



Andy Beshear  
GOVERNOR

## TRANSPORTATION CABINET

200 Mero Street  
Frankfort, Kentucky 40601

Jim Gray  
SECRETARY

November 6, 2024

CALL NO. 103  
CONTRACT ID NO. 245368  
ADDENDUM # 1

Subject: Kenton County, STP BRZ 9030 (486)  
Letting November 14, 2024

- (1) Revised - DBE Goal - Cover Page
- (2) Revised - Proposal Bid Items - Pages 96-97 of 97
- (3) Added - Railroad Notes & Special Note for Dynamic Pile Testing -  
Pages 1-43 of 43
- (4) Revised - Plan Sheet - R7

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

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

Sincerely,

A handwritten signature in black ink that reads "Rachel Mills".

Rachel Mills, P.E.  
Director  
Division of Construction Procurement

RM:mr  
Enclosures



**CALL NO. 103**

**CONTRACT ID. 245368**

**KENTON COUNTY**

**FED/STATE PROJECT NUMBER STP BRZ 9030 (486)**

**DESCRIPTION CR 1021**

**WORK TYPE BRIDGE REPLACEMENT**

**PRIMARY COMPLETION DATE 11/1/2025**

**LETTING DATE: November 14,2024**

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN STANDARD TIME November 14,2024. Bids will be publicly announced at 10:00 AM EASTERN STANDARD TIME.

**PLANS AVAILABLE FOR THIS PROJECT.**

**DBE CERTIFICATION REQUIRED - 0.00%**

**REQUIRED BID PROPOSAL GUARANTY:** Not less than 5% of the total bid.

**PROPOSAL BID ITEMS**

Report Date 11/6/24

**Section: 0001 - PAVING**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	712.00	TON		\$	
0020	00100		ASPHALT SEAL AGGREGATE	6.00	TON		\$	
0030	00103		ASPHALT SEAL COAT	1.00	TON		\$	
0040	00212		CL2 ASPH BASE 1.00D PG64-22	615.00	TON		\$	
0050	00301		CL2 ASPH SURF 0.38D PG64-22	118.00	TON		\$	
0060	00356		ASPHALT MATERIAL FOR TACK	2.00	TON		\$	

**Section: 0002 - ROADWAY**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0070	00020		TRAFFIC BOUND BASE	52.00	TON		\$	
0080	00462		CULVERT PIPE-18 IN	60.00	LF		\$	
0090	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	12.00	EACH		\$	
0100	02230		EMBANKMENT IN PLACE	2,031.00	CUYD		\$	
0110	02242		WATER	50.00	MGAL		\$	
0120	02360		GUARDRAIL TERMINAL SECTION NO 1	2.00	EACH		\$	
0130	02371		GUARDRAIL END TREATMENT TYPE 7	2.00	EACH		\$	
0140	02381		REMOVE GUARDRAIL	163.00	LF		\$	
0150	02429		RIGHT-OF-WAY MONUMENT TYPE 1	11.00	EACH		\$	
0160	02432		WITNESS POST	11.00	EACH		\$	
0170	02545		CLEARING AND GRUBBING APPROX LESS THAN 1 ACRE	1.00	LS		\$	
0180	02562		TEMPORARY SIGNS	500.00	SQFT		\$	
0190	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0200	02651		DIVERSIONS (BY-PASS DETOURS)	1.00	LS		\$	
0210	02671		PORTABLE CHANGEABLE MESSAGE SIGN	2.00	EACH		\$	
0220	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0230	02677		ASPHALT PAVE MILLING & TEXTURING	1.00	TON		\$	
0240	02726		STAKING	1.00	LS		\$	
0250	02731		REMOVE STRUCTURE	1.00	LS		\$	
0260	06514		PAVE STRIPING-PERM PAINT-4 IN	1,575.00	LF		\$	
0270	17046		EC POLE REMOVE (REVISED 11-6-24)	4.00	EACH		\$	
0280	20550ND		SAWCUT PAVEMENT	177.00	LF		\$	
0290	21415ND		EROSION CONTROL	1.00	LS		\$	
0300	21802EN		G/R STEEL W BEAM-S FACE (7 FT POST)	217.75	LF		\$	
0310	25078ED		THRIE BEAM GUARDRAIL TRANSITION TL-3	2.00	EACH		\$	
0320	25079ED		THRIE BEAM GUARDRAIL TRANSITION TL-2	2.00	EACH		\$	
0330	30004		FIELD GATE CSX SECURITY GATE	2.00	EACH		\$	

**Section: 0003 - BRIDGE - 059C00048N**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0340	02231		STRUCTURE GRANULAR BACKFILL	1,999.00	CUYD		\$	

**PROPOSAL BID ITEMS**

Report Date 11/6/24

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0350	03299		ARMORED EDGE FOR CONCRETE	36.00	LF		\$	
0360	08003		FOUNDATION PREPARATION	1.00	LS		\$	
0370	08020		CRUSHED AGGREGATE SLOPE PROT	89.00	TON		\$	
0380	08033		TEST PILES	173.00	LF		\$	
0390	08051		PILES-STEEL HP14X89	5,766.00	LF		\$	
0400	08100		CONCRETE-CLASS A	597.00	CUYD		\$	
0410	08104		CONCRETE-CLASS AA	72.00	CUYD		\$	
0420	08150		STEEL REINFORCEMENT	103,536.00	LB		\$	
0430	08151		STEEL REINFORCEMENT-EPOXY COATED	79,106.00	LB		\$	
0440	08160		STRUCTURAL STEEL APPROX 86022 LBS	1.00	LS		\$	
0450	08170		SHEAR CONNECTORS	1.00	LS		\$	
0460	08711		BRIDGE CHAIN LINK FENCE-6 FT	202.00	LF		\$	
0465	23233EC		DYNAMIC PILE TESTING (ADDED 11-6-24)	4.00	EACH		\$	
0470	23378EC		CONCRETE SEALING	9,258.00	SQFT		\$	
0480	25027ED		RAIL SYSTEM SINGLE SLOPE - 36 IN	202.00	LF		\$	
0490	26233EC		MOBILIZATION FOR CONCRETE SURF TREATMENT	1.00	LS		\$	

**Section: 0004 - DEMOBILIZATION &/OR MOBILIZATION**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0500	02568		MOBILIZATION	1.00	LS		\$	
0510	02569		DEMOBILIZATION	1.00	LS		\$	



## SPECIAL NOTES FOR PROTECTION OF RAILROAD INTEREST

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### CSX TRANSPORTATION, INC.

#### I. AUTHORITY OF RAILROAD ENGINEER AND STATE ENGINEER:

- A. *The authorized representative of the Railroad Company, hereinafter referred to as Railroad Engineer, shall have final authority in all matters affecting the safe maintenance of Railroad operations and property.*
- B. *The authorized representative of the State, hereinafter referred to as the Engineer, shall have authority over all other matters as prescribed herein and in the Project Specifications.*

#### II. NOTICE OF STARTING WORK:

- A. *The Contractor shall not commence any work on Railroad rights of way until he has complied with the following conditions:*
  - 1. Given the Railroad written notice, with copy to the Engineer who has been designated to be in charge of the work, **at least ten (10) days in advance** of the date he proposes to begin work on Railroad rights of way. The notice must refer to Railroad Agreement with the State by the date of the Agreement. **If flagging service is required, such notice shall be submitted at least thirty (30) days in advance** of the date scheduled to commence work. The Railroad's Contact information is on the Summary Sheet.
  - 2. Obtain written authorization from the Railroad to begin work on Railroad rights of way, such authorization to include an outline of specific conditions with which he must comply.
  - 3. Obtain written approval from the Railroad of Railroad Protective Insurance Liability coverage as required by paragraph 14 herein.
  - 4. Furnish a schedule for all work within the Railroad rights of way as required by paragraph 7, B, 1.
- B. *The Railroad's written authorization to proceed with the work shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.*

### III. INTERFERENCE WITH RAILROAD OPERATIONS:

- A. *The Contractor shall so arrange and conduct his work that there will be no interference with Railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad Company or to poles, wires, and other facilities of tenants on the rights of way of the Railroad Company. The Contractor shall store materials so as to prevent trespassers from causing damage to trains or Railroad property and shall not use Railroad property without written permission from the Railroad. Whenever work is to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service (watchman) shall be deferred by the Contractor until the flagging protection required by the Railroad is available at the job site.*
- B. *Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect train operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or his representative, such provisions are insufficient, the Railroad Engineer may require or provide such provisions, as he deems necessary at Contractor's cost and expense. In any event, such unusual provisions shall be at the Contractor's expense and without cost and/or time to the Railroad or the State.*

### IV. TRACK CLEARANCES

- A. *The minimum track clearances to be maintained by the Contractor during construction are shown on the Project Plans. However, before undertaking any work within Railroad rights of way, or before placing any obstruction over any track, the Contractor shall:*
1. Notify the Railroad's representative **at least 72 hours in advance** of the work.
  2. Receive assurance from the Railroad's representative that arrangements have been made for flagging service as necessary.
  3. Receive permission from the Railroad's representative to proceed with the work.
  4. Ascertain that the State Engineer has received copies of notice to the Railroad and of the Railroad's response thereto, and has approved the contractor's methods.

