06-8703 Taylor Creek Culvert

Pre Bid Meeting

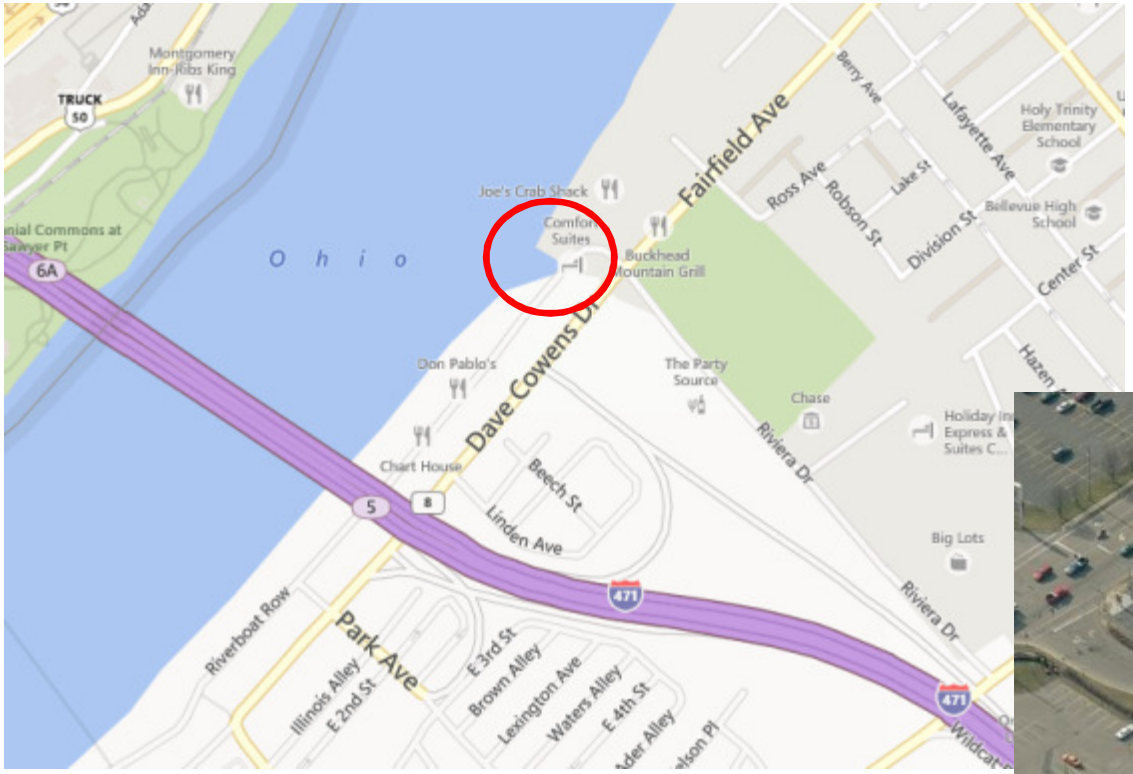
December 3, 2014

Introductions

- URS
  - Dave Wormald – Project Manager and Site Design
  - Craig Klusman and Travis Baker – Structural Design
- KYTC?
- SD-1?
- Others?

Project Location

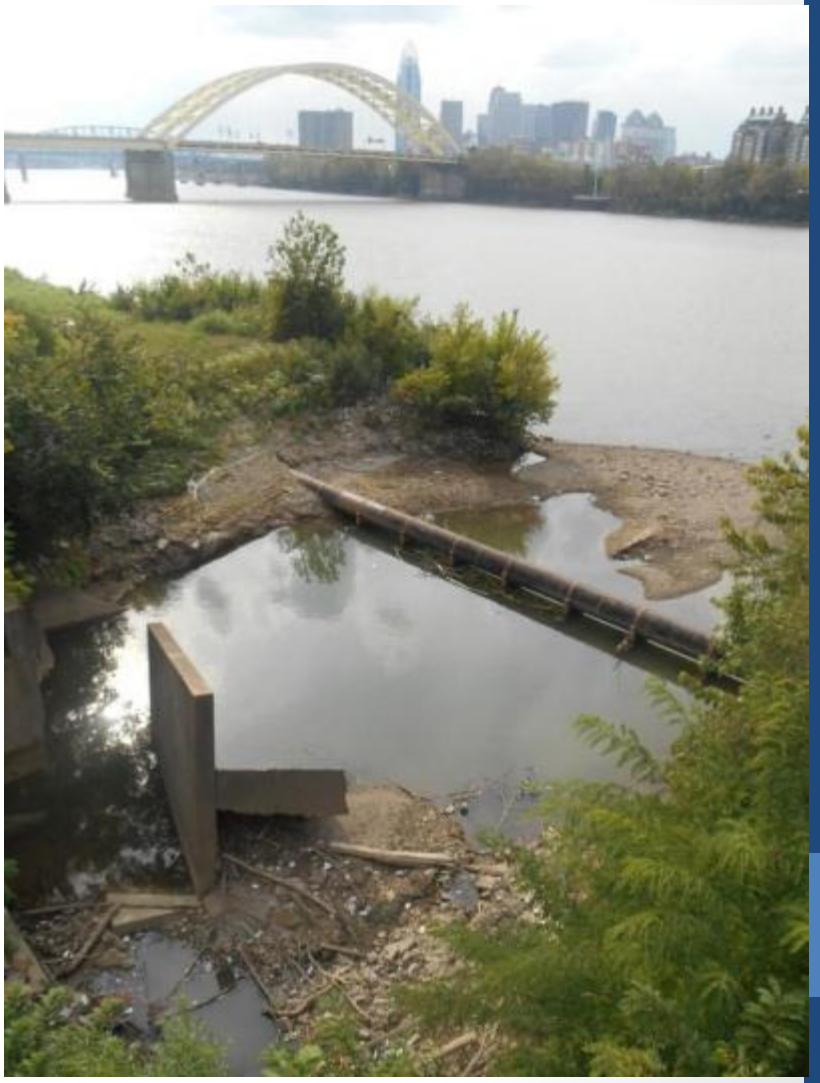
- Riverboat Row, Cities of Newport/Bellevue



Background

- Precast Arch Culvert Originally Constructed 1988 as part of I-471
- Cast-in-Place Liner during original construction
  (plans unavailable)
- Extensions to the inlet in 1992 and 2011
- Dredging in 1993
- Failure of apron and wingwall 2007+/-
- Continued Erosion and Slope Failures
- Construction of new SD1 Aerial Sewer 2012

Background



Site Access

- On City owned Property – Resolution for access
- Vehicular Access from Chart House side of Cove
- No vehicular access from Joe's Crab Shack
- River Access may require dredging
- Maintenance of Traffic on River Boat Row
- Limited laydown space and parking

Site Access


OHIO RIVER
CITY OF BELLEVUE
CONTRACTOR ACCESS
0.58 ACRES
CITY OF NEWPORT
CONTRACTOR ACCESS
1.48 ACRES
EXISTING SD-1 SANITARY SEWER
CHART HOUSE
EXISTING CULVERT
JOE'S CRAB SHACK
RIVERBOAT ROW
COMFORT SUITES
DAVE COWENS DRIVE (KY-8)
KYTC 06-8703 Taylor Creek Culvert
Contractor Access
KENTUCKY TRANSPORTATION CABINET
Legend
Layer
0 25 50 100 Feet
N

