



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov/

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

December 9, 2014

CALL NO. 315
CONTRACT ID NO. 141299
ADDENDUM # 1

Subject: Campbell County, FD04 019 0008 CUL EXT
Letting December 12, 2014

- (1) Revised - Plan Sheets - S1, S2, S3, S4, S5, S13, S14A, S15, S18, & S23
- (2) Revised - Bid Items - Pages 72-73 of 73
- (3) Added - Special Notes - Pages 1-17 of 17

Proposal revisions are available at <http://transportation.ky.gov/Construction-Procurement/>.

Plan revisions are available at <http://www.lynnimaging.com/kytransportation/>.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

A handwritten signature in blue ink that reads "Diana Castle Radcliffe".

Diana Castle Radcliffe
Director
Division of Construction Procurement

DR:ks

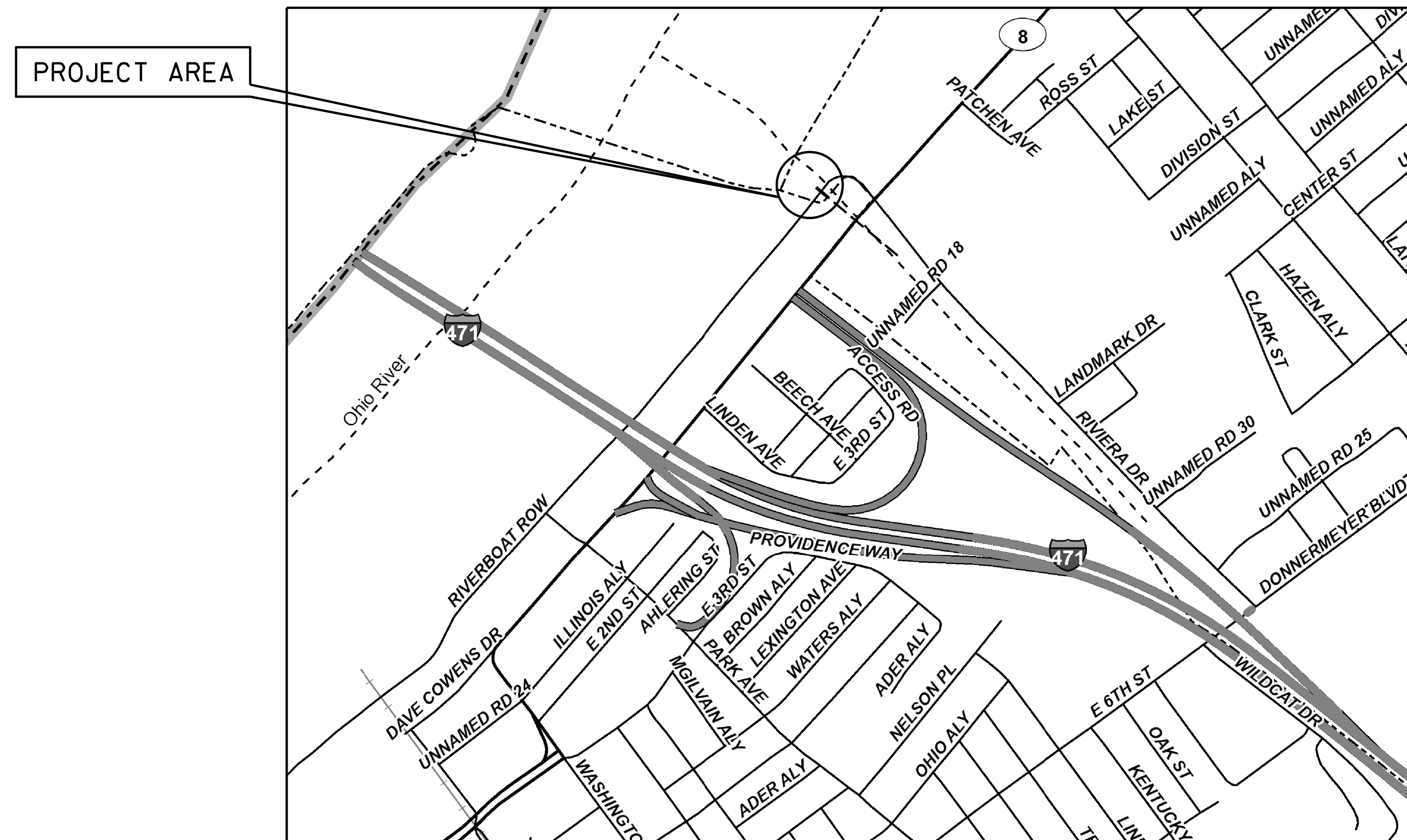
Enclosures



An Equal Opportunity Employer M/F/D

TRANSPORTATION CABINET DEPARTMENT OF HIGHWAYS

CAMPBELL COUNTY RIVERBOAT ROW TAYLOR CREEK CULVERT EXTENSION



LAYOUT MAP



SITE LAYOUT
November 17, 2014
STRUCTURE COMPONENTS
November 17, 2014



ITEM NUMBER
06-8703

INDEX OF SHEETS

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XI-XI2	Cross Sections

SPECIAL NOTES

Decorative Fence
Type B Armor Rock
Vibration Monitoring
Dynamic Pile Testing

SPECIAL PROVISIONS

ROADWAY STANDARD DRAWINGS

RDB-003-07	Drop Box Inlet Type 3
RDB-430-04	Manhole Steps
RDM-005-05	Manhole Type B
RDM-100-02	Frame and Lid Type 1
RDI-120-03	Bedding for Precast Box Culverts, Sewers, Storm Drains, and their Combinations
RDX-210-02	Temporary Silt Fence
RDX-220-04	Silt Trap Type A
RDX-230	Silt Trap Type C
RDX-300-03	Precast Box Culvert Extension
RGX-001-05	Miscellaneous Standards Part 1
RGX-010-03	Typical Embankment Foundation Benches
RGX-015-02	Settlement Platform

STRUCTURE STANDARD DRAWINGS

BGX-006-08	Stencils for Structures
BPS-011-03	HPI4x89 Steel Pile (See Foundation Notes)

SPECIFICATIONS

2012 Standard Specifications for Road and Bridge Construction.
2010 AASHTO LRFD Bridge Design Specifications with Current Interims.

REVISION	DATE
DATE: 11/17/2014	CHECKED BY: D. Wormald
DESIGNED BY: J. Ramler	DETAILED BY: J. Wanstrath

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
CAMPBELL

ROUTE CROSSING
TAYLOR CREEK CULVERT

TITLE SHEET

PREPARED BY
URS
URS Corporation
525 Vine Street, Suite 1800
Cincinnati, OH 45202
www.urscorp.com

SHEET NO.
S1
DRAWING NO.
27208

LETTING DATE

CONSTRUCTION PROJECT NO.

FILE NAME: S27208-001.dgn

USER: jon.wanstrath
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

TRANSPORTATION CABINET DEPARTMENT OF HIGHWAYS

CAMPBELL COUNTY RIVERBOAT ROW TAYLOR CREEK CULVERT EXTENSION

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- Decorative Fence
- Type B Armor Back
- Vibration Monitoring
- Dynamic Pile Testing

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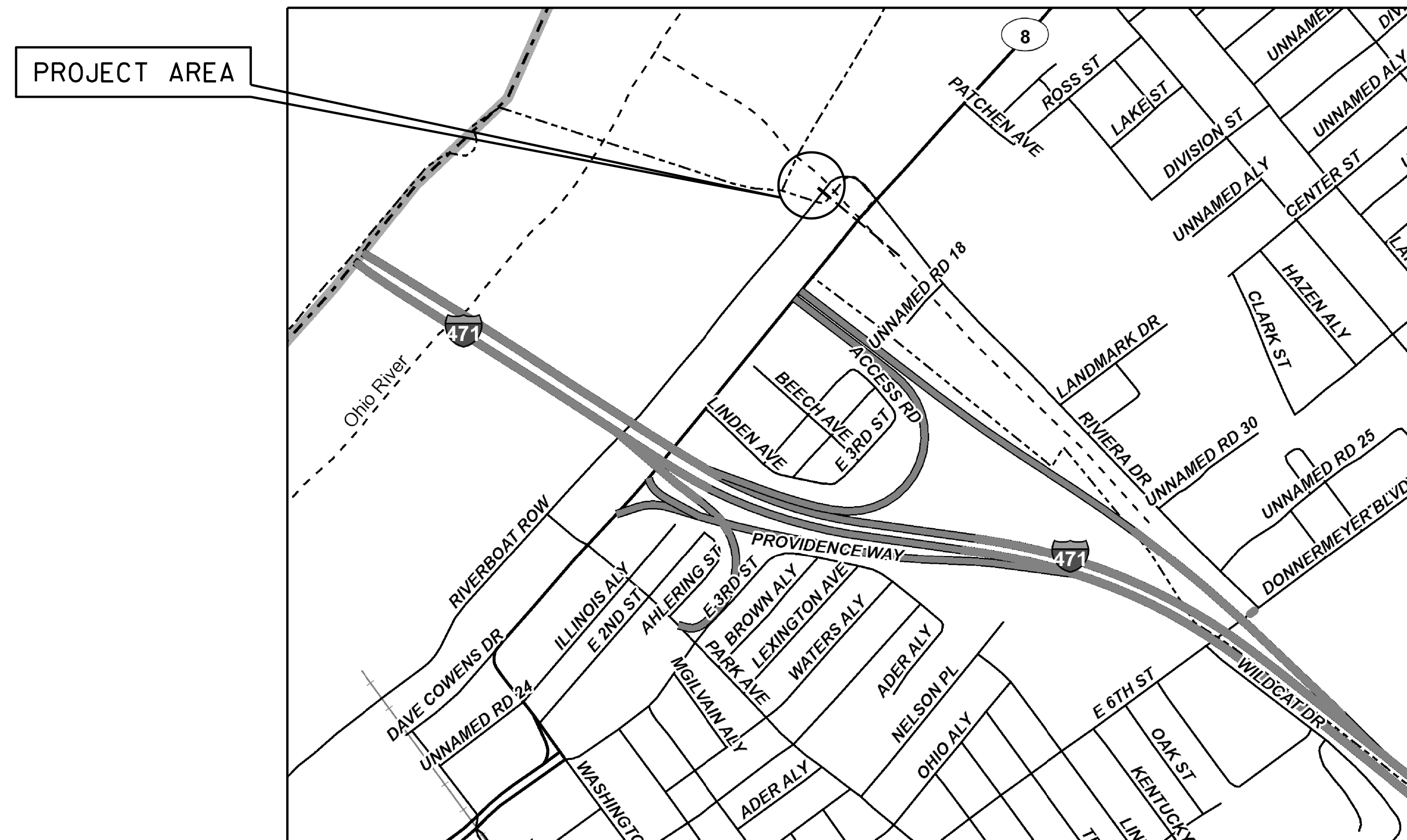
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

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CAMPBELL

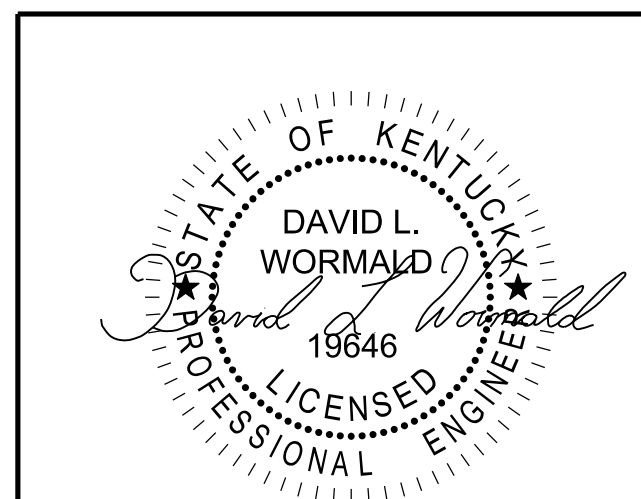
ROUTE CROSSING
TAYLOR CREEK CULVERT

TITLE SHEET

PREPARED BY: URS	URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com	SHEET NO. S1
		DRAWING NO. 27208

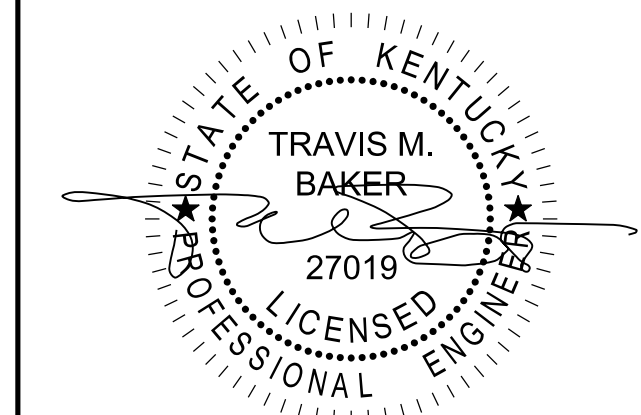


LAYOUT MAP



SITE LAYOUT

November 17, 2014



STRUCTURE COMPONENTS

November 17, 2014



ITEM NUMBER

06-8703

LETTING DATE

CONSTRUCTION PROJECT NO.

FILE NAME: S27208-001.dgn

USER: jon.wanstrath
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

GENERAL SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
71	CRUSHED AGGREGATE SIZE NO. 57	TON	4539
2230	EMBANKMENT IN PLACE	CUYD	5937
2231	STRUCTURE GRANULAR BACKFILL	CUYD	5617
2545	CLEARING AND GRUBBING	LS	1
2568	MOBILIZATION	LS	1
2569	DEMOBILIZATION	LS	1
2650	MAINTAIN & CONTROL TRAFFIC	LS	1
2726	STAKING	LS	1
2731	REMOVE STRUCTURE	LS	1
2998	MASONRY COATING	SOYD	165
5985	SEEDING AND PROTECTION	SOYD	3304
8003	FOUNDATION PREPARATION	LS	1
8019	CYCLOPEAN STONE RIPRAP	TON	194
8033	TEST PILES	LF	376
8039	PRE DRILLING FOR PILES	LF	390
8052	PILES HP 14X117	LF	7029
8095	PILE POINTS-14 IN	EACH	78
8100	CONCRETE-CLASS A	CUYD	358
8106	CONCRETE-CLASS M 1	CUYD	104
8150	STEEL REINFORCEMENT	LB	53000
8551	MACHINE PREP OF SLAB	SOYD	356
21804EN	3-SIDED CULVERT	LF	133
23143ED	KPDES PERMIT AND TEMP EROSION CONTROL	LS	1
23233EC	DYNAMIC PILE TESTING	EACH	4
23315EC	DECORATIVE FENCE	LF	202
24246EC	REMOVE ABANDONED SANITARY SEWER	LF	40
24423EC	TEMPORARY SHORING	LS	1
24630EC	TYPE B ARMOR ROCK	TON	351
24754ED	SETTLEMENT MONITORING	LS	1
24756EC	COMBINATION PILE WALL	SOFT	11309
24757EC	COMBINATION PILE WALL STRUCTURAL STEEL	LS	1
24758EC	SEWER SUPPORT SYSTEM	LS	1
24759EC	PUMPED GROUT	CF	100
24761EC	CLOSURE DIAPHRAGM	LS	1

PIPE DRAINAGE SUMMARY

SHEET NO.	ITEM CODE	SKEW	STORM SEWER PIPE 24 INCH	REMOVE PIPE	DROP BOX INLET TYPE 3	MANHOLE TYPE A	MANHOLE TYPE B	ADJUST MANHOLE	REMARKS
			524	1310	1496	1756	1761	1792	
	UNIT TO BID		LIN FT	LIN FT	EACH				
	STA 1+13.60 LT							1	
	STA 1+78.00 LT								
	TO		31						
	STA 1+81.20 LT				1				
	TO		50						
	STA 2+11.30 LT			14			1		
	STA 1+84.00 RT					1			CONST. ABOVE 3-SIDED CULVERT
	TOTAL PROJECT		81	14	1	1	1	1	

Earthwork Quantities	
Com Exc	= 386 (CUYD)
Emb*	= 13448 (CUYD)

* INCLUDES STRUCTURE GRANULAR BACKFILL AND CRUSHED AGGREGATE SIZE NO. 57

FILE NAME: S27208-002.dgn

USER: jon.wanstrath
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: J. Ramler	D. Wormald	
DETAILED BY: J. Wanstrath	J. Ramler	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
ESTIMATE OF QUANTITIES		
PREPARED BY	SHEET NO.	
URS URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com	S2	DRAWING NO. 27208

ITEM NUMBER
06-8703

GENERAL SUMMARY

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Earthwork Quantities

Com Exc = 386 (CUYD)
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* INCLUDES STRUCTURE GRANULAR BACKFILL AND CRUSHED AGGREGATE SIZE NO. 57

FILE NAME: S27208-002.dgn

USER: jon.wanstrath
 DATE PLOTTED: Nov. 17, 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION	DATE

DATE: 11/17/2014 CHECKED BY: D. Wormald
 DESIGNED BY: J. Ramler
 DETAILED BY: J. Wanstrath J. Ramler

**Commonwealth of Kentucky
 DEPARTMENT OF HIGHWAYS**

COUNTY
CAMPBELL

ROUTE: CROSSING:
TAYLOR CREEK CULVERT

ESTIMATE OF QUANTITIES

ITEM NUMBER	PREPARED BY:	SHEET NO.
06-8703	URS URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com	S2 DRAWING NO. 27208

GENERAL NOTES

GENERAL SPECIFICATION NOTES

SPECIFICATIONS: References to the specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction including any current Supplemental Specifications. All references to the AASHTO Specifications are to the AASHTO LRFD Bridge Design Specifications, 5th Edition.

CULVERT DESIGN LOAD: HL-93 Live Load with fill as shown on Culvert Profile at 126 pcf.

DESIGN METHOD: All reinforced concrete members are designed by the load and resistance factor method as specified in the current LRFD Specifications.

REINFORCEMENT: Dimensions shown from the face of concrete to bars are to center of bars unless otherwise shown. Spacing of bars is from center to center of bars. Clear distance to face of concrete is 2", unless otherwise noted. Epoxy coat bars designated by suffix (e) in accordance with section 811.10 of the standard specifications. Use stirrup bend diameters for bars designated by suffix (s) in a bill of reinforcement.

BEVELED EDGES: Bevel all exposed edges 1/8", unless otherwise noted.

INCIDENTAL MATERIALS: The structure is to be completed in accordance with the plans and specifications. Materials or labor, not otherwise specified, are to be considered incidental to the contract.

PILE POINTS: Provide pile points for all point bearing piles. Ensure pile points are in accordance with section 604 of the specifications and of the type as shown on the pile notes.

PILE PROTECTION: Provide pile protection in accordance with subsection 604.03.11 of the standard specifications.

FOOTING EXCAVATION: Ensure excavation for footings is in accordance with subsection 603.03.03 of the specifications. Raising of the bottom of footings is not allowed. It is anticipated that dewatering activities may be necessary while work is proceeding below the flow line elevation of the Ohio River at any given time.

PROHIBITED FIELD WELDING: Except as shown on the plans, no welding of any nature shall be performed without the written consent of the designer, and then only in the manner and at the locations designated in the authorization.

WELDING PROCEDURE: Qualification tests of all welding procedures shall be completed by the contractor and approved by the engineer prior to the final approval of the shop drawings and welding procedure and the start of the fabrication.

SAWCUTTING EXISTING CONCRETE: Prior to the removal of the existing concrete, cut the surface with a concrete saw to a depth of one inch to facilitate a neat line. The cost of cutting concrete shall be included in the unit price bid for remove structure.

SLOPE PROTECTION: Use dry cyclopean stone rip rap in accordance with the plans and specifications.

DIMENSIONS: Dimensions are for a normal temperature of 60 degrees Fahrenheit. Layout dimensions are horizontal dimensions.

COMPLETION OF THE STRUCTURE: The Contractor is required to complete the structure in accordance with the plans and specifications. Material, labor or construction operations, not otherwise specified, are to be included in the bid item most appropriate to the work involved. This may include cofferdams, shoring, excavations, backfilling, removing all or parts of existing structures, phase construction, incidental materials, labor or anything else required to complete the structure.

UTILITY PROTECTION: Any active utility ducts including the sanitary sewer, shall be adequately protected. Any damage to utilities caused by the Contractor shall be repaired at his own expense.

GEOTECHNICAL REPORT: The project specific geotechnical report is available from the Kentucky Transportation Cabinet District 6 at (859) 341-2700.

EXISTING SANITARY SEWER DRAWINGS: Project drawings for the existing Sanitation District No. 1 Sanitary Sewer are available from the Kentucky Transportation Cabinet District 6 at (859) 341-2700. These drawings are provided for information only. The contractor shall field verify existing locations, dimension and materials for the Sanitary Sewer.

GUARDRAIL: Contrary to KYTC Standard Drawing RBR-020-05 the guardrail end treatment ET-Plus manufactured by Trinity Industries will not be permitted as an option for bid item "Guardrail End Treatment Type I".

DAMAGE TO COMPLETED WORK: The contractor shall ensure that in-place construction work and improvements are not damaged, rendered unsuitable, altered, discolored, and impaired during the course of the construction project. If damages do occur to in-place work, the district bridge engineer shall be notified of such damages. All damages to completed work will be repaired at the contractor's expense.

SEQUENCE OF CONSTRUCTION

The Contractor is to construct the project using the following sequence of construction unless permission in writing is granted from the Engineer. The means and methods described in each step are at the Contractor's discretion.

1. Clear and Grub Site - Install Temporary Shoring
Utilizing Riverboat Row and adjacent areas, clear and grub the site to remove existing vegetation within the construction limits as well as remove debris. Install vibration monitoring system per special note. Place temporary erosion control measures in accordance with the project construction storm water permit requirements. Install temporary shoring adjacent to Riverboat Row and backfill to the limits shown in the plans. Portions of the existing culvert, wing wall and abandoned sanitary sewer can be removed to the limits shown at this time or any time prior to Step 4 to permit pile installation. Traffic on Riverboat Row will be maintained in accordance with the general notes. Portions of the 24" storm sewer located east of the culvert may be constructed in coordination with the shoring and backfilling operations.

2. Drive Combination Pile Wall
To drive the combination pile wall, access the site via the gravel drive adjacent to the Chart House restaurant or with a work barge from the Ohio River. If a work barge is used, some dredging may be necessary depending on the equipment required. Excavation and disposal of material from the Ohio River shall be in accordance with the project DA permit. It may be necessary to place temporary aggregate fill in the vicinity of the Combination Pile Wall to provide access for equipment.

SEQUENCE OF CONSTRUCTION (CONTINUED)

Once access is established, remove obstructions from the plunge pool as necessary and proceed with driving the combination pile wall to the limits of the existing plunge pool (approx Sta. 35+00 RT to Sta 45+00 LT), at a minimum, to provide for filling and dewatering of the plunge pool. Diversion of discharge from Taylor Creek shall be maintained during construction. Temporary fill for staging equipment above the existing aerial sanitary sewer is not permitted without authorization from the engineer. Fill the Combination Pile Wall pipe piles as shown in the plans.

3. Backfill to Construct Sewer Support
Following installation of the Combination Pile Wall, fill the existing plunge pool and surrounding areas with aggregate fill to El. 452.0 (+/- 2') for a work platform to construct the new sanitary sewer support. Excavate as needed to expose buried portions of existing sewer in preparation for pile driving and construction of sewer support. See the sewer support drawings for more information on installing the sewer support and monitoring requirements.

4. Drive H Piles for Culvert and Sewer Support System
Drive bearing piles for both the culvert slab foundations and the Sewer Support System. For ease of construction, the Contractor may choose to install the sewer piles and culvert piles simultaneously. An alternate approach could be to install the sewer piles, sewer support (see Step 5), and backfill to construct the culvert foundation (see Step 6) before installing the culvert piles.

