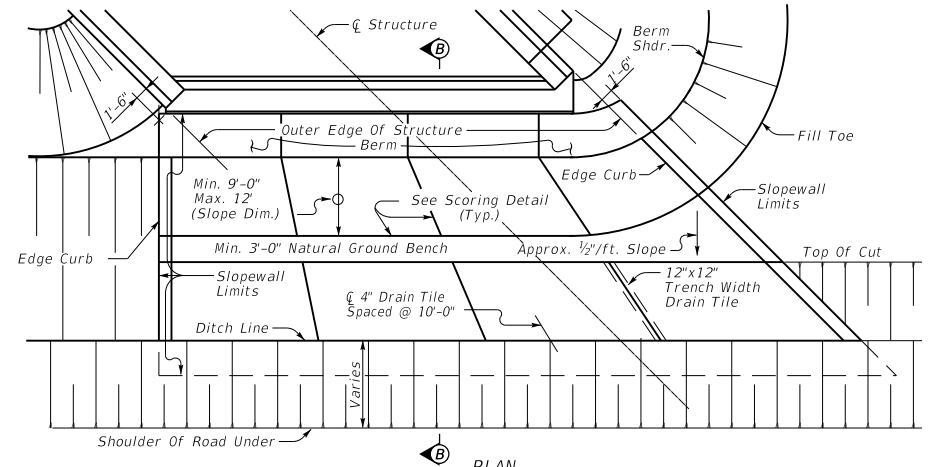


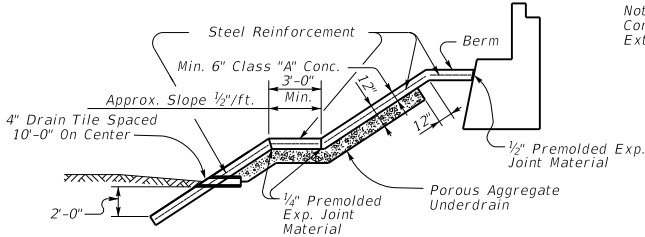
PLAN

**ROUTE UNDER ON FILL WITH ROUTE OVER ON FILL
ROUTE UNDER AT GRADE WITH ROUTE OVER ON FILL**



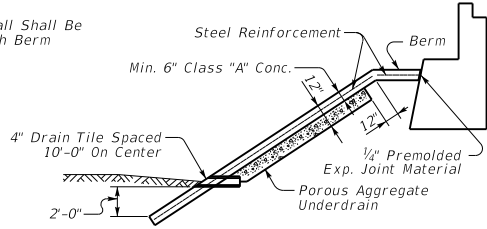
PLAN

**ROUTE UNDER IN EARTH CUT
ROUTE OVER ON FILL**

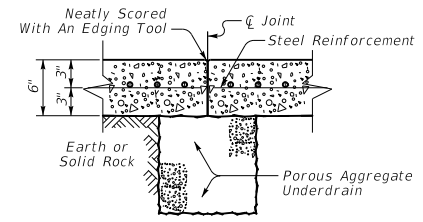


SECTION B-B

Note:
Concrete Slope Wall Shall Be
Extended Through Berm

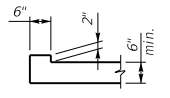


SECTION A-A



CONSTRUCTION JOINT DETAIL

CONSTRUCTION JOINTS REQUIRED AT 21'-0" CENTERS ALONG SLOPEWALL
CONSTRUCTION JOINTS PERMISSIVE AT SCORING DETAILS



SECTION D-D
Edge Curb

GENERAL NOTES

SPECIFICATIONS: Slope wall is to be constructed according to details shown and to Section 703 of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

INCIDENTALS: Include the cost of steel reinforcement, drain tile, preformed expansion joint material, aggregate, excavation, and all labor and materials required to complete the work in accordance with the plans and Specifications in the price for 6" Concrete Slope wall.

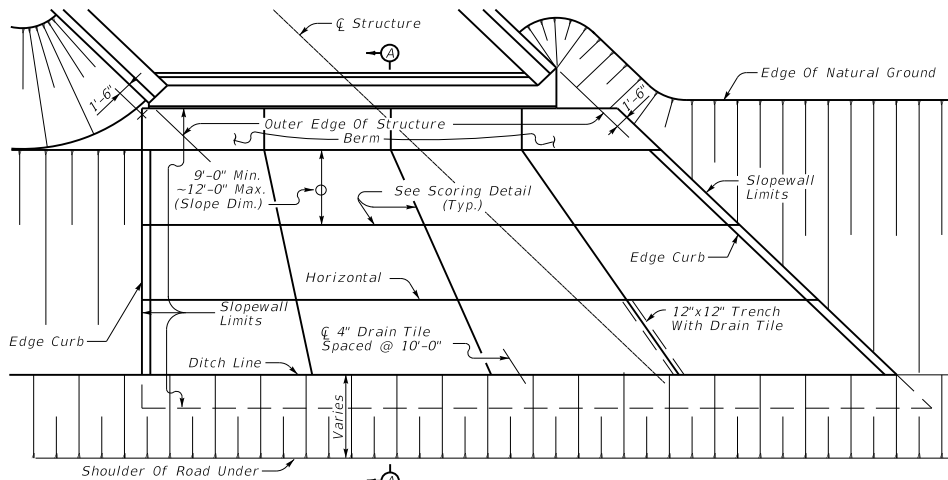
SKEW: A 45° Skew is detailed on this sheet. Details for other skews are similar.

ROCK EXCAVATION: Excavate the rock to plan depth and slope as near as possible to reduce the quantity of Concrete, Class "A" required to maintain a minimum slope wall thickness. Include the cost of additional concrete required to fill voids in the rock and maintain the slope wall thickness in the bid for 6" Concrete Slope wall.

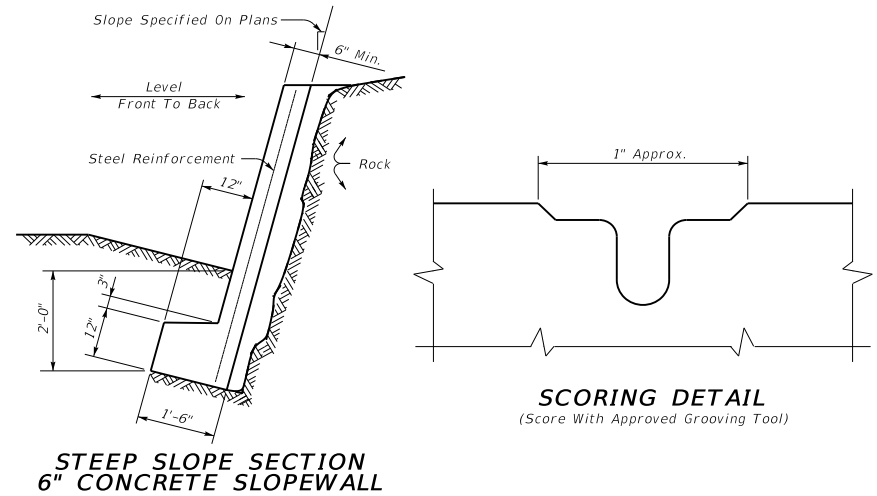
SLOPEWALL REINFORCEMENT: Use No. 4 bars at 18" centers in each direction or an equivalent area of welded deformed steel fabric to reinforce the slope wall.

Work This Drawing With Drawing No. BGX-005.c.e.

KENTUCKY DEPARTMENT OF HIGHWAYS		
CONCRETE SLOPE WALLS FOR GRADE SEPERATION BRIDGES		
STANDARD DRAWING NO. BGX-004-09		
SUBMITTED	<i>B. J. Adams</i> DIRECTOR DIVISION OF STRUCTURAL DESIGN	02-26-20 DATE
APPROVED	<i>[Signature]</i> STATE REGISTERED ENGINEER	02-26-20 DATE

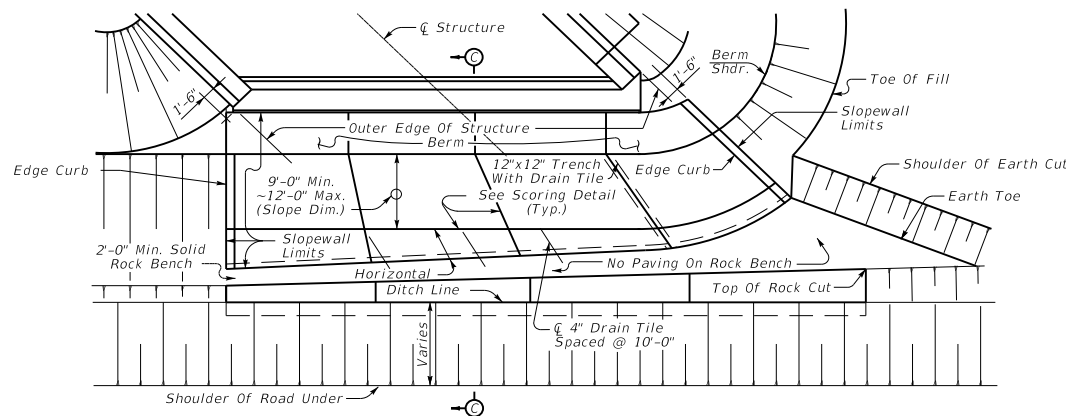


PLAN
ROUTE UNDER IN FULL EARTH CUT

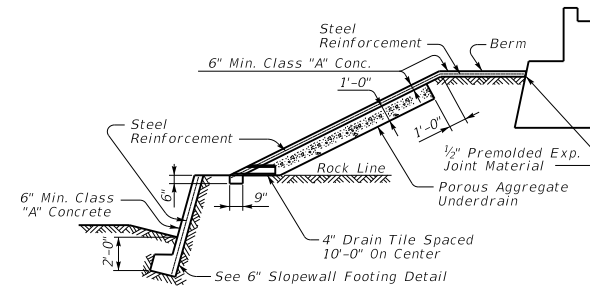


STEEP SLOPE SECTION
6" CONCRETE SLOPE WALL

SCORING DETAIL
(Score With Approved Grooving Tool)



PLAN
ROUTE UNDER IN ROCK CUT AND EARTH CUT
ROUTE OVER ON FILL



SECTION C-C

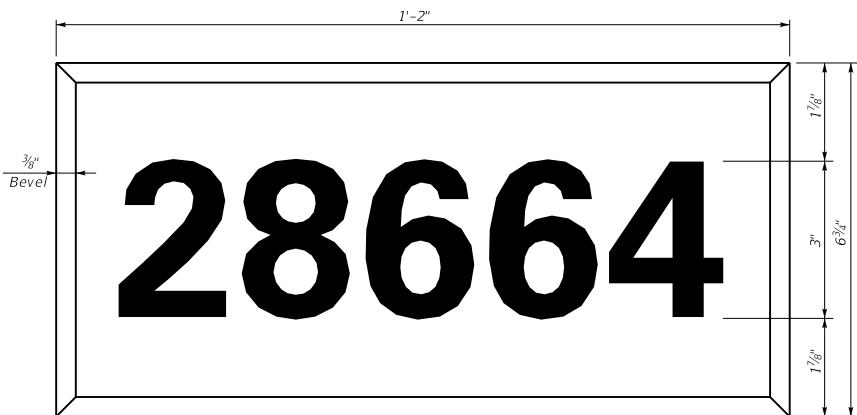
Work This Drawing With Drawing No. BGX-004.c.e.

KENTUCKY
DEPARTMENT OF HIGHWAYS
CONCRETE SLOPE WALLS
FOR GRADE
SEPERATION BRIDGES

STANDARD DRAWING NO. BGX-005-09
SUBMITTED: *Earl A. Johnson* 02-26-20 DATE
DIRECTOR DIVISION OF STRUCTURAL DESIGN
APPROVED: *[Signature]* 02-26-20 DATE
STATE ENGINEER



STENCIL FOR YEAR AND DESIGN LOADING
When year only is used place year in center of plate



STENCIL FOR DRAWING NUMBER

GENERAL NOTES

STENCILS: Fabricate all stencils from recessed panels with beveled edges with raised letters and figures in accordance with Subsection 601.03.19 of the Specifications.

YEAR AND DESIGN LOADING STENCIL: Show the year that the contract is executed and the design load as shown on the contract plans. The design load is required on all structures classified as bridges by Subsection 101.03 of the Specifications and on other structures as referenced on plans.

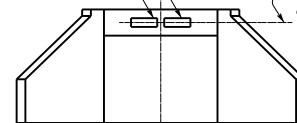
DRAWING NUMBER STENCIL: Use this stencil on all structures. The number to be placed on the stencil shall be taken from the contract plans.

CONTRACTOR STENCIL: Place on all bridges, the name of the prime contractor and subcontractor(s), when applicable, in proximity to other stencils required.

