BID REQUIREMENTS and CONDITIONS DOCUMENT

for

PHASE VI STREETSCAPE
MYRTLE STREET / EAST MAIN STREET

New Britain, Connecticut

PUBLIC BID No. 3972

STATE PROJECT No. L088-0002

CITY OF NEW BRITAIN, CONNECTICUT

HONORABLE ERIN E. STEWART, MAYOR

June 19, 2019

Prepared By: CARDINAL ENGINEERING ASSOCIATES

City of New Britain
Public Works Department
27 West Main Street
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BID REQUIREMENTS and CONDITIONS DOCUMENT

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INVITATION FOR BIDS

The CITY OF NEW BRITAIN, acting through the City Purchasing Agent, will receive bids for **Phase VI Streetscape Myrtle Street / East Main Street, Bid No. 3972 until 11:00 AM on the 3rd day of September, 2019,** at the Office of the Purchasing Department, Room 401 - City Hall, 27 West Main Street, New Britain, CT. 06051, at which time all bids will be publicly opened and read aloud.

The scope of work generally consists of the reconstruction of East Main Street between Martin Luther King Boulevard and Main Street and milling and overlaying Myrtle Street between Main Street and Washington Avenue. The work includes replacement of existing catch basin tops and installation of new catch basins, installation of new granite curbing, new concrete and brick sidewalks and pedestrian ramps to meet current ADA standards, installation of new signage and pavements markings, removal of impacted existing street trees and installation of new street trees.

The Bid Documents and Plans may be downloaded from the City of New Britain web site at http://bids.newbritainct.gov on or after **12:00 PM on the 5th day of August, 2019.** A complete set of the Bid Documents and Plans are on file at the Office of the Purchasing Dept., Room 401 - City Hall, for review only.

The City reserves the right to accept or reject any or all bids or any part of a bid presented, or to invite proposals as its interest may appear.

A pre-bid conference shall be held on the 20th day of August 2019, at 10:00 AM, in Room 504, City Hall, 27 West Main Street, New Britain, CT, and attendance is strongly recommended.

The City reserves the right to accept or reject any or all bids or any part of a bid presented, or to invite proposals as its interest may appear.

Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Bid Documents must be paid on this project. The Contractor must adhere to all relevant provisions of Section 46a-95 of the Connecticut General Statutes, and any other relevant laws and regulations regarding Affirmative Action.

An "affidavit" of non-collusion shall be included in the Bid Documents and must be completed by the prospective bidder and returned with the bid. Failure to return an executed non-collusion affidavit with a proposal may result in the subsequent rejection of subject bid. The Contractor shall comply with the Copeland Anti-Kickback Act and Regulations of the Secretary of Labor (29 CFR, Part 3).

The Contractor who is selected to perform this State project must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5. An Affirmative Action Plan must be filed with and

approved by the Commission on Human Rights and Opportunities prior to the commencement of construction.

State law requires a minimum of twenty-five (25%) percent of the state-funded portion (100%) of the Contract for award to subcontractors holding current certification from the Connecticut Department of Administrative Services ("DAS") under the provisions of CONN. GEN. STAT. § 4a-60g, as amended. (25% of the work with DAS certified Small and Minority owned businesses and 25% of that work with DAS certified Minority, Woman and/or Disabled owned businesses.) The Contractor must demonstrate good faith effort to meet the 25% set-aside goals.

For municipal public works contracts and quasi-public agency projects, the Contractor must file a written or electronic non-discrimination certification with the Commission on Human Rights and Opportunities. Forms can be found at the following address:
http://www.ct.gov/opm/cwp/view.asp?a=2982&q=390928&opmNav_GID=1806

JACK PIEPER
PURCHASING AGENT

INSTRUCTIONS TO BIDDERS

1. RECEIPT AND OPENING OF BIDS

The City of New Britain, (herein called the "Owner"), invites bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the Office of the Purchasing Agent, located in Room 401, City Hall, 27 West Main St., New Britain, Connecticut 06051, until **11:00 AM on the 3rd day of September, 2019**, and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to the City of New Britain at the aforementioned address and designated as Bids for **Phase VI Streetscape Myrtle Street / East Main Street, Bid No. 3972.**

The Owner may consider informal any bid not prepared and submitted in accordance with provisions hereof and may waive any informalities in or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

2. PREPARATION OF PROPOSAL

Proposals must be submitted on the prescribed forms included in the **Bid Proposal Submittal Package**, and any attachments as designated and necessary. All blank spaces must be filled in and all prompts answered. All responses shall be typewritten or hand printed in ink.

All bids must be completed on the **Form of Bid** included in the Bid Proposal Submittal Package, with the unit price for each item furnished in both words and figures, and the amount bid for each item furnished in figures. In addition, the total bid amount must be furnished in both words and figures. If there is a discrepancy between written words and figures, the words shall govern. All prices and amounts shall be typewritten or hand printed in ink. The Bidder's attention is directed to the eleven (11) stipulations set forth in the said Form of Bid and agreed to by the Bidder with his submittal of a bid for the subject project. All bids shall be subject to all requirements of the Bid Documents, including the Specifications, Drawings, any referenced documents, and these Instructions to Bidders. All bids must be regular in every respect and no interlineation, excisions or special conditions shall be made or included in the Bid Forms by the bidder.

Each bidder's proposal, including, completed in full:

a) Statement of Bidder's Qualifications / Notary's Certificate
b) Prospective Vendor's Residency and Tax Payment Certification
c) Certification of Non-Segregated Facilities
d) Certification of Bidder Regarding Equal Employment Opportunity
e) Certification by Proposed Subcontractor Regarding Equal Employment Opportunity
f) Certification of Non-Collusion

g) Bid / Proposal Affidavit
h) Form of Bid / Bid Bond

Any other specific pages requiring vendor response shall be enclosed in envelopes (outer and inner), both of which shall be sealed and clearly labeled with the words "Bid Proposal", the bid number, the bidder's name, and the date and time of Bid Opening, in order to guard against premature opening of the Bid.

Once bids have been received, analyzed and an apparent low bidder has been identified, the following forms must be completed by the apparent low bidder and returned to the City of New Britain for approval:

a) Contractor's Proposed Progress Chart
b) State of Connecticut Certificate of Compliance with Connecticut General Statute Section 31-57b
c) Anticipated Source of Material, Form CON-83
d) Certificate of Insurance, Standard ACCORD Form
e) Affirmative Action Program Certification

The Owner may consider as irregular any bid on which there is an alteration of or departure from the Bid Forms hereto attached and at its option may reject the same. The Owner reserves the right to reject any Bid submitted that is not in full compliance with these Instructions to Bidders as being not responsive. The Owner also reserves the right to reject the Bid of any Bidder it considers not responsible.

If the Contract is awarded, it will be awarded on the basis of the lowest bid and the selected Alternative and/or Optional Bid items, if any.

If forwarded by mail, the sealed envelope containing the proposal and marked as directed above, must be enclosed in another envelope addressed as specified in Article 1 of these Instructions to Bidders.

Erasures or other changes in the Bid Documents must be explained and noted over the signature of the Bidder.

3. BID DOCUMENTS

The Bid Documents for the Project shall consist of the following:

a) Bid Requirements and Conditions Document
b) Bid Proposal Submittal Document
c) Improvement Plans
d) Special Technical Specifications
e) New Britain Standard Specifications for Municipal Construction dated May 2008 available on the web under the Documents link at www.newbritainct.gov
f) Connecticut Department of Transportation Form 817

4. QUALIFICATIONS OF BIDDER

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any and all bids if evidence submitted by or investigation of such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein.

To assist the Owner in assessing the Bidder's ability to successfully perform the work, the Bidder shall complete in full the Statement of Bidder's Qualifications (pages SBQ-1 through SBQ-8) included in the Bid Proposal Submittal Package.

5. DISQUALIFICATION OF BIDDERS

More than one proposal from an individual, partnership, firm or corporation, or any association under the same or different names, will not be considered. Reasonable ground for believing that any bidder is interested in more than one proposal for the work contemplated will cause the rejection of all proposals in which such bidder is interested. Any or all proposals will be rejected if there is reason for believing that collusion exists among bidders, and all participants in such collusion will not be considered in future proposals for the same work.

6. BID SECURITY OR GUARANTY

Each bid must be accompanied by a bid bond or by a certified check of the bidder in the amount of TEN percent (10%) of the total bid amount, payable to the City of New Britain.

Such bonds or checks will be returned to all bidders, with the exception of the three lowest bidders, within three days after the formal opening of bids, and the remaining checks, or bid bonds, will be returned to the three lowest bidders within 48 hours after the Owner and the accepted bidder have executed the contract, or if no contract has been so executed, within 90 days after the date of opening of bids, or upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

The bid must also be accompanied by a letter from an approved bonding company satisfactory to the Owner stating that said bonding company will bond the Contractor for one hundred percent (100%) of his total bid amount, including any alternates, if said bidder shall be awarded the Contract for this project.

7. POWER OF ATTORNEY

Attorneys in fact who sign bid bonds or contract bonds must file with each bond a certified copy of their power of attorney to sign said bonds.

8. CONFLICT OF INTEREST

No member, officer, or employee of the OWNER, or its designees or agents, no member of the governing body of the locality in which the program is situated, and no other public official of such locality or localities who exercises any function or responsibilities with respect to the program during the tenure, or for one year thereafter, shall have any interest, direct or indirect, in any contract or subcontract, or the proceeds thereof, under the agreement. The Grantee shall incorporate, or cause to be incorporated, in all such contracts or subcontracts a provision prohibiting such interest pursuant to the purposes of this article.

9. CONDITIONS OF WORK

Each bidder is responsible to inform himself fully of the conditions relating to the construction and labor under which the work is to be performed. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions set forth in his bid. Insofar as possible, work shall be performed in such a manner as not to conflict with, or adversely affect other contractors or individuals routine performance of their duties, or otherwise affected by the work.

10. OBLIGATION OF BIDDER AND INSPECTION OF SITE

Prior to bid submittal, it is the responsibility of each bidder to visit the project site and verify and become familiar with existing site conditions and other site attributes which may affect performance of the proposed work. It is also the bidder's responsibility to understand and be thoroughly familiar with the terms, obligations and requirements of the improvement plans, specification, and all other Bid Documents, and of all applicable City, State and Federal laws, codes, regulations, and requirements, and to make due allowance in his bid for all contingencies. Submittal of a Bid Proposal shall be considered conclusive evidence that the bidder has met these responsibilities. The failure or omission of any Bidder to receive or examine any form, instrument or documents shall in no way relieve any bidder from any obligation in respect to his bid.

If any omissions, errors, or other inconsistencies are noticed in the Bid Documents, it is the responsibility of the bidder to call them to the attention of Owner prior to bid submittal.

11. ENFORCEMENT OF TERMS AND CONDITIONS

The bidders are notified that all terms and conditions of the Contract and these Bid Documents will be rigidly enforced.

12. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other Bid Documents will be made to any bidder orally. Every request for such interpretation should be made in writing addressed to the Owner, and, to be given consideration, must be received at least ten days prior to the scheduled bid opening. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the Bid Documents which, if issued, will be mailed by CERTIFIED mail with return

receipt requested to all prospective bidders (at the respective addresses furnished for such purpose) not later than five days prior to the scheduled bid opening. Failure of any bidder to receive any such addendum or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Bid Documents.

13. WITHDRAWAL OF BIDS

The following procedure shall apply for withdrawal of bids. A bidder may withdraw the bid by submitting either a written or facsimile request of withdrawal to the owner. The request of withdrawal must be received by the owner before the scheduled bid opening and may be made by mail, facsimile or hand-delivery. The bid guarantee of any bidder withdrawing the bid in compliance with this section shall be returned.

14. REJECTION OF BIDS

A. The Owner may reject a bid if:

1. The bidder fails to furnish any of the information requested pursuant to Article 2 of these Instructions to Bidders;

2. The submitted Bid does not strictly conform to law or the requirements of the Bid Documents;

3. The submitted Bid is conditional or qualified;

4. The submitted Bid is determined, in the opinion of the Owner, to be unbalanced. An unbalanced bid is defined as a bid containing a unit price or lump sum amount for any item which is deemed unreasonable when considering the item by itself and not in conjunction with the bid as a whole or any other item, or items, contained therein.

5. The owner determines, by means of Article 2 of these Instructions to Bidders or any other appropriate means, the bidder to be not responsible, incompetent, or unqualified or incapable to perform the work specified.

B. The Owner, however, reserves the right to reject any or all bids and to waive any informalities in a bid

15. ACCEPTANCE AND AWARD OF CONTRACT

The Owner will accept one of the submitted bids on each contract or will reject all bids on any or all contracts. Acceptance of the bid and Notice of Award will be in writing and signed the Owner or its designee and mailed to the address designated in the successful bidder's proposal. The Notice shall contain information and instructions as to the time and place set for execution of the Contract. The successful bidder shall appear at the designated time and place to execute the Contract and furnish all bonds and certificates of insurance required.

16. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder shall execute and deliver the contract and required bonds within 10 days after he has received notice of the acceptance of his bid. Failure or refusal to do so shall cause the bidder to forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

17. SECURITY FOR FAITHFUL PERFORMANCE

The bidder awarded the Contract shall, at the time of signing the Contract, submit an executed performance bond in the amount of 100% of the Contract amount conditioned upon the faithful performance of the Contract. Said performance bond shall be from a company or companies authorized to transact business in the State of Connecticut. The approved bonds shall also contain a labor and material bond for 100% of the Contract amount for the payment of all persons performing labor or furnishing materials in connection with this Contract.

18. SUBCONTRACTING

The successful bidder may utilize the services of specialty subcontractors on those portions of the work which, under normal contracting practices are performed by specialty subcontractors. The successful bidder shall not award any portion of the work to a subcontractor without prior written approval of the Owner. The acceptance of any and all subcontractors shall reside with the Owner, and the Owner's decision shall be final. The successful bidder shall be fully responsible to the Owner for the performance, finished products, acts, and omissions of his subcontractors and persons directly or indirectly employed thereby.

The successful bidder shall cause appropriate provisions to be included in all subcontracts relative to this project to bind subcontractors to the provisions of the Contract and these Bid Documents as applicable to work performed by the subcontractor on this project; and appropriate provisions to give the Owner the same powers and authority over any subcontractor as it has over the Contractor under the provisions of said documents.

19. WAGES AND SALARIES

Attention of the bidders is particularly called to the requirements concerning the payment of not less than the prevailing wage and salary rates as set forth by the State and Federal (if applicable) wage rates included in this Bid Requirements and Conditions Document (see Construction Contracts – Required Contract Provisions – Exhibit E), and the conditions of employment with respect to certain categories and classifications of employees included therein.

The rates of pay set forth are the minimum to be paid during the life of the Contract. It is therefore the responsibility of the bidders to inform themselves as to local labor conditions, such as the length of work day and work week, overtime compensation, health and welfare contributions, labor supply and prospective changes or adjustments of rates.

20. EQUAL EMPLOYMENT OPPORTUNITY

Attention of the bidders is called to the applicable State and Federal requirements for ensuring that employees and applicants for employment are not discriminated against because of their race, creed, color, or national origin.

21. EXECUTIVE ORDER No. 17

To comply with the Governor's Executive Order No. 17, the Contractor and any subcontractors holding a contract directly under the Contractor shall list all employment openings with the Connecticut State Employment Service. The Labor Commissioner may allow exceptions to listing of employment openings which the Contractor proposed to fill from within its organization with employees on the rolls of the Contractor on the date of publication of the invitation to bid, or the date on which the public announcement was published or promulgated advising of the program concerned.

22. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable State and Municipal laws, rules, ordinances and regulations of all authorities having jurisdiction over construction work in the locality of the project shall apply to the contract throughout, and they are deemed to be included herein as if written out in full.

23. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

See Contract and Form of Agreement.

24. APPROVALS

The Contractor shall be responsible for obtaining all the necessary permits and approvals from the City of New Britain and the State of Connecticut, as required to complete the work in accordance with the improvement plans and other Contract Documents. The Owner will assist within its means in the approval process. However, any delays to the Contractor or the project, or any actions against either due to failure to obtain the necessary approvals, or to do so in a timely manner, or due to the Contractors lack of knowledge of the necessary approvals or the approval process, remain solely the responsibility of the Contractor.

25. START OF CONSTRUCTION

The successful bidder agrees to commence construction within ten (10) calendar days after receipt of the Notice to Proceed from the Owner. The Notice to Proceed shall be sent by the Owner after execution and delivery of the Contract and required bonds in accordance with Article 17 of these Instructions to Bidders.

26. REFERENCE SPECIFICATIONS

A. The most recent edition of the "City of New Britain Standard Specifications for Municipal Construction" (also referred to as "Standard Specifications") is hereby made a part of these Bid Documents and the ensuing Contract by reference. Copies of the Standard Specifications are

available for review and purchase from the New Britain Bureau of Engineering, or on the web under Documents link at www.newbritainct.gov.

B. The State of Connecticut Department of Transportation "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817" with latest Supplemental Specifications, (also referred to as "Form 817"), is hereby made a part of these Bid Documents and the ensuing Contract by reference. Form 817 and Supplemental Forms may be viewed at the State of Connecticut, Department of Transportation's website at:

https://www.ct.gov/dot/lib/dot/documents/dpublications/817/_july2018_form817.pdf

and copies are available for review at the New Britain Bureau of Engineering.

27. CONFLICTING PROVISIONS

In the event of conflicts or inconsistencies between separate provisions of these Bid Documents and/or the executed Contract, such conflicts shall be resolved by applying the following in decreasing order of precedence:

Contractual Matters	Technical Matters
1) Contract-Form of Agreement	1) Special Technical Specifications
2) Invitation to Bid	2) Contract Drawings
3) Instructions to Bidders	3) Reference Specifications
4) Special Provisions	
5) Supplemental General Conditions	
6) General Conditions	

28. SAFETY AND HEALTH REGULATIONS

These construction documents, and the joint and several phases of construction hereby contemplated are to be governed at all times, by applicable provisions of the federal law(s), including but not limited to, the latest amendments of the following:

(1) William-Steiger Occupational Safety and Health Act of 1970, Public Law 91-956;

(2) Part 1910 - Occupational Safety and Health Standards, Chapter SVII of Title 29, Code of Federal Regulations;

(3) Part 1926 (formerly Part 1518) - Safety and Health Regulations for Construction, Chapter XIII of Title 29, Code of Federal Regulations.

In the event of any inconsistencies between the above laws and regulations and the provisions of these documents, the laws and regulations shall prevail.

29. SALES TAX

The Owner is exempt from Connecticut State Sales and Use Taxes on materials and equipment to be incorporated in this work. The Contractor may purchase materials or supplies to be consumed in the performance of this contract without payment of tax and shall not include taxes in his Contract Price.

30. SOURCE OF MATERIALS

Anticipated Source of Material, form CON-83 shall be completed in full by the apparent low bidder and submitted to the Engineer prior to Award of the Contract.

31. METHOD OF AWARD - Lowest Responsible Bidder

Bids will be compared on the basis of the total sum of the unit price submitted by the bidder for each base bid item applied to the estimated quantity designated in the bid form for that item, plus the amounts of any base bid lump sum items, plus any adjustments due to Options or Alternates selected by the City. Award will be made to the lowest responsible bidder, who shall be determined in accordance with and pursuant to Section 2-578 Items 1 through 12, inclusive, of the City of New Britain Code of Ordinances.

FORM OF AGREEMENT BETWEEN THE CONTRACTOR AND OWNER

THIS AGREEMENT, made the ___ day of _____ in the year **TWO THOUSAND AND NINETEEN by and between THE CITY OF NEW BRITAIN, hereinafter called the "OWNER" and _____, located in _____, hereinafter called the "CONTRACTOR".**

WITNESSETH:

WHEREAS, the City is desirous of entering into a contract for the **Phase VI Streetscape Myrtle Street / East Main Street, State Project L088-002, Bid No. 3972** in the City of New Britain Connecticut,

WHEREAS, the Contractor has entered a bid price and is adjudged the successful bidder, for the **Phase VI Streetscape Myrtle Street / East Main Street, State Project L088-002, Bid No. 3972** in the City of New Britain, Connecticut.

WITNESSETH THAT, the Contractor and the Owner for the considerations hereinafter named agree as follows:

Article 1. SCOPE OF WORK-- The Contractor shall furnish all of the materials and perform all of the work shown on the drawings and described in the specifications prepared by the City of New Britain as and in these Contract Documents entitled: **Phase VI Streetscape Myrtle Street / East Main Street, State Project L088-002, Bid No. 3972**; and shall do everything required by the Contract Documents as designated in Article 3 of this Agreement.

Article 2. THE CONTRACT PRICE-- The Owner will pay the Contractor for the performance of the Contract in current funds, for the **Phase VI Streetscape Myrtle Street / East Main Street, State Project L088-002, Bid No. 3972** at the unit prices stipulated in the bid proposal submittal document that the Contractor submitted for the several respective items of work completed subject to additions and deductions as provided in the Section entitled "Changes in the Work" under the "General Conditions."

City agrees to pay the Contractor for the **Phase VI Streetscape Myrtle Street / East Main Street, State Project L088-002, Bid No. 3972,** at the unit prices quoted in the Contractor's bid response of an estimated total bid price of $_____

Article 3. CONTRACT-- The executed contract documents shall consist of the following:

a. This Agreement
b. Addenda thereto: No. ____ date _____; No. __ date _____ No. __ date _____
c. Bid Requirements and Conditions Document
d. Bid Proposal Submittal Document, as submitted by Contractor

e. Improvement Plans
f. Other Contract Drawings issued
g. Special Technical Specifications
h. New Britain Standard Specifications for Municipal Construction
i. Connecticut Department of Transportation Form 817

This Agreement, together with the other documents enumerated in this Article 3 and other documents, which are made part hereof by reference, forms the Contract between the parties hereto.

The Contractor and the Owner for themselves, their successors, executors and administrators and assigns hereby agree to the full performance of the covenants herein contained.

The specifications, conditions and the bid terms of Bid No. 3972 are attached hereto, incorporated by reference and made a part of this agreement.

Article 4. NOTICE TO PROCEED, TIME OF COMPLETION, AND LIQUIDATED DAMAGES: The Contractor shall agree to commence work within ten (10) calendar days after receipt of the "Notice to Proceed" from the Owner. Such Notice may be sent after execution of this Agreement (also referred to herein as the "Contract").

The Contractor shall agree to complete the work within 310 days from receipt of the Notice to Proceed. The date of completion shall be known as the "Date of Substantial Completion" when all construction is sufficiently complete in accordance with the Contract Documents, so the owner can occupy or utilize the work or designated portion thereof for the use which it is intended, and the work is properly finished to provide the appearance intended, and the Certificate of Completion is issued by the Owner to the Contractor.

The Contractor shall prosecute the work continuously until completion. The rate of progress for any given Phase shall be at least that shown on the “Schedule of Progress” which is to be submitted to the Engineer by the Contractor in a form satisfactory to the Engineer prior to execution of this Agreement.

In general, work shall be prosecuted continuously throughout the term of the Contract, excluding the winter season, December 1st through the following March 31st. The Contractor will be expected to keep work going whenever possible. The Engineer will determine when conditions are unfavorable for work, or for any portion thereof, and may order that work be suspended on any part or all portions of the Contract whenever, in his opinion, the conditions are not such as will insure first class work.

The Contractor shall further agree that the Date of Completion of the Project Work provides reasonable time for completion of the work contemplated in accordance with the Improvement Plans, Specifications, and other Contract Documents, taking into consideration average weather conditions, availability of labor and delivery of materials and equipment.

If the Contractor neglects, fails or refuses to substantially complete the Project Work within the Time of Completion as specified herein, or any proper extension granted thereto by the Owner in accordance with the General Conditions, then the Contractor shall agree, as part consideration for the award of this Contract, to pay to the Owner a liquidated damage for breach of contract for **each and every calendar day** that the Contractor shall be in default on the subject Project. This is not to be construed in any sense as a penalty.

Where actual damages for any delay in substantial completion of a Phase are impossible to determine by reason of the Owner's election not to terminate the right of the Contractor to proceed, the Contractor and his sureties shall be liable for, and shall pay to the Owner, the sum of **Two Thousand Dollars ($2,000.00)**, as fixed, agreed, and liquidated damages for **each calendar day** of such delay until the work is substantially completed and accepted.

The Owner, however, may accept the work if there has been such a degree of completion as will, in the Owner's opinion, make the project reasonably safe, fit, and convenient for the use and accommodation for which it was intended. In such case, the Contractor shall not be charged with liquidated damages, but the Owner may assess the actual damages by such delay.

Article 5. GUARANTEE: -- The Contractor guarantees the work done under this contract and the materials furnished by him and used in the work are free from defects, and the guarantee is for a term of **one year** from and after the date of the **Certificate of Project Completion.** It is agreed and understood that the Contractor will at any time during this one-year period, upon notification in writing from the Engineer, and without expense to the Owner, immediately execute all repairs which may be necessitated, as determined by the Engineer, by reason of any defective materials used therein, or by defective workmanship, or by reason of the normal use or functioning of all facilities constructed under this contract.

The Owner reserves the right to retain up to five percent (5%) of the Total Contract Price, or to accept, at the Owner's option, a Guarantee Bond for up to five percent (5%) of the Total Contract Price, and to hold such retainage or bond for the duration of the guarantee period. Upon expiration of the guarantee period, provided that all work is in good order, the Contractor shall be entitled to receive said retainage or, if posted, the release of the Guarantee Bond.

The Contractor must provide to the Owner at the time of signing this contract Performance and Material Bonds for this project.

Article 6. PREVAILING WAGE RATES: Prevailing Wage Rates do apply for this project. The Contractor will submit weekly a copy of all payrolls to the Owner. The copy shall be accompanied by a statement signed by the Owner or his agent indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Connecticut Department of Labor and that of the Owner's prevailing wage rates for this project in accordance with the specifications, conditions, and bid terms of Bid #3853.

Article 7. INSURANCE COVERAGE: The Contractor shall agree to maintain in force at all times during which services are to be performed the following coverages placed with company(ies) licensed by the State of Connecticut which have at least an "A-VIII" policyholders' rating according to BEST Publications latest edition Key Rating Guide:

Commercial General Liability:	General Aggregate	$ 2,000,000
	Prod./Compl. Operations Aggregate	$ 2,000,000
	Occ. Aggregate	$ 1,000,000
Automobile Liability:	Liability Limit	$ 2,000,000

Umbrella	Each Occurrence	$1,000,000
(Excess Liability)	Aggregate	$1,000,000
Workers' Comp. And	WC Statutory Limits	
Employer's Liability:	EL Each Accident	$500,000
	EL Disease Each Employee	$500,000
	EL Disease Policy Limit	$500,000

The "City of New Britain", "Consolidated School District" and the "State of Connecticut" shall be named as "Additional Insured", and the Contractor agrees to provide replacement/renewal certificate at least 60 days prior to the expiration of the policy. Should any of the described policies be cancelled before the expiration date, written notice must be made to the City 30 days prior to cancellation.

The Contractor agrees to provide a certificate of insurance at the time of the execution of this contract as was as a replacement/renewal certificate at least 60 days prior to the expiration of the policy. Should any of the above-described policies be cancelled before the expiration date, written notice must be made to the City 30 days prior to cancellation. The Contractor also agrees to name the City as Additional Insured on all insurance policies except Workers Compensation and to provide a Waiver of Subrogation on all policies.

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

Contractor covenants and agrees to hold the City harmless and to indemnify the City from (I) any and all claims arising from the performance of service enumerated herein, or any work or thing whatsoever done, or any condition created (other than by the City)during the term of this contract or any extensions thereof, but only to the extent caused by the negligent or otherwise wrongful act or omission of Contractor, its agent, employees, contractors or licensees and (II) all costs, expenses, liabilities incurred in or in connection with each such claim or action or proceeding brought thereon. In case an action or proceeding, be brought against the City by reason of any such claim, Contractor, upon notice from the City, shall resist and defend such action claim or proceeding.

Article 8. HOLD HARMLESS AGREEMENT:--The Contractor, its agents and assigns shall indemnify and hold harmless the City of New Britain, including but not limited to, its elected officials, its officers, and agents, ("the City") from any and all claims made against the City, including but not limited to, damages, awards, costs and reasonable attorneys fees, to the extent any such claim directly and proximately results from the wrongful willful or negligent performance of services by the Contractor during the Contractor's performance of this Agreement or any other Agreements of the Contractor entered into by reason thereof. The City agrees to give the Contractor prompt notice of any such claim and absent a conflict of interest, an opportunity to control the defense thereof.

This Agreement shall be binding on and inure to the benefit of the parties hereto and to their respective successors and assigns.

Article 9. Any reference to this Agreement shall be by number. The number assigned to this Agreement shall be #3972.

Article 10. Retention of Records and Records Accessibility:

10.1 All services performed by Contractor shall be subject to the inspection and approval of City at all times, and Contractor shall furnish all information concerning the services. City or its representatives shall have the right, at reasonable hours, to inspect or examine the part of the plant or place of business or any books, records, and other documents of Contractor or its subcontractors or sub-Contractors pertaining to work performed under this agreement and shall allow such representatives free access to any and all such plants, places of business, books and records. City or its representatives will give the Contractor or its subcontractors or sub-Contractors at least twenty-four (24) hours' notice of such intended examination. At the City's request, the Contractor or sub-Contractors shall provide City with hard copies or an electronic format of any data or information in the possession or control of the Contractor or sub-Contractor which pertains to City's business under this agreement.

10.2 The Contractor shall retain and maintain accurate records and documents relating to performance of services under this agreement for a minimum of three (3) years starting from the date of submission of the final expenditure report with the following qualifications and shall make them available for inspection and audit by City or its representative:

a. If any litigation, claim or audit is started before the expiration date of the three-year period, the records shall be retained until all litigation, claims or audit findings involving the records have been resolved; and
b. Records for the purchase of equipment (i.e., non- expendable, tangible personal property) acquired with grant funds shall be retained for three years after the final disposition of said property.

10.3 Any subcontractor or sub-Contractor under this agreement shall retain and maintain accurate records and documents relating to performance of services under this agreement for a minimum of three (3) years from the expiration of the subcontract or sub grant and shall make them available for inspection and audit by the City or its representative.

10.4 The Contractor must incorporate this Article verbatim into any agreement it enters into with any subcontractor or sub-Contractor providing services under this agreement.

This Agreement was entered into pursuant to approval of the City of New Britain's Common Council, on _____, 2019 Resolution No._____ and approved by the Mayor.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the date first above written.

OWNER: CITY OF NEW BRITAIN

BY: _____
Jack Pieper
Purchasing Agent

WITNESS:

Signed in the presence of: _____

CONTRACTOR: _____

BY: _____

WITNESS:

Signed in the presence of: _____

STATE OF ss:_____ 2019

COUNTY OF

Personally appeared _____ who acknowledged the signing of this to be his free act and deed.

_____
Notary
Commissioner of Superior Court
Justice of the Peace

ACKNOWLEDGMENT OF PRINCIPAL, (IF A CORPORATION)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ___ day of _____, ___, before me, personally came and appeared_____ to me known, who, being by me duly sworn, did depose and say that he is the _____ of _____ the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation: that one of the impressions affixed to said instrument is an impression of such seal: that it was so affixed by order of the director of said corporation, and that he signed his name thereto by like order.

SEAL

ACKNOWLEDGMENT OF PRINCIPAL, (IF A PARTNERSHIP)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ___ day of _____,___, before me, personally came and appeared _____ to me known and known to me to be one of the members of the firm of_____ described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

SEAL

ACKNOWLEDGMENT OF PRINCIPAL, (IF AN INDIVIDUAL)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ___ day of _____, ___, before me, personally came and appeared _____ to me known and known to me to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same.

SEAL

CERTIFICATE OF CONTRACTOR'S ATTORNEY

I, the undersigned _____ the duly authorized and acting legal representative of _____, do hereby certify as follows:

I have examined the attached contract(s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements will be duly executed by the proper parties thereto acting through their duly authorized representatives. That said representatives have full power and authority to execute said agreements on behalf of the respective parties name thereon and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

BY: _____
Attorney-in-fact

Law Firm: _____

Address – Zip Code: _____

_____

Date: _____

PERFORMANCE PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____
(Name of Contractor)

a _____, hereinafter called "PRINCIPAL"
(Corporation, Partnership or Individual)

and _____ of _____, State of _____
(Surety)

hereinafter called the "SURETY", are held and firmly bound unto CITY OF NEW BRITAIN, hereinafter called "OWNER" in the penal sum of_____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators and successors jointly and severally, firmly by these presents.

THE CONDITION OF THIS OF THIS OBLIGATION is such that Whereas the Principal entered into a certain contract with the Owner, dated the ___ day of _____, ___, copy of which is hereto attached and made a part hereof for the construction of the

Phase VI Streetscape Myrtle Street / East Main Street,
State Project L088-002, Bid No. 3972

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such contract and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, and shall promptly make payment to all persons, firms subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

Provided, further, that the said Surety, for value received, hereby stipulates and agrees that no charge, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extensions of time alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this the _____ day of _____, _____.

ATTEST:

BY: _____
(Principal) Secretary

(SEAL)

_____ _____ (Address - Zip Code)

Witness as to Principal _____

_____ _____ (Address - Zip Code)

ATTEST:

BY: _____
Surety

_____ _____
(Surety) Secretary Attorney-in-fact

(SEAL)

_____ _____ (Address - Zip Code)

_____
Witness as to Surety

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute the bond.

_____ _____ (Address - Zip Code)

BOND NO.

LABOR AND MATERIAL PAYMENT BOND

Note: This bond is issued simultaneously with another Bond in favor of the Owner conditioned for the full and faithful performance of the Contract.

KNOW ALL MEN BY THESE PRESENTS:

That _____ , as Principal (hereinafter called Principal) and _____ as surety (hereinafter called Surety) are held and firmly bound unto THE CITY OF NEW BRITAIN as Obligee (hereinafter called Owner) for the use and benefit of claimants as hereinbelow 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 written agreement dated _____, entered into a Contract with Owner for the construction of

Phase VI Streetscape Myrtle Street / East Main Street,
State Project L088-002, Bid No. 3972

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 said Principal shall promptly pay for all materials furnished the said Principal shall promptly pay for all materials furnished and labor supplied or performed in the prosecution of the work included in and under the aforesaid Contract, whether or not the material or labor enters into and becomes a component part of the real asset, then this obligation shall be null and void otherwise it shall remain and be in full force and effect.

PROVIDED, that any alterations which may be made in the terms of the Contract or in the work to be done under it, or the giving by the Obligee of any extension of time for the performance of the Contract, or any other forbearance on the part of either the Obligee or the Principal to the other shall not in any way release the Principal and the Surety or either or any of them, their heirs, executors, administrators, successors or assigns from their liability hereunder, notice to the surety of any such alterations, extension or forbearance being hereby waived.

Any party, whether a subcontractor or otherwise, who furnished materials or supplies or performs labor or services in the prosecution of the work under said Contract, and who is not paid therefor, may bring a suit on this bond in the name of the person suing, prosecute the same to a final judgment, and have execution thereon for such sum as may be justly due.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals this ___ day of _____, ___, the name and corporate seal of each corporation partly being hereto affixed and these presents signed by its undersigned representative, pursuant to authority of its governing body.

In the presence of:

_____ (SEAL)
(Individual Principal)

_____
(Business Address)

_____

_____ (SEAL)
(Partnership)

_____
(Business Address)

_____

BY: _____

_____
(Corporate Principal)

_____
(Business Address)

BY:

Affix Corporate Seal

ATTEST:

_____
(Corporate Surety)

_____

BY:
Affix Corporate Seal

Countersigned

by

*Attorney-in-Fact, State of

*Power-of-Attorney for person signing for Surety Company must be attached to Bond.

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATION EXECUTIVE ORDER 11246

1. The offertory's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

Females	Minorities
8.0%	8.0%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Specific Affirmative Action Obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is

New Britain,	Hartford	Connecticut
(City)	(County)	(State)

ATTACHMENT B

The applicant agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereto, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, the following equal opportunity clause:

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay, or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers representative of the contractors' commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.

(5) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes to ascertain compliance with such rules, regulations and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further government construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for non-compliance: Provided however, that in the event a contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the City to enter into such litigation to protect the interests of the City.

The Contractor is further instructed that any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975 or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973 shall also apply to this contract.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in construction work: Provided that if the applicant so participating is a State or local government the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibilities for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government assisted construction contracts pursuant to the Executive order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the executive order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee): refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

ATTACHMENT C

Standard Federal Equal Employment Opportunity Construction Specifications (Executive Order 11246)

1. As used in these specifications:

a. "Covered area" means the geographical area described in the solicitation from which this contract resulted:

b. "Director" means director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority.

c. "Employer identification number" means the Federal Social Security number used on the Employers Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

d. "Minority" includes:

1. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

2. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

3. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);

4. American Indian or Alaskan Native; (all persons having origins in any of the original peoples of North America and Maintaining identifiable tribal affiliations through membership and participation or community identification).

5. Portuguese (all persons of Portuguese, Brazilian or other Portuguese culture or origin regardless of race).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which the contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clauses, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered contractor's or subcontractor's failure to make good faith efforts to achieve the plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contract should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward the goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with

specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organization's responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunity and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc. by specific review of the policy with all management personnel and with all minority and female employees at least once a year, and by posting the company EEO policy on bulletin board accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these terms with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with contractors and Subcontractors with whom the Contractor anticipates doing business.

I. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontract from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor union, contractor community, or other similar

group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participated in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work-force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's non-compliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the contract may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, of these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address,

telephone numbers, construction trade, union affiliation, if any, employee identification number when assigned, social security number, race, sex, status (e.g. mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

City of New Britain

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1. Contract and Contract Documents

The Plans, Specifications and Addenda, hereinafter enumerated in Paragraph 1 of the Supplemental General Conditions, shall form part of this Contract; and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

2. Definitions

The following terms as used in this contract are respectively defined as follows:

(a) "Contractor": A person, firm or corporation with whom the contract is made by the Owner.

(b) "Subcontractor": A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with, the Contractor.

(c) "Work on (at) the project": Work to be performed at the location of the project including the transportation of materials and supplies to or from the location of the project, by employees of the Contractor and any Subcontractor.

3. Additional Instructions and Detail Drawings

The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Architect/Engineer will prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the work.

4. Shop or Setting Drawings

The Contractor shall submit promptly to the Architect/Engineer two copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with two corrected copies. If requested by the Architect/Engineer the Contractor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/ Engineer, the Contractor will nevertheless be responsible for the accuracy of such drawings and for

their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

5. Materials, Services, and Facilities

(a) It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all material, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

(b) Any work necessary to be performed after regular working hours, on Sundays or Legal Holidays, shall be performed without additional expense to the Owner.

6. Contractor's Title to Materials

No materials or supplies for the work shall be purchased by the Contractor or by any Sub-contractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

7. Inspection and Testing of Materials

(a) Minimum testing requirements must meet or exceed those shown for LOTCIP in Chapter 7 of the latest version of the CT DOT Materials Testing Manual. All materials and equipment used in the construction of the project shall be subject to adequate inspection. The laboratory or inspection agency shall be selected by the Owner. The Owner will pay for all laboratory inspection service direct, and not as part of the contract.

(b) Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

8. "Or Equal" Clause

Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and, any material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable, provided the material, article, or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the contractor without the Architect/Engineer's written approval.

9. Patents

(a) The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and

expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.

(b) License or Royalty Fees: License and/or Royalty Fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the Contractor.

(c) If the contractor uses any design, devise or materials covered by letters, patent, or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, devise or materials, it is mutually agreed and understood that, without exception, the contract prices shall include all royalties or cost arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

10. Surveys, Permits, and Regulations

Unless otherwise expressly provided for in the Specifications, the Owner will furnish to the Contractor all surveys necessary for the execution of the work.

The Contractor shall procure and pay all permits, licenses and approvals necessary for the execution of his contract.

The Contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to performance of the work, the protection of adjacent property, and the maintenance of passage- ways, guard fences or other protective facilities.

11. Contractor's Obligations

The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings covered by this contract any and all supplemental plans and drawings, and in accordance with the directions of the Architect/Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract and specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Architect/Engineer and the Owner.

12. Weather Conditions

In the event of temporary suspension of work, or during inclement weather, or whenever the Architect/Engineer shall direct, the Contractor will, and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Architect/ Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors so to protect his work, such materials shall be removed and replaced at the expense of the Contractor.

13. Protection of Work and Property--Emergency

The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the Owner, or his duly authorized representatives.

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Architect/Engineer, in a diligent manner. He shall notify the Architect/Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Architect/Engineer for approval.

Where the Contractor has not taken action but has notified the Architect/Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized by the Architect/Engineer.

The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Paragraph 17 of the General Conditions.

14. Inspection

The authorized representatives of the City of New Britain and its agents shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

15. Reports, Records and Data

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

16. Superintendence by Contractor

At the site of the work the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Architect/Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll.

17. Changes (48 CFR Ch. 1 (Aug 1987) (10-1-90 Edition))

(a) The Owner may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes -

(1) In the specifications (including drawings and designs);

(2) In the method or manner of performance of the work;

(3) In the Owner-furnished facilities, equipment, materials, services, or site; or

(4) Directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction interpretation or determination) from the Owner that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Owner written notice stating (1) the date, circumstances, and source of the order and (2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement, or conduct of the Owner shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Owner shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Owner is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Owner a written statement describing the general nature and amount of proposal, unless this period is extended by the Owner. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

18. Disputes

(a) All disputes arising under this contract or its interpretation, whether involving law or fact or both, or extra work, and all claims for alleged breach of contract shall within ten (10) days of commencement of the dispute be presented by the Contractor to the Owner for decision. All papers pertaining to the claims shall be filed in quadruplicate. Such notice need not detail the amount of the claim but shall state the facts surrounding the claim in sufficient detail to identify the claim, together with its character and scope. In the meantime, the Contractor shall proceed with the work as directed. Any claim not presented within the time limit specified within this paragraph shall be deemed to have been waived, except that if the claim is of a continuing character and notice of the claim is not given within ten days of its commencement, the claim will be considered only for a period commencing ten days prior to the receipt of the Owner of notice thereof.

(b) The Contractor shall submit in detail his claim and proof thereof. Each decision by the Owner will be in writing and will be mailed to the Contractor by registered mail, return receipt requested.

(c) If the Contractor does not agree with any decision of the Owner, he shall in no case allow the dispute to delay the work but shall notify the Owner promptly that he is proceeding with the work under protest and he may then except the matter in question from the final release.

19. Arbitration and Litigation

Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall, at the option of the Owner, be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association and judgment upon the award rendered by the Arbitrator(s) may be entered in any court having jurisdiction thereof. The Owner shall exercise its option to arbitrate concurrent with the rendering of its final decision on the claim. Should it fail to render a final decision within the prescribed time or fail to exercise its option, the claim will be determined in accordance with the Rules of the American Arbitration Association as hereinbefore stated.

20. Time for Completion and Liquidated Damages

It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and as ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract.

Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; Provided, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government;

(b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, flood, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and

(c) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article:

Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

21. Correction of Work

All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by

the Contractor as his own expense. Rejected material shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgement of the Architect/Engineer shall be equitable.

22. Subsurface Conditions Found Different

Should the Contractor encounter sub-surface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, he shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans and/or indicated in the Specifications he will at once make such changes in the Plans and/or Specifications as he may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

23. Right of the Owner to Terminate Contract

In the event that any of the provisions of this contract are violated by the Contractor, or by any of his Subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the contract, such notices to contain the reasons for such intention to terminate the contract, and unless within ten (10) days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety and the Contractor and the Surety shall have the right to take over and perform the contract; Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account for the account and at the expense of the Contractor and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.

24. Construction Schedule and Periodic Estimates

Immediately after notification as to apparent low bidder, and prior to award of the contract, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial

payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

25. Payments to Contractor

(a) Not later than the 15th day of each calendar month the Owner shall make a progress payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this contract; but to insure the proper performance of this contract, the Owner shall retain five percent (5%) of the amount of each estimate until final completion and acceptance of all work covered by this contract: Provided, that the Contractor shall submit his estimate not later than the first day of the month; Provided, further, that the Owner may at any time after fifty percent (50%) of the work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining progress payments in full; Provided, further, that on completion and acceptance of each separate building, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made in full, including retained percentages thereon, less authorized deductions.

(b) In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.

(c) All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all of the terms of the contract.

(d) Owner's Right to Withhold Certain Amounts and Make Application Thereof: The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, material men and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature herein above designated have been paid, discharged, or waived. If the Contractor fails so to do, then the Owner may, after having served written notice on the said Contractor, either pay unpaid bills, of which the Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his Surety. In paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner, shall be considered as a payment made under the contract by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

26. Acceptance of Final Payment Constitutes Release

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payments, however, final or otherwise, shall operate to release the Contractor or his Sureties from any obligations under this contract or the Performance and Payment Bond.

27. Payments by Contractor

The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later that the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used, and (c) to each of his Subcontractors, not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his Subcontractors to the extent of each subcontractor's interest therein.

28. Insurance

The Contractor shall not commence work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his sub-contract until the insurance required of the Subcontractor has been so obtained and approved.

(a) Workers Compensation Insurance: The Contractor shall procure and shall maintain during the life of this contract Workers' Compensation Insurance as required by applicable State or territorial law for all of his employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor shall require the Subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workers' Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the Workers' Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of his employees as are not otherwise protected.

(b) Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amounts specified in the Supplemental General Conditions.

(c) Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall either (1) require each of his Subcontractors to procure and maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in the Supplemental General Conditions specified in subparagraph (b) hereof, or (2) insure the activities of this policy, specified in subparagraph (b) hereof.

(d) Scope of Insurance and Special Hazards: The insurance required under subparagraphs (b) and (c) hereof shall provide adequate protection for the Contractor and his Subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards which may be encountered in the performance of this contract as enumerated in the Supplemental General Conditions.

(e) Proof of Carriage of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement; "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the Owner." The City of New Britain must be shown on the certificate(s) as "Additional Insured".

29. Contract Security

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract prices as security for the faithful performance of this contract and also a payment bond in an amount not less than one hundred percent (100%) of the contract price or in a penal sum not less than that prescribed by State, territorial or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law.

30. Additional or Substitute Bond

If at any time the Owner for justifiable cause shall be or become dissatisfied with any Surety or Sureties, then upon the Performance or Payment Bonds, the Contractor shall within five (5) calendar days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished such an acceptable bond to the Owner.

31. Assignments

The Contractor shall not assign the whole or any part of this contract or any monies due or to become due hereunder without written consent of the Owner. In case the Contractor assigns all or part of any monies due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.

32. Mutual Responsibility of Contractors

If, through acts of neglect on the part of the Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or Subcontractors by agreement or arbitration if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

33. Separate Contract

The Contractor shall coordinate his operations with those of other Contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his Subcontractors, shall keep informed of the progress and the detail work of other Contractors and shall notify the Architect/Engineer immediately of lack of progress or defective workmanship on the part of other Contractors. Failure of a Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

34. Subcontracting

(a) The Contractor may utilize the services of specialty Subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty Subcontractors.

(b) The Contractor shall not award any work to any Subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the Subcontractor, which statement shall contain information as the Owner may require.

(c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his Subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

(d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind Subcontractors to the Contractor by the

terms of the General Conditions and other Contract Documents insofar as applicable to the work of Subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

(e) Nothing contained in this contract shall create any contractual relation between any Subcontractor and the Owner.

35. Architect/Engineer's Authority

The Architect/Engineer shall give all orders and directions contemplated under this contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Architect/Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor under this contract and other Contractors performing work for the Owner shall be adjusted and determined by the Architect/Engineer.

36. Stated Allowances – DOES NOT APPLY

The Contractor shall include in his proposal the cash allowances stated in the Supplemental General Conditions. The Contractor shall purchase the "Allowed Materials" as directed by the Owner on the basis of the lowest and best bid of at least three competitive bids. If the actual price for purchasing the "Allowed Materials" is more or less than the "Cash Allowance," the contract price shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowed Materials" shall be included in the applicable sections of the Contract Specifications covering this work.

37. Use of Premises and Removal of Debris

The Contractor expressly undertakes at his own expense:

(a) to take every precaution against injuries to persons or damage to property;

(b) to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractor's;

(c) to place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;

(d) to clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;

(e) before final payment to remove all surplus material, false- work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition;

(f) to affect all cutting, fitting or patching of his work required to make the same to conform to the plans and specifications and, except with the consent of the Architect/ Engineer, not to cut or otherwise alter the work of any other Contractor.

38. Lands and Rights-of-Way

Prior to the start of construction, the Owner shall obtain all lands and rights-of-way necessary for the carrying out and completion of work to be performed under this contract.

39. General Guarantee

Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the Owner, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

40. Notice and Service Thereof

Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor at his last given address, or delivered in person to the said Contractor or his authorized representative on the work.

41. Provisions Required by Law Deemed Inserted

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion or correction.

42. Protection of Lives and Health

In order to protect the lives and health of his employees under the contract, the Contractor shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the contract. He alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance, or operation.

43. Subcontracts

The Contractor will insert in any subcontracts the sections 52 through 56 contained herein and such other clauses as the City of New Britain may, by instructions, require, and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

44. Equal Employment Opportunity

During the performance of this contract the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the City of New Britain and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

(f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further contracts or Federally assisted construction contracts, in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the City of New Britain may direct as a means of enforcing such provisions, including sanction for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendors as a result of such direction by the City of New Britain; the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

45. Interest of Member of or Delegate to Congress

No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

46. Other Prohibited Interests

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any such legislative, executive, supervisory or other similar functions in connection of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

47. Use and Occupancy Prior to Acceptance by Owner

The Contractor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the Owner, provided the Owner:

(a) Secures written consent of the Contractor except in the event, in the opinion of the Architect/Engineer, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements;

(b) Secures endorsement from the insurance-carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction; or

(c) When the project consists of more than one building, and one of the buildings is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of the Surety must also be obtained.

48. Photographs of the Project

The Contractor shall furnish videos/ photographs of the project as required under Notice to Contractor.

49. Suspension of Work

Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable time as the Owner may be determined will compensate for time lost by such delay with such determination to be set forth in writing.

50. Withholding of Payments

The City of New Britain may withhold or cause to be withheld from the Contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics employed by the Contractor or any Sub- contractor on the work the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic employed or working on the site of the work, all or part of the wages required by the contract, the City of New Britain may, after written notice to the Contractor or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

51. Overtime

(a) No Contractor or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any laborer or mechanic in any workweek in which he is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of forty hours in such workweek, as the case may be;

(b) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (l), the Contractor and any Subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the clause set forth in subparagraph (l), in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (l).

(c) Withholding for unpaid wages and liquidated damages. The City of New Britain may withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or Subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2).

(d) Subcontracts. The Contractor shall insert in any subcontracts and clauses set forth in subparagraphs (a), (b), and (c) of this paragraph and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

52. Signs

The General Contractor shall erect a project sign at the project site identifying the project in accordance with the sign details shown on the plans. The project sign shall be substantially in accordance with instructions provided by the City of New Britain, made from 3/4-inch plywood, place in a prominent location, and maintained in good condition until completion of the project. Project sign shall be paid under Item #1220027 – Construction Signs.

53. Employment Practices

The Contractor (l) shall, to the greatest extent practicable, follow hiring and employment practices for work on the project which will provide new job opportunities for the unemployed and underemployed, and (2) shall insert or cause to be inserted the same provision in each construction subcontract.

54. Termination for Convenience of the Owner

(a) The Owner may terminate performance of work under this contract in whole, or from time to time, in part if the Owner determines that termination is in its best interest. The Owner shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Owner, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.

(3) Terminate all subcontracts to the extent they relate to the work terminated.

(4) Assign to the Owner, as directed by the Owner, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Owner shall have the right to settle or pay any termination settlement proposal arising out of those terminations.

(5) With approval or ratification to the extent required by the Owner, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for the purposes of this clause.

(6) As directed by the Owner, transfer title and deliver to the Owner:

(i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and;
(ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Owner.

(7) Complete performance of the work not terminated.

(8) Take any action that may be necessary, or that the Owner may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Owner has or may acquire an interest.

(9) Use its best efforts to sell, as directed or authorized by the Owner, any property of the types referred to in subparagraph (6) above; provided, however, that the Contractor:
(i) is not required to extend credit to any purchaser, and;
(ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Owner. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Owner under this contract, credited to the price or cost of the work, or paid in any other manner as directed by the Owner.

(c) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Owner a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Owner. The Contractor may request the Owner to remove those items or enter into an

agreement for their storage. Within fifteen days, the Owner will accept title to those items and remove them or enter into a storage agreement. The Owner may verify the list upon removal of the items, or if stored, within 45 days of the submission of the list, and shall correct the list, as necessary, before final settlement.

(d) After termination, the Contractor shall submit a final termination settlement proposal to the Owner in the form and with the certification prescribed by the Owner. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Owner upon written request of the Contractor within this 1-year period. However, if the Owner determines that the facts justify it, a termination settlement proposal may be received and acted upon after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Owner may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(e) Subject to paragraph (d) above, the Contractor and the Owner may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (e) or (f) below, exclusive of costs shown in subparagraph (f)(3), may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended and the Contractor paid the agreed amount. Paragraph (f) below shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(f) If the Contractor and the Owner fail to agree on the whole amount to be paid because of the termination of work, the Owner shall pay the Contractor the amounts determined by the Owner as follows, but without duplication of any amounts agreed on under paragraph (e) above:

(1) The contract price for completed supplies or services accepted by the Owner (or sold or acquired under subparagraph (b)(9) above) not previously paid for, adjusted for any saving of freight and other charges.

(2) The total of-

(i) The costs incurred in the performance of the work terminated, including initial cost and preparatory expense allocable thereto. but excluding any costs attributable to supplies or services paid or to be paid under subparagraph (f)(1) above;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (i) above; and

(iii) A sum, as profit on subdivision (i) above, determined by the Owner under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract

had it been completed, the Owner shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(3) The reasonable costs of settlement of the work terminated, including-

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of the termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage transportation and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(g) Except for normal spoilage, and except to the extent that the Owner expressly assumed the risk of loss, the Owner shall exclude from the amounts payable to the Contractor under paragraph (f) above, the fair value, as determined by the Owner, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Owner or to a buyer.

(h) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of the contract, shall govern all costs claimed or agreed to under this clause.

(i) The Contractor shall have the right of appeal, under the Disputes clause, for any determination made by the Owner under paragraph (d), (f), or (k), except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph (d) or (k), and failed to request a time extension, there is no right of appeal. If the Owner has made a determination of the amount due under paragraph (d), (f), or (k), the Owner shall pay the Contractor (1) the amount determined by the Owner if there is no right of appeal or if no timely appeal has been taken, or (2) the amount finally determined on an appeal.

(j) In arriving at the amount due the Contractor under this clause, there shall be deducted-

(1) All unliquidated advanced or other payments to The Contractor under the terminated portion of this contract;

(2) Any claim which the Owner has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Owner.

(k) If the termination is partial, the Contractor may file a proposal with the Owner for an equitable adjustment of the price(s) of the continued portion of the contract. The Owner shall make any equitable adjustment agreed upon. any proposal by the Contractor for an equitable adjustment under this clause shall be requested within

90 days from the effective date of termination unless extended in writing by the Owner.

(l)

(1) The Owner may, under the terms and conditions it prescribes, make partial payments and payments against incurred by the Contractor for terminated portions of the contract, if the Owner believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Owner upon demand, computed with interest at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination proposal because of a retention or other disposition of termination inventory until 10 days after the date of retention or disposition, or a later date determined by the Owner because of the circumstances.

(m) Unless otherwise provided for in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this Contract three years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Owner, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Owner, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

55. Ordinance Compliance

Submission of a bid in response to this solicitation indicates that the Contractor understands and agrees to the terms of this section. Contractor shall comply with City of New Britain Code of Ordinances, Section 2-580, provisions following:

(1) The contractor shall hire residents of the city to perform the necessary labor where possible.

(2) In the event the contractor is restricted by labor contracts, or the required specific skills are not available in the city, the contractor may hire tradesmen and laborers who reside outside the city.

(3) In contracts for new construction of any public works project where the total cost of all work to be performed by all contractors and subcontractors exceeds four hundred thousand dollars ($400,000) and in contracts for remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project where the total of all work to be performed by all contractors and subcontractors exceeds one hundred thousand dollars ($100,000), all tradesmen and laborers hired to perform under the contract shall be paid at the prevailing rates for the same work in the same trade in the city and shall receive the fringe benefits normally offered at that time

for the particular trade. "Prevailing rates" as used herein shall mean the latest rates published by the state labor department unless otherwise required to qualify for a federal grant pertaining to the contract.

As used herein, the term "contractor" shall include the general or prime contractor and shall include subcontractors performing work under the contract.

(4) All workers furnishing the goods and services in connection with the construction shall be properly classified as employees rather than independent contractors, causing them to be treated accordingly for the purposes of pay, benefits, workers' compensation insurance coverage, social security taxes and income tax withholding.

(5) In contracts where the total cost of all work to be performed exceeds one hundred thousand dollars ($100,000) and in all cases wherein one or more apprentices are employed, the employer shall be affiliated with a state-certified apprenticeship program.

(6) If a contractor signing a contract required under this subsection is found to have violated the provisions of this contract, it shall, if already paid by the City, reimburse to the City one percent of the payment that would have otherwise been owed by the City for every count of violation found. If a contractor signing a contract required under this subsection is found to have violated the provisions the contract and it has not already been paid by the City, the City shall withhold from payment one percent of the payment that would have otherwise been owed by the City for every count of violation found. For these purposes, each day of violation and each worker affected shall be deemed a separate count. Each construction contract entered into by the city shall recite that the contractor understands and agrees to the terms of this section.

(7) As used herein, the term "contractor" shall include the general or prime contractor and shall include subcontractors performing work under the contract.

SUPPLEMENTAL GENERAL CONDITIONS

1. SELECTED DEFINITIONS
2. INSURANCE REQUIREMENTS
3. MINIMUM WAGE REQUIREMENTS
4. ENGINEER - AUTHORITIES AND DUTIES
5. INSPECTION
6. SUPERINTENDENCE BY CONTRACTOR
7. CHARACTER OF WORKERS, METHODS, AND EQUIPMENT
8. SUBCONTRACTING
9. CONSTRUCTION SURVEYING / LAYOUT
10. PERMITS AND REGULATIONS
11. ACCESS CONSIDERATIONS
12. PROTECTION OF PERSON AND PROPERTIES
13. SUBSURFACE CONDITIONS
14. EXISTING CONDITIONS FOUND DIFFERENT
15. EXISTING UNDERGROUND UTILITIES, PROTECTION & RESPONSIBILITY
16. SANITARY PROVISIONS
17. NIGHT WORK AND SUNDAYS
18. RECORD DRAWINGS
19. SEWAGE AND WATER FLOWS ENCOUNTERED
20. POLLUTION CONTROL
21. CONTAMINATED OR HAZARDOUS MATERIAL
22. CONNECTION TO EXISTING WORK

23. SNOW REMOVAL

24. INCLEMENT AND FREEZING WEATHER CONDITIONS

25. FINAL INSPECTION AND CERTIFICATE OF COMPLETION

26. PAYMENT TO CONTRACTOR

27. FINAL PAYMENT AND LIENS

28. DISPUTES

29. ARBITRATION AND LITIGATION

30. PURCHASE ASSIGNMENT

31. QUALITY OF MATERIALS

32. DEFECTIVE MATERIALS

33. UNCOVERING AND CORRECTIVE WORK

34. PROTECTION OF THE WORK

35. CLEAN-UP

36. WORK STOPPAGES

37. SHEETING, SHORING AND BRACING

38. COMPLIANCE WITH LAW

39. TERMINATION FOR CONVENIENCE OF THE CITY

1. Selected Definitions

The following lists of selected definitions are included to supplement and amend those established in Section 1.01 of the reference specification "Form 817"; and said Section 1.01 is hereby made a part of this Article by Reference (including the abbreviations included therein).

Throughout these Contract Documents, the intent and meaning of the use of the following terms, or pronouns in place of them, shall be interpreted as follows (Note: the use of gender-specific pronouns or titles throughout the Contract Documents is for the sake of brevity, and are intended to refer to persons of either sex):

Bid - The offer or proposal of a Bidder submitted on the prescribed form, and in accordance with the provisions of the Bid Documents, setting forth the prices for the Project work.

Bid Documents - The documents, as issued by the Owner, enumerated in Article 3 of the Instructions to Bidders, from which, and in accordance therewith, the prospective Bidders are to base their respective Bids. All uses of the term "Contract Documents" shall be interpreted to mean the Bid Documents prior to Contract execution.

Bid item - An item of work specifically described in the Bid for which a price, either unit or lump sum, is provided.

Bidder - Any legal entity submitting a bid for the Project work.

Contract - The written agreement between the Owner and the Contractor regarding the prosecution of the Project work.

Contract Documents - The set of documents which form the written agreement between the Owner and the Contractor. The Contract Documents consist of the documents enumerated in Article 3 of the Contract together with any documents issued subsequent to the execution of the Contract which become a part of the Contract Documents in accordance with the provisions of said enumerated documents. All uses of the term "Bid Documents" shall be interpreted to intend and mean the Contract Documents following execution of the Contract.

Contract Drawings - The official drawings of any and every kind, or reproductions thereof, having been provided and/or approved by the Engineer, which show the location, character, dimensions, or details of the Project Work. Use of the term "**Drawings**" within these Contract Documents, or otherwise related to the Contract, shall refer to and mean the Contract Drawings.

Contract Price - As defined in Article 2 of the Contract. Use of the term "**Contract Amount**" within these Contract Documents, or otherwise related to the Contract, shall refer to and mean the Contract Price.

Contract Time - The number of calendar days allowed for completion of the Project as set forth by the Contract, plus any authorized time extensions. In case of a calendar date of completion being specified in the Contract in lieu of a number of calendar days, the Contract Time shall mean the period of time between the issuance of the Notice to Proceed and said calendar date; and the Project shall be completed by said calendar date. Use of the term "**Time of Completion**" within these Contract Documents or otherwise related to the Contract shall refer to and mean the Contract Time.

Contractor - The legal entity so designated in the Contract, and who shall undertake the prosecution of the Project work in accordance with the terms of the Contract Documents, acting directly or through a duly authorized representative. The Contractor

shall have control over the Project Work and the prosecution thereof, subject to the applicable provisions of the Contract Documents.

Engineer - The Director of Engineering of the City of New Britain, also known as the "City Engineer", or the person duly acting in that capacity, acting directly or through his designated representative(s) to the extents defined by the Contract Documents.

Extra Work - Any Project Work not included in or contemplated by the Contract Drawings or Specifications, or any other Contract Documents, but found essential to the satisfactory completion of the Project within its intended scope. By this definition, extra work involves a change to the Project Work, and therefore is covered by Article 17 of the General Conditions. Extra work for which a Change Order is not established in accordance with the provisions of said Article 17 shall be considered as unauthorized work.

Form 817 - The State of Connecticut Department of Transportation "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817" together with the most recent “Supplemental Specifications” thereto.

Improvement Plans - The set of Contract Drawings, as designated in Article 2 of the Special Provisions, which have been prepared by or for the Engineer, and approved thereby, to show work and facilities specific to the Project; and which have been included in the Bid Documents. The Improvement Plans are issued as a set, and are included in the Bid Documents and/or Contract Documents as such. Use of the terms "**Plans**" or “**Improvement Drawings”** within these Contract Documents, or otherwise related to the Contract, shall refer to and mean the Improvement Plans.

Owner - The City of New Britain, acting through the City Purchasing Agent, and represented by the Director of the City department for which the Project is being performed, or his authorized representative.

Project - All activities and work contemplated and/or completed in association with the construction, modifications, repairs, and removal of facilities and/or features designated within and intended by the Contract Documents.

Project Site - The physical location of the facilities and/or features to be constructed, modified, repaired, or removed under the Project, and the area surrounding the same that is reasonably necessary for such construction, modifications, repairs, or removal. The construction limit line as designated on the Improvement Plans, if so designated, define the limits of the Project Site.

Project Work - The furnishing of all labor, materials, equipment, and incidentals necessary or convenient to the successful completion of the Project and the fulfillment of the duties and obligations imposed upon the Contractor by the Contract Documents.

Specifications - The minute descriptions of the details of the construction of various aspects of the Project Work which serve to complement the Contract Drawings. Such descriptions include, but are not limited to, the type, quality, and quantity of materials to be used, the methods and manner of performance of the work to be used, and the methods of measurement and payment to be used for the Project Work.

The Specifications consist of the **Special Technical Specifications**, a set of specifications created and/or compiled specifically for this Project; the **Reference Specifications**, as designated in Article 26 of the Instructions to Bidders; and any other document, or appropriate portion thereof, issued to the Contractor by the Engineer which serves the function of a specification as defined in the preceding paragraph.

Standard Specifications - The most recent edition of the "City of New Britain Standard Specifications for Municipal Construction"

Supervision - Where used to indicate supervision by the Engineer, supervision shall mean, and be limited to, the performance of obligations imposed upon and the exercise of rights granted to the Engineer by the Contract Documents, specifically including, but not limited to, those set forth in Articles 4 and 5 of these Supplemental General Conditions.

Where used to indicate the supervision by the Contractor, supervision shall mean the Contractor exercising his control over and proper superintendence of the Project Work and performing his obligations and responsibilities as set forth by the Contract Documents with respect to the Project Work and the prosecution thereof.

Unauthorized Work - Any work performed by the Contractor in association with the Project which qualifies as, is considered as, or is designated as unauthorized in accordance with the provisions of the Contract Documents. The Owner reserves the right to accept, make payment for, reject, and/or to order the Contractor to remove, repair, and/or replace all such work at his sole option. The Contractor shall be liable for any and all expenses associated with the inspection, removal, repair, and/or replacement of unauthorized work.

2. Insurance Requirements

The Contractor shall not commence work under this contract until he has obtained all necessary insurance and has filed certificates of insurance with the City. Each insurance policy shall contain a clause providing that the City must be notified sixty (60) days in advance in the event of any restrictive amendment, cancellation, or non-renewal.

The ACORD form entitled "CERTIFICATE OF LIABILITY INSURANCE" shall be the only acceptable form as evidence of insurance and shall state that at a minimum, with respect to the contract, the bidder carries insurance in accordance with the requirements and stipulations listed below.

Insurance must be in effect for the whole duration of the contract and for two (2) years following acceptance of the work by the City.

Failure to provide the required insurance and certificates may, at the option of the City, be held to be a willful and substantial breach of this contract.

The contractor agrees to maintain insurance in force at all times during which services are to be performed, as well as to provide original, completed certificate(s) of insurance to the Purchasing Agent evidencing the following coverages from an insurance company(ies) licensed by the State of Connecticut which have at least an "A-VIII" policyholders rating according to BEST Publications' latest edition of their Key Rating Guide:

Commercial General Liability:	
General Aggregate	$2,000,000
Prod./Compl. Operations Aggregate	$2,000,000
Occ. Aggregate	$1,000,000
Automobile Liability:	
Liability Limit	$2,000,000
Professional Liability	
Each Claim or Occurrence	$1,000,000
Aggregate	$1,000,000
Umbrella Excess Liability:	
Each Occurrence	$1,000,000
Aggregate	$1,000,000

Worker's Comp. and Employer's Liability:
$500,000 each accident
$500,000 disease policy
$500,000 disease accident limit

The "City of New Britain", "Consolidated School District" and the "State of Connecticut" shall be named as "Additional Insured". Original, completed Certificates of Insurance must be presented to the Purchasing Agent prior to purchase order/contract issuance. The Contractor agrees to provide replacement/renewal certificates at least 60 days prior to the expiration of the policy. Should any of the above described policies be cancelled before the expiration date, written notice must be made to the City 30 days prior to cancellation.

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

These certificates must be presented to the Purchasing Agent prior to execution of the contract or issuance of the purchase order.

Failure to provide the required insurance and certificates may, at the option of the City, be held to be a willful and substantial breach of this contract.

3. Minimum Wage Requirements

The Contractor shall pay all tradesmen and laborers hired to perform work under the Contract not less than the prevailing Federal (if applicable) and State of Connecticut wage rates, including benefits, as set forth in the Bid Requirements and Conditions Document.

4. Engineer - Authorities and Duties

All work performed under this Contract is subject to the supervision of the Engineer on behalf of the Owner. The Engineer has the authority to enforce compliance with the Contract Drawings, Specifications, and all other Contract Documents, in all respects.

The Engineer shall decide all questions and disputes regarding the interpretation of the Drawings, Specifications, and other Contract Documents; as well as those regarding the quality and acceptability of materials furnished, work performed, manner of performance, rates of progress, and compliance with and acceptable fulfillment of all terms of the Contract, including compensation due thereunder. The Engineer shall also have the authority to, at his discretion; determine the points and times at which the Contractor may begin various aspects of the work and the order in which the work shall be prosecuted when the specific determination of the same is deemed to be in the best interest of the Owner.

The Engineer shall determine the amount and quality of work successfully completed by the Contractor at any time. His estimate of such completed work shall be basis for all payments by the Owner to the Contractor as compensation for Project Work completed.

All estimates and decisions of the Engineer shall be conclusive and final, except as otherwise expressly provided in the Contract Documents. In the case of the dispute of any estimate and/or decision of the Engineer by the Contractor, and proper assertion of the same in accordance with Articles 28 and 29 of these Supplemental General Conditions, such estimates and decisions of the Engineer shall not be final, but shall control until the subject dispute is properly and finally resolved. All directions of the Engineer shall be promptly and diligently carried out by the Contractor.

The Engineer shall also have all other authorities and duties as stated in the Contract Documents.

For certain projects, the Director of Engineering may designate, in writing to the Contractor, a Project Engineer, who shall be a supervisory staff person of the Bureau of Engineering. The Project Engineer shall have the authority to act as and for the Director of Engineering in all matters governed by the Contract Documents, with the exception of the Acceptance and Award of Contract and the issuance of the Certificate of Completion.

For all projects, the Director of Engineering shall designate a Project Inspector. The authorities and duties of the Project Inspector shall be as stated in Article 5 of these Supplemental General Conditions. The Engineer shall also enjoy all powers and authorities granted to the Project Inspector by said Article 5, and otherwise granted by the Contract Documents.

5. Inspection

All materials furnished, equipment, facilities, and methods used, and work performed by the Contractor under this Contract, including any sampling and testing deemed necessary by the Engineer, is subject to inspection by the Project Inspector, and to the approval of the Engineer. The Contractor shall cooperate in all respects and provide any assistance and/or facilities as requested in the Project Inspector's efforts to perform such inspections. The Project Inspector is performing his duties under the direction of the Engineer and solely at the behest of and on behalf of the Owner; and solely for the purpose of protecting the Owner's interest in having the Project work performed in accordance with the Contract Documents.

The presence of the Project Inspector, or lack thereof, at the project site, or the inspection, or lack thereof, by the Project Inspector of any Project work performed by the Contractor, does not in any way release the Contractor from, or in any way alter, his responsibility for strict compliance with all requirements of the Drawings, Specifications, and other Contract Documents. In case of any dispute arising between the Contractor and the Project Inspector regarding the materials furnished, the manner of performing the work, or any other matter relating to the Contractor’s compliance with the Contract Documents which may adversely affect work in progress, the Project Inspector has the authority to reject the material or stop the work until the question at issue can be

referred to, and decided by, the Engineer. The Project Inspector is not authorized to revoke, alter, enlarge, relax or release any requirements of the Contract Documents nor to approve or accept any portion of the work, nor to issue instructions contrary to the Contract Documents. The Project Inspector shall in no case act as foreman or perform other duties for the Contractor. Any advice which the Inspector may give to the Contractor shall not be construed as binding the Engineer nor the Owner in any way, nor as in any way releasing the Contractor from fulfillment of the terms of the Contract Documents.

The Contractor shall keep the Project Inspector properly notified, to the satisfaction of the Project Inspector, of the time and place that he intends to perform any aspect of the work. Prior to commencing the Project Work, or any subject portion thereof, the Contractor shall obtain from the Engineer either directly or through the Project Inspector pertinent information and requirements regarding the level, methods, and frequency of inspection anticipated for any aspect of the work. The Contractor shall fully comply with the same and shall make adjustments to his scheduling and methods for the work accordingly. The Engineer may change said level, methods, and frequency of inspection required for any aspect of the work at any time as deemed fit to adjust for actual levels and variations in the material conditions, working conditions, or workmanship; and the Contractor shall comply with any such changes.

The Engineer may not deem it necessary for the Project Inspector to be present at the project site at all times when project-related activities are taking place. The Contractor is reminded; however, that all work performed is subject to inspection and of his obligation to comply with the inspection requirements set forth in the previous paragraph. Any work performed in the absence of the Project Inspector is done at the Contractor's own risk, and shall be considered unauthorized. The Contractor is especially cautioned regarding the performance of unauthorized work which may not be readily inspected at a later time, including, but not limited to, underground utility installations, placement of base, fill and backfill, and concrete reinforcing and form work; and regarding the performance of subsequent work which may render previously performed unauthorized work difficult to inspect, or which may have to be removed and replaced in order to correct previously performed unauthorized work which may be found unacceptable by the Engineer.

The Contractor shall deliver, or have delivered, promptly to the Project Inspector copies of all written correspondence relating to the project from the Contractor. All oral correspondence between the Contractor and the Engineer regarding the project shall be directed through the Project Inspector, be conducted in the presence of the Project Inspector, or specific arrangements must be made between the Contractor and the Engineer to inform the Project Inspector of the proceedings of the correspondence.

6. Superintendence by Contractor

The Contractor shall, at all times during the occurrence of project activities, have present at the project site, as the Contractor's agent, a competent representative

thoroughly experienced in the type of work being performed, who shall be termed the "Project Superintendent".

The Project Superintendent shall have full authority to act for the Contractor in supervision of the Project Work as well as in all other matters relating to the Project Work, to receive directions and orders from the Engineer, to promptly execute and carry out said directions and orders within the terms of the Contract Documents, and to supply all materials, equipment, tools, labor, and incidentals as may be required to appropriately perform the Project work. If the Contractor chooses, an alternate representative to act in place of the Project Superintendent in his absence may be designated. Said alternate shall have similar qualifications and equal authority to act as the Contractor's agent as does the Project Superintendent and all references to the Project Superintendent herein apply likewise to the alternate when acting in such capacity.

The Project Superintendent and alternate are subject to the review of the Engineer. The name and qualifications of the proposed Project Superintendent and alternate shall be submitted to the Engineer prior to the commencement of work under the Contract by the Contractor. The Project Superintendent and alternate shall have the appropriate training and knowledge to be considered a "competent person" under the OSHA standards, regulations, instructions, and/or other guidelines applicable for, as a minimum, excavations and confined spaces.

The Project Superintendent shall remain in that capacity for the entirety of the Contract, or until his termination of employment with the Contractor or until his removal from such capacity is agreed to, in writing, by the Engineer. Should the Project Superintendent leave the employment of the Contractor, or otherwise be relieved of his duties as Project Superintendent, during the Contract, the alternate, if designated, shall become the Project Superintendent. If no alternate has been designated, the Contractor shall propose a new Project Superintendent to the Engineer for review through the proper submittal.

In the event that the Project Superintendent is absent from the project site, or cannot be rendered present at the location of certain subject work in a reasonable time, the Project Inspector has the authority to halt for reason of lack of superintendence, and until such time as proper superintendence is again provided, any work for which he may question the materials, workmanship, or other factor which may result in a final product not meeting the requirements of the Contract Documents. Any work performed while the Project Superintendent is absent from the project site shall be considered unauthorized due to lack of superintendence; and, therefore, the Contractor will be due no additional compensation for any additional work, down time, or delays as a result thereof, including any additional work, delays, or down time which may be a result of the Project Inspector halting work in accordance with this Article.

If, in the opinion of the Engineer, a communication problem develops between the Project Superintendent and the Project Inspector due to a language barrier, the

Contractor shall take all steps deemed necessary by the Project Inspector, including providing a qualified interpreter, to resolve the problem to the satisfaction of the Project Inspector.

7. Character of Workers, Methods, and Equipment

The Contractor shall at all times employ sufficient labor and equipment for prosecuting the several classes of work to full completion in the manner and time required by the Contract Documents.

All workers shall have sufficient skill and experience to perform properly the work assigned to them, including the operation of equipment and other specialty or skilled tasks. Any person employed by the Contractor who, in the opinion of the Engineer, does not perform his work in a proper and skillful manner, or who is intemperate, disorderly, or non-courteous toward the public, or who in any way endangers person or property by performing his duties with less than appropriate care, shall, at the direction of the Engineer, be removed from the job forthwith by the Contractor, and shall not be employed again on any portion of the work without the written approval of the Engineer. Upon request, the Engineer shall confirm in writing any such oral direction.

The Contractor shall neither permit nor allow the introduction or use of intoxicating liquors or drugs upon or about the project site by any persons under their control or responsibility during performance of project work; nor shall they permit or allow any person under their control or responsibility to perform any project work while under the influence of any intoxicating liquor or drug.

All equipment used on the work shall be in safe operating condition and shall be capable of performing its intended uses safely. The Contractor is solely responsible for the safety of all equipment used on Contract work and the manner in which it is used.

All equipment which is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet the requirements of the work and to produce a satisfactory quality of work in a timely manner. Equipment used on any portion of the project shall be such that its use or transportation will not cause any damage or injury to roadways or property; and shall be in accordance with all applicable laws, regulations, and restrictions. The Contractor shall remove no plant, materials, equipment, or other facilities from the project site without the Engineer's permission.

When the methods or equipment to be used by the Contractor in accomplishing the various aspects of the construction are not specified in the Contract Documents, the Contractor is free to utilize any methods or equipment that will accomplish the Project work in conformity with the requirements of the Contract Documents. When the methods or equipment anticipated or proposed for use by the Contractor are other than may be specified in the Contract Documents or are other than is standard practice in Connecticut, or when the Engineer may inquire as to the methods or equipment anticipated for use, the Contractor shall demonstrate to the satisfaction of the Engineer

that the subject methods or equipment will accomplish the Project work in conformity with the Contract Documents by means including, but not limited to, providing references, documentation, and demonstrations. Should the Engineer deem that any method or equipment in use by the Contractor is not satisfactory, i.e. that it does not, or will not, result in work conforming with the Contract Documents, the Contractor shall cease using the subject method or equipment and shall propose an alternative to the Engineer's satisfaction.

Should the Contractor continue to use any method or equipment subsequent to being notified of the Engineer's deeming the same not satisfactory, any work resulting or affected thereby shall be considered unauthorized subject to all restrictions and limitations accorded unauthorized work by the Contract Documents.

In the event the Contractor fails to remove from the Project site any person or unsafe equipment as required by the Engineer, or fails to furnish suitable and/or sufficient personnel for the proper prosecution of the work, the Engineer may suspend the work by written notice until such orders are complied with.

8. Subcontracting

(a) In all matters relating to the Contract and enforcement of the provisions of the Contract Documents, with the exception of subarticles (c), (d), and (e) below, any subcontractors utilized to perform Contract work shall be considered employees of the Contractor; and their work shall be subject to the provisions of the Contract Documents as such. Any use of the term "subcontractor", or reference to subcontractors or subcontracting contained in the Contract Documents is strictly for convenience of the Owner and Contractor in distinguishing between regular employees of the Contractor and legal entities subcontracted by the Contractor to specifically perform work on this Project.

(b) In accordance with the preceding paragraph, the Contractor shall be responsible for the performance, finished products, acts and omissions of his subcontractors, and of persons either directly or indirectly employed thereby, in all respects in matters relating to the Contract and applicable provisions of the Contract Documents.

(c) Prior to execution of the Contract, the Contractor shall furnish the Engineer with a list of all subcontractors proposed to perform work on the Project, together with the extents of the work to be performed thereby. Accompanying the list, the Contractor shall include a statement of qualifications, including related experience and listing projects involving similar work successfully completed, for those subcontractors proposed to perform major categories of the Project Work. The Contractor shall furnish all necessary City and State paperwork associated with the hiring of Subcontractors including but not limited to CLA-12's, Form 6 from Municipal Manual, etc.

(d) The Engineer has the authority to reject, for reason of insufficient experience, unsatisfactory past performance, or any other legitimate reason which may bring into question the proposed subcontractor's successful performance of the subject work, the use of any specific subcontractor to perform Project work; and the Contractor shall abide by the same. The Contractor shall provide the Engineer with any additional information requested to assist in the evaluation of the proposed subcontractors.

(e) The Contractor shall maintain said list of subcontractors up-to-date throughout the Project; and shall provide the Engineer with an updated copy in every instance that said list is revised. Any proposed changes to the list, following Contract execution, shall be submitted to and approved by the Engineer prior to any subcontractor not listed on the current active list held by the Engineer performing any Project work. The Engineer may require information as set forth in subarticles (c) and (d) above to assist in his evaluation of any additional subcontractors or duties proposed to be added to the list, and the Contractor shall supply the same.

(f) Nothing contained within the Contract Documents shall create, is intended to create, or should be construed to create a contractual relationship of any kind between the Owner and any subcontractor.

9. Construction Surveying / Layout

Unless otherwise designated in the Special Provisions, the Contractor is responsible for all construction surveying, staking, and layout as is necessary and/or is typically required for the prosecution of the work in accordance with the Contract drawings and specifications. The Engineer shall establish bench marks and reference points as deemed necessary by the Engineer for the Contractor to meet this responsibility. The Contractor is liable for the protection of said bench marks and reference points, as well as for any existing property corner markers located within the project site; and the Project Surveyor shall reset or replace, at the Contractor's expense, any of the same that are removed, lost, destroyed, or in any way damaged or disturbed during the prosecution of the Project Work. The Contractor assumes full responsibility for the accuracy, relative to the provided bench marks and reference points, for all dimensions and elevations measured and/or derived from the same; and it is the Contractor's responsibility to verify all such dimensions and elevations.

If so called for in the Special Provisions, the Contractor shall designate a Project Surveyor. The designation thereof, and the associated functions, duties, and responsibilities thereof, shall be in accordance with the provisions of the subject Article of the Special Provisions.

Except where separate bid items are included for all or portions of such work, all construction surveying and layout work shall be considered as included in, and incidental to, the prices bid for the various bid items in the Contract Documents.

10. Permits and Regulations

The Contractor shall procure and pay for all permits and licenses necessary for the execution of his work and the use of such work when completed.

The Contractor shall comply with all laws, ordinances, rules and regulations relating to the performance of the work, the protection of the adjacent property and the maintenance of passageways, guard fences or other protective facilities.

The Contractor shall, at his own expense, secure and pay to the appropriate departments (Board of Public Works, New Britain Water Department, Building Department) of the City of New Britain or State of Connecticut, the fees or charges for all permits for street excavations, pavements, sidewalks, curbs, sealing of house connection drains, pavement cuts, building, electrical, plumbing, water, subway (underground electric and telephone) and sanitary and storm water sewer permits required by the regulatory body of any of its agencies. The Contractor's attention is called to the fact that the City Engineer's office has a list of all State maintained streets which is readily available to the Contractor for inspection.

The Contractor shall comply with the applicable local laws and ordinances governing the disposal of surplus excavation, materials, debris and rubbish on or off the Project Area and commit no trespass on any public or private property in any operation due to or connected with the improvements embraced in this Contract.

11. Access Considerations

The Contractor shall conduct his work at all times and use all practical means available to minimize the interference to traffic, both vehicular and pedestrian, and the inconvenience and discomfort of adjacent residents and property owners and the general public. Except as otherwise provided for in the Special Provisions, vehicular access, as may be restricted by the prosecution of the Project work, will be maintained at all times to all adjacent or abutting properties, except when necessary construction precludes such access for reasonable periods of time. Pedestrian access shall be maintained to all adjacent or abutting properties at all times. Emergency access to all structures and emergency facilities shall be maintained at all times. In the event that Construction activities cause vehicular access to any property to be interrupted for more than, in the opinion of the Engineer, a reasonable time, the Contractor shall construct, or make other arrangements for, reasonably equivalent access to such property to the satisfaction of the Engineer.

In the maintenance and protection of traffic, the Contractor shall abide by, in order of preference and subject to all applicable laws, 1) the rules, regulations, and directions of the New Britain Police Department, 2) the applicable provisions of the most recent edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", (MUTCD) and any supplements thereto, as published by the Federal Highway

Administration of the U.S. Dept. of Transportation, 3) any directives of the Engineer, and 4) the applicable provisions of the Contract Documents.

The Contractor shall supply, maintain, and incorporate into the Project such barricades, warning lights, and directional, informational, warning, construction, and other signage, as well as any other safety precautions, as may be required, necessary, or prudent for the protection and safety of person, property, Project work and workers; and as may be required, necessary, or prudent to the maintenance of traffic flows and access in clear and convenient means (as is practical). The Contractor is referred to said MUTCD regarding the proper selection, placement, and usage of many such devices and precautions.

The Contractor is hereby notified that the New Britain Police Department may require the presence of police officers for the purpose of safety and traffic control at any location where construction activities affect a public street and the flow of traffic thereon. The Contractor is responsible for 1) contacting the traffic division of the Police Department at 826-3000 to properly notify them of the pending construction to determine what level of police presence may be required and arranging for the same, and 2) paying all costs to the Police Department for the same. Unless the necessity for police presence was not contemplated in the Project at the time of Contract execution, or by any Change Order thereafter, and is the result of the Contractor's actions or inactions, the Contractor shall be appropriately reimbursed for all such costs by the Owner.

The Contractor shall cooperate with the various parties involved in the delivery of mail, school transportation, and the collection and removal of trash and recyclables to maintain existing schedules for these services.

If a bid item for "Maintenance and Protection of Traffic" and/or other related bid items are included in the Contract, all work required or performed, and the associated expenses incurred, in accordance with the provisions of this Article are considered to be included as a part of such bid items. If there are no such bid items, or if the project is bid lump sum, all work required or performed, and the associated expenses incurred, in accordance with the provisions of this Article are considered to be part of the project work as bid, and therefore are considered as included in the price bid for the various Bid items. The Contractor shall be due no additional compensation as a result of any work performed or expenses incurred in accordance with this Article.

12. Protection of Person and Property

The Contractor is responsible and liable for the protection and care of persons and property from harm or injury within the Project Site and otherwise related to his prosecution of the Project Work. The Contractor shall exercise proper precaution at all times for said protection and care of persons and property from harm or injury as a result of the Contractor's actions, or inactions, both on and off the Project site.

The Contractor shall at all times comply with the provisions of all applicable Federal, State, and local safety and health laws, codes, and regulations; and shall take such additional safety and health measures he may determine to be necessary for said protection and care, as well as any such measures that the Engineer may deem to be reasonably necessary.

At all times, as required by any applicable OSHA standards, regulations, instructions, and/ or other guidelines, the Contractor shall have at the site of any excavation, confined space, or any other aspect of the Project work regulated thereby, an employee or other authorized representative having the appropriate training, knowledge, and authority to be considered a "competent person" regarding such work under said OSHA standards, regulations, instructions, and/or other guidelines.

The Contractor shall install and maintain such barricades, fences, and other protective and warning facilities and measures, and shall employ such methods and means, as may be appropriate, required, and/or directed, to protect person and property from excavations, equipment, stored materials, slopes, ditches, flowing water or sewage, exposed utilities, and/or other aspects of the work which may pose a hazard.

All applicable aspects of the Project shall be in accordance with the safety provisions of the "Manual of Accident Prevention in Construction" as published by the Associated General Contractors of America, to the extent said provisions are not in conflict with applicable laws or regulations. Said safety provisions are hereby made a part of this Article by reference.

To the extent possible, the Contractor shall plan the work in such a manner as to avoid the use of explosives in the close proximity structures or utilities. When the use of explosives is necessary for the prosecution of the work, the Contractor shall use the utmost care not to endanger person or property, and shall comply with the requirements of all applicable laws, codes, and regulations. The Contractor is responsible to notify all nearby property owners, the owners of nearby utilities, and all others who may be affected, of the Contractor's intention to use explosives on the project; and such notice shall be given sufficiently in advance of the use of the explosives as to allow the noticees and the Contractor to take any actions deemed necessary for protection of person and property. Such notice shall not relieve the Contractor from responsibility for any damage and/or claims resulting from blasting operations.

The Contractor shall be held responsible for, and required to make restitution at his own expense for, any and all damage to person or property resulting from any act, omission, carelessness, or neglect on the part of the Contractor, or the agent or employees thereof, during the prosecution of the work, or lack thereof, and until its final acceptance.

The Contractor shall maintain an accurate record of all cases of death, occupational disease, and/or injury requiring medical attention or causing loss of time from work, and/or all cases of property damage, occurring as a result of or in the course of the prosecution of work under this Contract. The Contractor shall promptly furnish the Engineer with reports concerning these matters.

The Contractor and his actions shall also be subject to the provisions of Section 1.07.09 of the Reference Specification "Form 817"; and said Section 1.07.09 is hereby made a part of this Article by reference.

All work performed or required, and the associated expenses incurred, in accordance with the provisions of this Article are considered part of the project work as bid, and therefore are considered as included in the price bid for the various Bid items. The Contractor shall be due no additional compensation as a result of such work performed or expenses incurred.

13. Subsurface Conditions

The Contractor is responsible for performing whatever research and/or investigations deemed appropriate for determining the existing soil, groundwater, or other subsurface conditions which may have bearing on the Project work prior to submitting a bid on the Project (reference Article 10 of the Instructions to Bidders). Any information regarding borings, test pits, or other soils or subsurface conditions included in the Contract Documents is provided solely as a courtesy to be used as seen fit by the Contractor; and does not in any way relieve the Contractor of any responsibilities stated in the Contract Documents. The Contractor will not be granted any additional compensation, or any other extra, for any additional work or costs associated with subsurface conditions which could have been reasonably expected to exist and/or to interfere with, or otherwise affect, the Project work in any way.

14. Existing Conditions Found Different

In addition to showing the construction proposed under this Project, the drawings show certain information obtained by the Owner regarding conditions and features which exist at the site of the work, both at and below the surface of the ground.

The Owner and the Engineer expressly disclaim any responsibility for the accuracy or completeness of the information given on the drawings with regard to the existing conditions and features and the Contractor will not be entitled any extra compensation on account of inaccuracy or incompleteness of such information except as provided

herein. It is specifically called to the Contractor's attention that all services, laterals, etc., are not shown on the Contract Drawings and it shall be his responsibility to locate and protect the same. The information which is shown is only for the convenience of the Contractor, who must verify this information to his own satisfaction.

The giving of this information upon the Contract Drawings will not relieve the Contractor of his obligations to support and protect all existing utilities, structures and fixtures, which may be encountered during the construction of the work and to repair any and all damages done to such existing utilities.

The Contractor shall immediately notify the Engineer of any existing or latent conditions encountered during the prosecution of Project work which are significantly different from those shown or described in the Contract Documents or from those expected by the Contractor, and/or which may affect or alter the Project work in any way contrary to the Plans and Specifications; and shall, upon such encounter, immediately suspend all work relating to, or affected or altered by, said different conditions.

The Engineer shall thereupon promptly investigate said conditions and, if the conditions are found to be substantially different, shall give such advice and/or instructions, and shall make such adjustments and/or alterations to the Drawings, Specifications, proposed work, quantities, and/or compensation due to the Contractor, as deemed appropriate and/or necessary, and in a manner consistent with the applicable provisions of the Contract Documents. The Contractor shall not resume the performance of any work suspended in accordance with the provisions of this Article until being instructed to do so by the Engineer.

Any work associated with existing conditions found different which is performed by the Contractor and which is, in the opinion of the Engineer, in non-compliance with the provisions of this Article shall be considered unauthorized. Any such unauthorized work shall not be considered to be extra work nor shall any additional compensation be due the Contractor therefor, except as otherwise determined by, and at the sole discretion of, the Engineer.

15. Existing Underground Utilities - Protection and Responsibilities

The Contractor must notify Call Before You Dig (Tel. 1-800-922-4455) in accordance with Public Act No. 81-146 & 77-350 at least forty-eight (48) hours prior to start of construction, and shall keep such notification properly updated as the prosecution of the Project work proceeds.

The Contractor should inquire of the City of New Britain Broad of Water Commissioners, Southern New England Telephone Company, Northeast Utilities (Helco & C.L.&P), Connecticut Natural Gas Corporation, Comcast and the City Public Works Department and any other public utility companies as to the locations of their facilities, particularly house service pipes, in the vicinity of his trenches and mark or cause to have marked on the site the locations of such pipes, etc. For the guidance of his

employees and so that damage to such pipes may be avoided. The Contractor shall protect water pipes from freezing at all times during cold weather.

The Contractor prior to opening an excavation shall make every effort to determine whether underground installation, i.e., sewer, water, fuel, electric lines, etc., will be encountered and if so, where such underground installations are located. When the excavation approaches the estimated location of such an installation, the exact location shall be determined by careful probing or hand digging, and when it is uncovered, proper supports shall be provided for the existing installation. The Contractor shall, without expense to the City, do everything necessary to provide proper support, protect and maintain from direct or indirect injury all utilities, pipes, bridges, conduits, sewers, drains, wires, poles, or fixtures of all kinds lawfully in the line of excavation or adjacent thereto, and all fences, walls, buildings or other structures and property in the vicinity which may be damaged by the work herein contemplated. He shall give at least 24 hours notice, before breaking ground, to the owners of the structures, pipes or wire conduit that may be affected by his operations and shall not cause any hindrance to or interference with any such owners or their agents in protecting or repairing their property should they wish to do so, but will suffer them to take all such measures as they may deem necessary for said purpose.

The Contractor shall be responsible for the repair of or the replacement of any underground utilities, laterals or mains broken or damaged and any costs for maintenance service while line is out of service along the course of construction. Omissions or improperly located utility lines on the contract drawings will not be cause to hold the Owner liable.

The Engineer may require the Contractor to take proper steps to protect the main lines of public utilities in the immediate vicinity of the work when endangered by the operation of the Contractor, and, if the Contractor fails to take adequate provisions to protect such lines or structures the Engineer may employ others to perform protective work, as may be reasonably needed, at the Contractor's expense.

Guard rails, posts, guard cables, signs, poles, markers, mail boxes, fences, wall and stone walls, etc., which are temporarily removed to facilitate construction, shall be replaced and restored in their original condition to the satisfaction of the Owner or Engineer. This work shall be included in the Item “Clearing and Grubbing”.

16. Sanitary Provisions

The Contractor shall provide an approved field toilet to maintain a neat and sanitary condition on the job site. The Contractor shall commit no public nuisance. These facilities shall be cleaned regularly and, in all ways, comply with the State and City Health Regulations. The Contractor shall provide a safe drinking water supply for use of all working personnel on the work site including the construction inspector.

17. Night Work and Sundays

Night work or work on Saturdays, Sundays or legal holidays requiring the presence of an inspector will be permissible upon the approval of the Engineer except in emergencies. Should night work be permitted, required or desired to operate continuous night work or for emergency night work, the lighting, safety and other facilities which are deemed necessary for performing such night work shall be provided by the Contractor and comply with the applicable safety codes. Night work, work on Saturdays, Sundays or legal holidays, if performed, the Contractor shall receive no extra payment, but compensation shall be considered as having been included in the prices stipulated for the appropriate items of work as listed in the bid.

18. Record Drawings

Unless otherwise designated in the Special Provisions, the Contractor shall be responsible for preparing various record drawings for the City's files. These drawings shall be executed in the manner specified in the edition of the "City of New Britain, Bureau of Engineering, Requirements for As-Built Maps" current at the time this Contract was entered into. Typical maps and copies of the current standards are available for review and purchase at the Bureau of Engineering.

