

**RESOLUTION 20-113A**

**A RESOLUTION TO APPROVE PROFESSIONAL SERVICES AGREEMENT  
WITH THE CORRADINO GROUP FOR TRAFFIC SIGNAL STUDY FOR PORT  
ROYAL/SATURN PKWY. INTERCHANGE AND PORT ROYAL CORRIDOR  
FROM RESERVE BOULEVARD TO BUCKNER LANE**

**WHEREAS**, the Board of Mayor and Aldermen approved Resolution 17-82 to authorize the Mayor to execute a Local Agency Program Agreement with TDOT that sets forth the responsibilities of the City of Spring Hill for the maintenance and operation of the traffic signal system being installed by TDOT at Port Royal Road and Saturn Parkway (SR-396); and

**WHEREAS**, TDOT has recently completed the installation of the traffic signal system at Port Royal Road and Saturn Parkway (SR-396) that includes the construction of signalized intersections and associated road improvements on both ramps of the interchange; and

**WHEREAS**, the installation of the traffic signal system at Port Royal Road and Saturn Parkway (SR-396) provided only for basic programming of the signal system that was not customized to the traffic flow and patterns on Port Royal Road and the nearby commercial corridor the interchange serves as well as synchronization with traffic signals along the Port Royal Road corridor from Reserve Boulevard to Buckner Lane; and

**WHEREAS**, the Board of Mayor and Aldermen determined the need to provide proper signal timing and phasing for the newly installed traffic signals at Port Royal Road and Saturn Parkway and along the Port Royal corridor from Reserve Boulevard to Buckner Lane to optimize traffic flow and to synchronize timing and phasing to further optimize traffic flow, especially during AM and PM peak travel periods; and

**WHEREAS**, The Corradino Group is performing other transportation planning and engineering services for the City of Spring Hill including engineering design services for the Buckner Road transition project; and

**WHEREAS**, the City requested The Corradino Group submit a proposal for preparing a traffic signal study for the intersection of Port Royal Road and Saturn Parkway (SR-396) and Reserve Boulevard to optimize and synchronize traffic flow between these intersections and along the Port Royal Road corridor; and

**WHEREAS**, The Corradino Group submitted a proposal attached hereto as an Exhibit to perform a signal timing study at Port Royal Road and Saturn Parkway (SR-396) and Reserve Boulevard using a phased approach as outlined in the proposal to optimize and synchronize traffic flow along the corridor for a lump sum fee amount of \$22,015 plus a not-to-exceed amount of \$4,250 in direct expenses to be invoice at cost for traffic data collection for a total project cost of \$26,265; and

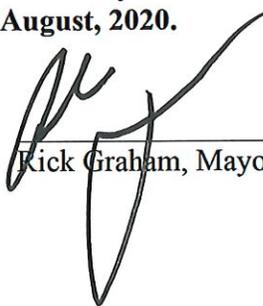
**WHEREAS**, the Board of Mayor and Alderman appropriated \$33,000 from State Street Aid funds for preparing traffic signal studies during FY20-21 including the subject study and a traffic signal warrant study for the Kedron Road/Saturn Parkway interchange.

**NOW, THEREFORE BE IT RESOLVED**, that the City of Spring Hill Board of Mayor and Aldermen:

1. Approves the Professional Services Agreement and corresponding proposal attached hereto as an Exhibit to the Resolution with The Corradino Group to prepare a traffic signal study for Port Royal Road/Saturn Parkway (SR-396) and along Port Royal corridor from Reserve Boulevard to Buckner Lane for a lump sum fee amount of \$22,015 plus a not-to-exceed amount of \$4,250 in direct expenses to be invoice at cost for traffic data collection for a total project cost of \$26,265.

2. Authorize the Mayor to Execute the Professional Services Agreement attached hereto.

**Passed and adopted by the Board of Mayor and Aldermen of the City of Spring Hill, Tennessee on the 17<sup>th</sup> day of August, 2020.**

  
\_\_\_\_\_  
Rick Graham, Mayor

ATTEST:

  
\_\_\_\_\_  
April Goad, City Recorder

LEGAL FORM APPROVED:

  
\_\_\_\_\_  
Patrick Carter, City Attorney



**REQUEST:** Resolution 20-113 and Resolution 20-113A - Approve Professional Services Agreement with The Corradino Group for Traffic Signal Study for Port Royal Rd/Saturn Pkwy and Related Intersections

**SUBMITTED BY:** Chuck Downham, Assistant City Administrator

**DATE:** August 17, 2020

**ATTACHMENTS:** Resolution 20-113 and Resolution 20-113A and Supporting Documentation

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**PURPOSE:**

To approve Resolution 20-113 to approve a Professional Services Agreement with The Corradino Group for a traffic signal study for the signaled intersections located at Port Royal Road/Saturn Parkway (SR-396) and Reserve Boulevard or alternatively to approve Resolution 20-113A to approve a Professional Services Agreement with The Corradino Group for a traffic signal study for the signaled intersections located at Port Royal Road/Saturn Parkway (SR-396) and along the Port Royal corridor from Reserve Boulevard to Buckner Lane.

**BACKGROUND:**

The TDOT initiated a traffic signal and street improvement project at the Port Royal Road/Saturn Parkway interchange that has recently been completed and is operational. The Board of Mayor and Aldermen approved Resolution 17-82 to authorize the Mayor to execute a Local Agency Program Agreement with TDOT that sets forth the responsibilities of the City of Spring Hill for the maintenance and operation of the traffic signal system being installed by TDOT at Port Royal Road and Saturn Parkway (SR-396).

The installation of the traffic signal system at Port Royal Road and Saturn Parkway (SR-396) provided only for basic programming of the signal system that was not customized to the traffic flow and patterns on Port Royal Road and the nearby commercial corridor the interchange serves as well as synchronization with traffic signals along the Port Royal Road corridor including Reserve Boulevard. During recent deliberations involving the City's annual fiscal budget process, the Board of Mayor and Aldermen determined the need to provide proper signal timing and phasing for the newly installed traffic signals at Port Royal Road and Saturn Parkway as well as the nearby signaled intersection at Reserve Boulevard to optimize traffic flow and to synchronize timing and phasing to further optimize traffic flow, especially during AM and PM peak travel periods.

Based upon current transportation engineering services being performed by The Corradino Group for the Buckner Road transition project, the City requested The Corradino Group submit a proposal for preparing a traffic signal study for the intersection of Port Royal Road and Saturn Parkway (SR-396) and Reserve Boulevard to optimize and synchronize traffic flow between

these intersections and along the Port Royal Road corridor. The Corradino Group submitted a proposal attached hereto as an Exhibit to perform a signal timing study at Port Royal Road and Saturn Parkway (SR-396) and Reserve Boulevard using a phased approach as outlined in the proposal to optimize and synchronize traffic flow at these intersections.

During the Board of Mayor and Aldermen work session, Alderman Fitterer with concurrence from other Board members requested consideration to expand the scope of services to include other signals along the Port Royal Road corridor from Reserve Boulevard to Buckner Lane. The Corradino Group prepared a revised proposal containing a phased approach for performing a signal study to include additional signaled intersections along the corridor from Reserve Boulevard to Buckner Lane. The scope of services and schedule are outlined in the proposal.

### **FINANCIAL IMPACT:**

The Board of Mayor and Aldermen appropriated \$33,000 in State Street Aid funds for the purpose of performing traffic signal studies that included the above referenced project as well as a traffic signal warrant study for Kedron Road interchange with Saturn Parkway (SR-396). The proposal attached as Exhibit to Resolution 20-113 from The Corradino Group includes a lump sum fee amount of \$17,210 plus a not-to-exceed amount of \$2,750 in direct expenses to be invoiced at cost for traffic data collection for a total project cost of \$19,960. There is sufficient funding appropriated for this project.