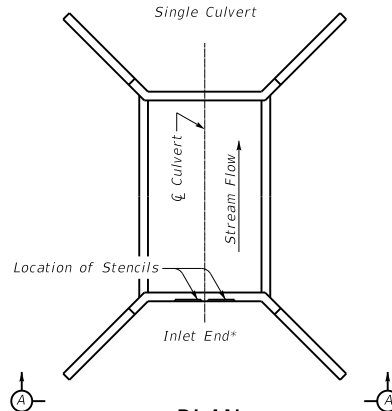


CONTRACTOR STENCIL

Location of Stencils
 ☉ Plate is midpoint of parapet



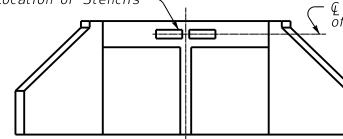
ELEVATION A-A
Single Culvert



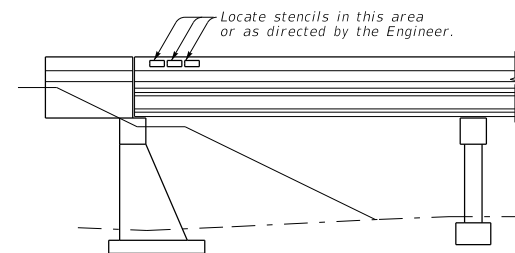
PLAN

Location of Stencils on all Culverts (Single or Multiple) and Arches

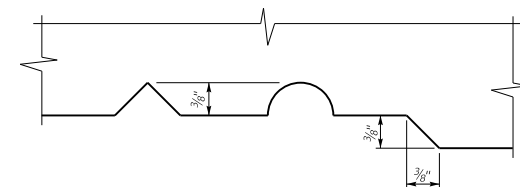
Location of Stencils
 ☉ Plate is midpoint of parapet



ELEVATION A-A
Multiple span Culvert



LOCATION OF STENCILS ON BRIDGES



TYPE OF LETTERS

* Use the outlet end for outlet only extensions

KENTUCKY
DEPARTMENT OF HIGHWAYS

STENCILS
FOR STRUCTURE

STANDARD DRAWING NO. BGX-006-10

SUBMITTED *Bob Adams* DATE 02-26-20

DIRECTOR DIVISION OF STRUCTURAL DESIGN

APPROVED *Bob Adams* DATE 02-26-20

STATE REGISTERED ENGINEER

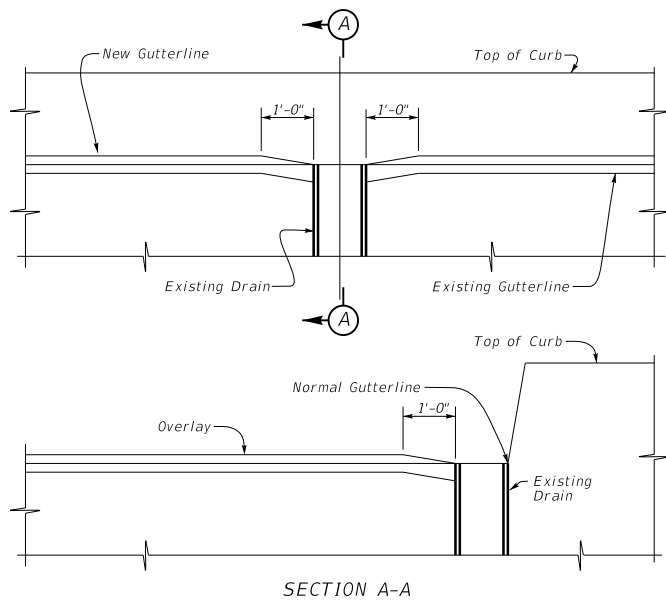


FIGURE NO. 1

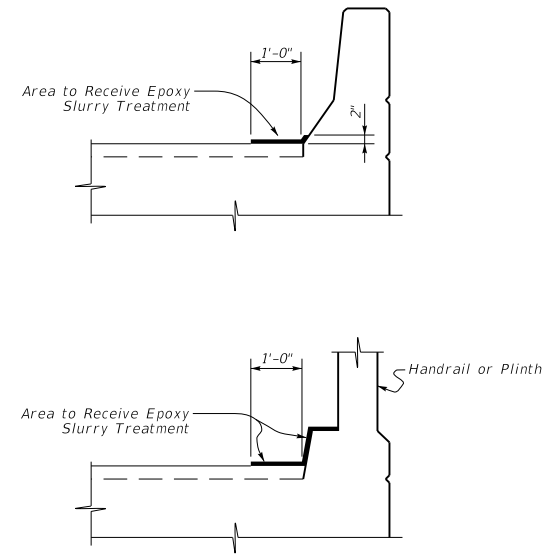


FIGURE NO. 2

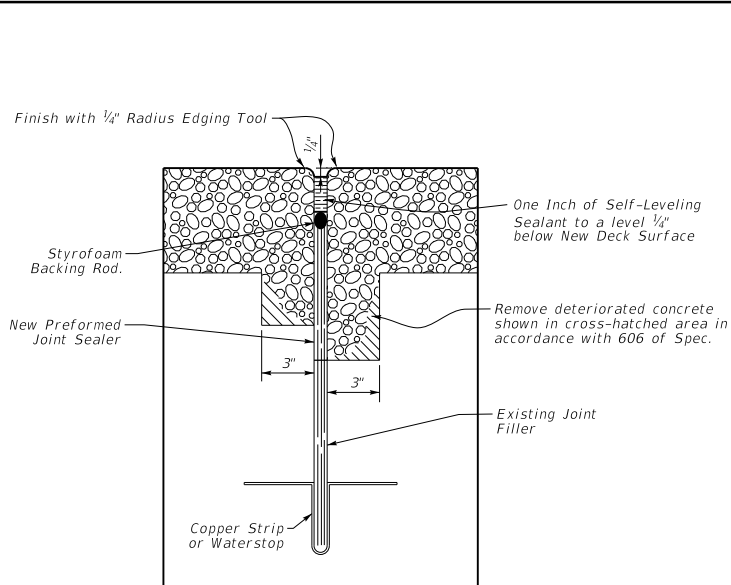
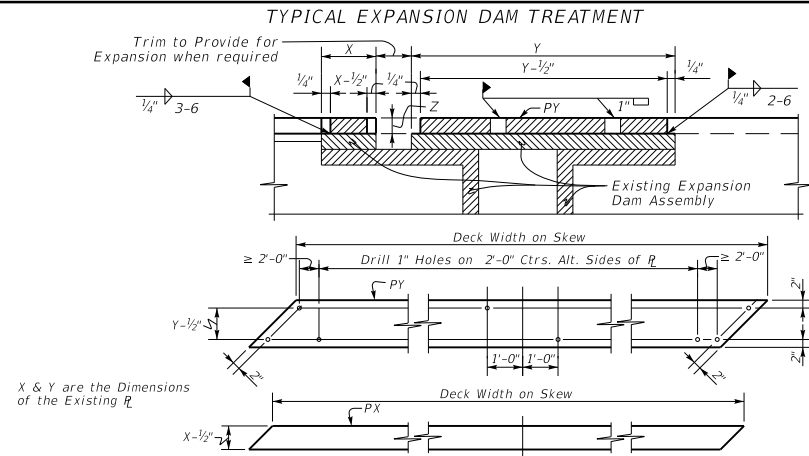


FIGURE NO. 3



Structural Steel weights given are approximate and the Contractor is responsible for all measurements.

Determine dimension Z for thickness of the built-up plates as the minimum specified thickness of overlay minus 1/4".

Steel is to be furnished in 3-foot minimum lengths welded together as directed by the Engineer.

FIGURE NO. 4

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

**BRIDGE RESTORATION
AND WATERPROOFING WITH
CONCRETE OVERLAYS**

STANDARD DRAWING NO. BGX-009-04

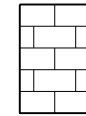
SUBMITTED: *Bob Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED: *[Signature]* 02-26-20
STATE REGISTERED ENGINEER DATE

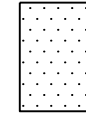
Description of Soil Compactness or Consistency

SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF PENETRATION RESISTANCE	RANGE OF UNCONFINED COMPRESSIVE STRENGTH
Coarse grained soils (More than half of material is larger than No. 200 sieve size.)	Very loose Loose Medium compact Compact Very compact	Less than 4 blows per ft. 4 to 10 10 to 30 30 to 50 Greater than 50	Not applicable
Fine grained soils (More than half of material is smaller than No. 200 sieve size.)	Very soft Soft Medium stiff Stiff Very stiff Hard	Not applicable	Less than 0.25 tsf 0.25 to 0.50 0.50 to 1.0 1.0 to 2.0 2.0 to 4.0 Greater than 4.0

- AI Activity Index
- LI Liquidity Index
- N Penetration Resistance
- S+C(%) Material finer than No. 200 sieve
- Rockline Soundings
- ⊕ Disturbed Sample Boring
- ⊙ Undisturbed Sample Boring
- ⊗ Undisturbed Sample Boring & Rock Core
- Rock Core
- ⊗ Slope Inclinometer Installation
- typical applications: ○ ⊕ ⊙ ⊗ ⊗
- Approximate Footing Elevation



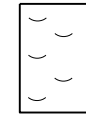
LIMESTONE



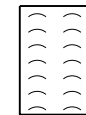
SANDSTONE



COAL



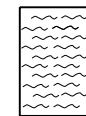
NONDURABLE SHALE (SDI < 90)



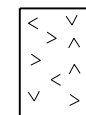
DURABLE SHALE (SDI ≥ 90)



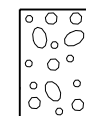
TALUS OR MINE WASTE OR FILL MATERIAL



ROADWAY FILL-GRANULAR EMBANKMENT



STRUCTURE GRANULAR BACKFILL



SLOPE PROTECTION

Unified Soil Classifications

MAJOR DIVISION	SYMBOL	NAME	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well graded sands or gravelly sands, little or no fines.
		SP	Poorly graded sands or gravelly sands, little or no fines.
		SM	Silty sands, sand-silt mixtures.
	SC	Clayey sands, sand-clay mixtures.	
FINE GRAINED SOILS	SILTS AND CLAYS LL IS LESS THAN 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays silty clays, lean clays.
	SILTS AND CLAYS LL IS GREATER THAN 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
UNCLASSIFIED MATERIAL	NONE		Non-classified material (i.e. overburden, pavement, slag, etc.) include visual desc.

- OW 7-Day (or greater) Water Table & Date
- ⊗ Thin-walled Tube Sample
- Standard Penetration Test Sample
- < UU (psi) Unconsolidated, Undrained Triaxial Test
- Qu (psi) Unconfined Compressive Strength
- w (%) Moisture Content
- RQD (%) Rock Quality Designation
- SDI (JS) Slake Durability Index (Jar Slake Test)
- Rec. (%) Core Recovery
- ∅ Angle of Internal Friction
- c (psi) Effective Angle of Internal Friction
- c̄ (psi) Cohesion
- γ Total Unit Weight
- RDZ Rock Disintegration Zone
- OB Overburden Bench
- IB Intermediate Bench
- R Refusal
- NR Refusal Not Encountered
- VS (psi) Field Vane Shear Strength

Relation of RQD and in situ Rock Quality	
RDQ (%)	Rock Quality
90 - 100	Excellent
75 - 90	Good
50 - 75	Fair
25 - 50	Poor
0 - 25	Very Poor

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DEPARTMENT OF HIGHWAYS

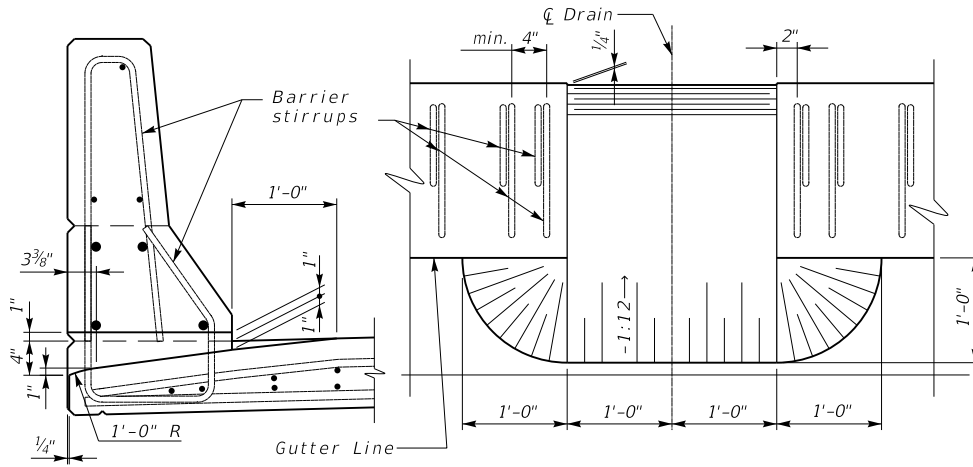
GEOTECHNICAL
LEGEND

STANDARD DRAWING NO. BGX-012-02

SUBMITTED *Boyd Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED *[Signature]* 02-26-20
STATE REGISTERED ENGINEER DATE

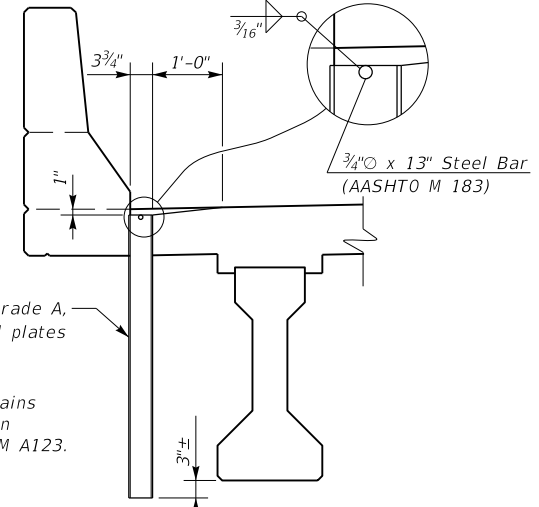
NOTE: Reposition barrier stirrups in manner shown as to not interfere with drain opening.



