

Federal Project Number: CM-9321(2)
State Project Number: 19LPLM-F3-139
TDOT PIN: 120327.01

Bid Addendum #1
Issued 01/28/2020

Item #1 Attachments

1. A copy of the sign in sheet from the pre-bid meeting is included with this Addendum.
2. Receipt of Addendum form, to be completed and submitted with final Bid Book. Acknowledgement of addendums is required by TDOT for Bid Award.
3. Network Switches Test Plan required for the contractor to perform.

Item #2 Bidding Information

Items addressed by Kimley-Horn and Associates, Inc. at the Pre-Bid Meeting:

1. Bids are due Tuesday, February 4, 2020 at 2:00 pm Central Standard Time (CST) at the City of Goodlettsville City Hall, located at 105 Main Street, Goodlettsville, TN. The reading of the bids will begin at 2:00 pm CST.
2. This project does have federal and state funding. It is a Tennessee Department of Transportation (TDOT) Locally Managed Project and will be following all TDOT requirements. Please be aware that this project can be audited since it has federal funding associated with it.
3. Bidders must pick-up an official Bid Set from the City of Goodlettsville in order to be able to bid on this project. Bid Sets can be collected from Greg Edrington, P.E. at the City of Goodlettsville City Hall located at 105 Main Street, Goodlettsville, TN.
4. Bidders must be pre-qualified through TDOT; bids will NOT be opened from any contractor not on the TDOT pre-qualified list at the time of bid opening. Sub-contractors do not need to be pre-qualified at the time of the bid but must be pre-qualified prior to beginning any work on the project.
5. We ask the following on the front of their bid envelope:
 - a. Contractor name, address, telephone number, email address
 - b. List of sub-consultants
 - c. The project numbers and project description listed at the top of this bid addendum
6. **All forms must be completed by hand in the bid book provided. Do not scan the book and reprint it. Do not remove pages from the bid book. Do not add any pages to the bid book except for the power of attorney form to accompany the proposal bond or a check to accompany the bid guarantee.**
7. **Complete the front cover of the bid book with Contractor name and Surety name.**
8. All questions must be submitted by January 29, 2020 at 5:00 pm Central Standard Time in writing to terrance.hill@kimley-horn.com. Responses will be provided by January 30, 2020 at 5:00 pm Central Standard Time.
9. Project has a schedule to be completed on or before nine (9) months from Construction NTP. The City of Goodlettsville will work with the low bidder to issue the Notice to Proceed within a

reasonable date following TDOT concurrence with bid award. Kimley-Horn will work with the contractor to complete bonds, contracts, etc. in order for contractor to begin work promptly after NTP.

10. Liquidated damages will apply to end date per TDOT Standard Specifications.
11. The contractor will be required to coordinate with utilities throughout the project for markings of lines and any notifications for inspection.
12. Traffic Control – Contractor is responsible for traffic control. Minimal road closures may be allowed for milling and paving operations. If it is determined a road closure is necessary, requests must be submitted in writing to the City of Goodlettsville seven days prior to the closure. Any lane or closure request must be approved by TDOT and the City of Goodlettsville.
13. Monthly Meetings – An informed and responsible representative from the general contractor will be expected to attend monthly (at a minimum) or bi-weekly construction meetings held at the City of Goodlettsville City Hall. This person should be prepared to discuss the prior week's activities as well as expected activity for the following weeks.
14. T2's and certifications will be required of any item before payment is made to contractor.
15. For a complete bid to be accepted, the following forms in the project bid book must be filled out:
 - a. Completed cover page
 - b. Completed proposal
 - c. Completed bid form
 - i. Acknowledgement of addendum
 - d. Completed proposal certification
 - e. Completed proposal bond with attached power of attorney OR completed proposal guarantee with attached cashier's check
16. Do not remove these forms from the original bid book document or include any attachments other than the power of attorney or cashier's check.
17. Do not use any other type of bid bond form other than the one in the office bid book.

Item #3 Contractor Questions

1. Electronic pdf versions of the plans package are available via the link associated with this email. However, a contractor must pick up a hard copy set of plans and bid book in order to bid on the project.
2. The City would prefer replacement of the Caldwell median island nose with new pavement in the immediate area directly adjacent to the median nose. The new pavement will be full depth.
3. The Contractor will be allowed to work in multiple locations within the project limits at the same time with prior TDOT approval. The Contractor will have to pull a ROW permit for work within the ROW (at no charge) and no ROW bond requirement beyond the overall project bond.
4. The integration of central software will be the responsibility of the central software vendor, not the Contractor. See the attached Network Switches Test Plan for Contractor's responsibilities.

Item #4 – Revisions

1. The City will consider a contract extension to the nine (9) months from Construction NTP schedule, pending the lead time for mast arm materials provided by pole fabricators.
2. ATC Cabinets will include both front and back doors.

3. Traffic signal controllers will be provided by the City. The Contractor will be responsible for installing City provided controllers and providing communication between the controllers and the central software. The central software vendor will provide, install, and configure the central software and server.
4. The City requests the Contractor's work to begin on Windsor Green/Conference Drive intersection.
5. The City requests the Contractor to replace the existing span wire across the westbound Windsor Green approach at Conference Drive.

