Steven L. Beshear
Governor

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

Joseph W. Prather
Secretary

July 10, 2009

CALL NO. 116
CONTRACT ID NO. 091046
ADDENDUM # 1

Subject: Kenton County, ARRA 27-3 (014)
Letting July 24, 2009

(1) Added - Special Note for Drilled Shafts - Pages 18(a)-18(u) of 213
(2) Revised - Special Notes for Utility Clearance - Pages 66-69 of 213
(3) Revised - Bid Items - Pages 201-213 of 213

Proposal revisions are available at http://transportation.ky.gov/contract/.

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

Sincerely,

Ryan Griffith
Director
Division of Construction Procurement

Enclosures
RG:ks

SPECIAL NOTE FOR DRILLED SHAFTS - SUPPLEMENT

Kenton County
Item No. 6-273.0
12th Street Bridge over CSX Railroad - Drawing No. 26098

1.0 DESCRIPTION

This is a supplement to the "Special Note for Drilled Shafts" contained in the Appendix B of the Standard Specifications; however, this is not a substitute for the "Special Note for Drilled Shafts". The supplement will govern in the case of any conflicts with the "Special Note for Drilled Shafts".

1.1 Construction Experience Requirements. Prior to the project preconstruction meeting, submit documentation showing that the drilled shaft contractor and on-site supervisor meet the experience requirements below. The Engineer will notify the Contractor whether or not the drilled shaft contractor and on-site supervisor are acceptable.

1.1.1 Experience requirements for the drilled shaft contractor are:

- A minimum of five (5) years experience constructing drilled shafts, with a minimum of ten (10) projects and at least 200 drilled shafts completed in the past five (5) years.
- A minimum of one (1) project and at least 20 drilled shafts no less than 50 feet deep in conditions similar to those on this project (i.e. saturated sand, shafts bearing in soil, etc.) completed in the last five (5) years.

1.1.2 Experience requirements for the on-site supervisor in charge of drilled shaft operations on this project are:

- A minimum of five (5) years experience constructing drilled shafts, with a minimum of ten (10) projects and at least 200 drilled shafts completed in the past five (5) years.
- A minimum of two (2) projects and at least 40 drilled shafts no less than 50 feet deep in conditions similar to those on this project (i.e. saturated sand, shafts bearing in soil, etc.) with a minimum of one (1) of these projects and at least 20 drilled shafts using construction methods similar to those to be used on this project completed in the last five (5) years. Examples of construction methods similar to those to be used on this project are drilling slurry, temporary casing (including extraction method), as applicable.

1.1.3 As a minimum, include the following for each project necessary to satisfy the requirements:

- The names and current phone numbers of the owner's representative(s) who can verify that the Contractor meets the requirements.
- The dates of construction.
- The type of construction and shaft depths.

1.2 Drilled Shaft Installation Plan. Submit an installation plan to the Engineer for review no later than 45 calendar days prior to beginning drilled shaft construction. In addition to the applicable items required in Section 3.1.3 in the "Special Note for Drilled Shafts" include:

- Details of concrete delivery to the site and placement of concrete in a continuous pour, including operational procedures for tremie or pump, and methods to prevent and handle delays in concrete batching and delivery to the site and a contingency plan for an emergency construction joint.
- Methods of casing installation and extraction, if applicable.
- Details of casings to be used, if applicable, including calculations showing the ability of the casing to withstand anticipated hydraulic and earth pressures, and to withstand stresses due to installation without undue deformation. Include methods for casing handling, splicing, straightening and out-of-round correction. Any calculations included in the installation plan must be signed and sealed by a professional engineer licensed to practice in the Commonwealth of Kentucky.

2.0 MATERIALS

2.1 Slurry (If Applicable). Drilling slurry will be defined as mineral slurry, polymer slurry, natural slurry formed during the drilling process, water, or other fluids used to maintain stability of the drilled shaft excavation to aid in the drilling process. In addition, the terms mineral slurry and polymer slurry, as used herein, will be defined as the final mixed composite of all additives, including manufactured mineral or polymer slurry additives required to produce the acceptable drilling slurry. Use drilling slurry if detailed in the approved installation plan, if in accordance with the contract documents or if approved in writing by the Engineer.

2.1.1 General Properties. Provide slurry containing material not detrimental to the concrete or surrounding ground strata.

- Mineral slurries - Provide slurry with both a mineral grain size that remains in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system.
- Polymer slurries - Provide slurry with sufficient viscosity and gel characteristics to transport excavated material to suitable screening systems or settling tanks. Provide material to make the slurry with a percentage and specific gravity sufficient to maintain the stability of the excavation and to allow proper concrete placement.
- Water and on-site soils as a drilling slurry (if approved by the Engineer) - Meet the range of acceptable values for density, viscosity and pH shown in Table 1 for bentonite slurry, except that the maximum density is 70 pounds/cubic foot.

2.1.2. Preparation. Prior to introduction into the shaft excavation, pre-mix the manufactured mineral or polymer slurry admixture thoroughly with clean, fresh water and for adequate time in accordance with the slurry admixture manufacturer's recommendations allotted for hydration. Use slurry tanks of adequate capacity for slurry mixing, circulation, storage and treatment. No excavated slurry pits will be allowed in lieu of slurry tanks without written approval from the Engineer. Provide adequate desanding equipment as necessary to control slurry properties during the drilled shaft excavation in accordance with Table 1.

2.1.3 Control Tests. The contractor is responsible for performing all slurry control tests using personnel with experience and proficiency performing such tests. Prior to beginning drilled shaft construction, submit the resume showing experience and training related to drilling slurry of the person(s) responsible for performing the control tests to the Engineer. Provide suitable apparatus to perform testing on the slurry to determine density, viscosity, sand content and pH of freshly mixed slurry, recycled slurry and slurry in the excavation. Conduct tests of slurry samples from within one (1) foot (0.3 m) of the bottom and at mid-height of the shaft in each shaft excavation during the excavation process to establish a consistent working pattern. Conduct a minimum of four (4) sets of tests during the first eight hours of slurry use on the project. When the results show consistent behavior, the testing frequency may be decreased to one set every four hours of slurry use, or as otherwise approved by the Engineer. Furnish reports of all tests, signed by an authorized representative of the contractor, to the Engineer on completion of each drilled shaft. An acceptance range of values for the physical properties is provided in Table 1 below. The Engineer may observe the control tests and may elect to perform independent verification tests using the contractor's equipment.

2.1.4 Sampling. When slurry samples are found to be unacceptable, bring the slurry in the shaft excavation to within specification requirements. Do not pour concrete until resampling and testing results produce acceptable values. Prior to placing shaft concrete, take slurry samples from within one foot (0.3 m) of the bottom and at mid-height of the shaft. Remove any heavily contaminated slurry that has accumulated at the bottom of the. Dispose slurry in areas approved by the Engineer. Perform final shaft bottom cleaning after suspended solids have settled from the slurry mix.

Table 1

Range of Acceptable Values for Mineral and Polymer Slurries in Fresh Water Without Additives

Property	Bentonite	Emulsified Polymer	Dry Polymer	Units	Test Method
Unit Weight at Introduction	63.5 - 66.8	< 63	< 63	lb/ft^3	Density Balance
Prior to Concreting	63.5 - 70.5	< 63	< 63		
Marsh Funnel Viscosity at Introduction	32 – 60	33 – 43 [a]	50 – 80 [a]	sec/qt	Marsh Funnel
Prior to Concreting	32 – 60	33 – 43 [a]	50 – 80 [a]		
pH at Introduction	8 – 10	8 – 11	7 – 11		pH Paper or pH Meter
Prior to Concreting	8 – 10	8 – 11	7 – 11		
Sand Content at Introduction	< 4	< 1	< 1	% by volume	API Sand Content Kit
Prior to Concreting	< 10	< 1	< 1		
Maximum Contact Time [b]	4	72	72	hours	

[a] Higher viscosities may be required to maintain excavation stability in loose or gravelly sand deposits.

[b] Without agitation and sidewall cleaning.

2.2 Casing (If Applicable). Provide welded or seamless steel casings in accordance with ASTM A 252, Grade 2, unless otherwise specified. Furnish two copies of certification from the fabricator detailing the designated specification with which the furnished casings comply. Provide smooth, clean, and watertight casings. For out-of-round tolerance of steel casings before and after installation, the departure of any point on the periphery of the casing from a true circle, the maximum tolerable departure of any point is one (1) inch (25 mm) measured radially.

3.0 CONSTRUCTION.

3.1 Construction Method. Use construction methods necessary, to produce sound, durable concrete drilled shafts free of defects and meeting the requirements in the plans and other contract documents. Permanent casing is not permitted. Some portions of this supplement or other parts of the contract documents may not be applicable depending on the construction methods actually used. **Significant changes in construction methods after technique shaft construction and load testing have been completed may result in additional technique shaft(s) and/or load test(s) at the Contractor's expense.**

3.2 Protection of Existing Structures. Take precautions to prevent damage to existing structures and utilities. Such measures include, but are not limited to, monitoring and controlling the vibrations from driving casing or drilling the shafts, and selecting construction methods and procedures that prevent excessive caving of the shaft excavation. Refer to the "Special Note for Vibration Monitoring".

3.3 Out-of-Position Technique Shaft.

Demonstrate the adequacy of methods and equipment used during construction of the first drilled shaft, which will be an out-of-position technique shaft, constructed with reinforcement as identified for production shafts on the plans. Unless directed otherwise the first technique shaft wll be 72 inches in diameter and 80 foot deep. Technique shafts will be paid at the applicable contract bid price for production drilled shafts.