19. Sewage and Water Flows Encountered

The Contractor shall furnish all equipment and take all precautions and steps necessary and appropriate for conveying and perpetuating, in their entirety, all sanitary sewage, storm, groundwater, surface water, and flood water flows encountered in the prosecution of the Project Work in a safe, sanitary, and non-degrading manner. Such work includes, if necessary and appropriate, but is not limited to, furnishing, installing, and operating pumps and conduits, constructing coffer dams, diversion channels, and sumps, the blocking of conduits, and other means and methods used for such purposes.

Sanitary sewage flows shall be conveyed in a closed conduit and shall only be discharged into the City's sanitary sewer system. Under no circumstances shall the contractor willfully allow sewage flows to discharge to the storm drainage system, surface drainways, or any surface water.

Water discharged to the storm drainage system, any surface drainway, or any surface water shall be in accordance with the regulations and standards of the Connecticut Department of Environmental Protection and/or any other regulating authority. In addition, the discharge of water onto private property is only allowed with the prior written permission of the subject property owner and the Engineer.

All aspects of handling sewage and water encountered during prosecution of the Project work is subject to the supervision and approval of the Engineer. Any approval or intervention of the Engineer in such matters in no way relieves the Contractor of any

of his responsibilities to comply with any and all applicable laws, regulations, permits, orders, and/or directives established or given by a regulating authority, and/or the safe perpetuation of any such flows.

The Contractor is responsible for knowledge of and compliance with all aspects of any laws, regulations, permits, orders, and/or directives established or given by a regulating authority relating to the handling of sewage and water flows associated with the Project. The Contractor is responsible for obtaining all approvals, and for performing all sampling, testing, and/or analyses, which may be required by the same.

The Contractor is also responsible for any damages to any facilities or properties as a result of his efforts to handle sewage and water encountered, and for the complete restoration of the same upon the completion of any measures which affected the facility or property.

Except where a separate bid item (or items) is included in the Contract Documents for such work, all work and other aspects of handling water and sewage flows shall be considered as included in, and incidental to, the prices bid for the various bid items in the Contract Documents. The Contractor will not be granted any additional compensation, or any other extra, for any work or other aspect of handling water and sewage flows which could have been reasonably expected to be required or necessary in the prosecution of the Contract Work, or which is a result of the Contractor's actions, lack of action, negligence, or failure to comply with any aspect of this Article, or any other provision of the Contract Documents.

20. Pollution Control

The Contractor shall conduct his operations in conformity with all applicable permits, regulations, and standards of the Connecticut Department of Environmental Protection, and any other Federal, State, or local agency or authority having jurisdiction thereover, concerning water, air, and noise pollution and the handling and disposal of toxic or hazardous materials.

Pollution control measures shall apply to all contractor activities including, but not limited to, the construction site, waste and disposal areas, borrow sites and gravel banks, storage areas, haul roads, access roads, and detours.

In case of the failure on the part of the Contractor to perform pollution control work in a timely manner, the Engineer may, upon 48 hours' written notice, arrange for the performance of the subject work by approved forces, and the cost thereof will be deducted from any monies due, or which may become due, the Contractor under the Contract. In the case of an emergency the Engineer may take such actions immediately upon what he considers to be failure of the Contractor to perform pollution control work in a timely fashion.

(a) Water Pollution Control Measures - The Contractor shall exercise every reasonable precaution throughout the life of the contract to prevent, control and abate siltation, sedimentation and pollution of all surface waters, underground water systems and inland wetlands. The City of New Britain will obtain all permits which may be required concerning inland wetlands and watercourses for work appearing on the plans. The Contractor shall obtain any permits and pay any fees required for work not included on the plans in the fulfillment of his contract concerning the removal of material, depositing of material in, obstruction of, construction within, altering or polluting of any inland wetland, tidal wetland, coastal or navigable water, streams, ponds, lakes, water supplies or other water bodies.

Construction operations in water areas shall be held to a practicable minimum and shall be restricted to those areas which must be entered for the planned construction and for temporary operations pursuant thereto. The frequent fording of live streams shall be avoided during the construction and the use of temporary bridges or culverts is preferred. Mechanized equipment shall not be operated promiscuously in live streams. Roiling of waters shall be cause for the construction of diversion dikes or settling basins to avoid sediment problems.

The banks and beds of waterways and impoundments shall be properly cleared of all debris, falsework and obstructions placed therein or caused by the construction operations, but which are not a part of the planned improvement.

The dumping of oil or other deleterious materials on the ground is expressly forbidden. The Contractor shall provide a means of catching and retaining drained oil, removed oil filters, or other deleterious materials and of properly disposing of same, subject to the approval of the Engineer.

(b) Air Pollution Control Measures - The Contractor shall exercise every reasonable precaution throughout the life of the contract to safeguard the air resources of the State by Controlling or abating air pollution as set forth by the Department of Environmental Protection's regulations. These measures shall include the control and abatement of dust, fumes, mist, smoke, vapor, gas, aerosol, other particulate matter, odorous substances or any combination thereof arising from the construction operations, hauling, storage or manufacture of materials. All trucks carrying materials susceptible to having pollutants enter the ambient air are to be covered during transit.

(c.) Noise Pollution Control Measures - The Contractor shall take measures to control the noise intensity to comply with the prescribed ratings as set forth by the regulations of the Department of Environmental Protection, the Occupational Safety and Health Administration and any other agency of the State or Federal government.

(d) Erosion and Sedimentation Control Measures - All watercourses shall be protected from sedimentation, both during and after construction. This provision applies particularly to dewatering activities, storage of excavated or stockpiled material, trench excavation, and placement of compacted berms and embankments. The Contractor

shall control erosion and sedimentation in accordance with the publication entitled "2002 Connecticut Guidelines for Soil Erosion and Sediment Control" issued by the Connecticut Council on Soil and Water Conservation, effective May 2002, in accordance with the plans, or as otherwise approved by the Engineer. The Contractor shall submit details of his erosion and sediment controls to the Engineer for review and approval prior to commencement of the work.

(e) Cleaning of Adjacent Streets - The Contractor shall sweep, and use other methods as necessary, to keep adjacent streets clean of mud, dirt, and debris caused by Project activities. Such sweeping or other methods shall be used on a daily basis when mud, dirt, or debris has been deposited on a street.

The Contractor is responsible for knowledge of and compliance with all aspects of any laws, regulations, permits, orders, and/or directives established or given by a regulating authority relating to pollution control associated with the Project. The Contractor is responsible for obtaining all approvals, and for performing all sampling, testing, and/or analyses, which may be required by the same.

Except where a separate bid item (or items) is included in the Contract Documents for such work, all work and other aspects of pollution control shall be considered as included in, and incidental to, the prices bid for the various bid items in the Contract Documents. The Contractor will not be granted any additional compensation, or any other extra, for any work or other aspect of handling water and sewage flows which could have been reasonably expected to be required or necessary in the prosecution of the Contract Work, or which is a result of the Contractor's actions, lack of action, negligence, or failure to comply with any aspect of this Article, or any other provision of the Contract Documents.

21. Contaminated or Hazardous Material

In the event the Contractor, during the prosecution of Contract Work, encounters any material that is believed to be contaminated, toxic, or hazardous to person or the environment, provided that the occurrence of, handling of, and protection of and from the subject material was not contemplated at the time of Contract execution, the Contractor shall immediately cease work in the immediate area and notify the Engineer. If the nature of the material or the situation under which it is encountered is such that immediate notification of the Connecticut Dept. of Environmental Protection or other regulating agency is required, such notification is the responsibility of the Contractor.

Upon said notification of the Engineer by the Contractor, the Engineer shall take the steps deemed necessary for making investigations and determinations regarding the handling of, protection of and from, and/or the disposal of the subject material. The Engineer shall delineate, or have delineated, a "no-work" area in the vicinity of the subject material within which all project work shall remain suspended until written permission to the contrary is given by the Engineer. The Contractor shall follow all directions and recommendations of the Department of Environmental Protection, or any

other regulating authority having jurisdiction, and shall comply with all applicable laws and regulations, regarding the handling of, protection of and from, and/or disposal of the subject material. The Contractor shall also cooperate fully with any special personnel whom the Owner may retain the services of for the same.

22. Connection to Existing Work

The Contractor shall remove such existing masonry, concrete, equipment and piping as is necessary, in order to make the proper connections to the existing work at the locations shown. Also, he shall make the necessary pipe line, roadway and other connections required, in order that on completion of the Contract, water, sewage, or storm water, or as the case may be, will flow through the pipe lines and structures. No extra payment will be made for this work, but the entire cost shall be included in the unit or lump sum prices bid for the various items of the work to be done under this Contract.

23. Snow Removal

If the Contractor's operations or occupancy of any public street or highway, or the rough surfaces over any trench or area being maintained by the Contractor, shall interfere with the removal or plowing of snow or ice by the public authorities or property owners, or sanding of icy surfaces, in the ordinary manner with regular highway equipment, then the Contractor shall perform such services for the public authority or property owner without charge; or failing to do so, shall reimburse the said authority, owners or the City for any additional cost they incur for doing such work occasioned by the conditions arising from the Contractor's operations, occupancy or trench surfaces, together with the damage to the equipment of said parties by those conditions, or claims of any party for damage or injury or loss by reason of failure to remove snow or ice, or to sand the icy spots under those conditions.

24. Inclement and Freezing Weather Conditions

In the event of temporary suspension of work, or during inclement weather, or whenever the Engineer shall direct, the Contractor will, and will cause the Subcontractor to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Engineer, any work or materials have been damaged by the failure of the Contractor or Subcontractors to protect the work, such work or materials shall be removed and replaced at the expense of the Contractor.

Unless written permission is given, work liable to be affected by frost or freezing shall be suspended during freezing weather when work proceeds under freezing conditions the Contractor shall provide approved facilities for heating the materials and for protecting the finished work.

25. Final Inspection and Certificate of Completion

Upon the completion of all work whatsoever required, the Contractor must submit a written request to the City Engineer for a final inspection. The Engineer and/or his representative, representatives of the governing authority of the completed project (re: Public Works, Water Dept., etc.) and the Contractor shall hold a semi-final inspection of all work to ascertain that the work is acceptable to the governing authority.

Unacceptable work shall be corrected at no additional costs. After approval, the Engineer shall file a written certificate with the Owner and with the Contractor as to the entire amount of work performed and compensation earned by the Contractor including extra work and compensation thereof.

26. Payment to Contractor

The Owner agrees to pay the Contractor monthly or as nearly once a month as possible, ninety-five (95%) percent of the whole amount due the Contractor for the amount of work which the Engineer shall estimate as done up to the last day of that particular month. Payment of the estimated bill shall follow within thirty days after the receipt and approval of the estimate. It shall also be required in this Contract that the weekly payrolls and basic records (reference General Conditions paragraph 53) be submitted at the same time with the estimated monthly bill.

27. Final Payment and Liens

Thirty (30) days after the filing of such certificate of completion, the Owner shall pay to the Contractor 95 percent of the amount therein stated, less all prior payments and advances whatsoever to or for the account of the Contractor. All prior estimates and payments, including those relating to extra work shall be subject to correction by this payment which is throughout this Contract called Final Payment. The final 5% of the total amount will be paid at the end of one year (12 months) maintenance period, provided the whole of the work is at that time in conformity with the requirements of the Contract; if not, then as soon thereafter as the work shall be made to conform thereto. Said maintenance period for all parts of the work shall not commence prior to filing of the certificate of completion. After final acceptance of the work, the Contractor may request the filing a maintenance bond covering the maintenance period for the total amount of the retained 5% percent. If the City approves the maintenance bond option, the retained 5% percent shall then be paid to the Contractor.

Neither the final Contract payment nor any part of the retainage thereto shall become due to the Contractor until he has, if required, delivered to the Owner either a complete release of all liens arising out of the Contract or receipts in full in lieu thereof. In addition, if required, the Contractor shall furnish the Owner an affidavit that states that so far as he has knowledge or information, the releases and receipts described above include all labor, material and equipment for which a lien could be filed. In the event a subcontractor or materials provider is unwilling or unable to furnish a release or receipt in full, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against any liens. If any liens remain unsatisfied after all payments are made,

the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney fee.

28. Disputes

a) All disputes arising under this contract or its interpretation, whether involving law or fact or both, or extra work, and all claims for alleged breach of contract shall within ten (10) days of commencement of the dispute be presented by the Contractor to the Owner for decision. All papers pertaining to the claims shall be filed in quadruplicate. Such notice need not detail the amount of the claim, but shall state the facts surrounding the claim in sufficient detail to identify the claim, together with its character and scope. In the meantime the Contractor shall proceed with the work as directed. Any claim not presented within the time limit specified within this paragraph shall be deemed to have been waived, except that if the claim is of a continuing character and notice of the claim is not given within ten days of its commencement, the claim will be considered only for a period commencing ten days prior to the receipt of the Owner of notice thereof.

b) The Contractor shall submit in detail his claim and proof thereof. Each decision by the Owner will be in writing and will be mailed to the Contractor by registered mail, return receipt requested.

c) If the Contractor does not agree with any decision of the Owner, he shall in no case allow the dispute to delay the work but shall notify the Owner promptly that he is proceeding with the work under protest and he may then except the matter in question from the final release.

29. Arbitration and Litigation

Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall, at the option of the Owner, be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association and judgment upon the award rendered by the Arbitrator(s) may be entered in any court having jurisdiction thereof. The Owner shall exercise its option to arbitrate concurrent with the rendering of its final decision on the claim. Should it fail to render a final decision within the prescribed time or fail to exercise its option, the claim will be determined in accordance with the Rules of the American Arbitration Association as hereinbefore stated.

30. Purchase Assignment

The contractor or subcontractor offers and agrees to assign to the public purchasing body all right, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act, 15 U.S.C. Section 15, or under Chapter 624 of the General Statutes of Connecticut, arising out of the purchase of services, property or intangibles of any kind pursuant to a public purchase contract or subcontract. This assignment

shall be made and become effective at the time the public purchasing body awards or accepts such contract, without further acknowledgment by the parties.

31. Quality of Materials

All work done and materials furnished shall be new and of the best quality customarily used in or furnished for installation of the character of that proposed. Many features of the proposed work are described in detail herein, but the failure to describe any part of the proposed work or any detail or appurtenance thereof shall not be an exception to the above rule. The absence of requirements in the contract or specifications covering details usually included in first-class installation of this type shall not excuse the Contractor for their omission in this work.

32. Defective Materials

The Engineer may reject any or all defective or damaged material or any material not, in his opinion, in conformity with the specifications. Material which may at any time be rejected shall be promptly removed from the site. If the Contractor does not remove defective material promptly after written notice, the Engineer may cause such removal by such means as he shall select and at the Contractor's expense. No defective or damaged materials shall be used in the work. All defective material shall be conspicuously marked.

33. Uncovering and Corrective Work

If any portion of the work should be covered contrary to the request of the Engineer or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Engineer, be uncovered for his observation, and the Contractor shall bear the costs of uncovering and recovering and shall be responsible for resulting delays, even if the uncovered work is found to be in accordance with the Contract Documents.

The Contractor shall promptly correct all work rejected by the Engineer as defective or as failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all cost of correcting such rejected work, including compensation for the Engineer's additional services made necessary thereby.

If the Contractor fails to correct any such defective or nonconforming work to the satisfaction of the Engineer within a reasonable time after notification of the same, the Owner may, upon written notification to the Contractor of his intent to do so, separately arrange for the work to be corrected as he deems fit; and deduct any costs associated with the arrangements for and performance of the corrective work from any monies due, or to become due, the Contractor. Should such costs exceed the monies due, or to become due, the Contractor, than the Contractor shall be liable to the Owner for all amounts exceeding those due, or to become due, the Contractor.

34. Protection of the Work

The Contractor shall protect all work done under this contract and all work done by other contractors within the limits of this contract during the progress of the work and until completion and acceptance, from injury by reason of any work under this contract or by reason of any negligence on his part, or by reason of weather conditions.

35. Clean-up

Upon suspension or completion of the work or of any section thereof, the Contractor shall remove all materials, equipment and rubbish and shall leave the premises in a neat and orderly condition. The premises shall, during the progress of the work, be kept clean, presentable and satisfactory to the Engineer, and shall be left so at the completion of the contract.

36. Work Stoppages

Should the City be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the City, the Contractor shall not be entitled to or assert claim for damage by reason of said delay. However, time for completion of the work will be extended to such reasonable time as the City may determine by means of a written Change Order.

37. Sheeting, Shoring and Bracing

Where necessary, the sides of trenches and excavations shall be supported by adequate sheeting, shoring, and bracing. The Contractor shall be held accountable and responsible for the sufficiency of all sheeting, shoring, and bracing used and for all damage to persons, property, streets or utilities resulting from the improper quality, strength, placing, maintaining, or removing of the same. Where sheeting is removed, care shall be taken not to disturb the new work or existing utilities and structures.

No sheeting is to be left in place unless expressly permitted by the Engineer. No direct payment will be made for sheeting, shoring, and bracing, and compensation for such work and all expenses incidental thereto shall be considered as included in the unit prices bid for the various items of this contract.

38. Compliance with Law

a) In the administration and execution of the Project, the Applicant shall comply with all pertinent provisions of local, State and Federal law, and failure to do so shall constitute a default by the Applicant under this Agreement.

b) The contract is subject to the provisions of Section 4-114a(a)-(e) of the Connecticut General Statutes which state: "The contractor agrees and warrants that in the performance of this contract he will not discriminate or permit

discrimination against any person or group of persons on the grounds of race, color, retardation or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut. If the contract is for a public works project, the contractor agrees and warrants that he will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such project. The contractor further agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission concerning the employment practices and procedures of the contractor as relate to the provisions of this section and Section 46a-56."

c) This contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill promulgated June 16, 1971 and, as such, this contract may be canceled, terminated or suspended by the State Labor Commissioner for violation or of noncompliance with said Executive Order No. Three, or any State or Federal Law concerning nondiscrimination, notwithstanding that the Labor Commissioner is not a party to this contract. The parties to this contract, as part of the consideration hereof, agree that said Executive Order No. Three is incorporated herein by reference and made a part hereof. The parties agree to abide by said Executive Order and agree that the State Labor Commissioner shall have continuing jurisdiction in respect to contract performance in regard to nondiscrimination, until the contract is completed or terminated prior to completion. The contractor agrees as part consideration hereof, that this contract is subject to the guidelines and rules issued by the State Labor Commissioner to implement Executive Order No. Three and that he will not discriminate in his employment practices or policies, will file all reports as required, and will fully cooperate with the State of Connecticut and the State Labor Commissioner.

d) This contract is subject to the provisions of Executive Order No. Seventeen of Governor Thomas J. Meskill promulgated February 15, 1973, and as such, this contract may be canceled, terminated or suspended by the Contracting agency or the State Labor Commissioner for violation of or noncompliance with said Executive Order No. Seventeen, notwithstanding that the Labor Commissioner may not be a part to this contract. The parties to this contract, as part of the consideration hereof, agree that the Executive Order No. Seventeen is incorporated herein by reference and made a part hereof. The parties agree to abide by said Executive Order and agree that the contracting agency and the State Labor Commissioner shall have joint and several continuing jurisdiction in respect to contract performance in regard to listing all employment openings with the Connecticut Employment Service.

39. Termination for Convenience of the City

a) The City may terminate performance of work under this contract in whole, or, from time to time, in part, if the City determines that termination is in its best interest. The City shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

b) After receipt of a Notice of Termination, and except as otherwise directed by the City, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under his clause:

    1) Stop work as specified in the notice.
    2) Place no further subcontracts or orders for materials, services, or facilities related to the terminated work.
    3) Terminate all subcontracts to the extent they relate to the work terminated.
    4) Assign to the City, as directed by the City, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the City shall have the right to settle or pay any termination settlement proposal arising out of those terminations.
    5) With approval or ratification to the extent required by the City, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for the purposes of this clause.
    6) As directed by the City, transfer title and deliver to the City (I) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and (ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the City.
    7) Complete performance of the work not terminated.
    8) Take any action that may be necessary, or that the City may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the City has or may acquire an interest.
    9) Use its best efforts to sell, as directed or authorized by the City, any property of the types referred to in subparagraph (6) above; provided, however, that the Contractor (I) is not required to extend credit to any purchaser and (ii) may acquire the property under the conditions prescribed by, and at prices approved by, the City. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the City under this contract, credited to the price or cost of the work, or paid in any other manner as directed by the City.

c) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the City a list, certified as to quantity and quality, of termination inventory not previously

disposed of, excluding items authorized for disposition by the City. The Contractor may request the City to remove those items or enter into an agreement for their storage. Within fifteen days, the City will accept title to those items and remove them or enter into a storage agreement. The City may verify the list upon removal of the items, or if stored, within 45 days of the submission of the list, and shall correct the list, as necessary, before final settlement.

d) After termination, the Contractor shall submit a final termination settlement proposal to the City in the form and with the certification prescribed by the City. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the City upon written request of the Contractor within this 1 year period. However, if the City determines that the facts justify it, a termination settlement proposal may be received and acted upon after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the City may determine, based on the information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

e) Subject to paragraph (d) above, the Contractor and the City may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (e) or (f) below, exclusive of costs shown in subparagraph (f)(3), may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended and the Contractor paid the agreed amount. Paragraph (f) below shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

f) If the Contractor and the City fail to agree on the whole amount to be paid because of the termination of work, the City shall pay the Contractor the amounts determined by the City as follows, but without duplication of any amounts agreed on under paragraph (e) above:

    1) The contract price for completed supplies or services accepted by the City (or sold or acquired under subparagraph (b)(9) above) not previously paid for, adjusted for any saving of freight and other charges.
    2) The total of-
        i. The costs incurred in the performance of the work terminated, including initial cost and preparatory expense allocable thereto. but excluding any costs attributable to supplies or services paid or to be paid under subparagraph (f)(1) above;
        ii. The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (I) above; and

iii. A sum, as profit on subdivision (I) above, determined by the City under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the City shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

3) The reasonable costs of settlement of the work terminated, including-
   i. Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of the termination settlement proposals and supporting data;
   ii. The termination and settlement of subcontracts (excluding the amounts of such settlements); and
   iii. Storage transportation and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

g) Except for normal spoilage, and except to the extent that the City expressly assumed the risk of loss, the City shall exclude from the amounts payable to the Contractor under paragraph (f) above, the fair value, as determined by the City, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the City or to a buyer.

h) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of the contract, shall govern all costs claimed or agreed to under this clause.

i) the Contractor shall have the right of appeal, under the Disputes clause, for any determination made by the City under paragraph (d), (f), or (k), except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph)d) or (k), and failed to request a time extension, there is no right of appeal. If the City has made a determination of the amount due under paragraph (d), (f), or (k), the City shall pay the Contractor (1) the amount determined by the City if there is no right of appeal or if no timely appeal has been taken, or (2) the amount finally determined on an appeal.

j) In arriving at the amount due the Contractor hereby , there shall be deducted:
   1) All unliquidated advanced or other payments to The Contractor under the terminated portion of this contract;
   2) Any claim which the City has against the Contractor under this contract; and
   3) The agreed price for, or the proceeds of sale of, materials, supplies or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the City.

k) If the termination is partial, the Contractor may file a proposal with the City for an equitable adjustment of the price(s) of the continued portion of the contract. The City shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the City.

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1) The City may, under the terms and conditions it prescribes, make partial payments and payments against incurred by the Contractor for terminated portions of the contract, if the City believes the total of these payments will not exceed the amount to which the Contractor will be entitled.
2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the City upon demand, computed with interest at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination proposal because of a retention or other disposition of termination inventory until 10 days after the date of retention or disposition, or a later date determined by the City because of the circumstances.

m) Unless otherwise provided for in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this Contract for three years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the City, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the City, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS
NOTIFICATION TO BIDDERS

(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to "aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials." "Minority business enterprise" is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: "(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n." "Minority" groups are defined in Section 32-9n of the Connecticut General Statutes as "(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4)Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . ." An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder's qualifications under the contract compliance requirements:

(a) the bidder's success in implementing an affirmative action plan;
(b) the bidder's success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
(c) the bidder's promise to develop and implement a successful affirmative action plan;
(d) the bidder's submission of employment statistics contained in the "Employment Information Form", indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
(e) the bidder's promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

INSTRUCTIONS AND OTHER INFORMATION

The following BIDDER CONTRACT COMPLIANCE MONITORING REPORT must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to Sections 4a-60 and 4a-60a CONN. GEN. STAT., and Sections 46a-68j-23 of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder's good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) Definition of Small Contractor

Section 4a-60g CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision 4a-60g CONN. GEN. STAT.

2) Description of Job Categories (as used in Part IV Bidder Employment Information) (Page 2)

MANAGEMENT: Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

BUSINESS AND FINANCIAL OPERATIONS: These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

MARKETING AND SALES: Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

LEGAL OCCUPATIONS: In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

COMPUTER SPECIALISTS: Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

ARCHITECTURE AND ENGINEERING: Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

OFFICE AND ADMINISTRATIVE SUPPORT: All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving o f written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

BUILDING AND GROUNDS CLEANING AND MAINTENANCE: This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

CONSTRUCTION AND EXTRACTION: This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category.

INSTALLATION, MAINTENANCE AND REPAIR: Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

MATERIAL MOVING WORKERS: The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

PRODUCTION WORKERS: The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

3) Definition of Racial and Ethnic Terms (as used in Part IV Bidder Employment Information) (Page 3)

White (not of Hispanic Origin)-All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East. Black (not of Hispanic Origin)-All persons having origins in any of the Black racial groups of Africa. Hispanic- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.	Asian or Pacific Islander- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa. American Indian or Alaskan Native- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

BIDDER CONTRACT COMPLIANCE MONITORING REPORT

PART 1 – Bidder Information

Company Name: Street Address: City & State: Chief Executive:	Bidder Federal Employer Identification Number: Or Social Security Number:
Major Business Activity: (brief description)	Bidder Identification (response optional/definitions on page 1) -Bidder is a small contractor? Yes ☐ No ☐ -Bidder is a minority business enterprise? Yes ☐ No ☐ (If yes, check ownership category) Black ☐ Hispanic ☐ Asian American ☐ American Indian/Alaskan Native ☐ Iberian Peninsula ☐ Individual(s) with a Physical Disability ☐ Female ☐ -Bidder is certified as above by State of CT? Yes ☐ No ☐
Bidder Parent Company: (If any)	
Other Locations in CT: (If any)	

PART II - Bidder Nondiscrimination Policies and Procedures

1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes ☐ No ☐	7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes ☐ No ☐
2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes ☐ No ☐	8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes ☐ No ☐
3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes ☐ No ☐	9. Does your company have a mandatory retirement age for all employees? Yes ☐ No ☐
4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes ☐ No ☐	10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes ☐ No ☐ N/A ☐
5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes ☐ No ☐	11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes ☐ No ☐ N/A ☐
6. Does your company have a collective bargaining agreement with workers? Yes ☐ No ☐ 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes ☐ No ☐ 6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of CT? Yes ☐ No ☐	12. Does your company have a written affirmative action Plan? Yes ☐ No ☐ If no, please explain. 13. Is there a person in your company who is responsible for equal employment opportunity? Yes ☐ No ☐ If yes, give name and phone number:

1. Will the work of this contract include subcontractors or suppliers? Yes ☐ No ☐

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above? Yes ☐ No ☐

PART IV - Bidder Employment Information Date:

JOB CATEGORY *	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Management											
Business & Financial Ops											
Marketing & Sales											
Legal Occupations											
Computer Specialists											
Architecture/Engineering											
Office & Admin Support											
Bldg/ Grounds Cleaning/Maintenance											
Construction & Extraction											
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE											
Total One Year Ago											
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

PART V - Bidder Hiring and Recruitment Practices (Page 5)

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification		3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination
SOURCE	YES	NO	% of applicants provided by source	(X)		
State Employment Service	☐	☐			Work Experience	
Private Employment Agencies	☐	☐			Ability to Speak or Write English	
Schools and Colleges	☐	☐			Written Tests	
Newspaper Advertisement	☐	☐			High School Diploma	
Walk Ins	☐	☐			College Degree	
Present Employees	☐	☐			Union Membership	
Labor Organizations	☐	☐			Personal Recommendation	
Minority/Community Organizations	☐	☐			Height or Weight	
Others (please identify)	☐	☐			Car Ownership	
	☐	☐			Arrest Record	
	☐	☐			Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature)	(Title)	(Date Signed)	(Telephone)

Construction Contracts - Required Contract Provisions
(State Funded Only Contracts)

Index

1. Title VI of the Civil Rights Act of 1964 / Nondiscrimination Requirements

2. Contractor Work Force Utilization / Specific Equal Employment Opportunity

3. Contract Wage Rates

4. Americans with Disabilities Act of 1990, as Amended

5. Connecticut Statutory Labor Requirements

    a. Construction, Alteration or Repair of Public Works Projects; Wage Rates
    b. Debarment List - Limitation on Awarding Contracts
    c. Construction Safety and Health Course
    d. Awarding of Contracts to Occupational Safety and Health Law Violators Prohibited
    e. Residents Preference in Work on Other Public Facilities (Not Applicable to Federal Aid Contracts)

6. Tax Liability - Contractor's Exempt Purchase Certificate (CERT – 141)

7. Executive Orders (State of CT)

8. Non Discrimination Requirement (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised)

9. Whistleblower Provision

10. Connecticut Freedom of Information Act

    a. Disclosure of Records
    b. Confidential Information

11. Service of Process

12. Substitution of Securities for Retainages on State Contracts and Subcontracts

13. Health Insurance Portability and Accountability Act of 1996 (HIPAA)

14. Forum and Choice of Law

15. Summary of State Ethics Laws

16. Audit and Inspection of Plants, Places of Business and Records

17. Campaign Contribution Restriction

18. Tangible Personal Property

19. Bid Rigging and/or Fraud – Notice to Contractor

20. Consulting Agreement Affidavit

Index of Exhibits

EXHIBIT A – Title VI Contractor Assurances (page 13)
EXHIBIT B – Contractor Work Force Utilization / Equal Employment Opportunity (page 14)
EXHIBIT C – Health Insurance Portability and Accountability Act of 1996 (HIPAA) (page 17)
EXHIBIT D - Campaign Contribution Restriction (page 25)
EXHIBIT E - State Wage Rates (Attached at the end)

1. Title VI of the Civil Rights Act of 1964 / Nondiscrimination Requirements

The Contractor shall comply with Title VI of the Civil Rights Act of 1964 as amended (42 U.S.C. 2000 et seq.), all requirements imposed by the regulations of the United States Department of Transportation (49 CFR Part 21) issued in implementation thereof, and the Title VI Contractor Assurances attached hereto at Exhibit A, all of which are hereby made a part of this Contract.

2. Contractor Work Force Utilization / Equal Employment Opportunity

(a) The Contractor shall comply with the Contractor Work Force Utilization / Equal Employment Opportunity requirements attached at Exhibit B and hereby made part of this Contract, whenever a contractor or subcontractor at any tier performs construction work in excess of $10,000. These goals shall be included in each contract and subcontract. Goal achievement is calculated for each trade using the hours worked under each trade.

(b) Companies with contracts, agreements or purchase orders valued at $10,000 or more will develop and implement an Affirmative Action Plan utilizing the ConnDOT Affirmative Action Plan Guideline. This Plan shall be designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex or national origin, and to promote the full realization of equal employment opportunity through a positive continuation program. Plans shall be updated as required by ConnDOT.

3. Contract Wage Rates

The Contractor shall comply with:

The State wage rate requirements indicated in Exhibit E hereof are hereby made part of this Contract.

Prevailing Wages for Work on State Highways; Annual Adjustments. With respect to contracts for work on state highways and bridges on state highways, the Contractor shall comply with the provisions of Section 31-54 and 31-55a of the Connecticut General Statutes, as revised.

As required by section 1.05.12 (Payrolls) of the State of Connecticut, Department of Transportation's Standard Specification for Roads, Bridges and Incidental Construction (FORM 816), as may be revised, every Contractor or subcontractor performing project work on a federal aid project is required to post the relevant prevailing wage rates as determined by the United States Secretary of Labor. The wage rate determinations shall be posted in prominent and easily accessible places at the work site.

4. Americans with Disabilities Act of 1990, as Amended

This provision applies to those Contractors who are or will be responsible for compliance with the terms of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. 12101 et seq.), (Act), during the term of the Contract. The Contractor represents that it is familiar with the terms of this Act and that it is in compliance with the Act. Failure of the Contractor to satisfy this standard as the same applies to performance under this Contract, either now or during the term of the Contract as it may be amended, will render the Contract voidable at the option of the State upon notice to the contractor. The Contractor warrants that it will hold the State harmless and indemnify the State from any liability which may be imposed upon the State as a result of any failure of the Contractor to be in compliance with this Act, as the same applies to performance under this Contract.

5. Connecticut Statutory Labor Requirements

(a) Construction, Alteration or Repair of Public Works Projects; Wage Rates. The Contractor shall comply with Section 31-53 of the Connecticut General Statutes, as revised. The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i) of section 31-53 of the Connecticut General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day.

(b) Debarment List. Limitation on Awarding Contracts. The Contractor shall comply with Section 3l-53a of the Connecticut General Statutes, as revised.

(c) Construction Safety and Health Course. The Contractor shall comply with section 31-53b of the Connecticut General Statutes, as revised. The contractor shall furnish proof to the Labor Commissioner with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 of the Connecticut General Statutes, as revised, on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

Any employee required to complete a construction safety and health course as required that has not completed the course, shall have a maximum of fourteen (14) days to complete the course. If the employee has not been brought into compliance, they shall be removed from the project until such time as they have completed the required training.

Any costs associated with this notice shall be included in the general cost of the contract. In addition, there shall be no time granted to the contractor for compliance with this notice. The contractor's compliance with this notice and any associated regulations shall not be grounds for claims as outlined in Section 1.11 – "Claims".

(d) Awarding of Contracts to Occupational Safety and Health Law Violators Prohibited. The Contract is subject to Section 31-57b of the Connecticut General Statutes, as revised.

(e) Residents Preference in Work on Other Public Facilities. NOT APPLICABLE TO FEDERAL AID CONTRACTS. Pursuant to Section 31-52a of the Connecticut General Statutes, as revised, in the employment of mechanics, laborers or workmen to perform the work specified herein, preference shall be given to residents of the state who are, and continuously for at least six months prior to the date hereof have been, residents of this state, and if no such person is available, then to residents of other states

6. Tax Liability - Contractor's Exempt Purchase Certificate (CERT – 141)

The Contractor shall comply with Chapter 219 of the Connecticut General Statutes pertaining to tangible personal property or services rendered that is/are subject to sales tax. The Contractor is responsible for determining its tax liability. If the Contractor purchases materials or supplies pursuant to the Connecticut Department of Revenue Services' "Contractor's Exempt Purchase Certificate (CERT-141)," as may be revised, the Contractor acknowledges and agrees that title to such materials and supplies installed or placed in the project will vest in the State simultaneously with passage of title from the retailers or vendors thereof, and the Contractor will have no property rights in the materials and supplies purchased.

Forms and instructions are available anytime by:

Internet: Visit the DRS website at www.ct.gov/DRS to download and print Connecticut tax forms; or Telephone: Call 1-800-382-9463 (Connecticut calls outside the Greater Hartford calling area only) and select Option 2 or call 860-297-4753 (from anywhere).

7. Executive Orders

This contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the contract as if they had been fully set forth in it. The contract may also be subject to Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services and to Executive Order No. 49 of Governor Dannel P. Malloy, promulgated May 22, 2015, mandating disclosure of certain gifts to public employees and contributions to certain candidates for office. If Executive Order No. 14 and/or Executive Order No. 49 are applicable, they are deemed to be incorporated into and are made a part of the contract as if they had been fully set forth in it. At the Contractor's request, the Department shall provide a copy of these orders to the Contractor.

8. Non Discrimination Requirement (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised): References to "minority business enterprises" in this Section are not applicable to Federal-aid projects/contracts. Federal-aid projects/contracts are instead subject to the Federal Disadvantaged Business Enterprise Program.

(a) For purposes of this Section, the following terms are defined as follows:

(1) "Commission" means the Commission on Human Rights and Opportunities;
(2) "Contract" and "contract" include any extension or modification of the Contract or contract;
(3) "Contractor" and "contractor" include any successors or assigns of the Contractor or contractor;
(4) "Gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose.
(5) "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;

(6) "good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements;

(7) "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced;

(8) "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders;

(9) "minority business enterprise" means any small contractor or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of Connecticut General Statutes § 32-9n; and

(10) "public works contract" means any agreement between any individual, firm or corporation and the State or any political subdivision of the State other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the State, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.

For purposes of this Section, the terms "Contract" and "contract" do not include a contract where each contractor is (1) a political subdivision of the State of Connecticut, including, but not limited to municipalities, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state of the United States, including but not limited to, the District of Columbia, Puerto Rico, U.S. territories and possessions, and federally recognized Indian tribal governments, as defined in Connecticut General Statutes § 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3), or (4) of this subsection.

(b) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut; and the Contractor further agrees to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by the Contractor that such disability prevents performance of the work involved; (2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission; (3) the Contractor agrees to provide each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which the Contractor has a contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Contractor's commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Contractor

agrees to comply with each provision of this Section and Connecticut General Statutes §§ 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes §§ 46a-56, 46a-68e and 46a-68f; and (5) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor as relate to the provisions of this Section and Connecticut General Statutes § 46a-56. If the contract is a public works contract, the Contractor agrees and warrants that he will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works projects.

(c) Determination of the Contractor's good faith efforts shall include, but shall not be limited to, the following factors: The Contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.

(d) The Contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission, of its good faith efforts.

(e) The Contractor shall include the provisions of subsection (b) of this Section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes §46a-56; provided if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

(f) The Contractor agrees to comply with the regulations referred to in this Section as they exist on the date of this Contract and as they may be adopted or amended from time to time during the term of this Contract and any amendments thereto.

(g) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) the Contractor agrees to provide each labor union or representative of workers with which such Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such Contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) the Contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes § 46a-56; and (4) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor which relate to the provisions of this Section and Connecticut General Statutes § 46a-56.

(h) The Contractor shall include the provisions of the foregoing paragraph in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such

provisions including sanctions for noncompliance in accordance with Connecticut General Statutes § 46a-56; provided, if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

Please be aware the Nondiscrimination Certifications can be found at the Office of Policy and Management website:

https://portal.ct.gov/OPM/Fin-PSA/Forms/Nondiscrimination-Certification

9. Whistleblower Provision

The following clause is applicable if the Contract has a value of Five Million Dollars ($5,000,000) or more.

Whistleblowing. This Contract may be subject to the provisions of Section 4-61dd of the Connecticut General Statutes. In accordance with this statute, if an officer, employee or appointing authority of the Contractor takes or threatens to take any personnel action against any employee of the Contractor in retaliation for such employee's disclosure of information to any employee of the contracting state or quasi-public agency or the Auditors of Public Accounts or the Attorney General under the provisions of subsection (a) of such statute, the Contractor shall be liable for a civil penalty of not more than five thousand dollars for each offense, up to a maximum of twenty per cent of the value of this Contract. Each violation shall be a separate and distinct offense and in the case of a continuing violation, each calendar day's continuance of the violation shall be deemed to be a separate and distinct offense. The State may request that the Attorney General bring a civil action in the Superior Court for the Judicial District of Hartford to seek imposition and recovery of such civil penalty. In accordance with subsection (f) of such statute, each large state contractor, as defined in the statute, shall post a notice of the provisions of the statute relating to large state contractors in a conspicuous place which is readily available for viewing by the employees of the Contractor.

10. Connecticut Freedom of Information Act

(a) Disclosure of Records. This Contract may be subject to the provisions of section 1-218 of the Connecticut General Statutes. In accordance with this statute, each contract in excess of two million five hundred thousand dollars between a public agency and a person for the performance of a governmental function shall (a) provide that the public agency is entitled to receive a copy of records and files related to the performance of the governmental function, and (b) indicate that such records and files are subject to FOIA and may be disclosed by the public agency pursuant to FOIA. No request to inspect or copy such records or files shall be valid unless the request is made to the public agency in accordance with FOIA. Any complaint by a person who is denied the right to inspect or copy such records or files shall be brought to the Freedom of Information Commission in accordance with the provisions of sections 1-205 and 1-206 of the Connecticut General Statutes.

(b) Confidential Information. The State will afford due regard to the Contractor's request for the protection of proprietary or confidential information which the State receives from the Contractor. However, all materials associated with the Contract are subject to the terms of the FOIA and all corresponding rules, regulations and interpretations. In making such a request, the Contractor may not merely state generally that the materials are proprietary or confidential in nature and not, therefore, subject to release to third parties. Those particular sentences, paragraphs, pages or sections that the Contractor believes are exempt from disclosure under the FOIA must be specifically identified as such. Convincing explanation and rationale sufficient to justify each exemption consistent with the FOIA must

accompany the request. The rationale and explanation must be stated in terms of the prospective harm to the competitive position of the Contractor that would result if the identified material were to be released and the reasons why the materials are legally exempt from release pursuant to the FOIA. To the extent that any other provision or part of the Contract conflicts or is in any way inconsistent with this section, this section controls and shall apply and the conflicting provision or part shall not be given effect. If the Contractor indicates that certain documentation is submitted in confidence, by specifically and clearly marking the documentation as "CONFIDENTIAL," DOT will first review the Contractor's claim for consistency with the FOIA (that is, review that the documentation is actually a trade secret or commercial or financial information and not required by statute), and if determined to be consistent, will endeavor to keep such information confidential to the extent permitted by law. See, *e.g.*, Conn. Gen. Stat. §1-210(b)(5)(A-B). The State, however, has no obligation to initiate, prosecute or defend any legal proceeding or to seek a protective order or other similar relief to prevent disclosure of any information that is sought pursuant to a FOIA request. Should the State withhold such documentation from a Freedom of Information requester and a complaint be brought to the Freedom of Information Commission, the Contractor shall have the burden of cooperating with DOT in defense of that action and in terms of establishing the availability of any FOIA exemption in any proceeding where it is an issue. In no event shall the State have any liability for the disclosure of any documents or information in its possession which the State believes are required to be disclosed pursuant to the FOIA or other law.

11. Service of Process

The Contractor, if not a resident of the State of Connecticut, or, in the case of a partnership, the partners, if not residents, hereby appoints the Secretary of State of the State of Connecticut, and his successors in office, as agent for service of process for any action arising out of or as a result of this Contract; such appointment to be in effect throughout the life of this Contract and six (6) years thereafter.

12. Substitution of Securities for Retainages on State Contracts and Subcontracts

This Contract is subject to the provisions of Section 3-ll2a of the General Statutes of the State of Connecticut, as revised.

13. Health Insurance Portability and Accountability Act of 1996 (HIPAA)

The Contractor shall comply, if applicable, with the Health Insurance Portability and Accountability Act of 1996 and, pursuant thereto, the provisions attached at Exhibit C, and hereby made part of this Contract.

14. Forum and Choice of Law

Forum and Choice of Law. The parties deem the Contract to have been made in the City of Hartford, State of Connecticut. Both parties agree that it is fair and reasonable for the validity and construction of the Contract to be, and it shall be, governed by the laws and court decisions of the State of Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by Federal law or the laws of the State of Connecticut do not bar an action against the State, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be

transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Contractor waives any objection which it may now have or will have to the laying of venue of any Claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

15. Summary of State Ethics Laws

Pursuant to the requirements of section 1-101qq of the Connecticut General Statutes, the summary of State ethics laws developed by the State Ethics Commission pursuant to section 1-81b of the Connecticut General Statutes is incorporated by reference into and made a part of the Contract as if the summary had been fully set forth in the Contract.

16. Audit and Inspection of Plants, Places of Business and Records

(a) The State and its agents, including, but not limited to, the Connecticut Auditors of Public Accounts, Attorney General and State's Attorney and their respective agents, may, at reasonable hours, inspect and examine all of the parts of the Contractor's and Contractor Parties' plants and places of business which, in any way, are related to, or involved in, the performance of this Contract. For the purposes of this Section, "Contractor Parties" means the Contractor's members, directors, officers, shareholders, partners, managers, principal officers, representatives, agents, servants, consultants, employees or any one of them or any other person or entity with whom the Contractor is in privity of oral or written contract and the Contractor intends for such other person or entity to Perform under the Contract in any capacity.

(b) The Contractor shall maintain, and shall require each of the Contractor Parties to maintain, accurate and complete Records. The Contractor shall make all of its and the Contractor Parties' Records available at all reasonable hours for audit and inspection by the State and its agents.

(c) The State shall make all requests for any audit or inspection in writing and shall provide the Contractor with at least twenty-four (24) hours' notice prior to the requested audit and inspection date. If the State suspects fraud or other abuse, or in the event of an emergency, the State is not obligated to provide any prior notice.

(d) The Contractor shall keep and preserve or cause to be kept and preserved all of its and Contractor Parties' Records until three (3) years after the latter of (i) final payment under this Agreement, or (ii) the expiration or earlier termination of this Agreement, as the same may be modified for any reason. The State may request an audit or inspection at any time during this period. If any Claim or audit is started before the expiration of this period, the Contractor shall retain or cause to be retained all Records until all Claims or audit findings have been resolved.

(e) The Contractor shall cooperate fully with the State and its agents in connection with an audit or inspection. Following any audit or inspection, the State may conduct and the Contractor shall cooperate with an exit conference.

(f) The Contractor shall incorporate this entire Section verbatim into any contract or other agreement that it enters into with any Contractor Party.

17. Campaign Contribution Restriction

For all State contracts, defined in Conn. Gen. Stat. §9-612(f)(1) as having a value in a calendar year of $50,000 or more, or a combination or series of such agreements or contracts having a value of $100,000 or more, the authorized signatory to this contract expressly acknowledges receipt of the State Elections Enforcement Commission's notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice, as set forth in "Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations," a copy of which is attached hereto and hereby made a part of this contract, attached as Exhibit D.

18. Tangible Personal Property

(a) The Contractor on its behalf and on behalf of its Affiliates, as defined below, shall comply with the provisions of Conn. Gen. Stat. §12-411b, as follows:

(1) For the term of the Contract, the Contractor and its Affiliates shall collect and remit to the State of Connecticut, Department of Revenue Services, any Connecticut use tax due under the provisions of Chapter 219 of the Connecticut General Statutes for items of tangible personal property sold by the Contractor or by any of its Affiliates in the same manner as if the Contractor and such Affiliates were engaged in the business of selling tangible personal property for use in Connecticut and had sufficient nexus under the provisions of Chapter 219 to be required to collect Connecticut use tax;
(2) A customer's payment of a use tax to the Contractor or its Affiliates relieves the customer of liability for the use tax;
(3) The Contractor and its Affiliates shall remit all use taxes they collect from customers on or before the due date specified in the Contract, which may not be later than the last day of the month next succeeding the end of a calendar quarter or other tax collection period during which the tax was collected;
(4) The Contractor and its Affiliates are not liable for use tax billed by them but not paid to them by a customer; and
(5) Any Contractor or Affiliate who fails to remit use taxes collected on behalf of its customers by the due date specified in the Contract shall be subject to the interest and penalties provided for persons required to collect sales tax under chapter 219 of the general statutes.

(b) For purposes of this section of the Contract, the word "Affiliate" means any person, as defined in section 12-1 of the general statutes, that controls, is controlled by, or is under common control with another person. A person controls another person if the person owns, directly or indirectly, more than ten per cent of the voting securities of the other person. The word "voting security" means a security that confers upon the holder the right to vote for the election of members of the board of directors or similar governing body of the business, or that is convertible into, or entitles the holder to receive, upon its exercise, a security that confers such a right to vote. "Voting security" includes a general partnership interest.

(c) The Contractor represents and warrants that each of its Affiliates has vested in the Contractor plenary authority to so bind the Affiliates in any agreement with the State of Connecticut. The Contractor on its own behalf and on behalf of its Affiliates shall also provide, no later than 30 days after receiving a request by the State's contracting authority, such information as the State may require to ensure, in the State's sole determination, compliance with the provisions of Chapter 219 of the Connecticut General Statutes, including, but not limited to, §12-411b.

19. Bid Rigging and/or Fraud – Notice to Contractor

The Connecticut Department of Transportation is cooperating with the U.S. Department of Transportation and the Justice Department in their investigation into highway construction contract bid rigging and/or fraud.

A toll-free "HOT LINE" telephone number 800-424-9071 has been established to receive information from contractors, subcontractors, manufacturers, suppliers or anyone with knowledge of bid rigging and/or fraud, either past or current. The "HOT LINE" telephone number will be available during normal working hours (8:00 am – 5:00 pm EST). Information will be treated confidentially and anonymity respected.

20. Consulting Agreement Affidavit

The Contractor shall comply with Connecticut General Statutes Section 4a-81(a) and 4a-81(b), as revised. Pursuant to Public Act 11-229, after the initial submission of the form, if there is a change in

the information contained in the form, a contractor shall submit the updated form, as applicable, either (i) not later than thirty (30) days after the effective date of such change or (ii) prior to execution of any new contract, whichever is earlier.

The Affidavit/Form may be submitted in written format or electronic format through the Department of Administrative Services (DAS) website.

EXHIBIT A

TITLE VI CONTRACTOR ASSURANCES

During the performance of this Contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

1. **Compliance with Regulations:** The Contractor shall comply with the regulations relative to nondiscrimination in federally assisted programs of the United States Department of Transportation (hereinafter, "USDOT"), Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the "Regulations"), which are herein incorporated by reference and made a part of this contract.

2. **Nondiscrimination:** The Contractor, with regard to the work performed by it during the Contract, shall not discriminate on the grounds of race, color, national origin, sex, age, or disability in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by Subsection 5 of the Regulations, including employment practices when the Contract covers a program set forth in Appendix B of the Regulations.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:**
In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, national origin, sex, age, or disability.

4. **Information and Reports:** The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Connecticut Department of Transportation (ConnDOT) or the Funding Agency (FHWA, FTA and FAA) to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to ConnDOT or the Funding Agency, as appropriate, and shall set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the ConnDOT shall impose such sanctions as it or the Funding Agency may determine to be appropriate, including, but not limited to:

A. Withholding contract payments until the Contractor is in-compliance; and/or
B. Cancellation, termination, or suspension of the Contract, in whole or in part.

6. **Incorporation of Provisions:** The Contractor shall include the provisions of paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as the ConnDOT or the Funding Agency may -direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the ConnDOT to enter into such litigation to protect the interests of the Funding Agency, and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States

EXHIBIT B

CONTRACTOR WORKFORCE UTILIZATION / EQUAL EMPLOYMENT OPPORTUNITY

1. **Project Workforce Utilization Goals:**
These goals are applicable to all the Contractor's construction work (whether or not it is Federal or Federally assisted or funded) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where the work is actually performed.

Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications which contain the applicable goals for minority and female participation.

The goals for minority and female utilization are expressed in percentage terms for the contractor's aggregate work-force in each trade on all construction work in the covered area, are referenced in the Appendix A below.

STATE FUNDED PROJECTS (only)
APPENDIX A
(Labor Market Goals)

LABOR MARKET AREA GOAL			***Minority***
Female			
Bridgeport			**22.7%**
1.4%			
Ansonia	Beacon Falls	Bridgeport	Derby
Easton	Fairfield	Milford	Monroe
Oxford	Seymour	Shelton	Stratford
Trumbull			
Danbury			**10.7%**
3.8%			
Bethel	Bridgewater	Brookfield	Danbury
Kent	New Fairfield	New Milford	Newtown
Redding	Ridgefield	Roxbury	Sherman
Washington			
Danielson			**4.3%**
1.8%			
Brooklyn	Eastford	Hampton	Killingly
Pomfret	Putnam	Scotland	Sterling
Thompson	Voluntown	Union	Woodstock
Hartford			**13.7%**
2.1%			
Andover	Ashford	Avon	Barkhamsted

Belin	Bloomfield	Bolton	Bristol
Burlington	Canton	Chaplin	Colchester
Columbia	Coventry	Cromwell	Durham
East Granby	East Haddam	East Hampton	East Hartford
East Windsor	Ellington	Enfield	Farmington
Glastonbury	Granby	Haddam	Hartford
Harwinton	Hebron	Lebanon	Manchester
Mansfield	Marlborough	Middlefield	Middletown
Newington	Plainville	Plymouth	Portland
Rocky Hill	Simsbury	Somers	South Windsor
Southington	Stafford	Suffield	Tolland
Vernon	West Hartford	Wethersfield	Willington
Winchester	Windham	Windsor	Windsor Locks

Lower River 1.8%				**4.3%**
Chester	Deep River	Essex	Old Lyme	
Westbrook				

LABOR MARKET AREA GOAL ***Minority***
Female

New Haven 3.1%				**17.9%**
Bethany	Branford	Cheshire	Clinton	
East Haven	Guilford	Hamden	Killingworth	
Madison	Meriden	New Haven	North Branford	
North Haven	Orange	Wallingford	West Haven	
Woodbridge				

New London 3.1%				**7.4%**
Bozrah	Canterbury	East Lyme	Franklin	
Griswold	Groton	Ledyard	Lisbon	
Montville	New London	North Stonington	Norwich	
Old Lyme	Old Saybrook	Plainfield	Preston	
Salem	Sprague	Stonington	Waterford	
Hopkinton	RI – Westerly Rhode Island			

Stamford 2.1%				**33.2%**
Darien	Greenwich	New Canaan	Norwalk	
Stamford	Weston	Westport	Wilton	

Torrington 1.8%				**4.3%**
Canaan	Colebrook	Cornwall	Goshen	
Hartland	Kent	Litchfield	Morris	
Norfolk	North Canaan	Salisbury	Sharon	

Torrington	Warren		

Waterbury				**12.4%**
1.6%				
Bethlehem	Middlebury	Naugatuck	Prospect	
Southbury	Thomaston	Waterbury	Watertown	
Wolcott	Woodbury			

Rev. 4/24/2019

EXHIBIT C

Health Insurance Portability and Accountability Act of 1996 ("HIPAA").

(a) If the Contactor is a Business Associate under the requirements of the Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), the Contractor must comply with all terms and conditions of this Section of the Contract. If the Contractor is not a Business Associate under HIPAA, this Section of the Contract does not apply to the Contractor for this Contract.

(b) The Contractor is required to safeguard the use, publication and disclosure of information on all applicants for, and all clients who receive, services under the Contract in accordance with all applicable federal and state law regarding confidentiality, which includes but is not limited to HIPAA, more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E; and

(c) The State of Connecticut Agency named on page 1 of this Contract (hereinafter the "Department") is a "covered entity" as that term is defined in 45 C.F.R. § 160.103; and

(d) The Contractor, on behalf of the Department, performs functions that involve the use or disclosure of "individually identifiable health information," as that term is defined in 45 C.F.R. § 160.103; and

(e) The Contractor is a "business associate" of the Department, as that term is defined in 45 C.F.R. § 160.103; and

(f) The Contractor and the Department agree to the following in order to secure compliance with the HIPAA, the requirements of Subtitle D of the Health Information Technology for Economic and Clinical Health Act (hereinafter the HITECH Act), (Pub. L. 111-5, sections 13400 to 13423), and more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E.

(g) Definitions

(1) "Breach shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(1))

(2) "Business Associate" shall mean the Contractor.

(3) "Covered Entity" shall mean the Department of the State of Connecticut named on page 1 of this Contract.

(4) "Designated Record Set" shall have the same meaning as the term "designated record set" in 45 C.F.R. § 164.501.

(5) "Electronic Health Record" shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(5))

(6) "Individual" shall have the same meaning as the term "individual"' in 45 C.F.R. § 160.103 and shall include a person who qualifies as a personal representative as defined in 45 C.F.R. § 164.502(g).

(7) "Privacy Rule" shall mean the Standards for Privacy of Individually Identifiable Health Information at 45 C.F.R. part 160 and parts 164, subparts A and E.

(8) "Protected Health Information" or "PHI" shall have the same meaning as the term "protected health information" in 45 C.F.R. § 160.103, limited to information created or received by the Business Associate from or on behalf of the Covered Entity.

(9) "Required by Law"' shall have the same meaning as the term "required by law" in 45 C.F.R. § 164.103.

(10) "Secretary" shall mean the Secretary of the Department of Health and Human Services or his designee.

(11) "More stringent" shall have the same meaning as the term "more stringent" in 45 C.F.R. § 160.202.

(12) "This Section of the Contract" refers to the HIPAA Provisions stated herein, in their entirety.

(13) "Security Incident" shall have the same meaning as the term "security incident" in 45 C.F.R.§ 164.304.

(14) "Security Rule" shall mean the Security Standards for the Protection of Electronic Protected Health Information at 45 C.F.R. part 160 and parts 164, subpart A and C.

(15) "Unsecured protected health information" shall have the same meaning as the term as defined in section 13402(h)(1)(A) of HITECH. Act. (42 U.S.C. §17932(h)(1)(A)).

(h) Obligations and Activities of Business Associates.

(1) Business Associate agrees not to use or disclose PHI other than as permitted or required by this Section of the Contract or as Required by Law.

(2) Business Associate agrees to use appropriate safeguards to prevent use or disclosure of PHI other than as provided for in this Section of the Contract.

(3) Business Associate agrees to use administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of electronic protected health information that it creates, receives, maintains, or transmits on behalf of the Covered Entity.

(4) Business Associate agrees to mitigate, to the extent practicable, any harmful effect that is known to the Business Associate of a use or disclosure of PHI by Business Associate in violation of this Section of the Contract.

(5) Business Associate agrees to report to Covered Entity any use or disclosure of PHI not provided for by this Section of the Contract or any security incident of which it becomes aware.

(6) Business Associate agrees to insure that any agent, including a subcontractor, to whom it provides PHI received from, or created or received by Business Associate, on behalf of the Covered Entity, agrees to the same restrictions and conditions that apply through this Section of the Contract to Business Associate with respect to such information.

(7) Business Associate agrees to provide access, at the request of the Covered Entity, and in the time and manner agreed to by the parties, to PHI in a Designated Record Set, to Covered Entity or, as directed by Covered Entity, to an Individual in order to meet the requirements under 45 C.F.R. § 164.524.

(8) Business Associate agrees to make any amendments to PHI in a Designated Record Set that the Covered Entity directs or agrees to pursuant to 45 C.F.R. § 164.526 at the request of the Covered Entity, and in the time and manner agreed to by the parties.

(9) Business Associate agrees to make internal practices, books, and records, including policies and procedures and PHI, relating to the use and disclosure of PHI received from, or created or received by, Business Associate on behalf of Covered Entity, available to Covered Entity or to the Secretary in a time and manner agreed to by the parties or designated by the Secretary, for purposes of the Secretary determining Covered Entity's compliance with the Privacy Rule.

(10) Business Associate agrees to document such disclosures of PHI and information related to such disclosures as would be required for Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.

(11) Business Associate agrees to provide to Covered Entity, in a time and manner agreed to by the parties, information collected in accordance with clause h. (10) of this Section of the Contract, to permit Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder. Business Associate agrees at the Covered Entity's direction to provide an accounting of disclosures of PHI directly to an individual in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.

(12) Business Associate agrees to comply with any state or federal law that is more stringent than the Privacy Rule.

(13) Business Associate agrees to comply with the requirements of the HITECH Act relating to privacy and security that are applicable to the Covered Entity and with the requirements of 45 C.F.R. sections 164.504(e), 164.308, 164.310, 164.312, and 164.316.

(14) In the event that an individual requests that the Business Associate (a) restrict disclosures of PHI; (b) provide an accounting of disclosures of the individual's PHI; or (c) provide a copy of the individual's PHI in an electronic health record, the Business Associate agrees to notify the covered entity, in writing, within two business days of the request.

(15) Business Associate agrees that it shall not, directly or indirectly, receive any remuneration in exchange for PHI of an individual without (1) the written approval of the covered entity, unless receipt of remuneration in exchange for PHI is expressly authorized by this Contract and (2) the valid authorization of the individual, except for the purposes provided under section 13405(d)(2) of the HITECH Act,(42 U.S.C. § 17935(d)(2)) and in any accompanying regulations

(16) Obligations in the Event of a Breach

A. The Business Associate agrees that, following the discovery of a breach of unsecured protected health information, it shall notify the Covered Entity of such breach in accordance with the requirements of section 13402 of HITECH (42 U.S.C. 17932(b) and the provisions of this Section of the Contract.
B. Such notification shall be provided by the Business Associate to the Covered Entity without unreasonable delay, and in no case later than 30 days after the breach is discovered by the Business Associate, except as otherwise instructed in writing by a law enforcement official pursuant to section 13402 (g) of HITECH (42 U.S.C. 17932(g)) . A breach is considered discovered as of the first day on which it is, or reasonably should have been, known to the Business Associate. The notification shall include the identification and last known address, phone number and email address of each individual (or the next of kin of the individual if the individual is deceased) whose unsecured protected health information has been, or is reasonably believed by the Business Associate to have been, accessed, acquired, or disclosed during such breach.
C. The Business Associate agrees to include in the notification to the Covered Entity at least the following information:
    1. A brief description of what happened, including the date of the breach and the date of the discovery of the breach, if known.

    2. A description of the types of unsecured protected health information that were involved in the breach (such as full name, Social Security number, date of birth, home address, account number, or disability code).

    3. The steps the Business Associate recommends that individuals take to protect themselves from potential harm resulting from the breach.

    4. A detailed description of what the Business Associate is doing to investigate the breach, to mitigate losses, and to protect against any further breaches.

    5. Whether a law enforcement official has advised either verbally or in writing the Business Associate that he or she has determined that notification or notice to

individuals or the posting required under section 13402 of the HITECH Act would impede a criminal investigation or cause damage to national security and; if so, include contact information for said official.

D. Business Associate agrees to provide appropriate staffing and have established procedures to ensure that individuals informed by the Covered Entity of a breach by the Business Associate have the opportunity to ask questions and contact the Business Associate for additional information regarding the breach. Such procedures shall include a toll-free telephone number, an e-mail address, a posting on its Web site and a postal address. Business Associate agrees to include in the notification of a breach by the Business Associate to the Covered Entity, a written description of the procedures that have been established to meet these requirements. Costs of such contact procedures will be borne by the Contractor.

E. Business Associate agrees that, in the event of a breach, it has the burden to demonstrate that it has complied with all notifications requirements set forth above, including evidence demonstrating the necessity of a delay in notification to the Covered Entity.

(i) Permitted Uses and Disclosure by Business Associate.

(1) General Use and Disclosure Provisions Except as otherwise limited in this Section of the Contract, Business Associate may use or disclose PHI to perform functions, activities, or services for, or on behalf of, Covered Entity as specified in this Contract, provided that such use or disclosure would not violate the Privacy Rule if done by Covered Entity or the minimum necessary policies and procedures of the Covered Entity.

(2) Specific Use and Disclosure Provisions

(A) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI for the proper management and administration of Business Associate or to carry out the legal responsibilities of Business Associate.

(B) Except as otherwise limited in this Section of the Contract, Business Associate may disclose PHI for the proper management and administration of Business Associate, provided that disclosures are Required by Law, or Business Associate obtains reasonable assurances from the person to whom the information is disclosed that it will remain confidential and used or further disclosed only as Required by Law or for the purpose for which it was disclosed to the person, and the person notifies Business Associate of any instances of which it is aware in which the confidentiality of the information has been breached.

(C) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI to provide Data Aggregation services to Covered Entity as permitted by 45 C.F.R. § 164.504(e)(2)(i)(B).

(j) Obligations of Covered Entity.

(1) Covered Entity shall notify Business Associate of any limitations in its notice of privacy practices of Covered Entity, in accordance with 45 C.F.R. § 164.520, or to the extent that such limitation may affect Business Associate's use or disclosure of PHI.

(2) Covered Entity shall notify Business Associate of any changes in, or revocation of, permission by Individual to use or disclose PHI, to the extent that such changes may affect Business Associate's use or disclosure of PHI.

(3) Covered Entity shall notify Business Associate of any restriction to the use or disclosure of PHI that Covered Entity has agreed to in accordance with 45 C.F.R. § 164.522, to the extent that such restriction may affect Business Associate's use or disclosure of PHI.

(k) Permissible Requests by Covered Entity. Covered Entity shall not request Business Associate to use or disclose PHI in any manner that would not be permissible under the Privacy Rule if done by the Covered Entity, except that Business Associate may use and disclose PHI for data aggregation, and management and administrative activities of Business Associate, as permitted under this Section of the Contract.

(l) Term and Termination.

(1) Term. The Term of this Section of the Contract shall be effective as of the date the Contract is effective and shall terminate when the information collected in accordance with clause h. (10) of this Section of the Contract is provided to the Covered Entity and all of the PHI provided by Covered Entity to Business Associate, or created or received by Business Associate on behalf of Covered Entity, is destroyed or returned to Covered Entity, or, if it is infeasible to return or destroy PHI, protections are extended to such information, in accordance with the termination provisions in this Section.

(2) Termination for Cause Upon Covered Entity's knowledge of a material breach by Business Associate, Covered Entity shall either:

(A) Provide an opportunity for Business Associate to cure the breach or end the violation and terminate the Contract if Business Associate does not cure the breach or end the violation within the time specified by the Covered Entity; or

(B) Immediately terminate the Contract if Business Associate has breached a material term of this Section of the Contract and cure is not possible; or

(C) If neither termination nor cure is feasible, Covered Entity shall report the violation to the Secretary.

(3) Effect of Termination

(A) Except as provided in (l)(2) of this Section of the Contract, upon termination of this Contract, for any reason, Business Associate shall return or destroy all PHI received from Covered Entity, or created or received by Business Associate on behalf of Covered Entity. Business Associate shall also provide the information collected in accordance with clause h. (10) of this Section of the Contract to the Covered Entity

within ten business days of the notice of termination. This provision shall apply to PHI that is in the possession of subcontractors or agents of Business Associate. Business Associate shall retain no copies of the PHI.

(B) In the event that Business Associate determines that returning or destroying the PHI is infeasible, Business Associate shall provide to Covered Entity notification of the conditions that make return or destruction infeasible. Upon documentation by Business Associate that return or destruction of PHI is infeasible, Business Associate shall extend the protections of this Section of the Contract to such PHI and limit further uses and disclosures of PHI to those purposes that make return or destruction infeasible, for as long as Business Associate maintains such PHI. Infeasibility of the return or destruction of PHI includes, but is not limited to, requirements under state or federal law that the Business Associate maintains or preserves the PHI or copies thereof.

(m) Miscellaneous Provisions.

(1) Regulatory References. A reference in this Section of the Contract to a section in the Privacy Rule means the section as in effect or as amended.

(2) Amendment. The Parties agree to take such action as in necessary to amend this Section of the Contract from time to time as is necessary for Covered Entity to comply with requirements of the Privacy Rule and the Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191.

(3) Survival. The respective rights and obligations of Business Associate shall survive the termination of this Contract.

(4) Effect on Contract. Except as specifically required to implement the purposes of this Section of the Contract, all other terms of the Contract shall remain in force and effect.

(5) Construction. This Section of the Contract shall be construed as broadly as necessary to implement and comply with the Privacy Standard. Any ambiguity in this Section of the Contract shall be resolved in favor of a meaning that complies, and is consistent with, the Privacy Standard.

(6) Disclaimer. Covered Entity makes no warranty or representation that compliance with this Section of the Contract will be adequate or satisfactory for Business Associate's own purposes. Covered Entity shall not be liable to Business Associate for any claim, civil or criminal penalty, loss or damage related to or arising from the unauthorized use or disclosure of PHI by Business Associate or any of its officers, directors, employees, contractors or agents, or any third party to whom Business Associate has disclosed PHI contrary to the provisions of this Contract or applicable law. Business Associate is solely responsible for all decisions made, and actions taken, by Business Associate regarding the safeguarding, use and disclosure of PHI within its possession, custody or control.

(7) Indemnification. The Business Associate shall indemnify and hold the Covered Entity harmless from and against any and all claims, liabilities, judgments, fines, assessments, penalties, awards and any statutory damages that may be imposed or assessed pursuant to HIPAA, as amended or the

HITECH Act, including, without limitation, attorney's fees, expert witness fees, costs of investigation, litigation or dispute resolution, and costs awarded thereunder, relating to or arising out of any violation by the Business Associate and its agents, including subcontractors, of any obligation of Business Associate and its agents, including subcontractors, under this section of the contract, under HIPAA, the HITECH Act, the Privacy Rule and the Security Rule.

CONNECTICUT STATE ELECTIONS ENFORCEMENT COMMISSION **EXHIBIT D**

Rev. 1/11
Page 1 of 2

Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations

This notice is provided under the authority of Connecticut General Statutes §9-612(g)(2), as amended by P.A. 10-1, and is for the purpose of informing state contractors and prospective state contractors of the following law (italicized words are defined on the reverse side of this page).

CAMPAIGN CONTRIBUTION AND SOLICITATION LIMITATIONS

No *state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor*, with regard to a *state contract* or *state contract solicitation* with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee (which includes town committees).

In addition, no holder or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of State senator or State representative, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

On and after January 1, 2011, no state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor, with regard to a state contract or state contract solicitation with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall **knowingly** *solicit* contributions from the state contractor's or prospective state contractor's employees or from a *subcontractor* or *principals of the subcontractor* on behalf of (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

DUTY TO INFORM

State contractors and prospective state contractors are required to inform their principals of the above prohibitions, as applicable, and the possible penalties and other consequences of any violation thereof.

PENALTIES FOR VIOLATIONS

Contributions or solicitations of contributions made in violation of the above prohibitions may result in the following civil and criminal penalties:

Civil penalties—Up to $2,000 or twice the amount of the prohibited contribution, whichever is greater, against a principal or a contractor. Any state contractor or prospective state contractor which fails to make reasonable efforts to comply with the provisions requiring notice to its principals of these prohibitions and the possible consequences of their violations may also be subject to civil penalties of up to $2,000 or twice the amount of the prohibited contributions made by their principals.

Criminal penalties—Any knowing and willful violation of the prohibition is a Class D felony, which may subject the violator to imprisonment of not more than 5 years, or not more than $5,000 in fines, or both.

CONTRACT CONSEQUENCES

In the case of a state contractor, contributions made or solicited in violation of the above prohibitions may resulting the contract being voided.

In the case of a prospective state contractor, contributions made or solicited in violation of the above prohibitions shall result in the contract described in the state contract solicitation not being awarded to the prospective state contractor, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

The State shall not award any other state contract to anyone found in violation of the above prohibitions for a period of one year after the election for which such contribution is made or solicited, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.
Additional information may be found on the website of the State Elections Enforcement Commission, www.ct.gov/seec. Click on the link to “Lobbyist/Contractor Limitations.”

DEFINITIONS

"State contractor" means a person, business entity or nonprofit organization that enters into a state contract. Such person, business entity or nonprofit organization shall be deemed to be a state contractor until December thirty-first of the year in which such contract terminates. "State contractor" does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person's capacity as a state or quasi-public agency employee.

"Prospective state contractor" means a person, business entity or nonprofit organization that (i) submits a response to a state contract solicitation by the state, a state agency or a quasi-public agency, or a proposal in response to a request for proposals by the state, a state agency or a quasi-public agency, until the contract has been entered into, or (ii) holds a valid prequalification certificate issued by the Commissioner of Administrative Services under section 4a-100. "Prospective state contractor" does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person's capacity as a state or quasi-public agency employee.

"Principal of a state contractor or prospective state contractor" means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a state contractor or prospective state contractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization**,** (ii) an individual who is employed by a state contractor or prospective state contractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a state contractor or prospective state contractor, which is not a business entity, or if a state contractor or prospective state contractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any state contractor or prospective state contractor who has *managerial or discretionary responsibilities with respect to a state contract*, (v) the spouse or a *dependent child* who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the state contractor or prospective state contractor.

"State contract" means an agreement or contract with the state or any state agency or any quasi-public agency, let through a procurement process or otherwise, having a value of fifty thousand dollars or more, or a combination or series of such agreements or contracts having a value of one hundred thousand dollars or more in a calendar year, for (i) the rendition of services, (ii) the furnishing of any goods, material, supplies, equipment or any items of any kind, (iii) the construction, alteration or repair of any public building or public work, (iv) the acquisition, sale or lease of any land or building, (v) a licensing arrangement, or (vi) a grant, loan or loan guarantee. "State contract" does not include any agreement or contract with the state, any state agency or any quasi-public agency that is exclusively federally funded, an education loan, a loan to an individual for other than commercial purposes or any agreement or contract between the state or any state agency and the United States Department of the Navy or the United States Department of Defense.

"State contract solicitation" means a request by a state agency or quasi-public agency, in whatever form issued, including, but not limited to, an invitation to bid, request for proposals, request for information or request for quotes, inviting bids, quotes or other types of submittals, through a competitive procurement process or another process authorized by law waiving competitive procurement.

"Managerial or discretionary responsibilities with respect to a state contract" means having direct, extensive and substantive responsibilities with respect to the negotiation of the state contract and not peripheral, clerical or ministerial responsibilities.

"Dependent child" means a child residing in an individual's household who may legally be claimed as a dependent on the federal income tax of such individual.

"Solicit" means (A) requesting that a contribution be made, (B) participating in any fund-raising activities for a candidate committee, exploratory committee, political committee or party committee, including, but not limited to, forwarding tickets to potential contributors, receiving contributions for transmission to any such committee or bundling contributions, (C) serving as chairperson, treasurer or deputy treasurer of any such committee, or (D) establishing a political committee for the sole purpose of soliciting or receiving contributions for any committee. Solicit does not include: (i) making a contribution that is otherwise permitted by Chapter 155 of the Connecticut General Statutes; (ii) informing any person of a position taken by a candidate for public office or a public official, (iii) notifying the person of any activities of, or contact information for, any candidate for public office; or (iv) serving as a member in any party committee or as an officer of such committee that is not otherwise prohibited in this section.

"Subcontractor" means any person, business entity or nonprofit organization that contracts to perform part or all of the obligations of a state contractor's state contract. Such person, business entity or nonprofit organization shall be deemed to be a subcontractor until December thirty first of the year in which the subcontract terminates. "Subcontractor" does not include (i) a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or (ii) an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person's capacity as a state or quasi-public agency employee.

"Principal of a subcontractor" means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a subcontractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a subcontractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a subcontractor, which is not a business entity, or if a subcontractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any subcontractor who has managerial or discretionary responsibilities with respect to a subcontract with a state contractor, (v) the spouse or a dependent child who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the subcontractor.

EXHIBIT E

(state wages will be inserted here)

CONTRACTOR'S PROPOSED PROGRESS CHART – HIGHWAY CONSTRUCTION BAR CHART

Project Number(s): _____ Town(s) of: _____

Date Submitted: _____ Description: _____

Operation	Quantity	Duration
Organization		
Clearing & Grubbing		
Earth Excavation		
Rock Excavation		
Channel Excavation		
Borrow		
Drainage (Trench, Pipe)		
Pile Driving		
Footing		
Abutments & Wings		
Steel Erection		
Floor Slabs		
Concrete Pavement		
Bit. Conc. Pavement		
Bridge Railing		
Curbing		
Sidewalk		
Fencing		
Electrical Work		
Traffic Items		
Misc. & Clean up		

Calendar Days

Equipment to expect to use:

_____

_____

_____

_____

Total Calendar Days: _____

Signed By: _____

1/95

ANTICIPATED SOURCE OF MATERIAL

REV. 8/98
PRINTED ON RECYCLED PAPER

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
P.O. BOX 317546
NEWINGTON, CT 06111-7546

PROJECT NUMBER	
TOWN	

MATERIALS	SOURCE OF SUPPLY AND MAILING ADDRESS PG. 1 of 2
AGGREGATES:	
Coarse	
Fine	
BITUMINOUS CONCRETE	
BITUMEN:	
Asphalt Cement	
Asphalt Cutbacks	
Emulsion	
Tar	
BRICK	
CEMENT - PORTLAND	
Type I	
Type II	
Type 1A	
Type IIA	
TYPE OF DELIVERY:	
Truck	
R.R. Car	
CONCRETE BLOCKS	
CONCRETE, PORTLAND CEMENT	
CURING MATERIAL:	
Mats	
Paper	
Compound	
Other	
DAMPPROOFING and/or WATERPROOFING:	
Primer	
Seal	
Fabric	
FENCE:	
Property or Wire	
Posts: Steel	
Wood	
Chain Link	
Fittings for Chain Link	
GRAVEL	
GUIDE RAIL:	
Wire Rope	
Fittings	
Posts:	
Metal	
Wood	
JOINT FILLER	
JOINT SEALER	
LOAD TRANSFER UNIT	
METAL FLASHING	
METAL BEAM TYPE RAIL (BRIDGE)	
METAL BEAM TYPE RAIL	
METAL BRIDGE RAIL	
OVERHEAD SIGN SUPPORTS	
PAINT:	
2nd Prime Coat (Field)	
1st Field Coat	

MATERIALS	SOURCE OF SUPPLY AND MAILING ADDRESS PG. 2 of 2
PILING:	
Sheets	
Bearing	
Pipe	
Wood (Pressure Treated)	
Precast, Prestressed	
PIPE:	
C.C.M.	
Cast Iron	
Reinf. Concrete	
Vitrified Clay	
PRECAST, PRESTRESSED UNITS	
STEEL:	
Bar Mat Fabric and/or Wire Mesh	
Metal Cribbing	
Reinforcement	
Scuppers	
SHEAR CONNECTORS:	
Spiral	
Welded	
STRUCTURAL (BRIDGES)	
STRUCTURAL (Side mounted sign supports)	
	CONTRACTOR
	SIGNED BY
	DATE

NOTE: Items not listed above shall be listed below.

STATE OF CONNECTICUT

Certificate of Compliance with Connecticut General Statute Section 31 - 57b

I hereby certify that all of the statements herein contained below have been examined by me, and to the best of my knowledge and belief are true and correct.

The _____ **HAS / HAS NOT**
Company Name (Cross out Non-applicable)

been cited for three (3) or more willful or serious or serious violations of any Occupational Safety and Health Act (OSHA) or of any standard, order or regulation promulgated pursuant to such act, during the three year period preceding the bid, provided such violations were cited in accordance with the provisions of any State Occupational Safety and Health Aet of 1970, and not abated within the time fixed by the citation and such citation has not been set aside following appeal to the appropriate agency of court having jurisdiction or **HAS / HAS NOT** (Cross out Non-applicable) received one or more criminal convictions related to the injury or death of any employee in the three-year period preceding the bid.

The list of violations (if applicable) is attached.

_____
(Name of Firm, Organization or Corporation)

Signed: _____
Written Signature:

_____
Name Typed: *(Corporation Seal)*

Title: _____
(Title of Above Person, typed)

Dated: _____

State of)

County of) ***ss:*** ***A.D., 20_____***

)

Sworn to and personally appeared before me for the above, _____,
(Name of Firm, Organization, Corporation)

Signer and Sealer of the foregoing instrument of and acknowledged the same to be the free act and deed of

_____, and his/her free act and deed as
(Name of Person appearing in front of Notary or Clerk)

_____.
(Title of Person appearing in front of Notary or Clerk)

My Commission Expires: _____
(Notary Public) *(Seal)*

AFFIRMATIVE ACTION PROGRAM CERTIFICATION

City/Town of _____

_____

Firm Name: _____

_____

Address: _____

_____

Project Description: _____

_____

_____

Bid Amount: _____

Date: _____

I _____ **of** _____
(Name of Person) (Name of Firm)

intend to honor our Affirmative Action Program on file with the Connecticut Department of Transportation, Office of Contract Compliance. I further certify that our Affirmative Action Program is current and that the last approval was on (Date) _____**, 20**___ **and it expires on (Date)** _____**, 20**___**.**

Signed By: _____

Title: _____

EEO Officer: _____

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	NAIC #
INSURED	INSURER A :	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ CLAIMS-MADE ☐ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	☐ POLICY ☐ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	$
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB ☐ OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ PER STATUTE ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

INDEX TO SPECIAL PROVISIONS
PHASE VI STREETSCAPE MYRTLE STREET/EAST MAIN STREET

SPECIAL PROVISIONS

NOTICE TO CONTRACTOR - CITY OF NEW BRITAIN DISCLAIMER
NOTICE TO CONTRACTOR - SPECIAL PROVISIONS
NOTICE TO CONTRACTOR - TECHNICAL SPECIFICATIONS
NOTICE TO CONTRACTOR - CODE OF ETHICS
NOTICE TO CONTRACTOR - CONTRACTOR TRAINING REQUIREMENT FOR 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE
NOTICE TO CONTRACTOR - PROCUREMENT OF MATERIALS
NOTICE TO CONTRACTOR - REQUIREMENTS OF TITLE 49, CODE OF FEDERAL REGULATIONS PART 26
NOTICE TO CONTRACTOR - VEHICLE EMISSIONS
NOTICE TO CONTRACTOR - FIRE DEPARTMENT, POLICE & EMERGENCY MEDICAL SERVICES
NOTICE TO CONTRACTOR - SIGN INVENTORY
NOTICE TO CONTRACTOR - SAFEGUARDING OF RESIDENCES AND COMMERCIAL PROPERTIES
NOTICE TO CONTRACTOR - NOISE POLLUTION
NOTICE TO CONTRACTOR - CITY PERMITS
NOTICE TO CONTRACTOR - PROTECTION OF UNDERGROUND UTILITIES
NOTICE TO CONTRACTOR - UTILITY COORDINATION
NOTICE TO CONTRACTOR - WATER USAGE FEE
NOTICE TO CONTRACTOR - LIST OF CONTACTS OF UTILITY PERSONNEL
NOTICE TO CONTRACTOR - WORK NEAR EVERSOURCE FACILITIES
NOTICE TO CONTRACTOR - SALVAGEABLE MATERIALS
NOTICE TO CONTRACTOR - UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES
NOTICE TO CONTRACTOR - TRAFFIC SIGNALS
NOTICE TO CONTRACTOR - SIDEWALK FREE PATH
NOTICE TO CONTRACTOR - ELECTRIC SERVICE CONNECTION
NOTICE TO CONTRACTOR - UTILITY COMPANIES
NOTICE TO CONTRACTOR - ALL-INCLUSIVE DRAINAGE
NOTICE TO CONTRACTOR - CNG DEPARTMENTAL PROCEDURE 480.01
NOTICE TO CONTRACTOR - CNG DEPARTMENTAL PROCEDURE 482.01

INDEX TO SPECIAL PROVISIONS
PHASE VI STREETSCAPE MYRTLE STREET/EAST MAIN STREET

GENERAL

SECTION 1.05	CONTROL OF WORK
SECTION 1.06	CONTROL OF MATERIALS
SECTION 1.07	LEGAL RELATIONS AND RESPONSIBILITY
SECTION 1.08	PROSECUTION AND PROGRESS
SECTION 2.86	DRAINAGE TRENCH EXCAVATION, ROCK IN DRAINAGE TRENCH EXCAVATION
SECTION 4.06	BITUMINOUS CONCRETE
SECTION 5.86	CATCH BASINS, MANHOLES AND DROP INLETS
SECTION 6.86	DRAINAGE PIPES, DRAINAGE PIPE ENDS
SECTION 10.00	GENERAL CLAUSES FOR HIGHWAY ILLUMINATION AND TRAFFIC SIGNAL PROJECTS
SECTION M.04	BITUMINOUS CONCRETE MATERIALS

TECHNICAL SPECIFICATIONS

0201001A	CLEARING AND GRUBBING
0202451A	TEST PIT EXCAVATION
0202503A	REMOVAL OF CONCRETE CURBING
0202513A	REMOVAL OF CONCRETE SIDEWALK
0212000A	SUBBASE
0213100A	GRANULAR FILL
0219011A	SEDIMENT CONTROL SYSTEM AT CATCH BASIN
0304002A	PROCESSED AGGREGATE BASE
0404100A	BITUMINOUS CONCRETE PATCHING – FULL DEPTH
0406002A	TEMPORARY PAVEMENT
0406275A	FINE MILLING BITUMINOUS CONCRETE (0-4”)
0406999A	ASPHALT ADJUSTMENT COST
0507758A	RESET MANHOLE (STORM)
1403501A	RESET MANHOLE (SANITARY SEWER)
0811001A	CONCRETE CURBING
0921001A	CONCRETE SIDEWALK
0921005A	CONCRETE SIDEWALK RAMP
0924006A	CONCRETE DRIVEWAY RAMP
0813021A	6” GRANITE STONE CURBING
0813031A	6” GRANITE CURVED STONE CURBING
0921024A	BRICK PAVER SIDEWALK
0921050A	DETECTABLE WARNING CAST IRON PAVER

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PHASE VI STREETSCAPE MYRTLE STREET/EAST MAIN STREET

0921098A	FLEXI-PAVE PAVEMENT AT EXISTING TREE
0922002A	TEMPORARY BITUMINOUS CONCRETE SIDEWALK
0944101A	PLACING TOPSOIL
0949000A	TRIPLE SHREDDED HARDWOOD MULCH
0949572A	ZELKOVA SERRATA – WILLAGE GREEN ZELKOVA
0950005A	TURF ESTABLISHMENT
0971001A	MAINTENANCE AND PROTECTION OF TRAFFIC
1002130A	INSTALL CITY FURNISHED LIGHT STANDARD FOUNDATION
1008127A	2” PVC SCHEDULE 80 CONDUIT
1008128A	3” PVC SCHEDULE 80 CONDUIT
1010052A	CAST IRON HANDHOLE COVER
1010054A	CAST IRON HANDHOLE COVER – TYPE II
1017034A	INSTALL SERVICE
1102000A	8’ ALUMINUM PEDESTAL
1102009A	10’ ALUMINUM PEDESTAL
1104028A	30’ STEEL MAST ARM ASSEMBLY
1104033A	40’ STEEL MAST ARM ASSEMBLY
1105101A	1-WAY 1-SECTION MAST ARM TRAFIC SIGNAL
1105103A	1-WAY 3-SECTION MAST ARM TRAFIC SIGNAL
1105303A	1-WAY 3-SECTION PEDESTAL MOUNTED TRAFIC SIGNAL
1106001A	1-WAY PEDESTRIAN SIGNAL POLE MOUNTED
1106003A	1-WAY PEDESTRIAN SIGNAL PEDESTAL MOUNTED
1107011A	ACCESSIBLE PEDESTRIAN SIGNAL AND DETECTOR (TYPE A)
1108118A	NEMA TS2, TYPE 2 TRAFFIC CONTROLLER AND CABINET
1108727A	PHASE SELECTOR (AUDIO)
1112207A	SIREN DETECTOR
1108843A	12-POSITION WALL MOUNTED FIBER OPTIC PATCH PANEL
1111201A	TEMPORARY DETECTION (SITE NO. 1)
1111600A	EXTENSION BRACKET
1112286A	360 DEGREE CAMERA ASSEMBLY
1112289A	360 DEGREE CLOSED LOOP SYSTEM VIDEO DETECTION PROCESSOR
1113725A	23 AWG 4 TWISTED PAIR CATEGORY 6 CABLE
1112242A	FIBER OPTIC SPLICE ENCLOSURE (SIGNAL)
1113030A	12 STRAND FIBER OPTIC INTERCONNECT CABLE
1112284A	VEHICLE DETECTION MONITOR
1118012A	REMOVAL AND/OR RELOCATION OF TRAFFIC SIGNAL EQUIPMENT
1206023A	REMOVAL AND RELOCATION OF EXISTING SIGNS

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PHASE VI STREETSCAPE MYRTLE STREET/EAST MAIN STREET

1208931A	SIGN FACE SHEET ALUMINUM (TYPE IX RETROREFLECTIVE SHEETING)
1302046A	RESET MANHOLE (WATER)
1302054A	REPLACE CURB BOX
1302061A	ADJUST GATE BOX (WATER)
1302062A	ADJUST GATE BOX (GAS)
1303195A	REMOVE HYDRANT (WATER MAIN)
1303204A	HYDRANT ASSEMBLY (WATER MAIN)
1500209A	RESET MANHOLE (TELEPHONE)

NOTICE TO CONTRACTOR - CITY OF NEW BRITAIN DISCLAIMER

City of New Britain bidding and other information and documents which are obtained through the Internet, World Wide Web Sites or other sources are not to be construed to be official information for the purposes of bidding or conducting other business with the City.

It is the responsibility of each bidder and all other interested parties to obtain all bidding related information and documents from official sources within the City.

Persons and/or entities which reproduce and/or make such information available by any means are not authorized by the City to do so and may be liable for claims resulting from the dissemination of unofficial, incomplete and/or inaccurate information.

NOTICE TO CONTRACTOR - SPECIAL PROVISIONS

The following Special Provisions are hereby incorporated and made part of this contract. Should a conflict occur between the City of New Britain requirements and the State of Connecticut requirements, the requirements of the State shall apply in all cases. Bid Requirements and Conditions Document, Bid Proposal Submittal Document, Improvement Plans and Special Technical Specifications shall govern followed by the Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817 and then by the City of New Britain Standard Specifications for Municipal Construction, Dated May 2008. The New Britain Standard Specifications for Municipal Construction are available on the web under the Documents link at www.newbritainct.gov.

1. Notification of Anticipated Start Date

The Contractor shall notify the City of New Britain inspector assigned to the project, or if the Contractor is not aware of an inspector being assigned, the City Engineer, at (860) 826-3350, a minimum of five (5) working days prior to commencing work on the project.

2. City Requirements Not Waived

Failure to include any specification requirement of the City of New Britain from the Contract Documents shall not be construed as reason to waive or eliminate the requirement from applying to work performed under this contract.

3. Record of Preconstruction Conditions

The Contractor shall furnish to the Engineer photographs and videos of the Project Site and immediate surrounding areas as specified below, no separate payment shall be made for this work:

A. PHOTOGRAPHS

1. Prior to the start of construction, the Contractor, together with the City Inspector, shall digitally photograph the project to document existing conditions, special care items and critical areas. Special attention should be paid to areas where construction is anticipated on private property, areas along the entire Project Site boundary, and any features (e.g. walls, fences, structures, driveways, landscaping, trees, poles, architectural features, etc.) near or within the Project Site which will or may be affected by Project activities. The photographs should be taken from various locations and perspectives throughout the project area so as to provide a maximum coverage of the area.

2. After the completion of the project the Contractor, together with the City Inspector, shall digitally photograph the project to show completed work. The photographs should be taken from approximately the same locations and perspectives as those taken prior to construction.

B. VIDEOS

1. A narrated digital video of the Project Site and its immediate surrounding areas shall be taken prior to construction, with the date, time and locations clearly defined in the film. This video shall also be taken in the presence of the City Inspector. Special attention should be paid to areas where construction is anticipated on private property, areas along the entire Project Site boundary, and any features (e.g. walls, fences, structures, driveways, landscaping, trees, poles, architectural features, etc.) near or within the Project Site which will or may be affected by Project activities.

2. A narrated digital video of the Project Site and its immediate surrounding areas taken after construction, with the date, time and locations clearly defined in the film. The videos content (locations, perspective, sequence, etc.) should essentially replicate that of the pre-construction video.

Pre-construction project photograph and video files on DVD shall be delivered to the Engineer prior to commencing any construction; and the post-construction project photograph and video files shall be delivered to the City with the final payment requisition. The photographer(s) should consult with the Project Inspector prior to shooting regarding any particular locations, perspectives, and/or features the Project Inspector may wish to have recorded.

4. Project Surveyor

Prior to commencement of any Project construction, the Contractor shall submit to the Engineer the name, place of professional employment, business address and phone number, and license number of a licensed land surveyor in the State of Connecticut whose services have been retained by the Contractor to serve as Project Surveyor. The duties and responsibilities of the Project Surveyor shall include construction layout (Article 9 of the Supplemental General Conditions [SGC]), locating and verifying all existing survey and property monuments and markers prior to commencement of construction, establishment or re-establishment of survey and property monuments and markers, and data gathering for and preparation of record drawings (e.g. As-built drawings).

The Project Surveyor shall perform or **directly** supervise the performance of all such duties and responsibilities; and the Engineer has the authority to verify such supervision and to halt construction for reason of lack of property supervision if the level of such supervision is not satisfactory.

Prior to Final Acceptance of any portion of the project, As-built drawings of that portion of the project, prepared at the Contractor's expense by the Project Surveyor in accordance with the latest revision of the City of New Britain Requirements for As-built Maps, must be submitted to, and approved by, the Engineer. As-built data is to be clearly and legibly recorded, under the supervision of the Project Surveyor, as the work progresses. As-built data for any, or all, completed work must be made available to the Engineer for review upon demand.

The designated Project Surveyor may not be changed without valid cause and written approval from the Engineer. In order to change the designated Project Surveyor, the Contractor must submit, in writing, to the Engineer, the reason for the desired change, along with all pertinent information required regarding the proposed replacement Project Surveyor. The Engineer retains the right to contact and obtain information from the Project Surveyor regarding his functioning in such capacity on the Project and the Contractor's proposal to relieve him of such duties.

NOTICE TO CONTRACTOR - TECHNICAL SPECIFICATIONS

The material and construction methods for the work specified in this contract shall conform with the applicable provisions of the State of Connecticut, Department of Transportation specification entitled *Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817*, Dated 2016, Last Revised July 2018 and the Special Provisions contained in the Contract Documents. *Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817* and all subsequent revisions, *Supplemented Form 817, July 2018* are hereby made part of this contract. "Form 817" and Supplemental Forms may be viewed at the State of Connecticut, Department of Transportation's web site at

https://www.ct.gov/dot/lib/dot/documents/dpublications/817/_july2018_form817.pdf

All references to Commissioner, Department, Engineer, and State anywhere with the Contract Documents and Form 817 shall be interpreted to mean the City of New Britain or a duly authorized agent of the City. Any questions or ambiguity regarding any definitions shall be brought to the immediate attention of the City.

NOTICE TO CONTRACTOR - CODE OF ETHICS

The Contractor shall comply with the provisions contained in Section 1-86e of the Connecticut General Statutes, which provides as follows:

(a) No person hired by the state as a Contractor or independent contractor shall:

(1) Use the authority provided to the person under the contract, or any confidential information acquired in the performance of the contract, to obtain financial gain for the person, an employee of the person or a member of the immediate family of any such person or employee;
(2) Accept another state contract which would impair the independent judgment of the person in the performance of the existing contract; or
(3) Accept anything of value based on an understanding that the actions of the person on behalf of the state would be influenced.

(b) No person shall give anything of value to a person hired by the state as a Contractor or independent contractor based on an understanding that the actions of the Contractor or independent contractor on behalf of the state would be influenced.

*The following clause is applicable to those contracts with a value of five hundred thousand dollars ($500,000) or more**:***

The Contractor shall comply with the Code of Ethics for Public Officials, Conn. Gen. Stat. §§ 1-79 *et seq.*, and Code of Ethics for Lobbyists, Conn. Gen. Stat. §§1-91 *et seq.*, when and where applicable. Insofar as state contractors are concerned, a summary of the most relevant provisions of the Codes of Ethics is contained in the Summary of State Ethics Laws for Current and Potential State Contractors. The Contractor acknowledges receiving such Summary, which is incorporated herein by reference. The Summary may change from time to time and may be accessed via the Internet at www. ethics.state.ct.us.

The Contractor agrees that the above clause will also be incorporated in all of its contracts with its subcontractors and consultants.

The Contractor agrees that any instance of its violating the Code of Ethics or the Department of Transportation Ethics Policy will be sufficient cause for the Department to terminate any or all of the Contractor's pending contracts with the Department.

In addition, the Contractor hereby acknowledges and agrees to comply with the policies enumerated in "Connecticut Department of Transportation Policy Statement Policy No. F&A-10, Subject: Code of Ethics Policy", dated June 1, 2007, a copy of which is attached hereto and made a part hereof.