SECTION THROUGH DRAIN PLAN OF DRAIN (Barrier not in place)

NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain 2 1/2" of concrete cover through the drain. Bend reinforcement approximately 1'-0" from the gutter line. Transverse slab reinforcement adjacent to the opening is not to be bent. Longitudinal reinforcement is not to be tied to the transverse reinforcement adjacent to the drain for a distance sufficient to allow the reinforcement to sag under the bent reinforcement in the drain area.

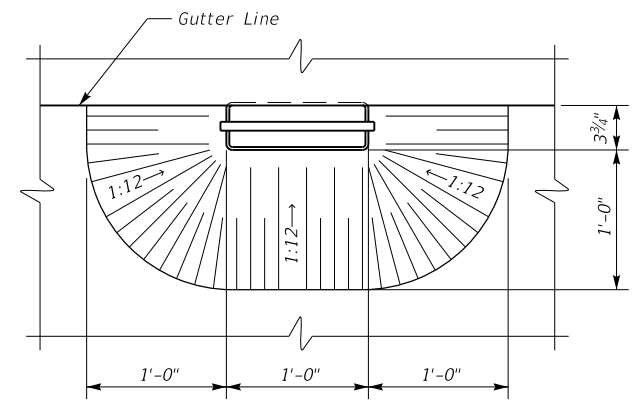
THROUGH BARRIER DRAIN DETAILS



1'-0" x 4" x 1/4" Tubing, Grade A, or 1/4" welded plates

NOTE: Assembled drains shall be galvanized in accordance with ASTM A123.

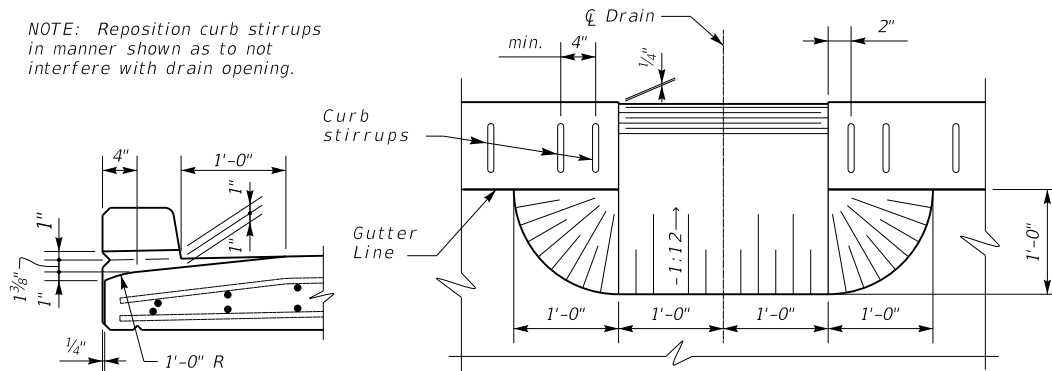
SECTION THROUGH DRAIN



PLAN OF DRAIN

THROUGH DECK DRAIN DETAILS

NOTE: Reposition curb stirrups in manner shown as to not interfere with drain opening.

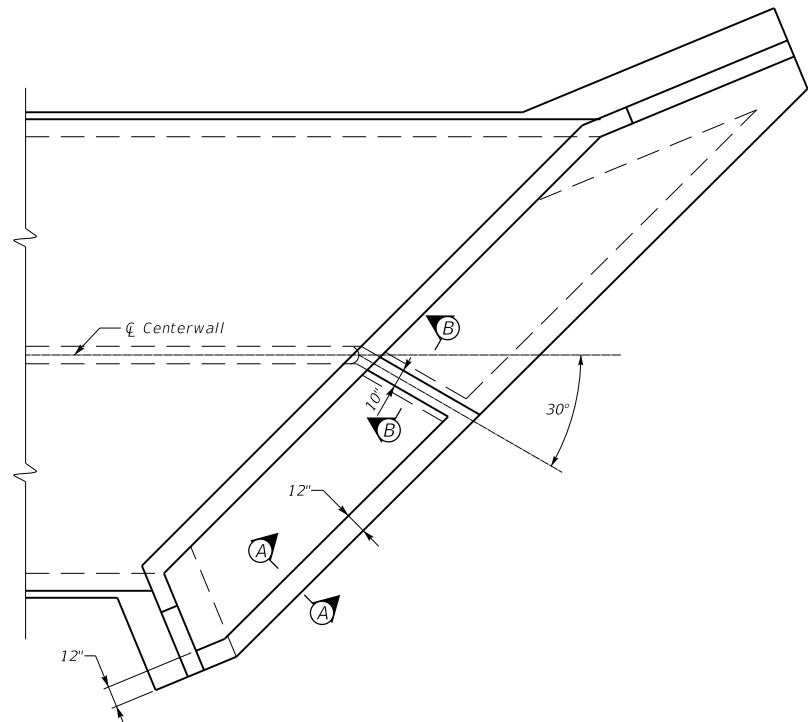


SECTION THROUGH DRAIN PLAN OF DRAIN (Curb not in place)

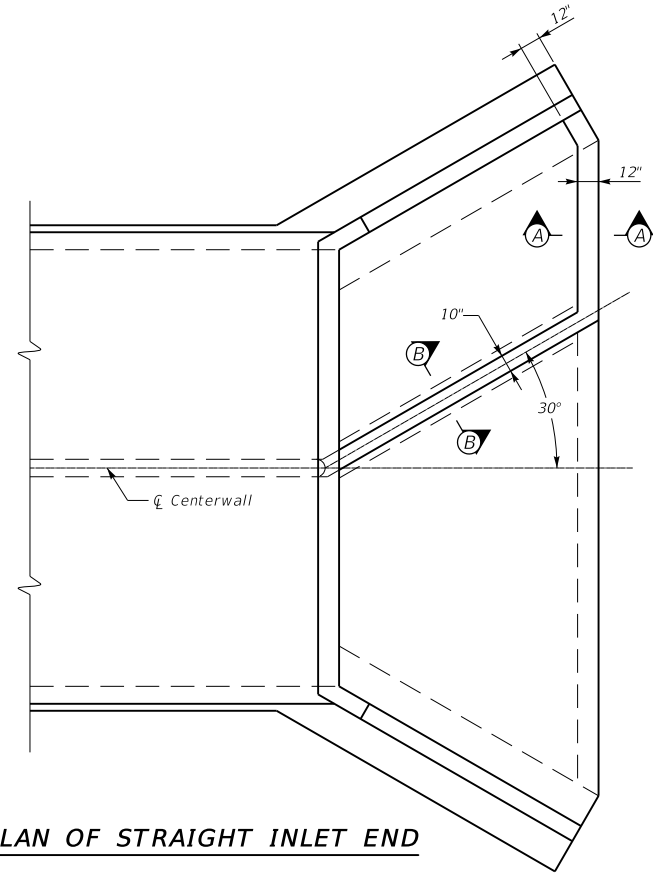
NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain 2 1/2" of concrete cover through the drain. Bend reinforcement approximately 1'-0" from the gutter line. Transverse slab reinforcement adjacent to the opening is not to be bent. Longitudinal reinforcement is not to be tied to the transverse reinforcement adjacent to the drain for a distance sufficient to allow the reinforcement to sag under the bent reinforcement in the drain area.

THROUGH CURB DRAIN DETAILS

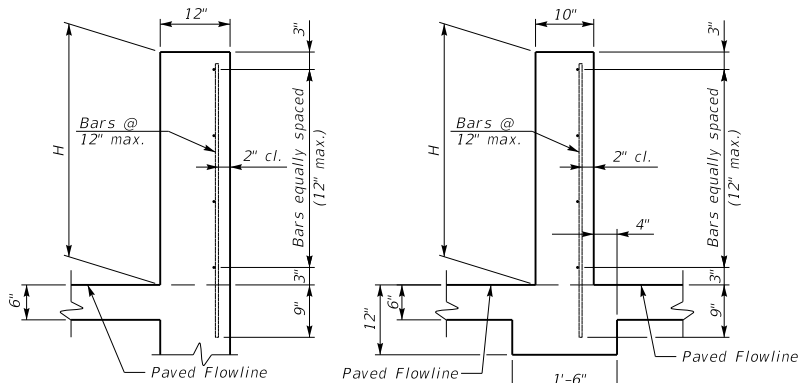
KENTUCKY DEPARTMENT OF HIGHWAYS	
BRIDGE DRAINS	
STANDARD DRAWING NO. BGX-015-04	
SUBMITTED <i>Ben Adams</i>	02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN	DATE
APPROVED <i>[Signature]</i>	02-26-20
STATE PROFESSIONAL ENGINEER	DATE



PLAN OF SKEWED INLET END



PLAN OF STRAIGHT INLET END



SECTION A-A

SECTION B-B

General Notes

LOW FLOW DIVERSION CURB: Include all materials and labor required to construct the Low Flow Diversion Curb in the bid for Low Flow Diversion Curb.

DIMENSION "H": This dimension is the lesser of the wing tip elevation, one-half the barrel height opening, or as designated on the plans.

METHOD OF MEASUREMENT: The limits of the Low Flow Diversion Curb is the entire wall that is above the paved flowline, extending from the centerwall to the wing face as detailed on the Plan views, and the 6" x 1'-6" footing as shown in Section B-B.

STEEL REINFORCEMENT: All steel reinforcement is #4 bars in accordance with ASTM A 615, Grade 60.

CONCRETE: Class "A" Concrete is to be used.

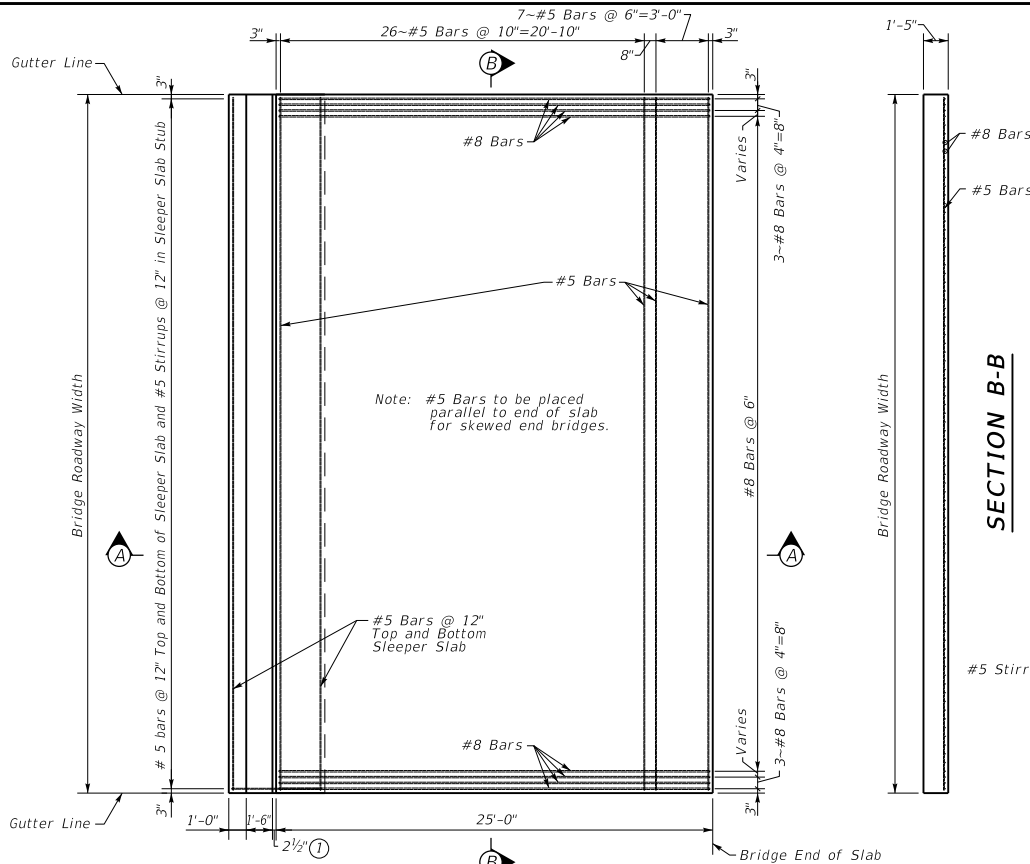
KENTUCKY
DEPARTMENT OF HIGHWAYS

LOW FLOW
DIVERSION
CURB

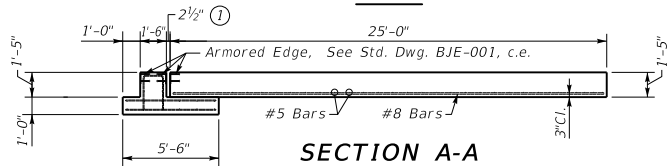
STANDARD DRAWING NO. BGX-016-01

SUBMITTED: *Bob Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

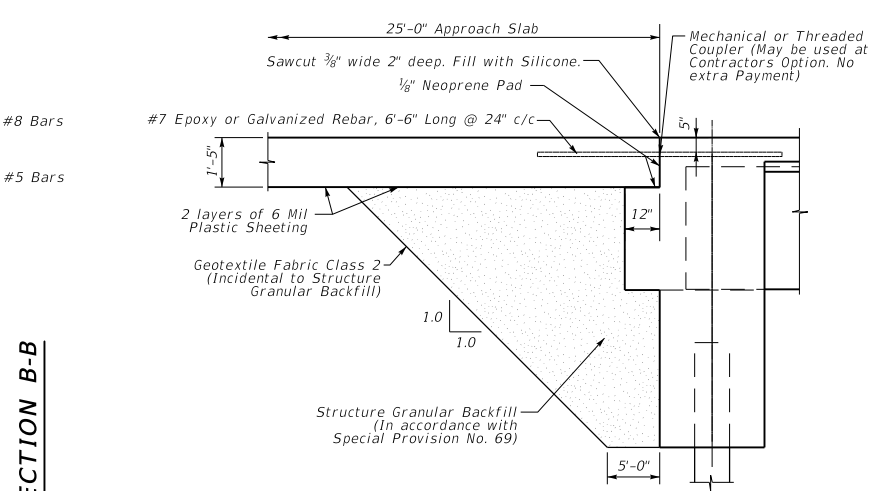
APPROVED: *[Signature]* 02-26-20
STATE ENGINEER DATE