Cut off 3 feet (0.9 m) below ground line, bury, or otherwise dispose of technique shafts as specified in the contract documents or as directed by the Engineer.

Once approval has been given to construct production shafts, no changes will be permitted in the methods of equipment used to construct the shaft without approval from the Engineer. Failure at any time to demonstrate to the Engineer the adequacy of methods or equipment will be cause for the Engineer to require appropriate alterations in equipment or method by the contractor to eliminate unsatisfactory results which may include additional technique shaft(s) at the expense of the contractor.

3.4 Drilled Shaft Load Test. The Engineer will use results of the drilled shaft load test to establish final tip elevations for the 60- and 72-inch diameter production shafts at the abutments and piers. The load test will be performed on a 72-inch diameter drilled shaft anticipated to be approximately 60 feet deep; however, the depth may vary depending on the specific location and/or field conditions encountered. **It is possible that the tip elevations will be raised or lowered depending on the load test results.** It is anticipated that the production shaft elevations will be provided to the Contractor approximately five working days after an initial data report containing the load-movement curves and data tables has been provided to the Geotechnical Branch. Tip elevations of the 36-inch diameter retaining wall shafts will not be dependent on the load test results. Refer to the "Special Note for Drilled Shaft Load Tests" for additional information.

3.5 Slurry Construction (If Applicable).

3.5.1 Time Limitations. When bentonite slurry is used, adjust construction operations such that the maximum time that slurry is in contact with the bottom 5 feet (1.5 m) of the shaft, the time from the end of drilling to the beginning of concrete placement, does not exceed four hours without agitation. If the four-hour limit is exceeded, over ream the bottom 5 feet (1.5 m) of the shaft prior to performing other operations in the shaft.

3.5.2 Level of Slurry. During construction, maintain the level of slurry at a height sufficient to prevent caving of the excavation. If the Engineer determines that the slurry construction method is failing to produce the desired final results, discontinue operations and propose an alternate method for approval from the Engineer.

3.5.3 Slurry Manufacturer's Representative. When manufactured mineral or polymer slurry additives are to be incorporated into the drilling slurry mix, provide the technical assistance of a representative of the mineral or polymer slurry additive manufacturer at the site prior to introduction of the slurry into the first shaft where slurry use will be used, and during drilling and completion of a minimum of one shaft to adjust the slurry mix to the specific site conditions.

3.6 Temporary Casing Construction Method (If Applicable). Before and during casing withdrawal, maintain a 5-foot (1.5 m) minimum head of fresh concrete above the bottom of the casing at such a level that fluid trapped behind the casing is displaced upward out of the shaft excavation without mixing with or displacing the shaft concrete. Extract the casing at a slow, uniform rate with the pull in line with the axis of the shaft. Remove temporary casings while the concrete is still workable and the slump of the concrete is between 4 and 8 inches (100 and 200 mm). Do not use vibratory hammers for casing installation or removal within 50 feet (15.2 m) of other shafts that have been completed less than 24 hours earlier. Do not damage or displace the reinforcing cage when withdrawing the temporary casing.

3.7 Final Bottom Cleaning. Use an airlift, or other method approved by the Engineer, to clean the bottom of the shaft excavation.

3.8 Logs of Excavated Material. Maintain logs of excavated material for each drilled shaft containing depths, material type, etc. Deliver these logs to the Engineer within 48 hours of completion of each shaft.

SPECIAL NOTE FOR DRILLED SHAFT LOAD TESTS

Kenton County
Item No. 6-273.0
12th Street Bridge over CSX Railroad - Drawing No. 26098

1.0 DESCRIPTION

1.1 This work consists of furnishing all materials and labor necessary for conducting a drilled shaft load test, reporting the results to the Engineer, and removing all test apparatus after the load test has been completed, except portions which will remain a part of the finished construction.

1.2 The Contractor will not perform the load test with its own forces but will be responsible for contracting with LOADTEST, Inc. who will conduct the load test using the patented Osterberg cell (O-cell) method.

LOADTEST, Inc.
2631-D NW 41st Street
Gainesville, FL 32606

Website: www.loadtest.com
Phone: 352-378-3717 or 800-368-1138
Fax: 352-378-3934

However, the Contractor (and/or Subcontractor) will be expected to provide assistance to LOADTEST, Inc. in the form of materials, labor, etc. prior to, during, and after the load test. **The Contractor is ultimately responsible for successful performance of the load test and bidders are advised to ensure that they are aware of what assistance will be expected of them.** The Department will not be responsible for any additional costs resulting from misunderstandings between the Contractor, Subcontractors, and LOADTEST, Inc.

1.3 The Contractor will be required to supply material and labor as specified herein prior to, during, and after the load test. The instrumentation of the load test shaft, conduct of the load test, and reduction of the load test data will be performed by LOADTEST Inc. and/or a subconsultant. No reaction system is required to conduct the load test. The load test is a non-destructive test and, if directed by the Engineer, the test shaft selected must be in a condition suitable for use as a production shaft in the finished structure at the completion of the load test.

1.4 The Engineer will use results of the drilled shaft load test to establish final tip elevations for the 60- and 72-inch diameter production shafts at the abutments and piers. It is possible that the tip elevations will be raised depending on the load test results. It is anticipated that the production shaft elevations will be provided to the Contractor approximately five working days after an initial data report containing the load-movement curves and data tables has been provided to the Geotechnical Branch.

1.5 Unless directed otherwise by the Engineer, the following general construction sequence will be required:

a. Construct at least one out-of-position technique shaft (not to be load-tested) on the west side of the railroad tracks as directed by the Engineer.
b. The load test will be performed on a 72-inch diameter drilled shaft anticipated to be approximately 60 feet deep; however, the depth may vary depending on the specific location and/or field conditions encountered.
c. Perform CSL testing on the out-of-position technique shaft.
d. Construct the load test shaft in the vicinity of Pier 3 when directed to do so by the Engineer and at a specific location designated by the Engineer.
e. Perform CSL testing on the load test shaft.
f. Perform the load test after the CSL test results have been evaluated by the Engineer.
g. Begin work on the remaining 60- and 72-inch diameter drilled shafts only after being directed to do so by the Engineer after the load test and CSL test results for the load tested drilled shaft have been evaluated.

- Direction by the Engineer to construct the load test shaft will be contingent upon the first test shaft being acceptable based on satisfactory field procedures, CSL test data, and any other applicable criteria.
- The Department will consider other specific locations for the load test shaft if proposed by the Contractor.
- Refer to other sections of this Special Note for specific requirements related to construction of the load test shaft.

NOTE: Construction of the 36-inch diameter retaining wall drilled shafts at End Bent 1 will be independent of the load test and the Contractor will be permitted to work on these shafts during down times between the above-referenced activities.

1.6 Any additional load tests that are necessary because of damage caused by the Contractor will be at the Contractor's expense with no extension of contract time.

2.0 MATERIALS

Supply all materials required to install the O-cell, conduct the load test, remove the load test apparatus projecting above the shaft as required and, if directed by the Engineer, return the drilled shaft to a condition suitable for use in the finished structure.

No later than three (3) weeks prior to beginning fabrication of the test shaft cage, submit shop drawings (in pdf format) prepared by LOADTEST, Inc. which show the reference beam system, O-cell assemblies, instrumentation, CSL tube placement in the load test shaft, etc. for review by the Geotechnical Branch. It is anticipated that the Engineer will provide a response to the Contractor within five working days.

2.1 Osterberg Cell Assembly - Furnish one Osterberg cell with a nominal capacity of 2250 kips in each direction (20-inch nominal diameter) to be placed approximately 1/2 shaft diameter above of the bottom of shaft or as shown in the shop drawings prepared by LOADTEST, Inc. Provide Osterberg cell assemblies equipped with all necessary hydraulic lines, fittings, pressure source, pressure gages and telltale devices as required for the load test shaft. The load test will be performed on a 72-inch diameter drilled shaft anticipated to be approximately 60 feet deep; however, the depth may vary depending on the specific location and/or field conditions encountered.

2.2 Instrumentation - Provide sufficient levels of telltales, strain gages, and other instrumentation as approved by the Engineer, so that shedding of the load from the shaft to the soil and/or rock can be determined. Install instrumentation to the satisfaction of representatives of LOADTEST, Inc. before the cage is placed in the drilled shaft excavation. Unless directed otherwise, four (4) strain gages will be required at each of the following approximate depths below the top of shaft: 20, 30, 40, and 50 feet.

2.3 Required incidental materials include, but are not limited to the following:

a. Fresh, clean, potable water from an approved source to be used as hydraulic fluid to pressurize the Osterberg Cell(s).
b. Materials sufficient to construct and shade a stable reference beam system for monitoring movements of the shaft during testing. Support the system at a minimum distance of 3 shaft diameters from the center of the test shaft to minimize disturbance of the reference system. Provide a tripod to support an automated digital survey level used to monitor movement of the reference system during testing. [Alternatively, two survey levels located in excess of three shaft diameters may be used to monitor the top of shaft displacement in lieu of the beam. In this case, provide two tripods and weather protection (Quikshade).]
c. Materials sufficient to construct a protected work area (including provisions such as a tent or shed for protection from inclement weather for the load test equipment and personnel) of size and type required by the Engineer and LOADTEST, Inc. In the case of cold weather, maintain the protected work area at a temperature above 40° F in order to insure proper operation of the load testing equipment.
d. Stable electric power source, as required for lights, welding, instruments, etc.
e. Materials such as angle or channel iron, steel bearing plates and/or other devices needed to attach O-cell assembly to rebar cage or carrying frame, as required.

