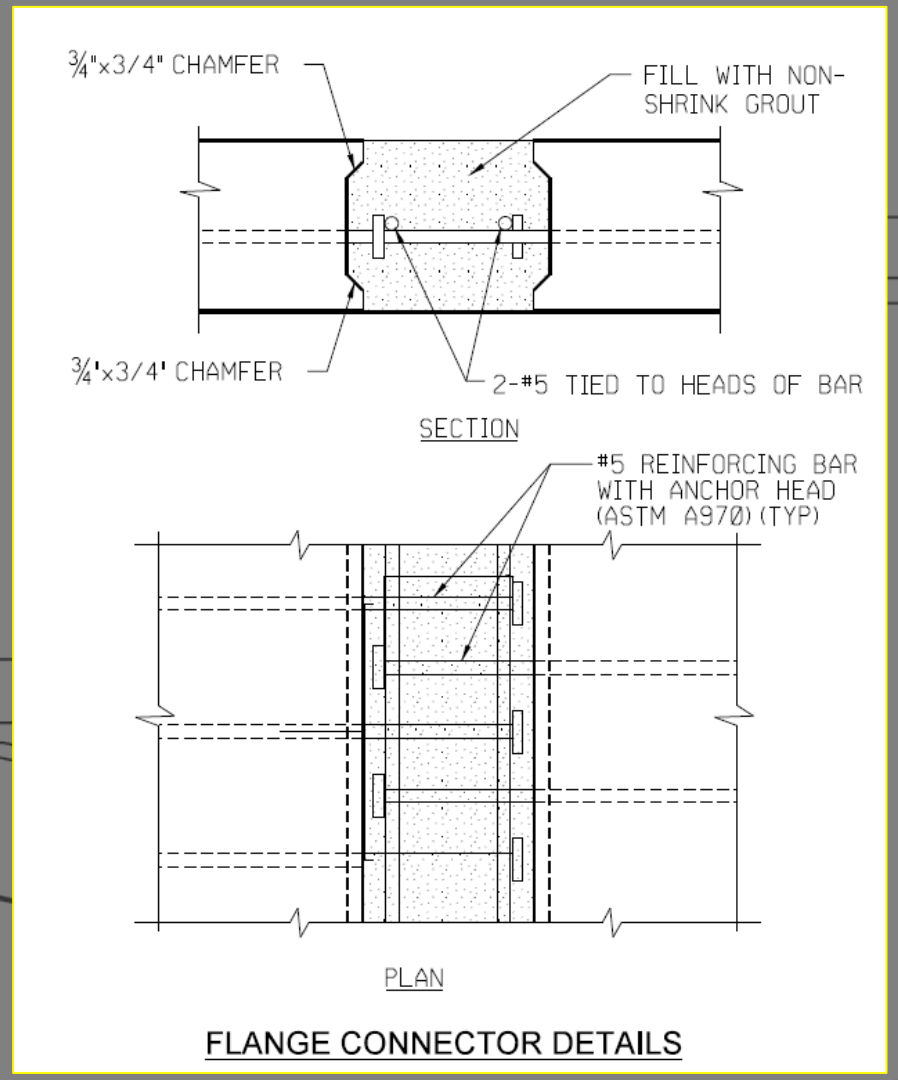
NEXT BEAM - SECTION PROPERTIES

BEAM DESIGNATION	BEAM WIDTH INCHES	BEAM DEPTH INCHES	BASE STEM WIDTH INCHES	AREA IN²	I IN⁴	Yb INCHES	Y† INCHES	S† IN³	Sb IN³	WEIGHT PLF
	A	B	C			D	E			
MINIMUM WIDTH BEAMS										
NEXT 40 D	96.00	40.00	13.00	1666	238059	25.47	14.54	16378	9348	1735
NEXT 36 D	96.00	36.00	13.25	1562	176674	23.03	12.97	13624	7671	1627
NEXT 32 D	96.00	32.00	13.50	1455	126111	20.57	11.43	11033	6131	1516
NEXT 28 D	96.00	28.00	13.75	1346	85651	18.06	9.94	8620	4742	1402
MAXIMUM WIDTH BEAMS										
NEXT 40 D	120.00	40.00	13.00	1858	258171	26.55	13.45	19201	9722	1935
NEXT 36 D	120.00	36.00	13.25	1754	191453	24.01	11.99	15973	7973	1827
NEXT 32 D	120.00	32.00	13.50	1647	136502	21.44	10.57	12920	6368	1716
NEXT 28 D	120.00	28.00	13.75	1538	92597	18.80	9.20	10069	4924	1602