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. F&A-10
June 1, 2007

SUBJECT: Code of Ethics Policy

The purpose of this policy is to establish and maintain high standards of honesty, integrity, and quality of performance for all employees of the Department of Transportation ("DOT" or "Department"). Individuals in government service have positions of significant trust and responsibility that require them to adhere to the highest ethical standards. Standards that might be acceptable in other public or private organizations are not necessarily acceptable for the DOT.

It is expected that all DOT employees will comply with this policy as well as the Code of Ethics for Public Officials, and strive to avoid even the appearance of impropriety in their relationships with members of the public, other agencies, private vendors, consultants, and contractors. This policy is, as is permitted by law, in some cases stricter than the Code of Ethics for Public Officials. Where that is true, employees are required to comply with the more stringent DOT policy.

The Code of Ethics for Public Officials is State law and governs the conduct of all State employees and public officials regardless of the agency in which they serve. The entire Code, as well as a summary of its provisions, may be found at the Office of State Ethics' web site: www.ct.gov/ethics/site/default.asp. For formal and informal interpretations of the Code of Ethics, DOT employees should contact the Office of State Ethics or the DOT's Ethics Compliance Officer or her designee.

All State agencies are required by law to have an ethics policy statement. Additionally, all State agencies are required by law to have an Ethics Liaison or Ethics Compliance Officer. The DOT, because of the size and scope of its procurement activities, has an Ethics Compliance Officer who is responsible for the Department's: development of ethics policies; coordination of ethics training programs; and monitoring of programs for agency compliance with its ethics policies and the Code of Ethics for Public Officials. At least annually, the Ethics Compliance Officer shall provide ethics training to agency personnel involved in contractor selection, evaluation, and supervision. A DOT employee who has a question or is unsure about the provisions of this policy, or who would like assistance contacting the Office of State Ethics, should contact the Ethics Compliance Officer or her designee.

The DOT Ethics Compliance Officer is:

Denise Rodosevich, Managing Attorney
Office of Legal Services

For questions, contact the Ethics Compliance Officer's Designee:

Alice M. Sexton, Principal Attorney
Office of Legal Services
2800 Berlin Turnpike
Newington, CT 06131-7546
Tel. (860) 594-3045

To contact the Office of State Ethics:

Office of State Ethics
20 Trinity Street, Suite 205
Hartford, CT 06106
Tel. (860) 566-4472
Facs. (860) 566-3806
Web: www.ethics.state.ct.us

Enforcement

The Department expects that all employees will comply with all laws and policies regarding ethical conduct. Violations of the law may subject an employee to sanctions from agencies or authorities outside the DOT. Whether or not another agency or authority imposes such sanctions, the Department retains the independent right to review and respond to any ethics violation or alleged ethics violation by its employees. Violations of this policy or ethics statutes, as construed by the DOT, may result in disciplinary action up to and including dismissal from State service.

Prohibited Activities

1. ***Gifts:*** DOT employees (and in some cases their family members) are prohibited by the Code of Ethics and this Policy from accepting a gift from anyone who is: (1) doing business with, or seeking to do business with, the DOT; (2) directly regulated by the DOT; (3) prequalified as a contractor pursuant to Conn. Gen. Stat. §4a-100 by the Commissioner of the Department of Administrative Services (DAS); or (4) known to be a registered lobbyist or a lobbyist's representative. These four categories of people/entities are referred to as "restricted donors." A list of registered lobbyists can be found on the web site of the Office of State Ethics (www.ct.gov/ethics/site/default.asp). A list of prequalified consultants and contractors, *i.e.,* those seeking to do business with the DOT, can be found on the DOT's Internet site under "Consultant Information" and "Doing Business with ConnDOT," respectively.

   The term "gift" is defined in the Code of Ethics for Public Officials, Conn. Gen. Stat. §1-79(e), and has numerous exceptions. For example, one exception permits the acceptance of food and/or beverages valued up to $50 per calendar year from any one donor and consumed on an occasion or occasions while the person paying or his representative is present. Therefore, such food and/or beverage is not a "gift." Another exception permits the acceptance of items having a value up to ten dollars ($10) provided the aggregate value of all things provided by the donor to the recipient during a calendar year does not exceed fifty dollars ($50). Therefore, such items are not a "gift." Depending on the circumstances, the "donor" may be an individual if the individual is bearing the expense, or a donor may be the individual's employer/group if the individual is passing the expense back to the employer/group he/she represents.

   This policy requires DOT employees to immediately return any gift (as defined in the Code of Ethics) that any person or entity attempts to give to the employee(s). If any such gift or other item of value is received by other than personal delivery from the subject person or entity, the item shall be taken to the Office of Human Resources along with the name and address of the person or entity who gave the item. The Office of Human Resources, along with the recipient of the item of value, will arrange for the donation of the item to a local charity (e.g., Foodshare, local soup kitchens, etc.). The Office of Human Resources will then send a letter to the gift's donor advising the person of the item's donation to charity and requesting that no such gifts be given to DOT employees in the future.

2. ***Contracting for Goods or Services for Personal Use With Department Contractors, Consultants, or Vendors:*** Executive Order 7C provides that: "Appointed officials and state employees in the Executive Branch are prohibited from contracting for goods and services, for personal use, with any person doing business with or seeking business with his or her agency, unless the goods or services are readily available to the general public for the price which the official or state employee paid or would pay."

3. ***Gift Exchanges Between Subordinates and Supervisors/Senior Staff:*** A recent change in the Code of Ethics prohibits exchanges of gifts valued at $100 or more between (*i.e.,* to and from) supervisors and employees under their supervision. The Citizen's Ethics Advisory Board has advised that: (1) the monetary limit imposed by this provision is a per-gift amount; (2) gifts given between supervisors and subordinates (or *vice versa)* in celebration of a "major life event," as defined in the Code of Ethics, need not comply with the $100 limit; and (3) the limitations imposed by this provision apply to a direct supervisor and subordinate *and to any individual up or down the chain of command.* The Citizen's Ethics Advisory Board has also advised that supervisors or subordinates may not pool their money to give a collective or group gift valued at $100 or more, even though each of the individual contributions is less than $100.

4. ***Acceptance of Gifts to the State:*** A recent change to the Code of Ethics for Public Officials modified the definition of the term "gift" to limit the application of the so-called "gift to the State" exception. In general, "gifts to the State" are goods or services given to a State agency for use on State property or to support an event and which facilitate State action or functions. Before accepting any benefit as a "gift to the State," DOT employees should contact the Ethics Compliance Officer.

5. ***Charitable Organizations and Events:*** No DOT employee shall knowingly accept any gift, discount, or other item of monetary value for the benefit of a charitable organization from any person or entity seeking official action from, doing or seeking business with, or conducting activities regulated by, the Department.

6. ***Use of Office/Position for Financial Gain:*** DOT employees shall not use their public office, position, or influence from holding their State office/position, nor any information gained in the course of their State duties, for private financial gain (or the prevention of financial loss) for themselves, any family member, any member of their household, nor any "business with which they are associated." In general, a business with which one is associated includes any entity of which a DOT employee or his/her immediate family member is a director, owner, limited or general partner, beneficiary of a trust, holder of 5 percent or more stock, or an officer (president, treasurer, or executive or senior vice president).

   DOT employees shall not use or distribute State information (except as permitted by the Freedom of Information Act), nor use State time, personnel, equipment, or materials, for other than State business purposes.

7. ***Other Employment:*** DOT employees shall not engage in, nor accept, other employment that will either impair their independence of judgment with regard to their State duties or require or induce them to disclose confidential information gained through their State duties.

   Any DOT employee who engages in or accepts other employment (including as an independent contractor), or has direct ownership in an outside business or sole proprietorship, shall complete an Employment/Outside Business Disclosure Form (see attached) and submit it to the Department's Human Resources Administrator. Disclosure of other employment to the DOT Human Resources Administrator shall *not* constitute approval of the other employment for purposes of the Code of Ethics for Public Officials.

   Inquiries concerning the propriety of a DOT employee's other employment shall be directed to the Office of State Ethics to assure compliance with the Code of Ethics for Public Officials. Employees anticipating accepting other employment as described above should give ample time (at least one month) to the Office of State Ethics to respond to such outside employment inquiries.

No employee of the DOT shall allow any private obligation of employment or enterprise to take precedence over his/her responsibility to the Department.

8. ***Outside Business Interests:*** Any DOT employee who holds, directly or indirectly, a financial interest in any business, firm, or enterprise shall complete an Employment/Outside Business Disclosure Form (see attached) and submit it to the Department's Human Resources Administrator. An indirect financial interest includes situations where a DOT employee's spouse has a financial interest in a business, firm, or enterprise. A financial interest means that the employee or his spouse is an owner, member, partner, or shareholder in a non-publicly traded entity. Disclosure of such outside business interests to the DOT Human Resources Administrator shall *not* constitute approval of the outside business interest under this Policy or the Code of Ethics for Public Officials. DOT employees shall not have a financial interest in any business, firm, or enterprise which will either impair their independence of judgment with regard to their State duties or require or induce them to disclose confidential information gained through their State duties. Inquiries concerning the propriety of a DOT employee's outside business interests shall be directed to the Office of State Ethics to assure compliance with the Code of Ethics for Public Officials.

9. ***Contracts With the State***: DOT employees, their immediate family members, and/or a business with which a DOT employee is associated, may not enter into a contract with the State, other than pursuant to a court appointment, valued at $100 or more unless the contract has been awarded through an open and public process.

10. ***Sanctioning Another Person's Ethics Violation***: No DOT official or employee shall counsel, authorize, or otherwise sanction action that violates any provision of the Code of Ethics.

11. ***Certain Persons Have an Obligation to Report Ethics Violations:*** If the DOT Commissioner, Deputy Commissioner, or "person in charge of State agency procurement" and contracting has reasonable cause to believe that a person has violated the Code of Ethics or any law or regulation concerning ethics in State contracting, he/she *must* report such belief to the Office of State Ethics. All DOT employees are encouraged to disclose waste, fraud, abuse, and corruption about which they become aware to the appropriate authority (see also Policy Statement EX.O.-23 dated March 31, 2004), including, but not limited to, their immediate supervisor or a superior of their immediate supervisor, the DOT Office of Management Services, the Ethics Compliance Officer, the Auditors of Public Accounts, the Office of the Attorney General, or the Office of the Chief State's Attorney.

12. ***Post-State Employment Restrictions:*** In addition to the above-stated policies of the Department, DOT employees are advised that the Code of Ethics for Public Officials bars certain conduct by State employees ***after they leave State service. Upon leaving State service:***

    - ***Confidential Information***: DOT employees must never disclose or use confidential information gained in State service for the financial benefit of any person.

    - ***Prohibited Representation***: DOT employees must *never* represent anyone (other than the State) concerning any "particular matter" in which they participated personally and substantially while in State service and in which the State has a substantial interest.

      DOT employees also must not, for one year after leaving State service, represent anyone other than the State for compensation before the DOT concerning a matter in which the State has a substantial interest. In this context, the term "represent" has been very broadly defined. Therefore, any former DOT employee contemplating post-State employment work that might involve interaction with any bureau of DOT (or any Board or Commission administratively under the DOT) within

their first year after leaving State employment should contact the DOT Ethics Compliance Officer and/or the Office of State Ethics.

- ***Employment With State Vendors:*** DOT employees who participated substantially in, or supervised, the negotiation or award of a State contract valued at $50,000 or more must not accept employment with a party to the contract (other than the State) for a period of one year after resigning from State service, if the resignation occurs within one year after the contract was signed.

13. ***Ethical Considerations Concerning Bidding and State Contracts:*** DOT employees also should be aware of various provisions of Part IV of the Code of Ethics that affect any person or firm who: (1) is, or is seeking to be, prequalified by DAS under Conn. Gen. Stat. §4a-100; (2) is a party to a large State construction or procurement contract, or seeking to enter into such a contract, with a State agency; or (3) is a party to a consultant services contract, or seeking to enter into such a contract, with a State agency. These persons or firms shall not:

    - With the intent to obtain a competitive advantage over other bidders, solicit any information from an employee or official that the contractor knows is not and will not be available to other bidders for a large State construction or procurement contract that the contractor is seeking;

    - Intentionally, willfully, or with reckless disregard for the truth, charge a State agency for work not performed or goods not provided, including submitting meritless change orders in bad faith with the sole intention of increasing the contract price, as well as falsifying invoices or bills or charging unreasonable and unsubstantiated rates for services or goods to a State agency; and

    - Intentionally or willfully violate or attempt to circumvent State competitive bidding and ethics laws.

    Firms or persons that violate the above provisions may be deemed a nonresponsible bidder by the DOT.

    In addition, no person with whom a State agency has contracted to provide consulting services to plan specifications for any contract, and no business with which such person is associated, may serve as a consultant to any person seeking to obtain such contract, serve as a contractor for such contract, or serve as a subcontractor or consultant to the person awarded such contract.

    DOT employees who believe that a contractor or consultant may be in violation of any of these provisions should bring it to the attention of their manager.

Training for DOT Employees

A copy of this policy will be posted throughout the Department, and provided to each employee either in hard copy or by e-mail. As set forth above, State law requires that certain employees involved in contractor/consultant/vendor selection, evaluation, or supervision must undergo annual ethics training coordinated or provided by the Ethics Compliance Officer. If you believe your duties meet these criteria, you should notify your Bureau Chief to facilitate compilation of a training schedule. In addition, the DOT Ethics Compliance Officer can arrange for periodic ethics training provided by the Office of State Ethics. Finally, the Department will make available, on its web site or otherwise, a copy of this policy to all vendors, contractors, and other business entities doing business with the Department.

Important Ethics Reference Materials

It is strongly recommended that every DOT employee read and review the following:

- Code of Ethics for Public Officials, Chapter 10, Part 1, Conn. General Statutes Sections 1-79 through 1-89a found at: www.ct.gov/ethics/site/default.asp
- Ethics Regulations Sections 1-81-14 through 1-81-38, found at: www.ct.gov/ethics/site/default.asp
- The Office of State Ethics web site includes summaries and the full text of formal ethics advisory opinions interpreting the Code of Ethics, as well as summaries of previous enforcement actions: www.ct.gov/ethics/site/default.asp. DOT employees are strongly encouraged to contact the Department's Ethics Compliance Officer or her designee, or the Office of State Ethics with any questions or concerns they may have.

(This Policy Statement supersedes Policy Statement No. F&A-10 dated January 6, 2006)

R. J. Carpenter

Ralph J. Carpenter
COMMISSIONER

Attachment

List 1 and List 3
(Managers and supervisors are requested to distribute a copy of this Policy Statement to all employees under their supervision.)

cc: Office of the Governor, Department of Administrative Services, Office of State Ethics

Emp&discForm 5/07

Department of Transportation
Employment & Outside Business
Disclosure Form

In accordance with Department of Transportation (Department) Policy Statement No. F&A-10, Code of Ethics Policy, I am hereby advising the Department that in addition to my current DOT position, I have other employment and/or a direct or indirect financial interest in an outside business as follows:

1. Full name of outside employer, or entity in which I or my spouse have a financial interest (e.g., ownership or member/partner):

_____

2. Location of Employer/Entity disclosed above: _____

3. Nature of my/my spouse's relationship to employer/entity disclosed above (check at least one):

_____ Employee or Independent Contractor (circle one)
_____ Owner/Member/Partner/etc.
_____ Family Member of Owner/Member/Partner/etc.

4. State agency(ies) with which above employer/entity is doing business or seeking Business (write "N/A" if not applicable): _____

5. Job Title at Outside Employer: _____

6. Job Responsibilities at Outside Employer: _____

_____

_____

7. Current State Title: _____

8. Current State Job Responsibilities: _____

_____

_____

9. Name/Title of Current State Supervisor: _____

I understand that the filing of this Disclosure with the DOT Human Resources Administrator does not relieve me of any obligations I have to comply with the Code of Ethics for Public Officials, and does not constitute approval of my outside employment and/or financial interests under the Code of Ethics for Public Officials. *Employees engaging in outside employment are strongly urged to seek written approval of their outside employment from the Office of State Ethics, 20 Trinity Street, Hartford, CT 06106.* I also understand that if either my State or outside employment/financial interest changes in location or function I am required to notify the Department immediately.

Signed: _____ Date: _____
Printed Name: _____

NOTICE TO CONTRACTOR – CONTRACTOR TRAINING REQUIREMENT FOR 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

In accordance with Connecticut General Statute 31-53b and Public Act No. 08-83, the Contractor is required to furnish proof that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53, has completed a course of at least ten hours in duration in construction safety and health approved by the Federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

Proof of compliance with the provisions of the statute shall consist of a student course completion card issued by the federal Occupational Safety and Health Administration, or other such proof as deemed appropriate by the Commissioner of the Connecticut Department of Labor, dated no earlier than five years prior to the commencement of the project. Each employer shall affix a copy of the construction safety course completion card for each applicable employee to the first certified payroll submitted to the Department of Transportation on which the employee's name first appears.

Any employee required to complete a construction safety and health course as required that has not completed the course, shall have a maximum of fourteen (14) days to complete the course. If the employee has not been brought into compliance, they shall be removed from the project until such time as they have completed the required training.

This section does not apply to employees of public service companies, as defined in section 16-1 of the 2008 supplement to the General Statutes, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

The internet website for the federal Occupational Safety and Health Training Institute is http://www.osha.gov/fso/ote/training/edcenters.

Additional information regarding this statute can be found at the Connecticut Department of Labor website, http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm.

Any costs associated with this notice shall be included in the general cost of the contract. In addition, there shall be no time granted to the contractor for compliance with this notice. The contractor's compliance with this notice and any associated regulations shall not be grounds for claims as outlined in Section 1.11 – "Claims".

NOTICE TO CONTRACTOR - PROCUREMENT OF MATERIALS

Upon Notice to Proceed, the Contractor shall proceed with shop drawings, working drawings, procurement of materials, and all other submittals required to complete the work in accordance with the contract documents.

NOTICE TO CONTRACTOR - REQUIREMENTS OF TITLE 49, CODE OF FEDERAL REGULATIONS PART 26

The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

NOTICE TO CONTRACTOR - VEHICLE EMISSIONS

All motor vehicles and/or construction equipment (both on-highway and non-road) shall comply with all pertinent State and Federal regulations relative to exhaust emission controls and safety.

The contractor shall establish staging zones for vehicles that are waiting to load or unload at the contract area. Such zones shall be located where the emissions from the vehicles will have minimum impact on abutters and the general public.

Idling of delivery and/or dump trucks, or other equipment shall not be permitted during periods of non-active use, and it should be limited to three minutes in accordance with the Regulations of Connecticut State Agencies Section 22a-174-18(b)(3)(c):

> No mobile source engine shall be allowed "to operate for more than three (3) consecutive minutes when the mobile source is not in motion, except as follows:
>
> (i) When a mobile source is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control,
>
> (ii) When it is necessary to operate defrosting, heating or cooling equipment to ensure the safety or health of the driver or passengers,
>
> (iii) When it is necessary to operate auxiliary equipment that is located in or on the mobile source to accomplish the intended use of the mobile source,
>
> (iv) To bring the mobile source to the manufacturer's recommended operating temperature,
>
> (v) When the outdoor temperature is below twenty degrees Fahrenheit (20 degrees F),
>
> (vi) When the mobile source is undergoing maintenance that requires such mobile source be operated for more than three (3) consecutive minutes, or
>
> (vii) When a mobile source is in queue to be inspected by U.S. military personnel prior to gaining access to a U.S. military installation."

All work shall be conducted to ensure that no harmful effects are caused to adjacent sensitive receptors. Sensitive receptors include but are not limited to hospitals, schools, daycare facilities, elderly housing and convalescent facilities. Engine exhaust shall be located away from fresh air intakes, air conditioners, and windows.

A Vehicle Emissions Mitigation plan will be required for areas where extensive work will be performed in close proximity (less than 50 feet (15 meters)) to sensitive receptors. No work will proceed until a sequence of construction and a Vehicle Emissions Mitigation plan is submitted in writing to the Engineer for review and all comments are addressed prior to the commencement of any extensive construction work in close proximity (less than 50 feet (15 meters)) to sensitive receptors. The mitigation plan must address the control of vehicle emissions from all vehicles and construction equipment.

If any equipment is found to be in non-compliance with this specification, the contractor will be issued a Notice of Non-Compliance and given a 24-hour period in which to bring the equipment into compliance or remove it from the project. If the contractor then does not comply, the Engineer shall withhold all payments for the work performed on any item(s) on which the non-conforming equipment was utilized for the time period in which the equipment was out of compliance.

Any costs associated with this "Vehicle Emissions" notice shall be included in the general cost of the contract. In addition, there shall be no time granted to the contractor for compliance with this notice. The contractor's compliance with this notice and any associated regulations shall not be grounds for claims as outlined in Section 1.11 – "Claims".

NOTICE TO CONTRACTOR - FIRE DEPARTMENT, POLICE & EMERGENCY MEDICAL SERVICES

The Contractor shall contact the Fire Department, Police and Emergency Medical Services, prior to work impacting local streets and establish coordination necessary as to disruption of services during construction.

NOTICE TO CONTRACTOR - SIGN INVENTORY

Prior to the commencement of construction, the Contractor and the Engineer shall conduct a joint inventory of signs, delineators and object markers. Signs, delineators or object markers that are knocked down or destroyed by the Contractor during the construction of the project shall be replaced by the Contractor at no cost to the City.

NOTICE TO CONTRACTOR – SAFEGUARDING OF RESIDENCES AND COMMERCIAL PROPERTIES

The Contractor shall maintain and protect traffic operations at all driveways and provide adequate sightline. The Contractor shall not restrict sightline with construction equipment when not actively working. The Contractor shall also safeguard pedestrian operation and maintain access to properties at all times.

NOTICE TO CONTRACTOR – NOISE POLLUTION

The Contractor shall take measures to control the noise intensity caused by his construction operations and equipment, including but not limited to equipment used for drilling, pile driving, blasting, excavation or hauling.

All methods and devices employed to minimize noise shall be subject to the continuing approval of the Engineer and in accordance with the City of New Britain Ordinance Article V. Noise, Sec. 16-103-(16) & (17), Sec. 16-104-(7) (9) & (10). The maximum allowable level of noise at the nearest residence or occupied building shall be 90 decibels on the "A" weighted scale (dBA). Any operation that exceeds this standard will cease until a different construction methodology is developed to allow work to proceed within the 90 dBA limit.

NOTICE TO CONTRACTOR – CITY PERMITS

The Contractor shall obtain all necessary city permits including but not limited to sidewalk, curb and road opening.

NOTICE TO CONTRACTOR - PROTECTION OF UNDERGROUND UTILITIES

The Contractor is hereby instructed to follow established "Call Before You Dig" procedures.

The Contractor is hereby advised that placement of heavy equipment and materials or the traversing of heavy construction equipment over underground utilities which might be damage utility shall be reviewed and approved by the Engineer.

The Contractor shall consider in his/her bid any inconvenience and work required for this condition. The work to repair or replace any damage caused by the Contractor's operations will be made solely at the Contractor's expense.

NOTICE TO CONTRACTOR - UTILITY COORDINATION

In addition to the requirements of the Supplemental General Conditions Section 15, Existing Underground Utilities, Protection, and Responsibility, the Contractor is advised of the following Utility coordination items.

The Contractor will be responsible for the protection and support of utilities within the project limits. The Contractor is responsible for the design, method and manner of installations of temporary supports, if needed. The design for temporary supports must be submitted to the Engineer for review and approval.

The Contractor is hereby advised that upon issuance of the notice to proceed, the Contractor shall immediately coordinate the installation of all utilities, and develop a schedule for construction that accommodates each utility installation without negatively impacting the overall project schedule. Items specific for the project utility companies include:

- New Britain Water Department - coordinate inspection of new fire hydrant

The Contractor shall install all proposed utilities while maintaining existing utility services live at all times. In addition, the Contractor shall stake out the proposed construction survey base line and provide bench marks for any utility company requiring this service for their use in relocation of their facility. The cost of this service shall be included in the bid item for "Construction Staking".

ALL UTILITIES

The Contractor shall coordinate construction activities with the utility companies and develop a construction schedule accordingly. The contractor is advised that his operations and road construction work may be significantly impacted until the utility companies have completed their proposed utility work. The Contractor should note that he will be required to reset casting of any utility work constructed and completed by others prior to the Contractor performing his work at any location within the project limits to final grade.

NOTICE TO CONTRACTOR - WATER USAGE FEE

The New Britain Water Department shall charge the contractor for a water usage permit for each 6-month period or partial period beginning January to June and July to December for their usage of water throughout the duration of the project until completion.

NOTICE TO CONTRACTOR - LIST OF CONTACTS OF UTILITY PERSONNEL

Prior to the commencement of construction, the Contractor shall contact, coordinate and maintain close liaison with the following Utility Companies:

City of New Britain (Director of Public Works)	Mark E. Moriarty	(860) 826-3350
City of New Britain (City Engineer)	Robert Trottier	(860) 826-3355
New Britain Water Department	Chris Polkowski	(860) 826-3538
Connecticut Light and Power dba Eversource Energy - Electric	Thomas Woronik	(860) 267-3891
Frontier Communications	Lynne DeLucia	(203) 238-5000
Connecticut Natural Gas Corp. (CNG)	Jonathan Gould	(860) 727-3044
Comcast of Connecticut, Inc	Jim Bitzas	(413) 562-9923
Lightower Fiber Networks	Eric Clark	(203) 649-3904
WilTel Communications, LLC	Mike Weaver	(919) 710-8891

NOTICE TO CONTRACTOR - WORK NEAR EVERSOURCE FACILITIES

All work in and/or within three (3) feet of energized Eversource facilities shall be performed by a qualified Eversource contractor. Contact Eversource for a list of their qualified contractors.

NOTICE TO CONTRACTOR - SALVAGEABLE MATERIALS

The Contractor shall salvage the following materials:

ITEMS	DESTINATIONS
Catch Basin Tops, Brick Pavers and Traffic Signal Equipment (excluding mast arm assemblies)	Department of Public Works 55 Harvard Street New Britain, CT Tel. (860) 828-3480
Fire Hydrants	New Britain Water Department 1000 Shuttle Meadow Avenue New Britain, CT Tel. (860) 826-3536

The materials to be salvaged shall be delivered by the Contractor to the destination indicated above between the hours of 8:00 AM and 3:00 PM Monday through Friday, holidays excluded, after the proper notification has been made to the above Authorities.

All salvageable material shall be loaded, transported and unloaded by the Contractor.

The Contractor shall not receive payment for this work. The costs for loading, transporting and unloading of salvageable materials shall be included in the overall cost of this project.

NOTICE TO CONTRACTOR – UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES

If historic properties are unexpectedly encountered during Project construction, the contractor will immediately cease all construction activities in the immediate vicinity that may reasonably be assumed to affect the historic properties. Any historic property discoveries shall to the extent possible be protected in situ to allow for consultation among the Parties and the Tribes. The historic properties may be preserved in situ or mitigated on a case-by-case basis in consultation with the Parties and the Tribes. No artifacts are to be removed from the site unless approved by all parties. Notwithstanding anything to the contrary herein, the curation and disposition of any cultural resources shall be consistent with 36 C.F.R. Part 79 and other applicable law. If human remains are unexpectedly encountered during Project construction, the remains will be treated in a respectful manner and in accordance with the respective laws of the State of Connecticut (Connecticut General Statutes Chapter 184a Section 10-388) and State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, Article 1.10.06.

https://www.ct.gov/dot/lib/dot/documents/dpublications/817/_july2018_form817.pdf

NOTICE TO CONTRACTOR - TRAFFIC SIGNALS

The Contractor is hereby notified that certain conditions pertaining to the installation of new signals and maintenance of traffic signal operations are required when relevant, as part of this contract.

Qualified/Unqualified Workers

U.S. Department of Labor
Occupational Safety & Health Administration (OSHA) www.osha.gov

Part Number	**1910**
Part Title	**Occupational Safety & Health Administration**
Subpart	**S**
Subpart Title	**Electrical**
Standard Number	**1910.333**
Title	**Selection and use of work practices**

This project includes countdown pedestrian signals. The countdown display is allowed only during the flashing don't walk time of the pedestrian movement.

The Controller Unit (CU) shall conform to the current edition of the Functional Specifications for Traffic Control Equipment. The Functional Specifications require the CU meet NEMA Standard Publication No. TS2-1992 Type 2. The Functional Specifications are available on the Departments' web site http://www.ct.gov/dot/site/default.asp, click on "Doing Business with CONNDOT", under Engineering ~~Resourses~~Resources click on "Traffic Engineering", Scroll down to Traffic Documents click on "Functional_Specifications_for_Traffic_Control_Equip.pdf".

The contractor will be held liable for all damage to existing equipment resulting from his or his subcontractor's actions. A credit will be deducted from monies due the Contractor for all maintenance calls responded to by City of New Britain personnel.

The 30-Day Test on traffic control equipment, as specified in Section 10.00, Article 10.00.10 - TESTS, will not begin until the items listed below are delivered to the City Engineer.

Five (5) sets of cabinet wiring diagrams. Leave one set in the controller cabinet.
All spare load switches and flash relays.

Siren Pre-emption Notes:

- Pre-emption is to operate through the internal pre-emption of the signal controller.
- If not present in a controller cabinet the contractor shall install the following items:
    - Pre-emption disconnect switch.
    - Pre-emption termination panel with “D” harness.
    - Pre-emption test pushbuttons.
- Contractor must provide a chart, or print out of the program steps and settings.
- Detector locations are for illustration only. Exact locations shall be determined by the Manufacturer or his designated representative. Detector cables are to be installed continuous between each detector and the auxiliary equipment cabinet.

The Contractor shall field verify the locations, dimensions, equipment locations and notify the City Engineer of any discrepancies.

NOTICE TO CONTRACTOR – SIDEWALK FREE PATH

The clearance of traffic signal appurtenances (mast arms, span poles, and pedestals) when in or adjacent to sidewalks was recently revised to require a free path of not less than 4 feet (1.2 m.) Locations where the 4 foot (1.2 m) free path cannot be met are noted on the plan. All other locations where the 4 foot (1.2 m) free path cannot be met require the Contractor to notify the Engineer and contact the City of New Britain.

NOTICE TO CONTRACTOR – ELECTRIC SERVICE CONNECTION

Electric service for the operation of the traffic control signal will be provided via an underground conduit connection to an electric manhole. Eversource Electric is the owner of the electric manhole and all work associated with the service connection shall be coordinated directly with their representative.

The manhole connection work including coring through the manhole wall and installing a three-foot stub of rigid metal conduit shall be conducted by Eversource or one of their approved contractors. The project work includes connecting to the three-foot stub conduit and running the rest of the required conduit into the controller and providing the service wire.

The Contractor will be required to **hire Eversource or their approved vendor and pay** for all the work associated with the connection to the manhole.

The cabinet wiring and any required electrical inspections by the City of New Britain shall be conducted and coordinated by the Contractor. Following the inspection, notify Eversource and provide all required documentation. Eversource will facilitate the final service connection from the manhole into the cabinet electric panel. The Contractor shall provide the service wire unless otherwise advised by Eversource.

The coordination activities associated with the service connection to the Eversource manhole shall be initiated early in the project to ensure timely activation of the traffic control signal.

NOTICE TO CONTRACTOR – UTILITY COMPANIES

It is understood that any references in the contract documents to Northeast Utilities, CL&P and/or Yankee Gas are meant to refer to Eversource.

It is understood that any references in the contract documents to AT&T is meant to refer to Frontier Communications.

NOTICE TO CONTRACTOR - ALL-INCLUSIVE DRAINAGE

ADDED SECTIONS:

2.86 – DRAINAGE TRENCH EXCAVATION

ROCK IN DRAINAGE TRENCH EXCAVATION

5.86 – CATCH BASINS, MANHOLES AND DROP INLETS

6.86 – DRAINAGE PIPES

DRAINAGE PIPE ENDS

This Contract contains the above-noted Special Provisions for all-inclusive drainage, developed to replace the following Sections in their entireties:

- Section 5.07 – *Catch Basins, Manholes and Drop Inlets*
- Section 6.51 – *Culverts*
- Section 6.52 – *Culvert Ends*

The Section 5.86 and 6.86 items include excavation and bedding material in the drainage structure, pipe and pipe end unit prices.

Section 2.05 *Trench Excavation* may be included for miscellaneous trenching, where necessary, but will not be used with all-inclusive drainage items.

Other Standard Specifications, Supplemental Specifications or Special Provisions may contain references to Articles or Subarticles from previous versions of Sections 5.07, 6.51 and 6.52 which are no longer valid.

The following Standard Specifications Sections or Supplements contain references to Articles or Subarticles from Section 2.05 which shall remain in effect:

- Section 2.06 – *Ditch Excavation*
- Section 5.06 – *Retaining Walls, Endwalls and Steps*
- Section 7.51 – *Underdrains and Outlets*
- Section 10.01 – *Trenching and Backfilling*

'Rock in Drainage Trench Excavation' is now defined in Section 2.86. 'Rock in Trench Excavation' will remain in Section 2.05 and may be used with trenching not associated with all-inclusive drainage items.

Any references to Articles beginning with "5.07," "6.51," or "6.52" shall refer to the pertinent topic or materials in the new Special Provisions contained herein.

Date: 3/22/07

NOTICE TO CONTRACTOR

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

PURPOSE

This procedure establishes Corporate policy for the protection/replacement of gas facilities when exposed.

The practice of the Corporation is to adhere to the prescriptions of appropriate sections of Title 49 of the Code of Federal Regulations, Part 192.614. Any contractor, utility company crew, builder, or excavator must adhere to the regulations.

PROCEDURE

I. DEFINITIONS

A. Excavation - An operation for the purpose of movement or removal of earth, rock, or other materials in or on the ground, or otherwise disturbing the subsurface of the earth, by the use of powered or mechanized equipment. This includes, but is not limited to, digging, pile driving, augering, backfilling, test boring, drilling, grading, plowing-in, hammering, pulling-in, trenching, and tunneling.

B. Damage - Includes, but is not limited to, the weakening of structure or support, penetration or destruction of the protective coating, housing, or the severance, partial or complete, of gas facilities.

C. Gas Facility - All physical facilities which house or move gas for transportation and distribution including pipe, valves, and other appurtenances attached to the pipe.

II. NOTIFICATION

A. A copy of this procedure is given to all agencies requesting review of their proposed construction designs.

B. Upon receipt of outside agencies' plans, maps, and correspondence, Engineering Services reviews the project relative to the Corporation's facilities and responds to the requesting party.

C. The excavator notifies "Call Before You Dig" (CBYD) as prescribed by Connecticut State Law, Section 16-345 of Public Act 87-71.

D. Once excavation is started, the construction site supervisors are responsible for visiting the excavation site as outlined in Procedure #929.01 - "Monitoring of CNG Gas Facilities."

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

III. GUIDELINES

A. General

1. The support for the gas facility either by strapping (see EXHIBITS I and III) or wooden vertical supports (see EXHIBIT II) is installed in a manner that the pipe does not move when the soil is removed from under the pipe and that undue stress is not imposed at fittings, valves, and other accessories on the pipe.

2. Trench shoring practices are not affected by the requirements outlined in this procedure.

3. An excavator is responsible for any damages that he/she inflicts upon the Corporation's facilities.

4. If the excavator/contractor is to be billed for damages or a replacement, the Distribution Supervisor documents, takes photographs of the affected facility, and immediately sends a letter (Exhibit IV) to the excavator/contractor stating that a bill will be forthcoming.

5. Any conflicts between CNG or the excavator/contractor regarding the billing for repair of the damage or the possible replacement are resolved by a Distribution Manager.

B. Crossings

1. Temporary Support - Cast Iron, Steel, Plastic

   EXHIBIT I is a drawing which depicts a temporary support for a gas main that crosses a trench at any angle with an exposed pipe length of greater than six feet for cast iron or ten feet for plastic or steel (see 2b).

2. Permanent Support - Cast Iron

   a. When cast iron pipe crossing exposure is six feet or less in length, one permanent pipe support is required (see EXHIBIT II).

   b. When cast iron pipe is six inches or less in diameter and crossing exceeds six feet in length, the pipe is replaced. When this condition exists, the replacement consists of the length of exposure plus a minimum of four feet measured perpendicular from the trench wall to the pipe. The removal and replacement expense is borne by the excavator/contractor.

c. When cast iron pipe is greater than six inches in diameter and is crossed and exceeds six feet in length, two or more permanent pipe supports are required.

d. When cast iron pipe is greater than six inches in diameter and is crossed and the exposure exceeds 12 feet in length, it is considered for possible replacement depending on site conditions.

3. Permanent Support - Steel, Plastic

A firm foundation of properly compacted backfill is the only permanent support required for plastic or steel pipe.

C. Parallel Excavation

1. Temporary Support - Cast Iron, Steel, Plastic

a. The EXHIBIT III drawing depicts a type of temporary support for a gas main that is exposed or undermined by a parallel excavation.

b. The policy of the Company is to replace the cast iron pipe at the excavator's/contractor's expense.

1) If the relocation is not possible at the start of the project, temporary supporting may be permitted by CNG after consideration is given to the type of pipe, length of exposed pipe, service lines, and other pertinent facts.

2) When temporary support is allowed, it should be done in a manner similar to EXHIBIT III. After the completion of the project, the replacement of a facility is scheduled to be replaced in accordance with Procedure #930.01 - "Replacement of Cast Iron Pipe."

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

2. Permanent Support - Cast Iron

   a. After the excavation and before backfilling, if the length of exposure of a cast iron main is less than six feet, the main must be permanently supported as shown in EXHIBIT III.

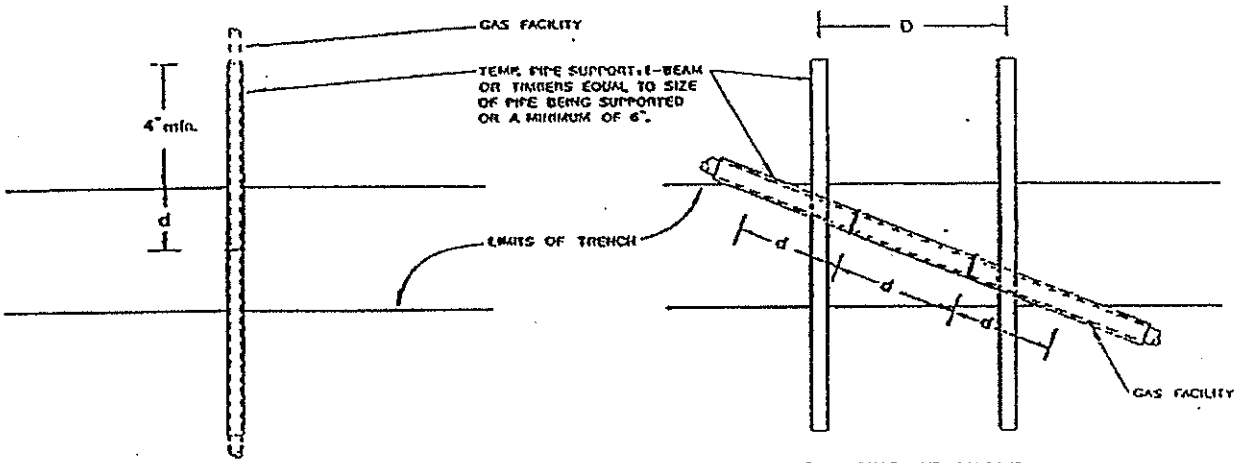
   b. If the length of exposure is greater than six feet, the pipe is replaced in compliance with Departmental Procedure #930.01. The cost of this replacement will be borne by the excavator/contractor.

Approved:

Regional Director – CNG Field Operations 3/22/07

Refer to Procedure Memorandum #480.01

EXHIBIT I



MAXIMUM DISTANCES BETWEEN SUPPORTS – IN FEET

PIPE DIAMETER		1"	2"	4" & LARGER
CAST IRON	D	6	6	6
	d	4	4	4
STEEL / PLASTIC	D	10	15	20
	d	7	10	15

D – DISTANCE BETWEEN SUPPORTING BEAMS
d – DISTANCE BETWEEN SUPPORTING STRAPS

EXHIBIT I

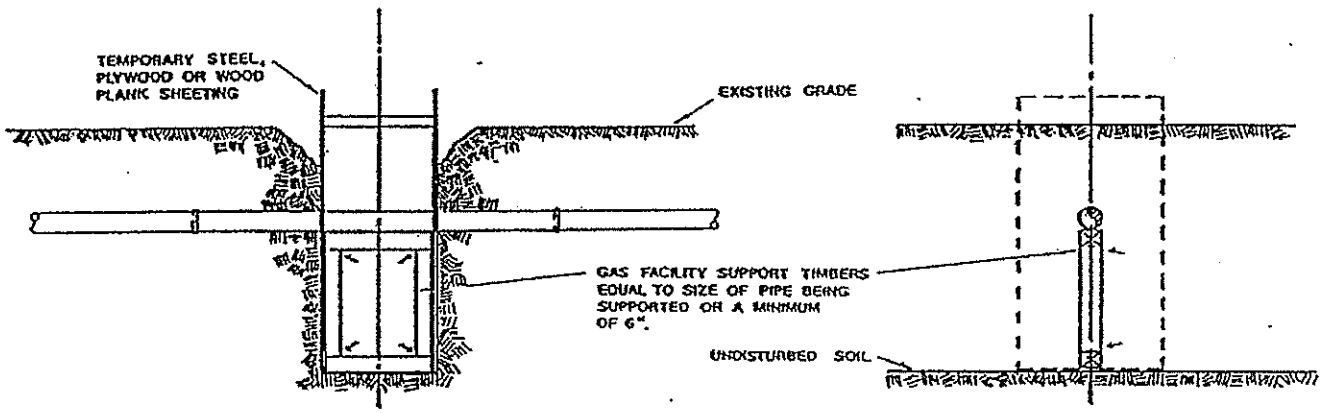
PROTECTION of EXPOSED GAS FACILITIES 480.01

TYPICAL TEMPORARY GAS MAIN SUPPORT

CONNECTICUT NATURAL GAS CORP.

DRAWN	JW	SCALE	NONE
CHECKED		DATE	3.13.87
APPROVED		SHEET NO.	1 of 3

Refer to Procedure Memorandum #480.01

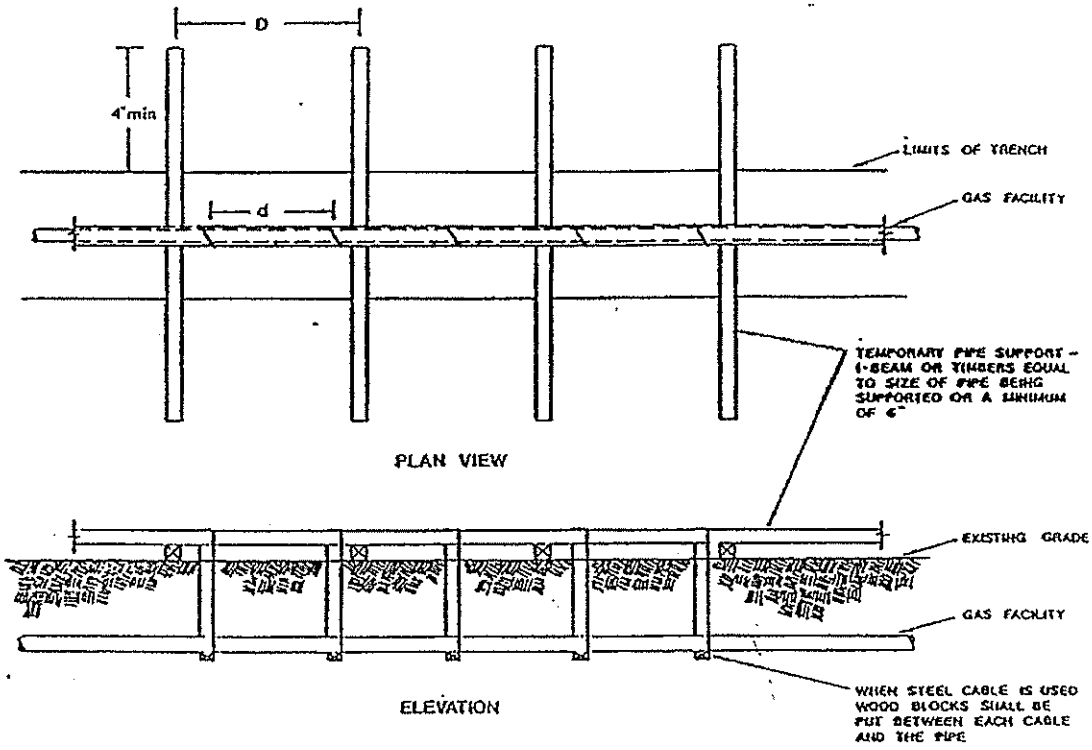


* WOOD WEDGES AS REQUIRED

EXHIBIT II	
PROTECTION of EXPOSED GAS FACILITIES 480.01	
TYPICAL PERMANENT CAST IRON GAS MAIN SUPPORT	
CONNECTICUT NATURAL GAS CORP.	
DRAWN JW	SCALE NONE
CHECKED	DATE 3.13.87
APPROVED	SHEET NO. 2 of 3

Refer to Procedure Memorandum #480.01

EXHIBIT III



MAXIMUM DISTANCES BETWEEN SUPPORTS - IN FEET

	PIPE DIAMETER	1"	2"	4" & LARGER
CAST IRON	D	6	6	6
	d	4	4	4
STEEL / PLASTIC	D	10	15	20
	d	7	10	15

D – DISTANCE BETWEEN SUPPORTING BEAMS
d – DISTANCE BETWEEN SUPPORTING STRAPS

EXHIBIT III
PROTECTION of EXPOSED GAS FACILITIES 480.01
TYPICAL TEMPORARY GAS MAIN SUPPORT/PARALLEL EXCAVATIONS

CONNECTICUT NATURAL GAS CORP.		
DRAWN JW	SCALE	NONE
CHECKED	DATE	3.13.87
APPROVED	SHEET NO.	3 of 3

Refer to Procedure Memorandum #480.01

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

Exhibit IV

Excavator's Name
Excavator's Address
City, State, Zip

Re:

Gentlemen:

Connecticut Natural Gas Construction Site Inspector, , states that as a result of your excavating operations on , approximately feet of inch cast iron pipe was exposed and/or undermined.

It is the responsibility of the excavator to exercise reasonable care in accordance with the State of Connecticut Public Act 87-71, Section 16-345-4, Responsibility of Excavators:

> ("a") [V] (5) Exercise reasonable care when working in proximity to the under-ground facilities of any public utility. REASONABLE CARE SHALL INCLUDE, WITHOUT LIMITATION, THE USE OF CONSTRUCTION METHODS APPROPRIATE TO ENSURE THE INTEGRITY OF EXISTING UTILITY FACILITIES AND THEIR TEMPORARY AND PERMANENT SUPPORT INCLUDING BUT NOT LIMITED TO ADEQUATE AND PROPER SHORING AND PROPER BACKFILL METHODS AND TECHNIQUES; THE SELECTION OF EQUIPMENT AND EXPLOSIVES CAPABLE OF PERFORMING THE WORK WITH THE MINIMUM REASONABLE LIKELIHOOD OF DISTURBANCE TO UNDERGROUND FACILITIES; ADEQUATE SUPERVISORY PERSONNEL TO ENSURE PROPER ACTIONS; PROPER UNDERSTANDING BY THE PERSONNEL ON THE JOB SITE OF THE AUTHORITY OF ALL PARTIES INVOLVED IN THE ACTIVITY SO THAT PROMPT ACTION CAN BE TAKEN IN THE EVENT OF UNANTICIPATED CONTACT WITH UNDERGROUND FACILITIES; ADEQUATE TRAINING OF EMPLOYEES IN EXECUTING THEIR ASSIGNMENTS TO ENSURE PROTECTION OF UTILITY FACILITIES AND THE PUBLIC; MAINTAINING NECESSARY LIAISON WITH OWNERS OF UNDERGROUND FACILITIES; SPONSORING PREPLANNING AND PRECONSTRUCTION MEETINGS AS NECESSARY AND COMPLYING WITH ALL APPLICABLE LAWS AND REGULATIONS."

The cast iron pipe appears to have been undermined to an extent that jeopardizes the integrity of the facility. As a result, replacement of the facility in the immediate vicinity of excavation may be necessary. If replacement is necessary, a bill for the replacement will be submitted to you in the near future once the work is complete.

If you have any questions regarding this matter, please contact me.

Very truly yours,

Construction Site Inspector

Refer to Procedure Memorandum #480.01

NOTICE TO CONTRACTOR

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

PURPOSE

This outlines the procedures followed when blasting is required near pipes conveying combustible gas.

The practice of the Corporation is to assure the safety of its facilities by assuring that contractors comply with the Connecticut General Statute Sections 16-345 through 16-355 and the Connecticut Regulations of State Agencies Sections 16-345-1 et. seq. (see EXHIBIT I).

PROCEDURE

I. ADMINISTRATION

CNG shall obey and comply with all pertinent provisions of the Connecticut State Statutes and Regulations.

A. Engineering Services provides each city or town fire chief and state fire marshal a copy of the CNG guidelines for blasting and the guidelines are updated as necessary.

B. When notified by Call Before You Dig (CBYD) that there will be blasting near a CNG facility, the Distribution Supervisor obtains the time of blasting, the blaster's name, the person calling and the time notified. A Construction Site Inspection Form (See EXHIBIT II) is completed by the Distribution Supervisor.

C. The Distribution Supervisor obtains the necessary gas facility records and schedules the inspection at the job site.

II. DISTRIBUTION RESPONSIBILITIES

A. Prior to each blasting project, a Distribution Supervisor or their designee arranges to meet with the contractor and the blaster to:

1. Check the contractor's and blaster's permits and insurance certificates;

2. Review CNG's blasting policy with the general and blasting contractor;

3. Perform a leak survey of the entire blasting project area.

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

B. Prior to each detonation, the Distribution Supervisor or their designee arranges to meet with the contractor and the blaster to:

1. Complete Parts A through R and U through W of the CNG Blasting Investigation Report (see EXHIBIT III).

2. Conduct a leak survey prior to each detonation and record the results on Part S of the CNG Blasting Investigation Report. In the event a gas leak is detected, the Distribution Supervisor or his designee shall ensure that no further blasting occurs until the leak is repaired and all residual gas is cleared.

3. Inspect the site and plot W (maximum pounds/delay of eight milli-seconds or more) versus R (horizontal distance between explosion and pipeline) on EXHIBIT IV, using the appropriate pipe material type.

   a. If the plot of the parameters lies in the area marked "Blasting Allowed Upon Permission of Area Inspector", the Manager, Distribution Services is contacted.

   b. If the plot of the parameters lies in the area marked "Blasting Not Allowed", the Manager of Distribution Services is contacted.

   c. If any unusual conditions exist, the city or town inspector, fire chief, or state marshal are notified.

4. Any time the recommended CNG policy limit is planned to be exceeded, the Manager, Engineering Services shall be contacted. The Manager, Engineering Services or his designee shall consult a Connecticut certified blasting consultant to review and approve the proposed blasting plan. The expense for this shall be borne by the contractor responsible for the project.

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

C. After each detonation, the Distribution Supervisor or their designee:

1. Conducts a leak survey after each detonation and records the results on Part T of the Blasting Investigation Report. In the event a gas leak is detected, the Distribution Supervisor or his designee shall ensure that no further blasting occurs until the leak is repaired and all residual gas is cleared.

2. Returns the completed Blasting Investigation Report to Distribution for filing.

APPROVED: _____ CTL 3/22/07

TITLE: Regional Director- CNG Field Operations

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

Exhibit I

PUBLIC SERVICE COMPANIES
CHAPTER 293
SECTION 16-345
EXCAVATION, DEMOLITION, OR DISCHARGE OF EXPLOSIVES

Section

16-345	Definitions
16-346	Compliance with chapter required prior to excavation or discharge of explosives.
16-347	Public utilities to file with Department of Public Utility Control
16-348	Central clearinghouse. Apportionment of costs
16-349	Notice of proposed excavation, discharge of explosives or demolition
16-350	Permits to require compliance with chapter
16-351	Information and assistance relocation of underground facilities
16-352	Emergency excavation, demolition, or discharge of explosives
16-353	Relation of chapter to permits and other laws
16-354	Care to be exercised near underground facilities
16-355	Procedure when contact is made with or damage is suspected or done to underground

Law Review Commentaries
Regulated Industries. James E. Rice (1980) 54 Connecticut Bar J. 514

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

Section 16-345: Definitions.

(a) "Person" means an individual, partnership, corporation, or association, including a person engaged as a contractor by a public agency but excluding a public agency.

(b) "Public Agency" means the state or any political subdivision thereof, including any governmental agency.

(c) "Public Utility" means the owner or operator of underground facilities for furnishing electric, gas, telephone, telegraph, pipeline, sewage, water, community television antenna, steam or traffic signal service, including a municipal or other public owner or operator.

(d) "Central Clearinghouse" means the group of public utilities formed pursuant to Section 16-348 for the purposes of receiving and giving notice of excavation activity within the state.

(e) "Excavation" means an operation for the purposes of movement or removal of earth, rock, or other materials in or on the ground, or otherwise disturbing the subsurface of the earth, by the use of powered or mechanized equipment, including but not limited to digging, blasting, auguring, back filling, test boring, drilling, pile driving, grading, plowing-in, hammering, pulling-in, trenching and tunneling; excluding the movement of earth by tools manipulated only by human or animal power and the tilling of soil for agricultural purposes.

(f) "Demolition" means the wrecking, razing, rending, moving, or removing of any structure.

(g) "Damage" includes but is not limited to substantial weakening of structural or lateral support of a utility line, penetration or destruction of any utility line protective coating, housing or other protective device or the severance, partial or complete, of any utility line.

(h) "Approximate location of underground facilities" means a strip of land not more than three feet wide or a strip of land extending not more than one an done-half feet on either side of the underground facilities.

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

Section 16-346: Compliance with chapter required prior to excavation or discharge of explosives.

No person, public agency, or public utility shall engage in excavation or discharge explosives at or near the location of a public utility underground facility or demolish a structure located at nor near or containing a public utility facility without having first ascertained the location of all underground facilities of public utilities in the area of such excavation, discharge, or demolition in the manner prescribed in this chapter and in such regulations as the department shall adopt pursuant to Section 16-357.

Section 16-347: Public utilities to file with Department of Public Utility Control.

A public utility shall file with the Department of Public Utility Control the location of its underground facilities, except facilities for storm sewers, by reference to a standard grid system, to be established by the department, and the title, address, and telephone number of its representative designated to receive the notice required by Section 16-349.

Section 16-348: Central clearinghouse. Apportionment of costs.

The public utilities of the state shall, under the direction of the Department of Public Utility Control, organize and operate a central clearinghouse within the state for receiving and giving the notices required by Section 16-349. The department shall apportion the cost of this service equitably among the public utilities for those underground facilities registered with the department, as provided in Section 16-347, except sanitary sewer or water facilities owned or operated by a city, town, or borough.

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

Section 16-349: Notice of proposed excavation, discharge of explosives or demolition.

Except as provided in Section 16-352, a person, public agency, or public utility responsible for excavating or discharging explosives at or near the location of public utility facilities or demolishing a structure containing a public utility facility shall notify the central clearinghouse of such proposed excavation, discharge, or demolition, orally or in writing, at least two full days, excluding Saturdays, Sundays, and holidays, but not more than thirty days before commencing such excavation, demolition, or discharge of explosives. The central clearinghouse shall immediately transmit such information to the public utilities whose facilities may be affected. In the event the proposed excavation, demolition, or discharge of explosives has not commenced within thirty days of such notification, or the excavation, demolition, or discharge of explosives will be expanded outside of the location originally specified in such notification, the person, public agency or public utility responsible for such excavation, demolition or discharge of explosives shall again notify the central clearinghouse at least two full days, excluding Saturdays, Sundays, and holidays, but not more than thirty days before commencing or expanding such excavation, demolition, or discharge of explosives.

Section 16-350: Permits to require compliance with chapter.

Any permit issued by a public agency for excavation, demolition, or discharge of explosives shall require compliance with this chapter. No such permit shall be issued by any public agency unless such public agency receives satisfactory evidence from the person, public agency, or public utility seeking such permit that the requirements of this chapter have been met. Such evidence shall be obtained from the central clearinghouse and shall be in such form as the department may prescribe by regulations pursuant to Section 16-357.

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

Section 16-351: Information and assistance relocation of underground facilities.

A public utility receiving notice pursuant to Section 16-349 shall inform the person, public agency, or pubic utility proposing to excavate, discharge explosives, or demolish a structure, of the approximate location of its underground facilities in the area in such manner as will enable such person, public agency, or public utility to establish the precise location of the underground facilities, and shall provide such other assistance in establishing the precise location of the underground facilities as the department may require by regulation pursuant to Section 16-357. Such person, public agency, or public utility shall designate the area of the proposed excavation, demolition, or discharge of explosives as the department may prescribe by regulation. The public utility receiving notice shall mark the approximate location of its underground facilities in such manner and using such methods, including color coding, as the department may prescribe by regulation. If the precise location of the underground facilities cannot be established, the person, public agency, or public utility shall so notify the public utility whose facilities may be affected, which shall provide such further assistance as may be needed to determine the precise location of the underground facilities in advance of the proposed excavation or discharge of explosives or demolition.

Section 16-352: Emergency excavation, demolition, or discharge of explosives.

(a) In case of emergency involving danger to life, health, or property or which requires immediate correction to continue the operation of a major industrial plant, or to assure the continuity of public utility service, excavation, or demolition without explosives may be made without the two-day notice required to Section 16-349 provided notice thereof by telephone is given as soon as reasonably possible.

(b) In case of an emergency involving an immediate and substantial danger of death or serious personal injury, explosives may be discharged if notice thereof is given at any time before discharge.

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE 482.01

BLASTING NEAR PIPES CONVEYING COMBUSTIBLE GAS

Section 16-353: Relocation of chapter to permits and other laws.

Except as provided in Section 16-350, this chapter shall not be construed to affect or impair local ordinances, charters, or other provisions of law requiring permits to be obtained before excavating in a public highway or to demolish structures on private property, nor shall it be construed to grant to any person or public agency any rights not specifically provided by this chapter. A permit from a public agency shall not relieve any person from responsibility for complying with the provisions of this chapter. The failure of any person who has been granted a permit to comply with the provisions of this chapter shall not be deemed to impose any liability upon the public agency issuing the permit.

Section 16-354: Care to be exercised near underground facilities.

A person, public agency, or public utility responsible for excavating, discharging explosives, or demolition shall exercise reasonable care when working in proximity to the underground facilities of any public utility and shall comply with such safety standards and other requirements as the department shall prescribe by regulation pursuant to Section 16-357. If the facilities are likely to be exposed, such support shall be provided as may be reasonably necessary for protection of the facilities. If gas facilities are likely to be exposed, only hand digging shall be employed.

Section 16-355: Procedure when contact is made with or damage is suspected or done to underground.

When any contact is made with or any damage is suspected or done to any underground facility of a public utility, the person, public agency, or public utility responsible for the operations causing the contact, suspected damage or damage shall immediately notify the public utility whose facilities have been affected, which shall dispatch its own personnel as soon as reasonably possible to inspect the underground facility and, if necessary, effect temporary or permanent repairs. If a serious electrical short is occurring or if dangerous fluids or gas are escaping from a broken line, the person, public agency, or public utility responsible for the operations causing the damage shall alert all persons within the danger area and take all feasible steps to insure the public safety pending the arrival of repair personnel. As used in this section, "contact" includes, without limitation, the striking, scraping, or denting, however slight, of any underground utility facility, the structural or lateral support of an underground utility line and any underground utility line protective coating, housing, or other protective device.

CONSTRUCTION SITE INSPECTION

PAGE ____ OF ____

STREET: _____ TOWN: _____ INSPECTOR: _____
EXCAVATOR: _____ CBYD #: _____ DATE: _____
EXCAVATOR CONTACT PERSON: _____ TIME ARRIVED: _____
EXCAVATOR PHONE #: _____ TIME DEPARTED: _____
EXCAVATOR ADDRESS: _____

TYPE OF EXCAVATION — INSTALLATION ☐ REPAIR ☐

- ☐ San Sewer
- ☐ Storm Drain
- ☐ Water
- ☐ Foundations
- ☐ Telephone
- ☐ Electric
- ☐ Cable TV
- ☐ Manhole
- ☐ Gas
- ☐ Road Reconstruction
- ☐ Blasting (Form 815.65 Required)
- ☐ Other

EXCAVATION CLASSIFICATION

Excavation Classification Grade A B C Criteria No(s) _____ (See Reverse Side)

Limit of Proposed Excavation: From: _____ To: _____ Length: _____ Ft.
Limit of Actual Excavation: From: _____ To: _____ Length: _____ Ft.
Average Depth of Excavation: ____ Ft. ____ In.
Average Width of Excavation: ____ Ft. ____ In.
Distance from C/L of Excavation to Gas Facility: ____ Ft. ____ In.

Existing Gas Facilities Within Scope of Inspection/Proposed work area: MAINS
Material _____ Size _____ Pressure Class _____ Cover _____
Material _____ Size _____ Pressure Class _____ Cover _____

Existing Gas Facilities Within Scope of Inspection/Proposed work area: SERVICES
Material _____ Size _____ Pressure Class _____ Cover _____
Material _____ Size _____ Pressure Class _____ Cover _____

Other Gas Facilities: _____
Gas Facility Exposed? Yes ☐ No ☐ If Yes, Complete 'Existing Pipe Inspection' Section
Critical Valve Located? Yes ☐ No ☐ If Yes, Attach Copy of Valve Record Cards

EXISTING PIPE INSPECTION

MATERIAL: Steel ☐ MD Plastic ☐ HD Plastic ☐ C. Iron ☐ Copper ☐ Other ☐ _____
COATING: None ☐ X-Tru ☐ Coal Tar ☐ Thin Film ☐ Other ☐ COATING CONDITION: Good ☐ Fair ☐ Poor ☐
TYPE CORROSION: None ☐ Rust/Scale ☐ Shallow Pits ☐ Deep Pits ☐ Leak ☐ Graphitization (Cast Iron) ☐

LEAKAGE SURVEY

Pre-Construction Survey: Date of Previous Annual Leakage Survey: _____
Existing Leakage: Yes ☐ No ☐
Location: _____ Order No: _____ Date: _____
Location: _____ Order No: _____ Date: _____
Inspection Leakage Survey:
From: _____ To: _____ Length: _____ Ft.
F.I. ID No. _____ CGI ID No. _____ Date: _____
Leakage Detected: Yes ☐ No ☐ If Yes, Attach Copy of 'Leak Survey Field Report'

NTACT WITH EXCAVATOR/COMMENTS: _____

SEE BACK SIDE:

ATTACHMENTS

- ☐ CBYD Ticket
- ☐ CNG Prints
- ☐ Photograph
- ☐ F.I. Survey
- ☐ Inspection Sketch
- ☐ Construction Drawing
- ☐ Valve Record Cards
- ☐ Other _____
- ☐ Blasting Investigation Report (815.65)
- ☐ Leak Survey Field Report (C:-LEAK (1-92))
- ☐ Hand Written Work Order (P-30)

BLASTING INVESTIGATION REPORT

A. Prepared by _____

B. Date: _____

C. CBYD Ticket No. _____

D. Time of Arrival at Job Site _____

E. Location _____ Town _____

F. Contractor _____ Subcontractor _____

G. Contractor's Insurer _____

H. Blasting Contractor _____ Blaster's Name _____

I. Blasting Company's Insurer _____

J. Material to be Blasted _____ Pipe Material _____

K. Time of Blast

L. Horizontal Distance to Nearest Gas Line (ft), R

M. Amount of Explosive per Delay (lbs./delay), W

N. Number of Delays

O. Time per Delay (Milliseconds)

P. Depth of Blast Hole (Feet)

Q. Depth of Gas Pipeline (Feet)

R. Diameter of Pipeline (Inches)

S. CGI Reading Before Detonation

U. CGI Reading After Detonation

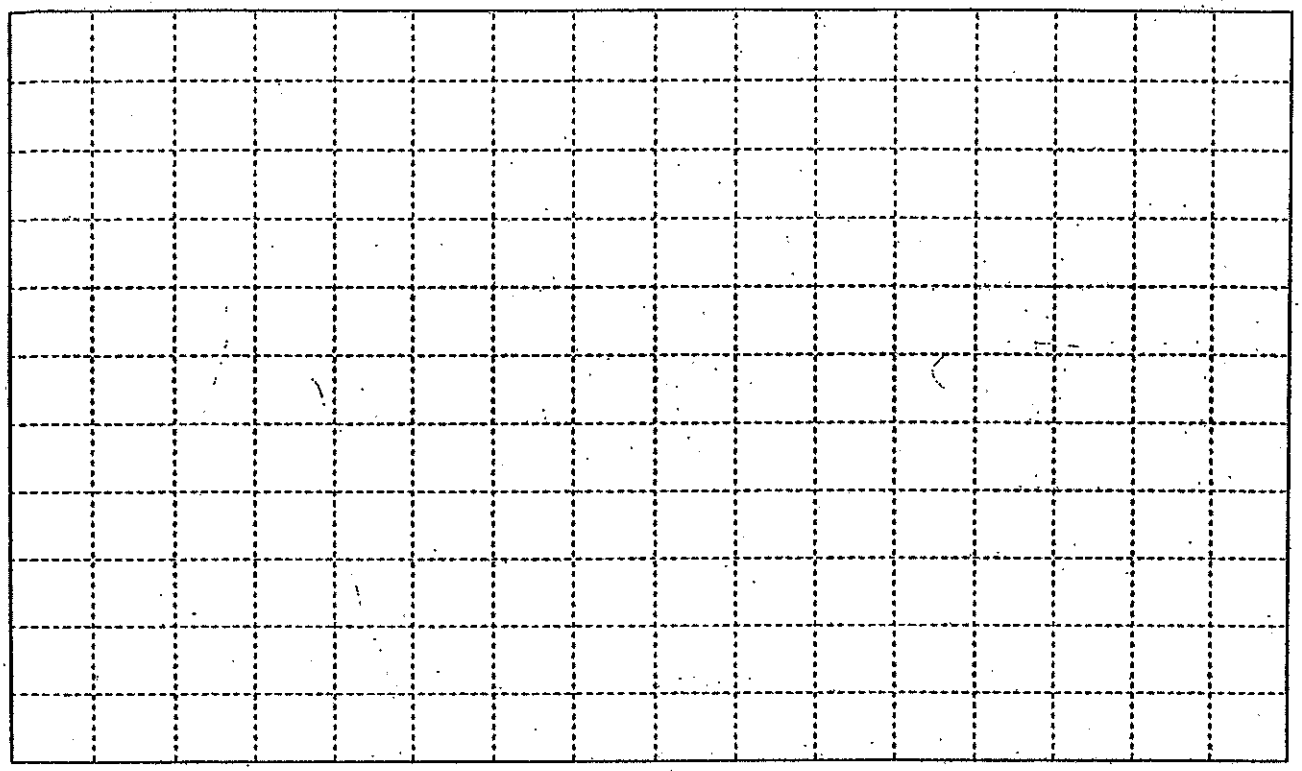
U. CGI Serial Number

(Continued on page 2)

Refer to Procedure Memorandum #482.01

BLASTING INVESTIGATION REPORT

V. Sketch of Area



W. Sketch of Blast Hole

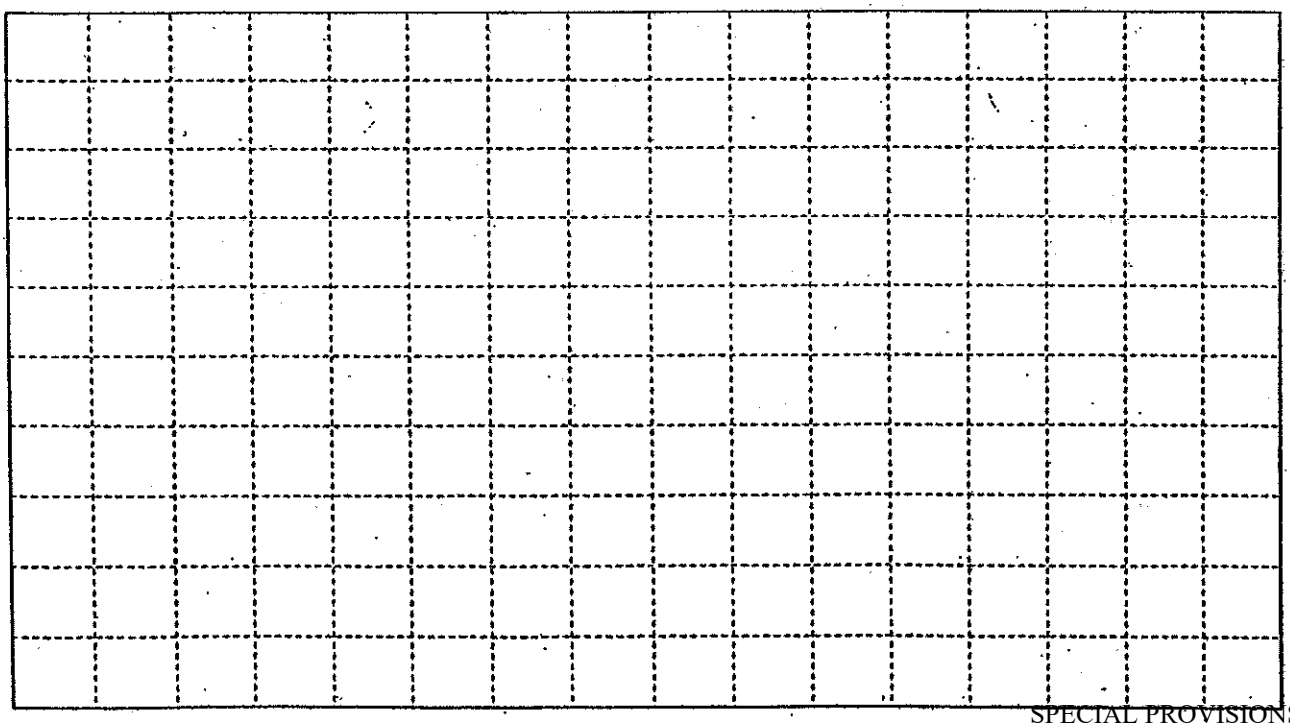
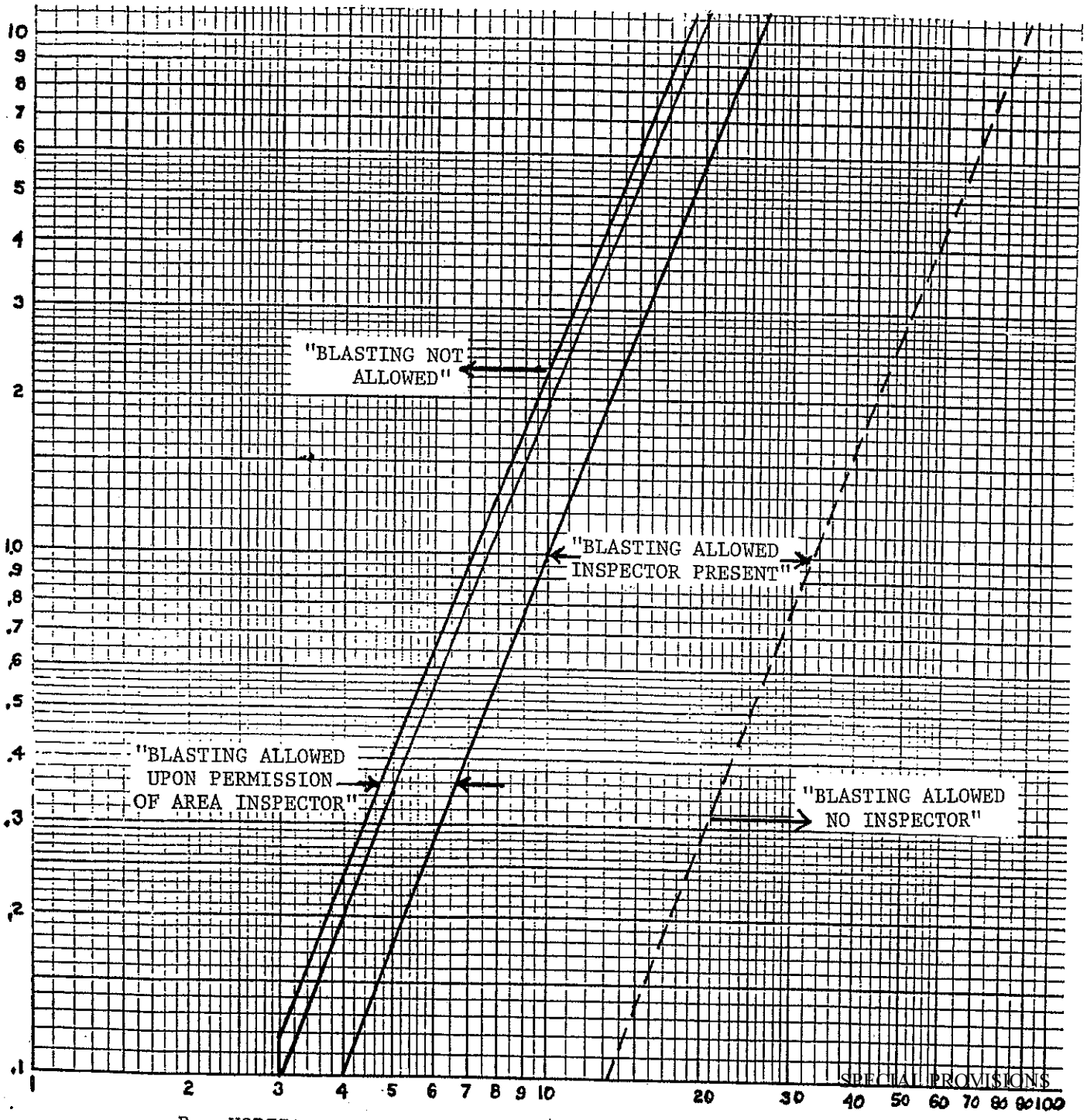


EXHIBIT IV

STEEL

CHARGE-DISTANCE LIMITS IN BLASTING
NEAR BURIED PIPELINES

REFER TO PROCEDURE MEMORANDUM #482.01



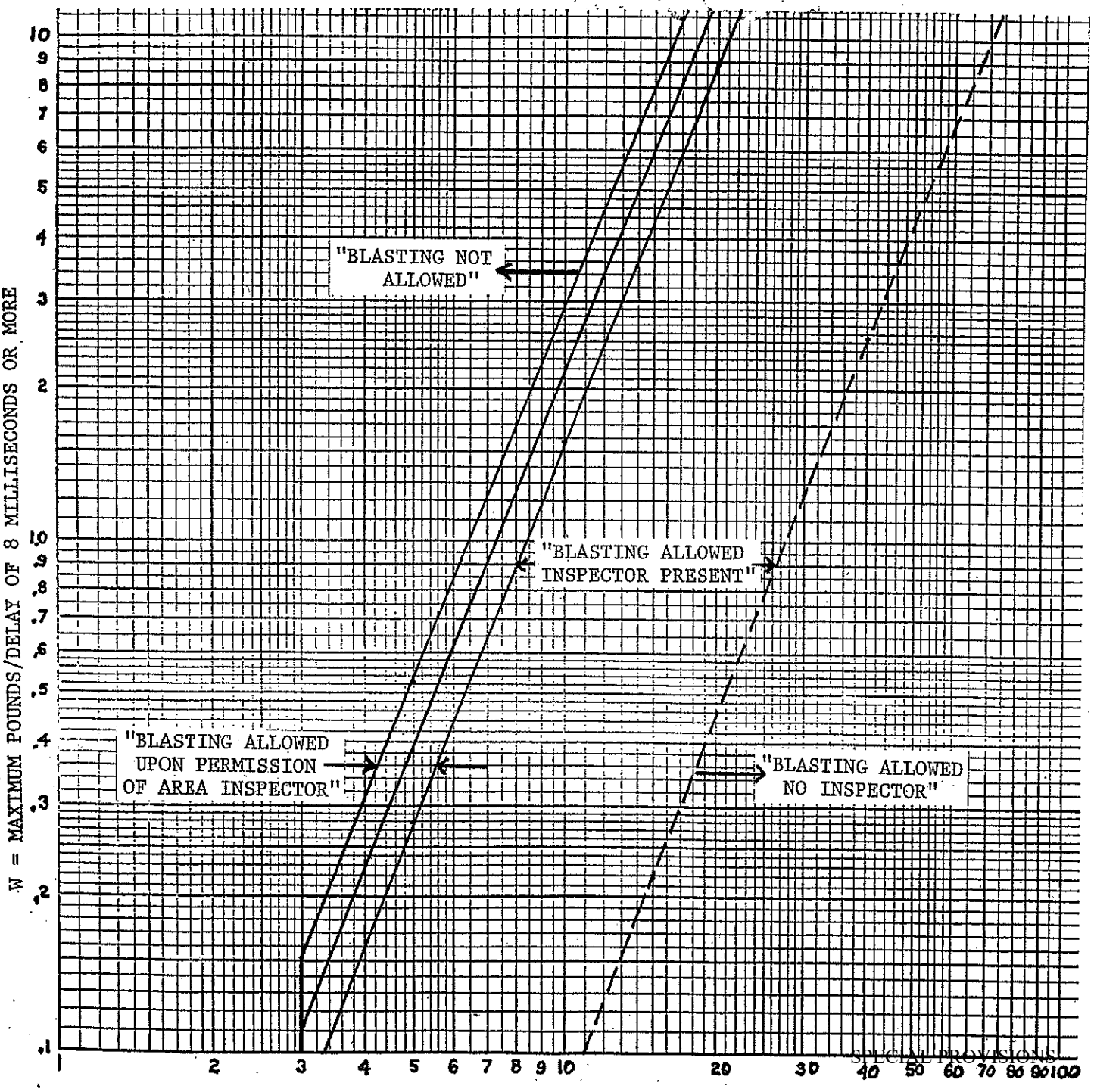
SPECIAL PROVISIONS

EXHIBIT IV

PLASTIC

CHARGE-DISTANCE LIMITS IN BLASTING
NEAR BURIED PIPELINES

REFER TO PROCEDURE MEMORANDUM #482.01



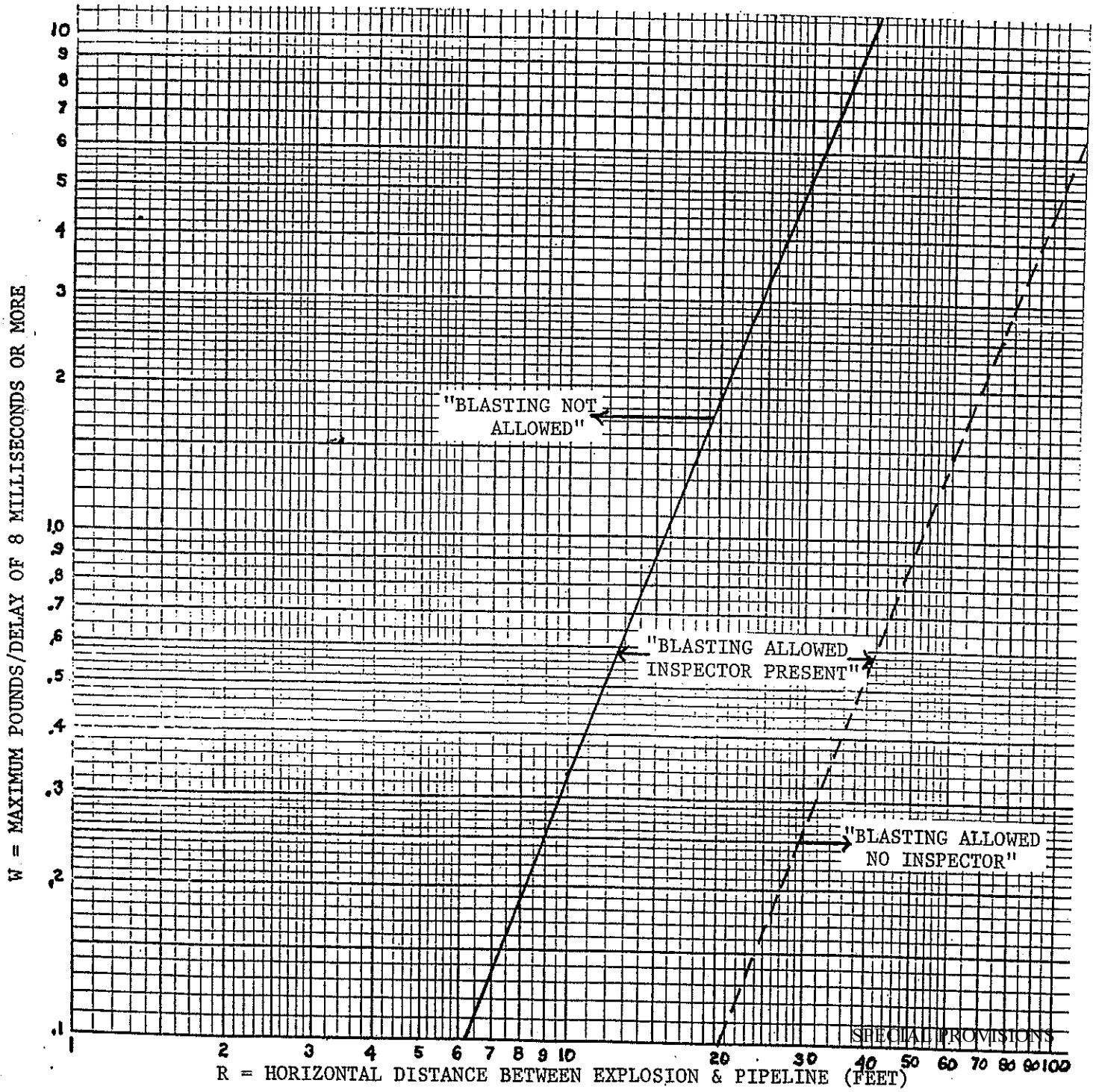
SPECIAL PROVISIONS

EXHIBIT IV

CAST IRON AND BARE STEEL

CHARGE-DISTANCE LIMITS IN BLASTING
NEAR BURIED PIPELINES

REFER TO PROCEDURE MEMORANDUM #482.01



SECTION 1.05 - CONTROL OF THE WORK

Article 1.05.02 - Plans, Working Drawings and Shop Drawings are supplemented as follows:

Sub article 1.05.02 - (2) is supplemented by the following:

Traffic Signal Items:

When required by the contract documents or when ordered by the City of New Britain or the Engineer, The Contractor shall prepare and submit product data sheets, working drawings and/or shop drawings for all traffic signal items to the City of New Britain and Tighe & Bond, Inc. for approval before fabrication. The packaged set submitted in an electronic portable document format (.pdf) shall be in an individual file with appropriate bookmarks for each item. The electronic files for catalog cuts shall be created on ANSI A (8 ½" x 11"; 216 mm x 279mm; letter) sheets. Working drawings and shop drawings shall be created on ANSI B (11" x 17"; 279 mm x 432 mm; ledger/tabloid) sheets.

Please send the pdf documents via email to:

Mr. Robert Trottier, P.E.
City Engineer
New Britain City Hall
27 West Main Street
New Britain, Connecticut 06051
rtrottier@NewBritainCT.gov

Mr. Christopher Granatini, P.E.
Tighe & Bond, Inc.
213 Court Street, Suite 900
Middletown, Ct 06457
cogranatini@tighebond.com

Steel Span Poles and Mast Arm Assemblies:

When these items are included in the project, the submission for Steel Span Poles and Mast Arm Assemblies shall follow the format and be sent to the "Engineer of Record" as described in the Steel Span Pole and Steel Mast Arm Assembly special provision.

At the completion of the Work, submit one complete set of the approved submittals to the City of New Britain at the contacts listed above.

SECTION 1.06 CONTROL OF MATERIALS

Article 1.06.01 - Source of Supply and Quality:

Add the following:

Traffic Signal Items:

For the following traffic signal items the contractor shall submit a complete description of the item, shop drawings, product data sheets and other descriptive literature which completely illustrates such items presented for formal review. Such review shall not change the requirements for a certified test report and materials certificate as may be called for. All documents shall be grouped into one separate file for each group of items as indicated by the Roman numerals below (for example, one pdf file for all of the pedestal items). The documents for all of the traffic signal items shall be submitted at one time, unless otherwise allowed by the engineer.

I. 1003204 – Light Standard (10' Bracket, 30' Mounting Height)

II. 10080XX – Rigid Metal Conduit

III. 10100XXA – Concrete Handholes & Covers

IV. 11020XX – Aluminum Pedestals

V. 1051XXA – Traffic Signals, Mast Arm Mounted - LEDs, Housings and Hardware
11052XXA – Traffic Signals, Pole Mounted - LEDs, Housings and Hardware
11053XXA – Traffic Signals, Pedestal Mounted - LEDs, Housings and Hardware
11055XXA – LED Traffic Signal Lamp Unit

VI. 11070XXA – Accessible Pedestrian Signal & Detector - Button, Housings & Sign

VII. 1108118A – NEMA TS2, Type 2 Traffic Controller and Cabinet

VIII. 11XXXXXA – Siren Pre-Emption – Detector & Phase Selector

IX. 1108843A - 12-Position Wall Mounted Fiber Optic Patch Panel

X. 1111600A – Extension Bracket
11122XXA – Vehicle Detection - Camera Assembly, Processor and Monitor

XI. 1112242A – Fiber Optic Cable Splice Enclosure

XII. 1113XXXA – Cable - Control Cable, Comm., CAT6, VC, Detector Cable (optical)
1113023A – 12 Strand Fiber Optic Interconnect Cable

Article 1.06.07 - Certified Test Reports and Materials Certificate.

Add the following:

1) For the materials in the following items, a Certified Test Report will be required confirming their conformance to the requirements set forth in these plans or specifications or both. Should the consignee noted on a Certified Test Report be other than the Prime Contractor, then Materials Certificates shall be required to identify the shipment.

    Steel Mast Arm Anchor Bolts
    Steel Mast Arm Assembly

2) For the materials in the following items, a Materials Certificate will be required confirming their conformance to the requirements set forth in these plans or specifications or both.

Aluminum Pedestals

Steel Mast Arm Assembly
Traffic Signal Housings and Hardware

LED Traffic Signal Lamp Unit
Pedestrian Signals Housing and Hardware
Pedestrian Pushbuttons and Type of Sign
Accessible Pedestrian Signal & Detector
Traffic Signal Controller Unit
    Traffic Controller Cabinet
    Controller Unit
    Solid State Time Switch
    Solid State Load Switch
    Conflict Monitor
    Solid State Flasher
    Flash Transfer Relay

Siren Pre-Emption Equipment
    Siren Detector
    Phase Selector (Audio)

Video Vehicle Detection
    Camera Assembly
    Camera Extension Bracket
    Video Detector Processor
    Camera Cable
    Monitor

Communication Cable

SECTION 1.06 CONTROL OF MATERIALS

Article 1.06.07 - Certified Test Reports and Materials Certificates:

Add the following:

All materials used on this project shall require a Certified Test Report or Material Certificate.

Following is a partial list of items that may be included in the project.

1. For the materials in the following items, a Certificate Test Report will be required confirming their conformance to the requirements set forth in the plans, these Specifications or both. Should the consignee noted on a Certified Test Report be other than the Prime Contractor, then Materials Certificates shall be required to identify the shipment.

Subbase	Granular Fill	Class A Concrete
Pervious Structure Backfill	Processed Aggregate Base	Class F Concrete
Topsoil	Joint Sealer	Riprap
Bedding Material	Cement	#8 Stone
#6 Stone	Anchoring Cement	#67 Stone
Sand	Chemical Anchors	Deformed Steel Bars
Threaded Steel Bars		

2. For the material in the following items, a Materials Certificate will be required confirming their conformance to the requirements set forth in the plans or these specifications if it is from a Connecticut Department of transportation approved plant/supplier. Otherwise, testing is required.

Bituminous Concrete	Portland Cement Concrete	Class A Concrete
Portland Cement	Pavement Marking	Class F Concrete
Signs	Sanitary Manhole Brick (for invert)	Joint Sealer
Concrete Building Brick	Masonry Concrete Units	Deformed Steel Bars
Reinforcing Steel	Wire & Welded Wire Fabric	Threaded Steel Bars
Anchor Bolts	Structural Steel	Membrane Waterproofing
Dowel Bars	Galvanizing	* Membrane
Paint	Damp Proofing	* Glass Fabric
Metal Beam Rail Elements	Grass Seed	* Primer
Precast Concrete Units	Fertilizer	* Mastic
	Wetland Seed Mix	

SECTION 1.07
LEGAL RELATIONS AND RESPONSIBILITIES

1.07.01—Laws to be Observed: is amended as follows:

In the second sentence of the first paragraph, after the word "State" add the words "and Municipality".

1.07.03—Proprietary Devices, Materials and Processes: is amended as follows:

After the word "State" add the words "and Municipality" throughout this Article.

1.07.04—Restoration of Surfaces Opened Pursuant to Permit or Contract: is amended as follows:

Replace the word "Department" with "Municipality" throughout this Article.

1.07.07—Safety and Public Convenience: is amended as follows:

In the penultimate paragraph, after the word "Department," add the words "or Municipality".

1.07.09—Protection and Restoration of Property: is supplemented and amended as follows:

Add the words "or Municipality" after the word "State" wherever the word "State" appears in this Article.

Add the phrase "or Municipality, as applicable" after the word "Department" wherever the word "Department" appears in this Article.

Add the following:

The Contractor shall notify the Tree Warden of the Municipality in which the project is located, five (5) days prior to flagging so that the Tree Warden may be present during the flagging.

All trees scheduled to be removed outside of the proposed gutter or curb lines of the highway shall be visibly marked or flagged by the Contractor at least five (5) days prior to cutting of such trees.

The Engineer will inspect the identified trees and verify the limits of tree removal prior to the Contractor proceeding with his cutting operation, should such an operation be required elsewhere in this contract.

1.07.10 - Contractor's Duty to Indemnify the State Against Claims for Injury or Damage: is amended as follows:

Revise the title of this Article to read "Contractor's Duty to Indemnify the State and/or Municipality Against Claims for Injury or Damage."

In the first sentence, delete the words "the Department".

Replace the word "State" with "State and/or Municipality" throughout this Article.

Replace the word "Commissioner" with "Engineer" throughout this Article.

Add the following paragraph after the only paragraph:

"It is further understood and agreed by the parties hereto, that the Contractor shall not use the defense of Sovereign Immunity in the adjustment of claims or in the defense of any suit, including any suit between the State and/or Municipality and the Contractor, unless requested to do so by the State and/or Municipality."

1.07.13—Contractor's Responsibility for Adjacent Property and Services: is supplemented with the following:

The Contractor's attention is directed to the fact that overhead utilities (including utility poles, pole guys and overhead wires) exist in the immediate vicinity of the project.

The Contractor shall be liable for all damages and claims received or sustained by any persons, corporations or property in consequence of damage to the existing utilities, their appurtenances, or other facilities caused directly or indirectly by the operations of the Contractor.

The following company and representative shall be contacted by the Contractor to coordinate the protection of their utilities on this project 30 days prior to the start of any work on this project involving their utilities:

Company	Representative	Phone # /Email	Address
City of New Britain Public Works	Mr. Robert Trottier	(860) 826-3355 Robert.Trottier@newbritainct.gov	27 West Main Street New Britain, CT 06051
City of New Britain Water Department	Mr. Chris Polkowski	(860) 826-3538 water@NewBritainCT.gov	1000 Shuttle Meadow Ave. New Britain, CT 06052
Eversource Energy	Mr. Thomas Woronik	(860) 267-3891 Thomas.Woronik@eversource.com	22 East High Street East Hampton, CT 06424
Comcast of Connecticut, Inc	Mr. Jim Bitzas	(413) 562-9923 jim_bitzas@cable.comcast.com	1110 East Mountain Road Westfield, MA 01085
Frontier Communications of Connecticut	Ms. Lynne DeLucia	(203) 238-5000 Lynne.m.delucia@ftr.com	1441 North Colony Rd. Meriden, CT 06450

Connecticut Natural Gas Corporation	Mr. Jonathan Gould	(860) 727-3044 Jgould@ctgcorp.com	76 Meadow Street, 1st Floor E. Hartford, CT 06108
Lightower Fiber Networks I, LLC	Mr. Eric Clark	(203) 649-3904 Eric.Clark@crowncastle.com	1781 Highland Avenue Cheshire, CT 06410
WilTel Communications, LLC	Mr. Mike Weaver	(919) 710-8891 mike.weaver@level3.com	1025 Eldorado Boulevard - 43C-317 Broomfield, CO 80021

The City of New Britain Building Department shall be contacted for electrical service inspections for controllers. Please provide the electrical service request number provided by the power company. This is a Work Request (WR) Number provided by Eversource.

1.07.14—Personal Liability of Representatives of the State: is amended as follows:

Add the words "and Municipality" after the word "State".

1.07.15—No Waiver of Legal Rights: is amended as follows:

Replace the words "Commissioner" and "Department" with "Municipality" or "Municipal" throughout this Article.

1.07.16—Unauthorized Use of Area(s) within the Project Site: is amended as follows:

Replace the words "Commissioner" and "State" with "Municipality" throughout this Article.

Add the following new Subarticle:

1.07.19—Personal Liability of Representatives of the Municipality

In carrying out any of the provisions of these specifications, or in exercising any power or authority granted to them by or within the scope of the Contract, the Engineer and his authorized representatives, including consultant engineering firms and their employees, shall be subject to no liability, either personally or as officials of the Municipality, it being understood that in all such matters they act solely as agents and representatives of the Municipality.

SECTION 1.08 - PROSECUTION AND PROGRESS

Article 1.08.03 - Prosecution of Work:

Add the following:
The Contractor shall stake the limits of the concrete sidewalks and ramps in conjunction with staking the locations of foundations to ensure that pedestrian push buttons will be located appropriately and will be accessible from a landing area.

The Contractor will not be allowed to install traffic signal or pedestrian heads until the controllers are on hand and ready for installation. Once installation of this equipment commences, the Contractor shall complete this work in a most expeditious manner.

The Contractor shall notify the City of New Britain and the Engineer when all traffic signal work is completed. This will include all work at signalized intersections including relocation work including handholes. The City of New Britain will coordinate a field inspection of all work. Refer to Section 10.00 – General Clauses For Highway Illumination And Traffic Signal Projects, Article 10.00.10 and corresponding special provision.

Article 1.08.04 - Limitation of Operations - Add the following:

In order to provide for traffic operations as outlined in the Special Provision "Maintenance and Protection of Traffic," the Contractor will not be permitted to perform any work which will interfere with the described traffic operations on all project roadways as follows:

All Project Roadways

Monday through Friday between 7:00 a.m. and 9:00 a.m. & between 4:00 p.m. and 6:00 p.m.

From Friday at 6:00 p.m. to Monday 7:00 a.m.

No work shall be performed Monday through Sunday between 6:00 p.m. to 6:00 a.m.

SECTION 2.86 - DRAINAGE TRENCH EXCAVATION, ROCK IN DRAINAGE TRENCH EXCAVATION

2.86.01—Description
2.86.03—Construction Methods
2.86.04—Method of Measurement
2.86.05—Basis of Payment

2.86.01—Description: Drainage trench excavation consists of the excavation necessary for the proper installation of drainage structures, pipes, pipe ends and any other incidental drainage items.