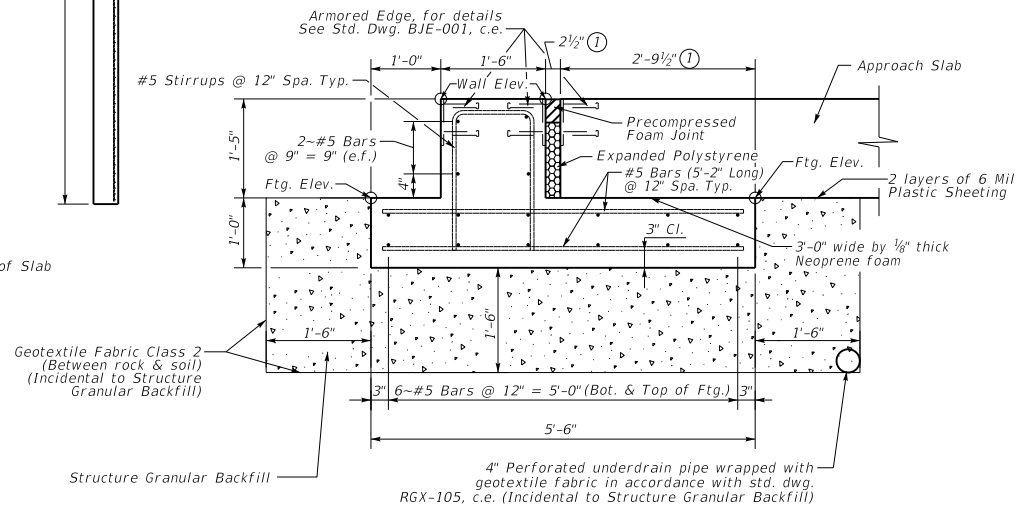
PLAN



SECTION A-A



TYPICAL SECTION @ BRIDGE END



TYPICAL SECTION @ SLEEPER SLAB END

GENERAL NOTES

CROWN AND ELEVATIONS: Crown shall conform to the rate of crown at the approach pavement and bridge deck. If the rate of crown at the bridge deck differs from that of approach pavement, a smooth transition shall be provided within the limits of the approach slab. Elevations shall be given in the plans for top of footing and top of wall as shown on the sleeper slab typical section. Grade elevations shall also be given along the approach slab to ensure it is built to proper grade. These elevations shall be provided at each gutter line and at the crown (if applicable) and at maximum spacings of 8'-0" along the approach slab. Approach slabs and sleeper slabs added to existing bridges will require the contractor to provide field surveys to obtain existing elevations. The contractor shall calculate all elevations noted above and submit to the Engineer for review. All costs to field survey and calculate elevations are incidental to unit price bid for Approach Slab.

CONCRETE: Concrete shall be Class "AA".

REINFORCEMENT: All steel reinforcement shall be Grade 60 and epoxy coated or galvanized.

PAYMENT: Include the cost of Class "AA" Concrete, epoxy-coated or galvanized steel reinforcement, precompressed foam joint seal, expanded polystyrene, plastic sheeting, and all labor and materials required to construct the approach slab in the bid item for Approach Slab. Payment for armored edges and structural granular backfill shall be made separately.

① The joint opening width shall be 2.5 in for expansion lengths of 150 feet or less, regardless of the joint setting temperature. For expansion lengths greater than 150 feet, the joint opening width shall be constructed based on the actual ambient temperature at the time of construction, with the manufacturer's joint setting table. The expansion length must be shown in the plans.

The precompressed foam joint shall be able to accommodate both the minimum and the maximum joint opening widths as shown below:

Concrete Bridge Expansion length less than 347 feet and Steel Bridge Expansion Length less than 275 feet.
 W(min) = 1.0 inch
 W(max) = 4.0 inches

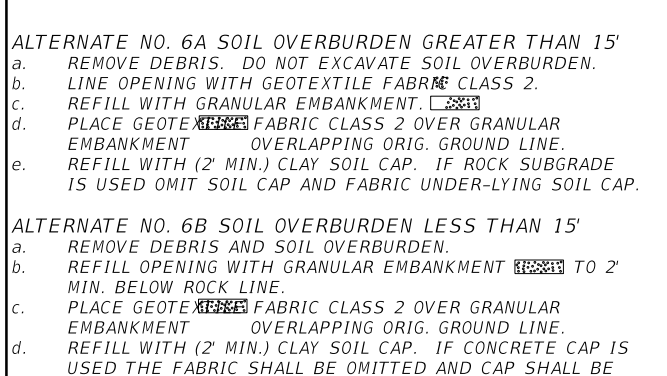
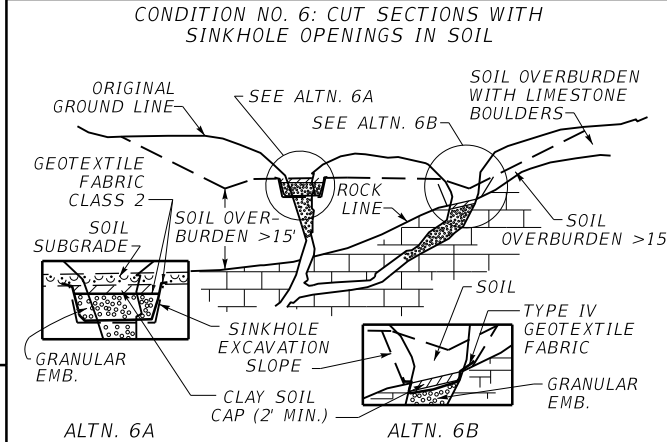
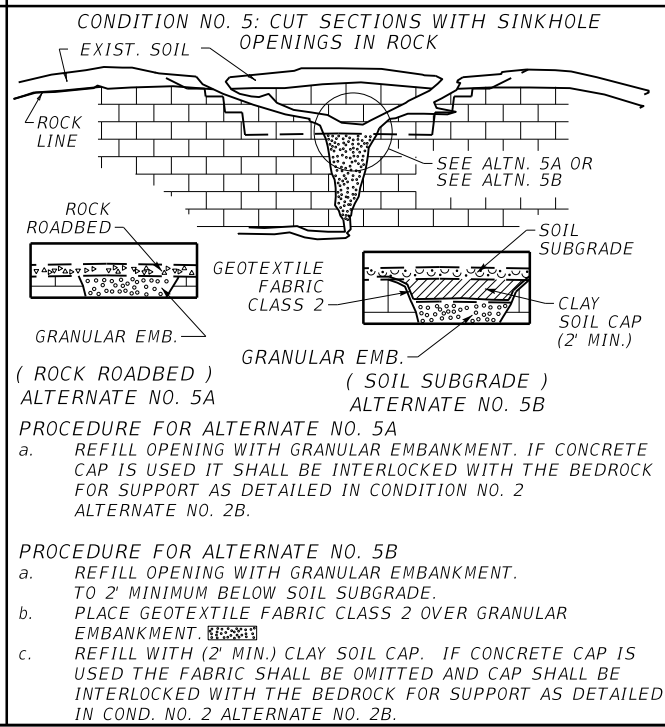
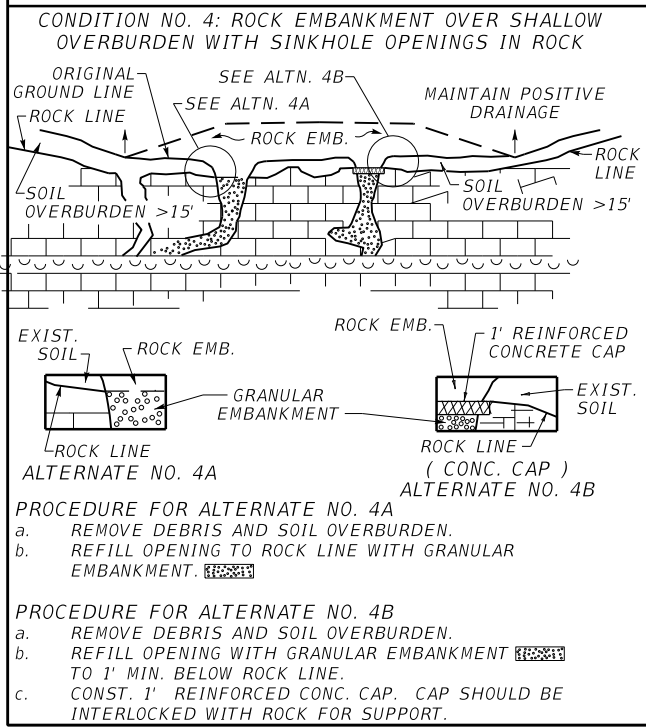
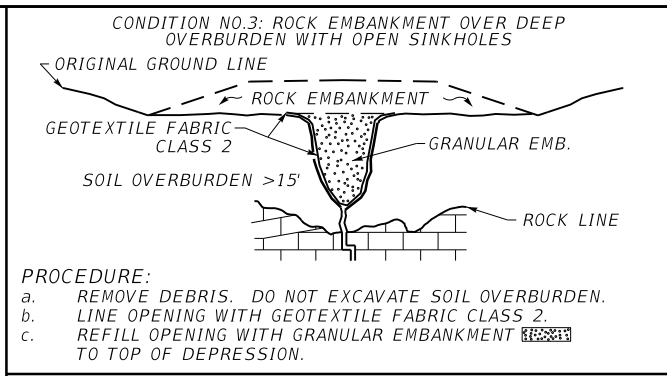
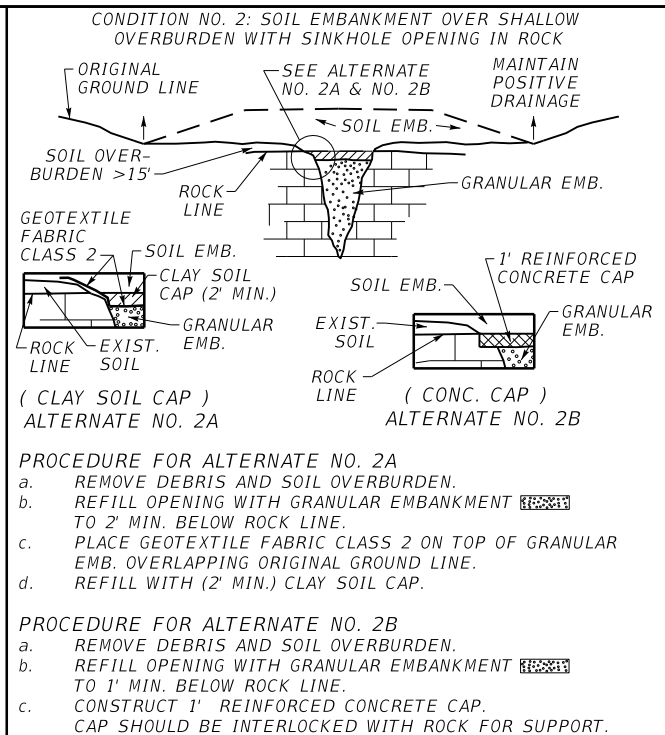
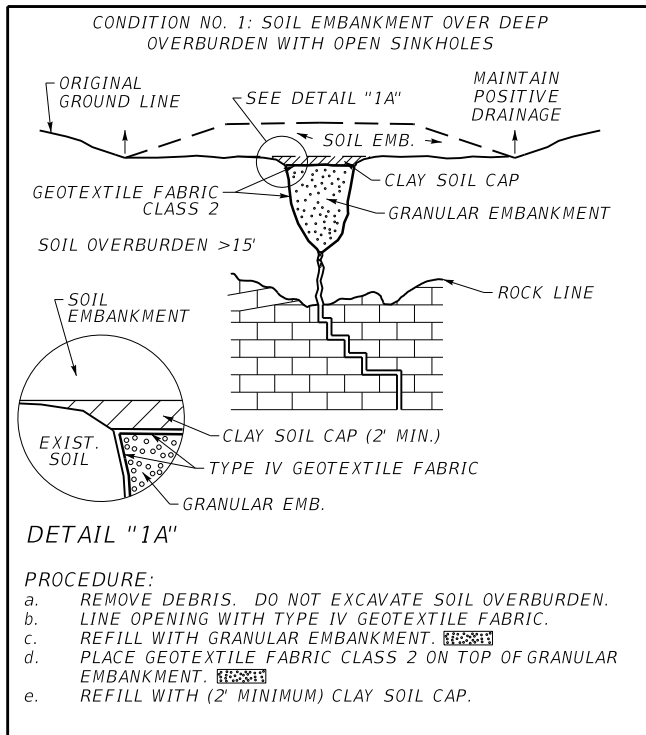
This standard is not applicable for concrete bridge expansion lengths greater than 347 feet or Steel bridge expansion lengths must be done and placed within the plans using a joint capable of greater movements greater than 275 feet. For bridges exceeding these limits a special design must be done and placed within the plans using a joint capable of greater movements.

