

# Special Specification 6141

## Existing Traffic Management Equipment



### 1. DESCRIPTION

Remove and relocate existing Intermediate Amplifier (IA) Cabinets, Communications Hubs, Camera Pole Structure and Cabinet, Lane Control Systems (LCS), Radar Vehicle Sensing Devices (RVSD), and RVSD Pole Structure and Cabinet at sites shown on plans and as specified within this specification.

### 2. REMOVE EXISTING IA CABINET

2.1. **Materials.** Remove the following equipment at each IA Cabinet field site as shown on the plans (includes but is not limited to):

- Intermediate Amplifier (IA) Cabinet including all internal components.
- Cabling from power source to cabinet.
- Cabling and connectors from telecommunications source to cabinet.
- Communication Cabinet Foundation. Remove to 2 ft. below existing grade and backfill and repair with material to match existing area surrounding removed foundation or as approved by the Engineer.

2.2. **Construction.** Prior to removal of the IA Cabinet, disconnect and isolate any existing electrical power supply.

Perform removal in strict conformance with the requirements stated and the lines, grades, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during removal.

Any portion of the IA Cabinet, including components, damaged or lost will be replaced by the Contractor at no cost to the Department.

All materials not designated for reuse or retention by the State will become the property of the Contractor and be removed from the project site at the Contractor's expense. Deliver Items to be retained by the State to location approved by the Engineer.

Store all Communication Cabinets and associated equipment removed on this project in a secure place as approved by the Engineer until time for relocation to location shown on plans. The Contractor is fully responsible for the equipment until released by the Engineer.

### 3. RELOCATE EXISTING IA CABINET

3.1. **Materials.** Relocate the following equipment at each IA Cabinet field site shown on the plans (includes but is not limited to):

- Intermediate Amplifier (IA) Cabinet with all internal components.

Contractor is responsible for reconfiguring the Local Control Unit and for all provisioning and addressing changes required in the cabinet and at CTECC.

Construct new IA Cabinet Foundation for relocated IA Cabinet as shown in plans and as specified in this specification.

Make the relocated IA Cabinet fully operational and integrated with the CTECC system.

If plans show radar detectors to be connected to relocated IA Cabinet instead of surveillance loop detectors, remove existing digital loop vehicle detection units and deliver to location approved by the Engineer to make space for radar detector cards.

- 3.2. **Construction.** Perform the relocation in strict conformance with the requirements stated and the lines, grades, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during relocation. Any portion of Communication Cabinet assembly damaged or lost will be replaced by the Contractor at his expense.

Make all arrangements for connection to the power supply and telecommunications source including any permits required for the work to be done under the Contract. Furnish and install any required materials not provided by the power or telephone company in accordance with the plans. Provide wire for the power connection at least the minimum size indicated on the plans and insulated for 600V. Meet the requirements of the National Electrical Code (NEC).

#### 4. REMOVE EXISTING COMMUNICATIONS HUB

- 4.1. **Materials.** Remove the following equipment at each Communications Hub field site as shown on the plans (includes but is not limited to):

- Communications Hub with external and internal cabinets including all internal equipment components and back panels.
- Cabling from power source to cabinet.
- Cabling and connectors from telecommunications source to cabinet.
- Communications Hub Foundation. Remove to 2 ft. below existing grade and backfill and repair with material to match existing area surrounding removed foundation or as approved by the Engineer.

- 4.2. **Construction.** Prior to removal of the Communications Hub, disconnect and isolate any existing electrical power supply.

Perform removal in strict conformance with the requirements stated and the lines, grades, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during removal.

Any portion of the Communications Hub, including components, damaged or lost will be replaced by the Contractor at no cost to the Department.

All materials not designated for reuse or retention by the State will become the property of the Contractor and be removed from the project site at the Contractor's expense.

Store all Communications Hubs and associated equipment removed on this project in a secure place as approved by the Engineer until time for relocation to location shown on plans. The Contractor is fully responsible for the equipment until released by the Engineer.

