



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

December 21, 2004

**Addendum No. 2**

RE: Contract ID: C201288  
TIP Number: I-3311D  
Mecklenburg County  
Project Description: I-77 from I-485 to SR 2136 (Gilead Road) Exit 23

**January 20, 2005 Letting**

To Whom It May Concern:

Reference is made to the Request for Proposal recently furnished to you on the above project. The following revisions have been made to the Request for Proposal:

On page 52, the *Environmental Scope of Work* has been revised. Please void Page No. 52 in your proposal and staple the revised Page No. 52 thereto.

Page No.'s 87, 104, 108, and 121, the *Intelligent Transportation Scope of Work* has been revised. Please void Page No.'s 87, 104, 108, and 121 in your proposal and staple the revised Page No.'s 87, 104, 108, and 121 thereto.

Sincerely,

A handwritten signature in black ink, appearing to read "R.A. Garris".

R.A. Garris, P.E.  
Contract Officer

- c: Mr. Len Sanderson, PE
- Mr. Steve Varnedoe, PE
- Ms. Deborah Barbour, PE
- Mr. Steve Dewitt, PE (with attachment)
- Mr. Ellis Powell, PE (with attachment)
- Mr. Victor Barbour, PE (with attachment)
- Mr. Benton Payne, PE (with attachment)
- Mr. Art McMillan, PE (with attachment)
- Mr. Rodger Rochelle, PE (with attachment)
- Mr. Clarence Coleman, FHWA (with attachment)
- Mr. Jay Bennett, PE
- Mr. Scott Blevins, PE (with attachment)
- Mr. Andy Gay, PE (with attachment)
- Mr. Ron Davenport, PE (with attachment)
- Ms. Marsha Sample (with attachment)
- Mr. Mitch Hendee, PE (with attachment)
- Mr. Shannon Lasater, PE (with attachment)
- Mr. Chris Smitherman, EIT (with attachment)
- Mr. Njorge W. Wainaina, PE (with attachment)
- Mr. John Fargher, PE (with attachment)
- Mr. Barney Blackburn, PE (with attachment)
- Mr. Ayman Alqudwah, PE (with attachment)
- Mr. Marshall Clawson, PE (with attachment)
- Mr. Lonnie Brooks, PE (with attachment)
- Dr. Clark Morrison, Ph.D., PE (with attachment)
- Mr. Richy Narron (with attachment)
- Mr. Joseph Ishak, PE (with attachment)
- Mr. Jay Stancil (with attachment)
- Ms. Sherry Yow (with attachment)
- Mr. Phillip Todd (with attachment)
- Technical Review Committee Members (with attachment)
- File (with attachment)

If their design requires a permit, the Design-Build Team shall re-verify and update, as needed, the required environmental data that expires prior to the obtaining the permit. US Army Corps of Engineers stream and wetland verifications are effective for 5 years after the date of jurisdictional determination. If a permit is not obtained before March 19, 2006, the Design-Build Team must work through PDEA-ONE to contact the US Army Corps of Engineers Regulatory Field Office and reverify the jurisdictional determination of streams and wetlands within the project area. Field surveys conducted by NCDOT on August 26, 2004 satisfy the Green Sheet commitment that states "Threatened and Endangered species will be resurveyed, prior to construction of this project, in areas of suitable habitat within the footprint of the project."

Direct coordination between the Design-Build Team, the Department's Alternative Delivery Systems Engineer, Resident Engineer, and PDEA-ONE will be necessary to ensure proper permit application development. Upon completion of the permit application package, the Design-Build Team will forward the package to the Alternative Delivery Systems Engineer, Resident Engineer, DEO and PDEA-ONE for review and approval. The Department will subsequently forward the package to the appropriate agencies to have the permit application placed on public notice to reflect the details.

The Department will allow no direct contact between the Design-Build Team and representatives of the environmental agencies. No contact between the Design-Build Team and the environmental agencies will be allowed either by phone, e-mail or in person, without representatives of the Department's PDEA Branch and/or the Division's Environmental Officer present.

The Design-Build Team shall submit one permit application for the entire project. The Design-Build Team shall not submit multiple applications to develop a "staged permitting" process to expedite construction activities in a phased fashion.

Any temporary construction measures, including de-watering, construction access, etc. must be addressed in the permit application. Impacts that result from so-called temporary measures may not be judged to be temporary impacts by the agencies. These issues must be addressed and reviewed by PDEA-ONE prior to submittal of the permit application.

The Design-Build Team must also clearly indicate the location of and impacts of haul roads and utility relocations on jurisdictional areas. The Design-Build Team shall also identify all proposed borrow and waste sites. These details must be included in the permit application data. Further, the Design-Build Team must describe the methods of construction of all structures. The description of the temporary impacts (haul roads, utility relocations, work bridges, etc.) must include restoration plans, schedules, and disposal plans. This information must be included in the permit application.