5. Install Sewer Support System
For any of the pile installation procedures described in Step 4, the Sewer Support System must be in place and existing sewer piles cut before backfill is placed above El. 452.0 (+/- 2'). See the sewer support drawings for more information on installing the sewer support and monitoring requirements.

6. Backfill to Construct Culvert Foundation
Following installation of the Sewer Support System, backfill to bottom of culvert slab. Install culvert piles if not installed during Step 4.

7. Construct Culvert Foundation
Once the sewer support system is in place, the culvert piles have been installed, and the backfill has been placed up to El. 458.5, the cast-in-place culvert foundation slab and walls can be constructed. Place backfill settlement platforms as shown in the plans and begin monitoring. Discharge from Taylor Creek must be maintained during the foundation construction. Once the base slab and walls have been completed the discharge can be directed to the new slab location. Regrade the existing culvert flowline, as shown in the plans, following construction of culvert foundation.

8. Place Precast Culvert Segments
Place the precast culvert segments in accordance with the manufacturer's directions. Install the access manhole. Install external connections between segments, lateral restraints and waterproofing in accordance with manufacturer's recommendations. Construct 24" storm pipe connected to culvert.

9. Cast Culvert Closure Diaphragm
Install dowel bars and cast the culvert closure diaphragm as shown in the plans between the existing precast culvert and new precast culvert sections. Coordinate closure pour with modification to the existing culvert flow line performed during Step 7.

10. Install Combination Pile Wall Threaded Rods and Anchor Walls
Complete driving of Combination Pile Wall to the limits shown in the plans. Backfill to El. 461.0 including structure granular backfill as shown in the cross sections. Once the anchor walls are driven, install the wales and threaded rods in the protective rigid conduit according to the Combination Pile Wall details and notes. Continue monitoring of settlement platforms.

11. Backfill to Final Grade
Place backfill around culvert, Combination Pile Wall threaded rods, and anchor walls to final grade as shown in the plans. Backfill behind Combination Pile Wall, and within anchor rod zone shall use structural granular backfill as shown in the plans. Place Type III Geotextile fabric between structural granular backfill and surrounding soils or clay cap. Extend settlement platforms to final grade.

12. Complete Final Activities
- a) Cast closure pours between the combination pile wall and precast culvert headwall segment.
 - b) Remove temporary shoring as necessary along Riverboat Row.
 - c) Place permanent erosion control (protection Cyclopean riprap and Type B Armor Rock).
 - d) Pump grout under existing culvert slab, construct cast-in-place concrete cap a minimum of one week following placement of backfill in Step 11 or as directed by Engineer and backfill to grade.
 - e) Install decorative fencing.
 - f) Restore all disturbed areas and place permanent seeding, etc.

MATERIAL SPECIFICATION NOTES

DESIGN STRESSES:

Steel Reinforcing: Fy = 60000 psi

MATERIALS: The Kentucky Department of Highways Standard Specifications for Road and Bridge Construction shall govern the following materials furnished:

Class "M" Concrete (Culvert Regrading) - See Section 601. Use either "M1" or "M2".

Class "A" Concrete (All Other Locations) - See Section 601. f'c = 3500 psi

See sheet S15 for additional information for pile materials.

FILE NAME: S27208-003.dgn

USER: jon.wanstrath
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: J. Ramler	D. Wormald	
DETAILED BY: A. Dykes	J. Ramler	

**Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS**

COUNTY
CAMPBELL

ROUTE CROSSING
TAYLOR CREEK CULVERT

GENERAL NOTES (1)

ITEM NUMBER
06-8703

PREPARED BY
URS
URS Corporation
525 Vine Street, Suite 1800
Cincinnati, OH 45202
www.urscorp.com

SHEET NO. S3
DRAWING NO. 27208

GENERAL NOTES

REVISED 12-08-14

GENERAL SPECIFICATION NOTES

SPECIFICATIONS: References to the specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction including any current Supplemental Specifications. All references to the AASHTO Specifications are to the AASHTO LRFD Bridge Design Specifications, 5th Edition.

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UTILITY PROTECTION: Any active utility ducts including the sanitary sewer, shall be adequately protected. Any damage to utilities caused by the Contractor shall be repaired at his own expense.

GEOTECHNICAL REPORT: The project specific geotechnical report is available from the Kentucky Transportation Cabinet District 6 at (859) 341-2700.

EXISTING SANITARY SEWER DRAWINGS: Project drawings for the existing Sanitation District No. 1 Sanitary Sewer are available from the Kentucky Transportation Cabinet District 6 at (859) 341-2700. These drawings are provided for information only. The contractor shall field verify existing locations, dimension and materials for the Sanitary Sewer.

GUARDRAIL: Contrary to KYTC Standard Drawing RBR-020-05 the guardrail end treatment ET-Plus manufactured by Trinity Industries will not be permitted as an option for bid item "Guardrail End Treatment Type I".

DAMAGE TO COMPLETED WORK: The contractor shall ensure that in-place construction work and improvements are not damaged, rendered unsuitable, altered, discolored, and impaired during the course of the construction project. If damages do occur to in-place work, the district bridge engineer shall be notified of such damages. All damages to completed work will be repaired at the contractor's expense.

SEQUENCE OF CONSTRUCTION

The Contractor is to construct the project using the following sequence of construction unless permission in writing is granted from the Engineer. The means and methods described in each step are at the Contractor's discretion.

1. Clear and Grub Site - Install Temporary Shoring
Utilizing Riverboat Row and adjacent areas, clear and grub the site to remove existing vegetation within the construction limits as well as remove debris. Install vibration monitoring system per special note. Place temporary erosion control measures in accordance with the project construction storm water permit requirements. Install temporary shoring adjacent to Riverboat Row and backfill to the limits shown in the plans. Portions of the existing culvert, wing wall and abandoned sanitary sewer can be removed to the limits shown at this time or any time prior to Step 4 to permit pile installation. Traffic on Riverboat Row will be maintained in accordance with the general notes. Portions of the 24" storm sewer located east of the culvert may be constructed in coordination with the shoring and backfilling operations.

2. Drive Combination Pile Wall
To drive the combination pile wall, access the site via the gravel drive adjacent to the Chart House restaurant or with a work barge from the Ohio River. If a work barge is used, some dredging may be necessary depending on the equipment required. Excavation and disposal of material from the Ohio River shall be in accordance with the project DA permit. It may be necessary to place temporary aggregate fill in the vicinity of the Combination Pile Wall to provide access for equipment.

SEQUENCE OF CONSTRUCTION (CONTINUED)

Once access is established, remove obstructions from the plunge pool as necessary and proceed with driving the combination pile wall to the limits of the existing plunge pool (approx Sta. 35+00 RT to Sta 45+00 LT), at a minimum, to provide for filling and dewatering of the plunge pool. Diversion of discharge from Taylor Creek shall be maintained during construction. Temporary fill for staging equipment above the existing aerial sanitary sewer is not permitted without authorization from the engineer. Fill the Combination Pile Wall pipe piles as shown in the plans.

3. Backfill to Construct Sewer Support
Following installation of the Combination Pile Wall, fill the existing plunge pool and surrounding areas with aggregate fill to El. 452.0 (+/- 2') for a work platform to construct the new sanitary sewer support. Excavate as needed to expose buried portions of existing sewer in preparation for pile driving and construction of sewer support. See the sewer support drawings for more information on installing the sewer support and monitoring requirements.

4. Drive H Piles for Culvert and Sewer Support System
Drive bearing piles for both the culvert slab foundations and the Sewer Support System. For ease of construction, the Contractor may choose to install the sewer piles and culvert piles simultaneously. An alternate approach could be to install the sewer piles, sewer support (see Step 5), and backfill to construct the culvert foundation (see Step 6) before installing the culvert piles.

5. Install Sewer Support System
For any of the pile installation procedures described in Step 4, the Sewer Support System must be in place and existing sewer piles cut before backfill is placed above El. 452.0 (+/- 2'). See the sewer support drawings for more information on installing the sewer support and monitoring requirements.

6. Backfill to Construct Culvert Foundation
Following installation of the Sewer Support System, backfill to bottom of culvert slab. Install culvert piles if not installed during Step 4.

7. Construct Culvert Foundation
Once the sewer support system is in place, the culvert piles have been installed, and the backfill has been placed up to El. 458.5, the cast-in-place culvert foundation slab and walls can be constructed. Place backfill settlement platforms as shown in the plans and begin monitoring. Discharge from Taylor Creek must be maintained during the foundation construction. Once the base slab and walls have been completed the discharge can be directed to the new slab location. Regrade the existing culvert flowline, as shown in the plans, following construction of culvert foundation.

8. Place Precast Culvert Segments
Place the precast culvert segments in accordance with the manufacturer's directions. Install the access manhole. Install external connections between segments, lateral restraints and waterproofing in accordance with manufacturer's recommendations. Construct 24" storm pipe connected to culvert.

9. Cast Culvert Closure Diaphragm
Install dowel bars and cast the culvert closure diaphragm as shown in the plans between the existing precast culvert and new precast culvert sections. Coordinate closure pour with modification to the existing culvert flow line performed during Step 7.

10. Install Combination Pile Wall Threaded Rods and Anchor Walls
Complete driving of Combination Pile Wall to the limits shown in the plans. Backfill to El. 461.0 including structure granular backfill as shown in the cross sections. Once the anchor walls are driven, install the wales and threaded rods in the protective rigid conduit according to the Combination Pile Wall details and notes. Continue monitoring of settlement platforms.

11. Backfill to Final Grade
Place backfill around culvert, Combination Pile Wall threaded rods, and anchor walls to final grade as shown in the plans. Backfill behind Combination Pile Wall, and within anchor rod zone shall use structural granular backfill as shown in the plans. Place Type III Geotextile fabric between structural granular backfill and surrounding soils or clay cap. Extend settlement platforms to final grade.

12. Complete Final Activities
- a) Cast closure pours between the combination pile wall and precast culvert headwall segment.
 - b) Remove temporary shoring as necessary along Riverboat Row.
 - c) Place permanent erosion control (protection Cyclopean riprap and Type B Armor Rock).
 - d) Pump grout under existing culvert slab, construct cast-in-place concrete cap a minimum of one week following placement of backfill in Step 11 or as directed by Engineer and backfill to grade.
 - e) Install decorative fencing.
 - f) Restore all disturbed areas and place permanent seeding, etc.

MATERIAL SPECIFICATION NOTES

DESIGN STRESSES:

Steel Reinforcing: Fy = 60000 psi

MATERIALS: The Kentucky Department of Highways Standard Specifications for Road and Bridge Construction shall govern the following materials furnished:

Class "M" Concrete (Culvert Regrading) - See Section 601. Use either "M1" or "M2".

Class "A" Concrete (All Other Locations) - See Section 601. f'c = 3500 psi

See sheet S15 for additional information for pile materials.

FILE NAME: S27208-003.dgn

USER: jon.wanstrath
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: J. Ramler	D. Wormald	
DETAILED BY: A. Dykes	J. Ramler	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
GENERAL NOTES (1)		
PREPARED BY		
ITEM NUMBER		SHEET NO.
06-8703		S3
URS		DRAWING NO.
URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com		27208

GENERAL NOTES

BACKFILL

The backfill around the extended culvert and behind the proposed combination pile wall, anchor rods and sheet pile anchor wall shall be select granular backfill as shown in the plans followed by compacted clayey backfill. The select granular backfill shall consist of free-draining soils classified into AASHTO Group A-1, except that the percent passing No. 200 sieve should be restricted to a maximum of three percent. The backfill materials, placement and compaction of the backfill should be performed in accordance with the current Kentucky Standard Specifications for Road and Bridge Construction, the precast concrete culvert manufacturer's specifications and the following requirements. The backfill shall be compacted to at least 95 percent of the Standard Proctor Maximum Dry Density (AASHTO T99) or at least 80 percent relative density (ASTM D4253 and D4254), whichever results in a greater dry density. The select granular backfill for the culvert and combination pile wall shall be capped with at least two feet of compacted clayey soils to reduce infiltration and the buildup of hydrostatic pressures on the culvert and walls. The Contractor shall select appropriate equipment and methods to compact the fill and backfill without damaging the precast culvert or combination pile wall and anchorages.

The select granular backfill shall be paid for as Structure Granular Backfill. The two foot clayey cap over the select granular backfill shall be considered incidental to embankment in place.

REMOVE STRUCTURE

This item shall include removal of the existing culvert headwalls, headwall foundation and a 16 foot length of the existing 3-sided culvert, stem walls, floor and reinforced concrete liner as detailed in the plans. The detached headwall shall be removed completely. The intact headwall shall be removed to at least the limits shown in the plans.

UTILITY OWNERSHIP

CINCINNATI BELL:
CONTACT & PHONE #

DUKE ENERGY: ELECTRIC
CONTACT & PHONE #

DUKE ENERGY: GAS
CONTACT & PHONE #

NORTHERN KENTUCKY WATER DISTRICT:
CONTACT & PHONE #

SANITATION DISTRICT NO. 1:
CONTACT & PHONE #

CONTRACTOR IS RESPONSIBLE FOR OBTAINING GRADING PERMIT FROM SANITATION DISTRICT NO. 1. CONTRACT SEAN BLAKE, STORM WATER DEPARTMENT, SANITATION DISTRICT NO. 1 AT 859-578-7468.

CULVERT NOTES

- Dimensions and elevations shown are approximate and intended to convey enough information to develop detail structural drawings, and bidding documents. If contractor desires to modify this layout, no payment adjustments will be allowed.
- If a listed alternate is used, flow areas must be equal to or greater than the minimum flow areas shown below. If modifications to the layout due to selection of an alternate structure are required, no payment adjustments will be allowed.
- Work to construct the 3-sided culvert is paid for under the bid items "3-sided culvert." "3-sided culvert" is a linear foot bid item that covers all work to construct the culvert unless otherwise noted. This includes labor and materials to construct the culvert sections, precast headwall, steel exterior restraints, joint sealing, and structure drainage appurtenances.
- All components must be designed to meet structural requirements as set forth for earth, dead, and HL-93 live load in AASHTO LRFD Bridge Design Specifications, with interims. All designs submitted for consideration must be performed and stamped by a qualified professional engineer licensed to practice in the Commonwealth of Kentucky.
- All materials used must be in conformance with KYTC Standard Specifications for Road and Bridge Construction, the KYTC list of approved materials, and all applicable ASTM and AASHTO standards unless otherwise noted.
- All precast components shall be manufactured by a fabricator approved by KYTC and be in strict compliance with Section 615 of the KYTC Standard Specifications for Road and Bridge Construction.
- Comply with section 106.04 of the Standard Specifications for Road and Bridge Construction by American requirement.
- In accordance with section 615 of KYTC Standard Specifications for Road and Bridge Construction, weep holes will be required for these structures. See plans for details.
- 3-sided structures that require special backfill contrary to KYTC Standard Specifications for Road and Bridge Construction will require a certification letter stating that the backfill was constructed properly. The letter will be signed by the contractor and the manufacturer of the 3-sided structure and will be submitted to the resident engineer. See plans for backfill requirements.
- The manufacturer or supplier must provide 6 copies of detailed shop drawings for final approval for use on this project. Backfill requirements and any specifications that are contrary to the KYTC Standard Specifications for Road and Bridge Construction should be supplied as well. Include one set of structural design calculations for review and archival purposes. This information will be submitted to the division of construction. Allow 4 weeks time for review of this material.

Acceptable products as shown in the approved list for 3-sided culverts are:

Aqua-Arch	20' Span X 10' Rise	Flow Area 185 Sq Ft
Conspan "Mid-Span" Spa, Series	20' Span X 10' Rise	Flow Area 185 Sq Ft
Ecospan "Arch Box (AB) Series"	20' Span X 10' Rise	Flow Area 185 Sq Ft
Hy-Span Bridge System	20' Span X 10' Rise	Flow Area 185 Sq Ft

The 3-sided culvert depicted in these drawings is based on the Conspan "Mid-Span" Spa, Series.

MAINTENANCE OF TRAFFIC

- Traffic shall be maintained in accordance with the Manual On Uniform Traffic Control Devices, the Standard Specifications for Road and Bridge Construction and the Standard Drawings, current editions.
- Except for the roadway and traffic control bid items listed, all items of work necessary to maintain and control traffic will be paid at the lump sum bid price to "Maintain And Control Traffic" as set forth in the Current Standard Specifications for Road and Bridge Construction unless otherwise provided for in these notes. The lump sum bid to "Maintain And Control Traffic" shall also include, but is not limited to, the following items and operations:
 - All grading and necessary drainage (unless a bid item for detour construction is included) for the temporary roadway and removal thereof, when it is no longer needed. If a bid item for Detour Construction is included, grading and drainage will be paid for in the bid item "Detour Construction".
 - All labor and materials necessary for construction and maintenance of traffic control devices and markings.
 - All flag persons and traffic control devices such as, but not limited to, flashers, signs barricades and vertical panels, plastic drums (steel drums will not be permitted) and cones necessary for the control and protection of vehicular and pedestrian traffic as specified in these notes, the plans, the MUTCD or the Engineer.
- Any temporary traffic control items, devices, materials and incidentals shall remain the property of the Contractor when no longer needed.
- The Contractor shall maintain a two-lane traveled way on Riverboat Row with a minimum lane width of 11 feet. Riverboat Row can be closed during installation of the temporary shoring and at other times at the discretion of the Engineer. All access points from Riverboat Row to Joe's Crabshack, the Chart House and Comfort Suites shall remain open during Riverboat Row closures. At the Engineer's discretion, short term closures of these access points may be allowed provided adequate signing and a flag person are at the location. When the north side of Riverboat Row is closed, the sidewalk shall also be closed and signed accordingly. Closures will not be permitted to provide storage area for materials or equipment while not in use.
- Riverboat Row may be closed at the discretion of the Engineer. Coordinate all closures with the cities of Newport and Bellevue. The cities shall be notified a minimum of ten days prior to any closure. A detour shall be adequately signed per the MUTCD. Traffic shall be detoured along KY 8. The Transit Authority of Northern Kentucky (TANK) operates a bus route for the Southbank Shuttle along Riverboat Row within the project limits. The Contractor shall notify TANK a minimum of ten days prior to any closure to allow time for routes to be revised.
- The Contractor shall completely cover any signs, existing, permanent or temporary, which do not properly apply to the current traffic phasing, and shall maintain the covering until the signs are applicable or are removed.
- In general, all traffic control devices shall be placed starting and proceeding in the direction of the flow of traffic and removed starting and proceeding in the direction opposite the flow of traffic.
- The Engineer and the Contractor, or their authorized representatives, shall review the signing before traffic is allowed to use any lane closures, crossovers or detours. All signing shall be approved by the Engineer before work can be started by the Contractor.
- If the Contractor desires to deviate from the traffic control scheme and construction schedule outlined in these plans and this proposal, he shall prepare an alternate plan and present it in writing to the Engineer. This alternate plan can be used only after review and approval of the Divisions of Traffic, Design and Construction, and the Federal Highway Administration, where applicable.
- If traffic should be stopped due to construction operations and an emergency vehicle on an official emergency run arrives at the scene, the Contractor shall make the provisions for the passage of that vehicle as quickly as possible.
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- When the sidewalk is open and the adjacent construction site is active, the Contractor shall protect pedestrians from the work with construction fencing or other devices as approved by the Engineer.

BEFORE YOU DIG

FILE NAME: S27208-004.dgn

USER: jon.wanstrath
DATE PLOTTED: Nov. 17, 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: J. Ramler	D. Wormald	
DETAILED BY: A. Dykes	J. Ramler	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
CAMPBELL

ROUTE CROSSING
TAYLOR CREEK CULVERT

GENERAL NOTES (2)

ITEM NUMBER
06-8703

PREPARED BY

URS URS Corporation
525 Vine Street, Suite 1800
Cincinnati, OH 45202
www.urscorp.com

SHEET NO.
S4

DRAWING NO.
27208

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DUKE ENERGY: ELECTRIC
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CONTACT & PHONE #

NORTHERN KENTUCKY WATER DISTRICT:
CONTACT & PHONE #

SANITATION DISTRICT NO. 1:
CONTACT & PHONE #

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CONTACT SEAN BLAKE, STORM WATER DEPARTMENT, SANITATION DISTRICT NO. 1 AT 859-578-7468.

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- If the Contractor desires to deviate from the traffic control scheme and construction schedule outlined in these plans and this proposal, he shall prepare an alternate plan and present it in writing to the Engineer. This alternate plan can be used only after review and approval of the Divisions of Traffic, Design and Construction, and the Federal Highway Administration, where applicable.
- If traffic should be stopped due to construction operations and an emergency vehicle on an official emergency run arrives at the scene, the Contractor shall make the provisions for the passage of that vehicle as quickly as possible.
- All signs necessary for a marked detour will be provided by the Contractor as required by Standard Drawings and the MUTCD. Signs outside the project limits shall be paid for by the square foot. This quantity shall include sign mounting hardware and posts.
- When the sidewalk is open and the adjacent construction site is active, the Contractor shall protect pedestrians from the work with construction fencing or other devices as approved by the Engineer.

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

FILE NAME: S27208-004.dgn

USER: jon.wanstrath
DATE PLOTTED: Nov. 17, 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: J. Ramler	D. Wormald	
DETAILED BY: A. Dykes	J. Ramler	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
CAMPBELL

ROUTE: **TAYLOR CREEK CULVERT**

GENERAL NOTES (2)

ITEM NUMBER
06-8703

PREPARED BY

URS URS Corporation
525 Vine Street, Suite 1800
Cincinnati, OH 45202
www.urscorp.com

SHEET NO.
S4

DRAWING NO.
27208

GENERAL NOTES

DEPARTMENT OF THE ARMY PERMIT AND WATER QUALITY CERTIFICATION APPROVALS

A Department of the Army COE Permit, which may require approval of a State Water Quality Certification from the Kentucky Division of Water, regulates this project at one or more locations. Perform all applicable work in compliance with the conditions stated in the DA permit and the approved Water Quality Certification. Post a copy of the DA permit and the Water Quality Certification in a conspicuous place at the project site. If a DA permit or Water Quality Certification approval is pending, do not work in or disturb the designated area(s) until obtaining the appropriate approval(s). Refer to notice(s) contained in the contract bid proposal for designated area(s) where work is prohibited by the absence of approval.

EROSION PREVENTION AND SEDIMENT CONTROL

The Contractor shall be responsible for filing the Kentucky Pollution Discharge Elimination System (KPDES) KYRIO permit Notice of Intent (NOI) with the Kentucky Division of Water (DOW) and any KPDES local Municipal Separate Storm Sewer System (MS4) program that has jurisdiction. The NOI shall name the Contractor as the Facility Operator and include the KYTC Contract ID Number (CID) for reference.

The Contractor shall perform all temporary erosion/sediment control functions including: providing a Best Management Practice (BMP) Plan, conducting required inspections, modifying the BMP plan documents as construction progresses and documenting the installation and maintenance of BMPs in conformance with the KPDES KYRIO permit effective on August 1, 2009 or a permit re-issued to replace that KYRIO permit. This work shall be conducted in conformance with the requirements of Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction.

Contrary to Section 213.03.03, paragraph 2, the Engineer shall conduct inspections as needed to verify compliance with Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction. The Engineer's inspections shall be performed a minimum of once per month and within seven days after a storm of 1/2 inch or greater or when the Ohio River or Taylor Creek inundate portions of the project limits. Copies of the Engineer's inspections shall not be provided to the contractor unless improvements to the BMP's are required. The contractor shall initiate corrective action within 24 hours of any reported deficiency and complete the work within 5 days. The Engineer shall use Form TC 63-61 A for this report. Inspections performed by the Engineer do not relieve the Contractor of any responsibility for compliance with the KPDES permit.