2.4 Materials supplied which do not become a part of the finished structure become the responsibility of the Contractor at the conclusion of the load test. Remove these materials from the job site.

3.0 EQUIPMENT

Supply equipment required to install the Osterberg cell, conduct the load test, remove the load test apparatus as required, and, when required by the Engineer, return the drilled shaft to a condition suitable for use in the finished structure. Required equipment includes but is not limited to:

a. Welding equipment, qualified welding personnel and labor, as required to assemble the test equipment under the supervision of LOADTEST, Inc. personnel, attach instrumentation to the Osterberg cell(s), and prepare the work area.
b. Equipment and labor to construct the steel reinforcing cage and/or placement frame including any steel bearing plates required for the test shaft.
c. Equipment and operators for handling the Osterberg cell, instrumentation and placement frame or steel reinforcing cage during the installation of the Osterberg cell and during the conduct of the test, including but not limited to a crane or other lifting device, manual labor, and hand tools as required by LOADTEST, Inc. and the Engineer.
d. Equipment and labor sufficient to erect the protected work area and reference beam system, to be constructed to the requirements of the Engineer and LOADTEST, Inc.
e. Air compressor (minimum 185 cfm, 150 psi) for pump operation during the load test.

4.0 SONAR CALIPERING

4.1 Sonar calipering of the load test shaft will be required after shaft excavation has been completed but prior to placement of reinforcing steel and load test instrumentation. Sonar calipering will be performed by LOADTEST, Inc. and/or a subconsultant.

4.2 Sonar calipering provides an effective method for evaluating shaft verticality, volume and diameter in-situ by profiling the excavated surfaces of drilled shafts prior to reinforcement or concrete placement. This method uses one or more radial-spaced ultrasonic transceivers to transmit and receive acoustic signals between the tool and the casing and/or borehole wall. This information can then be used to provide a 3 dimensional model of the shaft cavity. The cost of sonar calipering is incidental to the bid price for "Drilled Shaft Load Test".

4.3 Provide the test personnel access to the top of the shaft (allowing one person to centralize and lower the Sonar Caliper into the test shaft). Provide a surrounding work area clear and free of debris. Provide such assistance, equipment or necessary materials to the testing agency as required to facilitate the calipering process. A 110-volt power source will be required at the test shaft location for operation of the Sonar Caliper testing equipment.

4.4 At a minimum, take caliper readings every 5 feet in uncased portions, every 20 feet in the casing, and every 1 foot for 5 feet above and below each casing transition.

4.5 Provide "real-time" data regarding the shaft verticality, diameter and volume to the engineer on site as the SCTS testing is in progress. If a feature, which in the opinion of the engineer could affect the integrity of the uncased shaft, is identified on the real time visual display, the Engineer may reduce the testing interval as necessary to improve the definition of the feature. Provide these additional readings at no additional cost to the Department.

4.6 The Engineer will review the “real-time” data collected during the testing process. If defects or features noted by the testing firm in the shaft excavation are deemed sufficient by the Engineer to potentially cause concrete loss or soil intrusion during concrete placement, or loss of bearing capacity, the Engineer will meet with the Contractor to discuss remediation.

4.7 Within 1 hour after completing sonar claipering, provide a computer file of an analysis of shaft verticality, diameter and volume. As a minimum, include the following information in the load test report:

- Date of test
- Shaft No., and reference elevation
- A plot of shaft volume vs. depth
- Analysis of shaft verticality and diameter; and
- Description of any shaft wall encroachment

5.0 CONSTRUCTION PROCEDURES

5.1 For the drilled shaft(s) selected for testing by the Engineer, construct the drilled shaft using the approved shaft installation techniques to the final shaft tip elevation as specified in the plans or directed by the Engineer.

5.2 Perform sonar calipering in accordance with Section 4.0 of this Special Note.

5.3 The Osterberg Cell, hydraulic supply lines and other instruments will be assembled and made ready for installation under the direction of LOADTEST, Inc. and the Engineer, in a suitable area, adjacent to the test shaft, to be provided by the Contractor. Weld the Osterberg Cell assembly to the rebar cage or carrying frame. Set the plane of the bottom plate(s) of the O-cell(s) at right angles to the long axis of the cage. Use the utmost care in handling the test assembly so as not to damage the instrumentation during installation. Limit the deflection of the cage to two (2) feet between pick points while lifting the cage from the horizontal position to vertical. The maximum spacing between pick points is 25 feet. Provide support bracing, strong backs, etc. to maintain the deflection within the specified tolerance. Ensure that the O-cell assembly remains perpendicular to the long axis of the reinforcing cage throughout the lifting and installation process.

5.4 When the test shaft excavation has been completed, inspected and accepted by the Engineer, the O-cell assembly and the reinforcing steel may be installed. Place a seating layer of concrete using an approved method, in the base of the shaft to provide a level base and reaction for the O-cell. The preferred method is to install the O-cell assembly and deliver the seating layer using a pump line or tremie pipe extending through the O-cell assembly to the base of the shaft. Depending on the configuration of the test assembly, it may be necessary to deliver the seating layer of concrete prior to installing the O-cell. In this case, install the O-cell assembly while the concrete at the base is still fluid, under the direction of LOADTEST, Inc. and the Engineer. The O-cell should end up at least partially submerged and firmly seated into the base concrete.

5.5 After seating the Osterberg cell, concrete the remainder of the drilled shaft in a manner similar to that specified for production shafts. At least four (4) concrete test cylinders, in addition to those specified elsewhere, are required from the concrete used in the test shaft, to be tested at the direction of LOADTEST, Inc. At least one of these test cylinders must be tested prior to the load test and at least two cylinders must be tested on the day of the load test.

5.6 During the load test, no casings may be vibrated into place without prior approval of the Engineer. Drilling may not continue within a 100-foot radius of the test shaft. If test apparatus shows any interference due to construction activities outside of this perimeter, cease such activities immediately.

5.7 After the completion of the load test, and at the direction of the Engineer, remove any equipment, material, waste, etc. which are not to be a part of the finished structure. If the load test shaft is constructed at a production location and intended to carry service loads, grout the interior of the Osterberg cell and annular space around the outside of the Osterberg cell using grouting techniques approved by the Engineer and LOADTEST, Inc.

5.8 Replace or repair O-cells or instrumentation damaged during handling, installation of the cage or concrete placement at no additional cost to the Department and with no extension of contract time.

6.0 LOAD TESTING AND REPORTING

The load testing must be performed by a qualified geotechnical engineer or technician approved in advance by the Engineer. The engineer or technician must have a demonstrated knowledge of load testing procedures, and have performed at least 10 Osterberg cell load tests within the past two years. The report must be reviewed and signed by a Professional Engineer with the above-referenced experience.

6.1 Testing

6.1.1 Perform the load testing in general compliance with *ASTM D 1143 Standard Test Method for Piles Under Static Axial Load* using the Quick Load Test Method for Individual Piles. Initially, apply the loads in increments equaling 5 to 10% of the anticipated ultimate capacity of the test shaft. The magnitude of the load increments may be increased or decreased depending on the project requirements but should not be changed during the test.

6.1.2 Direct movement indicator measurements should be made of the following: O-cell expansion either directly or with telltales (minimum of 3 indicators required), upward top-of-shaft displacement (minimum of 2 indicators required) and shaft compression above O-cell (minimum of 2 indicators required).

6.1.3 Apply loads at the prescribed intervals until the ultimate capacity of the shaft is reached in either end bearing or side shear, until the maximum capacity or maximum stroke of the O-cell is reached, or unless otherwise directed by the Engineer.

6.1.4 At each load increment or decrement read movement indicators at 1, 2, 4 and 8-minute intervals while the load is held constant.

6.1.5 During unloading cycles use a load decrement such that at least 4 data points are acquired for the load versus movement curve. Additional cycles of loading and unloading using similar procedures may be required by the Engineer following the completion of the initial test cycle.

6.1.6 Displacement sensors used to measure O-cell expansion and top-of-shaft displacement should have a minimum travel of 4 inches and be capable of being read to the nearest 0.001 inch division. When O-cell expansion is measured directly, LVWDTs capable of measuring the full stroke of the Osterberg Cell will be used (typically 6 inches). Displacement sensors used to measure shaft compression should have a minimum travel of 1 inch and be capable of being read to the nearest 0.001 inch division.

6.2 Reporting

a. Within four (4) working days of the completion of load testing, provide an initial data report (emailed pdf or faxed to the Geotechnical Branch) containing the load-movement curves, data tables, and sonar calipering data specified in Section 4.6 of this Special Note to the Engineer to allow evaluation of the test results.
b. Within ten (10) working days after completion of the load testing, provide three (3) hard copies and a pdf file of the report of the sonar calipering and load test, as prepared by LOADTEST, Inc. or others approved by the Engineer.

7.0 POST-TEST GROUTING PROCEDURES FOR PRODUCTION DRILLED SHAFTS TESTED WITH AN OSTERBERG CELL

During the O-cell test, the shaft breaks on a horizontal plane separating the upper section above the O-cell (upper side shear) from the lower section below (combined end bearing and lower side shear). This creates an annular space, the size of which depends on the shaft/O-cell geometry and the expansion of the O-cell.

When a production shaft has been tested, the Engineer may want to include the end bearing component from the lower section in order to obtain sufficient capacity of the production shaft. In such cases the contractor will be required to grout the O-cell and the annular space around the O-cell in order to allow load transfer to the lower side shear and end bearing.

