Steven V. Stenger
County Executive

Saint Louis
COUNTY
TRANSPORTATION
PUBLIC WORKS

Daniel W. Dreisewerd, P.E., PTOE
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May 21, 2018

ADDENDUM NO. 2

Notice to All Persons and Firms Proposing
to Submit a Bid or Furnish Materials for
Clayton Road – ARS Infrastructure
St. Louis County Project No. AR-1674
Federal Project No. STP-5438(611)

The construction contract for this project has been revised as follows:

No. 1

The following Job Special Provisions were not included in the original contract book. This addendum adds these Job Special Provisions:

900.30.20 Communication Cable for Accessible Pedestrian Signal Equipment
900.30.21 Pedestrian Push Button Detector
1200.90.10 Controller Phase Requirements
1200.90.11 Actuated Controller Unit Features

No. 2

The six (6) APS Pushbutton Programming supplemental documents were not included in the original contract book. This addendum adds these supplemental documents.

ATTENTION BIDDERS: THE ADDENDUM ACKNOWLEDGEMENT IN THE BID DOCUMENTS MUST BE COMPLETED AND SUBMITTED WITH ALL BID PROPOSALS.

Joseph W. Kulessa, P.E.
Division Manager, Design

JWK/JWD/jlh
Attachments: JSP's 900.30.20, 900.30.21, 1200.90.10, 1200.90.11, APS Pushbutton Intersection Forms (6)

Saint Louis COUNTY TRANSPORTATION

APS PUSH BUTTON PROGRAMMING

Project Name:	Clayton Road ARS Infrastructure
St. Louis County Project Number:	Clayton Road ARS Infrastructure (AR-1674)
Federal Project Number:	STP-5438(611)
E/W Gateway TIP Number:	6503D-16 and 6607I-16

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Midblock (Immacolata School)

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1a	Right	Voice	Clayton Road
2a	Right	Voice	Clayton Road

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Galleria/Commercial Entrance

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1	Left	Tone	
2a	Left	Tone	
4	Right	Tone	
4a	Left	Tone	
5	Left	Tone	
5a	Left	Tone	

2 Addendum 2

Saint Louis COUNTY TRANSPORTATION

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E/W Gateway TIP Number:	6503D-16 and 6607I-16

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Clayshire Dr

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1a	Left	Tone	
3	Right	Tone	
3a	Left	Tone	
4	Right	Tone	

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Brentwood Blvd

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1a	Left	Voice	Brentwood Blvd
1b	Right	Voice	Clayton Road
2	Right	Voice	Clayton Road
2a	Right	Voice	Brentwood Blvd
3	Right	Voice	Clayton Road
3a	Left	Voice	Brentwood Blvd
4	Right	Voice	Brentwood Blvd
4a	Left	Voice	Clayton Road

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Crescent Dr/Commercial Entr

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1	Left	Voice	Cresent Drive
1a	Right	Voice	Clayton Road
2	Left	Voice	Cresent Drive
2a	Right	Voice	Clayton Road
3	Right	Voice	Clayton Road
3a	Right	Voice	Commercial Entrance
4	Right	Voice	Commercial Entrance
4a	Left	Voice	Clayton Road

2 Addendum 2

Saint Louis COUNTY TRANSPORTATION

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E/W Gateway TIP Number:	6503D-16 and 6607I-16

Intersection Name:		Mainline Street	Cross Street
		Clayton Road	Central Ave/East Linden Ave
Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1	Right	Voice	Clayton Road
1	Left	Voice	Central Avenue
2	Left	Voice	Clayton Road
2a	Right	Voice	East Linden Avenue
3	Right	Voice	East Linden Avenue
4	Left	Voice	Clayton Road
5	Right	Voice	Clayton Road
5	Left	Voice	Central Avenue
6a	Left	Voice	Central Avenue
6b	Right	Voice	Central Avenue

Intersection Name:		Mainline Street	Cross Street
		Clayton Road	Hanley Road
Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1	Right	Tone	
1b	Right	Tone	
2	Left	Tone	
2a	Right	Tone	
3	Right	Tone	
3a	Left	Tone	
4	Right	Tone	
4a	Right	Tone	

Intersection Name:		Mainline Street	Cross Street
		Clayton Road	Glen Ridge Ave
Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1a	Left	Tone	
2	Left	Tone	
2a	Right	Tone	
3	Right	Tone	

