



Matthew G. Bevin
Governor

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

Greg Thomas
Secretary

April 12, 2018

CALL NO. 306
CONTRACT ID NO. 182160
ADDENDUM # 1

Subject: FAYETTE COUNTY, FD05 034 0922 005-010
Letting April 27, 2018

- (1) Revised - Proposal Bid Items - Page 37 of 37
- (2) Added - Special Notes- Pages 1-10 of 10

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 cursive script that reads "Rachel Mills".

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

RM:mr
Enclosures



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PROPOSAL BID ITEMS

Report Date 4/12/18

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	20.00	TON		\$	
0020	00190		LEVELING & WEDGING PG64-22	299.00	TON		\$	
0030	00221		CL2 ASPH BASE 0.75D PG64-22	120.00	TON		\$	
0040	00307		CL2 ASPH SURF 0.38B PG64-22	2,615.00	TON		\$	
0050	00356		ASPHALT MATERIAL FOR TACK	26.00	TON		\$	
0060	02562		TEMPORARY SIGNS	190.00	SQFT		\$	
0070	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0080	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0090	02677		ASPHALT PAVE MILLING & TEXTURING	35.00	TON		\$	
0100	02697		EDGELINE RUMBLE STRIPS	32,335.00	LF		\$	
0110	06510		PAVE STRIPING-TEMP PAINT-4 IN	66,000.00	LF		\$	
0120	06514		PAVE STRIPING-PERM PAINT-4 IN	66,000.00	LF		\$	
0130	06568		PAVE MARKING-THERMO STOP BAR-24IN	40.00	LF		\$	
0140	10020NS		FUEL ADJUSTMENT	4,723.00	DOLL	\$1.00	\$	\$4,723.00
0150	10030NS		ASPHALT ADJUSTMENT	11,862.00	DOLL	\$1.00	\$	\$11,862.00
0151	24781EC		INTELLIGENT COMPACTION FOR ASPHALT (ADDED: 4-12-18)	2,615.00	TON		\$	
0152	24891EC		PAVE MOUNT INFRARED TEMP EQUIPMENT (ADDED: 4-12-18)	427,815.00	SF		\$	
0153	24986EC		HMA ELECTRONIC DELIVERY MGMT SYSTEM (ADDED: 4-12-18)	1.00	L S		\$	

Section: 0002 - DEMOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0160	02569		DEMOBILIZATION	1.00	LS		\$	

SPECIAL NOTE FOR INTELLIGENT COMPACTION OF ASPHALT MIXTURES

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

1.0 DESCRIPTION. Provide and use Intelligent Compaction (IC) Rollers for compaction of all asphalt mixtures.

2.0 MATERIALS AND EQUIPMENT. In addition to the equipment specified in Subsection 403.02, a minimum of one (1) IC roller is to be used on the project at all times. The Contractor may elect to only use one (1) IC roller for compaction, but two (2) IC rollers are preferred as any combination of the breakdown, intermediate and finish rollers in the roller train. All IC rollers will meet the following minimum characteristics:

- 1) Are self-propelled double-drum vibratory rollers equipped with accelerometers mounted in or about the drum to measure the interactions between the rollers and compacted materials in order to evaluate the applied compactive effort. The IC rollers must have the approval of the Engineer prior to use. Examples of rollers equipped with IC technology can be found at www.IntelligentCompaction.com.
- 2) Are equipped with non-contact temperature sensors for measuring pavement surface temperatures.
- 3) The output from the roller is designated as the IC-MV which represents the stiffness of the materials based on the vibration of the roller drums and the resulting response from the underlying materials.
- 4) Are equipped with integrated on-board documentation systems that are capable of displaying real-time color-coded maps of IC measurement values including the stiffness response values, location of the roller, number of roller passes, machine settings, together with the material temperature, speed and the frequency and amplitude of roller drums. Ensure the display unit is capable of transferring the data by means of a USB port or through wireless transmission.
- 5) Are equipped with a mounted Global Positioning System GPS radio and receiver either a Real Time Kinematic (RTK-GPS) or Global Navigational Satellite System (GNSS) units that monitor the location and track the number of passes of the rollers. Accuracy of the positioning system is to be a minimum of 12 inches.