End of Addendum #1

Goodlettsville CMAQ

Goodlettsville, Tennessee

Construction Pre-Bid Meeting

Attendance Sheet

| | Name | Company | Telephone | Email |
|----|-----------------|------------------------|--------------|--------------------------------|
| 1 | CREEK EDZINGTON | CITY OF GOODLETTSVILLE | 615-851-2461 | CEEDZINGTON@GOODLETTSVILLE.GOV |
| 2 | TERRANCE HILL | Kimley-Horn | 615-564-8869 | terrance.hill@kimley-horn.com |
| 3 | ZAC DUFOUR | KIMLEY-HORN | 615-564-2701 | Zachary.dufour@kimley-horn.com |
| 4 | POPE MCCORMICK | Goodlettsville | 615-851-2204 | umccormick@goodlettsville.gov |
| 5 | TRENT LEAVER | STANSELL ELECTRIC | 615-369-4143 | tleave@stanssell electric.com |
| 6 | MIKE BIGGS | THE CORRADINO GROUP | 615-372-6972 | mbiggs@corradino.com |
| 7 | GERARD BOLDEN | THE CORRADINO GROUP | 615-406-8767 | gbolden@corradino.com |
| 8 | CHARLIE BALLARD | CITY OF GOODLETTSVILLE | 615-851-2239 | cballard@goodlettsville.gov |
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RECEIPT OF ADDENDUM

The Bidder acknowledges that he (she) has received the following addenda. The modifications to the Bid Documents noted therein have been considered and all cost thereto are included in the Bid Sum.

A. Addendum Number _____ Dated _____

B. Addendum Number _____ Dated _____

C. Addendum Number _____ Dated _____

Signature of Bidder

Printed Name and Title

NETWORK SWITCHES TEST PLAN

January 28, 2020



1 Introduction

This test plan describes the testing procedures the Contractor must perform to ensure that the network switch elements installed and integrated meet the Contract's specifications and are properly integrated into the existing systems at the City's Traffic Operations Center (TOC).

Three (3) separate tests shall be performed by the Contractor, including field acceptance tests (FATs), TOC Integration testing, and 30-Day system acceptance testing. This specification is in addition to any testing requirements identified in specifications for the equipment installed. Other testing requirements including, but not limited to, manufacturer testing and certification prior to shipment or other testing prior to the equipment arrival on-site is still applicable. Should test acceptance criteria differ between this test plan and specific device special provisions, the more stringent requirements shall be met.

2 Approach

The Contractor shall adhere to the following test plan to ensure that the Layer 2 field Ethernet switch (L2) and/or Layer 3 (L3) ethernet switch equipment installed under the contract meets project and Specification requirements. The procedures to be followed during each test can be found in the Appendix.

2.1 Test Types

Field Acceptance Tests (FATs)

Field Acceptance Tests demonstrate compliance with the Specifications and manufacturing standards. The Contractor shall perform FATs at each field site as required by the Engineer.

TOC Integration Testing

TOC Integration testing shall be performed using the TOC's ATMS and network management system (NMS) software to verify that proper communication exists between the TOC and the devices within the system.

30-Day System Acceptance Test (SAT)

System Acceptance Testing (SAT) shall be performed to verify proper operations and TOC control of all devices installed under the Contract for 30 days.

2.2 Overall Test Strategy/Sequencing

All devices shall be tested and installed using vendor and off-the-shelf software. It is the responsibility of the Contractor to provide all vendor and off-the-shelf software necessary to test all required functions included in these test plan procedures and Specifications at no additional cost to the City.

The Contractor shall coordinate with and support the City's integrator to facilitate the integration of the devices to be installed into the system. This shall include, but not be

limited to, device configuration changes, network addressing changes, firmware/software updates, providing software development kit (SDK) tools and documentation, and general support/field support necessary to complete the integration of the new devices into the network.

3 Responsibilities

Upon completion of all tests, the Contractor shall submit the attached test forms to the Engineer, found in Appendix C, with confirmation of completion denoted at the end of each form. The Engineer or his/her representative shall witness all tests. The City representative shall confirm approval at the end of the corresponding test form.

Certificate of Compliance shall be submitted with each Network Switch as proof of successful completion of the test.

The City reserves the right to witness all Field Acceptance Tests (FATs). The Contractor shall notify the Engineer at least 14 days prior to the start of FATs, and submit the results of the FATs to the Engineer within 1 week of performing the testing.

4 Schedule

The following test sequencing schedule shall be conducted on all devices unless otherwise approved by the Engineer:

- Perform Field Acceptance Tests (FATs) on all individual devices.
- Perform TOC Integration testing using TOC central software.
- Coordinate with the TOC staff to perform system acceptance testing (SAT);
 - Confirm that, for 30 consecutive days, each device is performing properly and all devices in a communication channel perform properly as a network.
 - Confirm at the end of the 30 days that the devices installed still perform properly.
 - The SAT process shall not begin on any device in a communication channel until all devices in that channel have been completely integrated into the TOC.