Contrary to Section 213.05, bid items for temporary BMP's will not be listed and will be replaced with one lump sum item for the services. Payment will be pro-rated based on the Project Schedule as submitted by the Contractor and as agreed to by the Engineer.

The contractor shall be responsible for applying "good engineering practices" as required by the KPDES permit. The contractor may use any temporary BMPs with the approval of the KYTC Engineer.

The contractor shall provide the Engineer copies of all documents required by the KPDES permit at the time they are prepared.

The contractor shall be responsible for the examination of the soils to be encountered and make his own independent determination of the temporary BMP's that will be required to accomplish effective erosion prevention and sediment control.

The Contractor shall be responsible for filing the KPDES permit Notice of Termination (NOT) with the Kentucky DOW and any local MS4 program that has jurisdiction. The NOT shall be filed after the Engineer agrees that the project is stabilized or the project has been formally accepted.

SEEDING AND PROTECTION

Permanent seeding shall be in accordance with Section 212 of the standard specifications Place Type I seed mix on all slopes 3:1 or less within the construction limits. Place Type II seed mix on steeper slopes within the construction limits not covered with cyclopean rip rap. Coordinate seeding and protection with Water Pollution Control per Section 213.

TYPE B ARMOR ROCK

Type B Amor rock shall be placed in the Ohio River to the limits shown in the plans. See special note for additional information.

CONTRACTOR ACCESS

The contractor may access the site from Riverboat Row, areas downstream of the site adjacent to the Chart House Restaurant and from the Ohio River. The contractor may not stage activities from the Port Bellevue (Joe's Crab Shack) parking lot. Access from the Ohio River may require dredging. Excavation and disposal of material from the Ohio River shall be in accordance with the Project DA permit. Due to space limitations dredged material must be disposed of off-site in an upland area.

See maintenance of Traffic Notes for additional information regarding access from Riverboat Row. Contractor parking in adjacent businesses is prohibited.

WORKING HOURS FOR POWER-OPERATED EQUIPMENT

Activities and land uses adjacent to this project may be affected by construction noise. In order to minimize adverse construction noise impacts, do not operate power-operated construction equipment between the hours of 5:00 pm and 7:30 am. Exceptions to this restriction may be granted by the Engineer in the case of high-water events on the Ohio River or Taylor Creek, as well as emergencies which may damage adjacent property or utilities. The Contractor shall plan his or her schedule to accommodate the working hour limitations noted above.

PUMPED GROUT

This procedure shall consist of filling the voids beneath the end of the existing culvert by pumping grout under the concrete slab.

MATERIALS AND EQUIPMENT:

ASTM C 618: Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

ASTM C 1107: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

Use standard mix design that is customarily used for pressure-grouting or mudjacking.

Obtain Engineer's approval for grout mix design prior to installation.

Adjust water content to meet local conditions.

Equipment shall be capable of supplying a homogenous product at the appropriate rate.

The equipment used shall be that customarily used in the field of pressure-grouting or mudjacking.

Concrete drill or saw capable of producing circular holes of adequate size for the application type.

CONSTRUCTION: The pressure grouting contractor shall drill the slab to insert pressure grouting apparatus at the locations shown in the plans. The drill shall be rotated to avoid cracking of the concrete and provide proper diameter for effective operations. The drill shall be held as nearly to perpendicular as possible to the slab surface. No more holes shall be drilled during a day's operation than can be grouted during that same day.

After the holes are drilled, a pipe connected to the discharge hose on the pressure grout pump shall be lowered into the holes. The discharge end of the pipe shall not extend below the bottom surface of the culvert.

The Contractor shall continuously pump in a pattern and amount required to slowly and evenly fill voids beneath the existing culvert. The overflow of the grout hole or adjacent grout holes is sufficient evidence that the voids under the culvert are being filled.

After grouting has been completed in any hole, the discharge pipe shall be withdrawn from that hole as the pressure in the line decreases.

The drilled holes through the slab shall be filled with non-shrink grout.

The department will measure the quantity in cubic feet. Payment is full compensation for temporarily diverting culvert flow during grouting operations, drilling through existing culvert floor, pumping grout under existing culvert, including all new materials, labor, equipment, tools, and incidentals necessary to complete the work according to the plans and specifications.

MACHINE PREPARATION OF EXISTING SLAB

This department will measure the quantity in square yards. Payment is full compensation for diverting culvert flow as needed, scarifying existing culvert floor slab, and disposal of removed material off site, including all labor equipment, tools, and incidentals necessary to complete the work according to the plans and specifications.

DECORATIVE FENCE


See special note for additional information.

FILE NAME: S27208-005.dgn

USER: mark.zorc
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: J. Ramler	D. Wormald	
DETAILED BY: A. Dykes	J. Ramler	
Commonwealth of Kentucky		
DEPARTMENT OF HIGHWAYS		
COUNTY		
CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
GENERAL NOTES (3)		
PREPARED BY		
ITEM NUMBER		SHEET NO.
06-8703		S5
 URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com		DRAWING NO.
		27208

GENERAL NOTES

DEPARTMENT OF THE ARMY PERMIT AND WATER QUALITY CERTIFICATION APPROVALS

A Department of the Army COE Permit, which may require approval of a State Water Quality Certification from the Kentucky Division of Water, regulates this project at one or more locations. Perform all applicable work in compliance with the conditions stated in the DA permit and the approved Water Quality Certification. Post a copy of the DA permit and the Water Quality Certification in a conspicuous place at the project site. If a DA permit or Water Quality Certification approval is pending, do not work in or disturb the designated area(s) until obtaining the appropriate approval(s). Refer to notice(s) contained in the contract bid proposal for designated area(s) where work is prohibited by the absence of approval.

EROSION PREVENTION AND SEDIMENT CONTROL

The Contractor shall be responsible for filing the Kentucky Pollution Discharge Elimination System (KPDES) KYRIO permit Notice of Intent (NOI) with the Kentucky Division of Water (DOW) and any KPDES local Municipal Separate Storm Sewer System (MS4) program that has jurisdiction. The NOI shall name the Contractor as the Facility Operator and include the KYTC Contract ID Number (CID) for reference.

The Contractor shall perform all temporary erosion/sediment control functions including: providing a Best Management Practice (BMP) Plan, conducting required inspections, modifying the BMP plan documents as construction progresses and documenting the installation and maintenance of BMPs in conformance with the KPDES KYRIO permit effective on August 1, 2009 or a permit re-issued to replace that KYRIO permit. This work shall be conducted in conformance with the requirements of Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction.

Contrary to Section 213.03.03, paragraph 2, the Engineer shall conduct inspections as needed to verify compliance with Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction. The Engineer's inspections shall be performed a minimum of once per month and within seven days after a storm of 1/2 inch or greater or when the Ohio River or Taylor Creek inundate portions of the project limits. Copies of the Engineer's inspections shall not be provided to the contractor unless improvements to the BMP's are required. The contractor shall initiate corrective action within 24 hours of any reported deficiency and complete the work within 5 days. The Engineer shall use Form TC 63-61 A for this report. Inspections performed by the Engineer do not relieve the Contractor of any responsibility for compliance with the KPDES permit.

Contrary to Section 213.05, bid items for temporary BMP's will not be listed and will be replaced with one lump sum item for the services. Payment will be pro-rated based on the Project Schedule as submitted by the Contractor and as agreed to by the Engineer.

The contractor shall be responsible for applying "good engineering practices" as required by the KPDES permit. The contractor may use any temporary BMPs with the approval of the KYTC Engineer.

The contractor shall provide the Engineer copies of all documents required by the KPDES permit at the time they are prepared.

The contractor shall be responsible for the examination of the soils to be encountered and make his own independent determination of the temporary BMP's that will be required to accomplish effective erosion prevention and sediment control.

The Contractor shall be responsible for filing the KPDES permit Notice of Termination (NOT) with the Kentucky DOW and any local MS4 program that has jurisdiction. The NOT shall be filed after the Engineer agrees that the project is stabilized or the project has been formally accepted.

SEEDING AND PROTECTION

Permanent seeding shall be in accordance with Section 212 of the standard specifications Place Type I seed mix on all slopes 3:1 or less within the construction limits. Place Type II seed mix on steeper slopes within the construction limits not covered with cyclopean rip rap. Coordinate seeding and protection with Water Pollution Control per Section 213.

TYPE B ARMOR ROCK

Type B Amor rock shall be placed in the Ohio River to the limits shown in the plans. See special note for additional information.



CONTRACTOR ACCESS

The contractor may access the site from Riverboat Row, areas downstream of the site adjacent to the Chart House Restaurant and from the Ohio River. The contractor may not stage activities from the Port Bellevue (Joe's Crab Shack) parking lot. Access from the Ohio River may require dredging. Excavation and disposal of material from the Ohio River shall be in accordance with the Project DA permit. Due to space limitations dredged material must be disposed of off-site in an upland area.

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DECORATIVE FENCE


See special note for additional information.

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DATE PLOTTED: Nov. 17 2014

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MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: J. Ramler	D. Wormald	
DETAILED BY: A. Dykes	J. Ramler	
Commonwealth of Kentucky		
DEPARTMENT OF HIGHWAYS		
COUNTY		
CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
GENERAL NOTES (3)		
PREPARED BY		
ITEM NUMBER		SHEET NO.
06-8703		55
 URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com		DRAWING NO. 27208

SETTLEMENT MONITORING

The contractor shall install two settlement platforms at the locations and elevations shown in the plans in accordance with Section 216.

Measurements at the settlement platforms shall be taken weekly that correlate with the placement of backfill. All settlement platform measurements shall be furnished to the Engineer. Stop work at any location where settlement platforms are disturbed or damaged, and make necessary repairs or replacement. As the embankment is constructed, add sections of 2 1/2" and 4" pipe to the assembly (tighten each new section of 2 1/2" pipe with a pipe wrench before taking a reading to ensure that the next added section does not affect future readings). Keep the top of the outer pipe closed as work progresses with a 4" standard cap. When work is complete, secure the cap to the final outer pipe section. The elevation of top of the pipe shall be adjusted as necessary to match the surface of the proposed final grade.

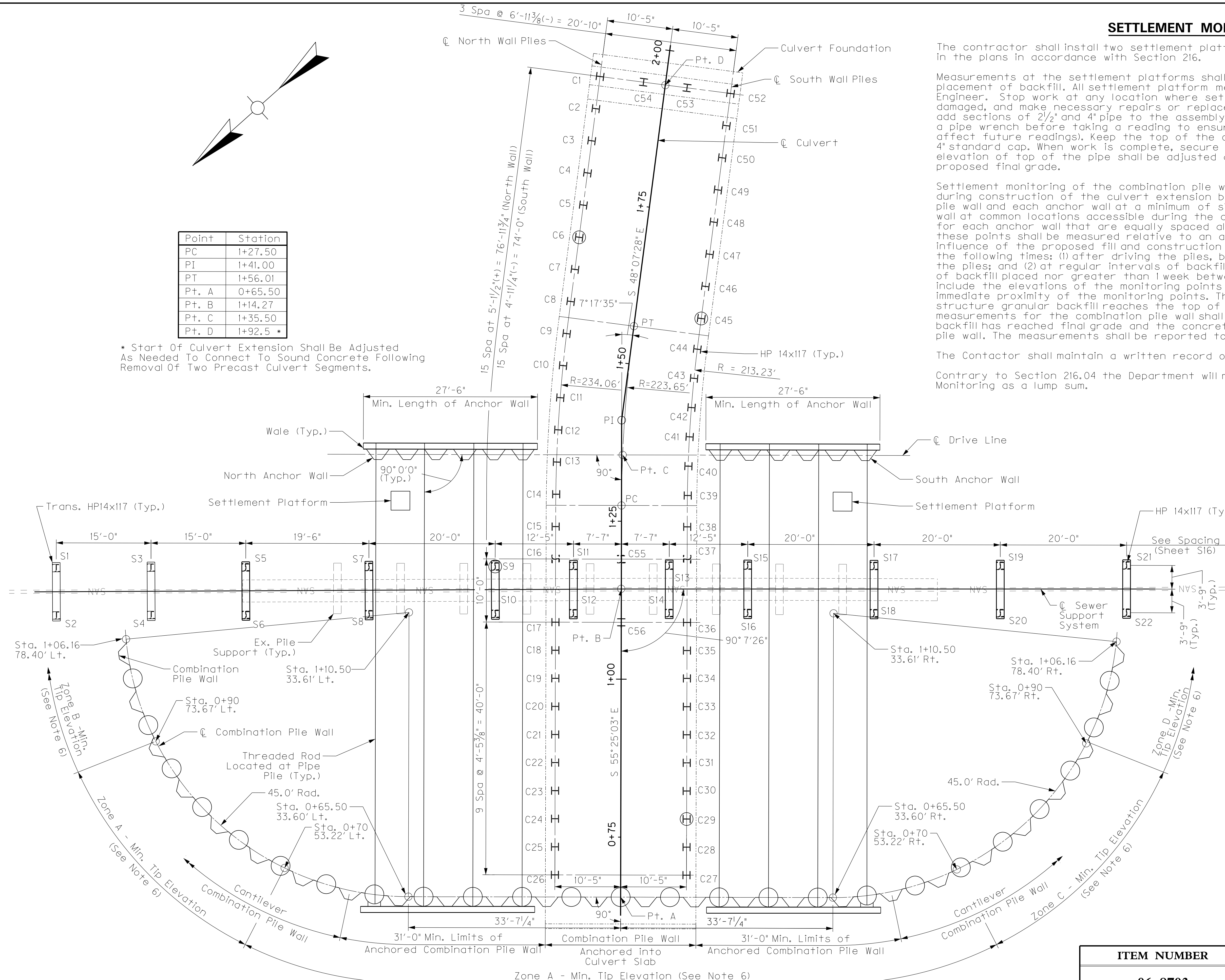
Settlement monitoring of the combination pile walls and anchor walls shall be performed during construction of the culvert extension by surveying and monitoring the combination pile wall and each anchor wall at a minimum of six (6) locations along the combination pile wall at common locations accessible during the construction as well as three (3) locations for each anchor wall that are equally spaced along the length of each wall. Elevations at these points shall be measured relative to an approved benchmark located outside of the influence of the proposed fill and construction operations. Measurements shall be made at the following times: (1) after driving the piles, but prior to placing backfill behind/around the piles; and (2) at regular intervals of backfill placement, but not less than every 2 feet of backfill placed nor greater than 1 week between measurements. Measurements shall include the elevations of the monitoring points and the elevation of the backfill in the immediate proximity of the monitoring points. The anchor walls shall be monitored until the structure granular backfill reaches the top of the sheetpile. The last set of measurements for the combination pile wall shall be taken a minimum of one week after the backfill has reached final grade and the concrete cap has been cast on the combination pile wall. The measurements shall be reported to the Engineer on a weekly basis.

The Contractor shall maintain a written record of all settlement measurements.

Contrary to Section 216.04 the Department will measure the quantity for Settlement Monitoring as a lump sum.

Point	Station
PC	1+27.50
PI	1+41.00
PT	1+56.01
Pt. A	0+65.50
Pt. B	1+14.27
Pt. C	1+35.50
Pt. D	1+92.5 *

* Start Of Culvert Extension Shall Be Adjusted As Needed To Connect To Sound Concrete Following Removal Of Two Precast Culvert Segments.



LEGEND

- I Indicates Vertical Pile
- ⊕ Indicates Test Pile

NOTES

1. For General Notes, See Sheets S3-S5.
2. For Sewer Support System, See Sheet S16-S18.
3. For Combination Pile Wall, See Sheet S14.
4. For Pile Notes, See Sheet S15.
5. For Culvert Foundation, See Sheets S19-S22.
6. For Combination Wall Tip Elevation See Sheet S15
7. For installation of all piles, Contractor shall protect adjacent structures from damage according to the special note for Vibration Monitoring and per Section 107 of the Standard Specifications.

REVISION	DATE

DATE: 11/17/2014	CHECKED BY: N. Hamadani
DESIGNED BY: T. Baker	T. Baker
DETAILED BY: J. Corley	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
CAMPBELL

ROUTE CROSSING
TAYLOR CREEK CULVERT

FOUNDATION LAYOUT

ITEM NUMBER
06-8703

PREPARED BY
URS URS Corporation
 525 Vine Street, Suite 1800
 Cincinnati, OH 45202
 www.urscorp.com

SHEET NO.
S13
 DRAWING NO.
27208

FILE NAME: S27208-013.DGN
 USER: Travis Baker
 DATE PLOTTED: Nov. 17 2014
 E-SHEET NAME:
 MicroStation v8.11.9.397

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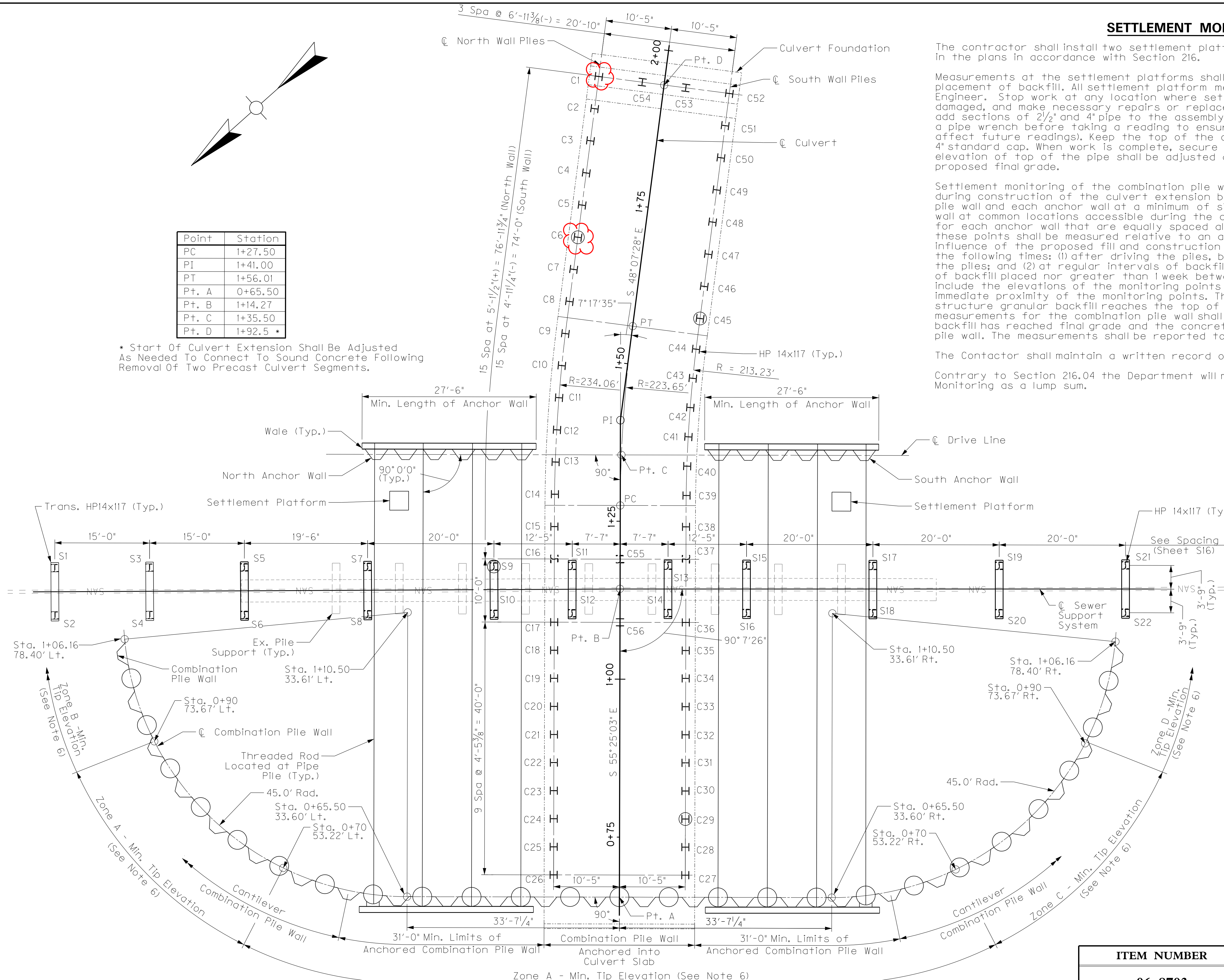
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REVISION	DATE

DATE: 11/17/2014	CHECKED BY: N. Hamadani
DESIGNED BY: T. Baker	T. Baker
DETAILED BY: J. Corley	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
CAMPBELL

ROUTE CROSSING
TAYLOR CREEK CULVERT

FOUNDATION LAYOUT

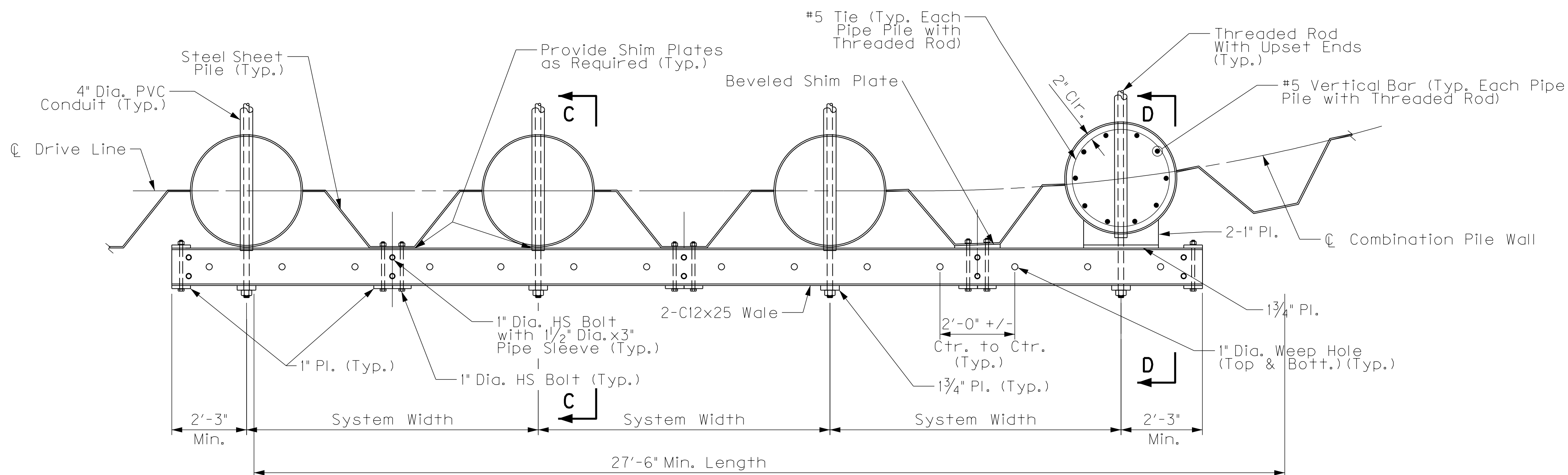
ITEM NUMBER	06-8703
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PREPARED BY
URS