7.1 Post-Test Grouting of Osterberg Cells (O-cells)

a. Provide grout consisting of Portland cement and water only, **NO SAND**. Provide grout that is fluid and pumpable. An initial mix consisting of 6 to 7 gallons of water per 95-pound bag of cement is recommended. Adjust water to obtain desired consistency.
b. Thoroughly mix the grout to ensure that there are no lumps of dry cement. Pass the grout through a window screen mesh before pumping.
c. Connect the grout pump outlet to one hydraulic line of the O-cell. Open the other line and establish a flow of water through the system.
d. Pump the grout through the O-cell hydraulic line while collecting the effluent from the bleed line. Monitor characteristics of effluent material and when it becomes equivalent to the grout being pumped, stop pumping.
e. Take three samples of the grout for compression testing @ 28 days, if required.

Recommended Pre-Mixed Amount of Grout for Grouting of an O-Cell						
O-cell Diameter (Inches)	9	13	16	21	26	34
Grout Volume (Cubic Feet)	3	4	5	7	9	13

7.2 Post-Test Grouting of Annular Space Around Osterberg Cells (O-cells)

a. Prepare a fluid grout mix consisting of Portland cement and water only, **NO SAND**. The mixing procedures should be as outlined for grouting the O-cells. The quantity of grout should be at least three (3) times the theoretical volume required to fill the annular space and grout pipes.
b. Pump water and establish a flow through the grout pipes (two per shaft).
c. Pump the fluid grout through one of the grout pipes until grout is observed flowing from the second grout pipe or until 1.5 times the theoretical volume has been pumped.
d. If no return of grout is observed from the second grout pipe, transfer the pump to the second pipe and pump grout through it until 1.5 times the theoretical volume has been pumped.
e. If higher strength grout is deemed necessary, immediately proceed with pumping the higher strength grout (which may be a sand mix). The pumping procedures for this grout will be the same as described above for the initial cement-water grout. The entire grouting operation must be completed before the set time for the initial grout has elapsed.
f. Take three (3) samples of each type of grout for compression testing @ 28 days.

Recommended Pre-Mixed Amount of Grout for Grouting of Annular Space								
Shaft Diameter (Feet)	2	3	4	5	6	7	8	9
Grout Volume (Cubic Feet)	25	30	40	50	65	80	100	125

8.0 METHOD OF MEASUREMENT AND PAYMENT

The Drilled Shaft Load Test includes any material, labor, equipment, etc. required above the requirements of drilled shaft installation. The item includes everything necessary to assemble, install, conduct and remove the drilled shaft load test, under the direction of the Engineer and LOADTEST, Inc. representatives. This constitutes full compensation for all costs incurred during installation, sonar calipering, conduct of the load test, and subsequent removal of test apparatus and appurtenances including costs incurred by the Contractor, LOADTEST, Inc. and their subconsultants. All costs associated with the normal production of the drilled shafts are measured and paid for elsewhere in the contract documents.

Post-Test Grouting includes any materials, labor, equipment, etc. necessary to grout the O-cell(s) and annular space around the O-cell(s) for a single load-tested production drilled shaft in accordance with Section 6.0 of this Special Note when directed to do so by the Engineer.

The Department will pay for the completed and accepted quantities under the following:

Pay Item	Pay Unit
Drilled Shaft Load Test	Each
Post-Test Grouting	Each

SPECIAL NOTE FOR NON-DESTRUCTIVE TESTING OF DRILLED SHAFTS

Kenton County
Item No. 6-273.0
12th Street Bridge over CSX Railroad - Drawing No. 26098

1.0 DESCRIPTION

Crosshole Sonic Logging (CSL) is a nondestructive method to test the integrity of drilled shafts. The Contractor will be responsible for supplying all equipment and materials necessary to perform this testing, and obtaining the services of a CSL Testing Firm using personnel experienced with CSL testing and approved by the Engineer to perform the testing.

1.1 The CSL tests must either be performed by or under the supervision of a responsible licensed professional engineer with:

- a minimum of three (3) years experience performing CSL tests, and
- experience performing CSL tests on a minimum of three (3) past projects with a scope and complexity similar to this project including a minimum of 60 drilled shafts in the past three (3) years.

If the responsible professional engineer does not perform the testing, then the responsible field technician who does perform the testing must meet the same experience requirements.

1.2 Preliminary Submittal - At least 21 calendar days before beginning drilled shaft construction, submit a technical proposal prepared by the CSL Testing Firm that documents the personnel's experience and addresses the testing procedures. Experience documentation should include resumes, references, certifications, project lists, experience descriptions and details, etc. Within 10 working days, the Engineer will review the proposal and report to the Contractor whether the CSL Testing Firm and personnel are approved and the proposal is acceptable.

1.3 The Contractor will be responsible for providing:

a. access tubes which will be used for CSL testing of the drilled shafts;
b. watertight shoes, watertight caps, and non-shrink grout;
c. suitable working space and access to every shaft;
d. a reliable 600 watt (minimum) generator; and
e. any other equipment or materials necessary to accomplish the testing.

Table 1 - Minimum Number of Access Tubes and CSL Logs

Shaft Diameter (inches)	Number of Tubes	Diagonal Logs	Perimeter Logs
30 to 36	3	NA	3
42 to 54	4	2	4
60 to 78	6	3	6
84 to 96	8	4	8

2.0 MATERIALS

2.1 Supply the number of access tubes shown in the plans or in Table 1. Provide access tubes meeting the requirements below. The Engineer will accept access tubes based on visual inspection and certification that the steel pipe meets the requirements below:

a. 1.5 to 2.0 inch ID schedule 40 steel pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S;
b. contains round, regular internal diameters free of defects or obstructions, including any at pipe joints;
c. capable of permitting the free, unobstructed passage of a 1.4 inch diameter source and receiver probes; and
d. watertight and free from corrosion with clean internal and external faces to ensure passage of the probes and a good bond between the concrete and the tubes.

2.2 Provide watertight shoes on the bottom and removable watertight caps on the top of the tubes.

2.3 Provide non-shrink grout to fill the access tubes and any cored holes at the completion of the CSL tests. Use grout conforming to Section 601.03.03 of the Standard Specifications.

3.0 CONSTRUCTION

3.1 Access Tube Installation

a. Install access tubes equally spaced around the perimeter of each of the drilled shafts.
b. Securely attach the tubes to the longitudinal reinforcement. Wire-tie the tubes a minimum of every 3 feet so they will stay in position during placement of rebar and concrete. Place the tubes so they will be parallel with each other and as near to vertical as possible in the finished shaft. Even moderate bending of the tubes will result in large regional variations in the data.
c. Place the tubes from 6 inches above the shaft tip to at least 3 feet above the top of shaft and at least 2 feet above ground level or top of casing. Under no circumstances may the tubes be allowed to come to rest on the bottom of the excavation.
d. Ensure that any joints in the tubes are watertight.
e. During placement of the reinforcement cage, exercise care so that the tubes will not be damaged to the extent that would prevent a 1.4-inch diameter probe from passing through them.
f. After placing the reinforcing cage and before beginning concrete placement, fill the tubes with clean potable water and cap or seal the tube tops to keep debris out of the tubes. Replace the watertight caps immediately after filling the tubes with water.
g. Before placing concrete, investigate at least one tube per shaft to make sure that there are no bends, crimps, obstructions or other impediments to the free passage of the testing probes.
h. During removal of the caps from the tubes, exercise care so as not to apply excess torque, hammering, or other stresses which could break the bond between the tubes and concrete.

i. After concrete placement and before the beginning of CSL testing, inspect the access tubes and report any access tubes that the 1.4-inch diameter test probe cannot pass through to the Engineer. The Engineer will make an evaluation to determine if the CSL testing can be successfully performed without the tube(s); the Engineer may require the contractor to, at its own expense, replace one or more tubes with 2-inch diameter holes cored through the concrete for the entire length of the shaft, excluding the bottom 6 inches. Unless directed otherwise by the Engineer, locate core holes approximately 6 inches inside the reinforcement such that it does not damage the reinforcement. For each core hole drilled, record a log with descriptions of inclusions and voids in the cored holes and submit a copy of the log to the Engineer. Preserve the cores, identify as to location and make available for inspection by the Engineer.

3.2 Grouting - After completion of the CSL testing and evaluation of results, and only after being directed to do so by the Engineer, remove the water from the access tubes and any cored holes, completely fill the tubes and holes with approved grout. After grouting, cut the tubes flush with the tops of the drilled shafts.

4.0 TESTING AND REPORTING

The Engineer may elect to reduce the amount of testing and will pay only for the authorized quantities.

4.1 Testing

a. Perform CSL testing according to ASTM D6760, “Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing”.
b. Provide access to the top of the shaft for testing personnel and equipment.
c. Perform CSL testing in accordance with generally accepted CSL Testing methods.
d. Obtain the minimum number of CSL logs shown in Table 1 unless otherwise directed by the Engineer.
e. Perform CSL testing on all completed shafts designated for testing by the Engineer, after the shaft concrete has cured at least 48 hours. Additional curing time may be necessary, depending on the concrete admixtures that are used.

4.2 Test Reports - Submit a test report prepared by the CSL Testing Firm and signed by the responsible professional engineer which, as a minimum, contains:

a. Pier No., Plan Shaft No., Station, Offset, and Top of Shaft Elevation;
b. Schematic showing a plan view of the access tube locations;
c. CSL logs presented for each tube pair tested with any defect zones indicated on the logs and discussed in the report as appropriate;
d. Analyses of initial pulse arrival time versus depth or velocity versus depth if requested by the Engineer; and
e. Analyses of pulse energy/amplitude versus depth.