2 Addendum 2

Saint Louis COUNTY TRANSPORTATION

APS PUSH BUTTON PROGRAMMING

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E/W Gateway TIP Number:	6503D-16 and 6607I-16

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Crestwood Dr/Boland Pl

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1a	Right	Tone	
1b	Left	Tone	
2	Right	Tone	
2a	Left	Tone	
3	Left	Tone	
3a	Left	Tone	
4	Right	Tone	
4a	Left	Tone	

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Big Bend Blvd

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1	Right	Tone	
1a	Left	Tone	
2	Right	Tone	
2a	Left	Tone	
3a	Right	Tone	
3b	Left	Tone	
4	Right	Tone	
4a	Left	Tone	
5	Right	Tone	
5a	Left	Tone	

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Midblock (Esquire Theater)

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1	Right	Voice	Clayton Road
2	Right	Voice	Clayton Road

2 Addendum 2

APS
PUSH BUTTON
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E/W Gateway TIP Number:	6503D-16 and 6607I-16

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	St. Rita Ave/Highland Ter

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1	Right	Tone	
2	Right	Tone	
3a	Right	Tone	
3b	Left	Tone	
4a	Right	Tone	

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	Bellevue Ave/Seminary Pl

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1a	Right	Voice	Bellevue Ave
1b	Right	Voice	Clayton Road
2a	Right	Voice	Clayton Road
2b	Left	Voice	Seminary Pl
3	Left	Voice	Clayton Road
3a	Right	Voice	Seminary Pl
4a	Left	Voice	Clayton Road
4b	Right	Voice	Bellevue Ave

Intersection Name:	Mainline Street	Cross Street
	Clayton Road	

Location:	Arrow Direction	Tone / Voice	Voice (if needed)
1a	Right	Tone	
1b	Left	Tone	
2a	Right	Tone	
2b	Left	Tone	

2 Addendum 2

Saint Louis COUNTY TRANSPORTATION

APS
PUSH BUTTON
PROGRAMMING

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Federal Project Number:		STP-5438(611)	
E/W Gateway TIP Number:		6503D-16 and 6607I-16	
3a	Right	Tone	
3b	Left	Tone	
4	Left	Tone	
4a	Right	Tone	

2 Addendum 2

900.30.20 COMMUNICATION CABLE FOR ACCESSIBLE PEDESTRIAN SIGNAL EQUIPMENT

A. This communication cable is only to be used to connect the pedestrian push button detector to the relay in the pedestrian signal indication.

B. This type of cable shall be 300 volts and have four (4) conductors. The conductors shall be No. 18 AWG, stranded thin copper wire, with polyvinyl chloride insulation (0.017 inch thick) color and/or number coded with a nylon overcoat. The communication cable shall have a black polyvinyl chloride outer jacket (0042 inch thick) and be plainly marked on the outside with the manufacturer's name and identification of the type of cable. This communication cable shall be rated for outdoor use. The nominal outside diameter of the cable shall be approximately 0.309 inches.

C. Payment for this work will be made at the contract unit prices for Bid Item No. 904-85.34, Cable, Communication, #18 Gauge, 4 Conductor (APS).

900.30.21 PEDESTRIAN PUSH BUTTON DETECTOR

Section 904.4.7.1 of the St. Louis County Transportation Standard Specifications for Road and Bridge Construction is replaced as follows:

904.4.7.1 Pedestrian Push Button Detector. The pedestrian push button detector shall be able to operate as either a standard push button detector or as an accessible pedestrian signal (APS).

904.4.7.1.1 Basic Construction and Mounting The pedestrian push button detector shall be vandal resistant, pressure activated piezo type, with momentary LED, a push button locator tone, and a tactile arrow with high visual contrast. .The push button shall be connected to the controller cabinet by means of a two conductor cable. The detector shall be a removable contact assembly mounted in an aluminum round case. The back of each case shall be designed for mounting to a round pole. A 1/2 inch opening for cable shall also be provided in the back of each case. Holes shall be formed in the assembly case for mounting the push button unit. The operating button shall be sturdy, secure against electrical shock to the user, and of such construction as to withstand continuous hard usage. Push buttons shall be mounted forty-two (42) inches above the paved landing with the face of the push button parallel with the associated crosswalk.