The expanded scope as provided in Resolution 20-113A provides an associated lump sum fee amount of \$22,015 plus a not-to-exceed amount of \$4,250 in direct expenses to be invoiced at cost for traffic data collection for a total project cost of \$26,265. The updated proposal represents an increase in overall cost from \$19,960 to \$26,265 or \$6,305. As stated above, the budget appropriation for traffic studies that included this project and Kedron Road interchange will sufficiently cover the expanded scope as presented in the proposal but, there will not be sufficient remaining funds to complete the Kedron Road interchange signal warrant study. Staff recommends the Board consider an additional budget appropriation to further supplement the appropriation so that there is \$18,000 to \$20,000 available for the Kedron Road study.

### **RECOMMENDATION:**

The Board of Mayor and Aldermen have been presented with two separate resolutions that reflect the initial scope of work for Port Royal-Saturn Pkwy/Reserve intersections only (Resolution 20-113) as well as an expanded scope of work that includes intersections from Port Royal-Saturn Parkway to Buckner Lane (Resolution 20-113A). There is sufficient funding for either scope of service with the understanding that addition funding will be required in order to move forward with the signal warrant study for Kedron Road-Saturn Parkway interchange. Each resolution contains the corresponding Professional Services Agreement and proposal from The Corradino Group and is ready for signature following the selection of the preferred scope of work by the Board.

**PROFESSIONAL SERVICES AGREEMENT BETWEEN  
CITY OF SPRING HILL, TENNESSEE  
AND THE CORRADINO GROUP**

**THIS AGREEMENT** is made this the \_\_\_\_ day of \_\_\_\_\_, 2020, by and between **CITY OF SPRING HILL, TENNESSEE** (hereinafter "City"), and The Corradino Group, Inc. in Brentwood, Tennessee (hereinafter "Consultant").

**WITNESSETH:**

**WHEREAS**, the City has determined to enter into an agreement with a consulting firm that affirms itself to have extensive experience in providing professional services in transportation planning, design and construction engineering and inspection; and

**WHEREAS**, the City submits that it has the authority to contract with Consultant to provide professional services for the work desired by the City; and

**WHEREAS**, by entering into this Agreement, Consultant affirms that it has extensive experience in transportation planning, traffic engineering and design for the City of Spring Hill providing such services in a professional manner in accordance with the terms and conditions of this Agreement as well as the standard of care practiced by other consultants and professionals performing similar services within the industry.

**NOW, THEREFORE**, in consideration of the premises and recitals hereinabove set forth, which are incorporated herein by reference, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and the mutual covenants contained herein, the City and Consultant agree as follows:

**ARTICLE 1 - SCOPE OF SERVICES TO BE RENDERED BY CONSULTANT**

1. Consultant shall perform all necessary professional services in a satisfactory and proper manner, consistent with the City's requirements for the Project and by reference made a part hereof, including, but not be limited to, the following:

a. See Attached Exhibit A (Scope of Services)

2. All documents prepared by Consultant that form a part of the services rendered hereunder shall, upon completion of the exhibits, calculations, draft reports, presentation material, etc. will become the property of the City. Such documents shall not be used by either party on any other project, except as reference materials.

3. The City will furnish all information, data, reports and maps as are existing and identified by Consultant as necessary for carrying out the work that are available to the City without cost to Consultant.

## **ARTICLE 2 – CITY’S RESPONSIBILITIES**

The City will provide to Consultant all criteria and full information as to the Project’s requirements, and shall furnish the following:

1. Provide Consultant with all known available information that is pertinent to the Project.
2. Meet with Consultant for ongoing discussions to assist in directing the consultant.
3. Give thorough consideration to all reports, exhibits or technical memorandums and other documents presented by Consultant and inform Consultant of all decisions within a reasonable time so as not to delay the work of Consultant (i.e. furnish approval or instructions for change).
4. Promptly schedule all required special meetings, serve all public and private notices, receive and act upon all protests.
5. Designate, in writing, a single person to act as Consultant point of contact with the City. The contact person for the City of Spring Hill will be Mr. Chuck Downham.
6. Give prompt written notice to Consultant when it is known that either the Project criteria or conditions have changed, or there is reason to believe Consultant work is deficient in intent or technical content.

## **ARTICLE 3 - TERM**

1. The services of the Consultant for Task 1 and 2 shall be undertaken and completed by within 8 weeks from receipt of Task 1 and 2 Notice to Proceed, unless otherwise agreed upon by the City. Based on the triggering events defined in the Scope of Services for Task 3, the services of the Consultant for Task 3 shall be undertaken and completed within 10 weeks from receipt of Task 3 Notice to Proceed, unless otherwise agreed upon by the City.

## **ARTICLE 4 - FEES**

1. In consideration of the performance of services rendered under this Contract, Consultant shall be compensated a total Lump Sum for services performed in accordance with Article 1, not to exceed \$26,265.00. Tasks 1 and 2 services account for \$8,465.00 of the total lump sum fee. Task 3 services account for \$13,550.00 of the total lump sum fee. ~~Reimbursable expenses are included in the lump sum fee. shall not exceed [Insert amount] unless otherwise authorized in writing by the City.~~ Reimbursable expenses shall not exceed \$4,250.00 to be invoiced by the Consultant at direct cost to the City.

2. Invoices shall be submitted by Consultant to the City in monthly statements for services rendered, if any. The statements shall be based on percent completion of the lump sum amount, and incurred expenses. Each individual invoice shall be due and payable thirty (30) days after receipt.

3. If the City disputes any portion of Consultant invoices, the undisputed portion will be paid by the City, and Consultant will be notified in writing within ten (10) days of receipt of the exceptions taken to such invoice. The City and Consultant will attempt to resolve any payment dispute within sixty (60) days, and both parties agree that no action for collection thereon shall be filed within this time period.

4. If the City delays the Project for more than six months (6) beyond the designated date when work is scheduled to begin, which is more particularly defined as the date this Agreement is executed, then the lump sum as designated in Sub-Paragraph 1 of this Section shall be increased by three percent (3%) per year. The intent of this language is that the increase shall be cumulative, as a delay would cause Consultant to have to revisit the plans created in accordance with the designated start date as defined herein.

#### **ARTICLE 5 – NOTICE**

All notices, certificates or other communications hereunder shall be deemed sufficiently given and shall be deemed given when delivered by hand-delivery or mailed by first class, postage prepaid, registered or certified mail and addressed as follows:

If to Consultant:                      Attn: Gerald Bolden, PE, PTOE  
Vice President  
7000 Executive Center Drive, Suite 2-250  
Brentwood, TN 37027

If to City:                                      Attn: Victor Lay  
Title: City Administrator  
199 Town Center Parkway  
Spring Hill, TN 37174

Copy to:                                        Patrick M. Carter, Esq.  
City Attorney  
P.O. Box 1431  
Columbia, TN 38402-1431

#### **ARTICLE 6 - TERMINATION**

1. This Agreement may be terminated by either party upon thirty (30) days' written notice should the other party fail substantially to perform in accordance with the terms outlined herein through no fault of the party initiating the termination.

2. This Agreement may be terminated by Consultant in the event that the City permanently abandons the Project.

2. In the event of termination by either party, Consultant shall be compensated for all services performed prior to the termination date.

#### **ARTICLE 7 - DISPUTE RESOLUTION AND GOVERNING LAW**

1. The City and Consultant shall attempt to resolve conflicts or disputes under this Agreement in a fair and reasonable manner and agree that if an informal resolution cannot be achieved, the parties shall submit the matter to a mutually agreed upon mediator in an attempt to resolve the dispute through the mediation process. Such mediation process shall be initiated by a request in writing by either party.

2. The mediation provision can be waived by the mutual consent of the parties or by either party if such party's right would be irrevocably prejudiced by a delay in initiating a legal proceeding.

3. Governing Law, Venue and Jurisdiction: This Agreement shall be governed by and construed in accordance with the laws of the State of Tennessee. The venue and jurisdiction for any dispute arising pursuant to this Agreement shall be in the Circuit Court for Maury County, Tennessee.

#### **ARTICLE 8 - BREACH**

1. The term "breach of agreement" specifically includes, but is not limited to, failure to comply with any applicable federal, state or local laws or regulations.

2. One or more waivers of breach of any provision of this Agreement by any party shall not be construed as a waiver of subsequent breach of the same provision, nor shall it be considered a waiver of any other then existing or subsequent breach of a different provision.

3. The substantially prevailing party in any legal proceeding hereunder by and between the parties shall be entitled to their reasonable attorney's fees and court costs incurred in said legal proceeding.

#### **ARTICLE 9 - MODIFICATION**

This Agreement shall not be modified unless such modifications are evidenced in writing in the form of a written Amendment, which is signed by both the City and Consultant. Should any changes in the design of the Project be necessary, the City's designee shall report such change to Consultant in writing. If the City determines that any changes in work are necessary to complete the Project, then Consultant shall be allowed compensation based upon the original contract terms, including the additional work in the overall cost of the construction of the Project.

## **ARTICLE 10 - INDEMNITY AND HOLD HARMLESS**

1. City shall agree to indemnify and hold Consultant, its officers, agents and/or employees, harmless from and against any and all lawsuits, damages and expenses, including court costs and attorneys' fees, by reason of any claim and/or liability imposed, claimed and/or threatened against the City, its officials, agents and/or employees, for damages because of bodily injury, death and/or property damages arising out of or in consequence of the performance of services under this Agreement to the extent that such bodily injuries, death and/or property damages are attributable to the negligence of the City, its agents, employees, or any other entity for which the City may be found to be legally liable. This provision shall survive the completion of all services, obligation and duties provided pursuant to the Project, or the termination of this Agreement for any reason.

2. Consultant shall agree to indemnify and hold the City, its officers, agents and/or employees, harmless from and against any and all lawsuits, damages and expenses, including court costs and attorneys' fees, by reason of any claim and/or liability imposed, claimed and/or threatened against Consultant, its officials, agents and/or employees, for damages because of bodily injury, death and/or property damages arising out of or in consequence of the performance of services under this Agreement to the extent that such bodily injuries, death and/or property damages are attributable to the negligence of Consultant, its agents, employees, or any other entity for which Consultant may be found to be legally liable. This provision shall survive the completion of all services, obligation and duties provided pursuant to the Project, or the termination of this Agreement for any reason.

## **ARTICLE 11 – INSURANCE**

Consultant shall maintain, during the term of this Agreement, or any extension hereof, the following insurance policy, written by an insurance company authorized to do business within the State of Tennessee, and furnish City, in duplicate, Certificates of Insurance as evidence thereof:

1. Worker's Compensation: Providing coverage in compliance with the laws of the state in which any part of the work is to be performed, and Employer's Liability Coverage in the minimum amount of the statutory limit for each occurrence.

2. Comprehensive (Commercial) General Liability Insurance: Bodily injury and property damage combined single limit in the minimum amount of \$1,000,000.00 for each occurrence.

3. Automobile (Business) Liability Insurance: Bodily injury and property damage combined single limit in the minimum amount of \$1,000,000.00 for each occurrence, \$1,000,000.00 aggregate.

4. Professional Liability Insurance: Professional liability insurance covering claims arising from errors, omissions or negligent acts committed in the performance of professional services under this Agreement with limits of \$1,000,000.00.

**ARTICLE 12 - SEVERABILITY**

In the event any provision of this Agreement or any instrument delivered in connection herewith shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provisions hereof or thereof.

**ARTICLE 13 - BINDING EFFECT**

This Agreement shall inure to the benefit of and shall be binding upon the parties and their respective heirs, administrators, successors and assigns.

**ARTICLE 14 - INDEPENDENT CONTRACTOR RELATIONSHIP**

It is specifically understood that Consultant relationship with City shall be that of independent contractor and Consultant shall in no sense be considered an agent or employee of City, nor shall Consultant be, as a result of the relationship established by this Agreement, entitled to or eligible to participate in any benefits or privileges extended or given by City to its employees, notwithstanding this Agreement.

**ARTICLES 15 - HEADINGS AND EXHIBITS**

The paragraph headings in this Agreement are for convenience only, and they form no part of this Agreement and shall not affect its interpretation.

**ARTICLE 16 - FORCE MAJEURE**

Consultant shall not be liable to City or be deemed to be in breach of this Agreement for any failure or delay in rendering performance arising out of causes beyond Consultant reasonable control and without its fault or negligence. Such causes may include, but are not limited to, acts of God or the public enemy, terrorism, significant fires, floods, earthquakes, epidemics, quarantine restrictions, strikes, freight embargoes, or Governmental Authorities approval delays which are not caused by any act or omission by Consultant and unusually severe weather. Consultant agrees to notify City of the existence and nature of any delay.

**ARTICLE 17 - ENTIRE AGREEMENT**

This Agreement and accompanying documents contain the entire agreement between the parties with respect to the subject matter hereof and all prior or contemporaneous written or oral agreements with respect to the subject matter hereof are superseded hereby.

**IN WITNESS WHEREOF**, the City has caused this Agreement to be signed by its authorized representative, and Consultant has caused this Agreement to be signed in its corporate name by its authorized representative as of the day and year first written above.

**CITY OF SPRING HILL, TENNESSEE**

By:  \_\_\_\_\_  
Rick Graham, Mayor

**The Corradino Group, Inc.**

By: \_\_\_\_\_

Gerald Bolden, Vice President  
(Print Name)

August 7, 2020

Mr. Chuck Downham  
Assistant City Administrator  
City of Spring Hill  
199 Town Center Parkway  
Spring Hill, TN 37174

**Re: Scope of Work and Fee Proposal  
Port Royal Road Traffic Signal Timing**

Dear Mr. Downham:

Attached for your approval is our scope of work and lump sum fee proposal in the amount of \$26,265.00 to provide professional services for development of traffic signal timings for Port Royal Road from Buckner Lane to Saturn Parkway Eastbound Ramps and communications equipment evaluation and recommendation. As discussed, the scope of work and fees were developed with a phased approach, whereas, Task 1 and 2 has fee of \$8,465.00 and Task 3 has a fee of \$13,550.00. This fee includes costs for all labor and a not-to-exceed amount of \$4,250.00 for reimbursable expenses associated with traffic data collection.

We are available at your discretion to further discuss and answer any questions the City may have concerning this information. We greatly appreciate this opportunity and look forward to working with you and the City.

Sincerely,

**THE CORRADINO GROUP, INC.**



**Gerald Bolden, PE, PTOE**  
Vice President  
Tennessee Operations Manager

## SCOPE OF SERVICES

July 22, 2020 (REVISED August 7, 2020)

### PORT ROYAL TRAFFIC SIGNAL TIMING (RESERVE BOULEVARD AND SATURN PARKWAY RAMPS)

*The Corradino Group (Corradino) understands the following item(s) to be included within the scope of work for the referenced project:*

The Tennessee Department of Transportation (TDOT) recently completed intersection improvements, including signalization, at Port Royal Road and Saturn Parkway Ramps. During project development by TDOT, the City of Spring Hill (City) coordinated with and requested TDOT to include synchronized timings between the new signals installed at the Saturn Parkway ramp termini and Reserve Boulevard, located approximately 600 feet north of the westbound ramp termini intersection. As part of the intersection project, TDOT provided basic start-up timing plans for the Saturn Parkway ramp intersections and communications equipment (omni antenna) at westbound ramp intersection. Due to Reserve Boulevard being outside of the project scope for the Saturn Parkway intersections, any updated signal timings, field adjustments and synchronization for and/or with Reserve Boulevard would be the responsibility of the City, according to TDOT.

Additionally, there is planned traffic signalization for the intersection of Port Royal Road and Kroger Access(east leg)/Port Royal Road Access (west leg). This new traffic signal will be located approximately 1,000 feet north of Reserve Boulevard intersection. With the addition of this new traffic signal within the corridor and with the typical traffic operations and congestion along the corridor, the existing signalized intersection of Port Royal Road and Buckner Lane was requested to be included in the overall project limits. Therefore, this scope of work includes four existing signalized intersections and the planned signalized intersection at the Kroger Access.

#### **Traffic Signal Timing Optimization**

Corradino will prepare coordinated traffic signal plans for five total (four existing and one planned) signalized intersections along Port Royal Road, consisting of Port Royal Road at Buckner Lane; Port Royal Road at Reserve Boulevard; Port Royal Road at Saturn Parkway Westbound Ramps; Port Royal Road at Saturn Parkway Eastbound Ramps; and Port Royal Road at Kroger Access/Port Royal Road Access (planned signalization) and provide assistance to the City for identification of additional traffic signal equipment needed to communicate with and maintain coordination between each of the five intersections.

Due to the uncertainty of school operations and traffic impacts resulting from the COVID-19 pandemic, the scope was developed with a phased approach to provide timely signal timing modifications (basic fine-tuning of existing timings) and to be able to provide more efficient traffic operations based on school and business operations in the short time period.

Task 1: Communications Equipment Evaluation

- 1.1 Corradino will conduct a communications equipment evaluation for the intersections to determine the best and most cost-effective strategy for interconnection of the Port Royal Road intersections. As previously noted, TDOT installed an omni antenna at the Saturn Parkway westbound ramp termini intersection to be used for a communications link to Reserve Boulevard. Corradino will coordinate with the City and the City's signal contractor for the equipment needed for the communications link.
- 1.2 As part of the installation of the new communications equipment and communications link for all of the intersections, Corradino will provide oversight and verification of functionality of the system.
- 1.3 Corradino will provide a written recommendation in a Technical Memorandum for the communications/interconnect equipment for this segment of Port Royal Road.

Task 2: Initial Observation and Fine-Tuning

- 2.1 Corradino will conduct an initial site visit at each of the four (4) intersections along Port Royal Road – Buckner Lane; Reserve Boulevard; Saturn Parkway Eastbound Ramps; Saturn Parkway Westbound Ramps.
- 2.2 Corradino will gather existing traffic signal timing data from each of the intersections.
- 2.3 Corradino will observe traffic conditions during the AM and PM peak periods and during a typical off-peak period. Corradino will perform field observations twice for each period.
- 2.4 Corradino will gather sample 15-minute turning movement counts (TMCs) at the intersections during the observation periods.
- 2.5 During the observations, Corradino will evaluate the need for any signal timing fine-tuning for the intersections, which may include but not limited to minimum or maximum phase durations, offsets between intersections, cycle lengths, etc. If needed, initial fine-tuning will be conducted during the observation period.
- 2.6 Additionally, Corradino will setup the initial Synchro Traffic Signal Timing model utilizing the traffic signal timings obtained/fine-tuned in the field and the sample 15-minute TMCs.

**NOTE:** This model will be utilized to evaluate the existing/field fine-tuned timings and, as explained in Task 3 – scenario (b) below if schools are in remote operations and the intersection operations degrade significantly, to development “temporary” timing plans until such time as school and business operations return to some level of normal.

Task 3: Traffic Signal Timing Development

The completion of Task 3 will be dependent on variables such as school and business operations, review of traffic conditions, and intersection operations. Corradino will maintain coordination with the City to determine when this phase of the project should be undertaken. There are two (2) potential execution scenarios for Task 3:

- (a) If/when schools return to normal operations (whether in August, January or other period) and businesses are progressing with/towards normal operations, Task 3 should be fully undertaken (subtask 3.1 - 3.9) with traffic data collection (turning movement counts, etc.) completed while schools are in normal operations;
- (b) If schools are in remote learning and there are restrictions on business operations, then the operations of the intersections should be monitored, and Task 3 should not be completed until such time as intersection operations are not considered acceptable or are significantly degraded. At such time the model and sample 15-minute TMCs obtained in the initial field

observations will be utilized to develop and implement “temporary” timing plans as outlined in subtask 3.2 - 3.7.

For either scenario above, the traffic signal timings will be developed utilizing the best possible or most current traffic data available. However, due to the COVID pandemic, traffic volumes may still fluctuate as schools and business operations vary. After the signal timing implementation and fine-tuning (outlined in Task 3), the operations of the intersections should be monitored and, if necessary, the timings may continue to be fine-tuned as traffic conditions warrant. Corradino is happy to coordinate with the City and provide requested additional timing adjustments as an additional service.

- 3.1 Corradino will gather existing traffic data to be used for the model development and evaluations. If available, any recent (2018 or 2019) TMCs from previous traffic impact studies or TDOT traffic data may be used as the base traffic data in the model. If adequate traffic data is not available, and traffic volumes and conditions are considered typical or similar to pre-COVID conditions, actual full TMCs and bi-directional ADTs will be collected.

The base model and subsequent initial traffic signal timing plans (3 plans – AM, PM, Off-peak/weekend) will be developed utilizing the latest version of Synchro Traffic Signal Timing and Analysis software.

- 3.2 Corradino will evaluate the clearance (yellow and all-red) intervals and pedestrian walk and flashing don't walk clearances for each intersection.
- 3.3 Corradino will perform cycle length evaluations in Synchro for each of the plan periods and determine the most appropriate model developed cycle length. NOTE: Once the timings are implemented in the field, fine-tuning and adjustments will occur that may require changes to the overall cycle lengths.
- 3.4 Corradino will develop a Time-of-Day (TOD) schedule. This will be based on available traffic data and observations throughout the day.
- 3.5 Corradino will evaluate each intersection to determine the optimal phase splits, phase sequence and offsets between intersections for the model developed cycle lengths. NOTE: Once the timings are implemented in the field, fine-tuning and adjustments will occur to the phase splits and offsets to minimize queueing and vehicle stops within the segment and maximize intersection operations.
- 3.6 Each of the three intersections within the Reserve Boulevard to Saturn Parkway Eastbound Ramps segment have emergency vehicle preemption equipment installed. Corradino will coordinate with the City on the operation of the preempt and as needed will develop preemption timing parameters for the intersections. Additionally, Corradino will coordinate with the City to verify emergency vehicle preemption is installed with the planned signalization at the intersection of Port Royal Road and Kroger Access/Port Royal Road Access and determine the need for emergency vehicle preemption at the intersection of Port Royal Road and Buckner Lane.
- 3.7 Once the optimal timing plans (cycle, phase splits, sequence and offsets) are determined, the timings will be coded into the existing controllers and implemented in the field. At such time, Corradino will be onsite conducting field observations and fine-tuning the timings to obtain optimal performance of the intersections. Corradino will perform field observations twice for each timing plan (AM, PM, Off-peak/weekend) developed.

- 3.8 At the conclusion of the project, Corradino will provide the final traffic signal timing documentation to the City.
- 3.9 Also, if requested, Corradino will prepare a presentation for BOMA.

**Additional Services**

Services not specifically mentioned, outside the project limits, or beyond the scope of services in Task 1-3 can be negotiated as additional services based on the hourly rate schedule for The Corradino Group.

Tasks and SubTasks	THE CORRADINO GROUP					
	Prin.	PM/Sr Engineer	Staff Engineer	Eng. Intern	SR ITS/Signal Inspector	Admin
<b>Project Management</b>						
Project Kickoff Meeting		0.5				
Project Admin (Invoicing/StatusReports/Misc)	0.5	1				2
Status Meetings		2				
<b>Task Hours - Subtotal</b>	<b>0.5</b>	<b>3.5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Task 1 - Equipment Evaluation/Recommendation/Specification/Coordination</b>						
Evaluate Existing Equipment		1	1			
Provide Recommendation for Communications/Connectivity		2				
Equipment Specification			2			
Coordination with Contractor (including site visit/CEI)		1			12	
<b>Task Hours - Subtotal</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>12</b>	<b>0</b>
<b>Task 2 - Initial Observation and Fine-Tuning</b>						
Assumes 2 staff w/ 2 observation periods/plan						
Site Visit (including traffic signal timing data; intersection geometry; observations (AM/PM/Off))		8		6		2
Sample 15-minute counts (AM/PM/Off)						6
Fine-tuning		5		5		
Base Synchro Model (temporary)		1	4			
<b>Task Hours - Subtotal</b>	<b>0</b>	<b>14</b>	<b>4</b>	<b>11</b>	<b>0</b>	<b>8</b>
<b>Task 3A - Timing Plan Development</b>						
Traffic Data Collection and/or Coordination (from previous studies and/or Coord w/ count firm)				2		
Base Synchro Model (Update)		1	2			
Yellow-Red-Pedestrian Timings Evaluation		0.5	2			
Timing Plan (3 plans) Development & Operational Analysis (Proposed)		4	12			
Emergency Preemption Coordination and Timing Parameters		2	3			
Intersection Coding Sheets		1	4			
Controller Programming		1	4		2	
<b>Task Hours - Subtotal</b>	<b>0</b>	<b>9.5</b>	<b>27</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Task 3B - Field Implementation</b>						
Assumes 2 staff w/ 2 observation periods/plan						
AM Peak		4	5			2
PM Peak		4	5			2
Off/Weekend Peak		4	6			2
<b>Task Hours - Subtotal</b>	<b>0</b>	<b>12</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>6</b>
<b>Task 3C - Project Documentation</b>						
Presentation	0.5	4	1			
<b>Task Hours - Subtotal</b>	<b>0.5</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Hours</b>	<b>1.0</b>	<b>47.0</b>	<b>51.0</b>	<b>13.0</b>	<b>14.0</b>	<b>16.0</b>

TASK	ESTIMATED FEE
Project Management	\$1,030.00
Task 1 - Equipment Evaluation/Recommendation/Specification/Coordination	\$2,815.00
Task 2 - Initial Observation and Fine-Tuning	\$5,210.00
Task 3A - Timing Plan Development	\$6,435.00
Task 3B - Field Implementation	\$5,380.00
Task 3C - Project Documentation	\$1,145.00
DIRECT EXPENSES (Not-to-Exceed for Traffic Data Collection)	\$4,250.00
<b>TOTAL</b>	<b>\$26,265.00</b>

## 2020 CLASSIFICATION HOURLY RATE SCHEDULE

Principal .....	\$240.00
Project Manager .....	\$220.00
Senior ITS Engineer.....	\$210.00
Senior Design Engineer .....	\$192.00
Staff Engineer .....	\$145.00
Engineer Intern.....	\$90.00
Senior Planner .....	\$145.00
Staff Planner.....	\$115.00
Construction Manager.....	\$180.00
Inspector.....	\$100.00
Travel Demand Modeler .....	\$145.00
Technician.....	\$100.00
Administrative.....	\$70.00

**RESOLUTION 17-82**

**A RESOLUTION TO AUTHORIZE THE MAYOR TO SIGN A PROPOSAL WITH THE TENNESSEE DEPARTMENT OF TRANSPORTATION FOR PROJECT NO. 60952-3503-94, REGARDING SIGNALS ON PORT ROYAL ROAD INTERSECTIONS WITH ON/OFF RAMPS TO EAST SR-396**

**WHEREAS**, the Tennessee Department of Transportation (TDOT) desires to install a traffic signal system within the city limits of Spring Hill, TN (State Project No60952-3503-94; PIN No. 118928.01) at the Port Royal Road intersections with the on/off ramps to SR-396; and

**WHEREAS**, TDOT has prepared a Local Agency Program Agreement outlining the responsibilities of the City of Spring Hill for maintenance and operation of said traffic signals; and

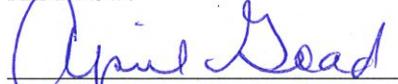
**WHEREAS**, TDOT requests the City of Spring Hill execute the Agreement that will require the signature of the Mayor and City Attorney.

**NOW, THEREFORE, BE IT RESOLVED**, that the City of Spring Hill authorizes the Mayor and City Attorney of the City of Spring Hill, TN to sign a proposal with the Tennessee Department of Transportation for Project No. 60952-3503-94, hereto attached.

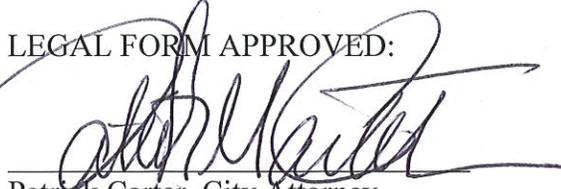
**Passed and adopted by the Board of Mayor and Aldermen of the City of Spring Hill, Tennessee on this 7<sup>th</sup> day of August, 2017.**

  
\_\_\_\_\_  
Rick Graham, Mayor

ATTEST:

  
\_\_\_\_\_  
April Goad, City Recorder

LEGAL FORM APPROVED:

  
\_\_\_\_\_  
Patrick Carter, City Attorney



**STATE OF TENNESSEE**  
**DEPARTMENT OF TRANSPORTATION**  
**PROGRAM DEVELOPMENT & ADMINISTRATION DIVISION**  
**LOCAL PROGRAMS DEVELOPMENT OFFICE**  
SUITE 600, JAMES K. POLK BUILDING  
505 DEADERICK STREET  
NASHVILLE, TN 37243-1402  
(615) 741-5314

**JOHN C. SCHROER**  
COMMISSIONER

**BILL HASLAM**  
GOVERNOR

April 18, 2017

The Honorable Rick Graham  
Mayor, City of Spring Hill  
199 Town Center Pkwy  
P.O. Box 789  
Spring Hill, TN 37174

Re: Signal Maintenance for Signals on Port Royal Rd Intersections with On/Off Ramps to East SR-396,  
LM 2.12 and West SR-396, LM 2.368  
Spring Hill, Maury County  
PIN Number: 118928.01  
Federal Project Number: HSIP-9323(3)  
State Project Number: 60952-3503-94  
Agreement Number: 170056

Dear Mayor Graham:

I am attaching a contract providing for the maintenance of the referenced project. Please review the contract and advise me if it requires any additional explanation. If you find the contract fully satisfactory, please execute it in accordance with all rules, regulations and laws, obtain the signature of the attorney for your agency and return the contract to me. Once we have a fully executed contract, we will return a copy to your office for your files.

If you have any questions or need any additional information, please contact Ms. Maria Hunter at 615-532-3632 or [maria.hunter@tn.gov](mailto:maria.hunter@tn.gov).

Sincerely,

A handwritten signature in black ink that reads "Whitney Sullivan".

Whitney Sullivan  
Transportation Manager

Attachment

**Ecc:** Paul Degges  
Ronnie Porter  
Whitney Sullivan  
Kip Mayton  
John Phillips  
David Hayhew  
Joe Deering  
Mike Brown  
Jason McCoy w/attachment  
Stephanie Ward w/attachment  
E-File

**Bcc:** Contract File  
File

AGREEMENT NO: 170056  
PROJECT IDENTIFICATION NO: 118928.01  
FEDERAL PROJECT NO: HSIP-9323(3)  
STATE PROJECT NO: 60952-3503-94  
State of Tennessee Department of Transportation

LOCAL AGENCY PROGRAM AGREEMENT

THIS AGREEMENT, made and entered into this 7<sup>th</sup> day of August, 2017 by and between the STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION, an agency of the State of Tennessee (hereinafter called the "Department") and the City of Spring Hill (hereinafter called the "Agency").

W I T N E S S E I T H:

WHEREAS, the Department desires to install a traffic signal within the jurisdictional limits of the Agency and

WHEREAS, the Agency, in recognition of the benefits to be received from the installation of said traffic signal desires to cooperate with the Department such that the traffic signal may be installed, operated and maintained.

NOW THEREFORE, in consideration of these premises, the Department and the Agency hereby enter into agreement to provide performance of the project.

SECTION I: The Project to be performed is described as follows:

"Signals on Port Royal Rd Intersection with On/Off Ramps to East SR-396, LM 2.12 and West SR-396, LM 2.368"

SECTION II: The Agency shall be solely responsible for and pay all costs associated with maintenance and operation of all electrically operated devices together with the related equipment, wiring and other necessary appurtenances, and the Agency shall furnish electrical current to all such devices which may be installed as part of the project. Additionally, the Agency shall be solely responsible for and pay all costs associated with the maintenance and operation of solar-powered devices, including, but not limited to, replacement of solar panels, batteries, lights and lenses.

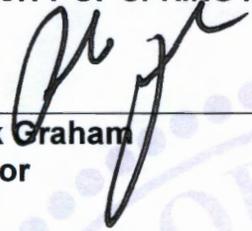
SECTION III: The Agency agrees to comply with all applicable federal and state laws and regulations in the performance of its duties under this contract. The parties hereby agree that failure of the Agency to comply with this provision shall constitute a material breach of this agreement and subject the Agency to the repayment of all state funds expended, or expenses incurred, under this agreement.

IN WITNESS WHEREOF, the parties have caused this instrument to be executed by their respective authorized officials on the date first above written.

CITY OF SPRING HILL

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

By:

  
Rick Graham  
Mayor

8-7-17  
Date

By:

John C. Schroer  
Commissioner

Date

APPROVED AS TO  
FORM AND LEGALITY

APPROVED AS TO  
FORM AND LEGALITY

By:

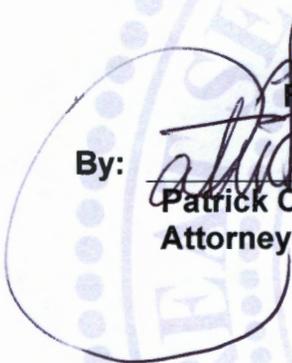
  
Patrick Carter  
Attorney

8-7-17  
Date

By:

John Reinbold  
General Counsel

Date





**STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
PROGRAM DEVELOPMENT & ADMINISTRATION DIVISION  
LOCAL PROGRAMS DEVELOPMENT OFFICE**

SUITE 600, JAMES K. POLK BUILDING  
505 DEADERICK STREET  
NASHVILLE, TN 37243-1402  
(615) 741-5314

**JOHN C. SCHROER**  
COMMISSIONER

**BILL HASLAM**  
GOVERNOR

August 30, 2017

The Honorable Rick Graham  
Mayor, City of Spring Hill  
199 Town Center Pkwy  
P.O. Box 789  
Spring Hill, TN 37174

Re: Signal Maintenance for Port Royal Rd from North of Jim Warren Rd to Old Port Royal Rd North  
Spring Hill, Maury Co  
PIN: 118928.01  
Federal Project Number: HSIP-9323(3)  
State Project Number: 60952-3503-94  
Contract Number: 170056

Dear Mayor Graham:

Attached for your files is a copy of the fully executed contract regarding maintenance for the referenced project. The Department will now proceed with the development of the project.

If you have any questions or need any additional information, please contact Ms. Maria Hunter at 615-532-3632 or [maria.hunter@tn.gov](mailto:maria.hunter@tn.gov).

Sincerely,

Whitney Britt  
Transportation Manager

Attachment

**AGREEMENT NO: 170056**  
**PROJECT IDENTIFICATION NO: 118928.01**  
**FEDERAL PROJECT NO: HSIP-9323(3)**  
**STATE PROJECT NO: 60952-3503-94**  
**State of Tennessee Department of Transportation**

**LOCAL AGENCY PROGRAM AGREEMENT**

THIS AGREEMENT, made and entered into this 28<sup>th</sup> day of Aug, 2017 by and between the STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION, an agency of the State of Tennessee (hereinafter called the "Department") and the City of Spring Hill (hereinafter called the "Agency").

W I T N E S E T H:

WHEREAS, the Department desires to install a traffic signal within the jurisdictional limits of the Agency and

WHEREAS, the Agency, in recognition of the benefits to be received from the installation of said traffic signal desires to cooperate with the Department such that the traffic signal may be installed, operated and maintained.

NOW THEREFORE, in consideration of these premises, the Department and the Agency hereby enter into agreement to provide performance of the project.

SECTION I: The Project to be performed is described as follows:

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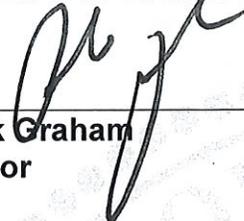
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SECTION III: The Agency agrees to comply with all applicable federal and state laws and regulations in the performance of its duties under this contract. The parties hereby agree that failure of the Agency to comply with this provision shall constitute a material breach of this agreement and subject the Agency to the repayment of all state funds expended, or expenses incurred, under this agreement.

IN WITNESS WHEREOF, the parties have caused this instrument to be executed by their respective authorized officials on the date first above written.

CITY OF SPRING HILL

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION

By:   
Rick Graham  
Mayor

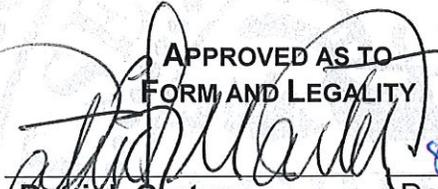
8-7-17  
Date

By:   
John C. Schroer  
Commissioner

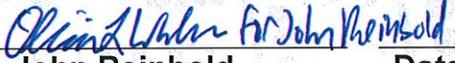
AUG 28 2017  
Date

APPROVED AS TO  
FORM AND LEGALITY

APPROVED AS TO  
FORM AND LEGALITY

By:   
Patrick Carter  
Attorney

8-7-17  
Date

By:  for John Reinbold  
John Reinbold  
General Counsel

8-25-17  
Date

RESOLUTION 17-82

**A RESOLUTION TO AUTHORIZE THE MAYOR TO SIGN A PROPOSAL WITH THE TENNESSEE DEPARTMENT OF TRANSPORTATION FOR PROJECT NO. 60952-3503-94, REGARDING SIGNALS ON PORT ROYAL ROAD INTERSECTIONS WITH ON/OFF RAMPS TO EAST SR-396**

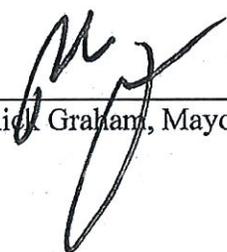
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WHEREAS, TDOT has prepared a Local Agency Program Agreement outlining the responsibilities of the City of Spring Hill for maintenance and operation of said traffic signals; and

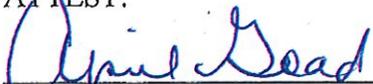
WHEREAS, TDOT requests the City of Spring Hill execute the Agreement that will require the signature of the Mayor and City Attorney.

NOW, THEREFORE, BE IT RESOLVED, that the City of Spring Hill authorizes the Mayor and City Attorney of the City of Spring Hill, TN to sign a proposal with the Tennessee Department of Transportation for Project No. 60952-3503-94, hereto attached.

Passed and adopted by the Board of Mayor and Aldermen of the City of Spring Hill, Tennessee on this 7<sup>th</sup> day of August, 2017.