#### 5. RELOCATE EXISTING CAMERA POLE STRUCTURE AND CABINET

- 5.1. **Materials.** Remove and relocate existing camera pole structure and pole mounted cabinet with all internal components at locations shown on the plans and as directed by the Engineer. Unless otherwise shown on the plans, the Contractor should stake and the Engineer will verify camera pole structure location.

The following requirements are minimum. Strict compliance with these minimum requirements will not relieve the Contractor of the responsibility for adopting whatever additional provisions may be necessary to insure the successful completion of the work.

- 5.2. **Construction.** Perform the relocation in strict conformance with the requirements stated and the lines, grades, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during relocation.

Prior to removal of the existing camera pole structure, the Contractor must ensure that the power cables are disconnected and isolated from the electric power supply and all cables (power and communication) are disconnected from the equipment and the camera, pan/tilt assembly, CCTV equipment cabinet, RVSD equipment, and other accessories are removed from the camera pole structure. Removal of the existing camera pole structure as shown on the plans will be accomplished only at such time as authorized by the Engineer.

The existing camera pole structure must be removed in a manner acceptable to the Engineer. The method should be such that no undue overstress or damage will result to the structure or appurtenances attached. The Contractor will be responsible for any damage to the structure.

The Contractor must use a crane of sufficient capacity to remove the pole. The existing camera pole structure must be disconnected from the foundation and relocated as shown on the plans in a manner acceptable to the Engineer.

When the poles are laid down, the Contractor must place the poles on timber cribbing so that the poles lie reasonably straight to prevent any damage or deterioration. The Contractor will be responsible for any damage to the structure.

Safe construction and operation practices must be maintained at all times. The poles should be handled in such a manner during removal so as to prevent damage to the pole's exterior finish. The contractor must repair any damage to the finish of the structure in accordance with Item 445, "Galvanizing" or Item 446, "Cleaning and Painting Steel" as appropriate.

The existing concrete foundation must be removed to a depth of at least 2 ft. below finish grade with all steel cut off. The excavation must be back-filled with material equal in composition and density to the surrounding area, and by replacing any surfacing, such as asphalt pavement, concrete riprap or brick pavers, with like material to equivalent condition as approved by the Engineer.

Careful erection and aligning of the relocated camera pole structure should be considered an essential feature of the installation of the pole structure.

All anchor bolts required for the installation of the camera pole structure must be supplied by the Contractor. Bolt dimensions and lengths must be as shown in the plans and as directed by the Engineer. The new anchor bolts must conform to all requirements in Item 449, "Anchor Bolts."

The new foundation must be constructed in accordance with Item 416, "Drilled Shaft Foundations."

The new conduit must be constructed in accordance with Item 618, "Conduit."

Use care to prevent damage to any support structures. Any portion of camera pole structure or cabinet damaged or lost will be replaced by the Contractor at his expense.

Make all arrangements for connection to the power supply and telecommunications source including any permits required for the work to be done under the Contract. Furnish and install any required materials not provided by the power or telephone company in accordance with the plans. Provide wire for the power connection at least the minimum size indicated on the plans and insulated for 600V. Meet the requirements of the National Electrical Code (NEC).

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## 6. REMOVE EXISTING LANE CONTROL SYSTEM

- 6.1. **Materials.** Remove the following equipment at each Lane Control System field site as shown on the plans (includes but is not limited to):
- Lane Control System (LCS) heads and mounting hardware. Remove the LCS heads from the structure immediately after the system becomes non-operational.
  - LCS Controller and Cabinet.
  - Cabling, conduit and connectors from LCS Controller to LCS heads.
  - Cabling and connectors from power source to cabinet.
  - Cabling and connectors from telecommunications source to cabinet.
  - LCS Cabinet Foundation. Remove to 2 ft. below existing grade and backfill and repair with material to match existing area surrounding removed foundation or as approved by the Engineer.

- 6.2. **Construction.** Prior to removal of the Lane Control System, disconnect and isolate any existing electrical power supply.

Perform removal in strict conformance with the requirements stated and the lines, grades, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during removal.

Use care to prevent damage to the sign support structure. Any portion of the Lane Control System or sign support structure, including components, damaged or lost will be replaced by the Contractor at no cost to the Department.