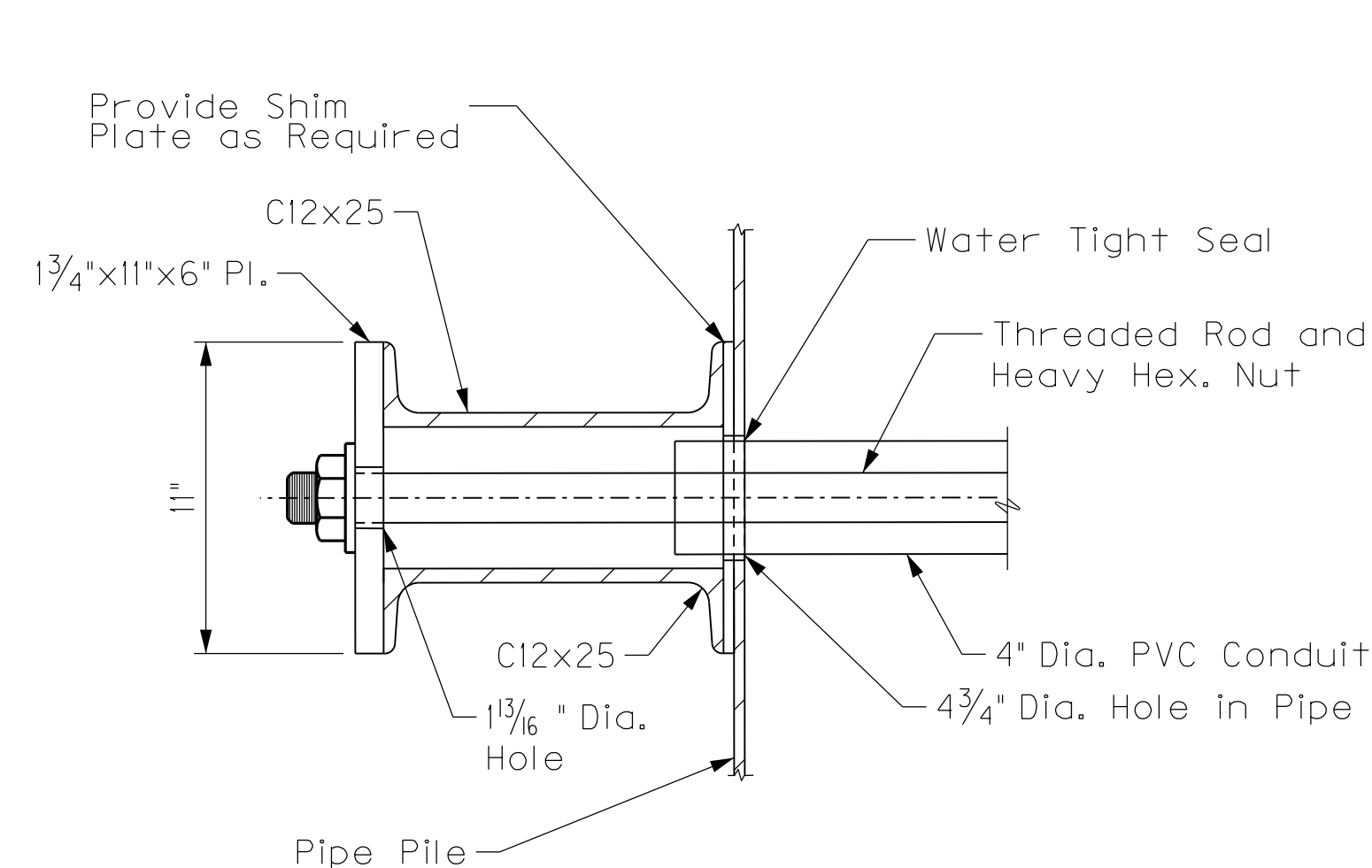
SHEET NO.
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URS Corporation
 525 Vine Street, Suite 1800
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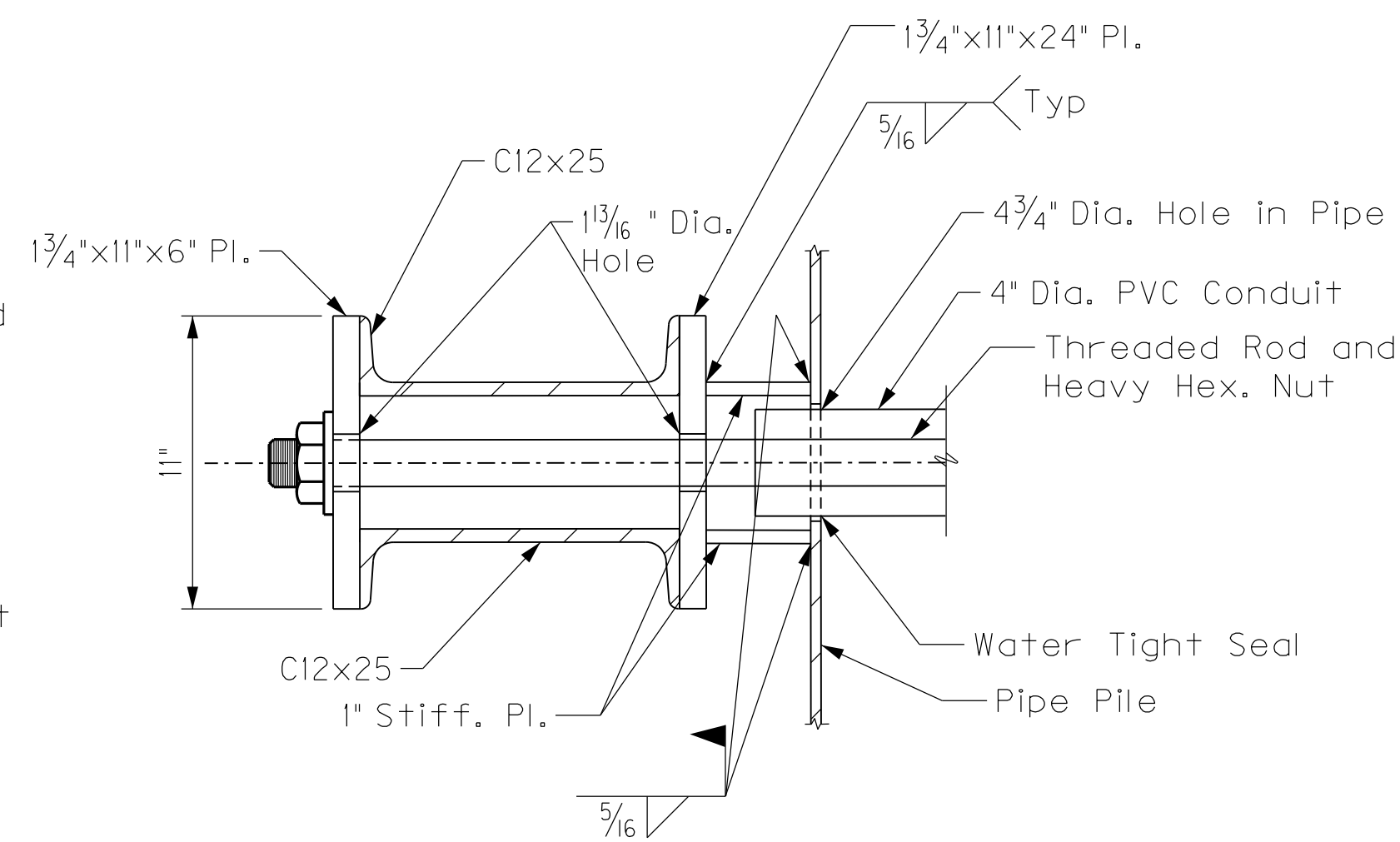
FILE NAME: S27208-013.DGN
 USER: Travis Baker
 DATE PLOTTED: Nov. 17 2014
 E-SHEET NAME:
 MicroStation v8.11.9.397



COMBINATION PILE WALL WALE DETAIL



SECTION C-C



SECTION D-D

NOTES

1. For General Notes, See Sheet S3-S5.
2. For Pile Notes, See Sheet S15.
3. For Concrete Cap, See Sheet S24.
4. Wale Splices are not Permitted.

REVISION		DATE
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
COMBINATION PILE WALL		
	PREPARED BY	SHEET NO.
		S14A
		DRAWING NO.
		27208

ITEM NUMBER
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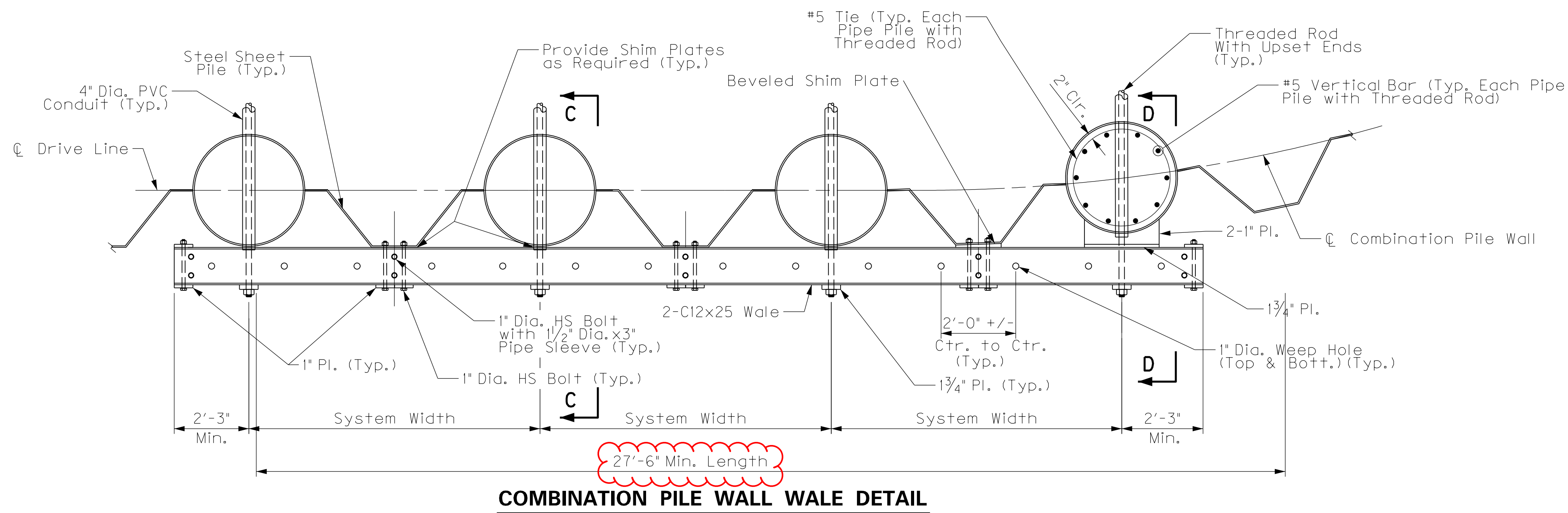
URS
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525 Vine Street, Suite 1800
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FILE NAME: S27208_014A.DGN

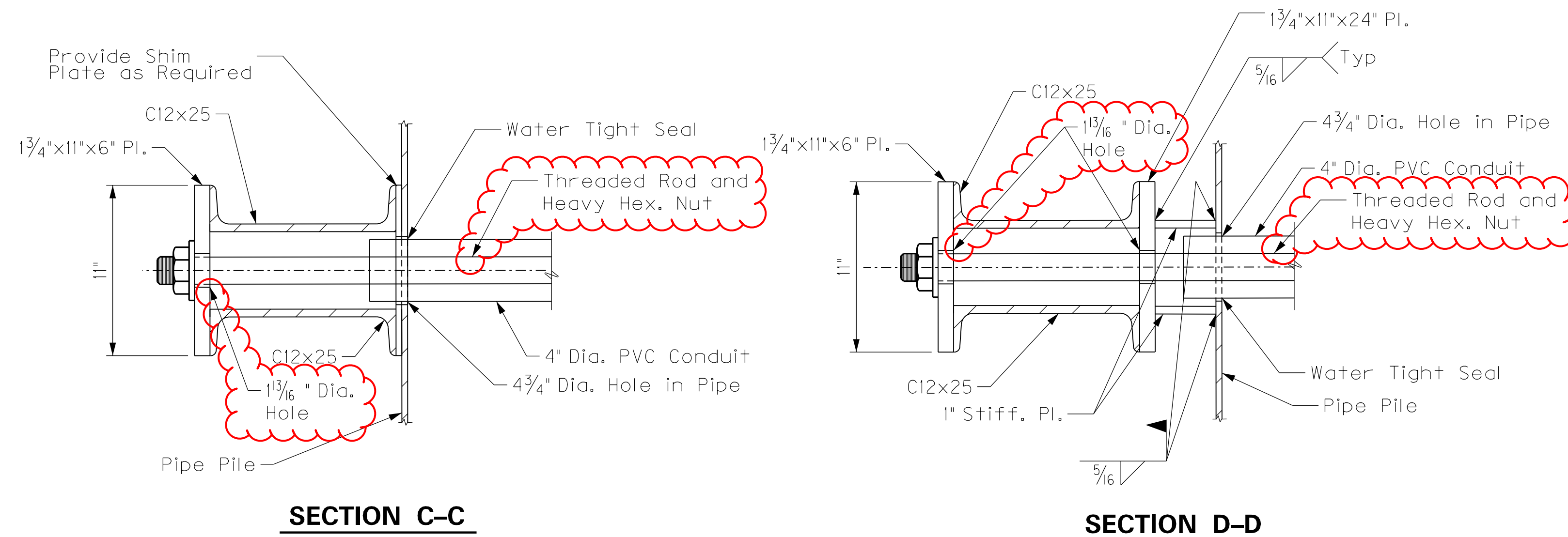
USER: Travis.Baker
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COMBINATION PILE WALL WALE DETAIL



SECTION C-C

SECTION D-D

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DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: C Klusman	I. McElhone	
DETAILED BY: J. Corley	T. Baker	
Commonwealth of Kentucky		
DEPARTMENT OF HIGHWAYS		
COUNTY		
CAMPBELL		
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COMBINATION PILE WALL		
ITEM NUMBER	PREPARED BY	SHEET NO.
06-8703	URS URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com	S14A
		DRAWING NO. 27208

STEEL PILE WALL DATA TABLE

CONSTRUCTION INFORMATION								DESIGN PARAMETERS						
Element	MINIMUM ELASTIC SECTION MODULUS	MINIMUM REQUIRED MOMENT OF INERTIA	MINIMUM REQUIRED AREA	MINIMUM WALL TIP ELEVATION	WALL TOP ELEVATION	AS DRIVEN WALL TIP ELEVATION	AS DRIVEN WALL HEIGHT	SOIL ELEVATION		WATER ELEVATION		FACTORED DESIGN SURCHARGE LOAD		
								*	*	FRONT OF WALL	BACK OF WALL		FRONT OF WALL	BACK OF WALL
								FRONT OF WALL	BACK OF WALL					
IN'/FT	IN' ² /FT	IN' ² /FT	FT	FT	FT	FT	FT	FT	FT	FT	PSF			
Combination Pile Wall	88.0	1865		**	475.25		1865	444.40	476.00	454.40	458.48	0.0		
North Anchor Wall	70.6	695		455.0	473.00							0.0		
South Anchor Wall	70.6	695		455.0	473.00							0.0		
Threaded Rod			0.57											

STEEL PILE WALLS

MATERIAL

COMBINATION PILE WALL AND ANCHOR WALLS: The contractor shall furnish a combination wall and anchor walls consisting of spiral welded pipe piles (combination wall only) and hot rolled zee shaped sheet piles with interconnecting ball and socket ends from the same manufacturer. The piles shall be left in place at the completion of the project. The piles should be new and the contractor shall submit the mill inspection and certification reports of all material. The pile material shall conform to ASTM A252 for pipe piles and A572 for sheet piles, Grade 50. Provide standard handling holes for all pile sections. Dimensional tolerances for piling are per Section 604.03.08 of The Standard Specifications.

The design drawings have been created to accommodate a maximum System Width of 8'-0". For any pile walls furnished that exceed this width, the contractor shall be responsible for redesigning all components of the pile walls, as well as the combination pile wall cap.

THREADED RODS: The threaded rods shall be galvanized and conform to ASTM A615, Grade 75.

FILTER FABRIC: See Section 843-Geotextile fabrics for Type I filter fabric.

STRUCTURAL STEEL: The steel for wales, plates and washers shall conform to ASTM A572, Grade 50.

BOLTS: All structural bolting will consist of A325 hot dipped galvanized tension controlled bolts and heavy duty washers and is incidental to the unit bid for combination pile wall structural steel.

SUBMITTALS

The contractor shall comply with the submittal requirements detailed in Section 108 of the Standard Specifications and submit the following written items to the engineer 14 days prior to construction:
 A. Structural steel shop drawings
 B. AWS welding certificates

INSTALLATION

The contractor shall drive the pile to the desired minimum wall tip elevation as indicated on the drawings. The pile members shall be continuous without laps, splices, or joints. The piles should be driven plumb along a flat ground surface and should align with adjacent pile members. The interlocking piles should be clean of debris and kept free of distortion. A pile log of the driven lengths of pile shall be maintained for review. Piles shall be driven with hammers adequate to drive the piles to required depth in satisfactory condition. To maintain satisfactory alignment, piles shall be driven in increments of penetration necessary to prevent distortion, twisting out of position or pulling apart at interlocks. Use of jets will require written approval of the engineer. When approved, jetting will be done at the contractor's expense. If heads of piles are appreciably distorted or otherwise damaged below cut-off level, damaged portions shall be removed and replaced at no direct pay. Piles damaged during driving, or driven out of proper position or below cut-off elevation, shall be withdrawn and replaced with new piles at no additional cost. Piles shall be placed in a plumb position with each pile interlocked with adjoining piles for its entire length, so as to form a continuous diaphragm throughout the length of the wall. Interlocks shall be properly engaged with the thumb of each pile gripped by the thumb and finger of the adjacent pile. All piles shall be placed as true to line as possible. Suitable temporary wales or guide structures shall be provided to insure that the piles are driven to correct alignment. Piles shall be installed per manufacturer's recommendations.

PLACEMENT OF FILTER FABRIC: The filter fabric should extend down along the sheet pile wall past the weep holes to encapsulate the dirt. The contractor should place the filter fabric without ripping and tearing the filter fabric material. The filter fabric should be lapped 12" minimum at joints. See Section 843.

FABRICATION: The contractor should fabricate and erect the materials per the latest edition of the American Institute of Steel Construction (AISC) Steel Construction Manual. The material shall have material certificates that demonstrate the required specifications per the structural plans. All welding shall be per the American Welding Society (AWS). All structural welding shall be performed by certified AWS welders and be inspected by an AWS inspector. Welding certificates shall be submitted prior to fabrication.

DELIVERY, STORING, & HANDLING: The piles should be delivered to the construction site undamaged and be stored according to steel grade and length. Piles should be clean free of dirt, rust and scale and stored on platforms above the ground surface. The piles should be handled as to prevent damage to connecting ends, warping and bending of the structural sections.

THREADED RODS: To prevent overstressing of the rods during settlement that may occur during backfilling, position the rods in a smooth walled, 4 inch diameter, PVC conduit with a minimum wall thickness of 0.237 inches, in accordance with Section 701. All threaded rods shall be adequately supported and braced prior to backfilling. Threaded rods shall not deflect more than 2" from true alignment upon completion of backfilling operations.

CUTTING OFF PILES: The piles shall be cut off after the member is driven to the desired elevation and the engineer has approved the driven elevations per the pile logs. The pile should be cut-off straight, square and in a clean manner. Tapered piles shall follow the slope of the compacted earth.

CONSTRUCTION SUPERVISION: The contractor shall have a fully competent full time field superintendent on the project site during the construction phase. The field superintendent should supervise construction work, subcontractors, project schedule, material delivery, quality control, and construction safety for the duration of the project.

DRIVING EQUIPMENT: The pile driving equipment shall be adequate to erect and drive the pile members to the plan bottom elevation.

- * MINIMUM OF DESIGN GROUND SURFACE OR DESIGN SCOUR DEPTH.
- ** MINIMUM WALL TIP ELEVATION
 Zone A - 418.40 ft
 Zone B - 427.00 ft
 Zone C - 424.00 ft
 Zone D - 434.00 ft

BEARING PILE RECORD

PILE NO.	PILE CUT-OFF ELEVATION	PILE LENGTH IN PLACE	POINT OF PILE ELEVATION AS DRIVEN	PILE NO.	PILE CUT-OFF ELEVATION	PILE LENGTH IN PLACE	POINT OF PILE ELEVATION AS DRIVEN
FT		FT		FT		FT	
C1	457.59			C41	459.36		
C2	459.36			C42	459.36		
C3	459.36			C43	459.36		
C4	459.36			C44	459.36		
C5	459.36			C45	459.36		
C6	459.36			C46	459.36		
C7	459.36			C47	459.36		
C8	459.36			C48	459.36		
C9	459.36			C49	459.36		
C10	459.36			C50	459.36		
C11	459.36			C51	459.36		
C12	459.36			C52	457.59		
C13	459.36			C53	457.59		
C14	459.36			C54	457.59		
C15	459.36			C55	457.53		
C16	457.53			C56	457.53		
C17	457.53						
C18	459.36						
C19	458.74			S1			
C20	458.21			S2			
C21	457.68			S3			
C22	457.15			S4			
C23	456.62			S5			
C24	456.09			S6			
C25	455.56			S7			
C26	455.31			S8			
C27	455.31			S9			
C28	455.56			S10			
C29	456.09			S11			
C30	456.62			S12			
C31	457.15			S13			
C32	457.68			S14			
C33	458.21			S15			
C34	458.74			S16			
C35	459.36			S17			
C36	457.53			S18			
C37	457.53			S19			
C38	459.36			S20			
C39	459.36			S21			
C40	459.36			S22			

C = Culvert Piles
 S = Sewer Piles

PRACTICAL REFUSAL (CONT.): Advance production piling to the driving resistance specified above and to depths determined by the dynamically tested production piles (test piles) and boring logs. Immediately cease driving operations if the pile visibly yields or becomes damaged during driving. If hard driving is encountered because of dense strata or an obstruction, such as a boulder, before the pile is advanced to the depth anticipated, the Engineer will determine if more blows than the average driving resistance specified for the practical refusal is required to further advance the pile. Drive additional production and test piles if directed by the Engineer.

FIELD DATA

For each pile, the project engineer shall record the following on the pile record: pile length in place, point of pile elevation as driven. Submit this record to:

Director, Division of Structural Design
 Transportation Cabinet Office Bldg.
 200 Mero Street, 3rd Floor
 Frankfort, KY 40622-001

This pile record does not replace other pile records the project engineer is required to keep and submit.

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: T. Baker	N. Hamadani	
DETAILED BY: I. McElhone	C. Klusman	
Commonwealth of Kentucky		
DEPARTMENT OF HIGHWAYS		
COUNTY		
CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
PILE NOTES		

ITEM NUMBER	PREPARED BY
06-8703	URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com

SHEET NO. S15
DRAWING NO. 27208

FILE NAME: S27208-015.dgn
 USER: Travis.Baker
 DATE PLOTTED: Nov. 17 2014
 E-SHEET NAME:
 MicroStation v8.11.9.397

SANITATION DISTRICT 1 SANITARY SEWER SUPPORT SYSTEM

The existing aerial sanitary sewer owned by Sanitation District No. 1 (SD1) shall remain in service and undisturbed during construction. The Sanitation District shall be notified a minimum of seven (7) days prior to construction and prior to the project activities noted below.

Bob Wilson
Sanitation District NO. 1
1045 Eaton Drive
Ft. Wright, KY 41017
(859) 578-6885

The dimensions shown are based on the existing Taylor Creek Crossing Sanitary Sewer Replacement drawings. The support brackets have been located with respect to joints in the sewer pipe based on available as-built data. Contractor shall field verify locations of existing supports, piles, and sewer pipe. The location of the new piles and supports shall be adjusted as needed to fit the existing conditions, as shown on the spacing diagram.

Field splices in the longitudinal support beam shall be either bolted or welded. The contractor shall locate field splices away from the pipe support brackets. Design of the field splices shall be the responsibility of the contractor and completed by a professional engineer licensed in the Commonwealth of Kentucky.

All bolts shall be A325 bolts, snug tightened.

Steel for longitudinal beams shall be ASTM A572, Grade 50. Steel for remaining plates shall be ASTM A36. All structural steel to be in accordance with Section 812.