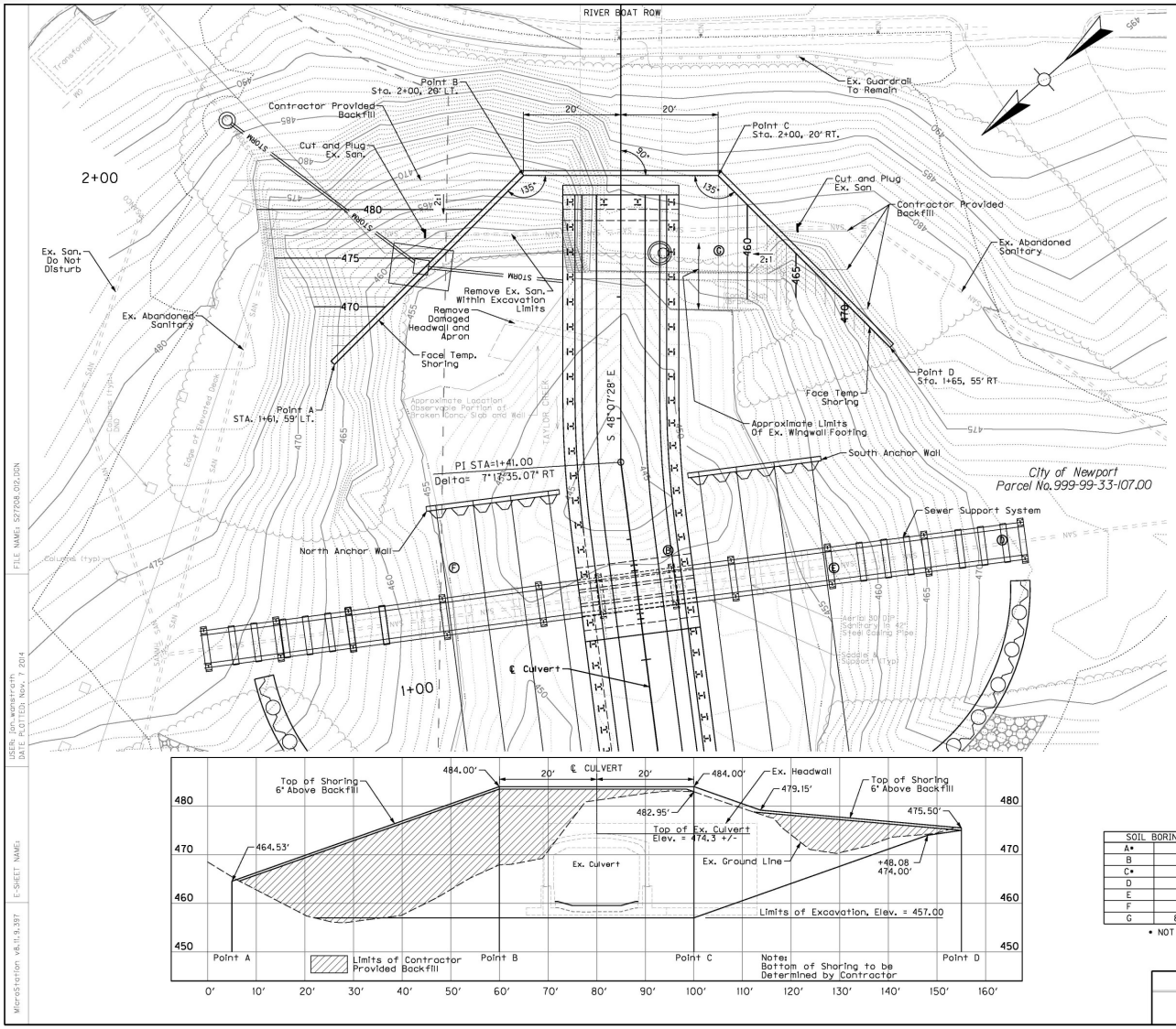
Scope of Work Elements

- Temporary Shoring
- Removals
- Combination Pile Wall
- Aerial Sewer Support
- Pile Supported Base Slab
- Pre Cast 3 sided Arch Culvert
- Backfill/Erosion Protection

Temporary Shoring

- Temporary Shoring Initial Task
- Contractor may vary layout and materials from plans
- Design by PE – Department Approval Required
- Contractor provided backfill 2:1 min
- Monitor Riverboat Row
- Remove Abandoned Sanitary/Wingwalls
- Permit Removal of Existing Culvert Segments

Temporary Shoring



TEMPORARY SHORING NOTES

The Contractor shall furnish a Contractor designed temporary shoring system to allow for excavation, removal of portions of the existing culvert and construction of the proposed culvert extension.

The temporary shoring shall be in general conformance with the limits and elevation shown in the plans. The shoring shall permit a maximum temporary slope of 2:1 between the top of shoring and Riverboat Row. The lump sum cost for temporary shoring shall be full compensation for all materials, labor and equipment needed for the design, excavation, construction, backfill and removal of the temporary shoring system.

The Contractor may propose alternative layout or limits for approval by the Engineer. The temporary shoring shall provide sufficient space for removal, excavation and construction. The Contractor may prepare an alternate design to support the sides of excavations. If constructing an alternate layout for temporary shoring, the Department will pay for the temporary shoring at the contract lump sum price. No additional payment will be made for providing an alternate layout.

The design of the temporary shoring shall be stamped by a professional engineer licensed in the Commonwealth of Kentucky. The earth pressures and soil properties listed in the plans or geotechnical report must be incorporated into the temporary shoring design. The shoring design shall not disturb any existing utilities. The Contractor shall submit six copies of drawings and calculations for approval by the Department. The Contractor shall not proceed with installation of the temporary shoring without notice to proceed from the Engineer.

The temporary shoring submittal shall include:
- Design calculations (including a global stability analysis)
- Soil properties
- Shoring material properties
- Shoring plan layout (showing maintenance of traffic during construction)
- Shoring details

Temporary shoring shall be paid for as a lump sum including all cost for designing, furnishing, installing and removal. All material used for shoring shall remain the property of the Contractor. Shoring is to be removed only after backfilling has been completed.

Portions of the temporary shoring located above the existing culvert shall be designed to allow the existing culvert to remain undisturbed.

The Contractor shall monitor the existing slope and pavement conditions along Riverboat Row during installation of the shoring system, construction of the culvert extension, filling operations and removal of the temporary shoring system. Any visible signs of slippage, settlement or other movement shall be reported to the Engineer immediately. In such cases further construction may be suspended until approved by the Engineer.

Earth pressures for temporary shoring shall be determined on the basis of the following parameters:

- Above El. 460 feet, a unit weight of 130 PCF, an effective friction angle of 32 degrees, and zero cohesion shall be assumed.

- Below El. 460 feet, a unit weight of 125 PCF, an effective friction angle of 28 degrees, and zero cohesion shall be assumed. As an alternative, the soils below El. 460 feet can be assumed to have an undrained shear strength of 750 PSF (i.e., the effective friction angle is zero).

Earth pressures shall account for appropriate surcharges (e.g., sloping backfill, vehicle loads, construction loads, etc.) and water levels on both sides of the shoring system (e.g., hydrostatic pressures and buoyant unit weights).