## V. CONSTRUCTION PROCEDURES

### A. General:

1. Construction work on Railroad property shall be:
  - a) Subject to the inspection and approval of the Railroad.
  - b) In accord with the Railroad's written outline of specific conditions.
  - c) In accord with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment, which the Contractor shall obtain from the Railroad.
  - d) In accord with all Special Notes, Summaries, and Addendums.
2. The Railroad requires a submission of construction procedure that meets the requirements of these Special Notes and attachments. The Railroad's **submittal review period is thirty (30) days. Resubmissions will be reviewed within (30) days.**
3. All requirements of the *Construction Submission Criteria* shall be met. Requirements in addition to those in the *Construction Submission Criteria* are listed below in this document:

### B. Excavation:

1. The sub grade of an operated track shall be **maintained with edge of berm at least 15'0" from centerline of track and not more than 24 inches below top of rail.** Contractor will not be required to make existing section meet this specification if substandard, in which case the existing section will be maintained.
2. Additionally, the Railroad Engineer may require installation of orange construction fencing for protection of the work area located on Railroad right of way.

### C. Excavation of Structures:

1. The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles, or sheeting for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material. The procedure for doing such work, including need of and plans for shoring, shall first be submitted, with the stamp of an Engineer in the State of Kentucky, and approved by

the Engineer and the Railroad Engineer, but such approval shall not relieve the Contractor from liability.

2. Additionally, a walkway with handrail protection may be required as noted in Section XI herein.

*D. Demolition, Erection, Hoisting*

1. Railroad tracks and other railroad property must be protected from damage during the procedure. No crane or equipment may be set on the rails or track structure and no material may be dropped on Railroad property.
2. Loads shall not be supported while any trains are passing if that piece of equipment has the capacity to **foul a 50' envelope**.
3. The Railroad may require the Contractor to install filter fabric over the track and ballast to prevent any concrete dust or other construction debris from fouling the ballast. This will be determined during actual construction activities by the Railroad or its representatives. Fabric should extend at least 25 feet beyond the outside edges of the bridge. Fabric will remain in place until all construction activities are complete.
4. Temporary construction clearance: Ensure all falsework, bracing, or forms have a minimum vertical clearance of 23 feet above the top of the highest rail and a minimum horizontal clearance of 12 feet measured perpendicular to the centerline of the nearest track.

*E. Blasting:*

1. The Contractor shall obtain advance written approval of the Railroad Engineer and the Engineer for use of explosive on or adjacent to Railroad property. The request for permission to use explosives shall include a detailed blasting plan. If permission for use of explosives is granted, the Contractor will be required to comply with the following:
  - a) No blasting shall be done without the presence of an authorized representative of the Railroad. **At least 10 days advance notice** to the person designated in the Railroad's notice of authorization to proceed (see Section II.B above) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.



2. The Railroad representative will:
  - a) Determine the approximate location of trains and advise the Contractor the approximate amount of time available for the blasting operation and clean-up.
  - b) Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these Special Notes.

*F. Maintenance of Railroad Facilities:*

1. The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either (1) silt fence; (2) berm or temporary ditches; (3) sediment basin; (4) aggregate checks; and (5) channel lining. The Contractor will promptly repair eroded areas with Railroad rights of way and to repair any other damage to the property of the Railroad or its tenants at the Contractor's expense.
2. All maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

*G. Storage of Materials and Equipment:*

1. Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the rights of way of the Railroad Company without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad Company will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.
2. All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

H. *Cleanup:*

1. Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights of way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights of way in a neat condition satisfactory to the Railroad Engineer or his authorized representative.

VI. **DAMAGES:**

- A. *The Contractor shall assume all liability for any and all damages to his/her work, employees, equipment and materials caused by Railroad traffic.*
- B. *Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.*

VII. **FLAGGING SERVICES:**

A. *When Required:*

1. Flagging services will not be provided until the contractor's insurance has been reviewed & approved by the Railroad.
2. Under the terms of the agreement between the Department and the Railroad, the **Railroad has sole authority to determine the need for flagging** required to protect its operations. In general, the requirements of such services will be whenever the Contractor's personnel or equipment are likely to be, working on the Railroad's rights of way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a railroad structure or the railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging. If any element (workers, equipment, tools, scaffolding, etc.) may exist or fall within 50 -feet of the edge of track, a flagman is necessary.
3. Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three-(3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the Railroad's authorized representative, a flagman or flagmen may be required until the project has been completed.

*B. Scheduling and Notification:*

1. Not later than the time that approval is initially requested to begin work on Railroad rights of way, Contractor shall furnish to the Railroad and the Department a schedule for all work required to complete the portion of the project within Railroad rights of way and arrange for a job site meeting between the Contractor, the Department, and the Railroad's authorized representative. Flagman or Flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
2. The Contractor will be required to give the Railroad representative **at least 10 working days of advance written notice** of intent to begin work within Railroad rights of way. If it is necessary for the Railroad to advertise a flagging job for bid, it **may take up to 30-days to obtain service**. Once begun, when work is suspended at any time for any reason, the Contractor will be required to give the Railroad representative **at least 72 hours in advance** before resuming work on Railroad rights of way. Such notice shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Engineer a copy; if notice is given verbally it shall be confirmed in writing with copy to the Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen is present at the job site. It **may take up to 30 days to obtain flagging initially** from the Railroad. When flagging begins the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer needed and may be unable to be called for on a spot basis. If flagging becomes unnecessary and is suspended, it **may take up to 30 days to again obtain flagging services** from the Railroad. Due to labor agreements, it is necessary to give **5 working days notice before flagging service may be discontinued** and responsibility for payment stopped.
3. If, after the flagman is assigned to the project site, emergencies arise which require the flagman's presence elsewhere, and then the Contractor shall delay work on Railroad rights of way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Department or Railroad.
4. When demobilizing, the Contractor shall contact the flagman to avoid unnecessary flagging charges. This communication shall be documented.

C. *Payment:*

1. **The Cabinet will be responsible for paying the Railroad directly for any and all costs of flagging,** which may be required to accomplish the construction. **The Contractor shall adhere to the Special Note for Railroad Flagging, if applicable, and may be charged for flagging in excess of the allowable days, per said Special Note.**
  
2. The estimated cost of flagging is listed on the Summary Sheet. The charge to the Cabinet by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.
  
3. Work by a flagman (M/W) in excess of 8 hours per day or 40 hours per week or on rest days, but not more than 16 hours a day will result in overtime pay at 1 ½ times the appropriate rate. Work by a flagman (M/W) in excess of 16 hours per day will result in overtime pay at 2 times the appropriate rate. Flagman (M/W) working in excess of 16 hours must receive a minimum of 5 hours of rest between shifts or their next shift of work is paid at the overtime rate of 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 ½ times the normal rate.  
  
Work by a flagman (T&E) in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 ½ times the appropriate rate. After a 12 hour work day the flagman (T&E) must be provided with 12 hours of rest. Flagman (T&E) who work six days consecutive days must receive two days off.  
  
Flagman's work day begins and ends at his reporting location.
  
4. Railroad work involved in preparing and handling bills will also be charged to the Contractor. Charges to the Department by the Railroad shall be in accordance with applicable provisions of Subchapter B, Part 140, Subpart I and Subchapter G, Part 646, Subpart B of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. The above estimates of flagging cost are provided for information only and are not binding in any way.

*D. Verification:*

1. The Contractor and Project Engineer will review and sign the Railroad flagman's time sheet, attesting that the flagman was present during the time recorded. Flagman may be removed by Railroad if form is not signed. If flagman is removed, the Contractor will not be allowed to re-enter the Railroad rights of way until the issue is resolved. Any complaints concerning flagman or flagmen must be resolved in a timely manner. If need for flagman or flagmen is questioned, please contact the Railroad's Representative listed on the Project Summary Sheet. All verbal complaints must be confirmed in writing by the Contractor within 5 working days with copy to the Highway Engineer. All written correspondence should be addressed to the Railroad's Representative listed on the Project Summary Sheet.
2. The Railroad flagman assigned to the project will be responsible for notifying the Project Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Project Engineer will document such notification in the project records. When requested, the Project Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

**VIII. HAUL ACROSS RAILROAD:**

- A. Where the plans show or imply that materials of any nature must be hauled across a Railroad, unless the plans clearly show that the State has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad. The Contractor will be required to bear all costs incidental, including flagging, to such crossings whether services are performed by his own forces or by Railroad personnel.*
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad Company unless a license agreement or right of entry is granted and executed for its installation, maintenance, necessary watching and flagging thereof and removal, all at the expense of the Contractor. **The approval process for an agreement normally takes 90-days.***

**IX. WORK FOR THE BENEFIT OF THE CONTRACTOR:**

- A. *All temporary or permanent changes in wire lines on the Railroad or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the State and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the State and/or the Railroad.*
- B. *Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.*