It shall include earth and rock excavation, removal of existing pipes, dewatering, backfill, and disposal of materials; to the trench limits described herein, to the dimensions shown on the plans, or as directed by the Engineer.

Classifications:

(1) Drainage Trench Excavation will include only the excavation necessary for the construction of the drainage items and the removals specified above.

(2) Rock in Drainage Trench Excavation, insofar as it applies to drainage trench excavation, shall be defined as **1/2 cubic yard or more** in volume of the following obstructions removed from the limits of the drainage trench:

(a) rock in definite ledge formation
(b) boulders, or portions of boulders
(c) cement masonry structures
(d) concrete or reinforced concrete structures
(e) reinforced concrete pipe
(f) subsurface concrete pavement or concrete base

The removal shall be as indicated or directed from within the limits defined in 2.86.03 for drainage trench excavation.

2.86.03—Construction Methods:

(1) Drainage Trench Excavation Limits:

Horizontal Limits: Trench widths for pipes, pipe ends, pipe-arches, and drainage structures shall be as follows:

(a) 2 feet greater than the nominal inside diameter of circular pipe or nominal inside span of elliptical pipe or pipe-arch for such diameters or spans of less than 30 inches
(b) 3 feet greater than the nominal inside diameter of circular pipe or the nominal inside span of elliptical pipe or pipe-arch for such diameters or spans that are 30 inches or greater
(c) 4 feet greater than the nominal inside diameter or nominal horizontal inside span for pipe-arches fabricated from structural plates
(d) 2 feet beyond the neat lines of all exterior or foundation walls of drainage structures

Vertical Limits: Trench depths shall extend vertically as follows:

(a) From the bottom of the trench to the bottom of the roadway excavation, or in areas away from roadway excavation, to the top of existing ground surface.

(b) Where drainage pipe is to be laid in a fill area, the embankment shall be placed and compacted to a minimum elevation 12 inches above the top of the proposed pipe, whereupon the drainage trench excavation shall be performed and the pipe installed.

(2) Drainage Trench Excavation: Drainage trench excavation shall be made in conformity with the requirements of the plans, or as directed by the Engineer. The Contractor shall furnish and employ such shores, braces, pumps, or ancillary equipment as needed for the proper protection of property, proper completion of the work, as well as safety of the public and employees of both the Contractor and the Department. All bracing and shoring shall be removed when no longer required for the construction or safety of the work. When required, the Contractor shall provide or have on the Site at all times any OSHA certification for equipment to be used, per 1.07.07. For support of trenches greater than 10 feet in depth, working drawings shall be submitted, in accordance with 1.05.02. The Contractor shall control erosion and sedimentation at trench locations and ensure that pumped water from the drainage excavation is discharged in accordance with the requirements of 1.10.

Where a firm foundation is not encountered at the grades established due to unsuitable material, such as soft, spongy, or unstable soil, the unsuitable material shall be removed and replaced with approved backfill, thoroughly compacted in lifts not to exceed 6 inches, for the full trench width. The Engineer shall be notified prior to removal of the unsuitable material in order to determine the depth of removal necessary.

After the excavation is complete, the Contractor shall notify the Engineer and no drainage structure or material shall be placed in the excavated area until the Engineer has approved the depth of excavation and the character of the foundation material.

(3) Rock in Drainage Trench Excavation:

(a) Rock in Drainage Trench Excavation - Ledge: When rock in definite ledge form is encountered, the Contractor shall excavate a minimum of 12 inches below the bottom of the proposed pipe or drainage structure; and this depth shall be filled with bedding material (as specified in M.08.03-1) below the proposed pipe; or granular fill (as specified in M.02.01) below the proposed drainage structure, which shall be thoroughly compacted in lifts not to exceed 6 inches.

(b) Rock in Drainage Trench Excavation - Boulders: When boulders are encountered, the Contractor shall remove them from the trench and if backfill is required, the void shall be filled with bedding material, surplus excavated material (as specified in 2.02.03-8) or granular fill which shall be thoroughly compacted in lifts not to exceed 6 inches.

(c) Rock in Drainage Trench Excavation –Structures: When cement masonry, concrete or reinforced concrete structures are encountered within the drainage trench limits, the Contractor shall remove the structure in its entirety or as directed by the Engineer, and if backfill is required, the void shall be filled with bedding material, surplus excavated material or granular fill which shall be thoroughly compacted in lifts not to exceed 6 inches.

(4) Backfill: Suitable material excavated from the drainage trench shall be used as backfill material prior to consideration of using any other source of backfill. Backfill material used shall be of a quality satisfactory to the Engineer and shall be free from large or frozen lumps, wood and other extraneous material. Rock fill or stones larger than 5 inches shall not be placed within 1 foot of the drainage structure or pipe. The grading shall be

completed to the lines shown on the plans, or as ordered, by refilling to the required elevation with approved material, placed in layers not to exceed 6 inches in depth after compaction, which shall be thoroughly compacted with equipment approved by the Engineer.

All surplus or unsuitable material shall be removed and disposed of as directed. Should additional material be required for backfilling, it may be obtained from the Project surplus excavation in accordance with 2.02.03-8 or from borrow pits, gravel pits, or elsewhere as directed by the Engineer.

2.86.04—Method of Measurement:

Drainage Trench Excavation: Drainage trench excavation will not be measured for payment.

If granular fill or borrow is required to replace unsuitable material it will be measured for payment as directed by the Engineer.

Rock in Drainage Trench Excavation: If any material meeting the definition of Rock in Drainage Trench Excavation is encountered, the Contractor shall strip it of sufficient overlying material to allow for proper measurement and shall then notify the Engineer that the rock surface is ready for measurement. If the Contractor fails to give such notice, the Engineer will presume that the measurements taken at the time the Engineer first saw the material in question will give the true quantity of excavation.

Rock in Drainage Trench Excavation will be measured according to the classification provided in 2.86.01 and within the drainage trench excavation limits provided in 2.86.03.

For the removal of underground obstructions, as classified in 2.86.01-2, the measurement shall be the actual volume of rock removed (1/2 cubic yard or more) as approved by the Engineer.

Rock in Drainage Trench Excavation will not be measured for payment in fills.

Bedding Material or other suitable fill, as specified in 2.86.03(3), used to fill voids after rock is excavated will not be measured for payment.

2.86.05—Basis of Payment:

Drainage Trench Excavation: There will be no direct payment for drainage trench excavation required for the installation of drainage pipes, pipe ends, catch basins, drop inlets, manholes, and other drainage structures, or any other incidental drainage work including materials, tools, equipment and labor necessary to complete the drainage trench excavation in conformity with the plans or as directed by the Engineer.

There will be no direct payment for backfill or disposal of surplus material necessary for the satisfactory completion of this work.

There will be no direct payment made for shoring, bracing, dewatering, or for material or equipment necessary for the satisfactory completion of the work.

Where called for on the plans to install temporary earth retaining systems for the support of existing facilities, pavement, utilities, or for other constraints, payment will be made in accordance with such items in the Contract.

If granular fill or borrow is used to replace unsuitable material, payment will be made at the respective Contract unit prices, or in the absence of such items in the Contract, as Extra Work in accordance with 1.04.05.

Rock in Drainage Trench Excavation: When rock, conforming to the description in 2.86.01 is encountered within the limits of drainage trench excavation, its removal will be classified and

paid for at the Contract unit price per cubic yard for "Rock in Drainage Trench Excavation 0' – 10' Deep," or "Rock in Drainage Trench Excavation 0' – 20' Deep," as the case may be.

Those portions of drainage trench excavation classified and paid for as "Rock in Drainage Trench Excavation" of the various depths will be the actual volumes of rock excavated within the limits for drainage trench excavation, at the applicable bottom depth price.

Where no item or items for "Rock in Drainage Trench Excavation" at the applicable depth appear in the proposal and rock is encountered in drainage trench excavation, its removal will be paid for as Extra Work in accordance with 1.04.05.

When excavation is necessary in fill, no such excavation will be paid for as "Rock in Drainage Trench Excavation."

When excavation is necessary for any purpose other than drainage-related items, no such excavation will be paid under this item.

Bedding material or any other suitable material used to fill voids vacated by excavated rock will not be paid for but shall be included in the unit price per cubic yard for "Rock in Drainage Trench Excavation."

Pay Item	Pay Unit
Rock in Drainage Trench Excavation 0' - 10' Deep	c.y.
Rock in Drainage Trench Excavation 0' - 20' Deep	c.y.

SECTION 4.06 - BITUMINOUS CONCRETE

Section 4.06 is being deleted in its entirety and replaced with the following:

4.06.01—Description
4.06.02—Materials
4.06.03—Construction Methods
1. **Material Documentation**
2. **Transportation of Mixture**
3. **Paving Equipment**
4. **Test Section**
5. **Transitions for Roadway Surface**
6. **Spreading and Finishing of Mixture**
7. **Longitudinal Joint Construction Methods**
8. **Contractor Quality Control (QC) Requirements**
9. **Temperature and Seasonal Requirements**
10. **Field Density**
11. **Acceptance Sampling and Testing**
12. **Density Dispute Resolution Process**
13. **Corrective Work Procedure**
14. **Protection of the Work**
15. **Cut Bituminous Concrete Pavement**

4.06.04—Method of Measurement
4.06.05—Basis of Payment

4.06.01—Description: Work under this Section shall include the production, delivery, placement and compaction of a uniform textured, non-segregated, smooth bituminous concrete pavement to the grade and cross section shown on the plans.

The following terms as used in this specification are defined as:

Bituminous Concrete: A composite material consisting of prescribed amounts of asphalt binder and aggregates. Asphalt binder may also contain additives engineered to modify specific properties and/or behavior of the composite material. References to bituminous concrete apply to all of its forms, such as those identified as hot-mix asphalt (HMA) or polymer-modified asphalt (PMA).

Bituminous Concrete Plant (Plant): A structure where aggregates and asphalt binder are combined in a controlled fashion into a bituminous concrete mixture suitable for forming pavements and other paved surfaces.

Course: A continuous layer (a lift or multiple lifts) of the same bituminous concrete mixture placed as part of the pavement structure.

Density Lot: The total tonnage of all bituminous concrete placed in a single lift which are:

PWL density lots = When the project total estimated quantity per mixture is larger than 3,500 tons

Simple Average density lots = When the project total estimated quantity per mixture is 3,500 tons or less

Disintegration: Erosion or fragmentation of the pavement surface which can be described as

polishing, weathering-oxidizing, scaling, spalling, raveling, or formation of potholes.
Dispute Resolution: A procedure used to resolve conflicts between the Engineer and the Contractor's results that may affect payment.
Hot Mix Asphalt (HMA): A bituminous concrete mixture typically produced at 325°F.
Job Mix Formula (JMF): A recommended aggregate gradation and asphalt binder content to achieve the required mixture properties.
Lift: An application of a bituminous concrete mixture placed and compacted to a specified thickness in a single paver pass.
Percent Within Limits (PWL): The percentage of the lot falling between the Upper Specification Limit (USL) and the Lower Specification Limit (LSL).
Polymer Modified Asphalt (PMA): A bituminous concrete mixture containing a polymer-modified asphalt binder and using a qualified warm mix technology.
Production Lot: The total tonnage of a bituminous concrete mixture from a single source that may receive an adjustment.
Production Sub Lot: Portion of the production lot typically represented by a single sample.
Quality Assurance (QA): All those planned and systematic actions necessary to provide CTDOT the confidence that a Contractor will perform the work as specified in the Contract.
Quality Control (QC): The sum total of activities performed by the vendor (Producer, Manufacturer, and Contractor) to ensure that a product meets contract specification requirements.
Superpave: A bituminous concrete mix design used in mixtures designated as "S*" Where "S" indicates Superpave and * indicates the sieve related to the nominal maximum aggregate size of the mix.
Segregation: A non-uniform distribution of a bituminous concrete mixture in terms of gradation, temperature, or volumetric properties.
Warm Mix Asphalt (WMA) Technology: A qualified additive or technology that may be used to produce a bituminous concrete at reduced temperatures and/or increase workability of the mixture.

4.06.02—Materials: All materials shall meet the requirements of Section M.04.

1. Materials Supply: The bituminous concrete mixture must be from one source of supply and originate from one Plant unless authorized by the Engineer.

2. Recycled Materials: Reclaimed Asphalt Pavement (RAP), Crushed Recycled Container Glass (CRCG), Recycled Asphalt Shingles (RAS), or crumb rubber (CR) from recycled tires may be incorporated in bituminous concrete mixtures in accordance with Project Specifications.

4.06.03—Construction Methods

1. Material Documentation: All vendors producing bituminous concrete must have Plants with automated vehicle-weighing scales, storage scales, and material feeds capable of producing a delivery ticket containing the information below.

a. State of Connecticut printed on ticket.
b. Name of Producer, identification of Plant, and specific storage silo if used.
c. Date and time.
d. Mixture Designation, mix type and level. Curb mixtures for machine-placed curbing must state "curb mix only."

e. If WMA Technology is used, "-W"must be listed following the mixture designation.
f. Net weight of mixture loaded into the vehicle. (When RAP and/or RAS is used, the moisture content shall be excluded from mixture net weight.)
g. Gross weight (equal to the net weight plus the tare weight or the loaded scale weight).
h. Tare weight of vehicle (daily scale weight of the empty vehicle).
i. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
j. Vehicle number - unique means of identification of vehicle.
k. For Batch Plants: individual aggregate, recycled materials, and virgin asphalt max/target/min weights when silos are not used.
l. For every mixture designation: the running daily and project total delivered and sequential load number.

The net weight of mixture loaded into the vehicle must be equal to the cumulative measured weights of its components.

The Contractor must notify the Engineer immediately if, during production, there is a malfunction of the weight recording system in the automated Plant. Manually written tickets containing all required information will be allowed for no more than 1 hour.

The State reserves the right to have an Inspector present to monitor batching and/or weighing operations.

2. Transportation of Mixture: The mixture shall be transported in vehicles that are clean of all foreign material, excessive coating or cleaning agents, and that have no gaps through which material might spill. Any material spilled during the loading or transportation process shall be quantified by re-weighing the vehicle. The Contractor shall load vehicles uniformly so that segregation is minimized. Loaded vehicles shall be tightly covered with waterproof covers acceptable to the Engineer. Mesh covers are prohibited. The cover must minimize air infiltration. Vehicles found not to be in conformance shall not be loaded

Vehicles with loads of bituminous concrete being delivered to State projects must not exceed the statutory or permitted load limits referred to as gross vehicle weight (GVW). The Contractor shall furnish a list and allowable weights of all vehicles transporting mixture. The State reserves the right to check the gross and tare weight of any vehicle. If the gross or tare weight varies from that shown on the delivery ticket by more than 0.4%, the Engineer will recalculate the net weight. The Contractor shall correct the discrepancy to the satisfaction of the Engineer.

If a vehicle delivers mixture to the Project and the delivery ticket indicates that the vehicle is overweight, the load may not be rejected but a "Measured Weight Adjustment" will be taken in accordance with Article 4.06.04.

Vehicle body coating and cleaning agents must not have a deleterious effect on the mixture. The use of solvents or fuel oil, in any concentration, is prohibited for the coating of vehicle bodies.

For each delivery, the Engineer shall be provided a clear, legible copy of the delivery ticket.

3. Paving Equipment: The Contractor shall have the necessary paving and compaction equipment at the Project Site to perform the work. All equipment shall be in good working order and any equipment that is worn, defective, or inadequate for performance of the work shall be repaired or replaced by the Contractor to the satisfaction of the Engineer. During the paving operation, the use of solvents or fuel oil, in any concentration, is strictly prohibited as a release agent or cleaner on any paving equipment (i.e., rollers, pavers, transfer devices, etc.).

Refueling or cleaning of equipment is prohibited in any location on the Project where fuel or solvents might come in contact with paved areas or areas to be paved. Solvents used in cleaning mechanical equipment or hand tools shall be stored clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off of areas paved or to be paved.

Pavers: Each paver shall have a receiving hopper with sufficient capacity to provide for a uniform spreading operation and a distribution system that places the mix uniformly, without segregation. The paver shall be equipped with and use a vibratory screed system with heaters or burners. The screed system shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screed units as part of the system shall have auger extensions and tunnel extenders as necessary. Automatic screed controls for grade and slope shall be used at all times unless otherwise authorized by the Engineer. The controls shall automatically adjust the screed to compensate for irregularities in the preceding course or existing base. The controls shall maintain the proper transverse slope and be readily adjustable, and shall operate from a fixed or moving reference such as a grade wire or floating beam (minimum length 20 feet).

Rollers: All rollers shall be self-propelled and designed for compaction of bituminous concrete. Roller types shall include steel wheeled, pneumatic, or a combination thereof. Rollers that operate in a dynamic mode shall have drums that use a vibratory or oscillatory system or combination. Vibratory rollers shall be equipped with indicators for amplitude, frequency, and speed settings/readouts to measure the impacts per foot during the compaction process. Oscillatory rollers shall be equipped with frequency indicators. Rollers can operate in the dynamic mode using the oscillatory system on concrete structures such as bridges and catch basins if at the lowest frequency setting.

Pneumatic tire rollers shall be equipped with wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 psi uniformly over the surface. The Contractor shall furnish documentation to the Engineer regarding tire size, pressure and loading to confirm that the proper contact pressure is being developed and that the loading and contact pressure are uniform for all wheels.

Lighting: For paving operations which will be performed during hours of darkness the paving equipment shall be equipped with lighting fixtures as described below or with an approved equal. Lighting shall minimize glare to passing traffic. The lighting options and minimum number of fixtures are listed in Tables 4.06-1 and 4.06-2.

TABLE 4.06-1: Minimum Paver lighting

Option	Fixture Configuration	Fixture Quantity	Requirement
1	Type A	3	Mount over screed area
	Type B (narrow) or Type C (spot)	2	Aim to auger and guideline
	Type B (wide)or Type C (flood)	2	Aim 25feet behind paving machine
2	Type D Balloon	2	Mount over screed area

TABLE 4.06-2: Minimum Roller Lighting

Option	Fixture Configuration	Fixture Quantity	Requirement
1	Type B (wide)	2	Aim 50 feet in front of and behind roller
	Type B (narrow)	2	Aim 100 feet in front of and behind roller
2	Type C (flood)	2	Aim 50 feet in front of and behind roller
	Type C (spot)	2	Aim 100 feet in front of and behind roller
3	Type D Balloon	1	Mount above the roller

*All fixtures shall be mounted above the roller.

Type A: Fluorescent fixture shall be heavy duty industrial type. Each fixture shall have a minimum output of 8,000 lumens. The fixtures shall be mounted horizontally and be designed for continuous row installation.

Type B: Each floodlight fixture shall have a minimum output of 18,000 lumens.

Type C: Each fixture shall have a minimum output of 19,000 lumens.

Type D: Balloon light – each balloon light fixture shall have minimum output of 50,000 lumens and emit light equally in all directions.

Material Transfer Vehicle (MTV): A MTV shall be used when placing bituminous concrete surface course (a lift or multiple lifts) as indicated in the Contract except as noted on the plans or as directed by the Engineer. In addition, continuous paving lengths of less than 500 feet may not require the use of a MTV as determined by the Engineer.

The MTV must be a vehicle specifically designed for the purpose of delivering the bituminous concrete mixture from the delivery vehicle to the paver. The MTV must continuously remix the bituminous concrete mixture throughout the placement process.

The use of a MTV will be subject to the requirements stated in Article 1.07.05 Load Restrictions. The Engineer may limit the use of the vehicle if it is determined that the use of the MTV may damage highway components, utilities, or bridges. The Contractor shall submit to the Engineer at time of pre-construction the following information:

1. The make and model of the MTV.
2. The individual axle weights and axle spacing for each piece of paving equipment (haul vehicle, MTV and paver).
3. A working drawing showing the axle spacing in combination with all pieces of equipment that will comprise the paving echelon.

4. Test Section: The Engineer may require the Contractor to place a test section whenever the requirements of this specification or Section M.04 are not met.

The Contractor shall submit the quantity of mixture to be placed and the location of the test section for review and approval by the Engineer. The same equipment used in the construction of a passing test section shall be used throughout production.

If a test section fails to meet specifications, the Contractor shall stop production, make necessary adjustments to the job mix formula, Plant operations, or procedures for placement and compaction. The Contractor shall construct test sections, as allowed by the Engineer, until all the required specifications are met. All test sections shall also be subject to removal as set forth in Article 1.06.04.

5. Transitions for Roadway Surface: Transitions shall be formed at any point on the roadway where the pavement surface deviates, vertically, from the uniform longitudinal profile as specified on the plans. Whether formed by milling or by bituminous concrete mixture, all transition lengths shall meet the criteria below unless otherwise specified.

Permanent Transitions: Defined as any gradual change in pavement elevation that remains as a permanent part of the work.

A transition shall be constructed no closer than 75 feet from either side of a bridge expansion joint or parapet. All permanent transitions, leading and trailing ends shall meet the following length requirements:

Posted Speed Limit	Permanent Transition Length Required
> 35 mph	30 feet per inch of elevation change
35 mph or less	15 feet per inch of elevation change

In areas where it is impractical to use the above-described permanent transition lengths, the use of a shorter permanent transition length may be permitted when approved by the Engineer.

Temporary Transitions: Defined as a transition that does not remain a permanent part of the work.

All temporary transitions shall meet the following length requirements:

Posted Speed Limit	Temporary Transition Length Required
> 50 mph	Leading Transition: 15 feet per inch of vertical change (thickness) Trailing Transition: 6 feet per inch of vertical change (thickness)
40, 45 or 50 mph	Leading and Trailing: 4 feet per inch of vertical change (thickness)
35 mph or less	Leading and Trailing: 3 feet per inch of vertical change (thickness)

Note: Any temporary transition to be in place over the winter shutdown period or during extended periods of inactivity (more than 14 calendar days) shall meet the greater than 50 mph requirements shown above.

6. Spreading and Finishing of Mixture: Prior to the placement of the mixture, the underlying base course shall be brought to the plan grade and cross section within the allowable tolerance.

Immediately before placing a bituminous concrete lift, a uniform coating of tack coat shall be applied to all existing underlying pavement surfaces and on the exposed surface of a wedge joint. Such surfaces shall be clean and dry. Sweeping or other means acceptable to the Engineer shall be used.

The mixture shall not be placed whenever the surface is wet or frozen.

Tack Coat Application: The tack coat shall be applied by a pressurized spray system that results in uniform overlapping coverage at an application rate of 0.03 to 0.05 gal./s.y. for a non-milled surface and an application rate of 0.05 to 0.07 gal./s.y. for a milled surface. For areas

where both milled and un-milled surfaces occur, the tack coat shall be an application rate of 0.03 to 0.05 gal /s.y. The Engineer must approve the equipment and the method of measurement prior to use. The material for tack coat shall be heated to 160°F ± 10°F and shall not be further diluted.

Tack coat shall be allowed sufficient time to break prior to any paving equipment or haul vehicles driving on it.

The Contractor may request to omit the tack coat application between bituminous concrete layers that have not been exposed to traffic and are placed during the same work shift. Requests to omit tack coat application on the upper and lower surfaces of a wedge joint will not be considered.

Placement: The mixture shall be placed and compacted to provide a smooth, dense surface with a uniform texture and no segregation at the specified thickness and dimensions indicated in the plans and specifications.

When unforeseen weather conditions prevent further placement of the mixture, the Engineer is not obligated to accept or place the bituminous concrete mixture that is in transit from the Plant.

In advance of paving, traffic control requirements shall be set up, maintained throughout placement, and shall not be removed until all associated work including density testing is completed.

The mixture temperature will be verified by means of a probe or infrared type of thermometer. The placement temperature range shall be listed in the quality control plan (QCP) for placement and meet the requirements of Table M.04.03-4. Any HMA material that that falls outside the specified temperature range as measured by a probe thermometer may be rejected.

The Contractor shall inspect the newly placed pavement for defects in mixture or placement before rolling is started. Any deviation from standard crown or section shall be immediately remedied by placing additional mixture or removing surplus mixture. Such defects shall be corrected to the satisfaction of the Engineer.

Where it is impracticable due to physical limitations to operate the paving equipment, the Engineer may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a thickness that will result in a completed pavement meeting the designed grade and elevation.

Placement Tolerances: Each lift of bituminous concrete placed at a specified thickness shall meet the following requirements for thickness and area. Any pavement exceeding these limits shall be subject to an adjustment or removal. Lift tolerances will not relieve the Contractor from meeting the final designed grade. Lifts of specified non-uniform thickness, i.e. wedge or shim course, shall not be subject to thickness and area adjustments.

a) Thickness: Where the average thickness of the lift exceeds that shown on the plans beyond the tolerances shown in Table 4.06-3, the Engineer will calculate the thickness adjustment in accordance with Article 4.06.04.

TABLE 4.06-3: Thickness Tolerances

Mixture Designation	Lift Tolerance
S1	+/- 3/8 inch
S0.25, S0.375, S0.5	+/- 1/4 inch

Where the thickness of the lift of mixture is less than that shown on the plans beyond the

tolerances shown in Table 4.06-3, the Contractor, with the approval of the Engineer, shall take corrective action in accordance with this Section.

b) Area: Where the width of the lift exceeds that shown on the plans by more than the specified thickness, the Engineer will calculate the area adjustment in Article 4.06.04.

c) Delivered Weight of Mixture: When the delivery ticket shows that the truck exceeds the allowable gross weight for the vehicle type, the Engineer will calculate the weight adjustment in accordance with Article 4.06.04.

Transverse Joints: All transverse joints shall be formed by saw-cutting to expose the full thickness of the lift. Tack coat shall be applied to the sawn face immediately prior to additional mixture being placed.

Compaction: The Contractor shall compact the mixture to meet the density requirements as stated in Article 4.06.04 and eliminate all roller marks without displacement, shoving cracking, or aggregate breakage.

When placing a lift with a specified thickness less than 1 1/2 inches, or a wedge course, the Contractor shall provide a minimum rolling pattern as determined by the development of a compaction curve. The procedure to be used shall be documented in the Contractor's QCP for placement and demonstrated on the first day of placement.

The use of the vibratory system on concrete structures is prohibited. When approved by the Engineer, the Contractor may operate a roller using an oscillatory system at the lowest frequency setting.

If the Engineer determines that the use of compaction equipment in the dynamic mode may damage highway components, utilities or adjacent property, the Contractor shall provide alternate compaction equipment.

Rollers operating in the dynamic mode shall be shut off when changing directions.

These allowances will not relieve the Contractor from meeting pavement compaction requirements.

Surface Requirements:

Each lift of the surface course shall not vary more than 1/4 inch from a Contractor-supplied 10 foot straightedge. For all other lifts of bituminous concrete, the tolerance shall be 3/8 inch. Such tolerance will apply to all paved areas.

Any surface that exceeds these tolerances shall be corrected by the Contractor at its own expense.

7. Longitudinal Joint Construction Methods: The Contractor shall use Method I - Notched Wedge Joint (see Figure 4.06-1) when constructing longitudinal joints where lift thicknesses are 1 ½ inches to 3 inches. S1.0 mixtures shall be excluded from using Method I. Method II - Butt Joint (see Figure 4.06-2) shall be used for lifts less than 1 1/2 inches or greater than 3 inches. Each longitudinal joint shall maintain a consistent offset from the centerline of the roadway along its entire length. The difference in elevation between the two faces of any completed longitudinal joint shall not exceed 1/4 inch at any location.

Method I - Notched Wedge Joint:

A notched wedge joint shall be constructed as shown in Figure 4.06-1 using a device that is attached to the paver screed and is capable of independently adjusting the top and bottom vertical notches. The device shall have an integrated vibratory system. The top vertical notch must be located at the centerline or lane line in the final lift. The requirement for paving full width "curb to curb" as described in Method II may be waived if addressed in the QC plan and approved by

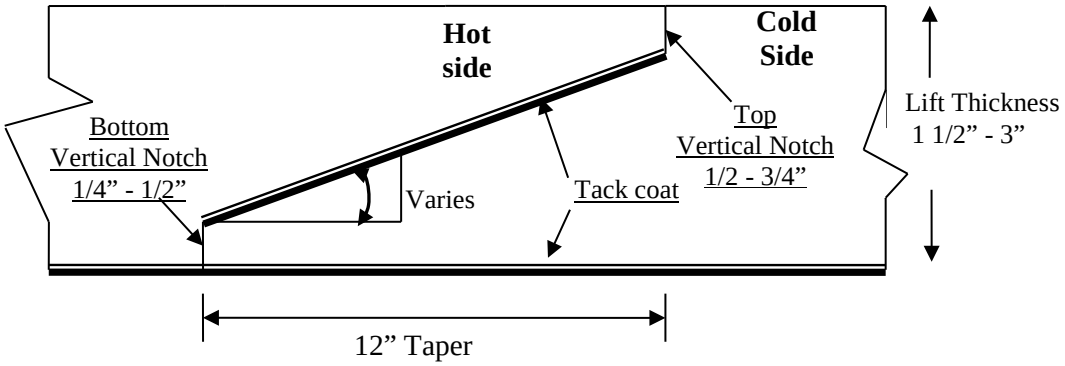
the Engineer.

The taper portion of the wedge joint shall be evenly compacted using equipment other than the paver or notch wedge joint device. The compaction device shall be the same width as the taper and not reduce the angle of the wedge or ravel the top notch of the joint during compaction.

When placed on paved surfaces, the area below the sloped section of the joint shall be treated with tack coat. The top surface of the sloped section of the joint shall be treated with tack coat prior to placing the completing pass.

The taper portion of the wedge joint shall not be exposed to traffic for more than 5 calendar days.

Figure 4.06-1: Notched Wedge Joint (Not to Scale)



Any exposed wedge joint must be located to allow for the free draining of water from the road surface.

The Engineer reserves the right to define the paving limits when using a wedge joint that will be exposed to traffic.

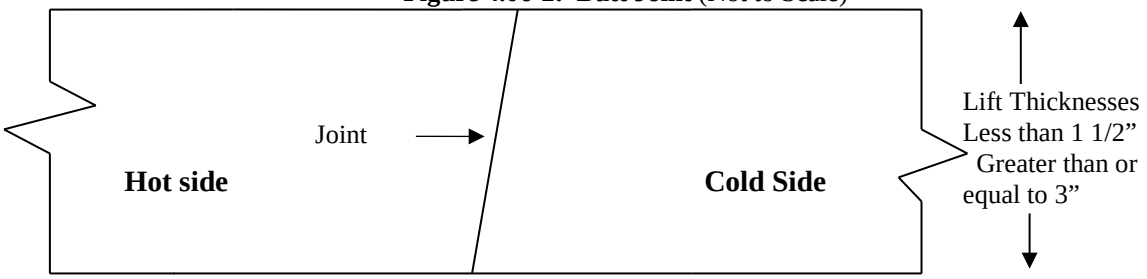
If Method I cannot be used on those lifts which are 1 ½ inches to 3 inches, Method III may be substituted according to the requirements below for "Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment."

Method II - Butt Joint:

When adjoining passes are placed, the Contractor shall use the end gate to create a near vertical edge (refer to Figure 4.06-2). The completing pass (hot side) shall have sufficient mixture so that the compacted thickness is not less than the previous pass (cold side). During placement of multiple lifts, the longitudinal joint shall be constructed in such a manner that it is located at least 6 inch from the joint in the lift immediately below. The joint in the final lift shall be at the centerline or at lane lines. The end gate on the paver should be set so there is an overlap onto the cold side of the joint.

The Contractor shall not allow any butt joint to be incomplete at the end of a work shift unless otherwise allowed by the Engineer. When using this method, the Contractor is not allowed to leave a vertical edge exposed at the end of a work shift and must complete paving of the roadway full width "curb to curb."

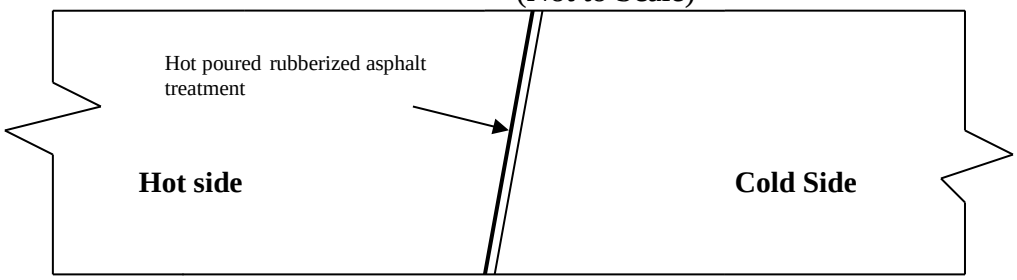
Figure 4.06-2: Butt Joint (Not to Scale)



Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment:

If Method I cannot be used due to physical constraints in certain limited locations, the Contractor may submit a request in writing for approval by the Engineer to use Method III as a substitution in those locations. There shall be no additional measurement or payment made when Method III is substituted for Method I. When required by the Contract or approved by the Engineer, Method III (see Figure 4.06-3) shall be used.

Figure 4.06-3: Butt Joint with Hot Poured Rubberized Asphalt Treatment
(Not to Scale)



All of the requirements of Method II must be met with Method III. In addition, the longitudinal vertical edge must be treated with a rubberized joint seal material meeting the requirements of ASTM D6690, Type 2. The joint sealant shall be placed on the face of the "cold side" of the butt joint as shown above prior to placing the "hot side" of the butt joint. The joint seal material shall be applied in accordance with the manufacturer's recommendation so as to provide a uniform coverage and avoid excess bleeding onto the newly placed pavement.

8. Contractor Quality Control (QC) Requirements: The Contractor shall be responsible for maintaining adequate quality control procedures throughout the production and placement operations. Therefore, the Contractor must ensure that the materials, mixture, and work provided by Subcontractors, Suppliers, and Producers also meet Contract specification requirements.

This effort must be documented in Quality Control Plans (QCP) and must address the actions, inspection, or sampling and testing necessary to keep the production and placement operations in control, to determine when an operation has gone out of control and to respond to correct the situation in a timely fashion.

The Standard QCP for production shall consist of the quality control program specific to the production facility.

There are 3 components to the QCP for placement: a Standard QCP, a Project Summary Sheet

that details Project-specific information, and, if applicable, a separate Extended Season Paving Plan as required in 4.06.03-9 "Temperature and Seasonal Requirements."

The Standard QCP for both production and placement shall be submitted to the Department for approval each calendar year and at a minimum of 30 days prior to production or placement.

Production or placement shall not occur until all QCP components have been approved by the Engineer.

Each QCP shall include the name and qualifications of a Quality Control Manager (QCM). The QCM shall be responsible for the administration of the QCP, and any modifications that may become necessary.

The QCM shall have the ability to direct all Contractor personnel on the Project during paving operations.

The QCPs shall also include the name and qualifications of any outside testing laboratory performing any QC functions on behalf of the Contractor. The QC Technician performing in-place density testing shall be NETTCP certified as a paving inspector.

Approval of the QCP does not relieve the Contractor of its responsibility to comply with the Project specifications. The Contractor may modify the QCPs as work progresses and must document the changes in writing prior to resuming operations. These changes include but are not limited to changes in quality control procedures or personnel. The Department reserves the right to deny significant changes to the QCPs.

QCP for Production: Refer to M.04.03-1.

QCP for Placement: The Standard QCP, Project Summary Sheet, and Extended Season Paving Plan shall conform to the format provided by the Engineer. The format is available at http://www.ct.gov/dot/lib/dot/documents/dconstruction/pat/qcp_outline_hma_placement.pdf

The Contractor shall perform all quality control sampling and testing, provide inspection, and exercise management control to ensure that bituminous concrete placement conforms to the requirements as outlined in its QCP during all phases of the work. The Contractor shall document these activities for each day of placement.

The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours in a manner acceptable to the Engineer.

The Contractor may obtain 1 mat core and 1 joint core per day for process control, provided this process is detailed in the QCP. The results of these process control cores shall not be used to dispute the Department's determinations from the acceptance cores. The Contractor shall submit the location of each process control core to the Engineer for approval prior to taking the core. The core holes shall be filled to the same requirements described in Subarticle 4.06.03-10.

9. Temperature and Seasonal Requirements: Paving, including placement of temporary pavements, shall be divided into 2 seasons, "In-Season" and "Extended-Season." In-Season paving occurs from May 1 to October 14, and Extended Season paving occurs from October 15 to April 30. The following requirements shall apply unless otherwise authorized or directed by the Engineer:

- Mixtures shall not be placed when the air or subbase temperature is less than 40°F regardless of the season.
- Should paving operations be scheduled during the Extended Season, the Contractor must submit an Extended Season Paving Plan for the Project that addresses minimum delivered mix temperature considering WMA, PMA, or other additives; maximum paver speed; enhanced rolling patterns; and the method to balance mixture delivery and placement

operations. Paving during Extended Season shall not commence until the Engineer has approved the plan.

10. Field Density The Contractor shall obtain cores for the determination of mat and longitudinal joint density of bituminous concrete pavements. Within five calendar days of placement, mat and joint cores shall be extracted on each lift with a specified thickness of 1 1/2 inches or more. Joint cores shall not be extracted on HMA S1.0 lifts.

The Contractor shall extract cores from random locations determined by the Engineer in accordance with ASTM D3665. Four (4) or six (6) inch diameter cores shall be extracted for S0.25, S0.375 and S0.5 mixtures; 6 inch diameter cores shall be required for S1.0 mixtures. The Contractor shall coordinate with the Engineer to witness the extraction, labeling of cores, and filling of the core holes.

Each lift will be separated into lots as follows:

a. Simple Average Density Lots: For total estimated quantities below 2,000 tons, the lift will be evaluated in one lot which will include the total paved tonnage of the lift and all longitudinal joints between the curb lines.
   For total estimated quantities between 2,000 and 3,500 tons, the lift will be evaluated in two lots in which each lot will include approximately half of the total tonnage placed for the full paving width of a lift including all longitudinal joints between the curb lines.
b. PWL Density Lots: Mat density lots will include each 3,500 tons of mixture placed within 30 calendar days. Joint density lots will include 14,000 linear feet of constructed joints. Bridge density lots will always be analyzed using simple average lot methodology.
c. Partial Density Lot (For PWL only): A mat density lot with less than 3,500 tons or a joint density lot with less than 14,000 linear feet due to:
   - completion of the course; or
   - a lot spanning 30 calendar days.

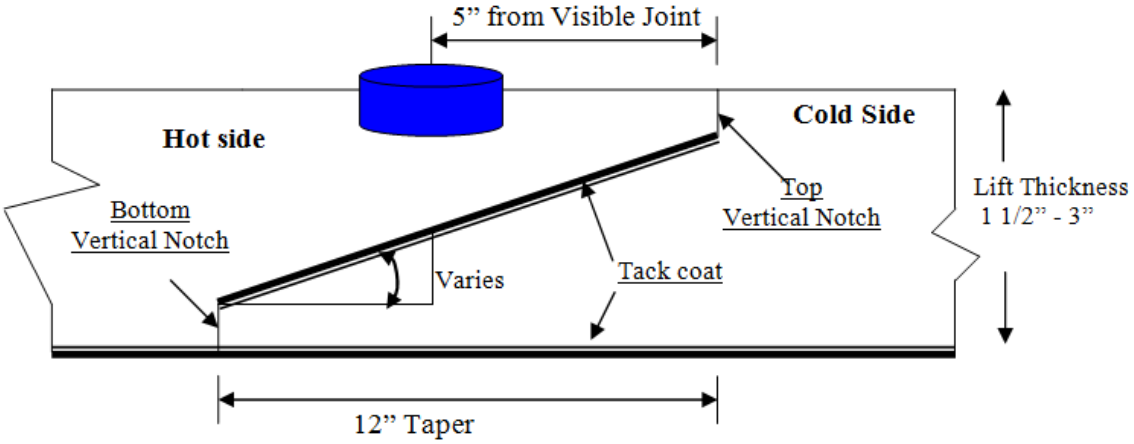
Prior to paving, the type and number of lot(s) will be determined by the Engineer. Noncontiguous areas such as highway ramps may be combined to create one lot.

After the lift has been compacted and cooled, the Contractor shall cut cores to a depth equal to or greater than the lift thickness and shall remove them without damaging the lift(s) to be tested. Any core that is damaged or obviously defective while being obtained will be replaced with a new core from a location within 2 feet measured in a longitudinal direction.

A mat core shall not be located any closer than 1 foot from the edge of a paver pass. If a random number locates a core less than 1 foot from any edge, the location will be adjusted by the Engineer so that the outer edge of the core is 1 foot from the edge of the paver pass.

Method I, Notched Wedge Joint cores shall be taken so that the center of the core is 5 inches from the visible joint on the hot mat side (Figure 4.06-4).

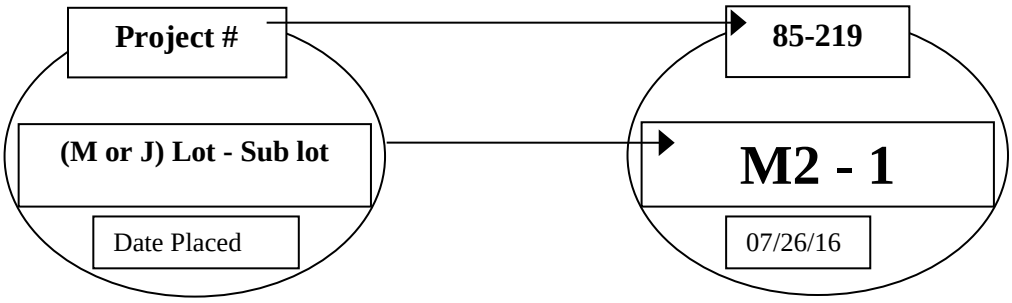
Figure 4.06-4: Notched Wedge Joint Cores (Not to Scale)



When Method II or Method III Butt Joint is used, cores shall be taken from the hot side so the edge of the core is within 1 inch of the longitudinal joint.

The cores shall be labeled by the Contractor with the Project number, date placed, lot number, and sub-lot number. The core's label shall include "M" for a mat core and "J" for a joint core. For example, a mat core from the first lot and the first sub-lot shall be labeled with "M1 – 1." A mat core from the second lot and first sub-lot shall be labeled "M2-1" (see Figure 4.06-5). The Engineer shall fill out a MAT-109 to accompany the cores. The Contractor shall deliver the cores and MAT-109 to the Department's Central Lab. The Contractor shall use a container approved by the Engineer. The container shall have a lid capable of being locked shut and tamper proof. The Contractor shall use foam, bubble wrap, or another suitable material to prevent the cores from being damaged during handling and transportation. Once the cores and MAT-109 are in the container the Engineer will secure the lid using security seals at the removable hinges(s) and at the lid opening(s). The security seals' identification number must be documented on the MAT-109. All sealed containers shall be delivered to the Department's Central Lab within two working days from time of extraction. Central Lab personnel will break the security seal and take possession of the cores.

Figure 4.06-5: Labeling of Cores



Each core hole shall be filled within 4 hours upon core extraction. Prior to being filled, the hole shall be prepared by removing any free water and applying tack coat using a brush or other

means to uniformly cover the cut surface. The core hole shall be filled using a bituminous concrete mixture at a minimum temperature of 240°F containing the same or smaller nominal maximum aggregate size and compacted with a hand compactor or other mechanical means to the maximum compaction possible. The bituminous concrete shall be compacted to 1/8 inch above the finished pavement.

Simple Average Density Lots:

A standard simple average density lot is the quantity of material placed within the defined area excluding any bridge decks.

A combo simple average density lot is the quantity of material placed within the defined area including bridge decks less than or equal to 500 feet long.

A bridge simple average density lot is the quantity of material placed on a bridge deck longer than 500 feet.

The number of cores per lot shall be determined in accordance with Table 4.06-4. If a randomly selected mat or joint core location is on a bridge deck, the core is to be obtained on the bridge deck in addition to the core(s) required on the bridge deck.

The number of cores per lot shall be determined in accordance with Table 4.06-5. Multiple bridge decks can be combined into one lot if the paving and underlying conditions are comparable. If multiple bridge decks are combined into a single bridge lot, at least one mat and joint core shall be obtained on each bridge.

The longitudinal locations of mat cores within a standard, combo, or bridge lot containing multiple paving passes will be determined using the combined length of the paving passes within the lot.

TABLE 4.06-4: Number of Cores per Lot (Simple Average)

Lot Type	No. of Mat Cores		No. of Joint Cores	
Standard Lot < 500 Tons	3		3	
Standard Lot ≥ 500 Tons	4		4	
Combo Lot < 500 Tons	2 plus	1 per bridge (≤ 300')	2 plus	1 per bridge (≤ 300)
Combo Lot ≥ 500 Tons[(1)]	4 plus	2 per bridge (301' – 500')	4 plus	2 per bridge (301' – 500')

TABLE 4.06-5: Number of Core per Bridge Density Lot (Simple Average)

Length of Bridge(s) (Feet)	Minimum No. of Mat Cores	Minimum No. of Joint Cores
< 500	2	2
501 – 1,500	3	3
1,501 – 2,500	4	4
2,501 and greater	5	5

PWL Density Lots:

A PWL mat density lot is 3,500 tons of material placed within the defined area excluding any bridges. One mat core will be obtained per every 500 tons placed.

A PWL joint density lot is 14,000 linear feet of longitudinal joint excluding any joints on bridge decks. One joint core will be obtained per every 2,000 linear feet of joint.

Bridge density lots will always be analyzed as using the simple average lot methodology. The number of cores per lot shall be determined in accordance with Table 4.06-5. Multiple bridge decks can be combined into one lot if the paving and underlying conditions are comparable. If multiple bridge decks are combined into a single bridge lot, at least one mat and joint core shall be obtained on each bridge.

11. Acceptance Sampling and Testing: Sampling shall be performed in accordance with ASTM D3665 or a statistically-based procedure of stratified random sampling approved by the Engineer.

Plant Material Acceptance: The Contractor shall provide the required sampling and testing during all phases of the work in accordance with M.04. The Department will verify the Contractor's acceptance test results. Should any test results exceed the specified tolerances in the Department's current QA Program for Materials, the Contractor's test results for a subject lot or sub lot may be replaced with the Department's results for the purpose of calculating adjustments. The verification procedure is included in the Department's current QA Program for Materials.

Density Acceptance: The Engineer will perform all acceptance testing in accordance with AASHTO T 331. The density of each core will be determined using the daily production's average maximum theoretical specific gravity (Gmm) established during the testing of the parent material at the Plant. When there was no testing of the parent material or any Gmm exceeds the specified tolerances in the Department's current QA Program for Materials, the Engineer will determine the maximum theoretical density value to be used for density calculations.

12. Density Dispute Resolution Process: The Contractor and Engineer will work in partnership to avoid potential conflicts and to resolve any differences that may arise during quality control or acceptance testing for density. Both parties will review their sampling and testing procedures and results and share their findings. If the Contractor disputes the Engineer's test results, the Contractor must submit in writing a request to initiate the Dispute Resolution Process within five calendar days of the notification of the test results. No request for dispute resolution will be allowed unless the Contractor provides quality control results from samples taken prior to and after finish rolling, and within the timeframe described in 4.06.03-8 supporting its position. No request for dispute resolution will be allowed for a density lot in which any core was not taken within the required 5 calendar days of placement. Should the dispute not be resolved through evaluation of existing testing data or procedures, the Engineer may authorize the Contractor to obtain a new core or set of core samples per disputed lot. The core samples must be extracted no later than seven calendar days from the date of the Engineer's authorization. All such core samples shall be extracted and the core hole filled using the procedure outlined in 4.06.03-10.

a) Simple Average Lots: The Contractor may only dispute any simple average lot that is adjusted at or below 95 percent payment. The number and location (mat, joint, or structure) of the cores taken for dispute resolution must reflect the number and location of the original cores. The location of each core shall be randomly located within the respective original sub lot. The dispute resolution results shall be combined with the original results and averaged for determining the final in-place density value.

b) PWL Lots: The Contractor may dispute any PWL sublot when the PWL falls below 50%

calculated in accordance with section 4.06.04.2.b. An additional random core in the sublot may be taken to validate the accuracy of the core in question. The Department will verify the additional core test result and may average the original test result with the additional core result for purpose of calculating adjustments.

13. Corrective Work Procedure:

If pavement placed by the Contractor does not meet the specifications, and the Engineer requires its replacement or correction, the Contractor shall:

a) Propose a corrective procedure to the Engineer for review and approval prior to any corrective work commencing. The proposal shall include:
   - Limits of pavement to be replaced or corrected, indicating stationing or other landmarks that are readily distinguishable.
   - Proposed work schedule.
   - Construction method and sequence of operations.
   - Methods of maintenance and protection of traffic.
   - Material sources.
   - Names and telephone numbers of supervising personnel.

b) Any corrective courses placed as the final wearing surface shall match the specified lift thickness after completion.

14. Protection of the Work: The Contractor shall protect all sections of the newly finished pavement from damage that may occur as a result of the Contractor's operations for the duration of the Project.

15. Cut Bituminous Concrete Pavement: Work under this item shall consist of making a straight-line cut in the bituminous concrete pavement to the lines delineated on the plans or as directed by the Engineer. The cut shall provide a straight, clean, vertical face with no cracking, tearing or breakage along the cut edge.

4.06.04—Method of Measurement:

1. HMA S* or PMA S*: Bituminous concrete will be measured for payment as the amount of material in tons placed as determined by the net weight on the delivered tickets and adjusted by area, thickness and weight as follows:

Quantity Adjustments**:** Adjustments may be applied to the placed bituminous concrete quantities that will be measured for payment using the following formulas:

Yield Factor for Adjustment Calculation = 0.0575 tons/SY/inch

Actual Area (SY) = [(Measured Length (ft)) x (Avg. of width measurements (ft))]÷9 s.f./SY

Actual Thickness (t) = Total tons delivered / [Actual Area (SY) x 0.0575 tons/SY/inch]

a) Area: If the average width exceeds the allowable tolerance, an adjustment will be made using the following formula. The tolerance for width is equal to the specified thickness (inch) of the lift being placed.

Quantity Adjusted for Area (T_A) = [(L x W_{adj})/9] x (t) x 0.0575 Tons/SY/inch = (-) tons

Where: L = Length (ft)

(t) = Actual thickness (inches)

W_{adj} = (Designed width (ft) + tolerance /12) - Measured Width)

b) Thickness: If the actual average thickness is less than the allowable tolerance, the Contractor shall submit a repair procedure to the Engineer for approval. If the actual thickness exceeds the allowable tolerance, an adjustment will be made using the following formula:

Quantity Adjusted for Thickness (T_T) = A x t_{adj} x 0.0575 = (-) tons

Where: A = Area = {[L x (Design width + tolerance (lift thickness)/12)] / 9}
t_{adj} = Adjusted thickness = [(Dt + tolerance) - Actual thickness]
Dt = Designed thickness (inches)

c) Weight: If the quantity of bituminous concrete representing the mixture delivered to the Project is in excess of the allowable gross vehicle weight (GVW) for each vehicle, an adjustment will be made using the following formula:

Quantity Adjusted for Weight (T_W) = GVW – DGW= (-) tons

Where: DGW = Delivered gross weight as shown on the delivery ticket or measured on a certified scale

2. Bituminous Concrete Adjustment Cost:

a) Production Lot Adjustment: An adjustment may be applied to each production lot as follows:

i. Non-PWL Production Lot (less than 3,500 tons):
The adjustment values in Tables 4.06-6 and 4.06-7 will be calculated for each sub lot based on the Air Void (AV) and Asphalt Binder Content (PB) test results for that sub lot. The total adjustment for each day's production (lot) will be computed as follows:

Tons Adjusted for Superpave Design (T_{SD}) = [($AdjAV_t$ + $AdjPB_t$) / 100] x Tons

Where: $AdjAV_t$: Percent adjustment for air voids
$AdjPB_t$: Percent adjustment for asphalt binder
Tons: Weight of material (tons) in the lot adjusted by 4.06.4-1

Percent Adjustment for Air Voids = $AdjAV_t$ = [$AdjAV_1$ + $AdjAV_2$ + $AdjAV_i$ + … + $AdjAV_n$)] /n

Where: $AdjAV_t$ = Total percent air void adjustment value for the lot
$AdjAV_i$ = Adjustment value from Table 4.06-6 resulting from each sub lot or the average of the adjustment values resulting from multiple tests within a sub lot, as approved by the Engineer.
n = number of sub lots based on Table M.04.03-2

TABLE 4.06-6: Adjustment Values for Air Voids

Adjustment Value ($AdjAV_i$) (%)	S0.25, S0.375, S0.5, S1 Air Voids (AV)
+2.5	3.8 - 4.2
+3.125*(AV-3)	3.0 - 3.7
-3.125*(AV-5)	4.3 – 5.0
20*(AV-3)	2.3 – 2.9
-20*(AV-5)	5.1 – 5.7
-20.0	≤ 2.2 or ≥ 5.8

Percent Adjustment for Asphalt Binder = $AdjPB_t = [(AdjPB_1 + AdjPB_2 + AdjPB_i + \ldots + AdjPB_n)] /n$

Where: $AdjPB_t$= Total percent liquid binder adjustment value for the lot
$AdjPB_i$ = Adjustment value from Table 4.06-7 resulting from each sub lot
n = number of binder tests in a production lot

TABLE 4.06-7: Adjustment Values for Binder Content

Adjustment Value ($AdjAV_i$) (%)	S0.25, S0.375, S0.5, S1 Pb
0.0	JMF Pb ± 0.3
- 10.0	≤ JMF Pb - 0.4 or ≥ JMF Pb + 0.4

ii. PWL Production Lot (3500 tons or more):

For each lot, the adjustment values will be calculated using PWL methodology based on AV, VMA, and PB test results. The results will be considered as being normally distributed and all applicable equations in AASHTO R 9 and AASHTO R 42 Appendix X4 will apply.

Only one test result will be considered for each sub lot. The specification limits are listed in M.04.

For AV, PB, and voids in mineral aggregate (VMA), the individual material quantity characteristic adjustment (Adj) will be calculated as follows:

For PWL between 50 and 90%: $Adj(AV_t \text{ or } PB_t \text{ or } VMA_t) = (55 + 0.5\ PWL) - 100$

For PWL at and above 90%: $Adj(AV_t \text{ or } PB_t \text{ or } VMA_t) = (77.5 + 0.25\ PWL) - 100$

Where: $AdjAV_t$ = Total percent AV adjustment value for the lot
$AdjPB_t$= Total percent PB adjustment value for the lot
$AdjVMA_t$= Total percent VMA adjustment value for the lot

A lot with PWL less than 50% in any of the 3 individual material quality characteristics will be evaluated under 1.06.04.

The total adjustment for each production lot will be computed using the following formula:

Tons Adjusted for Superpave Design (T_{SD}) = [(0.5AdjAV$_t$ + 0.25AdjPB$_t$ + 0.25 AdjVMA$_t$) / 100] X Tons

Where Tons: Weight of material (tons) in the lot adjusted by 4.06.4-1

iii. Partial Lots:

Lots with less than 4 sub lots will be combined with the prior lot. If there is no prior lot with equivalent material or if the last test result of the prior lot is over 30 calendar days old, the adjustment will be calculated as indicated in 4.06.04-2.a)i.

Lots with 4 or more sub lots will be calculated as indicated in 4.06.04-2.a)ii.

Production Lot Adjustment: T_{SD} x Unit Price = Est. (Pi)

Where: Unit Price = Contract unit price per ton per type of mixture

Est. (Pi)= Pay Unit in dollars representing incentive or disincentive per lot

b) Density Lot Adjustment: An adjustment may be applied to each density lot as follows:

i. Simple Average Density Lot (less than 3500 tons) and Bridge Lots:

The final lot quantity shall be the difference between the total payable tons for the Project and the sum of the previous lots. If either the Mat or Joint adjustment value is "remove and replace," the density lot shall be removed and replaced (curb to curb).

No positive adjustment will be applied to a density lot in which any core was not taken within the required 5 calendar days of placement.

Tons Adjusted for Density (T_D) = [{(PA_M x 0.50) + (PA_J x 0.50)} / 100] X Tons

Where: T_D = Total tons adjusted for density for each lot

PA_M = Mat density percent adjustment from Table 4.06-8

PA_J = Joint density percent adjustment from Table 4.06-9

Tons: Weight of material (tons) in the lot adjusted by 4.06.4-1

TABLE 4.06-8: Adjustment Values for Pavement Mat density

Average Core Result Percent Mat Density	Percent Adjustment (Bridge and Non-Bridge) [(1)(2)]
97.1 - 100	-1.667*(ACRPD-98.5)
94.5 – 97.0	+2.5
93.5 – 94.4	+2.5*(ACRPD-93.5)
92.0 – 93.4	0
90.0 – 91.9	-5*(92-ACRPD)
88.0 – 89.9	-10*(91-ACRPD)
87.0 – 87.9	-30
86.9 or less	Remove and Replace (curb to curb)

Notes:

(1) ACRPD = Average Core Result Percent Density

(2) All Percent Adjustments to be rounded to the second decimal place; for example round 1.667 to 1.67.

TABLE 4.06-9: Adjustment Values for Pavement Joint Density

Average Core Result Percent Joint Density	Percent Adjustment (Bridge and Non-Bridge) [(1)(2)]
97.1 – 100	-1.667*(ACRPD-98.5)
93.5 – 97.0	+2.5
92.0 – 93.4	+1.667*(ACRPD-92)
91.0 – 91.9	0
89.0 – 90.9	-7.5*(91-ACRPD)
88.0 – 88.9	-15*(90-ACRPD)
87.0 – 87.9	-30
86.9 or less	Remove and Replace (curb to curb)

Notes:
(1) ACRPD = Average Core Result Percent Density
(2) All Percent Adjustments to be rounded to the second decimal place; for example round 1.667 to 1.67

Additionally, any sublot with a density result below 87% will be evaluated under 1.06.04.

ii. PWL Density Lot (3,500 tons or more):

For each lot, the adjustment values will be calculated using PWL methodology based on mat and joint density test results. Only one result will be included for each sublot. The results will be considered as being normally distributed and all applicable equations in AASHTO R 9 and AASHTO R 42 Appendix X4 will apply.

The specification limits for the PWL determination are as follows:

Mat Density: 91.5-98%
Joint Density: 90-98%

For mat and joint density, the individual percent adjustment (PA) will be calculated as follows:

For PWL between 50 and 90%: PA ($_M$ or $_J$)= 0.25 * PWL – 22.50
For PWL at and above 90%: PA ($_M$ or $_J$)= 0.125 * PWL – 11.25

Where: PA_M = Total percent mat density adjustment value for the PWL mat density lot
PA_J= Total percent joint density adjustment value for the PWL joint density lot

No positive adjustment will be applied to a density lot in which any core was not taken within the required 5 calendar days of placement.

A lot with PWL less than 50% will be evaluated under 1.06.04.
The total adjustment for each PWL mat density lot will be computed as follows:

Tons Adjusted for Mat Density (T_{MD}) = (PA_M / 100) X Tons

Where: Tons= Weight of material (tons) in the lot adjusted by 4.06.4-1.
The total adjustment for each PWL joint density lot will be computed as follows:

Tons Adjusted for Joint Density (T_{JD}) = (PA_J / 100) X J_Tons

Tons Adjusted for Joint Density will be calculated at the end of each project or project phase.

Where: $\text{J\_Tons} = \text{Tons in project or phase adjusted by } 4.06.4 - 1 \text{ x } \frac{\text{Lot joint length}}{\text{Joint length in project or phase}}$

All bridge density lot adjustments will be evaluated in accordance with 4.06.04-2.b)i.

Additionally, any sublot with a density result below 87% will be evaluated under 1.06.04.

iii. Partial Lots:

Lots with less than 4 sub lots will be combined with the prior lot. If there is no prior lot with equivalent material and placement conditions or if the last test result of the prior lot is over 30 calendar days old, the mat and joint individual adjustments will be calculated in accordance to Tables 4.06-8 and 4.06-9. T_{MD} and T_{JD} will be calculated as indicated in 4.06.04-2.b)i.

Lots with 4 or more sub lots will be calculated as indicated in 4.06.04-2.b)ii.

Density Lot Adjustment (Simple Average Lots): T_D x Unit Price = Est. (Di)
Density Lot Adjustment (PWL Lots): (T_{MD} or T_{JD}) x Unit Price = Est. (DMi or DJi)

Where: Unit Price = Contract unit price per ton per type of mixture
Est. (Di)= Pay Unit in dollars representing incentive or disincentive per simple average density lot
Est. (DMi)= Pay Unit in dollars representing incentive or disincentive per PWL mat lot
Est. (DJi)= Pay Unit in dollars representing incentive or disincentive per PWL joint lot

Additionally, any sublot with a density result below 87% will be evaluated under 1.06.04.

3. Transitions for Roadway Surface: The installation of permanent transitions will be measured under the appropriate item used in the formation of the transition.

The quantity of material used for the installation of temporary transitions will be measured for payment under the appropriate item used in the formation of the transition. The installation and removal of a bond breaker and the removal and disposal of any temporary transition formed by milling or with bituminous concrete pavement is not measured for payment.

4. Cut Bituminous Concrete Pavement: The quantity of bituminous concrete pavement cut will be measured in accordance with 2.02.04.

5. Material for Tack Coat: The quantity of tack coat will be measured for payment by the number of gallons furnished and applied on the Project and approved by the Engineer. No tack coat material shall be included that is placed in excess of the tolerance described in 4.06.03.

a. Container Method – Material furnished in a container will be measured to the nearest 1/2 gallon. The volume will be determined by either measuring the volume in the original container by a method approved by the Engineer or using a separate graduated container

capable of measuring the volume to the nearest 1/2 gallon. The container in which the material is furnished must include the description of material, including lot number or batch number and manufacturer or product source.

b. Vehicle Method
   i. Measured by Weight: The number of gallons furnished will be determined by weighing the material on calibrated scales furnished by the Contractor. To convert weight to gallons, one of the following formulas will be used:
   Tack Coat (gallons at 60°F) = Measured Weight (pounds) / Weight per gallon at 60°F
   Tack Coat (gallons at 60°F) = 0.996 x Measured Weight (pounds) / Weight per gallon at 77°F
   ii. Measured by automated metering system on the delivery vehicle:
   Tack Coat (gallons at 60°F) = 0.976 x Measured Volume (gallons).

6. Material Transfer Vehicle (MTV): The furnishing and use of a MTV will be measured separately for payment based on the actual number of surface course tons delivered to a paver using the MTV.

4.06.05—Basis of Payment:

1. HMA S* or PMA S*: The furnishing and placing of bituminous concrete will be paid for at the Contract unit price per ton for " HMA S*" or " PMA S*."

All costs associated with providing illumination of the work area are included in the general cost of the work.

All costs associated with cleaning the surface to be paved, including mechanical sweeping, are included in the general cost of the work. All costs associated with constructing longitudinal joints are included in the general cost of the work.

All costs associated with obtaining cores for acceptance testing and dispute resolution are included in the general cost of the work.

2. Bituminous Concrete Adjustment Costs: This adjustment will be calculated using the formulas shown below if all of the measured adjustments in 4.06.04-2 are not equal to zero. A positive or negative adjustment will be applied to monies due the Contractor.

Production Lot: Σ Est (Pi) = Est. (P)
Density Lot (Simple Average Lots): Σ Est (Di) = Est. (D)
Density Lot (PWL): Σ Est (DMi) + Σ (DJi) = Est. (D)
Bituminous Concrete Adjustment Cost= Est. (P) + Est. (D)

Where: Est. ( )= Pay Unit in dollars representing incentive or disincentive in each production or density lot calculated in 4.06.04-2

The Bituminous Concrete Adjustment Cost item, if included in the bid proposal or estimate, is not to be altered in any manner by the Bidder. If the Bidder should alter the amount shown, the altered figure will be disregarded and the original estimated cost will be used for the Contract.

3. Transitions for Roadway Surface: The installation of permanent transitions will be paid under the appropriate item used in the formation of the transition. The quantity of material used for the installation of temporary transitions will be paid under the appropriate pay item used in the formation of the transition. The installation and removal of a bond breaker, and the removal and disposal of any temporary transition formed by milling or with bituminous concrete

pavement is included in the general cost of the work.

4. The cutting of bituminous concrete pavement will be paid in accordance with 2.02.05.

5. Material for tack coat will be paid for at the Contract unit price per gallon at 60°F for "Material for Tack Coat."

6. The Material Transfer Vehicle (MTV) will be paid at the Contract unit price per ton for "Material Transfer Vehicle."

Pay Item	Pay Unit
HMA S*	ton
PMA S*	ton
Bituminous Concrete Adjustment Cost	est.
Material for Tack Coat	gal.
Material Transfer Vehicle	ton

SECTION 5.86 - CATCH BASINS, MANHOLES AND DROP INLETS

5.86.01—Description
5.86.02—Materials
5.86.03—Construction Methods
5.86.04—Method of Measurement
5.86.05—Basis of Payment

5.86.01—Description: The work under this Section shall consist of furnishing, preparing, and installing catch basins, manholes and drop inlets (and also the removal, abandonment, alteration, reconstruction, or conversion of such existing structures) in conformity with the lines, grades, dimensions and details shown on the plans.

This Section shall also include resetting or replacing catch basin tops as well as manhole frames and covers.

5.86.02—Materials: The materials for this work shall meet the following requirements:

Drainage structures shall meet the requirements of M.08.02 and shall utilize concrete with a 28-day minimum compressive strength of 4000 psi.

Galvanizing shall meet the requirements of M.06.03.

Mortar shall meet the requirements of M.11.04.

Butyl rubber joint seal shall meet the requirements of ASTM C990.

Granular fill, if necessary, shall meet the requirements of M.02.01.

Protective compound material shall be a type appearing on the Department's Qualified Products List and be acceptable to the Engineer, as specified in M.03.09.

5.86.03—Construction Methods: Drainage trench excavation, including rock in drainage trench excavation and backfilling, shall be performed in accordance with 2.86.03 and the requirements of the plans.

Where a drainage structure is to be installed below the surface, a drainage trench shall be excavated to the required depth, the bottom of which shall be graded to the elevation of the bottom of the proposed drainage structure or to ensure a uniform foundation for the structure.

Where a firm foundation is not encountered at the grades established due to unsuitable material, such as soft, spongy, or unstable soil, the unsuitable material shall be removed and replaced with approved granular fill, thoroughly compacted in lifts not to exceed 6 inches. The Engineer shall be notified prior to removal of the unsuitable material in order to determine the depth of removal necessary.

When rock, as defined in 2.86.01-2, is encountered, work shall be performed in accordance with 2.86.03 and the requirements of the plans.

When a drainage structure outside of proposed drainage trench limits is to be removed, it shall be completely removed and all pipes shall be removed or plugged with cement masonry.

When a drainage structure is to be abandoned, the structure shall be removed to a depth 2 feet below the subgrade or as directed by the Engineer. The floor of the structure shall be broken and all pipes shall be plugged with cement masonry.

Drainage structures shall be constructed in accordance with the plans and the requirements contained herein for the character of the work involved. The provisions of 6.02.03 pertaining to bar reinforcement shall apply except that shop drawings need not be submitted for approval unless called for in the plans, Contract or directed by the Engineer. Welding shall be performed in accordance with the applicable sections of the AWS Structural Welding Code, D1.1.

When it becomes necessary to increase the horizontal dimensions of manholes, catch basins and drop inlets to sizes greater than those shown on the plans in order to provide for multiple pipe installations, large pipes or for other reasons, the Contractor shall construct such manholes, catch basins and drop inlets to modified dimensions as directed by the Engineer.

The surfaces of the tops of all catch basins, and drop inlets shall be given a coat of protective compound material, at the manufacturer's recommended application rate, immediately upon completion of the concrete curing period.

All masonry units shall be laid in full mortar beds.

Metal fittings for catch basins, manholes or drop inlets shall be set in full mortar beds or otherwise secured as shown on the plans.

All inlet and outlet pipes shall be set flush with the inside face of the wall of the drainage structure as shown on the plans. The pipes shall extend through the walls for a sufficient distance beyond the outside surface to allow for satisfactory connections, and the concrete or masonry shall be constructed around them neatly to prevent leakage along their outer surfaces.

When constructing a new drainage structure within a run of existing pipe, the section of existing pipe disturbed by the construction shall be replaced with new pipe of identical type and size extending from the drainage structure to the nearest joint of the existing pipe in accordance with 6.86.03 or as directed by the Engineer.

Backfilling shall be performed in accordance with 2.86.03.

Frames, covers and tops which are to be reset shall be removed from their present beds, the walls or sides shall be rebuilt to conform to the requirements of the new construction and the frames, covers and tops shall be reset as shown on the plans or as directed by the Engineer.

5.86.04—Method of Measurement:

Drainage Trench Excavation: In accordance with 2.86.04, excavation for drainage trench will not be measured for payment but shall be included in the Contract unit price for the type of structure being installed.

Rock in Drainage Trench Excavation: Rock in Drainage Trench Excavation will be measured in accordance with the drainage trench excavation limits described in 2.86.03.

Manholes, Catch Basins and Drop Inlets will be measured as separate units.

Resetting of Manholes, Catch Basins and Drop Inlets will be measured as separate units.

Replacement of frames, covers, and tops will be measured as a unit for catch basin top or manhole frame and cover.

Conversion of drainage structures as specified on the plans, or as directed by the Engineer, including structure reconstruction will be measured for payment as a unit.

Removal or abandonment of drainage structures outside of drainage trench excavation limits, as defined in 2.86.03, will be measured as separate units.

There will be no measurement or direct payment for the application of the protective compound material, the cost of this work shall be considered as included in the general cost of the work.

Measurement for payment for work and materials involved with installing pipes to connect new drainage structures into a run of existing pipe will be as provided for under the applicable Contract items in accordance with 6.86.04.

There will be no measurement or direct payment for plugging existing pipes with cement masonry, the cost of this work will be considered as included in the general cost of the work.

5.86.05—Basis of Payment:

Drainage Trench Excavation for the installation of proposed structures described herein will be paid for under the respective drainage Contract item(s) for which the excavation is being performed, in accordance with the provisions of 2.86.05.

Rock in Drainage Trench Excavation will be paid for in accordance with the provisions of 2.86.05.

Manholes and Catch Basins will be paid for at the Contract unit price for each "Manhole," or "Catch Basin," of the type specified, at "0' to 10' Deep" or "0' to 20' Deep," complete in place, which price shall include all excavation, backfill, materials, equipment, tools and labor incidental thereto.

Drop Inlets will be paid for at the Contract unit price for each "Drop Inlet," of the type specified, complete in place, which price shall include all excavation, backfill, materials, equipment, tools and labor incidental thereto.

Manholes, Catch Basins and Drop Inlets constructed to modified dimensions as directed by the Engineer, will be paid for as follows:

Where the interior floor area has to be increased to accommodate existing field conditions, as measured horizontally at the top of the base of the completed structure, and does not exceed 125% of the interior floor area as shown on the plans for that structure, then the structure shall be paid for at the Contract unit price for each "Manhole," "Catch Basin," or "Drop Inlet" of the type specified. Where the floor area is greater than 125%, the increase in the unit price for the individual structure shall be in direct proportion to the increase of the completed structure interior floor area as compared to the interior floor area as shown on the plans for that structure. Such increased unit price shall include all excavation, materials, equipment, tools, and labor incidental to the completion of the structure.

Reset Units will be paid for at the Contract unit price each for "Reset Manhole," "Reset Catch Basin," or "Reset Drop Inlet," of the type specified, respectively, complete in place, which price shall include excavation, cutting of pavement, removal and replacement of pavement structure, and all materials, equipment, tools and labor incidental thereto, except when the work requires reconstruction greater than 3 feet, measured vertically, then the entire cost of resetting the unit will be paid for as Extra Work in accordance with the provisions of 1.04.05.

Frames, Covers, and Tops when required in connection with reset units, will be paid for at the Contract unit price each for such "Manhole Frame and Cover" or "(Type) Catch Basin Top," complete in place, including all incidental expense; or when no price exists, the furnishing and placing of such material will be paid for as Extra Work in accordance with the provisions of 1.04.05.

When the catch basin top has a stone or granite curb in its design, the curb or inlet shall be included in the cost of the "(Type) Catch Basin Top."

Conversion of drainage structures will be paid for at the Contract unit price each for "Convert Catch Basin to (Type) Catch Basin," "Convert Catch Basin to (Type) Manhole," or

"Convert Manhole to (Type) Catch Basin," complete in place, which price shall include excavation, cutting of pavement, removal and replacement of pavement, backfill, all alterations to existing structure, all materials including catch basin frame and grate of the type specified, or manhole frame and cover, all equipment, tools and labor incidental thereto.

The maximum change in elevation of frame under these items shall not exceed 3 feet. Greater depth changes, if required, shall be paid for as Extra Work, in accordance with 1.04.05.

Removal or abandonment of drainage structures outside of drainage trench excavation limits as defined in 2.86.03 will be paid for at the Contract unit price each for "Remove Drainage Structure – 0' to 10' Deep," "Remove Drainage Structure – 0' to 20' Deep," or "Abandon Drainage Structure," which price shall include excavation, cutting of pavement, removal and replacement of pavement, backfill, and all equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
(Type) Catch Basin – 0' to 10' Deep	ea.
(Type) Catch Basin – 0' to 20' Deep	ea.
Manhole (Size) – 0' to 10' Deep	ea.
Manhole (Size) – 0' to 20' Deep	ea.
(Type) Drop Inlet	ea.
Reset Catch Basin	ea.
Reset Manhole	ea.
Reset Drop Inlet	ea.
Convert Catch Basin to (Type) Catch Basin	ea.
Convert Catch Basin to (Type) Manhole	ea.
Convert Manhole to (Type) Catch Basin	ea.
Manhole Frame and Cover	ea.
(Type) Catch Basin Top	ea.
Remove Drainage Structure – 0' to 10' Deep	ea.
Remove Drainage Structure – 0' to 20' Deep	ea.
Abandon Drainage Structure	ea.

SECTION 6.86 - DRAINAGE PIPES, DRAINAGE PIPE ENDS

6.86.01—Description
6.86.02—Materials
6.86.03—Construction Methods
6.86.04—Method of Measurement
6.86.05—Basis of Payment

6.86.01—Description: This work shall consist of furnishing, preparing and installing drainage pipes of the size and type specified, bedding material, joint sealant, rubber gaskets, clamps, collars, grout, grout collars, drainage trench excavation, backfilling or satisfactory disposal of all materials, the removal of which is necessary for the proper completion of the work, connecting proposed drainage systems to existing systems, plugging or abandoning existing pipes and removal of existing pipe within trench limits, as shown on the plans or as directed by the Engineer.

This Section shall also include removal of drainage pipes outside of drainage trench excavation limits, as defined in 2.86.03-1.

6.86.02—Materials: The materials for this work shall meet the following requirements:

Drainage Pipe, Drainage Pipe Ends, Sealers, Gaskets and connection hardware shall meet the requirements of M.08.01.

Bedding Material shall meet the requirements of M.08.03-1.

Granular Fill, if necessary, shall meet the requirements of M.02.01.

Brick Masonry shall meet the requirements of M.11.03 and Mortar shall meet the requirements of M.11.04.

Concrete used for Concrete Pipe Connections shall be Class “F” Concrete meeting the requirements of M.03.

6.86.03—Construction Methods:

(1) Drainage Trench Excavation: Drainage trench excavation and backfilling shall be performed in accordance with 2.86.03 and the requirements of the plans.

Where drainage pipe is to be laid below the surface, a drainage trench shall be excavated to the required depth, the bottom of which shall be graded to the elevation of the bottom of the bedding material.

Where drainage pipe is to be laid in a fill area, the embankment shall be placed and compacted to a minimum elevation 12 inches above the top of the proposed pipe, whereupon the drainage trench excavation shall be performed and the pipe installed.

(2) Rock in Drainage Trench Excavation: When rock, as defined in 2.86.01-2, is encountered, work shall be performed in accordance with 2.86.03 and the requirements of the plans.

(3) Drainage Pipe Installation: New or re-laid drainage pipes shall be installed on 4 inches of bedding material (12 inches if over rock in ledge formation), the details as shown on the plans, or as directed by the Engineer. Prior to placement of the drainage pipe, in accordance with the plans, bedding material shall be pre-shaped to 10% of the total height

of the pipe in order to keep the pipe in the center of the trench. Following placement of the drainage pipe, bedding material backfill shall be placed in accordance with the following table:

Internal Pipe Diameter	**Required Bedding Material Backfill**
< 48 inches*	25% of total height of the pipe
≥ 48 inches*	12 inches above the top of the pipe
*Includes pipe arch of equivalent internal horizontal span See Standard Drawing	

The placement of the drainage pipe shall start at the downstream end and progress upstream or as shown on the plans, or as directed by the Engineer. All drainage pipes shall be carefully laid in the center of the drainage trench, true to the lines and grades given. Bell ends shall face upgrade and all joints shall be tight.

Joints in concrete pipe shall be sealed with cold-applied bituminous sealer, preformed plastic gaskets or flexible, watertight, rubber-type gaskets. Portland cement mortar shall not be used for sealing pipe joints except with permission of the Engineer.

When cold-applied bituminous sealer is used, the bell and spigot ends shall be wiped clean and dry before applying the bituminous sealer to the pipe ends. Before the drainage pipes are placed in contact with each other, the spigot or tongue end shall be completely covered with bituminous sealer; then the pipe shall be laid to line and grade so the inside surface of all abutting pipes are flush. Additional bituminous sealer shall be applied to the joint after the connection has been made to ensure a water tight connection.

Where the end of an existing drainage pipe is not compatible with the end of a proposed concrete pipe, the Contractor shall align the inner diameters of the pipes being connected, butt the pipe ends together, and construct a cast-in-place concrete pipe connection, as shown in the plans. Incompatible bell/spigot or tongue/groove ends shall be cut off as required to ensure the interior drainage pipe walls are aligned to provide a smooth transition between the pipes.

Metal pipe and pipe arches shall be carefully joined and firmly clamped together by approved connecting bands, which shall be properly bolted in place before any backfill is placed.

Newly installed drainage pipe which is not in true alignment, or which shows any settlement or distortion, shall be reinstalled in accordance with 1.05.03.

When drainage pipe outside of proposed drainage trench limits is to be removed, it shall be removed to the limits shown on the plans and all remaining pipes shall be plugged with cement masonry.

Where shown on the plans or directed by the Engineer, the Contractor shall plug abandoned existing pipes with cement masonry.

(4) Drainage Pipe End Installation: Reinforced concrete drainage pipe ends shall be placed on a prepared bed of the existing ground and accurately aligned as shown on the plans. The joints shall be sealed as specified in 6.86.03-3 and backfill shall be placed around both sides of the unit simultaneously to the elevation shown on the plans.

Metal drainage pipe ends shall be placed on a prepared bed of the existing ground and accurately aligned as shown on the plans. After the attachment of the drainage pipe end, backfill shall be placed around both sides of the unit up to the elevation shown on the plans, exercising caution to avoid displacement or deformation of the unit.

6.86.04—Method of Measurement: This work will be measured as follows:

Drainage Trench Excavation, in accordance with 2.86.04, will not be measured for payment.

Rock in Drainage Trench Excavation will be measured in accordance with 2.86.04.

Bedding Material will not be measured for payment.

New and Re-laid Pipes and Pipe Arches will be measured for payment by the actual number of linear feet of pipe or pipe arch of the various sizes and types, completed and accepted and measured in place along the invert. Coupling bands and fittings for pipes and pipe arches will not be measured for payment.

Reinforced Concrete Drainage Pipe Ends and Metal Drainage Pipe Ends will be measured for payment as separate units.

Corrugated Metal Pipe Elbows (of the Size and Type specified) will be measured for payment by the actual number of linear feet of pipe elbows completed and accepted, based on 6 linear feet per elbow, as shown on the plans. Coupling bands for elbows will not be measured for payment.

Concrete Pipe Connection will be measured for payment by the number of each concrete pipe connection constructed at locations where proposed concrete pipes tie into an existing pipe with an incompatible end, completed and accepted by the Engineer.

Removal of drainage pipe outside of drainage trench excavation limits, as defined in 2.86.03, will be measured for payment by the actual number of linear feet of drainage pipe removed.

There will be no measurement for plugging existing pipes with cement masonry.

6.86.05—Basis of Payment:

Drainage Trench Excavation for the installation of drainage pipes will not be paid separately but shall be included in the Contract unit price for the respective drainage pipe or pipe end item(s), in accordance with the provisions of 2.86.05.

Rock in Drainage Trench Excavation will be paid for in accordance with the provisions of 2.86.05.

Bedding Material necessary for the installation of drainage items described herein will be included in the Contract unit price for the respective drainage pipe or pipe end item(s). Bedding material required to fill voids when rock in drainage trench is encountered will not be measured for payment but shall be included in the Contract unit price for "Rock in Drainage Trench Excavation," in accordance with 2.86.05.

New Pipes and Pipe Arches will be paid for at the Contract unit price per linear foot for "(Size and Type) Pipe (Thickness) – 0' to 10' Deep," "(Size and Type) Pipe (Thickness) – 0' to 20' Deep," "(Size) Pipe Arch (Thickness) – 0' to 10' Deep" or "(Size) Pipe Arch (Thickness) – 0' to 20' Deep" complete in place, including materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

Relaid Pipes and Pipe Arches will be paid for at the Contract unit price per linear foot for "Relaid Pipe (Size and Type) – 0' to 10' Deep," "Re-laid Pipe (Size and Type) – 0' to 20' Deep," "Relaid Pipe Arch (Size and Type) – 0' to 10' Deep," or "Relaid Pipe Arch (Size and Type) – 0' to 20' Deep," complete in place, including all materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

Reinforced Concrete Drainage Pipe Ends and Metal Drainage Pipe Ends will be paid for at the Contract unit price for each drainage pipe end of the Size and Type specified, complete in place, including all excavation, materials, attachment systems, equipment, tools and labor incidental thereto.

Corrugated Metal Pipe Elbows will be paid for at the Contract unit price per linear foot for "(Size and Type) Corrugated Metal Pipe Elbow" including all materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

Concrete Pipe Connection will be paid for at the Contract unit price each for "Concrete Pipe Connection" complete in place, including all materials, equipment, tools and labor incidental thereto.

Removal of drainage pipes of all types and sizes, outside of drainage trench excavation limits, as defined in 2.86.03-1, will be paid for at the Contract unit price per linear foot for "Remove Existing Pipe – 0' to 10' Deep," or "Remove Existing Pipe – 0' to 20' Deep," which price shall include excavation, temporary trench protection, backfill, and all equipment, tools and labor incidental thereto.

There will be no direct payment for the plugging of existing drainage pipes, but the cost thereof shall be included in the respective drainage Contract item(s).

Pay Item	Pay Unit
(Size and Type) Pipe (Thickness) – 0' to 10' Deep	l.f.
(Size and Type) Pipe (Thickness) – 0' to 20' Deep	l.f.
(Size and Type) Pipe Arch (Thickness) – 0' to 10' Deep	l.f.
(Size and Type) Pipe Arch (Thickness) – 0' to 20' Deep	l.f.
Relaid (Size and Type) Pipe– 0' to 10' Deep	l.f.
Relaid (Size and Type) Pipe– 0' to 20' Deep	l.f.
(Size and Type) Relaid Pipe Arch – 0' to 10' Deep	l.f.
(Size and Type) Relaid Pipe Arch – 0' to 20' Deep	l.f.
(Size) Reinforced Concrete Drainage Pipe End	ea.
(Size) Metal Drainage Pipe End	ea.
(Size and Type) Corrugated Metal Pipe Elbow	l.f.
Concrete Pipe Connection	ea.
Remove Existing Pipe – 0' to 10' Deep	l.f.
Remove Existing Pipe – 0' to 20' Deep	l.f.

SECTION 10.00 - GENERAL CLAUSES FOR HIGHWAY ILLUMINATION AND TRAFFIC SIGNAL PROJECTS

Article 10.00.03 – Plans:
In the first paragraph, replace the 2nd, 3rd, and 4th sentences with the following:

> The Contractor shall digitally mark, in red, any changes on the plan(s) using a pdf program.
>
> The Contractor shall submit the digital pdf file(s) to the City of New Britain and the Engineer, for Traffic Signals, prior to requesting the Functional Inspection.
>
> Also prior to requesting the Functional Inspection, the Contractor shall deliver to the Engineer the following:

In the first paragraph, last sentence, in item no. 1, replace "Four (4)" with "Digital PDF Files and Five (5)" [paper prints of schematics and wiring diagrams…].

Article 10.00.10 Section 3. Functional Inspection, first paragraph after the 2nd sentence: Add the following:

The Contractor shall have a bucket truck with crew on site during the Functional Inspection to make any necessary aerial signal adjustments as directed by the City of New Britain or the Engineer.

Article 10.00.12 - Negotiations with utility company: Add the following:

The Contractor shall give notice to utility companies a minimum of 30 days prior to required work or services to the utility company. Refer to Section 1.07 – Legal Relations and Responsibilities for the list of utility companies and representatives the contractor shall use.

The Contractor shall perform all work in conformance with Rules and Regulations of Public Utility Regulatory Authority (PURA) concerning Traffic Signals attached to Public Service Company Poles. The Contractor is cautioned that there may be energized wires in the vicinity of the specified installations. In addition to ensuring compliance with NESC and OSHA regulations, the Contractor and/or its Sub-Contractors shall coordinate with the appropriate utility company for securing/protecting the site during the installation of traffic signal mast arms, span poles or illumination poles.

SECTION M.04 - BITUMINOUS CONCRETE MATERIALS

Section M.04 is being deleted in its entirety and replaced with the following:

M.04.01—Bituminous Concrete Materials and Facilities
M.04.02—Mix Design and Job Mix Formula (JMF)
M.04.03—Production Requirements

M.04.01—Bituminous Concrete Materials and Facilities: Each source of material, Plant, and laboratory used to produce and test bituminous concrete must be qualified on an annual basis by the Engineer. AASHTO or ASTM Standards noted with an (M) have been modified and are detailed in Table M.04.03-5.

Aggregates from multiple sources of supply must not be blended or stored in the same stockpile.

1. Coarse Aggregate: All coarse aggregate shall meet the requirements listed in M.01.

2. Fine Aggregate: All fine aggregate shall meet the requirements listed in M.01.

3. Mineral Filler: Mineral filler shall conform to the requirements of AASHTO M 17.

4. Performance Graded (PG) Asphalt Binder:

(a) General:

i. PG asphalt binder shall be uniformly mixed and blended and be free of contaminants such as fuel oils and other solvents. Binder shall be properly heated and stored to prevent damage or separation.

ii. The binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29. The Contractor shall submit a Certified Test Report and bill of lading representing each delivery in accordance with AASHTO R 26(M). The Certified Test Report must also indicate the binder specific gravity at 77°F; rotational viscosity at 275°F and 329°F; and the mixing and compaction viscosity-temperature chart for each shipment.

iii. The Contractor shall submit the name(s) of personnel responsible for receipt, inspection, and record keeping of PG binder. Contractor Plant personnel shall document specific storage tank(s) where binder will be transferred and stored until used and provide binder samples to the Engineer upon request. The person(s) shall assure that each shipment is accompanied by a statement certifying that the transport vehicle was inspected before loading was found acceptable for the material shipped and that the binder is free of contamination from any residual material, along with 2 copies of the bill of lading.

iv. The blending or combining of PG binders in 1 storage tank at the Plant from different suppliers, grades, or additive percentages is prohibited.

(b) Basis of Approval: The request for approval of the source of supply shall list the location where the material will be manufactured, and the handling and storage methods, along with necessary certification in accordance with AASHTO R 26(M). Only suppliers/refineries that have an approved "Quality Control Plan for Performance Graded Binders" formatted in accordance with AASHTO R 26(M) may supply PG binders to Department projects.

(c) Standard Performance Grade (PG) Binder:

i. Standard PG binder shall be defined as "Neat." Neat PG binders shall be free from modification with: fillers, extenders, reinforcing agents, adhesion promoters,

thermoplastic polymers, acid modification and other additives such as re-refined motor oil, and shall indicate such information on each bill of lading and Certified Test Report.

ii. The standard asphalt binder shall be PG 64S-22.

(d) Modified Performance Grade (PG) Binder: The modified asphalt binder shall be Performance Grade PG 64E-22 asphalt modified solely with a Styrene-Butadiene-Styrene (SBS) polymer. The polymer modifier shall be added at either the refinery or terminal and delivered to the bituminous concrete production facility as homogenous blend. The stability of the modified binder shall be verified in accordance with ASTM D7173 using the Dynamic Shear Rheometer (DSR). The DSR G*/sin(δ) results from the top and bottom sections of the ASTM D7173 test shall not differ by more than 10%. The results of ASTM D7173 shall be included on the Certified Test Report. The binder shall meet the requirements of AASHTO M 332 (including Appendix X1) and AASHTO R 29.

(e) Warm Mix Additive or Technology:

i. The warm mix additive or technology must be listed on the North East Asphalt User Producer Group (NEAUPG) Qualified Warm Mix Asphalt (WMA) Technologies List at the time of bid, which may be accessed online at http://www.neaupg.uconn.edu.

ii. The warm mix additive shall be blended with the asphalt binder in accordance with the manufacturer's recommendations.

iii. The blended binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29 for the specified binder grade. The Contractor shall submit a Certified Test Report showing the results of the testing demonstrating the binder grade. In addition, it must include the grade of the virgin binder, the brand name of the warm mix additive, the manufacturer's suggested rate for the WMA additive, the water injection rate (when applicable), and the WMA Technology manufacturer's recommended mixing and compaction temperature ranges.

5. Emulsified Asphalts:

(a) General:

i. The emulsified asphalt shall meet the requirements of AASHTO M 140(M) or AASHTO M 208 as applicable.

ii. The emulsified asphalts shall be free of contaminants such as fuel oils and other solvents.

iii. The blending at mixing Plants of emulsified asphalts from different suppliers is prohibited.

(b) Basis of Approval:

i. The request for approval of the source of supply shall list the location where the material is manufactured, the handling and storage methods, and certifications in accordance with AASHTO R 77. Only suppliers that have an approved "Quality Control Plan for Emulsified Asphalt" formatted in accordance with AASHTO R 77 and that submit monthly split samples per grade to the Engineer may supply emulsified asphalt to Department projects.

ii. Each shipment of emulsified asphalt delivered to the Project site shall be accompanied with the corresponding Certified Test Report listing Saybolt viscosity, residue by evaporation, penetration of residue, and weight per gallon at 77°F and Material Certificate.

iii. Anionic emulsified asphalts shall meet the requirements of AASHTO M-140. Materials

used for tack coat shall not be diluted and meet grade RS-1 or RS-1h. When ambient temperatures are 80°F and rising, grade SS-1 or SS-1h may be substituted if permitted by the Engineer.

iv. Cationic emulsified asphalt shall meet the requirements of AASHTO M-208. Materials used for tack coat shall not be diluted and meet grade CRS-1. The settlement and demulsibility test will not be performed unless deemed necessary by the Engineer. When ambient temperatures are 80°F and rising, grade CSS-1 or CSS-1h may be substituted if permitted by the Engineer.

6. Reclaimed Asphalt Pavement (RAP):

(a) General: RAP is a material obtained from the cold milling or removal and processing of bituminous concrete pavement. RAP material shall be crushed to 100% passing the 1/2 inch sieve and free from contaminants such as joint compound, wood, plastic, and metals.

(b**)** Basis of Approval: The RAP material will be accepted on the basis of one of the following criteria:

i. When the source of all RAP material is from pavements previously constructed on Department projects, the Contractor shall provide a Materials Certificate listing the detailed locations and lengths of those pavements and that the RAP is only from those locations listed.

ii. When the RAP material source or quality is not known, the Contractor shall request approval from the Engineer at least 30 calendar days prior to the start of the paving operation. The request shall include a Material Certificate and applicable test results stating that the RAP consists of aggregates that meet the specification requirements of M.04.01-1 through M.04.01-3 and that the binder in the RAP is substantially free of solvents, tars and other contaminants. The Contractor is prohibited from using unapproved material on Department projects and shall take necessary action to prevent contamination of approved RAP stockpiles. Stockpiles of unapproved material shall remain separate from all other RAP materials at all times. The request for approval shall include the following:

1. A 50-lb. sample of the RAP to be incorporated into the recycled mixture.
2. A 25-lb. sample of the extracted aggregate from the RAP.

7. Crushed Recycled Container Glass (CRCG):

(a) Requirements: The Contractor may propose to use clean and environmentally-acceptable CRCG in an amount not greater than 5% by weight of total aggregate.

(b) Basis of Approval: The Contractor shall submit to the Engineer a request to use CRCG. The request shall state that the CRCG contains no more than 1% by weight of contaminants such as paper, plastic, and metal and conforms to the following gradation:

CRCG Grading Requirements	
Sieve Size	Percent Passing
3/8 inch	100
No. 4	35-100
No. 200	0.0-10.0

The Contractor shall submit a Material Certificate to the Engineer stating that the CRCG complies with all the applicable requirements in this Section.

8. Joint Seal Material: Joint seal material must meet the requirements of ASTM D6690 - Type 2. The Contractor shall submit a Material Certificate in accordance with 1.06.07 certifying that the joint seal material meets the requirements of this Section.

9. Recycled Asphalt Shingles (RAS): RAS shall consist of processed asphalt roofing shingles from post-consumer asphalt shingles or from manufactured shingle waste. The RAS material under consideration for use in bituminous concrete mixtures must be certified as being asbestos-free and shall be entirely free of whole, intact nails. The RAS material shall meet the requirements of AASHTO MP 23.

The Producer shall test the RAS material to determine the asphalt content and the gradation of the RAS material. The Producer shall take necessary action to prevent contamination of RAS stockpiles.

The Contractor shall submit a Material Certificate to the Engineer stating that the RAS complies with all the applicable requirements in this Section.

10. Plant Requirements:

(a) General: The Plant producing bituminous concrete shall comply with AASHTO M 156.

(b) Storage Silos: The Contractor may use silos for short-term storage with the approval of the Engineer. A storage silo must have heated cones and an unheated silo cylinder if it does not contain a separate internal heating system. When multiple silos are filled, the Contractor shall discharge 1 silo at a time. Simultaneous discharge of multiple silos for the same Project is not permitted.

Type of silo cylinder	Maximum storage time for all classes (hr)	
	HMA	WMA/PMA
Open Surge	4	Mfg Recommendations*
Unheated - Non-insulated	8	Mfg Recommendations*
Unheated - Insulated	18	Mfg Recommendations*
Heated - No inert gas	TBD by the Engineer	TBD by the Engineer

*Not to exceed HMA limits

(c) Documentation System: The mixing Plant documentation system shall include equipment for accurately proportioning the components of the mixture by weight and in the proper order, controlling the cycle sequence, and timing the mixing operations. Recording equipment shall monitor the batching sequence of each component of the mixture and produce a printed record of these operations on each Plant ticket, as specified herein.

If recycled materials are used, the Plant tickets shall include their dry weight, percentage, and daily moisture content.

If a WMA Technology is added at the Plant, the Plant tickets shall include the actual dosage rate.

For drum Plants, the Plant ticket shall be produced at 5 minute intervals and maintained by the vendor for a period of 3 years after the completion of the Project.

For batch Plants, the Plant ticket shall be produced for each bath and maintained by the vendor for a period of 3 years after the completion of the Project. In addition, an asterisk (*)

shall be automatically printed next to any individual batch weight(s) exceeding the following tolerances:

Each Aggregate Component	±1.5% of individual or cumulative target weight for each bin
Mineral Filler	±0.5% of the total batch
Bituminous Material	±0.1% of the total batch
Zero Return (Aggregate)	±0.5% of the total batch
Zero Return (Bituminous Material)	±0.1% of the total batch

The entire batching and mixing interlock cut-off circuits shall interrupt and stop the automatic batching operations when an error exceeding the acceptable tolerance occurs in proportioning.