4.3 Independent Comparison Tests - Consultants acting on behalf of the Department may perform independent comparison tests on the shafts tested by the Contractor's CSL Testing Firm.

5.0 EVALUATION OF TEST RESULTS

5.1 Allow direct communication between the CSL Testing Firm and the Department.

5.2 The Engineer will evaluate the CSL test results in the test report to determine whether or not the drilled shaft integrity is acceptable. Within 5 working days after receiving a test report, the Engineer will report to the Contractor whether the construction is acceptable or additional analyses are needed.

5.3 The Engineer will not require the Contractor to wait for CSL testing and evaluation to continue drilled shaft construction. However, if the CSL tests indicate that the integrity of any drilled shaft is questionable, the Engineer may direct the Contractor to suspend drilled shaft operations until the problem is resolved.

5.4 Continue with construction of the structure above the drilled shafts only after receiving written approval to do so, based on evaluation of the CSL test results.

5.5 If the CSL records are complex or inconclusive, the Engineer may require additional testing (such as Angled CSL, Crosshole Tomography, Singlehole Sonic Logging, or Sonic Echo/Impulse Response, etc.) or concrete cores to sample the concrete in question to verify shaft conditions. If core samples are needed, obtain cores with a minimum diameter of 2 inches, unless directed otherwise by the Engineer. Unless directed otherwise by the Engineer, locate core holes approximately 6 inches inside the reinforcement such that they do not damage the reinforcement. For each core hole drilled, record a log with descriptions of inclusions and voids in the cored holes and submit a copy of the log to the Engineer. Place the cores in crates properly marked showing the shaft depth at each interval of core recovery. Transport the cores and logs to the Geotechnical Branch in Frankfort for inspection and testing. Grout the core holes in accordance with Section 3.2 above.

5.6 If the additional testing or evaluation of cores indicate that concrete for any drilled shaft on which additional testing or coring was required is acceptable, the Department will pay for the additional testing and concrete coring and grouting on a cost plus basis. If the additional testing or evaluations of cores indicate that the concrete for any drilled shaft concrete is unacceptable, the additional testing and concrete coring and grouting will be at the expense of the Contractor.

5.7 If defects are found, the original structural designer will perform structural analyses, at the expense of the Contractor, based on the design criteria established for the structure to assess the effects of the defects on the structural performance of the drilled shaft. If the results of the analyses indicate that there is conclusive evidence that the defects will result in inadequate or unsafe performance under the design loads, as defined by the design criteria for the structure, the Engineer will reject the shaft.

5.8 If any shaft is rejected, provide a plan for remedial action to the Engineer for approval. Any modifications to the foundation shafts and/or other substructure elements caused by the remedial action will require calculations and working drawings by the original structural designer, at the expense of the Contractor. Begin remediation operations only after receiving approval from the Engineer for the proposed remediation. All remedial action will be at no cost to the Department and with no extension of contract time.

6.0 METHOD OF MEASUREMENT

The Department will pay for the authorized and accepted quantities of "CSL Testing" at the contract unit price per each shaft tested. This will constitute full compensation for all costs associated with travel and providing access for testing personnel and equipment, performing the CSL Testing in a single shaft, and reporting the results to the Engineer.

All costs for access tubes including but not limited to providing and installing access tubing and providing and placing grout in access tubes are incidental to the drilled shafts.

The Department will pay for additional testing and concrete coring required to investigate shafts with complex or inconclusive CSL records if evaluation of the additional testing or cores indicates that concrete for that drilled shaft is acceptable. This will be paid as cost plus and will constitute full compensation for all costs and delays associated with performing additional tests, obtaining and delivering concrete cores to the Geotechnical Branch, and grouting core holes.

7.0 PAYMENT

The Department will pay for the completed and accepted quantities under the following:

Pay Item	Pay Unit
CSL Testing	Each

SPECIAL NOTES FOR UTILITY CLEARANCE IMPACT ON CONSTRUCTION

Kenton County
FD52 059 51376 01U
12th Street Reconstruction from Russell Street to Scott Street
Including Madison Avenue from 12th Street to 11th Street
Item No. 06-0273.10

GENERAL NOTES AND NOTICES RELATIVE TO ALL GAS, WATER AND SANITARY SEWER WORK

The information provided below in these Special Notes For Utility Clearance Impact on Construction may not be exact nor complete. The information provided is for the contractor's use in planning the execution of the work. It shall be the road contractor's responsibility to verify the completeness and/or accuracy of all such information being furnished.

The road contractor MUST use flowable fill as the backfill media any place there are utility facilities that cross under existing or proposed roadway surfaces. It should also be noted that the cost of the flowable fill shall be incidental to the cost of the utility facility being installed.

All existing gas, water and sanitary sewer services are to be maintained throughout road construction. Temporary gas, water and sewer facilities to maintain service are to be provided and paid for by the road contractor as incidental to road construction. No additional compensation will be paid the contractor for temporary work and materials to maintain existing gas, water and sewer services. **No unauthorized discharge of sewage due to the road contractor's work will be allowed.**

The contractor shall notify the utility owner(s) of all planned shutdowns of utility mains or utility service to customers at least three business days in advance. Advance notice will allow for customers to be notified by the utility owner. Any unannounced disruption of gas, water, or sanitary sewer services or mains that inconveniences any customer is to be avoided.

Any intentional or accidental disruption of service due to damage to gas, sewer or water mains caused by any of the contractor's operations without three days advance notice to the utility owner shall be cause for the Cabinet to charge liquidated damages in the amount of five thousand dollars per day ($5,000/day) per occurrence against the contractor until such time as the utility main is restored.

Any intentional or accidental disruption of any individual gas, water or sewer service caused by any of the contractor's operations without three days advance notice to the utility owner shall be cause for the Cabinet to charge liquidated damages in the amount of five hundred dollars per day ($500/day) per occurrence against the contractor until such time as service is restored.

In the case of a main disruption, liquidated damages shall be charged at the main disruption rate only. Liquidated damages shall not be charged in addition for service disruptions when a main disruption is involved.

The Utility Owners will provide inspection when work is being performed by the contractor on their respective utility owner's facilities. It will be the road contractor's responsibility to notify the appropriate utility owner for inspection **at least three (3) days prior to the inspection day.**

Kentucky Division of Water permit for water relocation construction has been received and will be distributed at the pre-construction conference.

SPECIAL NOTES FOR UTILITY CLEARANCE IMPACT ON CONSTRUCTION 273.10 (CONTINUED)

The contractor shall plug and safe load the entire length of all abandoned pipes 6 inches in diameter and larger under proposed pavement and under any existing pavement that is to remain. The contractor shall plug and safeload the entire length of all abandoned pipes 15 inches and larger which will be located outside of proposed pavement but within project limits. Appropriate bid items have been included in the road contract. The safeloading criteria above shall be observed unless otherwise directed by the Resident Engineer or his representative.

NORTHERN KENTUCKY WATER DISTRICT facilities are to be relocated by the road contractor as shown on plans inserted into the roadway plans with specifications contained in the proposal. **NOTE: The proposal contains two sets of Water Relocation Plans. All facilities shown on these two sets of plans are owned by the Northern Kentucky Water District.** Alignment changes to proposed water to accommodate unforeseen field conditions are possible. However, it is the responsibility of the roadway contractor to communicate any proposed main alignment changes to the utility's respective inspector and the KYTC Resident Engineer or their designated representative prior to actually modifying the proposed main alignment.
The Water District will provide inspection when the contractor is performing work. It will be the road contractor's responsibility to notify the utility owner 3 days prior to the inspection.

SANITATION DISTRICT NO 1 existing sanitary sewers are to remain. The road contractor is to reline the existing facilities as outlined in the Sanitation District specifications included in the proposal and shown on the Utility Plans. The existing sanitary sewers located immediately West of the CSX Railroad may require adjustment and/or relocation concurrently with road construction. This work, if needed will be completed by the Sanitation District concurrently with road construction.
Sanitary sewers on Madison Avenue between 12th Street and 11th Street have previously been relined.
Existing sanitary manholes are to remain but may require adjustments to meet final pavement elevations. Specifications relating to adjusting manholes to grade are included in the SD 1 proposal. **The Sanitation District will provide inspection when the contractor is performing work. It will be the road contractor's responsibility to notify the utility owner 3 days prior to the inspection.**

DUKE ENERGY (ELECTRIC) and INSIGHT COMMUNICATINS facilities are to be relocated by the road contractor into a new underground duct system. The duct system is shown on the Utility plans and on the individual relocation plans for Duke Electric, Insight and Cincinnati Bell. Individual specifications for each utility are included in the proposal documents.
The contactor will install the duct system for Duke Electric and Insight Communications, but each individual utility will pull their own conductor into the system and make the final connections. In no case will the road contactor be required to place duct beyond the Right of Way limits. Any utility work beyond road Right of Way will be the responsibility of the affected utility company.
Final connections for electric and cable are to be coordinated by The City of Covington and their electrical contractor.

CINCINNATI BELL TELEPHONE will relocate and/or adjusted their facilities to accommodate road construction. Cincinnati Bell will adjust their existing duct system (which is to remain) in several areas as noted on the "Telephone's Information Only" plan sheets. These adjustments are to accommodate installation of proposed underground facilities. This work will occur concurrently with the road contractor's work. The road contractor is required to notify Cincinnati Bell as to when areas of conflict are available for Cincinnati Bell's work. Contact information will be provided at the pre-construction conference.