All materials not designated for reuse or retention by the State will become the property of the Contractor and be removed from the project site at the Contractor's expense. Deliver Items to be retained by the State to location approved by the Engineer.

Store all Lane Control System equipment removed on this project in a secure place as approved by the Engineer until time for relocation to location shown on plans. The Contractor is fully responsible for the equipment until released by the Engineer.

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## 7. REMOVE EXISTING RADAR VEHICLE SENSING DEVICE (RVSD)

- 7.1. **Materials.** Equipment to be removed at each RVSD site shown on the plans (includes but is not limited to):
- RVSD including all mounting hardware.
  - Conduit, cables, connectors from Device to cabinet.
  - Dual Loop emulation cards (if existing).

- 7.2. **Construction.** Prior to removal of the RVSD, disconnect and isolate any existing electrical power supply, adhering to requirements of the National Electrical Code.

Perform removal in strict conformance with the requirements stated and the lines, grades, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during removal.

Any portion of the RVSD damaged or lost will be replaced by the Contractor at no cost to the Department. Store all RVSD equipment removed on this project in a secure place as approved by the Engineer until time for relocation to location shown on plans. The Contractor is fully responsible for the equipment until released by the Engineer.

All materials not designated for reuse or retention by the State will become the property of the Contractor and be removed from the project site at the Contractor's expense. Deliver Items to be retained by the State to location approved by the Engineer.

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## 8. RELOCATE EXISTING RVSD POLE STRUCTURE AND CABINET

- 8.1. **Materials.** Remove and relocate existing Radar Vehicle Sensing Device (RVSD) pole structure and pole mounted cabinet with all internal components at locations shown on the plans and as directed by the Engineer. Unless otherwise shown on the plans, the Contractor should stake and the Engineer will verify RVSD pole structure location.

The following requirements are minimum. Strict compliance with these minimum requirements will not relieve the Contractor of the responsibility for adopting whatever additional provisions may be necessary to insure the successful completion of the work.

Furnish and install all new conduit, cables, junction boxes, mounting hardware, etc. to make the relocated RVSD fully operational with the CTECC system.

- 8.2. **Construction.** Perform the relocation in strict conformance with the requirements stated and the lines, grades, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during relocation.

Prior to removal of the existing RVSD pole structure, the Contractor must ensure that the power cables are disconnected and isolated from the electric power supply and all cables (power and communication) are disconnected from the equipment and the RVSD, RVSD cabinet, RVSD equipment, and other accessories are removed from the RVSD pole structure. Removal of the RVSD pole structure as shown on the plans must be accomplished only at such time as authorized by the Engineer.

The existing RVSD pole structure should be removed in a manner acceptable to the Engineer. The method should be such that no undue overstress or damage will result to the structure or appurtenances attached. The Contractor will be responsible for any damage to the structure.

The Contractor must use a crane of sufficient capacity to remove the pole. The existing RVSD pole structure must be disconnected from the foundation and relocated as shown on the plans in a manner acceptable to the Engineer.

When the poles are laid down, the Contractor must place the poles on timber cribbing so that the poles lie reasonably straight to prevent any damage or deterioration. The Contractor will be responsible for any damage to the structure.

Safe construction and operation practices must be maintained at all times. The poles should be handled in such a manner during removal so as to prevent damage to the pole's exterior finish. The contractor must repair any damage to the finish of the structure in accordance with Item 445, "Galvanizing" or Item 446, "Cleaning and Painting Steel" as appropriate.

The existing concrete foundation must be removed to a depth of at least 2 ft. below finish grade with all aluminum cut off. The excavation must be back-filled with material equal in composition and density to the surrounding area, and by replacing any surfacing, such as asphalt pavement, concrete riprap or brick pavers, with like material to equivalent condition as approved by the Engineer.

Careful erection and aligning of the relocated RVSD pole structure should be considered an essential feature of the installation of the pole structure.

All anchor bolts required for the installation of the RVSD pole structure must be supplied by the Contractor. Bolt dimensions and lengths must be as shown in the plans and as directed by the Engineer. The new anchor bolts must conform to all requirements in Item 449, "Anchor Bolts."