3.0 WORK PLAN. Submit to the Engineer an IC Work Plan at the Preconstruction Conference and at least 2 weeks prior to the beginning of construction. Describe in the work plan the following:

1. Compaction equipment to be used including:
 - Vendor(s)
 - Roller model(s),
 - Roller dimensions and weights,
 - Description of IC measurement system,
 - GPS capabilities
 - Documentation system,
 - Temperature measurement system, and
 - Software.
2. Roller data collection methods including sampling rates and intervals and data file types.
3. Transfer of data to the Engineer including method, timing, and personnel responsible. Data transfer shall occur at minimum twice per day or as directed by the Engineer and is to be electronic.
4. Training plan and schedule for roller operators, project foreman, project surveyors, quality control technicians, and Cabinet personnel including project engineers and field inspectors; including both classroom and field training. Training should be conducted at least 1 week before beginning IC construction. The training is to be performed by a qualified representative(s) from the IC Roller manufacture(s) to be used on the project. The training should be 4-8 hours in duration and minimum training topics shall include:

1. Background information for the specific IC system(s) to be used
2. Setup and checks for IC system(s), GPS receiver, base-station and hand held rovers
3. Operation of the IC system(s) on the roller; i.e., setup data collection, start/stop of data recording, and on-board display options
4. Transferring raw IC data from the rollers(s)
5. Operation of vendor's software to open and view raw IC data files and exporting all-passes and proofing data files in Veda-compatible format
6. Operation of Veda software to import the above exported all-passes and proofing data files, inspection of IC maps, input point test data, perform statistics analysis, and produce reports for project requirements
7. Coverage and uniformity requirements

4.0 CONSTRUCTION. Do not begin work until the Engineer has approved the IC submittals and the IC equipment.

Follow requirements established in Section 400 for production and placement, materials, equipment, acceptance plans and adjustments except as noted or modified in this Specification. Provide the Engineer at least one day's notice prior to beginning construction or prior to resuming production if operations have been temporarily suspended. Ensure paving equipment complies with all requirements specified in Section 400. The IC roller temperatures will be evaluated by the Department with the data from a Paver Mounted Infrared Temperature Gauge.

A. Pre-Construction Test Section(s) Requirements

1. Prior to the start of production, ensure the proper setup of the GPS, IC roller(s) and the rover(s) by conducting joint GPS correlation and verification testing between the Contractor, GPS representative and IC roller manufacturer using the same datum.

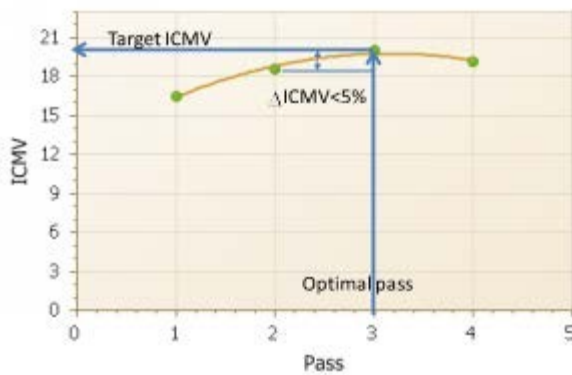
1. Ensure GPS correlation and verification testing includes the following minimum processes:
 - a. Establish the GPS system to be used either one with a base station or one with mobile receivers only. Ensure all components in the system are set to the correct coordinate system; then,
 - b. Verify that the roller and rover are working properly and that there is a connection with the base station; then,
 - c. Record the coordinates of the two edges where the front drum of the roller is in contact with the ground from the on-board, color-coded display; then,
 - d. Mark the locations of the roller drum edges and move the roller, and place the mobile receiver at each mark and record the readings; then,
2. Compare coordinates between the roller and rover receivers. If the coordinates are within 12.0 in. of each other, the comparison is acceptable. If the coordinates are not within 12.0 in., diagnose and perform necessary corrections and repeat the above steps until verification is acceptable.
3. Do not begin work until acceptable GPS correlation and verification has been obtained.
4. The Contractor and the Department should conduct random GPS verification testing during production to ensure data locations are accurate. The recommended rate is once per day with a requirement of at least once per week.

5. All acceptance testing shall be as outlined in Standard Specifications Section 400.

B. Construction Test Section(s) Requirements

Construct test section(s) at location(s) agreed on by the Contractor and the Engineer within the project limits. The test section is required to determine a compaction curve of the asphalt mixtures in relationship to number of roller passes and to the stiffness of mixture while meeting the Department in-place compaction requirements. All rollers and the respective number of passes for each is to be determined via control strip each time a material change, equipment change or when the Engineer deems necessary.