Appendix A – Field Acceptance Test (FAT) Procedures

Perform local field operational acceptance tests at each device location as required by the Engineer in order to demonstrate compliance with the Specifications. Testing shall be performed on all network switch equipment and shall include, but not be limited to, the following:

All Network Switches (L2 and L3):

- Inspect the quality and tightness of ground and surge protector connections.
- Verify that all equipment meets weatherproofing/waterproofing requirements according to manufacturer's standards.
- Connect devices to the power sources.
- Verify all connections, including correct installation of communication and power cables.
- Verify configuration of the switch's Internet Protocol (IP) addresses and subnetwork mask.
- Reboot the system and verify that all settings are retained.
- Confirm the capability to generate an alarm when a port goes down, and comes back online. Confirm the capability to generate an alarm and shut down ports when an unauthorized user attempts to access the network.
- Confirm proper network time protocol (NTP) or simple network time protocol (SNTP) sources are configured to synchronize device clocks.

Layer 3 Switches (L3):

- Confirm multicast routing functionality by requesting 1 or more streams from the switch to be shared with two or more remote workstations/laptops. Verify network monitoring statistics to validate bandwidth from a single stream until it reaches the closest L3 switch to the workstations.
- Demonstrate RSTP layer 2 network resolution of all communication channels/loops connected to the L3 Switch. Temporarily disconnect the connection to the L3 switch on one end or another and monitor resolution by performing a recurring ping test (resolution should occur in less than 45 seconds).
- Demonstrate/Verify Layer 3 network redundancy (VRRP) by temporarily disabling one of the primary L3 switch pairs. Perform recurring ping testing and network monitoring to verify that virtual gateway operations has been established. Repeat for all associated Layer 2 device loop channels between all Layer 3 switches paired to the origin Layer 3 site.
- Perform network route redundancy testing by temporarily disabling/disconnecting primary route fiber(s) towards the TOC. After successfully restoring fiber connection, remove the backup route connection and monitor the network for network resolution.
- Perform redundancy testing, where redundancy is utilized. (fans, processors, power supplies)

Layer 2 Ethernet Switch (L2)

- Demonstrate VLAN operability and restrictions by moving a laptop between two or more VLANs and performing ping tests to devices at the local switch on different VLAN segments.
- Perform testing of RSTP self-healing network functionality. Disconnect the network switch in the middle of the channel (if applicable), and monitor for network resolution on either side of the device failure that all other switch/device connections are restored within RSTP parameters.
- Confirm that all designated VLANs are configured for sites in each loop/channel (e.g. MGMT, Data, Video, etc.)

Appendix B – TOC Integration Test Procedures

As denoted in the test plan, the Contractor shall be responsible for coordinating with the City's integrator to ensure that the TOC is prepared for equipment integration prior to the start of TOC Integration testing.

Once ease of integration has been confirmed by the City's integrator, and FATs have been completed, the Contractor shall coordinate with the TOC to perform integration testing with the TOC's ATMS software for each switch site according to the following:

- Verify the network connection to all associated switches and connected devices through ping, telnet sessions, and/or TOC ATMS software.
- Confirm secure access and remote monitoring from TOC network management system.
- Perform redundancy testing, where redundancy is utilized.
 - L2 Switches: Verify that network protocol (STP or RSTP) is operating properly.
 - L3 Switches: Verify that VRRP, redundant fans, power supplies, and/or processors are operating properly.

Appendix C – System Acceptance Test (SAT) Procedures

Upon successful completion of TOC Integration, all switches shall undergo a 30-day System Acceptance Test to verify proper operations of the field switches and control of associated devices from the TOC. The SAT process shall not begin on any device in a communication channel until all devices in that channel have been completely integrated into the TOC. If the device does not operate properly during the SAT, corrective action shall be taken to restore the device to normal operation. If the device fails twice, corrective action shall be taken to restore the device to normal operation and the SAT shall restart for the full 30 days.

At the end of the 30 days, coordinate with TOC staff to perform the following tests at the TOC on all devices installed:

- Verify the network connection to the switch through ping, telnet sessions, and/or TOC ATMS software.
- Remote into each device, export the configurations and provide to the City with project documentation.

Additionally, coordinate with TOC staff to perform the following tests at the TOC on a sample (10% or a minimum of 5) of devices installed:

- Reboot the system and verify that all settings are retained.
- Remote into device and navigate the menu, then perform a remote reset.

Appendix D – Completion of 30-Day System Acceptance Test Agreement

This 30-Day System Acceptance Test (SAT) Completion Agreement is made as of this ___ day of _____, 20___ between the City of Goodlettsville (City) Transportation Operations Center (TOC) and _____ (“the Contractor”) for the following project: _____.

It is the intent of this Agreement that the network switch devices and equipment installed under the Contract have passed the required 30-Day SAT, and are henceforth under the Warranty agreed upon in the Contract.

Test Completion Confirmed by: _____ Date: _____

(City Representative)