The NCDOT hereby commits to ensuring, to the greatest extent possible, that the footprint of the impacts in areas under the jurisdiction of the federal Clean Water Act will not be increased during the Design-Build effort. All fill material will be immediately stabilized and maintained to prevent sediment from entering adjacent waters or wetlands. The Design-Build Team is responsible for ensuring that the design and construction of the project will not impair the movement of aquatic life.

**INTELLIGENT TRANSPORTATION SYSTEMS PROJECT SPECIAL PROVISION****I. INTRODUCTION**

The Metrolina Regional Transportation Management Center (MRTMC) currently manages traffic along an approximate 24 kilometer stretch of I-77 from the South Carolina line to north of the interchange of I-77 and I-485. The I-3311D project will enable MRTMC to extend its reach to the interchange of I-77 and Gilead Road by installing two (2) CCTV cameras, ten (10) Microwave Vehicle Detectors, and required length of fiber optic communications cable in conduit.

The Contractor will be responsible to determine exact location of these new devices, obtain Engineer's approval of the locations, install the devices, interconnect them to MRTMC via the new and existing communications infrastructure, and integrate them with the existing traffic management system.

Upon completion of the work, the Contractor will demonstrate successful integration and operation of the newly installed devices by conducting field and systems test using approved test plans and procedures.

**II. GENERAL REQUIREMENTS****A. STANDARD SPECIFICATIONS**

Perform all work to meet or exceed the requirements of these ITS Functional Specifications and Plans. Perform all work in accordance with the North Carolina Department of Transportation (NCDOT) Roadway Standard Drawings and the Standard Specifications. The current edition of these specifications and publications in effect on the date of advertisement will apply.

**1. 2002 Standard Specifications for Roads & Structures – Section 1098 Revisions**

The Standard Specifications are revised as follows:

**a. General Requirements (1098-1)**

Page 10-220, Article 1098-1(A), last paragraph, first sentence

Revise “by the date of advertisement of the project” to “by the date of equipment installation.”

**b. As-Built Documentation**

Page 10-221, Article 1098-1(G)

Include the following paragraphs to read as follows:

Provide real world coordinates for all field devices (including but not limited to microwave vehicle detectors [MVD], closed circuit television cameras, and oversized junction boxes) installed and/or modified under this project. Provide the coordinates in feet units using the North Carolina State Plane coordinate system (1983 North American Datum also known as NAD '83). Furnish coordinates that do not deviate more than 1.7 feet (1/2 meter) in the horizontal plane and 3.3 feet (1 meter) in the vertical plane. Global positioning system

meter to display pulling tension and a mechanism to ensure that the maximum allowable pulling tension cannot be exceeded at any time during installation.

Furnish and install attachment hardware, installation guides, and other necessary equipment, not specifically listed herein, as necessary to install the fiber optic cable.

Only splice individual fibers at locations that require splicing. Full-cable splicing is not warranted at cabinet installations, except when required to connect cables from two separate cable reels. Protect all splices in junction boxes and store in fiber optic splice enclosures. All spare fibers in the fiber drop cables must be terminated in the equipment cabinet that they serve. Perform all splices by means of the fusion splice technique and do not induce more than 0.05 dB attenuation for each splice. Splices found to exceed 0.05 dB attenuation must be re-spliced by the Contractor until this requirement is met.

Protect each splice in a protective sleeve or housing and secured in splice trays located in a fiber optic splice enclosure or an integrated fiber optic splice and termination unit. Bare fibers should be completely re-coated with a protective heat-shrink coating prior to placement in a sleeve or housing. Provide heat-shrink coating approved for use by the fiber optic cable manufacturer and installed in such a manner as to protect the fiber from scoring, dirt accumulation, moisture intrusion, and microbending.

Termination of distribution and trunk fibers should not exceed a measured attenuation of 0.5 dB at each termination. Fiber terminations should be neatly and permanently labeled to designate transmit or receive (when appropriate) and the string number. Spare fibers should be labeled as "spare" with the string number. Provide protective covers on unused terminations. Install fiber counts as shown on the Functional Plans.

## **VII. MICROWAVE VEHICLE DETECTOR**

### **A. DESCRIPTION**

Furnish and install a Microwave Vehicle Detection (MVD) unit and lead-in cable in accordance with the plans and specifications. The MVD must be a RTMS X3 from Electronic Integrated Systems Inc. (EIS) or an approved equivalent. Integrate MVD units with existing system software for configuration, control, and data analysis. The system software will be made available to the contractor. Comply with the provisions of Sections 1700 of the 2002 *Standard Specifications for Roads and Structures*.

### **B. MATERIAL**

The MVD will be a true presence detector, which can provide presence, volume, lane occupancy, and speed information on a minimum of eight (8) discreet detection zones. This information will be available via serial optical communications lines to the MVD software described in Section XIV.