The new foundation must be constructed in accordance with Item 416, "Drilled Shaft Foundations."

The new conduit must be constructed in accordance with Item 618, "Conduit."

Use care to prevent damage to any support structures. Any portion of RVSD pole structure, pole mounted cabinet, or equipment, damaged or lost will be replaced by the Contractor at his expense.

Make all arrangements for connection to the power supply and telecommunications source including any permits required for the work to be done under the Contract. Furnish and install any required materials not provided by the power or telephone company in accordance with the plans. Provide wire for the power connection at least the minimum size indicated on the plans and insulated for 600V. Meet the requirements of the National Electrical Code (NEC).

Mounting height and angle of relocated RVSD must be as recommended by manufacturer of RVSD. Connect RVSD to communication network as shown in plans.

Recalibrate the relocated RVSD for the conditions at each site (number of lanes, speeds, etc.) using radar as a control.

- 8.3. Provide phone numbers if necessary of new RVSD locations where new phone service communications have been established.

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## 9. IA CABINET FOUNDATION

- 9.1. **Materials.** Construct new IA Cabinet Foundation for relocated IA Cabinet as shown on "Cabinet Foundation Details" layout.

- 9.2. **Construction.** Construct the foundation in strict conformance with the requirements stated and the location, details and dimensions shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe constructions practices.

Construct the foundation in accordance with Item 656, "Foundations for Traffic Control Devices."

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## 10. TESTING

- 10.1. **Pre-Test.** Conduct performance testing prior to removal of the equipment. Test all functional operations of the equipment in the presence of representatives of the Contractor and TxDOT. Ensure that both representatives sign the test report indicating that the equipment has passed or failed each function. Once removed, the equipment becomes the responsibility of the Contractor until accepted by the State. Compare test data prior to removal and test data after installation. The performance test results after relocation must be equal to or better than the test results prior to removal. Repair or replace those components within the system which failed after relocation but which passed prior to removal.

- 10.2. **Post Test.** Testing of the TMS system is for the purpose of relieving the Contractor of maintenance of the system. The Contractor will be relieved of the responsibility for maintenance of the system in accordance with Item 7, "Legal Relations and Responsibilities," after a successful test period. The Contractor will not be required to pay for electrical energy consumed by the system.

After all TMS equipment has been installed, conduct approved continuity, stand alone, and TMS equipment system tests. Furnish test data forms containing the sequence of tests including all of the data taken as well as quantitative results for all tests. Submit the test data forms to the Engineer at least 30 days prior to the day the tests are to begin.

Obtain Engineer's approval of test procedures prior to submission of equipment for tests. Send at least 1 copy of the data forms to the Engineer.

Conduct an approved stand-alone test of the equipment installation at the field site(s). At a minimum, exercise all stand-alone (non-network) functional operations of the field equipment with all of the equipment installed per the plans as directed by the Engineer. Complete the approved data forms with test results and

turn over to the Engineer for review and either acceptance or rejection of equipment. Give at least 30 working days' notice prior to all tests to permit the Engineer or his representative to observe each test.

The State will conduct approved TMS equipment system tests on the field equipment with the CTECC central equipment. The tests will, as a minimum, exercise all remote control functions and display the return status codes from the controller.

If any unit fails to pass a test, prepare a report and deliver it to the Engineer. Describe in the report the nature of the failure and the corrective action needed. If the failure is the result of improper installation or damage during reinstallation, reinstall or replace the unit and repeat the test until the unit passes successfully, at no additional cost to the Department or extension of the contract period.

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## 11. TMS EXPERIENCE REQUIREMENTS

The Contractor or subcontractor must meet the following experience requirements prior to removal and/or relocation of TMS Equipment.