Conduct test section(s) on every lift and every asphalt mixture. Ensure test section quantities 1,000 tons of mainline mixtures. Operate IC rollers in the low to medium amplitude range and at the same settings (speed, frequency) throughout the section while minimizing overlapping of the roller, **the settings are to be used throughout the project with no changes**. After each roller pass, the qualified technician from the contractor observed by the Department will use a nondestructive nuclear gauge that has been calibrated to the mixture to estimate the density of the asphalt at 10 locations uniformly spaced throughout the test section within the width of a single roller pass. The density readings and the number of roller passes needed to achieve the specified compaction will be recorded. The estimated target density will be the peak of the average of the nondestructive readings within the desired compaction temperature range for the mixture. The IC roller data in conjunction with the Veda software will create an IC compaction curve for the mixture. The target IC-MV is the point when the increase in the IC-MV of the material between passes is less than 5 percent on the compaction curve. The IC compaction curve is defined as the relationship between the IC-MV and the roller passes. A compaction curve example is as follows:



Subsequent to the determination of the target IC-MV, compact an adjoining > 250 < 500 tons section using same roller settings and the number of estimated roller passes and allow the Department to verify the compaction with the same calibrated nondestructive nuclear gauge following the final roller pass. The Department will obtain cores at 10 locations, uniformly spaced throughout the test section within the width of the single roller. Obtain GPS measurement of the core locations with a GPS rover. Use the Veda software to perform least square linear regression between the core data and IC-MV in order to correlate the production IC-MV values to the Department specified in-place air voids. A sample linear regression curve example is as follows.



C. Construction Requirements

Use the IC roller on all lifts and types of asphalt within the limits of the project.

During construction, the Quality Control Technician shall be responsible for the following minimum functions:

1. Daily GPS check testing for the IC roller(s) and rover(s).
2. Test section construction to establish target compaction pass counts and target values for the strength of the materials using the standard testing devices; i.e., Nondestructive density gauges, pavement cores, and IC roller(s).
3. Monitoring of the construction operations and the IC roller(s) during production and final evaluation operations.
4. Quality control testing to monitor the pavement temperature and the required level of compaction.
5. Daily download and analysis of the IC data from the roller(s).
6. Daily set-up, take down and secure storage of GPS and IC roller components

Ensure the optimal number of roller passes determined from the test sections has been applied to a minimum coverage of 80% of the individual IC Construction area. Ensure a minimum of 75% of the individual IC Construction area meets the target IC-MV values determined from the test sections.

Do not continue paving operations if IC Construction areas not meeting the IC criteria are produced until they have been investigated by the Department. Obtain the Engineer's approval to resume paving operations. Non-IC rollers are allowed to be used as the third roller on the project; one of the breakdown or the finish rollers is to be equipped with IC technology.

The Contractor shall coordinate for on-site technical assistance from the IC roller representatives during the initial seven (7) days of production and then as needed during the remaining operations. As a minimum, the roller representative shall be present during the initial setup and verification testing of the IC roller(s). The roller representative shall also assist the Contractor with data management using the data analysis software including IC data input and processing.

IC Construction areas are defined as subsections of the project being worked continuously by the Contractor. The magnitude of the IC Construction areas may vary with production but must be at least 750 tons per mixture for evaluation. Partial IC Construction areas of < 750 tons will be included in the previous area evaluation. IC Construction areas may extend over multiple days depending on the operations.

The IC Construction Operations Criteria does not affect the Department's acceptance processes for the materials or construction operations

5.0 MEASUREMENT. The Department will measure the total tons of asphalt mixtures compacted using the IC roller(s). Compaction is to be performed by a minimum of one IC roller, material compacted by rollers not equipped with properly functioning IC equipment will not be accepted for payment of the bid item asphalt mixtures IC rolled. Use of non-IC rollers can be accepted on small areas due to equipment malfunctions at the written approval of the Engineer. Paving operations should be suspended for equipment malfunctions that will extend over three days of operation.

6.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

1. Payment is full compensation for all work associated with providing IC equipped rollers, transmission of electronic data files, two copies of IC roller manufacturer software, and training.

- 2. Delays due to GPS satellite reception of signals to operate the IC equipment or IC roller breakdowns will not be considered justification for contract modifications or contract extensions.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24781EC	Intelligent Compaction for Asphalt	TON

May 4, 2015

SPECIAL NOTE FOR PAVER MOUNTED TEMPERATURE PROFILES

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

1.0 DESCRIPTION. Provide paver mounted infrared temperature equipment to continually monitor the temperature of the asphalt mat immediately behind all paver(s) during the placement operations for all driving lanes (including ramps for Interstates and Parkways) within the project limits. Provide thermal profiles that include material temperature and measurement locations. Provide equipment measuring material temperature within the paver hopper and at the vibratory screed.