904.4.7.1.1.1 Control Module The pedestrian push button detector shall be connected to a control module located in the pedestrian head assembly by means of a four conductor cable outlined in section 904.3.2.6. The control module shall be supplied by the same manufacturer of the pedestrian push button detector to ensure compatibility. The control module shall be installed per the manufacture's recommendations.

904.4.7.1.2 Accessible Pedestrian Signal (APS) Features. Every pedestrian push button detector shall have the following specifications and features:

1) An accessible walk indication (a speech message or percussion tone) that runs concurrent with the pedestrian WALK signal indication shall be considered a standard feature. The accessible walk indication shall have the same duration as the pedestrian WALK signal indication except when the pedestrian signal rest in walk. If the pedestrian signal rests in walk, the accessible walk indication should be limited to the first 7 seconds of the walk interval. The accessible walk indication should be recalled by a button press during the walk interval provided that the crossing time remaining is greater than the pedestrian change interval.

2) A speech push button information message such as "wait" and / or "wait to cross Main Street"

3) All tones, messages, and alerts shall be programmed by the manufacture per the plans, specifications and construction documents before the buttons are installed.

4) Speech messages shall be generated by an approved speech generating program. Project site recordings of speech messages will not be permitted.

5) All tones, messages, and alerts shall be in an uncompressed Waveform audio file format (WAVE or more commonly known as .WAV format due to its filename extension).

6) Be capable of utilizing the extended push button features outlined in the MUTCD

904.4.7.1.3 Maintenance and Operational Features. The pedestrian push button shall have the following basic features.

1) The push button shall be designed in a way to allow the accessible walk indication to be programmed and electronically updated by means of an easily accessed and weatherproof USB Type A port. Programming and electronic updates shall have a layer of security that ensures only authorized personnel can program, update or access the audio features. The push button shall be designed to allow for bidirectional electronic transfer of all tones, messages and alerts in individual uncompressed .WAV files

2) The push button shall be designed in a way to allow all APS features to be turned off.

3) Automatic volume adjustment in response to ambient traffic sound levels.

4) The operating voltage shall not exceed 24 volts.

5) The Circuit board(s) shall be potted

6) The push button shall be designed in a way to facilitate the repair or replacement of components such as the speaker and circuit board with ease.

904.4.7.1.4 Pedestrian Push Button Detector Extension Assembly. A pedestrian push button detector extension assembly shall be a standard feature where an obstruction creates a horizontal side reach of more than ten (10) inches to the push button detector.

1) The pedestrian push button detector extension assembly shall be installed in accordance with standard detail drawing C904.20.

2) The pedestrian push button detector extension assembly shall be considered incidental to the cost of the pedestrian push button detector. No direct payment will be made for an extension assembly.

3) The pedestrian push button detector extension assembly should not exceed eight (8) inches in length.

904.4.7.1.4.1 Installation, Assembly, and Mounting.

1) The pedestrian push button detector extension assembly shall be banded onto the mast arm or aluminum post using a 5/8 inch by 0.30 inch stainless steel banding and stainless steel mounting hardware.

2) The push button case shall be attached to the extender plate weldment by means of two counter sink head bolts with flat washers, split lock washers, and hex head nuts. All bolts, washers and nuts shall be stainless steel.

904.4.7.1.5 Approval of Pedestrian Push Button Detector. In order for manufacturers' push button equipment to be approved, the following requirements must be fulfilled, unless otherwise approved by the Engineer.

1) The manufacturers' equipment must satisfactorily meet the specifications as described herein.

2) The manufacturers' equipment must have been previously tested with satisfactory results by the Saint Louis County Department of Transportation. It shall be the prerogative of the Saint Louis County Department of Transportation to determine whether a new model of previously approved equipment will be accepted without retest.

3) The manufacturers' equipment must meet the subjective approval of the Saint Louis County Department of Transportation concerning the following:

   a) Appearance (suitable size of equipment and ease of installation).

   b) User friendly (ease of programming, accessibility for monitoring).

   c) Uniformity and Compatibility (ease of maintenance, convenient board testing and removal, state of the art board layout and design,).

1200.90.10 CONTROLLER PHASE REQUIREMENTS

Section 904.4.6.3 of the St. Louis County Transportation Standard Specifications for Road and Bridge Construction is replaced as follows:

904.4.6.3 Controller Phase Requirements. The phasing and interval sequence to be provided shall be as shown on the plans or as specified in the purchase order.

