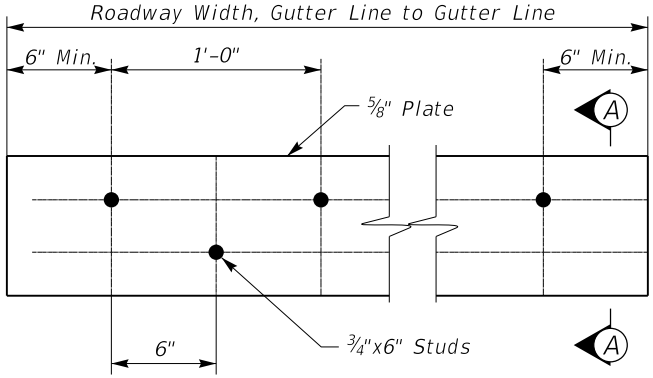
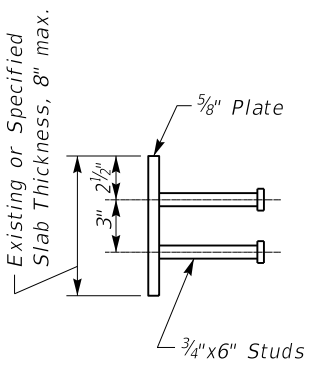
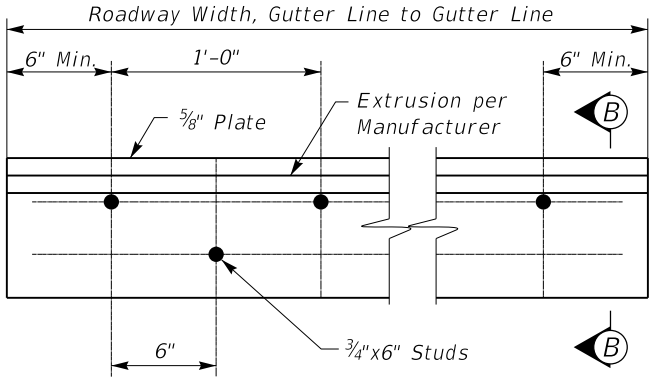


ARMORED EDGE

(For 1"–3" Expansion Dams and Bridge End)

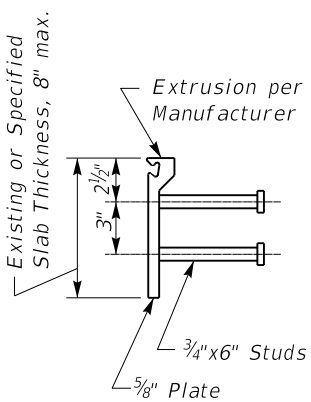


SECTION A-A

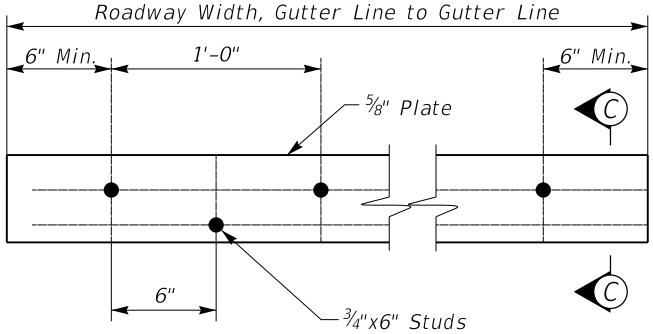


ARMORED EDGE

(For 4" & 5" Expansion Dams)

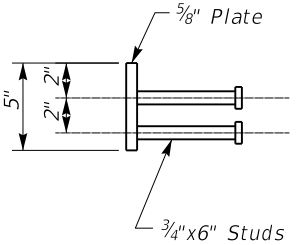


SECTION B-B



ARMORED EDGE

(For 5" Composite Box Beam Slab Ends)