0' 10' 20' 40'

Note:
See Cross Sections for Additional Shoring Details

SOIL BORING CALLOUTS	
A*	201
B	202
C*	203
D	110579-1
E	87520-1
F	87520-2
G	87520-KDOT 1

* NOT SHOWN

REVISION	DATE

DATE: 11/7/2014 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**

TEMPORARY SHORING

ITEM NUMBER: **06-8703**

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

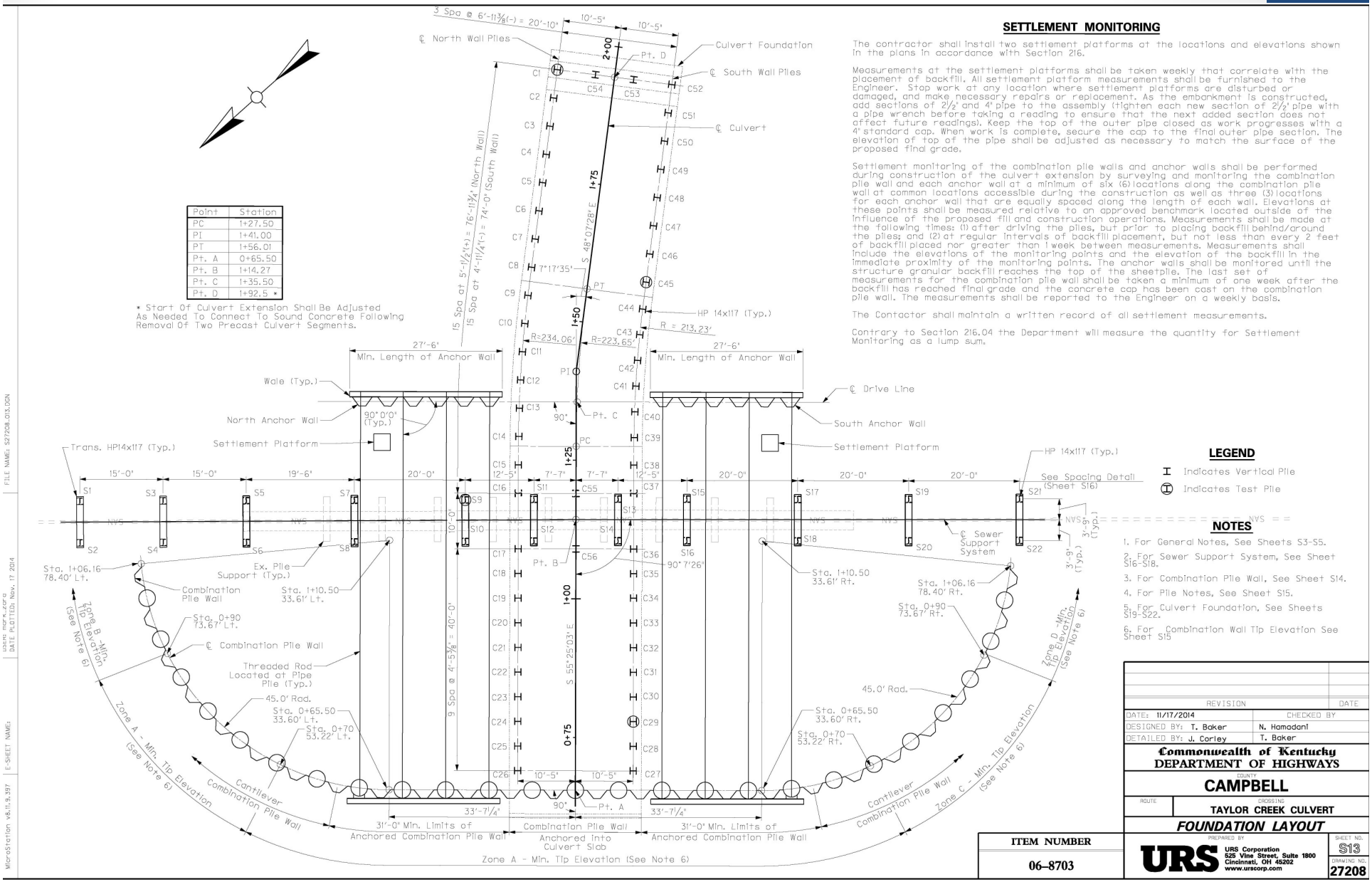
SHEET NO.: S12
DRAWING NO.: 27208

FILE NAME: S27208_012.DGN
USER: jan.wanstrath
DATE PLOTTED: Nov. 7 2014
E-SHEET NAME:
MicroStation v8.11.9.397

Combination Pile Wall

- Combination Pile Wall – minimum structural properties – design details may vary by system
- Geometry and layout to be compatible with culvert system
- System must be approved by Department (shop drawings required) including driving procedure
- Serves as cutoff wall during excavation and backfilling
- Depth varies by zone – Zone A driven initially
- Fill pipes with aggregate and concrete in anchorage zone

Combination Pile Wall



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.

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 2½' and 4' pipe to the assembly (tighten each new section of 2½' 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 Contactor 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.

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

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

FOUNDATION LAYOUT

ITEM NUMBER: 06-8703

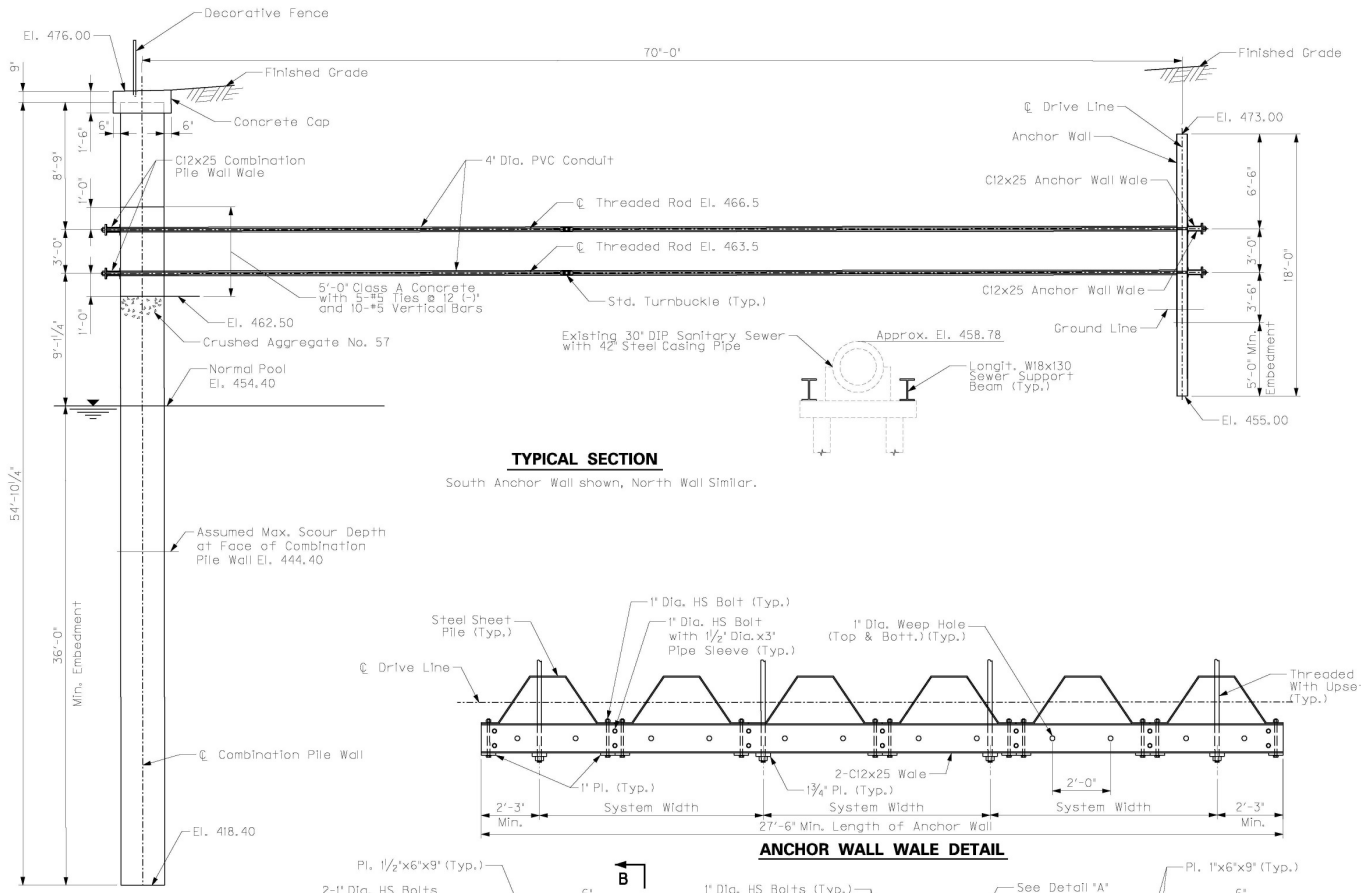
PREPARED BY: URS Corporation, 525 Vine Street, Suite 1800, Cincinnati, OH 45202, www.urscorp.com