The road contractor shall be aware that Cincinnati Bell Telephone will have to adjust existing telephone manhole frames and/or covers to proposed grade as necessary along the length of the project. It shall be the road contractor's responsibility to coordinate the work in these areas with Cincinnati Bell Telephone.

Alignment changes to the proposed duct system to accommodate unforeseen field conditions are possible. However, it is the responsibility of the roadway contractor to communicate any proposed alignment changes to the utility's respective inspector and the KYTC Resident Engineer or his designated representative prior to actually modifying the proposed adjustments. Utility contact information will be provided at the pre-construction conference.

ULH&P/CINERGY (GAS) facilities along 12th Street and Madison Avenue shall be relocated by the road contractor using plans inserted into Roadway construction plans and specifications inserted in the project proposal.

Only those contractors preapproved by the gas company and listed at the end of the gas specifications inserted in the proposal can perform gas relocation construction on this project. The prequalified contractors listed may or may not be prequalified by the Transportation Cabinet. It will be the bidder's responsibility to verify prequalification with the Cabinet. Duke Energy Gas provided this listing. The fact that a contractor is included on this list does not preclude that contractor from having to be prequalified by the Transportation Cabinet.

All existing gas services are to be maintained throughout the road construction. Temporary gas facilities to maintain a customer service are to be provided and paid for by the road contractor as incidental to road construction. No additional compensation will be paid the contractor for temporary work and materials to maintain existing gas services.

Alignment changes to proposed gas facilities to accommodate unforeseen field conditions are possible. However, it is the responsibility of the roadway contractor to communicate any proposed gas main alignment changes to the Duke Energy gas inspector and the KYTC Resident Engineer or their designated representative prior to actually modifying the proposed gas main alignment.

The unit cost for gas relocation items has been preset in the road contract as follows:

Description of Work	Est. Units	Units	Duke Energy Acceptable Unit Price
Gas Main Work			
Install Length of 8" PL Gas Main	150	Lin. Ft.	$49.00
Install Length of 8" SWPC Gas Main	465	Lin. Ft.	$75.00
Services			
Install M-C Long-Side Service Piping (1" or 1 1/4")	1	Each	$1,420.00
Install M-C Short-Side Service Piping (1" or 1 1/4")	1	Each	$350.00

A **"Gas Utility Coordination"** item is shown on the General Summary Sheet and has been established in the road contract for consideration by the road contractor. This item is provided, if needed, as compensation for any additional coordination to accommodate the inclusion of gas utility work with the roadway construction.
The road contractor can freely bid this item.

LIGHTING AND SIGNAL facilities are to be relocated to an underground duct system by the road contractor as shown on plans inserted into the roadway plans with specifications shown on the plan sheets. Alignment changes to proposed lighting and/or signal plans to accommodate unforeseen field conditions are possible. Contact information will be provided at the pre-construction conference.

CSX TRANSPORTATION INC. has facilities involved within the project limits. Appropriate notes are included elsewhere in the project proposal.

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PROTECTION OF UTILITIES

THE LOCATION OF UTILITIES PROVIDED IN THE CONTRACT DOCUMENTS HAS BEEN FURNISHED BY THE FACILITY OWNERS AND/OR BY REVIEWING RECORD DRAWINGS. THE INFORMATION MAY NOT BE EXACT NOR COMPLETE. IT WILL BE THE ROAD CONTRACTORS RESPONSIBILITY TO LOCATE UTILITIES BEFORE EXCAVATING BY CALLING THE VARIOUS UTILITY OWNERS AND BY EXAMINATING ANY SUPPLIMENTAL INFORMATION PROVIDED BY THE CABINET AND/OR UTILITY OWNER. THE ROAD CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND ELEVATION OF UTILITIES BY HAND DIGGING TO EXPOSE UTILITIES BEFORE HE EXCAVATES IN THE AREA OF A UTILITY. THE COST FOR REPAIR AND ANY OTHER ASSOCIATED COSTS FOR ANY DAMAGE TO UTILITIES CAUSED BY THE ROAD CONTRACTORS OPERATIONS SHALL BE BORNE BY THE ROAD CONTRACTOR.

THE CONTRACTOR IS ADVISED TO CONTACT THE B.U.D. ONE-CALL SYSTEM; HOWEVER, THE CONTRACTOR SHOULD BE AWARE THAT THE OWNERS OF THE UNDERGROUND FACILITIES ARE NOT REQUIRED TO BE MEMBERS OF THE B.U.D. ONE-CALL SYSTEM. IT MAY BE NECESSARY FOR THE CONTRACTOR TO CONTACT THE COUNTY COURT CLERK TO DETERMINE WHAT UTILITY COMPANIES HAVE FACILITIES IN THE PROJECT AREA.

CONTRACT ID: 091046 PAGE: 1
COUNTY: KENTON LETTING: 07/24/09
PROPOSAL: ARRA 27-3 (014) CALL NO: 116

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
	SECTION 0001	ROADWAY			
0010	00001	DGA BASE	274.000 TON		
0020	00003	CRUSHED STONE BASE	3,043.000 TON		
0030	00078	CRUSHED AGGREGATE SIZE NO 2	8,976.000 TON		
0040	00212	CL2 ASPH BASE 1.00D PG64-22	42.000 TON		
0050	00301	CL2 ASPH SURF 0.38D PG64-22	20.000 TON		
0060	00520	STORM SEWER PIPE-12 IN	28.000 LF		
0070	00521	STORM SEWER PIPE-15 IN	19.000 LF		
0080	00522	STORM SEWER PIPE-18 IN	1,169.000 LF		
0090	00524	STORM SEWER PIPE-24 IN	113.000 LF		
0100	01000	PERFORATED PIPE-4 IN	4,789.000 LF		
0110	01010	NON-PERFORATED PIPE-4 IN	29.000 LF		
0120	01015	INSPECT & CERTIFY EDGE DRAIN SYSTEM 12TH ST.	(1.00) LS		
0130	01015	INSPECT & CERTIFY EDGE DRAIN SYSTEM MADISON AVE.	(1.00) LS		
0140	01310	REMOVE PIPE	238.000 LF		
0150	01314	PLUG PIPE	6.000 EACH		
0160	01480	CURB BOX INLET TYPE B	17.000 EACH		
0170	01482	CURB BOX INLET TYPE B TRAPPED	3.000 EACH		
0180	01544	DROP BOX INLET TYPE 11	1.000 EACH		
0190	01642	JUNCTION BOX-18 IN	1.000 EACH		
0200	01705	REMOVE CURB & GUTTER BOX INLET	9.000 EACH		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 091046 PAGE: 2
COUNTY: KENTON LETTING: 07/24/09
PROPOSAL: ARRA 27-3 (014) CALL NO: 116

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT	UNIT PRICE	AMOUNT
0210	01710	FILL AND CAP CATCH BASIN	4.000	EACH		
0220	01761	MANHOLE TYPE B	3.000	EACH		
0230	01782	MANHOLE-TRAPPED	1.000	EACH		
0240	01791	ADJUST MANHOLE FRAME TO GRADE	4.000	EACH		
0250	01830	STANDARD INTEGRAL CURB	1,734.000	LF		
0260	01875	STANDARD HEADER CURB	1,997.000	LF		
0270	01904	REMOVE CURB	700.000	LF		
0280	01984	DELINEATOR FOR BARRIER-WHITE	8.000	EACH		
0290	02003	RELOCATE TEMP CONC BARRIER	727.000	LF		
0300	02014	BARRICADE-TYPE III	52.000	EACH		
0310	02061	PCC BASE-6 IN	656.800	SQYD		
0320	02063	PCC BASE-8 IN	5,972.000	SQYD		
0330	02069	JPC PAVEMENT-10 IN	3,535.000	SQYD		
0340	02101	CEM CONC ENT PAVEMENT-8 IN	776.000	SQYD		
0350	02159	TEMP DITCH	2,195.000	LF		
0360	02200	ROADWAY EXCAVATION	7,266.000	CUYD		
0370	02203	STRUCTURE EXCAV-UNCLASSIFIED	39.030	CUYD		
0380	02242	WATER	350.000	MGAL		
0390	02430	RIGHT-OF-WAY MONUMENT TYPE 1A	38.000	EACH		
0400	02545	CLEARING AND GRUBBING 3.518 ACRES	(1.00)	LS		
0410	02551	CONCRETE-CLASS A FOR STEPS	1.900	CUYD		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 091046 PAGE: 3
COUNTY: KENTON LETTING: 07/24/09
PROPOSAL: ARRA 27-3 (014) CALL NO: 116