SECTION C-C

General Notes

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

WELDING SPECIFICATIONS: *Ensure techniques and welding procedure comply with current joint specification ANSI/AASHTO/AWS D1.5 Bridge Welding Code.*

MATERIALS:

A. *Structural Steel. Use new, commercial grade steel suitable for welding. The Engineer will base acceptance on visual inspection.*

B. *Stud Anchors. The armored edge stud anchors are 3/4" embedded stud shear connectors conforming to ASTM A108, Grade 1015.*

LOCATION: *Locate armored edges and/or expansion dams in accordance with detail plans, proposals and applicable Standard Drawings.*

PAINT: *Clean and paint all structural steel in accordance with the with the requirement of Section 607, except that surfaces to come in contact wiht concrete are not to be painted and no field coating will be required.*

SHOP DRAWINGS: *Contrary to the Specifications, no shop plans are required.*

PLACEMENT: *Fabricate and place new armored edges to match original or new grade.*

STAGE CONSTRUCTION: *If installation of armored edges in two or more stages is necessary. Join the armored edges at or near the centerline of the roadway or lane line, field weld and grind smooth.*

BASIS OF PAYMENT:

A. *ARMORED EDGE AT END OF BRIDGE: Payment at the contract unit price bid for Amored Edge for Concrete shall be full compensation for furnishing and installing the armored edge as specified. Measurement shall be in linear feet from gutter line to gutter line with concrete barrier or curb type railing or existing parapet applications and from fascia to fascia of slab for metal or guardrail type railing systems and no curb.*

B. *ARMORED EDGE AT EXPANSION JOINTS: Payment for armored edge at expansion joints shall be included in the unit price bid for the specified application and joint size.*

KENTUCKY
DEPARTMENT OF HIGHWAYS

ARMORED EDGES

STANDARD DRAWING NO. BJE-001-14

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

General Notes

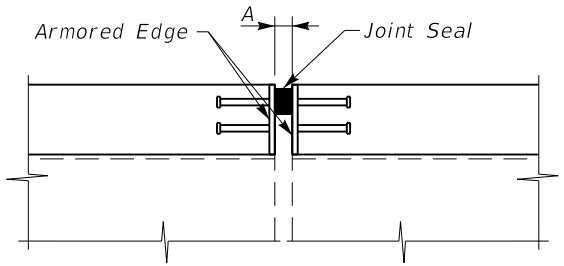
SPECIFICATIONS: *All references to the Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications.*

LOCATION: *Locate armored edges and/or expansion dams in accordance with detail plans.*

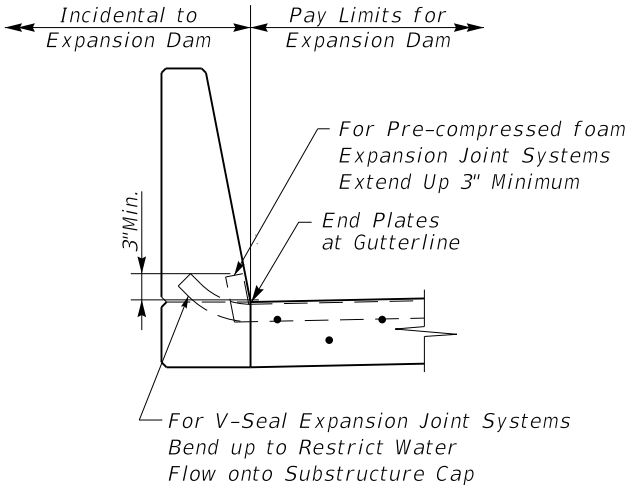
SHOP DRAWINGS: *Contrary to the Specifications, no shop plans are required.*

BASIS OF PAYMENT: *Payment at the contract unit price bid for Expansion Joint (specified size) shall be full compensation for finishing and installing expansion joint as specified. Measurement shall be in lineal feet from gutter line to gutter line.*

Note: For Details of Armored Edge
See STD DWG BJE-001 (C.E.)