- 11.1. Two years continuous existence by the Contractor or the subcontractor offering services in the installation of Communications Hubs, IA Cabinets, Radar Vehicle Sensing Devices, and Closed Circuit Television cameras (CCTV).
- 11.2. Two completed projects for each of the following items: A minimum of 2 DMS, 5 CCTV-cameras, 1 Communications Hub, 1 IA Cabinet, and 5 Radar Vehicle Sensing Devices, where the Contractor or the subcontractor's personnel installed and tested this equipment. All components listed above need not be part of the same project, however, additional project references may be required in order to meet the minimum number of installed equipment items listed above. The DMS must have been installed outdoors, permanently mounted on structure(s) with related sign and equipment. The RVSD's must have been installed outdoors, permanently mounted with related communication equipment.

The CCTV cameras must have been installed outdoors, permanently mounted on overhead structure(s) with related camera control and transmission equipment. The completed system installations must have been in continuous satisfactory operation for a minimum of 1 yr.

Prior to removal and/or relocation of TMS equipment, furnish a statement which outlines contractor or subcontractor's qualifications on system installation experience. Information on system installation experience must include specific projects, locations, and dates for beginning and completion of installation. The statement must also include the name, telephone number, and address of a representative of the agency or business owning the system, who will be contacted by the Department. If requested by the State, demonstrate to the Engineer's satisfaction a working computerized control system with the various equipment items as described above.

Failure to meet the above requirements will be sufficient reason for not being approved for the removal and/or relocation of the TMS equipment.

If any approved subcontractors fail to complete the entire project, qualification material for other subcontractors will have to be submitted and approved before work can be continued.

Any qualification statements which do not correctly address all specified items will be rejected for the reason of insufficient data. Submit the statement 2 weeks prior to removal and/or relocation of TMS equipment to allow the Department adequate time to review and respond to the Contractor for additional information if required. Failure to submit a complete and satisfactory statement will be sufficient reason for not being approved for the removal and/or relocation work. Submit all statements required by this Special Specification to the Traffic Management Engineer.

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**12. MEASUREMENT**

- 12.1. Remove Existing IA Cabinet will be measured as each IA Cabinet with all internal components removed.
- 12.2. Relocate Existing IA Cabinet will be measured as each IA Cabinet with all internal components relocated, tested and made fully operational with the CTECC system.
- 12.3. Remove Existing Communications Hub will be measured as each Communications Hub, including external and internal cabinets with all internal components including but not limited to equipment removed.
- 12.4. Relocate Existing Camera Pole Structure and Cabinet will be measured as each Camera Pole Structure and Pole Mounted Cabinet removed and relocated, complete in place, tested and made fully operational with the CTECC system.
- The new foundation will be measured in accordance with Item 416, "Drilled Shaft Foundations."
- The new conduit will be measured in accordance with Item 618, "Conduit."
- 12.5. Remove Existing Lane Control System will be measured as each Lane Control System, including field equipment to operate the Lane Control System, removed.
- 12.6. Remove Existing Radar Vehicle Sensing Device will be measured as each RVSD with all associated components removed.
- 12.7. Relocate Existing RVSD Pole Structure and Cabinet will be measured as each RVSD Pole Structure and Pole Mounted Cabinet with all associated components removed and relocated, complete in place, tested, and made fully operational with the CTECC system.
- The new foundation will be measured in accordance with Item 416, "Drilled Shaft Foundations."
- The new conduit will be measured in accordance with Item 618, "Conduit."
- 12.8. IA Cabinet Foundation will be measured as each foundation installed.

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**13. PAYMENT**

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement," will be paid for at the unit price bid for "Remove Existing IA Cabinet," "Relocate Existing IA Cabinet," "Remove Existing Communications Hub," "Relocate Existing Camera Pole Structure and Cabinet," "Remove Existing Lane Control System," "Remove Existing Radar Vehicle Sensing Device," "Relocate Existing RVSD Pole Structure and Cabinet," and "IA Cabinet Foundation." This price is full compensation for removing and relocating as shown on the plans; for testing, delivery and storage of components designated for retention or reuse; and for all manipulations, materials, labor, tools, equipment, and incidentals.

The new foundation must be constructed, measured and paid for in accordance with Item 416, "Drilled Shaft Foundations."

The new conduit must be constructed, measured and paid for in accordance with Item 618, "Conduit."