The scales shall not be manually adjusted during the printing process. In addition, the system shall be interlocked to allow printing only when the scale has come to a complete rest. A unique printed character (m) shall automatically be printed on the truck and batch plant printout when the automatic batching sequence is interrupted or switched to auto-manual or full manual during proportioning.

(d) Aggregates: Aggregate stockpiles shall be managed to prevent segregation and cross contamination. For drum Plants only, the percent moisture content, at a minimum prior to production and half way through production, shall be determined.

(e) Mixture: The dry and wet mix times shall be sufficient to provide a uniform mixture and a minimum particle coating of 95% as determined by AASTO T 195(M).

Bituminous concrete mixtures shall contain no more than 0.5% moisture when tested in accordance with AASHTO T 329.

(f) RAP: RAP moisture content shall be determined a minimum of twice daily (prior to production and halfway through production).

(g) Asphalt Binder: A binder log shall be submitted to the Department's Central Lab on a monthly basis.

(h) Warm mix additive: For mechanically foamed WMA, the water injection rate shall be monitored during production and not exceed 2.0% by total weight of binder. For additive added at the Plant, the dosage rate shall be monitored during production.

(i) Testing Laboratory: The Contractor shall maintain a laboratory to test bituminous concrete mixtures during production. The laboratory shall have a minimum of 300 s.f., have a potable water source and drainage in accordance with the CT Department of Public Health Drinking Water Division, and be equipped with all necessary testing equipment as well as with a PC, printer, and telephone with a dedicated hard-wired phone line. In addition, the PC shall have a high speed internet connection and a functioning web browser with unrestricted access to https://ctmail.ct.gov . This equipment shall be maintained in working order at all times and be made available for use by the Engineer.

The laboratory shall be equipped with a heating system capable of maintaining a minimum temperature of 65°F. It shall be clean and free of all materials and equipment not associated with the laboratory. Sufficient light and ventilation must be provided. During summer months

adequate cooling or ventilation must be provided so the indoor air temperature shall not exceed the ambient outdoor temperature.

The laboratory testing apparatus, supplies, and safety equipment shall be capable of performing all the applicable tests in their entirety that are referenced in AASHTO R 35 and AASHTO M 323. The Contractor shall ensure that the Laboratory is adequately supplied at all times during the course of the Project with all necessary testing materials and equipment.

The Contractor shall maintain a list of laboratory equipment used in the acceptance testing processes including, but not limited to, balances, scales, manometer/vacuum gauge, thermometers, and gyratory compactor, clearly showing calibration and/or inspection dates, in accordance with AASHTO R 18. The Contractor shall notify the Engineer if any modifications are made to the equipment within the laboratory. The Contractor shall take immediate action to replace, repair, or recalibrate any piece of equipment that is out of calibration, malfunctioning, or not in operation.

M.04.02—Mix design and Job Mix Formula (JMF)

1. Curb Mix:

(a) Requirements: The Contractor shall use bituminous concrete that meets the requirements of Table M.04.02-1. RAP may be used in 5% increments by weight up to 30%.

(b) Basis of Approval: Annually, an approved JMF based on a mix design for curb mix must be on file with the Engineer prior to use.

The Contractor shall test the mixture for compliance with the submitted JMF and Table M.04.02-1. The maximum theoretical density (Gmm) will be determined by AASHTO T 209. If the mixture does not meet the requirements, the JMF shall be adjusted within the ranges shown in Table M.04.02-1 until an acceptable mixture is produced.

An accepted JMF from the previous operating season may be acceptable to the Engineer provided that there are no changes in the sources of supply for the coarse aggregate, fine aggregate, recycled material (if applicable) and the Plant operation had been consistently producing acceptable mixture.

Any change in component source of supply or consensus properties must be approved by the Engineer. A revised JMF shall be submitted prior to use.

TABLE M.04.02-1:
Control Points for Curb Mix Mixtures

Mix	**Curb Mix**	**Production Tolerances from JMF Target**
Grade of PG **Binder content %**	**PG 64S-22** **6.5 - 9.0**	**0.4**
Sieve Size		
No. 200	3.0 - 8.0 (b)	2.0
No. 50	10 - 30	4
No. 30	20 - 40	5
No. 8	40 - 70	6
No. 4	65 - 87	7
1/4 inch		
3/8 inch	95 - 100	8
1/2 inch	100	8
3/4 inch		8
1 inch		
2 inch		
Additionally, the fraction of material retained between any 2 consecutive sieves shall not be less than 4%.		
Mixture Temperature		
Binder	325°F maximum	
Aggregate	280-350°F	
Mixtures	265-325°F	
Mixture Properties		
Air Voids (VA) %	0 – 4.0 (a)	
Notes: (a) Compaction Parameter 50 gyrations (N_{des}) (b) The percent passing the No. 200 sieve shall not exceed the percentage of bituminous asphalt binder.		

2. Superpave Design Method – S0.25, S0.375, S0.5, and S1:

(a) Requirements: All designated mixes shall be designed using the Superpave mix design method in accordance with AASHTO R 35. A JMF based on the mix design shall meet the requirements of Tables M.04.02-2 to M.04.02-5. Each JMF and component samples must be submitted no less than 7 days prior to production and must be approved by the Engineer prior to use. All JMFs expire at the end of the calendar year.

All aggregate component consensus properties and tensile strength ratio (TSR) specimens shall be tested at an AASHTO Materials Reference Laboratory (AMRL) by NETTCP Certified Technicians.

All bituminous concrete mixes shall be tested for stripping susceptibility by performing the TSR test procedure in accordance with AASHTO T 283(M) at a minimum every 36 months. The compacted specimens may be fabricated at the Plant and then tested at an AMRL accredited facility. A minimum of 45000 grams of laboratory or plant blended mixture and the

corresponding complete Form MAT-412s shall be submitted to the Division of Material Testing (DMT) for design TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer.

i. Superpave Mixtures with RAP: RAP may be used with the following conditions:
   - RAP amounts up to 15% may be used with no binder grade modification.
   - RAP amounts up to 20% may be used provided a new JMF is approved by the Engineer. The JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance with AASHTO M 323 Appendix X1, or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.
   - Two (2) representative samples of RAP shall be obtained. Each sample shall be split, and 1 split sample shall be tested for binder content in accordance with AASHTO T 164 and the other in accordance with AASHTO T 308.
   - RAP material shall not be used with any other recycling option.

ii. Superpave Mixtures with RAS: RAS may be used solely in HMA S1 mixtures with the following conditions:
   - RAS amounts up to 3% may be used.
   - RAS total binder replacement up to 15% may be used with no binder grade modification.
   - RAS total binder replacement up to 20% may be used provided a new JMF is approved by the Engineer. The JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance with AASHTO M 323 Appendix X1, or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.
   - Superpave Mixtures with RAS shall meet AASHTO PP 78 design considerations.

iii. Superpave Mixtures with CRCG: CRCG may be used solely in HMA S1 mixtures. One percent (1%) of hydrated lime, or other accepted non-stripping agent, shall be added to all mixtures containing CRCG. CRCG material shall not be used with any other recycling option.

(b) Basis of Approval: The following information must be included in the JMF submittal:

i. Gradation, consensus properties and specific gravities of the aggregate, RAP or RAS.
ii. Average asphalt content of the RAP or RAS by AASHTO T 164.
iii. Source of RAP or RAS and percentage to be used.
iv. Warm mix Technology, manufacturer's recommended additive rate and tolerances, and manufacturer recommended mixing and compaction temperatures.
v. TSR test report and anti-strip manufacturer and recommended dosage rate if applicable.
vi. Mixing and compaction temperature ranges for the mix with and without the warm-mix technology incorporated.
vii. JMF ignition oven correction factor by AASHTO T 308.

With each JMF submittal, the following samples shall be submitted to the Division of Materials Testing:

- 4 - one (1) quart cans of PG binder, with corresponding Safety Data Sheet (SDS)
- 1 - 50 lbs. bag of RAP
- 2 - 50 lbs. bags of Plant-blended virgin aggregate

A JMF may not be approved if any of the properties of the aggregate components or mix do not meet the verification tolerances as described in the Department's current QA Program for Materials, Acceptance and Assurance Testing Policies and Procedures.

Any material based on a JMF, once approved, shall only be acceptable for use when it is produced by the designated Plant, it utilizes the same components, and the production of material continues to meet all criteria as specified in Tables M.04.02-2, M.04.02-3 and M.04.02-4. A new JMF must be submitted to the Engineer for approval whenever a new component source is proposed.

Only 1 mix with 1 JMF will be approved for production at a time. Switching between approved JMF mixes with different component percentages or sources of supply is prohibited.

TABLE M.04.02-2: Superpave Master Range for Bituminous Concrete Mixture Design Criteria

	S0.25		**S0.375**		**S0.5**		**S1**	
Sieve	Control Points		Control Points		Control Points		Control Points	
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)
2.0	-	-	-	-	-	-	-	-
1.5	-	-	-	-	-	-	100	-
1.0	-	-	-	-	-	-	90	100
3/4	-	-	-	-	100	-	-	90
1/2	100	-	100	-	90	100	-	-
3/8	97	100	90	100	-	90	-	-
No. 4	72	90	-	72	-	-	-	-
No. 8	32	67	32	67	28	58	19	45
No. 16	-	-	-	-	-	-	-	-
No. 30	-	-	-	-	-	-	-	-
No. 50	-	-	-	-	-	-	-	-
No. 100	-	-	-	-	-	-	-	-
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0
VMA (%)	16.5 ± 1		16.0 ± 1		15.0 ± 1		13.0 ± 1	
VA (%)	4.0 ± 1		4.0 ± 1		4.0 ± 1		4.0 ± 1	
Gse	JMF value		JMF value		JMF value		JMF value	
Gmm	JMF ± 0.030		JMF ± 0.030		JMF ± 0.030		JMF ± 0.030	
Dust / effective binder	0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2	
TSR	≥ 80%		≥ 80%		≥ 80%		≥ 80%	
T-283 Stripping	Minimal as determined by the Engineer							

(c) Mix Status: Each facility will have each type of bituminous concrete mixture rated based on the results of the previous year of production. Mix status will be provided to each bituminous concrete Producer prior to the beginning of the paving season.

The rating criteria are based on compliance with Air Voids and Voids in Mineral Aggregate (VMA) as indicated in Table M.04.03-4 and are calculated as follows:

Criteria A: Percentage of acceptance test results with compliant air voids.

Criteria B: The average of the percentage of acceptance results with compliant VMA and the percentage of acceptance results with compliant air voids.

The final rating assigned will be the lower of the rating obtained with Criteria A or Criteria B.

Mix status is defined as:

"A" – Approved: Assigned to each mixture type from a production facility with a current rating of 70% or greater, or to each mixture type completing a successful PPT.

"PPT" – Pre-Production Trial: Temporarily assigned to each mixture type from a production facility when:

1. there are no compliant acceptance production test results submitted to the Department from the previous year;
2. there is a source change in one or more aggregate components;
3. there is a component percentage change of more than 5% by weight;
4. there is a change in RAP percentage;
5. the mixture has a rating of less than 70% from the previous season;
6. it is a new JMF not previously submitted; or
7. the average of 10 consecutive acceptance results for VFA, Density to N_{ini} or dust to effective binder ratio does not meet the criteria in tables M.04.02-2 and M.04.02-4.

Bituminous concrete mixtures rated with a "PPT" status cannot be used on Department projects. Testing shall be performed by the Producer with NETTCP certified personnel on material under this status. Test results must confirm that specification requirements in Tables M.04.02-2 through M.04.02-4 are met and the binder content (Pb) meets the requirements in Table M.04.03-2 before material can be used. One of the following methods must be used to verify the test results:

Option A: Schedule a day when a Department Inspector can be at the facility to witness testing

Option B: When the Contractor or their representative performs testing without being witnessed by an Inspector, the Contractor shall submit the test results and a split sample including 2 gyratory molds, 5,000 grams of boxed bituminous concrete, and 5,000 grams of cooled loose bituminous concrete for verification testing and approval

Option C: When the Contractor or their representative performs testing without being witnessed by a Department Inspector, the Engineer may verify the mix in the Contractor's laboratory

Witnessing or verifying by the Department of compliant test results will change the mix's status to "A"

The differences between the Department's test results and the Contractor's must be within the "C" tolerances included in the Department's QA Program for Materials, Acceptance and Assurance Testing Policies and Procedures in order to be verified.

"U" – Not Approved: Status assigned to a type of mixture that does not have an approved JMF. Bituminous concrete mixtures with a "U" status cannot be used on Department projects.

TABLE M.04.02-3:
Superpave Consensus Properties Requirements for Combined Aggregate

Traffic Level	Design ESALs (80kN) Millions	Coarse Aggregate Angularity[1] ASTM D5821, Minimum %	Fine Aggregate Angularity AASHTO T 304, Method A Minimum %	Flat and Elongated Particles[2] ASTM D4791, Maximum %	Sand Equivalent AASHTO T 176, Minimum %
1	< 0.3	55/- -	40	10	40
2	0.3 to < 3.0	75/- -	40	10	40
3	≥ 3.0	95/90	45	10	45

Notes:
(1) 95/90 denotes that a minimum of 95% of the coarse aggregate, by mass, shall have one fractured face and that a minimum of 90% shall have two fractured faces.
(2) Criteria presented as maximum Percent by mass of flat and elongated particles of materials retained on the No. 4 sieve, determined at 5:1 ratio.

TABLE M.04.02-4: Superpave Traffic Levels and Design Volumetric Properties

Traffic Level	Design ESALs	Number of Gyrations by Superpave Gyratory Compactor			Percent Density of Gmm from HMA/ WMA Specimen			Voids Filled with Asphalt (VFA) Based on Nominal Mix Size - Inch			
	(million)	N_{ini}	N_{des}	N_{max}	N_{ini}	N_{des}	N_{max}	0.25	0.375	0.5	1
1	<0.3	6	50	75	≤91.5	96.0	≤98.0	70-80	70-80	70-80	67-80
2	0.3 to <3.0	7	75	115	≤90.5	96.0	≤98.0	65-78	65-78	65-78	65-78
3	≥3.0	7	75	115	≤90.0	96.0	≤98.0	65-77	65-76	65-75	65-75

TABLE M.04.02-5:
Superpave Minimum Binder Content by Mix Type and Level

Mix Type	Level	Binder Content Minimum
S0.25	1	5.80
S0.25	2	5.70
S0.25	3	5.70
S0.375	1	5.70
S0.375	2	5.60
S0.375	3	5.60
S0.5	1	5.10
S0.5	2	5.00
S0.5	3	5.00
S1	1	4.60
S1	2	4.50
S1	3	4.50

M.04.03—Production Requirements:

1. Standard Quality Control Plan (QCP) for Production: The QCP for production shall describe the organization and procedures, which the Contractor shall use to administer quality control. The QCP shall include the procedures used to control the production process, to determine when immediate changes to the processes are needed, and to implement the required changes. The QCP must detail the inspection, sampling and testing protocols to be used, and the frequency for each.

Control Chart(s) shall be developed and maintained for critical aspect(s) of the production process as determined by the Contractor. The control chart(s) shall identify the material property, applicable upper and lower control limits, and be updated with current test data. As a minimum, the following quality characteristics shall be included in the control charts:

- percent passing No. 4 sieve
- percent passing No. 200 sieve
- binder content
- air voids
- Gmm
- Gse
- VMA

The control chart(s) shall be used as part of the quality control system to document variability of the bituminous concrete production process. The control chart(s) shall be submitted to the Engineer the first day of each month.

The QCP shall also include the name and qualifications of a Quality Control Manager. The Quality Control Manager shall be responsible for the administration of the QCP, including compliance with the plan and any plan modifications.

The Contractor shall submit complete production testing records to the Engineer within 24 hours in a manner acceptable to the Engineer.

The QCP shall also include the name and qualifications of any outside testing laboratory performing any QC functions on behalf of the Contractor. The QCP must also include a list of sampling and testing methods and frequencies used during production, and the names of all Quality Control personnel and their duties.

Approval of the QCP does not imply any warranty by the Engineer that adherence to the plan will result in production of bituminous concrete that complies with these specifications. The Contractor shall submit any changes to the QCP as work progresses.

2. Acceptance Requirements:

(a) General:

A NETTCP HMA Paving Inspector certified Contractor representative shall obtain a field sample of the material placed at the project site in accordance with AASHTO T 168 using the procedure indicated in Section 5.2.3 or an alternate procedure approved by the Engineer. The field sample shall be quartered by the Contractor in accordance with AASHTO R 47 and placed in an approved container. The container shall be sealed with a security tape provided by the Department and labelled to include the project number, date of paving, mix type, lot and sublot numbers and daily tonnage. The minimum weight of each quartered sample shall be 14000 grams. The Contractor shall transport one of the containers to the Departments Central Laboratory in Rocky Hill, retain one of the containers for potential use in dispute resolution and test the remaining material for acceptance.

The Contractor shall submit all acceptance tests results to the Engineer within 24 hours or prior to the next day's production. All acceptance test specimens and supporting documentation must be retained by the Contractor and may be disposed of with the approval of the Engineer. All quality control specimens shall be clearly labeled and separated from the acceptance specimens.

Contractor personnel performing QC and acceptance testing must be present at the facility prior to, during, and until completion of production, and be certified as a NETTCP HMA Plant Technician or Interim HMA Plant Technician and be in good standing. Production of material for use on State projects must be suspended by the Contractor if such personnel are not present. Technicians found by the Engineer to be non-compliant with NETTCP policies and procedures or Department policies may be removed by the Engineer from participating in the acceptance testing process for Department projects until their actions can be reviewed.

Verification and dispute resolution testing will be performed by the Engineer in accordance with the Department's QA Program for Materials.

Should the Department be unable to validate the Contractor's acceptance test result(s) for a lot of material, the Engineer will use results from verification testing and re-calculate the pay adjustment for that lot. The Contractor may request to initiate the dispute resolution process in writing within 24 hours of receiving the adjustment and must include supporting documentation or test results to justify the request.

(b) Curb Mix Acceptance Sampling and Testing Procedures: Curb Mixes shall be tested by the Contractor at a frequency of 1 test per every 250 tons of cumulative production, regardless of the day of production.

When these mix designs are specified, the following acceptance procedures and AASHTO test methods shall be used:

TABLE M.04.03-1: Curb Mix Acceptance Test Procedures

Protocol	Reference	Description
1	**AASHTO T 30(M)**	Mechanical Analysis of Extracted Aggregate
2	**AASHTO T 168**	Sampling of Bituminous Concrete
3	**AASHTO T 308**	Binder Content by Ignition Oven Method (adjusted for aggregate correction factor)
4	**AASHTO T 209(M)[(2)]**	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
5	**AASHTO T 312[(2)]**	[(1)]Superpave Gyratory Molds Compacted to N_{des}
6	**AASHTO T 329**	Moisture Content of Hot-Mix Asphalt (HMA) by Oven Method

Notes: [(1)] One (1) set equals 2 each of 6-inch molds. Molds to be compacted to 50 gyrations.
[(2)] Once per year or when requested by the Engineer.

i. Determination of Off-Test Status:
1. Curb Mix is considered "off test" when the test results indicate that any single value for bitumen content or gradation are not within the tolerances shown in Table M.04.02-1 for that mixture. If the mix is "off test," the Contractor must take immediate actions to correct the deficiency and a new acceptance sample shall be tested on the same day or the following day of production.
2. When multiple silos are located at 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the "off test" status.
3. The Engineer may cease supply from the Plant when test results from 3 consecutive samples are not within the JMF tolerances or the test results from 2 consecutive samples not within the control points indicated in Table M.04.02-1 regardless of production date.

ii. JMF Revisions
1. If a test indicates that the bitumen content or gradation are outside the tolerances, the Contractor may make a single JMF revision as allowed by the Engineer prior to any additional testing. Consecutive test results outside the requirements of Table M.04.02-1 JMF tolerances may result in rejection of the mixture.
2. Any modification to the JMF shall not exceed 50% of the JMF tolerances indicated in Table M.04.02-1 for any given component of the mixture without approval of the Engineer. When such an adjustment is made to the bitumen, the corresponding production percentage of bitumen shall be revised accordingly.

(c) Superpave Mix Acceptance:

i. Sampling and Testing Procedures

Production Lot: The lot will be defined as one of the following types:
- Non-PWL Production Lot for total estimated Project quantities per mixture less than 3500 tons: All mixture placed during a single continuous paving operation.
- PWL Production Lot for total estimated Project quantities per mixture of 3500 tons or more: Each 3500 tons of mixture produced within 30 calendar days.

Production Sub Lot:
- For Non-PWL: As defined in Table M.04.03-2
- For PWL: 500 tons (The last sub lot may be less than 500 tons.)

Partial Production Lots (For PWL only): A Lot with less than 3500 tons due to:

- completion of the course;
- a Job Mix Formula revision due to changes in:
    - cold feed percentages over 5%,
    - target combined gradation over 5%,
    - target binder over 0.15%,
    - any component specific gravity; or
- a lot spanning 30 calendar days.

The acceptance sample(s) location(s) shall be selected using stratified - random sampling in accordance with ASTM D3665 based on:

- the total daily estimated tons of production for non-PWL lots, or
- the total size for PWL lots.

One (1) acceptance sample shall be obtained and tested per sub lot with quantities over 125 tons. The Engineer may direct that additional acceptance samples be obtained. For non-PWL lots, one (1) acceptance test shall always be performed in the last sub lot based on actual tons of material produced.

For non-PWL lots, quantities of the same mixture per Plant may be combined daily for multiple State projects to determine the number of sub lots.

The payment adjustment will be calculated as described in 4.06.

TABLE M.04.03-2:
Superpave Acceptance Testing Frequency per Type/Level/Plant for Non-PWL Lots

Daily Quantity Produced in Tons (Lot)	Number of Sub Lots/Tests
0 to 125	0, Unless requested by the Engineer
126 to 500	1
501 to 1,000	2
1,001 to 1,500	3
1,500 or greater	1 per 500 tons or portions thereof

The following test procedures shall be used for acceptance:

TABLE M.04.03-3: Superpave Acceptance Testing Procedures

Protocol	Procedure	Description
1	AASHTO T 168	Sampling of bituminous concrete
2	AASHTO R 47	Reducing samples to testing size
3	AASHTO T 308	Binder content by ignition oven method (adjusted for aggregate correction factor)
4	AASHTO T 30(M)	Gradation of extracted aggregate for bituminous concrete mixture
5	AASHTO T 312	(1)Superpave gyratory molds compacted to N_{des}
6	AASHTO T 166	(2)Bulk specific gravity of bituminous concrete
7	AASHTO R 35	(2)Air voids, VMA
8	AASHTO T 209(M)	Maximum specific gravity of bituminous concrete (average of 2 tests)
9	AASHTO T 329	Moisture content of bituminous concrete

Notes: (1) One (1) set equals 2 each of 6-inch molds. Molds to be compacted to Nmax for PPTs and to Ndes for production testing. The first sub lot of the year shall be compacted to N_{max}.

(2) Average value of 1 set of 6-inch molds.

If the average ignition oven corrected binder content differs by 0.3% or more from the average of the Plant ticket binder content in 5 consecutive tests regardless of the production date (moving average), the Contractor shall immediately investigate, determine an assignable cause, and correct the issue. When 2 consecutive moving average differences are 0.3% or more and no assignable cause has been established, the Engineer may require a new ignition oven aggregate correction factor to be performed or to adjust the current factor by the average of the differences between the corrected binder content and production Plant ticket for the last 5 acceptance results.

The Contractor shall perform TSR testing within 30 days after the start of production for all design levels of HMA- and PMA- S0.5 Plant-produced mixtures, in accordance with AASHTO T 283(M). The TSR test shall be performed at an AMRL certified laboratory by NETTCP certified technicians. The compacted specimens may be fabricated at the Plant and then tested at an AMRL accredited facility. A minimum of 45000 grams of plant blended mixture and the corresponding complete Form MAT-412s shall be submitted to the DMT for production TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer. Additionally, the TSR test report and tested specimens shall be submitted to the Engineer for review. Superpave mixtures that require anti-strip additives (either liquid or mineral) shall continue to meet all requirements specified herein for binder and bituminous concrete. The Contractor shall submit the name, manufacturer, percent used, technical datasheet and SDS for the anti-strip additive (if applicable) to the Engineer.

i. Determination of Off-Test Status:
   1. Superpave mixes shall be considered *"off test"* when any control point sieve, binder content, VA, VMA, and Gmm value is outside of the limits specified in Table M.04.03-4 or the target binder content at the Plant is below the minimum binder

content stated in Table M.04.02-5. Note that further testing of samples or portions of samples not initially tested for this purpose cannot be used to change the status.

2. Any time the bituminous concrete mixture is considered off-test:
   A. The Contractor shall notify the Engineer when the Plant is *"off test"* for any mix design that is delivered to the Project in any production day. When multiple silos are located at 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the *"off test"* determination.
   B. The Contractor must take immediate actions to correct the deficiency, minimize *"off test"* production to the Project, and obtain an additional Process Control (PC) test after any corrective action to verify production is in conformance with the specifications. A PC test will not be used for acceptance and is solely for the use of the Contractor in its quality control process.

ii. Cessation of Supply for Superpave Mixtures in Non-PWL Lots:

A mixture **shall not be used** on Department projects when it is "off test" for:

1. four (4) consecutive tests in any combination of VA, VMA or Gmm, regardless of date of production, or
2. two (2) consecutive tests in the control point sieves in 1 production shift.

As a result of cessation of supply, the mix status will be changed to PPT

iii. JMF revisions:

JMF revisions are only permitted prior to or after a production shift. A JMF revision is effective from the time it was submitted and is not retroactive to the previous test(s).

JMF revisions shall be justified by a documented trend of test results.

Revisions to aggregate or RAP specific gravities are only permitted when testing is performed at an AMRL certified laboratory by NETTCP certified technicians.

A JMF revision is required when the Plant target RAP or bin percentage deviates by more than 5% or the Plant target binder content deviates by more than 0.15% from the active JMF.

TABLE M.04.03-4: Superpave Mixture Production Requirements

	S0.25		**S0.375**		**S0.5**		**S1**		Tolerances
Sieve	Control Points		Control Points		Control Points		Control Points		From JMF Targets[2]
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	+/- Tolerance
1.5	-	-	-	-	-	-	100	-	
1.0	-	-	-	-	-	-	90	100	
3/4	-	-	-	-	100	-	-	90	
1/2	100	-	100	-	90	100	-	-	
3/8	97	100	90	100	-	90	-	-	
No. 4	72	90	-	72	-	-	-	-	
No. 8	32	67	32	67	28	58	19	45	
No. 16	-	-	-	-	-	-	-	-	
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0	
Pb	JMF value		JMF value		JMF value		JMF value		0.3[3]
VMA (%)	16.5		16.0		15.0		13.0		1.0[4]
VA (%)	4.0		4.0		4.0		4.0		1.0[5]
Gmm	JMF value		JMF value		JMF value		JMF value		0.030
Mix Temp. – HMA[6]	265-325°F [1]		265-325°F [1]		265-325°F [1]		265-325°F [1]		
Mix Temp. – PMA[6]	285-335°F [1]		285-335°F [1]		285-335°F [1]		285-335°F [1]		
Prod. TSR	N/A		N/A		≥80%		N/A		
T-283 Stripping	N/A		N/A		Minimal TBD by the Engineer		N/A		

Notes: [1] 300°F minimum after October 15.

[2] JMF tolerances shall be defined as the limits for production compliance.

[3] 0.4 for PWL lots

[4] 1.3 for all PWL lots except S/P 0.25 mixes. 1.1 for S/P 0.25 Non-PWL lots. 1.4 for S/P 0.25 PWL lots

[5] 1.2 for PWL lots

[6] Also applies to placement

Table M.04.03-5:
Modifications to Standard AASHTO and ASTM Test Specifications and Procedures

AASHTO Standard Method of Test	
Reference	**Modification**
T 30	Section 7.2 through 7.4 Samples are not routinely washed for production testing
T 209	Section 7.2 The average of 2 bowls is used proportionally in order to satisfy minimum mass requirements. 8.3 Omit Pycnometer method.
T 283	When foaming technology is used, the material used for the fabrication of the specimens shall be cooled to room temperature, and then reheated to the manufacturer's recommended compaction temperature prior to fabrication of the specimens.
AASHTO Standard Recommended Practices	
Reference	**Modification**
R 26	All laboratory technician(s) responsible for testing PG binders shall be certified or Interim Qualified by NETTCP as a PG Asphalt Binder Lab Technician. All laboratories testing binders for the Department are required to be accredited by the AMRL. Sources interested in being approved to supply PG binders to the Department by use of an "in-line blending system" must record properties of blended material and additives used. Each source of supply of PG binder must indicate that the binders contain no additives used to modify or enhance their performance properties. Binders that are manufactured using additives, modifiers, extenders, etc., shall disclose the type of additive, percentage and any handling specifications or limitations required. All AASHTO M 320 references shall be replaced with AASHTO M 332. Once a month, 1 split sample and test results for each asphalt binder grade and each lot shall be submitted by the PG binder supplier to the Department's Central Lab. Material remaining in a certified lot shall be re-certified no later than 30 days after initial certification. Each April and September, the PG binder supplier shall submit test results for 2 BBR tests at 2 different temperatures in accordance with AASHTO R 29.

ITEM #0201001A – CLEARING AND GRUBBING

Work under this item shall conform to the requirements of Section 2.01 of the Standard specifications amended as follows:

Article 2.01.03 – Construction Methods:

Add the following:

All fences, mailboxes, sign posts, bollards, railings, stumps, shrubs, hedges, plantings, stone fences, etc., ornamental and utilitarian domestic accessories within the slope limit lines, shall be removed and reset (or disposed of) as directed by the Engineer.

ITEM # 0202451A - TEST PIT EXCAVATION

DESCRIPTION

The work covered under this Section of the Specifications includes furnishing of all plant, labor, equipment, appliances, materials and incidentals and performing all operations in connection with excavating and backfilling by machine and/or by hand, exploratory test pits at locations indicated or directed and approved in advance by the Engineer.

The purpose of test pits is for examining soils, ground water, and rock and for determining the location of drains, pipes, utilities, structures, foundations and/or any other obstacles or objects in the vicinity of the work contemplated under this Contract.

The work shall include removal of all materials including pavement within the limits of the test pit, dewatering as necessary; stockpiling and disposal of surplus pavement as required.

MATERIALS

Paving materials (if required) shall be Class 2 bituminous concrete conforming to CT DOT Form 817 Section M.04.

CONSTRUCTION METHODS

The Contractor shall notify the Engineer when test pits will be done.

Unless otherwise specified, the Contractor shall dig the test pits indicated on the drawings (if any) or requested by the Engineer and notify the Engineer of the results prior to the start of any excavation work. The Contractor shall notify the Engineer of any conflicts uncovered which may require design revisions, relocations and/or adjustment. No work shall be started within these areas of conflict until authorized by the Engineer.

The Contractor shall measure the size, configuration, exact horizontal and vertical location of all utilities, pipes or other obstacles uncovered in the various pits dug under this item. Excavation of test pits shall be accomplished by such means as are required to ensure that any underground utilities or structures as may be encountered are not damaged. It shall be the Contractor's sole responsibility for any damages incurred during the excavation operations. Any such damages shall be repaired or replaced by the Contractor (if permitted) to the satisfaction of the Engineer at the Contractor's own expense. Where the repair and/or replacement must be done by the Engineer, any and all costs thereof shall be borne by the Contractor; however, the Contractor shall be paid for all test pits based on his unit bid price.

When the location of the pit is within the roadway and will never be incorporated into any excavation being dug for proposed work under this Contract, the excavation shall be backfilled with material conforming CT DOT Form 817 Article M.02.01 – Gradation “A”. All backfill shall be placed in layers of not more than 6 inches deep after compaction and shall be thoroughly compacted by means of mechanical rammers or vibrators or by pneumatic tampers. Hand tampers shall be used only upon written permission of the Engineer. The dry density after compaction shall not be less than 95% of the dry density for that soil when tested in accordance with AASHTO T 180, Method D. Each layer of the backfill shall be compacted at optimum moisture content. No subsequent layer shall be placed until the specified compaction is obtained for the previous layer.

A 2-inch thickness of temporary bituminous concrete pavement (Class 2) shall be installed in any street area where a test pit has been dug.

METHOD OF MEASUREMENT

If the item "Test Pit Excavation" appears in the Bid Proposal, excavation for test pits will be measured for payment by the Engineer, and shall be the actual length, width and depth of the excavation within the limits ordered/approved by the Engineer. Water removed is never measured for payment.

Test pits will only be measured for payment where:

a) The location of the pit is such that said pit will never be incorporated into any excavation being dug for proposed work under this Contract.

b) The test pit will ultimately be within the limits of an excavation required for proposed work under this Contract, but said pit must be backfilled for safety or other reasons, as approved by the Engineer, prior to the excavation reaching the location of the pit.

If any pit is not backfilled and subsequently incorporated into the excavation, said pit will not be measured for payment under the Item "Test Pit" but will be measured under the appropriate excavation item.

Test pits dug by the respective utility owner will not be measured for payment.

BASIS OF PAYMENT

If the item "Test Pit Excavation" appears in the Bid Proposal, payment for the "Test Pit Excavation" shall be made at the contract unit price per cubic yard for "Test Pit Excavation", which price shall include the excavation of all materials as required. Included in the unit price bid for Test Pit will be excavation, sheeting, shoring, dewatering, backfill, compacting and the restoration of the surface of the "Test Pit" including temporary and permanent pavement replacement and all other materials, equipment, tools, labor and work incidental to or necessary for the completion of the Item.

ITEM #0202503A – REMOVAL OF CONCRETE CURBING

Work under this item shall conform to the requirements of Section 2.02, amended as follows:

2.02.01-Description: Add the following:

Concrete Curbing shall be removed and disposed of where shown on the contract plans, generally areas not included in "Earth Excavation" or as ordered by the Engineer.

2.02.03-Construction Methods: Add the following:

Wherever Concrete Curbing is to be removed, such removals shall be made to existing joints except when directed by the Engineer.

2.02.04-Method of Measurement: Add the following:

The work of removing concrete curbing shall be measured for payment by the number of linear feet of concrete curbing removed.

2.02.05-Basis of Payment: Add the following:

The removal of concrete curbing will be paid for at the contract unit price per linear foot for "Removal of Concrete Curbing" which price shall include all materials, equipment, tools and labor incidental thereto and all disposal costs.

Pay Item	Pay Unit
Removal of Concrete Curbing	LF

ITEM #0202513A – REMOVAL OF CONCRETE SIDEWALK

Work under this item shall conform to the requirements of Section 2.02, amended as follows:

2.02.01-Description: Add the following:

Existing concrete sidewalk shall be removed and disposed of where shown on the contract plans, generally areas not included in "Concrete Sidewalk" or as ordered by the Engineer.

2.02.03-Construction Methods: Add the following:

Wherever existing concrete sidewalk is to be removed, such removals shall be made to existing joints except when directed by the Engineer.

2.02.04-Method of Measurement: Add the following:

The work of removing concrete sidewalk shall be measured for payment by the number of square yards of concrete sidewalk removed.

2.02.05-Basis of Payment: Add the following:

The removal of concrete sidewalk will be paid for at the contract unit price per square yard for "Removal of Concrete Sidewalk" which price shall include all materials, equipment, tools and labor incidental thereto and all disposal costs.

Pay Item	Pay Unit
Removal of Concrete Sidewalk	SY

ITEM #0212000A – SUBBASE

Work under this item shall conform to the requirements of Section 2.12 of the Standard Specifications amended as follows:

2.12.02 – Materials: *Replace the paragraph with the following:*

All materials for this work shall meet the requirements of M.02.02 and M.02.06 with the following conditions/exceptions:

Grading "A" shall be used.

Reclaimed Miscellaneous Aggregate will not be accepted.

ITEM #0213100A – GRANULAR FILL

Work under this item shall conform to the requirements of Section 2.13 of the Standard Specifications amended as follows:

2.13.02 – Materials: *Replace the paragraph with the following:*

All materials for this work shall meet the requirements of M.02.01 with the following conditions/exceptions:

Reclaimed Miscellaneous Aggregate will not be accepted.

ITEM #0219011A – SEDIMENT CONTROL SYSTEM AT CATCH BASIN

Description
This work shall consist of installing, maintaining, and removing the sediment control filters for all existing and proposed drainage structures shown in the contract documents.

Inlet and gutter filters shall be installed to control sedimentation at new and existing inlet drainage structures. Inlet filters of geotextile fabric alone shall be installed to prevent silt, sediment and construction debris from entering the existing and newly constructed inlet drainage structures.

Materials
The materials used to construct the sediment control filters as shown in the details and in the contract documents shall meet the requirements of the following:

> For Curb Opening Structures: The sediment control filter unit shall consist of a sewn geotextile fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front and extending beyond the inlet opening on both sides and have a geotextile fabric sack attached designed to fit the opening of the catch basin and to hang underneath the grate and into the catch basin.
>
> For Curb-less Structures: The sediment control filter unit shall consist of a sewn geotextile fabric sack designed to fit the opening of the catch basin and to hang underneath the grate and into the catch basin.
>
> The geotextile fabric shall conform to the requirements specified in Section 7.55.
>
> The sediment control filters shall have lifting straps to allow removal of the unit and manual inspection of the storm water system.

Construction Methods
All construction of the sediment control filters shall be done in accordance with the manufacturer's recommendations, specifications, details and as ordered by the Engineer.

The installation of the sediment control filters shall be done as soon as any excavation is started on the job that could result in erosion runoff into the existing or proposed drainage system and as ordered by the Engineer.

It shall be the Contractor's responsibility to inspect the basins weekly and after each rainfall. The Contractor shall be required to clean all sediment that is accumulated in the sediment control filter. The filtering system shall be cleaned by using methods approved by the Engineer.

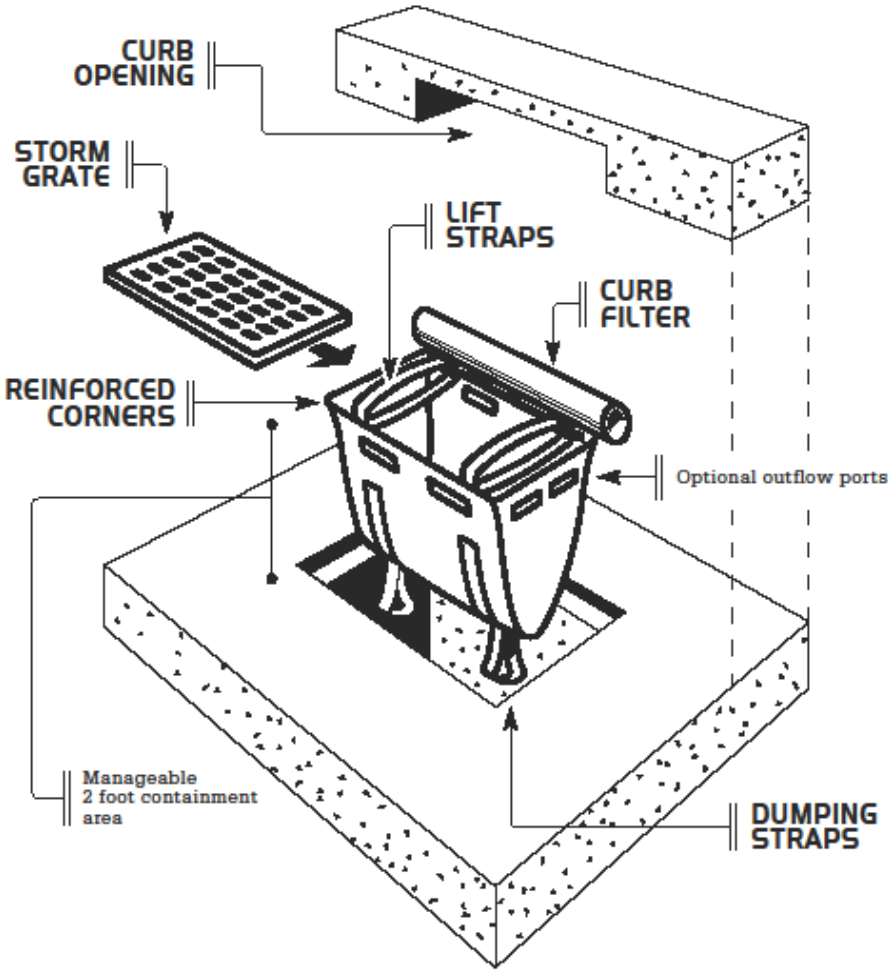
The sediment material that is removed from the drainage grate shall be removed from the site. All material that accumulates shall be disposed of by the Contractor in accordance with any State and Federal requirements at the time of removal. The silt protection screening shall then be

reinstalled in the same basin unless ordered to be disposed of by the Engineer. In the event that any part of the silt protection screening is determined unusable, the Contractor shall reconstruct or refurbish the silt protection at no additional cost to the City.

Method of Measurement
The work will be measured as the number of inlet filter sediment control units that are installed.

Basis of Payment
The unit price bid for each inlet filter sediment control unit shall include the cost of equipment, labor, materials, installation, cleaning and removal necessary to complete the work. Contractor will be paid 50% of the bid price upon the installation of the silt protection screening units and the remaining 50% upon the removal of the units when no longer needed as determined by the Engineer.

Pay Item	Pay Unit
Sedimentation Control System At Catch Basin	Each



ITEM #0304002A – PROCESSED AGGREGATE BASE

Work under this item shall conform to the requirements of Section 3.04 of the Standard Specifications amended as follows:

3.04.02 – Materials: *Replace the paragraph with the following:*

All materials for this work shall meet the requirements of M.05.01 with the following conditions/exceptions:

Course aggregate shall be broken stone.

Gravel or Reclaimed Miscellaneous Aggregate will not be accepted.

ITEM #0404100A—BITUMINOUS CONCRETE PATCHING – FULL DEPTH

Description: This work shall consist of installing full depth bituminous concrete patching in areas identified on the plans or areas of failed bituminous concrete pavement as follows:

a) Sawcutting, removal and proper disposal of pavement and granular base,

b) Grading and compacting remaining subbase or subgrade,

c) Furnishing, installation and compaction of processed aggregate base,

d) Application of tack coat on the vertical edges of the patch, and

e) Placement of Hot-Mix Asphalt (HMA), as detailed on the plans.

Materials: Materials for this work shall consist of the following:

a) Processed Aggregate Base shall meet the requirements of Article M.05.01.

b) HMA S0.5 shall meet the requirements of Section M.04. All HMA shall be Traffic Level 2 unless indicated otherwise on the plans.

c) Tack coat shall meet the requirements of Section M.04.

Construction Methods:

Equipment: Equipment for this work shall include pavement cutting, removal, material handling, and compaction equipment to perform all patching operations. Compaction equipment shall include steel-wheeled roller, vibratory plate compactor and jumping jack compactor, capable of compacting granular and HMA, materials to specified requirements. The Contractor shall also provide a 10-foot straightedge.

1. In areas not identified on the plans, the Engineer will mark areas for patching, which will extend a minimum of 1 foot beyond all edges of failed pavement wherever possible. The minimum length and width dimension of any area to be patched shall be 24 inches; the minimum depth shall be 18 inches.
2. Sawcut the existing pavement at the marked areas, excavate and remove all bituminous and granular layers to the depth indicated on the plans.
3. Once the existing bituminous concrete and granular material is removed, grade and compact the remaining subbase or subgrade. A minimum of 4 passes, or coverages, must be made by any one compaction device.
4. Install and compact processed aggregate base in accordance with Article 3.04.03, to the depth shown on the plans (minimum 18 inches).
5. The cut sides of the excavated areas shall be wiped or swept clean, tack coat shall be applied covering the entire area of the vertical bituminous concrete faces and allowed to cure.
6. HMA S0.5, shall be placed in 2-1/2” lifts and be placed as shown in the plans. Pavement placement shall also be in accordance with Subarticle 4.06.03-6. The Contractor shall confirm that the surface elevation of the finished patch matches the elevation of the surrounding pavement surface to within 1/4 inch using the 10-foot straightedge.

7. All excavated materials shall be properly disposed of at the end of the work shift.

Method of Measurement: This work will be measured by the number of square yards of accepted patched areas.

Basis of Payment: This work will be paid for at the Contract unit price per square yard for "Bituminous Concrete Patching - Full Depth," complete and accepted. The price shall include all tools, materials, labor, and equipment, pavement and granular base excavation, removal and disposal, grading, compacting, Processed Aggregate Base, tack coat application and HMA.

Pay Item	Pay Unit
Bituminous Concrete Patching – Full Depth	s.y.

ITEM #0406002A – TEMPORARY PAVEMENT

DESCRIPTION
Under this section of the specifications, the contractor shall install temporary pavement at the locations and to the general requirements shown on the contract drawings or as directed by the Engineer.

MATERIALS
The materials to be used in the construction of temporary pavement shall be those indicated on the plans and in the details or ordered by the Engineer.

Bituminous Concrete shall conform to the requirements of CT DOT Form 817 Article M.04.01.

CONSTRUCTION METHODS
The methods employed in placing the bituminous pavement and all equipment, tools, machinery and other plant equipment used in handling materials and executing any part of the work shall conform to all requirements of CT DOT Form 817 Article 4.06.03. The completed and compacted temporary pavement shall match the adjacent grade of the existing pavement and meet or surpass the uniformity of the adjacent surface and its roughness or riding quality. Replacement of the temporary pavement will be required at no additional cost to the Town where the pavement surface is not smooth or the compacted thickness of the bituminous concrete is deficient by more than ½".

It shall be the responsibility of the Contractor to maintain and repair temporary bituminous pavement surfaces until such time as the temporary pavements have been replaced with the construction of permanent pavements. The Contractor shall at all times maintain the permanent and temporary pavements in a safe and satisfactory condition and all maintenance and repairs of permanent and temporary pavements shall be provided by the Contractor at no additional expense to the City.

The Contractor shall perform and complete the construction work in a continuous manner and so that pavement replacement work may proceed without delay. The Contractor shall install the temporary pavement as soon as practical. Unless otherwise directed by the Engineer the Contractor shall install the temporary pavement by the end of each work week.

All curbing, street fixtures and such other appurtenant work damaged or displaced as a result of the Contractor's operations shall be repaired or replaced and restored by the Contractor in a manner satisfactory to the Engineer at no additional cost to the City.

METHOD OF MEASUREMENT
This work will be measured for payment by the square yards of temporary pavement surface to the limits shown on the plans or ordered by the Engineer and after verification of the proper depth of bituminous concrete pavement thickness by the Engineer.

BASIS OF PAYMENT
The temporary pavement will be paid for at the contract unit price per square yard for "Temporary Pavement" complete in place and approved which price shall include all materials, tools, equipment and labor incidental thereto.

No separate payments will be made for the saw cutting of existing pavement. The costs for these items shall be included in the contract unit price.

Pay Item	Pay Unit
Temporary Pavement	SY

ITEM #0406275A - FINE MILLING OF BITUMINOUS CONCRETE (0 TO 4 INCHES)

Description: This work shall consist of the milling, removal, and disposal of existing bituminous concrete pavement.

Construction Methods: The Contractor shall remove the bituminous concrete material using means acceptable to the Engineer. The pavement surface shall be removed to the line, grade, and existing or typical cross-section shown on the plans or as directed by the Engineer.

The bituminous concrete material shall be disposed of offsite by the Contractor at an approved disposal facility unless otherwise stated in the Contract.

Any milled surface, or portion thereof, that is exposed to traffic shall be paved within five (5) calendar days unless otherwise stated in the plans or Contract.

The equipment for milling the pavement surface shall be designed and built for milling bituminous concrete pavements. It shall be self propelled with sufficient power, traction, and stability to maintain depth and slope and shall be capable of removing the existing bituminous concrete pavement.

The milling machine shall be equipped with a built-in automatic grade averaging control system that can control the longitudinal profile and the transverse cross-slope to produce the specified results. The longitudinal controls shall be capable of operating from any longitudinal grade reference, including string line, contact ski (30 feet minimum), non-contact ski (20 feet minimum), or mobile string line (30 feet minimum). The transverse controls shall have an automatic system for controlling cross-slope at a given rate. The Engineer may waive the requirement for automatic grade or slope controls where the situation warrants such action.

The machine shall be able to provide a 0 to 4 inch deep cut in one pass. The rotary drum of the machine shall use carbide or diamond tipped tools spaced not more than $^{5}/_{16}$ inch apart. The forward speed of the milling machine shall be limited to no more than 45 feet/minute. The tools on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture.

The machine shall be equipped with an integral pickup and conveying device to immediately remove material being milled from the surface of the roadway and discharge the millings into a truck, all in one operation. The machine shall also be equipped with a means of effectively limiting the amount of dust escaping from the milling and removal operation.

When milling smaller areas or areas where it is impractical to use the above described equipment, the use of a lesser equipped milling machine may be permitted when approved by the Engineer.

Protection shall be provided around existing catch basin inlets, manholes, utility valve boxes, and any similar structures. Any damage to such structures as a result of the milling operation is the Contractor's responsibility and shall be repaired at the Contractor's expense.

To prevent the infiltration of milled material into the storm drainage system, the Contractor shall take special care to prevent the milled material from falling into the inlet openings or inlet grates. Any milled material that has fallen into inlet openings or inlet grates shall be removed at the Contractor's expense.

Surface Tolerance: The milled surface shall provide a satisfactory riding surface with a uniform textured appearance. The milled surface shall be free from gouges, longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, improper use of equipment, or poor workmanship. The Contractor, under the direction of the Inspector, shall perform random spot-checks with a Contractor supplied ten-foot straightedge to verify surface tolerances at a minimum of five (5) locations per day. The variation of the top of two ridges from the testing edge of the straightedge, between any two ridge contact points, shall not exceed ¼ inch. The variation of the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed ¼ inch. Any unsatisfactory surfaces produced are the responsibility of the Contractor and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

The depth of removal will be verified by taking measurements every 250 feet per each pass of the milling machine, or as directed by the Engineer. These depth measurements shall be used to monitor the average depth of removal.

Where a surface delamination between bituminous concrete layers or a surface delamination of bituminous concrete on Portland cement concrete causes a non-uniform texture to occur, the depth of milling shall be adjusted in small increments to a maximum of +/- ½ inch to eliminate the condition.

When removing bituminous concrete pavement entirely from an underlying Portland cement concrete pavement, all of the bituminous concrete pavement shall be removed leaving a uniform surface of Portland cement concrete, unless otherwise directed by the Engineer.

Any unsatisfactory surfaces produced by the milling operation are the Contractor's responsibility and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

No vertical faces, transverse or longitudinal, shall be left exposed to traffic unless the requirements below are met. This shall include roadway structures (catch basins, manholes, utility valve boxes, etc.). If any vertical face is formed in an area exposed to traffic, a temporary paved transition shall be established according to the requirements shown on the plans. If the milling machine is used to form a temporary transition, the length of the temporary transition shall conform to Special Provision Section 4.06 –Bituminous Concrete, "Transitions for Roadway Surface," the requirements shown on the plans, or as directed by the Engineer. At all

permanent limits of removal, a clean vertical face shall be established by saw cutting prior to paving.
Roadway structures shall not have a vertical face of greater than one (1) inch exposed to traffic as a result of milling. All structures within the roadway that are exposed to traffic and greater than one (1) inch above the milled surface shall receive a transition meeting the following requirements:

For roadways with a posted speed limit of 35 mph or less*:

1. Round structures with a vertical face of greater than 1 inch to 2.5 inches shall be transitioned with a hard rubber tapered protection ring of the appropriate inside diameter designed specifically to protect roadway structures.
2. Round structures with a vertical face greater than 2.5 inches shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.
3. All rectangular structures with a vertical face greater than 1 inch shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.

*Bituminous concrete tapers at a minimum 24 to 1 (24:1) taper in all directions may be substituted for the protection rings if approved by the Engineer.

For roadways with a posted speed limit of 40, 45 or 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 36 to 1 (36:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

For roadways with a posted speed limit of greater than 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 60 to 1 (60:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

All roadway structure edges and bituminous concrete tapers shall be clearly marked with fluorescent paint. The paint shall be maintained throughout the exposure to traffic.

The milling operation shall proceed in accordance with the requirements of the “Maintenance and Protection of Traffic” and “Prosecution and Progress” specifications, or other Contract requirements. The more stringent specification shall apply.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a sweeper truck. The sweeper truck shall be equipped with a water tank and be capable of removing the millings and loose debris from the surface. The sweeper truck shall operate at a forward speed that allows for the maximum pickup of millings from the roadway surface. Other

sweeping equipment may be provided in lieu of the sweeper truck where acceptable by the Engineer.

Any milled area that will not be exposed to live traffic for a minimum of 48 hours prior to paving shall require a vacuum sweeper truck in addition to, or in lieu of, mechanical sweeping. The vacuum sweeper truck shall have sufficient power and capacity to completely remove all millings from the roadway surface including any fine particles within the texture of the milled surface. Vacuum sweeper truck hose attachments shall be used to clean around pavement structures or areas that cannot be reached effectively by the main vacuum. Compressed air may be used in lieu of vacuum attachments if approved by the Engineer.

Method of Measurement: This work will be measured for payment by the number of square yards of area from which the milling of asphalt has been completed and the work accepted. No area deductions will be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar structures.

Basis of Payment: This work will be paid for at the Contract unit price per square yard for "Fine Milling of Bituminous Concrete (0 to 4 Inches)." This price shall include all equipment, tools, labor, and materials incidental thereto.

No additional payments will be made for multiple passes with the milling machine to remove the bituminous surface.

No separate payments will be made for cleaning the pavement prior to paving; providing protection and doing handwork removal of bituminous concrete around catch basin inlets, manholes, utility valve boxes and any similar structures; repairing surface defects as a result of the Contractors negligence; providing protection to underground utilities from the vibration of the milling operation; removal of any temporary milled or paved transition; removal and disposal of millings; furnishing a sweeper truck and sweeping after milling. The costs for these items shall be included in the Contract unit price.

Pay Item	Pay Unit
Fine Milling of Bituminous Concrete (0 to 4 Inches)	S.Y.

ITEM #0406999A - ASPHALT ADJUSTMENT COST

Description: The Asphalt Adjustment Cost will be based on the variance in price for the performance-graded binder component of hot mix asphalt (HMA), Polymer Modified Asphalt (PMA), and Ultra-Thin Bonded Hot-Mix Asphalt mixtures completed and accepted during the Contract.

The Asphalt Price is available on the Department of Transportation website at:

http://www.ct.gov/dot/asphaltadjustment

Construction Methods:

An asphalt adjustment will be applied only if all of the following conditions are met:

I. For HMA and PMA mixtures:
   a. The HMA or PMA mixture for which the adjustment would be applied is listed as a Contract item with a pay unit of tons.
   b. ***The total quantity for all HMA and PMA mixtures in the Contract or individual purchase order (Department of Administrative Service contract awards) exceeds 1000 tons or the Project duration is greater than 6 months.***
   c. The difference between the posted *Asphalt Base Price* and *Asphalt Period Price* varies by more than $5.00 per ton.

II. For Ultra-Thin Bonded HMA mixtures:
   a. The Ultra-Thin Bonded HMA mixture for which the adjustment would be applied is listed as a Contract item.
   b. The total quantity for Ultra-Thin Bonded HMA mixture in the Contract exceeds:
      i. 800 tons if the Ultra-Thin Bonded HMA item has a pay unit of tons.
      ii. 30,000 square yards if the Ultra-Thin Bonded HMA item has a pay unit of square yards.

      Note: The quantity of Ultra-Thin Bonded HMA measured in tons shall be determined from the material documentation requirements set forth in the Ultra-Thin Bonded HMA item Special Provision.
   c. The difference between the posted *Asphalt Base Price* and *Asphalt Period Price* varies by more than $5.00 per ton.
   d. No Asphalt Adjustment Cost will be applied to the liquid emulsion that is specified as part of the Ultra-Thin Bonded HMA mixture system.

III. Regardless of the binder used in all HMA or PMA mixtures, the Asphalt Adjustment Cost will be based on PG 64-22.

The Connecticut Department of Transportation (CTDOT) will post on its website, the average per ton selling price (asphalt price) of the performance-graded binder. The average is based on the high and low selling price published in the most recent available issue of the **Asphalt Weekly Monitor®** furnished by Poten & Partners, Inc. under the "East Coast Market – New England, New Haven, Connecticut area," F.O.B. manufacturer's terminal.

The selling price furnished from the Asphalt Weekly Monitor ® is based on United States dollars per standard ton (US$/ST).

Method of Measurement:

Formula: **HMA x [PG%/100] x [(*Period Price - Base Price*)] = $ ____**

where

- **HMA:**
  1. For HMA, PMA, and Ultra-Thin Bonded HMA mixtures with pay units of tons: The quantity in tons of accepted HMA, PMA, or Ultra-Thin Bonded HMA mixture measured and accepted for payment.
  2. For Ultra-Thin Bonded HMA mixtures with pay units of square yards: The quantity of Ultra-Thin Bonded HMA mixture delivered, placed, and accepted for payment, calculated in tons as documented according to the Material Documentation provision (Construction Methods, paragraph G) of the Ultra-Thin Bonded HMA Special Provision.
- ***Asphalt Base Price***: The asphalt price posted on the CTDOT website 28 days before the actual bid opening posted.
- ***Asphalt Period Price***: The asphalt price posted on the CTDOT website during the period the HMA or PMA mixture was placed.
- **PG%:** Performance-Graded Binder percentage
  1. For HMA or PMA mixes:
     - PG% = 4.5 for HMA S1 and PMA S1
     - PG% = 5.0 for HMA S0.5 and PMA S0.5
     - PG% = 6.0 for HMA S0.375, PMA S0.375, HMA S0.25 and PMA S0.25
  2. For Ultra-Thin Bonded HMA mixes: PG% = Design % PGB (Performance Graded Binder) in the approved job mix formula, expressed as a percentage to the tenth place (e.g. 5.1%)

The asphalt adjustment cost shall not be considered as a changed condition in the Contract as result of this provision since all bidders are notified before submission of bids.

Basis of Payment: The "Asphalt Adjustment Cost" will be calculated using the formula indicated above. A payment will be made for an increase in costs. A deduction from monies due the Contractor will be made for a decrease in costs.

The sum of money shown on the Estimate and in the itemized proposal as "Estimated Cost" for this item will be considered the bid price although the adjustment will be made as described above. The estimated cost figure is not to be altered in any manner by the bidder. If the bidder should alter the amount shown, the altered figure will be disregarded and the original cost figure will be used to determine the amount of the bid for the Contract.

Pay Item	Pay Unit
Asphalt Adjustment Cost	est.

ITEM #0507758A – RESET MANHOLE (STORM)

ITEM #1403501A - RESET MANHOLE (SANITARY SEWER)

3.01.01 – Description: Work under these items shall consist of the construction of all manholes, block, poured in place concrete or precast, in conformity with the lines, grades, dimensions and details shown on the plans or as ordered and in accordance with the provisions of these specifications for the various materials and work which constitutes the completed structure. Manhole type shall be as follows:

- Type I (precast – 4' dia.)
- Type I Modified (outside drop)
- Type II (precast – 5' or 6' dia.)
- Type II Modified (inside drop)
- Type III (precast - flattop)

3.01.02 – Materials: The materials to be used in the construction shall be those indicated on the plans or ordered by the Engineer and they shall conform to the requirements of these specifications.

Concrete shall be Class "A" as specified in Section M.03.01 and as amended as follows:

(a) The mix proportion shall be 1:2:4.

(b) The maximum size of the coarse aggregate shall be 3/4".

(c) Minimum compressive strength shall be 3000 psi at 28 days.

Concrete building brick, masonry concrete units and brick shall conform to Section M.08.02.

All frames and covers shall be of standard City of New Britain design and specification and as detailed on the plans.

Watertight manhole castings shall be a Fay, Spofford and Thorndike Watertight #LTW300 – manufactured by E.L. LeBaron Foundry Company, Brockton, MA 02403, locations as noted on the plans.

Concrete and reinforcement steel for precast manhole risers shall be as specified in the current ASTM C-76, Specification. Manhole risers shall be as specified in the current ASTM C-478 Specification. 5' I.D., 4' I.D. and 3' I.D. Reinforced Concrete Riser Sections shall be supplied in 2', 3' and 4' lengths by a reputable manufacturer who shall have prior approval of the Engineer and the City of New Britain. The Contractor shall supply the precast risers with rubber "O" ring joints of Kent-seal (CS-202) all weather Butyl Rubber Flexible permanent gaskets. One (1") inch size for 4' manhole, one and a half (1-1/2") for 5' manhole.

Non-shrink mortar grout shall be used on the inside and outside of manhole precast section at joints, around existing pipe and for the shelf when building manholes over existing sewer lines (re: dog house manholes).

Brick shall conform to Section M.08.02-1 of the Standard Specifications.

Damp proofing materials for sanitary manholes shall conform to the requirements of Section M.12.05 of the CTDOT Standard Specifications.

Pipe for drops shall be P.V.C. conforming to Section 3.03 of these specifications.

3.01.03 - Construction Methods: Trench Excavation and/or Rock Excavation and Backfill for manholes shall be done in accordance with the excavation provisions of the Trench Excavation item and/or Rock in Trench Excavation item found elsewhere in this specification.

All manholes and structures shall be block, pre-cast or poured in place concrete and constructed as shown on the plans. All reinforcing steel shall conform to Section 4.02 of the NB Standard Specifications.

All new sanitary manholes shall have a synthetic rubber flexible pipe to manhole connector employed in the connection of the sanitary sewer pipe. The connector shall be "Kor-N-Seal" as manufactured by NPC Systems, Inc., Milford, New Hampshire or approved equal.

Existing concrete manholes shall have the pipe entrance core-drilled in the field and a flexible pipe to manhole connector, "Kor-N-Seal" or equal shall be installed.

The connector shall be the sole element relied on to assure a flexible watertight seal of the pipe to the manhole. No adhesives or lubricants shall be employed in the installation of the connector into the manhole. The rubber for the connector shall comply with ASTM C443 and ASTM C923. It shall be 3/8" (9.4mm) thick or greater, and consist of EPDM and Neoprene or elastomers designed to be resistant to ozone, weather elements, chemicals, including acids, alkalis, animal and vegetable fats, oils and petroleum products from spills.

All stainless-steel elements of the connector shall be totally non-magnetic series 304 Stainless including the worn screw assembly for tightening the steel bank around the pipe. The worn screw for tightening the steel band shall be torqued by a breakaway torque wrench set for 60-70 inch/lbs.

The connector shall be installed in the manhole wall by activating the expanding mechanism in strict accordance with the recommendation of the connector manufacturer. The connector shall be of a size specifically designed for the pipe material and size being utilized on the project.

Existing manholes other than concrete manhole shall when the main sewer pipeline is PVC pipe have a PVC manhole adapter with an abrasive exterior as manufactured by GPK Products, Inc. Fargo, North Dakota Telephone 1-800-437-4670 or approved equal installed in the manhole.

The Contractor shall place Class "A" concrete in accordance with Section 6.01 of the CTDOT Standard Specifications amended as follows:

(a) Section 6.01.03 – Construction Methods, paragraph 22 - Test Beams and Cylinders shall be deleted and the following substituted:

The Contractor shall furnish the necessary concrete and several test cylinders from each day's run of concrete as directed by the Engineer and in accordance with ASTM C-31. The Contractor shall have a reputable testing laboratory, subject to the Engineer's approval, furnish the Engineers with the results of the test cylinders which shall be cured by the same method as used for the concrete which they represent and tested in accordance with ASTM C-39.

(a) Expansion, contraction and construction joints will be located as shown on the plans. Expansion joints shall be located at any point where the enclosure is partially in rock and partially in earth cut, or as directed by the Engineer.

(b) Section 6.01.04 – Method of Measurement and Section 6.01.05 – Basis of Payment are deleted.

There shall be no measurements made as to the quantity of concrete placed, and the cost for placing the same shall be included in the unit price bid for the special structures and manhole items. No concrete shall be poured in cold weather unless the following precautions are complied with to prevent freezing.

When temperatures are 32 degrees to 35 degrees and rising, the water required shall be heated. After pouring, the finished concrete shall be covered immediately with dry mat or board upon which shall be placed six inches of hay or straw and another layer of mats. Protection time shall be 72 hours.

When temperatures are 24 degrees and above and rising, all ingredients shall be heated before mixing. Finished concrete shall be protected as described above except eight inches of straw or hay shall be used. Protection time shall be 72 hours.

Contractor shall submit to the Engineer for approval shop drawings showing the location, size, spacing of all reinforcing steel and certified and sealed calculations showing the precast manholes will take H-20 loading. Certification must be by a registered professional Engineer in the State of Connecticut. Test cylinders of the 5000-psi concrete shall be in accordance with paragraph 3a herein.

For temperatures below 24 degrees, all ingredients shall be heated before mixing. The finished concrete shall be immediately covered and heating device used to maintain a temperature of 70 degrees around the concrete for a period of 72 hours.

Any manhole or structure constructed during cold weather is done at the Contractor's risk and all damaged manholes or structures shall be removed and replaced at his own expense.

Manhole structures shall be shaped as shown on plans. In no case shall the inside bottom of a manhole structure be flat but shall have a smooth shaped invert with a depth equal to the diameter of the largest pipe connected to the manhole. The invert may be constructed of masonry brick or formed concrete with a smooth finish. No ladder rungs are to be installed in any City manhole. The cost of the manhole invert shall be included in the price bid for the manhole structure.

Manholes shall be covered with a City of New Britain standard cast iron frame and cover, or as otherwise specified. Until such time as frames and covers are set, manholes shall be kept covered with planks or temporary covering to protect persons and animals and to prevent foreign matter from entering the manhole.

All RC Pipe shall be recessed into the face of the manhole or structure and pipe reinforcing steel shall be covered with a minimum of 1-1/2" mortar. Provisions must be made for all pipes, (existing and proposed) and stubs entering the manhole.

All manholes or structures shall be watertight and sanitary manholes shall be damp proofed. Manholes or structures found having infiltration shall be repaired by the Contractor to the satisfaction of the Engineer.

The Contractor shall place a minimum of 6" of foundation material under all manholes. The cost of this foundation material, which is specified elsewhere herein, shall be included in the price bid for the manhole.

At least the top six (6) inches of each manhole shall be constructed of brick, for the purpose of adjusting the elevation of the frame and cover. The cast iron frame and cover shall conform to the plans and shall be well coated with an approved bituminous paint prior to being put into place.

The joints between the manhole frame and chimney or corbel section of sanitary manholes shall be sealed with an internal flexible rubber seal as manufactured by Cretex Specialty Products, Waukeska, WI, or approved equal.

The internal flexible Rubber Seal shall be extruded from a high-grade rubber compound conforming to the requirements of ASTM C-923 with a hardness (durometer) of 45+5.

The sleeve shall be double pleated with a minimum unexpanded vertical height of 8 inches, a minimum thickness of 3/16 inches and shall be capable of a vertical expansion when installed of not less than 2 inches. The top and bottom section of the sleeve shall contain an integrally formed expansion band recess and multiple sealing fins. Any splice used to fabricate the sleeve shall be hot vulcanized and have a strength such that the sleeve shall withstand a 180-degree bend with no visible separation.

The expansion bands used to compress the sleeve against the manhole shall be 16-gauge stainless steel conforming to ASTM A-240 type 304, with a minimum width of 1-3/4 inches. The expansion mechanism shall have the capacity to develop the pressures necessary to make a watertight seal and shall have a minimum adjustment range of 2 diameter inches. Screws and nuts used for this mechanism shall be stainless steel conforming to ASTM F-593 and 594, type 304.

Cast iron frame shall be set to a full, even bearing on a 1" minimum cement mortar bed at the required line and grade. The flange of the frame shall not project outside of masonry on which it rests. Inner circle of frame shall not overhand more than one inch. After frames are set, care

must be exercised that they are not moved or disturbed by other operations such as backfilling, paving work, etc., and if disturbed, shall be reset on fresh bed of mortar.

When the construction of a new manhole is in conflict with an existing sewer and/or it becomes necessary to divert the existing flow away from the new construction, then the Contractor shall supply the necessary labor, equipment and materials to divert the flow and he shall include the cost of same in the price bid for the applicable Manhole item. When concrete blocks are used for the walls, they shall be laid by an experienced mason or bricklayer.

When existing sanitary sewers are to be connected to new manholes, the Contractor shall provide all necessary equipment, labor, and materials to make the connection and the cost of this work shall be included in the price bid for the applicable Manhole item.

When existing sewers are in conflict with the new manhole and the plans indicate that the existing sewer is to be plugged, the Contractor shall do the necessary work to plug the existing sewer as detailed in the plans and the cost of the plug shall be included in the price bid for the applicable manhole item.

On all manholes the cone section shall be set on the downstream side with the straight wall on the upstream side, the manhole casting shall be centered over the middle of the main channel of flow.

All manholes over 12’ deep shall be Type II 5’ inner diameter (min.). All manhole drops shall be constructed as shown on the plan, Standard Detail or as directed by the Engineer. If it becomes necessary to reset a manhole, it shall be done in conformance of applicable sections of Section 5.07 of CTDOT Standard Specifications.

All pavement replacement around manhole castings shall be to a minimum depth of 5 inches for a 5-foot diameter area. This area shall be compacted with extra care to provide good pavement densification around the manholes.

Frames, covers and tops which are to be reset shall be removed from their present beds, the walls or sides shall be rebuilt to conform to the requirements of the new construction and the tops, frames and covers reset, or the grates or covers may be raised by extensions of suitable height approved by the Engineer.

1. TESTING

All Sanitary Sewer manholes shall be vacuum tested before acceptance by the City with a vacuum testing machine as manufactured by NPC Systems, Inc., Milford, N.H. or approved equal. The testing shall be done after assembly at the manhole prior to brick work and casting placement. All lift holes shall be plugged with a non-shrink mortar and the seal between the manhole sections shall be in accordance with ASTM C923. The Contractor shall plug the pipe openings, taking care to securely brace the plugs and the pipe. After placing the vacuum tester set in place:

A. Inflate the compression band to effect a seal between the vacuum base and the manhole.

B. Connect the vacuum pump to the outlet port with the valve open.

C. Draw a vacuum to 10” of Hg. and close the valve.

The test shall be considered to pass if the vacuum remains at 10” Hg. or drops to 9” Hg. in a time greater than one minute. If the manhole fails the initial test, the Contractor shall locate the leak and make proper repairs, then retest the manhole structure until such time that it passes the vacuum test.

3.01.04 - Method of Measurement: These items will be measured in units for each manhole constructed and accepted in place. The applicable depth shall be determined by measuring from the bottom of the footing to proposed rim elevation.

Resetting tops, frames and covers will be measured as units. When resetting tops, frames and covers, there will be no measurement for excavation; cutting, removal and replacement of pavement; pervious material and backfill.

3.01.05 - Basis of Payment: This item shall be paid for at the contract unit price per manhole structure measured per unit complete and accepted in place. This price shall include the cost of all excavation, sheeting, shoring, dewatering, pumping, maintenance of existing flows, furnishing and installing foundation material, concrete, masonry brick, concrete blocks, brick or pipe inverts, inside or outside drops, stubs in manholes, precast sections, damp proofing, reinforcing steel, standard casting frame and cover, watertight manhole castings, manhole casting flexible rubber seals, core drilling, flexible pipe to manhole connector or adaptors, backfill, compaction, reconnection of existing sewers, plugging sewers to be abandoned and removal of existing structures to be abandoned, manhole testing and the required 5’ diameter 4’ pavement replacement around the manhole casting and all other labor, equipment and material necessary to complete the intended installation.

Reset units will be paid for at the contract unit price each for “Reset Manhole”, complete in place, which price shall include excavation, pervious material, backfill, cutting of pavement, removal and replacement of pavement structure, and all materials, equipment, tools and labor incidental thereto, except that when the work requires reconstruction greater than 3 feet, measured vertically, then the entire cost of resetting the unit will be paid for as extra work in accordance with the provisions of Article 1.04.05.

Where rock is encountered, it shall be paid for at the unit price bid per cubic yard for the “Rock in Trench Excavation” item and in accordance with payment lines which are 24” outside of the walls and to a depth equal to the elevation of the bottom surface of the base slab.

Pay Item	**Pay Unit**
Reset Manhole (Storm)	EA
Reset Manhole (Sanitary Sewer)	EA

ITEM #0811001A – CONCRETE CURBING

ITEM #0921001A – CONCRETE SIDEWALK

ITEM #0921005A – CONCRETE SIDEWALK RAMP

ITEM #0924006A – CONCRETE DRIVEWAY RAMP

Description: The work covered in this section consists of all equipment, labor, and materials necessary for constructing concrete curbing, sidewalk, driveway ramps, and pedestrian ramps in conformance with the lines and grades shown on the plans, and the thicknesses, cross sections, and details of the standard drawings or as established by the City Engineer. All work must be completed under the supervision of and to the satisfaction of the Board of Public Works and the City Engineer.

Materials: Material shall be furnished in accordance with the requirements of NB Standard Specifications Sections 4.01 and 4.02 except as hereinafter amended, supplemented, or restricted.

A) General

1) Concrete type shall be Class "F", as defined in CTDOT Standard Specifications, Section M.03. Minimum concrete compressive strength shall be 1800 psi at seven days and 4400 psi at twenty-eight days.

2) Preformed Expansion Joint Material shall conform to the requirements of CTDOT Standard Specifications, Section M.03-7.

3) Welded Wire Fabric shall be 6x6 W1.4.

4) Processed Aggregate Base shall conform to the requirements of CTDOT Standard Specifications Section M.05.01.

5) Paint shall conform with the requirements of CTDOT Standard Specifications, Section M.07.20.

6) Detectable Warning Surface shall comply with current ADA requirements.

B) Cement - only type II Portland Cement shall be used in batching the concrete for these items.

C) Construction Testing - Unless otherwise agreed to in writing or amended by City of New Britain Contract Special Conditions, a reasonable amount of testing shall be ordered on an "as needed" basis by the City Engineer. This testing will be performed at the City's expense. If initial testing results indicate that the specifications have not been met, additional testing will be ordered by the City Engineer. This additional testing shall be at the Contractor's expense and shall be continued until such time as the test results indicate conformance is being achieved.

At the request of the City Engineer, the Contractor shall be required, at his expense, to submit certified test reports in accordance with CTDOT Standard Specifications, Section

1.06.07 for any materials incorporated into the work. Failure or refusal to comply shall be deemed as grounds for immediate removal of subject materials and replacement with materials for which such reports and certificates can be provided, all at the Contractor's expense.

The City reserves the right to perform, at any time with its own forces and at its own expense, such additional testing as it may deem necessary.

Construction Methods: Construction methods shall conform with Section 4.01.03 of the NB Standard Specifications except as hereinafter amended, supplemented, or restricted.

A) All Items of Work

1) Excavation and Grading

a) The subgrade shall be excavated or filled with suitable material to the required grades and lines. Filled sections shall be compacted and extend a minimum of one foot (1') outside the form lines. The subgrade shall be compacted to a dry density of at least 90% of maximum dry density as determined by AASHTO T-180, Method D. The finished surface of the subgrade shall be smooth, free from surface irregularities and true to line and grade as established by grade hubs or pins.

b) Where spongy, organic or otherwise unsuitable material is encountered, which, in the opinion of the City Engineer, is unsuitable for subgrade, such unsuitable material shall be removed to the depth specified by the City Engineer and replaced with acceptable material. All such replacement material shall be compacted to a dry density of at least 90% of maximum dry density for the material used as determined by AASHTO T-180, Method D. Any boulders encountered shall be removed for one foot laterally and six inches vertically below all concrete. In no case shall concrete be placed on a saturated base/subgrade or if free water is standing on the base/subgrade.

c) The correct cross sections of the base/subgrade shall be checked before the concrete is placed by testing with a template of wood or metal, the bottom surface of which conforms to the desired contour. Any irregularities thus indicated shall be corrected.

d) The contractor shall, upon removing traffic signs to facilitate sidewalk installation, note the exact locations of the signs and the number of poles supporting each sign. During construction of the sidewalk, the contractor shall install galvanized steel or PVC (Schedule 40) pipe having a minimum 3 ½" inner diameter (ID) and a maximum 4" ID at the sign pole locations. The top of the pipe shall be flush with sidewalk grade and shall extend a minimum of 3" to a maximum of 5" into the processed gravel base. Construction joints shall be made in the concrete at 90-degree increments around the pipe run perpendicular and parallel to the curbing line and extending until they intersect with another construction joint or an expansion joint. The poles shall not be cemented in place.

2) Setting Forms

a) All forms shall be of wood or metal, straight, free from warp and of sufficient strength when staked to resist the pressure of the concrete without springing, and the upper edge shall form a true line. All forms shall be cleaned thoroughly and greased or oiled before concrete is placed against them. Forms that have become worn, bent, or broken shall not be used.

b) Sufficient support shall be given to the form to prevent movement in any direction during concrete placement or as a result of the weight of the concrete. Forms shall not be set until the base/subgrade has been prepared in accordance with these specifications and compacted within one inch (1") of the established grade. When set, the top of the form shall not depart from grade more than one-quarter inch (¼") when checked with a ten-foot (10') straightedge. The alignment shall not vary more than one-half inch (½") in ten feet (10'). Immediately prior to placing the concrete, forms shall be carefully inspected for proper grading, alignment and rigid construction. Adjustments and repairs as needed shall be completed before placing concrete.

c) The Contractor shall provide an approved metal straight edge, ten (10) feet in length for use in checking the alignment of the forms prior to placing the concrete and also to check the concrete surface during the finishing operation.

d) On short radii curves, steel plates or wood which can be readily formed to the desired radii shall be used. Face forms, if used, shall be preshaped to the proper radii. Care shall be exercised to insure conformance with the required cross-section around the entire radius during concrete placement and curing operations.

3) Placing

a) General

Concrete may be placed by an approved slip form/extrusion machine, by the formed method, or by a combination of these methods.

b) Formed Method

i) Before the concrete is placed, the base/subgrade shall be thoroughly dampened so that it is moist throughout, but without puddles of water.

ii) The concrete shall be placed only on a moist base. Concrete shall not be placed on a soft, muddy or frozen base.

iii) Concrete shall be placed as near to its final position as practicable. Precautions shall be taken not to overwork the concrete while it is still plastic.

iv) The concrete shall be thoroughly spaded along the forms to eliminate voids or honeycombs at the edges.

v) The rate of concrete placement shall not exceed the rate at which the various placing and finishing operations can be performed in accordance with these specifications.

vi) The concrete shall be properly placed in forms which are securely set to line and grade and shall at no time deviate more than ¼" from an accurate straight edge ten (10) feet in length. The operations of depositing and compacting the concrete shall be so conducted that the concrete shall be smooth and dense, free from honeycomb and free from pockets of segregated aggregate. At the end of the day, or in case of an unavoidable interruption of more than thirty (30) minutes, a transverse construction joint shall be placed at the point of stopping work, provided that the section on which work has been suspended is not less than the minimum length for that particular item or work. Sections less than the minimum length shall be removed. Concrete shall not be placed when weather is stormy, dusty, or otherwise inclement to the point that it precludes good workmanship. Air temperature shall be a minimum of 40 degrees F. and rising when the pour is started unless specific provisions are made for cold weather concreting in accordance with Section 4.01.

c) Machine Method

The slip form/extrusion machine approved shall be so designed as to place, spread, consolidate, screed, and finish the concrete in one complete pass in such a manner that a minimum of hand finishing will be necessary to provide a dense and homogeneous concrete section. The machine shall shape, vibrate, and/or extrude the concrete for the full width and depth of the concrete section being placed. It shall be operated with as nearly a continuous forward movement as possible. All operations of mixing, delivery, and spreading concrete shall be so coordinated as to provide uniform progress, with stopping and starting of the machine held to a minimum.

4) Jointing

a) Expansion joints shall be constructed straight, plumb, and shall extend through the entire section from top to bottom and from edge to back. Preformed expansion joint filler, one-half inch thick, meeting the requirements of Section 4.01, shall be used to form transverse expansion joints. Expansion joints shall be constructed at the intersection with any existing unyielding structures, concrete or stone structure, at the tangent point of curbing radii, and at intermediate intervals as specified for the item of work.

b) Expansion joints in slip formed curbing or walk shall be constructed with an appropriate hand tool by raking or sawing through partially set concrete for the full depth and width of the section. The cut shall be only wide enough to permit a snug fit for the joint filler.

c) After the filler is placed, open areas adjacent to the filler shall be filled with concrete and then troweled and edged.

d) Alternately, an expansion joint may be installed by removing a short section of freshly extruded curbing and gutter immediately, installing temporary holding forms, placing the expansion joint filler, and replacing and reconsolidating the concrete that was removed. Contaminated concrete shall be discarded.

e) As required at the end of day's run, construction joints shall be made at right angles to the longitudinal axis and shall be located at the regular spacing designated for block joints unless otherwise specifically permitted by the City Engineer. In no case shall any length of walk be less than five (5) feet between joints or any length of curbing less than six (6) feet.

5) Finishing

a) No finishing operation shall be performed while free water is present. Finishing operations shall be delayed until all water and water sheen has left the surface and the concrete has started to stiffen.

b) After water sheen has disappeared, edging operations, where required, shall be completed.

c) After edging and jointing operations, the surface shall be floated with either a wood or a magnesium float.

d) If necessary, tooled joints and edges shall be rerun after floating to maintain uniformity.

e) All honeycombed areas or small defects discovered while concrete is still fresh and has not "set" shall be properly pointed up with 1:2 mix mortar.

f) Face forms, if used, shall be left in place until the concrete has hardened sufficiently so that they can be removed without injury to the curbing. The exposed surfaces shall then be finished smooth and even by means of a moist wood float or a moist brick.

g) Any person who shall construct curbing or walks shall stamp his company name and date of construction at the beginning and end of each days pour so that it shall be legible and visible. Similar stamps should appear in each pedestrian ramp or driveway apron when done by separate pour.

6) Stripping Forms

a) Forms shall remain in place at least twelve (12) hours after concrete has been placed against them or for a longer period if so directed by the City Engineer. Crowbars or other heavy tools shall not be used against green concrete in removing the forms.

b) Forms may be removed at such time as the concrete is sufficiently set that removal will be without danger of chipping or spalling. When forms are removed before the expiration of the curing period, the edges of the concrete shall be protected with moist earth or sprayed with curing compound. All forms shall be cleaned, oiled and be examined for defects before they are used again.

c) Honeycomb, voids, and surface irregularities are unacceptable and must be corrected by removal of the defective work and replacement. The Contractor may propose correction of the deficient work by means other than removal and replacement. Any attempt at alternative correction must be approved and authorized by the City

Engineer, who shall set the specific terms under which the corrective work will be allowed.

7) Backfilling

a) In areas where lawns exist or as shown on the plans, the top four inches (4") of backfill shall be black loam or good topsoil which is suitable for the growth of lawns. It shall be placed out from the sidewalk or driveway a sufficient distance and in amount to replace turf or lawn removed during installation. Backfill shall be completed by grading to match the existing lawn and the level of the top of the adjacent sidewalk, driveway, or curbing. Disturbed areas shall be seeded or sodded and maintained.

b) Where lawns do not exist, the top four inches (4") of backfill shall be tamped earth and shall be placed to conform with the typical sections shown on the plans.

c) Backfill shall be compacted to prevent settlement and the surface shall be leveled off to a neat appearing and free draining surface.

B) Additional Requirements for Curbing

1) Placing

a) General

Concrete may be placed by an approved slip form/extrusion machine, by the formed method, or by a combination of these methods.

2) Jointing

a) Formed or Slip Formed Curbing

Curbing constructed by the formed method or slip form machine shall be constructed in sections not less than 6 feet and not more than 20 feet. Non-protruding expansion joints ½ inch thick by the width and depth of the curbing shall be placed at a maximum of 20 feet apart. Only the non-extruding expansion joint of the specified type shall be used and shall be placed so the top of the joint will be flush with the top of the concrete.

b) Jointing New and Existing Curbing Sections

Where the new curbing sections will join existing curbing with a different cross-section, a minimum six (6) foot long transition section shall be constructed. An expansion joint shall be placed at both ends of the transition section.

3) Backfilling

a) After the concrete has set sufficiently and prior to pavement repair, if any, the spaces in back of curbing shall be refilled with suitable material to the required elevations. The fill material shall be thoroughly tamped in maximum 6" thick layers.

b) During backfill and paving, the Contractor must keep curbing aligned and protected from damage. No extra payment will be made for realignment or for replacement of cracked or otherwise damaged curbing.

c) On all pavement repair, the base shall be satisfactorily compacted by tamping or rolling; and the surface course shall be compacted to a smooth even surface, flush with the adjacent pavement with an approved roller. Prior to placing the bituminous concrete, the edges of the existing bituminous shall be satisfactorily brushed or mopped with a liberal application of hot liquid asphalt or emulsified asphalt. After placing and compaction of the bituminous concrete, the joint between the existing and the new bituminous concrete shall be satisfactorily coated and sealed with hot liquid asphalt or emulsified asphalt and dusted with fine sand to prevent tracking.

C) Additional Requirements for Sidewalk, Driveway Ramps and Pedestrian Ramps

1) Excavation and Grading

The concrete shall be placed on a six (6) inch thickness of processed aggregate compacted to 95% of the maximum dry density at optimum moisture as determined by AASHTO T-180, Method D.

2) Reinforcing Steel

Welded wire fabric ends and sides shall overlap no less than one mesh and shall be fastened by wires at intervals not to exceed one foot.

3) Jointing

a) All concrete walks under 7 feet in width must be laid in sections not to exceed 20 feet in length and shall be separated with a strip of non-protruding expansion joint ½" thick and the full depth of the concrete set flush with the finished surface.

b) All concrete walks over 7 feet wide must be laid in sections not to exceed 15 feet in length and shall be separated with a strip of non-protruding expansion joint ½" thick and the full depth of the concrete set flush with finished surface.

c) All walks shall be marked with construction joints in 5-foot blocks with each section marked so as to give the appearance of separate blocks. These construction joints shall have a uniform depth one quarter of the thickness of the concrete.

d) In full concrete walks between the curbing and any building there shall be placed a strip of expansion joint filler ½" thick (¼" for granite curbing) and the full depth of the concrete set flush with the finished surface on or about the street line.

e) All saw cuts shall be in neat straight lines where proposed meets existing construction or as directed by the City Engineer. Place an expansion joint at each saw cut. Saw cut shall be completely through the concrete.

4) Detectable Warning Surface shall consist of raised truncated domes with a diameter of nominal 0.9 in, a height of nominal 0.2 in and a center-to-center spacing of nominal 2.35

in and shall contrast visually with adjoining surfaces, either light-on-dark, or dark-on-light. Installation shall comply with current ADA requirements.

5) Finishing

a) Broomed Finish

The surface of concrete shall be finished true to the lines and grades shown on the plans. Concrete shall be worked until the coarse aggregate is forced down into the body of the concrete and no coarse aggregate is exposed. Concrete that is adjacent to forms and formed joints shall be edged with a suitable edging tool to the dimensions shown on the plans. The surface shall than be floated with a wooden or other suitable float to a smooth and uniform surface. If necessary, tooled joints and edges shall be rerun after floating to maintain uniformity. When the concrete has hardened sufficiently, the surface shall be given a broom finish using a soft-bristled, long handled push broom. The strokes shall be square across the concrete from edge to edge with adjacent strokes overlapped. Strokes shall be made without tearing the concrete. The broomed finish shall produce regular corrugations not over one-eighth inch (1/8") in depth.

6) Backfilling

After the forms have been removed suitable fill material shall be placed along the edge of the walk and tamped by either hand or mechanical tampers to a density at least equal to that of the adjacent ground. The finish grade and section shall be as indicated on the drawings and to the satisfaction of the City Engineer.

D) Protection

The Contractor shall always have materials available to protect the surface of the plastic concrete against rain. These materials shall consist of waterproof paper or plastic sheeting. For slip form construction, materials such as wood planks or forms to protect the edges shall also be required.

Upon completion, all items of work under this specification shall be protected from travel and/or adjacent construction operations (e.g. paving) for a time sufficient to insure they are not damaged, but in no case for less than 72 hours.

E) Tolerances

The work shall be performed in a manner which results in the item being constructed true to line and grade, uniform in appearance and structurally sound. Items found with unsightly bulges, ridges, low spots or other defects shall be removed and replaced at the Contractor's expense if the City Engineer considers them to be irreparable. When checked with a ten-foot (10') straightedge, grade shall not deviate by more than one-quarter inch (¼") and alignment shall not vary by more than one-half inch (½").

F) Warranty

All concrete sidewalks, curbing, driveway ramps and pedestrian ramps constructed shall be guaranteed for a period of one (1) year, said period to commence at the time of official acceptance.

Method of Measurement: Concrete Sidewalks, Driveway Ramps and Pedestrian Ramps: This work will be measured for payment by the actual number of square feet of completed and accepted concrete sidewalks, driveway ramps or pedestrian ramps. This measurement should not include the curbing area, for either separate or monolithic sidewalk or driveway ramp.

Concrete Curbing: This work will be measured for payment by the actual number of linear feet of completed and accepted concrete curbing. This measurement should include the curbing, either separate or monolithic, along sidewalk or driveway ramps.

Basis of Payment:

A) General

1) The unit prices for all items of work shall include the cost of all saw cuts to meet existing facilities, the cost of removing and disposing of all surplus material, excavation, preparation of subgrade and base, base material, concrete (including additives), formwork, welded wire fabric, jointing, shoring, backfill, restoration of adjacent pavement and grassed areas, painting and cross walk adjustment, and all other labor, equipment, and material incidental or necessary to complete the item in accordance with the plans and specifications.

2) Unless otherwise specified, there will be no direct payment for adjusting to grade monuments, valve boxes, manhole frames and covers, hatchways, or other existing surface structures in any new or reconstructed walk, the cost of this work being considered to be included in the unit price for the item of work.

3) Openings in walk for tree wells and planters shall be determined prior to the start of construction. No additional payment for extra formwork, etc. occasioned by these features shall be made, the cost of this work being considered to be included in the unit price for the item of work.

B) Sidewalk

Standard concrete walk, including monolithic walk, shall be paid for at the contract unit price per square foot for “Concrete Sidewalk”, which price shall include the cost of all scoring and joints, as specified. When the walk is poured contiguous with concrete curbing, the top width of the curbing (8”) shall not be used to compute the payment area of the walk.

C) Curbing

Concrete shall be paid for at the contract unit price per linear foot for “Concrete Curbing”. Curbing shall include the New Britain standard curbing, recessed curbing, recessed curbing in driveway aprons, and the curbing in monolithic walks and pedestrian ramps.

D) Pedestrian Ramps

Concrete sidewalk pedestrian ramps, shall be paid for at the contract unit price per square foot for "Concrete Sidewalk Ramp", which price shall include the cost of all scoring and joints, as specified. When the walk is poured contiguous with concrete curbing, the top width of the curbing (8") shall not be used to compute the payment area of the ramp. The price shall also include furnishing and installing an ADA compliant detectable warning surface.

E) Driveway Ramps

Driveway ramps shall be paid for at the contract unit price per square foot for "Concrete Driveway Ramp", as measured along the exposed face of the curbing from the P.C. of the driveway radius. The top width of the recessed curbing (8") shall not be used to compute the payment area of the driveway.

Pay Item	Pay Unit
Concrete Curbing	LF
Concrete Sidewalk	SF
Concrete Sidewalk Ramp	SF
Concrete Driveway Ramp	SF

ITEM #0813021A – 6” GRANITE STONE CURBING
ITEM #0813031A – 6” GRANITE CURVED STONE CURBING

This work shall conform to Section 8.13, supplemental as follows:

Article 4.04.02 Materials

Add the following:

Base material for granite curbing shall be processed stone or subbase, as shown on the plans, and conform to the appropriate specification sections.

Class "C" Concrete shall conform to City of New Britain Standard Specifications Sections 4.01 and 4.02.

Article 4.04.03 Construction Methods

Add the following:

Class "C" Concrete shall be placed at each joint for straight curbing, and continuously for curved curbing and curbing at sidewalk ramps, as shown on the plans.

Article 4.04.05 Basis of Payment

Add the following:

Payment for this work shall also include furnishing and placing of Class "C" Concrete, as described herein, and any additional cutting of stone curbing required for proper curb placement on and around existing vaults, structures, planting beds, etc.

Pay Item	Pay Unit
6" Granite Stone Curbing	LF
6" Granite Curved Stone Curbing	LF

ITEM #0921024A – BRICK PAVER SIDEWALK

DESCRIPTION:
The work of this item includes furnishing all materials, equipment, supplies, accessories, incidentals, labor and supervision, and performing all operations required to furnish and install brick paver sidewalk as shown on the drawings, as specified herein, and as is additionally required to properly complete the work, including all sawcuts to meet existing facilities, the removing and disposal of all surplus materials, excavation, concrete sidewalks or driveway ramps removal and disposal, removal and disposal of existing miscellaneous foundations of any size and volume as directed by engineer except existing light pole and traffic signal foundations, furnishing and installing the concrete base slab, sidewalk ramp base slab, bituminous/sand setting bed, neoprene-modified asphalt setting adhesive, brick pavers, accent brick pavers, aluminum edge restraints, joint sand and expansion joints.

Submittals:
Submit sample units of each paver type representative of size, shape, color and finish, indicating color variation and texture range expected in finished installation. Submit minimum of ½ pallet of 4”x8” brick pavers, and submit minimum of twelve 8”x8” accent brick pavers. Lay out pavers on site or where directed for the Engineer’s approval. Do not order brick for project until Engineer's approval of the sample units.

Submit five (5) copies of Manufacturer's Product Data and Installation Instructions for the following items:

1. Brick pavers
2. Accent brick pavers
3. Polymeric sand joint filler mixture
4. Neoprene-modified asphalt setting adhesive
5. Bituminous setting bed

Submit five (5) copies of the test report of brick pavers and accent brick pavers indicating ASTM C-902 compliance as applicable. Testing shall be done by a qualified independent testing laboratory. Test procedures shall conform to ASTM C-67-03 methods, as applicable. Test report shall indicate, as a minimum, the following:

1. Compressive strength, psi
2. Absorption, 5 hr. submersion in cold water.
3. Absorption, 24 hr. submersion in cold water.
4. Maximum saturation coefficient.
5. Initial rate of absorption (suction).
6. Abrasion index.
7. Freeze-thaw.
8. Tolerance to saline conditions.
9. Efflorescence.

Installer Qualifications:
Installer shall have not less than three years experience with at least 75-100,000 square feet installed. Successful completion of five similar clay brick paver installations similar in design which are to be documented. Installer shall include the specified product(s) in their bid and shall have read and understand the contents of ASTM C 902 and/or C 1272 whichever is applicable.

Source Limitations:
Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

Dimensional Uniformity:
The entire order for all material including waste must be ordered and blended at the manufacturer's plant at one time, so that they can be supplied from one production run or sequential production runs to ensure reasonable dimensional uniformity. The manufacturer shall earmark the plant-blended pavers ordered for this Contract.

Inspections:
Inspect all materials upon delivery. Colors and size within a given shipment may vary slightly due to subtle changes in clay composition and kiln firing temperatures. Pavers are sealed with a siloxane-based penetrating sealer/water proofer.

Preinstallation Meetings:
Conduct pre-installation meeting one week prior to commencing work of this Section to verify project requirements, substrate condition, coordination with other trades, installation instructions, and warranty requirements. Preinstallation meeting shall include the Contractor, Installer, Engineer, Distributor and/or Manufacturer's Representative, and other interested parties as appropriate.