SECTION THROUGH JOINT



SECTION THROUGH BARRIER

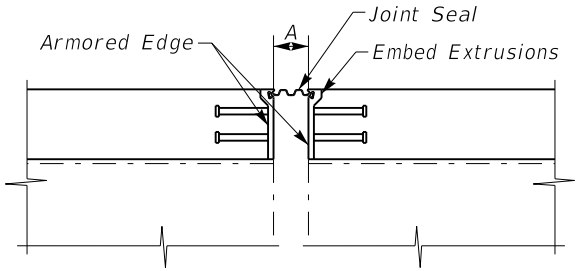
EXPANSION JOINT 1"-3"

Joint Data
Dim. A Maximum Opening
1"
1½"
2"
2½"
3"
4"
5"

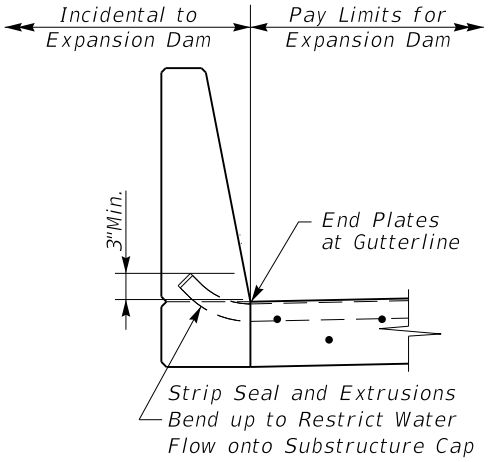
The joint seal supplied must accommodate the required movement shown. Set Dimension A with temperature change increment and as required by the manufacturer to obtain the required movement.

Temperature Change Increment per 10°F			
Concrete		Steel	
Expansion Length (ft)	Increment (in)	Expansion Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	1/8	101 - 140	3/32
201 - 260	5/32	141 - 180	1/8
261 - 320	7/32	181 - 220	5/32
321 - 380	1/4	221 - 260	3/16
381 - 440	5/16	261 - 300	7/32
		301 - 340	1/4

Note: For Details of Armored Edge
See STD DWG BJE-001 (C.E.)



SECTION THROUGH JOINT



SECTION THROUGH BARRIER

EXPANSION JOINT 4" & 5"

KENTUCKY
DEPARTMENT OF HIGHWAYS

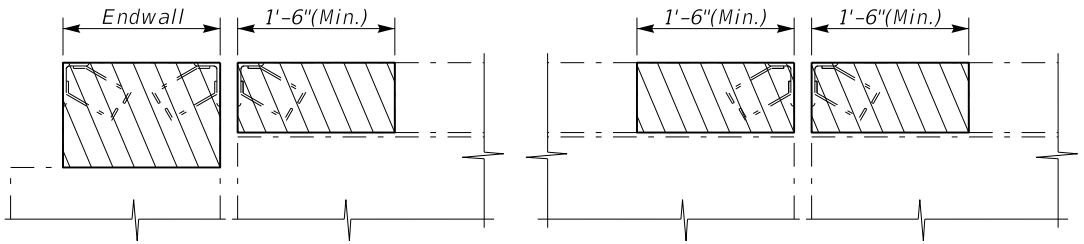
EXPANSION JOINTS

STANDARD DRAWING NO. BJE-002

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 02-26-20 DATE

Note: Remove X-Hatched Areas of Concrete & Expansion Device.