**X. COOPERATION AND DELAYS:**

- A. *It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefore.*
- B. *Train schedules cannot be provided to the Contractor. It is the Contractor's responsibility to contact the Railroad in order to arrange "Track Time." This "Track Time" will be an agreed upon prearranged time period (duration) that the Railroad will, without undue burden, schedule no train traffic to facilitate the Contractor's work on or near Railroad right-of-way. This track time must be arranged during the submission review process.*
- C. *No charge or claims of the Contractor against either the Department or the Railroad will be allowed for hindrance or delay on account of railroad traffic; any work done by the Railroad or other delay incident to or necessary for safe maintenance of Railroad traffic or for any delays due to compliance with these Special Notes.*
- D. *The Contractor shall cooperate with others participating in the construction of the Project to the end that all work may be carried on to the best advantage.*
- E. *The Railroad does not assume any responsibility for work performed by others in connection with the Project. No claims of the Contractor against the Railroad for any inconvenience, delay, or additional cost incurred by the Contractor on account of operations by others shall be filed.*

**XI. TRAINMAN'S WALKWAYS:**

- A. *Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than ~~12~~10 feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each day. If there is any excavation near the walkway, a handrail, with 12'-0" **minimum clearance from centerline of track**, shall be placed.*

**XII. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHTS OF WAY:**

- A. *All persons shall wear hard hats and reflective vest. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip on type boots is prohibited. High top (6-inch or more) safety-toe shoes with laces, oil-resistant soles, and a distinct separation between heel and sole are required.*
- B. *No one is allowed within 25' of the centerline of the track without specific authorization from the flagman.*
- C. *All persons working near track when train is passing are to look out for dragging bands, chains and protruding or shifting cargo.*
- D. *No one is allowed to cross tracks without specific authorization from the flagman.*
- E. *All work within 25' of track must stop when train is passing.*
- F. *No steel tape or chain will be allowed to cross or touch rails without permission.*

**XIII. GUIDELINES FOR EQUIPMENT ON RAILROAD RIGHTS OF WAY:**

- A. *No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15' of centerline of track without specific permission from Railroad Engineer.*
- B. *No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.*
- C. *All employees will stay with their machines when crane or boom equipment is pointed toward track.*
- D. *All cranes and boom equipment under load will stop work while a train is passing (including pile driving).*

- E. *Swinging loads must be secured to prevent movement while train is passing.*
- F. *No loads will be suspended above a moving train.*
- G. *No equipment will be allowed within **50' of centerline of track** without specific authorization of the flagman.*
- H. *Trucks, tractors or any equipment will not touch ballast line without specific permission from railroad official and flagman.*
- I. *No equipment or load movement **within 50' or above a standing train or other equipment** without specific authorization of the flagman.*
- J. *All operating equipment within **50' of track must halt operations when a train is passing**. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.*
- K. *All equipment, loads and cables are prohibited from touching rails.*
- L. *While clearing and grubbing, no vegetation will be removed from railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.*
- M. *No equipment or materials will be parked or stored on Railroad's property unless specific permission is granted from the Railroad Engineer.*
- N. *All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.*
- O. *All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.*

#### **XIV. INSURANCE:**

- A. *In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Contractor will be required to carry insurance of the following kinds:*
  - 1. *Commercial General Liability coverage at their sole cost and expense with limits of not less than **\$5,000,000** in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name the Railroad as an additional insured.*
  - 2. *Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than **\$1,000,000**, which insurance must contain a waiver of subrogation against the Railroad and its affiliates.*



3. Commercial automobile liability insurance with limits of not less than **\$1,000,000** combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name the Railroad as an additional insured.
4. Railroad Protective Liability (RPL) insurance with limits of not less than **\$5,000,000** combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of **\$10,000,000**, which insurance shall satisfy the following additional requirements:
  - a. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance – Insurance Services Office (ISO) Form CG 00 35.
  - b. The Railroad must be the named insured on the Railroad Protective Insurance Policy
  - c. Name and Address of the Contractor must be shown on the Declarations page.
  - d. Description of operations must appear on the Declarations page and must match the Project description, including project or contract identification numbers.
  - e. Terrorism Risk Insurance Act (TRIA) coverage must be included.
  - f. Authorized endorsements must include:
    - (i). Pollution Exclusion Amendment – CG 28 31, unless using form CG 00 35 version 96 and later.
  - g. Authorized endorsements may include:
    - (i). Broad form Nuclear Exclusion – IL 00 21
    - (ii). 30-day Advance Notices of Non-renewal or cancellation
    - (iii). Required State Cancellation Endorsement
    - (iv). Quick Reference or Index – CL/IL 240
  - h. Authorized endorsements may not include:
    - (i). A Pollution Exclusion Endorsement except CG 28 31
    - (ii). An Endorsement that excludes TRIA coverage
    - (iii). An Endorsement that limits or excludes Professional Liability coverage
    - (iv). A Non-Cumulation of Liability or Pyramiding of Limits Endorsement

- (v). A Known Injury Endorsement
- (vi). A Sole Agent Endorsement
- (vii). A Punitive or Exemplary Damages Exclusion
- (viii). A 'Common Policy Conditions' Endorsement
- (ix). Policies that contain any type of deductible
- (x). Any endorsement that is not named in Section 4 (f) or (g) above that the Railroad deems unacceptable

- 5. All insurance companies must be A. M. Best rated A- and Class VII or better.
- 6. Such additional or different insurance as the Railroad may require.

*B. Additional Terms:*

- 1. Contractor must submit the original Railroad Protective Liability policy, Certificates of Insurance, and all notices and correspondence regarding the insurance policy to the contact listed on the Project Summary Sheet.
- 2. The Contractor may not begin work on the Project until it has received the Railroad's written approval or the required insurance.

*C. Insurance policies shall follow the requirements of Subchapter G, Part 646, Subpart A of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments.*

*D. If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor shall be provided by or in behalf of the subcontractor to cover his operations. Endorsements to the Prime Contractor's policies specifically naming subcontractors and describing their operations will be acceptable for this purpose.*

*E. All insurance herein before specified shall be carried until all work required to be performed under the terms of the contract has been satisfactorily completed within the limits of the rights of way of the Railroad as evidenced by the formal acceptance by the Department. Insuring Companies may cancel insurance by permission of the Department and Railroad or on **thirty (30) days written notice** to the Department and Railroad Insurance Contacts as listed on the Project Summary Sheet.*

**XV. FAILURE TO COMPLY:**

- A. *These Special Notes are supplemental and amendatory to the current version of the Kentucky Department of Highways' Standard Specifications for Road and Bridge Construction and amendments thereof, and where in conflict therewith, these Special Notes shall govern.*
  
- B. *In the event the Contractor violates or fails to comply with any of the requirements of these Special Notes:*
  - 1. The Railroad Engineer may require that the Contractor vacate Railroad property.
  - 2. The Engineer may withhold any and all monies due the Contractor on pay estimates.
  - 3. Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

**XVI. PAYMENT FOR COST OF COMPLIANCE:**

- A. *No separate payment will be made for any extra cost incurred on account of compliance with these Special Notes. All such cost shall be included in prices bid for other items of the work as specified in the payment items.*



Kentucky Transportation Cabinet  
Division of Right of Way & Utilities

TC 69-008  
Rev. 4-2020  
Page 1 of 2

**SUMMARY FOR KYTC PROJECTS THAT INVOLVE A RAILROAD**

**Date:** 10/31/2024 *(enter using mm/dd/yyyy format)*

*This project actively involves the below listed railroad company. This Project Summary provides an abbreviated listing of project specific railroad data. The detailed needs of the specified railroad company are included in the Special Notes for Protection of Railroad Interest in the proposal package. By submitting a bid, the contractor attests that they have dutifully considered and accepted the provisions as defined in both documents.*

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**GENERAL ROAD PROJECT INFORMATION** *(This section must be provided by KYTC)*

**County:** Kenton  
**Federal Number:** N/A  
**State Number:** FD55 121 9414002U  
**Route:** CR 1021  
**Project Description:** REPLACE BRIDGE ON ERNEST BRIDGE DR (CR 1021) OVER CSX RAILROAD  
**Item Number:** 6 - 8954.00/6-10046      **Highway Milepost:** 0.027-0.065

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**GENERAL RAIL INFORMATION** *(The below sections must be provided by Railroad Company)*

**Rail Company Name:** CSX Transportation, Inc.  
**DOT# (if applicable):** 353 308T      **Railroad Milepost:** 0KC-13.97  
**Freight: Train Count (6am to 6pm):** 5 **Train Count (6pm to 6am):** 4 **Train Count (24 hr total):** 9 **Max Speed:** 60mph  
**Passenger: Train Cnt. (6am to 6pm):** 0 **Train Cnt. (6pm to 6am):** 0 **Train Cnt. (24 hr total):** 0 **Max Speed:** N/A  
*(This information is necessary to acquire the necessary insurances when working with Railroad Right of Way)*

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**INSURANCE REQUIREMENTS**

The named insured, description of the work and designation of the job site to be shown on the Policy are as follows:  
(a) Named Insured: CSX Transportation, Inc.  
(b) The project description should be as indicated in the General Road Project Information section.  
(c) The designation of the jobsite is the route, Milepost, and AAR-DOT# listed above.

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**FLAGGING INFORMATION**

**Flagging Estimate:**  
KYTC will be responsible for paying all flagging costs. Contractor shall adhere to the Special Note for Railroad Flagging if applicable  
**Hourly Rate:**  
\$1421.28 per Day based on a 8hour day effective as of the date of this document.

*Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 ½ times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime pay at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 ½ times the normal rate.*

**Forecasted Rate Increases:**

Rates will increase to \$ per based on a hour day effective *(enter using M/d/yyyy format).*

**RAILROAD CONTACTS**

*(to be provided by Railroad Company)*

**General Railroad Contact:**

Brad Armstrong, Project Manager - Public  
Projects  
4802 Decoursey Pike Taylor Mill, KY 41015  
**(Phone)** (513) 853 1221  
**(Email)** Brad\_Armstrong@CSX.com

**Regional Representative (Roadmaster):**

To be provided

**(Phone)**

**(Email)**

**Insurance contact:**

CSX Corporation  
Insurance Department

**(Phone)**

**(Email)** [InsuranceDocuments@CSX.com](mailto:InsuranceDocuments@CSX.com)

**Railroad Designer Contact:**

Contractor

Larry Shaw, Project Manager - Rail Division  
Alfred Benesch & Company

**(Phone)** (317) 417 1902

**(Email)** LShaw@benesch.com

**Railroad Construction Contact:**

Contractor

Wayne Bolen, Project Manager, Rails  
Division  
Alfred Benesch & Company

**(Phone)** (859) 250 5483

**(Email)** WBolen@benesch.com

**KENTUCKY TRANSPORTATION**

**CABINET CONTACTS** *(to be provided by  
KYTC)*

**KYTC Railroad Coordinator:**

Allen Rust, PE  
Div. of Right of Way & Utilities  
Kentucky Transportation Cabinet  
200 Mero Street, 5<sup>th</sup> Floor East  
Frankfort, Kentucky 40622  
**(Phone)** 502-782-4950  
**(Email)** allen.rust@ky.gov

**KYTC Construction Procurement Director:**

Rachel Mills, Director  
Div. of Construction Procurement  
Kentucky Transportation Cabinet  
200 Mero Street, 3<sup>rd</sup> Floor West  
Frankfort, Kentucky 40622  
**(Phone)** 502-782-5152  
**(Email)** [Rachel.Mills@ky.gov](mailto:Rachel.Mills@ky.gov)

**KYTC Construction Director:**

Matt Simpson, Director  
Div. of Construction  
Kentucky Transportation Cabinet  
200 Mero Street, 3<sup>rd</sup> Floor West  
Frankfort, Kentucky 40622  
**(Phone)** 502-564-4780  
**(Email)** Matt.Simpson@ky.gov



The project specific information provided herein is valid as of the date indicated. However, the specific information may be subject to change due to the normal business operations of all parties. The terms and conditions defined here, and in the bid proposal in its entirety, are inclusive and constant.

# APPENDIX

## CSX TRANSPORTATION

# CONSTRUCTION SUBMISSION CRITERIA

## INTRODUCTION

SECTION I: Definitions

SECTION II: Construction Submissions

SECTION III: Hoisting Operations

SECTION IV: Demolition Procedure

SECTION V: Erection Procedure

SECTION VI: Temporary Excavation and Shoring

SECTION VII: Track Monitoring

## INTRODUCTION

The intent of this document is to guide outside agencies and their Contractors when performing work on, over, or with potential to impact CSX property (ROW). Work plans shall be submitted for review to the designated CSX Engineering Representative for all work which presents the potential to affect CSX property or operations; this document shall serve as a guide in preparing these work plans. All work shall be performed in a manner that does not adversely impact CSX operations or safety; as such, the requirements of this document shall be strictly adhered to, in addition to all other applicable standards associated with the construction. Applicable standards include, but are not limited to, CSX Standards and Special Provisions, CSX Insurance Requirements, CSX Pipeline Occupancy Criteria, as well as the governing local, county, state and federal requirements. It shall be noted that this document and all other CSX standards are subject to change without notice, and future revisions will be made available at the CSX website: [www.csx.com](http://www.csx.com).

### I. DEFINITIONS

1. Agency – The project sponsor (i.e., State DOT, Local Agencies, Private Developer, etc.)
2. AREMA – American Railway Engineering and Maintenance-of-Way Association – the North American railroad industry standards group. The use of this term shall be in specific reference to the AREMA Manual for Railway Engineering.
3. Construction Submission – The Agency or its representative shall submit six (6) sets of plans, supporting calculations, and detailed means and methods procedures for the specific proposed activity. All plans, specifications, and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.
4. Controlled Demolition – Removal of an existing structure or subcomponents in a manner that positively prevents any debris or material from falling, impacting, or otherwise affecting CSX employees, equipment or property. Provisions shall be made to ensure that there is no impairment of railroad operations or CSX’s ability to access its property at all times.
5. Contractor – The Agency’s representative retained to perform the project work.
6. Engineer – CSX Engineering Representative or a GEC authorized to act on the behalf of CSX.
7. Flagman – A qualified CSX employee with the sole responsibility to direct or restrict movement of trains, at or through a specific location, to provide protection for workers.
8. GEC – General Engineering Consultant who has been authorized to act on the behalf of CSX.
9. Horizontal Clearance – Distance measured perpendicularly from centerline of any track to the nearest obstruction at any elevation between TOR and the maximum vertical clearance of the track.
10. Professional Engineer – An engineer who is licensed in State or Commonwealth in which the project is to occur. All plans, specifications, and supporting calculations shall be prepared by the Licensed Professional Engineer and shall bear his/her seal and signature.
11. Potential to Foul – Work having the possibility of impacting CSX property or operations; defined as one or more of the following:
  - a. Any activity where access onto CSX property is required.



b. Any activity where work is being performed on CSX ROW.

c. Any excavation work adjacent to CSX tracks or facilities, within the Theoretical Railroad Live Load Influence Zone, or where the active earth pressure zone extends within the CSX property limits.

d. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of the equipment during use, and may be a function of the equipment boom length. Note that hoisting equipment with the potential to foul must satisfy the 150% factor of safety requirement for lifting capacities.

e. Any work where the scatter of debris, or other materials has the potential to encroach within twenty five feet (25'-0") of the nearest track centerline.

f. Any work where significant vibration forces may be induced upon the track structure or existing structures located under, over, or adjacent to the track structure.

g. Any other work which poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by CSX.

12. ROW – Right of Way; Refers to CSX Right-of-Way as well as all CSX property and facilities. This includes all aerial space within the property limits, and any underground facilities.

13. Submission Review Period - a minimum of thirty (30) days in advance of start of work. Up to thirty (30) days will be required for the initial review response. Up to an additional thirty (30) days may be required to review any/all subsequent submissions or resubmission.

14. Theoretical Railroad Live Load Influence Zone – A 1 horizontal to 1 vertical theoretical slope line starting at bottom corner of tie.

15. TOR – Top of Rail. This is the base point for clearance measurements. It refers to the crown (top) of the steel rail; the point where train wheels bear on the steel rails.

16. Track Structure – All load bearing elements which support the train. This includes, but is not limited to, the rail, ties, appurtenances, ballast, sub-ballast, embankment, retaining walls, and bridge structures.

17. Vertical Clearance – Distance measured from TOR to the lowest obstruction within six feet (6'-0") of the track centerline, in either direction.

## II. GENERAL SUBMISSION REQUIREMENTS

A. A construction work plan is required to be submitted by the Agency or its Contractor, for review and acceptance, prior to accessing or performing any work with Potential to Foul.

B. The Agency or its representative shall submit six (6) sets of plans, specifications, supporting calculations, and detailed means and methods procedures for the specific proposed work activity.

C. Construction submissions shall include all information relevant to the work activity, and shall clearly and concisely explain the nature of the work, how it is being performed, and what measures are being taken to ensure that railroad property and operations are continuously maintained.

D. All construction plans shall include a map of the work site, depicting the CSX tracks, the CSX right of way, proposed means of access, proposed locations for equipment and material staging (dimensioned from nearest track centerline), as well as all other relevant project information. An elevation drawing may also be necessary in order to depict clearances or other components of the work.

E. Please note that CSX will not provide pricing to individual contractors involved in bidding projects. Bidding contractors shall request information from the agency and not CSX.

F. The Contractor shall install a geotextile fabric ballast protection system to prevent construction or demolition debris and fines from fouling ballast. The geotextile ballast protection system shall be installed and maintained by the Contractor to the satisfaction of the Engineer.

G. The Engineer shall be kept aware of the construction schedule. The Contractor shall provide timely communication to the Engineer when scheduling the work such that the Engineer may be present during the work. The Contractor's schedule shall not dictate the work plan review schedule, and flagging shall not be scheduled prior to receipt of an accepted work plan.

H. At any time during construction activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSX facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSX and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

I. Blasting will not be permitted to demolish a structure over or within CSX's right-of-way. When blasting off of CSX property but with Potential to Foul, vibration monitoring, track settlement surveying, and/or other protective measures may be required as determined by the Engineer.

J. Blasting is not permitted adjacent to CSX right-of-way without written approval from the Chief Engineer, CSX.

K. Mechanical and chemical means of rock removal must be explored before blasting is considered. If written permission for the use of explosives is granted, the Agency or Contractor must submit a work plan satisfying the following requirements:

1. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Agency or Contractor.
2. Electronic detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.
3. No blasting shall be done without the presence of an authorized representative of CSX. Advance notice to the Engineer is required to arrange for the presence of an authorized CSX representative and any flagging that CSX may require.