Mockup:
Construct a mockup of not less than 12' x 12' to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. The Mockup shall include the running bond "sidewalk" pattern, the herringbone "plaza" pattern, soldier course banding, brick accent pavers, and granite paver banding. Use mock-up(s) to determine pre-compaction setting bed level, joint sizes, lines, laying patterns, color and texture range, and workmanship. Do not start work until Engineer has approved mock-up. Remove mock-up and dispose of materials at the completion of the work or as directed by Engineer.

MATERIALS:

Brick Pavers:
The brick pavers shall be light–traffic paving brick; ASTM C 902, Class SX, Type I. 4"x8" brick pavers shall be Application PX. Provide brick without frogs or cores in surfaces exposed to view in the completed work.

The brick paver shall be 4 inches x 8 inches x 2 ¼ inches Whitacre-Greer dry-pressed beveled and lugged pavers. The color blend shall be 60 percent No. 36 "Red Sunset", 20 percent No. 32 "Antique", and 20 percent No. 33 "Dark Antique".

The accent brick paver shall be 8 inches x 8 inches x 2 ¼ inches Whitacre-Greer dry-pressed beveled and lugged pavers. The color blend shall be 60 percent No. 36 "Red Sunset", 20 percent No. 32 "Antique", and 20 percent No. 33 "Dark Antique".

All brick pavers and accent brick pavers shall be rated "not effloresced" when tested according to ASTM C 67.

Bituminous Setting-Bed:
Primer for Base shall be ASTM D 2028, cutback asphalt, grade as recommended by brick paver manufacturer.

Asphalt cement to be used in the bituminous setting bed shall be Performance Grade binder PG 64-28.

Fine aggregate to be used in the bituminous setting bed shall be clean, hard sand with durable particles and free from adherent coatings, lumps of clay, alkali salts, and organic matter. Aggregate shall be ASTM D 1073, No. 2 or No. 3.

Fine aggregate shall be dried and shall be combined with hot asphalt cement, and the mix shall be heated to approximately 300 degrees F at the asphalt plant. The approximate proportion of materials shall be 7% asphalt cement and 93% fine aggregate.

Neoprene-Modified Asphalt Setting Adhesive:
Neoprene modified asphalt setting adhesive shall meet paving manufacturer's standard adhesive consisting of oxidized asphalt combined with 2 percent neoprene and 10 percent long-fibered mineral fibers containing no asbestos.

Concrete Base Slab:
Conform to Section 0921001A of these specifications with the following additions:

All concrete base slabs will receive wire mesh reinforcing 2 inches below the top of the slab. Wire mesh reinforcing shall be plain finish welded steel, W1.4 x W 1.4 wire spaced 6" x 6" both ways meeting ASTM specifications A-185-02. The mesh shall be lapped 6"and tied together with wire spaced not over 12" on center to prevent displacement set.

Sand for Joints:
High Performance Polymeric Jointing Sand for pavers. Color to be selected by Engineer and conform to the ASTM C-144 requirements for joint sand.

1. Mixture of polymer binders and calibrated sand.
2. Water resistant after 90 minutes
3. For surface exposed to heavy foot traffic
4. Applied dry- hardens after being misted
5. Inhibits weed growth
6. Deters ants and other insect infestations
7. Resists erosion – water, frost heaving, wind, power washing, etc.
8. Stabilizes pavers – strengthens interlocking pavers

Pea Stone:
Crushed stone conforming to CDOT Form 817-2016, Article M.03.01-1 Coarse Aggregate. Do not use rounded gravel or reclaimed concrete aggregate. All stone materials shall be washed with less than 1% passing the No. 200 sieve.

Conforming to gradation as shown in Table below:

No. 8 Aggregate Grading Requirements

Sieve Size	Percent Passing
1/2-inch	100
3/8-inch	85 to 100
No. 4	10 to 30
No. 8	0 to 10
No. 16	0 to 5

Cork Joint Filler:
Preformed strips complying with ASTM D 1752, Type II.

Aluminum Edge Restraints:
4000 Series Heavy Duty "L" Shaped Aluminum Edge Restraint: 2" high x 2" base with Deco-Black Finish (.0008 to .0012 inch thick) electrostatic enamel acrylic in 8' sections as manufactured by Curv-Rite Inc., Wayland MI or approved equal. Sections to be aluminum alloy 6061with a T-6 hardness. A 3" aluminum splicer inserted 1-1/2" into each adjoining section shall be used to create an uninterrupted edging system that has a continuous support surface on both sides of the vertical wall. Edging base shall have holes 4" apart along its length of section for receiving 3/4-inch to 1-inch long powder-actuated concrete nails.

CONSTRUCTION METHODS:

Delivery, Storage, and Handling:
Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

Store asphalt cement and other bituminous materials in tightly closed containers.

Project Conditions:
Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

Weather Limitations for Bituminous Setting Bed:

1. Install bituminous setting bed only when ambient temperature is above 40 deg F and when base is dry.
2. Apply asphalt adhesive only when ambient temperature is above 50 deg F and when temperature has not been below 35 deg F for 12 hours immediately before application. Do not apply when setting bed is wet or contains excess moisture.

Protection of Finished Surfaces:
Finished surfaces adjacent to the paving work shall be adequately protected from soiling, staining, and other damage during construction.

Excavation:
Work under this item shall consist of removing and disposing of existing sidewalk and foundation to a full depth. Wherever portions of concrete sidewalks or concrete driveway ramps are to be removed, such

removals shall be made to neat lines. Partial removals shall generally be to existing joints except when a location other than a joint is identified on the plans or set by the Engineer due to construction staging limits. At removal limits where a joint is not present, the Contractor shall sawcut the concrete full depth to create a neat line. The bottom of the excavation shall be graded smooth and thoroughly compacted to a firm, even surface using a roller weighing not less than five tons or a motor driven vibratory compactor.

Work under this item shall also consist of removing and disposing of existing miscellaneous foundations as directed by engineer.

Work under this item shall include removal of existing brick pavers installed during previous phases of New Britain Downtown Streetscape construction, as required for the purpose of maintaining consistent brick patterns across phase limit lines without interruption. This work shall include repairs to bituminous setting beds due to paver removal operations. Clean and undamaged pavers may be reused at these locations if approved by the Engineer.

Concrete Base Slab:
Concrete installation shall conform to Section 0921001A of these specifications. Additional requirements for concrete slab are as follows:

All concrete base slabs shall receive 6 x 6 – W1.4 x W1.4 welded wire mesh reinforcing 2 inches below the top of the slab. Wire mesh reinforcing shall be plain finish welded steel, W1.4 x W1.4 wire spaced 6" x 6" both ways meeting ASTM specifications A-185-02. The mesh shall be lapped 6"and tied together with wire spaced not over 12" on center to prevent displacement set.

Preparation:
Core-drill weep holes in concrete substrates at 24-inch centers at lowest elevations, and against curbs, walls, and other permanent structures. Fill holes with washed pea gravel and install temporary plugs to prevent ingress of setting bed material or neoprene adhesive during construction. Remove plugs when paving adjacent to weep holes.

Sweep concrete substrates to remove dirt, dust, debris, and loose particles.

Bituminous Setting Bed:
Bituminous setting bed shall be installed over the fully cured concrete base. Apply primer to concrete slab or binder course immediately before placing setting bed.

Control bars ¾” deep shall be placed approximately 11 feet apart and parallel to one another, to serve as guides for striking board. Adjust bars to subgrades required for accurate setting of paving units to finished grades indicated.

Place bituminous setting bed where indicated, in panels, by spreading bituminous material between control bars. Spread mix at a minimum temperature of 250 deg F. Strike setting bed smooth, firm, even, and not less than 3/4 inch thick. Add fresh bituminous material to low, porous spots after each pass of striking board. After each panel is completed, advance first control bar to next position in readiness for striking adjacent panels. Carefully fill depressions that remain after removing depth-control bars.

The setting bed shall be rolled with a power roller to a nominal depth of ¾” while still hot. The thickness of the setting bed shall be adjusted so that when the bricks are placed and rolled, the top surface of the pavers will be at the required finished grade.

Apply neoprene-modified asphalt adhesive to cold setting bed by squeegeeing or troweling to a uniform thickness of 1/16 inch. Proceed with setting of paving units only after adhesive is tacky and surface is dry to touch.

Aluminum Edge Restraints:
Provide aluminum edge restraints wherever brick pavers abut lawns and other non-structural edges. Install edge restraints before placing brick pavers. Install edge restraints to comply with manufacturer's written instructions. Anchor with 3/4-inch to 1-inch powder-actuated concrete nails at 4-inches to 12-inches on center spacing to hold edge restraints in place during and after paver installation.

Brick Pavers:
Do not use brick pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.

Cut brick pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

Place pavers carefully by hand in straight courses, maintaining accurate alignment and uniform top surface. Protect newly laid pavers with plywood panels on which workers can stand. Advance protective panels as work progresses, but maintain protection in areas subject to continued movement of materials and equipment to avoid creating depressions or disrupting alignment of pavers. If additional leveling of paving is required, and before treating joints, roll paving with power roller after sufficient heat has built up in the surface from several days of hot weather.

Pavers shall be set true to the required lines and grades in the pattern detailed on the Drawings. Lay full pavers first and adjust pavers to form straight bond lines and appropriate joint widths. Provide 1/16" to 3/16" sand filled joints between pavers. Do not exceed 1/8-inch unit-to-unit offset from flush (lippage) nor 3/8 inch in 10 feet from level, or indicated slope, for finished surface of paving.

String lines or chalk lines must be used to keep paver bond lines straight and true. The straight and true bond lines shall not deviate more than +/- 1/2″ at the end of 50 feet. Establish a center line working outward setting parallel string lines or chalk lines every 2 to 6 feet, depending on the area, to continuously check and adjust paver bond lines.

Roll or compact bituminous-set pavers to achieve full bond with the setting bed, reduce lippage and improve the overall flatness of the surface. Fill the spaces between pavers in conformance with the polymeric sand producer's installation instructions and recommendations as soon as possible after the pavers have been placed. Clean joints of all debris with power air blowers or vacuums to ensure full penetration of the jointing sand. Sweep dry joint filling sand over surface of paving until all joints are completely filled. Once the initial filling of the joints is completed, roll the surface of the pavers to fully compact the pavers into place. Utilize a light rubber-tired roller with sufficient pressure to achieve a full bond to the setting bed or a 4-5000 LBF plate tamper with a protective mat attached. Do not operate the roller in a vibrating mode, as this may cause cracking of the pavers. Protect the surface with plywood or other suitable materials to prevent damage to the edges of the pavers. Perform rolling at the warmest part of the day, but prior to final set of the adhesive, taking care to ensure that the alignment is not altered. After rolling, add dry sand to the joints as necessary to ensure that the sand has penetrated to the bottom of the joints. Do not vibrate the pavers after they or the sand have been placed on the setting bed. Roll the surface when the sand shows no sign of further settlement. Add additional sand as necessary. Mist

and rinse in conformance with the polymeric sand producer's installation instructions and recommendations.

Do not permit traffic, including construction equipment, on pavers before joint filling. Disturbed areas of pavers should be taken up, the setting bed re-rolled and pavers re-laid. Remove cracked or damaged pavers and replace with new units. Protect areas were joints have not been filled with waterproof covering overnight.

Completed brick paver areas within the path of travel of any construction equipment shall be protected with steel road plates.

Discontinue laying operations when weather conditions are such that pavement performance may be compromised. On laying operations recommencement, verify acceptable setting bed condition before further pavers are laid.

METHOD OF MEASUREMENT:
Brick Paver Sidewalk will be measured on a per square foot basis, complete, in-place, as shown on the Drawings, as specified herein, and as directed by the Engineer. Price shall include all materials, equipment, tools and labor incidental thereto including all sawcuts to meet existing and proposed facilities, the removing and disposal of all surplus materials, excavation, concrete sidewalks or driveway ramps removal and disposal, removal and disposal of existing miscellaneous foundations as directed by engineer, furnishing and installing the process aggregate base, concrete base slab, sidewalk ramp base slab, aluminum edge restraints, bituminous/sand setting bed, neoprene-modified asphalt setting adhesive, joint sand, brick pavers, accent brick pavers, and expansion joints.

BASIS OF PAYMENT:
The brick paver sidewalk will be paid for at the contract unit price per square foot for "BRICK PAVER SIDEWALK" which price shall include all materials, equipment, tools and labor incidental thereto including all sawcuts to meet existing facilities, the removing and disposal of all surplus materials, excavation, concrete sidewalks or driveway ramps removal and disposal; removal, disposal, and backfilling of existing miscellaneous foundations except existing traffic signal and light pole foundations as directed by engineer; furnishing and installing the process aggregate base, concrete base slab, sidewalk ramp base slab, aluminum edge restraints, bituminous/sand setting bed, neoprene-modified asphalt setting adhesive, joint sand, brick pavers, accent brick pavers, and expansion joints.

Unless otherwise indicated, all areas of brick pavers, including but not limited to the running bond "sidewalk" pattern, the herringbone "plaza" pattern, the soldier course banding, the brick accent pavers, and the brick pavers within Sidewalk Ramps will be paid under this Item.

The cost of detectable warning pavers in sidewalk ramps will be paid for under the Item "Detectable Warning Cast Iron Paver".

The cost of the removal of granite curb shall be paid under the Item "Removal of Granite Stone Curbing."

The cost of removing existing light pole foundations will be paid for under the item, "Electrical Handhole at Existing Light Foundation".

The cost of removing existing traffic signal foundations will be paid for under the item, "Removal and/or Relocation of Traffic Signal Equipment".

The unit prices for all items of work shall include the cost of all saw cuts to meet existing facilities, the cost of removing and disposing of all surplus material; excavation, removal, backfilling, and disposal of existing miscellaneous foundations except existing traffic signal and light pole foundations as directed by engineer; preparation of subgrade and base, base material, concrete (including additives), formwork, welded wire fabric, jointing, shoring, backfill, restoration of adjacent pavement and grassed areas, painting and cross walk adjustment, and all other labor, equipment, and material incidental or necessary to complete the item in accordance with the plans and specifications.

Unless otherwise specified, there will be no direct payment for adjusting to grade monuments, valve boxes, manhole frames and covers, hatchways, vaults, or other existing surface structures in any new or reconstructed walk, the cost of this work being considered to be included in the unit price for the item of work.

There will be no direct payment for removal of existing brick pavers and repair of existing bituminous setting beds across phase limit lines, the cost of this work being considered to be included in the unit price for the item of work.

Openings in walk for tree wells and planters shall be determined prior to the start of construction.

No additional payment for extra formwork, etc. occasioned by these features shall be made, the cost of this work being considered to be included in the unit price for the item of work.

Pay Item	**Pay Unit**
Brick Paver Sidewalk	SF

ITEM #0921050A – DETECTABLE WARNING CAST IRON PAVER

DESCRIPTION: The work of this item includes furnishing all materials, equipment, supplies, accessories, incidentals, labor and supervision, and performing all operations required to furnish and install Detectable Warning Cast Iron Paver as shown on the drawings, as specified herein, and as is additionally required to properly complete the work, including the removing and disposal of all surplus materials, excavation, furnishing and installing the concrete base slab, detectable warning iron pavers, and expansion joints.

Submittals:

Detectable Warning Cast Iron Paver

1. Samples: Submit manufacturer's samples of materials and finishes.
2. Product Data: Submit manufacturer's product data, storage and handling requirements and recommendations and installation methods.
3. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.
4. Warranty: Manufacturer's standard warranty.

Quality Assurance:

Detectable Warning Cast Iron Paver

1. Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of tactile warning strips for more than 5 years.
2. Product Support: Products are supported with complete engineering drawings and design patents.

MATERIALS:

Detectable Warning Cast Iron Paver: The Detectable Warning Cast Iron Pavers, for new construction, shall be cast iron, 24-inch x 24-inch paver as shown on plans. Straight and radial detectable warning cast iron paver plates shall be ADA / ABA compliant, with slip resistant surface. Plate shall be heavy duty gray iron, compliant with ASTM A48 CL35B. The detectible warning cast iron paver shall have a 24-inch width of tactile warning strip for dimensioned lengths, unless otherwise indicated on plan. Detectable warning cast iron paver shall be manufactured with integral anchor lugs to ensure solid attachment to cast-in-place concrete. The detectable warning cast iron paver coating shall be undipped.

Concrete Base Slab: Conform to Section 0921024A of these specifications with the following additions:

All concrete base slabs will receive wire mesh reinforcing 2 inches below the top of the slab. Wire mesh reinforcing shall be plain finish welded steel, W1.4 x W 1.4 wire spaced 6" x 6" both ways meeting ASTM specifications A-185-02. The mesh shall be lapped 6"and tied together with wire spaced not over 12" on center to prevent displacement set.

CONSTRUCTION METHODS:

Protection of Finished Surfaces:

Finished surfaces adjacent to the paving work shall be adequately protected from soiling, staining, and other damage during construction.

Delivery, Storage, and Handling:
Detectable Warning Cast Iron Paver

1. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product names and manufacturer.
2. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.
3. Handling: Protect materials and finish during handling and installation to prevent damage.

Excavation: Work under this item shall consist of removing and disposing of existing sidewalk and foundation to a full depth. Wherever portions of concrete sidewalks or concrete driveway ramps are to be removed, such removals shall be made to neat lines. Partial removals shall generally be to existing joints except when a location other than a joint is identified on the plans or set by the Engineer due to construction staging limits. At removal limits where a joint is not present, the Contractor shall sawcut the concrete full depth to create a neat line. The bottom of the excavation shall be graded smooth and thoroughly compacted to a firm, even surface using a roller weighing not less than five tons or a motor driven vibratory compactor.

Concrete Base Slab: Concrete installation shall conform to Section 0921024A of these specifications. Additional requirements for concrete slab are as follows:

All concrete base slabs shall receive 6 x 6 – W1.4 x W1.4 welded wire mesh reinforcing 2 inches below the top of the slab. Wire mesh reinforcing shall be plain finish welded steel, W1.4 x W1.4 wire spaced 6" x 6" both ways meeting ASTM specifications A-185-02. The mesh shall be lapped 6"and tied together with wire spaced not over 12" on center to prevent displacement set.

Detectable Warning Cast Iron Paver: Install detectable warning cast iron paver in accordance with manufacturer's instructions at locations indicated on the drawings. Any cutting required to fit detectable warning to an abutting piece, shall be done making every effort that cut line does not bisect the tactile domes, but falls between them. If cuts do bisect a dome, then the edge of the cut dome must be ground to meet ADA requirements for change in vertical grades. Cut pieces shall be dry fitted to ensure tight butt joint between plates prior to placing tactile warning in wet concrete. Set plates in wet concrete at final position. Keep wet concrete off of the top surface of the plates at all times. Press tiles into wet concrete to final elevation. Finish brick paving around assembled plates. Plates must be flush with abutting surface and flush curbing.

METHOD OF MEASUREMENT: Detectable Warning Cast Iron Paver will be measured on a per square foot basis, complete, in-place, as shown on the Drawings, as specified herein, and as directed by the Engineer. Price shall include all materials, equipment, tools and labor incidental thereto including the removing and disposal of all surplus materials, excavation, furnishing and installing the concrete base slab, detectable warning cast iron pavers, and expansion joints**.**

BASIS OF PAYMENT: The detectable warning iron paver will be paid for at the contract unit price per square foot for "DETECTABLE WARNING CAST IRON PAVER" which price shall include all materials, equipment, tools and labor incidental thereto including the removing and disposal of all surplus materials, excavation, furnishing and installing the concrete base slab, detectable warning iron pavers, and expansion joints.

Pay Item	**Pay Unit**
Detectable Warning Cast Iron Paver	SF

ITEM #0921098A – FLEXI-PAVE PAVEMENT AT EXISTING TREE

DESCRIPTION:
The work of this Item includes furnishing all materials, equipment, supplies, accessories, incidentals, labor and supervision, and performing all operations required to install Flexi-Pave Pavement at existing trees as shown on the drawings, as specified herein, and as is additionally required to properly complete the work, including all sawcuts to meet existing facilities, the removing and disposal of all surplus materials, excavation, concrete sidewalks removal and disposal, contracting with a Contract Arborist, excavating using Supersonic Airtool, root pruning, root collar excavation, furnishing and installing filter fabric, clean coarse aggregate stone, KBI flexi-pave, and KBI flexi-stone.

Submittals:
Qualification Data: For qualified arborist and tree service firm.

Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities. Use sufficiently detailed photographs or videotape. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

Quality Assurance:
Contract Arborist Qualifications: Arborist certified by the State of Connecticut and the International Society of Arboriculture.

Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

All pruning, root pruning, soil excavation around tree roots with air spade, and repair work to trees to remain to be performed under the supervision of an Arborist certified by the State of Connecticut and the International Society of Arboriculture.

KBI Flexi®-Pave can be installed by K.B. Industries, Inc. Certified installers having the KBI certification number.

Definitions:
Certified Arborist: Credential of an individual arborist issued and administered by the International Society of Arboriculture. This credential must be current and valid to qualify to use the copyrighted designation of “Certified Arborist”.

Project Arborist: Arboricultural firm contracted to provide planning and design services, technical assistance and advice to the owner. Duties include but are not limited to the following: site investigation and documentation, develop tree preservation plans, methods, details and specifications, and provide final document review and monitoring of the Contract Arborist. Project Arborist is contracted directly to the

owner or owner representative and acts specifically on behalf of the owner concerning tree related issues. Project Arborist shall have authority over the Contract arborist and any disputes shall be decided by the Project Arborist and Engineer.

Contract Arborist: Arboricultural firm contracted to implement the approved tree preservation plans on site. All crews conducting arboricultural operations on site shall consist of at least one Certified Arborist who directly oversees all work by the crew. Arboricultural operations include, but are not limited to, pruning, tree protection device installation and maintenance, root pruning, air tool root excavation / exploration (SSAT), soil care activities, soil testing, mulch application, tree inspections, pesticide / chemical applications and tree removal. Special qualifications submittal is required for review and approval. Contract arborist will be sub-contracted by the general contractor.

Supersonic Airtool (SSAT): Hand held tool designed to focus highly compressed air (90-125 psi) provided from a large air compressor (185-375 cfm) at speeds close to 1400 mph at the tip of the tool. Widely used by arboricultural firms and consultants for multiple purposes including but not limited to: root collar investigation, CRZ investigation, root pruning (especially large roots >1.5 inch diameter or where existing underground cables or conduits are located), radial mulching and restoration of compacted soils, excavation for utilities within protected CRZs to minimize root damage from constriction.

MATERIALS:

Filter Fabric:
Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made 100% Spunbonded Polypropylene; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Tensile Strength: 73(lbs)
2. Puncture Strength (lbs): 23
3. Air Opening Size (equivalent sieve): 30/40
4. Air Opening Size (mm): 0.52
5. Trap Tear (lbs): 35
6. Air Permeability (cm/sec): 10x10-2
7. Flux (gal/ft2/min): 200
8. Permitivity (sec-1): 3.0
9. Color: Black

3/4-Inch Stone:
Crushed stone conforming to Form 817 Article M.03.01-1 Coarse Aggregate. Do not use rounded gravel or reclaimed concrete aggregate. All stone materials shall be washed with less than 1% passing the No. 200 sieve.

Conforming to gradation as shown in Table below:

No. 6 Aggregate Grading Requirements

Sieve Size	Percent Passing
1-inch	100
3/4-inch	90 to 100
1/2-inch	20 to 55
3/8-inch	0 to 15
No. 4	0 to 5

KBI Flexi-Pave:
KBI Flexi®-Pave HD1500 is a 1½" sub layer of a constructional paving material made from Recycled Passenger Tires and Aggregate bound together with a proprietary binding agent: XFP75 as manufactured by KB Industries, Inc. 28100 US Highway 19N, Suite 410 Clearwater, FL 33761, Tel: 727-726-2700, Toll Free: 877-826-8600, Fax: 727-726-2800.

KBI Flexi-Stone:
KBI Flexi®-Stone HDS2000 is a ½" layer consisting of a nominal 3/8" aggregate size. Which is bound together with KBI's proprietary binding agent, XFP75. KBI Flexi®-Stone is designed for the aggregate surface finish and is available as manufactured by KB Industries, Inc. 28100 US Highway 19N, Suite 410 Clearwater, FL 33761, Tel: 727-726-2700, Toll Free: 877-826-8600, Fax: 727-726-2800. Color: Tan.

CONSTRUCTION METHODS:

Mockup:
Construct an 6' x 8' display panel size, color, and finish specimen in this Item to illustrate component application including pattern and edge details. Do not start work until Engineer has approved mock-up. Remove mock-up and dispose of materials at the completion of the work or as directed by Engineer.

Protection of Finished Surfaces:
Finished surfaces adjacent to the paving work shall be adequately protected from soiling, staining, and other damage during construction.

Excavation:
Work under this item shall consist of removing and disposing of existing sidewalk and foundation to a full depth. Wherever portions of concrete sidewalks or concrete driveway ramps are to be removed, such removals shall be made to neat lines. Partial removals shall generally be to existing joints except when a location other than a joint is identified on the plans or set by the Engineer due to construction staging limits. At removal limits where a joint is not present, the Contractor shall sawcut the concrete full depth to create a neat line. The bottom of the excavation shall be graded smooth and tamped to a firm, even surface.

Soil Preparation for Pavement:
For excavation within the Flexi-pave pavement at existing trees areas of trees to remain, the intent is to protect roots and minimize root damage from excavations.

Excavation shall be performed using SSAT, hand tools (shovels, ect.), or other approved non-damaging method. Roots shall not be damaged by the excavation.

All work shall be directly supervised by ISA Certified Arborist (provided by the Contract Arborist) in collaboration with the Owner's trades and subcontractors.

Perform root collar excavation at base of existing trees to reduce the potential of vascular disorders.

Perform soil cultivation to eliminate compaction to a depth of 3 inches to approximately the extent of the flexi-pave pavement using an Supersonic Airtool.

Roots 1 inch and larger shall be protected during flexi-pave pavement installation. Larger roots may only be cut by the Contract Arborist if no alternative is deemed possible and Contract Arborist judges the tree impact to be acceptable. Any larger roots to be cut shall be documented including photographs and

justification for cutting. Smaller roots may be cut by the Contract Arborist. No roots may be cut by the contractor.

If no roots over 1 inch in diameter are located within the area of the flexi-pave pavement, the Contract Arborist shall prune the roots and the contractor may proceed with conventional excavation methods. Excavation shall not extend beyond the line where roots were pruned.

If roots over 1 inch in diameter are uncovered, they should be protected to the greatest extent possible. Contract arborist shall determine if specific roots of this size can be cut. Roots that are not cut shall be protected and the flexi-pave pavement excavation shall continue with hand excavation methods.

Roots over 3 inch in diameter are critical and shall not be cut without approval from the Engineer and Project Arborist.

Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered.

Excavate with Supersonic Airtool along flexi-pave pavement to expose roots for observation and prune roots for construction under the supervision of an Arborist certified by the State of Connecticut and the International Society of Arboriculture.

Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

Root Pruning: The purpose of the root pruning is to provide a more suitable cut so as to not rip or tear roots during excavations and grading with standard construction equipment. Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning. All root pruning operations shall be performed by the Contract Arborist and directed in the field by an ISA Certified Arborist with documented experience in similar SSAT excavation and root pruning.

Filter Fabric:
Install as shown on the drawings per manufacturers recommendations.

Clean Coarse Aggregate Stone:
Install as shown on the drawings compact to 95% compaction per AASHTO T-180.

KBI Flexi-Pave:

1. KBI Flexi®-Pave can be installed from 45ºF degree to 95ºF degree temperatures. Important: When curing, the temperature should not fall below 35ºF.
2. KBI Flexi®-Pave can be installed by K.B. Industries, Inc. CERTIFIED INSTALLERS having the KBI CERTIFICATION NUMBER.
3. Install as shown on the drawings per manufacturers recommendations.

KBI Flexi-Stone:

1. KBI Flexi®-Stone HDS2000 can be installed from 45ºF to 95ºF temperatures. Important: When curing, the temperature should not fall below 35ºF.
2. KBI Flexi®-Stone can be installed by K.B. Industries, Inc. CERTIFIED INSTALLERS having the KBI CERTIFICATION NUMBER.

3. KBI Flexi®-Stone HDS2000 is a construction paving material that is dynamic in its physical construction which is mixed directly at the installation site.
4. Install as shown on the drawings per manufacturers recommendations.

METHOD OF MEASUREMENT:
Flexi-Pave Pavement at Existing Tree will be measured on a per square foot basis, complete, in-place, as shown on the Drawings, as specified herein, and as directed by the Engineer. Price shall include all sawcuts to meet existing facilities, the removing and disposal of all surplus materials, excavation, concrete sidewalks removal and disposal, contracting with a Contract Arborist, excavating using Supersonic Airtool, root pruning, root collar excavation, furnishing and installing filter fabric, clean course aggregate stone, KBI flexi-pave, and KBI flexi-stone.

BASIS OF PAYMENT:
Flexi-Pave Pavement at Existing Tree will be paid for at the contract unit price per square foot for "FLEXI-PAVE PAVEMENT AT EXISTING TREE" complete, in-place, as shown on the Drawings, as specified herein, and as directed by the Engineer. Price shall include all sawcuts to meet existing facilities, the removing and disposal of all surplus materials, excavation, concrete sidewalks removal and disposal, contracting with a Contract Arborist, excavating using Supersonic Airtool, root pruning, root collar excavation, furnishing and installing filter fabric, clean coarse aggregate stone, KBI flexi-pave, and KBI flexi-stone.

Pay Item	**Pay Unit**
Flexi-Pave Pavement at Existing Tree	SF

ITEM #0922002A – TEMPORARY BITUMINOUS CONCRETE SIDEWALK

DESCRIPTION

Under this section of the specifications, the contractor shall install temporary bituminous concrete sidewalk at the locations and to the general requirements shown on the contract drawings or as directed by the Engineer.

MATERIALS

The materials to be used in the construction of temporary sidewalk shall be those indicated on the plans and in the details or ordered by the Engineer.

Bituminous Concrete shall conform to the requirements of CT DOT Form 817 Article M.04.01.

CONSTRUCTION METHODS

The methods employed in placing the bituminous sidewalk and all equipment, tools, machinery and other plant equipment used in handling materials and executing any part of the work shall conform to all requirements of CT DOT Form 817 Article 4.06.03. The completed and compacted temporary sidewalk shall match the adjacent grade and meet or surpass the uniformity of the adjacent surface and its roughness or riding quality. Replacement of the temporary sidewalk will be required at no additional cost to the Town where the sidewalk surface is not smooth or the compacted thickness of the bituminous concrete is deficient by more than ½".

It shall be the responsibility of the Contractor to maintain and repair temporary bituminous sidewalk surfaces until such time as the temporary sidewalks have been replaced with the construction of permanent sidewalks. The Contractor shall at all times maintain the permanent and temporary sidewalks in a safe and satisfactory condition and all maintenance and repairs of permanent and temporary sidewalks shall be provided by the Contractor at no additional expense to the Town.

The Contractor shall perform and complete the construction work in a continuous manner and so that sidewalk replacement work may proceed without delay. The Contractor shall install the temporary sidewalk as soon as practical.

All curbing, street fixtures and such other appurtenant work damaged or displaced as a result of the Contractor's operations shall be repaired or replaced and restored by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Town.

METHOD OF MEASUREMENT

This work will be measured for payment by the square yards of temporary sidewalk surface to the limits shown on the plans or ordered by the Engineer.

BASIS OF PAYMENT

The temporary sidewalk will be paid for at the contract unit price per square yard for "Temporary Bituminous Concrete Sidewalk" complete in place and approved which price shall include all materials, tools, equipment and labor incidental thereto.

No separate payments will be made for the saw cutting of existing sidewalk. The costs for these items shall be included in the contract unit price.

Pay Item	Pay Unit
Temporary Bituminous Concrete Sidewalk	SY

ITEM #0944101A – PLACING TOPSOIL

DESCRIPTION:
The Work shall consist of furnishing and placing topsoil; including testing, screening, amending, placing and finish grading all imported topsoil as shown on the Drawings and specified herein. Provide all imported topsoil and compost and amendments necessary to properly complete all turf establishment operations. Provide specified depth of topsoil in all turf establishment lawn areas.

Quality Assurance:
Topsoil Testing: Representative samples of borrow topsoil and stockpiled topsoil shall be subject to testing analysis to determine: Nutrient analysis using the Modified Morgan extractant for soil available P, K, Ca, and Mg; Soil pH; organic content determined by loss of weight on ignition; and particle size analysis of sand, silt, and clay percentages using the hydrometer or pipette methods of particle size analysis with size fractions based upon size limits established by USDA.

Topsoil testing shall be performed as directed by Engineer.

Submittals:
Submit topsoil for testing/analysis and subsequent or conditional approval based on results.

Submit materials certificates and product data for compost and soil amendments, clearly marked, to indicate proposed materials. Printed data shall state application rates and amount of product to be added, if applicable.

Submit delivery tickets for the soil amendments, compost and processed sand, indicating the trade name, the supplier/distributor's name and the amount of product delivered to the contracting firm/project site.

Submit materials certificate and certified test report for processed sand and gravel.

Product Handling:
Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

Project Conditions:
Stockpile existing topsoil as required. Review quantity/quality of existing topsoil with Engineer. Verify that storm sewerage system and dry wells are complete and fully functional prior to beginning work of this Section. Protect storm sewerage system and dry wells from failure.

MATERIALS:

Topsoil:
Borrow Topsoil shall be clean, fertile, friable, and well draining; not to contain materials harmful to plant life. All topsoil to be free of any subsoil earth clods, sods, stones over 3/4" in any dimension, sticks, roots, weeds, litter and other deleterious material. Topsoil shall be uniform in quality and texture and contain specified organic matter and mineral elements necessary for sustaining healthy plant growth. Topsoil shall have a pH of 5.5 to 6.5. Topsoil shall have an Organic Matter Content of 5 to 8%. Nutrient levels shall be achieved by the Contractor's addition of amendments to the topsoil to meet the optimum nutrient levels specified in the testing laboratory report. A single source of all import topsoil is required. Topsoil shall meet the USDA Soils Textural Classification percentage of sand, silt and clay for "sandy loam" or "fine sandy loam' classifications. Topsoil shall be free of any toxic chemical, waste or any material or condition that would prevent the establishment of a suitable lawn. Import topsoil shall be from local sources. All textural classes of topsoil with greater than 80% sand content will be rejected.

The Contractor shall notify the Engineer of the location of the topsoil at least 15 calendar days prior to delivery. The topsoil and its source shall be inspected and approved by the Engineer before the material is delivered to the project. Any material delivered to the project, which does not meet specifications or which has become mixed with undue amounts of subsoil during any operation at the source or during placing and spreading, will be rejected and shall be replaced by the Contractor with acceptable material.

Amendments:
Soil Amendments shall be as recommended by the Topsoil Test Report.

Compost:
Compost shall be derived from organic wastes such as food and agricultural residuals, animal manures, mixed solid wastes and biosolids (treated sewage sludge) that meet all State Environmental Agency requirements. The product shall be well composted, free of viable weed seeds and contain material of a generally humus nature capable of sustaining growth of vegetation, with no materials toxic to plant growth. Compost generator shall also provide minimum available nitrogen and other macro and micro nutrients to determine fertilizer requirements. Compost shall have the following properties:

Parameters	Range
pH	5.5 – 7.0
Moisture Content	35% - 55%
Soluble Salts	4.0 mnhos (dS)
C:N ratio	15 – 30:1
Particle Size	<1"
Organic Matter Content	>50%
Bulk Density	<1000 lbs./cubic yard
Foreign Matter	<1% (dry weight)

Sand:
Sand shall meet ASTM C33 Fine Aggregate.

CONSTRUCTION METHODS:

Topsoil Preparation:
Determine quantity of imported topsoil scheduled to be placed. Provide imported topsoil to complete the work of this Section. Based on topsoil testing reports, provide amendments and conditioners to topsoil to

bring it in compliance with project requirements. Bulk mix to produce a homogeneous product.

Shaping and Grading of Subsoil at Lawn Areas:
At completion of rough grading, shape and grade subgrade areas to lines and levels as noted on the drawings. All approved topsoil is to be spread. Shape subgrade areas to allow placement of uniform depth of topsoil. Provide all shaping adjustments at no additional cost to the owner. Harrow or otherwise loosen the subgrade soil to a depth of 4 inches. Remove all sticks, stones, or foreign material two (2) inches or greater in dimension from surface. Remove debris and stone off-site.

Spreading Topsoil and Topsoil/Compost Mixes:
Do not apply topsoil materials to the scarified subgrade without approval of Engineer. No vehicular traffic or rubber tired equipment shall be allowed on finished subgrades. Topsoil materials shall not be spread until topsoil has been amended as required. Topsoil materials shall not be delivered or worked in a frozen or muddy condition. Uniformly distribute and spread topsoil materials over all graded lawn areas to conform smoothly to the lines, grades, and elevations shown or otherwise required. Maintain consistent depths of material throughout the project area. Manually supply topsoil around all trees to remain. Avoid damage to root systems. Depth of topsoil around existing trees to be determined by Engineer.

Place topsoil in layers that will provide the scheduled thickness after natural settlement and light rolling. Spread topsoil from edges inward toward the middle of areas being topsoiled. Do not allow equipment directly on the loosened subgrade. Do not overcompact the topsoil. Do not allow rubber-tired equipment on topsoiled areas. Use lightest weight equipment practicable. Sequence operations to minimize the number of equipment passes required. Track topsoiled slopes parallel to the fall line. Place topsoil materials only when it can be immediately followed by seeding operations. Resupply and place topsoil to eroded, settled or damaged areas until all lawn areas are stabilized. Care shall be taken not to damage grass or pavement areas in the replacement to topsoil.

Protection:
Remove weeds prior to lawn development operations. No weeds shall be allowed to go to seed. Keep heavy equipment, trucks, etc. off topsoiled areas at all times. If compaction occurs, harrow to the full depth of the topsoil and regrade topsoil.

METHOD OF MEASUREMENT:

This work will be measured for payment by the number of cubic yards of topsoil furnished and placed, completed and accepted.

BASIS OF PAYMENT:

This work will be paid for at the contract unit price per cubic yard of “PLACING TOPSOIL”, completed and accepted, including all equipment, material, tools, labor and incidental expenses thereto.

Pay Item	**Pay Unit**
Placing Topsoil	CY

ITEM #0949000A – TRIPLE SHREDDED HARDWOOD MULCH
ITEM #0949572A – ZELKOVA SERRATA – VILLAGE GREEN ZELKOVA

9.49.01—Description: The work under these items shall consist of furnishing, planting and mulching trees, shrubs, vines and ground cover plants of the type and size indicated on the plans or special provisions. It shall also include perforated pipe, planting soil, and all incidental operations, such as the care of the living plants and the replacement of dead and unsatisfactory plants or unsatisfactory materials before final acceptance of the contract.

9.49.02—Materials: The material for this work shall conform to the requirements of Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction or as noted below,

Plant Material – Section M.13.07.
Planting Soil – Section M.13.02-1
Triple Shredded Hardwood Mulch – Provide Sample for Approval

9.49.03—Construction Methods: Construction methods shall be performed in accordance with these specifications. The Contractor is cautioned that within the limits of any project, buried cable for illumination or utilities, which may be energized, may be present.

1. Planting Season: Unless otherwise shown on the plans or directed by the Landscape Architect, the planting seasons shall be those indicated below. No planting shall be done in frozen ground or when snow covers the ground, or the soil is otherwise in an unsatisfactory condition for planting.

Deciduous Material

Spring: March 1st to May 1st (inclusive) except for balled and burlapped material, the planting of which will terminate on May 15th.
Fall: From October 15th until the ground freezes. Such plant items, as may be designated elsewhere in the contract documents, shall be planted in the spring planting season only.

Evergreen Material

Spring: March 1st to June 1st (inclusive).
Fall: August 15th to October 1st (inclusive).

2. Protection: Plants received by the Contractor shall be kept moist, fresh and protected against exposure to sun, wind and freezing temperatures whether in the receiving yard, in transit, while being handled or in temporary storage on the job site awaiting planting. Bare-root plants, which are not planted immediately upon receipt, shall be heeled-in in trenches with the bundles opened, the plants separated and all roots covered so as to leave no air spaces. Balled and burlapped plants shall have their earth balls covered by earth, wood chips, cloth, straw or other suitable material which shall be kept moist.

3. Excavation: Excavation for planting beds and pits shall conform to the approved staked locations and outlines. The latter shall be neatly formed by means of spades or other approved

tools. All sod, weeds, roots and other objectionable material excavated from the plant beds or pit sites which are unsuitable for backfill shall be removed from the site immediately and disposed of by the Contractor in a manner satisfactory to the Landscape Architect.

The Contractor at his option may apply, prior to excavating plant pits in designated planting bed locations, at no expense to the City of New Britain, a post-emergent aqueous spray treatment of Glyphosate (isopropylamine salt of glyphosate) 41% acid equivalent (ae) to the existing bed vegetation in accordance with the manufacturer's recommendations for perennial vegetation control, instead of excavating the planting bed.

A minimum of fourteen (14) days post application, or when the perennial species shows the visible effects of the treatment, the Contractor shall mow, at no expense to the City of New Britain, all treated bed areas to a maximum height of 4 inches.

Plant pits may then be excavated, and the excavated soil and vegetative debris shall then be immediately removed from the project site.

In landscape areas following the excavation of the pits, but before the installation of plant material, the remaining turf grasses and unwanted vegetation shall be sprayed, unless otherwise directed by the Landscape Architect, with Glyphosate at the manufacturer's recommended rate.

5. Pits: The pit diameters shall be twice the diameter of the root-spread or container diameters, and shall be 2- inches less than the height of the rootball measured from the bottom of the ball to the root collar. (i. e. A 12-inch measurement between the root collar and the bottom of the rootball will require a 10-inch deep pit). Any excavation in excess of that required shall be replaced with planting soil and compacted to the satisfaction of the Landscape Architect.

6. Obstructions Below Ground: Any rock or underground obstruction shall be removed to the depth necessary for planting as specified, unless other locations for the planting are approved by the Landscape Architect. If removal of obstructions results in a deeper hole than needed for planting, backfill material shall be added and compacted to the satisfaction of the Landscape Architect.

7. Backfill: Backfill shall conform to M.13.02-1 Planting Soil.

8. Setting Plants: All plants shall be plumb and at a level that is 2-inches higher than the surrounding ground. Backfill material for all plants shall be thoroughly and properly settled by firming or tamping. Thorough watering shall accompany backfilling. Saucers capable of holding water shall be formed at individual plants (exclusive of plant beds) by placing ridges of planting soil around each, or as directed by the Landscape Architect.

> **a. Balled and Burlapped plants:** Plants shall be handled in such manner so that the soil will not be loosened from the roots inside of the ball. Carefully place the plant into the prepared pits and backfill with planting soil to one - half the depth of the pit, thoroughly tamp to the satisfaction of the Landscape Architect around the ball. Fill the remaining area of the pit with water. Once water has completely drained, loosen the burlap and peel

down the top one third. If wire baskets are used, remove the basket. Roots that have been wrapped around the ball within the burlap shall be straightened and the remainder of the pit filled with planting soil tamped to ensure that no air pockets remain.

b. Container Grown Plants: Carefully remove the plant from the container over the prepared pits. Gently loosen the soil and straighten all roots as naturally as possible. Place into the bottom of the pit. Backfill with planting soil to one - half the depth of the pit. Thoroughly tamp to the satisfaction of the Landscape Architect. Fill remaining area of the pit with water. Once water has completely drained fill the remainder of the pit with planting soil tamped to ensure that no air pockets remain.

9. Fertilizing: Landscape shall be fertilized at the rate of 3 pounds per 100 square feet of surface area (broadcast). The fertilizer shall be uniformly applied to the surface of the beds and worked into the upper 2 inches of soil. Individual trees shall be fertilized at the rate of 2 pounds per inch of trunk diameter, and the fertilizer shall be mixed into the upper 2 inches of soil. A second application of fertilizer shall be applied to all plant items at the same specified rates over the triple shredded hardwood mulch at the end of the period of establishment.

10. Watering: All plants shall be watered upon setting and as many times thereafter as conditions warrant.

The following is a guide for minimum requirements:

Trees:

2 ½" Caliper and less – Fifteen (15) gallons each.
3" to 5" Caliper – Twenty (20) gallon each.
5 ½" Caliper and above – Twenty-five (25) gallon each.

Shrubs:

24" and less – Six (6) gallons each.
More than 24" – Ten (10) gallons each.

Perennials and Ornamental Grasses – Three (3) gallons each.

a. Water shall be applied at a controlled rate and in such a manner to ensure that the water reaches the root zone (saucer) of the plant or plant bed and does not run off to adjacent areas. Watering shall be applied in a manner that does not dislodge plants, erode soil or mulch, or cause damage to saucer.

b. The Contractor may use slow-release, drip irrigation bags for watering in accordance with manufacturer's instructions. The use of these portable/temporary irrigation bags will require the approval of the Landscape Architect. Overhead hydro-seeder spray nozzles shall not be used as watering devices.

11. Pruning: As directed by the Landscape Architect, plants shall be pruned at the project site before or immediately after planting in accordance with the best horticultural practice. No leader shall be cut unless directed by the Landscape Architect. Broken, or badly bruised branches, sucker growth, etc., shall be removed with clean cuts.

12. Spraying: Spraying with antidesiccant shall be at the Contractor's discretion and as approved by the Landscape Architect at no additional cost to the City of New Britain.

13. Mulching: Following the plant material installations triple shredded hardwood mulch shall be hand placed and spread to a depth of 3 inches and raked to an even surface over all saucer areas for individual trees and shrubs and over the entire area of shrub beds and elsewhere as directed.

14. Repair: Repair of existing grass areas damaged by the Contractor in the progress of his work shall be the responsibility of the Contractor, who shall restore the disturbed areas to their original condition at no additional expense to the City of New Britain.

15. Establishment Period: All plant material shall be subject to a One-Year Establishment Period. During this time, the Contractor shall use currently accepted horticultural practices to keep all plant material installed in a healthy, vigorous growing condition at the date of final acceptance. The date of final acceptance shall be one full calendar year following the satisfactory completion of the planting activities as confirmed by the Landscape Architect.

An inspection will be held one year from the date of installation with the Contractor, Engineer, and Landscape Architect to determine the acceptability of the plant establishment. An inventory of losses and rejected materials will be made and corrective and necessary clean up measures will be determined at the plant inspection.

If tree is replaced during One-Year Establishment Period, the contractor must also replace the Flexi-pave pavement and piping at no cost to the city.

9.49.04—Method of Measurement:

1. Planting: The quantity for which payment will be made will be the number of each size and kind of plants counted in place, planted and accepted.

2. Mulching: This work will be measured for payment by the number of cubic yards surface measurement of the specified thickness for the area on which triple shredded hardwood mulch has been completed and accepted.

9.49.05—Basis of Payment:

1. Planting: Payment for this work will be made at the contract unit price each for the kind and size of plant and method of planting (including planting soil) in Flexi-pave tree pits, as the case may be, completed and accepted in place, except that when approved, partial payment for work satisfactorily performed in the excavation of plant pits and for furnishing and placing planting

soil and peat humus admixture may be made in amounts not to exceed 20% of the unit bid price for the respective plant.

2. Mulching: This work will be paid for at the contract unit price per cubic yard for triple shredded hardwood mulch complete in place.

3. Perforated PVC: Payment for this work will be included in the unit price per tree

4. The unit prices shall include all materials, equipment, tools, labor, transportation, operations and all work incidental thereto, including perforated pipe and the removal of guy wires, hose and tree support stakes after the initial establishment period.

Pay Item	**Pay Unit**
Triple Shredded Hardwood Mulch	c.y.
Zelkova Serra – Village Green Zelkova, 3 ½" – 4", B & B	ea.

ITEM #0950005A- TURF ESTABLISHMENT

9.50.02—Materials: Delete and replace with the following

Unless otherwise specified by the Engineer, the seed mixture shall conform to the following:

Variety	Proportion by Weight Percent	Min. Purity Percent	Min. Germination Percent
A 34 Kentucky	25	90	30
Georgetown Kentucky	25	90	30
Touchdown Kentucky	25	90	30
Palmer Perennial Ryegrass	8.33	90	90
Pennfine Perennial Ryegrass	8.33	90	90
Fiesta Perennial Ryegrass	8.33	90	90

Other improved seed varieties of similar type may be substituted upon approval of the Superintendant of Parks for the City of New Britain. All seed shall be subject to the testing provisions of the Association of Official Seed Analysts.

Pay Item	**Pay Unit**
Turf Establishment	SY

ITEM No. 0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC

Article 9.71.01 – Description is supplemented by the following:

The Contractor shall maintain and protect traffic as described by the following and as limited in the Special Provision "Prosecution and Progress":

East Main Street and Myrtle Street

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet and there shall be no more than one alternating one-way traffic operation within the project limits without prior approval of the Engineer.

Commercial and Residential Driveways

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the project limits. The Contractor will be allowed to close said driveways to perform the required work during those periods when the businesses are closed, unless permission is granted from the business owner to close the driveway during business hours. If a temporary closure of a residential driveway is necessary, the Contractor shall coordinate with the owner to determine the time period of the closure.

Article 9.71.03 - Construction Method is supplemented as follows:

General

Unpaved travel paths will only be permitted for areas requiring full depth and full width reconstruction, in which case, the Contractor will be allowed to maintain traffic on processed aggregate for a duration not to exceed 10 calendar days. The unpaved section shall be the full width of the road and perpendicular to the travel lanes.

The Contractor is required to delineate any raised structures within the travel lanes, so that the structures are visible day and night, unless there are specific contract plans and provisions to temporarily lower these structures prior to the completion of work.

When the installation of all intermediate courses of bituminous concrete pavement is completed for the entire roadway, the Contractor shall install the final course of bituminous concrete pavement.

If applicable, when an existing sign is removed, it shall be either relocated or replaced by a new sign during the same working day.

The Contractor shall not store any material on-site which would present a safety hazard to motorists or pedestrians (e.g. fixed object or obstruct sight lines).

The field installation of a signing pattern shall constitute interference with existing traffic operations and shall not be allowed, except during the allowable periods.

Signing Patterns

The Contractor shall erect and maintain all signing patterns in accordance with the traffic control plans contained herein. Proper distances between advance warning signs and proper taper lengths are mandatory.

Pavement Markings -Non-Limited Access Multilane Roadways
Secondary and Local Roadways

During construction, the Contractor shall maintain all pavement markings on paved surfaces on all roadways throughout the limits of the project.

Interim Pavement Markings

The Contractor shall install painted pavement markings, which shall include centerlines, shoulder edge lines, lane lines (broken lines), lane-use arrows, and stop bars, on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work day/night. If the next course of bituminous concrete pavement will be placed within seven days, shoulder edge lines are not required. The painted pavement markings will be paid under the appropriate items.

If the Contractor will install another course of bituminous concrete pavement within 24 hours, the Contractor may install Temporary Plastic Pavement Marking Tape in place of the painted pavement markings by the end of the work day/night. These temporary pavement markings shall include centerlines, lane lines (broken lines) and stop bars; shoulder edge lines are not required. Centerlines shall consist of two 4 inch wide yellow markings, 2 feet in length, side by side, 4 to 6 inches apart, at 40-foot intervals. No passing zones should be posted with signs in those areas where the final centerlines have not been established on two-way roadways. Stop bars may consist of two 6 inch wide white markings or three 4 inch wide white markings placed side by side. The Contractor shall remove and dispose of the Temporary Plastic Pavement Marking Tape when another course of bituminous concrete pavement is installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

If an intermediate course of bituminous concrete pavement will be exposed throughout the winter, then Epoxy Resin Pavement Markings should be installed unless directed otherwise by the Engineer.

Final Pavement Markings

The Contractor should install painted pavement markings on the final course of bituminous concrete pavement by the end of the work day/night. If the painted pavement markings are not installed by the end of the work day/night, then Temporary Plastic Pavement Marking Tape shall

be installed as described above and the painted pavement markings shall be installed by the end of the work day/night on Friday of that week.

If Temporary Plastic Pavement Marking Tape is installed, the Contractor shall remove and dispose of these markings when the painted pavement markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

The Contractor shall install permanent Epoxy Resin Pavement Markings in accordance with Section 12.10 entitled "Epoxy Resin Pavement Markings, Symbols, and Legends" after such time as determined by the Engineer.

TRAFFIC CONTROL DURING CONSTRUCTION OPERATIONS

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

TRAFFIC CONTROL PATTERNS

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

Speed and volume of traffic
Duration of operation
Exposure to hazards

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided and this area shall be free of equipment, workers, materials and parked vehicles.

Typical traffic control plans 19 through 25 may be used for moving operations such as line striping, pot hole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and appropriate trafficperson shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

PLACEMENT OF SIGNS

Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists, abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

TABLE I – MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

SECTION 1. WORK ZONE SAFETY MEETINGS

1.a) Prior to the commencement of work, a work zone safety meeting will be conducted with representatives of DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the project. Other work zone safety meetings during the course of the project should be scheduled as needed.

1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the meeting to outline the anticipated traffic control issues during the construction of this project. Any issues that can't be resolved at these meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda should include:

- Review Project scope of work and time
- Review Section 1.08, Prosecution and Progress
- Review Section 9.70, Trafficpersons
- Review Section 9.71, Maintenance and Protection of Traffic
- Review Contractor's schedule and method of operations.
- Review areas of special concern: ramps, turning roadways, medians, lane drops, etc.
- Open discussion of work zone questions and issues
- Discussion of review and approval process for changes in contract requirements as they relate to work zone areas

SECTION 2. GENERAL

2.a) If the required minimum number of signs and equipment (i.e. one High Mounted Internally Illuminated Flashing Arrow for each lane closed, two TMAs, Changeable Message Sign, etc.) are not available; the traffic control pattern shall not be installed.

2.b) The Contractor shall have back-up equipment (TMAs, High Mounted Internally Illuminated Flashing Arrow, Changeable Message Sign, construction signs, cones/drums, etc.) available at all times in case of mechanical failures, etc. The only exception to this is in the case of sudden equipment breakdowns in which the pattern may be installed but the Contractor must provide replacement equipment within 24 hours.

2.c) Failure of the Contractor to have the required minimum number of signs, personnel and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for loss time.

2.d) In cases of legitimate differences of opinion between the Contractor and the Inspection staff, the Inspection staff shall err on the side of safety. The matter shall be brought to the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

SECTION 3. INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS

3.a) Lane Closures shall be installed beginning with the advance warning signs and proceeding forward toward the work area.

3.b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advance warning signs.

3.c) Stopping traffic may be allowed:

- As per the contract for such activities as blasting, steel erection, etc.
- During paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic should not travel across the longitudinal joint or difference in roadway elevation.
- To move slow moving equipment across live traffic lanes into the work area.

3.d) Under certain situations when the safety of the traveling public and/or that of the workers may be compromised due to conditions such as traffic volume, speed, roadside obstructions, or sight line deficiencies, as determined by the Engineer and/or State Police, traffic may be briefly impeded while installing and/or removing the advance warning signs and the first ten traffic cones/drums only. Appropriate measures shall be taken to safely slow traffic. If required, traffic slowing techniques may be used and shall include the use of Truck Mounted Impact Attenuators (TMAs) as appropriate, for a minimum of one mile in advance of the pattern starting point. Once the advance warning signs and the first ten traffic cones/drums are installed/removed, the TMAs and sign crew shall continue to install/remove the pattern as described in Section 5 and traffic shall be allowed to resume their normal travel.

3.e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.

3.f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travelpath prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.

3.g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.

3.h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

SECTION 4. USE OF HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

4.a) On limited access roadways, one Flashing Arrow shall be used for each lane that is closed. The Flashing Arrow shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the traffic control plan. For multiple lane closures, one Flashing Arrow is required for each lane closed. If conditions warrant, additional Flashing Arrows should be employed (i.e.: curves, major ramps, etc.).

4.b) On non-limited access roadways, the use of a Flashing Arrow for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the Flashing Arrow.

4.c) The Flashing Arrow shall not be used on two lane, two-way roadways for temporary alternating one-way traffic operations.

4.d) The Flashing Arrow board display shall be in the “arrow” mode for lane closure tapers and in the “caution” mode (four corners) for shoulder work, blocking the shoulder, or roadside work near the shoulder. The Flashing Arrow shall be in the “caution” mode when it is positioned in the closed lane.

4.e) The Flashing Arrow shall not be used on a multi-lane roadway to laterally shift all lanes of traffic, because unnecessary lane changing may result.

SECTION 5. USE OF TRUCK MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)

5.a) For lane closures on limited access roadways, a minimum of two TMAs shall be used to install and remove traffic control patterns. If two TMAs are not available, the pattern shall not be installed.

5.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to utilize the TMAs.

5.c) Generally, to establish the advance and transition signing, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane. The flashing arrow board mounted on the TMA should be in the "flashing arrow" mode when taking the lane. The sign truck and workers should be immediately ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Changeable Message Signs, signs, Flashing Arrows, and cones/drums are installed. The flashing arrow board mounted on the TMA should be in the "caution" mode when traveling in the closed lane.

5.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The flashing arrow board mounted on the TMA should be in the "caution" mode when in the closed lane.

5.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to the specification entitled "Type 'D' Portable Impact Attenuation System". Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) should be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.

5.f) TMAs should be paid in accordance with how the unit is utilized. When it is used as a TMA and is in the proper location as specified, and then it should be paid at the specified hourly rate for "Type 'D' Portable Impact Attenuation System". When the TMA is used as a Flashing Arrow, it should be paid at the daily rate for "High Mounted Internally Illuminated Flashing Arrow". If a TMA is used to install and remove a pattern and then is used as a Flashing Arrow, the unit should be paid as a "Type 'D' Portable Impact Attenuation System" for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove), and is also paid for the day as a "High Mounted Internally Illuminated Flashing Arrow".

SECTION 6. USE OF TRAFFIC DRUMS AND TRAFFIC CONES

6.a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.

6.b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.

6.c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.

6.d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

SECTION 7. USE OF (REMOTE CONTROLLED) CHANGEABLE MESSAGE SIGNS (CMS)

7.a) For lane closures on limited access roadways, one CMS shall be used in advance of the traffic control pattern. Prior to installing the pattern, the CMS shall be installed and in operation, displaying the appropriate lane closure information (i.e.: Left Lane Closed - Merge Right). The CMS shall be positioned ½ - 1 mile ahead of the lane closure taper. If the nearest Exit ramp is greater than the specified ½ - 1 mile distance, than an additional CMS shall be positioned a sufficient distance ahead of the Exit ramp to alert motorists to the work and therefore offer them an opportunity to take the exit.

7.b) CMS should not be installed within 1000 feet of an existing CMS.

7.c) On non-limited access roadways, the use of CMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the CMS.

7.d) The advance CMS is typically placed off the right shoulder, 5 feet from the edge of pavement. In areas where the CMS cannot be placed beyond the edge of pavement, it may be placed on the paved shoulder with a minimum of five (5) traffic drums placed in a taper in front of it to delineate its position. The advance CMS shall be adequately protected if it is used for a continuous duration of 36 hours or more.

7.e) When the CMS are no longer required, they should be removed from the clear zone and have the display screen cleared and turned 90° away from the roadway.

7.f) The CMS generally should not be used for generic messages (ex: Road Work Ahead, Bump Ahead, Gravel Road, etc.).

7.g) The CMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs (Examples include: Exit 34 Closed Sat/Sun - Use Exit 35, All Lanes Closed - Use Shoulder, Workers on Road - Slow Down).

7.h) Messages that need to be displayed for long periods of time, such as during stage construction, should be displayed with construction signs. For special signs, please coordinate with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.

7.i) The messages that are allowed on the CMS are as follows:

Message No.	Frame 1	Frame 2	Message No.	Frame 1	Frame 2
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	WORKERS ON ROAD	REDUCE SPEED
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	WORKERS ON ROAD	SLOW DOWN
5	RIGHT LANE CLOSED	MERGE LEFT	13	EXIT XX CLOSED	USE EXIT YY
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	EXIT XX CLOSED USE YY	FOLLOW DETOUR
7	RIGHT LANE CLOSED	REDUCE SPEED	15	2 LANES SHIFT AHEAD	USE CAUTION
8	2 RIGHT LANES CLOSED	REDUCE SPEED	16	3 LANES SHIFT AHEAD	USE CAUTION

For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.

SECTION 8. USE OF STATE POLICE OFFICERS

8.a) State Police may be utilized only on limited access highways and secondary roadways under their primary jurisdiction. One Officer may be used per critical sign pattern. Shoulder closures and right lane closures can generally be implemented without the presence of a State Police Officer. Likewise in areas with moderate traffic and wide, unobstructed medians, left lane closures can be implemented without State Police presence. Under some situations it may be desirable to have State Police presence, when one is available. Examples of this include: nighttime lane closures; left lane closures with minimal width for setting up advance signs and staging; lane and shoulder closures on turning roadways/ramps or mainline where sight distance is minimal; and closures where extensive turning movements or traffic congestion regularly occur, however they are not required.

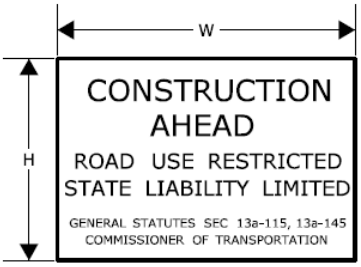
8.b) Once the pattern is in place, the State Police Officer should be positioned in a non-hazardous location in advance of the pattern If traffic backs up beyond the beginning of the pattern, then the State Police Officer shall be repositioned prior to the backup to give warning to the oncoming motorists. The State Police Officer and TMA should not be in proximity to each other.

8.c) Other functions of the State Police Officer(s) may include:

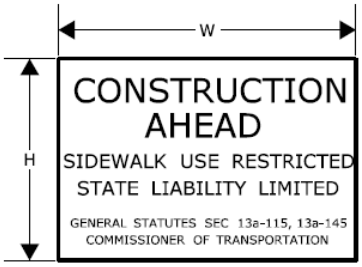
- Assisting entering/exiting construction vehicles within the work area.
- Enforcement of speed and other motor vehicle laws within the work area, if specifically requested by the project.

8.d) State Police Officers assigned to a work site are to only take direction from the Engineer.

SERIES 16 SIGNS



		W H
16-E	80-1605	84" x 60"
16-H	80-1608	60" x 42"
16-M	80-1613	30" x 24"



		W H
16-S	80-1619	48" x 30"

THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

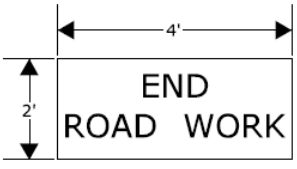
THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

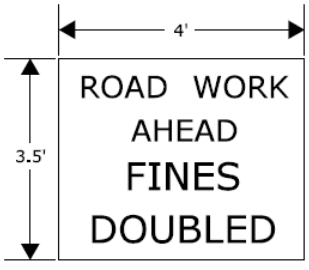
"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.

80-9612



31-1906



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

REQUIRED SIGNS

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
2012.06.05 11:35:43-04'00'

PRINCIPAL ENGINEER

NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.

2. SIGNS (AA), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.

3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.

4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.

5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.

6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.

7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).

8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.

9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.

10 SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE
30 OR LESS	180' (55m)
35	250' (75m)
40	320' (100m)
45	540' (165m)
50	600' (180m)
55	660' (200m)
65	780' (240m)

METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

NOTES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

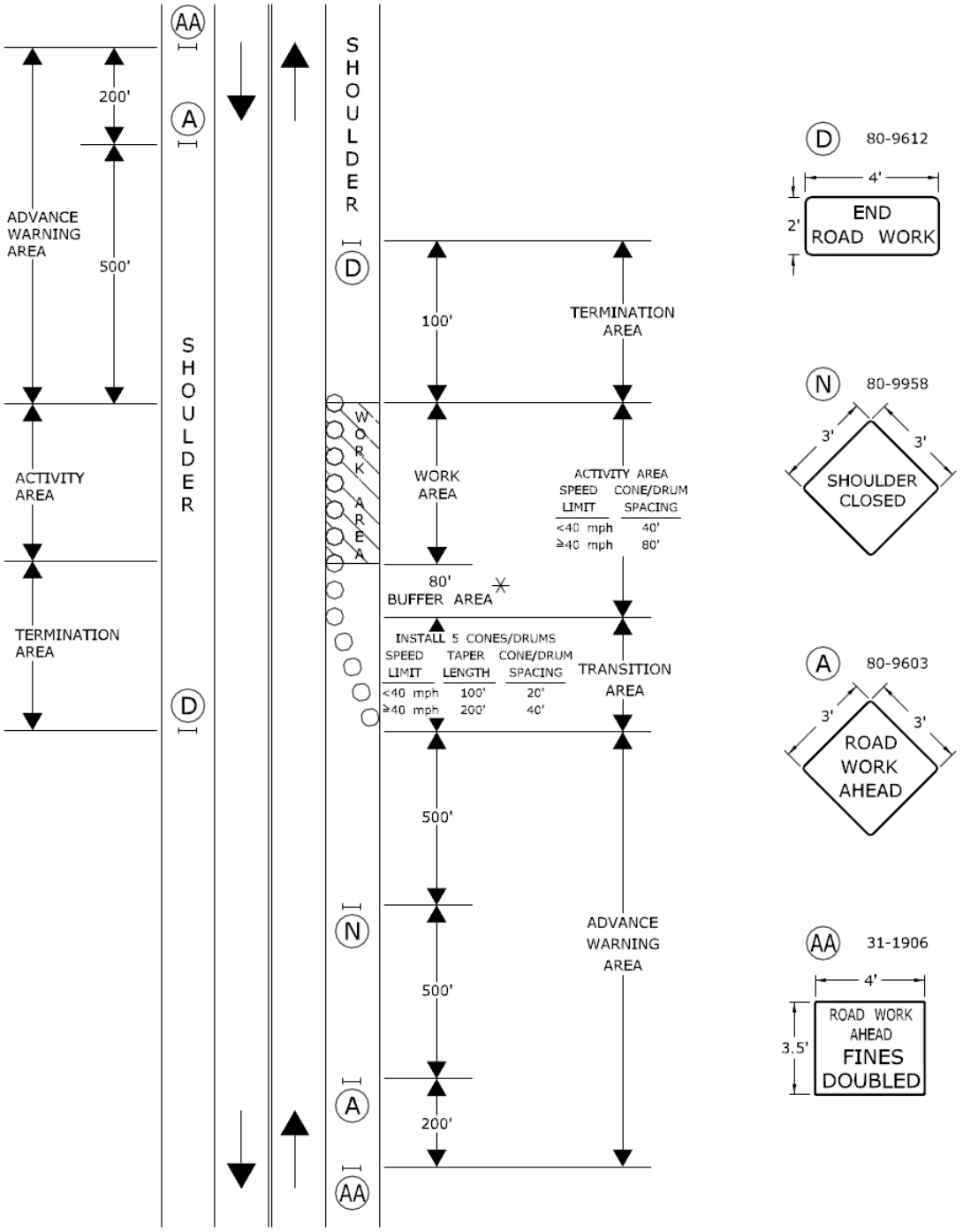
APPROVED

Charles S. Harlow
2012.06.05 15:50:35-04'00'

PRINCIPAL ENGINEER

WORK IN SHOULDER - TWO LANE HIGHWAY

SIGN FACE
71 SQ. FT (MIN.)



D 80-9612

N 80-9958

A 80-9603

AA 31-1906

◯ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢ PORTABLE SIGN SUPPORT
⇐ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

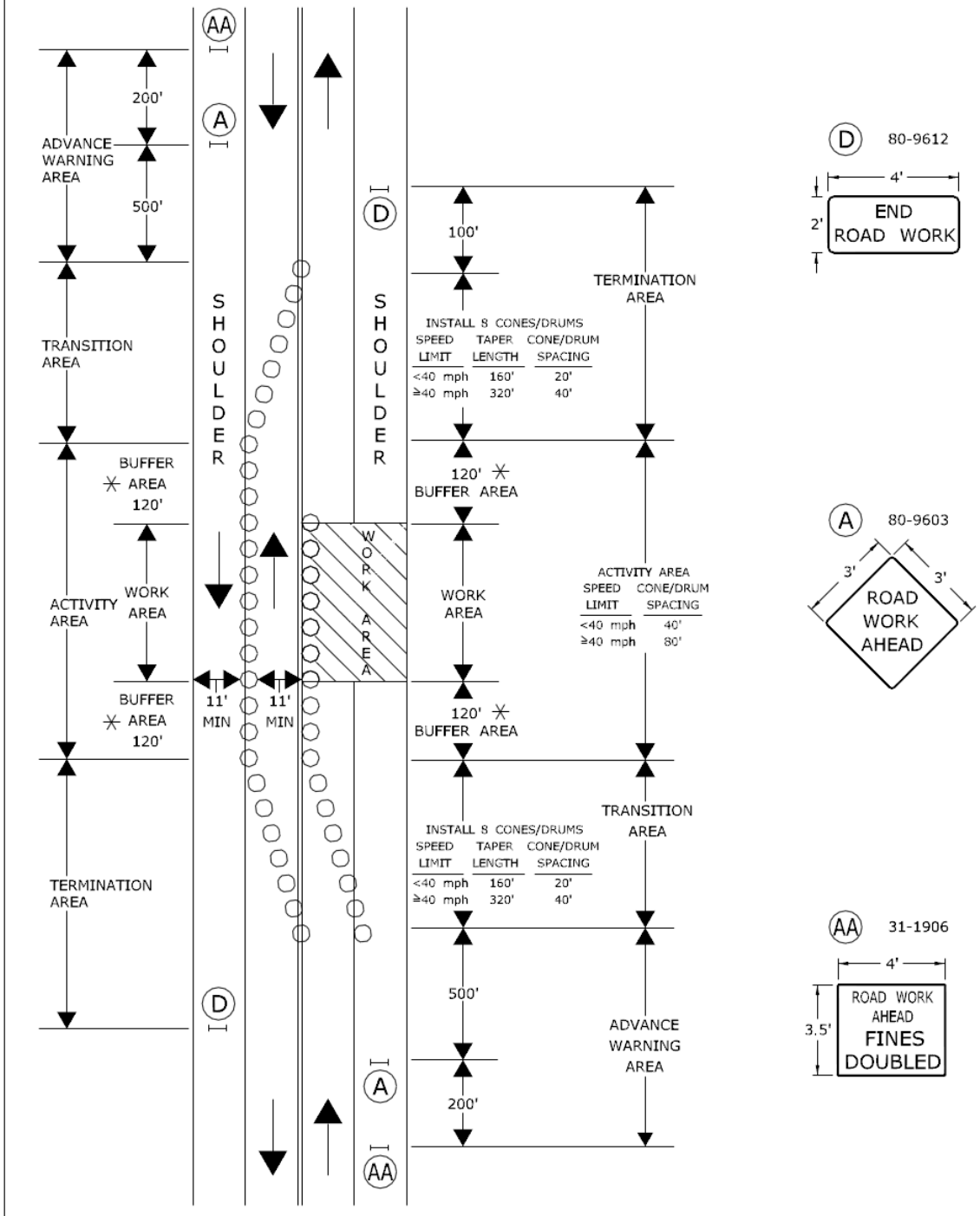
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 14
SEE NOTES 1, 2, 4, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:56:09-04'00'
PRINCIPAL ENGINEER

WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY

SIGN FACE
62 SQ. FT (MIN.)



D 80-9612

A 80-9603

AA 31-1906

○ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢ PORTABLE SIGN SUPPORT
⟵ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 15

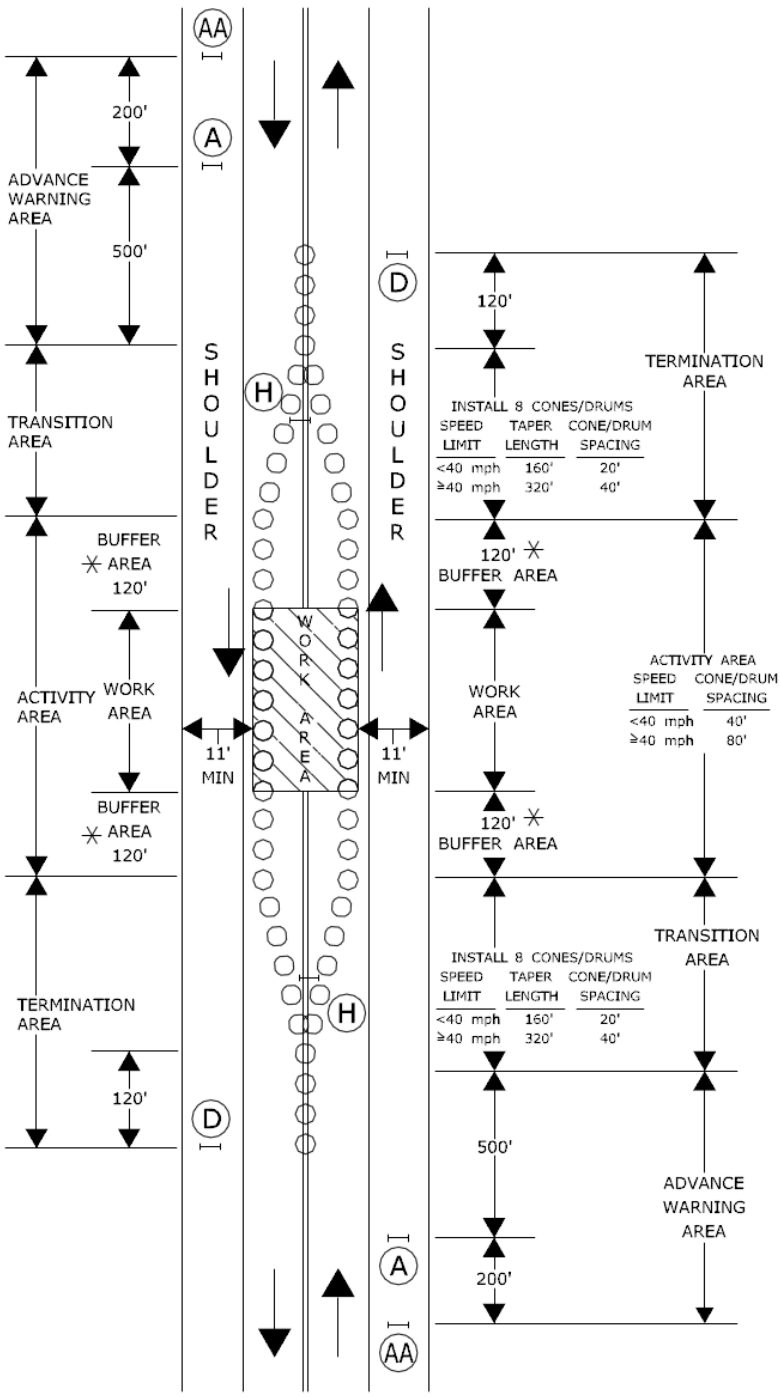
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

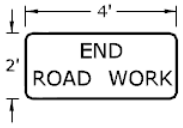
APPROVED Charles S. Harlow 2012.06.05 15:56:29-04'00'
PRINCIPAL ENGINEER

WORK IN MIDDLE OF ROADWAY
TWO LANE HIGHWAY

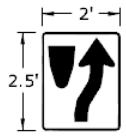
SIGN FACE
72 SQ. FT (MIN.)



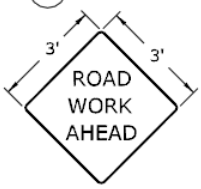
D 80-9612



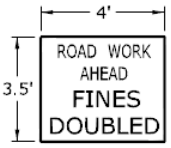
H 31-1526



A 80-9603



AA 31-1906



○ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊣ PORTABLE SIGN SUPPORT
⇐ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 16

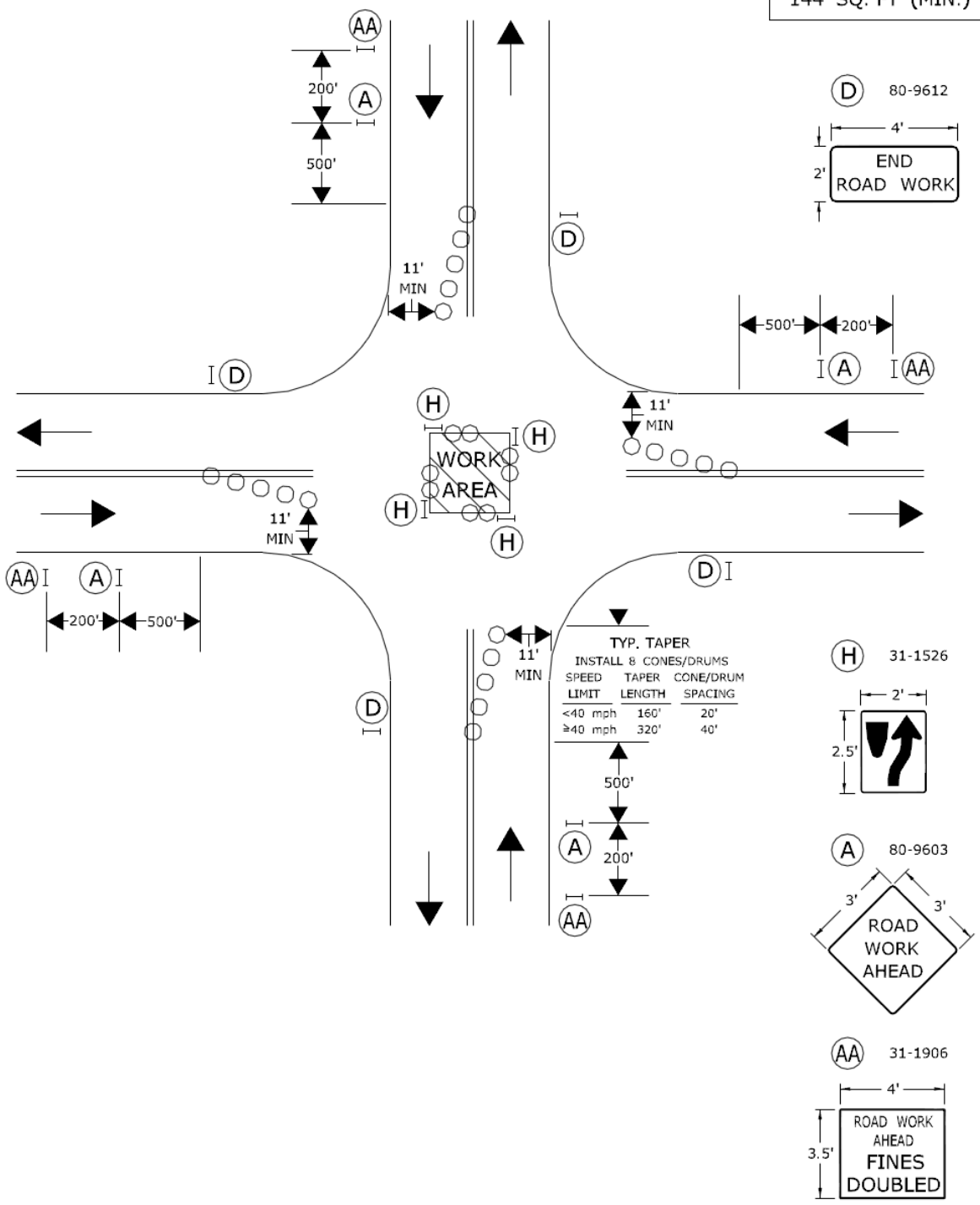
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:56:51-04'00'
PRINCIPAL ENGINEER

WORK IN MIDDLE OF ROADWAY AT INTERSECTION

SIGN FACE
144 SQ. FT (MIN.)



TRAFFIC CONE **OR** TRAFFIC DRUM
OPTIONAL TRAFFIC DRUM PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

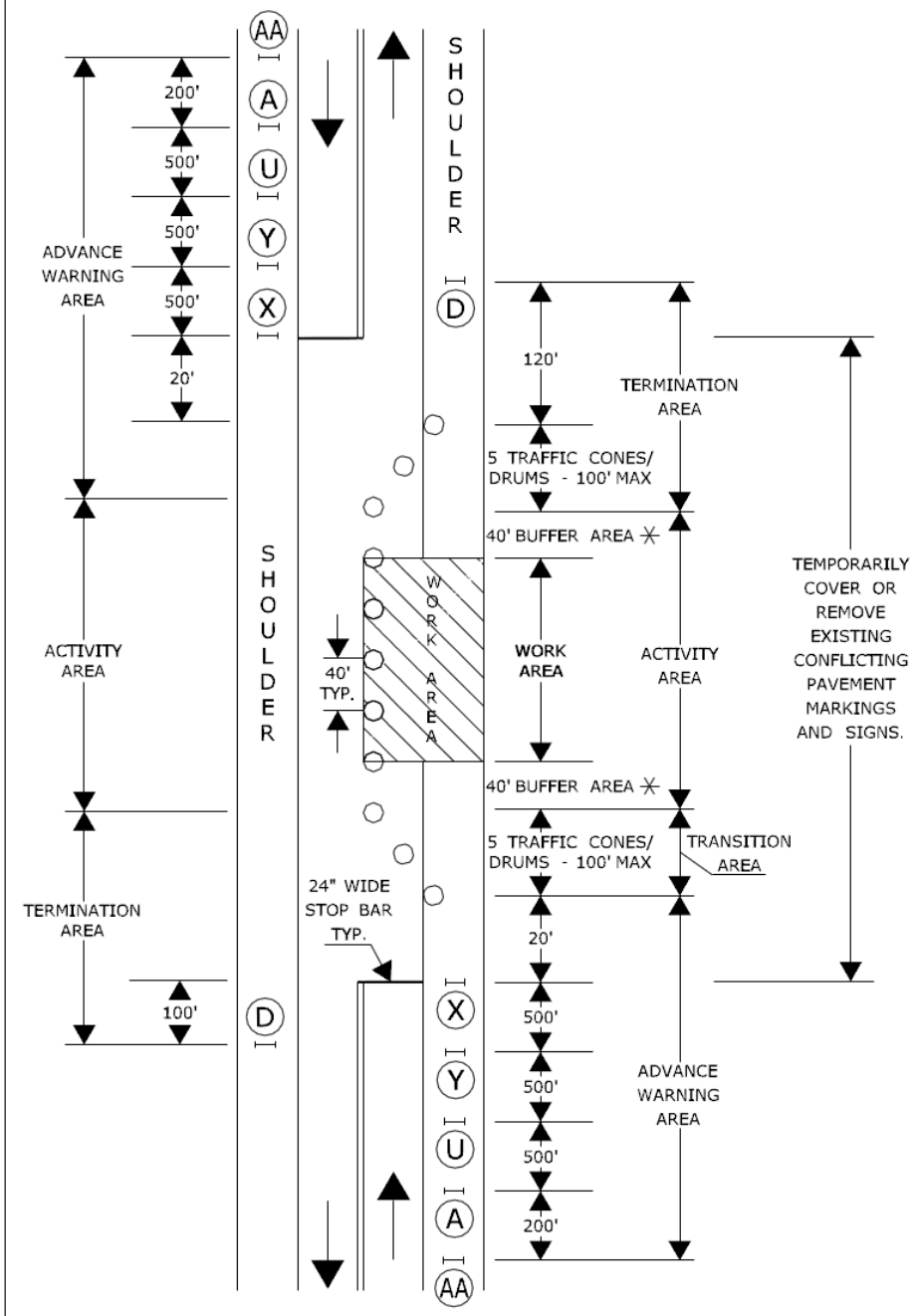
SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 17
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED
Charles S. Harlow
2012.06.05 15:57:16-04'00'
PRINCIPAL ENGINEER

WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS
STOP SIGN CONTROL



SIGN FACE
125 SQ. FT (MIN.)

D 80-9612
4'
2'
END ROAD WORK

X 31-0557
4'
STOP

Y 80-9050
3'
3'

U 80-9834
3'
3'
ONE LANE ROAD AHEAD

A 80-9603
3'
3'
ROAD WORK AHEAD

AA 31-1906
4'
3.5'
ROAD WORK AHEAD
FINES DOUBLED

○ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢ PORTABLE SIGN SUPPORT
⟵ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 18
SEE NOTES 1, 2, 4, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

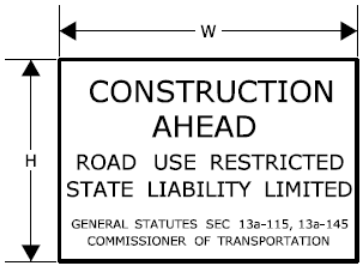
APPROVED
Charles S. Harlow
2012.06.05 15:57:37-04'00'
PRINCIPAL ENGINEER

Article 9.71.05 – Basis of Payment is supplemented by the following:

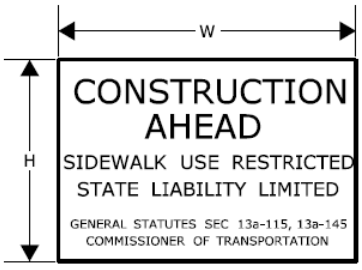
The temporary relocation of signs and supports, and the furnishing, installation and removal of any temporary supports shall be paid for under the item "Maintenance and Protection of Traffic". Temporary overhead sign supports and foundations shall be paid for under the appropriate item(s).

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item "Maintenance and Protection of Traffic."

SERIES 16 SIGNS



		W H
16-E	80-1605	84" x 60"
16-H	80-1608	60" x 42"
16-M	80-1613	30" x 24"



		W H
16-S	80-1619	48" x 30"

THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

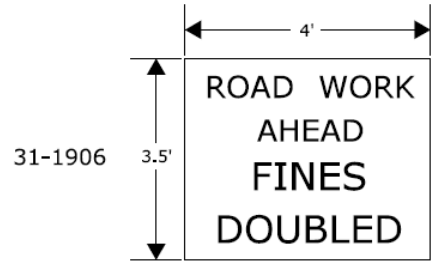
SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

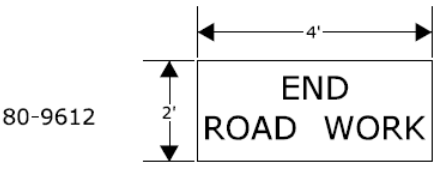
THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.



"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
REQUIRED SIGNS

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 11:35:43-04'00'
PRINCIPAL ENGINEER

ITEM #971001A

NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.

2. SIGNS (AA), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.

3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.

4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.

5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.

6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.

7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).

8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.

9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.

10 SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE
30 OR LESS	180' (55m)
35	250' (75m)
40	320' (100m)
45	540' (165m)
50	600' (180m)
55	660' (200m)
65	780' (240m)

METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

NOTES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

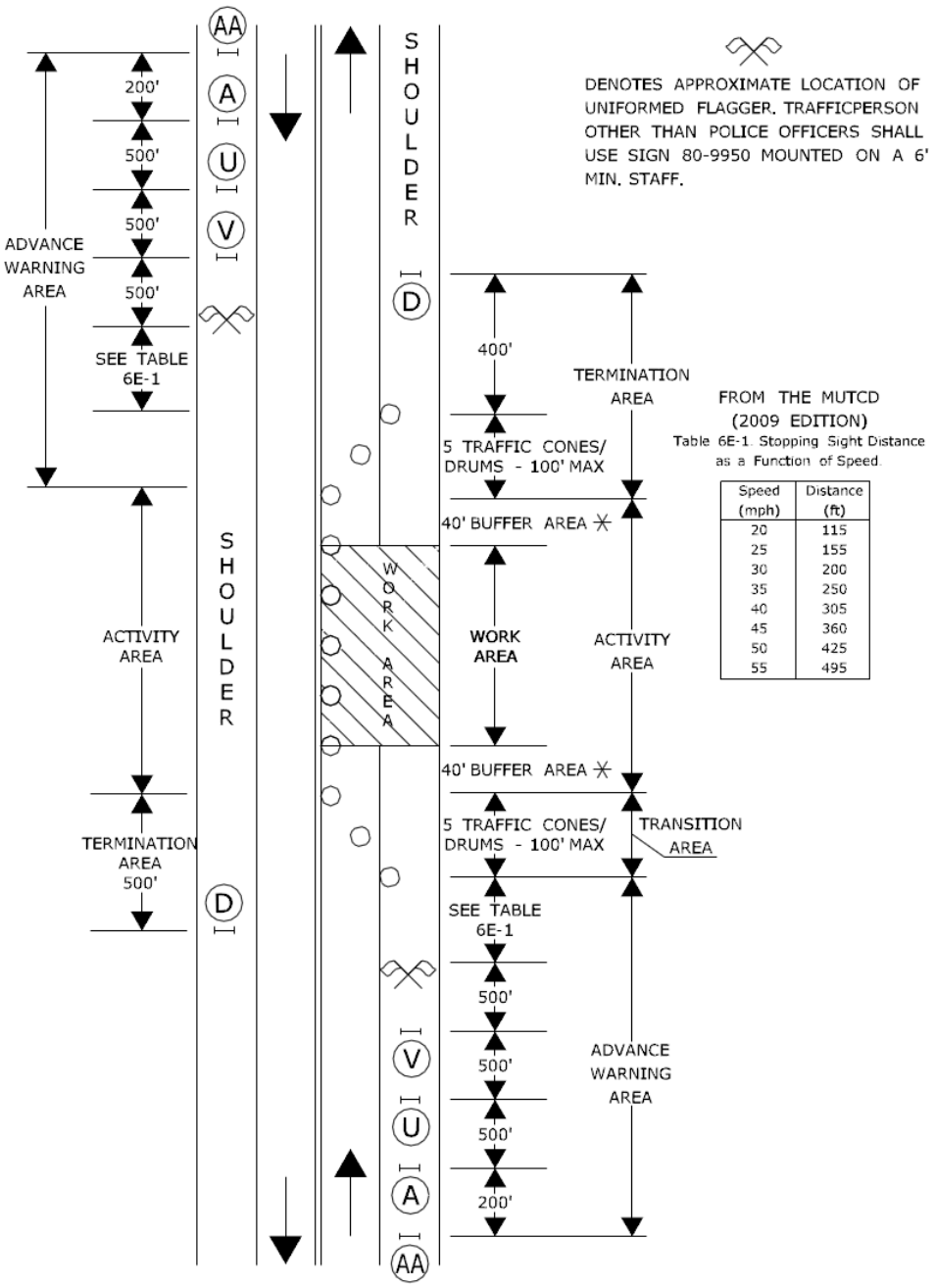
Charles S. Harlow
2012.06.05 15:50:35-04'00'

PRINCIPAL ENGINEER

ITEM #971001A

WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)

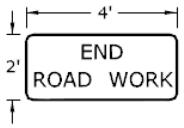


DENOTES APPROXIMATE LOCATION OF UNIFORMED FLAGGER. TRAFFICPERSON OTHER THAN POLICE OFFICERS SHALL USE SIGN 80-9950 MOUNTED ON A 6' MIN. STAFF.

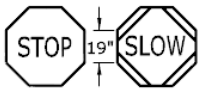
FROM THE MUTCD (2009 EDITION)
Table 6E-1. Stopping Sight Distance as a Function of Speed

Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495

D 80-9612



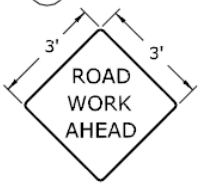
80-9950
SIDE A SIDE B



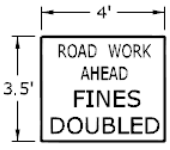
V 80-9803

U 80-9834

A 80-9603



AA 31-1906



TRAFFIC CONE **OR** TRAFFIC DRUM
OPTIONAL TRAFFIC DRUM PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 13 - SHEET 1 OF 2

SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:55:23-04'00'
PRINCIPAL ENGINEER

ITEM #971001A

WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.07, FLAGGER PROCEDURES, IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TRAFFIC STANDARD SHEET TR-1220 01 ENTITLED, "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

A. TO STOP TRAFFIC

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.

B. TO DIRECT TRAFFIC TO PROCEED

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.

C. TO ALERT OR SLOW TRAFFIC

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.

◯ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢⊣ PORTABLE SIGN SUPPORT
⟵ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 13 - SHEET 2 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

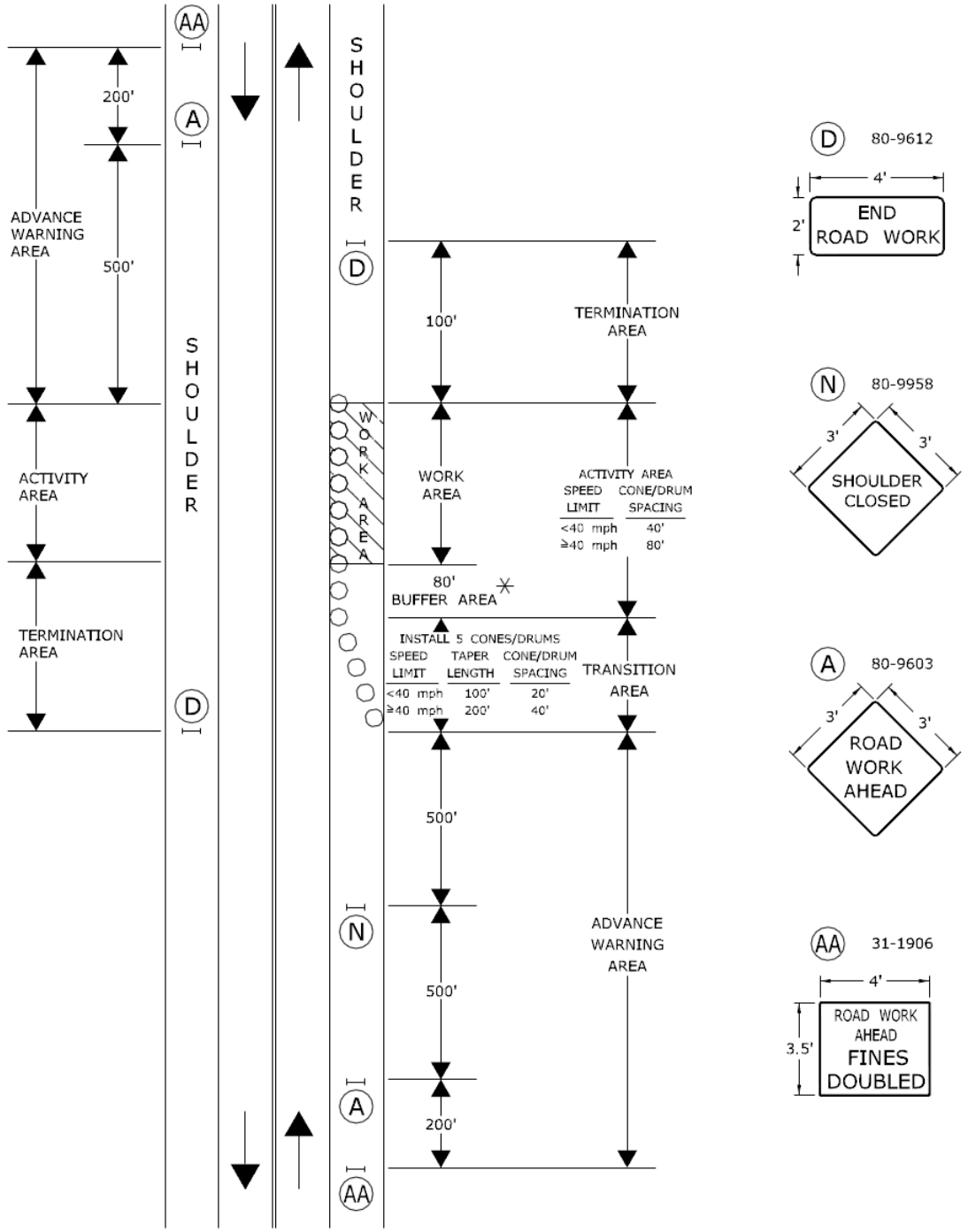
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:55:45-04'00'
PRINCIPAL ENGINEER

ITEM #971001A

WORK IN SHOULDER - TWO LANE HIGHWAY

SIGN FACE
71 SQ. FT (MIN.)