The existing piles shall not be cut until the entire sewer support system has been installed. The contractor shall provide temporary support for portions of sewer pipe and casing without existing piles while excavations are in place to install sewer support system.

Prior to the start of construction, the contractor shall take survey elevations at each existing support bracket, on the top of the strap plate. Elevations shall be measured relative to an approved benchmark located outside of the influence of the proposed fill and construction operations. These will serve as baseline elevations to be maintained throughout the duration of the sewer support system construction. Following the baseline measurements, the contractor shall resurvey the baseline locations at the subsequent times:

Following installation of the combination pile wall.

Following placement of backfill in the existing plunge pool and excavation of banks to construct sewer support. Once the buried portions of pipe are exposed, establish baseline locations on the top of the pipe outside the limits of the casing at intervals not to exceed 10'-0".

Following pile driving for culvert and sewer piles. If the duration of pile driving exceeds one (1) week, resurvey baseline locations at the beginning of each work week.

Following installation of the sewer support brackets. The sewer support brackets shall be installed flush with the existing pipe and casing such that no change in elevation occurs. The sewer support brackets may be shimmed as directed by the engineer.

If movement of the support brackets is noted, the contractor shall notify the engineer and SD1. The support brackets may be shimmed and re-bolted as directed by the engineer and SD1. Once all components of the sewer support system are installed, the existing piles have been cut, and the baseline elevations have been verified to be maintained, no further surveying of the sewer is required.

Compaction within 3'-0" to the side or above the sewer pipe and sewer support system shall be completed with walk behind plated compactors. See Section 206.

Lump sum payment for sewer support system is full compensation for furnishing and installing structural steel, longitudinal and transverse beam members, pipe support brackets, neoprene pads, plates, washers, and bolts, including all new materials, longitudinal support beam field splice design and details, surveying, temporary support, welding, labor, equipment, tools, and incidentals necessary to complete the work according to the plans and specifications. Steel Piles will be paid in accordance with Section 604. Excavation will be paid for with Foundation Preparation.

NOTES

1. For General Notes, See Sheets S3-S5.

FILE NAME: S27208_01B.DGN

USER: Travis.Baker
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: T. Baker	N. Hamadani	
DETAILED BY: J. Corley	T. Baker	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
SEWER SUPPORT SYSTEM (3)		

ITEM NUMBER	PREPARED BY	SHEET NO.
06-8703	URS URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com	S18
		DRAWING NO. 27208

SANITATION DISTRICT 1 SANITARY SEWER SUPPORT SYSTEM

The existing aerial sanitary sewer owned by Sanitation District No. 1 (SD1) shall remain in service and undisturbed during construction. The Sanitation District shall be notified a minimum of seven (7) days prior to construction and prior to the project activities noted below.

Bob Wilson
Sanitation District NO. 1
1045 Eaton Drive
Ft. Wright, KY 41017
(859) 578-6885

The dimensions shown are based on the existing Taylor Creek Crossing Sanitary Sewer Replacement drawings. The support brackets have been located with respect to joints in the sewer pipe based on available as-built data. Contractor shall field verify locations of existing supports, piles, and sewer pipe. The location of the new piles and supports shall be adjusted as needed to fit the existing conditions, as shown on the spacing diagram.

Field splices in the longitudinal support beam shall be either bolted or welded. The contractor shall locate field splices away from the pipe support brackets. Design of the field splices shall be the responsibility of the contractor and completed by a professional engineer licensed in the Commonwealth of Kentucky.

All bolts shall be A325 bolts, snug tightened.

Steel for longitudinal beams shall be ASTM A572, Grade 50. Steel for remaining plates shall be ASTM A36. All structural steel to be in accordance with Section 812.

The existing piles shall not be cut until the entire sewer support system has been installed. The contractor shall provide temporary support for portions of sewer pipe and casing without existing piles while excavations are in place to install sewer support system.

Prior to the start of construction, the contractor shall take survey elevations at each existing support bracket, on the top of the strap plate. Elevations shall be measured relative to an approved benchmark located outside of the influence of the proposed fill and construction operations. These will serve as baseline elevations to be maintained throughout the duration of the sewer support system construction. Following the baseline measurements, the contractor shall resurvey the baseline locations at the subsequent times:

Following installation of the combination pile wall.

Following placement of backfill in the existing plunge pool and excavation of banks to construct sewer support. Once the buried portions of pipe are exposed, establish baseline locations on the top of the pipe outside the limits of the casing at intervals not to exceed 10'-0".

Following pile driving for culvert and sewer piles. If the duration of pile driving exceeds one (1) week, resurvey baseline locations at the beginning of each work week.

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If movement of the support brackets is noted, the contractor shall notify the engineer and SD1. The support brackets may be shimmed and re-bolted as directed by the engineer and SD1. Once all components of the sewer support system are installed, the existing piles have been cut, and the baseline elevations have been verified to be maintained, no further surveying of the sewer is required.

Compaction within 3'-0" to the side or above the sewer pipe and sewer support system shall be completed with walk behind plated compactors. See Section 206.

Lump sum payment for sewer support system is full compensation for furnishing and installing structural steel, longitudinal and transverse beam members, pipe support brackets, neoprene pads, plates, washers, and bolts, including all new materials, longitudinal support beam field splice design and details, surveying, temporary support, welding, labor, equipment, tools, and incidentals necessary to complete the work according to the plans and specifications. Steel Piles will be paid in accordance with Section 604. Excavation will be paid for with Foundation Preparation.

NOTES

1. For General Notes, See Sheets S3-S5.

FILE NAME: S27208_01B.DGN

USER: Travis.Baker
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: T. Baker	N. Hamadani	
DETAILED BY: J. Corley	T. Baker	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
SEWER SUPPORT SYSTEM (3)		

ITEM NUMBER	PREPARED BY	SHEET NO.
06-8703	URS URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com	S18 DRAWING NO. 27208

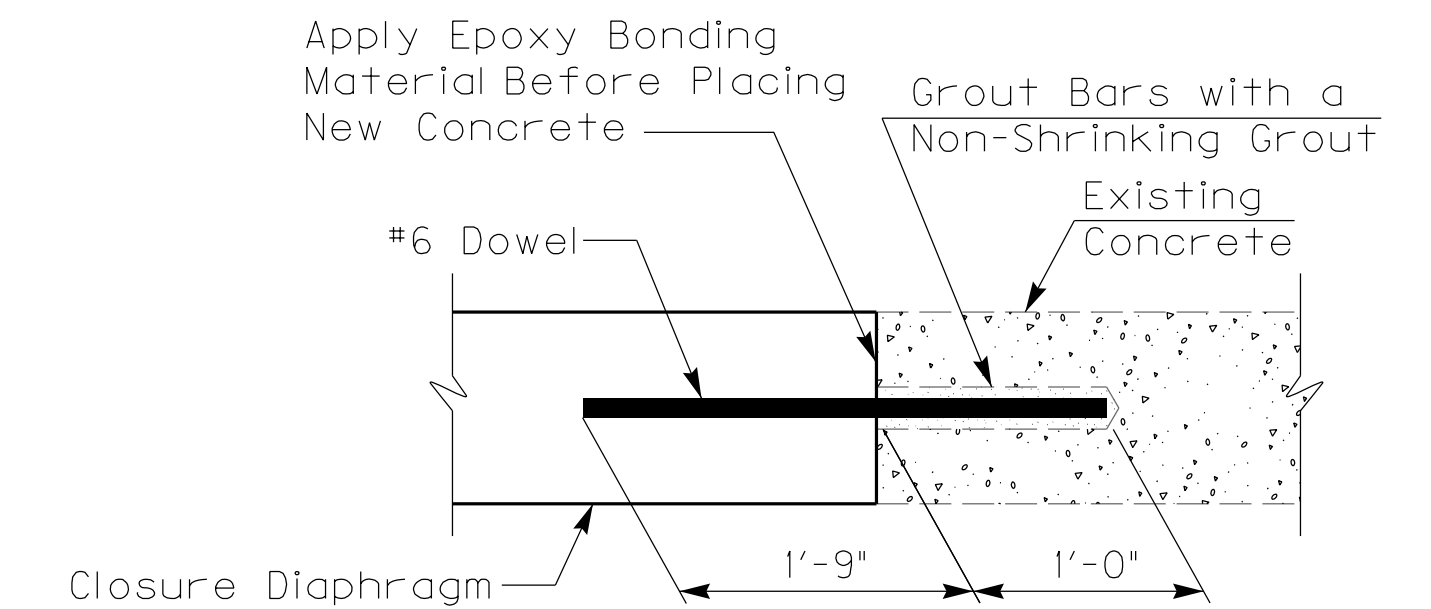
CLOSURE DIAPHRAGM

The lump sum bid price for this item shall be full compensation for designing, detailing, furnishing, and installing concrete and steel reinforcing for the closure diaphragm between the existing and proposed three sided culvert, application of exterior water proofing at joints, and diverting culvert flow as needed, including all labor, equipment, tools, and incidentals necessary to complete the work according to the plans and specifications. Closure diaphragm shall be designed to incorporate horizontal reinforcing from the existing reinforced concrete lining or dowel bars between the closure diaphragm and the existing reinforced concrete lining. Design of closure diaphragm shall be stamped by a professional engineer licensed in the Commonwealth of Kentucky.

The contractor shall furnish shop drawings to the engineer illustrating the proposed details of the concrete and reinforcement for approval prior ordering materials. The details for the closure diaphragm shall be coordinated with the manufacturer of the three-sided culvert utilized for the project.

Completed closure diaphragm shall not reduce the current hydraulic capacity of the culvert and shall not extend beyond the interior limits of the existing reinforced concrete lining. Concrete shall be in accordance with Section 601 and reinforcing steel shall be in accordance with Section 602.

The Department will measure the quantity as:
CLOSURE DIAPHRAGM LUMP SUM

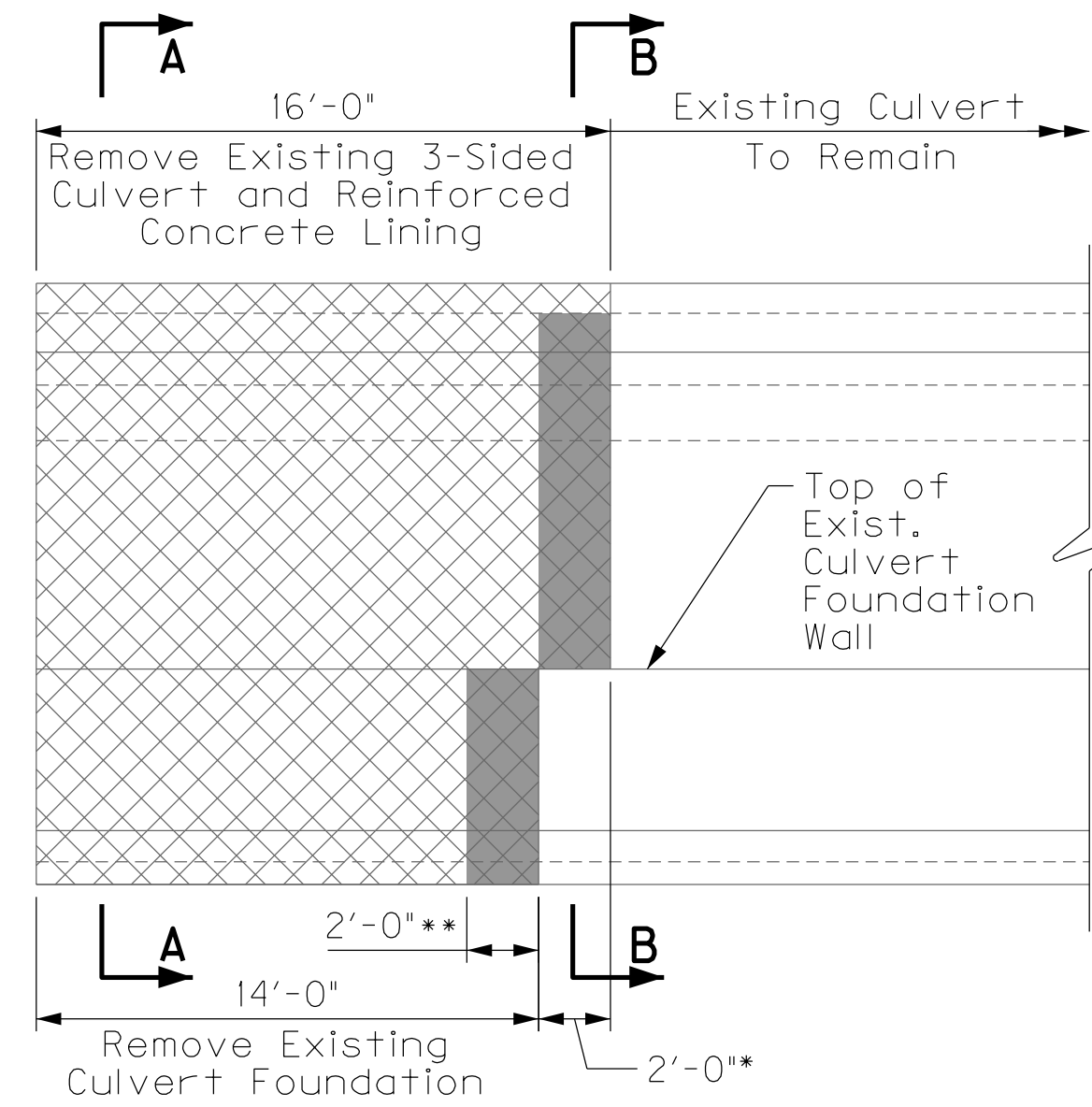


DOWEL DETAIL

Note: The cost of drilling holes, grouting, and epoxy bonding material shall be incidental to the cost of Closure Diaphragm.

NOTES

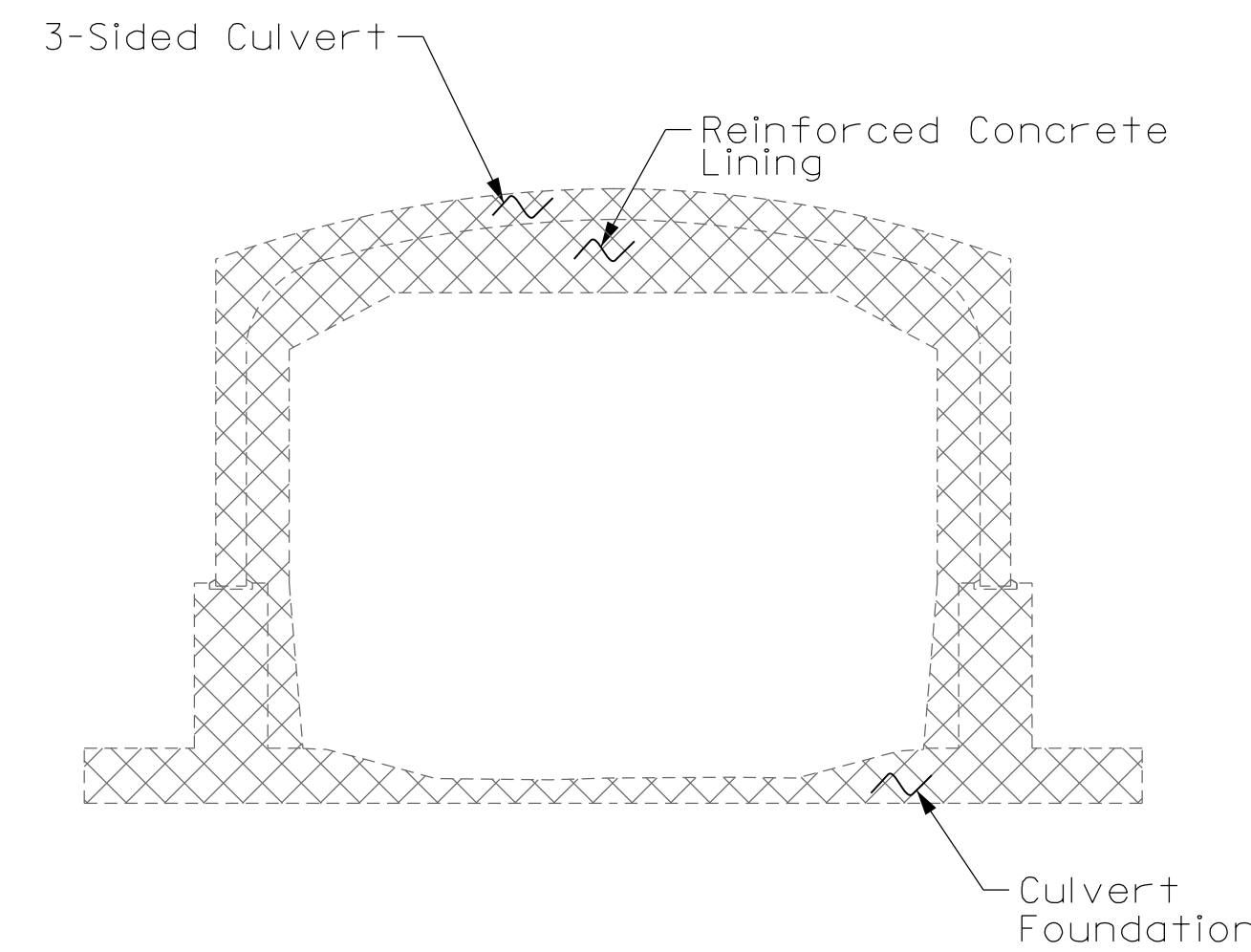
1. For General Notes, See Sheets S3-S5.
2. For Culvert Profile, See Sheet S8.
3. For Culvert Foundation, See Sheets S19-S22



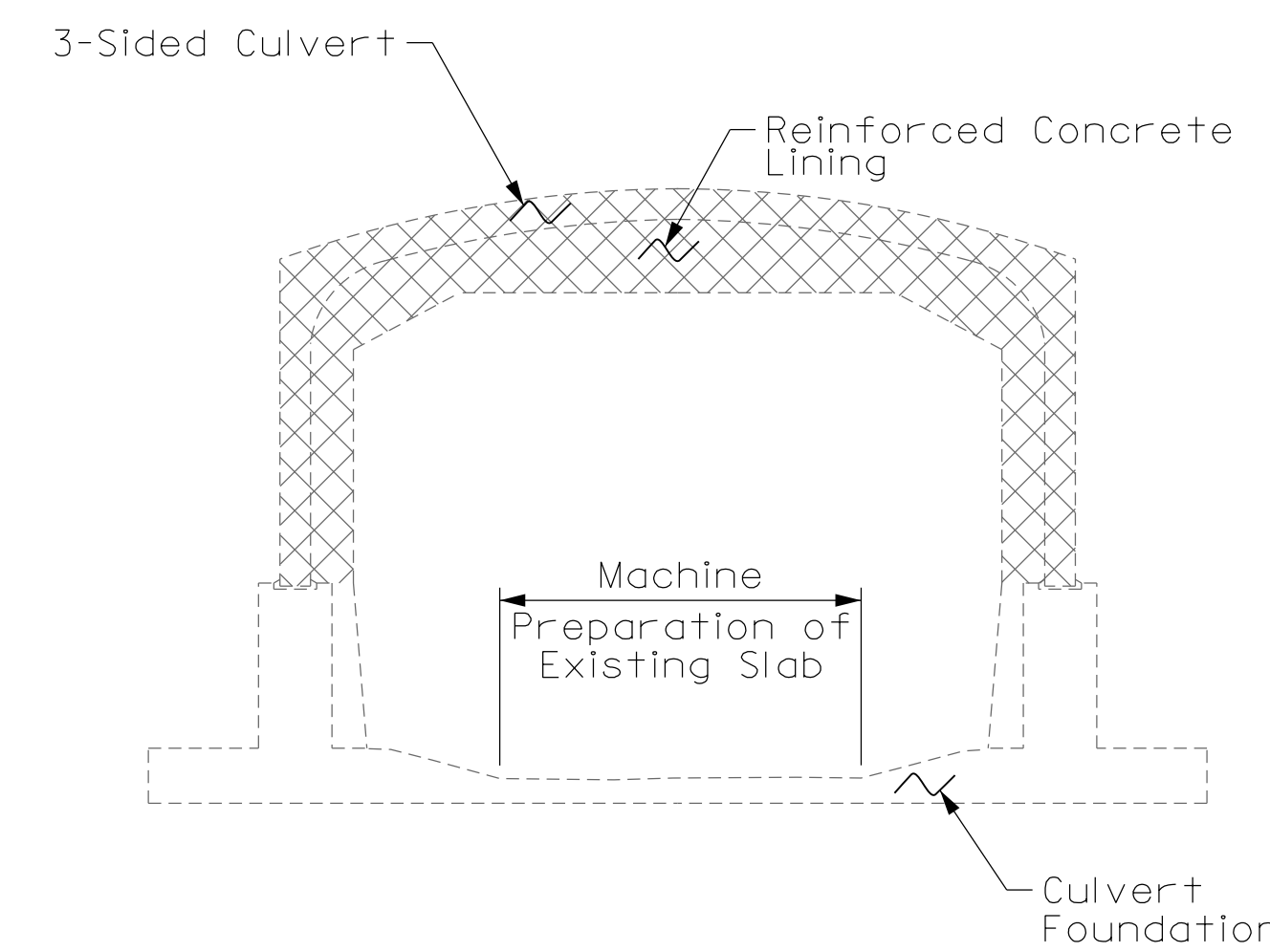
END ELEVATION

* Clean and Incorporate Existing Horizontal Reinforcement Bars From Reinforced Concrete Lining into Closure Diaphragm.

** Clean and Incorporate Existing Horizontal Reinforcement Bars From Culvert Foundation into Culvert Foundation Walls and Bottom Slab.