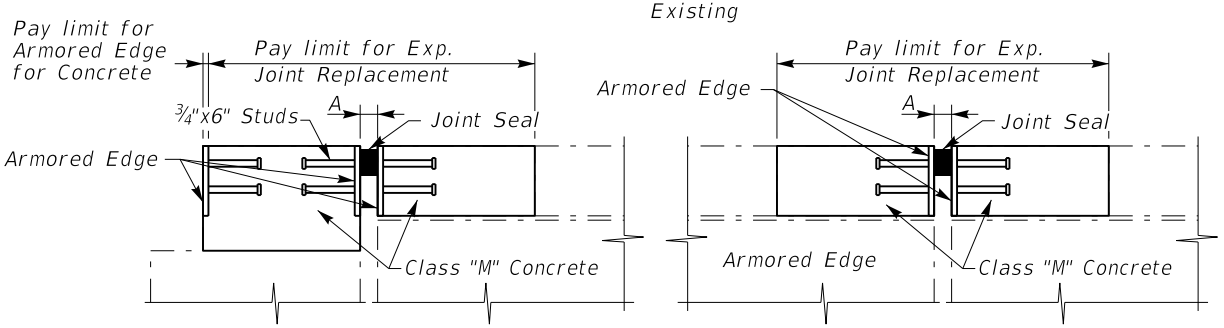


@ End Bents or Abutments @ Piers or Bents

SECTION THROUGH JOINT

Existing

Joint Data	The joint seal supplied must accommodate the required movement shown. Set Dimension A with temperature change increment and as required by the manufacturer to obtain the required movement.
Dim. A Maximum Opening	
1"	
1½"	
2"	
2½"	
3"	



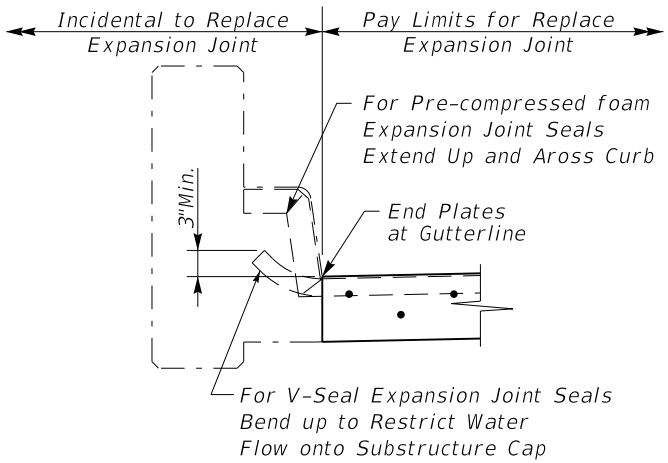
@ End Bents or Abutments @ Piers or Bents

SECTION THROUGH JOINT

Proposed

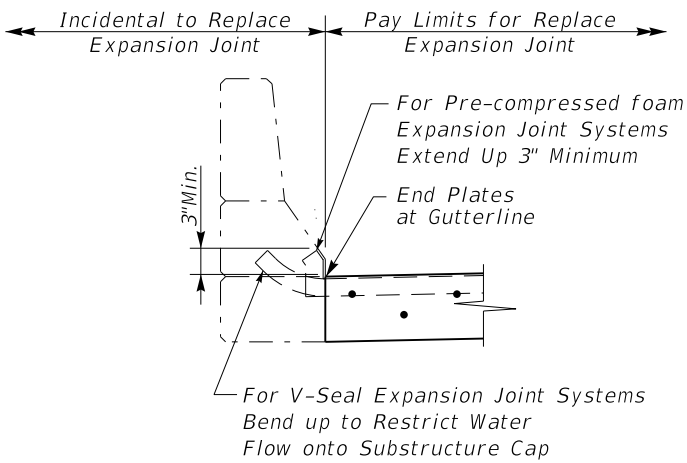
Note: For Details of Armored Edge See STD DWG BJE-001 (C.E.)