- The MVD must be capable of simultaneously providing the contact closure pairs and the serial communications data from within the MVD unit, while providing a real time display of vehicles.
- The MVD must have a software based utility that provides the option of both manual and automatic setup and calibration.

interconnected through an RS-232 interface channel. All field communication OTRs should be configured as slave devices. Connect the two master OTRs to the RFL IMUX2000 in the respective communication node/hub. Perform stand-alone and system testing as described in the Testing section.

If necessary, add node(s) (RFL IMUX 2000) to maintain ring topology.

## **IX. CLOSED CIRCUIT TELEVISION CAMERAS**

### **A. DESCRIPTION**

The MRTMC includes a CCTV subsystem for use in monitoring traffic conditions along the sections of I-77. Install two new CCTV cameras as shown on the plans and integrate with the existing system software. The system software shall provide configuration and control for the CCTV cameras and will be made available to the contractor. The contractor must verify and revise as necessary the general CCTV location shown on the plans. CCTV cameras located along I-77 should use video optical transceivers and multiplexers as specified in these documents for communication of the video signal.

### **B. MATERIAL**

Provide color cameras, enclosed in environmentally pressurized domes, mounted on poles and equipped with zoom lenses and pan-and-tilt mechanisms. All cameras furnished should be equipped with source identification generator. To ensure compatibility with the existing equipment, provide Cohu™ 3800 series (or approved equivalent) cameras inside an environmental dome housing, compatible with the existing system software, unless otherwise approved by the Engineer or required to support compatibility.

Presets must be provided on both the zoom lens and the pan/tilt mechanism. The presets will allow either the system or the operator to command the lens and the pan/tilt to predefined locations.

Based on initial observations of candidate camera locations, the camera support poles will range in height from 10 to 17 meters (33 to 55 feet). The Contractor should determine the camera mounting height and location by performing a camera siting study. The camera siting study will include field checking the proposed CCTV locations with a bucket truck and video camera and making field adjustments as necessary. An NCDOT representative will be present during the camera siting study. The results of this study should be submitted to the Engineer for review. Provide support poles and foundations that are consistent with the existing CCTV poles. The Contractor is responsible for providing pole and foundation designs and obtaining electrical service (including paying for engineering and construction for obtaining the electrical service). The Engineer will approve pole and foundation designs prior to any new equipment being installed.

Provide a camera with 6.35mm interline transfer charge couple device (CCD) with digital signal processing capabilities and a 16:1 minimum optical zoom and an 8:1 minimum digital zoom.

Provide a multipoint RS-232 communication interface compatible with the existing CCTV central system equipment. If the controller uses another type of digital communication, such as RS-422, provide the appropriate converter. Provide each camera with a unique, easily

make the required modifications at the MRTMC. If the contractor elects to make modifications to the map at the MRTMC, these modifications may not be made during the normal system operating hours.

#### **A. MODIFYING THE SYSTEM DATABASE TO ACCOMMODATE NEW FIELD DEVICES**

The contractor will be required to configure and modify the system database to incorporate all new devices installed with this project to make the device a fully functional component of the MRTMC system.

Field devices are configured using external software or the device keypad according to the manufacturer's instructions. The devices must be configured using addressing and communication parameters compatible with the configuration of the central system.

The EasyStreets database maintenance utility provides a user interface for adding new devices to the system database. The MRTMC System User's Guide provides instruction in the use of the EasyStreets database maintenance utilities. In addition to the list of equipment defined within the system, the database includes lane designations, segments, and incident parameters associated with the field devices. The contractor will be required to update the database for all of these devices (with the exception of incident parameters which will be installed by the NCDOT at a later date).

The delivery documents associated with each system build contain updated information on database contents. The contractor will be required to assure new device parameters do not conflict with any existing database parameters as defined in the most recent delivery documents.

The MRTMC system utilizes SL-GMS as a graphics engine. SL-GMS provides utility programs for updating and maintaining graphic displays. The SL-GMS utilities required to maintain the map are located on the development computer and will be made available to the contractor. The contractor will be required to update the system map to include the new devices and lanes. The updated system map shall maintain the same level of functionality as the existing map.

### **XV. TESTING**

#### **A. TEST PLAN**

Submit a detailed test plan to the Engineer for approval at least 45 working days prior to initiation of any testing. Identify all required testing levels for the specific equipment provided. Identify the test organization including the roles and responsibilities of the quality assurance organization. For each piece of equipment that requires testing, the test plan must at a minimum, delineate the following:

- Submittal schedule of test procedures
- Start time of each level of testing
- Test duration including any re-tests that are required or anticipated
- Submittal of the completed and signed off test report

Revisions to the test plan must be provided to the Engineer at the Monthly Progress Meeting. A critical path method (CPM) chart must be developed to track the sequence and completion of test plans for each level of testing, including periodic revisions.