SHEET NO. S13

DRAWING NO. 27208

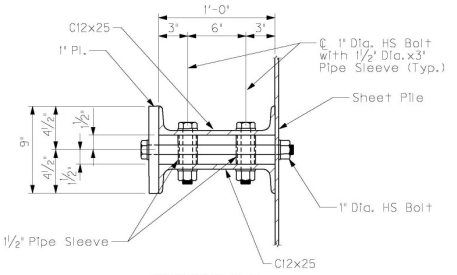
FILE NAME: S27208_013.DGN
USER NAME: mark.asch
DATE PLOTTED: Nov. 17 2014
E-SHEET NAME:
MicroStation v8.11.9.397

Combination Pile Wall

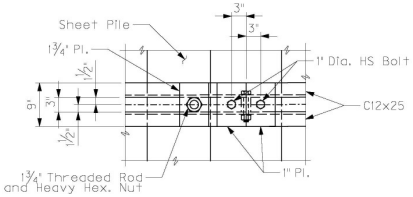


TYPICAL SECTION

South Anchor Wall shown, North Wall Similar.

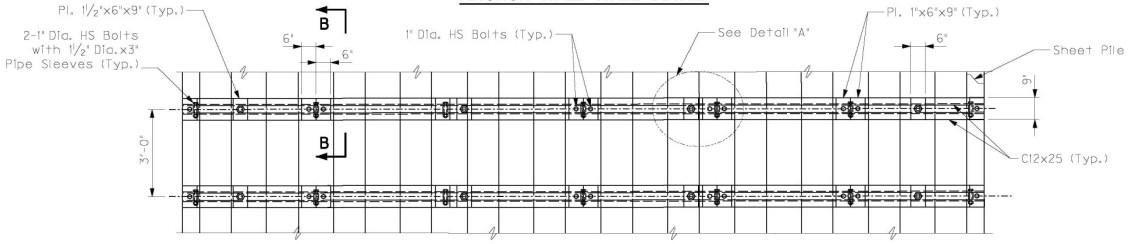


SECTION B–B



DETAIL "A"

ANCHOR WALL WALE DETAIL



ANCHOR WALL WALE ELEVATION

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 Premitted.
5. For Grading Plan, See Sheet S7

REVISION	DATE
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

ROUTE | CROSSING: TAYLOR CREEK CULVERT

COMBINATION PILE WALL

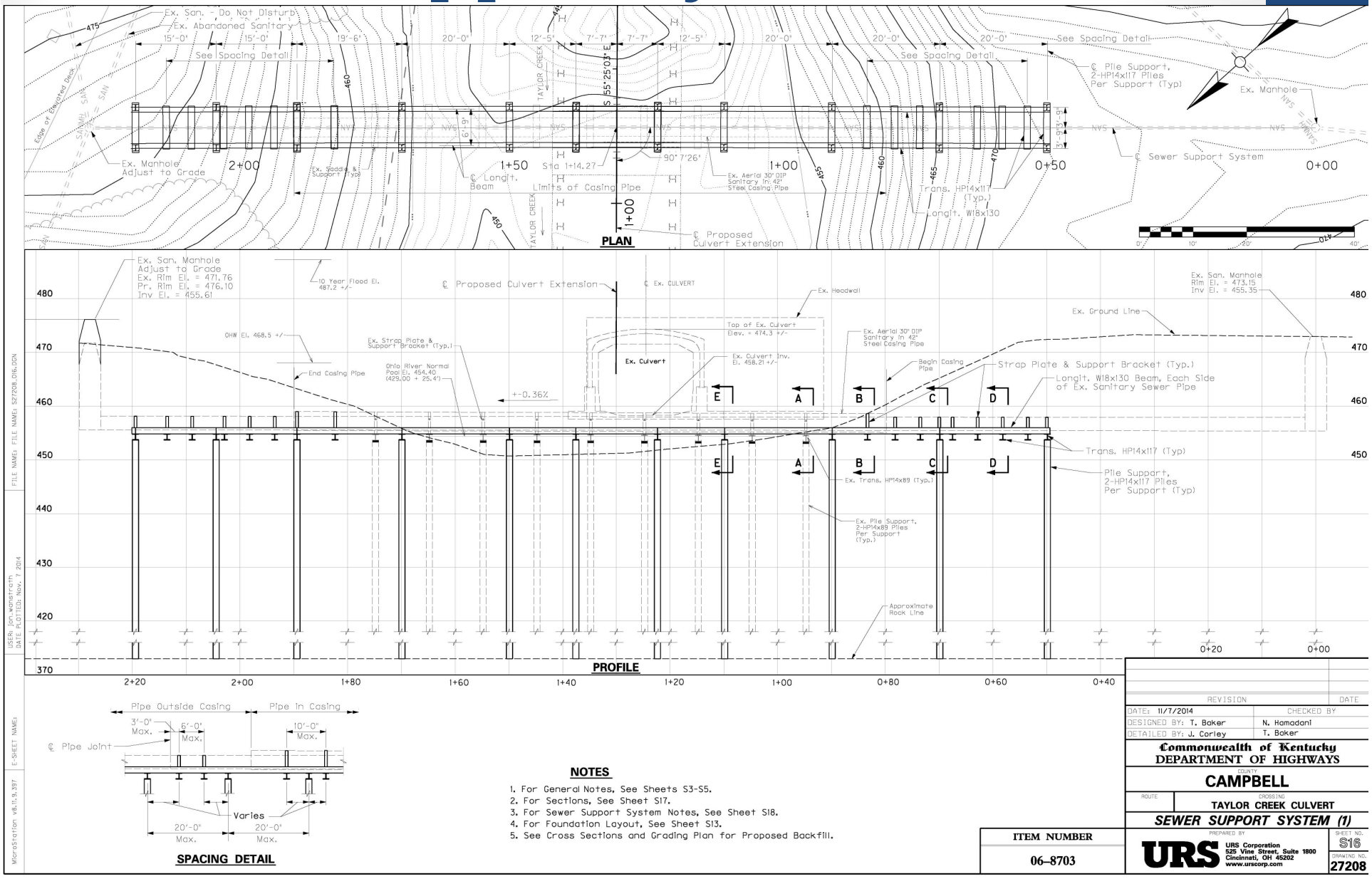
ITEM NUMBER	PREPARED BY	SHEET NO.
06–8703	URS Corporation, 525 Vine Street, Suite 1800, Cincinnati, OH 45202, www.urscorp.com	S14
		DRAWING NO. 27208

FILE NAME: S27208_014.DGN
USER: travis.baker
DATE PLOTTED: Nov. 17 2014
E-SHEET NAME:
MicroStation v8.11.9.397

Sewer Support System

- Coordinate with SD1 during installation
- Existing sanitary Interceptor supported on steel saddle bents and friction piles
- New pile support system needed with bearing piles
- Adjust location of bearing piles based on pipe joint locations
- Existing piles to be cut free
- Need to maintain pipe profile during construction
- Excavation required at ends to install supports
- Steel framing from W and HP sections

Sewer Support System



NOTES

1. For General Notes, See Sheets S3-S5.
2. For Sections, See Sheet S17.
3. For Sewer Support System Notes, See Sheet S18.
4. For Foundation Layout, See Sheet S13.
5. See Cross Sections and Grading Plan for Proposed Backfill.