4. Agency or Contractor must have at the project site adequate equipment, labor and materials, and allow sufficient time, to clean up debris resulting from the blasting and correct any misalignment of tracks or other damage to CSX property resulting from the blasting. Any corrective measures required must be performed as directed by the Engineer at the Agency's or Contractor's expense without any delay to trains. If Agency's or Contractor's actions result in the delay of any trains including passenger trains, the Agency or Contractor shall bear the entire cost thereof.

5. The Agency or Contractor may not store explosives on CSX property.

6. At any time during blasting activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSX facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSX and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

### III. HOISTING OPERATIONS

A. All proposed hoisting operations with Potential to Foul shall be submitted in accordance with the following:

1. A plan view drawing shall depict the work site, the CSX track(s), the proposed location(s) of the lifting equipment, as well as the proposed locations for picking, any intermediate staging, and setting the load(s). All locations shall be dimensioned from centerline of the nearest track. Crane locations shall also be dimensioned from a stationary point at the work site for field confirmation.

2. Computations showing the anticipated weight of all picks. Computations shall be made based upon the field-verified plans of the existing structure. Pick weights shall account for the weight of concrete rubble or other materials attached to the component being removed; this includes the weight of subsequent rigging devices/components. Rigging components shall be sized for the subsequent pick weight.

3. All lifting equipment, rigging devices, and other load bearing elements shall have a rated (safe lifting) capacity that is greater than or equal to 150% of the load it is carrying, as a factor of safety. Supporting calculations shall be furnished to verify the minimum capacity requirement is maintained for the duration of the hoisting operation.

4. Dynamic hoisting operations are prohibited when carrying a load with the Potential to Foul. Cranes or other lifting equipment shall remain stationary during lifting. (i.e., no moving picks).

5. For lifting equipment, the manufacturer's capacity charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted.

6. A schematic rigging diagram must be provided to clearly call out each rigging component from crane hook to the material being hoisted. Copies of catalog or information sheets shall be provided to verify rigging weights and capacities.

7. For built-up rigging devices, the contractor shall submit the following:

i. Details of the device, calling out material types, sizes, connections and other properties.

ii. Load test certification documents and/or design computations bearing the seal and signature of a Professional Engineer. Load test shall be performed in the configuration of its intended use as part of the subject demolition procedure.

iii. Copies of the latest inspection reports of the rigging device. The device shall be inspected within one (1) calendar year of the proposed date for use.

8. A detail shall be provided showing the crane outrigger setup, including dimensions from adjacent slopes or facilities. The detail shall indicate requirements for bearing surface preparation, including material requirements and compaction efforts. As a minimum, outriggers and/or tracks shall bear on mats, positioned on level material with adequate bearing capacity.

9. A complete written narrative that describes the sequence of events, indicating the order of lifts and any repositioning or re-hitching of the crane(s).

#### IV. DEMOLITION PROCEDURE

A. The Agency or its Contractor shall submit a detailed procedure for a controlled demolition of any structure on, over, or adjacent to the ROW. The controlled demolition procedure must be approved by the Engineer prior to beginning work on the project.

B. Existing Condition of structure being demolished:

1. The Contractor shall submit as-built plans for the structure(s) being demolished

2. If as-built plans are unavailable, the Contractor shall perform an investigation of the structure, including any foundations, substructures, etc. The field measurements are to be made under the supervision of the Professional Engineer submitting the demolition procedure. Findings shall be submitted as part of the demolition means and methods submittal for review by the Engineer.

3. Any proposed method for temporary stabilization of the structure during the demolition shall be based on the existing plans or investigative findings, and submitted as part of the demolition means and methods for review by the Engineer.

C. Demolition work plans shall include a schematic plan depicting the proposed locations of the following, at various stages of the demolition:

1. All cranes and equipment, calling out the operating radii.

2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track

3. Proposed locations for stockpiling material or locations for truck loading

4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.

5. Note that no crane or equipment may be set on the CSX rails or track structure and no material may be dropped on CSX property.

D. Demolition submittal shall also include the following information:

1. All hoisting details, as dictated by Section III of this document.
2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e., torch/saw cutting various portions of the superstructure or substructure, dismantling splices, installing temporary bracing, etc.) shall be furnished so that the potential impact(s) to CSX operations may be assessed and eliminated or minimized.
3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.
4. Design and supporting calculations shall be prepared, signed, and sealed by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSX forces, at the expense of the Agency or its contractor.

E. Girders or girder systems shall be stable at all times during demolition. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).

F. Existing, obsolete, bridge piers shall be removed to a minimum of three feet (3'-0") below the finished grade, final ditch line invert, or as directed by the Engineer.

G. A minimum quantity of twenty five (25) tons of CSX approved granite track ballast may be required to be furnished and stockpiled on site by the Contractor, or as directed by the Engineer.

H. The use of acetylene gas is prohibited for use on or over CSX property. Torch cutting shall be performed utilizing other materials such as propane.

I. CSX's tracks, signals, structures, and other facilities shall be protected from damage during demolition of existing structure or replacement of deck slab.

J. Demolition Debris Shield

1. On-track or ground-level debris shields (such as crane mats) are prohibited for use by CSX.
2. Demolition Debris Shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the structure. The demolition debris shield shall be erected from the underside of the bridge over the track area to catch all falling debris. The debris shield shall not be the primary means of debris containment.
  - i. The demolition debris shield design and supporting calculations, all signed/sealed by a Professional Engineer, shall be submitted for review and acceptance.
  - ii. The demolition debris shield shall have a minimum design load of 50 pounds per square foot (50 psf) plus the weight of the equipment, debris, personnel, and all other loads.

iii. The Contractor shall verify the maximum particle size and quantity of the demolition debris generated during the procedure does not exceed the shield design loads. Shield design shall account for loads induced by particle impact; however the demolition procedure shall be such that impact forces are minimized. The debris shield shall not be the primary means of debris containment.

iv. The Contractor shall include installation/removal means and methods for the demolition debris shield as part of the proposed Controlled Demolition procedure submission.

v. The demolition debris shield shall provide twenty three feet (23'-0") minimum vertical clearance, or maintain the existing vertical clearance if the existing clearance is less than twenty three feet (23'-0").

vi. Horizontal clearance to the centerline of the track should not be reduced unless approved by the Engineer.

vii. The Contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Engineer.

#### K. Vertical Demolition Debris Shield

1. This type of shield may be required for substructure removals in close proximity to CSX track and other facilities, as determined by the Engineer.
2. The Agency or its Contractor shall submit detailed plans with detailed calculations, prepared, signed, and sealed by a Professional Engineer, of the protection shield.

### V. ERECTION PROCEDURE

A. The Agency or its Contractor shall submit a detailed procedure for erection of a structure with Potential to Foul. The erection procedure must be approved by the Engineer prior to beginning work on the project.

B. Erection work plans shall include a schematic plan depicting the following, at all stages of the construction:

1. All proposed locations of all cranes and equipment, calling out the operating radii.
2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track.
3. All proposed locations for stockpiling material or locations for truck loading.
4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.

C. No crane or equipment may be set on the CSX rails or track structure and no material may be dropped on CSX property.

D. For erection of a structure over the tracks, the following information shall be submitted for review and acceptance by the Engineer, at least thirty (30) days prior to erection:

1. As-built beam seat elevations – field surveyed upon completion of pier/abutment construction.
2. Current Top of Rail (TOR) elevations – field measured at the time of as-built elevation collection.
3. Computations verifying the anticipated minimum vertical clearance in the final condition which accounts for all deflection and camber, based upon the current TOR and as-built beam seat elevations. The anticipated minimum

vertical clearance shall be greater than or equal to that which is indicated by the approved plans. Vertical clearance (see definitions) is measured from TOR to the lowest point on the overhead structure at any point within six feet (6'-0") from centerline of the track. Calculations shall be signed and sealed by a Professional Engineer.

E. Girders or girder systems shall be stable at all times during erection. No crane may unhook prior to stabilizing the beam or girder.

1. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).
2. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer.
3. Temporary bracing shall not be removed until sufficient lateral bracing or diaphragm members have been installed to establish a stable condition. Supporting calculations, furnished by the Professional Engineer, shall confirm the stable condition.

F. Erection procedure submissions shall also include the following information:

1. All hoisting details, as dictated by Section III of this document.
2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e., performing aerial splices, installing temporary bracing, installation of diaphragm members, etc.) shall be furnished so that the potential impact(s) to CSX operations may be assessed and eliminated or minimized.
3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.
4. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSX forces, at the expense of the Agency or its Contractor.
5. Design and supporting calculations prepared by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review.

## VI. TEMPORARY EXCAVATION AND SHORING

A. The Agency or its Contractor shall submit a detailed design and procedure for the installation of a sheeting/shoring system adjacent to the tracks. Shoring protection shall be provided when excavating with Potential to Foul, or as otherwise determined by CSX. Shoring shall be provided in accordance with the AREMA, except as noted below.

B. Shoring may not be required if all of the following conditions are satisfied:

1. The excavation does not encroach within the Theoretical Live Load Influence Zone. Please refer to Figure 1.
2. The track structure is situated on level ground, or in a cut section, and on stable soil.
3. The excavation does not adversely impact the stability of a CSX facility (i.e., signal bungalow, drainage facility, undergrade bridge, building, etc), or the stability of any structure on, over, or adjacent to CSX property with potential to foul.
4. Shoring is not required by any governing federal, state, local or other construction code.