KENTUCKY
DEPARTMENT OF HIGHWAYS

APPROACH SLAB

STANDARD DRAWING NO. BGX-017-03

SUBMITTED: *[Signature]* 02-26-20
 DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
 APPROVED: *[Signature]* 02-26-20
 STATE ENGINEER DATE



**KENTUCKY
DEPARTMENT OF HIGHWAYS**

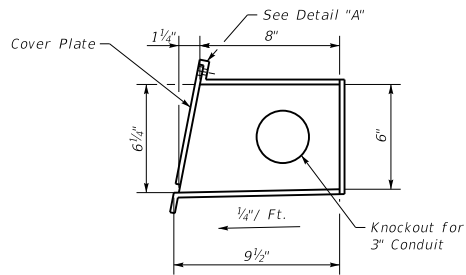
**TREATMENT
OF
OPEN SINKHOLES**

STANDARD DRAWING NO. **BGX-018**

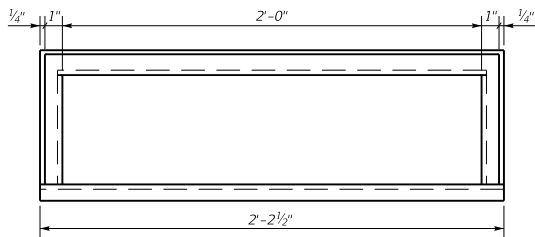
SUBMITTED: *B. J. Adams* DIRECTOR DIVISION OF STRUCTURAL DESIGN 02-26-20
DATE

APPROVED: *[Signature]* STATE HIGHWAY ENGINEER 02-26-20
DATE

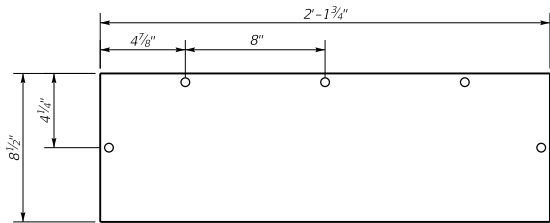
THE CONCRETE CAP SHALL BE CLASS "B" CONC. AND CONTAIN NO. 8 REINFORCING BARS PLACED AT 12" CTRS. IN BOTH DIRECTIONS AND LOCATED 3" FROM THE BOTTOM SURFACE OF THE CAP.



SIDE ELEVATION

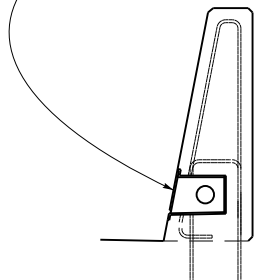


FRONT ELEVATION

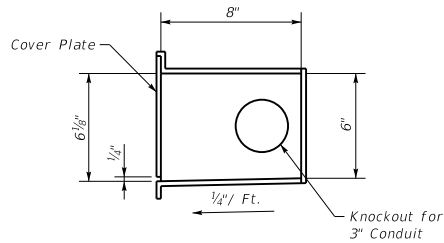


COVER PLATE

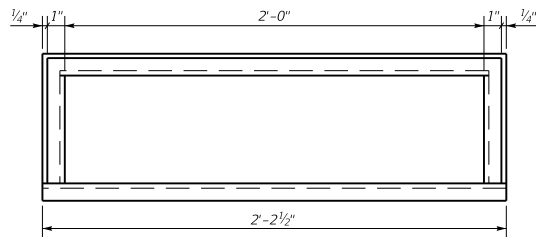
Mount box flush with barrier face.
Bottom of box will slope approximately
1/4" per foot to drain when properly installed.



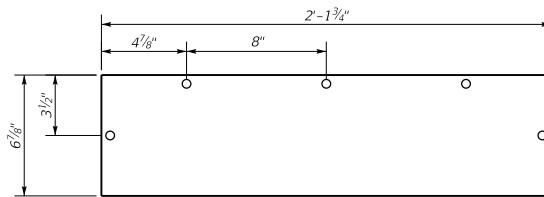
**TYPICAL INSTALLATION
IN SINGLE SLOPE BARRIER**



SIDE ELEVATION

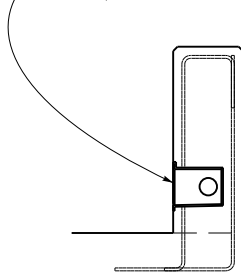


FRONT ELEVATION



COVER PLATE

Mount box flush with barrier face.
Bottom of box will slope approximately
1/4" per foot to drain when properly installed.



**TYPICAL INSTALLATION
IN VERTICAL BARRIER**

General Notes

Construct junction boxes from 1/4" A36 steel plate and the junction box cover from 1/8" A36 plate. Hot dip galvanize box and cover after fabrication and in accordance with ASTM A123 and the Standard Specifications. Cover plate shall include (5) Stainless Steel screw taps with wing nuts and a Rubber Gasket for all sides where screws are installed.

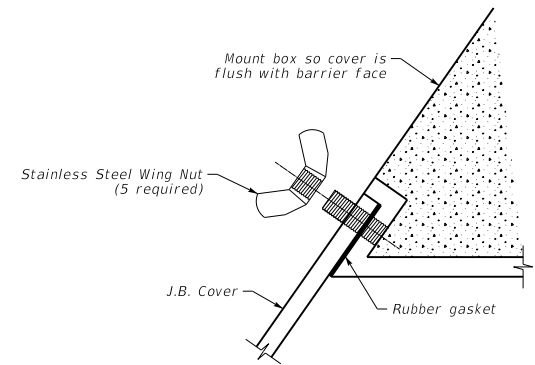
Fittings shall be UL listed and CSA-certified concrete tight on the outside of the Junction Box conduit connection. Use a sealing lock nut and a rigid PVC conduit bushing on the inside for all conduit penetrations.

Liberalily coat the threads of the cover fasteners with anti-seize compound during construction and before final closure.

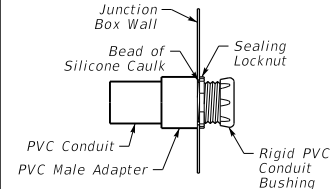
Protect cover of J.B. from damage/disfigurement from masonry coating application and other sources by taping or wrapping during construction. Remove protection prior to final electrical inspection and repair any damage or disfigurement to the satisfaction of the Engineer and at no cost to the Department.

When properly installed, box cover will be flush with barrier face and box bottom will slope to drain approximate 1/4" / ft. in all cases.

The price bid for Junction Box - 24" shall include all costs to furnish and install the junction box in accordance with these plans and the Specifications.



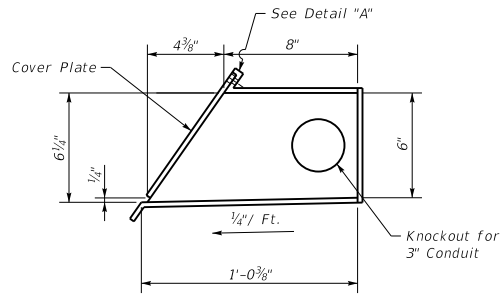
DETAIL "A"



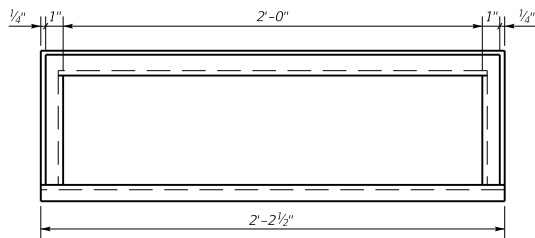
**BUSHING DETAIL AT
J.B. CONDUIT ENTRY**

KENTUCKY
DEPARTMENT OF HIGHWAYS
24 INCH JUNCTION BOX
SINGLE SLOPE AND
VERTICAL BARRIER

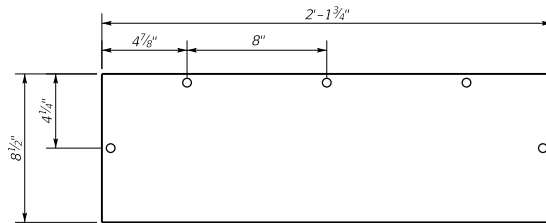
STANDARD DRAWING NO. **BGX-019**
SUBMITTED: *Bob Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
APPROVED: *Bob Adams* 02-26-20
STATE PROFESSIONAL ENGINEER DATE



SIDE ELEVATION

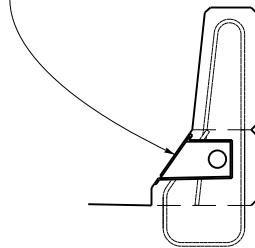


FRONT ELEVATION



COVER PLATE

Mount box flush with barrier face.
Bottom of box will slope approximately
1/4" per foot to drain when properly installed.



**TYPICAL INSTALLATION
IN TYPE 3 BARRIER**

General Notes

Construct junction boxes from 1/4" A36 steel plate and the junction box cover from 1/8" A36 plate. Hot dip galvanize box and cover after fabrication and in accordance with ASTM A123 and the Standard Specifications. Cover plate shall include (5) Stainless Steel screw taps with wing nuts and a Rubber Gasket for all sides where screws are installed.

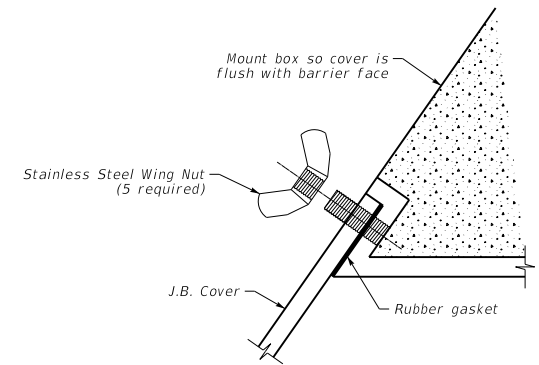
Fittings shall be UL listed and CSA-certified concrete tight on the outside of the Junction Box conduit connection. Use a sealing lock nut and a rigid PVC conduit bushing on the inside for all conduit penetrations.

Liberalily coat the threads of the cover fasteners with anti-seize compound during construction and before final closure.

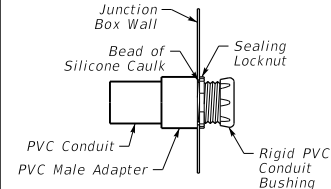
Protect cover of J.B. from damage/disfigurement from masonry coating application and other sources by taping or wrapping during construction. Remove protection prior to final electrical inspection and repair any damage or disfigurement to the satisfaction of the Engineer and at no cost to the Department.

When properly installed, box cover will be flush with barrier face and box bottom will slope to drain approximate 1/4" / ft. in all cases.

The price bid for Junction Box - 24" shall include all costs to furnish and install the junction box in accordance with these plans and the Specifications.