ITEM NUMBER
06-8703

REVISION	DATE
DATE: 11/7/2014	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 (1)

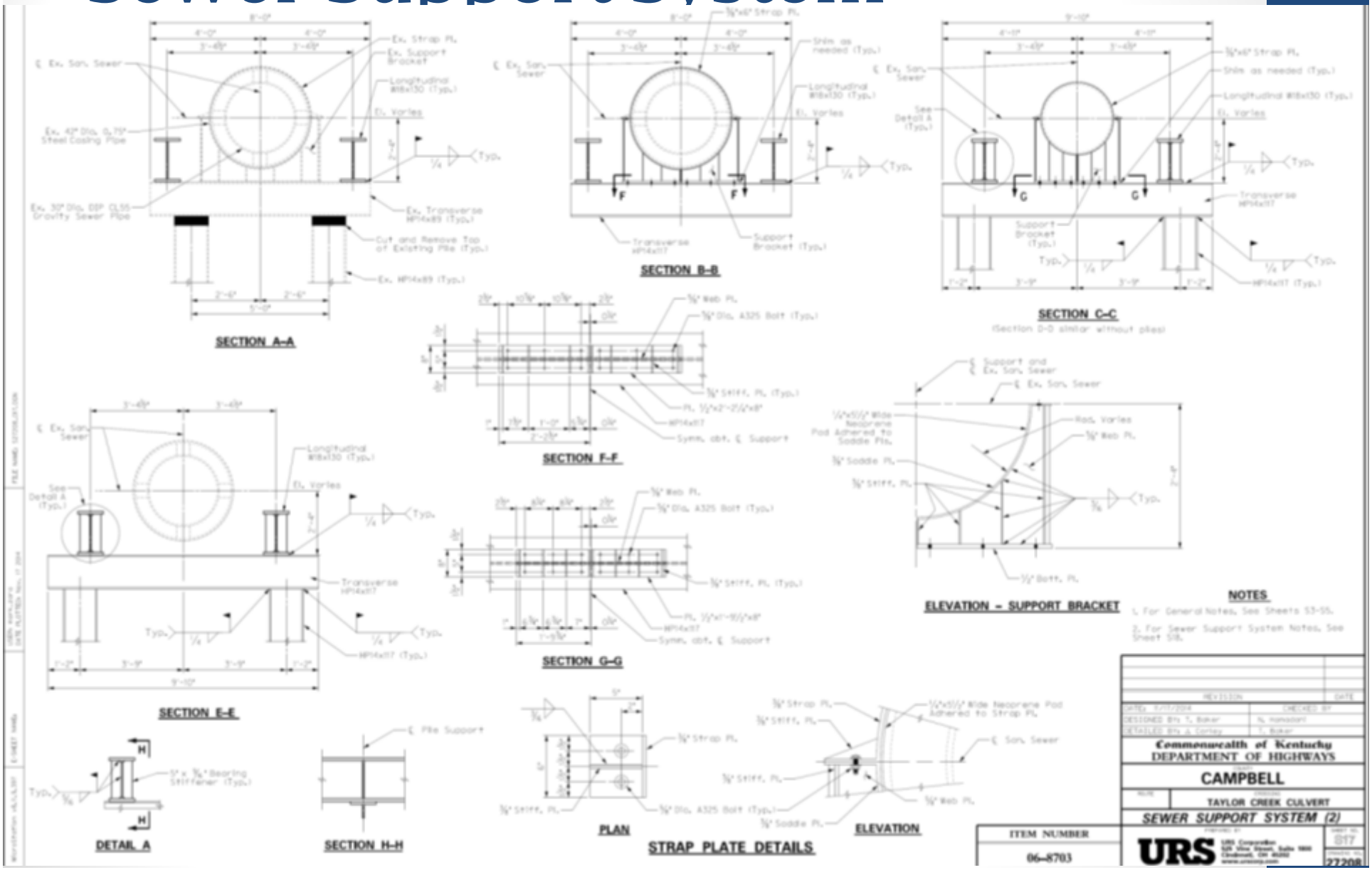
PREPARED BY: URS Corporation, 525 Vine Street, Suite 1800, Cincinnati, OH 45202, www.urscorp.com

SHEET NO. S16

DRAWING NO. 27208

FILE NAME: FILE NAME: S27208_016.DGN
USER: jon.wanstrath
DATE PLOTTED: Nov. 7 2014
E-SHEET NAME:
MicroStation v8.11.9.397