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
0420	02562	SIGNS	1,274.000 SQFT		
0430	02565	OBJECT MARKER TYPE 2	4.000 EACH		
0440	02599	FABRIC-GEOTEXTILE TYPE IV	22,371.000 SQYD		
0450	02600	FABRIC GEOTEXTILE TY IV FOR PIPE	1,000.000 SQYD	2.00	2,000.00
0460	02650	MAINTAIN & CONTROL TRAFFIC	(1.00) LS		
0470	02671	PORTABLE CHANGEABLE MESSAGE SIGN	2.000 EACH		
0480	02692	SETTLEMENT PLATFORM	2.000 EACH		
0490	02701	TEMP SILT FENCE	4,798.000 LF		
0500	02703	SILT TRAP TYPE A	11.000 EACH		
0510	02704	SILT TRAP TYPE B	74.000 EACH		
0520	02705	SILT TRAP TYPE C	90.000 EACH		
0530	02706	CLEAN SILT TRAP TYPE A	60.000 EACH		
0540	02707	CLEAN SILT TRAP TYPE B	390.000 EACH		
0550	02708	CLEAN SILT TRAP TYPE C	459.000 EACH		
0560	02709	CLEAN TEMP SILT FENCE	4,798.000 LF		
0570	02720	SIDEWALK-4 IN CONCRETE	2,600.500 SQYD		
0580	02726	STAKING	(1.00) LS		
0590	02898	RELOCATE CRASH CUSHION	4.000 EACH		
0600	03171	CONCRETE BARRIER WALL TYPE 9T	414.000 LF		
0610	03340	STEEL PIPE-2 1/2 IN	21.000 LF		
0620	03343	STEEL PIPE-4 IN	49.000 LF		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 091046 PAGE: 4
COUNTY: KENTON LETTING: 07/24/09
PROPOSAL: ARRA 27-3 (014) CALL NO: 116

LINE NO	ITEM	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT PRICE	AMOUNT
0630	05950	EROSION CONTROL BLANKET	21,438.000	SQYD		
0640	05952	TEMP MULCH	22,590.000	SQYD		
0650	05990	SODDING	22,590.000	SQYD		
0660	05997	TOPSOIL FURNISHED AND PLACED	28.000	CUYD		
0670	06510	PAVE STRIPING-TEMP PAINT-4 IN	1,774.000	LF		
0680	06514	PAVE STRIPING-PERM PAINT-4 IN	9,003.000	LF		
0690	06515	PAVE STRIPING-PERM PAINT-6 IN	2,543.000	LF		
0700	06550	PAVE STRIPING-TEMP REM TAPE-W	3,276.000	LF		
0710	06551	PAVE STRIPING-TEMP REM TAPE-Y	5,584.000	LF		
0720	06568	PAVE MARKING-THERMO STOP BAR-24IN	1,386.000	LF		
0730	06573	PAVE MARKING-THERMO STR ARROW	11.000	EACH		
0740	06574	PAVE MARKING-THERMO CURV ARROW	15.000	EACH		
0750	06575	PAVE MARKING-THERMO COMB ARROW	8.000	EACH		
0760	06598	PAVEMENT MARKING REMOVAL	895.000	SQFT		
0770	08100	CONCRETE-CLASS A	62.580	CUYD		
0780	08150	STEEL REINFORCEMENT	1,474.000	LB		
0790	08901	CRASH CUSHION TY VI CLASS BT TL2	3.000	EACH		
0800	10020NS	FUEL ADJUSTMENT	1,543.000	DOLL	1.00	1,543.00
0810	20096ES601	CONCRETE ENCASEMENT	40.000	CUYD		
0820	20099ES842	PAVE MARK TEMP PAINT STOP BAR	164.000	LF		
0830	20100ES842	PAVE MARK TEMP PAINT LINE ARROW	8.000	EACH		

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
FRANKFORT, KY 40622

CONTRACT ID: 091046 PAGE: 5
COUNTY: KENTON LETTING: 07/24/09
PROPOSAL: ARRA 27-3 (014) CALL NO: 116

LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
0840	20242NN	PLUG MANHOLE	3.000 EACH		
0850	20425ED	ABANDON MANHOLE	4.000 EACH		
0860	20818ND	GAS UTILITY COORDINATION	(1.00) LS		
0870	20833ND	REPLACE MANHOLE	3.000 EACH		
0880	23158ES505	DETECTABLE WARNINGS	983.000 SQFT		
0890	23178EC	REM ORNAMENTAL WROUGHT IRON FENCE/GATE	192.600 LF		
0900	23179EC	REM-STORE-RESET ORNA WROUGHT IRON FENCE	6.000 LF		
0910	23181EC	REMOVE-STORE AND RESET BRICK-PAVERS	30.100 SQYD		
0920	23183EC	REM-STORE AND RESET CHAINLINK FENCE/GATE	172.900 LF		
0930	23185EC	BRICK-PAVERS FOR SIDEWALK	656.800 SQYD		
0940	23188EC	STAMPED CONCRETE-10 IN	390.000 SQYD		
0950	23214EC	BRICK-PAVERS FOR ROADWAY	5,911.000 SQYD		
	SECTION 0002	BRIDGE			
0960	02231	STRUCTURE GRANULAR BACKFILL	1,007.000 CUYD		
0970	02403	REMOVE CONCRETE MASONRY	76.400 CUYD		
0980	02555	CONCRETE-CLASS B	189.000 CUYD		
0990	02998	MASONRY COATING	3,712.000 SQYD		
1000	03299	ARMORED EDGE FOR CONCRETE	116.000 LF		
1010	08001	STRUCTURE EXCAVATION-COMMON	534.000 CUYD		
1020	08020	CRUSHED AGGREGATE SLOPE PROT	20.000 TON		
1030	08100	CONCRETE-CLASS A	583.100 CUYD		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
1040	08104	CONCRETE-CLASS AA	818.000 CUYD		
1050	08150	STEEL REINFORCEMENT	65,916.000 LB		
1060	08151	STEEL REINFORCEMENT-EPOXY COATED	200,266.000 LB		
1070	08160	STRUCTURAL STEEL 723,296 LB	(1.00) LS		
1080	08170	SHEAR CONNECTORS 8,164 LB	(1.00) LS		
1090	08269	ELECTRICAL CONDUIT	(1.00) LS		
1100	08435	JACK & SUPPORT BRIDGE SPAN	(1.00) LS		
1110	08470	EXPANSION DAM-2 IN NEOPRENE	36.000 LF		
1120	08472	EXPANSION DAM-4 IN NEOPRENE	115.000 LF		
1130	08709	BRIDGE CHAIN LINK FENCE-7 FT	1,363.000 LF		
1140	20744ED	DRILLED SHAFT 60 IN-COMMON	931.000 LF		
1150	21322NC	CSL TESTING (6 TUBES)	21.000 EACH		
1160	21532ED	RAIL SYSTEM TYPE III	754.000 LF		
1170	21679EN	FIBERGLASS DRAIN PIPE	11.000 LF		
1180	23248EC	DRILLED SHAFT-36 IN COMMON	356.000 LF		
1190	23249EC	DRILLED SHAFT-72 IN COMMON	551.000 LF		
1200	23271EC	DRILLED SHAFT LOAD TEST	1.000 EACH		
1210	23272EC	CSL TESTING (3 TUBES)	7.000 EACH		
1220	23273EC	POST TEST GROUTING	1.000 EACH		
1230	23555EC	EXPANSION DAM-1 5/8 IN-NEOPRENE	72.000 LF		
	SECTION 0003	GASLINE			

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
1240	20717ED	GAS MAIN 8 IN SWPC INSTALL (REVISED: 7-9-09)	465.000 LF	75.00	34,875.00
1250	20718ED	GAS MAIN 8 IN PL INSTALL (REVISED: 7-9-09)	150.000 LF	49.00	7,350.00
1260	20731ND	INST M-C SHORT-SIDE SERVICE PIPING-1 IN (REVISED: 7-9-09)	1.000 EACH	350.00	350.00
1270	22183NN	INST M-C LONG-SIDE SERVICE PIPING-4 IN (REVISED: 7-9-09)	1.000 EACH	1,420.00	1,420.00
	SECTION 0004	ELECTRIC			
1280	03559	BEND 90 DEG 4 IN	8.000 EACH		
1290	04799	CONDUIT-4 IN SERVICE CONDUCTOR	1,265.000 LF		
1300	23430EC	PULL BOX-3 X 5	2.000 EACH		
	SECTION 0005	COMMUNICATION			
1310	03559	BEND 90 DEG 4 IN	8.000 EACH		
1320	04799	CONDUIT-4 IN TRUNK AND DIST.	465.000 LF		
1330	23433EC	PVC COUPLING-4 IN	4.000 EACH		
1340	23582EC	PULL BOX-2 X 3	3.000 EACH		
	SECTION 0006	SEWER			
1350	01789	RECONSTRUCT MANHOLE	1.000 EACH		
1360	01791	ADJUST MANHOLE FRAME TO GRADE	3.000 EACH		
1370	23476EC	LATERAL SERVICE INVESTIGATION	(1.00) LS		
1380	23477EC	REMOVE PROTRUDING LATERAL	5.000 EACH		
1390	23478EC	CURE IN PLACE PIPE LINER-12 IN	223.000 LF		
1400	23479EC	CURE IN PLACE PIPE LINER-15 IN	300.000 LF		
1410	23480EC	CURE IN PLACE PIPE LINER-18 IN	520.000 LF		
1420	23481EC	CURE IN PLACE PIPE LINER-21 IN	55.000 LF		