DETAIL "A"

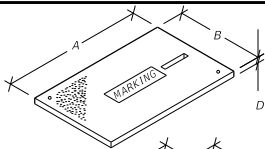


**BUSHING DETAIL AT
J.B. CONDUIT ENTRY**

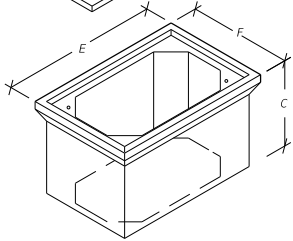
KENTUCKY
DEPARTMENT OF HIGHWAYS

24 INCH JUNCTION BOX
TYPE 3 BARRIER

STANDARD DRAWING NO. BGX-020
SUBMITTED: *Bob Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
APPROVED: *[Signature]* 02-26-20
STATE PROFESSIONAL ENGINEER DATE



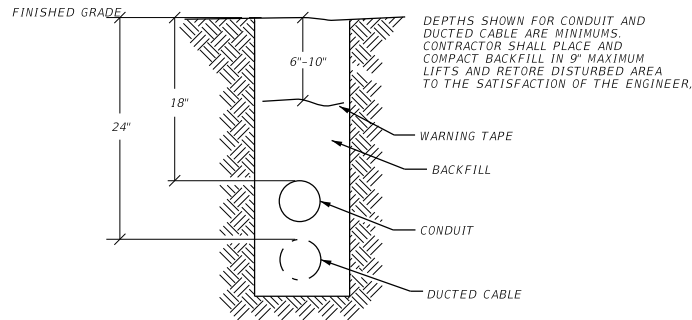
JUNCTION BOX DIMENSIONS (NOMINAL)					
A	B	C	D	E	F
23"	14"	27"	2"	25"	15"



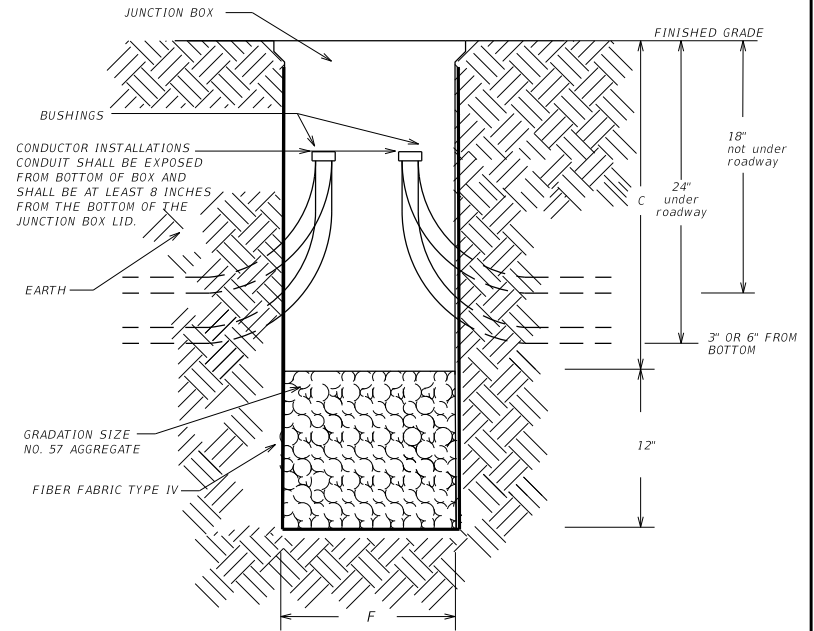
Junction Box shall meet or exceed ANSI/SCTE 77-2002, Tier 15 and shall be installed flush with the finished grade as shown.

Junction box for traffic signal installations shall be marked "Traffic". Junction box for lighting installations shall be marked "Lighting". Covers shall be attached with a minimum of two 3/8" Stainless Steel hex bolts.

Where required, Junction box shall be oriented such that the dimensions comply with the national electric code.

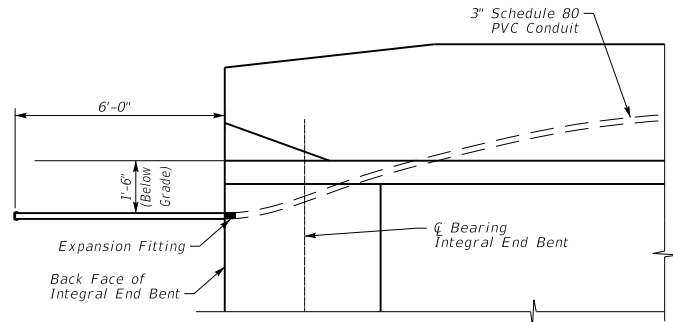


CONDUIT, DUCTED CABLE AND WARNING TAPE TRENCH

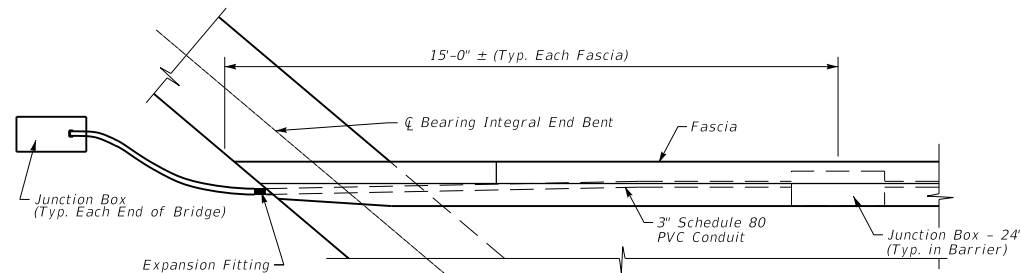


JUNCTION BOX INSTALLATION

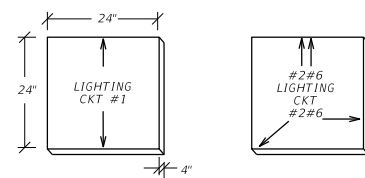
BEFORE THE INSTALLATION OF THE #57 AGGREGATE AND JUNCTION BOX, THE CONTRACTOR SHALL INSTALL GEOTEXTILE FILTER FABRIC TYPE IV IN THE HOLE. THE FABRIC SHALL EXTEND TO JUST BELOW THE LIP OF THE JUNCTION BOX AND SHALL BE CONTINUOUSLY ADHERED TO THE EXTERIOR OF THE BOX WITH ADHESIVE. ANY LOCATIONS WHERE CONDUITS ENTER THE BOX, THE FABRIC SHALL BE "X" CUT ONLY AS MUCH AS NECESSARY TO ALLOW PASSAGE OF EACH INDIVIDUAL CONDUIT THROUGH THE FABRIC. THE FABRIC SHALL BE INCIDENTAL TO BID ITEMS 4811, 20391NS835, OR 20392NS835.



ELEVATION - EXPANSION AND CONDUIT DETAILS



PLAN - EXPANSION AND CONDUIT DETAILS



CONCRETE CABLE MARKERS

GENERAL NOTES

The bid for junction boxes shall include furnishing and installing specified junction box in accordance with the specifications. Junction box, Type A, shall include #57 aggregate as shown on this sheet, backfilling and restoration of disturbed areas to the satisfaction of the resident engineer, and concrete (if required).

Provide and install conduit caps and sleeve type expansion devices capable of sustaining + 1", 2" total movement at each integral end bent. All conduit shall have copper grounding bushings installed. The cost of the caps, expansion devices, and copper grounding bushings is incidental to the 3" conduit.

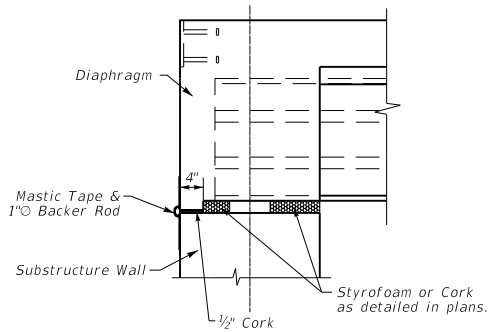
The 3" conduit in each barrier is to be schedule 80 PVC and is a separate pay item.

KENTUCKY
DEPARTMENT OF HIGHWAYS

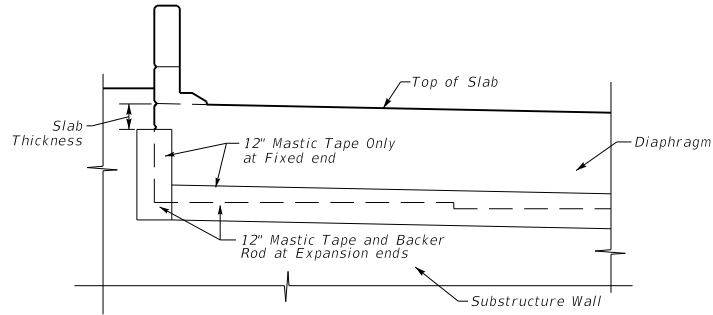
JUNCTION BOX
TYPE - A

STANDARD DRAWING NO. BGX-021

SUBMITTED *B. J. Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
APPROVED *[Signature]* 02-26-20
STATE ENGINEER DATE

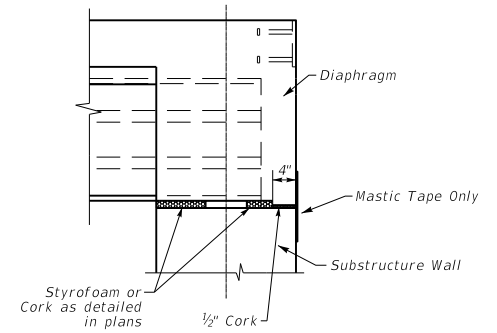


EXPANSION END
(Flush Diaphragm and Substructure)

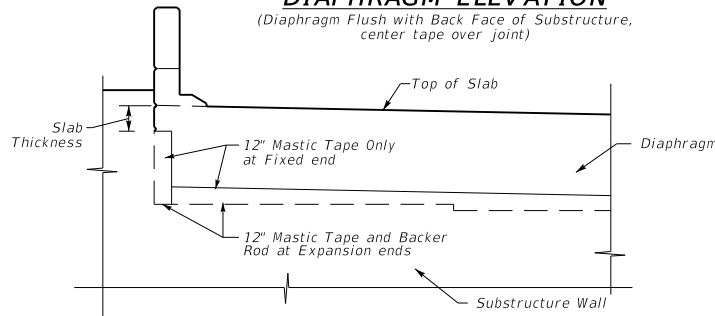


DIAPHRAGM ELEVATION

(Diaphragm Flush with Back Face of Substructure, center tape over joint)

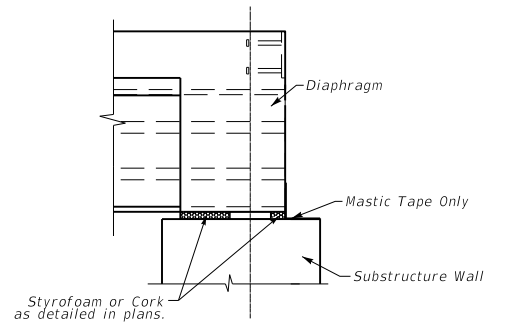


FIXED END
(Flush Diaphragm and Substructure)

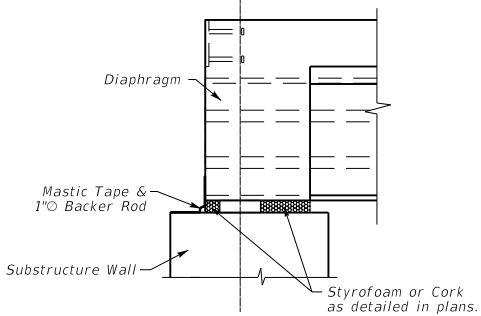


DIAPHRAGM ELEVATION

(Offset Diaphragm and Substructure)



FIXED END
(Offset Diaphragm and Substructure)

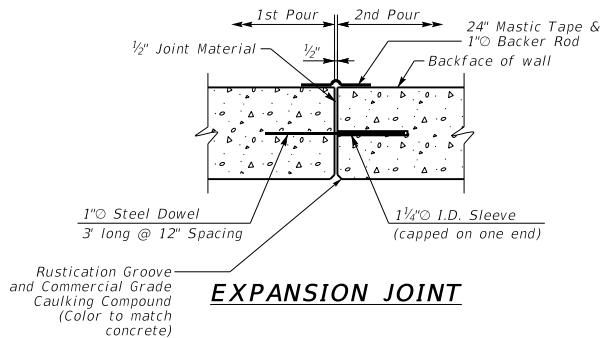


EXPANSION END
(Offset Diaphragm and Substructure)

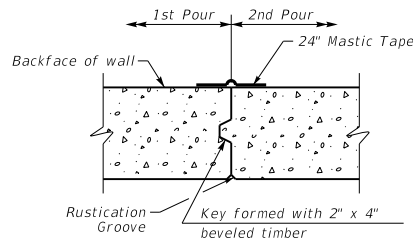
MASTIC TAPE APPLICATION AT BRIDGE ENDS

The cost of labor, materials, and incidental items for furnishing and installing Mastic Tape shall be considered incidental to the unit price bid for Concrete Class 'AA' and no separate measurement or payment shall be made.

Note: Center Mastic Tape over joint.



EXPANSION JOINT



CONTRACTION JOINT

NOTE:
Maintain 2 inch clearance from ends of Longitudinal reinforcement to edge of expansion joint.

MASTIC TAPE APPLICATION AT RETAINING WALLS

GENERAL NOTES

MASTIC TAPE: Mastic Tape used to seal joints is to meet the requirements of ASTM C-877 Type I, II, or III. The joint is to be covered with 12-inch wide mastic tape. Prior to application, the joint surface shall be clean and free of dirt, debris, or deleterious material. Primer, if required by the tape mfr., shall be applied for a minimum width of nine inches on each side of the joint.