2.0 MATERIALS AND EQUIPMENT. In addition to the equipment specified in Subsection 403.02 utilize a thermal equipment supplier that can provide a qualified representative for onsite technical assistance during the initial setup, pre-construction verification, and data management and processing as needed during the project to maintain equipment within specifications and requirements.

Provide operator settings, user manuals, required viewing/export software for analysis. Ensure the temperature equipment will meet the following:

1. A device with one or more infrared sensors that is capable of measuring in at least 1 foot intervals across the paving width, with a minimum width of 12 feet, or extending to the recording limits of the equipment, whichever is greater. A Maximum of two (2) brackets are allowed in the influence area under the sensors. A temperature profile must be made on at least 1 foot intervals longitudinally down the road;
2. Infrared sensor(s):
 - Measuring from 32°F to 400°F with an accuracy of $\pm 2.0\%$ of the sensor reading;
3. Ability to measure the following:
 - The placement distance using a Global Positioning System (GPS) or a Distance Measuring Instrument (DMI) and a Global Positioning System (GPS)
 - Stationing;
4. GPS: Accuracy ± 4 feet in the X and Y Direction;
5. Latest version of software to collect, display, retain and analyze the mat temperature readings during placement. The software must have the ability to create and analyze:
 - Full collected width of the thermal profiles,
 - Paver speed and
 - Paver stops and duration for the entire Project;
6. Ability to export data automatically to a remote data server;

At the preconstruction meeting, provide the Department with rights to allow for web access to the data server. This web-based software must also provide the Department with the ability to download the raw files and software and to convert them into the correct format.

The thermal profile data files must provide the following data in a neat easy to read table format:

- Project information including Road Name and Number, PCN, Beginning and Ending MPs.
- IR Bar Manufacturer and Model number
- Number of Temperature Sensors (N)
- Spacing between sensors and height of sensors above the asphalt mat
- Total number of individual records taken each day (DATA BLOCK)
- Date and Time reading taken
- Latitude and Longitude
- Distance paver has moved from last test location
- Direction and speed of the paver
- Surface temperature of each of the sensors

3.0 CONSTRUCTION. Provide the Engineer with all required documentation at the pre-construction conference.

1. Install and operate equipment in accordance with the manufacturer's specifications.
2. Verify that the temperature sensors are within $\pm 2.0\%$ using an independent temperature device on a material of known temperature. Collect and compare the GPS coordinates from the equipment with an independent measuring device.
 - Ensure the independent survey grade GPS measurement device is calibrated to the correct coordinate system (using a control point), prior to using these coordinates to validate the equipment GPS.
 - The comparison is considered acceptable if the coordinates are within 4 feet of each other in the X and Y direction.
3. Collect thermal profiles on all Driving Lanes during the paving operation and transfer the data to the "cloud" network or if automatic data transmission is not available, transfer the data to the Engineer at the end of daily paving.
4. Contact the Department immediately when System Failure occurs. Daily Percent Coverage will be considered zero when the repairs are not completed within two (2) working days of System Failure. The start of this two (2) working day period begins the next working day after System Failure.
5. Evaluate thermal profile segments, every 150 feet, and summarize the segregation of temperature results. Results are to be labeled as Minimal $0^{\circ} \square 25^{\circ}\text{F}$, Moderate $25.1^{\circ} \square 50^{\circ}\text{F}$ and Severe $>50^{\circ}$. Severe readings over 3 consecutive segments or over 4 or more segments in a day warrant investigation on the cause of the differential temperature distribution.

4.0 MEASUREMENT. The Department will measure the total area of the driving lanes mapped by the infrared scanners. Full payment will be provided for all driving lanes with greater than 85% coverage. Partial payment will be made for all areas covered from 50% coverage to 85% coverage at the following rate Coverage area percentage X Total bid amount. Area with less than 50% coverage will not be measured for payment.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

1. Payment is full compensation for all work associated with providing all required equipment, training, and documentation.
2. Delays due to GPS satellite reception of signals or equipment breakdowns will not be considered justification for contract modifications or contract extensions.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24891EC	PAVE MOUNT INFRARED TEMP EQUIPMENT	SQFT

SPECIAL NOTE FOR HMA ELECTRONIC DELIVERY MANAGEMENT SYSTEM (HMA e-Ticketing)

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

1.0 DESCRIPTION. Incorporate a GPS Fleet Management System for all HMA delivered to the project in order to monitor, track, and report loads of HMA during the construction processes from the point of measurement and loading to the point of incorporation to the project.