Temperature Change Increment per 10°F			
Concrete		Steel	
Expansion Length (ft)	Increment (in)	Expansion Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	1/8	101 - 140	3/32
201 - 260	5/32	141 - 180	1/8
261 - 320	7/32	181 - 220	5/32
321 - 380	1/4	221 - 260	3/16
381 - 440	5/16	261 - 300	7/32
		301 - 340	1/4



SECTION THROUGH PAPAPET

(Typ. for Plinth Walls)



SECTION THROUGH PARAPET

(Typ. for Barrier Walls)

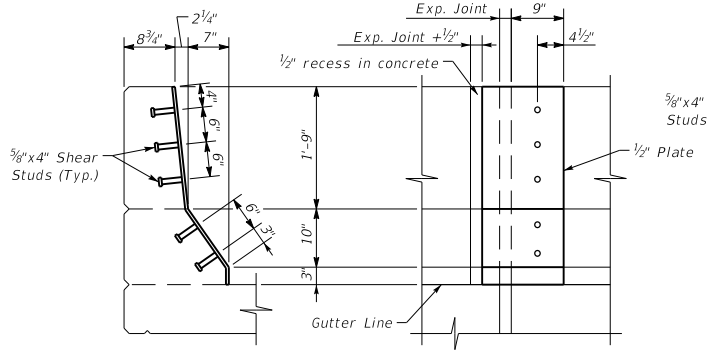
KENTUCKY DEPARTMENT OF HIGHWAYS

EXPANSION JOINT REPLACEMENT 1"-3"

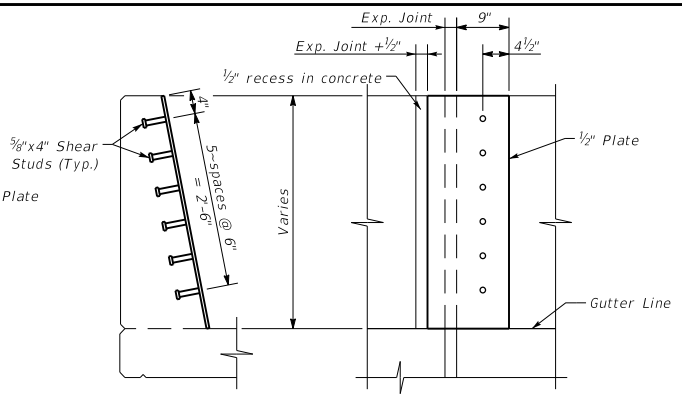
STANDARD DRAWING NO. BJE-003

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

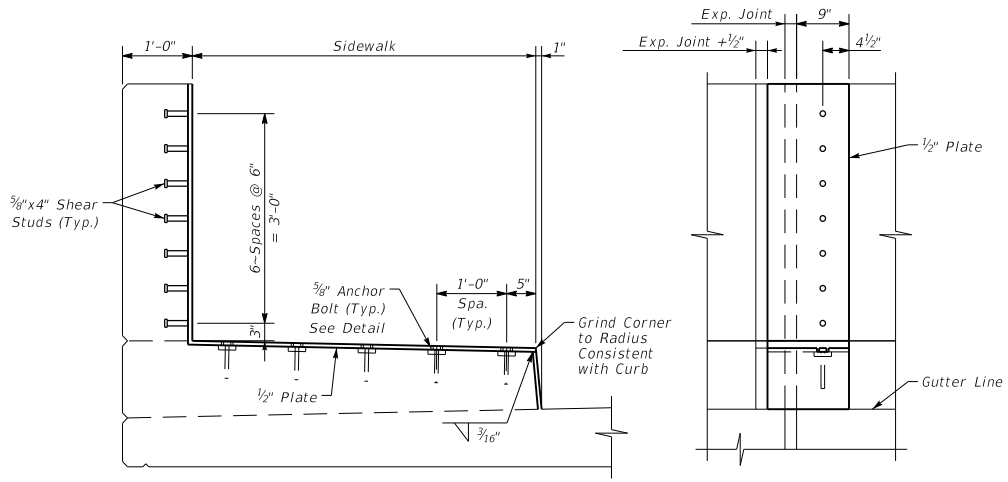
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER DATE



TYPE 3 SLIDE PLATE



SINGLE SLOPE SLIDE PLATE



SIDEWALK SLIDE PLATE

General Notes

SPECIFICATIONS: *All references to the Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. All references to the AASHTO Specifications are to the current edition of the AASHTO Standard Specifications for Highway Bridges.*