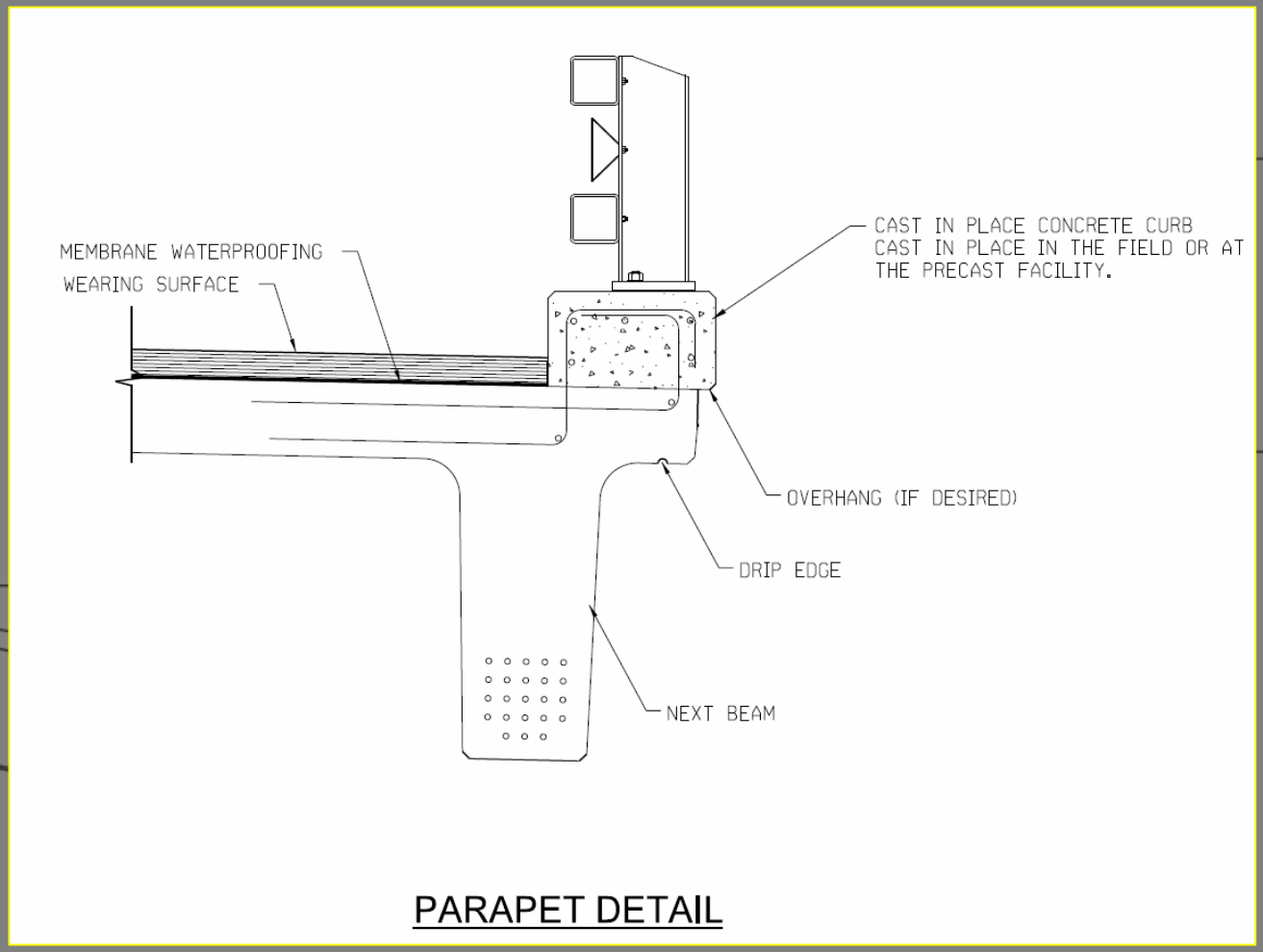
Deck Beam Details



Deck Beam Details



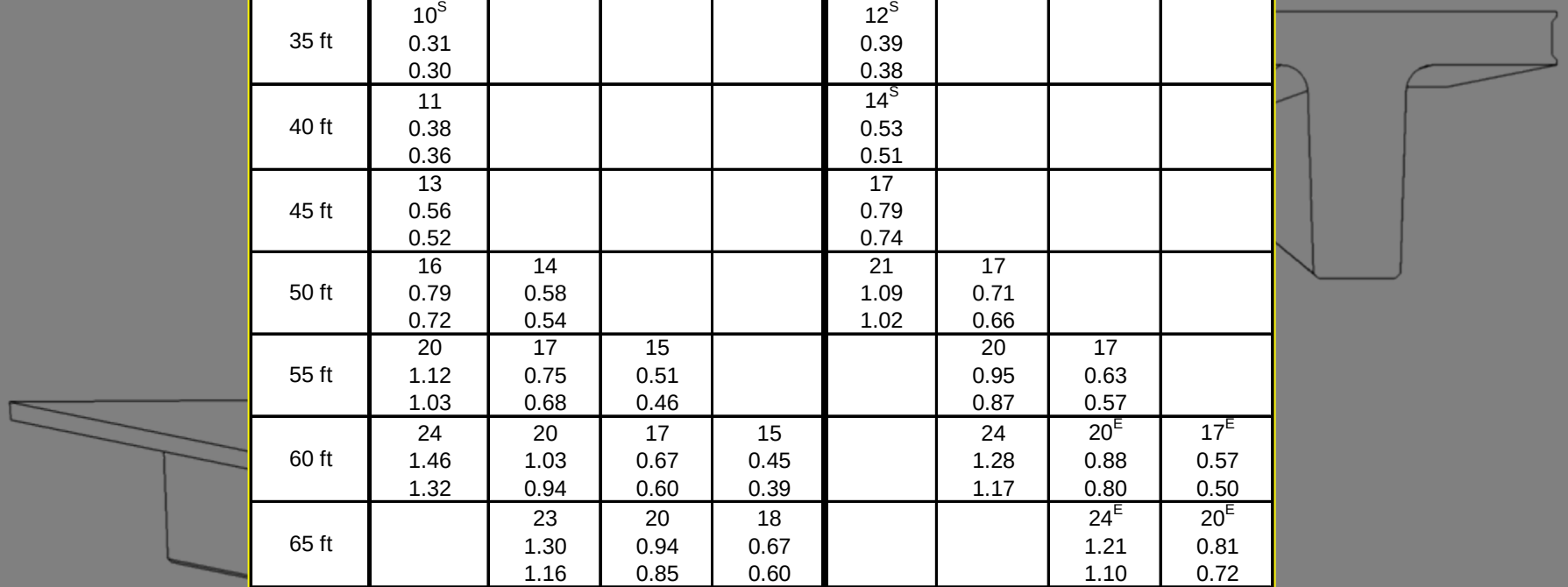
Deck Beam Details



PARAPET DETAIL

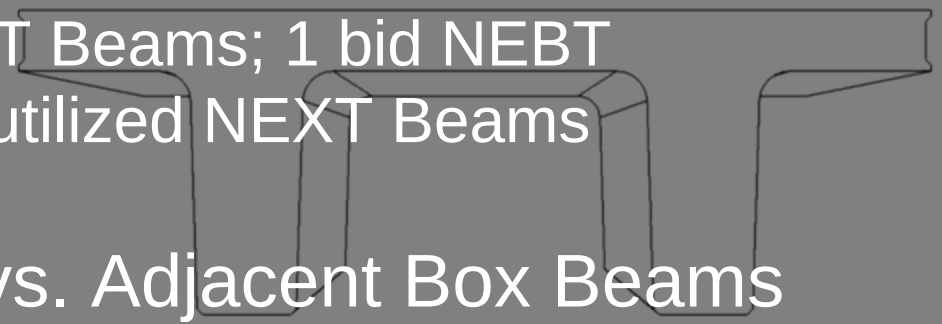
Deck Beam Design

D Beam Design Table 1/2" Dia. Special 270ksi Low-Lax Strand								
Span	D28x8ft	D32x8ft	D36x8ft	D40x8ft	D28x10ft	D32x10ft	D36x10ft	D40x10ft
30 ft	9[S] 0.22 0.21				10[S] 0.26 0.26			
35 ft	10[S] 0.31 0.30				12[S] 0.39 0.38			