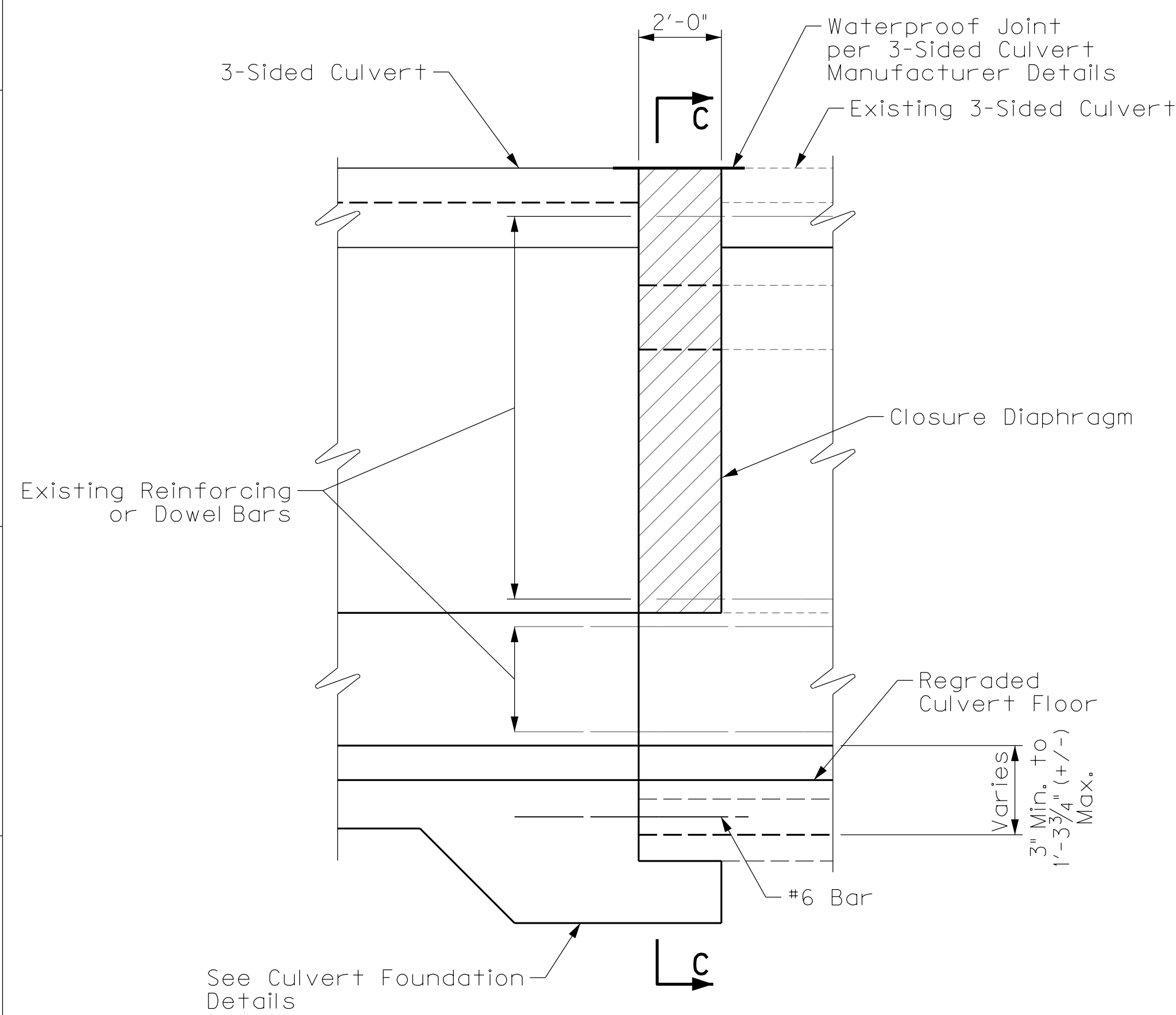
SECTION A-A



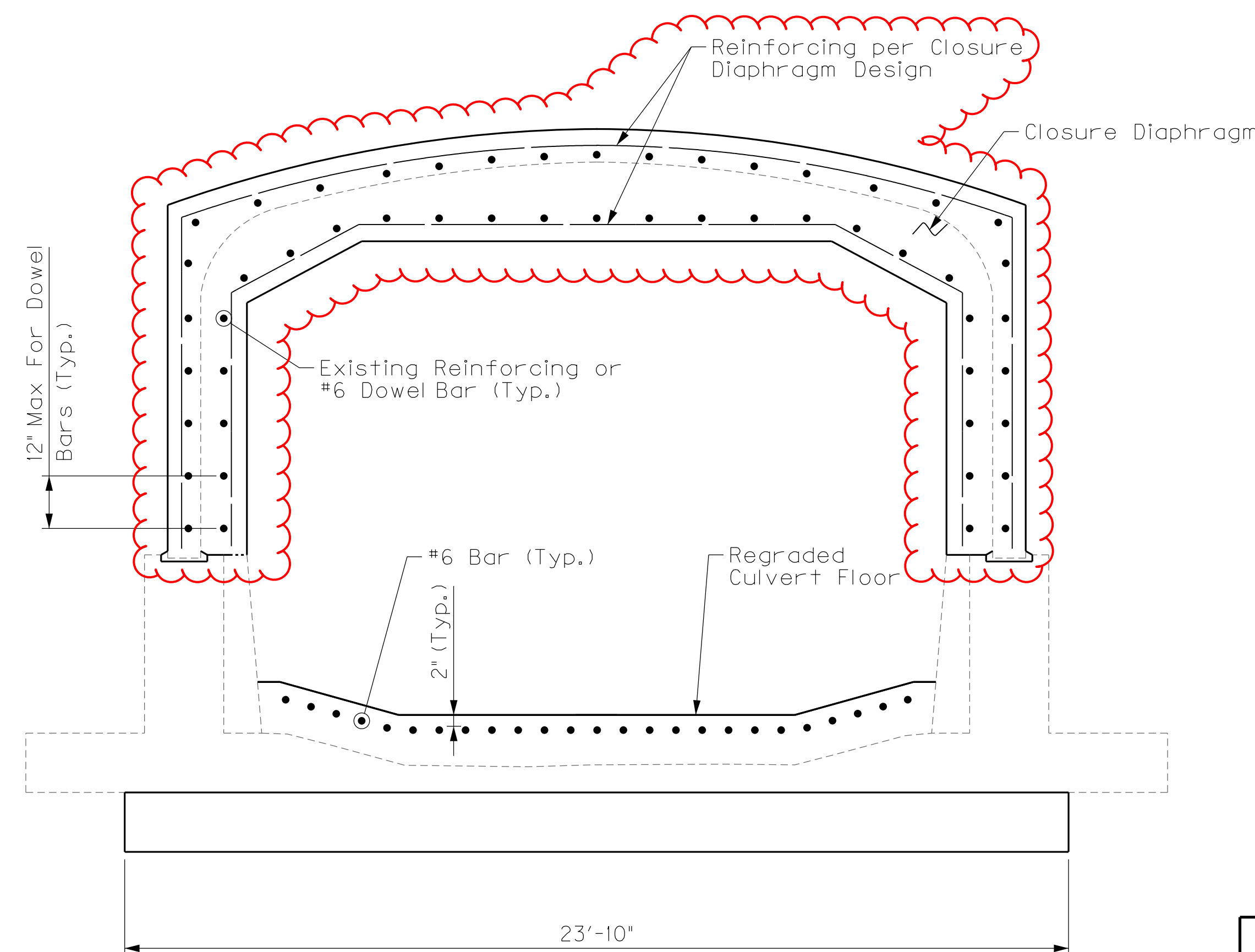
SECTION B-B

EXISTING CULVERT REMOVAL

The contractor shall exercise caution when removing the last 2'-0" of existing culvert, to minimize the damage to existing reinforcement that is to be reused as part of the cast-in-place closure diaphragm, culvert foundation walls, and bottom slab. In the event the existing reinforcement is deemed unsuitable to be reused by the Engineer, drilled and grouted dowel bars shall be used.



CLOSURE DIAPHRAGM ELEVATION



SECTION C-C

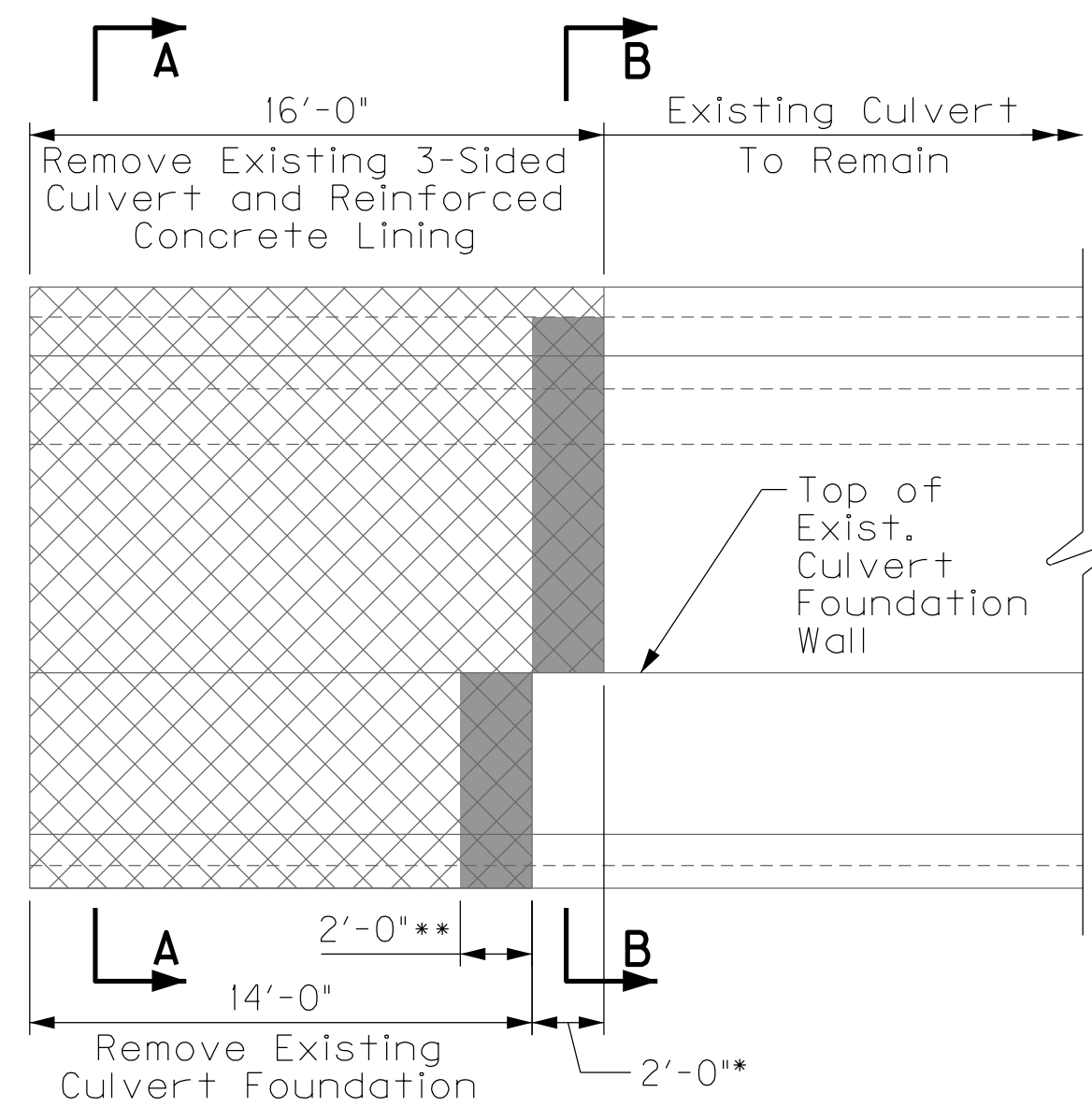
FILE NAME: S27208.021.DGN

USER: Travis Baker
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397

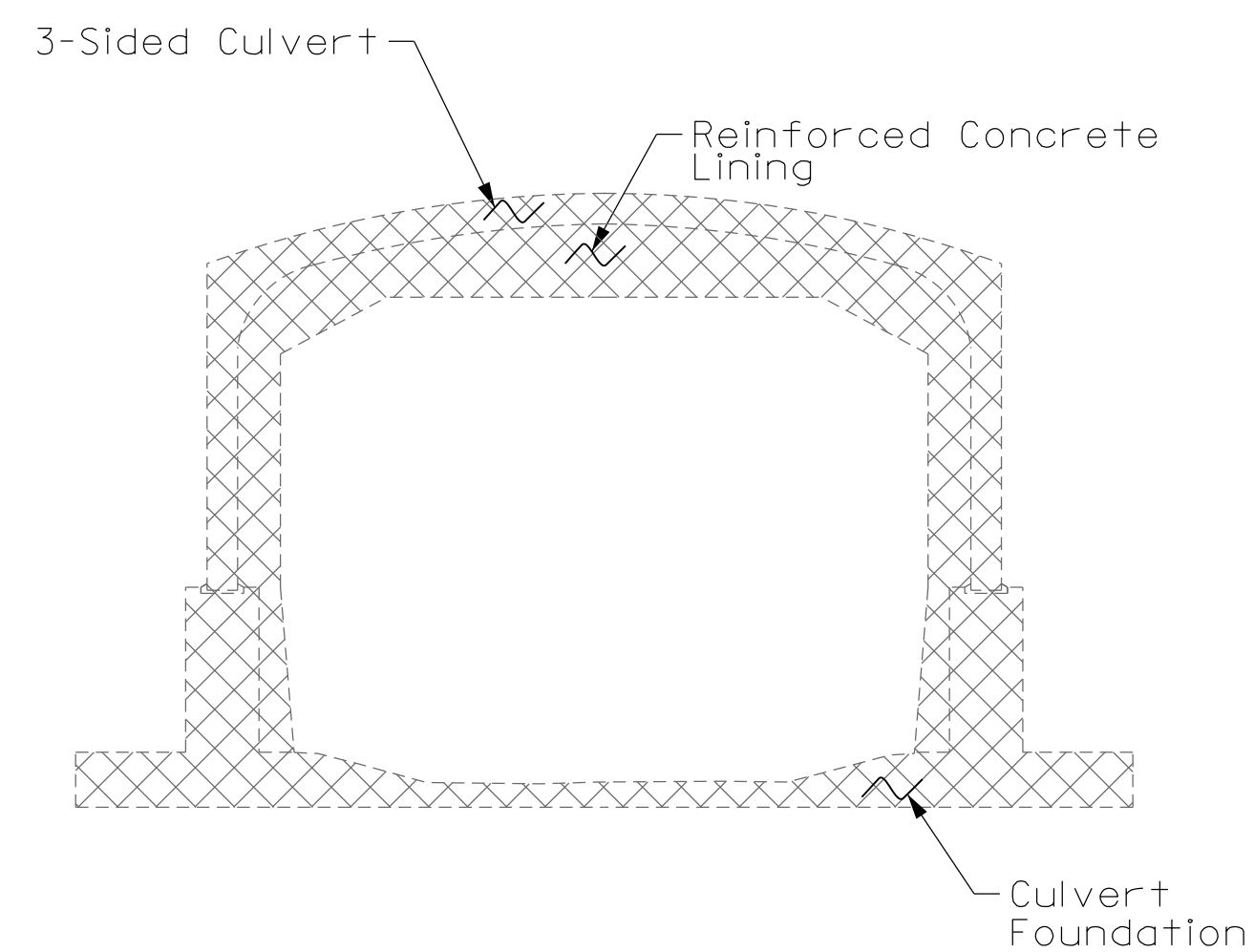
ITEM NUMBER	06-8703
PREPARED BY	URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com
CHECKED BY	N. Hamadani
DESIGNED BY	T. Baker
DATE	11/17/2014
DETAILED BY	J. Corley
REVISION	DATE
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS COUNTY CAMPBELL ROUTE CROSSING TAYLOR CREEK CULVERT CLOSURE DIAPHRAGM	
SHEET NO.	S23
DRAWING NO.	27208



END ELEVATION

* Clean and Incorporate Existing Horizontal Reinforcement Bars From Reinforced Concrete Lining into Closure Diaphragm.

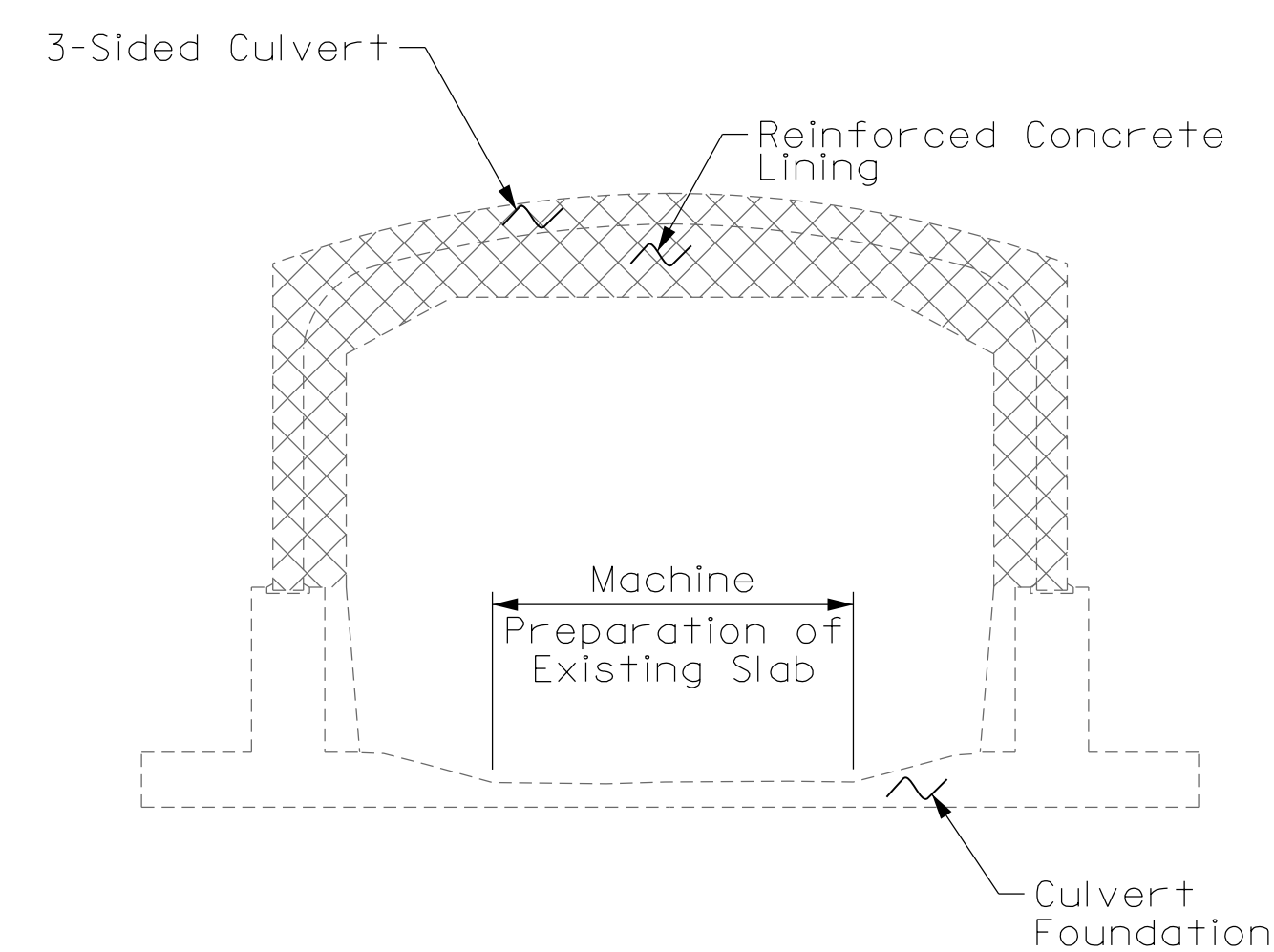
** Clean and Incorporate Existing Horizontal Reinforcement Bars From Culvert Foundation into Culvert Foundation Walls and Bottom Slab.



SECTION A-A

EXISTING CULVERT REMOVAL

The contractor shall exercise caution when removing the last 2'-0" of existing culvert, to minimize the damage to existing reinforcement that is to be reused as part of the cast-in-place closure diaphragm, culvert foundation walls, and bottom slab. In the event the existing reinforcement is deemed unsuitable to be reused by the Engineer, drilled and grouted dowel bars shall be used.



SECTION B-B

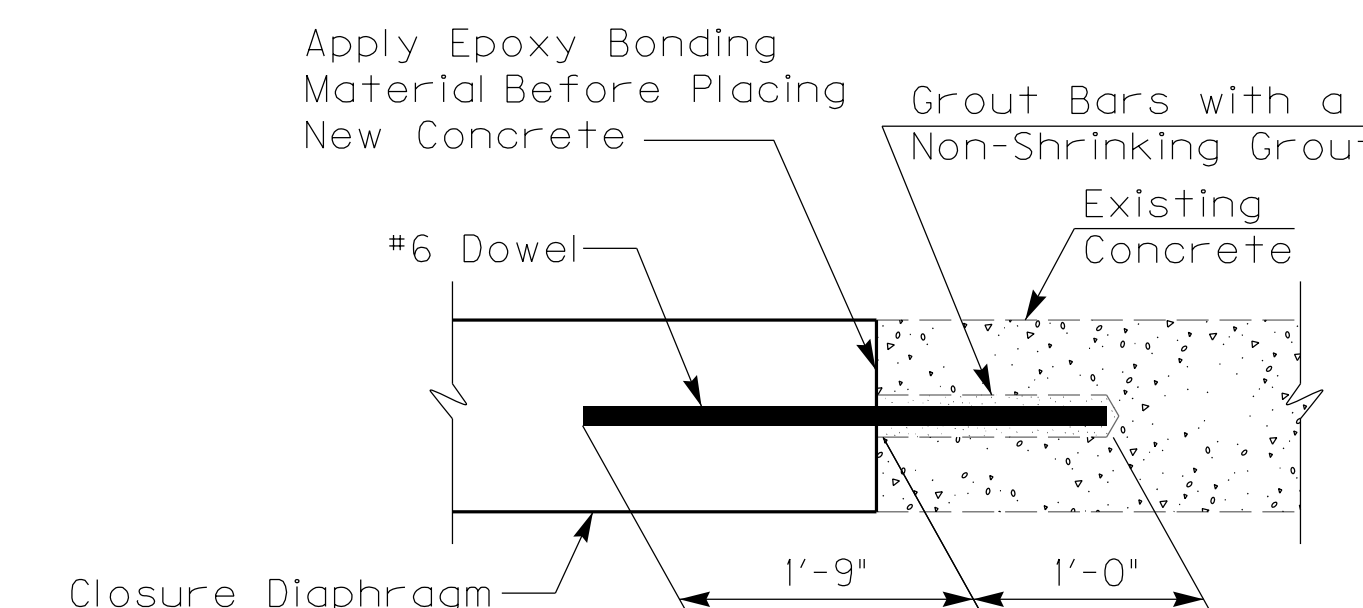
CLOSURE DIAPHRAGM

The lump sum bid price for this item shall be full compensation for designing, detailing, furnishing, and installing concrete and steel reinforcing for the closure diaphragm between the existing and proposed three sided culvert, application of exterior water proofing at joints, and diverting culvert flow as needed, including all labor, equipment, tools, and incidentals necessary to complete the work according to the plans and specifications. Closure diaphragm shall be designed to incorporate horizontal reinforcing from the existing reinforced concrete lining or dowel bars between the closure diaphragm and the existing reinforced concrete lining. Design of closure diaphragm shall be stamped by a professional engineer licensed in the Commonwealth of Kentucky.

The contractor shall furnish shop drawings to the engineer illustrating the proposed details of the concrete and reinforcement for approval prior ordering materials. The details for the closure diaphragm shall be coordinated with the manufacturer of the three-sided culvert utilized for the project.

Completed closure diaphragm shall not reduce the current hydraulic capacity of the culvert and shall not extend beyond the interior limits of the existing reinforced concrete lining. Concrete shall be in accordance with Section 601 and reinforcing steel shall be in accordance with Section 602.

The Department will measure the quantity as:
CLOSURE DIAPHRAGM LUMP SUM



DOWEL DETAIL

Note: The cost of drilling holes, grouting, and epoxy bonding material shall be incidental to the cost of Closure Diaphragm.