MATERIAL SPECIFICATIONS: *Steel material shall be new, M270 GR50 steel suitable for welding. Shop drawings will be required for the assembly. Anchor studconnectors shall conform to ASTM A108, Grade 1015. Acceptance will be based onvisual inspection by the Engineer. Joint sealing material, only, is in accordance with Section 807 of the Specifications. Ensure stud shear connectors conform toASTM A108, Grade 1015. All structural steel shall be galvanized in accordance with ASTM A123.*

WELDING SPECIFICATIONS: *Ensure techniques and welding procedure comply with current joint specification ANSI/AASHTO/AWS D1.5 Bridge Welding Code.*

BASIS OF PAYMENT: *The cost of furnishing and placing the Expansion Joint and all plates, hardware and materials as shown in these assembly details shall beincluded in the contract unit price per linear foot, measured along centerline of joint between the ends of the trough. Joint assembly shall conform to theroadway grade and cross slope or 2% with parabolic crown.*

ANCHOR BOLT DETAIL

KENTUCKY
DEPARTMENT OF HIGHWAYS

EXPANSION JOINT COVER PLATE DETAILS

STANDARD DRAWING NO. BJE-004

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

General Notes ~ Expansion Joint Replacement

SPECIFICATIONS: All references to the Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications.

MATERIALS.

A. Class "M" Concrete. Use either "M1" or "M2". See Section 601.
B. Steel Reinforcement. Use Grade 60. See Section 602.
C. Epoxy Bond Coat. See Section 511.
D. Joint Seal System. Use a joint seal system for the specified width in accordance with section 807.

EQUIPMENT.

A. See Section 606.

CONSTRUCTION.

A. Remove Existing Materials. Remove existing Expansion Dam, Bridge End, Remove debris and/or expansion joint filler as directed by the Engineer. Clean and leave all existing steel reinforcement encountered in place. Damaged steel reinforcement will be repaired as directed by the Engineer at no additional cost to the Department. Dispose of all removed material entirely away from the job site.

B. Place New Concrete and Armored Edges. After all specified existing materials have been removed, place new armored edges to match the grade of the proposed overlay or to match the original grade. Place the new Class "M" concrete to the scarified grade and finish to receive the new overlay or place the new Class "M" concrete to the original grade and finish with broom strokes drawn transversely from curb to curb. All new structural steel shall be cleaned and painted in accordance with requirements of Section 607.03.23, except that surfaces to come in contact with concrete are not to be painted and no field coating will be required. Blast clean all areas of existing concrete and structural steel to come in contact with new concrete until free of all laitance and deleterious substances immediately prior to the placement of the Class "M" Concrete. The surface areas of existing concrete to come in contact with the new Class "M" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible.

C. Additional Epoxy Coated Steel Reinforcement. Furnish for replacement, as directed by the Engineer, 200 linear feet of #4 steel reinforcing bars in 20' lengths. Place these bars in areas deemed by the Engineer to require additional reinforcement. Field cutting and bending is permitted. Do not place any additional steel reinforcement above the height of the top row of studs on the armored edges. Ensure that all exposed steel reinforcement is tied in accordance with Section 602. prior to pouring the new Class "M" Concrete. Deliver unused bars as directed by the Engineer.

D. Stage Construction. Installation of concrete and armored edges in two (or more if specified) stages is necessary. Join the armored edges at or near the centerline of the roadway or lane line, field weld and grind smooth.

E. Pre-Compressed Foam Expansion Joint Systems. System shall be supplied in pre-compressed sticks for easy installation. System shall be installed in accordance with manufacture's recommendations concerning approved adhesives, welds between sticks, appurtenances, and adhesion to concrete or armored edges and section 609.

CONSTRUCTION. (Continued)

F. Preformed Neoprene Strip Seals and V Seals. Place the seals in one continuous, unbroken length. Place neoprene strip seals as recommended by the manufacturer and in accordance with Section 609.