Mastic Tape shall be either:

EZ-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION,
SEAL WRAP by MAR MAC MANUFACTURING CO. INC.,
CADILLOC by the UP RUBBER CO. INC.
or approved equal.

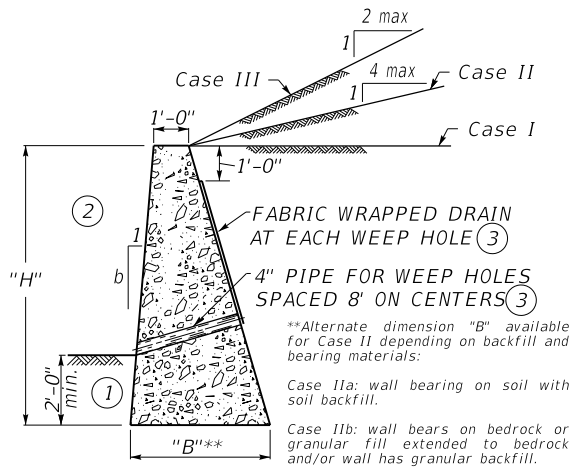
Mastic Tape shall cover the joint continuously unless otherwise shown in the plans. Mastic Tape shall be spliced by lapping a minimum of six inches and in accordance with the mfrs. recommendations with the overlap running downhill.

All preformed expansion joint material, caulking, mastic tape, pipe sleeve and equipment and labor necessary to complete the joints are incidental to the square foot bid for Retaining Walls.

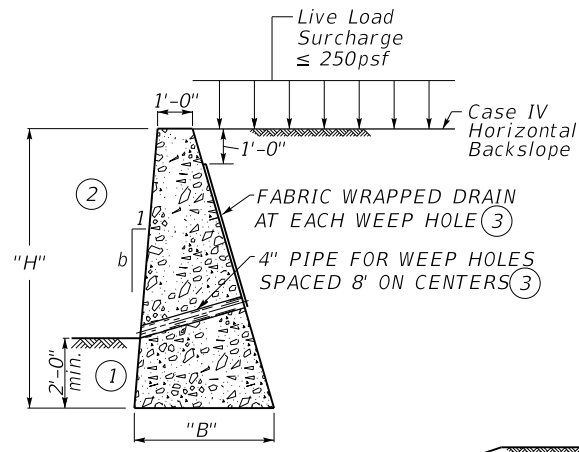
KENTUCKY
DEPARTMENT OF HIGHWAYS

JOINT
WATERPROOFING

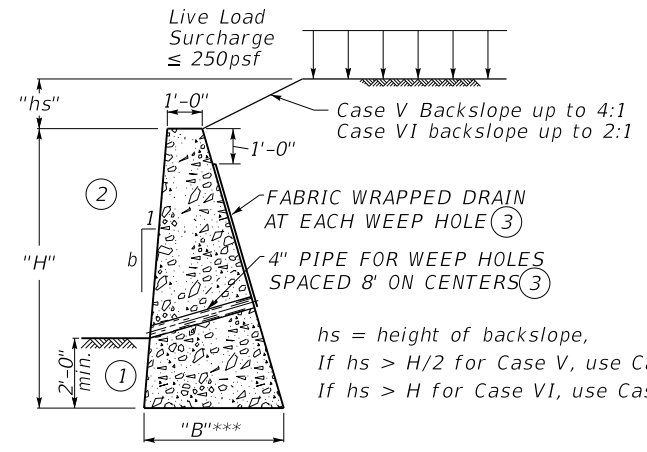
STANDARD DRAWING NO. BGX-022
SUBMITTED: *Boyd Adams* 02-26-20
DATE: DIRECTOR DIVISION OF STRUCTURAL DESIGN
APPROVED: *[Signature]* 02-26-20
DATE: STATE REGISTERED ENGINEER



CASES I, II, AND III

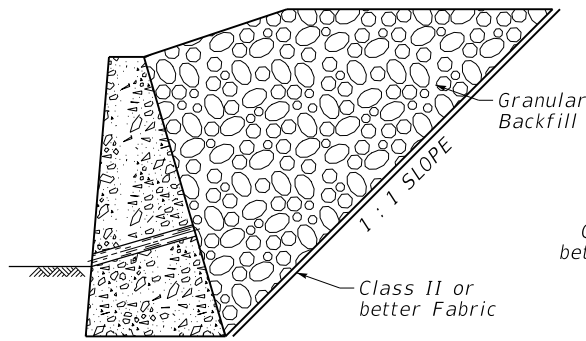


CASE IV



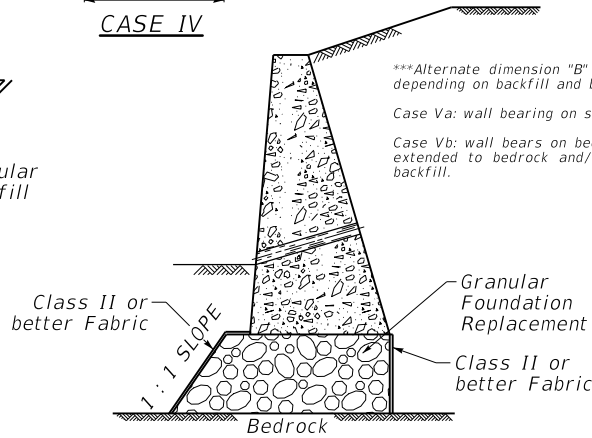
CASES V AND VI

hs = height of backslope,
If hs > H/2 for Case V, use Case II.
If hs > H for Case VI, use Case III.

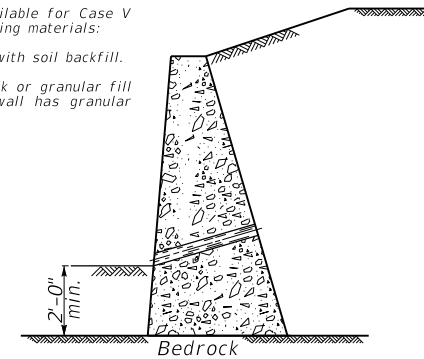


GRANULAR BACKFILL

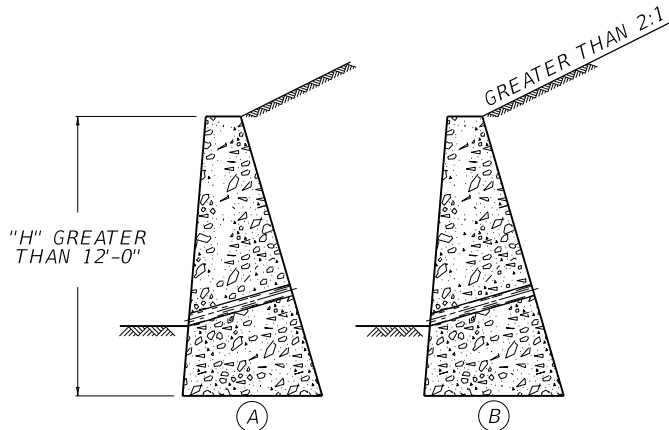
(Required if wall is subject to standing or flowing water regardless of case.)



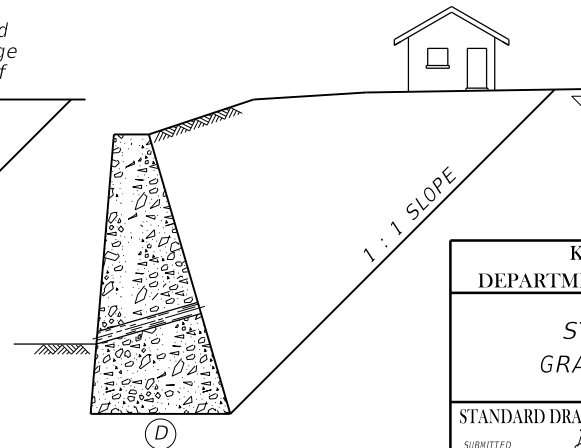
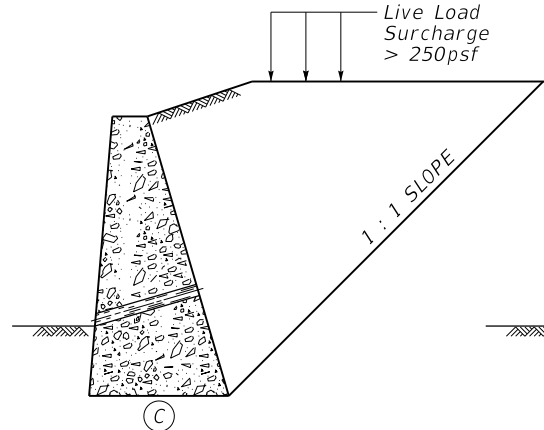
GRANULAR FOUNDATION REPLACEMENT



BEARING ON BEDROCK



SPECIAL DESIGNS REQUIRED



KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD
GRAVITY WALL

STANDARD DRAWING NO. BGX-023

SUBMITTED *B. J. Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED *[Signature]* 02-26-20
STATE REGISTERED ENGINEER DATE

STANDARD GRAVITY WALL NOTES

The retaining walls depicted on these drawings shall be used when the height (H) of the wall is 12'-0" or less provided the following conditions are met:

- CASE I - Wall backfill slopes down, is level, or slopes up from wall at 20H:1V or flatter slope. This low slope allows for backfills that would be level except for the slope required to facilitate proper drainage.
- CASE II - Backfill slopes steeper than 20H:1V but no more than 4H:1V.
- CASE III - Backfill slopes steeper than 4H:1V but no more than 2H:1V.
- CASE IV - Backfill slopes down, is level, or slopes up from wall at 20H:1V or flatter slope (as needed to facilitate proper drainage) and has a maximum live load surcharge of 250 pounds per square foot applied behind the wall.
- CASE V - Broken-back backfill slopes no more than 4H:1V to a level surface level (except for slope needed to facilitate proper drainage) and has a maximum live load surcharge of 250 pounds per square foot applied to the level portion of the backfill. If the height of the backfill to the slope break equals or exceeds one-half the height of the wall ($h_s \geq H/2$), use CASE II.
- CASE VI - Broken-back backfill slopes up steeper than 4H:1V but no more than 2H:1V to a level surface (except for slope needed to facilitate proper drainage) and has a maximum live load surcharge of 250 pounds per square foot applied to the level portion of the backfill. If the height of the backfill to the slope break equals or exceeds the height of the wall ($h_s \geq H$), use Case III.

Special Designs shall be required when the following conditions exist:

- (A) Wall height is greater than 12'-0".
- (B) Backfill slopes are steeper than 2H:1V.
- (C) The wall is surcharged with a live load exceeding 250 pounds per square foot within the limits of a 1:1 slope extending from the base of the wall.
- (D) The wall is surcharged with a dead load (i.e., buildings, structures, or other permanent facilities) within the limits of a 1:1 slope extending from the base of the wall.
- (1) Minimum embedment value is 2'-0" for all cases.
- (2) Batter (b) shall be as follows:
Cases I, II a, and II b - For $H < 10'-0"$ use 12V:1H. For $H \geq 10'-0"$ use 6V:1H.
Case III - For $H < 7'-0"$ use 12V:1H. For $H \geq 7'-0"$ use 6V:1H.
Cases IV, V a, V b, and VI - For $H < 6'-0"$ use 12V:1H. For $H \geq 6'-0"$ use 6V:1H.
- (3) Fabric wrapped drains and 4" pipe for weep holes shall be included in the unit price bid for gravity type retaining walls.

Granular backfill, granular foundation replacement to bedrock, or a wall bearing directly on competent un-weathered bedrock is required for the following cases:

- Case II b for $H > 9.5'$
- Case III - for $H > 8'$
- Case V b for $H > 10.5'$
- Case VI for $H > 9'$

Walls subject to standing or flowing water (adjacent to streams, ponds, lakes, rivers, detention basins, etc.) shall have granular backfill meeting the requirements below regardless of the Case.

Granular backfill or granular foundation replacement to bedrock (when required) shall meet the requirements of "Granular Embankment" in Section 805 of the Standard Specifications, current edition, except that the maximum size is 4 inches with a minus No. 200 content not exceeding 5.0 percent. Use material that classified as nonerrodible, as defined in Section 805 of the Standard Specifications, current edition. Gravels or sands, crushed or uncrushed, shall not be allowed. Place Class II or better Geotextile Fabric in accordance with Sections 214 and 843 of the Standard Specifications, current edition, as shown below, where there is a soil-granular material interface.

Construct standard gravity retaining walls according to Section 613 of the Standard Specifications, current edition, with the exceptions that the wall shall be constructed according to this Standard Drawing and that the wall's base width shall exceed 1/2 vertical height when required by plan notes or this Standard Drawing. Gravity walls meeting the criteria for Standard Gravity Wall defined herein may still require a Geotechnical Investigation. Conditions warranting a site investigation and geotechnical exploration shall be as defined in this Standard Drawing and KYTC Geotechnical Policy Manual Section 400, current edition.