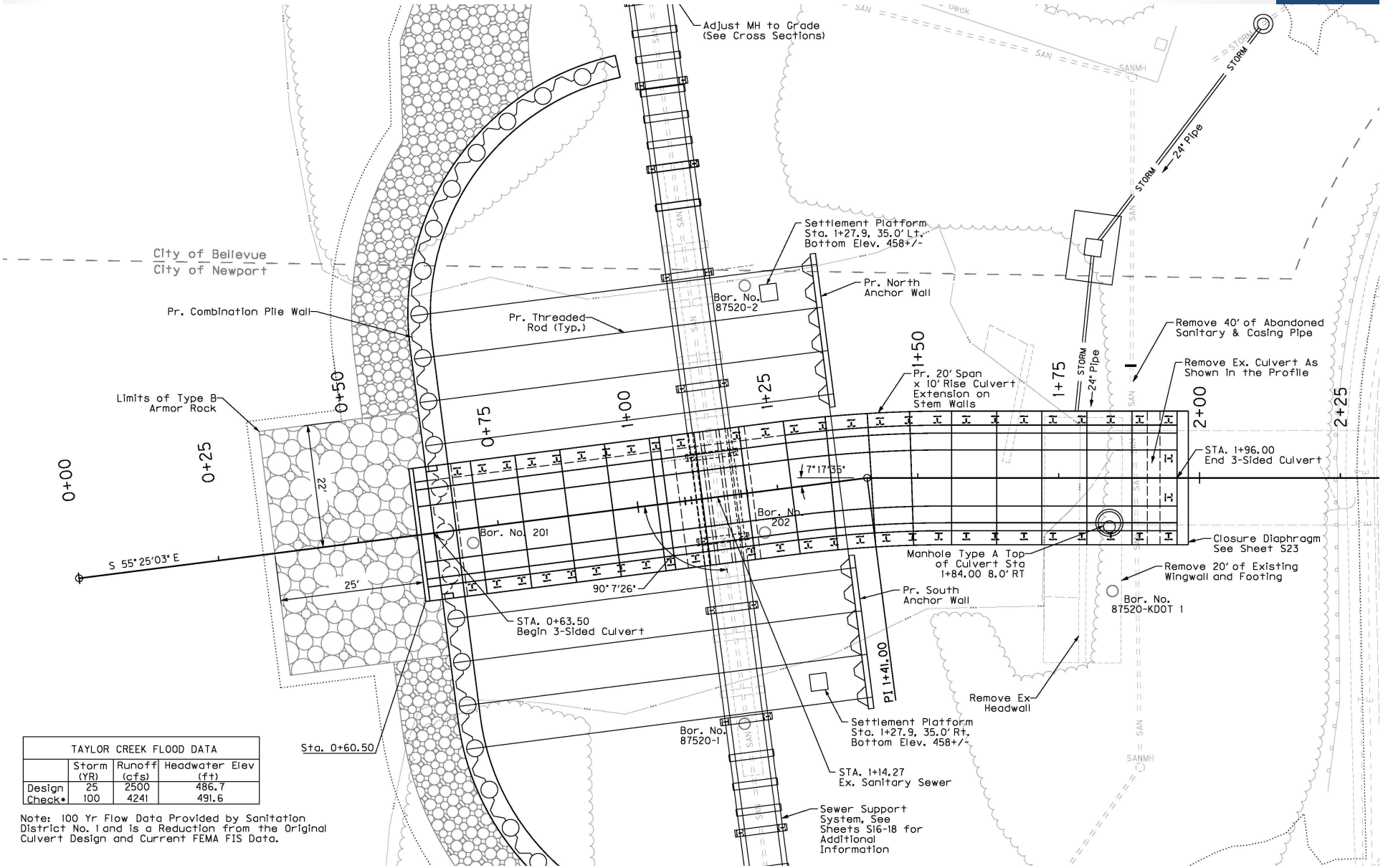
Sewer Support System



Culvert

- Cast in place pile supported base slab
- Follow KYTC Three Sided Arch procedure
- Manufacturer approved by the Cabinet
- Horizontal curve
- Manhole/stormsewer openings
- External restraints
- Select structural backfill
- Modify Existing Culvert – flow line adjustment /closure diaphragm/grouting

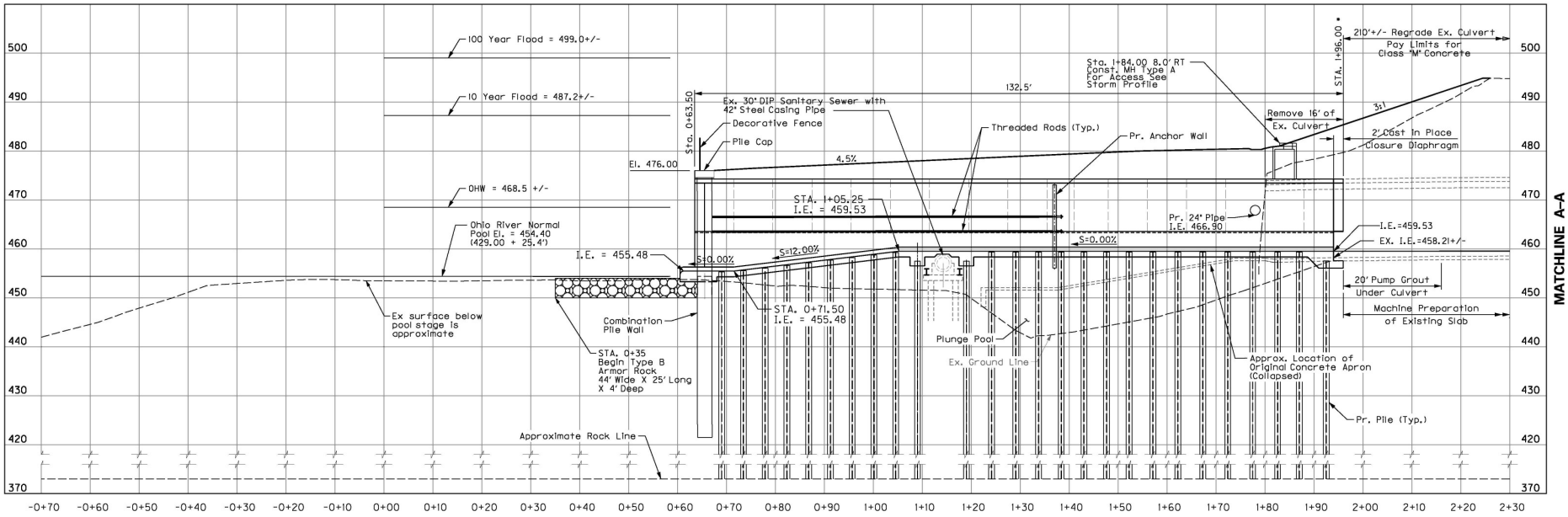
Culvert

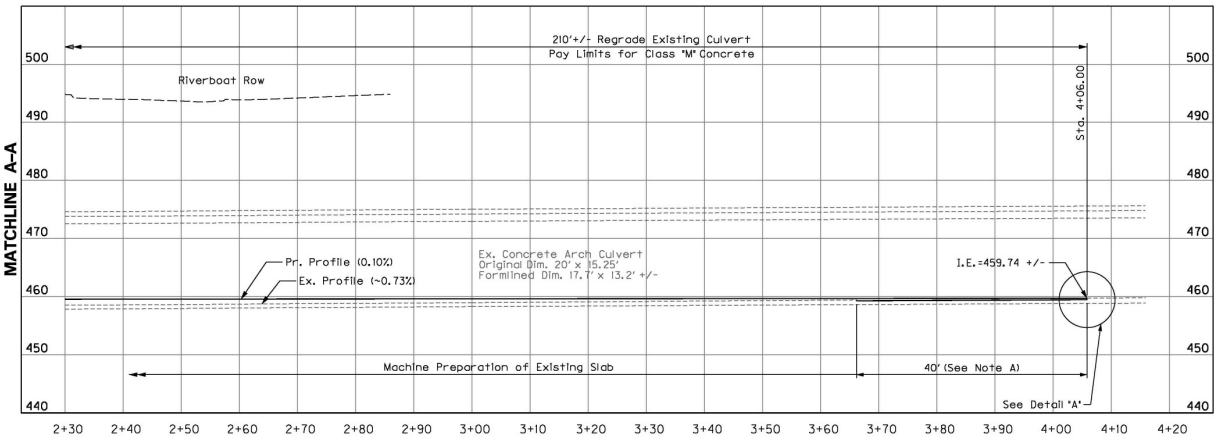


TAYLOR CREEK FLOOD DATA			
	Storm (YR)	Runoff (cfs)	Headwater Elev (ft)
Design	25	2500	486.7
Check*	100	4241	491.6

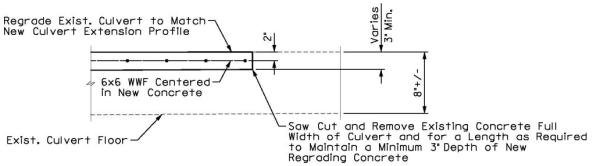
Note: 100 Yr Flow Data Provided by Sanitation District No. 1 and is a Reduction from the Original Culvert Design and Current FEMA FIS Data.

Culvert





Note A:
Remove and Replace 3'x40' of Concrete Surface from Existing Culvert Bottom with the Regrading of the Culvert



DETAIL "A"

Regrade existing culvert using Class M Concrete and #4 steel reinforcement at 18-inch centers in each direction or an equivalent area of welded deformed steel fabric. Place reinforcement 2" from top of concrete throughout limits of regraded culvert. Include the cost of this reinforcement in the bid for concrete, Class 'M'. See Sheet S23 for more details.

- Start of culvert extension shall be adjusted as needed to connect to sound concrete following removal of two precast culvert segments.