G. Approach Pavement Repair. If no bridge overlay approach is specified the Contractor shall repair any and all damage to the approach pavement due to this construction. A new asphalt surface wedge up to three feet long and the width of the bridge deck shall be placed and compacted to the satisfaction of the Engineer prior to allowing traffic back onto the structure after each section of the joint is replaced. No additional payment will be allowed for this work, as it will be considered incidental to the pay item "Armored Edge for Concrete".

H. Verifying Field Conditions. The Contractor shall field verify all dimensions before ordering any material. New material that is unsuitable due to variation in existing structure shall be replaced at the Contractors expense.

I. Damage to the Structure. The Contractor shall bear all responsibility and expense for any and all damage to the structure during the repair work even to removal and replacement of a fallen span, should the fallen span result from the Contractor's actions.

J. Shop Plans. Shop plans will not be required. The Contractor is responsible for obtaining field measurements and supplying properly sized materials to complete the work.

MEASUREMENT.

A. Expansion Joint Replace - 1", ½", 2", 2½", 3", 4" & 5" The Department will measure the quantity in linear feet from gutter line to gutter line along the centerline of the joint.
B. Armored Edge for Concrete. The Department will measure the quantity in linear feet from gutter line to gutter line along the centerline of the joint.
C. Steel Reinforcement. The Department will measure the quantity in LBS.

PAYMENT:

A. Expansion Joint Replace - 1", 1½", 2" 2 ½", 3", 4" & 5". Payment at the contract unit price per linear foot shall be full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete, seal, and all incidental items necessary to complete the work within the specified pay limits.

B. Armored Edge for Concrete. Payment at the contract unit price per linear foot shall be full compensation for furnishing and installing new armored edges at each end of bridge.

C. Steel Reinforcement. See Section 602.

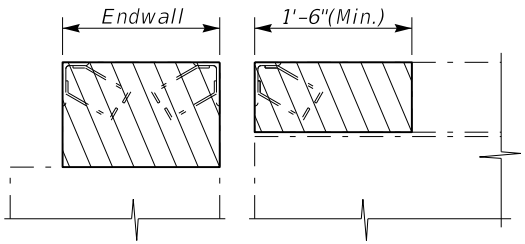
KENTUCKY
DEPARTMENT OF HIGHWAYS

EXPANSION JOINT
REPLACEMENT
GENERAL NOTES

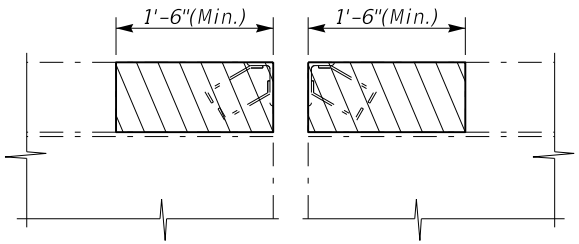
STANDARD DRAWING NO. BJE-005

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



@ End Bents or Abutments



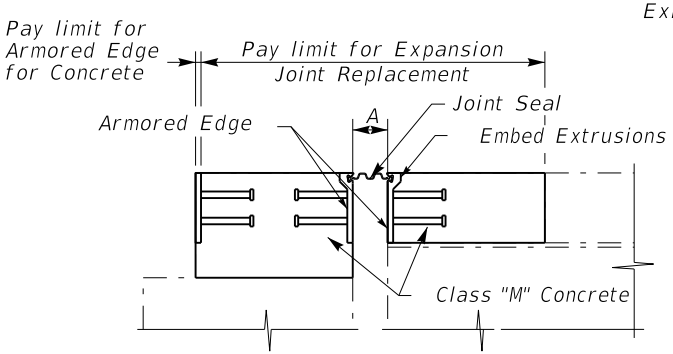
@ Piers or Bents

Note: Remove X-Hatched Areas of Concrete & Expansion Device.