NOTES

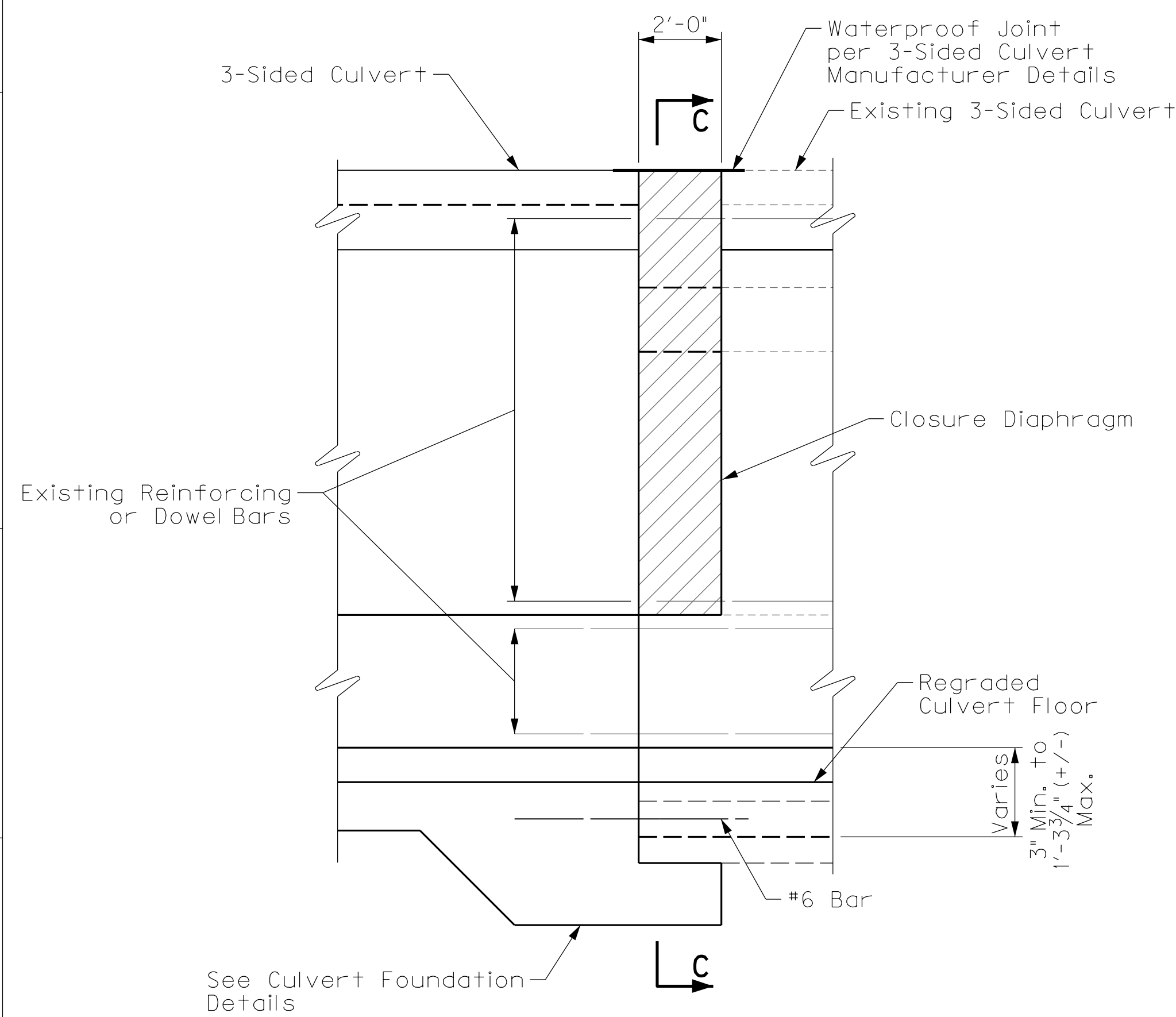
1. For General Notes, See Sheets S3-S5.
2. For Culvert Profile, See Sheet S8.
3. For Culvert Foundation, See Sheets S19-S22

FILE NAME: S27208.023.DGN

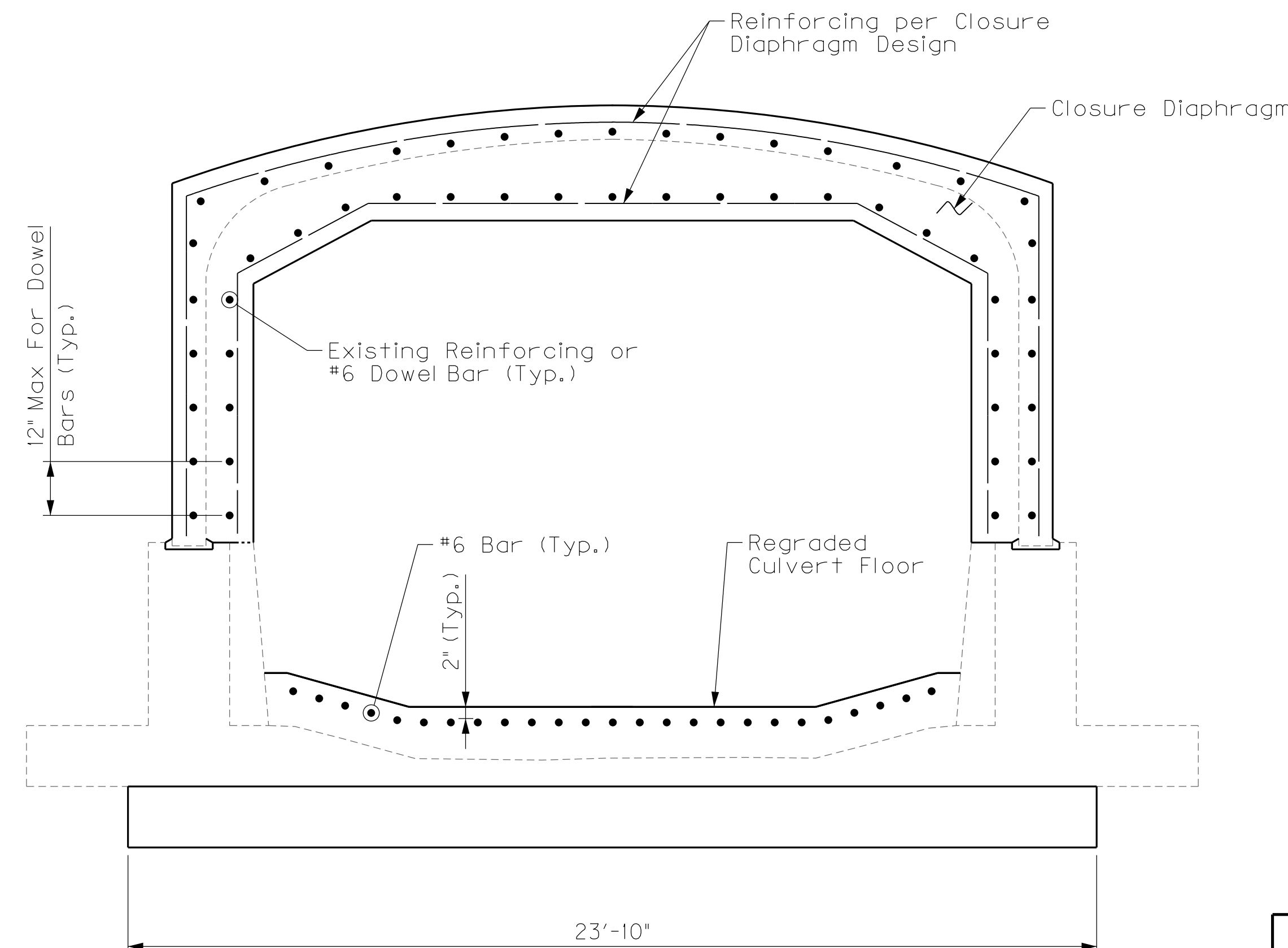
USER: Travis Baker
DATE PLOTTED: Nov. 17 2014

E-SHEET NAME:

MicroStation v8.11.9.397



CLOSURE DIAPHRAGM ELEVATION



SECTION C-C

ITEM NUMBER	06-8703
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REVISION		DATE
DATE: 11/17/2014	CHECKED BY	
DESIGNED BY: T. Baker	N. Hamadani	
DETAILED BY: J. Corley	T. Baker	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY CAMPBELL		
ROUTE	CROSSING	
	TAYLOR CREEK CULVERT	
CLOSURE DIAPHRAGM		
PREPARED BY		SHEET NO.
URS		S23
URS Corporation 525 Vine Street, Suite 1800 Cincinnati, OH 45202 www.urscorp.com		DRAWING NO. 27208

PROPOSAL BID ITEMS

141299

Page 1 of 2

Report Date 12/9/14

Section: 0001 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00524		STORM SEWER PIPE-24 IN	81.00	LF		\$	
0020	01310		REMOVE PIPE	14.00	LF		\$	
0030	01496		DROP BOX INLET TYPE 3	1.00	EACH		\$	
0040	01756		MANHOLE TYPE A	1.00	EACH		\$	
0050	01761		MANHOLE TYPE B	1.00	EACH		\$	
0060	01792		ADJUST MANHOLE	1.00	EACH		\$	

Section: 0002 - BRIDGE - RIVERBOAT ROAD - TAYLOR CREEK CULVER- DWG. 27208

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0070	00071		CRUSHED AGGREGATE SIZE NO 57	4,539.00	TON		\$	
0080	02230		EMBANKMENT IN PLACE	5,937.00	CUYD		\$	
0090	02231		STRUCTURE GRANULAR BACKFILL	5,617.00	CUYD		\$	
0100	02545		CLEARING AND GRUBBING (UNKNOWN ACREAGE)	1.00	LS		\$	
0110	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0120	02726		STAKING	1.00	LS		\$	
0130	02731		REMOVE STRUCTURE	1.00	LS		\$	
0140	02998		MASONRY COATING	165.00	SQYD		\$	
0150	05985		SEEDING AND PROTECTION	3,304.00	SQYD		\$	
0160	08003		FOUNDATION PREPARATION	1.00	LS		\$	
0170	08019		CYCLOPEAN STONE RIP RAP	194.00	TON		\$	
0180	08033		TEST PILES	376.00	LF		\$	
0190	08039		PRE-DRILLING FOR PILES (REVISED: 12-9-14)	390.00	LF		\$	
0200	08052		PILES-STEEL HP14X117	7,029.00	LF		\$	
0210	08095		PILE POINTS-14 IN	78.00	EACH		\$	
0220	08100		CONCRETE-CLASS A	358.00	CUYD		\$	
0230	08106		CONCRETE-CLASS M 1	104.00	CUYD		\$	
0240	08150		STEEL REINFORCEMENT	53,000.00	LB		\$	
0250	08551		MACHINE PREP OF SLAB	356.00	SQYD		\$	
0260	21804EN		3-SIDED CULVERT	133.00	LF		\$	
0270	23143ED		KPDES PERMIT AND TEMP EROSION CONTROL	1.00	LS		\$	
0271	23233EC		DYNAMIC PILE TESTING (ADDED: 12-9-14)	4.00	EACH		\$	
0280	23315EC		DECORATIVE FENCE	202.00	LF		\$	
0290	24246EC		REMOVE ABANDONED SANITARY SEWER	40.00	LF		\$	
0300	24423EC		TEMPORARY SHORING	1.00	LS		\$	
0310	24630EC		TYPE B ARMOR ROCK	351.00	TON		\$	
0320	24754ED		SETTLEMENT MONITORING	1.00	LS		\$	
0330	24756EC		COMBINATION PILE WALL	11,309.00	SQFT		\$	
0340	24757EC		COMBINATION PILE WALL STRUCTURAL STEEL	1.00	LS		\$	
0350	24758EC		SEWER SUPPORT SYSTEM	1.00	LS		\$	
0360	24759EC		PUMPED GROUT	100.00	CUFT		\$	
0370	24761EC		CLOSURE DIAPHRAGM	1.00	LS		\$	

PROPOSAL BID ITEMS

141299

Page 2 of 2

Report Date 12/9/14

Section: 0003 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0380	02568		MOBILIZATION	1.00	LS		\$	
0390	02569		DEMOBILIZATION	1.00	LS		\$	

06-8703

SPECIAL NOTE FOR DYNAMIC PILE TESTING

Campbell County (Item No. 06-8703) Riverboat Row Taylor Creek Culvert Extension

1.0 GENERAL

1.1 Scope of Work The scope of work includes furnishing all labor, equipment and analyses associated with dynamic testing of driven piles for the culvert foundations as specified in this Special Note and in general accordance with ASTM D 4945, *High-Strain Dynamic Testing of Piles*. Dynamic testing involves attaching at least two strain transducers and two accelerometers to the pile near the pile head during initial driving or at a convenient location during restrike testing. A cable or wireless transmission connects the sensors near the pile head with the Pile Driving Monitoring Hardware located a safe distance from the pile, but not more than 330 ft from the pile. The piles that are to be tested must be of sufficient extra length to ensure that sensors are not driven into the ground.

1.2 Personnel Qualifications Perform dynamic pile testing utilizing the services of an independent Dynamic Pile Testing Consultant with qualified personnel as described below.

- Pile Driving Monitoring - An engineer with a minimum of 3 years of dynamic pile testing and analysis experience or who has achieved Basic or better certification under the High-Strain Dynamic Pile Testing Examination and Certification process of the Pile Driving Contractors Association or Foundation QA.
- Wave Equation and Pile Driving Analyses - A licensed professional engineer with a minimum of 5 years of dynamic pile testing and analysis experience or who has achieved Advanced or better certification under the High-Strain Dynamic Pile Testing Examination and Certification process of the Pile Driving Contractors Association or Foundation QA.

1.3 Equipment Supply equipment such as sensors, cables or wireless transmitters, etc. conforming to ASTM D 4945, *High-Strain Dynamic Testing of Piles* and furnished by the dynamic testing consultant. Prior to beginning work, submit the product name and manufacturer of the hardware and software components below for acceptance by the Engineer. If requested by the Engineer, submit additional information including technical specifications, etc.

- Pile Driving Modeling - Wave Equation Software
- Pile Driving Monitoring - Hardware & Software
- Pile Driving Analysis - Signal Matching Software

To prepare the pile for sensor attachment, provide a drill (and bit) of sufficient power, operated by either a DC battery (preferred) or a generator. A hammer drill is required for preparation of concrete piles.

06-8703

1.4 Submittals and General Testing & Analysis Requirements See Tables 1 and 2 on the following page. The Engineer will respond to the Contractor regarding acceptability of submittals as soon as practical.

Table 1 - Schedule of Dynamic Pile Testing Submittals			
Submittal Number	Submittal Item	Calendar Days	Event
1	Proposed independent dynamic pile testing consultant, and a listing of assigned personnel and their experience and qualifications.	45 Before	Start of Pile Driving Monitoring
2	Details of the hardware and software components, method of testing, and materials to be used.	45 Before	Start of Pile Driving Monitoring
3	Completed <i>Pile and Driving Equipment Data Form</i> (Figure 1 of this Special Note) and the results of wave equations analyses.	21 Before	Start of Pile Driving Monitoring
4	Preliminary Reports as defined in Section 3.1 of this Special Note.	1 After	Completion of Each Field Test
5	Summary Report(s) as defined in Section 3.2 of this Special Note.	10 After	Completion of All Field Tests
Provide all submittals and reports in .pdf format.			

Table 2 - General Testing and Analysis Requirements		
Item	Requirement	
Wave Equation Analysis	Minimum of 1 and sufficient additional analyses as needed to define performance for all combinations of piles, driving systems and subsurface conditions anticipated.	
Dynamic Testing Pile Resistance (i.e. Capacity)	Required Nominal Pile Resistance (i.e. Ultimate Pile Capacity) as shown in the plans and/or as directed by the Engineer.	
End of Initial Driving Test Frequency	Minimum of 4 production piles at the locations shown in the plans or as directed by the Engineer during the final 25 feet of initial driving	
Beginning of Restrike Test Frequency	Minimum of 4 production piles at the locations shown in the plans f or as directed by the Engineer.	
Time Interval between End of Initial Driving and Restrike	Minimum of 7 days unless stated otherwise elsewhere in the contract documents and/or directed otherwise by the Engineer based on the criteria below.	
	Soil Type	Time Delay Until Restrike
	Clean Sands	24 hours
	Silty Sands	48 hours
	Sandy Silts	72 – 120 hours
	Silts and Clays	7 - 14 Days
Shales	7 Days	
Pile Driving Analyses using Signal Matching Techniques	For each End of Initial Driving Test and each Beginning of Restrike Test	

06-8703

Table 2 - General Testing and Analysis Requirements	
Item	Requirement
Perform testing and analyses in accordance with this table and ASTM D 4945, <i>High-Strain Dynamic Testing of Piles</i>.	

06-8703

2.0 TESTING AND ANALYSES

2.1 Preconstruction Wave Equation Analyses At least 21 calendar days before beginning pile driving monitoring submit to the Engineer the completed Pile and Driving Equipment Data Form (Figure 1 of this Special Note) and preconstruction wave equation analyses performed by the Dynamic Pile Testing Consultant in accordance with Table 2 in this Special Note and a summary report of the results. The required nominal resistance (i.e. ultimate capacity) is provided in the plans and/or elsewhere in the contract documents. Upon request, the Geotechnical Report for the project can be provided.

The purpose of the wave equation analyses is to assess the ability of all proposed pile driving systems to install piles to the required nominal resistance (i.e. ultimate capacity) and the desired penetration depth within allowable driving stresses. Acceptability of the wave equation report and the adequacy of analyses will be determined by the Engineer. In the Wave Equation Summary Report, include:

- a. drivability graph relating pile resistance (i.e. capacity), blow count and driving stresses to depth;
- b. bearing graph relating the pile resistance (i.e. capacity) to the pile driving resistance which indicates blow count versus resistance (i.e. capacity) and stroke; and
- c. constant resistance (i.e. capacity) analysis or inspectors chart to assist the Engineer in determining the required driving resistance at other field-observed strokes.

2.1.1 Acceptance by the Engineer of the proposed pile driving system will be based upon the wave equation analyses indicating that the proposed system can develop the specified pile resistance (i.e. capacity) at a pile driving rate of 20 blows per inch (240 blows/ft.) at the end of driving and beginning of restrrike, and within allowable driving compressive stress of 80 to 90% of the yield stress of the piles. Provide preliminary pile driving criteria based on wave equation analyses and any anticipated resistance (i.e. capacity) changes after driving, set-up or relaxation, subject to revision based upon dynamic pile testing field measurements.

2.1.2 If any changes or modifications are made to the accepted pile driving system, additional wave equation analyses in accordance with Section 2.1 of this Special Note will be required.

2.2 High-Strain Dynamic Pile Testing

2.2.1 Perform dynamic pile testing at the locations and frequency required in accordance with Table 2 in this Special Note.

2.2.2 Dynamic pile testing involves monitoring the response of a pile subjected to heavy impact applied by the pile hammer at the pile head. The testing will provide information on the driving stresses, pile resistance (i.e. capacity), structural integrity, and hammer efficiency.

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2.2.3 Engage an independent dynamic pile testing consultant and qualified personnel in accordance with Section 1.2 of this Special Note. Prior to testing, the Engineer will review and accept the proposed independent dynamic pile testing consultant, the experience and qualifications of assigned personnel, details of the method of testing, a list of equipment, and the method of analysis of test results.

2.2.4 Perform all field testing and measurements in the presence of the Engineer or authorized representative.

2.2.5 Remote Dynamic Pile Testing where data is collected in the field and sent to the office of the Dynamic Pile Testing Consultant **will not be allowed** on this project. The testing consultant is required to have at least one person meeting the requirements for “Pile Driving Monitoring” as defined in Section 1.2 of the Special Note for Dynamic Pile Testing in the field during all dynamic pile testing. However, “wireless” technology that eliminates cables from the test pile to the data acquisition equipment will be allowed.

2.3 Field Testing

2.3.1 Equipment Perform dynamic pile testing field measurements using equipment, software and recording equipment accepted in accordance with Section 1.4 of this Special Note. Analyze the data collected at the end of initial driving and the beginning of restrike using accepted signal matching techniques and software.

2.3.2 Monitoring During Driving During pile driving, instrument the piles and monitor them with testing equipment satisfying the requirements of Section 1.3 of this Special Note. Prior to lifting the pile to be dynamically tested, provide a minimum of 3 ft of clear access to 180 degree opposite faces of the pile for pile preparation then drill and prepare holes for sensor attachment. Sensors are usually attached near the pile top.

2.3.2.1 Install two sets of strain transducers and accelerometers near the top of each pile to be tested, and use a compatible measuring and recording system to record the data during driving.

2.3.2.2 Appropriately position and fix the equipment required to be attached to the pile to the satisfaction of the Engineer.

2.3.2.3 Use a pile driving hammer and other equipment capable of delivering an impact force sufficient to mobilize the specified pile resistance (i.e. capacity) indicated in the structure plans without damaging the pile.

2.3.2.4 Use the testing equipment to monitor pile stresses during driving to prevent pile damage and ensure pile integrity and resistance (i.e. capacity). If the testing equipment indicates overstressing or damage to the pile, immediately discontinue driving and notify the Engineer and propose a new pile driving system, modifications to existing system, or new pile installation procedures. Acceptance by the Engineer of any proposed changes to the pile driving system or pile installation procedures will be based upon the results of additional wave equation analyses in accordance with Section 2.1.2 of this Special Note.

2.3.3 Preparation of the Pile Head The preparation of the pile head for the application of dynamic test load may involve, where appropriate, trimming the head, cleaning, and building up the pile using materials that, at the time of testing, safely withstand the impact stresses. Provide an impact surface that is flat and at right angles to the pile axis.

2.3.4 Dynamic Measurement and Analysis Begin monitoring of pile driving when pile driving begins. Record and process the data immediately in the field by the pile driving monitoring equipment and software. Unless monitoring indicates that additional driving will damage the pile, continue pile driving and monitoring until both the specified pile tip elevation and the specified pile resistance (i.e. capacity) are reached. When the level of the sensors is within 1 foot of any obstruction endangering the survival of sensors or cables, halt driving to remove the sensors from the pile. If additional driving is required, remove the obstruction or splice the pile and reattach the sensors to the head of the next pile segment prior to resuming driving. For each pile tested, perform pile driving analysis using signal matching techniques for a selected blow at the end of driving (EOD) to determine the relative capacities from end bearing and skin friction along the pile. Unless stated elsewhere in the contract documents or directed otherwise by the Engineer use the table below to determine the pile resistance (i.e. capacity) required at EOD.

Soil Type	Setup Factor	EOD Resistance as a % of Required Nominal Resistance
Clay	2.0	≈ 50%
Silt-Clay & Sand-Clay	1.5	≈ 70%
Sand-Silt & Fine Sand	1.2	≈ 85%
Sand & Sand-Gravel	1.0	≈ 100%

Make any required adjustments to the fuel and/or power setting of the hammer if necessary to verify the resistance at a pile driving rate of 20 blows per inch (240 blows/ft.) at the end of driving and beginning of restrrike and within allowable driving compressive stress of 80 to 90% of the yield stress of the piles or to meet other applicable testing objectives.

2.3.4.1 Perform beginning of restrrike (BOR) tests at the frequency indicated in Table 2 of this Special Note with the time interval between end of initial driving and beginning of restrrike in accordance with Table 2 of this Special Note. During restrrike, instrument and monitor the pile in a manner similar to that used during initial driving. For each restrrike test, perform pile driving analysis using signal matching techniques for a selected blow from the beginning of restrrike to determine the relative capacities from end bearing and skin friction along the pile.

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2.3.4.2 Perform the restrike test after warming up the hammer by driving another non-test production pile. If overstressing or damage to the test pile is indicated, immediately discontinue driving and notify the Engineer. In the event initial restrike testing indicates a pile resistance below the specified resistance, an additional restrike test after the redrive may be required as directed by the Engineer.

2.3.4.3 The Engineer may request use of pile driving monitoring equipment and software on additional piles if inconclusive results are obtained or unusual driving conditions are encountered.

2.3.4.4 Evaluate pile resistance and integrity based on the standard procedure used in practice.

2.3.4.5 Immediately provide tabular records of the dynamic pile testing field measurements obtained at the end of initial driving and at the beginning of restrike to the Engineer.

3.0 DYNAMIC PILE TEST REPORTS

3.1 Preliminary Dynamic Pile Test Reports Submit a preliminary test report for each pile tested for review by the Engineer. In the reports, include tabular as well as graphical presentation of the dynamic test results versus depth and proposed pile driving criteria for the additional piles to be installed at the substructure unit of the pile tested. Also include the following:

- a. The maximum force applied to the pile head.
- b. The maximum pile head velocity.
- c. The maximum energy imparted to the pile.
- d. The assumed soil damping factor and wave speed.
- e. Static resistance (i.e. capacity) estimate.
- f. The maximum compressive and tensile forces in the pile.
- g. Pile integrity.
- h. Blows per inch.
- i. Stroke.
- j. Summary results of pile driving analysis from up to three selected blows analyzed using signal matching techniques and software.
- k. Results of refined wave equation analyses based upon dynamic testing signal matching analysis, including tabular and graphical inspector's charts at EOD and BOR for the required pile resistance values specified for each specific substructure.