D 80-9612

N 80-9958

A 80-9603

AA 31-1906

○ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢ PORTABLE SIGN SUPPORT
⇦ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 14

SEE NOTES 1, 2, 4, 7, 8

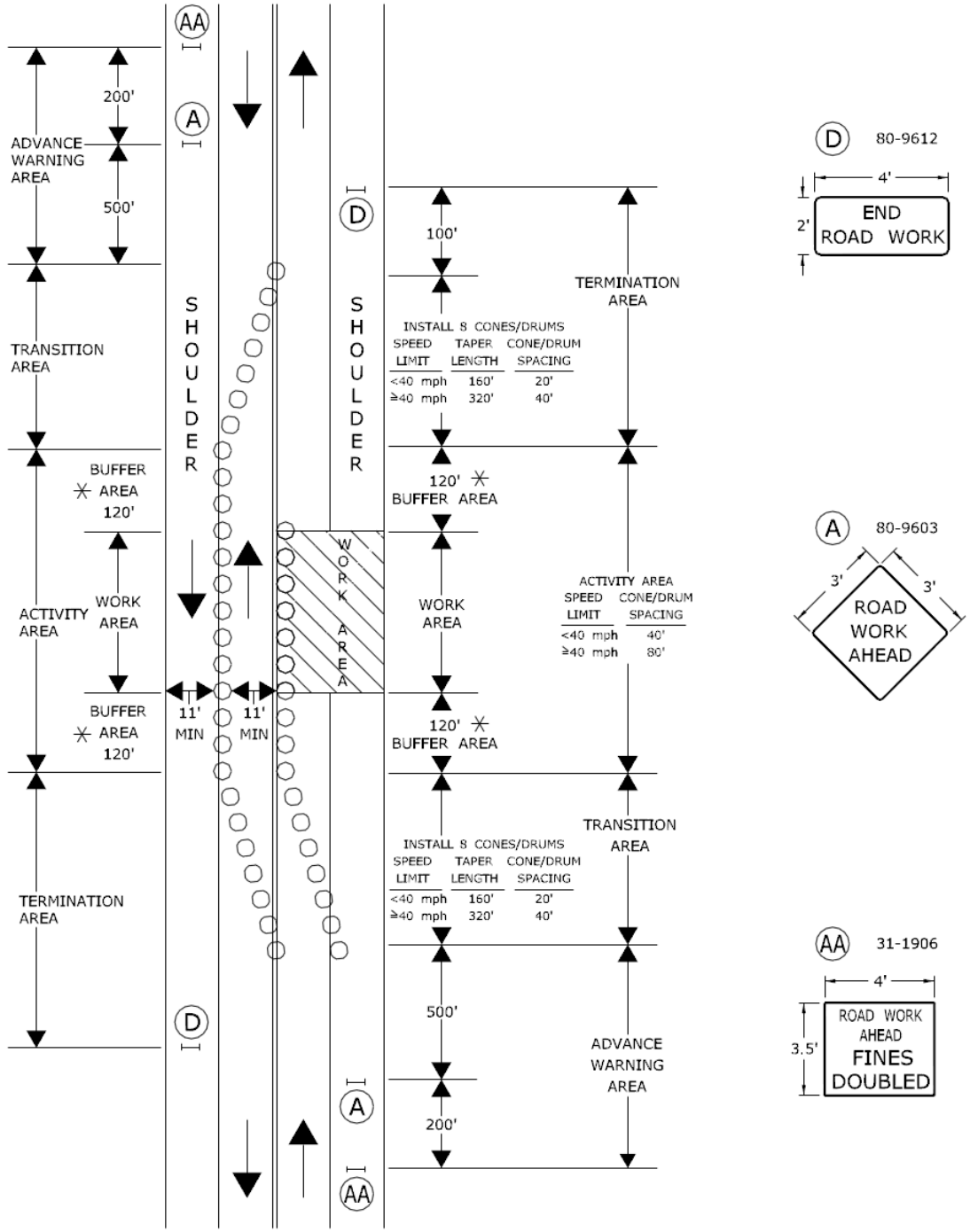
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:56:09-04'00'
PRINCIPAL ENGINEER

ITEM #971001A

WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY

SIGN FACE
62 SQ. FT (MIN.)



D 80-9612

A 80-9603

AA 31-1906

○ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢ PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 15

SEE NOTES 1, 2, 4, 6, 7, 8

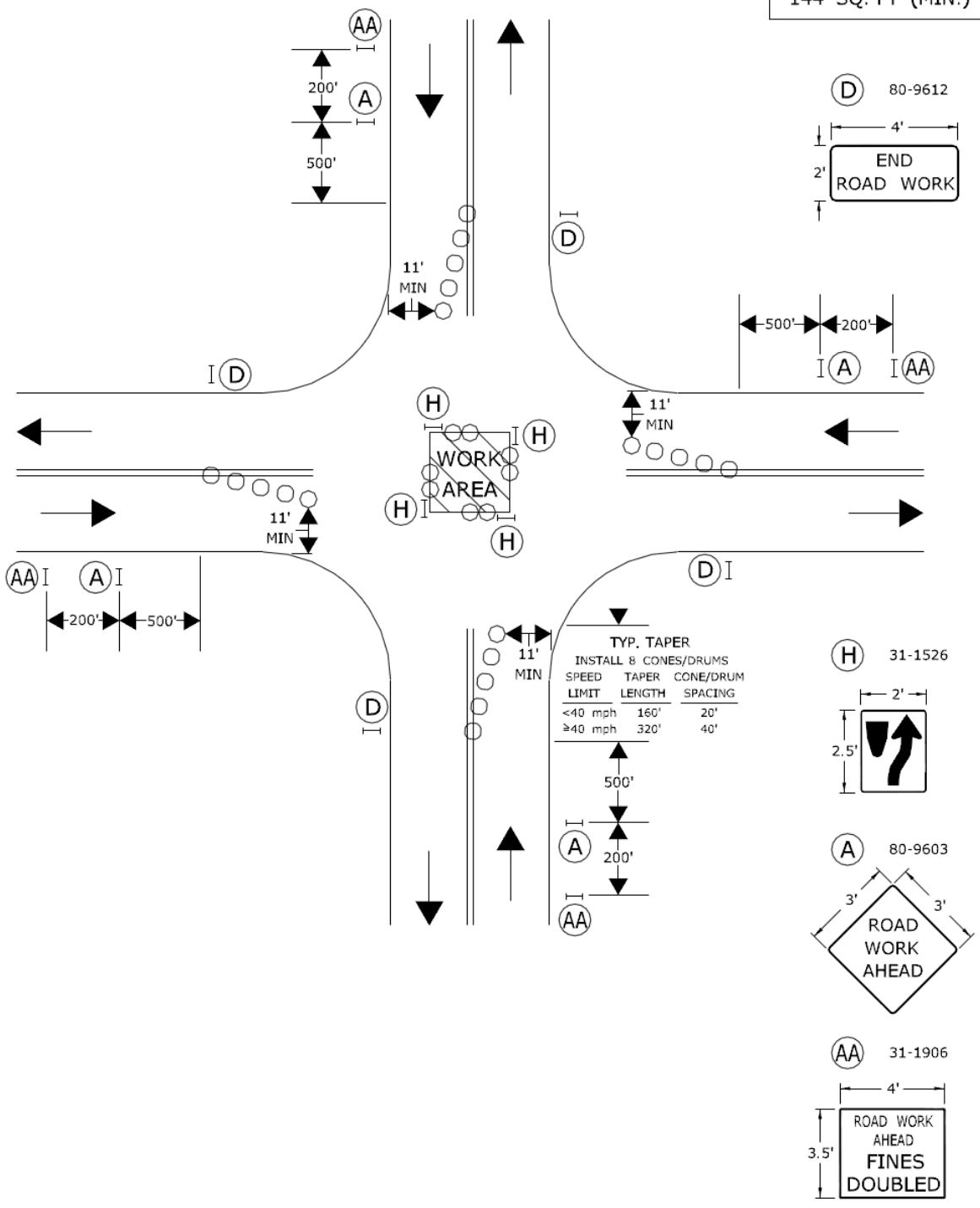
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:56:29-04'00'
PRINCIPAL ENGINEER

ITEM #971001A

WORK IN MIDDLE OF ROADWAY AT INTERSECTION

SIGN FACE
144 SQ. FT (MIN.)



TRAFFIC CONE **OR** TRAFFIC DRUM
OPTIONAL TRAFFIC DRUM PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 17

SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
2012.06.05 15:57:16-04'00'

PRINCIPAL ENGINEER

ITEM #971001A

ITEM #1002130A – INSTALL CITY FURNISHED LIGHT STANDARD FOUNDATION

10.02.01 – Description: This item shall consist of installing the light standard foundation, and related equipment, furnished by the City of New Britain as indicated on the plans or directed by the Landscape Architect**.**

10.02.02 – Materials: Light Standard Foundation shall be furnished by the City of New Britain.

10.02.03 – Construction Methods:

The Contractor shall arrange a schedule with the City, Department of Public Works 2 weeks in advance to pick up the light standard foundations and related materials. In addition, telephone 24 hours prior to the scheduled date to confirm the location and time of pick up.

The Contractor shall sign a receipt, listing all material furnished by the City. All material provided by the City shall be transported by the Contractor, and stored if necessary. It shall be the Contractors responsibility from the time of pick up until the light standard foundation is in place according to plan, to repair or replace any material damaged during delivery or during installation.

The Contractor shall pick up the light standard foundations at the following locations:

Eversource
705 West Johnson Avenue
Cheshire, CT

10.02.04 – Method of Measurement: This work will be measured for payment by the number of light standard foundations and related equipment for each, picked up, installed and accepted in place.

10.02.05 – Basis of Payment: This work will be paid for at the contract unit price each for "Install City Furnished Light Standard Foundation" complete in place, which shall include transportation from the pickup source to the location, storage, all miscellaneous hardware, tools and work incidental thereto.

Pay Item	**Pay Unit**
Install City Furnished Light Standard Foundation	ea.

ITEM #1008127A – 2” SCH 80 PVC CONDUIT
ITEM #1008129A – 3” SCH 80 PVC CONDUIT

10.08.01 – Description: This item shall consist of furnishing and installing conduit of the size and type specified with necessary fittings, where called for, at locations shown on the plans or as directed by the Landscape Architect and in accordance with these specifications.

10.08.02 – Materials: Materials for this work shall conform to the requirements of Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Section M.15.09.

10.08.03 – Construction Methods: The conduit shall be installed in the locations and to the dimensions shown on the plans or as directed by the Landscape Architect. All conduit runs shall be installed in a neat and workmanlike manner in accordance with recognized trade practices recognized trade practices. Trenching and backfilling of conduit shall conform to Article 10.01. All conduit shall be installed in strict accordance with the current NEC. Where conduit is to be capped, a commercial pipe or conduit cap shall be used. An expansion fitting shall be used wherever required by an expansion joint in the structure. Upon completion of the work, all conduits shall be cleaned, swabbed and free from obstructions and burrs. For buried conduit, marking tape shall be installed in the trench at the depth and to requirements as set forth in the Article 1.05.15. After all cable has been installed, U.L. approved duct sealing compound shall be installed in the ends of all conduit which terminates in foundations, handholes, junction boxes and manholes. PVC is to be concrete encased to a minimum of the pipe diameter plus 1 inch.

1. **Conduit Surface:** Beam clamps or conduit strips with back spacers shall be provided at intervals in accordance with the NEC. Expansion fittings shall be installed at all expansion joints. All surface mounted conduit on wood poles shall be bonded to a driven ground rod. Stand-offs shall be installed in accordance with serving utility company regulations.

2. **Conduit in Trench:** Trenches shall be of the depth and cross section shown on the plans or as directed by the Landscape Architect. All conduit shall have a minimum covering of 2 feet.

3. **Conduit under Roadway:** Installations shall be such as to avoid pockets in runs. Conduit shall have a minimum cover of 2 feet. Each end of conduit runs shall terminate with a cap in a concrete handhole as shown on plans. The Contractor shall coordinate the placement of the conduit prior to the placement of the pavement.

Where conduit is to be install under an existing roadway a trench shall be opened and conduit installed as shown on plans, or as directed by the Landscape Architect. The trench shall be backfilled with suitable material and the surface shall be restored to original condition.

4. Conduit in Structure: It shall be the Contractor's responsibility to coordinate the setting of all conduit in structure prior to pouring concrete. Expansion fittings shall be installed at all expansion joints. Where shown on the plans, outlet boxes with the conduits properly connected and conduit hanger inserts with proper sized nuts installed, shall be accurately and securely placed in the forms for concrete. Care shall be taken during the placing of the concrete around these boxes and inserts to consolidate the concrete thoroughly, preventing voids and honeycomb and to prevent any material displacement of the boxes or inserts. Sealed bonding bushing shall be provided at each conduit outlet in all boxes.

10.08.04 – Method of Measurement: Conduit will be measured for payment by the actual number of linear feet of the type and size installed and accepted. The measured length shall be from end to end along the centerline through all fittings.

10.08.05 – Basis of Payment: This work will be paid for at the Contract unit price per linear foot for 2-inch and 3-inch polyvinyl chloride conduits in trench.

1. The price shall include all materials required including expansion fittings, conduit fittings, locknuts, bonding bushings, bonding wire, hangers, clamps, duct seal, caps, inserts, encasing concrete, equipment, tools, labor and work incidental thereto.

2. The price shall include the cost to hire Eversource or a company authorized by Eversource to work within 3' of vault or to make vault penetrations as required.

3. Trenching and backfilling shall be paid under Article 10.01.

4. No payment for trenching and backfilling will be made for conduit installed during construction under new pavement or in the fill area of new median barrier curb installations.

Pay Item	**Pay Unit**
2-inch Sch 80 PVC Conduit	LF
3-inch Sch 80 PVC Conduit	LF

ITEM #1010052A – CAST IRON HANDHOLE COVER

ITEM #1010054A – CAST IRON HANDHOLE COVER – TYPE II

Article 10.10.05 - Basis of Payment:

After the words “Cast Iron Handhole Cover, insert the phrase “of the type called for”.

Add to the list of pay items:

Pay Item	Pay Unit
Cast Iron Handhole Cover	EA.
Cast Iron Handhole Cover Type II	EA.

ITEM# 1017034A - INSTALL SERVICE

Description:

Coordination activities with Eversource Electric and the City of New Britain and hiring and paying for the electric manhole connection and conduit stub to facilitate installation of the service cable. Other incidental work associated with providing the electric service to the unmetered controller.

Materials:

None

Construction Methods:

Contact the Eversource representative for exact requirements of the electric service. All installation charges required for an underground service connection are the responsibility of the Contractor, including procuring Eversource and/or one of their approved contractors to provide the connection to the manhole and a conduit stub. The connection to the manhole shall be performed by Eversource, or an authorized contractor. When the work is complete, but prior to connecting the service cable, notify the City of New Britain and the Engineer to inspect and confirm that the work complies with all codes, including the National Electric Code. Following the inspection, contact the power company to schedule the connection.

Comply with the National Electric Code (NEC), Public Utility Regulatory Authority (PURA), and the serving power company requirements. Ensure all circuit breakers are off when service is connected by the utility company. The work must be inspected and approved by the Engineer or his designated representative prior to scheduling a service connection. Record the meter number and the date service is connected for billing purposes.

Service Request

- Traffic Signal on State Road: Contact the CT DOT Traffic Electrical office to complete the necessary service request forms.
- Traffic Signal on Town Road: Complete all necessary request forms and forward to the appropriate power company office.
- Incident Management Site: Complete all necessary request forms and forward to the appropriate power company office.

Method of Measurement:

This work will be measured for payment by the number of electric services, completed with service connected, and accepted in place.

Basis of Payment:

This work will be paid for at the Contract unit price per each for "Install Service" complete and accepted in place. The price shall include payment to Eversource and/or their approved contractor for work associated with the electric manhole connection. The price shall also include the direct-buried ground clamp, bonding wire, pull rope, all material, equipment, tools, labor and incidentals necessary.

ITEM #1102002A - 8' ALUMINUM PEDESTAL

ITEM #1102009A – 10’ ALUMINUM PEDESTAL

Article 11.02.02 – Materials: The materials for this work shall conform to the requirements of Article M.16.03.

Article M.16.03 – Materials:

Add the following paragraph:
The shaft, base and all brackets and hardware shall be coated at the manufacturer’s site prior to shipping and protected from damage during shipping. The color shall be **Black, Federal Standard No. 595, Color No. 37038** as approved by the City of New Britain. Submit the proposed costing process and a color sample on a representative material of the final products to the City of New Britain.

ITEM #1104028A – 30' STEEL MAST ARM ASSEMBLY

ITEM #1104033A – 40' STEEL MAST ARM ASSEMBLY

Description: Work under this item shall consist of designing, fabricating and installing a mast arm assembly to carry traffic appurtenances (such as traffic signals, signs, antenna, etc.) of the type specified, on a prepared foundation, in accordance with the details shown on the plans, in accordance with these specifications and as ordered by the Engineer.

All mast arms and hardware shall be painted black. The color of the finish coat for Mast Arms and anchor bolt covers, handhole covers, post caps, and end caps shall be included under this item and approved by the City if New Britain Engineer.

Materials: The structural plate components, such as the baseplate and the plates in the arm to pole ring stiffened, built-up box connection, shall be made of steel that conforms to the requirements, including the supplementary notch toughness requirements, of ASTM A709, Grade 50F2 (ASTM A709M, Grade 345F2).

The tubular components, such as the pole, arm and luminaire arm, and the steel for the handhole reinforcement, shall be made of steel with a minimum yield stress of 35,000 psi (241 MPa). The steel shall meet the following notch toughness requirements:

Yield Strength	Thickness in. (mm)	Minimum Test Value Energy ft.-lbs. (J)	Minimum Average Energy, ft.-lbf (J)
$F_y \leq$ 36 ksi (250 MPa)	$\leq$ 4 (100)	20	25 (34) at 40ºF (4ºC)
36 ksi (250 MPa) < $F_y \leq$ 50 ksi (345 MPa)	$\leq$ 2 (50)	20	25 (34) at 40ºF (4ºC)
36 ksi (250 MPa) < $F_y \leq$ 50 ksi (345 MPa)	2 < t $\leq$ 4 (50 < t $\leq$ 100)	24	30 (41) at 40ºF (4ºC)
50 ksi (345 MPa) < $F_y \leq$ 70 ksi (485 MPa)	$\leq$ 4 (100)	28	35 (48) at -10ºF (-23ºC)

Charpy V-notch sampling and testing shall be in accordance with AASHTO T243 (ASTM A673/A673M), "P" piece frequency.

The non-structural components, such as hand hole covers, caps and anchor bolt covers, shall be made of steel with minimum yield strength of 36,000 psi (250 MPa).

All high strength bolts shall conform to ASTM A325, Type 1 (ASTM A325M, Type 1). Nuts shall conform to ASTM A563, Grade DH (ASTM A563M, Property Class 10S). Circular, flat, hardened steel washers shall conform to ASTM F436 (ASTM F436M). The bolts, nuts and washers shall be galvanized in accordance with ASTM A153 (ASTM A153M) or ASTM B695, Grade 50. The nuts shall be overtapped to the minimum amount required for the bolt assembly and all surfaces of the nuts shall be lubricated with a lubricant containing a visible dye of any

color that contrasts with the color of the galvanizing. The high strength bolts shall conform to the requirements of Subarticle M.06.02-5, amended elsewhere herein.

The anchor bolts shall conform to ASTM F1554, Grade 105. The nuts shall conform to ASTM A563, Grade DH (ASTM A563M, Class 10S). The washers shall conform to ASTM F436 (ASTM F436M). The bolts, nuts and washers shall be galvanized in accordance with ASTM A153 (ASTM A153M). All surfaces of the nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. The nuts shall be overtapped to the minimum amount required for the bolt assembly and all surfaces of the nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing.

All steel components, including anchor bolts, shall be completely hot-dip galvanized, after fabrication, in accordance with ASTM A123 (ASTM A123M) or ASTM A153 (ASTM A153M), as applicable. Zinc-rich field primer for touch up shall conform to the requirements of ASTM A780. The use of aerosol spray cans shall not be permitted.

Where "Silicone Joint Sealant" is specified on the plans, a primer will also be required for proper adhesion of the joint sealant to the steel. The following primer and silicone joint sealant or approved equals shall be used:

Dow Corning 1200 Prime Coat and Dow Corning 790 Silicone Building Sealant, manufactured by the Dow Corning Corporation, Midland, Michigan 48686-0994.

Neoprene gasket material for the access openings shall conform to ASTM D1056, Grade 2A2 or 2A3. Other grades of neoprene approved by the Engineer may be used.

Closed cell elastomer for sealing the space between the foundation and base plate shall conform to ASTM D1056, Grade 2A2 or 2A3 and shall have a pressure-sensitive adhesive backing on one side for adhesion to steel. Closed cell elastomer contained within the anchor bolt pattern shall not interfere with the anchor bolt leveling nuts and shall not block the opening in the base plate.

Bare copper grounding conductor shall be #8 AWG stranded bare copper wire conforming to M.15.13. The grounding bolt shall be stainless steel with a hex head.

The Contractor shall submit Certified Test Reports and Materials Certificates in conformance with Article 1.06.07 for the steel used in the mast arm members and components, high-strength bolts (including nuts and washers) and anchor bolts (including nuts and washers). The Certified Test Reports shall include the following:

a. Mill test reports that indicate the place where the material was melted and manufactured.

b. High-strength bolt test results for proof load tests, wedge tests, and rotational-capacity tests that indicate where the tests were performed, date of tests, location of where the components were manufactured and lot numbers.

c. Galvanized material test results that indicate the thickness of the galvanizing.

Prior to incorporation into the work, the Contractor shall submit samples in conformance with Article 1.06.02 for the steel used in the mast arm members and components, high-strength bolts (including nuts and washers) and anchor bolts (including nuts and washers).

Construction Methods: The design and fabrication of the mast arm assembly, including its anchorage (into the foundation), shall conform to the requirements of the latest edition of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, including the latest interim specifications, amended as follows:

- The design wind speed shall be 120 mph (193 km/hr). The computation of wind pressures in accordance with Appendix C is not permitted.

- The mast arms shall be designed to support fixed mounted traffic signals and signs. The wind drag coefficient for traffic signals and luminaires shall be 1.2.

- The mast arms shall be designed for fatigue category I. The mast arms shall be designed for the wind load effects due to galloping, natural wind gusts and truck-induced gusts. The luminaire arms shall be designed for the wind load effects due to natural wind gusts. The design pressure for the truck-induced gust shall be based on a truck speed of 65 mph (105 km/hr). The design of the mast arms assuming that vibration mitigation devices will not be installed.

- The vertical deflection of the free end of the arm due to the wind load effects of galloping and truck-induced gusts shall not exceed 8” (200 mm).

- The minimum design life for mast arms shall be 50 years.

- The maximum stress ratio (the ratio of the computed stress to the allowable stress) or combined stress ratio in any mast arm component due to each group load shall not exceed 0.90.

- The maximum arm length arm shall be 35’-0” (12 000 mm), measured from the centerline of the pole to the tip of the arm.

- The maximum luminaire arm length shall be 15’-0” (4500 mm).

- The maximum diameter of the pole at its base shall be 18" (457 mm).

- The maximum diameter of the arm at the arm-pole connection shall be 15" (381 mm).

- The minimum wall thickness of the arm at the pole connection and the pole shall be 5/16" (8 mm).

- The arm, luminaire arm and pole may be fabricated from either round or multisided tubular members. Multisided tubular members with other than 8, 12 or 16 sides are not permitted. The arm and luminaire arm shall be fabricated with a taper (change in diameter).

- A maximum of one slip-type field splice is permitted in the arm. Slip-type field splices are not permitted in the pole. The wall thickness of the pole and arm component members shall be uniform throughout their lengths. The use of multiple plies (laminations) to obtain the required arm and pole thickness is not permitted. The use of shop-fabricated stepped members is not permitted.

- The arm, luminaire arm and pole members may be fabricated with no more than 2 longitudinal seam welds.

- The longitudinal seam welds within 6” (152 mm) of the member ends shall be complete joint penetration groove welds. The longitudinal seam welds on the female section of telescopic (slip-type) field splices shall be complete joint penetration groove welds for a length equal to the minimum splice plus 6” (150 mm).

- Partial joint penetration longitudinal seam welds shall be non-destructively tested in accordance with the magnetic particle method. Complete joint penetration longitudinal seam welds in members less than 5/16" (8 mm) thick shall be non-destructively tested in accordance with the magnetic particle method on both the inside and outside surfaces. Complete joint penetration seam welds in members greater than or equal to 5/16" (8 mm) thick shall be non-destructively tested in accordance with the ultrasonic method. \

- The arm to transverse plate connection shall be made with a complete joint penetration groove weld with a backing ring attached to the plate with a continuous fillet weld. The pole to transverse base plate connection (at the foundation) shall be made with a complete joint penetration groove weld with a backing ring attached to the plate with a continuous fillet weld. 100% of the complete joint penetration groove welds shall be non-destructively tested by the ultrasonic method. After galvanizing, the joint between the backing ring and tubular member shall be sealed with silicone sealant.

- The strength of a connection made with a complete joint penetration groove weld shall be no greater than the strength of the base metal. In connections

joining base metal with different yield strengths, the base metal with the lower yield strength shall govern the design.

- The minimum base plate and flange plate thickness shall be 2” (51 mm). The determination of the plate thickness in the tubular member to transverse plate connections shall consider the potential for the plate to warp due to the heat from welding. Consideration should be given to the use of thicker plates to allow for subsequent machining of warped plates to a flat surface so that removal of material will not compromise the required strength of the plate.

- The flange plate connection in the arm to pole in the ring stiffened, built-up box connection shall be designed as slip critical connections with standard holes. The minimum number of high-strength bolts in a flange splice shall be 8. Consideration should be given to the use of smaller diameter bolts since they require lower specified minimum bolt tensions.

- The minimum thickness of the ring plates and gusset plates in the ring stiffened, built-up box connection shall be ½” (12 mm).

- The size of fillet welds specified in designed connections shall be no less than 5/16”. The use of seal and tack welds is not permitted. No welding shall be performed after galvanizing.

- The use of stiffeners at tubular member to transverse plate connections and at the arm to pole connection is not permitted.

- The pole base plate anchor bolt circle diameter shall be 24" (610 mm).

- The anchor bolt to base plate connection shall be designed as a double-nut connection with shear holes. The anchor bolts shall use embedded anchorage plates to transmit loads from the pole base to the concrete foundation. The use of hooked anchor bolts is not permitted. The minimum number of anchor bolts shall be 8. The minimum anchor bolt diameter shall be 2” (51 mm). The minimum anchor bolt embedment, the distance from the top of the foundation to the top of the embedded anchorage plate, shall be 3’-6” (1067 mm). Each anchor bolt shall be supplied with 4 nuts and 4 washers. Washers shall be placed on the top and bottom surfaces of the pole base plate and anchorage plate. Welding to the anchor bolts is not permitted.

The mast arm shall be designed for the load effects due to the actual traffic appurtenances (signals, signs, luminaires, cameras, etc.). The mast arms shall also be designed for the effects of traffic appurtenances during all stages of construction that may exist during the project under which the mast arms are installed. The mast arms shall be designed to support traffic appurtenances with properties no less than those tabulated on the plans.

The dimensions of the mast arm assemblies are shown on the traffic plans, elevations, cross-sections or in the special provisions. The arm, luminaire arm and pole lengths and the attachment heights shall be verified by the Contractor prior to fabrication based on the finished grade at the site, top of foundation elevation, the locations of overhead utility cables and the traffic appurtenance mounting heights. If either the arm or pole length is inadequate, the Contractor shall notify the Engineer.

The minimum vertical clearance from the top of the finished road to the bottom of the traffic signals shall be 16'-0" (4877 mm). The maximum vertical clearance from the top of the finished road to the bottom of the traffic signals shall be 18'-0" (5486 mm). The traffic signals shall be installed so that the bottom of all the signals for each approach is at the same elevation.

The arm to pole connection shall be made with a ring stiffened, built-up box. The luminaire arm to pole connection shall be made with either a built-up box or a ring stiffened built-up box. A minimum of 8 high-strength bolts shall be used to connect the arm flange plate to the built-up box connection plate. A minimum of 4 high-strength bolts shall be used to connect the luminaire arm flange plate to the built-up box connection plate. All fasteners and their components used in the connection shall be visible. The use of tapped holes in the plates of the connection is not permitted. A hole(s) shall be provided in the connection to allow wires to pass from the pole to the arm and luminaire arm. The sides of all other holes in the connection shall be ground smooth and the edges rounded by grinding to prevent the wires from chafing. Holes placed in the connection for galvanizing shall be filled with neoprene plugs.

A J-hook shall be welded to the inside of the pole at the top for wire handling and support.

The mast arm pole shall have a handhole centered 1'-3" (380 mm) from the top of the base plate. The handhole shall be located away from traffic. The handhole shall be reinforced with a frame having a minimum 4" (102 mm) wide by minimum 6" (152 mm) high clear opening. The minimum thickness of the handhole frame shall be no less than the thickness of the pole. The handhole frame shall be connected to the pole with a partial joint penetration groove weld reinforced with a fillet weld. The handhole shall be provided with a cover connected to the frame with stainless steel screws. The cover shall be installed with a neoprene gasket matching the dimensions of the cover. The cover shall also be attached to the frame with a stainless steel chain. The inside bottom of the frame shall have a hole tapped for the stainless steel grounding bolt.

The mast arm shall be supplied with a pole cap plate, arm cap plate, and anchor bolt covers. The cap plates shall be attached with fasteners. The joint between the tubular member and plate shall be sealed with a neoprene gasket matching the dimensions of the plate.

The mast arm shall include a base band to cover the anchor bolts extending from the foundation to the base plan. The band shall be a clamshell band and painted black and sized per mast arm location. The band shall be fastened to the base plate by appropriate means to visually shield the anchor bolts and area under the base plate.

Prior to fabrication, the Contractor shall submit working drawings and design computations for each mast arm assembly to the Engineer for review in accordance with Article 1.05.02. An individual, independently packaged set of working drawings and computations, with all details and documents necessary for fabrication and erection of the structure and its components, including a copy of the certificate of insurance, shall be prepared and submitted for **each** mast arm. **A single set of drawings with tabulated data for multiple mast arm locations is not permitted.** The alpha-numeric mast arm identifier shall be included on these documents. The working drawings and computations shall be prepared in Customary U.S. units.

The packaged set of working drawings and computations for each mast arm assembly shall be submitted either in paper (hard copy) form or in an electronic portable document format (.pdf) with appropriate bookmarks. The packaged set submitted in paper form shall be bound with a staple. The packaged set submitted in an electronic portable document format (.pdf) shall be in an individual file. The packaged set shall include the following:

- title sheet
- table of contents
- contact information for designer, fabricator and galvanizer – contact information should include name and address of each firm and the name of contact person with phone number and email address
- copy of the certificate of insurance
- copy of the traffic signal control plan detailing mast arm assembly
- mast arm assembly working drawings
- mast arm assembly design computations
- welding procedures
- mast arm installation procedure, including the method to plumb the mast arm pole, and the method to tighten the anchor bolts

The working drawings and design computations shall be **signed, dated and sealed** by a Professional Engineer licensed in the State of Connecticut, who shall also be available for consultation in interpreting his computations and drawings, and in the resolution of any problems which may occur during the performance of the work. Each working drawing shall be signed, dated and sealed. The cover/first sheet for the computations shall be signed, dated and sealed.

Working drawings submitted in paper form shall be printed on ANSI B (11” x 17”; 279 mm x 432 mm; Ledger/Tabloid) sheets. Each drawing shall have a border and title block. Located in the lower right-hand corner of the drawing adjacent to the title block, each drawing shall have a rectangular box, 2 ¼” wide x 1 ¾” high (57 mm wide x 44 mm high), for the reviewer’s stamp. On the ANSI B sheets, the minimum text height and width shall be 1/16”. All letter characters shall be uppercase. Design computations, procedures and other supporting data shall be submitted on 8 ½" x 11" (216 mm x 279 mm) (Letter) sheets.

Working drawings submitted in an electronic portable document format (.pdf) shall be created on ANSI D (22” x 34”; 559 mm x 864 mm) full scale (1” electronic file = 1” paper) sheets. (The purpose of creating the drawings on ANSI D sheets is so that the sheets may be printed/plotted at

that size or smaller without loss of legibility.) Each drawing shall have a border and title block. Located in the lower right-hand corner of the drawing adjacent to the title block, each drawing shall have a rectangular box, 2 ¼" wide x 1 ¾" high (57 mm wide x 44 mm high), for the reviewer's stamp. On the ANSI D full scale sheets, the minimum text height and width shall be 1/8". All letter characters shall be uppercase. The electronic files for the design computations, procedures and other supporting data shall be created on ANSI A (8 ½" x 11", 216 mm x 279 mm) letter sheets.

The working drawings shall include complete details of all mast arm components. The drawings shall include, but not be limited to the following:

- the project number, town and mast arm identification number
- reference to the design specifications, including interim specifications
- reference to the design specifications design criteria, such as design wind speed, minimum design life, fatigue category, vehicle speed, etc.
- material specifications for all components
- material designations for the arm and pole, with an explanation of the alpha numeric characters (equivalent thickness, in inches (in millimeters), shall be provided for gage numbers)
- non-destructive weld testing requirements
- details of the location of the longitudinal seam welds in the arm, luminaire arm and pole
- a plan view of the anchor bolt layout relative to the orientation of the arm(s)
- anchor bolt dimensions, including embedment and projection
- permanent camber
- mast arm installation procedure, including the method to plumb the mast arm pole, and the method to tighten the anchor bolts, including bolt lubrication requirements

The design computations shall include, but not be limited to the following:

- the project number, town and alpha-numeric mast arm identifier

- computations for projects in Customary U.S. units shall be provided in Customary U.S. units. Computations for projects in metric units shall be provided in both Customary U.S. units and metric units.

- references to design specifications, including interim specifications, and the applicable code section and articles

- description/documentation for all computer programs used in the design

- drawings/models of the structure, components and connections, with dimensions, loads and references to the local and global coordinate systems used (as applicable), to facilitate review of the results

- a tabulation of the section properties of the tubular members at each analyzed section. The tabulated values should include the diameter, D (if round member); effective width, b (if multisided member, AASHTO 5.5.2); equivalent diameter (if multisided member, AASHTO 5.6), wall thickness, t; inside bend radius, r_b (if multisided member, AASHTO 5.5.2), cross-sectional area, A; moment of inertia, I; section modulus, S; radius of gyration, r. AASHTO Table B-1 may be used to determine the section properties. If Table B-1 is used, the radius measured to the mid-thickness of the wall shall also be provided.

- results of all group loads and load combinations

The mast arm assemblies shall be fabricated in accordance with the latest edition of the AASHTO LRFD Bridge Construction Specifications, including the latest interim specifications, amended herein.

The steel fabricator shall be AISC certified for the fabrication of Simple Steel Bridges (SBR).

Fabrication of the mast arm may begin only after the working drawings and design computations have been reviewed and the Engineer has authorized fabrication to begin. The Contractor shall submit to the Engineer, no less than 2 weeks prior to the start of fabrication, the name and location of the fabrication shop where the work will be done so that arrangements can be made for an audit of the facility and the assignment of the Department Quality Assurance inspector. No fabrication will be accepted unless the QA inspector is present during fabrication. No changes may be made during fabrication without prior written approval by the Department.

The Contractor shall furnish facilities for the inspection of material and workmanship in the shop by the Engineer. The Engineer and his representative shall be allowed free access to the necessary parts of the premises.

The Engineer will provide Quality Assurance (QA) inspection at the fabrication shop to assure that all applicable Quality Control plans and inspections are adequately adhered to and

maintained by the Contractor during all phases of the fabrication. A thorough inspection of a random selection of elements at the fabrication shop may serve as the basis of this assurance.

Prior to shipment to the project, each individual piece of structural steel shall be marked in a clear and permanent fashion by a representative of the fabricators' Quality Control (QC) Department to indicate complete final inspection by the fabricator and conformance to the project specifications for that piece. The mark must be dated. A Materials Certificate in accordance with Article 1.06.07 may be used in lieu of individual stamps or markings, for all material in a single shipment. The Materials Certificate must list each piece within the shipment and accompany the shipment to the project site.

Following the final inspection by the fabricator's QC personnel, the Engineer may select pieces of structural steel for re-inspection by the Department's QA inspector. Should non-conforming pieces be identified, all similar pieces must be re-inspected by the fabricator and repair procedure(s) submitted to the Engineer for approval. Repairs will be made at the Contractor's expense.

The pieces selected for re-inspection and found to be in conformance, or adequately repaired pieces, may be marked by the QA inspector. Such markings indicate the Engineer takes no exception to the pieces being sent to the project site. Such marking does not indicate acceptance or approval of the material by the Engineer.

Following delivery to the project site, the Engineer will perform a visual inspection of all material to verify shipping documents, fabricator markings, and that there was no damage to the material or coatings during transportation and handling.

The Engineer is not responsible for approving or accepting any fabricated materials prior to final erection and assembly at the project site.

Fabrication of the mast arm assemblies shall conform to the requirements of Articles 6.03.04-6, and 10-13.

All welding details, procedures and nondestructive testing shall conform to the requirements of AWS D1.1 Structural Welding Code - Steel.

Personnel performing the nondestructive testing shall be certified as a NDT Level II technician in accordance with the American Society for Non Destructive Testing (ASNT), Recommended Practice SNT-TC-1A and approved by the Engineer.

All nondestructive testing shall be witnessed by Engineer. Certified reports of all tests shall be submitted to the Engineer for examination. Each certified report shall identify the structure, member, and location of weld or welds tested. Each report shall also list the length and location of any defective welds and include information on the corrective action taken and results of all retests of repaired welds.

The Department reserves the right to perform additional testing as determined by the Engineer. Should the Engineer require nondestructive testing on welds not designated in the contract, the cost of such inspection shall be borne by the Contractor if the testing indicates that any weld(s) are defective. If the testing indicates the weld(s) to be satisfactory, the actual cost of such inspection will be paid by the Department.

All members and components shall be hot-dip galvanized in a single dip. Double-dipping shall not be used. All damaged areas of the galvanizing shall be properly prepared and touched-up. Damaged zinc shall be touched-up in accordance with ASTM A780. Spray aerosol cans of zinc rich primer will not be permitted.

After fabrication, the arm to pole bolted connection shall be assembled in the fabricator's shop, in the presence of the Engineer, to determine the acceptability of the connection. The high-strength bolts, including nuts and washes, shall be installed and tensioned in accordance with Subarticle 6.03.03-19, amended elsewhere herein. The faying surfaces shall be free of dirt, loose scale, burrs, other foreign material and other defects that would prevent solid seating of the parts. Prior to assembly, the galvanized faying surfaces shall be scored by wire brushing. The connection may be found acceptable by the Engineer if the faying surfaces of the flange (connection) plates are in firm, continuous contact after properly tensioning the bolts. Only mast arm assemblies with acceptable arm to pole bolted connections shall be shipped. Bolts, nuts and washers used for the trial shop fit-up shall not be reused in the final field assembly.

After fabrication and prior to shipping, aluminum identification tags shall be attached to the arm and pole members with self-tapping tamper resistant screws.

The finished members and components shall be protected with sufficient dunnage and padding to protect them from damage and distortion during transportation. Damage to any material during transportation, improper storage, faulty erection, or undocumented fabrication errors may be cause for rejection of said material at the project site. All costs associated with any corrective action will be borne by the Contractor.

High-strength bolts, nuts and washers shall be stored in accordance with Subarticle 6.03.03-19, amended elsewhere herein.

The mast arm shall be erected and installed according to the procedures submitted with the working drawings.

Prior to installation of the mast arm pole, the threads of the embedded anchor bolts shall be cleaned of accumulated dirt and concrete. The anchor bolt nuts shall be re-lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. On each anchor bolt, all the nuts shall be run down by hand on the anchor bolt threads.

High-strength bolts, including nuts and washes, shall be installed and tensioned in accordance with Subarticle 6.03.03-19, amended elsewhere herein. The arm shall be temporarily and fully supported while all the high-strength bolts are installed and tensioned. The temporary arm support

shall not be removed until the Engineer has confirmed that the faying surfaces of the flange (connection) plates are in firm, continuous contact and the high-strength bolts were properly installed and tensioned. All high-strength bolts in the arm to pole bolted connection shall be inspected (in accordance with Subarticle 6.03.03-19, amended elsewhere herein) to confirm the high-strength bolts were properly tensioned.

After erecting the mast arm, the mast arm shall be electrically grounded by attaching the bare copper grounding conductor to the inside of the handhole frame with a stainless-steel bolt and to the ground rod with a ground clamp. The rigid metal conduit shall be electrically grounded by attaching the bare copper grounding conductor to the insulated bonding bushing and to the ground rod with a ground clamp.

The traffic appurtenances shall be located and mounted on the arm as shown on the cross-sections. Holes, if required for wires, shall be located adjacent to the appurtenances and shall be drilled in the bottom of the arm. A rubber grommet shall be installed in each hole to protect the wires from chafing.

After installation of the traffic appurtenances, the anchor bolt nuts (leveling and top anchor nut) and washers shall be in full contact with the top and bottom surfaces of the pole base plate and the centerline of the pole shall be plumb. The top nuts shall have full thread engagement. The distance from the bottom of the leveling nuts to the top of the foundation shall not exceed 1" (25 mm).

After installation of the traffic appurtenances, if the structure exhibits excessive vibration, oscillations or deflections as determined by the Engineer, the Contractor shall design and construct devices to mitigate the movements. Prior to installation of any mitigation device, the Contractor shall submit drawings, design computations other documentation to the Engineer for review in accordance with Article 1.05.02 and the above requirements.

The last character of the mast arm identification number shall be stenciled with black paint on the pole of each mast arm. The character shall be 3" (76 mm) high and placed approximately 1' (305 mm) above the top of the base plate facing the centerline of the roadway.

All mast arm assemblies, including all brackets and hardware, shall be factory painted after galvanization.

The steel mast arm (shaft, arm, and base and camera bracket) shall be hot-dip galvanized, conforming to the requirements of ASTM-A123. Pole Cap, bolt covers, handhole covers, bolts, washers, nuts and screws shall be galvanized, conforming to the requirements of ASTM A153.
Second Coat: After galvanizing, the exterior steel surface shall be blast cleaned to Steel Structures Painting Council Surface Preparation Specification No. 6 (SSPC-SP6) requirements utilizing cast steel abrasives conforming to the Society of Automotive Engineers (SAE) Recommended Practice J827. The blast method used is a recirculating, closed cycle centrifugal wheel system with abrasive conforming to SAE Shot Number S280.

Interior surfaces (pole shafts only) at the base end for a length of approximately 610mm shall be mechanically cleaned and coated with a zinc rich epoxy powder. The coating shall be electrostatically applied and cured in a gas fired convection oven by heating the steel substrate to a minimum of 177 degrees Celsius (350 degrees Fahrenheit) and a maximum of 204 degrees Celsius (400 degrees Fahrenheit).

All exterior surfaces shall be coated with a Urethane or Triglycidyl Isocyanurate (TGIC) Polyester Powder to a minimum film thickness of 2.0 mils (0.0508mm). The coating shall be electrostatically applied and cured in a gas fired convection oven by heating the steel substrate to a minimum of 177 degrees Celsius (350 degrees Fahrenheit) and a maximum of 204 degrees Celsius (400 degrees Fahrenheit). The thermosetting powder resin shall provide both intercoat as well as substrate fusion adhesion that meets 5A or 5B classifications of ASTM D3359.

The color of the finish coat for steel mast arms (shaft, arm, and base and camera arm), anchor bolt covers, handhole covers, post caps, end caps, bolts, washers and nuts shall be Black. **The color of the finished coat shall be BLACK,** No. 37038, Federal Standard No. 595. The Contractor shall submit color samples to the City of New Britain Engineer for approval prior to fabrication.

The powder coating facilities shall be owned and operated by the pole manufacturer to ensure a quality coating system. Prior to shipment, small poles shall be wrapped in 4.8mm (0.19 inches) thick Ultraviolet inhibiting plastic backed foam. Larger poles shall be cradled in a 303mm (12 inches) rubberized foam base.

Any coating damaged prior to or during the installation of shall be repaired. Areas to be repaired shall be clean, dry, free from grease, oil, corrosion products and other contamination. If contaminated, power wash or scrub with stiff brush and clean water. Repair areas may be brushed or sprayed as appropriate. If the Contractor elects to spray they must provide overspray containment. The minimum overspray containment shall conform to the requirements of SSPC Guide 6 for the Class 3A level.
All defective work shall be corrected by the Contractor at no cost to the Town or Department.

Compliance with Regulations: The Contractor is required to meet all OSHA and EPA as well as state and local government regulations regarding worker safety and protection,
hazardous waste handling and disposal through the use of appropriate containment, engineering controls, respirators, monitors, etc.

Method of Measurement: This work will be measured for payment by the number of steel mast arm assemblies of the type specified, completed and accepted in place.

Basis of Payment: This work will be paid for at the contract unit price each for "XX' Steel Mast Arm Assembly" of the type specified, complete in place, which price shall include all equipment, materials, tools and labor incidental to the design, fabrication and installation, including mitigation devices if required, of the mast arms at the locations specified on the plans.

ITEM #1105101A - 1 WAY, 1 SECTION MAST ARM TRAFFIC SIGNAL

ITEM #1105103A - 1 WAY, 3 SECTION MAST ARM TRAFFIC SIGNAL

Article 11.05.03 – Construction Methods:

In the second paragraph, delete the last sentence ("A balance adjuster shall…").

Add the following paragraphs:

Circular indications that have an identification mark (such as an arrow) on the top of the lens shall be installed with that mark at the 12 o-clock position.

Article 11.05.05 – Basis of Payment:

In the first sentence of the first paragraph, delete "balance adjuster,".

Article M.16.06 - Traffic Signals

Sub Article 3 - Housing:

In the last sentence, between the words "housing" and "shall" add "and all internal hardware".

Add the following after the last paragraph.

Each section of the housing shall be provided with a removable visor. The visor shall be the cap type, unless otherwise noted on the plan. The visor shall be a minimum .05 inch (.13 mm) thick. The visor shall be the twist on type and secured to the signal by four equidistant flat tabs screwed to the signal head.

Sub Article 4 - Brackets:

Add the following at the end of the last paragraph:

Backplates shall be 5" wide and louvered.

Install a 3" wide yellow retroreflective strip (Type IX sheeting) along the perimeter of the face of the backplate.

Replace the last paragraph with the following (Sheet Thickness…)

Delete Sub Article 5 - Optical Unit and **Sub Article 6** – Lamp Socket and replace with the following:

Optical Unit, Light Emitting Diode:

(a) General:

Only Optical Units that meet the requirements contained herein supplied by the below manufacturers that have been tested by the Department's Signal Lab will be accepted. Final approval for model numbers will be done at the time of the catalog cut submittals.

Duralight
Trastar, Inc.
860 N. Dorothy Dr., Suite 600
Richardson, TX 75081

GE Lighting Solutions
Corporate Headquarters
1975 Noble Road Building 338E
East Cleveland, OH 44112-6300

Dialight
1501 Foute 34 South
Farmingdale, NJ 07727

Leotek
726 South Hillview Drive
Milpitas, CA 95035

The materials for Light Emitting Diode (LED), Optical Unit, circular and arrow, shall conform to the following:

- The ITE Performance Specification for Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement for circular indications dated June 27, 2005.
- The ITE Performance Specification for Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement for arrow indications dated July 1, 2007.

Section 4, Adjustable Traffic Signals and General Housing sections of the **Department of Transportation Functional Specifications for Traffic Control Equipment, current edition governs.** Where the Department of Transportation Functional Specifications conflict with this Special Provision or the 2005/2007 ITE Performance Specifications, this Special Provision and the 2005/2007 ITE Performance Specifications shall govern.

The Optical Unit shall have an Incandescent look and be made up of a smooth surfaced outer shell, multiple LED light sources, a filtered power supply and a back cover, assembled into a sealed unit. The Optical Unit shall be certified as meeting the 2005/2007 ITE Specifications by Intertek Testing Services, Inc. (ITSNA, formerly ETL) or another organization currently recognized by

the Occupational Safety and Health Administration (OSHA) as a Nationally Recognized Testing Laboratory (NRTL.) The Optical Unit shall perform to the requirements of the ITE Specification for a minimum of 60 months.

A "Swing Test" will be performed by the Department to ensure no significant dimming or blanking occurs, until the lamp is obscured by the visor. All L.E.D Lamps will be subjected to further field testing for reliable operation.

The Arrow Optical Unit shall be "Omni-Directional" so that it may be oriented in a right, left or straight configuration without degradation of performance.

(b) Electrical Requirement:

Operating voltage:

80 to 135 Volts AC with cutoff voltage (no visible indication) below 35Volts AC.

Power requirements:

Circular Indications: 12", (300 mm) – no more than 16 Watts
Circular Indications: 8", (200mm) - no more than 16 Watts
Arrows Indications: 12", (300mm) - no more than 16 Watts

Power Supply:

Fused and filtered to provide excess current protection and over voltage protection from electrical surges and transient voltages.

(c) Photometric Requirement:

Beam Color:

Meet 2005/2007 ITE Specifications

(d) Mechanical Requirements:

Diameter:

The Circular Optical Unit shall fit into standard 12" (300mm) or 8" (200mm) housing.
The Arrow Optical Unit shall fit 12" (300mm) housings only.

Enclosure:

UV (Ultraviolet) stabilized polycarbonate back cover.
Clear lens cover for all Red, Yellow and Green Circular Optical Units.
For Arrow Optical Units the arrow indication segment of the lens shall be clear.
Enclosure sealed and waterproofed to eliminate dirt contamination and be suitable for installation in all weather conditions.

Clearly mark on the housing the following information:

- Manufacturer & model number
- Date of manufacture (must be within one year of installation)

The model number shall end with the number of LEDs used to comprise the unit as the last digits of the model number. Example, if the unit comprised of 3 LEDs and the model is x12y, then the new model number shall read x12y3.

Operating temperature:
Meet 2005/2007 ITE Specification

Wiring: L.E.D. lamps shall have **color coded 16 AWG wires** for identification of heads as follows:

RED L.E.D. Lamps	RED with WHITE neutral
YELLOW L.E.D. Lamps	YELLOW with WHITE neutral
GREEN L.E.D. Lamps	GREEN or Brown with WHITE neutral
RED L.E.D. ARROWS	RED/WHITE with WHITE neutral
YELLOW L.E.D. ARROWS	YELLOW/WHITE with WHITE neutral
GREEN L.E.D. ARROWS	GREEN/WHITE or BROWN/WHITE with WHITE neutral
GREEN/YELLOW LE.D ARROWS	GREEN/WHITE or BROWN/WHITE, YELLOW/WHITE, with WHITE neutral

Wires shall be terminated with a Block Spade, 6-8 stud/ 16-14 wire size.

All Circular Optical Units shall be supplied with a minimum 40" pigtail and all Arrow Optical Units Supplied with a minimum 60" pigtail.

Sub Article 9 - **Painting:**

Add the following:

All equipment, housing, brackets and hardware shall be factory coated by the manufacturer prior to shipment and protected during shipment from damage to the finish. The color shall be **BLACK, No. 37038, Federal Standard No. 595.**

Under the paragraph titled Third Coat, Replace the first two sentences with the following:

Third Coat: BLACK Enamel shall be Black exterior-baking enamel and shall comply with Federal Specifications A-A 2962. The color shall be **No. 37038, Federal Standard No. 595.** The Contractor shall submit a description of the costing process and color samples on representative materials to the City of New Britain for approval prior to fabrication.

ITEM#1106001A- 1 WAY PEDESTRIAN SIGNAL POLE MOUNTED

ITEM#1106003A- 1 WAY PEDESTRIAN SIGNAL PEDESTAL MOUNTED

Description:
Pedestrian signals shall be painted black in accordance with the special provisions and as described herein.

Section 11.06.02 Pedestrian Signal, Materials

Section M.16.07 C. Optical Unit

Delete 2. LED: and replace with the following:

General

- Meet requirements of current MUTCD Section 4E.
- Meet current ITE specifications for Pedestrian Traffic Control Signal Indications - (PTCSI) Part 2: Light Emitting Diode (LED).
- Meet CT DOT, 2008 - 2010 Functional Specifications for Traffic Control Equipment; Section 5D, LED Pedestrian Signal with Countdown Timer.
- Meet EPA Energy Star® requirements for LED Pedestrian Signal Modules.

Operational

- Countdown display only during the flashing Pedestrian Clearance (Ped Clr) Interval. Timer goes blank at end of flashing ped clr even if countdown has not reached zero.

Physical

- Sealed optical module to prevent entrance of moisture and dust.
- Self-contained optical module, including necessary power supplies.
- Designed to securely fit into standard housing without the use of special tools or modifications to the housing.
- Identification information on module: manufacturer's name, model number, serial number, and date code.

Optical

- Multiple LED sources; capable of partial loss of LED's without loss of symbol or countdown message.
- Two complete self contained optical systems. One to display the walking person symbol (walk) and the hand symbol (don't walk). One to display the countdown timer digits.
- Visual Image similar to incandescent display; smooth, non-pixilated.
- Symbol and countdown digit size as shown on the plan.
- Solid hand/person symbol; outline display not allowed.
- Overlaid hand/person symbols and countdown digits arranged side by side.
- Countdown digit display color: Portland Orange in accordance with ITE requirements.
- Countdown digits comprised of two seven segments, each in a figure 8 pattern.
- Photometric Requirements: Luminance, Uniformity, and Distribution in accordance with ITE requirements.

- Color Uniformity in accordance with ITE requirements.
- Blank–Out design; symbols and digits illegible even in direct sunlight when not illuminated.

Electrical

- Operating voltage: 89 VAC to 135 VAC.
- Low Voltage Turn-Off: 35 VAC.
- Turn-On and Turn-Off times in accordance with ITE specifications.
- Combined Hand – Countdown Digits wattage: $\geq$ 20 Watts.
- Input impedance at 60 Hertz sufficient to satisfy Malfunction Management Unit (MMU) requirements.
- Two separate power supplies. One to power the walking person symbol. One to power the hand symbol and the countdown digits.
- Meet Federal Communication Commission (FCC) regulations concerning electronic noise.
- Filtered and protected against electrical transients and surges.

Warrantee

- Five years from date ownership is accepted.

Section M.16.07 F. Painting:

Remove the 2nd and 3rd sentences referring to the color.

Third coat: Replace with the following:

All brackets and hardware shall be painted black by the manufacturer at their facility prior to shipping. The color shall be Black, **No. 37038, Federal Standard No. 595.**

Third Coat – BLACK ENAMEL: Shall be MATTE BLACK exterior-baking enamel and shall comply with Federal Specifications A-A 2962. The color shall be **No. 37038, Federal Standard No. 595**. The Contractor shall submit color samples on representative materials similar to the provided equipment to the City Engineer of New Britain for approval prior to fabrication.

ITEM #1107011A - ACCESSIBLE PEDESTRIAN SIGNAL AND DETECTOR (TYPE A)

Description:

Furnish and install an Accessible Pedestrian Signal and Detector (APS&D). The APS&D provides audio and tactile information to augment the visual pedestrian signal.
Type A provides a low frequency percussive tone during the walk interval and is used where there is an exclusive pedestrian phase or ≥ 10 foot separation between APS&Ds.

Material:

A. General:

- Conform to applicable sections of the current MUTCD Chapter 4E, Pedestrian Control Features as specified herein.
- All features fully operational when the traffic signal is in colors mode.
- All features non-operational when the traffic signal is in flash mode.
- Interchangeable with a non-accessible type pedestrian pushbutton with no modifications to the Controller Assembly (CA) or Controller Unit.
- Audible transducer integral with the APS&D housing, adjacent to the pushbutton.
- Operation programming method: Either or combination of:
  - Mechanically by dip switches or circuit board jumpers
  - Infrared remote-control hand-held device

B. Electrical:

- Metallic components either grounded or insulated to preclude an electrical hazard to pedestrians under all weather conditions.
- All features powered by the 110VAC Walk signal and the 110VAC Don't Walk signal so that additional conductors from the CA are not needed.

C. Audible Pushbutton Locator Tone

- Frequency: repeating tone at one (1) second intervals
- Tone duration: ≤ 0.15 seconds
- Volume:
  - Minimum setting of zero
  - Manually adjustable initial setting
  - Automatically adjusted after initial setting. Volume increased in response to a temporary increase in ambient noise and subsequently decreased with a decrease in ambient noise.
  - Maximum volume: 100 dBA which is the approximate sound pressure of a gasoline powered lawn mower nearby.
  - Automatic volume adjustment independent of other APS&Ds at the intersection.
  - May be disabled without affecting operation of other features.
- Silent only during walk interval. Active all other times.

D. Vibrotactile Arrow Pushbutton

- Pushbutton contained in a circular assembly which fits inside the housing and is attached to the housing with 4 screws.
- Actuation of pushbutton initiates speech message "Wait".

- ADA compliant: Size: ≥ 2.0" (50) diameter, Actuation force: ≤ 5 ft-lb (22.2 N)

- Shape: Circular, raised slightly above housing so that it may be actuated with the back of a hand
- Tamper-proof, vandal-proof, weatherproof, freeze-proof, impact-resistant design and construction.
- Operation: Vibrates only during the walk interval (when the walk indication is displayed).
- Tactile Arrow:
  - Attached to surface of the button assembly by a tamperproof method.
  - Raised slightly above surface of pushbutton, minimum 0.125" (0.3)
  - Size: Length ≥ 1.5" (38), Height ≥ 1.0" (25)
  - Color: Sharp contrast to background color of pushbutton and housing

E. Audible Walk Interval

1. General:
   - Operation independent of other APS&Ds at intersection.
   - Active only during the walk interval (when the walk indication is displayed).
   - Volume:
     - Minimum setting of zero
     - Manually adjustable initial setting
     - Automatically adjusted after initial setting. Volume increased in response to a temporary increase in ambient noise and subsequently decreased with a decrease in ambient noise.
     - Automatic volume adjustment independent of other APS&Ds at the intersection.
     - Maximum volume: 100 dBA which is the approximate sound pressure of a gasoline powered lawn mower nearby.
   - Duration:
     - Default method: Automatically set by the duration of the visual walk signal display.
     - When selected: Manually set when rest-in-walk is used for a concurrent pedestrian movement.
   - Audible sounds that mimic any bird call are not allowed.

2. Type A, Percussive Tone:
   - Repeating tone at eight (8) to ten (10) ticks per second.
   - Tone frequency: Multiple frequencies with a dominant component at 880 Hz which creates a "tick - tick - tick…" sound.

F. Pushbutton Housing/Sign Frame/Sign

- One piece die cast aluminum meeting requirements of ASTM B85.
- Sign frame designed to accept 9" x 15" (230 x 380) four-hole advisory sign.
- Flat back to facilitate surface mount.
- Available brackets to either pedestal top-mount or pole side-mount on pole diameter range of 3½" (89) to 15" (380).
- Available brackets to allow mounting two (2) APS&Ds to the same 3½" (89) pole, facing ≥ 60 degrees apart, at the same height.
- Available extension bracket of a size indicated on the plan – 18" maximum.
- Wire entrance through the rear.
- Stainless steel mounting hardware.
- Color: The color shall be black, No. 37038, Federal Standard No. 595 or as approved by City of New Britain City Engineer. The Contractor shall submit color samples on representative materials to the City of New Britain City Engineer for approval prior to fabrication.

- Finish: Housing/Frame and all mounting brackets either:
  1. Painted with 3 coats of infrared oven-baked paint before assembly.
     - Primer: Baked iron oxide which meets or exceeds FS TT-P-636.
     - Second coat: Exterior-baking enamel, light gray, which meets or exceeds FS TT-E-527.
     - Third coat: Exterior-baking enamel, which meets or exceeds FS TT-E-489.
  2. Electrostatic powder coated after chemically cleaned in the manufacturer's facility prior to shipment and protect the equipment during shipping from damage.
     a. Color: **BLACK, No. 37038**, Federal Standard No. 595. The Contractor shall submit color samples on representative materials to the City of New Britain for approval prior to fabrication.
- Sign: CT DOT Sign No. 31-0845

Construction Methods:

Install the APS&D according to the manufacturer's instructions. Position the ASP&D so the plane of the sign face is parallel to the crossing (sign is facing perpendicular) and the arrow is pointing in the same direction as the crossing, not necessarily at the ramp. Notify the Engineer if there is any discrepancy or ambiguity between the plans and field conditions that prevent placement of the ASP&D as shown on the plan. Set the minimum sound levels of the locator tone and the audible walk indication when there is little or no ambient noise as in night time operation. Set the volume of audible walk indications and pushbutton locator tones to a maximum of 5dBA louder than ambient sound. The locator tone should be audible 6' to 12' (1.8 m to 3.6 m) from the pushbutton or to the building line, whichever is less. Confirm the volume of both audible walk indication and the locator tone increases with an increase in ambient sound and subsequently decreases when the ambient noise decreases.

If programming method is remote, by an infrared hand-held device, provide one device and operation manual for each intersection where APS&D is installed.

Method of Measurement:

This work is measured by the number of APS&Ds of the type specified, installed, tested, fully operational, and accepted.

Basis of Payment:

Payment for this work is based on the installation, inspection, successful completion of the 30 day test period, and final acceptance of the Accessible Pedestrian Signal and Detector of the type specified. Payment includes the sign, mounting brackets for adjacent buttons on the same structure, extension brackets, all necessary cable, all incidental materials, labor, tools, and equipment necessary to complete the installation. Payment also includes the warrantee, installation manual, and operation manual.

If programming method is remote by an infrared hand-held device, the total bid price of all APS&Ds includes one remote programming device and accompanying operation manual for each intersection where APS&D is installed.

Pay Item	Pay Unit
Accessible Pedestrian Signal and Detector (Type A)	Each

ITEM #1108118A - NEMA TS2, TYPE 2 TRAFFIC CONTROLLER AND CABINET

11.08.01 – Description: This item shall consist of furnishing and installing an actuated controller, which shall be a completely digital solid state unit, for controlling the operation of the traffic signals.

The controller shall be completely furnished with the number of phases called for in the item. The cabinet to house the controller shall be completely wired and all sub-bases shall be complete with load switches and flash relays as specified. The cabinet shall also have all necessary auxiliary equipment required to provide the sequence and timing indicated on the plans.

11.08.02 – Materials: All materials furnished, assembled, fabricated, or installed shall be new, corrosion resistant, and in strict accordance with the latest provisions set forth by the City of New Britain Specifications. All equipment furnished under this item shall be current production equipment, compatible with the City of New Britain's existing traffic signal system.

1. Controller: The controller shall be Model Number "980 ATC TS2, Type 2 Controller with Ethernet & USB" as manufactured by Trafficware. The controller shall be ATC and NEMA TS2 standards based. The controller shall be capable of providing complex phasing, detector processing, coordination, communications, adaptive timing and systems operation as a master or secondary controller.

   The Controller shall be equipped with LCD display and menu-driven software for programming and built-in diagnostics for evaluation of operational status. The controller shall have a flash memory which allows software upgrades without PROM replacement. The controller shall have a front panel mounted USB port to facilitate upgrades and file access. The controller shall be Ethernet-enabled to allow communication across a TCP/IP network.

2. Cabinet: Each controller assembly shall be completely wired and housed in a rigid metal cabinet with a painted color "CT Gray" finish. The cabinet shall be a NEMA P-44 Traffic Control Cabinet of clean-cut design and appearance and shall be substantially constructed of aluminum alloy. Door handle and hinges shall be stainless steel

   The cabinet shall be base mounted with approximate dimensions of 54" high x 44" wide x 26" deep. The cabinet shall have a single front door with #2 Corbins lock. The cabinet door shall have an auxiliary door which shall be equipped with a lock and a police key. Two keys shall be furnished for each lock. When closed, all doors shall fit tightly to neoprene gasket material.

   The cabinet ventilation shall include two intakes, exhausts, filtrations, two fans, and one thermostat assembly. Each electric fan shall be equipped with ball or roller bearings and with a capacity of at least 100 cfm. The fans shall be mounted inside the front top of the

cabinet ventilation holes. The fans shall be controlled by one manually adjustable thermostat.

One pullout drawer shall be provided mounted under the bottom shelf in the cabinet. The drawer shall be approx. 1" high x 13" deep x 16" wide and capable of holding 40 lbs in weight when the drawer is extended. This drawer shall have a flip up lid to place a laptop computer on top when extended while protecting any documentation in the drawer when the cabinet door is open.

3. Malfunction Management Unit: Malfunction Management Unit (MMU) shall be shelf-mountable, sixteen channel, LCD display, solid state Malfunction Management Unit. The MMU shall meet the following requirements:

   a. No circuit cuts shall be allowed on circuit boards in any of the equipment supplied. Any wire jumpers included on circuit boards shall be placed in plated through holes that are specifically designed to contain them. Jumpers that are tack soldered to circuit traces or are added to correct board layout errors are not acceptable.

   b. MMU shall have an Ethernet connector and shall be connected to the switch.

   c. All IC's with 16 or more pins shall be mounted in machine-tooled sockets. All sockets shall have two-piece, machined contacts and closed end construction to eliminate solder wicking. The outer sleeve shall be brass with tin or gold plating and tapered to allow easy IC insertion. The inner contact shall be beryllium copper sub plated with nickel and plated with gold. All sockets shall have thermoplastic bodies meeting UL Specification 94V-0. Other high quality sockets may be acceptable but must have prior approval of the Engineer. Sockets meeting alternate specifications shall be submitted in writing with the bids. Zero insertion force sockets will not be allowed.

   d. The design shall allow for removal or replacement of a circuit board without unplugging or removing other circuit boards.

   e. The unit shall be designed so that one side of each board can be completely accessible for troubleshooting and testing the unit while it is still operating. This may be accomplished with extender boards or cables. This need apply to only one circuit board at a time.

   f. No more than two circuit boards shall be attached to each other to constitute a circuit assembly. Attaching hardware shall use captive nuts or other acceptable method to secure the boards together. Alternate methods shall be submitted in writing with the bids. The boards shall be designed so that the purchaser can test and operate the controller unit with the boards separated.

g. If this specification is used to support the purchase of a complete controller assembly, the unused red circuits shall be connected to the AC Line in the controller cabinet.

h. A RS232 port shall be accessible from the front panel of the MMU. The RS232 port shall be compatible with portable computer and/or a PDA device that provides the following information:
   - Programming Report
   - Analyzer Report
   - History Report
   - Clear Report Logs
   - Download Real-Time Clock

   A RS232 Communication Cable shall be supplied to interface the MMU to the controller.

i. Each Malfunction Monitoring Unit shall have a unique serial number that is permanently and neatly displayed on the face of the unit. If this serial number is not on the face of the unit, then an additional temporary label that is neatly printed or typed shall be affixed to the MMU. The MMU supplied must be the Enhanced model with RS232 communication or City approved equal. 1 MMU shall be provided.

4. Auxiliary Equipment: All other auxiliary equipment, flasher units, load switches, wiring, fittings, and other cabinet requirements shall conform to the current edition of the State of Connecticut, Department of Transportation Functional Specifications for Traffic Signal Control Equipment.

11.08.03 – Construction Methods: The controller, mounted in controller cabinet, shall be installed at the locations shown on the plans in the following manner:

The cabinet shall have the base casting attached to the foundation and leveled before the cabinet proper is bolted to the base. A mastic type compound meeting the requirements of ASTM C647 shall be used between the cabinet and the base casting to make the two units rain-tight.

11.08.04 – Method of Measurement: This work will be measured for payment by the number of controllers completed, operating, and accepted in place.

11.08.05 – Basis of Payment: This work will be paid for a the Contract unit price each for "NEMA TS2, Type 2 Traffic Controller and Cabinet", which price shall include controller, controller cabinet, malfunction management unit, auxiliary equipment, wiring, miscellaneous fittings, paint and painting, and all materials, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
NEMA TS2, Type 2 Traffic Controller and Cabinet	EA

Article M.16.09 - Controllers: Add the following sub-articles:

The Connecticut Department of Transportation Functional Specifications for Traffic Control Equipment, current edition governs the material for the Controller Assembly. The Functional Specifications are advertised biennial for vendors to provide equipment to the State on a low bid basis. All underlined text indicates an addition or revision to these specifications from the previous version. The Functional Specifications are available on the Departments website.

Supplemental specifications listed below, have been added for material and controller operations which the Department of Transportation does not include in the Functional Specifications for Traffic Control Equipment.

U.C.F. Time Switch Flash Command Procedure
Time Clock/Time Base Installation Requirements
24 Volt Relay Type A
110 Volt Relay Type F
Type G
Time Delay Relay
Non-Actuated Advance Green Phase
Actuated Advance Green Phase
Non-Actuated Clearance / Lag Green Phase
Actuated Clearance / Lag Green Phase
Flashing Stop Ahead Sign
Max II Actuation By Pedestrian Call

UNIFORM CODE FLASH COMMAND PROCEDURE

1. Activate the **MINIMUM RECALL** input to the controller to ensure cycling prior to transferring to flashing operation.

2. Omit all non-actuated and actuated artery advance phases.

3. Omit phases 1 & 5 of all quad sequences.

4. Activate the **STOP TIME** input to the controller, upon entering flash, to prevent cycling.

5. Transfer to flash at the end of the last side street all red condition (at the point the artery **ON** output becomes active).

6. Special technical notes on the intersection plan supercede the above requirements.

TC/TBC INSTALLATION REQUIREMENTS

The following requirements are to be observed when engineering the installation of TC/TBC:

1 a. Circuit 1 shall be designated FLASH and be reserved for night flash command.
b. Circuit 2 shall be designated MAX 2 and be reserved for Max 2 command.
c. Circuit 3 shall be designated COORD and shall select coordinated operation of the intersection.
d. Circuit 4 shall be the yield, and force off command to the controller.

2. All clock outputs shall be active to select the function specified. For example; If the TC/TBC were removed for repair, no inputs would be applied to the controller. The intersection will then operate non-coordinated, in Max 1. Programming the TC/TBC without cycle and offset is not an acceptable method to create a non-coordinated operation. Refer to the typical hookup diagram.

3. All TC/TBC clock installations shall be wired as detailed in figure 1. This method is used for both full and semi actuated operation.

4. Midnight resync shall occur at 12:00 AM.

5. A program card shall be completed indicating all input steps and settings. Four copies shall be provided. One copy left in the cabinet. Three delivered to the engineer along with the cabinet wiring diagrams.

TIME CLOCK / TIME BASE COORDINATION

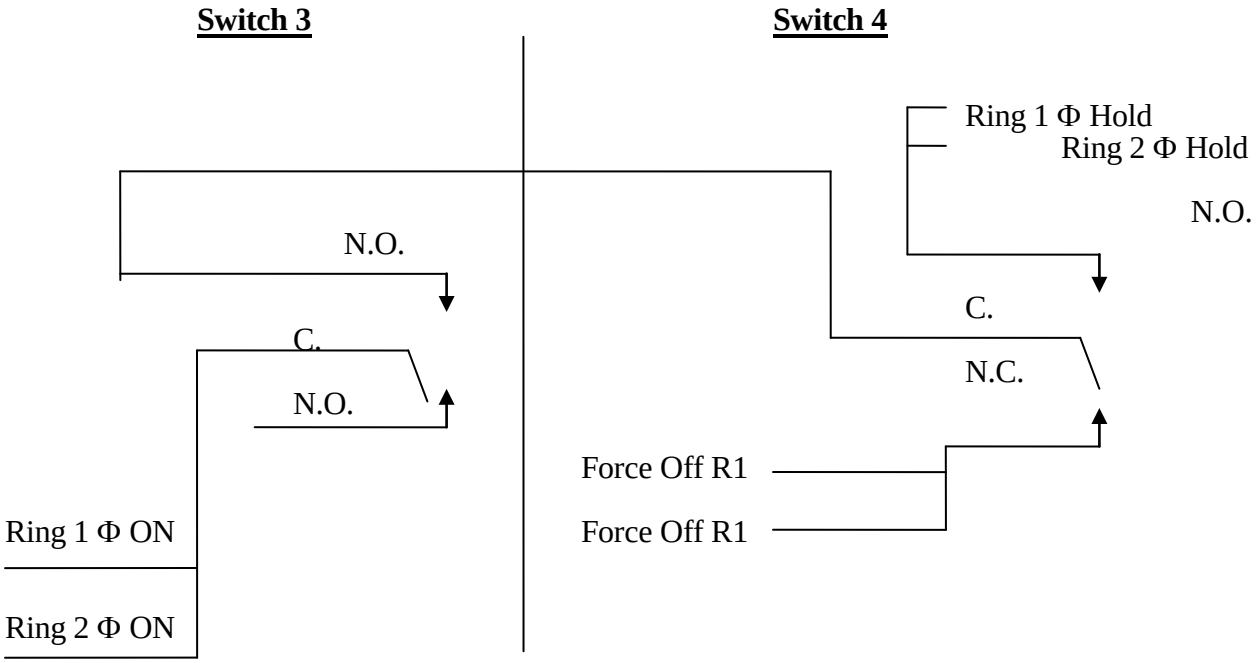


FIG. 1

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24 VOLT RELAY

All 24 Volt relays shall meet the requirements of one of the following two types. Diodes shall be installed across the coils of all direct current relays to shunt the reverse voltage generated when the coil de-energizes. All diodes shall be general purpose ECG 125 1000prv @ 25A or equivalent, rated at least .5 amp forward biased. Diodes shall be external to the relay, not enclosed in the dust cover.

TYPE A: Midland Ross, Midtex 155-92 or equivalent.

DESCRIPTION:
This relay shall be enclosed in a clear polycarbonate removable dust cover. It shall have a mechanical life of more than 100,000 operations at rated load.

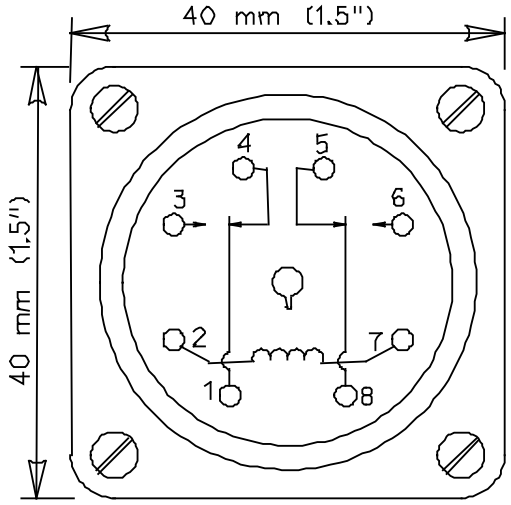
CONTACTS:
The contacts shall be 2 form C (D.P.D.T), U.L. rated at 5 amps 120 volts A.C. The contacts shall be pure fine silver (gold flash). There shall be no tungsten (lamp) load on the contacts of this relay.

COIL: The coil shall operate on 24 V.D.C. and have no less than 450 OHMS impedance.

SIZE: The relay shall be no larger than 65mm(2.5") H x 40mm(1.5") L x 40mm(1.5") W.

BASE: This relay shall have an eight pin octal plug-in base with the pin designation shown below:

1. Common (1)
2. Coil
3. Normally open (1)
4. Normally closed (1)
5. N.C. (2)
6. N.O. (2)
7. Coil (2)
8. Comm.



Bottom View And Wiring Diagram

SOCKET: The socket shall be a closed back, screw terminal type. The front mounted screws shall be 6-32 capable of accepting #14 AWG wire.

Rev. 2/14/2018

110 VOLT RELAY

All 110 volt relays shall meet the requirements of one of the following two types. Across the coil of each relay there shall be a molded suppressor rated at .1uf - 47 ohm @ 600V to suppress electrical noise created by the energization / de-energization of the relay.

TYPE F: Midland Ross, Midtex 136-62T3A1 or equivalent

DESCRIPTION:

Relays of this type shall function as flash transfer, power switching and signal drive. Other uses are acceptable, however, type G relays cannot be used for the above applications.

CONTACTS:

The contacts shall be in the D.P.D.T. form and consist of 10mm(3/8") diameter silver cadmium oxide, rated at 20 Amps @ 117 VAC resistive.

COIL:

The coil shall operate on 110 VAC. No semi-conductors will be allowed in the coil circuit of this relay.

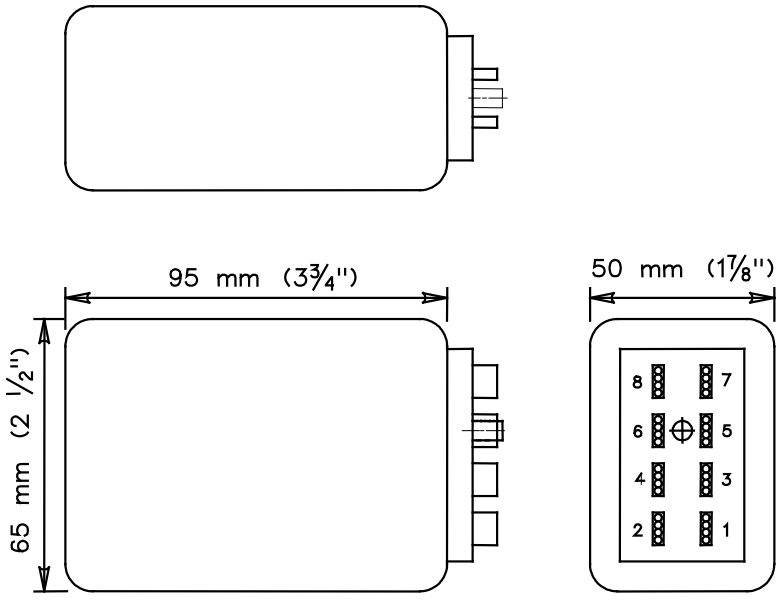
SIZE:

The relay shall be enclosed in a clear plastic dust cover. The overall dimensions shall be no larger than 63mm(2 1/2") x 94mm(3 3/4") x 47mm(1 7/8") as illustrated below.

BASE:

This relay shall have an eight blade plug-in base, Ventron Beau Plug P-5408 or equivalent with the pin designations as shown below:

1. Coil
2. Coil
3. N.C. 1
4. N.C. 2
5. Comm. 1
6. Comm. 2
7. N.O. 1
8. N.O. 2



SOCKET:

The socket shall be Ventron Beau Plug S-5408 or equivalent, contacts rated at 15 Amps @ 1750 VRMS.

TYPE G: Magnecraft, W 88 ACXP-8 or equivalent

DESCRIPTION:

Relays of this type shall function in low current switching applications such as interconnect interface or pre-emption circuits. A clear polycarbonate plastic enclosure shall cover the relay mechanism.

CONTACTS:

The contacts shall be in the D.P.D.T. form and consist of 5mm (3/16") diameter gold flashed, silver alloy, rated at 10 Amps @ 120 VAC resistive.

COIL:

The coil shall operate on 120 Volts AC and require a nominal 3 VA.

SIZE:

Height, length and width dimensions shall be the same as the 24 volt relay Type A: 35mm (1 3/8") x 60mm (2 3/8") x 35mm (1 3/8").

BASE:

The base shall be an octal plug with the pin designations the same as the 24 volt relay Type A.

SOCKET:

The socket shall be the same as that for the 24 volt relay Type A.

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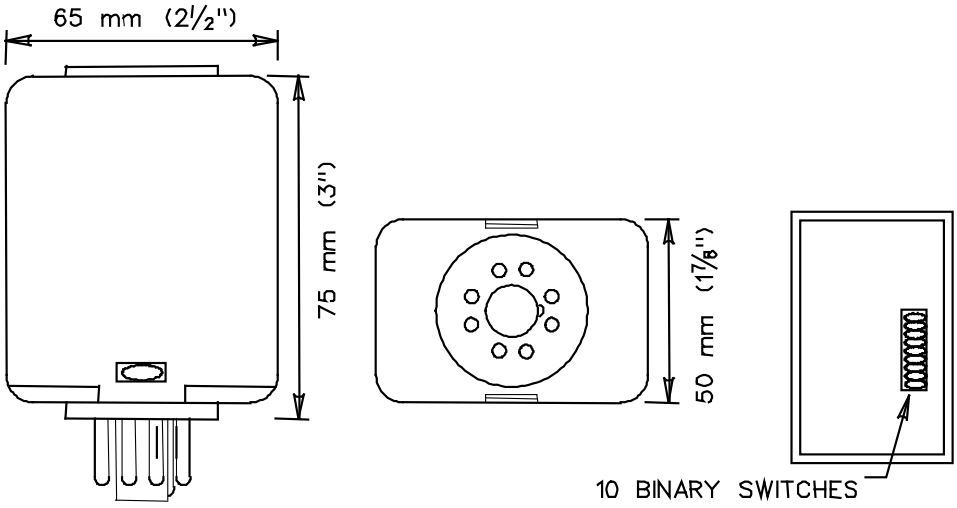
TIME DELAY RELAY

120 VAC SSAC TDM120A or equivalent
24 VDC SSAC TDM24DL or equivalent

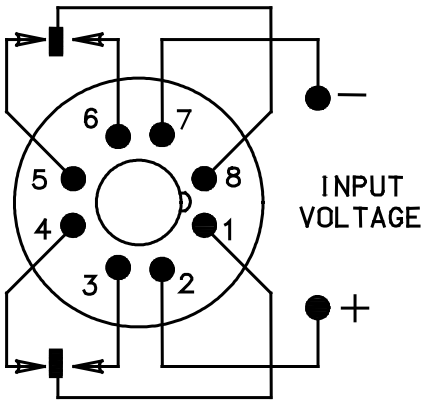
DESCRIPTION:

The time delay relays shall be self enclosed, plug-in, delay on operate type. They shall be digitally timed and adjustable by the use of dip switches located on the top of the case. The timing range shall be 1 to 1023 seconds in 1 second intervals. The time delay relays shall have an internal double pole double throw relay with form "C" contacts rated at 10 amps 120 volts AC. They shall operate accurately in a temperature range of -20 to +65 degrees C. A 120 volt AC input shall initiate timing of the 120 VAC TDR and a 24 VDC input shall initiate timing of the 24 VDC TDR. Removal of the input voltage shall reset the timer. Maximum dimensions of the case shall be as shown below.



SOCKET:

The socket shall be a standard octal base (8 pin) with screw terminal connectors. The pin designation shall be as shown below.



OCTAL (8 PIN) BASE

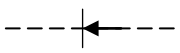
NON-ACTUATED ADVANCE GREEN PHASE

Where the timing and sequence indicates an advance green phase that always precedes the phase in recall (usually phase 2), and that either is fixed timed or is to be extended only, the following guidelines shall be in effect:

1. The parent phase ON output shall be diode connected to the advance phase OMIT input.

2. If the advance phase is to be extendable, it shall be in minimum recall. If the advance phase is fixed timed, it shall be in maximum recall. A different advance time may be selected by switching to maximum 2.

Example: Phase 1 is the advance phase (extendable), in minimum recall.
Phase 2 is the artery, in recall.
Phase 4 is the minor street, in non-lock.

Phase 2 ON  Phase 1 OMIT

Where the timing and sequence indicates an advance phase that is fixed timed (not extendable), and that always precedes either a phase other than phase 2 or a phase not in recall, the following guidelines shall be in effect:

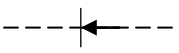
1. The recall phase (usually Phase 2) ON output shall be diode connected to the advance phase's, parent phase OMIT input.

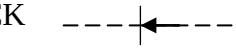
2. The parent phase CHECK output shall be diode connected to the advance phase vehicle detector input.

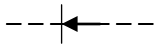
3. The advance phase ON output shall be diode connected to the following parent phase vehicle detector input. This is to insure a green indication on the parent phase.

4. The advance phase shall be in the non-lock mode. The advance time shall be selected from the maximum interval.

Example: Phase 2 is the artery, in recall.
Phase 3 is the advance for phase 4, in non-lock mode.
Phase 4 (parent phase) is the minor street, in non-lock mode.

Phase 2 ON  Phase 4 OMIT

Phase 4 CHECK  Phase 3 vehicle detector

Phase 3 ON  Phase 4 vehicle detector

ACTUATED ADVANCE GREEN

Where the timing and sequence indicates an advance green phase that is to be extended only, and is to always precede either a phase other than phase 2 or a phase not in recall, the following guidelines shall be in effect:

1. The phase ON outputs of all phases that could precede the advance phase, shall be diode connected to the parent phase OMIT input.

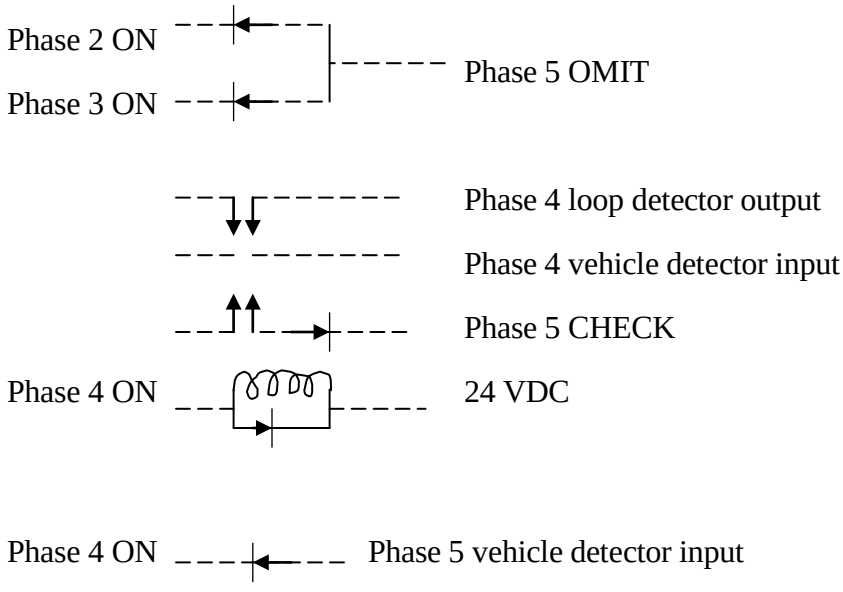
2. The parent phase CHECK output shall be diode connected, through the normally closed contacts of a relay, to the advance phase vehicle detector input. The advance phase loop detector output shall be connected to the normally open contacts.

3. The relay coil shall be energized by the advance phase ON output, which in turn will switch the vehicle detector input from the parent phase CHECK circuit to the loop detector.

4. The advance phase ON output shall be diode connected to the following parent phase vehicle detector input. This is to insure a green indication from the parent phase.

5. The advance phase shall be in the non-lock mode.

Example: Phase 2 is the artery, in recall.
Phase 3 is the pedestrian phase.
Phase 4 is the advance for phase 5, in non-lock.
Phase 5 (parent phase) is the minor street, in non-lock.



The 24 volt relay shall be Type C as previously described in these specifications.

NON-ACTUATED CLEARANCE PHASE

NON-ACTUATED LAG GREEN PHASE

Where the timing and sequence indicates a non-actuated clearance phase or a lagging green phase that always follows the phase in recall, the following guidelines shall be in effect:

1. The parent phase ON output shall be diode connected to all appropriate phase OMIT inputs except the clearance phase.

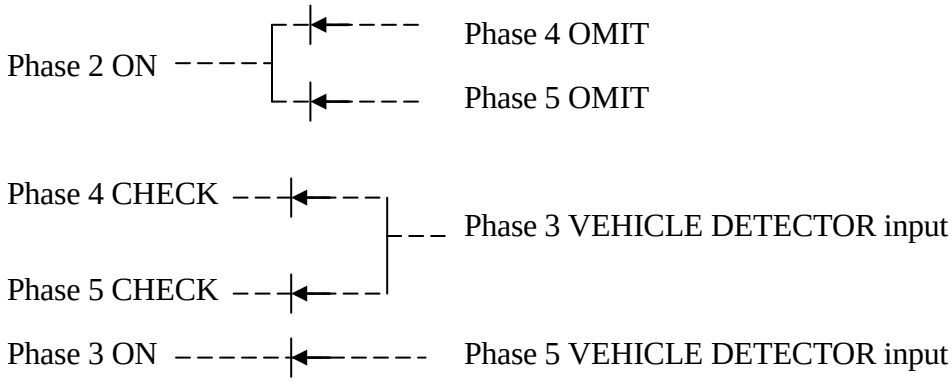
2. The remaining actuated phases shall have their CHECK outputs diode connected to the clearance phase vehicle detector input.

3. The clearance phase ON output shall be diode connected to the following phases vehicle detector input (if the phase is in non-lock mode). This will prevent the controller from returning to the parent phase from the clearance phase without servicing the minor street.

4. The clearance phase shall be in the non-lock mode.

5. The clearance, or lag green time shall be selected from the maximum interval.

Example: Phase 2 is the artery, in recall.
Phase 3 is the clearance phase, in non-lock.
Phase 4 is the pedestrian phase.
Phase 5 is the minor street, in non-lock.



Where the timing and sequence shows a non-actuated clearance phase or lagging green phase following either a phase other than phase 2 or a phase not in recall, the following guidelines shall be in effect:

1. The parent phase ON output shall be diode connected to the following clearance phase vehicle detector input. This insures the clearance phase will always follow the parent phase.

2. The clearance phase shall be in the non-lock mode.

3. The clearance, or lag green time shall be selected from the minimum green interval.

ACTUATED CLEARANCE PHASE

ACTUATED LAG GREEN PHASE

Where the timing and sequence indicates an actuated lagging green phase that is to be extended only, and always follows another phase, the following guidelines shall be in effect:

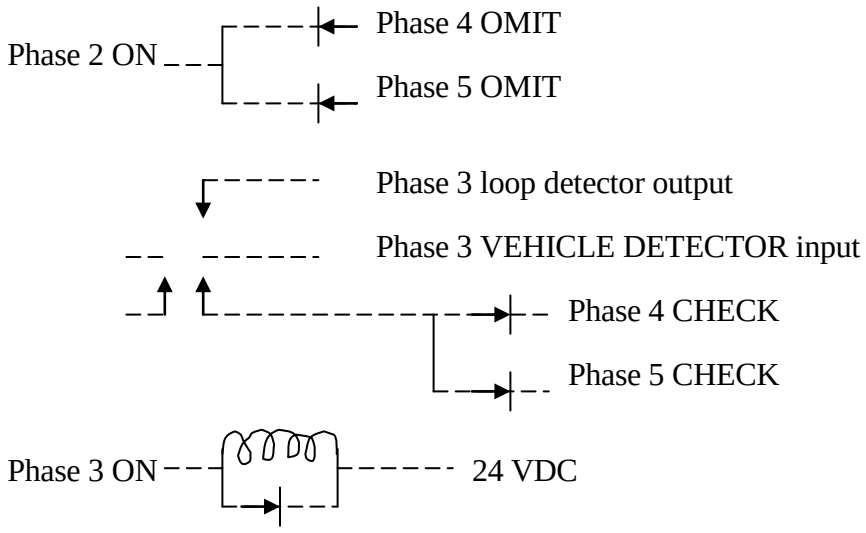
1. The parent phase (usually phase 2) ON output shall be diode connected to the phase OMIT inputs of all phases that could follow the lag phase.

2. The CHECK outputs of all phases that could follow the lag phase shall be diode connected, through the normally closed contacts of a relay, to the lag phase vehicle detector input. The lag phase loop detector output shall be connected to the normally open contacts.

3. The relay coil shall be energized by the lag phase ON output which in turn will switch the phase detector input from the CHECK circuits to the loop detector.

4. The lag phase shall be in the non-lock mode.

Example: Phase 2 (parent phase) is the artery, in recall.
Phase 3 is the lag phase, in non-lock.
Phase 4 is the pedestrian phase.
Phase 5 is the minor street, in non-lock.



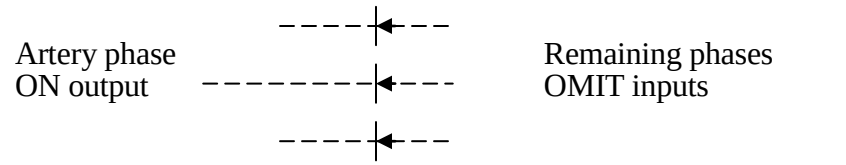
The 24 VDC relay shall be Type C as previously described in these specifications.

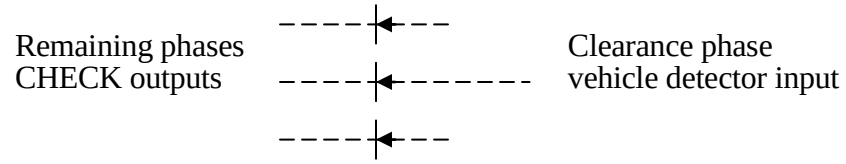
FLASHING STOP AHEAD SIGN

Where the timing and sequence indicates a flashing stop ahead sign, the clearance interval following the phase that the sign is off shall be timed by the following method.

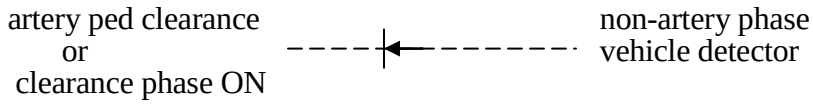
The following phase shall be used for the clearance time. These phases shall be overlapped. The green indication will be maintained by the overlap feature and the following phase green time will be the stop ahead sign clearance.

The artery phase ON output shall be diode connected to all other phase OMIT inputs except the clearance phase and the artery phase. The CHECK outputs from the remaining phases (as needed) shall be diode connected to the sign clearance phase vehicle detector input. The clearance phase shall be in the non-lock mode.

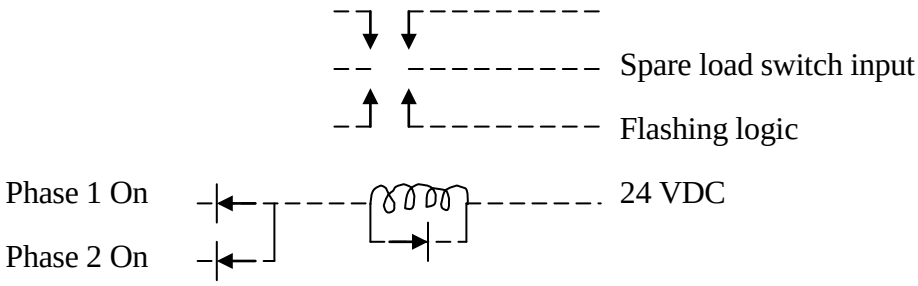




If the non-artery phases are in the non-lock mode, a call must be forced to the non-artery phase once the controller leaves the artery Hold interval (either artery walk or artery green). This prevents a false "Stop Ahead" indication if a vehicle turns right on red during the flashing sign clearance interval.



Unless otherwise shown on the plans, the 110 VAC flash power shall be from a spare load switch in the controller cabinet. The load switch input shall be driven with the flashing logic output from the controller. The flashing logic output shall be disconnected from the load switch during the intervals the sign is inactive.