H(ft)	Required base width, B(ft)								
	Case I	Case II a	Case II b	Case III	Case IV	Case V a	Case V b	Case VI	
3.0	1.50	1.50	1.50	1.50	3.00	3.00	3.00	3.25	
3.5	1.75	1.75	1.75	1.75	3.25	3.25	3.25	3.50	
4.0	2.00	2.00	2.00	2.00	3.50	3.50	3.50	3.75	
4.5	2.25	2.25	2.25	2.25	3.75	4.00	4.00	4.25	
5.0	2.50	2.50	2.50	2.50	4.00	4.25	4.25	4.50	
5.5	2.75	2.75	2.75	2.75	4.25	4.50	4.50	4.75	12:1 Batter
6.0	3.00	3.00	3.00	3.00	4.50	4.75	4.75	5.00	6:1 Batter
6.5	3.25	3.25	3.25	3.25	4.75	5.00	5.00	5.50	
7.0	3.50	3.50	3.50	3.50	5.00	5.50	5.50	5.75	
7.5	3.75	3.75	3.75	3.75	5.25	5.75	5.75	6.00	
8.0	4.00	4.00	4.00	4.00	5.75	6.00	6.00	6.50	
8.5	4.25	4.25	4.25	4.25*	6.00	6.25	6.25	6.75	
9.0	4.50	4.50	4.50	4.50*	6.25	6.50	6.50	7.00	
9.5	4.75	4.75	4.75	4.75*	6.50	6.75	6.75	7.25*	12:1 Batter
10.0	5.00	5.25	5.00*	5.00*	6.75	7.00	7.00	7.50*	6:1 Batter
10.5	5.25	5.50	5.25*	5.25*	7.00	7.25	7.25	7.75*	
11.0	5.50	5.75	5.50*	5.50*	7.25	7.75	7.50*	8.25*	
11.5	5.75	6.00	5.75*	5.75*	7.50	8.25	7.75*	8.50*	
12.0	6.00	6.25	6.00*	6.00*	7.75	8.75	8.00*	9.00*	

* Requires Granular Backfill, Granular Foundation replacement to bedrock, or bearing directly on competent unweathered bedrock.

DESIGN PARAMETERS

Large block retaining walls without reinforced backfill are suitable alternatives to Standard Gravity Walls. Approved large block retaining wall suppliers can be found on the Structural Design web site. Contractors shall submit to the Engineer for review and approval a design for a large block wall alternative using the following design parameters unless site-specific geotechnical information is provided or required. The wall design shall be in accordance with the AASHTO Standard Specifications for Highway Bridges, current edition.

Soil Backfill
Foundation
Granular backfill or foundation replacement

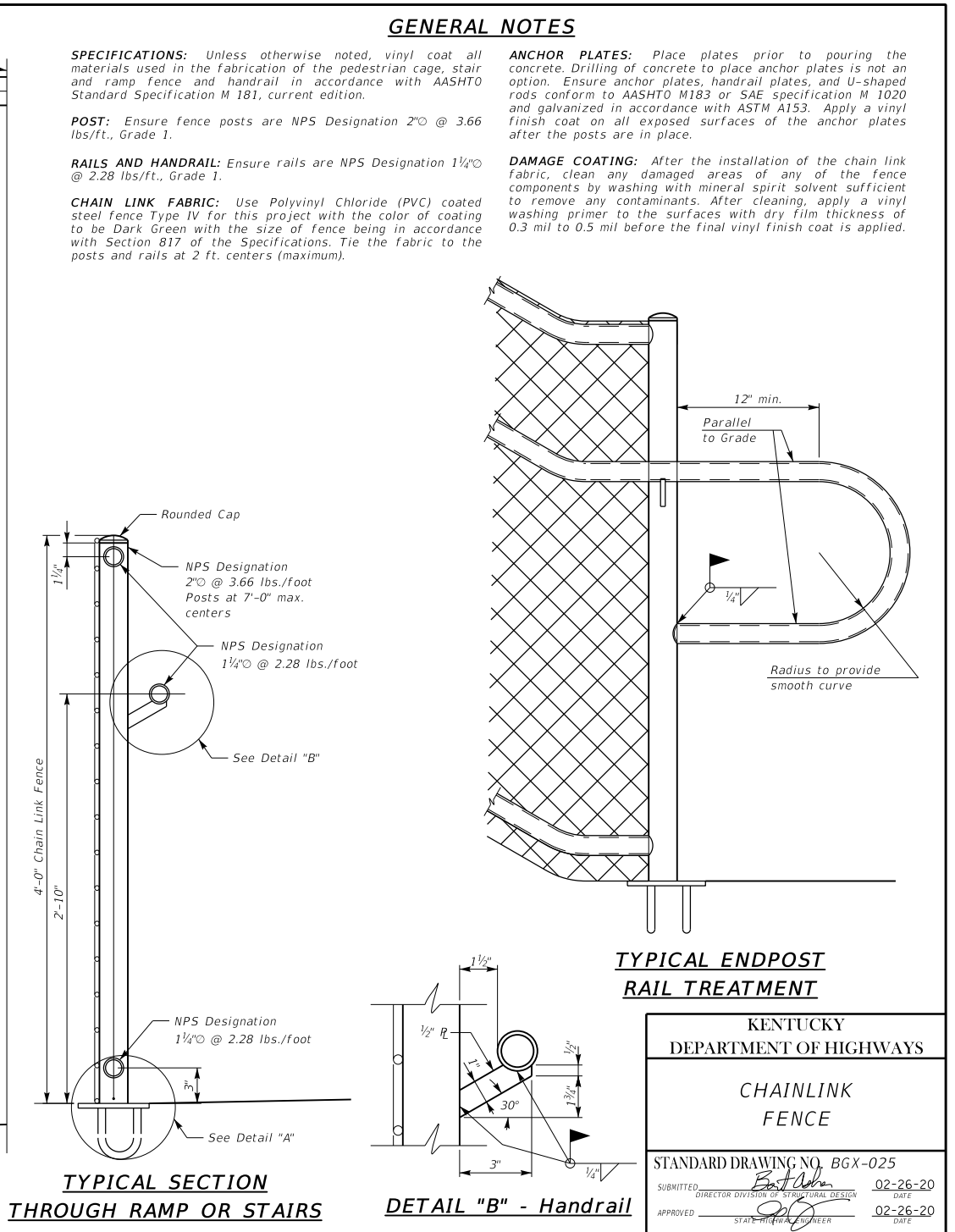
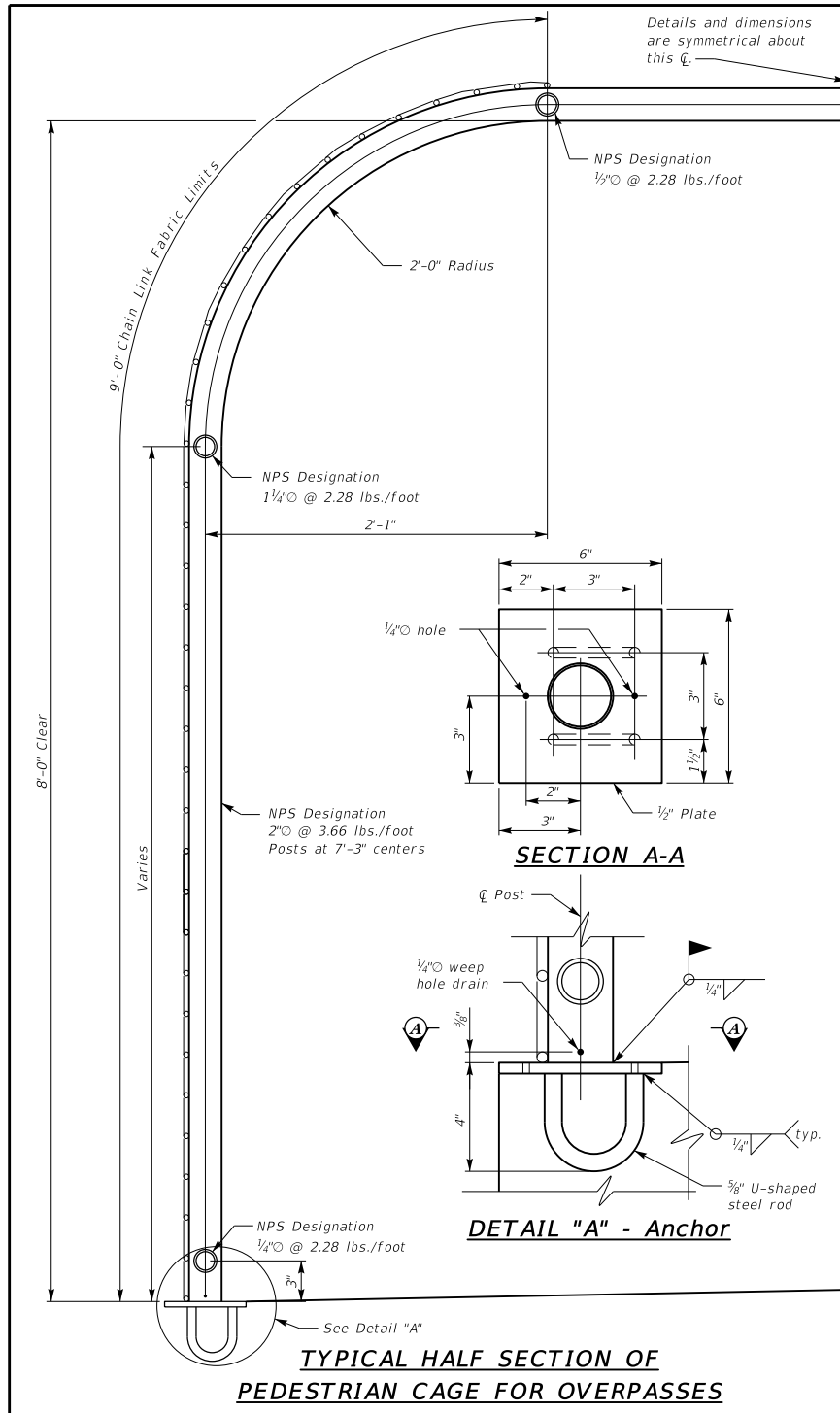
$c = 0$ psf, $\Phi = 28^\circ$, $\gamma = 120$ pcf
 $c = 1200$ psf, $\Phi = 0^\circ$, $\gamma = 120$ pcf
 $c = 0$, $\Phi = 38^\circ$, $\gamma = 115$ pcf

Pay Items:

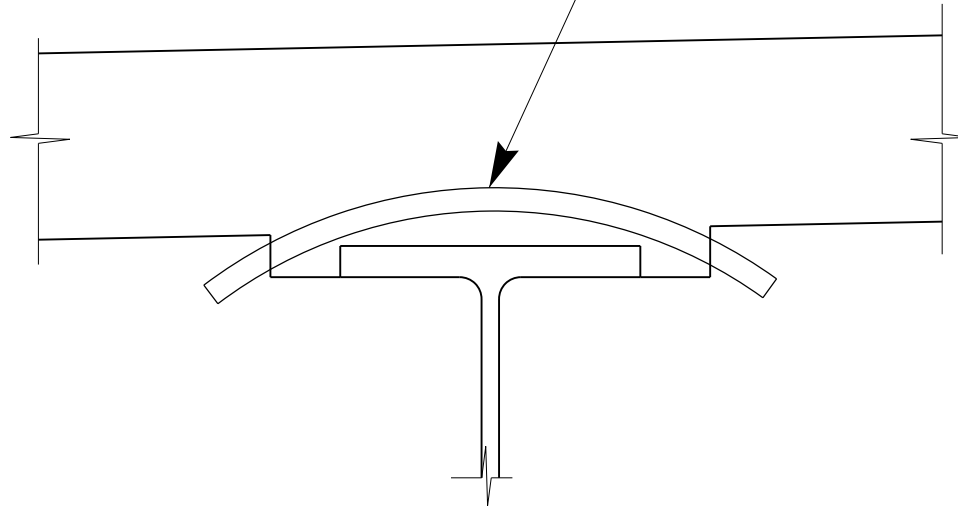
Concrete, Class B
Structure Excavation
Granular Embankment (when required)
Geotextile Fabric (when required)

Cu. Yd.
Cu. Yd.
Cu. Yd.
Sq. Yd.

KENTUCKY DEPARTMENT OF HIGHWAYS	
STANDARD GRAVITY WALL	
STANDARD DRAWING NO. BGX-024	
SUBMITTED	02-26-20 DATE
<i>Boyd Adams</i> DIRECTOR DIVISION OF STRUCTURAL DESIGN	
APPROVED	02-26-20 DATE
<i>[Signature]</i> STATE REGISTERED ENGINEER	



*1" I.D. Plastic Pipe
Field Bend as Shown*



NOTE: *When Slab is used and high water expected over bottom of beam elevation, place 1" plastic pipe above beams 4'-0" from each end. Work and material is incidental to superstructure concrete.*

AIR VENT DETAIL

KENTUCKY
DEPARTMENT OF HIGHWAYS

AIR VENT
DETAILS

STANDARD DRAWING NO. BGX-026
SUBMITTED: *B. J. Adams* 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
APPROVED: *[Signature]* 02-26-20
STATE ENGINEER DATE