The Engineer will use the results of the preliminary reports to provide pile driving criteria for production piles to the Contractor.

3.2 Dynamic Pile Test Summary Report Submit a summary report of all piles tested on each structure for review by the Engineer. (Where phased construction is used it may be

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desirable to provide different reports for each phase. In such cases, the contractor should seek the approval of the Engineer.) In the report, include the results of hammer performance, pile driving stresses, and pile resistance during initial driving and restrrike for all piles tested. Also include the following:

- a. Identification of the structure, including: County, Route, Crossing, and Drawing Number.
- b. Date of testing and date of pile installation.
- c. Pile identification number and location.
- d. All information given in preliminary reports as follows:
 1. Length of pile below the surface.
 2. Total length of pile, including projection above the surface at time of test.
 3. Length of pile from instrumentation position to tip.
- e. Hammer type, drop, and other relevant details.
- f. Blow selected for signal matching analysis.
- g. Maximum compressive and tensile stresses, stroke, and resistance (i.e. capacity) versus penetration depth.
- h. Temporary compression.
- i. Pile integrity and location of damage, if any.
- j. Force/velocity versus time trace.
- k. Force/velocity match curve.
- l. Resistance distribution along the pile.
- m. Detailed graphical and tabular results from up to three selected blows analyzed using signal matching techniques and software.
- n. Results of refined wave equation analyses based upon dynamic testing signal matching analysis, including tabular and graphical inspector's charts at EOD and BOR for the required pile resistance values for each specific substructure.

4.0 INCIDENTAL EQUIPMENT

Prior to the beginning of dynamic testing, provide one electronic device to aid in recording pile hammer blows, stroke, and energy such as an "E-Saximeter" or accepted equivalent meeting the specifications in the Appendix to this Special Note. This device will immediately become property of the Department for use on the project.

Provide field training by someone proficient in the use of the device to ensure that approximately 3 to 5 employees of the Department are competent in the use of the device. This training may be performed by a representative of the independent Dynamic Pile Testing Consultant who is proficient in the use of the device or a manufacturer's representative. The required training time is anticipated to be no more than one day.

The cost of furnishing this device and providing the training is incidental to the contract price for "Dynamic Pile Testing" and no separate payment will be made.

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5.0 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Dynamic pile testing will be measured per each. Payment for each restrrike test performed will be in addition to payment for each test performed at the end of initial driving. Payment for redrive testing will be included in the price for the restrrike test immediately prior to the redrive. Payment for each test will include pile driving monitoring and pile driving analysis performed. Payment for the above described work, including all material, equipment, tools, labor and any other incidental work necessary to complete this item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
23233EC Dynamic Pile Testing	Each

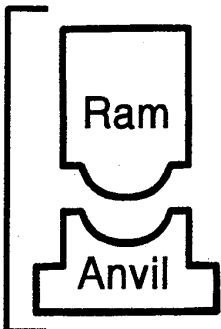


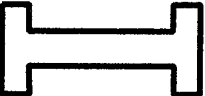

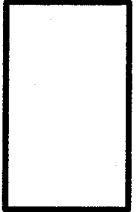
Contract No.: _____		Structure Name and/or No.: _____													
Project: _____		Pile Driving Contractor or Subcontractor: _____													
County: _____		(Piles driven by)													
Hammer Components		Hammer	Manufacturer: _____ Model No.: _____ Hammer Type: _____ Serial No.: _____ Manufacturers Maximum Rated Energy: _____ (ft. - lb.) Stroke at Maximum Rated Energy: _____ (ft.) Range in Operating Energy: _____ to _____ (ft. - lb.) Range in Operating Stroke: _____ to _____ (ft.) Ram Weight: _____ (lb.) Modifications: _____ _____ _____												
		Striker Plate	Weight: _____ (lb.) Diameter: _____ (in.) Thickness: _____ (in.)												
		Hammer Cushion	<table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;">Material #1</td> <td style="width:50%; border: none;">Material #2 (for Composite Cushion)</td> </tr> <tr> <td style="border: none;">Name: _____</td> <td style="border: none;">Name: _____</td> </tr> <tr> <td style="border: none;">Area: _____ (in.²)</td> <td style="border: none;">Area: _____ (in.²)</td> </tr> <tr> <td style="border: none;">Thickness/Plate: _____ (in.)</td> <td style="border: none;">Thickness/Plate: _____ (in.)</td> </tr> <tr> <td style="border: none;">No. of Plates: _____</td> <td style="border: none;">No. of Plates: _____</td> </tr> <tr> <td colspan="2" style="border: none;">Total Thickness of Hammer Cushion: _____</td> </tr> </table>	Material #1	Material #2 (for Composite Cushion)	Name: _____	Name: _____	Area: _____ (in. ²)	Area: _____ (in. ²)	Thickness/Plate: _____ (in.)	Thickness/Plate: _____ (in.)	No. of Plates: _____	No. of Plates: _____	Total Thickness of Hammer Cushion: _____	
	Material #1	Material #2 (for Composite Cushion)													
	Name: _____	Name: _____													
Area: _____ (in. ²)	Area: _____ (in. ²)														
Thickness/Plate: _____ (in.)	Thickness/Plate: _____ (in.)														
No. of Plates: _____	No. of Plates: _____														
Total Thickness of Hammer Cushion: _____															
	Helmet (Drive Head)	Weight: _____ (lb.)													
	Pile Cushion	Material: _____ Area: _____ (in. ²) Thickness/Sheet: _____ (in.) No. of Sheets: _____ Total Thickness of Pile Cushion: _____ (in.)													
	Pile	Pile Type: _____ Wall Thickness: _____ (in.) Taper: _____ Cross Sectional Area: _____ (in. ²) Weight/Foot : _____ Ordered Length: _____ (ft.) Design Load: _____ (kips) Ultimate Pile Capacity: _____ (kips) Description of Splice: _____ _____ Driving Shoe/Closure Plate Description: _____ _____ Submitted By: _____ Date: _____ Telephone No.: _____ Fax No.: _____													

Figure 1
Pile and Driving Equipment Data Form (From FHWA-HI-097-014)

Appendix

Physical:

Size: 100mm X 190mm X 50mm (4 inches X 7.5 inches X 2 inches)
Weight: 0.7 kg (1.5 lb.)
Temperature range: -10 to 50°C (14 to 104°F) operating
Power: built-in rechargeable battery w/ 8 hour min duration
Display: LCD, 4 Lines x 16 characters, viewing area 62 mm by 26 mm (2.5 inches by 1 inch)
Keypad: Large key (1.27 mm²), non tactile

Electronic:

32 bit microcontroller up to 20.97 MHz
12 bit digital to analog converter 8 bit 4 channel analog to digital converter
Internal microphone 70 to 115 dB
RS232 connector for data transfer
4 MB internal memory

Functional and Other:

Maximum blow detection rate: 68 bpm for open end diesel hammers; 300 bpm for all others
Furnished with SAXLINK program for data transfer in text format
Operates in English or SI units
Full one year warranty
Technical manual included

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VIBRATION MONITORING

1.0 DESCRIPTION

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

This item shall include all labor, equipment, materials and incidental items for the following:

The Contractor shall retain a qualified Consultant to perform vibration monitoring during construction of the temporary shoring and pile installation for the Combination Pile Wall, sewer support system, and culvert base slab as well as any other construction deemed necessary by the Engineer. The Contractor's vibration-monitoring personnel shall include a qualified Vibration Instrumentation Engineer who is a licensed Professional Engineer, and who has at least 4 years of experience in the installation and use of vibration-monitoring instrumentation and in interpreting instrumentation data for ground vibrations caused by heavy construction, and who has conducted a minimum of 5 vibration monitoring projects for ground vibrations caused by heavy construction. This specialist shall also supervise the Contractor's vibration-monitoring program.

Within 14 days after receiving a Notice To Proceed, submit a written plan to the Engineer, which includes, but is not limited to the following: vibration monitoring plan (including the format for reporting the vibration readings), anticipated vibration levels at the closest structures, condition survey format, and communications activities.

The Contractor will install vibration monitoring stations prior to starting construction. The Contractor will be required to schedule construction to facilitate the collection of vibration data. The instruments shall be in place until construction is completed but may be removed from the site temporarily during scheduled lag in activities from the time of the installation of the temporary shorting to additional construction.

The maximum allowable peak particle velocity (PPV) value resulting from construction activities is 0.30 inches per second.

2.0 PRECONSTRUCTION SURVEY

In conjunction with the vibration monitoring program, the Contractor including representatives of the Department, will perform pre-construction surveys of buildings adjacent to the project site which could be susceptible to damage from construction vibrations. The Contractor will provide detail (by engineering sketches, video, photographs, and/or notes) of any existing structural or cosmetic damage.

Documentation of the surveys will be provided to the Engineer prior to beginning construction.

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Conduct a Post-Construction Condition Survey within 10 calendar days after the pile-driving activities have been completed. The survey will follow the same procedures, and the report will have the same format, as the Pre-Construction Survey.

3.0 VIBRATION MONITORING TEST PROGRAM

Provide vibration monitoring equipment capable of continuously recording the peak particle velocity, recording and transmitting a permanent record of the entire vibration event, and transmitting alarms when threshold values are exceeded. Provide vibration monitoring equipment with the following minimum features:

- a) Seismic range: 0.01 to 4 inches per second with an accuracy of +5 percent of the measured peak particle velocity or better at frequencies between 10 Hertz and 100 Hertz, and with a resolution of 0.01 inches per second or less.
- b) Frequency response (+3 dB points): 2 to 200 Hertz.
- c) Three channels for simultaneous time-domain monitoring of vibration velocities in digital format on three perpendicular axes.
- d) Two power sources: internal rechargeable battery and charger and backup power source.
- e) Capable of internal, dynamic calibration.
- f) Capability to transfer data from memory to permanent digital storage. Instruments must be capable of transmitting vibration data readings to the Contractor within 15 minutes of obtaining the readings. Provide computer software to perform analysis and produce reports of continuous monitoring.
- g) Continuous monitoring mode must be capable of recording single-component peak particle velocities, and frequency of peaks with an interval of one minute or less.

Perform a Vibration Monitoring Test Program prior to and during construction of the Temporary Shoring. The results will be used to determine the appropriate seismograph trigger levels and to refine the positioning of equipment. It may be necessary to perform this test program at a different time for installation of the combination pile wall and culvert base slab.

Provide a minimum of two weeks' notice prior to performing the test program, in order to coordinate schedules. Mobilize equipment anticipated to be used for construction activities. Perform typical construction operations in cooperation with the vibration monitoring to insure that sufficient data is being obtained to meet the objectives of the test program. It is estimated that the test program will take approximately two full working days and that the construction criteria will be available the next working day after the testing program will be completed.

Use only construction equipment evaluated during the test program. Additional test program will be required to evaluate alternative equipment prior to approving its use.

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Additional tests will be the responsibility of the Contractor with not additional costs or extension of contract time. Submit a written request to perform additional test programs and identify all alternative equipment proposed in this request. Submit such requests to the Engineer a minimum of two weeks prior to needing the test program to be conducted.

The Vibration Monitoring Consultant will review and interpret data generated by the vibration monitoring devices and will adjust and reposition the devices as necessary. The Vibration Monitoring Consultant will use the results of this test program to establish construction criteria necessary to achieve the specified peak particle velocity (PPV) criteria.

4.0 CONSTRUCTION

Exercise appropriate care and avoid damaging all monitoring and instrumentation devised referenced in this Special Note. These devices will be clearly marked in the field and Contractor personnel should ensure they understand their locations. Any monitoring or instrumentation devices damaged or destroyed by the Contractor or by theft or vandalism will be reinstalled or replaced at the Contractors expense. Additionally the Contractor will be responsible for protecting and/or storing the devices at all times. The Contractor's Consultant must ensure that spare monitoring equipment should be readily available and replacement equipment should be installed the same day if necessary.

The Contractor will keep a detailed daily log of construction activities performed including items below. Submit these logs to the Engineer weekly.

- a) The specified types sizes and pieces of equipment in use for specific time periods
- b) Data and time intervals during which actual construction activities are performed
- c) Type, size, depth and location of piles driven
- d) Discretion of any occurrences known to cause spikes in measured vibration levels.
- e) Number and names of personnel on site
- f) And daily weather conditions, and Ohio River levels, as well as any unusual activities or occurrences.

If at any time the vibration monitoring equipment indicates construction activities are generating vibrations above the limits established during the test program, immediately suspend construction activities until the Vibration Monitoring Consultant and Department can review the data. If necessary, the Contractor will be required to develop an action plan to reduce vibrations to within acceptable limits. This may require the Contractor to utilize different equipment or construction techniques at no expense to the Department with any extension of Contract Time.

Maintain a log of any complaints and make this available to the Engineer on request.

Submit a copy of all final reports to the Engineer within 14 days after completing the Condition Survey and Vibration Monitoring field activities.

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5.0 MEASUREMENT

The Department will not measure the quantity of Vibration Monitoring separately for payment.

6.0 PAYMENT

Vibration Monitoring shall be considered incidental to Mobilization.

The Department will consider payment for Mobilization as full compensation for all work required in this provision.

END OF NOTE

Taylor Creek Culvert Hydrologic Analysis

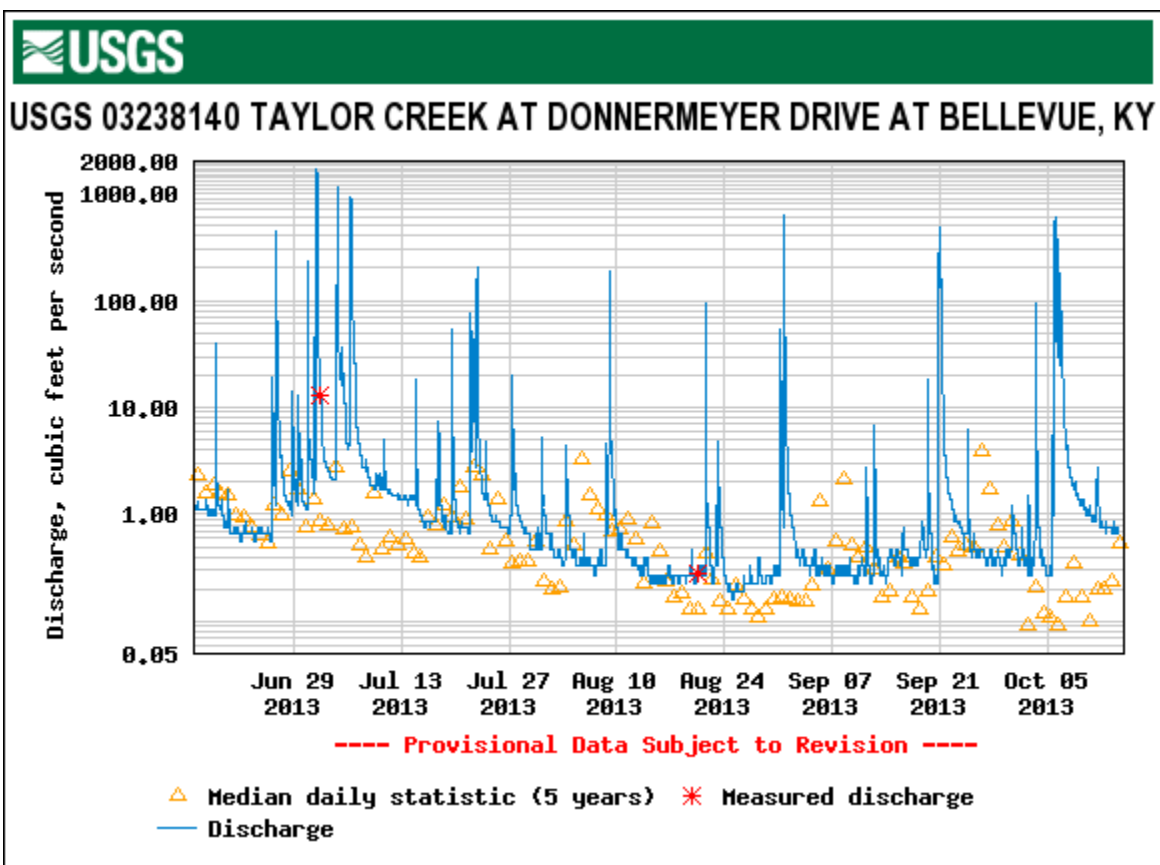
08/11/14

USGS 03238140 TAYLOR CREEK AT DONNERMEYER DRIVE AT BELLEVUE, KY

Available data for this site Surface-water: Peak streamflow

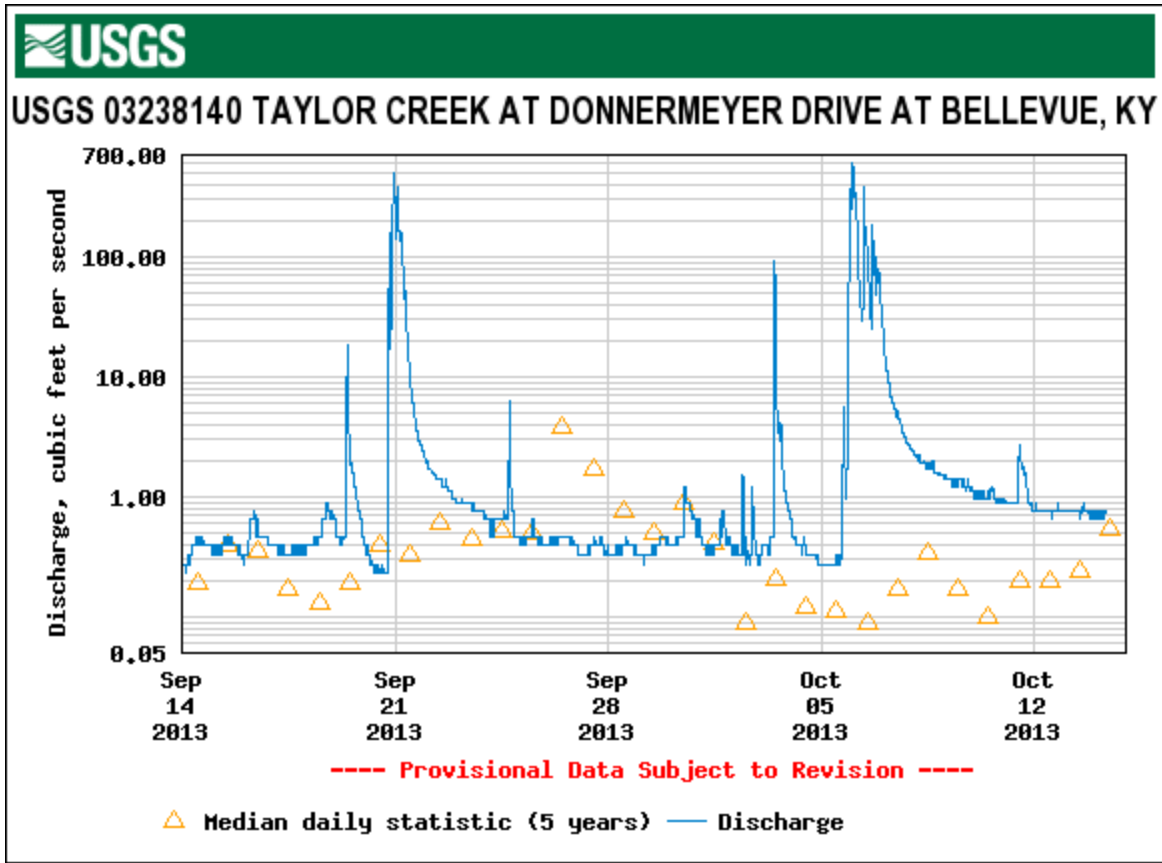
Campbell County, Kentucky
Hydrologic Unit Code 05090203
Latitude 39°05'50", Longitude 84°28'58" NAD27
Drainage area 4.24 square miles
Gage datum 479.49 feet above NAVD88

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
2011	Jun. 10, 2011	8.77	1,590
2012	Jul. 18, 2012	6.48	820



Taylor Creek Culvert Hydrologic Analysis

08/11/14



00060, Discharge, cubic feet per second,
Mean of daily mean values for each day for 6 - 6 years of record in, ft³/s (Calculation Period 2007-10-01 -> 2013-09-30)

Day of month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4.6	9.9	3.8	4.0	10	5.8	8.9	0.98	0.70	2.6	1.1	2.5
2	2.0	5.2	4.1	4.4	21	1.7	11	0.86	4.1	1.7	0.94	11
3	1.7	2.3	3.4	5.9	22	10	1.2	2.5	8.5	0.47	5.2	3.3
4	1.9	2.7	25	23	4.5	12	15	5.8	1.6	0.38	3.4	4.8
5	1.8	14	15	6.1	14	2.0	3.8	4.3	2.2	0.38	1.2	31
6	2.3	13	5.2	3.4	16	3.0	25	1.3	0.49	1.1	1.0	5.3
7	2.0	6.5	3.3	3.1	4.1	0.80	1.7	4.9	5.0	0.40	0.93	9.3
8	2.3	4.9	5.8	3.5	11	0.69	5.3	3.3	15	2.9	0.92	12
9	2.1	2.7	16	4.7	3.4	1.1	3.7	3.6	1.7	12	0.98	15
10	8.9	3.3	7.3	5.1	6.1	20	0.99	2.4	0.50	1.2	0.86	8.4
11	9.0	5.0	20	19	7.8	15	0.90	2.1	0.38	0.78	1.2	3.3
12	3.3	5.2	9.7	14	5.8	15	0.78	0.79	1.4	0.76	4.5	5.1
13	11	3.1	8.7	4.1	12	5.2	19	0.67	0.20	1.3	1.4	8.7
14	4.0	2.6	8.6	7.2	8.1	8.0	1.3	0.87	0.20	1.2	5.4	2.4
15	2.4	2.7	10	2.9	20	5.5	2.0	0.65	1.4	0.97	9.5	9.8
16	1.7	4.3	4.9	13	11	3.5	1.5	0.55	0.35	1.8	6.2	6.6
17	17	3.6	3.1	3.5	3.3	1.8	1.6	0.88	0.25	0.54	2.5	4.4
18	3.8	2.9	43	2.1	3.0	1.8	7.0	0.86	0.30	1.5	1.8	2.2
19	2.7	3.1	30	29	5.3	2.8	2.9	0.56	1.1	9.0	1.3	7.0
20	2.1	2.1	5.2	16	8.7	7.4	3.7	0.36	7.8	4.0	1.4	11
21	5.0	19	3.0	4.6	2.4	13	2.0	1.7	11	0.82	5.2	7.0
22	2.4	8.5	5.4	6.0	2.0	4.3	7.4	0.35	1.9	8.4	11	8.2
23	6.1	4.2	12	18	10	4.5	2.5	0.33	2.4	22	3.6	4.6
24	5.9	8.5	8.7	13	3.2	1.0	1.4	0.22	3.9	4.3	4.6	11
25	3.3	17	14	8.6	1.6	0.83	2.7	0.35	2.3	1.1	14	3.9
26	18	9.4	7.8	6.0	12	11	1.9	0.26	16	7.0	8.4	6.6
27	6.4	14	11	5.4	3.1	2.0	3.5	0.89	3.1	7.3	7.1	7.2
28	5.9	6.8	8.8	11	1.5	6.4	1.3	0.49	0.66	4.1	14	3.5
29	4.4	10	4.3	4.1	1.5	2.3	5.2	0.31	1.2	1.1	7.4	2.7
30	7.6		3.7	3.6	1.3	2.6	3.9	0.38	0.85	2.4	11	4.1
31	2.7		4.9		4.3		8.3	5.5		5.9		2.8