0' 10' 20' 40'

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

CULVERT PROFILE

ITEM NUMBER: 06-8703

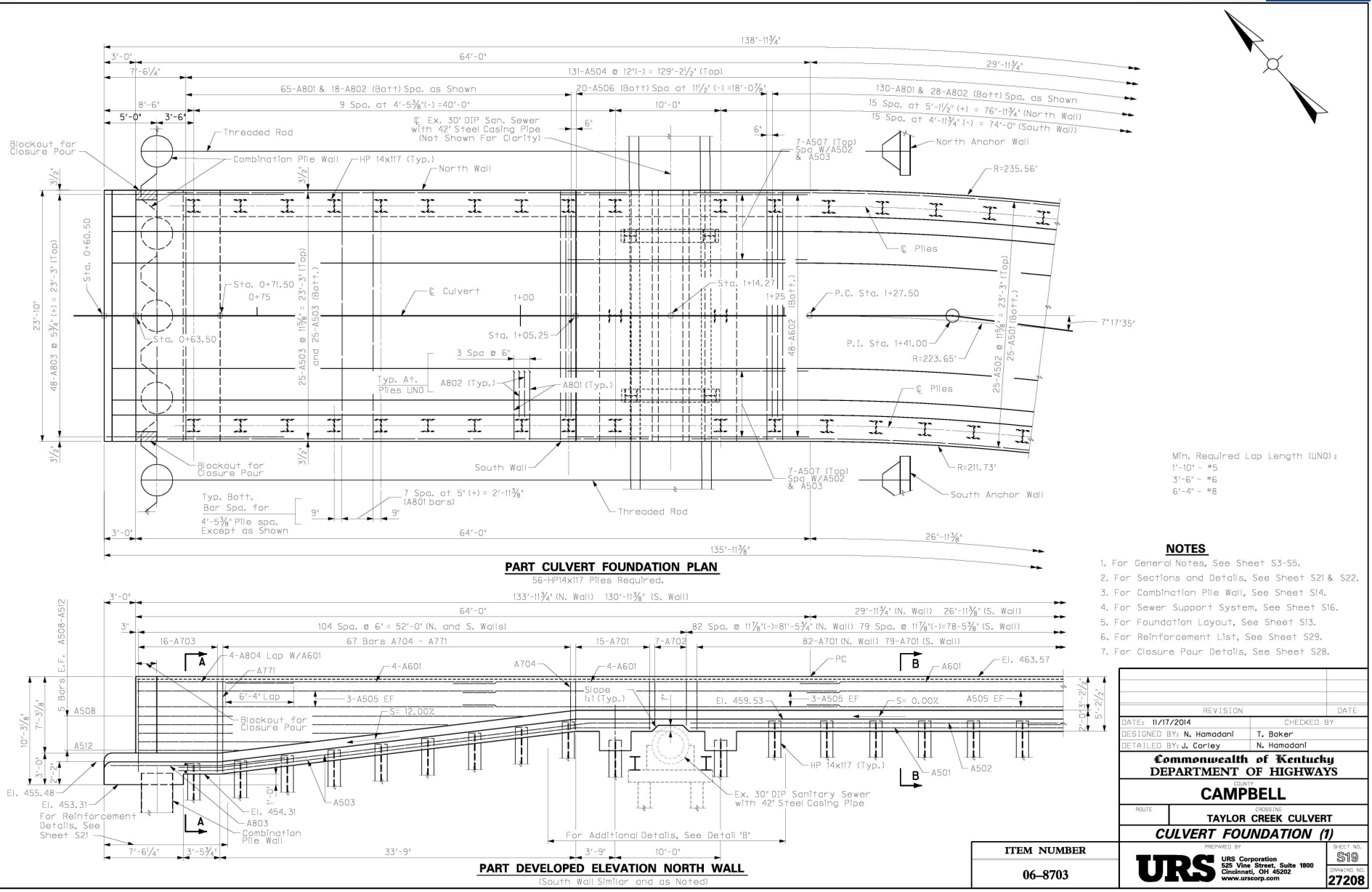
PREPARED BY: URS Corporation, 525 Vine Street, Suite 1800, Cincinnati, OH 45202, www.urscorp.com

SHEET NO.: S8

DRAWING NO.: 27208

FILE NAME: S27208_008.dgn
USER: mark_zara
DATE PLOTTED: Nov. 17 2014
E-SHEET NAME:
MicroStation v8.11.9.397

Culvert



NOTES

1. For General Notes, See Sheet S3-S5.
2. For Sections and Details, See Sheet S21 & S22.
3. For Combination Pile Wall, See Sheet S14.
4. For Sewer Support System, See Sheet S16.
5. For Foundation Layout, See Sheet S13.
6. For Reinforcement List, See Sheet S29.
7. For Closure Pour Details, See Sheet S28.

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

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: CAMPBELL

ROUTE | CROSSING: TAYLOR CREEK CULVERT

CULVERT FOUNDATION (1)

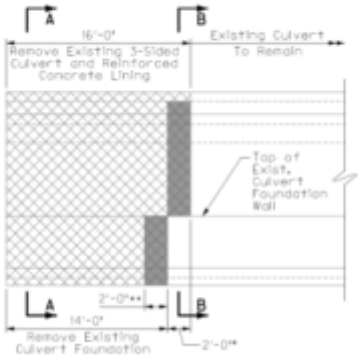
ITEM NUMBER: 06-8703

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

SHEET NO.: S19

DRAWING NO.: 27208

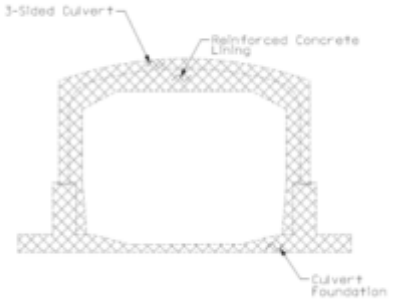
Culvert



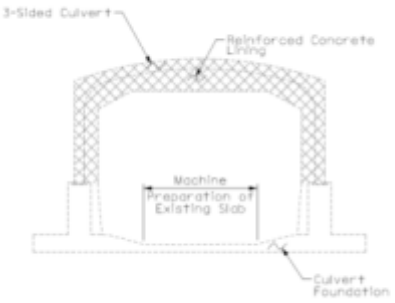
END ELEVATION

* 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.

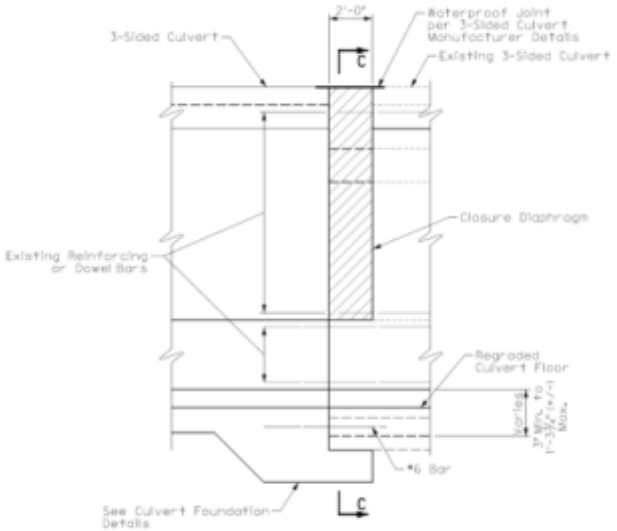
CLOSURE DIAPHRAGM

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.