40 ft	11 0.38 0.36				14[S] 0.53 0.51			
45 ft	13 0.56 0.52				17 0.79 0.74			
50 ft	16 0.79 0.72	14 0.58 0.54			21 1.09 1.02	17 0.71 0.66		
55 ft	20 1.12 1.03	17 0.75 0.68	15 0.51 0.46			20 0.95 0.87	17 0.63 0.57	
60 ft	24 1.46 1.32	20 1.03 0.94	17 0.67 0.60	15 0.45 0.39		24 1.28 1.17	20[E] 0.88 0.80	17[E] 0.57 0.50
65 ft		23 1.30 1.16	20 0.94 0.85	18 0.67 0.60			24[E] 1.21 1.10	20[E] 0.81 0.72
70 ft			23 1.20 1.06	20 0.85 0.74				24[E] 1.12 1.01
75 ft				24 1.18 1.05				



Cost Comparisons

- Bid Results from ME New Bridge
  - Two P/S Options in CDs—NEXT Beam, NEBT
  - 4 of 5 Bidders bid NEXT Beams; 1 bid NEBT
  - Low and Awarded Bid utilized NEXT Beams

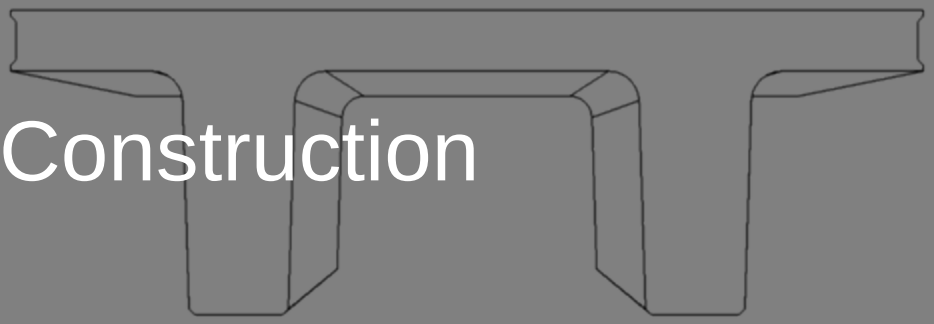


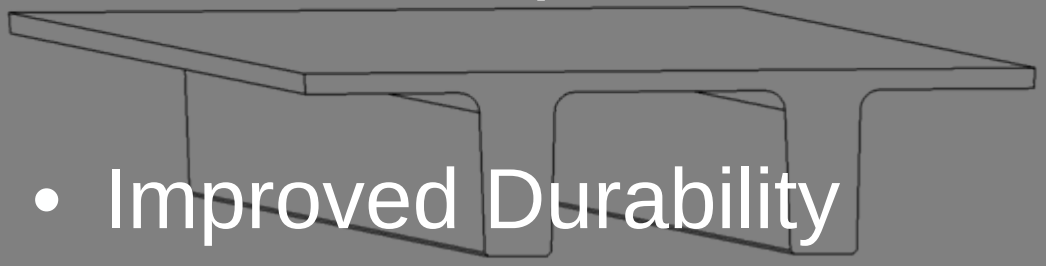
- Project Cost Savings vs. Adjacent Box Beams
  - Fabrication, Delivery, Erection Costs (Fewer Beams)