1) When the plans or purchase order specify a four phase actuated controller, an eight phase actuated controller unit shall be provided in the size cabinet specified and be completely wired for four vehicle phases, two pedestrian phases and two overlaps.

2) When the plans or purchase order specify an eight phase actuated controller, an eight phase actuated controller unit shall be provided in the size cabinet specified and be completely wired for eight vehicular phases, four pedestrian phases and four overlaps.

Addendum 2

1200.90.11 ACTUATED CONTROLLER UNIT FEATURES

Section 904.4.6.4 of the St. Louis County Transportation Standard Specifications for Road and Bridge Construction is replaced as follows:

904.4.6.4 Actuated Controller Unit Features. The controller unit shall be a fully actuated controller unit with a full complement of operational, programming, and diagnostics capabilities. The controller unit shall meet or exceed both NEMA TS-1 1989 and TS-2 2003 Actuated Controller Unit Standards. The controller unit shall have a LCD alphanumeric backlit display unit (8-line 40 character/line). Programming shall use English language menus. The Controller can also be utilized as a master control unit using master software. An external 10 base-T Ethernet port with configurable IP shall be built in. 8MB of flash memory shall be required to retain all timing and control parameters even during power outages.

The controller unit shall be capable of the following:

1) 16 vehicle phases
2) 16 pedestrian phases
3) 4 timing rings
4) 16 overlaps
5) 80 detectors
6) Adaptive maximum routines
7) Adaptive protected/permissive routines
8) Coordination virtual split routine
9) Diagnostics & status displays
10) Multiple reports
11) Peer to Peer communication
12) 4 phase banks that are programmable by time of day
13) Each phase shall have 2 Walk times and 2 Don't Walk times that can be used in conjunction with the extended press feature

904.4.6.4.1 Controller Unit Functional Standards. The following controller unit functional standards are required in addition to those specified in the latest edition and revision of NEMA Standards Publication No. TS 2 Type 2, Traffic Control Systems.

1) Each vehicle phase provided shall have volume-density capability.

2) Dual ring controller units shall have the capability of dual entry operation without the use of external logic.

904.4.6.4.2 Controller Unit Connector Pin Designations. Unless otherwise specified, all designated pins of the controller unit connectors shall be internally wired. The manufacturer shall not be allowed to internally wire the Reserved, Spare, and Test Input pins for any special use, unless otherwise approved by the Engineer.

904.4.6.4.3 Controller Unit Assembly Requirements. The actuated controller unit shall conform to the physical standards, as specified in the latest edition and revision of NEMA Standards Publication No. TS 2 Type 2, Traffic Control Systems, and to the assembly design requirements specified herein:

1) The controller unit shall be designed for placement on a shelf.

2) The front panel(s) of the controller unit shall be permanently marked to identify the fuses, indicators, switches, controls, etc., so that the operation of each shall be readily apparent.

3) The controller unit shall be designed utilizing microprocessor based technology.

4) The controller unit shall be modular by design. Modules shall be positively fastened to the frame and easily removed and replaced without the use of any special tools. An upper and lower guide or track shall be provided for each module assembly in the controller unit chassis. All modules of unlike function shall be mechanically keyed to prevent insertion into the wrong opening and subsequent damage to the controller unit.

5) All connectors shall be front panel mounted.

6) All switching functions shall be accomplished by fully solid state electronic circuitry.

7) Timing shall be entered by a front panel keyboard and by computer. Easy to read keys shall provide either tactile or audio feedback.

8) Menu driven programming shall be provided utilizing traffic engineering terminology prompts. Within a menu, each parameter shall be viewed for simple cursor control of data entries. Adding or changing data entries and instructions shall be accomplished without the use of an access code.

9) During a power failure, no batteries shall be required to retain memory.

10) A minimum 8 line by 40 character, alpha-numeric, liquid crystal display shall be provided on the front panel of the controller unit. The display shall have adjustable contrast settings providing easy to read displays under all lighting conditions. The display shall provide comprehensive visibility of program entries, operational parameters, controller units, and the status of intersection operation.

11) All component parts and terminals shall be readily accessible when the boards are removed from the enclosure for adjustments, testing or maintenance.

12) All wiring for input and output functions shall be terminated on panel terminal strips.

13) Controller units shall have the capability to log and display critical alarms on the unit display.