2.0 MATERIALS AND EQUIPMENT. Submit to the Engineer for approval, no fewer than 30 days prior to HMA placement activities, a GPS fleet management system supplier that can provide a qualified representative for on-site technical assistance during the initial setup, pre-construction verifications, and data management and processing as needed during the Project to maintain equipment.

Provide operator settings, user manuals, training videos, and required viewing/export software for review. Provide equipment that will meet the following:

1. A wireless fleet management or GPS device that is capable of tracking all delivery trucks (both company-owned and third-party) must be installed on all trucks and equipment (dump trucks, belly dumps, side-load dumps, transfer vehicles, pavers, or any other trucks/vehicles) used to transfer and incorporate HMA into the project. KYTC personnel shall have the ability to access Real Time monitoring through the use of a mobile device such as an iPad, smartphone, etc.
2. The fleet management system shall be fully integrated with the Contractor's Load Read-Out scale system at the HMA plant site.
3. The fleet management system shall have the ability to measure and track vehicles and their contents (weights and material types) continuously from the plant site to the project site. The system shall have internal battery backup capabilities due to loss of power, and have the ability to store data if GPS connectivity is lost and transmit that same data when unit re-establishes connectivity. To be considered continuous, no two data points shall be more than 60 seconds apart unless the vehicle is stopped. Duration of stop time for any reason shall be recorded. The fleet management system shall have the ability to track the engagement of the truck PTO to indicate the dump the material.

3.0 CONSTRUCTION. Provide the Engineer with the manufacturer's specifications and all required documentation for data access at the pre-construction conference.

A. Construction Requirements

1. Install and operate equipment in accordance with the manufacturer's specifications.
2. Verify the GPS is working within the requirements of this Special Note.

B. Data Deliverables

Provide to the Engineer a means in which to gather report summaries by way of iOS apps, web pages, or any other method at the disposal of the Engineer. The Engineer may request data at any time during paving operations.

1. Real-time Continuous Data Items

Provide the Engineer access to a GIS map-based data viewer which displays the following information in real-time with a web-based system compatible with iOS and Windows environments.

- Each Truck
 - UniqueTruck ID
 - Truck status

- Time At Source
 - Time At Destination
 - Time At Paver
 - Time At Scale
 - Time to and from plant/job
 - Time of PTO engagement
 - Time Stopped with Engine Running
 - Time of last transmission
 - Location (Latitude and Longitude in decimal degrees to nearest 0.0000001) every 60 seconds
 - Description of Material being transported (i.e. asphalt base, asphalt surface)
 - Mix Design Number
 - Net Weight of material being transported to the nearest 0.01 ton
 - Running Daily Total of Net Weight of material being transported to nearest 0.01 ton.
 - Project Number
- Scale Location
 - Project Location
 - Point of Delivery (i.e. paver)

2. Daily Summary

The following summary information shall be provided to the Engineer electronically within 4 hours of beginning operations on the next working day

- For each Material
 - List of Individual Loads
 - Contractor Name
 - Project Number
 - Unique Truck ID
 - Net Weight For Payment (nearest 0.01 tons)
 - Date
 - Mix Temperature at Time of Loading, Fahrenheit
 - Time Loaded
 - Time Unloaded
 - Delivery Location (Latitude/Longitude in decimal degrees to nearest 0.0000001)
- For each Bid Item
 - Total Quantity for Payment (nearest 0.01 tons)

4.0 MEASUREMENT. The Department will measure the HMA electronic delivery management system as a lump sum item.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

1. Payment is full compensation for all work associated with providing all required equipment, training, and documentation.
2. Delays due to GPS satellite reception of signals or equipment breakdowns will not be considered justification for contract modifications or contract extensions.
3. Payment will be full compensation for costs related to providing the GPS system, including all equipped pavers and transfer vehicles, integration with plant load-out systems, and any software required for the construction and reporting process. All quality control procedures including the GPS systems representative's technical support and on-site training shall be included in the Contract lump sum price.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24986EC	HMA ELECTRONIC DELIVERY MGMT SYSTEM	LS