  
\_\_\_\_\_  
Rick Graham, Mayor

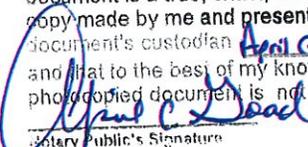
ATTEST:

  
\_\_\_\_\_  
April Goad, City Recorder

LEGAL FORM APPROVED:

  
\_\_\_\_\_  
Patrick Carter, City Attorney

State of TN  
County of Maury

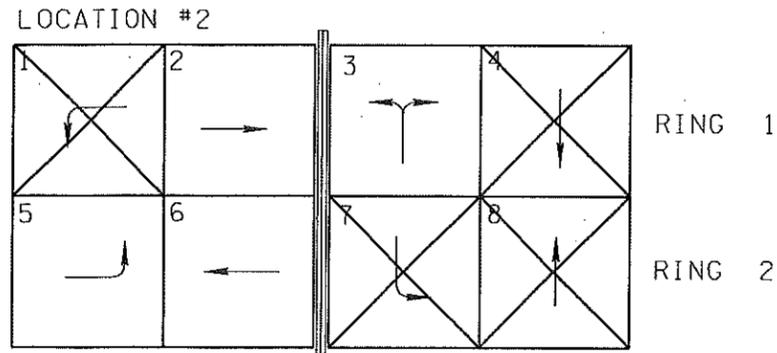
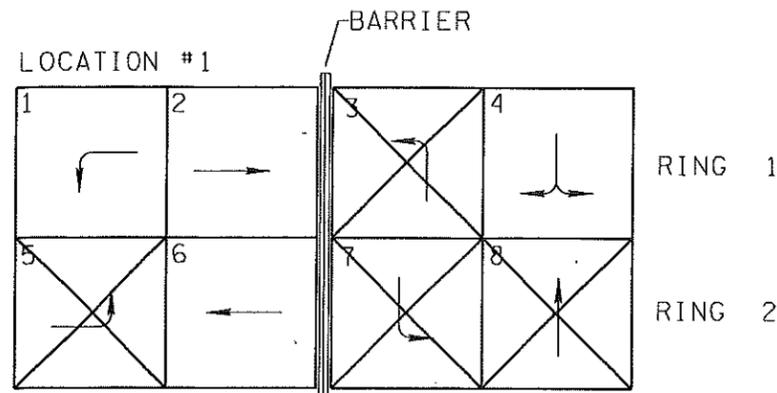
On this 16<sup>th</sup> day of Aug, 2017, I certify that this document is a true, exact, complete, and unaltered copy made by me and presented to me, by the document's custodian April Goad, Resolution 17-82 and that to the best of my knowledge, that the photocopied document is not a publicly recorded document.  
  
\_\_\_\_\_  
Notary Public's Signature







TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST	2018	HSIP-9323(3)	21B



NEMA EIGHT PHASE DESIGNATIONS

- ACTIVE PHASE
- INACTIVE PHASE (NOT USED)

- OPERATION IS DUAL ENTRY MODE, FULL SKIP CAPABILITY
- SINGLE DIRECTION, LAGGING LEFT TURN PHASES ARE NOT ALLOWED
- ALL SIGNAL DISPLAYS AND CLEARANCES SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

SPECIAL SEQUENCING

BASIC OR SEMI - ACTUATED TIMING (SECS)

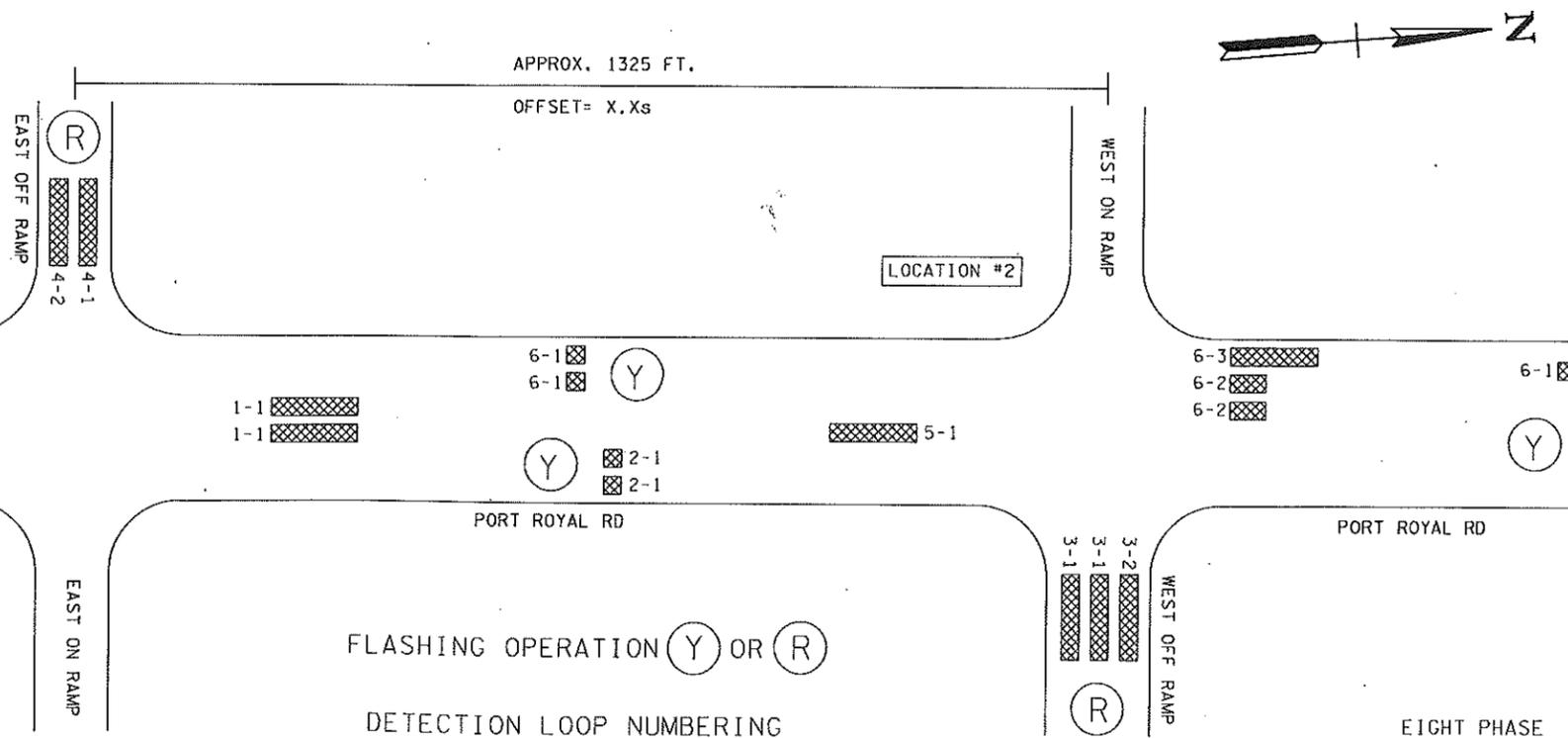
PHASE	MINIMUM INITIAL	PASSAGE TIME	AM MAX. GREEN	PM MAX GREEN	CLEARANCE		RECALL TO	MEMORY POSITION (1)	LEFT TURN OPERATION (2)
					YELLOW	ALL RED			
LOCATION #1 - 1	-	-	-	-	-	-	NONE	NL	PROT
LOCATION #1 - 4	-	-	-	-	-	-	NONE	NL	PROT
LOCATION #2 - 5	-	-	-	-	-	-	NONE	NL	PROT
LOCATION #2 - 3	-	-	-	-	-	-	NONE	NL	PROT

VOLUME - DENSITY TIMING (SECS)

PHASE	MINIMUM INITIAL	ADDED INITIAL PER ACTUATION	PASSAGE TIME	AM MAX GREEN	PM MAX GREEN	CLEARANCE		RECALL TO	MEMORY POSITION (1)
						YELLOW	ALL RED		
LOCATION #1 - 2	-	-	-	-	-	-	-	MIN	L
LOCATION #1 - 6	-	-	-	-	-	-	-	MIN	L
LOCATION #2 - 2	-	-	-	-	-	-	-	MIN	L
LOCATION #2 - 6	-	-	-	-	-	-	-	MIN	L