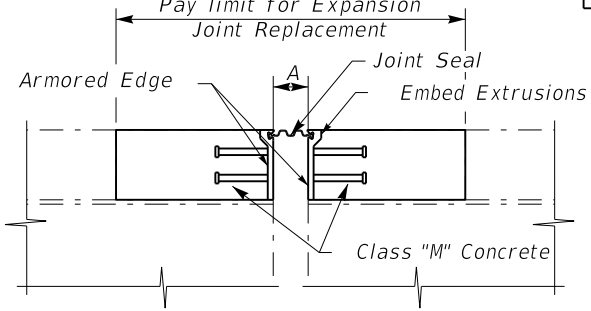
SECTION THROUGH JOINT

Existing

Joint Data	The joint seal supplied must accommodate the required movement shown. Set Dimension A with temperature change increment and as required by the manufacturer to obtain the required movement.
Dim. A Maximum Opening	
4"	
5"	



@ End Bents or Abutments



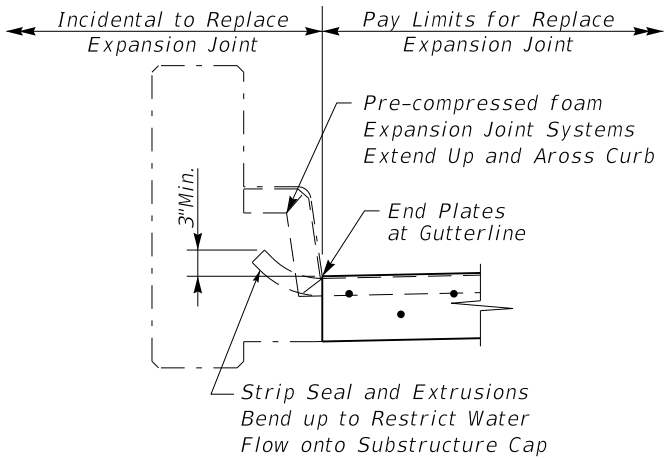
@ Piers or Bents

Temperature Change Increment per 10°F			
Concrete		Steel	
Expansion Length (ft)	Increment (in)	Expansion Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	1/8	101 - 140	3/32
201 - 260	5/32	141 - 180	1/8
261 - 320	7/32	181 - 220	5/32
321 - 380	1/4	221 - 260	3/16
381 - 440	5/16	261 - 300	7/32
		301 - 340	1/4

SECTION THROUGH JOINT

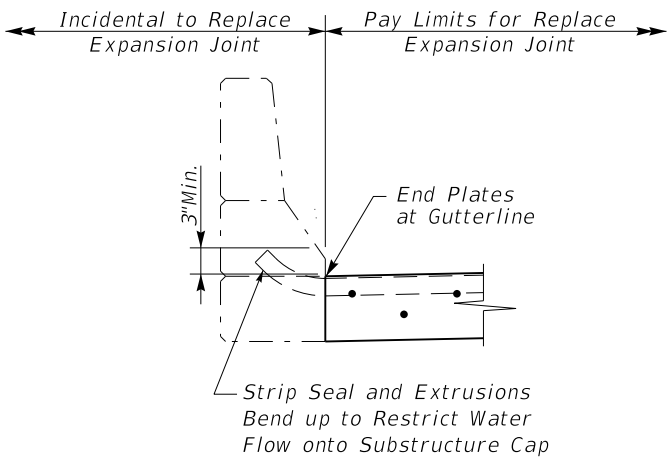
Proposed

Note: For Details of Armored Edge See STD DWG BJE-001 (C.E.)



SECTION THROUGH PAPAPET

(Typ. for Plinth Walls)



SECTION THROUGH PARAPET

(Typ. for Barrier Walls)

KENTUCKY
DEPARTMENT OF HIGHWAYS

EXPANSION JOINT
REPLACEMENT
4" & 5"

STANDARD DRAWING NO. BJE-006

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE