

CONTRACT DOCUMENTS AND SPECIFICATIONS

for

City of Portsmouth Project #22008

Traffic Signal Upgrades

**Maplewood Avenue
at Congress, Hanover and Deer Streets**

Bid #22-20

City of Portsmouth

Rockingham County

Karen S. Conard, City Manager

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City of Portsmouth
Portsmouth, New Hampshire
Department of Public Works

Traffic Signal Upgrades Maplewood Avenue Bid #22-20

INVITATION TO BID

Sealed bid proposals, **plainly marked Traffic Signal Upgrades, Maplewood Avenue, Bid Proposal #22-20 on the outside of the mailing envelope as well as the sealed bid envelope**, addressed to the Finance/Purchasing Department, City Hall, 1 Junkins Avenue, Portsmouth, New Hampshire, 03801, will be accepted until February 13, 2020 at 2:00 p.m.; at which time all bids will be publicly opened and read aloud.

This project consists of the installation of traffic signal equipment and conduit, concrete sidewalk repairs, ADA-accessible pedestrian push buttons and pedestals, signs, and new signal programming at three locations in Portsmouth NH. The three locations are: Maplewood Avenue at Deer Street, Maplewood Avenue at Hanover Street and Maplewood Avenue at Congress Street/Middle Street/Islington Street.

Work may begin at any time, with Substantial completion by September 1, 2020. Liquidated damages shall be assessed at \$100.00 per day. Hours of work will be 7:00 AM to 5:00 PM weekdays, unless otherwise approved by the City of Portsmouth DPW.

The Contractor will be required to keep roadways and sidewalks passable for the public and employees to the maximum degree possible. Contractor proposed traffic or pedestrian detour routes or phasing shall be approved by the City of Portsmouth DPW prior to the commencement of work.

The General Contractor for this project must be Pre-qualified with the New Hampshire Department of Transportation (NHDOT) for Road Construction and/or Signal Work.

Bidders must determine the quantities of work required and the conditions under which the work will be performed.

Specifications may be obtained at the City's website: <http://www.cityofportsmouth.com/finance/purchasing.htm>
Addenda to this project, if any, including written answers to questions, will not be provided directly to vendors, but will be posted by 4:00 p.m., February 6, 2020 on the City of Portsmouth Website under the project heading.

Electronic copies of the plans and specifications may be obtained off of the City's webpage. Documents are not available for pickup.

The City reserves the right, after bid opening and prior to award of the contract, to modify the amount of the work in the event that bids exceed budgeted amounts. The City of Portsmouth further reserves the right to reject any or all bids, to waive technical or legal deficiencies, to re-bid, and to accept any bid that it may deem to be in the best interest of the City. Also, the City reserves the right to approve or deny subcontractors for this project. An award of this project is contingent upon additional process and funding.

Each Bidder shall furnish a bid security in the amount of ten percent (10%) of the bid. The Bid Security may be in the form of a certified check or a bid bond executed by a surety company authorized to do business in the State of New Hampshire, made payable to the City of Portsmouth, N.H.

INSTRUCTIONS TO BIDDERS

BIDDING REQUIREMENTS AND CONDITIONS

1. Special Notice to Bidders

Appended to these instructions is a complete set of bidding and general contract forms. These forms may be detached and executed for the submittal of bids. The plans, specifications, and other documents designated in the proposal form will be considered as part of the proposal, whether attached or not.

The bidders must submit a statement of bidder's qualifications, if requested, subsequent to bid opening but prior to award.

Addenda to this bid document, if any, including written answers to questions, will be posted by 4:00 p.m., February 6, 2020 on the City of Portsmouth website at <http://www.cityofportsmouth.com/finance/purchasing.htm> under the project heading. Addenda and updates will NOT be sent directly to firms. Contractors submitting a bid should check the web site daily for addenda and updates after the release date. Firms should print out, sign and return addenda with the proposal. Failure to do so may result in disqualification.

2. Interpretation of Quantities in Bid Schedules

The quantities appearing in the bid schedule are approximate only and are prepared for the comparison of bids. Payment to the contractor will be made only for actual work performed and accepted in accordance with the contract. Any scheduled item of work to be done and materials to be furnished may be increased, decreased or omitted as hereinafter provided, and no claim for loss, anticipated profits or costs incurred in anticipation of work not ultimately performed will be allowed due to such increase or decrease.

3. Examination of Plans, Specifications and Site Work

The bidder is expected to examine carefully the site of the proposed work, the plans, standard specifications, supplemental specifications, special provisions and contract forms before submitting a proposal. The submission of a bid shall be considered conclusive evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the contract. It will be conclusive evidence that the bidder has also investigated and is satisfied with the sources of supply for all materials.

Plans, surveys, measurements, dimensions, calculations, estimates and statements as to the condition under which the work is to be performed are believed to be correct, but the contractors must examine for themselves, as no allowance will be made for any errors or inaccuracies that maybe found therein.

4. Familiarity with Laws

The bidder is assumed to have made himself or herself familiar with all federal and state laws, procedures, and documentation requirements; and all local by-laws, ordinances and regulations which in any manner affect those engaged or employed on the work or affect the materials or equipment used in the work or affect the conduct of the work, and the bidder, if awarded the contract, shall be obligated to perform the work in conformity with said laws, by-laws, ordinances and regulations notwithstanding its ignorance thereof. If the bidder shall discover any provision in the plans or specifications which is in conflict with any such law, by-law, ordinance or regulation the bidder shall forthwith report it to the engineer in writing.

5. Preparation of Proposal

- a) The bidder shall submit its proposal upon the forms furnished by the Owner. The bidder shall specify a lump sum price in figures, for each pay item for which a quantity is given and shall also show the products of the respective prices and quantities written in figures in the column provided for that purpose and the total amount

of the proposal obtained by adding the amount of the several items. All words and figures shall be in ink or typed.

If a unit price or a lump sum bid already entered by the bidder on the proposal form is to be altered it should be crossed out with ink, the new unit price or lump sum bid entered above or below it and initialed by the bidder, also with ink.

- b) The bidder's proposal must be signed with ink by the individual, by one or more general partners of a partnership, by one or more members or officers of each firm representing a joint venture; by one or more officers of a corporation, by one or more members (if member-managed) or managers (if manager-managed) of a limited liability company, or by an agent of the contractor legally qualified and acceptable to the owner. If the proposal is made by an individual, his or her name and post office address must be shown, by a partnership the name and post office address of each general and limited partner must be shown; as a joint venture, the name and post office address of each venturer must be shown; by a corporation, the name of the corporation and its business address must be shown, together with the name of the state in which it is incorporated, and the names, titles and business addresses of the president, secretary and treasurer.

6. Nonconforming Proposals

Proposals will be considered nonconforming and may be rejected in the Owner's sole discretion for any of the following reasons:

- If the proposal is on a form other than that furnished by the Owner, or if the form is altered or any portion thereof is detached;
- If there are unauthorized additions, conditional or altered bids, or irregularities of any kind which may tend to make the proposal or any portion thereof incomplete, indefinite or ambiguous as to its meaning;
- If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award; or
- If the proposal does not contain a unit price for each pay item listed except in the case of authorized alter pay items.

7. Proposal Guaranty

No proposal will be considered unless accompanied by a bid bond, surety, or similar guaranty of the types and in an amount not less than the amount indicated in the Invitation to Bid. All sureties shall be made payable to the "City of Portsmouth". If a bid bond is used by the bidder it shall be:

- In a form satisfactory to the Owner;
- With a surety company licensed, authorized to do business in, and subject to the jurisdiction of the courts of the State of New Hampshire; and
- Conditioned upon the faithful performance by the principal of the agreements contained in the sub-bid or the general bid.

In the event any irregularities are contained in the proposal guaranty, the bidder will have four business days (not counting the day of opening) to correct any irregularities. The corrected guaranty must be received by 4:00 p.m. If irregularities are not corrected to the satisfaction of the Owner, the Owner, in its sole discretion, may reject the bid.

8. Delivery of Proposals

When sent by mail, the sealed proposal shall be addressed to the Owner at the address and in the care of the official in whose office the bids are to be received. All proposals shall be filed prior to the time and at the place specified in the invitation for bids. Proposals received after the time for opening of the bids will be returned to the bidder, unopened.

9. Withdrawal of Proposals

A bidder will be permitted to withdraw his or her proposal unopened after it has been submitted if the Owner receives a request for withdrawal in writing prior to the time specified for opening the proposals.

10. Public Opening of Proposals

Proposals will be opened and read publicly at the time and place indicated in the invitation for bids. Bidders, their authorized agents, and other interested parties are invited to be present.

11. Disqualification of Bidders

Any or all of the following reasons may be deemed by Owner in its sole discretion as being sufficient for the disqualification of a bidder and the rejection of his proposal:

- More than one proposal for the same work from an individual, firm, or corporation under the same or different name;
- Evidence of collusion among bidders;
- Failure to submit all required information requested in the bid specifications;
- If the Contractor is not listed with the New Hampshire Department of Transportation as a pre-qualified contractor under the classification of Road Construction and/or Signal Work;
- Lack of competency or of adequate machinery, plant or other equipment, as revealed by the statement of bidders qualification or otherwise;
- Uncompleted work which, in the judgment of the owner, might hinder or prevent the prompt completion of additional work if awarded;
- Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts;
- Default or unsatisfactory performance on previous contracts; or
- Such disqualification would be in the best interests of the Owner.

12. Material Guaranty and Samples

Before any contract is awarded, the bidder may be required to furnish a complete statement of the origin, composition and manufacture of any or all materials to be used in the construction of the work, and the Owner may, in its sole discretion, reject the bid based on the contents of the statement or as a result of the failure of the bidder to submit the statement.

AWARD AND EXECUTION OF CONTRACT

1. Consideration of Proposals

After the proposals are opened and read, they will be compared on the basis of the total price for all sections of work and any such additional considerations as may be identified in the bid documents. The comparisons of total price will be established from the base bid, and not the add/alternate bid. The results of such comparisons will be immediately available to the public. In case of a discrepancy between the prices written in words and those written figures, the prices written in words shall govern. In case of a discrepancy between the total shown in the proposal and that obtained by adding the products of the quantities of items and unit bid prices, the latter shall govern.

2. Award of Contract

Within 30 calendar days after the opening of proposals, if a contract is to be awarded, the award will be made to the lowest responsible and qualified bidder whose proposal complies with all the requirements prescribed. The successful bidder will be notified, in writing, mailed to the address on his or her proposal, that his or her bid has been accepted and that the bidder has been awarded the contract.

3. Reservation of Rights

The Owner reserves the right to reject any or all proposals, to waive technicalities or to advertise for new proposals, if, in the sole discretion of the Owner, the best interest of the City of Portsmouth will be promoted thereby. The Owner further reserves the right to conduct such investigations of the contractor's history, financial resources, and other qualifications as it deems necessary to determine whether bidder is qualified to do the work. Bidder may be asked to execute releases. Failure to execute a release upon request may result in disqualification.

The Owner reserves the right to cancel the award of any contract at any time before the execution of such contract by all parties without any liability of the Owner.

The City reserves the right, after bid opening and prior to award of the contract, to modify the amount of the work in the event that bids exceed budgeted amounts. An award of this project is contingent upon funding. The ADD-ALT portion of the bid may or may not be selected.

4. Return of Proposal Guaranty

All proposal guaranties, except those of the three lowest bidders, will be returned upon request following the opening and checking of the proposals. The proposal guaranties of the three lowest bidders will be returned within ten days following the award of the contract if requested.

5. Contract Bonds

At the time of the execution of the contract, the successful bidder shall furnish:

- A performance bond in the amount of 100 percent of the contract amount.
- Labor and materials payment bond in the sum equal to 100 percent of the contract amount.

Each bond shall be: (1) in a form satisfactory to the Owner; (2) with a surety company licensed and authorized to do business and with a resident agent designated for services of process in the State of New Hampshire; and (3) conditioned upon the faithful performance by the principal of the agreements contained in the original bid. All premiums for the contract bonds are to be paid by the contractor.

6. Execution and Approval of Contract

The successful bidder is required to present all contract bonds, to provide proof of insurance, and to execute the contract within 10 days following receipt of the City's notification of acceptance of the bid. No contract shall be considered as in effect until it has been fully executed by all parties.

7. Failure to Execute Contract

Failure to execute the contract and to provide acceptable bonds and proof of insurance within 10 days after notification of acceptance of bid shall be just cause for the cancellation of the award and the forfeiture of the proposal guarantee which shall become the property of the Owner, not as a penalty, but in liquidation of damages sustained. Award may then be made to the next lowest responsible bidder, or the City may exercise its reserved rights including the rejection of all bids or re-advertisement.

PROPOSAL FORM

**Traffic Signal Upgrades
Maplewood Avenue**

CITY OF PORTSMOUTH, N.H.

To the City of Portsmouth, New Hampshire, herein called the Owner.

The undersigned, as Bidder, herein referred to as singular and masculine declares as follows:

1. All interested in the Bid as Principals are named herein.
2. This bid is not made jointly, or in conjunction, cooperation or collusion with any other person, firm, corporation, or other legal entity;
3. No officer, agent or employee of the Owner is directly or indirectly interested in this Bid.
4. The bidder has carefully examined the sites of the proposed work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this Bid, and the bidder has carefully read and examined the Drawings, Agreement, Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;
5. The bidder understands that the quantities of work calculated in the Bid or indicated on the Drawings or in the Specifications or other Contract Documents are approximate and are subject to increase or decrease or deletion as deemed necessary by the Director of Public Works. Any such changes will not result in or be justification for any penalty or increase in contract prices; and agrees that, if the Bid is accepted the bidder will contract with the Owner, as provided in the Contract Documents, this Bid Form being part of said Contract Documents, and that the bidder will supply or perform all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other activities required by the Contract Documents in the manner and within the time therein set forth, and that the bidder will take in full payment therefore the following item prices, to wit:

ITEM #	EST. QTY	UNITS	ITEM DESCRIPTION AND UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
203	16	CY	Excavate existing sidewalk	\$_____	\$_____
304.3	5	CY	Crushed Gravel if needed	\$_____	\$_____
403.12	2	Tons	Hot Bituminous Pavement, Hand Method Under brick sidewalk	\$_____	\$_____
608.26	160	SF	6" Concrete Sidewalk	\$_____	\$_____

ITEM #	EST. QTY	UNITS	ITEM DESCRIPTION AND UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
608.52	75	SF	Brick Sidewalk	\$_____	\$_____
614.73114	83	LF	3" PVC Conduit, Schedule 40	\$_____	\$_____
615.06	75	SF	Traffic Sign Type CC	\$_____	\$_____
616.191	1	U	Alterations to Traffic Signals Location No. 1	\$_____	\$_____
616.192	1	U	Alterations to Traffic Signals Location No. 2	\$_____	\$_____
616.193	1	U	Alterations to Traffic Signals Location No. 3	\$_____	\$_____
616.650	3	Ea	New loop detectors (Exact Quantity Unknown)	\$_____	\$_____
618.61	\$5,000.00	Allow	Uniformed Officers with Vehicle	\$_____	\$_____
618.7	\$2,500.00	Allow	Flaggers	\$_____	\$_____
632.911	210	LF	Obliterate Pavement Marking Line, 12" Wide & Under	\$_____	\$_____
692	1	U	Mobilization	\$_____	\$_____

TOTAL FOR BASE BID AND BASIS OF AWARD

In Figures \$ _____

In Words \$ _____

**PROPOSAL FORM FOR ADDITIONAL/ALTERNATIVE #1 BID
CONSTRUCTION ITEM**

It is mandatory to fill out this section as well.

The Add Alternate #1 bid has been included for the installation of camera based detection and replacement of the existing communications between locations 1 and 4. The fourth location being the intersection of Middle Street and State Street.

ITEM #	EST. QTY	UNITS	ITEM DESCRIPTION AND UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
616.194	1	U	Addition of Video detection and upgrade of communications between signals and Public Works.	\$ _____	\$ _____

To Bidder:

The City reserves the right, after bid opening and prior to award of the contract, to modify the amount of the work in the event that bids exceed budgeted amounts.

It is the intention of this contract that the items listed above describe completely and thoroughly the entirety of the work as shown on the plans and as described in the specifications. All other items required to accomplish the above items are considered to be subsidiary work, unless shown as a pay item.

The undersigned agrees that for extra work, if any, performed in accordance with the terms and provisions of the Contract Documents, the bidder will accept compensation as stipulated therein.

Date:

Company

By: _____
Signature

Business Address

Title: _____

City, State, Zip Code

Telephone: _____

All Bids are to be submitted on this form and in a sealed envelope, plainly marked on the outside with the Bidder's name and address and the Project name as it appears at the top of the Proposal Form.

We certify that the Company is currently pre-qualified with the State of New Hampshire for Road Construction and/or Traffic Signal Work.

By:

Signature & Title

Date

BID SECURITY BOND

(This format provided for convenience, actual Bid Bond is acceptable in lieu of, if compatible.)

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned

_____, as Principal, and

_____, as Surety, are hereby

held and firmly bound unto _____

IN THE SUM OF _____

as liquidated damages for payment of which, well and truly to be made we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of this obligation is such that whereas the Principal has submitted to the

_____ A CERTAIN Bid attached hereto and hereby made a part hereof to enter into a contract in writing, hereinafter referred to as the "AGREEMENT" and or "CONTRACT", for

NOW THEREFORE,

- (a) If said Bid shall be rejected or withdrawn as provided in the INFORMATION FOR BIDDERS attached hereto or, in the alternative,
- (b) If said Bid shall be accepted and the Principal shall duly execute and deliver the form of AGREEMENT attached hereto and shall furnish the specified bonds for the faithful performance of the AGREEMENT and/or CONTRACT and for the payment for labor and materials furnished for the performance of the AGREEMENT and or CONTRACT,

then this obligation shall be void, otherwise it shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder in no event shall exceed the amount of this obligation.

BID SECURITY BOND (continued)

The Surety, for value received, hereby agrees that the obligation of said surety and its bond shall be in no way impaired or affected by any extensions of the time within such BID may be accepted, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the parties hereto have duly executed

this bond on the _____ day of _____, 20__.

(Name of Principal) L.S.

(SEAL)

BY _____

(Name of Surety)

BY _____

STATEMENT OF BIDDER'S QUALIFICATIONS

Supply with Bid

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. Add separate sheets if necessary

1. Name of Bidder
2. Permanent Main Office Address
3. Form of Entity
4. When Organized
5. Where Organized
6. How many years have you been engaged in the contracting business under your present name; also state names and dates of previous firm names, if any.
7. Contracts on hand; (schedule these, showing gross amount of each contract and the approximate anticipated dates of completion).
8. General character of work performed by your company.
9. Have you ever failed to complete any work awarded to you? ____ (no) ____ (yes). If so, where and why?
10. Have you ever defaulted on a contract?
____ (no) ____ (yes). If so, where and why?
11. Have you ever failed to complete a project in the time allotment according to the Contract Documents?
____ (no) ____ (yes). If so, where and why?
12. List the most important contracts recently executed by your company, stating approximate cost for each, and the month and year completed.
13. List your major equipment available for this contract.
14. List your key personnel such as project superintendent and foremen available for this contract.
15. List subcontractors for the following categories whom you will use for the following (unless this work is to be done by your own organization, in which case please state).
 - a. Signal Work _____
 - b. Concrete Flatwork _____
 - c. Brick Sidewalk _____

STATEMENT OF BIDDERS QUALIFICATIONS (continued)

The City reserves the right to disallow any subcontractor including work proposed to be completed by the General Contractor.

16. With what banks do you do business?

a. Do you grant the Owner permission to contact this/these institutions?
____(yes) ____ (no).

b. Latest Financial Statements, certified audited if available, prepared by an independent certified public accountant, may be requested by Owner. If requested, such statements must be provided within five (5) business days or the bid proposal will be rejected. Certified Audited Statements are preferred. Internal statements may be attached only if independent statements were not prepared.

Dated at _____ this _____ day of _____, 20 ____.

Name of Bidder

BY _____

TITLE _____

State of _____

County of _____

_____ being duly sworn, deposes and

says that the bidder is _____ of _____
(Name of Organization)

and answers to the foregoing questions and all statements contained therein are true and correct.

Sworn to before me this ____ day of _____, 20 ____.

Notary of Public
My Commission expires _____

CONTRACT AGREEMENT

**Traffic Signal Upgrades
Maplewood Avenue**

THIS AGREEMENT made as of ____ day of _____ in the year **2020**, by and between the City of Portsmouth, New Hampshire (hereinafter call the Owner) and _____ (hereinafter called the Contractor),

WITNESSETH; that the Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE I- Work - The Contractor shall perform all work as specified or indicated in the Contract Documents for the completion of the Project. The Contractor shall provide, at his expense, all labor, materials, equipment and incidentals as may be necessary for the expeditious and proper execution of the Project.

ARTICLE II - ENGINEER - The Director of Public Works or his authorized representative will act as engineer in connection with completion of the Project in accordance with the Contract Documents.

ARTICLE III - CONTRACT TIME - The work will commence in accordance with the Notice to Proceed. **All work shall be completed no later than September 1, 2020.**

ARTICLE IV - CONTRACT PRICE - Owner shall pay Contractor for performance of the work in accordance with the Contract Documents as shown under item prices in the base bid if selected for approval as shown in the Bid Proposal.

ARTICLE V - PAYMENT - Partial payments will be made in accordance with the Contract Documents. Upon final acceptance of the work and settlement of all claims, Owner shall pay the Contractor the unpaid balance of the Contract Price, subject to additions and deductions provided for in the Contract Documents.

ARTICLE VI - RETAINAGE – To insure the proper performance of this Contract, the Owner shall retain **ten percent** of the monthly payments claimed by the Contractor until 50% of the original contract work is invoiced and approved by the City. Once the Contractor has invoiced more than 50% of the contract value, provided that the Contractor has satisfied the City regarding the quality and timeliness of the work and provided further that there is no specific cause for withholding additional retainage, no further amount will be withheld. Upon substantial completion of the work the amount of retainage shall be reduced to 2% of the total contract value plus any additional retainage amounts required by the City based on the City's estimate of the fair value of any remaining punch list items. Any additional retainage held for punch list items shall be held until such time as all items on the punch list are repaired or completed to the City's acceptance. The final 2% of retainage shall be held until the warranty period has expired.

ARTICLE VII - LIQUIDATED DAMAGES - In event the Contractor fails to successfully execute the work within the specified contract time the Owner shall assess the Contractor liquidated damages in the amount of **one hundred dollars (\$100)** for each calendar day beyond the specified completion date for each section of work. Liquidated damages shall be deducted from the Contract Price prior to final payment of the Contractor.

CONTRACT AGREEMENT (continued)

ARTICLE VIII – CONTRACT DOCUMENTS – The Contract Documents which comprise the contract between Owner and Contractor are attached hereto and made a part hereof and consist of the following:

- 8.1 This Agreement
- 8.2 Contractor's Bid and Bonds
- 8.3 Notice of Award, Notice to Proceed
- 8.4 Instruction to Bidders
 - General Requirements, Control of Work, Temporary Facilities, Measurement and Payment, Standard Specifications
- 8.5 Insurance Requirements
- 8.6 Special Conditions
- 8.7 Standard and Technical Specifications
- 8.8 Drawings
- 8.9 Special Provisions
- 8.10 Any modifications, including change orders, duly delivered after execution of this Agreement.

ARTICLE IX – TERMINATION FOR DEFAULT – Should contractor at any time refuse, neglect, or otherwise fail to supply a sufficient number or amount of properly skilled workers, materials, or equipment, or fail in any respect to prosecute the work with promptness and diligence, or fail to perform any of its obligations set forth in the Contract, Owner may, at its election, terminate the employment of Contractor, giving notice to Contractor in writing of such election, and enter on the premises and take possession, for the purpose of completing the work included under this Agreement, of all the materials, tools and appliances belonging to Contractor, and to employ any other persons to finish the work and to provide the materials therefore at the expense of the Contractor.

ARTICLE X – INDEMNIFICATION OF OWNER – Contractor will indemnify Owner against all suits, claims, judgments, awards, loss, cost or expense (including without limitation attorneys' fees) arising in any way out of the Contractor's negligent performance of its obligations under this Contract. Contractor will defend all such actions with counsel satisfactory to Owner at its own expense, including attorney's fees, and will satisfy any judgment rendered against Owner in such action.

ARTICLE XI – PERMITS – The Contractor will secure at its own expense, all other permits and consents required by law as necessary to perform the work and will give all notices and pay all fees and otherwise comply with all applicable City, State, and Federal laws, ordinances, rules and regulations.

ARTICLE XII – INSURANCE – The Contractor shall secure and maintain, until acceptance of the work, insurance with limits not less than those specified in the Contract.

ARTICLE XII – MISCELLANEOUS –

- A. Neither Owner nor Contractor shall, without the prior written consent of the other, assign, sublet or delegate, in whole or in part, any of its rights or obligations under any of the Contract Documents; and, specifically not assign any monies due, or to become due, without the prior written consent of Owner.
- B. Owner and Contractor each binds himself, his partners, successors, assigns and legal representatives, to the other party hereto in respect to all covenants, agreements and obligations contained in the Contract Documents.
- C. The Contract Documents constitute the entire Agreement between Owner and Contractor and may only be altered amended or repealed by a duly executed written instrument.
- D. The laws of the State of New Hampshire shall govern this Contract without reference to the conflict of law principles thereof.
- E. Venue for any dispute shall be the Rockingham County Superior Court unless the parties otherwise agree.

IN WITNESS WHEREOF, the parties hereunto executed this

AGREEMENT the day and year first above written.

BIDDER:

BY: _____

TITLE: _____

CITY OF PORTSMOUTH, N.H.

BY: _____
Karen S. Conard

TITLE: City Manager

NOTICE OF INTENT TO AWARD

Date:

TO:

IN AS MUCH as you were the low responsible bidder for work entitled:

Traffic Signal Upgrades Maplewood Avenue

You are hereby notified that the City intends to award the aforesaid project to you.

Immediately take the necessary steps to execute the Contract and to provide required bonds and proof of insurance within ten (10) calendar days from the date of this Notice.

The City reserves the right to revoke this Notice if you fail to take the necessary steps to execute this Contract.

City of Portsmouth
Portsmouth, New Hampshire

Judie Belanger,
Finance Director

NOTICE TO PROCEED

DATE:

**Traffic Signal Upgrades
Maplewood Avenue**

TO:

YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE
WITH THE AGREEMENT DATED _____ AND ALL
WORK SHALL BE COMPLETED BY _____.

CITY OF PORTSMOUTH, N.H.

BY: Peter H. Rice, PE

TITLE: Public Works Director

ACCEPTANCE OF NOTICE

RECEIPT OF THE ABOVE NOTICE TO
PROCEED IS HEREBY ACKNOWLEDGED BY

This the _____ day of _____ 20__

By: _____

Title: _____

CHANGE ORDER

Change Order Number

Date of Issuance

Owner: CITY OF PORTSMOUTH, N.H

Contractor:

You are directed to make the following changes in the Contract Documents:

Description:

Purpose of Change Order:

Attachments:

CHANGE IN CONTRACT PRICE

CHANGE IN CONTRACT TIME

Original Contract Price:

\$

Original Completion Date:

Contract Price prior to this
Change Order:

\$

Contract date prior to this
Change Order:

Net Increase or Decrease of
this Change Order:

\$

Net Increase or Decrease of
this Change Order:

Contract Price with all
approved Change Orders:

\$

Contract Due date with all
approved Change Orders:

RECOMMENDED:

APPROVED:

APPROVED:

by _____

by _____

by _____

by _____

PW Director

City Finance

City Manager

Contractor

PERFORMANCE BOND

(This format provided for convenience, actual Performance Bond is acceptable in lieu, if compatible)

Bond Number _____

KNOW ALL MEN BY THESE PRESENTS

that _____ as Principal, hereinafter called Contractor, and _____ (Surety Company) a corporation organized and existing under the laws of the State of _____ and authorized to do business in the State of New Hampshire as surety, hereinafter called Surety, are held and firmly bound unto the City of Portsmouth, N.H. Obligee, hereinafter called Owner, in the amount of _____ Dollars (\$ _____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents. WHEREAS, Contractor has by written agreement dated _____ entered into a contract with Owner for _____ in accordance with drawings and specifications prepared by the Public Works Department, 680 Peverly Hill Road, Portsmouth, N.H. 03801, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Contractor shall well and faithfully do and perform the things agreed by him to be done and performed, according to the terms of said Contract and such alterations as may be made in said Contract during progress work, and shall further indemnify and save harmless the said Owner in accordance with the Contract and shall remedy without cost to the Owner any defect which may develop within one year from the time of completion and acceptance of the work.

The Surety hereby waives notice of any alteration in work or extension of time made by the Owner or any of its agents or representatives.

Whenever Contractor shall be, and declared by Owner to be, in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) Complete the Contract in accordance with its terms and conditions, or
- (2) Obtain a bid or bids for submission to the Owner for completing the Contract in accordance with its terms and conditions, and upon determination by Owner and Surety of the lowest responsible bidder, arrange for a contract between such bidder and Owner and make available as work progresses (even though there should be a default or a succession of defaults under the contract of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by the Owner to Contractor under the Contract and any amendments thereto, less the amount paid by Owner to Contractor.

PERFORMANCE BOND (continued)

Any suit under this bond must be instituted before the expiration of (2) years from the date on which final payment under the contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of Owner.

Signed and sealed this _____ day of _____

A.D., 20____ .

In the presence of:

(Witness) (Principal) (Seal) BY: _____

(Surety Company)

(Witness) (Title) (Seal) BY: _____

Note:

If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized Officer or Officers.

If this bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his Power of Attorney showing his authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Agreement.

LABOR AND MATERIAL PAYMENT BOND

(This format provided for convenience, actual Labor and Material Bond is acceptable in lieu, if compatible)

Bond Number _____

KNOW ALL MEN BY THESE PRESENTS:

that _____

as Principal, hereinafter called Contractor, and _____ (Surety Company) a corporation organized and existing under the laws of the State of

_____ and authorized to do business in the State of New Hampshire hereinafter called Surety, are held and firmly bound unto the City of Portsmouth, N.H. Oblige, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the

amount of _____ Dollars (\$ _____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____ entered into a

contract with Owner for _____ in accordance with drawings and specifications prepared by the Public Works Department, 680 Peverly Hill Road, Portsmouth, N.H. 03801, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract and for the hire of all equipment, tools, and all other things contracted for or used in connection therewith, then this obligation shall be void, otherwise it shall remain in full force and effect, subject however, to the following conditions:

(1) A claimant is defined as one having a direct contract with the Principal or, with a subcontractor of the Principal for labor, material, equipment, or other things used or reasonably required for use in the performance of the Contract. "Labor and material" shall include but not be limited to that part of water, gas, power, light, heat, oil and gasoline, telephone service or rental of equipment applicable to the Contract.

(2) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such a claimant, may sue on this bond for the use of such claimant, prosecute the suit by final judgment for such sum or sums as may be

LABOR AND MATERIAL PAYMENT BOND (continued)

justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any such suit or any costs or expenses of any such suit, and principal and surety shall jointly and severally indemnify, defend and hold the Owner harmless for any such suit, costs or expenses.

(3) No suit or action shall be commenced hereunder by any claimant:

(a) Unless Claimant, other than one having a direct contract with the Principal, shall have given notice to all the following:

The Principal, the Owner and the Surety above named, within six (6) calendar months after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State of New Hampshire save that such service need not be made by a public officer.

(b) After the expiration of one (1) year following the date on which Principal ceased all work on said contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

(c) Other than in a State court of competent jurisdiction in and for the county or other political subdivision of the State in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere. (4) The amount of this bond may be reduced by and to the extent of any payment of payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed on record against said improvement, whether or not claim for the amount of such lien by presented under and against this bond.

Signed and sealed this _____ day of _____, 20____. In the presence of:

(Witness) (Principal) (Seal) BY: _____

(Surety Company)

(Witness) BY: _____ (Title) (Seal)

LABOR AND MATERIAL PAYMENT BOND (continued)

Note:

If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized Officer or Officers.

If this bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his Power of Attorney showing his authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Agreement.

CONTRACTOR'S AFFIDAVIT

STATE OF _____:

COUNTY OF _____:

Before me, the undersigned, a _____
(Notary Public, Justice of the Peace)

in and for said County and State personally appeared, _____
(Individual, Partner, or duly authorized representative of Corporate)

who, being duly sworn, according to law deposes and says that the cost of labor, material, and equipment and outstanding claims and indebtedness of whatever nature arising out of the performance of the Contract between

CITY OF PORTSMOUTH, NEW HAMPSHIRE

and _____
(Contractor)

of _____

Dated: _____

has been paid in full for Construction of: **Traffic Signal Upgrades Maplewood Avenue**

(Individual, Partner, or
duly authorized
representative of
Corporate Contractor)

Sworn to and subscribed
before me this _____ day
of _____ 20 ____

CONTRACTOR'S RELEASE

KNOW ALL MEN BY THESE PRESENTS that _____

(Contractor) of _____, County of _____ and State of _____

_____ does hereby acknowledge

that _____ (Contractor)

has on this day had, and received from the CITY OF PORTSMOUTH NEW HAMPSHIRE, final and completed payment for the Construction of:

Traffic Signal Upgrades Maplewood Avenue

NOW THEREFORE, the said _____

(Contractor)

for myself, my heirs, executors, and administrators) (for itself, its successors and assigns) do/does by these presents remise, release, quit-claim and forever discharge the City of Portsmouth, New Hampshire, its successors and assigns, of and from all claims and demands arising from or in connection with the said Contract dated _____, and of and from all, and all manners of action and actions, cause and causes of action and actions, suits, debts, dues, duties, sum and sums of money, accounts, reckonings, bonds, bills, specifications, covenants, contracts, agreements, promises, variances, damages, judgments, extents, executions, claims and demand, whatsoever in law of equity, or otherwise, against the City of Portsmouth, New Hampshire, its successors and assigns, which (I, my heirs, executors, or administrators) (it, its successors and assigns) ever had, now have or which (I, my heirs, executors, or administrators) (it, its successors and assigns) hereafter can shall or may have, for, upon or by reason of any matter, cause, or thing whatsoever; from the beginning of record time to the date of these presents.

IN WITNESS WHEREOF,

Contractor:

print name of witness: _____

By: _____
Its Duly Authorized _____

Dated: _____

GENERAL REQUIREMENTS

SCOPE OF WORK

1. INTENT OF CONTRACT

The intent of the Contract is to provide for the construction and completion in every detail of the work described. The Contractor shall furnish all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the terms of the Contract. The Contractor shall be required to conform to the intent of the plans and specifications. No extra claims shall be allowed for portions of the work not specifically addressed in the plans and specifications but required to produce a whole and complete project, such work will be considered subsidiary to the bid items.

2. INCIDENTAL WORK

Incidental work items for which separate payment is not measured includes, but is not limited to, the following items:

- a. Clearing, grubbing and stripping (unless otherwise paid for)
- b. Clean up
- c. Plugging existing sewers and manholes
- d. Signs
- e. Mobilization/Demobilization (unless otherwise paid for)
- f. Restoration of property
- g. Cooperation with other contractors, abutters and utilities.
- h. Utility crossings, (unless otherwise paid for)
- i. Minor items - such as replacement of fences, guardrails, rock wall, etc.
- j. Steel and/or wood sheeting as required.
- k. Accessories and fasteners or components required to make items paid for under unit prices or lump sum items complete and functional.
- l. Preparation of temporary traffic control plans (TTCP) for vehicular and pedestrian movements.

3. ALTERATION OF PLANS OR OF CHARACTER OF WORK

The Owner reserves the right, without notice to Surety, to make such alterations of the plans or of the character of the work as may be necessary or desirable to complete fully and acceptably the proposed construction; provided that such alterations do not increase or decrease the contract cost. Within these cost limits, the alterations authorized in writing by the Owner shall not impair or affect any provisions of the Contract or bond and such increases or decreases of the quantities as a result from these alterations or deletions of certain items, shall not be the basis of claim for loss or for anticipated profits by the contractor. The contractor shall perform the work as altered at the contract unit price or prices.

4. EXTRA WORK ITEMS

Extra work shall be performed by the Contractor in accordance with the specifications and as directed, and will be paid for at a price as provided in the Contract documents or if such pay items are not applicable than at a price negotiated between the contractor and the Owner or at the unit bid price. If the Owner determines that extra work is to be performed, a change order will be issued.

GENERAL REQUIREMENTS (continued)

5. CHANGE ORDERS

The Owner reserves the right to issue a formal change order for any increase, decrease, deletion, or addition of work or any increase in contract time or price. The contractor shall be required to sign the change order and it shall be considered as part of the Contract documents.

6. FINAL CLEANING UP

Before acceptance of the work, the contractor shall remove from the site all machinery, equipment, surplus materials, rubbish, temporary buildings, barricades and signs. All parts of the work shall be left in a neat and presentable condition. On all areas used or occupied by the contractor, regardless of the contract limits, the bidder shall clean-up all sites and storage grounds.

The items prescribed herein will not be paid for separately, but shall be paid for as part of the total contract price.

7. ERRORS AND INCONSISTENCY IN CONTRACT DOCUMENTS

Any provisions in any of the Contract Documents that may be in conflict with the paragraphs in these General Requirements shall be subject to the following order of precedence for interpretation.

1. Standard Specifications for Road & Bridge Construction will govern General Requirements.
2. Technical Specifications will govern Standard Specifications.
3. Plans will govern Technical Specifications, and General Requirements.
4. Special Provisions written for this contract will govern the plans.

CONTROL OF WORK

1. AUTHORITY OF ENGINEER

(a) All work shall be done under supervision of the Engineer and to his satisfaction. The Engineer will decide all questions which may arise as to the quality and acceptability of materials furnished and work performed and as to the rate of progress of the work; all questions that may arise as to the interpretation of the plans and specifications; and all questions as to the acceptable fulfillment of the Contract by the Contractor.

(b) The Engineer will have the authority to suspend the work wholly or in part for such periods as he may deem necessary due to the failure of the Contractor to correct conditions unsafe for workers or the general public; for failure to carry out provisions of the Contract; for failure to carry out orders; for conditions considered unsuitable for the prosecution of the work, including unfit weather; or for any other condition or reason deemed to be in the public interest. The Contractor shall not be entitled any additional payments arising out of any such suspensions.

(c) The Owner reserves the right to demand a certificate of compliance for a material or product used on the project. When the certificate of compliance is determined to be unacceptable to the Engineer the Contractor may be required to provide engineering and testing services to guarantee that the material or product is suitable for use in the project, at its expense (see Sample of Certificate of Compliance).

2. PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPES

(a) The Contractor shall use every precaution to prevent injury or damage to wires, poles, or other property of public utilities; trees, shrubbery, crops, and fences along and adjacent to the right-of-way, all underground structures such as pipes and conduits, within or outside of the right-of-way; and the Contractor shall protect and carefully preserve all property marks until an authorized agent has witnessed or otherwise referenced their location.

(b) The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

(c) When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or as a result of the failure to perform work by the Contractor, the Contractor shall restore, at its own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing rebuilding, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

(d) The Contractor shall paint with tree paint all scars made on fruit or ornamental trees by equipment, construction operations, or the removal of limbs larger than one inch in diameter. Damaged trees must be replaced if so determined by the City Arborist, in his or her sole discretion.

(e) If the Contractor fails to repair, rebuild or otherwise restore such property as may be deemed necessary, the Owner, after 48 hours notice, may proceed to do so, and the cost thereof may be deducted from any money due or which may become due the Contractor under the contract.

(f) It is the intent of the Parties that the Contractor preserve, to as great an extent as possible, the natural features of the site.

CONTROL OF WORK (continued)

3. MAINTENANCE DURING CONSTRUCTION

The Contractor shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and workers to ensure that the structure is kept in satisfactory conditions at all times.

4. SAFETY PRECAUTIONS

Upon commencement of work, the Contractor shall be responsible for initiating, maintaining and supervising all safety precautions necessary to ensure the safety of employees on the site, other persons who may be affected thereby, including the public, and other property at the site or adjacent thereto.

5. PERMITS

It will be the responsibility of the Contractor to obtain all permits required for the operation of equipment in, or on, all city streets and public ways.

6. BARRICADES, WARNING SIGNS AND TRAFFIC OFFICERS

(a) The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public. Roadway closed to traffic shall be protected by effective barricades. Obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided to control and direct traffic in a proper manner, as approved by the engineer.

(b) The Contractor will be held responsible for all damage to the work from traffic, pedestrians, animals or any other cause due to lack of adequate controlling devices.

(c) The Contractor shall provide such police officers or flaggers as the Engineer deems necessary for the direction and control of traffic within the site of project.

The work prescribed herein will not be paid for separately but will be paid for as part of the Contract Price unless specifically appearing as a bid item.

TEMPORARY FACILITIES

1. STORAGE FACILITIES

(a) The Contractor shall not store materials or equipment in a public right-of-way beyond the needs of one working day. Equipment and materials shall be stored in an approved location.

(b) The Contractor shall protect all stored materials from damage by weather or accident and shall insure adequate drainage at and about the storage location.

(c) Prior to final acceptance of the work all temporary storage facilities and surplus stored materials shall be removed from the site.

2. SANITARY FACILITIES

(a) The Contractor shall provide for toilet facilities for the use of the workers employed on the work.

(b) Temporary toilet facilities may be installed provided that the installation and maintenance conforms with all State and local laws, codes, regulations and ordinances governing such work. They shall be properly lit and ventilated, and shall be kept clean at all times.

(c) Prior to final acceptance of the work all temporary toilet facilities shall be removed from the site.

3. TEMPORARY WATER

The Contractor shall make all arrangements with the local water department for obtaining water connections to provide the water necessary for construction operations and shall pay all costs.

4. TEMPORARY ELECTRICITY

The Contractor shall make all arrangements with the Eversource for obtaining electrical connections to provide the electrical power necessary for construction operations and security lighting and shall pay all electrical connection and power costs.

The Contractor shall be responsible with obtaining an electrical permit from the City Electrical Inspector.

INSURANCE REQUIREMENTS

Insurance shall be in such form as will protect the Contractor from all claims and liabilities for damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this contract whether such operation by himself or by anyone directly or indirectly employed by him.

AMOUNT OF INSURANCE

- A) Comprehensive General Liability:
Bodily injury or Property Damage - \$2,000,000
Per occurrence and general aggregate
- B) Automobile and Truck Liability:
Bodily Injury or Property Damage - \$2,000,000
Per occurrence and general aggregate

Coverage amounts may be met with excess policies

Additionally, the Contractor shall purchase and maintain the following types of insurance:

- A) Full Workers Comprehensive Insurance coverage for all people employed by the Contractor to perform work on this project. This insurance shall at a minimum meet the requirements of the most current laws of the State of New Hampshire.
- B) Contractual Liability Insurance coverage in the amounts specified above under Comprehensive General Liability.
- C) Product and Completed Operations coverage to be included in the amounts specified above under Comprehensive General Liability.

ADDITIONAL INSURED

All liability policies (including any excess policies used to meet coverage requirements) shall include the City of Portsmouth, New Hampshire as named Additional Insureds.

- 1) The contractor's insurance shall be primary in the event of a loss.
- 2) City of Portsmouth shall be listed as a Certificate Holder. The City shall be identified as follows:

City of Portsmouth
Attn: Legal Department
1 Junkins Avenue
Portsmouth, NH 03801

MEASUREMENT AND PAYMENT

1. MEASUREMENT OF QUANTITIES

- (a) All work completed under the contract will be measured according to the United States standard measure.
- (b) The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice. Unless otherwise stated all quantities measured for payment shall be computed or adjusted for "in place" conditions.
- (c) Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the dimensions shown on the plans or ordered in writing.
- (d) Structures will be measured according to lines shown on the plans or as ordered unless otherwise provided for elsewhere in the specifications.
- (e) In computing volumes of excavation, embankment, and borrow, the average end area method will be used. Where it is impracticable to measure by the cross-section method, acceptable methods involving three-dimensional measurement may be used. When measurement of borrow in vehicles is permitted, the quantity will be determined as 80 percent of the loose volume.
- (f) In computing volumes of concrete, stone and masonry, the prismoidal method will be used. The term "ton" will mean the short ton consisting of 2,000 pounds avoirdupois.
- (g) Except as specified below, all materials that are measured or proportioned by weight shall be weighed on scales which the Contractor has had sealed by the State or by a repairman registered by the Commissioner of Agriculture. All weighing shall be performed in a manner prescribed under the Rules and Regulations of the Bureau of Weights and Measures of the New Hampshire Department of Agriculture.
- (h) Weighing of materials on scales located outside New Hampshire will be permitted for materials produced or stored outside the state, when requested by the Contractor and approved. Out-of-state weighing in order to be approved, must be performed by a licensed public weigh master or a person of equal authority in the state concerned on scales accepted in the concerned state.
- (i) Each truck used to haul material being paid for by weight shall bear a plainly legible identification mark, and if required, shall be weighed empty daily at such times as directed.
- (j) When material is weighed, the individual weight slips, which shall be furnished by the Contractor, for trucks, trailers, or distributors, shall show the following information: the date; the project; the material or commodity; the dealer or vendor; the Contractor or Subcontractor; the location of the scales; the vehicle registration number or other approved legible identification mark; the tare and net weights, with gross weights when applicable; and the weigher's signature or his signed initials.
- (k) The right is reserved to weight any truck, trailer, or distributor, at locations designated, before and after making deliveries to the project.
- (l) Bituminous materials will be measured by the gallon or ton.
- (m) When material is specified to be measured by the cubic yard but measurement by weight is approved, such material may be weighed and the weight converted to cubic yards for payment purposes. Necessary conversion factors will be determined by the Owner.

MEASUREMENT AND PAYMENT (continued)

(n) The term "lump sum" when used as an item of payment will mean complete payment for the work described in the item.

(o) When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories, so as to provide the item complete and functional. Except as may be otherwise provided, partial payments for lump sum items will be made approximately in proportion to the amount of the work completed on those items.

(p) Material wasted without authority will not be included in the final estimate.

2. SCOPE OF PAYMENT

(a) The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials and for performing all work under the contract in a complete and acceptable manner and for all risk, loss, damage or expense of whatever character arising out of the nature of the work or the prosecution thereof.

(b) The Contractor shall be liable to the Owner for failure to repair, correct, renew or replace, at his own expense, all damage due or attributable to defects or imperfections in the construction which defects or imperfections may be discovered before or at the time of the final inspection and acceptance of the work.

(c) No monies, payable under the contract or any part thereof, except the first estimate, shall become due or payable if the Owner so elects, until the Contractor shall satisfy the Owner that the Contractor has fully settled or paid all labor performed or furnished for all equipment hired, including trucks, for all materials used, and for fuels, lubricants, power tools, hardware and supplies purchased by the Contractor and used in carrying out said contract and for labor and parts furnished upon the order of said Contractor for the repair of equipment used in carrying out said contract; and the Owner, if he so elects, may pay any and all such bills, in whole or in part, and deduct the amount of amounts so paid from any partial or final estimate, excepting the first estimate.

3. COMPENSATION FOR ALTERED QUANTITIES

(a) Except as provided for under the particular contract item, when the accepted quantities of work vary from the quantities in the bid schedule the Contractor shall accept as payment in full, so far as contract items are concerned, at the original contract unit prices for the accepted quantities of work done. No allowance will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the contract items of overhead expense on the part of the Bidder and subsequent loss of expected reimbursements therefore or from any other cause.

(b) Extra work performed will be paid for at the contract bid prices or at the price negotiated between the Owner and the Contractor if the item was not bid upon. If no agreement can be negotiated, the Contractor will accept as payment for extra work, cost plus 15% (overhead and profit). Costs shall be substantiated by invoices and certified payroll.

4. PARTIAL PAYMENTS

Partial payments will be made on a monthly basis during the contract period. From the total amount ascertained as payable, an amount equivalent to ten percent (10 %) of the whole will be deducted and retained by the Owner until such time as the work receives final acceptance.

MEASUREMENT AND PAYMENT (continued)

5. FINAL ACCEPTANCE

Upon due notice from the Contractor of presumptive completion of the entire project, the Engineer will make an inspection. If all construction provided for and contemplated by the contract is found complete to his satisfaction, this inspection shall constitute the final inspection and the Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of the final inspection.

If, however, the inspection discloses any work in whole or in part, as being unsatisfactory, the Engineer will give the Contractor the necessary instructions for correction of such work, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the final inspection provided the work has been satisfactorily completed. In such event, the Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

6. ACCEPTANCE AND FINAL PAYMENT

(a) When the project has been accepted and upon submission by the Contractor of all required reports, completed forms and certifications, the Owner will review the final estimate of the quantities of the various classes of work performed. The Contractor may be required to certify that all bills for labor and material used under this contract have been paid.

(b) The Contractor shall file with the Owner any claim that the Contractor may have regarding the final estimate at the same time the Contractor submits the final estimate. Failure to do so shall be a waiver of all such claims and shall be considered as acceptance of the final estimate. After approval of the final estimate by the Owner, the Contractor will be paid the entire sum found to be due after deducting all previous payments and all amounts to be retained or after all amounts deducted.

(c) All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

7. GENERAL GUARANTY AND WARRANTY OF TITLE

(a) Neither the final certification of payment nor any provision in the contract nor partial or entire use of the improvements embraced in this Contract by the Owner or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express or implied warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of twelve (12) months from the date of final acceptance of the work. The Owner will give notice of defective materials and work with reasonable promptness.

(b) No material, supplies or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease purchase or other agreement by which an interest therein or in any part thereof is retained by the Seller or supplier. The Contractor shall warrant good title to all materials, supplies and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens or charges. Neither the Contractor nor any person, firm or corporation furnishing any material or labor for any work covered by this Contract shall have the right to a lien upon any improvements or appurtenances thereon.

MEASUREMENT AND PAYMENT (continued)

Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontractors and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

8. NO WAIVER OF LEGAL RIGHTS

(a) Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or be stopped from recovering from the Contractor or his Surety, or both, such overpayment as it may sustain by failure on the part of the Contractor to fulfill his obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

(b) The Contractor, without prejudice to the Contract shall be liable to the terms of the Contract, shall be liable to the Owner for latent defects, fraud or such gross mistakes as may amount to fraud, and as regards the Owner's right under any warranty or guaranty.

9. TERMINATION OF CONTRACTOR'S RESPONSIBILITY

Whenever the improvement provided for by the Contract shall have been completely performed on the part of the Contractor and all parts of the work have been released from further obligations except as set forth in his bond and as provided in Section 8 above.

STANDARD SPECIFICATIONS

The Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation and any Addenda shall apply but without regard to Section 100 “General Conditions” of those Standard Specifications and without regard to any of those NHDOT provisions that allow for an adjustment for changing fuel and asphalt prices.

Special Provisions

Amendments to Standard Specifications:

608.2	Concrete Sidewalks
608.5	Brick Sidewalks
616.191	Alterations to Traffic Signals
616.192	Alterations to Traffic Signals
616.193	Alterations to Traffic Signals
616.194	Alterations to Traffic Signals (ADD-ALT #1)
618	Uniformed Officers and Flaggers

PORTSMOUTH

December 2019

SPECIAL PROVISION
AMENDMENT TO SECTION 608 - SIDEWALKS
Item 608.2X – Concrete Sidewalks

Amend Section 608 to include:

Description

Amend 1.1: This work shall consist of reconstructing sidewalks of Portland cement concrete, reinforced with fiber when specified. Portland cement concrete sidewalks shall receive a protective coating unless otherwise directed.

Materials

Amend 2.3: Reinforcement shall conform to 544.7. (Synthetic Fibers)

Method of Measurement

Amend 4.1: Sidewalks will be measured by the square foot to the nearest 0.5 square foot. The area occupied by the curb will not be included in the final pay quantity.

Basis of Payment

Amend 5.1: Sidewalks will be paid for at the Contract unit price per square yard complete in place.

<u>Pay item</u>		<u>Pay unit</u>
608.26	6" Concrete Sidewalks (Accessible Ramps and immediate sidewalk)	Square Foot

SPECIAL PROVISION

To Section 608 (NHDOT Standard Specifications) Sidewalks
(not a NHDOT Standard Specification)

Amend Section 608 to read:

SECTION 608.5
Brick Sidewalk

6.01 SCOPE OF WORK

- A. The work shall consist of reconstructing or repairing brick sidewalks as directed in the field by the Engineer.

6.02 METHODS OF CONSTRUCTION

- A. All labor and materials shall conform to the State of New Hampshire Standard Specifications for Road and Bridge Construction, Section 608.
- B. New bricks shall match existing as closely as possible with the existing bricks and conform to the requirements of ASTM Standard Specifications for Building Bricks Designation C902 SX type 1. The bricks shall be No. 1, wire cut type for paving, with a compressive strength of not less than 8,000 pounds per square inch. The bricks shall not be cored or have frogs. The Engineer will have 5 working days to approve the brick submittals before they are installed. It is the responsibility of the Contractor to provide suitable brick samples for approval.
- C. Select gravel for sidewalks shall be at a depth of 13 inches below finish grade to above. All unsuitable material shall be removed and disposed of off-site at the Contractor's own expense.
- D. The base material for sidewalks shall consist of 8" of type 304.3 ¾" crushed gravel. The material under the existing sidewalk may be reused if allowed by the Engineer.
- E. The Contractor shall lay the bricks to match existing.
- F. The sidewalk shall pitch 1/4 inch per foot towards the street or as directed.
- G. In areas where the edge of the brick sidewalk is not adjacent to granite curbing, the Contractor shall install edging to hold the bricks in place. Such edging shall be installed per the manufacturer's recommendations.
- H. In areas with a closed drainage system, the contractor shall provide "silt sacks" to prevent brick dust from entering the collection system. Also, the area will be swept daily to keep dust levels as low as possible.
- I. All half bricks will be snapped if possible and all efforts will be made to keep brick dust to a minimum. All cuts not made by snapping will be wet cut.
- J. Prior to placing the brick, the sidewalks will be paved parallel to grade with 3/8" bituminous asphalt top hot mix paving 2" compacted thickness. Paving for this will be paid for under item

403.12. 1" of 1:3 dragon type II portland cement / course sand mix will then be placed on the asphalt base and the pavers will be dry laid on the mixture.

Method of Measurement

4.1 This item is measured by the square foot.

Basis of Payment

Pay Item and Unit

403.12	Hand Method Bituminous Paving	Ton
608.5	Brick Sidewalk	Square Foot

PORTSMOUTH

December 2019

SPECIAL PROVISION
AMENDMENT TO SECTION 616 - TRAFFIC SIGNALS

Item 616.191 – Alterations to Traffic Signals

This special provision provides for the reconfiguring of the existing traffic control cabinet and pedestrian signal actuators at the intersection of Maplewood Avenue and Deer Street (Location 1) in the City of Portsmouth, NH. The system is coordinated with the traffic control signals at the following intersections:

- Maplewood Avenue and Hanover Street (Location 2 – Item 616.192)
- Maplewood Avenue and Congress Street/Middle Street/Islington Street (Location 3 – Item 616.193)
- Middle Street and State Street (Location 4 (Master Location) – Installation by others, ensure coordination.)

GENERAL:

All provisions of Section 616, except as modified or changed below, shall apply.

1. The Contractor shall be responsible for the traffic signal operation and maintenance once alterations to the existing signals, excavation or other work within 75 feet of the stop bar at any leg of the intersection has begun. The Contractor shall notify the City of Portsmouth Department of Public Works (603-427-1530) with names and phone numbers of persons to be contacted in case of a malfunction. The Contact person(s) must be available 24 hours a day, seven days a week. The Contractor shall also keep a signal log in the cabinet to track all maintenance work the Contractor completes on the signal system. This log shall be placed within a plastic cover and shall at least include the description of the trouble call, corrective action taken, date, time, and personnel who completed the work.
2. It is not intended that every fitting, minor detail or feature be shown and described, as the assumption is made that the Contractor and/or their Subcontractor is an expert in the particular area of responsibility and is capable of interpreting the plans, Specifications, and Special Provisions so that the bid and/or construction shall include all items required to provide complete, fully operational traffic control signal system and that they shall be provided and installed in a neat and workmanlike manner.
3. The traffic signal must be inspected and approved by the City of Portsmouth Department of Public Works (603-427-1530) prior to placing in operation. The Contractor shall contact Portsmouth DPW one week prior to turning the signals on flash. If the Contractor does not

Speak directly with Eric Eby they must leave a detailed message with the Administrative Assistant and expect a call back. Leaving a message does not constitute an approval.

4. The notation of approved equal or equivalent is denoted on several items however, any deviation requires specific approval by the Engineer and the City.

Add to 2.1:

2.1.3 List of Major Materials:

- 1 – Maintain existing traffic signal cabinet and controller during the duration of construction.
- 1 – Replace all traffic signal cabling impacted. No underground splicing except normal loop splicing. The Contractor shall properly dispose of all old cabling unless otherwise directed by the City of Portsmouth.
- 1– Provide and verify communications are active and functional to cabinets at Maplewood Avenue/Hanover Street, Maplewood Avenue/Congress Street/Middle Street/Islington Street, and Middle Street/State Street.
- 1- Add additional circuit breaker, for utility outlet and heat.
- 1- 16-Phase programmable traffic actuated signal controller of current NEMA specifications (TS2-Type 1) with internal time-based coordination and internal fire preemption with associated MMU to be operated in conflict monitor mode. The controller shall be a **Siemens model m60** NEMA controller with new compatible MMU. The controller and MMU/conflict monitor, plus any additional hardware shall be capable of initiating the flashing yellow arrow (FYA) sequence. The controller shall include an integrated Ethernet port and be IP addressable to function in an Ethernet based system.
- 1 – Program new controller and Master (if necessary) per timings to be delivered by DPW, bench test system.
- 1 – 16-channel Ethernet equipped enhanced malfunction management unit (as noted above), set-up to operate in conflict monitor mode. The MMU shall be compatible with the Siemens model m60 NEMA controller and shall include an integrated Ethernet port, or approved equal. The MMU shall support FYA operation.
- 1 – Environmentally Hardened Ethernet Switch if Add-Alt for camera detection is selected.
- 1- Verify all loop amplifiers are functioning properly and replace if necessary (if Add-Alt for camera is not selected). Verify all detection loops are functional and replace if necessary (if Add-Alt is not selected). New Loops will be paid for separately.
- 2 –8-foot black powder coated aluminum signal pedestal post with foundation. Relocate existing pedestrian signal heads onto new posts.
- 1 –8-foot black powder coated aluminum signal pedestal post on existing foundation. Relocate existing pedestrian signal heads onto new post.

- 8 – Black Pedestrian push button assemblies, mounted on traffic signal poles or posts. The push button assemblies shall provide Accessible Pedestrian signal (APS) capabilities; including vibratory warning and audio/audible warning. Push buttons shall be mounted perpendicular to the path of travel and detectable arrow parallel to the path of travel. Push button assemblies shall include a R10-3e sign, mounted with the push button, with arrow facing the corresponding crossing path.
- 4 – R10-15, 30 inch by 30 inch, “Turning Vehicles Yield to Peds” aluminum Type CC sign mast arm mounted. Paid under separate item.
- 2- Replace existing cooling fan, add second cooling fan so that two fans are operable using temperature controls.
- 1- Add heating element and temperature controls to cabinet.
- 1 – Contractor shall provide system integration testing. All closed loop system integration shall be tested by the Contractor in the presence of the ENGINEER. This testing shall include, but not be limited to the following: (1) Verification of the system database set up including a review of the complete programming data installed for system operation by the equipment supplier to determine that the proper system parameters have been installed, (2) Verification to determine that the communications link between intersections and the master controller, and the communication link with the remote computers are functioning and information is being transmitted and received, (3) Review of the central computer functions including set-up and graphics to determine that they function properly and provide graphics in accordance with the specifications, (4) Identification of equipment malfunctions, computer program errors, and communication problems, (5) Verification to ensure that data transfer between the central computers to field hardware (controllers) is complete and accurate (if Add-Alt for Camera is selected), and (6) Verification of system detector reports, event logs, and critical alarms in accordance with contract requirements. The Contractor shall provide supplier technician time to fine-tune the coordination timings, controller / master parameters, and potential phasing modifications.

2.1.4 Ethernet Switch. (Only applies if camera detection Add-Alt is selected) This work shall consist of furnishing, installing, and testing an Ethernet Switch that meets the requirements of a 100 Mbps Ethernet.

2.1.4.1 The Ethernet Switch shall include a minimum of four single mode fiber optic patch cords, each one meter in length, and terminated on both ends with Type SC single mode fiber optic connectors

2.1.4.2 The Ethernet Switch shall include sufficient Category 6 Ethernet patch cords, each one meter in length, and terminated on both ends with Type RJ45 connectors to provide full connectivity within the cabinet as shown in the Contract Documents.

2.1.4.3 The Ethernet Switch shall include all accessories required for a full and complete installation, including but not limited to all connecting cables, serial to Ethernet modems, power supplies, and mounting hardware.

Add to 3.15

3.15.2 Contractor shall be responsible for maintaining operations of the traffic signal during construction. The labor and equipment necessary to complete this application will be included in the cost.

Add to 5.1

5.1.2 Alterations to Traffic Signals will be paid for at the Contract lump sum price complete in place. The price shall be full compensation for all labor, equipment, hardware and incidentals necessary to make the traffic signal operational.

PORTSMOUTH

December 2019

SPECIAL PROVISION
AMENDMENT TO SECTION 616 - TRAFFIC SIGNALS

Item 616.192 – Alterations to Traffic Signals

This special provision provides for the reconfiguration of the existing traffic control signal cabinet and pedestrian signal actuators at the intersection of Maplewood Avenue and Hanover Street (Location 2) in the City of Portsmouth, NH. The system is coordinated with the traffic control signals at the following intersections:

- Maplewood Avenue and Deer Street (Location 1 – Item 616.191)
- Maplewood Avenue and Congress Street/Middle Street/Islington Street (Location 3 – Item 616.193)
- Middle Street and State Street (Location 4 (Master Location) – Installation by others, ensure coordination.)

GENERAL:

All provisions of Section 616, except as modified or changed below, shall apply.

1. The Contractor shall be responsible for the traffic signal operation and maintenance once alterations to the existing signals, excavation or other work within 75 feet of the stop bar at any leg of the intersection has begun. The Contractor shall notify the City of Portsmouth Department of Public Works (603-427-1530) with names and phone numbers of persons to be contacted in case of a malfunction. The Contact person(s) must be available 24 hours a day, seven days a week. The Contractor shall also keep a signal log in the cabinet to track all maintenance work the Contractor completes on the signal system. This log shall be placed within a plastic cover and shall at least include the description of the trouble call, corrective action taken, date, time, and personnel who completed the work.
2. It is not intended that every fitting, minor detail or feature be shown and described, as the assumption is made that the Contractor and/or their Subcontractor is an expert in the particular area of responsibility and is capable of interpreting the plans, Specifications, and Special Provisions so that the bid and/or construction shall include all items required to provide complete, fully operational traffic control signal system and that they shall be provided and installed in a neat and workmanlike manner.
3. The traffic signal must be inspected and approved by the City of Portsmouth Department of Public Works (603-427-1530) prior to placing in operation. The Contractor shall contact Portsmouth DPW one week prior to turning the signals on flash. If the Contractor does not

Speak directly with Eric Eby they must leave a detailed message with the Administrative Assistant and expect a call back. Leaving a message does not constitute an approval.

4. The notation of approved equal or equivalent is denoted on several items however, any deviation requires specific approval by the Engineer and the City.

Add to 2.1:

2.1.3 List of Major Materials:

- 1 – Maintain existing traffic signal cabinet and controller during the duration of construction.
- 1 – Replace all traffic signal cabling impacted. No underground splicing except normal loop splicing. The Contractor shall properly dispose of all old cabling unless otherwise directed by the City of Portsmouth.
- 1– Provide and verify communications to cabinets at Maplewood Avenue/Deer Street, Maplewood Avenue/Congress Street/Middle Street/Islington Street, and Middle Street/State Street.
- 1- Add additional circuit breaker, for utility outlet and heat.
- 1- 16-Phase programmable traffic actuated signal controller of current NEMA specifications (TS2-Type 1) with internal time-based coordination and internal fire preemption with associated MMU to be operated in conflict monitor mode. The controller shall be a **Siemens model m60** NEMA controller with new compatible MMU. The controller and MMU/conflict monitor, plus any additional hardware shall be capable of initiating the flashing yellow arrow (FYA) sequence. The controller shall include an integrated Ethernet port and be IP addressable to function in an Ethernet based system.
- 1 – Program new controller and Master (if necessary) per timings to be delivered by DPW, bench test.
- 1 – 16-channel Ethernet equipped enhanced malfunction management unit (as noted above), set-up to operate in conflict monitor mode. The MMU shall be compatible with the Siemens model m60 NEMA controller and shall include an integrated Ethernet port, or approved equal. The MMU shall support FYA operation.
- 1– Environmentally Hardened Ethernet Switch if Add-Alt for camera detection is selected.
- 1- Verify all loop amplifiers are functioning properly and replace if necessary (if Add-Alt for camera is not selected). Verify all detection loops are functional and replace if necessary. (If Add-Alt is not selected). New Loops will be paid for separately.
- 1 – 8-foot black powder coated aluminum signal pedestal post with foundation. Relocate existing pedestrian signal heads onto new post.
- 8 – Black pedestrian push button assemblies, mounted on traffic signal poles or posts. The push button assemblies shall provide Accessible Pedestrian signal (APS) capabilities; including vibratory warning and audio/audible warning. Push buttons shall be mounted perpendicular

to the path of travel and detectable arrow parallel to the path of travel. Push button assemblies shall include a R10-3e sign, mounted with the push button, with arrow facing the corresponding crossing path.

- 4 – R10-15, 30 inch by 30 inch, “Turning Vehicles Yield to Peds” aluminum Type CC sign mast arm mounted. Paid under separate item.
- 2- Replace existing cooling fan, add second cooling fan so that two fans are operable using temperature controls.
- 1- Add heating element and temperature controls to cabinet.
- 1 – Contractor shall provide system integration testing. All closed loop system integration shall be tested by the Contractor in the presence of the ENGINEER. This testing shall include, but not be limited to the following: (1) Verification of the system database set up including a review of the complete programming data installed for system operation by the equipment supplier to determine that the proper system parameters have been installed, (2) Verification to determine that the communications link between intersections and the master controller, and the communication link with the remote computers are functioning and information is being transmitted and received, (3) Review of the central computer functions including set-up and graphics to determine that they function properly and provide graphics in accordance with the specifications, (4) Identification of equipment malfunctions, computer program errors, and communication problems, (5) Verification to ensure that data transfer between the central computers to field hardware (controllers) is complete and accurate (If Add-Alt is selected), and (6) Verification of system detector reports, event logs, and critical alarms in accordance with contract requirements. The Contractor shall provide supplier technician time to fine-tune the coordination timings, controller / master parameters, and potential phasing modifications.

2.1.4 Ethernet Switch. (Only applies if camera detection Add-Alt is selected) This work shall consist of furnishing, installing, and testing an Ethernet Switch that meets the requirements of a 100 Mbps Ethernet.

2.1.4.1 The Ethernet Switch shall include a minimum of four single mode fiber optic patch cords, each one meter in length, and terminated on both ends with Type SC single mode fiber optic connectors

2.1.4.2 The Ethernet Switch shall include sufficient Category 6 Ethernet patch cords, each one meter in length, and terminated on both ends with Type RJ45 connectors to provide full connectivity within the cabinet as shown in the Contract Documents.

2.1.4.3 The Ethernet Switch shall include all accessories required for a full and complete installation, including but not limited to all connecting cables, serial to Ethernet modems, power supplies, and mounting hardware.

Add to 3.15

3.15.2 Contractor shall be responsible for maintaining operations of the traffic signal during construction. The labor and equipment necessary to complete this application will be included in the cost.

Add to 5.1

5.1.2 Alterations to Traffic Signals will be paid for at the Contract lump sum price complete in place. The price shall be full compensation for all labor, equipment, hardware and incidentals necessary to make the traffic signal operational.

PORTSMOUTH

December 2019

SPECIAL PROVISION
AMENDMENT TO SECTION 616 - TRAFFIC SIGNALS

Item 616.193 – Alterations to Traffic Signals

This special provision provides for the replacement of the existing traffic control signal cabinet, replacement of vehicular signal back plates and reconfiguration of portions of the pedestrian signals at the intersection of Maplewood Avenue and Congress Street/Middle Street/Islington Street (Location 3) in the City of Portsmouth, NH. The system will be coordinated with the traffic control signals at the following intersections:

- Maplewood Avenue and Deer Street (Location 1 – Item 616.191)
- Maplewood Avenue and Hanover Street (Location 2 – Item 616.192)
- Middle Street and State Street (Location 4 (Master Location) – Installation by others, ensure coordination.)

GENERAL:

All provisions of Section 616, except as modified or changed below, shall apply.

1. The Contractor shall be responsible for the traffic signal operation and maintenance once alterations to the existing signals, excavation or other work within 75 feet of the stop bar at any leg of the intersection has begun. The Contractor shall notify the City of Portsmouth Department of Public Works (603-427-1530) with names and phone numbers of persons to be contacted in case of a malfunction. The Contact person(s) must be available 24 hours a day, seven days a week. The Contractor shall also keep a signal log in the cabinet to track all maintenance work the Contractor completes on the signal system. This log shall be placed within a plastic cover and shall at least include the description of the trouble call, corrective action taken, date, time, and personnel who completed the work.
2. It is not intended that every fitting, minor detail or feature be shown and described, as the assumption is made that the Contractor and/or their Subcontractor is an expert in the particular area of responsibility and is capable of interpreting the plans, Specifications, and Special Provisions so that the bid and/or construction shall include all items required to provide complete, fully operational traffic control signal system and that they shall be provided and installed in a neat and workmanlike manner.
3. The traffic signal must be inspected and approved by the City of Portsmouth Department of Public Works (603-427-1530) prior to placing in operation. The Contractor shall contact Portsmouth DPW one week prior to turning the signals on flash. If the Contractor does not

Speak directly with Eric Eby they must leave a detailed message with the Administrative Assistant and expect a call back. Leaving a message does not constitute an approval.

4. The notation of approved equal or equivalent is denoted on several items and requires specific approval by the Engineer and the City.

Add to 2.1:

2.1.3 List of Major Materials:

- 1 – Maintain existing traffic signal cabinet and controller during the duration of construction as practical. Provide traffic control with local police during cabinet switchover.

1 – The traffic signal equipment shall be housed in a new black powder coat painted “P” Type (52x44x28) aluminum cabinet that is on the NHDOT approved products list and assembled by the equipment manufacturer with a 12-inch extension base. The interior of the cabinet shall be powder coated white. The cabinet shall be equipped with a pull out keyboard tray, an interior LED light, heating element with controls, dual fan cooling with controls and a standard internal generator hook-up with keyed connection point exterior door for future auxiliary power needs. The cabinet shall be equipped with a newly installed ground rod array and lightning arresting connections on all external cables leads. Lightning suppression shall be included in the cabinet for all Signal Outputs, Opticom pre-emption, and Loop Detection and/or Video Detection devices as needed. Cabinets shall have (2) saw tooth channels welded to the cabinet back for 16 position back panel mounting.

A separate power supply shall be supplied and installed in the TS 2 cabinet. The unit shall be AC line powered and provide regulated DC power, unregulated AC power, and a line frequency reference for the rack mounted loop amplifiers, bus interface units, load switches and other auxiliary cabinet equipment as required. At a minimum, the power supply shall meet all requirements of Section 5.3.5 of the NEMA TS 2 Standard. The power supply shall be shelf mounted. The unit shall contain four LED indicators on the front panel to indicate the four outputs; + 12 VDC +/- 1 VDC @ 5.0 amps, + 24 VDC +/- 2 VDC @ 2.0 amps, 12 VAC @ 250 milliamps, and 60 Hz line frequency reference. A test point terminal shall also be located on the unit’s front panel for +24VDC and logic ground testing.

The cabinet shall be mounted on the existing foundation (modify foundation as necessary).

The traffic signal controller unit (CU), malfunction management unit (MMU), detector amplifiers, and all other ancillary traffic signal control components included in the traffic control cabinet shall comply with the National Electrical Manufacturers Association (NEMA) Standard No. TS 2-1998, Traffic Controller Assemblies with National Transportation Communications for ITS Protocol (NTCIP) Requirements.

- 1- Replace all traffic signal cabling as needed as no underground splicing will be allowed except normal loop splicing. The Contractor shall properly dispose of all old cabling unless otherwise directed by the City of Portsmouth.

1- Provide and verify communications to cabinets at Maplewood Avenue/Deer Street, Maplewood Avenue/Hanover Street and Middle Street/State Street.

1- 16-Phase programmable traffic actuated signal controller of current NEMA specifications (TS2-Type 1) with internal time-based coordination and internal fire preemption with associated MMU to be operated in conflict monitor mode. The controller shall be a **Siemens model m60** NEMA controller with new compatible MMU. The controller and MMU/conflict monitor, plus any additional hardware shall be capable of initiating the flashing yellow arrow (FYA) sequence. The controller shall include an integrated Ethernet port and be IP addressable to function in an Ethernet based system.

1- GTT OPTICOM shall be provided. The existing optical detectors shall be reused.

The phase selector shall be a rack-mounted plug-in four channel, dual priority device manufactured by GTT OPTICOM model 700 series with built in Ethernet port. The phase selector shall plug into the Loop Detector Rack. Programming the phase selector shall be via a PC-based computer utilizing unit specific software.

1 – Program new controller and Master (if necessary) per timings to be delivered by DPW.

1 – 16-channel Ethernet equipped enhanced malfunction management unit (as noted above), set-up to operate in conflict monitor mode. The MMU shall be compatible with the Siemens model m60 NEMA controller and shall include an integrated Ethernet port, or approved equal. The MMU shall support FYA operation.

1 – Environmentally Hardened Ethernet Switch and/or proper hardware to communicate with other signals as necessary depending on Add-Alt selections.

1 – Rack Mounted Loop amplifiers as needed if Add-Alt for Camera system not selected.

3 – 8-foot black powder coated traffic aluminum signal pedestal posts with foundations. Relocate existing pedestrian signals onto new posts.

8 – Black Pedestrian push button assemblies, mounted on traffic signal poles or posts. The push button assemblies shall provide Accessible Pedestrian signal (APS) capabilities; including vibratory warning and audio/audible warning. Push buttons shall be mounted perpendicular to the path of travel and detectable arrow parallel to the path of travel. Push button assemblies shall include a R10-3e sign, mounted with the push button, with arrow facing the corresponding crossing path.

4 – R10-15, 30 inch by 30 inch, “Turning Vehicles Yield to Peds” aluminum Type CC sign mast arm mounted. Paid under separate item.

9- Replacement of existing aluminum with 5-inch louvered polycarbonate 3 section signal back plates, remove and discard existing. The outside perimeter of the back plate shall be lined with a fluorescent-yellow 2- inch strip of Type IX or XI retroreflective sheeting.

- 1- Replacement of existing aluminum with 5-inch louvered polycarbonate 4 section signal back plate, remove and discard existing. The outside perimeter of the back plate shall be lined with a fluorescent-yellow 2- inch strip of Type IX or XI retroreflective sheeting.
- 1 – Contractor shall provide system integration testing. All closed loop system integration shall be tested by the Contractor in the presence of the ENGINEER. This testing shall include, but not be limited to the following: (1) Verification of the system database set up including a review of the complete programming data installed for system operation by the equipment supplier to determine that the proper system parameters have been installed, (2) Verification to determine that the communications link between intersections and the master controller, and the communication link with the remote computers are functioning and information is being transmitted and received, (3) Review of the central computer functions including set-up and graphics to determine that they function properly and provide graphics in accordance with the specifications, (4) Identification of equipment malfunctions, computer program errors, and communication problems, (5) Verification to ensure that data transfer between the central computers to field hardware (controllers) is complete and accurate (Only required for Add-Alt selection), and (6) Verification of system detector reports, event logs, and critical alarms in accordance with contract requirements. The Contractor shall provide supplier technician time to fine-tune the coordination timings, controller / master parameters, and potential phasing modifications.

2.1.4 Ethernet Switch. (Only applies if camera detection Add-Alt is selected) This work shall consist of furnishing, installing, and testing an Ethernet Switch that meets the requirements of a 100 Mbps Ethernet.

- 2.1.4.1** The Ethernet Switch shall include a minimum of four single mode fiber optic patch cords, each one meter in length, and terminated on both ends with Type SC single mode fiber optic connectors
- 2.1.4.2** The Ethernet Switch shall include sufficient Category 6 Ethernet patch cords, each one meter in length, and terminated on both ends with Type RJ45 connectors to provide full connectivity within the cabinet as shown in the Contract Documents.
- 2.1.4.3** The Ethernet Switch shall include all accessories required for a full and complete installation, including but not limited to all connecting cables, serial to Ethernet modems, power supplies, and mounting hardware.

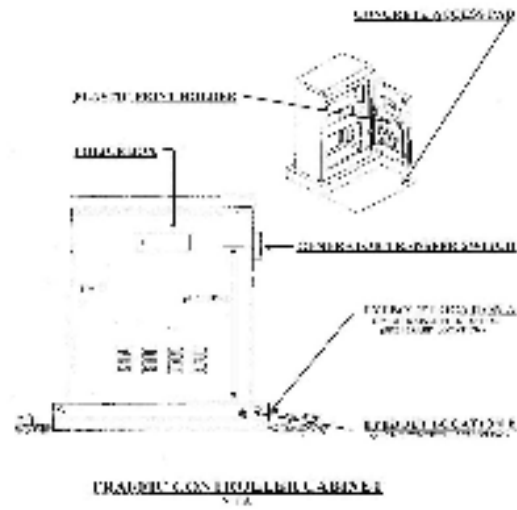
Add to 3.15

3.15.2 Contractor shall be responsible for maintaining operations of the traffic signal during construction. The labor and equipment necessary to complete this application will be included in the cost.

Add to 5.1

5.1.2 Alterations to Traffic Signals will be paid for at the Contract lump sum price complete in place. The price shall be full compensation for all labor, equipment, hardware and incidentals necessary to make the traffic signal operational.

ATTACHEMENT "A"



SPECIAL PROVISION

AMENDMENT TO SECTION 616 - TRAFFIC SIGNALS

Item 616.194 – Alterations to Traffic Signals at locations 1-4, addition of Video detection system and upgrade of communications between signals and from Master location and Public Works building.

Bid Alternate #1 Item, add:

4- Video Detection System - Grid Smart (or Approved equal) omni-direction Video Camera with manufacturer cables and rack cards, including all hardware mounted on the mast arm or approved equal with integral counting capability. Each video detection system (VDS) shall consist of video cameras, video detection processors (VDP), a Central Control Unit (CCU), (either a 19" rack or shelf-mount form factor), input/output extension modules, video surge suppressors and a pointing device, or any combination thereof.

4 - Rack Mounted Video Detection Processor and Cable, GridSmart GS2 or approved equal.

4- VDS Central Control Unit (CCU) - shall be supplied by the VDS manufacturer.

4 - Approximately 9" Color flat screen portable monitor or approved equal, compatible with installed video detection system, with capabilities to view video detection.

3- Modify the existing signal cabinets as necessary to properly eliminate the existing loop detection amplifiers and equipment etc.

2.1.4 Ethernet Switch. This work shall consist of furnishing, installing, and testing an Ethernet Switch that meets the requirements of a 100 Mbps Ethernet Switch.

2.1.4.1 The Ethernet Switch shall include a minimum of four single mode fiber optic patch cords, each one meter in length, and terminated on both ends with Type SC single mode fiber optic connectors

2.1.4.2 The Ethernet Switch shall include sufficient Category 6 Ethernet patch cords, each one meter in length, and terminated on both ends with Type RJ45 connectors to provide full connectivity within the cabinet as shown in the Contract Documents.

2.1.4.3 The Ethernet Switch shall include all accessories required for a full and complete installation, including but not limited to all connecting cables, serial to Ethernet modems, power supplies, and mounting hardware.

1 – System cable drop for connection between interconnect / video system to City of Portsmouth Department of Public Works.

1 – System cable modem in controller cabinet at Middle and State Intersection for broadband service between interconnect / video system and City of Portsmouth Department of Public Works. [The installation/service connection cost to be paid by the Contractor; monthly service to be assumed by the Portsmouth DPW]

1– Setup remote software as necessary on existing DPW provided laptop compatible with Portsmouth Department of Public Works computer system / server. The Contractor shall contact the Portsmouth Department of Public Works to determine compatibility. The software shall be capable of receiving transmitted video data and interconnect system data for viewing at Portsmouth Department of Public Works office. This effort and pricing shall include one half day of system training for Portsmouth Department of Public Works personnel at their facility.

1 – Contractor shall provide system integration testing. All closed loop system integration shall be tested by the Contractor in the presence of the ENGINEER. This testing shall include, but not be limited to the following: (1) Verification of the system database set up including a review of the complete programming data installed for system operation by the equipment supplier to determine that the proper system parameters have been installed, (2) Verification to determine that the communications link between intersections and the master controller, and the communication link with the remote computers are functioning and information is being transmitted and received, (3) Review of the central computer functions including set-up and graphics to determine that they function properly and provide graphics in accordance with the specifications, (4) Identification of equipment malfunctions, computer program errors, and communication problems, (5) Verification to ensure that data transfer between the central computers to field hardware (controllers) is complete and accurate, and (6) Verification of system detector reports, event logs, and critical alarms in accordance with contract requirements. The Contractor shall provide supplier technician time to fine-tune the coordination timings, controller / master parameters, and potential phasing modifications.

PORTSMOUTH

December 2019

SPECIAL PROVISION

AMENDMENT TO SECTION 618 – UNIFORMED OFFICERS AND FLAGGERS

Item 618.61 – Uniformed Officers with Vehicles

Item 618.7 –Flaggers

Amend Section 618 to include:

Description

Add 1.2: Daily traffic control personnel will be required to facilitate traffic through the work zone quickly and safely. The use of, type of, and number of personnel will be reviewed and approved with the Engineer. Flaggers will be used for all work outside of the vehicular path of travel (i.e ramp work, sidewalk work, etc. Uniformed officers will be used only when traffic signals are inoperable as part of work related to the project.

Method of Measurement

Amend 4.1: Uniformed Officers and Flaggers shall be measured by the actual hour worked in the field.

Basis of Payment

Amend 5.1: Uniformed Officers and Flaggers will be paid for by the actual hour worked. The City will reimburse the exact cost for this item, no cost markup is allowed. The allowance items on the bid form will be used.

COORDINATION CYCLE/SPLIT/OFFSET SCHEDULE

ALL ENTRIES IN SECONDS

PATTERN NUMBER	1	2	3	4
CYCLE LENGTH	75	80	90	90
OFFSET	21	6	20	19
COORDINATED ϕ	2+6	2+6	2+6	2+6
SPLIT TIME ϕ 1	15	15	15	15
SPLIT TIME ϕ 2	29	32	42	37
SPLIT TIME ϕ 3	-	-	-	-
SPLIT TIME ϕ 4	31	33	33	38
SPLIT TIME ϕ 5	-	-	-	-
SPLIT TIME ϕ 6	44	47	57	52
SPLIT TIME ϕ 7	-	-	-	-
SPLIT TIME ϕ 8	31	33	33	38
SPLIT TIME ϕ 9	-	-	-	-
SPLIT TIME ϕ 10	-	-	-	-

COORDINATION MODE SET
TO FIXED FORCE-OFF

COORDINATION NOTES:

- OFFSET IS REFERENCED TO THE END OF THE COORDINATED PHASE GREEN (SEE TABLE ABOVE).
- COORDINATION TO OPERATE BY TIME-OF-DAY (SEE COORDINATION SCHEDULE).

COORDINATION SCHEDULE

ALL ENTRIES IN SECONDS

DAY PLAN	PLAN 1	PLAN 2
MONTH	JAN-DEC	JAN-DEC
DAY OF WEEK	MON-FRI	SAT-SUN
DATES	ALL	ALL
EVENT 1/PATTERN	00:00/254	00:00/254
EVENT 2/PATTERN	7:45/1	7:45/4
EVENT 3/PATTERN	11:45/2	18:30/254
EVENT 4/PATTERN	16:30/3	-
EVENT 5/PATTERN	18:30/254	-
EVENT 6/PATTERN	-	-

SIGNAL TIMING SCHEDULE

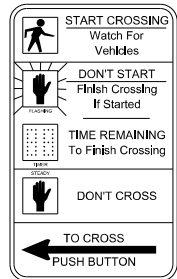
ITEM / PHASE	ϕ 1	ϕ 2	ϕ 3	ϕ 4	ϕ 5	ϕ 6	ϕ 7	ϕ 8	ϕ 9	ϕ 10
MINIMUM INITIAL	5	10	-	5	-	10	-	5	-	-
PASSAGE TIME	1.5	1.5	-	1.5	-	1.5	-	1.5	-	-
MAXIMUM 1	10	37	-	28	-	47	-	28	-	-
MAXIMUM 2	-	-	-	-	-	-	-	-	-	-
YELLOW	3	3	-	3	-	3	-	3	-	-
ALL RED	2	2	-	2.5	-	2	-	2.5	-	-
PED WALK	-	7	-	7	-	7	-	7	-	-
PED CLEAR	-	16	-	19	-	16	-	19	-	-
ADV WALK	-	5	-	5	-	5	-	5	-	-
RECALL	-	S	-	-	-	S	-	-	-	-
DETECTOR	-	-	-	-	-	-	-	-	-	-
PREEMPT PRIORITY	-	-	-	-	-	-	-	-	-	-
FLASH	R	Y	-	R	-	Y	-	R	-	-
DUAL ENTRY	-	ON	-	ON	-	ON	-	ON	-	-

PROPOSED SIGNS



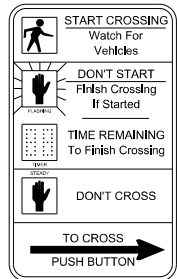
R10-15R
30"x30"

4 PROPOSED



R10-3eL
9"x15"

4 PROPOSED



R10-3eR
9"x15"

4 PROPOSED

PROPOSED FOUNDATION SCHEDULE

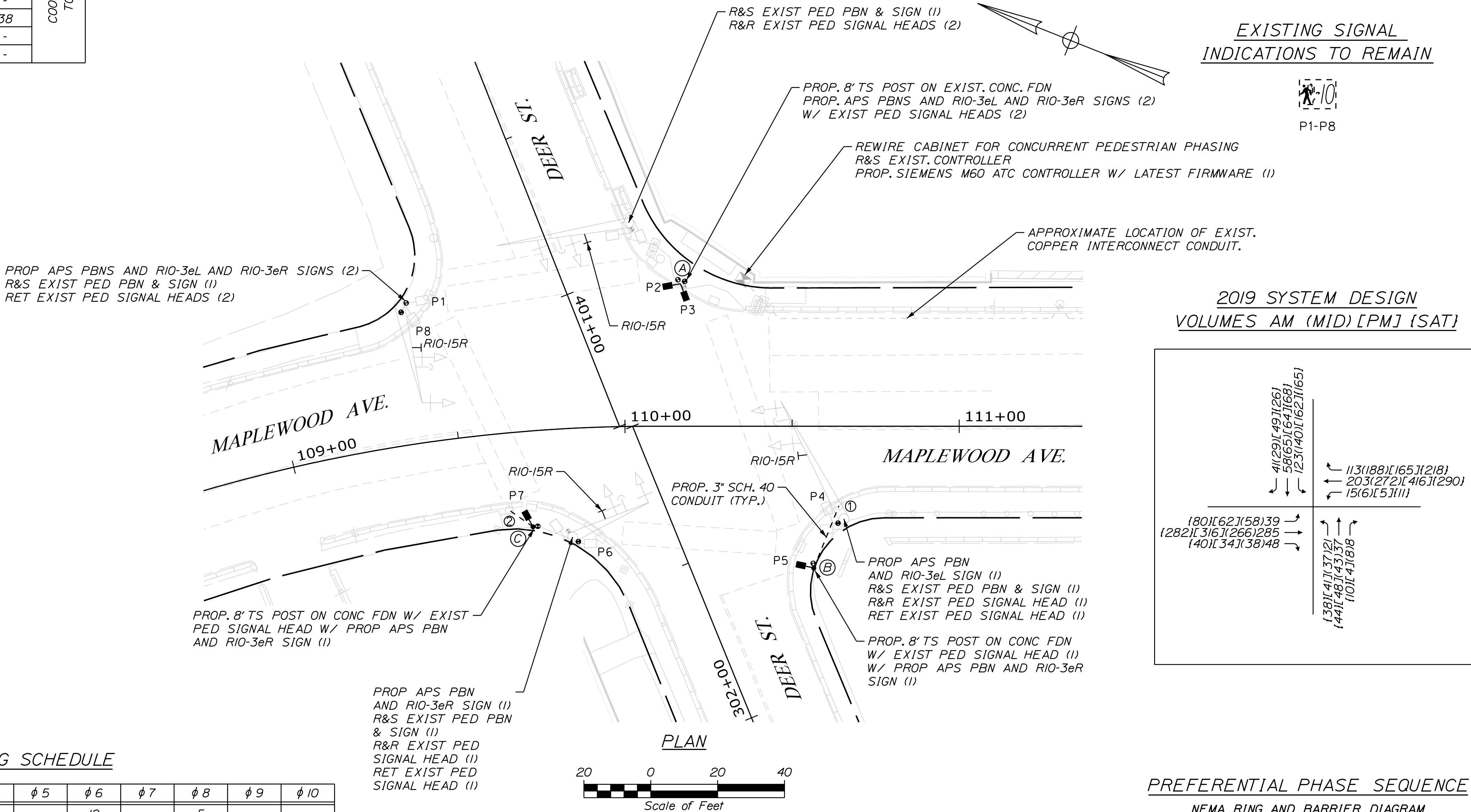
I.D.	LOCATION	DESCRIPTION	FOUNDATION
A	STA. 110+16.6 O/S 42.6' LT	8' PEDESTAL POLE	EXIST.
B	STA. 110+56.5 O/S 42.5' RT	8' PEDESTAL POLE	TSFND
C	STA. 109+70.2 O/S 28.7' RT	8' PEDESTAL POLE	TSFND

TSFND = CONCRETE FOUNDATION FOR PEDESTALS
CONSTRUCTED IN ACCORDANCE WITH NHDOT
SIGNAL AND LIGHTING STANDARDS SL-2

PROPOSED CONDUIT SCHEDULE

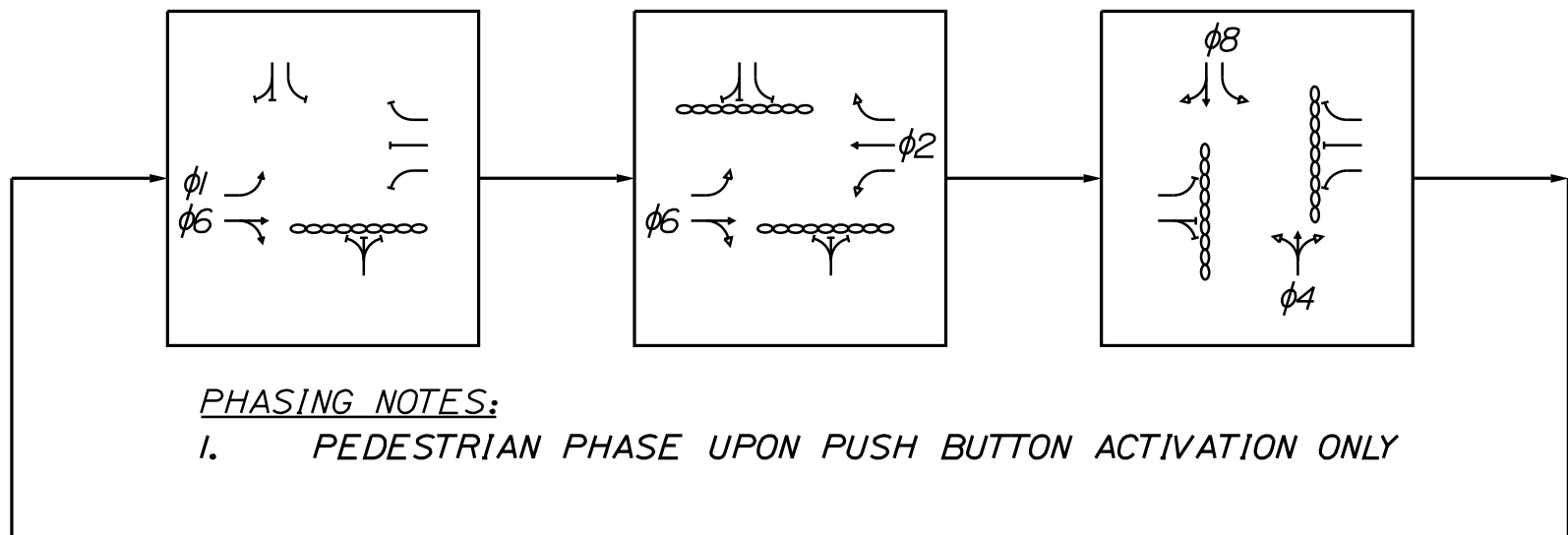
I.D.	NO.	LENGTH (FT.)	SCHEDULE TYPE*	REMARKS
1-B	1	20	40	FROM EXISTING PB TO PP
2-C	1	9	40	FROM EXISTING PB TO PP
TOTAL		29		

*3-INCH PVC



PREFERENTIAL PHASE SEQUENCE

NEMA RING AND BARRIER DIAGRAM



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75 John Roberts Rd.
Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

TRAFFIC SIGNAL PLAN
OF:
MAPLEWOOD AVENUE
SIGNAL IMPROVEMENTS
FOR:
CITY OF PORTSMOUTH
1 JUNKINS AVE.
PORTSMOUTH, NH 03801

PROJECT NO. 17134-02
SCALE 1" = 20'

SHEET 1 OF 4

COORDINATION CYCLE/SPLIT/OFFSET SCHEDULE

ALL ENTRIES IN SECONDS					
PATTERN NUMBER	1	2	3	4	COORDINATION MODE SET TO FIXED FORCE-OFF
CYCLE LENGTH	75	80	90	90	
OFFSET	16	7	13	13	
COORDINATED ϕ	2-6	2-6	2-6	2-6	
SPLIT TIME $\phi 1$	15	15	17	17	
SPLIT TIME $\phi 2$	32	35	42	42	
SPLIT TIME $\phi 3$	-	-	-	-	
SPLIT TIME $\phi 4$	28	30	31	31	
SPLIT TIME $\phi 5$	-	-	-	-	
SPLIT TIME $\phi 6$	47	50	59	59	
SPLIT TIME $\phi 7$	-	-	-	-	
SPLIT TIME $\phi 8$	28	30	31	31	
SPLIT TIME $\phi 9$	-	-	-	-	
SPLIT TIME $\phi 10$	-	-	-	-	

COORDINATION NOTES:

- OFFSET IS REFERENCED TO THE END OF THE COORDINATED PHASE GREEN (SEE TABLE ABOVE).
- COORDINATION TO OPERATE BY TIME-OF-DAY (SEE COORDINATION SCHEDULE).

REWIRE CABINET FOR CONCURRENT PEDESTRIAN PHASING
R&S EXIST. CONTROLLER
PROP. SIEMENS M60 ATC CONTROLLER
W/ LATEST FIRMWARE (1)

COORDINATION SCHEDULE

ALL ENTRIES IN SECONDS		
DAY PLAN	PLAN 1	PLAN 2
MONTH	JAN-DEC	JAN-DEC
DAY OF WEEK	MON-FRI	SAT-SUN
DATES	ALL	ALL
EVENT 1/PATTERN	00:00/254	00:00/254
EVENT 2/PATTERN	7:45/1	7:45/4
EVENT 3/PATTERN	11:45/2	18:30/254
EVENT 4/PATTERN	16:30/3	-
EVENT 5/PATTERN	18:30/254	-
EVENT 6/PATTERN	-	-

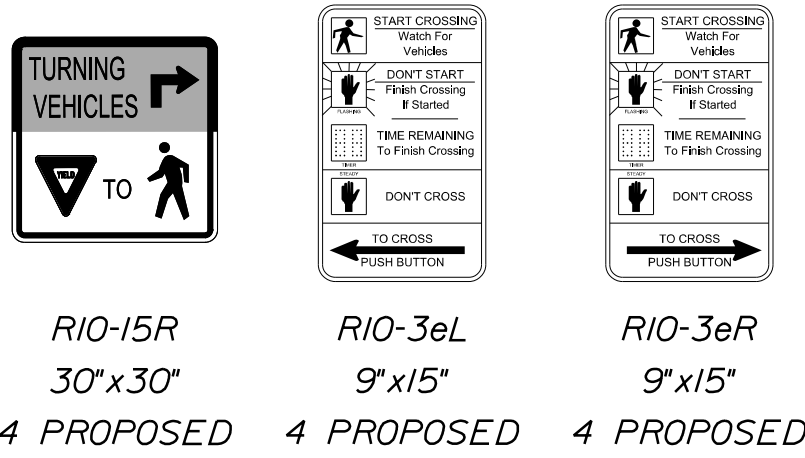
SIGNAL TIMING SCHEDULE

ITEM / PHASE	$\phi 1$	$\phi 2$	$\phi 3$	$\phi 4$	$\phi 5$	$\phi 6$	$\phi 7$	$\phi 8$	$\phi 9$	$\phi 10$
MINIMUM INITIAL	5	10	-	5	-	10	-	5	-	-
PASSAGE TIME	1.5	1.5	-	1.5	-	1.5	-	1.5	-	-
MAXIMUM 1	12	37	-	26	-	54	-	26	-	-
MAXIMUM 2	-	-	-	-	-	-	-	-	-	-
YELLOW	3	3	-	3	-	3	-	3	-	-
ALL RED	2	2	-	2	-	2	-	2	-	-
PED WALK	-	7	-	7	-	7	-	7	-	-
PED CLEAR	-	16	-	16	-	16	-	16	-	-
ADV WALK	-	5	-	5	-	5	-	5	-	-
RECALL	-	S	-	-	-	S	-	-	-	-
DETECTOR	-	-	-	-	-	-	-	-	-	-
PREEMPT PRIORITY	-	-	-	-	-	-	-	-	-	-
FLASH	R	Y	-	R	-	Y	-	R	-	-
DUAL ENTRY	-	ON	-	ON	-	ON	-	ON	-	-

SIGNAL TIMING DEFINITIONS:

Y = YELLOW
R = RED
D = DARK
S = SOFT RECALL
O = RECALL OFF
PR = PRESENCE

PROPOSED SIGNS



PROPOSED FOUNDATION SCHEDULE

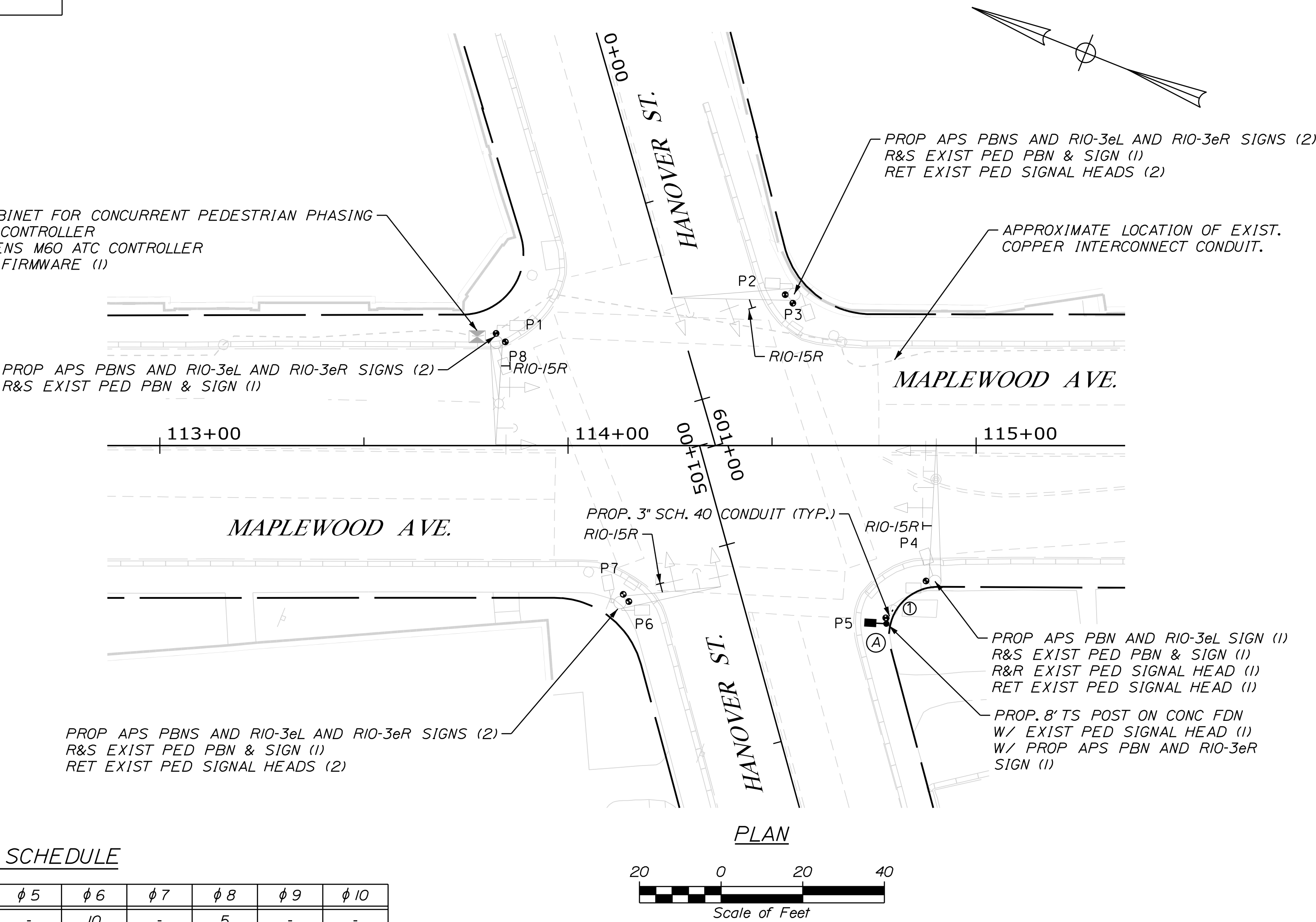
I.D.	LOCATION	DESCRIPTION	FOUNDATION
A	STA. 114+78.0 O/S 43.6' RT	8' PEDESTAL POLE	TSFND

TSFND = CONCRETE FOUNDATION FOR PEDESTALS
CONSTRUCTED IN ACCORDANCE WITH NHDOT
SIGNAL AND LIGHTING STANDARDS SL-2

PROPOSED CONDUIT SCHEDULE

I.D.	NO.	LENGTH (FT.)	SCHEDULE TYPE*	REMARKS
I-A	1	5	40	FROM EXISTING PB TO PP
TOTAL		10		

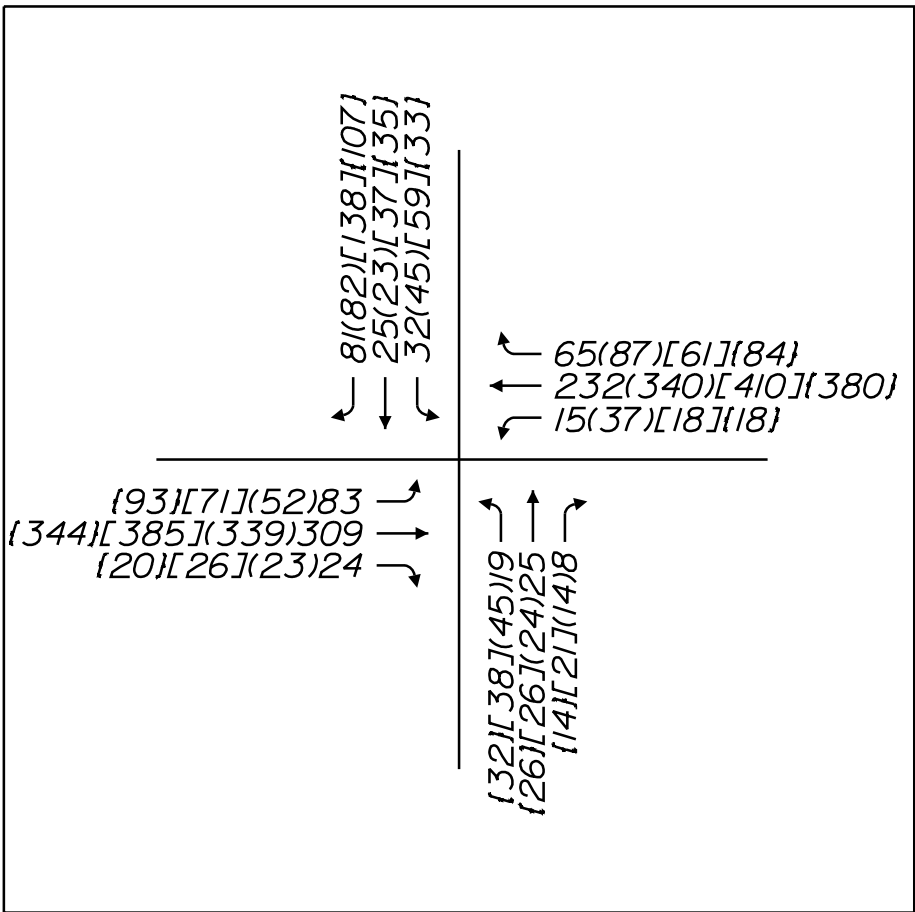
*3-INCH PVC



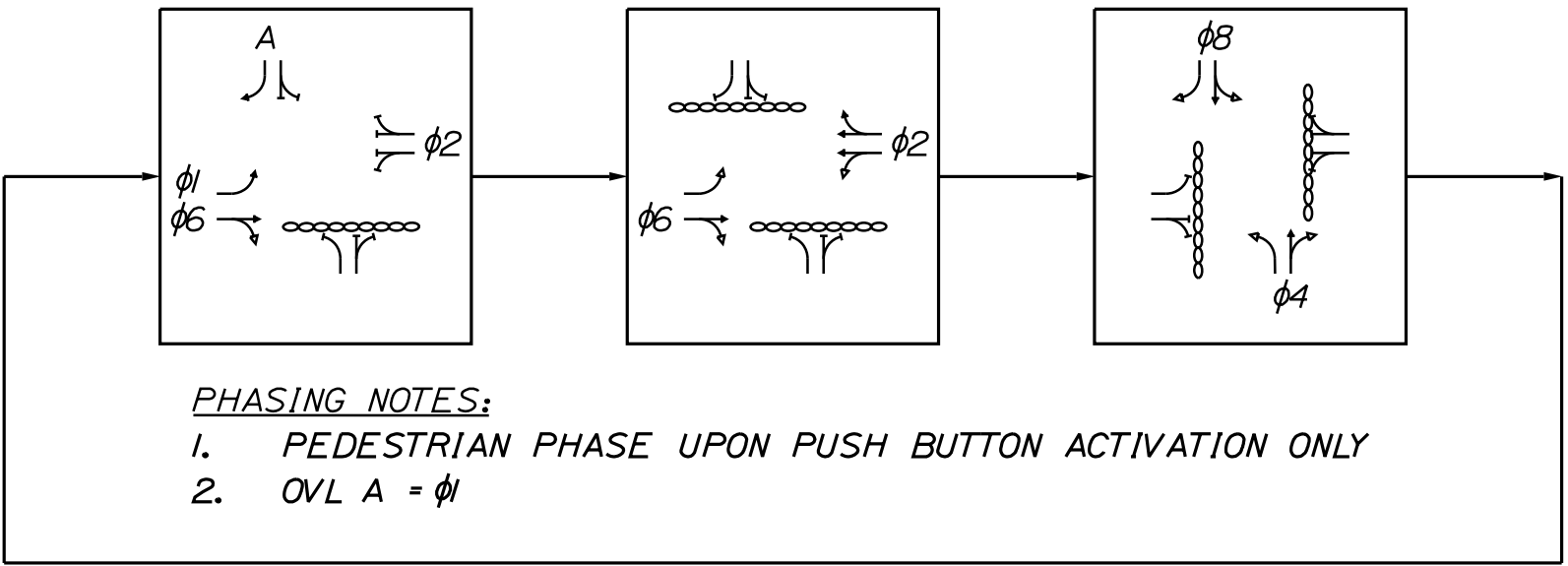
EXISTING SIGNAL INDICATIONS TO REMAIN



2019 SYSTEM DESIGN VOLUMES AM (MID) [PM] [SAT]



PREFERENTIAL PHASE SEQUENCE NEMA RING AND BARRIER DIAGRAM



PHASING NOTES:
1. PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY
2. OVL A = $\phi 1$

PLS OR PE

PLS OR PE

DESIGNED
BRL

CHECKED
SSS

3 BRL 12/27/19 100% SUBMISSION
2 BRL 11/11/19 95% SUBMISSION
1 BRL 10/10/19 90% SUBMISSION
REV: BY: DATE: STATUS:

BRADLEY R. LYON
No. 13810
LICENSED PROFESSIONAL ENGINEER

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TRAFFIC SIGNAL PLAN
OF:
MAPLEWOOD AVENUE
SIGNAL IMPROVEMENTS
FOR:
CITY OF PORTSMOUTH
1 JUNKINS AVE.
PORTSMOUTH, NH 03801

PROJECT NO.
17134-02

SCALE
1" = 20'

SHEET 2 OF 4

COORDINATION CYCLE/SPLIT/OFFSET SCHEDULE

ALL ENTRIES IN SECONDS

PATTERN NUMBER	1	2	3	4
CYCLE LENGTH	75	80	90	90
OFFSET	0	0	1	3
COORDINATED ϕ	2:6	2:6	2:6	2:6
SPLIT TIME $\phi 1$	-	-	-	-
SPLIT TIME $\phi 2$	30	32	39	39
SPLIT TIME $\phi 3$	18	21	24	21
SPLIT TIME $\phi 4$	27	27	27	30
SPLIT TIME $\phi 5$	-	-	-	-
SPLIT TIME $\phi 6$	30	32	39	39
SPLIT TIME $\phi 7$	15	16	18	21
SPLIT TIME $\phi 8$	30	32	33	30
SPLIT TIME $\phi 9$	-	-	-	-
SPLIT TIME $\phi 10$	-	-	-	-

COORDINATION MODE SET
TO FIXED FORCE-OFF

COORDINATION NOTES:

- OFFSET IS REFERENCED TO THE END OF THE COORDINATED PHASE GREEN (SEE TABLE ABOVE).
- COORDINATION TO OPERATE BY TIME-OF-DAY (SEE COORDINATION SCHEDULE).

COORDINATION SCHEDULE

ALL ENTRIES IN SECONDS

DAY PLAN	PLAN 1	PLAN 2
MONTH	JAN-DEC	JAN-DEC
DAY OF WEEK	MON-FRI	SAT-SUN
DATES	ALL	ALL
EVENT 1/PATTERN	00:00/254	00:00/254
EVENT 2/PATTERN	7:45/1	7:45/4
EVENT 3/PATTERN	11:45/2	18:30/254
EVENT 4/PATTERN	16:30/3	-
EVENT 5/PATTERN	18:30/254	-
EVENT 6/PATTERN	-	-

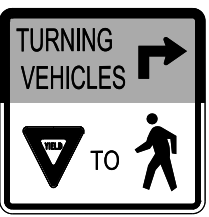
SIGNAL TIMING SCHEDULE

ITEM / PHASE	$\phi 1$	$\phi 2$	$\phi 3$	$\phi 4$	$\phi 5$	$\phi 6$	$\phi 7$	$\phi 8$	$\phi 9$	$\phi 10$
MINIMUM INITIAL	-	10	5	5	-	10	5	5	-	-
PASSAGE TIME	-	1.5	1.5	1.5	-	1.5	1.5	1.5	-	-
MAXIMUM 1	-	35	19	22	-	35	13	28	-	-
MAXIMUM 2	-	-	-	-	-	-	-	-	-	-
YELLOW	-	3	3	3	-	3	3	3	-	-
ALL RED	-	1.5	2	2	-	1.5	2	2	-	-
PED WALK	-	7	-	7	-	7	-	7	-	-
PED CLEAR	-	13	-	15	-	13	-	15	-	-
ADV WALK	-	5	-	5	-	5	-	5	-	-
RECALL	-	S	-	-	-	S	-	-	-	-
DETECTOR	-	-	-	-	-	-	-	-	-	-
PREEMPT PRIORITY	-	-	-	-	-	-	-	-	-	-
FLASH	-	Y	R	R	-	Y	R	R	-	-
DUAL ENTRY	-	ON	-	ON	-	ON	-	ON	-	-

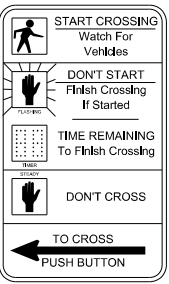
SIGNAL TIMING
DEFINITIONS:

Y = YELLOW
R = RED
D = DARK
S = SOFT RECALL
O = RECALL OFF
PR = PRESENCE

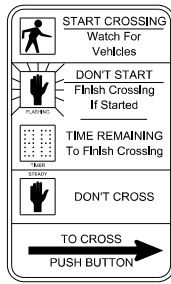
PROPOSED SIGNS



R10-15R
30"x30"
4 PROPOSED



R10-3eL
9"x15"
4 PROPOSED



R10-3eR
9"x15"
4 PROPOSED

PROPOSED FOUNDATION SCHEDULE

I.D.	LOCATION	DESCRIPTION	FOUNDATION
A	STA. 118+57.5 O/S 31.0' LT	8' PEDESTAL POLE	TSFND
B	STA. 118+71.9 O/S 41.7' RT	8' PEDESTAL POLE	TSFND
C	STA. 118+07.7 O/S 41.2' RT	8' PEDESTAL POLE	TSFND

TSFND = CONCRETE FOUNDATION FOR PEDESTALS
CONSTRUCTED IN ACCORDANCE WITH NHDOT
SIGNAL AND LIGHTING STANDARDS SL-2

PROPOSED CONDUIT SCHEDULE

I.D.	NO.	LENGTH (FT.)	SCHEDULE TYPE*	REMARKS
1-A	1	22	40	FROM EXISTING PB TO PP
2-B	1	7	40	FROM EXISTING PB TO PP
3-C	1	15	40	FROM EXISTING PB TO PP
TOTAL		44		