THESE TIMINGS ARE INITIAL AND MAY BE ADJUSTED BY THE CONTRACTOR BASED ON FIELD OBSERVATIONS TO PROVIDE EFFICIENT OPERATION. (1) NL = NONLOCK L = LOCK (2) PERM = PERMITTED PROT = PROTECTED P + P = PROT/PERM

DETECTION ZONE DIAGRAM (NOT TO SCALE)



CONSTRUCTION FIELD REVIEW

SEALED BY

INTERSECTION OF SR-396 AND PORT ROYAL RD.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNAL LAYOUT

PHASING, TIMING, AND DETECTOR ASSIGNMENT

RADAR DETECTOR TARGET ASSIGNMENT

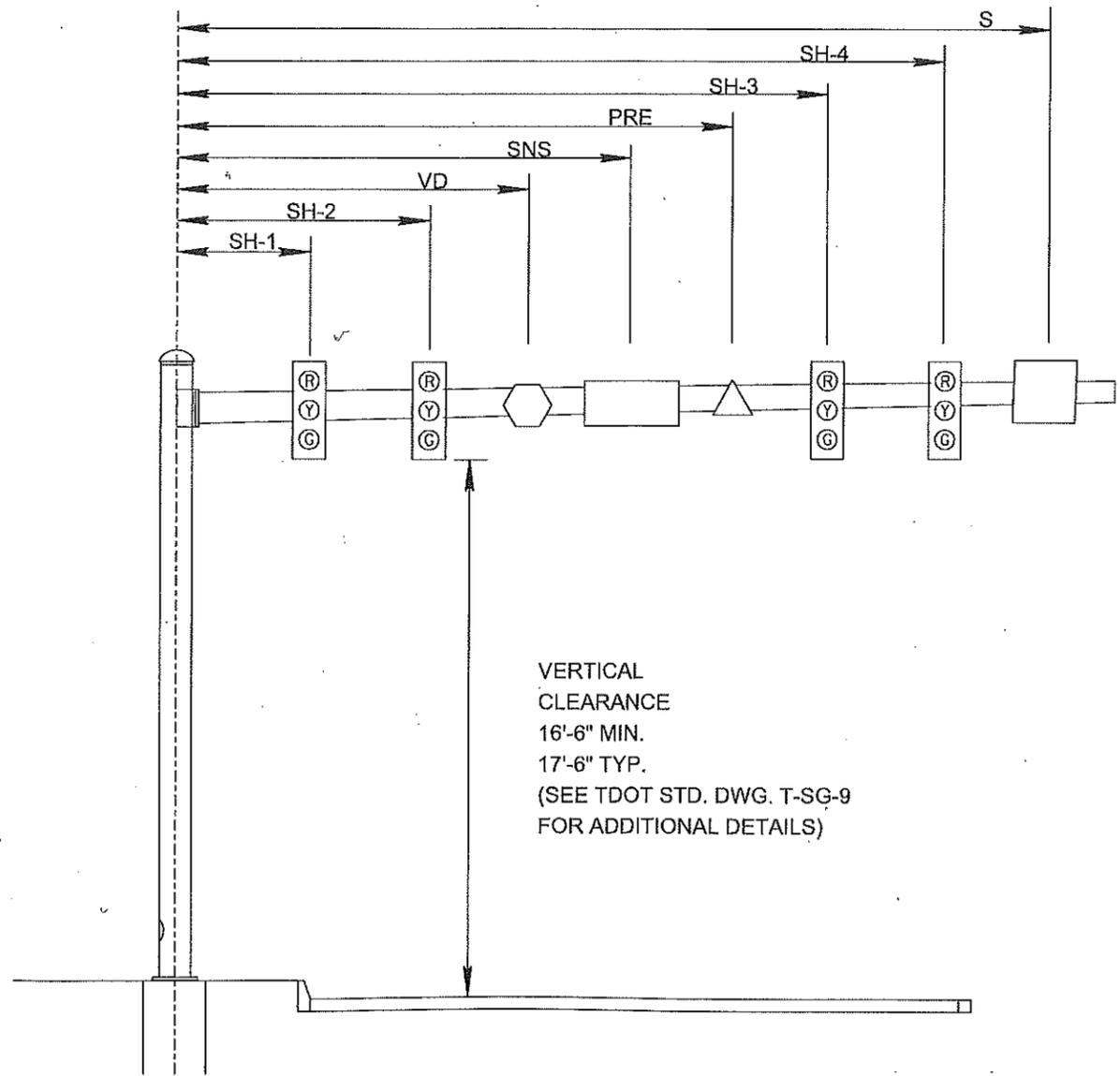
TARGET AREA #	DETECTOR #	TARGET AREA LENGTH	AMP. FEATURE TIMING (SEC)	ASSOC. Ø
2-1	RA1	106'		2
2-2	RS1	1050'		2
4-1	RS3	1050'		4
4-2	RS3	1050'		4
1-1	RS2	2050'		1
6-1	RA2	206'		6

2-1	RA1	206'		2
5-1	RS1	1050'		5
3-1	RS3	2050'		3
3-2	RS3	1050'		3
6-1	RA2	106'		6
1-1	RS2	2020'		1
1-2	RS2	1050'		1

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2018	HSP-9323(3)	21C

SIGNAL SUPPORT POLE DATA AND MAST ARM DETAILS: LOCATION #1																	
POLE NO.	STATION	OFFSET	NORTHING	EASTING	ARM	ARM LENGTH	VD	PRE	SH-1	VD	SNS	SH-2	VD	PRE	SH-3	SH-4	GROUND EL. @ POLE
SP1	104+70.50	67.00' LT.	510533.8477	1703143.0663		80.0'			37.0'	43.5'		49.0'		55.0'	61.0'	73.0'	696.19'
SP2	105+85.50	65.50' RT.	510637.1210	1703284.8577	A1	60.0'	29.5'	34.5'	39.5'	46.5'		51.5'	58.5'				698.98'
					A2	55.0'		30.5'	36.0'		42.0'	48.0'					

SIGNAL SUPPORT POLE DATA AND MAST ARM DETAILS: LOCATION #2																	
POLE NO.	STATION	OFFSET	NORTHING	EASTING	ARM	ARM LENGTH	VD	PRE	SH-1	VD	PRE	SH-2	PRE	VD	SNS	SH-3	GROUND EL. @ POLE
SP3	117+93.00	59.00' LT.	511850.8344	1703264.0362		45.0'	16.0'	21.0'	26.5'	32.5'		38.5'		42.5'			700.93'
SP4	118+91.00	77.50' LT.	511949.5282	1703253.6240		45.0'			16.5'		22.5'	28.5'			34.5'	40.5'	695.41'
SP5	119+22.00	79.00' RT.	511968.1777	1703412.0710		80.0'			48.5'	54.5'		60.5'	66.5'			72.5'	695.94'



**LEGEND**

- SIGNAL HEAD
- STREET NAME SIGN
- SIGN
- VEHICLE DETECTOR (VIDEO/RADAR)
- PRE-EMPTION

S: SIGN  
 SNS: STREET NAME SIGN  
 SH-X: SIGNAL HEAD  
 VD: VEHICLE DETECTOR (VIDEO/RADAR)  
 PRE: PRE-EMPTION

**CONSTRUCTION  
 FIELD  
 REVIEW**

SEALED BY

STATE OF TENNESSEE  
 DEPARTMENT OF  
 TRANSPORTATION

PROPOSED  
 SIGNAL LAYOUT

TRAFFIC SIGNAL  
 DETAILS

MAST ARM POLE