C. Shoring is required when excavating the toe of an embankment. Excavation of any embankment which supports an active CSX track structure without shoring will not be permitted.

D. Trench boxes are not an acceptable means of shoring. Trench boxes are prohibited for use on CSX property or within the Theoretical Railroad Live Load Influence Zone.

E. Shoring shall be a cofferdam-type, which completely encloses the excavation. However, where justified by site or work conditions, partial cofferdams with open sides away from the track may be permissible, as determined by the Engineer.

F. Cofferdams shall be constructed using interlocking steel sheet piles, or when approved by the Engineer, steel soldier piles with timber lagging. Wales and struts shall be included when dictated by the design.

G. The use of tiebacks can be permissible for temporary shoring systems, when conditions warrant. Tiebacks shall have a minimum clear cover of 6'-0", measured from the bottom of the rail. Upon completion of the work, tiebacks shall be grouted, cut off, and remain in place.

H. All shoring systems on, or adjacent to CSX right-of-way, shall be equipped with railings or other fall protection, compliant with the governing federal, state or local requirements. Area around pits shall be graded to eliminate all potential tripping hazards.

I. Interlocking steel sheet piles shall be used for shoring systems qualifying one or more of the following conditions:

1. Within 18'-0" of the nearest track centerline
2. Within the live load influence zone
3. Within slopes supporting the track structure
4. As otherwise deemed necessary by the Engineer.

J. Sheet piles qualifying for one or more of the requirements listed in Section VI.I (above) of this document shall not be removed. Sheet piles shall be left in place and cut off a minimum of 3'-0" below the finished grade, the ditch line invert, or as otherwise directed by the Engineer. The ground shall be backfilled and compacted immediately after sheet pile is cut off.

K. The following design considerations shall be considered when preparing the shoring design package:

1. Shoring shall be designed to resist a vertical live load surcharge of 1,880 lbs. per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, eight feet six inches (8'-6") wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in AREMA Manual for Railway Engineering, Chapter 8, Part 20.
2. Allowable stresses in materials shall be in accordance with AREMA Chapter 7, 8, and 15.3.
3. A minimum horizontal clearance of ten feet (10'-0") from centerline of the track to face of nearest point of shoring shall be maintained, provided a twelve feet (12'-0") roadbed is maintained with a temporary walkway and handrail system.



4. For temporary shoring systems with Potential to Foul, piles shall be plumb under full dead load. Maximum deflection at the top of wall, under full live load, shall be as follows:

- i. One-half (1/2) inch for walls within twelve feet (12'-0") of track centerline (Measured from centerline of the nearest track to the nearest point of the supporting structure).
- ii. One (1) inch for walls located greater than twelve feet (12'-0") from track centerline

L. Shoring work plans shall be submitted in accordance with Section II of this document, as well as the following additional requirements:

1. The work plan shall include detailed drawings of the shoring systems calling out the sizes of all structural members, details of all connections. Both plan and elevation drawings shall be provided, calling out dimensions from the face of shoring relative to the nearest track centerline. The elevation drawing shall also show the height of shoring, and track elevation in relation to bottom of excavation.
2. Full design calculations for the shoring system shall be furnished.
3. A procedure for cutting off the sheet pile, backfilling and restoring the embankment.

## VII. TRACK MONITORING

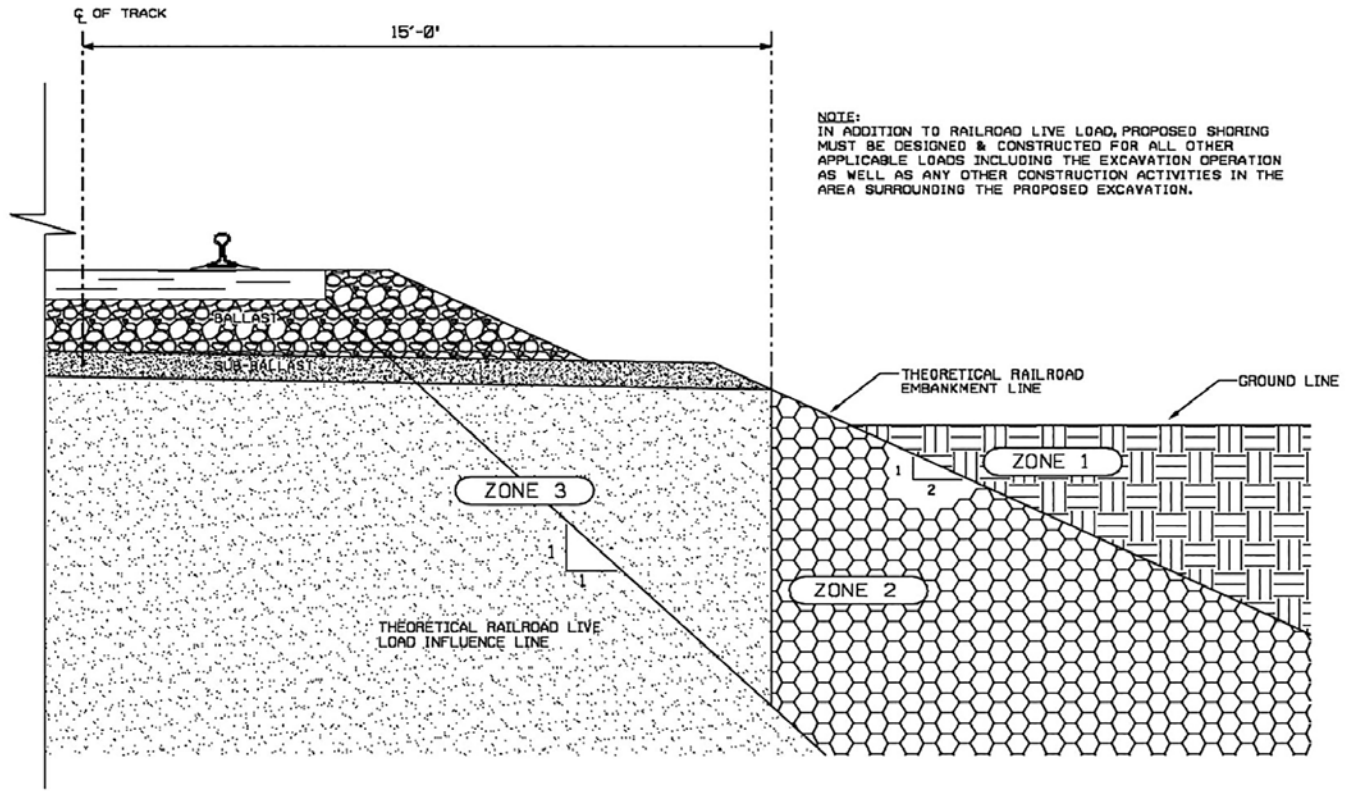
A. When work being performed has the potential to disrupt the track structure, a work plan must be submitted detailing a track monitoring program which will serve to monitor and detect both horizontal and vertical movement of the CSX track and roadbed.

B. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. CSX reserves to the right to modify the survey locations and monitoring frequency as necessary during the project.

C. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Engineer for analysis.

D. If any movement has occurred as determined by the Engineer, CSX will be immediately notified. CSX, at its sole discretion, shall have the right to immediately require all contractor operations to be ceased, have the excavated area immediately backfilled and/or determine what corrective action is required. Any corrective action required by CSX or performed by CSX including the monitoring of corrective action of the contractor will be at project expense.

FIGURE 1: Theoretical Live Load Influence Zone



**NORMAL REQUIREMENTS FOR SHORING ADJACENT TO TRACK**



ZONE 1 - EXCAVATIONS ABOVE AND OUTSIDE OF THE THEORETICAL RAILROAD EMBANKMENT LINE - DO NOT NORMALLY REQUIRE SHORING TO PROTECT RAILROAD ROADBED, SHORING MAY BE REQUIRED FOR OTHER REASONS.



ZONE 2 - EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 2 REQUIRE SHORING, BUT THE SHORING MAY NORMALLY BE PULLED AFTER THE EXCAVATION HAS BEEN BACKFIELD.



ZONE 3 - EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 3 WILL NORMALLY REQUIRE THE SHORING TO BE LEFT IN PLACE AND CUT-OFF 3' BELOW BASE OF RAIL. SHORING MUST BE DESIGNED FOR COOPER E88 LIVE LOAD

Visalia, Kenton County, KY KYTC  
Project No. FD55 121 94140 02U  
CSXT Milepost: 0KC-13.97  
CSXT OP No.: KY0521

**EXHIBIT D**

**CONTRACTOR'S ACCEPTANCE**

To and for the benefit of the *Company*, ("*Company*") and to induce the *Company* to permit Contractor on or about *Company's* property for the purposes of performing work in accordance with the Agreement dated \_\_\_\_\_, 20\_\_, between the Commonwealth of Kentucky Transportation Cabinet, Department of Highways and the *Company*, Contractor hereby agrees to abide by and perform all applicable terms of the Agreement, including, particularly Exhibits B and C as included herein.

Contractor: \_\_\_\_\_

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

## SPECIAL NOTE FOR RAILROAD FLAGGING

Unless otherwise noted, Section references herein are to the Department's Standard Specifications for Road and Bridge Construction. All applicable portions of the Department's Standard Specifications apply unless specifically modified herein.

- 1. DESCRIPTION.** It is estimated this project will require 180 days of railroad flagging. Guidelines for determining when flagging protection will be needed are included in the Special Provisions for Protection of Railroad Interest. The Daily Rate for this project will be \$1,500.00
- 2. DEFINITION OF FLAGGING.** The particular Railroad(s) involved in this project will define when flagging is required (see Summary for KYTC Projects That Involve a Railroad and Special Provisions for Protection of Railroad Interest) and the number of flaggers needed. At least 2 weeks notice is required before flagging will be provided, but it could take up to 30 days. It will remain the Contractor's responsibility to schedule work including any down time (such as winter) so as to minimize the use of flagging services. The Department retains no responsibility for coordinating flagging services between the Railroad and the Contractor.
- 3. REDUCTION AND EXTENSION OF RAILROAD FLAGGING TIME.** Based upon the Kentucky Standard Specifications, any changes in contract time for this project will be by change order. If the nature of the work in the change order necessitates additional use of railroad flagging services, then that shall be identified in that change order and the number of calendar days for railroad flagging services shall be increased. By signing the change order, the contractor waives all rights to any future request to change the number of days of railroad flagging associated with the work in that change order. Since the number of days involves the cost to the Department and not the Contractor, the number of days of railroad flagging shall not be reduced.
- 4. MEASUREMENT.** The Department will keep track of calendar days that railroad flagging is performed. This will include any day that any railroad flagger charges a minimum of 5 hours of onsite flagging. Except that from April 1<sup>st</sup> thru November 30<sup>th</sup> this will not include days where the Contractor cannot perform at least 5 hours of the work that necessitates railroad flagging due to weather, seasonal, or temperature limitations of the Specifications, or other conditions beyond the control of the Contractor as judged by the Engineer. From Dec 1<sup>st</sup> thru March 30<sup>th</sup> any day that any railroad flagger charges a minimum of 5 hours of onsite flagging then a calendar day of railroad flagging will be counted; without regard to weather, seasonal or temperature limitations of the Specifications. The Engineer will furnish the Contractor bi-weekly statements showing the number of railroad flagging days charged for the period. The Contractor acknowledges acceptance of, and agreement with, all bi-weekly statements unless the Contractor submits a written protest containing supporting evidence for a change within 14 calendar days of receiving the bi-weekly statement.

If the number of calendar days of railroad flagging has exceeded 180 days, then the Contractor will be charged for each day that additional flagging is needed multiplied by the Daily Rate. This will be in addition to any liquidated damages or other reimbursements that the contract or the Kentucky Standard Specifications may require. This charge will continue, based upon actual flagging use, until Formal Acceptance.

If upon Formal Acceptance the total number of calendar days that railroad flagging is performed is less than 180 days no additional monies will be given to the Contractor.

# SPECIAL NOTE FOR DYNAMIC PILE TESTING

## Kenton (6-10046) Ernstbridge Road over CSX Railroad

### 1.0 GENERAL

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

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

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

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

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

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

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

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

<b>Table 2 - General Testing and Analysis Requirements</b>		
<b>Item</b>	<b>Requirement</b>	
Wave Equation Analysis	Minimum of 1 and sufficient additional analyses as needed to define performance for all combinations of piles, driving systems and subsurface conditions anticipated.	
Dynamic Testing Pile Resistance (i.e. Capacity)	Required Nominal Pile Resistance (i.e. Ultimate Pile Capacity) as shown in the plans and/or as directed by the Engineer.	
End of Initial Driving Test Frequency	Minimum of 1 production pile for each substructure or as directed by the Engineer during the final 25 feet of initial driving	
Beginning of Restrike Test Frequency	Minimum of 1 production pile for each substructure or as directed by the Engineer.	
Time Interval between End of Initial Driving and Restrike	Minimum of 72 hours unless stated otherwise elsewhere in the contract documents and/or directed otherwise by the Engineer based on the criteria below.	
	<b>Soil Type</b>	<b>Time Delay Until Restrike</b>
	Clean Sands	24 hours
	Silty Sands	48 hours
	Sandy Silts	72 – 120 hours
	Silts and Clays	7 - 14 Days
Shales	7 Days	
Pile Driving Analyses using Signal Matching Techniques	For each End of Initial Driving Test and each Beginning of Restrike Test	
<b>Perform testing and analyses in accordance with this table and ASTM D 4945, <i>High-Strain Dynamic Testing of Piles</i>.</b>		

## 2.0 TESTING AND ANALYSES

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

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

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

**2.1.1** Acceptance by the Engineer of the proposed pile driving system will be based upon the wave equation analyses indicating that the proposed system can develop the specified pile resistance (i.e. capacity) at a pile driving rate of 3 to 10 blows per inch (36 to 120 blows/ft.) at the end of driving and beginning of restrrike, and within allowable driving compressive stress of 90% of the yield stress of the piles. Provide preliminary pile driving criteria based on wave equation analyses and any anticipated resistance (i.e. capacity) changes after driving, set-up or relaxation, subject to revision based upon dynamic pile testing field measurements.

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

## 2.2 High-Strain Dynamic Pile Testing

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

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



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

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

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

## **2.3 Field Testing**

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

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

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

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

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

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

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

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

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

**Make any required adjustments to the fuel and/or power setting of the hammer** if necessary to verify the resistance at a pile driving rate of 3 to 10 blows per inch (36 to 120 blows/ft.) at the end of driving and beginning of restrike and within allowable driving compressive stress of 90% of the yield stress of the piles or to meet other applicable testing objectives.

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

**2.3.4.2** Perform the restrike test with a warmed-up hammer by striking the pile a minimum of 10 blows unless testing equipment indicates overstressing or damage to the pile. If such overstressing or damage to the pile is indicated, immediately discontinue driving and notify the Engineer. Unless directed otherwise by the Engineer perform a redrive with dynamic testing for the remaining length of the test pile unless excessive driving stresses are encountered. In the event initial restrike testing indicates a pile resistance below the specified resistance, an additional restrike test after the redrive may be required as directed by the Engineer.

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

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

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

### **3.0 DYNAMIC PILE TEST REPORTS**

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

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

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

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

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

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

#### 4.0 INCIDENTAL EQUIPMENT

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

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

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

**5.0 METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

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

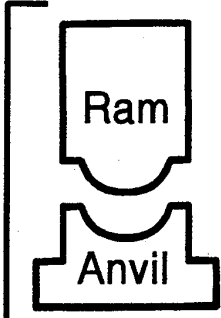
Payment will be made under:

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

Contract No.: _____		Structure Name and/or No.: _____	
Project: _____		Pile Driving Contractor or Subcontractor: _____	
County: _____		(Piles driven by)	

Hammer Components




**Hammer**

Manufacturer: \_\_\_\_\_ Model No.: \_\_\_\_\_  
 Hammer Type: \_\_\_\_\_ Serial No.: \_\_\_\_\_  
 Manufacturers Maximum Rated Energy: \_\_\_\_\_ (ft. - lb.)  
 Stroke at Maximum Rated Energy: \_\_\_\_\_ (ft.)  
 Range in Operating Energy: \_\_\_\_\_ to \_\_\_\_\_ (ft. - lb.)  
 Range in Operating Stroke: \_\_\_\_\_ to \_\_\_\_\_ (ft.)  
 Ram Weight: \_\_\_\_\_ (lb.)  
 Modifications: \_\_\_\_\_


Striker Plate



Weight: \_\_\_\_\_ (lb.) Diameter: \_\_\_\_\_ (in.)  
 Thickness: \_\_\_\_\_ (in.)

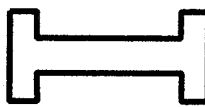
Hammer Cushion



Material #1	Material #2 (for Composite Cushion)
Name: _____	Name: _____
Area: _____ (in. <sup>2</sup> )	Area: _____ (in. <sup>2</sup> )
Thickness/Plate: _____ (in.)	Thickness/Plate: _____ (in.)
No. of Plates: _____	No. of Plates: _____
Total Thickness of Hammer Cushion: _____	


Helmet (Drive Head)



Weight: \_\_\_\_\_ (lb.)


Pile Cushion



Material: \_\_\_\_\_  
 Area: \_\_\_\_\_ (in.<sup>2</sup>) Thickness/Sheet: \_\_\_\_\_ (in.)  
 No. of Sheets: \_\_\_\_\_  
 Total Thickness of Pile Cushion: \_\_\_\_\_ (in.)

Pile



Pile Type: \_\_\_\_\_  
 Wall Thickness: \_\_\_\_\_ (in.) Taper: \_\_\_\_\_  
 Cross Sectional Area: \_\_\_\_\_ (in.<sup>2</sup>) Weight/Foot: \_\_\_\_\_  
 Ordered Length: \_\_\_\_\_ (ft.)  
 Design Load: \_\_\_\_\_ (kips)  
 Ultimate Pile Capacity: \_\_\_\_\_ (kips)

Description of Splice: \_\_\_\_\_

Driving Shoe/Closure Plate Description: \_\_\_\_\_

Submitted By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

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

## Appendix

### Physical:

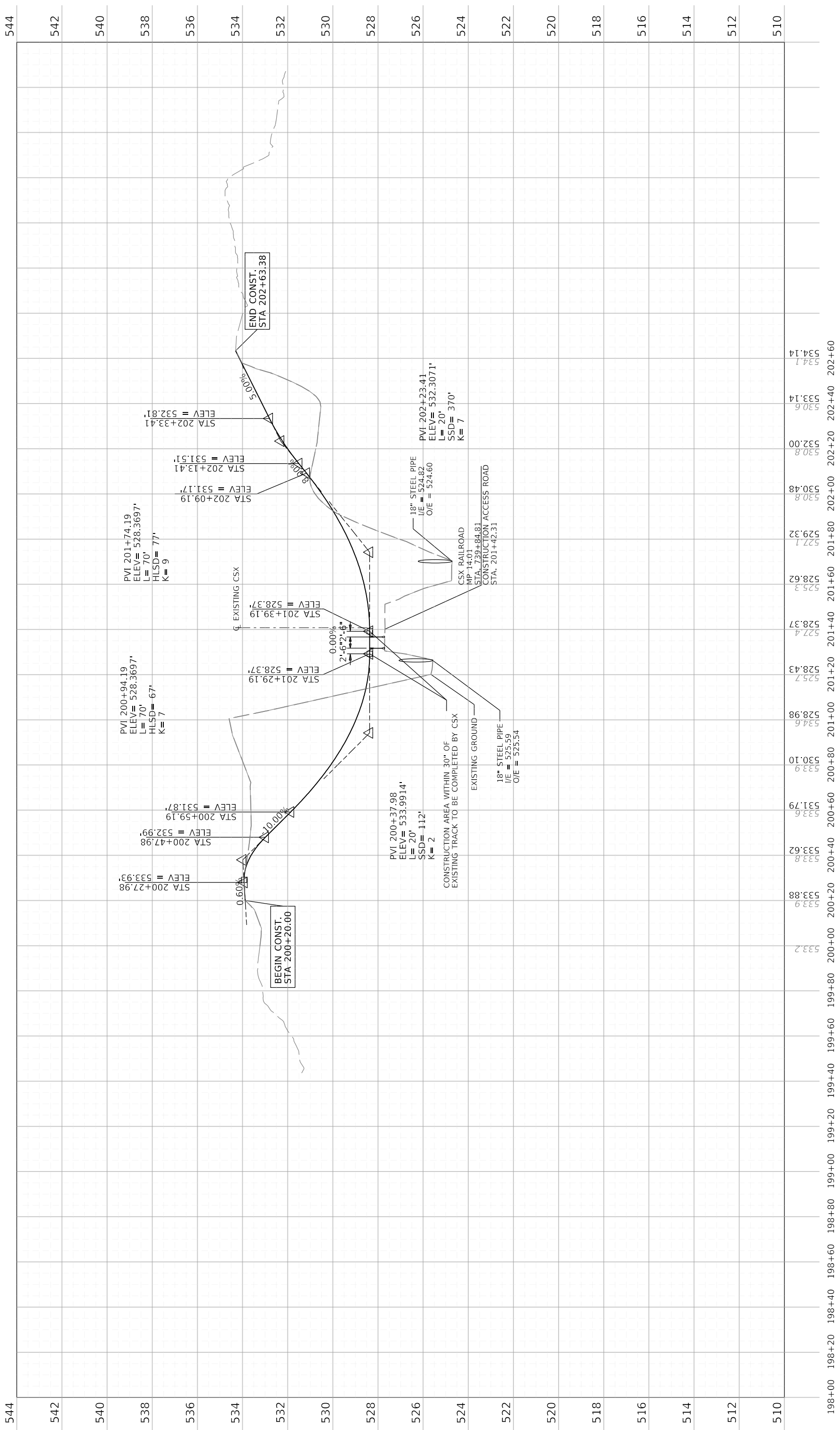
Size: 100mm X 190mm X 50mm (4 inches X 7.5 inches X 2 inches)  
Weight: 0.7 kg (1.5 lb.)  
Temperature range: -10 to 50°C (14 to 104°F) operating  
Power: built-in rechargeable battery w/ 8 hour min duration  
Display: LCD, 4 Lines x 16 characters, viewing area 62 mm by 26 mm (2.5 inches by 1 inch) 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

### Electronic:

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

### Functional and Other:

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



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**COMMONWEALTH OF KENTUCKY**  
DEPARTMENT OF HIGHWAYS

**DRAWING TITLE: CONSTRUCTION ACCESS ROAD**  
PROFILE SHEET

ITEM NO.  
06-10046.00  
SHEET NO.  
R7

COUNTY OF  
KENTON

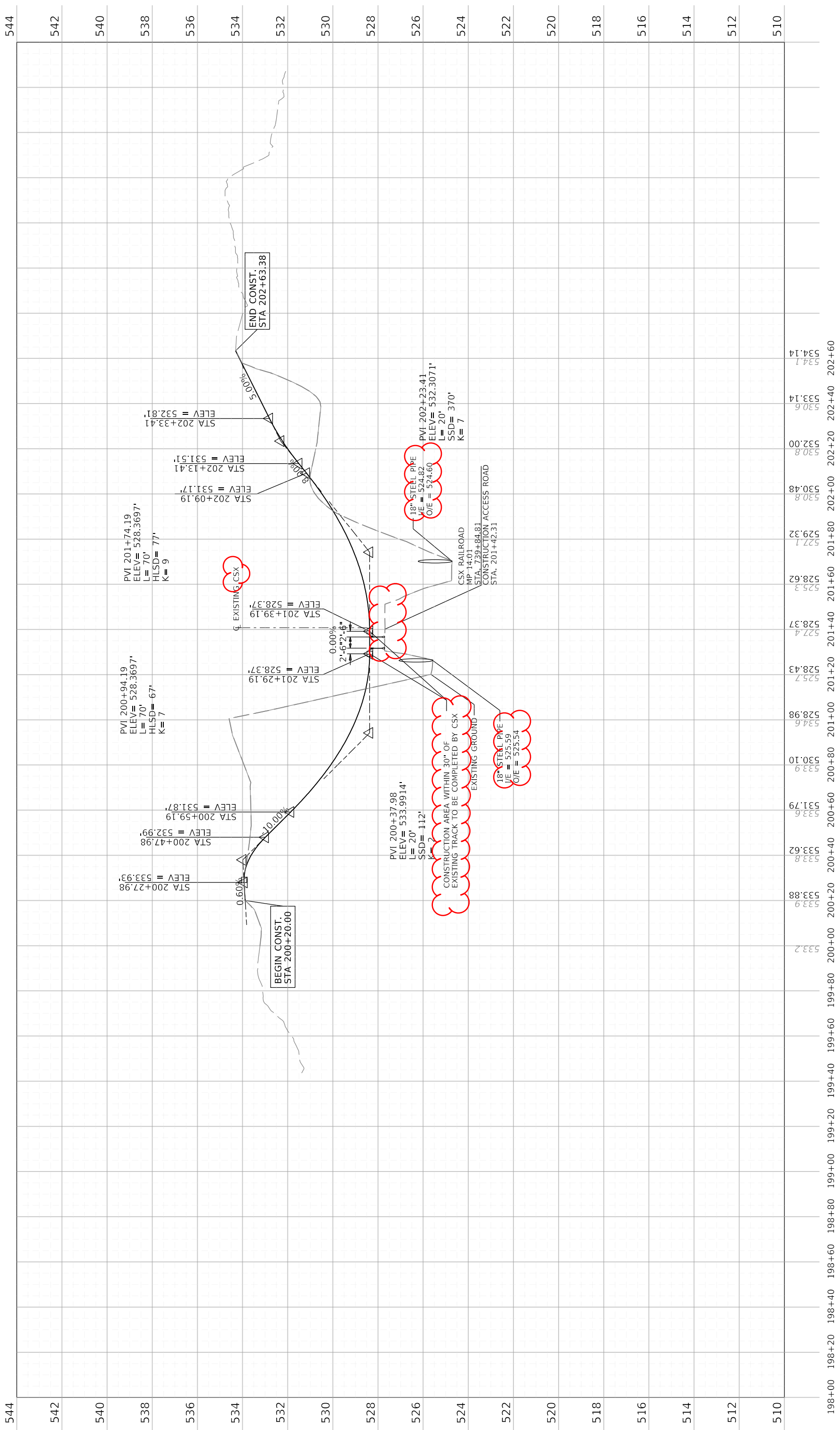
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VERTICAL SCALE: 1"=2'

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198+00 198+20 198+40 198+60 198+80 199+00 199+20 199+40 199+60 199+80 200+00 200+20 200+40 200+60 200+80 201+00 201+20 201+40 201+60 201+80 202+00 202+20 202+40 202+60

COMMONWEALTH OF KENTUCKY  
DEPARTMENT OF HIGHWAYS

**DRAWING TITLE: CONSTRUCTION ACCESS ROAD  
PROFILE SHEET**

ITEM NO.  
06-10046.00

SHEET NO.  
R7

COUNTY OF  
KENTON

HORIZONTAL SCALE: 1"=20'

VERTICAL SCALE: 1"=2'

DATE PLOTTED: 9/7/2005 7:08:02 PM  
FILE NAME: C:\BMS\WSP-US-PW\02\00732877\06\_10046\_00\_R7\_CONST\_PROFILE.DGN  
USER: USAM669455