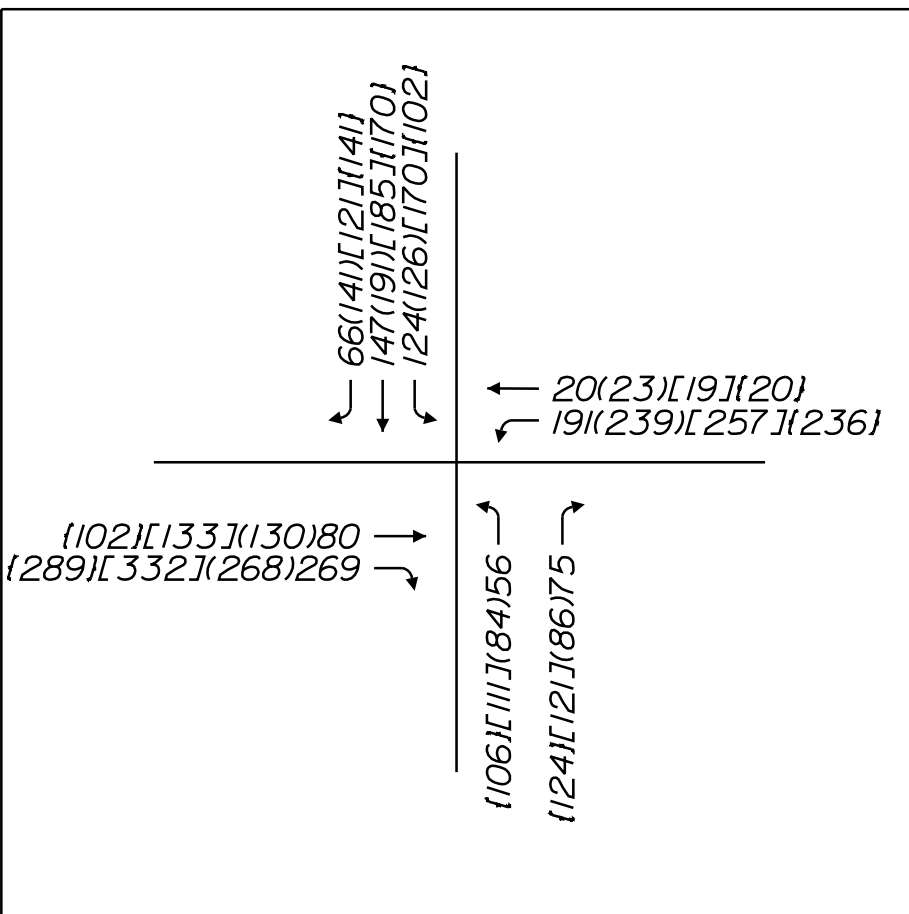
*3-INCH PVC

EXISTING SIGNAL
INDICATIONS TO REMAIN

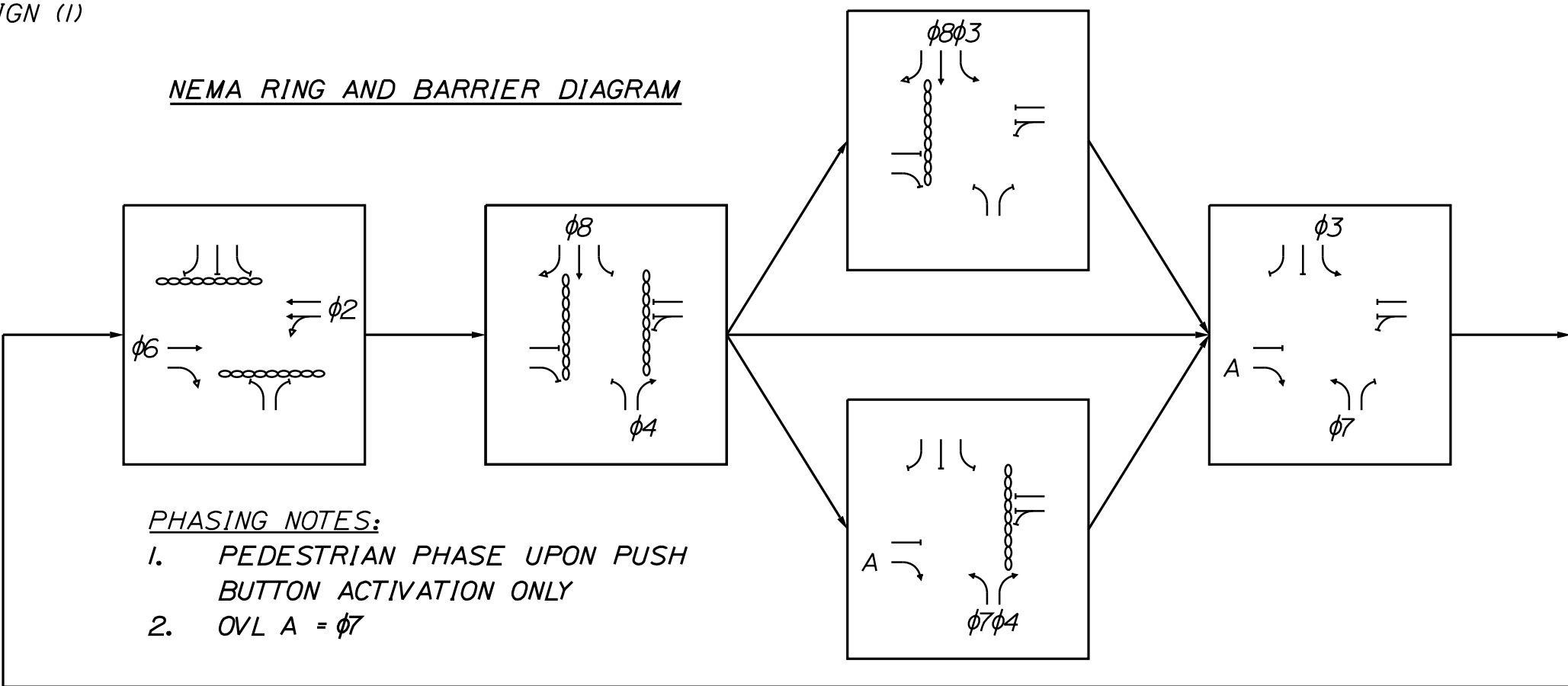


P1-P8

2019 SYSTEM DESIGN
VOLUMES AM (MID) [PM] [SAT]



PREFERENTIAL PHASE SEQUENCE



NEMA RING AND BARRIER DIAGRAM

- PHASING NOTES:
- PEDESTRIAN PHASE UPON PUSH BUTTON ACTIVATION ONLY
 - OVL A = $\phi 7$

PLS OR PE

PLS OR PE

DESIGNED	CHECKED
BRL	SSS
3 BRL 12/27/19 100% SUBMISSION	
2 BRL 11/11/19 95% SUBMISSION	
1 BRL 10/10/19 90% SUBMISSION	
REV: BY: DATE: STATUS:	

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TRAFFIC SIGNAL PLAN
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1 JUNKINS AVE.
PORTSMOUTH, NH 03801

PROJECT NO.	SCALE
17134-01	1" = 20'

SHEET 3 OF 4

COORDINATION CYCLE/SPLIT/OFFSET SCHEDULE

ALL ENTRIES IN SECONDS				
PATTERN NUMBER	1	2	3	4
CYCLE LENGTH	75	80	90	90
OFFSET	65	78	82	82
COORDINATED ϕ	2+6	2+6	2+6	2+6
SPLIT TIME $\phi 1$	13	13	13	13
SPLIT TIME $\phi 2$	25	27	34	37
SPLIT TIME $\phi 3$	-	-	-	-
SPLIT TIME $\phi 4$	11	14	17	14
SPLIT TIME $\phi 5$	-	-	-	-
SPLIT TIME $\phi 6$	38	40	47	50
SPLIT TIME $\phi 7$	-	-	-	-
SPLIT TIME $\phi 8$	-	-	-	-
SPLIT TIME $\phi 9$	26	26	26	26
SPLIT TIME $\phi 10$	-	-	-	-

COORDINATION MODE SET
TO FIXED FORCE-OFF

COORDINATION NOTES:

- OFFSET IS REFERENCED TO THE END OF THE COORDINATED PHASE GREEN (SEE TABLE ABOVE).
- COORDINATION TO OPERATE BY TIME-OF-DAY (SEE COORDINATION SCHEDULE).

COORDINATION SCHEDULE

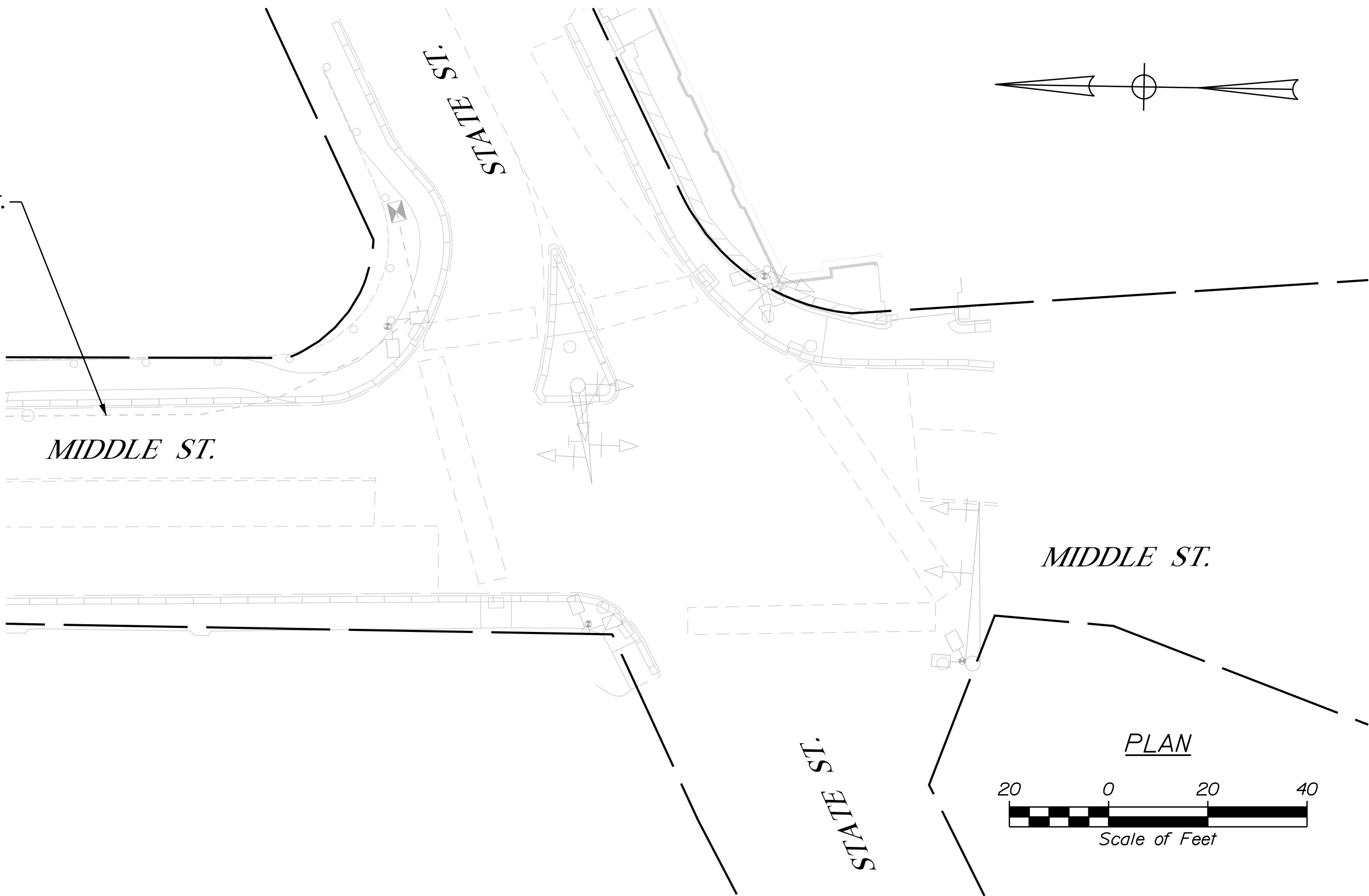
ALL ENTRIES IN SECONDS		
DAY PLAN		
MONTH	JAN-DEC	JAN-DEC
DAY OF WEEK	MON-FRI	SAT-SUN
DATES	ALL	ALL
EVENT 1/PATTERN	00:00/254	00:00/254
EVENT 2/PATTERN	7:45/1	7:45/4
EVENT 3/PATTERN	11:45/2	18:30/254
EVENT 4/PATTERN	16:30/3	-
EVENT 5/PATTERN	18:30/254	-
EVENT 6/PATTERN	-	-

SIGNAL TIMING SCHEDULE

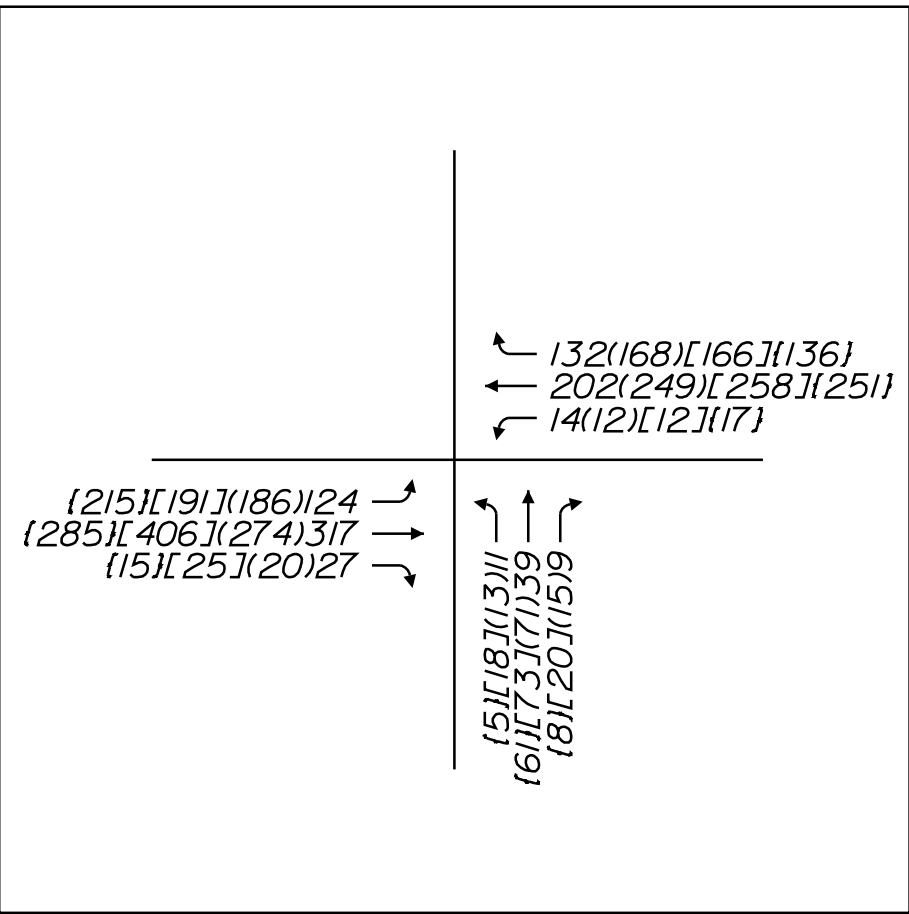
ITEM / PHASE	$\phi 1$	$\phi 2$	$\phi 3$	$\phi 4$	$\phi 5$	$\phi 6$	$\phi 7$	$\phi 8$	$\phi 9$	$\phi 10$
MINIMUM INITIAL	5	10	-	5	-	10	-	-	-	-
PASSAGE TIME	1.5	1.5	-	1.5	-	1.5	-	-	-	-
MAXIMUM 1	9	28	-	12	-	41.5	-	-	26	-
MAXIMUM 2	-	-	-	-	-	-	-	-	-	-
YELLOW	3	3	-	3	-	3	-	-	2	-
ALL RED	1.5	2.5	-	2	-	2.5	-	-	1	-
PED WALK	-	-	-	-	-	-	-	-	7	-
PED CLEAR	-	-	-	-	-	-	-	-	16	-
ADV WALK	-	-	-	-	-	-	-	-	-	-
RECALL	-	S	-	-	-	S	-	-	-	-
DETECTOR	-	-	-	-	-	-	-	-	-	-
PREEMPT PRIORITY	-	-	-	-	-	-	-	-	-	-
FLASH	R	Y	-	R	-	Y	-	-	-	-
DUAL ENTRY	-	ON	-	ON	-	ON	-	-	-	-

SIGNAL TIMING DEFINITIONS:

Y = YELLOW
R = RED
D = DARK
S = SOFT RECALL
O = RECALL OFF
PR = PRESENCE



2019 SYSTEM DESIGN
VOLUMES AM (MID) [PM] [SAT]



PLS OR PE

PLS OR PE

DESIGNED	CHECKED
BRL	SSS
3 BRL 12/27/19 100% SUBMISSION	
2 BRL 11/11/19 95% SUBMISSION	
1 BRL 10/10/19 90% SUBMISSION	
REV: BY: DATE: STATUS:	

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TRAFFIC SIGNAL PLAN
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1 JUNKINS AVE.
PORTSMOUTH, NH 03801

PROJECT NO.	SCALE
17134-02	1" = 20'

SHEET 4 OF 4

\\008-TrafficSignal_REV 1.dgn