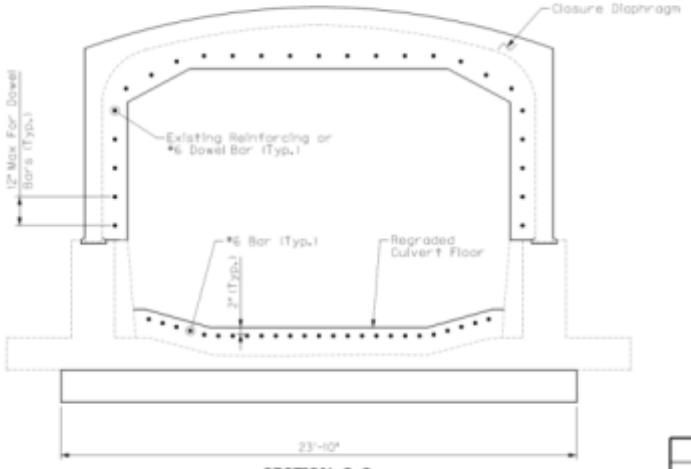
The contractor shall furnish shop drawings to the engineer illustrating the proposed details of the concrete and reinforcement for approval prior ordering materials. The details for the closure diaphragm shall be coordinated with the manufacturer of the three-sided culvert utilized for the project.

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.

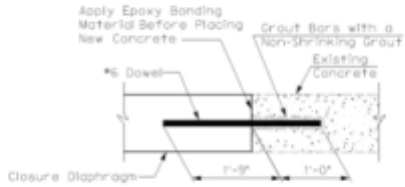
The Department will measure the quantity as
CLOSURE DIAPHRAGM LUMP SUM



CLOSURE DIAPHRAGM ELEVATION



SECTION C–C



DOWEL DETAIL

Notes: 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

REVISION	DATE
DATE: 9/17/2014	CHECKED BY:
DESIGNED BY: T. Baker	N. Momdani
DETAILED BY: J. Corley	T. Baker

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

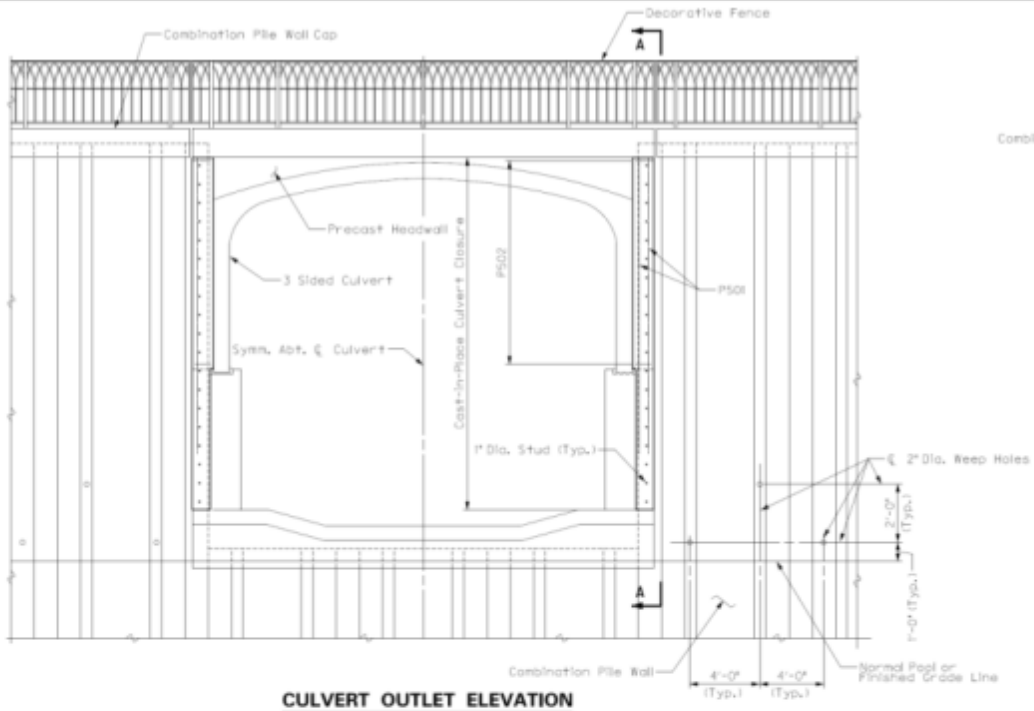
COUNTY: CAMPBELL

ROUTE | CROSSING: TAYLOR CREEK CULVERT

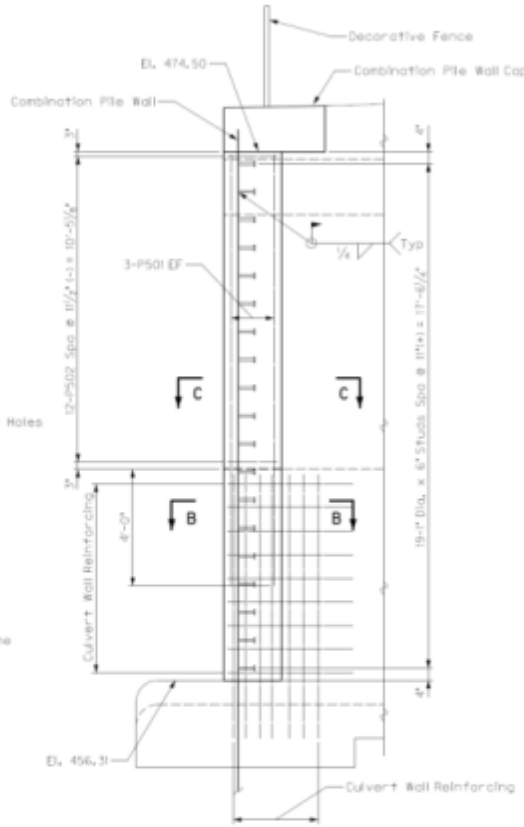
CLOSURE DIAPHRAGM

ITEM NUMBER	PREPARED BY	SHEET NO.
06-8703	URS Corporation, 525 Vine Street, Suite 1800, Cincinnati, OH 45202, www.urscorp.com	S23
		DRAWING NO. 27208

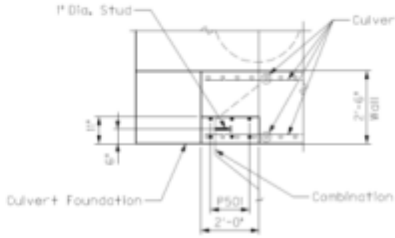
Culvert



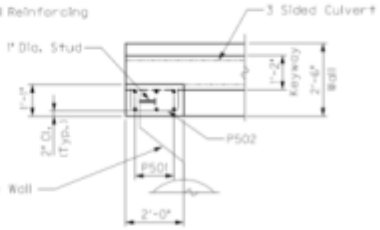
CULVERT OUTLET ELEVATION



SECTION A–A



SECTION B–B



SECTION C–C

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

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: CAMPBELL

ROUTE | CROSSING: TAYLOR CREEK CULVERT

MISCELLANEOUS DETAILS (3)

ITEM NUMBER	PREPARED BY	SHEET NO.	DRAWING NO.
06–8703	URS Corporation, 525 Vine Street, Suite 1800, Cincinnati, OH 45202, www.urscorp.com	028	27208

Backfill/Site Work

- Fill plunge pool with aggregate
- Select structural backfill around culvert and combination pile wall anchors/settlement platforms
- Storm sewer from Joe's Crab Shack
- Blend in contours with adjacent riverbank
- Armor Rock at culvert outfall and cyclopean riprap on riverbank
- Combination pile wall cap
- Disposal of materials on site not permitted
- Minimal utilities

Miscellaneous Items

- Permitting/Temp Erosion Control
- Maintain Taylor Creek Discharge
- Restricted work Hours
- Maintenance of Traffic
- Submittals
- Schedule - Working Days – High Water

Questions

Site Review to Follow