- Project Cost Savings vs. Spread Box Beams
  - Fabrication, Delivery, Erection Costs (Site Formwork)
  - Added Safety of inherent work platform

NEXT Beam Advantages

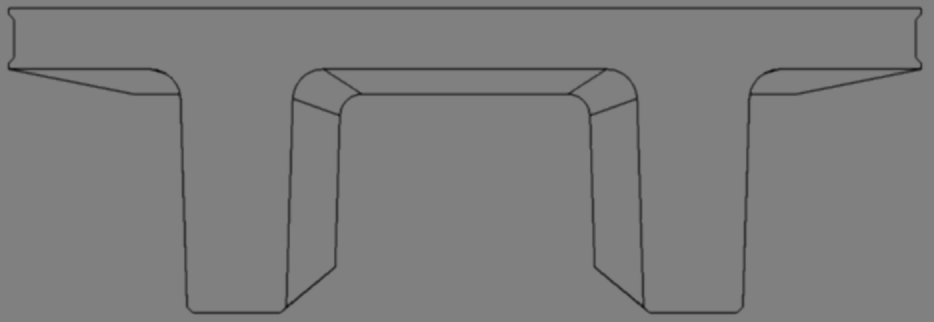
- Cost Savings
- Accelerated Bridge Construction
- Ease of Inspection
- Improved Durability



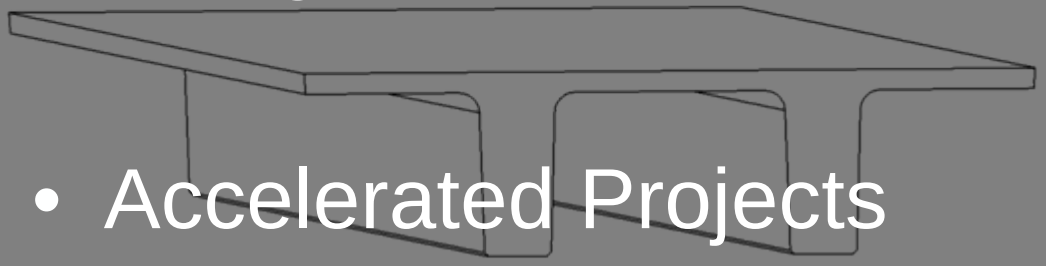


Opportunities with the Next Beam

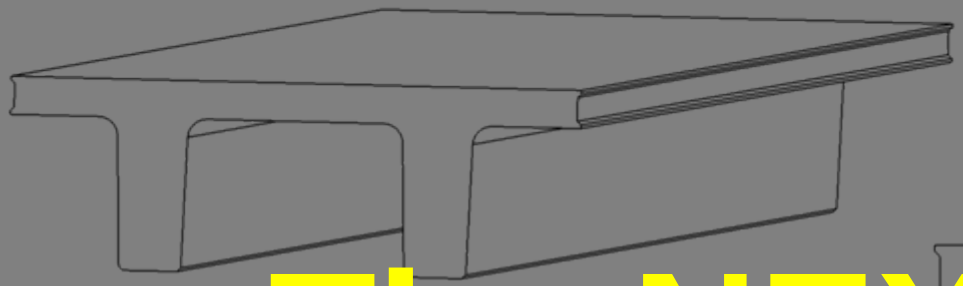
- Value-Engineering or Alternate Design



- Design-Build
- Design-Bid-Build



- Accelerated Projects



The NEXT Beam

Contact Rich Truxel, Sales Manager
717.207.4303 or RTruxel@high.net