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1430	23482EC	SANITARY SEWER POINT REPAIR	1.000 EACH		
1440	23483EC	SANITARY SERVICE & LATERAL CONN REINST GROUTING	2.000 EACH		
1450	23484EC	PERFORM CIPP ACCEPTANCE TESTING	(1.00) LS		
	SECTION 0007	SIGNALIZATION			
1460	04795	CONDUIT-2 IN	1,986.000 LF		
1470	04811	JUNCTION BOX TYPE B	23.000 EACH		
1480	04820	TRENCHING AND BACKFILLING	1,096.000 LF		
1490	04830	LOOP WIRE	5,807.000 LF		
1500	04844	CABLE-NO. 14/5C	7,602.000 LF		
1510	04845	CABLE-NO. 14/7C	350.000 LF		
1520	04850	CABLE-NO. 14/1 PAIR	2,829.000 LF		
1530	04881	MAST ARM POLE 30' 20 FT-KIPS	1.000 EACH		
1540	04881	MAST ARM POLE 44'/34' 65 FT-KIPS	1.000 EACH		
1550	04881	MAST ARM POLE 47'/33' 65 FT-KIPS	1.000 EACH		
1560	04881	MAST ARM POLE 48' 65 FT-KIPS	1.000 EACH		
1570	04881	MAST ARM POLE 52'/51' 100 FT-KIPS	1.000 EACH		
1580	04881	MAST ARM POLE 56'/54' 130 FT-KIPS	1.000 EACH		
1590	04881	MAST ARM POLE 60'/49' 120 FT-KIPS	1.000 EACH		
1600	04881	MAST ARM POLE 63'/51' 150 FT-KIPS	1.000 EACH		
1610	04885	MESSENGER-10800 LB	231.000 LF		
1620	04895	LOOP SAW SLOT AND FILL (ADDED: 7-9-09)	2,567.000 LF		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT PRICE	AMOUNT
1630	04931	INSTALL CONTROLLER TYPE 170	5.000	EACH		
1640	04932	INSTALL STEEL STRAIN POLE	4.000	EACH		
1650	04935	TEMP SIGNAL 12TH ST. AT MADISON AVE.	(1.00)	LS		
1660	04935	TEMP SIGNAL 12TH ST. AT RUSSELL ST.	(1.00)	LS		
1670	04950	REMOVE SIGNAL EQUIPMENT	5.000	EACH		
1680	06472	INSTALL SPAN MOUNTED SIGN	7.000	EACH		
1690	20188NS835	INSTALL LED SIGNAL-3 SECTION	36.000	EACH		
1700	20189NS835	INSTALL LED SIGNAL-5 SECTION	2.000	EACH		
1710	20390NS835	INSTALL COORDINATING UNIT	5.000	EACH		
1720	21743NN	INSTALL PEDESTRIAN DETECTOR	40.000	EACH		
1730	22668EN	DIRECTIONAL BORE	352.000	LF		
1740	23064NN	INSTALL SIGNAL-PEDESTRIAN COUNTDOWN	40.000	EACH		
1750	23157EN	TRAFFIC SIGNAL POLE BASE	48.000	CUYD		
1760	23222EC	INSTALL SIGNAL PEDESTAL	10.000	EACH		
	SECTION 0008	LIGHTING				
1770	04740	POLE BASE	32.000	EACH		
1780	04770	HPS LUMINAIRE	14.000	EACH		
1790	04780	FUSED CONNECTOR KIT	64.000	EACH		
1800	04795	CONDUIT-2 IN	3,800.000	LF		
1810	04820	TRENCHING AND BACKFILLING	3,485.000	LF		
1820	04821	OPEN CUT ROADWAY	315.000	LF		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT PRICE	AMOUNT
1830	04832	WIRE-NO. 12	1,865.000	LF		
1840	04833	WIRE-NO. 8	3,800.000	LF		
1850	04835	WIRE-NO. 4	4,750.000	LF		
1860	04836	WIRE-NO. 2	5,035.000	LF		
1870	23224EC	METAL HALIDE LUMINAIRE	18.000	EACH		
1880	23225EC	POLE 20 FT MTG HT	32.000	EACH		
1890	23226EC	BANNER ARM	4.000	EACH		
	SECTION 0009	WATERLINE				
1900	01095	DUCTILE IRON PIPE-8 IN CLASS 50 W/POLYWRAP	22.000	LF		
1910	01099	DUCTILE IRON PIPE-12 IN CLASS 50 W/POLYWRAP	305.000	LF		
1920	03360	COPPER PIPE-3/4 IN	150.000	LF		
1930	03361	COPPER PIPE-1 IN	88.000	LF		
1940	03361	COPPER PIPE-1 IN TO SPRINKLER	48.000	LF		
1950	03363	COPPER PIPE-2 IN	85.000	LF		
1960	03426	ADJUST FIRE HYDRANT	2.000	EACH		
1970	03431	RELOCATE WATER METER	8.000	EACH		
1980	03433	RELOCATE FIRE HYDRANT	2.000	EACH		
1990	03437	RECONNECT SERVICE	8.000	EACH		
2000	03438	RECONNECT TO MAIN	8.000	EACH		
2010	03551	TAPPING SLEEVE & VALVE 24" X 6"	1.000	EACH		
2020	20081NN	CONNECT TO WATER MAIN TIE-IN 12 INCH	2.000	EACH		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
2030	20081NN	CONNECT TO WATER MAIN TIE-IN 4 INCH	1.000 EACH		
2040	20139EC	BUTTERFLY VALVE 24 INCH	4.000 EACH		
2050	20248NC	DUCTILE IRON CROSS 24" X 24"	1.000 EACH		
2060	20253NN	PLUG & BLOCK 10 INCH	3.000 EACH		
2070	20253NN	PLUG & BLOCK 24 INCH	1.000 EACH		
2080	20253NN	PLUG & BLOCK 4 INCH	1.000 EACH		
2090	20555NC	BEND AND BLOCK-8 IN	2.000 EACH		
2100	20559NC	CONNECT TO 6 IN	1.000 EACH		
2110	20582ND	PROPOSED WATER METER 1INCH FOR SPRINKLER	1.000 EACH		
2120	20788ND	BEND AND BLOCK-12 IN	2.000 EACH		
2130	20790ND	CONNECT TO 12 IN	1.000 EACH		
2140	21053ND	REDUCER 8 IN X 4IN	1.000 EACH		
2150	21193ND	CONNECT TO 4 IN	1.000 EACH		
2160	21526ND	ANCHOR TEE AND BLOCK 12" X 12" X 6"	1.000 EACH		
2170	21526ND	ANCHOR TEE AND BLOCK 12" X 8"	1.000 EACH		
2180	21526ND	ANCHOR TEE AND BLOCK 24" X 24" X 6"	1.000 EACH		
2190	22169NN	CONNECT TO 10 IN	1.000 EACH		
2200	22170NN	PLUG AND BLOCK-6 IN	1.000 EACH		
2210	22782NN	RESTRAINED JOINT BEND-12 IN	1.000 EACH		
2220	22874NN	RESILIENT SEAT GATE VALVE-12 IN	2.000 EACH		
2230	22874NN	RESILIENT SEAT GATE VALVE-12 IN DUCTILE IRON	3.000 EACH		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
2240	23442EC	RESILIENT SEATED GATE VALVE-6 IN	3.000 EACH		
2250	23443EC	RESILIENT SEATED GATE VALVE-8 IN	1.000 EACH		
2260	23443EC	RESILIENT SEATED GATE VALVE-8 IN DUCTILE IRON	1.000 EACH		
2270	23446EC	RESTRAINED JOINT BEND AND BLOCK-6 IN	2.000 EACH		
2280	23447EC	RESTRAINED JOINT BEND AND BLOCK-12 IN	3.000 EACH		
2290	23450EC	RESTRAINED JOINT BEND AND BLOCK-24 IN	5.000 EACH		
2300	23452EC	RESTRAINED JOINT REDUCER-8 X 4 IN	1.000 EACH		
2310	23456EC	CONNECT TO 24 IN	2.000 EACH		
2320	23457EC	AIR RELEASE VALVE-3/4 IN	1.000 EACH		
2330	23465EC	SPRINKLER CONNECTION TO MAIN-1 IN	1.000 EACH		
2340	23493EC	AIR RELEASE VALVE-2 IN	1.000 EACH		
2350	23559ND	ADJUST WATER METER BOX TO GRADE	2.000 EACH		
2360	23560ED	RESTRAINED JOINT REDUCER 12" X 10"	1.000 EACH		
2370	23560ED	RESTRAINED JOINT REDUCER 24" X 12"	2.000 EACH		
2380	23566NC	RESTRAINED JOINT BEND -24 IN	3.000 EACH		
2390	23567EC	RESTRAINED JOINT BEND AND BLOCK-8 IN	1.000 EACH		
2400	23568EC	RESTRAINED JOINT BEND AND BLOCK-10 IN	1.000 EACH		
2410	23569EC	RESTRAINED JOINT TEE AND BLOCK 12" X 12" X 8"	1.000 EACH		
2420	23569EC	RESTRAINED JOINT TEE AND BLOCK 24" X 24" X 24"	1.000 EACH		
2430	23570EC	RESTRAINED JOINT DIP,CL50 W/POLYWRAP-4IN	5.000 LF		
2440	23571EC	RESTRAINED JOINT DIP,CL50 W/POLYWRAP-6IN	10.000 LF		

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LINE NO	ITEM	DESCRIPTION	APPROXIMATE UNIT QUANTITY	UNIT PRICE	AMOUNT
2450	23572EC	RESTRAINED JOINT DIP,CL50 W/POLYWRAP-8IN	28.000 LF		
2460	23573EC	RESTRAINED JOINT DIP,CL50 W/POLYWRP-10IN	5.000 LF		
2470	23574EC	RESTRAINED JOINT DIP,CL50 W/POLYWRP-12IN	628.000 LF		
2480	23575EC	RESTRAINED JOINT DIP,CL50 W/POLYWRP-24IN	530.000 LF		
	SECTION 0010	MOB AND DEMOB			
2490	02568	MOBILIZATION (NO MORE THAN 5%)	LUMP		
2500	02569	DEMOBILIZATION (AT LEAST 1.5%)	LUMP		
		TOTAL BID			