SP-090058
(New)

Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
INTELLIGENT COMPACTION - HMA - ROLLER PASS MAPPING

Kossuth County
STP-009-4(44)--2C-55

Effective Date
February 16, 2010

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

In addition to the requirements of Section 2303 of the Standard Specifications, the following shall apply:

090058.01 Description
This specification describes the Contractor's responsibilities for furnishing Intelligent Compaction (IC) – HMA Roller Pass Mapping equipped rollers, the required data acquisition and reporting method, the training program requirement, and the data file types and process for transmitting data to the Engineer. IC-HMA Roller Pass Mapping is herein defined as the documentation of roller pass coverage data from all rollers used in the HMA compaction process. Real Time Kinematic (RTK) based Global Positions System (GPS) with base station corrections shall be used for determining the position of the rollers. Results from the IC roller pass coverage shall be displayed to the roller operator on a color coded computer screen in real-time during roller operations and the data saved for transfer and viewing by the Engineer. Data collection and reporting shall include roller position, date/time, speed, pass count, and travel direction.

Quality acceptance for IC-HMA Roller Pass Mapping will be based on cores according to Section 2303 of the Standard Specifications. The IC results will be used as a guide to supplement core sampling for research purposes. Secure a maximum of three additional cores per lot collected concurrently with acceptance cores based on viewing roller pass mapping data. The Engineer will determine the location for the additional cores.

Submit to the Engineer a work plan for IC-HMA Roller Pass Mapping at least two weeks prior to the Preconstruction Conference. Describe in the work plan the following:

- Compaction equipment to be used including:
    - Vendor
    - Roller model,
    - Roller dimensions and weights,
    - Description of IC-HMA Roller Pass Mapping measurement system,

  - GPS capabilities,
  - Documentation system, and
  - Software.

- Roller data collection methods including sampling rates and intervals and data file types.
- Transfer of data to the Engineer including method, timing, and personnel responsible. Data transfer shall occur at minimum once per day or as directed by the Engineer.
- Training plan and schedule for roller operators, Engineer's personnel, and Iowa State University's research personnel; including both classroom and field training.
- Communication protocol for informing the Iowa State University research team point of contact concerning construction progress and schedule to facilitate research field testing and data collection.

090058.02 Equipment and Materials

A. Rollers

Comply with Article 2001.05 of the Standard Specifications for rollers.
Ensure that IC equipment can measure roller position, date/time, speed, pass count, and travel direction. Provide a computer screen in the roller cab for viewing measured results. Ensure that results are stored for transfer to the Engineer for viewing on a laptop computer. Provide the Engineer and Iowa State University each with a copy of the IC equipment vendor software for viewing results. Ensure that results are displayed as color coded spatial maps based on GPS coordinates.

B. Data Collection, Export, and Onboard Display

Provide and export the following data in a comma, colon, or space delimited ASCII file format:

1) Machine Model, Type, and Serial/Machine Number
2) Roller Drum Dimensions (Width and Diameter)
3) Roller and Drum Weights
4) File Name
5) Date Stamp
6) Time Stamp
7) RTK based GPS position measurements showing Northing, Easting, and Elevation
8) Roller Travel Direction (e.g., forward or reverse)
9) Roller Speed
10) Pass count

Ensure that the roller's onboard display will furnish color-coded GPS based mapping showing number of roller passes, on a computer screen in the roller operators cab. Provide displayed results to the Engineer for review upon request.

C. Local GPS Base Station

Provide a real time kinematic global positioning system (RTK GPS) to acquire northing, easting, and elevation data used in mapping of IC measurements. Ensure the system has the capability to collect data in an established project coordinate system. Furnish a local GPS base station used for broadcasting differential correction data to the rollers with a tolerance less than 0.1 ft in the vertical and horizontal.

D. Training

1. Preconstruction (classroom)

Make available all personnel responsible for roller operations to attend a one-day classroom training on IC. Classroom training will involve both the Contractor's and Engineer's personnel and the Iowa State University research team. Training will be provided by the IC equipment manufacturer and contactor and scheduled in coordination with the Engineer.

2. Field (prior to and during compaction operations)
Provide two working days of field training by the IC equipment vendor to roller operators and Engineer's personnel.

E. Geotechnical Mobile Lab Parking
Provide the Engineer an all weather access, parking for the Iowa State University Geotechnical Mobile lab trailer (8 feet by 44 feet), and parking for 3 vehicles at the HMA plant site or agreed upon alternative location. The lab trailer will be furnished and operated by Iowa State University which will be under contract with the Contracting Authority to perform IC-HMA research.

090058.03 Construction

A. Roller Operations
Record all IC-HMA roller passes including forward and reverse directions. Check, verify and recalibrate, if necessary, IC equipment at the beginning of each workday to ensure proper performance.

B. Equipment Breakdowns
In the event of IC equipment breakdowns/IC system malfunctions/GPS problems, the Contactor may operate with conventional rolling operations, but IC-HMA Roller Pass Mapping data shall be collected and provided for a minimum 80% of the project surface and intermediate HMA quantity.

C. Data submittal
Furnish to the Engineer an electronic file in a comma, colon, or space delimited ASCII file format with information listed under Article SP-090058.02, B. As a minimum, the file transfer shall occur immediately following the final compaction operations on each working day. The Engineer may request data any time during compaction operations.

090058.04 Method of Measurement
None. Lump sum item.

090058.05 Basis of Payment

A. Payment for IC-HMA Roller Pass Mapping will be the lump sum contract price.

B. Payment is full compensation for all work associated with providing IC equipped rollers, transmission of electronic data files, two copies of IC equipment manufacturer software, training, and preparing and maintaining work space for Iowa State University's mobile lab and associated parking.

C. 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.