Typical drive circuit for “WHEN FLASHING STOP AHEAD” sign

TIME BASE COORDINATION
MAX II ACTUATION BY PEDESTRIAN CALL

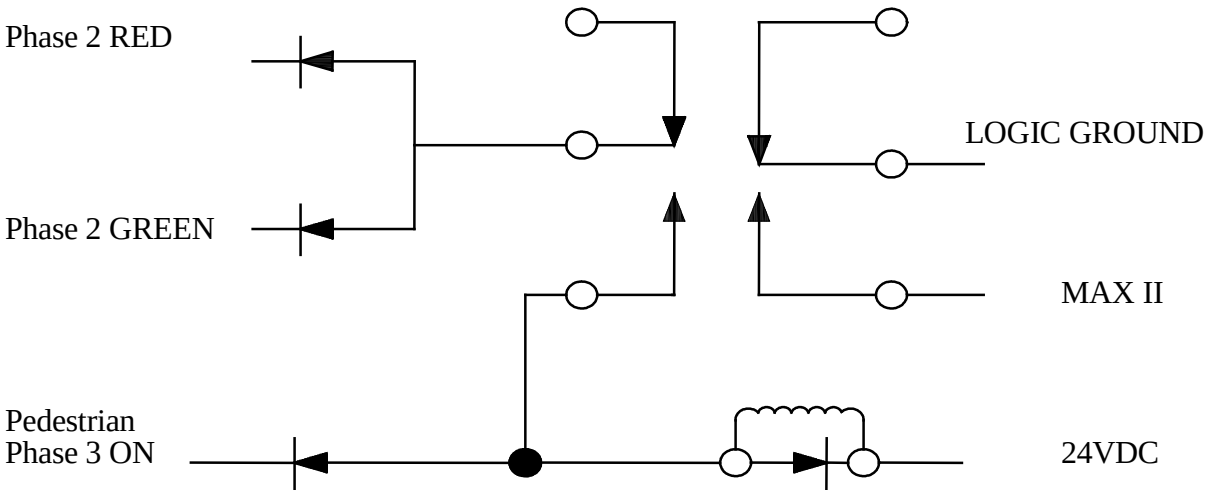
When the sum of the split times, including the walk and don't walk, exceed the background cycle length, the designer may choose to either allow a double cycle of the background timer or reduce the phase timings when the ped phase is called. Reduction of the phase timing by switching to MAX 2 avoids double cycling.

Where indicated on the plans the exclusive pedestrian phase will call MAX II. The minor movement max 2 times are set low so that the total phase times do not exceed the coordination cycle length.

Install a 24 volt relay connected to the inputs and outputs as shown on the following schematic.

Operation: When the controller advances to the exclusive pedestrian phase, the relay is actuated and latched. MAX II timing is selected for one complete cycle, until the relay is unlatched by the artery yellow (absence of red or green).

Example: Phase 2 is the artery. Phase 3 is the exclusive pedestrian phase.



ITEM #1108727A – PHASE SELECTOR (AUDIO)

ITEM #1112207A – SIREN DETECTOR

System Description:

The emergency vehicle priority system shall enable an emergency vehicle to remotely cause the traffic signal controller to advance to and/or hold a desired traffic signal phase.

The system shall consist of the following components:

Siren Detector
Phase Selector (Audio)

Material:

All system components shall meet or exceed NEMA TS1 and TS2 environmental specifications.

Siren Detector

The acoustical siren detector (SD) shall be a lightweight, weatherproof, highly directional microphone capable of sensing and transforming audible siren sound energy into electrical signals useable by the phase selector. The unit shall include a single 45-ohm microphone, which provides high directional discrimination. Microphone mounting hardware shall allow for full 360-degree alignment on a traffic standard, mast arm, pedestal, wood pole or span wire application. The microphone shall be responsive to a siren that produces a nominal sound pressure level of 120-db spell at a 10-foot distance from the vehicle.

1. The siren detector shall be capable of recognizing three different and distinct types of signals: Yelp, Wail and Hi-Lo.

2. Shall operate over an ambient temperature range of minus 40^{O} C to plus 85^{O} C. (minus 40^{O} F. to plus 185^{O} F.)

3. Shall have internal circuitry potted in a semi-flexible compound to ensure moisture resistance.

4. Shall operate in 0 to 95 % humidity.

5. Shall have a cone of detection of not more than 13 degrees. The detector shall not sense a pre-emption signal from a siren outside this cone.

Phase Selector (AUDIO)

The Phase Selector (PS) supplies power to and receives electrical signals from the siren detector.

The PS shall be capable of assigning priority traffic movement to one of two channels on a first-come, first-serve basis. Each channel is connected to the appropriate pre-emption input of the traffic controller. Once a call is recognized, "commit to green" circuitry in the PS functions so that the desired pre-emption call will be obtained even if siren communication is lost. After serving a priority traffic demand, the PS unit will release the controller to follow normal sequence operation.

The PS shall consist of a standard 4.500" x 6.875" three-slot stand-alone card rack with a signal processor card and a microphone interface card. The signal processor shall have switches for manual pre-emption and an RS-232 port for communications via a laptop computer. The third slot shall accept an optional Confirmation Light driver card when specified. When not specified the slot shall have a cover to prevent dirt, moisture etc. from entering the card rack. All input and output signals shall be interfaced from the chassis rear via 44 contact backplane connectors.

1. Shall include an internal power supply to supply power to the SD.

2. Shall have minimum two-channel operation with the capability of interfacing with an additional phase selector for expansion of channels of operation.

3. Shall have adjustable detector range controls for each channel of operation, from 12M (40 feet) to 548M (1800 feet).

4. Shall have solid state indicator lights for power on and channel called.

5. Shall operate over an ambient temperature range of minus 34^{O} C to plus 60^{O} C (minus 30^{O} F. to plus 140^{O} F.)

6. Shall operate in 0 to 95 % humidity.

System Operation:

A. The pre-emption sequence shall be initiated when the directional SD receives the required acoustical signal from the EV siren. The SD converts the siren's acoustical signal into an electrical signal that is sent to the PS.

B. The PS produces a ground-true output that is connected to the appropriate traffic controller pre-emption input.

C. The traffic controller begins the pre-emption run as shown on the plan and as programmed in the controller.

D. A SD facing away from the approaching EV shall sense the change in siren audible level when the EV passes through the intersection. The PS shall then terminate the pre-emption call within 10 seconds. If the EV does not pass through the intersection or if

the siren is turned off, the PS shall automatically terminate the pre-emption call after 45 seconds.

E. The PS shall not respond to acoustical signals from an EV if it is already processing acoustical signals from another emergency vehicle.

System Interface:

System shall be capable of operating in a computerized traffic management system when the computer supplier provides appropriate interfacing.

Construction Methods:

General:

The Contractor shall furnish the manufacturer the phasing diagrams indicating controller sequence and timing and proposed SD locations. Detector and CL locations shown on the plan are for illustration purposes only. The manufacturer or his designated representative shall be responsible for final location of SD's and CL's; determining and setting the optimal range for the emergency vehicle pre-emption system; conducting system test.

The Contractor shall secure from the manufacturer a guarantee for the equipment for a period of sixty (60) months, which time shall commence from the date of delivery. Manufacturer shall certify upon request that all materials furnished will conform to this specification.

All equipment shall be installed and wired in a neat and orderly manner in conformance with the manufacturers' instructions.

Traffic signals owned and maintained by the State that have pre-emption equipment owned and maintained by the town shall have an Auxiliary Equipment Cabinet (AEC) attached to the controller cabinet. The pre-emption equipment shall be housed in the AEC. Traffic signals owned and maintained by the town do not require an AEC to house the pre-emption equipment.

Detector cables shall be continuous with no splices between the siren detector and the AEC.

If not present in an existing traffic controller cabinet, the following items shall be installed and connected, in conformance with the current Functional Specifications for Traffic Control Equipment, "D" Cabinet Requirements (Pre-emption Type):

- Controller "D" harness and adapter.
- Pre-emption termination panel with terminal block and relay bases.
- Pre-emption disconnect switch, mounted on the emergency switch panel (on inside of cabinet door).
- Pre-emption test buttons, mounted on the pre-emption termination panel.

All connections from the phase selector to the "D" harness and to the cabinet wiring shall be made at the termination panel. The termination panel shall have AC+ Lights, AC-, and a switched logic ground. The switched logic ground feeds all the pre-empt inputs to the controller unit. When switched off by the pre-emption disconnect switch, the traffic controller shall not be affected by pre-empt calls from the pre-emption system. A minimum of two test buttons shall be provided. If there are more than two pre-empt runs, a button for each shall be installed. Program

the traffic controller to the pre-emption runs as shown on the plans. A chart or print out indicating the program steps and settings shall be provided along with the revised cabinet wiring diagrams.

Pre-emption System Test:

1. Notify the system owner/user, such as the municipal fire chief or public works director, of the scheduled inspection.

2. Request a fire department representative and an emergency vehicle, which has a siren to conduct the test. If not available, the contractor shall provide a siren.

3. In the presence of the Engineer and the municipal representative, test each pre-empted approach with the emergency vehicle. Test the following items of the system:

    * Confirm that the siren activates the phase selector and the PS activates the correct pre-emption input to the controller.

    * Confirm adequate range. The traffic signal must be pre-empted to green sufficiently in advance of the emergency vehicle arrival. The vehicle siren shall initiate pre-emption at a minimum distance of 548.6M (1800 feet).

    * Confirm there are no false calls. Keep the siren active as the emergency vehicle passes through the intersection. No other detectors shall initiate a pre-emption run and the pre-emption call shall terminate after 10 seconds.

4. Document the test. Provide the Engineer and the municipality copies of the test results.

If a malfunction is found or the system needs adjustment (such as range, siren intensity, or detector location), schedule a follow-up test. Repeat the above steps for all approaches that did not pass.

Method of Measurement:

Detectors and Phase Selector will be measured for payment by the number of each supplied, installed and accepted.

Basis of Payment:

Payment for Siren Detectors will include the item unit cost, including all manufacturer's required mounting hardware and the cost of installation and supervision by the manufacturer or his designated representative, including travel and subsistence, and all materials, equipment and labor incidental thereto. Payment for Phase Selector (Audio) will include the card rack with signal processor card and microphone interface card, operation manual, parts list and warrantee. When needed, payment for the phase selector shall also include the termination panel, “D” harness, test buttons, program chart (or print out) and revised cabinet wiring diagrams.

Pay Items	Pay Units
Phase Selector	Ea.
Siren Detector	Ea.

ITEM # 1108843A – 12-POSITION WALL MOUNTED FIBER OPTIC PATCH PANEL

Description:
The 12-Position Fiber Optic Patch Panel shall be used for the termination of fiber optic cables within field cabinets. The Patch Panels shall consist of the following main components:

- Patch Panel Housing
- Connector Modules

Materials:

Patch Panel Housing
The patch panel housings shall be rack or shelf mountable and shall provide for the cross-connecting or inter-connecting of fibers. The patch panel housing shall allow for the mounting of multiple connector modules. The units shall provide for direct connectorization and pigtail splicing.

Rack-mountable housings shall be mountable in an EIA-310 compatible 465 or 592 mm (19" or 24") rack. The unit shall be modular with separate splicing, connector, jumper management and combination connector /splicing housings available. The unit shall be mounted with a 120 mm (4.75") frontal projection, with the option to flush mount. The unit shall not exceed a depth requirement of 305 mm (12").

The unit shall meet the design requirements of ANSI/TIA/EIA-568 and the plastics flammability requirements of UL 94 V-0.

Housings shall be manufactured using 16 gauge aluminum or equivalent for structural integrity and shall be finished with a wrinkled black powder coat for durability. Installation fasteners shall be included and shall be black in color.

The unit shall have patch cord routing guides that allow a transition and segregation point for jumpers exiting the sides of the housing.

The unit shall accommodate a 12-Position port count.

The unit shall include a clamshell-type cable clamping mechanism to provide cable strain relief. The cable clamp shall accept one cable from 0.735 TO 1.125 inches (9.5 to 28.6 mm) in diameter. The cable clamp mechanism shall also handle multiple smaller fiber count cables when used with the multiple cable insert. The total cable capacity per clamp shall be five cables ($\leq$ 0.4 in/10.2mm OD) when used with the multiple cable insert. Housing cable clamp capacity shall be two clamps for the 12-position fiber optic patch panel housings. Additional cable clamps shall be available as an accessory kit.

The 12-position fiber optic patch panel housings shall utilize a slide-out tray for connector access. These connector housings shall have metal front and rear doors and jumpers shall route out the sides of the housing. Front and rear doors shall utilize a set of swell latches to provide ready access and closing. The front and rear doors shall be lockable when used with an optional key lock kit.

The connector housings shall have a labeling scheme that complies with ANSI/TIA/EIA-606.

Provisions for the mounting of fiber optic fan-out kits shall be incorporated into the housing.

Connector Modules

A connector module is defined as a modular removable case containing optical fiber connector adapters and provisions for strain-relief, slack storage, and the furcation of fiber optic cables. The connector module shall have the following characteristics:

The connector panel shall utilize a single mounting footprint and shall be available with three, four, six, eight or twelve connector adapters in each panel. The panel shall be attached with two push-pull latches to allow quick installation and removal.

Blank connector panels shall be available to fill unused space within the housings. The blank connector panel shall be attached with at least two push-pull latches to allow quick installation and removal. Housings shall be supplied with blank connector panels for all available positions unless the housing is ordered with optical fiber adapters or copper jacks pre-installed. The blank panels shall be manufactured from injection molded polycarbonate and shall be finished with a wrinkled black texture to match the housing.

Connector modules shall be manufactured from 16 gauge cold rolled steel or injection molded polycarbonate for structural integrity.

Connector modules shall be finished with a wrinkled black texture to match other hardware.

The connector module shall consist of a panel incorporated into a protective case with a removable cover for access to the interior connectors and fibers.

The 12-Position Fiber Optic Patch Panel shall include a total of two connector modules with six Type SC single mode connectors on each. Connectors shall be field mountable and shall not exceed 0.15 dB loss rating.

Pigtails

The 12-Position Fiber Optic Patch Panel shall include and be capable of terminating up to 12 connectorized pigtails. The pigtails shall be factory made. The Patch Panels shall use connectorized pigtails to connect the 12 strand fiber optic cable entering the field cabinet to the patch panel connectors. The Contractor shall furnish pigtails and splice them to the fiber optic cables. The fiber optic strand of the connectorized pigtail shall have matching optical properties as the fiber optic strand used on the fiber optic cable.

All splices shall be fusion type. All strands of all fiber optic cables shall be spliced to pigtails and terminated on the patch panel. The Contractor shall provide all equipment and consumable supplies necessary for performing the splices. Prior to the start of each shift, fusion splicing equipment shall be cleaned, calibrated and specifically adjusted to the present fiber and environmental conditions. Splice enclosures, tools and procedures, shall be approved by the cable manufacturer as being compatible with the cable type being delivered.

Each spliced fiber shall be packaged in a protective waterproof sleeving. Bare fibers shall be completely re-coated with a protective room temperature vulcanizing (RTV) coating gel or similar approved substance, prior to application of the sleeve, so as to protect the fiber from scoring, dirt or microbending.

Average splice loss shall not exceed a mean of 0.1 dB. If a splice is measured to exceed 0.15 dB during the splicing process, it shall be remade until its loss falls below 0.15 dB. Each attempt shall be recorded for purposes of acceptance.

All splice losses shall be recorded in tabular form and submitted to the Engineer for approval. An optical time domain reflectometer (OTDR) shall be used to record splice loss, and chart recordings of the “signature” and shall be submitted with the splice data with a record of all OTDR settings and the OTDR locations written on the trace.

The Contractor shall supply and install a shelf or rack mounted splice tray housing as directed by the Engineer and two splice trays. The Patch Panel shall include a restraining system to hold the splice trays securely in place.

The splice trays shall each accommodate twelve single mode fusion splices. All of the splice trays shall be used to connect all strands of the 12 strand fiber optic cable entering the field cabinet to the patch panel connectors. The splice trays meeting the following requirements:

The splice trays shall incorporate a system to retain and provide strain relief to the fiber optic buffers tubes and connector pigtails. The splice trays shall incorporate grooves where the fiber optic splice can be held in place. Each splice tray shall incorporate a snap on lid.

The 12-Position Fiber Optic Patch Panel shall incorporate cable guides that maintain fiber strands and fiber buffer tubes bending radius greater than the minimum allowed by the manufacturer.

The 12-Position Fiber Optic Patch Panel shall incorporate a restraining mechanism to hold the fiber optic cable central member and outside jacket.

Environmental Requirements:

All equipment shall be certified to operate over a temperature range of -20° C to +60° C with a relative humidity of 10% to 95%, non-condensing.

Construction Methods:

Installation

The installation of the 12-Position Fiber Optic Patch Panels shall conform to all the manufacturer's recommended installation procedures and as described in this specification. The manufacturer's installation procedures shall supersede in the case of conflicting details.

The Contractor shall install the 12-Position Fiber Optic Patch Panels in the field cabinets as directed by the Engineer. The Contractor shall provide and install all interconnection fiber optic patch cords between the optical equipment in the cabinet, as shown on contract documents. Sufficient lengths of cable between the patch panel and the optical equipment installed in the rack shall be coiled in the equipment cabinet to allow the splice closures to be removed from the cabinet for splicing.

Submittals

In addition to the submittal requirements specified elsewhere, the Contractor shall submit the following:

- Product data, installation manuals, materials, system configuration options and features, and accessories for the 12-Position Fiber Optic Patch Panels.
- Shop Drawings shall be completely dimensioned and shall indicate the intended installation method and details for the 12-Position Fiber Optic Patch Panels.
- "As-built" installation prints and equipment manuals for the 12-Position Fiber Optic Patch Panels.

Delivery, Storage, and Handling

The Contractor shall deliver, store, handle and install all materials and equipment in such a manner as not to degrade quality, serviceability or appearance. The Contractor shall be responsible for storage of the materials and equipment prior to installation in a clean, dry location free from construction dust, precipitation and excess moisture. The Contractor shall replace any damaged materials and equipment, at no additional cost.

Manufacturer's Requirements

A minimum of ten (10) year's experience in the design, manufacture, and testing of the 12-Position Fiber Optic Patch Panels is required. The equipment shall be designed and manufactured according to world class quality standards. The manufacturer shall be ISO 9001 certified.

Method of Measurement:

This item shall be measured for payment for each installed 12-Position Fiber Optic Patch Panel complete, as specified and shown on the drawings and these specifications

Basis of Payment:

The unit price bid for each 12-Position Fiber Optic Patch Panel shall include the cost of furnishing all labor, materials, tools and equipment necessary to complete the work. Payment for all miscellaneous hardware, cabling, necessary documentation, and testing shall be included under this item.

Pay Item:	**Unit:**
12-Position Fiber Optic Patch Panel	EA

ITEM NO. 1111201A – TEMPORARY DETECTION (SITE NO. 1)

Description:

Provide a Temporary Detection (TD) system at signalized intersection throughout the duration of construction, as noted on the contract plans or directed by the Engineer. TD is intended to provide an efficient traffic-responsive operation which will reduce unused time for motorists travelling through the intersection. A TD system shall consist of all material, such as pedestrian pushbutton, accessible pedestrian signal, conduit, handholes, cable, messenger, Video Image Detection System (VIDS) and any additional components needed to achieve an actuated traffic signal operation.

Materials:

Material used for TD shall be installed by the Contractor and in good working condition and turned over to the City of New Britain upon completion of the contract. TD material will not become part of the permanent installation.

Construction Methods:

The work for this item includes furnishing, installation, relocating, realigning, and maintaining the necessary detection systems as to provide vehicle and pedestrian detection during each phase of construction. If not shown on the plan, program the TD modes (pulse or presence) as the existing detectors or as directed by the Engineer. The TD method shall be via VIDS and must be indicated on the TD Plan submission.

The traffic signal plan-of-record, if not in the controller cabinet will be provided upon request. Ensure the controller phase mode (recall, lock, non-lock) and phase timing are correct for the TD. Adjust these settings as needed or as directed by the Engineer.

At least 30 days prior to implementation of each phase of construction submit a TD proposal to the Engineer and the City of New Britain for approval. Submit the TD proposal at the same time as the Temporary Signalization plan. Indicate the following information for each intersection approach:

- Phase Mode
- Temporary Detection Method (VIDS)
- Area of Detection
- Detector Mode

Submit the proposed temporary phase timing settings and the TD installation schedule with the TD proposal. See the example below.

Example Proposed Temporary Detection and Timing

Site 1

Warren, Rt. 45 at Rt. 341, Location #149-201

Approach	Phase	Phase Mode	TD Method	Area of Detection	Det Mode
Rt. 45 NB	***2***	***Min Recall***	***VIDS***	***150' from Stop Bar***	***Pulse***
Rt. 45 SB	***2***	***Min Recall***	***SPVD***	***150' from Stop Bar***	***Pulse***
Rt. 341	***4***	***Lock***	***Microwave***	***30' from Stop Bar***	***Pulse***
Rt. 341	***4***	***Lock***	***Pushbutton***	***At SE & SW corners***	***n/a***

Temporary Phase Timing Settings:

Phase	Min	Ped	Ped Clr	Ext	Max 1	Max2	Yel	Red
2	***20***	***0***	***0***	***6***	***45***	***60***	***4***	***1***
4	***14***	***7***	***9***	***3***	***27***	***35***	***3***	***1***

Scheduled TD: ***July 4, 2011***

Site 2

Scotland, Rt. 14 at Rt. 97, Location #123-201

Approach	Phase	Phase Mode	TD Method	Area of Detection	Det Mode
Rt. 15 WB Left Turn	***1***	***Non-Lock***	***VIDS***	***5' in front to 10' Behind Stop Bar***	***Presence***
Rt. 14 EB	***2***	***Min Recall***	***Existing Loop***	***150' from Stop Bar***	***Pulse***
Ped Phase	***3***	***Non-Lock***	***Pushbutton***	***At all corners***	***n/a***
Rt. 14 WB	***6***	***Min Recall***	***VIDS***	***150' from Stop Bar***	***Pulse***
Rt. 97	***4***	***Lock***	***Loop, Pre-formed***	***20' from Stop Bar***	***Pulse***

Temporary Phase Timing Settings:

Phase	Min	Ped	Ped Clr	Ext	Max 1	Max2	Yel	Red
1	***5***	***0***	***0***	***2***	***12***	***18***	***3***	***0***
2 & 6	***24***	***0***	***4***	***4***	***26***	***36***	***4***	***1***
3	***16***	***7***	***9***	***0***	***16***	***16***	***4***	***1***
4	***14***	***7***	***9***	***3***	***27***	***35***	***3***	***1***

Scheduled TD: ***July 4, 2011***

Install TD at the initiation of construction and configure the traffic signal operations to actuate all approaches per the existing traffic control signal plan. Install and make TD operational prior to removing existing detection. TD must be operational throughout all construction phases.

Provide a list of telephone numbers of personnel who will be responsible for the TD to the Engineer. If the TD malfunctions or is damaged, notify the Engineer and place the associated phase on max recall. Respond to TD malfunctions by having a qualified representative at the site within three (3) hours. Restore detection to the condition prior to the malfunction within twenty-four (24) hours.

If the Engineer determines that the nature of a malfunction requires immediate attention and the Contractor does not respond within three (3) hours following the initial contact, then an alternative maintenance service will be called to restore TD. Expenses incurred for alternative service will be deducted from monies due to the Contractor with a minimum deduction of $500.00 for each service call. The alternate maintenance service may be the traffic signal owner or another qualified Contractor.

TD shall be terminated when the detection is no longer required. This may be either when the temporary signal is taken out of service or when the permanent detectors are in place and fully operational.

Any material and equipment supplied by the Contractor specifically for TD shall become City of New Britain property. Remove and deliver all equipment used as TD to the City of New Britain Public Work Department – City Yard at the address below. Supply all necessary manpower and equipment to load, transport, and unload the material. The condition and quantity of the material after unloading will be verified by the City.

Department of Public Works - City Yard
55 Harvard St.
New Britain, CT 06051

Method of Measurement:

Temporary Detection will be paid only once per site as a percentage of the contract Lump Sum price. Fifty percent (50%) will be paid when Temporary Detection is initially set up, approved, and becomes fully operational, and fifty percent (50%) will be paid when Temporary Detection terminates and all temporary equipment is removed and delivered to the City of New Britain to the satisfaction of the Engineer.

Basis of Payment:

This work will be paid at the contract Lump Sum price for "Temporary Detection (Site No. X)". The price includes furnishing, installing, relocating, realigning, maintaining, and removing, the necessary detection systems and all incidental material, labor, tools, and equipment. This price also includes any detector mode setting changes, timing or program modifications to the controller that are associated with TD. All Contractor supplied material that will remain the Contractor's property or be turned over to the City of New Britain will be included in the contract Lump Sum price for "Temporary Detection (Site No. X)." Any items installed for TD that will become part of the permanent installation will not be paid for under this item but are paid for under the bid item for that work.

Pay Item	Pay Unit
Temporary Detection (Site No.)	L. S.

ITEM #1111600A – EXTENSION BRACKET

ITEM #1112286A – 360 DEGREE CAMERA ASSEMBLY

ITEM #1112289A – 360-DEGREE CLOSED LOOP SYSTEM VIDEO DETECTION PROCESSOR

ITEM #1113725A – 23 AWG 4 TWISTED PAIR CATEGORY 6 CABLE

Description: Furnish and install a 360 Degree Video Image Detection System (360VIDS) as shown on the plans or as directed by the Engineer. The 360VIDS consists of a 360 Degree Camera Assembly (360CA), 360 Degree Closed Loop System Video Detection Processor (360CLSVDP), and 23 AWG 4 Twisted Pair Category 6 Cable. The Extension Bracket will be included on a case-by-case basis.

Materials: All hardware shall be new, corrosion resistant. All equipment shall be current production.

360 Degree Camera Assembly: The Camera Assembly shall be the GridSmart 5MP 360 degree Bell Camera and conform to the following requirements:

Camera:

- No-aim, no-focus camera
- Downward facing lens and camera shroud
- Single Power Over Ethernet (POE) connection for power and data collection.
- Color image camera with 360 degree point of view (POV)
- Active picture elements (pixels): 2560 (H) x 1920 (V), minimum.
- Signal to noise ratio : 55dB
- Heated camera
- IP addressable

Camera Enclosure:

- Tamper proof constructed of painted or powder coated aluminum of at least 0.25 inch (6.35-mm) thickness.
- IP66-rated camera housing.

Camera Mounting Hardware:

- Swivel bracket for dual plane adjustment for leveling
- Quick connect junction box
- Hybrid terminal junction box with surge.
- Astro-Brac banded bracket
- 34 inch to 78 inch 90 degree mounting arm pole.

- Bracket and hardware shall be Black, Federal Standard No. 595, Color No. 37038 as approved by the City of New Britain. Camera Enclosure shall be manufacturer's standard color and not painted black.

Extension Bracket: The extension bracket shall conform to the following requirements:

- Single arm [10' (3.0m) or less], or Truss type [10' (3.0m) or greater].
- Length shown on plan.
- Clamp-on attachment to pole shaft 1' (300mm) from top of pole.
- Designed to support minimum 30 lbs. (13.6 Kg), 2 sq. ft. (.2 sq. M) end load with minimal movement from wind.
- Schedule 40, 2" IPS galvanized pipe.
- Heavy duty galvanized finish
- Refer to detail drawing contained herein.
- Extension Bracket and hardware shall be Black, Federal Standard No. 595, Color No. 37038 as approved by the City of New Britain.

360 Degree Closed Loop System Video Detection Processor: The 360 Camera Video Detection Processor shall be the GridSmart GS_2 Processor and conform to the following requirements:

Functional:

- Connectivity: Local Area Network (LAN), Wide Area Network (WAN), Camera interfaces.
- NEMA TS1/ TS2, Type 170 and 2070 ATC compatible
- Four (4) USB 3.0 expansion ports.
- Front panel LED indicators displays calls and light states.
- Twenty-four (24) optically isolated I/O interface.
- Two (2) camera ports – Up to two (2) 360 Degree Camera Assembly; or one (1) 360 Degree Camera Assembly and four (4) IP video detection camera assembly (IPVDCA) or thermal cameras; or eight (8) IPVDCA or thermal cameras.
- Phase and detection display.
- Wi-Fi capable
- Power – 110/220 VAC 50/60 Hz
- Point and click zone drawing feature
- Digital flattening of image
- Omni-directional vehicle tracking
- Virtual pan-tilt-zoom
- Zone level visibility monitoring.
- Monitor phases and loops, generates calls to controllers.
- Support MJPEG video output
- Environmental : -29F to +165F (-34C to +74C), 0-95% non-condensing
- Fail-safe in the event of loss of video from 360CA or loss of power to 360CLSVDP.
- Shall be capable of configuring and adjusting the detection zone with the cabinet mounted VDM.

- Shall collect traffic data such as counts, turning movements, speed, and vehicle classification.
- Storage required to support collection of data.
- Support ability to transmit collected traffic data and alarm events from field devices to remote desktop pc

Application Software:

- Shall be provided at no additional cost
- Shall be capable of searching the network for other 360CLSVDP
- Shall be compatible with Windows operating system.
- Shall maintain an historical log of all configurations when site is modified
- Shall be capable Point and click zone drawing
- Shall feature digital flattening of image
- Shall feature the ability to digitally pan, tilt, and zoom within the camera assembly's field of view without movement of the camera.
- Detection zone data stored in non-volatile memory so that after recovery from power interruption, all parameters are returned to latest settings.
- Shall support the import and export of program database from notebook PC or remote desktop PC. The program database shall also be allowed to be transferred through a USB flash drive.
- Shall be capable of superimposing detection zone on real time video image from selected camera with time stamping capabilities.
- Shall be capable of monitoring real time video and adjusting zones in field or remotely while 360CLSVDP is actuating the traffic controller.
- Shall provide visual confirmation of detection by highlighting detection zone symbols.
- Shall support quad view video monitoring.
- Shall be capable of syncing with a cloud network resource to allow for program database and collected traffic data backup.
- Shall maintain a database of current and historical traffic data, and allow users to run reports against the data to include traffic counts, turning movements, speed, vehicle classification, red/green occupancy, and cycle lengths.
- Shall be capable of displaying data in a graph or chart format.
- Shall be capable of selecting data collection resolution in at least 15, 30, and 60-minute intervals through software.
- Shall provide a means by which alerts can be configured to be delivered to different individuals via email.
- Report output formats shall include at minimum PDF, rich text format, and Microsoft Excel formats.

Physical:

- Shelf mounted, stand alone design.
- Aluminum card rack frame capable of accepting four (4) 360CLSVDP modules.
- TS2 harness cable.

- Standard Ethernet and USB connectors for video input and video output.
- Female metal shell connector with latching clamp for NEMA TS 2 detector outputs and inputs.
- LED indications to monitor all detector outputs.
- Side or rear mounted connectors and controls are not allowed on standalone units.
- NEMA FR-4 glassepoxy or equivalent circuit boards.

Ethernet Repeater:

- Utilize Ethernet repeater if CAT6 cable distance is over 328'.

Ethernet Switch:

- Power Over Ethernet (POE) switch
- Ports for up-to four (4) IPVDCA or thermal cameras.
- Powder coated aluminum.
- Dual purpose LED port lights.
- RJ-45 CAT6 connectivity.
- Environmental: -29F to +165F (-34C to +74C).
- NEMA TS2 compliant.

Video Encoder:

- Power Over Ethernet (POE)
- Video: H.264 (MPEG-4 Part 10/AVC) Baseline and Main Profile
- Compression: Motion JPEG
- Resolutions: 176x120 to 720x576, 176x120 to 1536x1152 for quad view.
- Frame rate:
    - H.264: 25/30 (50/60 Hz) fps,
    - 15fps in quad view in full resolution,
    - Motion JPEG: 25/30 (50/60 Hz) fps,
    - 15fps in quad view in full resolution.
- Video Streaming: Multi-stream H.264 and Motion JPEG: One H.264 and one JPEG stream on each channel (8 streams in total) in full frame rate individually configured streams in max. resolution at 25/30 fps; more streams if identical or limited in frame rate/ resolution. Controllable frame rate and bandwidth; VBR/CBR H.264.
- Environmental: -40F to +167F (-40C to +75C), 10-95% non-condensing.
- NEMA TS2 compliant.

Ethernet Protection Module:

- Either shelf mounted or standalone design.
- Protect 360CA, IPVDCA, thermal cameras and 360CLSVDP in the event of a surge or lightning.

Peripherals:

- Separable Keypad & Joystick or Computer Mouse including all necessary cables for connectivity to 360CLSVDP.

Environmental:

- Comply with NEMA TS 2, Section 2 requirements for Controller Assembly.
- Pass following NEMA TS 2 tests and applicable test procedures.
  - Vibration: Section 3.13.3, Section 3.13.8.
  - Shock: Section 3.13.4, Section 3.13.9.
  - Transients, Temperature, Voltage and Humidity: Section 3.13.7.
  - Power Interruption: Section 3.13.10.

23 AWG 4 Twisted Pair Category 6 Cable:

- Supply the 360CA power and return the video signal to the 360CLSVDP.
- Outdoor Aerial CAT6 cable with UV insulation.
- Rated for 48VDC
- 250MHZ, shielded, gel-filled (flooded core) direct burial grade.
- Polyethylene insulation.
- Shall be installed continuous between the 360CA and 360CLSVDP.
- Cable shall be installed according to TIA/EIA-568-B.
- Other type cable may be substituted at the request of the 360CLSVDP manufacturer.

Construction Methods:

A Site Survey shall be performed with the 360CLSVDP manufacturer representative at all 360VIDS locations prior to installation. The purpose of the survey is to optimize the performance from the 360VIDS equipment when it is installed and insure that it will meet the accuracy requirements specified previously. Prior to installation, submit the results of this survey to the Engineer in a report, which lists all 360VIDS locations with any recommended changes to camera locations, mounting adjustments, camera lens adjustments, and desired detection zone locations.

The 360VIDS equipment shall be installed in accordance with the manufacturer instructions and recommendations to achieve the detection zones as shown in the plans and accuracy as described in these specifications. The location of the 360CA shown on the plan may be revised as a result of the Site Survey. Peripherals are to be furnished and fully installed in an easily accessible position within the controller cabinet. Leave proper clearance(s) surrounding video monitor to allow for accessible connections and space to utilize surrounding equipment.

Warranties and Guarantees for 360CA and 360CLSVDP shall be provided to the City of New Britain in accordance with Article 1.06.08 of the Standard Specifications. Warranties for all equipment furnished as part of this Contract are to cover a period of 36 months following successful completion of the entire intersection acceptance test.

Method of Measurement:

The 360 degree Camera Assembly will be measured for payment as the number of 360 degree cameras furnished, installed operational and accepted.

The Extension Bracket will be measured for payment as the number of brackets furnished, installed and accepted.

The 360 degree Closed Loop System Video Detection Processor will be measured for payment as the number of units including all additional work and materials listed in Basis of Payment, furnished, installed, operational and accepted.

23 AWG 4 Twisted Pair Category 6 Cable will be measured for payment as linear feet, furnished, installed and accepted.

Basis of Payment:

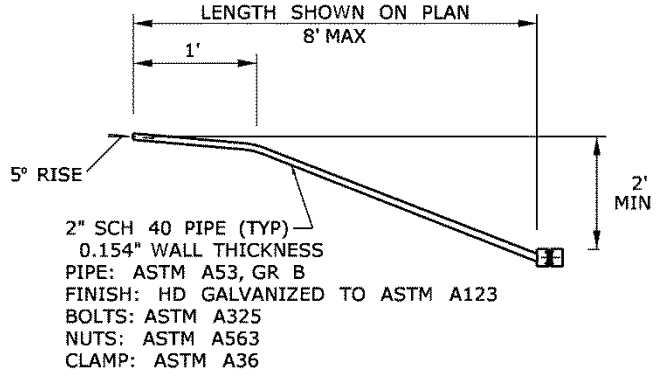
360 degree Camera Assembly will be paid for at the Contract unit price for "360 Degree Camera Assembly" which price shall include 360 degree camera, enclosure, brackets and hardware used to attach the 360 degree camera assembly to a support structure or extension bracket, all material, equipment, paint, painting, warrantee, tools, labor and work incidental thereto.

Extension Bracket will be paid for at the Contract unit price for "Extension Bracket" which price shall include bracket, paint, painting, all labor, tools and equipment necessary to attach the bracket to a pole shaft.

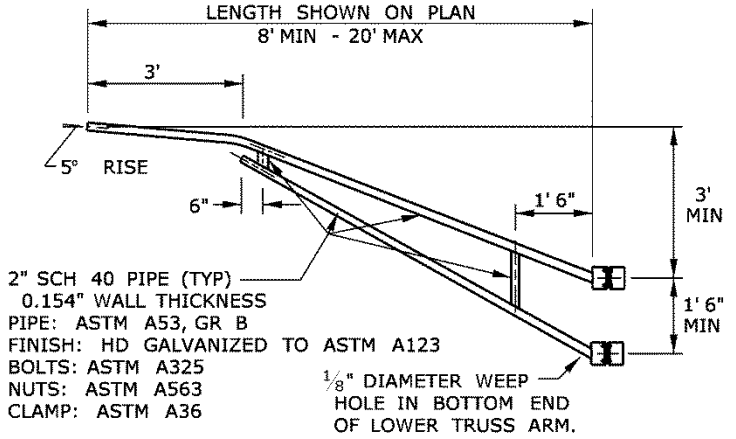
360 degree Closed Loop System Video Detection Processor will be paid for at the Contract unit price for "360 degree Closed Loop System Video Detection Processor" which price shall include the manufacturers' site survey, unlimited number of any necessary 360VIDS configuration software and license, card rack frame, power supply, all miscellaneous hardware such as PC interface cable with connectors, necessary peripherals such as Ethernet repeater, Ethernet switch, video encoder, Ethernet protection module, documentation, warrantee, labor, tools and equipment necessary to make the 360VIDS fully operational.

23 AWG 4 Twisted Pair Category 6 Cable will be paid for at the Contract unit price per linear foot for "23 AWG 4 Twisted Pair Category 6 Cable" which price shall include installation, all connectors, labor, tools and equipment necessary to install the cable between the 360CA and the 360CLSVDP.

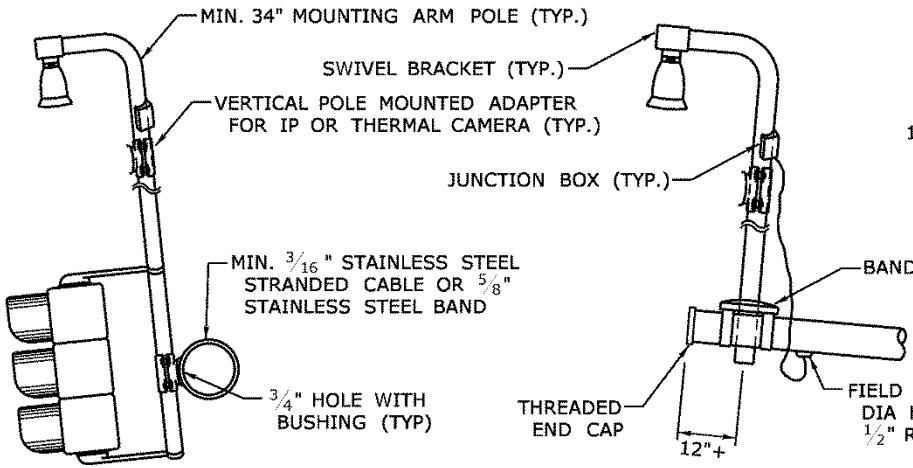
Pay Item	Pay Unit
360 Degree Camera Assembly	ea.
Extension Bracket	ea.
360 Degree Video Detection Processor	ea.
23 AWG 4 Twisted Pair Category 6 Cable	l.f.



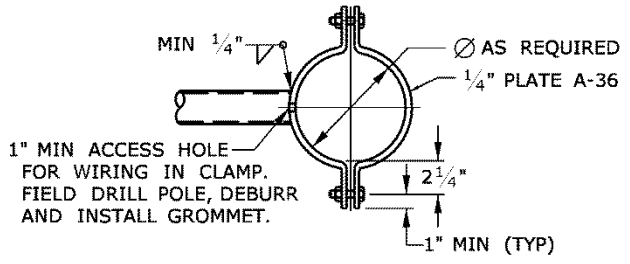
POLE MOUNT EXTENSION BRACKET, SINGLE ARM



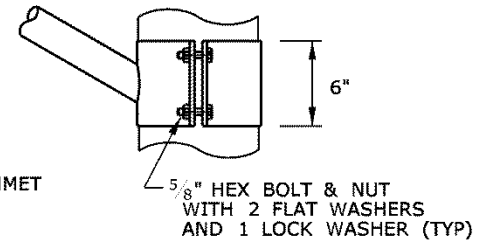
POLE MOUNT EXTENSION BRACKET, TRUSS



MAST ARM MOUNTING DETAIL



MAST ARM / POLE MOUNT EXTENSION BRACKET MOUNTING DETAIL



ARM CLAMP DETAIL

NOTE: TORQUE ALL BOLTS TO MANUFACTURER'S SPECIFICATIONS.

FILENAME: X:\999_CTDOT_STANDARDS\Traffic\8x11 PLANS\EXTENSION_BRACKETS\TR_DET_EXT_BRACKET.dgn MODEL: 360

ITEM #1111600A, 1112286A, 1112289A, 1113725A

Rev. 2/15/2018

1112242A FIBER OPTIC SPLICE ENCLOSURE (SIGNAL)
1113023A 12 STRAND FIBER OPTIC INTERCONNECT CABLE

Description:

Under these items, the Contractor shall furnish and install the required fiber optic cables and splice enclosure in accordance with the contract documents and as ordered by the Engineer.

The Contractor shall furnish and install the fiber optic interconnects, and all necessary components required to form a complete cable interconnect system and shall conduct acceptance tests for this interconnect as specified.

The passive components that shall be provided under this specification include the following:

- All Fiber Optic Cable Connectors and Splices
- Fiber Optic Splice Trays
- Fiber Optic Splice Enclosures

Other passive components that are required to form a complete communication system include (1) terminations and (2) moisture and water sealants and cable caps for below-grade applications. The components supplied shall be commercially available components whose specifications indicate state-of-the-art capability for the application.

The Contractor shall furnish, install, splice, and test all of the fiber optic cables as part of the installation of the fiber optic cable splice enclosure. All equipment for installation, splicing, and testing shall be provided by the Contractor. All fibers in the fiber optic cable shall be spliced and/or terminated in designated equipment as specified or as directed by the Engineer.

Materials:

Fiber Optic Interconnect Cable
The single mode fiber optic Interconnect cable to be provided shall be a loose, flexible buffer tube cable design as specified herein. The fiber optic interconnect cable shall contain twelve (12) fibers, as shown in the Drawings. The fiber optic cable shall be suitable for outside duct, aerial, and direct buried installations, and for indoor use when installed in accordance with NEC Article 770 and local building code requirements. All cables shall consist of the number of fibers as specified on the plans.

The single mode fiber optic interconnect cable shall be unterminated One end shall be fusion spliced in the splice enclosure to the designated trunk fiber strand as shown in the Drawings. The other end of the fiber optic interconnect cable shall be spliced to fiber optic pigtails in the fiber optic patch panel (specified elsewhere). The contractor shall test the fiber optic cable splices using approved materials, methods and fiber optic test equipment.

The interconnect cable shall be sufficient length to be installed as shown on the Drawings, with a minimum of 10 meters of slack provided in the handhole or as shown on the Drawings.

The Contractor shall follow the interconnect cable manufacturer's recommendation in the installation of the interconnect cables, including the individual breakout fibers.

Fiber optic interconnect cables shall be installed on aerial messenger cable or in conduit, connected to the fiber optic backbone cable and equipment cabinet fiber optic patch panels as shown on the Drawings. The fiber optic interconnect cables shall be spliced to the designated fiber strands within approved spliced closures installed on the messenger wire, on the utility pole or in handholes as shown on the Drawings or as directed by the Engineer.

The cable shall meet the requirements of REA 7 CFR 1755.900 at a minimum, and shall be new, unused and of current design and manufacture.

The cable shall meet all requirements stated in this specification. The cable shall be an accepted Product of the United States Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900 and meet the requirements of ANSI/ICEA Standard for Fiber Optic Outside Plant Communications Cable, ANSI/ICEA S-87-640-1992.

Optical Requirements:

- Nominal Attenuation: < 0.4 dB/km 1310 nm, < 0.3 dB/km at 1550 nm
- Attenuation Uniformity: No point discontinuity greater than 0.10 dB at either 1310 nm or 1550 nm.
- Maximum Attenuation: Each individual fiber shall not be greater than 0.15 dB/km at 1550 nm.
- Attenuation at the Water Peak: The attenuation at 1383 ± 3 nm shall not exceed 2.1 dB/km.
- Cutoff Wavelength: The cabled fiber cutoff wavelength (λ_{ccf}) shall be < 1250 nm.
- Mode-Field Diameter: 9.30 ± 0.50 μm at 1310 nm, 10.50 ± 1.00 μm at 1550 nm.
- Zero Dispersion Wavelength (λo): 1301.5 nm ≤ λo ≤ 1321.5 nm.
- Zero Dispersion Slope (So): ≤ 0.092 ps/(nm²•km).
- Fiber Polarization Mode Dispersion (PMD): ≤ 0.5 $ps/\sqrt{km}$.
- Chromatic Dispersion: The maximum dispersion shall be ≤ 3.2 ps/(nm•km) from 1285 nm to 1330 nm and shall be < 18 ps/(nm•km) at 1550 nm as measured in accordance with TIA/EIA Standard FOTP-169.

Mechanical Requirements: All fibers in the cable must be usable fibers. All fibers within a given cable shall be from the same manufacturer, shall contain no factory splices, and conform to the following minimum requirements:

- Typical Core Diameter: 8.3 μm.
- Cladding Diameter: 125.0 ± 1.0 μm.
- Core-to-Cladding Offset: ≤ 0.6 μm.
- Cladding Non-Circularity: ≤ 1.0%.
- Fiber Curl: ≥ 4.0 m radius of curvature

Color Coating: Each fiber shall have a color coating applied to it by the manufacturer. The coating shall not affect the optical characteristics of the fiber. Each fiber shall be distinguishable by means of color coding in accordance with TIA/EIA-598-A, "Optical Fiber Cable Color Coding." The fibers shall be colored with ultraviolet (UV) curable inks. The nominal diameter of the colored fiber shall be 250 μm.

Primary Coating: The coating shall be a dual layered, UV-cured acrylate applied by the fiber manufacturer. The coating shall be mechanically strippable without damaging the fiber. The coating diameter shall be 245 ± 10 μm.

The force required to mechanically remove at least 30 mm of unaged coating shall not exceed 10 N as measured in accordance with TIA/EIA Standard FOTP-178.

Central Strength Member: The central anti-buckling member shall consist of a dielectric, glass reinforced plastic (GRP) rod. The purpose of the central member is to prevent buckling of the cable. The GRP rod shall be over-coated with a black colored thermoplastic when required to achieve dimensional sizing to accommodate buffer tubes/fillers.

Buffering: All fibers shall be placed inside a non-conductive loose buffer tube. Each buffer tube shall contain up to twelve (12) fibers. The Contractor shall submit the fiber count per buffer tube and the buffer tube count configuration to the Engineer for approval. The fiber shall not adhere to the inside of the buffer tube. Buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-A, "Optical Fiber Cable Color Coding."

In buffer tubes containing multiple fibers, the colors shall be stable across the specified storage and operating temperature range and not subject to fading or smearing onto each other or into the gel filling material. Coloring medium shall not cause fibers to stick together.

Buffer tubes shall be of dual layer construction, standard colors are used for tubes 1 through 12 and stripes are used to denote tubes 13 through 24. The color sequence applies to tubes containing fibers only, and shall begin with the first tube. If fillers are required, they shall be placed in the inner layer of the cable. The tube color sequence shall start from the inside layer and progress outward.

Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogeneous gel to prevent water and moisture penetration. The gel shall contain

anti-oxidant additives, and the gel shall be readily removable with conventional solvents. The gel shall be non-toxic and safe to exposed skin. It shall be chemically and mechanically compatible with all cable components.

The nominal outer diameter of the buffer tube shall be 3.0 mm. The buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrink back requirements of 7 CFR 1755.900. Buffer tube colored stripes shall be inlaid in the tube by means of co-extrusion when required. The nominal stripe width shall be 1 mm.

Filler Rods: Filler rods shall be used to fill all unused buffer tubes, or shall be used instead of unused buffer tubes in the cable core to lend symmetry to the cable cross-section where needed. Fillers shall be placed so that they do not interrupt the consecutive positioning of the buffer tubes. In dual layer cables, any fillers shall be placed in the inner layer. Fillers shall be nominally 3.0 mm in outer diameter.

Stranding: Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation, or "S-Z", stranding process. Water blocking yarn(s) shall be applied longitudinally along the central member during stranding. Two polyester yarn binders shall be applied in contra helix form with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non- hygroscopic, non-wicking, and dielectric with low shrinkage.

Core and Cable Flooding: For single layer cables, a water blocking tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The tape shall be held in place by a single polyester binder yarn. The water blocking tape shall be non-nutritive to fungus, electrically non-conductive and homogenous. It shall also be free from dirt and foreign matter.

For dual layer cables, a second (outer) layer of buffer tubes shall be stranded over the original core to form a two-layer core. A water blocking tape shall be applied longitudinally over both the inner and outer layer with each being held in place with a single polyester binder yarn. The water blocking tape shall be non-nutritive to fungus, electrically non-conductive and homogenous. It shall also be free from dirt and foreign matter.

Tensile Strength Provisions: Tensile strength shall be provided by dielectric yarns. The high tensile strength dielectric yarns shall be helical stranded evenly around the cable core. The maximum pulling tension shall be 2700 N (608 lbf) during installation (short term) and 890 N (200 lbf) long term installed.

Inner Jacket: The cable shall have an inner jacket of medium density polyethylene (MPDE) with a minimum nominal jacket thickness of 1.0 mm. The inner jacket shall be applied directly over the tensile strength members and the water blocking tape.

Outer Jacket: The outer jacket shall be medium density polyethylene (MPDE) with a minimum nominal jacket thickness of 1.4 mm. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus. The cable jacket shall

contain no metal elements and shall be of a consistent thickness. The jacket shall be free of holes, splits, and blisters.

The MPDE jacket material shall be as defined by ASTM D1248, Type II, Class C and Grades J4, E7 and E8.

The jacket shall be marked in contrasting color at one (1) meter intervals with the following information and in accordance with Section 350G of the National Electrical Safety Code (NESC).

- FIBER OPTIC CABLE - XXX - MM/YY
- XXX = Number of optical fibers in the cable
- MM/YY = Month and Year that the cable was manufactured

In addition, the outer jacket shall have sequential meter markings as approved by the Engineer. The actual length of the cable shall be within 1% of the length markings.

Ripcords: The cable shall contain two (2) ripcords under the sheath for easy sheath removal of all-dielectric cable. The cable shall contain one ripcord under the inner sheath and one under the steel armor for armored cable. The ripcord color shall be orange for non-armored sheaths and yellow for armored sheaths

Bend Radius: The cable shall be capable of withstanding a minimum bending radius of 10 times its outer diameter during operation and 15 times its outer diameter during installation without changing the characteristics of the optical fibers.

Diameter: The nominal outer diameter of the various cable sizes shall be the following:

- 12 Fiber - 11.5 mm (0.46 in)
- 72 Fiber - 12.5 mm (0.50 in)

Manufacturer's Certification

The following tests shall be performed and the test results documented for the type of cable supplied. The cable manufacturer shall certify that each reel of cable furnished meet or exceeds the following specifications:

Attenuation Change: When tested in accordance with TIA/EIA Standard FOTP-3, "Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components," the change in attenuation at extreme operational temperatures (-40°C and +70°C) shall not exceed 0.05 dB/km at 1550 nm.

Water Penetration: When tested in accordance with TIA/EIA Standard FOTP-82, "Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable." a one meter length of unaged cable shall withstand a one meter static head or equivalent continuous pressure of water for 24 hours, without leakage through the open cable end. If the first sample fails, subsequent test shall be done in accordance with either Bellcore TR-TSY-000020 or REA PE-90.

Filling Compound Flow: When tested in accordance with TIA/EIA Standard FOTP-81, "Compound Flow (Drip) Test for Filled Fiber Optic Cable", the cable shall exhibit no flow (drip or leak) of filling and/or flooding material at 80°C. If material flow is detected, the weight of any compound that drips from the sample shall be less than 0.05 grams.

Comprehensive Strength: When tested in accordance with TIA/EIA Standard FOTP-41, "Compressive Loading Resistance of Fiber Optic Cables," the cable shall withstand a minimum compressive load of 440 N/cm (250 lbf/in) uniformly over the length of the sample. The load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for ten minutes. The magnitude of the fibers shall be within the repeatability measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation greater than 0.1 dB. The repeatability of the measurement system is typically ± 0.05 dB or less. No fibers shall exhibit a measurable change in attenuation after load removal.

Impact Resistance: When tested in accordance with TIA/EIA Standard FOTP-25, "Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies," the cable shall withstand 25 impact cycles. The magnitude of the attenuation change shall be within the repeatability measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1dB at 1550 nm. The repeatability of the measurement system shall be ± 0.05 dB or less. The cable jacket shall exhibit no cracking or splitting when observed under 5X magnification.

Cable Flex: When tested in accordance with TIA/EIA Standard FOTP-104, "Fiber Optic Cable Cyclic Flexing Test," the cable shall withstand 25 mechanical flexing cycles at a rate of 30 ± cycles per minute with a sheave diameter not greater than 20 times the cable diameter. The magnitude of the attenuation change shall be within the repeatability measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1dB at 1550 nm. The repeatability of the measurement system shall be ± 0.05 dB or less. The cable jacket shall exhibit no cracking or splitting when observed under 5X magnification.

Cable Freezing: When tested in accordance with TIA/EIA Standard FOTP-98, the cable shall be immersed in water. Upon freezing, the magnitude of the attenuation change shall be within the repeatability measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1dB at 1550 nm. The repeatability of the measurement system shall be ± 0.05 dB or less. The cable jacket shall exhibit no cracking or splitting when observed under 5X magnification.

Jacket Shrinkage: When tested in accordance with TIA/EIA Standard FOTP-86, the maximum outer cable jacket shrinkage shall be less than 5%.

Outer Jacket Adhesion: When tested in accordance with Bellcore TR-TSY-000020, the force required to initiate slippage between the cable outer jacket and the steel armor shall be a minimum of 14.0 N/mm of a cable circumference.

Lightning Protection: When tested in accordance with TIA/EIA Standard FOTP-181, "Lightning Damage Susceptibility Test for Optic Cables with Metallic Components," the cable shall withstand a simulated lightning strike with a peak value of the current pulse equal to 105 kA without loss of fiber continuity. A damped oscillatory test current shall be used with a maximum time-to-peak value of 15 μs (which corresponds to a minimum frequency of 16.7 kHz) and a maximum frequency of 30 kHz. The time to half-value of the wave form envelope shall be from 40 - 70 μs. In addition to the analysis criterion set forth in FOTP-181, the integrity of the buffer tubes (or analogous loose tube and strength members) must be intact after removal of the cable specimens from the test box.

Cable Twist: When tested in accordance with TIA/EIA Standard FOTP-85, "Fiber Optic Cable Twist Test," a length of cable no greater than 4 meters shall withstand 10 cycles of mechanical twisting. The magnitude of the attenuation change shall be within the repeatability measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1dB at 1550 nm. The repeatability of the measurement system shall be ± 0.05 dB or less. The cable jacket shall exhibit no cracking or splitting when observed under 5X magnification.

Tensile Strength: When tested in accordance with TIA/EIA Standard FOTP-33, "Fiber Optic Cable Tensile Loading and Bending Test," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a tensile load of 2700 N (608 lbf). The magnitude of the attenuation change shall be within the repeatability measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.2dB during loading and 0.1 dB after loading at 1550 nm. The repeatability of the measurement system shall be ± 0.05 dB or less. The cable jacket shall exhibit no cracking or splitting when observed under 5X magnification.

Cable Bend: When tested in accordance with TIA/EIA Standard FOTP-37, "Low or High Temperature Bend Test for Fiber Optic Cable", the cable shall withstand four full turns around a mandrel of ≤ 10 times the cable diameter for non-armored cables and ≤ 20 times the cable diameter for armored cables after conditioning for four hours at test temperatures of -30°C and +60°C. Neither the inner or outer surfaces of the jacket shall exhibit visible cracks, splits, tears or other openings. Optical continuity shall be maintained throughout the test.

Fiber Optic Splices

All fiber optic splices shall be fusion splices. A factory fabricated fusion splice kit containing materials necessary for quality fusion splicing shall be provided for each fiber splice. All fusion splice kits shall have a specified maximum loss of 0.1 dB at 1310 nm.

Fiber Optic Splice Enclosures

The Contractor shall furnish and install one fiber optic splice enclosure at the Putnam Boulevard location and in the traffic signal controller cabinet as shown on the Drawings and as directed by the Engineer. The fiber optic splice enclosure shall be capable of accepting the specified fiber optic cable used.. The fiber optic splice enclosure shall meet all requirements stated in the following specification:

- The splice enclosure housing shall be non-metallic. It shall be resistant to solvents, stress cracking, and creep. The housing materials shall also be compatible with chemicals and other materials to which they might be exposed in normal applications.

- The fiber optic closure shall be available in distinct sizes to accommodate a variety of cable entries. A small fiber optic closure shall be capable of accommodating up to five cables in a butt or branch configuration. A medium sized fiber optic closure shall accommodate six cables in a butt configuration or twelve cables in a through configuration. A large fiber optic closure shall accommodate eight or sixteen cables in a butt or through configuration, respectively. A mid-span (express) configuration shall be achievable using two cable entry ports located at the seam of the end cap halves.

- The closure shall be capable of accepting additional cables without removal of the sheath retention or strength member clamping hardware on previously installed cables or disturbing existing splices. The fiber optic splice closure shall provide a robust clamping mechanism to prevent pistoning of the central member or strength members and to prevent cable sheath slip or pullout.

- The splice closure shall have available appropriate hardware and installation procedures to facilitate the bonding and grounding of metal components in the closure and the cable armored sheath. The cable bonding hardware shall be able to accommodate a copper conductor equal to or larger than a #6 AWG.

- Aerial splice closures shall have available the necessary hardware to attach and secure the closure to an aerial strand.

- The splice organizer used in the closure shall accommodate splice trays suitable for single fiber splices.

- The splice closure shall accommodate a minimum of 12 single fiber splices.

- Spliced fibers shall not be subjected to a bend radius smaller than 30 mm (1.2 inches). Buffer tubes shall not be subjected to a bend radius smaller than 38 mm (1.5 inches).

- The installation of the splice closure shall not require specialized tools or equipment, other than those normally carried by construction crews.

- The splice closure shall incorporate a mechanical compression and/or mastic tape sealing system to maintain a barrier against water penetration.

A bond clamp shall remain firmly attached to the cable armor sheath while under a tensile load of 9 kg (20 lbf). Following removal of the load, there shall be no evidence of clamp loosening or damage to the cable sheath, armor, or clamp that would reduce its current carrying capacity as required by the AC fault test.

- The electrically conductive path used for continuity and grounding of the splice closure metallic components shall be capable of withstanding an AC current of 1000 Amperes for 20 seconds.

- The cable clamping and sealing hardware used to terminate fiber optic cable shall not cause an attenuation change greater than ± 0.05 dB per fiber, when tested with a source operating at 1550 nm ± 20 nm.

- An axial load of 100 lbf, individually applied to each cable, shall not cause mechanical damage to the cable or clamping hardware. The load to the fiber optic cable shall not cause an attenuation change greater than ± 0.05 dB per fiber, when tested with a source operating at 1550 nm ± 20 nm.

- Subjecting the closure/cable interface to 90° flexing for 8 cycles at ambient temperatures of -18°C ± 2°C (0°F ± 3.6°F) and 40°C ± 2°C (104°F ± 3.6°F) shall not cause any mechanical damage to the cable or clamping hardware. In addition, flexing of the fiber optic cable shall not cause an attenuation change greater than ± 0.05 dB per fiber, when tested with a source operating at 1550 nm ± 20 nm.

- Subjecting the closure/cable interface to 10 cycles of torsional loading at ambient temperatures of -18°C ± 2°C (0°F ± 3.6°F) and 40°C ± 2°C (104°F ± 3.6°F) shall not cause any mechanical damage to the cable or clamping hardware. In addition, torsional loading of the fiber optic cable shall not exceed allowable attenuation changes.

- The diameter of the fiber optic splice closure shall not permanently deform more than 10 %, nor temporarily deform more than 20%, when it is compressed by a uniformly distributed load of 300 lbf. Additionally, the compressive load shall cause no mechanical damage to the closure or its contents.

- A closure shall not exhibit any mechanical damage after being subjected to mechanical impact of 85 lbf (115 Nm) at temperatures of -18°C ± 2°C (0°F ± 3.6°F) and 40°C ± 2°C (104°F ± 3.6°F).

- The closure central member clamp shall prevent movement (e.g. bowing, pistoning, or breaking) of the cable central member (CM) when the CM exerts a force of 100 lbf on the clamp.

- Sealing components (gaskets, grommets, O-rings) used in a closure, shall not permit the entry of water into the closure after thermal aging at 90°C ± 1°C (194°F ± 1.8°F) for 720 hours (30 days).

- The closure shall be capable of being safely and properly assembled at temperatures of 0°C ± 2°C (32°F ± 3.6°F) and 40°C ± 2°C (104°F ± 3.6°F) using materials and procedures specified by the manufacturer.

- The splice closure shall show no evidence of water penetration following exposure to a 20-foot water-head for a period of 7 days.

- A closure shall show no evidence of corrosion following exposure to salt-fog for a period of 90 days.

- Samples of polymeric closure materials shall not support fungus growth when tested per ASTM G 21. A rating of 0 is required.

Splice Trays

The Contractor shall furnish and install fiber optic splice trays to organize and store splices within splice closures. The trays shall be compatible with the fiber optic splices and splice closures specified herein and shall meet the following minimum requirements:

- The tray shall have the capacity of up to 12 splices. It shall be compatible with the fusion splices specified herein and provide optimum physical protection.

- The trays shall be engineered for use with loose tube optical cable designs. They shall not induce attenuation due to fiber bending. No cable ties are to be used. The loose tube buffers shall be secured with a tube guide or channel snap.

- Slack fiber within the tray shall be placed in an oval shape along an inside wall of the tray.

Quality Assurance

All optical fibers shall be proof tested by the fiber manufacturer to a minimum load of 0.7 GN/m^2 (100 kpsi). All optical fibers shall be attenuation tested. The attenuation of each fiber shall be provided for each reel of cable furnished. The cable manufacturer shall be ISO 9001 registered.

Environmental Requirements

The cable shall function within the specifications over the following temperature ranges:

- Shipping/Storage: -50°C to 70°C
- Installation: -30°C to 70°C
- Operation: -40°C to 70°C

Construction Methods

Prior to the installation of the fiber optic cable, the Contractor shall submit his proposed cable plant design to the Engineer for approval. The cable plant design shall include the following at a minimum:

- Catalog cuts and shop drawings for all cable, connectors, splice equipment, splice enclosures, splice trays and cable installation and test equipment.
- Locations of all proposed splices.

Fiber Optic Interconnect Cable

The fiber optic cable installation techniques and procedures shall be specified by the cable manufacturer and shall be such that the optical and mechanical characteristics of the cables are not degraded at the time of installation.

Experience Requirements

Personnel involved in the installation, splicing and testing of the fiber optic cable shall meet the following requirements:

- A minimum of seven (7) years experience in the installation of fiber optic cables, including fusion splicing, terminating, and testing single mode fibers.

- Shall have installed at least five (5) communication systems where fiber optic cables in aerial/outdoor conduits and the systems are in continuous satisfactory operation for at least two (2) years. The Contractor shall submit as proof, photographs or other supporting documents, and the names, addresses and telephone numbers of the operating personnel who can be contacted regarding the fiber optic systems.

- Personnel performing Splicing shall have been trained and certified by the manufacturer of the fiber splice equipment and material to be used, in fiber optic splicing procedures. Proof of this training must be submitted to the Engineer for approval.

- Installers shall have been trained and certified by the manufacturer of the fiber optic cable to be used, in fiber optic cable installation and handling procedures. Proof of this training must be submitted to the Engineer for approval.

- Personnel involved in testing shall have been trained and certified by the manufacturer of the fiber optic cable test equipment to be used, in fiber optic cable testing procedures. Proof of this training must be submitted to the Engineer for approval.

Installation

All fiber optic cables to be installed in a new or existing conduit, duct facility or overhead shall be pulled as a unit. The Contractor shall ensure the cable is not damaged during storage, delivery and installation. The cable shall not be pulled along the ground or over or around obstructions. The cable shall not be stepped on by workmen, nor run over by vehicles or equipment. All cable shall be inspected and approved by the Engineer prior to installation. All cables shall be pulled in conduit and along a cable messenger with a cable grip designed to provide a firm hold on the exterior covering of the cable. Heat shrinkable end caps shall be placed on the cable ends. Conduit ends shall be sealed with a urethane compound after the cable installation.

When installing cable in existing conduits which already have cables within them, the Contractor shall not damage existing cables. Should the Contractor cause damage to the fiber optic cable, or any existing cables, he shall immediately notify the Engineer and the affected owner. Corrective action will be made by the cable owner. The cost to repair damages caused by the Contractor's

actions shall be deducted from the payment due to the Contractor and paid to the cable owner for cable repair purposes.

The cable pulling operation shall be performed such that a minimum bending of the cable shall occur in the unreeling and pulling operations. Entry guide chutes shall be used to guide the cable into the pull-box conduit ports. Lubricating compound shall be used to minimize friction. Corner rollers (wheels), if used, shall not have radii less than the minimum installation bending radius of the cable. A series array of smaller wheels can be used for accomplishing the bend if the array is specifically approved by the cable manufacturer. The pulling tension shall be continuously measured and it shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable; breakaway swivels must be used to insure cable tensile strength is not exceeded. The pulling system shall have an audible alarm that shall sound whenever a pre-selected tension level is reached. Tension levels shall be recorded continuously and shall be given to the Engineer upon request.

The central strength member and aramid yarn shall be attached directly to the pulling eye during cable pulling. “Basket grip” or “Chinese finger” type attachments to the cable outer jacket will not be permitted. A breakaway swivel with a cable manufacturer approved tensile rating shall be used on all pulls.

Cable slack of 10 meters shall be provided in pull boxes.

Splicing Requirements

All optical fibers shall be spliced to provide continuous runs. Splices shall be allowed in locations shown on the Drawings.

All splices shall use the fusion technique. Fusion splicing equipment shall be provided by the Contractor and shall be clean, calibrated and specifically adjusted to the fiber and environmental conditions at the start of each shift. Splice enclosures, tools and procedures, shall be approved by the cable manufacturer as being compatible with the cable type being delivered.

Each spliced fiber shall be packaged in a protective sleeving or housing. Bare fibers shall be completely recoated with a protective RTV, gel or similar substance, prior to application of the sleeve or housing, so as to protect the fiber from scoring, dirt or microbending.

Splice losses shall not exceed an average of 0.10 dB. If a splice is measured to exceed 0.15 dB during the splicing process, it shall be remade until its loss falls below 0.15 dB @ 1310 nm. Each attempt shall be recorded for purposes of acceptance.

All splice losses shall be recorded in tabular form and submitted to the Engineer for approval. An optical time domain reflectometer (OTDR) shall be used to record splice loss, and chart recordings of the “signature” and shall be submitted with the splice data with a record of all OTDR settings and the OTDR locations written on the trace.

Unused optical fibers shall be properly protected with sealed end caps.

Documentation Requirements:
Four (4) complete sets of operation and maintenance manuals shall be provided. The manuals shall, as a minimum, include the following:

- Complete and accurate as-built schematic diagrams showing the fiber optic cable and locations of all splices.
- Complete performance data of the cable showing the losses at each splice joint and each terminal connector.
- Installation, splicing, terminating and testing procedures.
- Complete parts list including names of vendors.
- Complete maintenance and trouble-shooting procedures.

One (1) month prior to installation, four (4) copies of the Contractor's Installation Practices shall be submitted for approval. This shall include installation methods, list of installation equipment, and splicing and test equipment. Field quality control procedures shall be detailed as well as procedures for corrective action.

Testing Requirements
The following tests shall be conducted. All tests shall be conducted in accordance with the approved test procedures. The Contractor shall submit test procedures and forms for approval to the Engineer.

Pre-Installation Tests: The fiber optic cable shall be tested at the storage site prior to installation. Each optical fiber in the cable shall be tested from one end with an OTDR with wavelength (1310 and 1550 nm) and fiber type. Testing shall check for continuity, length, anomalies, and attenuation. Each measurement shall be recorded with color, location, and type of fiber measure. In the event that a meaningful measurement cannot be made from one end, it shall be performed from the opposite end of that fiber.

Post-Installation Tests: After installation, each optical fiber in the cable shall be tested again for loss characteristics. Both directions of operation of the fiber shall be tested with an OTDR with wavelengths 1310 and 1550 nm.

After each fiber splice and connector installation, the cable shall be tested with an OTDR and the data shall be submitted to the Engineer as a basis for acceptance.

Subsystem Tests: The Contractor shall conduct approved fiber optic network subsystem tests after the integration of the fiber optic terminal equipment to the fiber optic network. The tests, as a minimum, shall demonstrate the capability of the fiber optic cable to transmit the specified signals. The tests shall run continuously for a minimum of twenty four (24) hours without any network outage. Approved data forms shall be completed and turned over to the Engineer for review as the basis for acceptance/rejection.

If a subsystem fails because of any components in the subsystem, the particular components shall be corrected or replaced with other components and the tests shall be repeated.

If a component has been modified as a result of the subsystem test failure, a report shall be prepared and delivered to the Engineer prior to testing.

Method of Measurement:

The quantity of single mode fiber optic interconnect cable to be paid will be measured for payment as the number of linear feet actually furnished and installed.

The quantity of fiber optic cable splice enclosures to be paid will be measured as the number of splice enclosures actually furnished and installed.

Basis of Payment:

The unit price paid per linear foot for Fiber Optic Interconnect Cable shall include the cost of furnishing, installing, grounding and bonding, connecting and testing the fiber optic cable of the type specified. The price shall also include furnishing all labor, tools, materials, documentation, equipment, storage, transportation, and other incidentals necessary to complete the work.

The unit price paid for Fiber Optic Cable Splice Enclosure shall include the cost of furnishing, installing, connecting and testing of the splice enclosure. The price shall also include furnishing all labor, tools, materials, documentation, equipment, storage, transportation, and other incidentals necessary to complete the work.

Pay Item:	**Unit:**
Fiber Optic Cable Splice Enclosure	EA
Fiber Optic Interconnect Cable	LF

ITEM #1112284A — VEHICLE DETECTION MONITOR

Description:
Furnish and install a Vehicle Detection Monitor with stand in the Controller Cabinet.

Materials:
All hardware shall be new, corrosion-resistant. All equipment shall be current production.

Physical:

- Compact and easily accessible stand-mounted LCD/ LED Flat Panel Display.
- Diagonal screen size minimum 10 inches and maximum 15 inches.
- Withstand temperatures ranging from -4 to 140°F (-20 to 60°C).
- Operating humidity: 10-90% non-condensing.

Functional:

- Compatible with Color or Monochrome Detection systems.
- Industrial-grade video panel.
- ANSI contrast ratio of 300:1 minimum.
- Minimum brightness level: 400 candelas per square meter (400 lux).
- Native resolutions: 1024 (horizontal) x 768 (vertical).
- Support both National Television Standards Committee (NTSC) and Phase Alternating Line (PAL) video formats with auto-sensing.
- Minimum viewing angle: 140 degrees horizontally, 120 degrees vertically.
- On-Screen Display (OSD) controls brightness, contrast, color as well as horizontal and vertical positioning.
- Compatible with video detection processor output. Use appropriate converters/ adapters if necessary.
- Operable on 110 VAC or 220 VAC, 50 or 60 Hz.
- FCC, Voluntary Control Council for Interference (VCCI), Electromagnetic Compatibility (EMC), Consumer Electronics (CE) approved, UL listed and Energy Star efficient.
- MTBF Rating: 50,000 hours minimum.

Warranties and Guarantees:

Provide warranties and guarantees to the **Department of Transportation Office of Maintenance** in accordance with Article 1.06.08 of the Standard Specifications. Warranties for all equipment furnished as part of this Contract are to cover a period of 24 months following successful completion of the entire intersection acceptance test.

Method of Measurement:
The Vehicle Detection Monitor will be measured for payment as the number of units furnished, installed, operational and accepted.

Basis of Payment:

This work will be paid at the Contract unit price for each accepted "Vehicle Detection Monitor," which price shall include the Vehicle Detection Monitor, stand, documentation, warranty, labor, tools and equipment incidental thereto.

Pay Item	Pay Unit
Vehicle Detection Monitor	EA.

ITEM#1118012A REMOVAL AND/OR RELOCATION OF TRAFFIC SIGNAL EQUIPMENT

Section 11.18: Replace the entire section with the following:

11.18.01 – Description:

Remove all existing traffic signal equipment, salvage equipment or dispose of equipment as directed by the City of New Britain and the Engineer. Restore the affected area.

Lead paint may be present on surface of traffic signal equipment located within project limits. Any activities performed by the contractor that results in a painted surface being impacted or altered, shall be performed in accordance OSHA Lead in Construction Standard 29CFR 1926.62, or the painted surface shall be tested prior to any paint being disturbed by a qualified third party hired by the contractor to confirm that no lead is present.

11.18.02 – Materials:

The related sections of the following specifications apply to all incidental and additional material required for the proper relocation of existing equipment and the restoration of any area affected by this work.

- Division III, "Materials Section" of the Standard Specifications.
- Current Supplemental Specifications to the Standard Specifications.
- Applicable Special Provisions to the Standard Specifications.
- Current Department of Transportation, Functional Specifications for Traffic Control Equipment.

Article 11.18.03 - Construction Methods:

Schedule/coordinate the removal and/or relocation of existing traffic signal equipment with the installation of new equipment to maintain uninterrupted traffic signal control. This includes but is not limited to vehicle signals and detectors, pedestrian signals and pushbuttons, coordination, and pre-emption.

Abandoned Equipment

The contract traffic signal plan usually does not show existing equipment that will be abandoned. Consult the existing traffic signal plan for the location of abandoned material especially messenger strand, conduit risers, and handholes that are a distance from the intersection. A copy of the existing plan is usually in the existing controller cabinet. If not, a plan is available from City of New Britain upon request.

Unless shown on the plans it is not necessary to remove abandoned conduit in-trench and conduit under-roadway.

When a traffic signal support strand, rigid metal conduit, down guy, or other traffic signal equipment is attached to a utility pole, secure from the pole custodian permission to work on the pole. All applicable Public Utility Regulatory Authority (PURA) regulations and utility company requirements govern. Keep utility company apprised of the schedule and the nature of the work. Remove all abandoned hardware, conduit risers, and down guys, Remove anchor rods, to 6" (150mm) below grade.

When underground material is removed, backfill the excavation with clean fill material. Compact the fill to eliminate settling. Remove entirely the following material: mast arms, pedestal and pedestal foundation; controller cabinet and foundation; handhole; and existing wiring. Unless otherwise shown on the plan, remove mast arm foundations to a depth of 2 feet (600mm) below grade. Restore the excavated area to a grade and condition compatible with the surrounding area.

- If in an unpaved area apply topsoil and establish turf in accordance with Section 9.44 and Section 9.50 of the Standard Specifications.

- If in pavement or sidewalk, restore the excavated area in compliance with the applicable Sections of Division II, "Construction Details" of the Standard Specifications.

Salvage Equipment

Salvage existing traffic signal equipment as directed by the City of New Britain. The following materials shall be carefully removed, protected, transported and delivered to the City of New Britain: Pedestrian Signals, Pedestrian Push Buttons, Traffic Signals, Traffic Controller and other electronic equipment in the controller cabinet.

All material not identified for salvage, becomes the property of the Contractor. Properly handle, transport, then dispose in a suitable dump or recycle this material. Comply with all Federal and State hazardous waste laws and regulations.

In the presence of the Engineer, verify the condition and quantity of salvage material prior to removal. After removal transport and store the material protected from moisture, dirt, and other damage. Coil and secure copper cable separate from other cable such as galvanized support strand.

Within 2 working days of removal, return the salvage material to the City of New Britain Public Works Department – City Yard. Supply all necessary manpower and equipment to load, transport, and unload the material. The condition and quantity of the material after unloading will be verified by the City.

Department of Public Works - City Yard
55 Harvard St.
New Britain, CT 06051

Article 11.18.04 – Method of Measurement:

This work will be measured as a Lump Sum.

Article 11.18.05 – Basis of Payment:

This work will be paid for at the contract lump sum price for "Removal and/or Relocation of Traffic Signal Equipment" which price shall include relocating signal equipment and associated hardware, all equipment, material, tools and labor incidental thereto. This price shall also include removing, loading, transporting, and unloading of signal equipment/materials designated for salvage and all equipment, material, tools and labor incidental thereto. This price shall also include removing and disposing of traffic signal equipment not to be salvaged and all equipment, material, tools and labor incidental thereto.

Payment is at the contract lump sum price for "Removal and/or Relocation of Traffic Signal Equipment" inclusive of all labor, vehicle usage, storage, and incidental material necessary for the complete removal of abandoned equipment/material and/or relocation of existing traffic signal equipment/material. Payment will also include the necessary labor, equipment, and material for the complete restoration of all affected areas.

A credit will be calculated and deducted from monies due the Contractor for salvage material not returned or that has been damaged and deemed unsalvageable due to the Contractor's operations.

Pay Item	Pay Unit
Removal and/or Relocation of Traffic Signal Equipment	L.S.

ITEM NO. 1206023A - REMOVAL AND RELOCATION OF EXISTING SIGNS

Section 12.06 is supplemented as follows:

Article 12.06.01 – Description is supplemented with the following:
Work under this item shall consist of the removal and/or relocation of designated side-mounted extruded aluminum and sheet aluminum signs, sign posts, sign supports, and foundations where indicated on the plans or as directed by the City of New Britain. Work under this item shall also include furnishing and installing new sign posts and associated hardware for signs designated for relocation.

Article 12.06.03 – Construction Methods is supplemented with the following:
The Contractor shall take care during the removal and relocation of existing signs, sign posts, and sign supports that are to be relocated so that they are not damaged. Any material that is damaged shall be replaced by the Contractor at no cost to the City.

Sheet aluminum signs designated for removal are to be salvaged if they are in suitable condition as determined by the Engineer. The Contractor shall sort all salvaged sheet aluminum signs by size and shall stack ten signs to a bundle. Each bundle shall be bound by tape or metal strap and the bundles shall be stacked on pallets. The Contractor shall confirm intended delivery of the salvaged sheet aluminum signs at least seven days in advance and shall deliver the signs to the following address:

Department of Public Works - City Yard
55 Harvard St.
New Britain, CT 06051

Signs not suitable for salvage and sign supports designated for removal shall be removed and disposed of by the Contractor as directed by the Engineer and in accordance with existing standards for removal of signing.

Sheet aluminum signs designated for relocation are to be re-installed on new sign posts.

Article 12.06.04 – Method of Measurement is supplemented with the following:
Payment under Removal and Relocation of Existing Signs shall be at the contract lump sum price which shall include all extruded aluminum and sheet aluminum signs, sign posts, and sign supports designated for relocation, all new sign posts and associated hardware for signs designated for relocation, all extruded aluminum signs, sheet aluminum signs, sign posts and sign supports designated for scrap, and foundations and other materials designated for removal and disposal, and all work and equipment required.

Article 12.06.05 – Basis of Payment is supplemented with the following:
This work will be paid for at the contract lump sum price for "Removal and Relocation of Existing Signs" which price shall include relocating designated extruded aluminum and sheet aluminum signs, sign posts, and sign supports, providing new posts and associated hardware for relocated signs, removing and disposing of foundations and other materials, and all equipment, material, tools and labor incidental thereto. This price shall also include removing, loading, transporting, and unloading of extruded aluminum signs, sheet aluminum signs, sign posts, and sign supports designated for scrap and all equipment, material, tools and labor incidental thereto.

Pay Item	Pay Unit
Removal and Relocation of Existing Signs	L.S.

ITEM #1208931A – SIGN FACE - SHEET ALUMINUM (TYPE IX RETROREFLECTIVE SHEETING)

Section 12.08 is supplemented and amended as follows:

12.08.01—Description:

Add the following:

This item shall also include field testing of metal sign base posts as directed by the Engineer.

12.08.03—Construction Methods:

Delete the last sentence and add the following:

Metal sign base posts shall be whole and uncut. Sign base post embedment and reveal lengths shall be as shown on the plans. The Contractor shall drive the metal sign base posts by hand tools, by mechanical means or by auguring holes. If an obstruction is encountered while driving or placing the metal sign base post, the Contractor shall notify the Engineer who will determine whether the obstruction shall be removed, the sign base post or posts relocated, or the base post installation in ledge detail shall apply. Backfill shall be thoroughly tamped after the posts have been set level and plumb.

Field Testing of Metal Sign Posts: When the sign installations are complete, the Contractor shall notify the Engineer the Project is ready for field testing. Based on the number of posts in the Project, the Engineer will select random sign base posts which shall be removed by the Contractor for inspection and measurement by the Engineer. After such inspection is completed at each base post location, the Contractor shall restore or replace such portions of the work to the condition required by the Contract. Refer to the table in 12.08.05 for the number of posts to be field tested.

12.08.04—Method of Measurement:

Add the following:

The work required to expose and measure sign base post length and embedment depth using field testing methods, and restoration of such work, will not be measured for payment and shall be included in the general cost of the work.

12.08.05—Basis of Payment:

Replace the entire Article with the following:

This work will be paid for at the Contract unit price per square foot for "Sign Face - Sheet Aluminum" of the type specified complete in place, adjusted by multiplying by the applicable Pay Factor listed in the table below. The price for this work shall include the completed sign, metal sign post(s), span-mounted sign brackets and mast arm-mounted brackets, mounting hardware, including reinforcing plates, field testing, restoration and replacement of defective base post(s), and all materials, equipment, and work incidental thereto.

Pay Factor Scale: Work shall be considered defective whenever the base post length or base post embedment depth is less than the specified length by more than 2 inches. If the number of defects results in rejection, the Contractor shall remove and replace all metal sign base posts on the Project, at no cost to the Department.

Number of Posts to be Tested and Pay Factors (Based on Number of Defects)

Number of Posts in Project =>	**51-100**	**101-250**	**251-1000**	**>1000**
Sample Size=>	**5 Posts**	**10 Posts**	**40 Posts**	**60 Posts**
0 Defects	1.0	1.0	1.025	1.025
1 Defect	0.9	0.95	0.975	0.983
2 Defects	Rejection	0.9	0.95	0.967
3 Defects	Rejection	Rejection	0.925	0.95
4 Defects	Rejection	Rejection	0.9	0.933
5 Defects	Rejection	Rejection	Rejection	0.917
6 Defects	Rejection	Rejection	Rejection	0.9
7 or more Defects	Rejection	Rejection	Rejection	Rejection

Note: Projects with 50 or fewer posts will not include field testing

ITEM #1302046A - RESET MANHOLE (WATER)

DESCRIPTION

The work under this Section shall consist of the adjustment of existing water manhole frames and covers to match the proposed roadway or unpaved area grade. Adjustments shall be made by adding or removing brick to bring the cover to the required finish grade.

The work also includes the removal and replacement of new or existing cones and/or risers, if necessary, to allow the frame and cover to meet the proper finish grade to the satisfaction of the Engineer.

MATERIALS

Concrete building brick for manholes shall conform to the requirements of ASTM C55-11, Grade S II, as amended. Precast concrete grade rings may be used in place of, or in tandem with, concrete brick if directed by the Engineer.

Masonry concrete units for manholes shall conform to the requirements of ASTM 139-11, as amended.

Clay brick for manholes shall conform to the requirements of ASTM C32-11, as amended. Clean used, used paving or building brick, which meet these Specifications, or radial brick or concrete meeting the requirements herein given may be used for sewer structures.

Mortar for masonry in manholes shall be 1:2 cement sand mix, provided that hydrated lime be substituted for and not exceed 10% by weight of the cement.

CONSTRUCTION METHODS

When brick or concrete units are used for structures, they shall be laid with joints completely filled with mortar. Horizontal joints shall not exceed ½–inch, vertical joints ¼-inch, on the interior face. In building structures, lay all bricks or blocks as headers, breaking the joints between courses. Strike the interior joints smooth with the face of the wall. Plaster the exterior of sanitary manholes, constructed of brick or masonry units with 1:2 cement mortar, ¾-inch thick.

Manhole frames shall be set with the tops conforming accurately to the grade of the pavement or the finished ground surface, as indicated on the Drawings, or as directed. Frames shall be set concentric with the top of the masonry and in a full bed of mortar, so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around the bottom flange and have a slight slope to shed water away from the frame.

When directed by the Engineer, the Contractor shall use concrete brick or grade rings under the manhole frame to adjust the manhole frame or replace the existing brick.

METHOD OF MEASUREMENT

The quantity to be measured for payment under this Item shall be actual number of existing manhole frames and covers that are reset to meet the proposed pavement grade after full depth pavement reconstruction and/or milling and overlay operations or to meet the existing unpaved grade. The manhole frame and cover shall be set to meet the final pavement grade or surrounding unpaved area grade, unless otherwise directed by the Engineer.

BASIS OF PAYMENT

The unit price for this Item shall include earth excavation and support, removal, storage and replacement of existing frame and cover, removal of existing brick/mortar courses to allow for the lowering of the frame and cover if necessary, furnish and install new brick and mortar courses to raise or reinstall the frame and cover if necessary, backfill (gravel in paved areas) and compaction, and all materials, labor and equipment necessary to reinstall the manhole frame and cover to the line and grade shown on the Drawings or to meet the final finished grade as determined by the Engineer.

PAY ITEM	PAY UNIT
Reset Manhole (Water)	Each

ITEM #1302054A- REPLACE CURB BOX

Description

The Contractor shall replace curb stop valve boxes and covers appurtenant to individual water services which are in a damaged condition prior to construction as determined by the Engineer. The Contractor shall bring to the attention of the Engineer any curb stop valve boxes which are found to be damaged prior to their replacement. Curb stop valve boxes which are damaged by the contractor shall be replaced by the contractor at no cost to the City. If necessary, the contractor shall furnish and install a new top section of the curb stop valve box so as to protect and make accessible the curb stop valve contained therein. If the bottom section is damaged, this shall be replaced as well.

Materials

The Contractor shall furnish a Bingham & Taylor buffalo style cast iron curb box type 94E and cover or approved equal. All backfill material required shall be furnished and placed by the Contractor and shall conform to Article M.02.01 of Form 817.

Construction Methods

Contractor shall carefully excavate around the curb stop valve box to expose, remove and install the new curb stop valve box. The new curb stop valve box shall be installed and adjusted to final grade and the excavation backfilled and compacted in one-foot lifts to insure no settlement. The Curb stop valve cover must be exposed and accessible. After completion, the cover shall be removed, and a curb stop key lowered to insure it mates with the curb stop valve to facilitate shut off & turn on.

Method of Measurement

This work will be measured for payment at the unit price per each curb stop valve box and cover that is installed and approved.

Basis of Payment

This work shall be paid for at the contract unit price for "Replace Curb Box" complete in place, which price shall include the cost of furnishing all material, labor, equipment, clearing, trenching, disposal of excavated materials, furnishing and placing backfill material and grading necessary to complete the work.

Pay Item	Pay Unit
Replace Curb Box	EA

ITEM #1302061A – ADJUST GATE BOX (WATER)

ITEM #1302062A – ADJUST GATE BOX (GAS)

Description

The Contractor shall furnish any needed gate box extensions and make necessary gate box adjustments to meet proposed line and grade in any areas necessary within the project construction limits.

Materials

The Contractor shall furnish cast iron Dwyer type gate box sections as required and extension stems if necessary as shown on the drawings for water gate box adjustments.

The Contractor shall furnish appurtenances that meet the standards of Connecticut Natural Gas (CNG) for gas gate box adjustments.

Shop drawings, test reports and a certificate of compliance for all materials shall be furnished for approval by the Engineer prior to manufacture.

Construction Methods

Install gate box extensions (where needed) and make adjustments to the lines and grade as shown on the Drawings. Support valve box during backfilling; maintain vertical alignment. Install so that top of valve box is flush with final grade.

Methods of Measurement

Furnishing gate box extensions and adjusting as required and as directed will be measured for payment by the actual number of gate boxes adjusted to grade.

Basis of Payment

This work will be paid for at the contract unit price each for "Adjust Gate Box (Water)" and “Adjust Gate Box (Gas), of the appropriate size, complete in place, which price shall include the cost of the materials, cleaning, trenching, and disposal of excavated materials, refilling trenches, and all incidental work required for the proper completion of this work.

Pay Item	Pay Unit
Adjust Gate Box (Water)	EA
Adjust Gate Box (Gas)	EA

ITEM #1303195A – REMOVE HYDRANT (WATER MAIN)
ITEM #1303204A – HYDRANT ASSEMBLY (WATER MAIN)

13.00.01 – Description:

NOTE: In This Special Provision, the "Owner" is the New Britain Water Department.

Work under this item shall consist of the furnishing, installing, disinfecting, and testing of all cement lined ductile iron water pipe, including fittings, bends, tapping sleeves, air valves, and blow-offs, hydrants, joint restraints, including concrete thrust blocks, connecting sleeves, and other appurtenances, as indicated on the plans, with no substitutions, or as directed by the Engineer. Abandonment of existing water mains, including disconnecting and reconnecting new and existing water main, and water services, removal of existing water main and appurtenances, and cutting, filling the main with grout, and plugging mains and services to be abandoned in place, shall also be included as part of this item. Work under the appropriate items shall also include the relining of the existing water main as called for on the contract drawings and as specified herein.

In addition to all materials, the contractor shall furnish all labor, equipment, excavation, sheeting and trench boxes, backfilling, including flowable fill and polyethylene wrap as required and ordered by the engineer, dewatering and utility support necessary to complete the installation of the new water main and water services and as required to abandon existing facilities where necessary to complete the installation.

Work under this item shall also consist of providing new fire hydrant assemblies where shown on the plans or where directed by the Engineer. Work shall also include, but not be limited to, the removal and salvage of existing fire hydrants with hydrant branch, valve and valve box, where indicated on the plans, and delivered to the Water Department.

Work shall include, but not be limited to, trench excavation and backfill, furnishing and installing the hydrant lead complete with hydrant, anchoring tee, thrust block, pipe, fittings, mechanical joint retainer glands, coverall pipe joint restrainers, and hydrant with concrete thrust block units and drainage stone.

Work shall also include providing temporary water service, if required or directed by the Engineer. A plan for any temporary services shall be approved by the New Britain Water Department prior to the start of construction.

Manufacturer's data sheets and certification of compliance with specifications for all pipes, valves, fittings, and appurtenances shall be submitted to the Engineer for approval.

Manufacturer's data sheets for hydrants, pipe, gate valves, fittings, coveralls and retainer glands shall also be submitted to the Engineer for approval.

Where "Form 817" is used, it shall mean the "State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817, 2016" with latest revisions.

13.00.02 – Materials: Unless otherwise specified by the Engineer, the pipe, fittings, valves and appurtenances to be utilized in this work shall be new and unused, shall be of the types and materials specified herein, and shall meet the requirements specified herein. All material found during the progress of the work to have cracks, flaws or other defects will be rejected by the Engineer. All defective materials shall be promptly removed from the work site and replaced at no additional expense to the City of New Britain or ConnDOT.

1. Ductile Iron Pipe, Fittings and Joints shall meet the requirements of the latest revisions of AWWA C151 (ANSI A21.51). Joints shall be rubber gasket push-on type manufactured in accordance with the latest revision of AWWA C111 (ANSI A21.11). Pipe shall be supplied with the standard exterior bituminous coating of either coal tar or asphalt base approximately one mil thick. The interior shall be cement lined in accordance with the latest revision of AWWA C104 (ANSI A21.4), and pipe shall be of thickness Class 52 unless otherwise indicated. Any cut pipe that does not socket, due to the outside diameter of the pipe barrel exceeding the tolerances stated in the American Standard Specifications shall be replaced with new pipe. All ductile iron pipes shall be rated for a minimum working pressure of 125 psi (862 kPa) and a test pressure of 200 psi (1,380 kPa).

   All pipe and fittings shall have cast on it or stamped with the maker's name or mark, the letters "DI", and the casting date. The length and weight of pipe, thickness class and running number shall be painted on each pipe.

   All fittings shall be mechanical joint only. All pipe joints shall be either mechanical or push-on types, which employ a single elongated grooved rubber gasket to affect a watertight joint seal except for 6-in (150-mm) pipe which shall have mechanical joints only. Rubber gaskets shall be furnished with the pipe and shall be considered included in the price per meter of pipe.

   Fittings including tees, bends, reducers, caps and plugs, and mechanical joint plugs, shall be ductile iron meeting the requirements of AWWA C110 (ANSI A21.10) with mechanical joints in conformance with AWWAC111 (ANSI A21.11). Fittings shall be rated for a minimum working pressure of 125 psi (862 kPa) and a test pressure of 200 psi (1,380 kPa). Pipe and fittings shall have an inside lining of cement-mortar in accordance with AWWA C104 (ANSI A21.4). All pipe and fittings shall be coated inside and outside with an approved bituminous material. Compact firings meeting the requirements of AWWA C153 (ANSI A21.53) of latest revision may be used. Exterior coating shall be standard bituminous coating of either coal tar or asphalt base approximately 0.001 in (0.025 mm) thick.

   Connecting sleeves or step couplings for connecting new water mains to existing mains shall have mechanical joint ends restrained using retainer glands and shall be solid sleeve

   Model F-1014 as manufactured by the Clow Corporation, Oak Brook, Illinois, U.S. Pipe, Birmingham, Alabama, or approved equal.

   Coverall pipe joint restrainers shall be the Series 1700 restrainer as manufactured by Ebba Iron, Inc., Eastland, Texas or approved equal.

Mechanical joint retainer glands shall be "Megalug" as manufactured by Ebba Iron, Eastland, Texas, or approved equal.

Tiebolts, tic-bolt nuts, rod couplings, threaded and rod nuts, retainer clamps, and round flat washers for restrained joints shall be steel, meeting the requirements of ASTM A 36-77a.

Concrete thrust blocks shall be provided where indicated on the plans. Concrete for thrust blocks and pipe cradles, shall be Class "A" concrete and conform to the requirements of CONN DOT From 817 Section M.03. Mortar shall conform to the requirements of CONN DOT Form 817 Section M.11.04.

Testing of Ductile Iron pipe and Fittings and Final Acceptance of Ductile Iron pipe and fittings shall be as per the standards and guidelines set forth in the City of New Britain's Standard Specifications for Municipal Construction Section 4.01-2E.

2. Gate Valve, Butterfly Valve Assembly and Boxes

All gate valves shall be mechanical joint type and shall meet the requirements of AWWA C509 and AWAAA C504 of latest revision. Valves shall open to the right, (clockwise), shall have non-rising stems, O-ring seals, square operating nuts with bolts, glands and rubber gaskets. Valves shall be rated for a minimum working pressure of 175 psi (1210 kPa) and a test pressure of 300 psi (2,068 kPa). Gate and Butterfly valves shall be manufactured by Mueller Company or approved equal.

Valve boxes shall consist of a base and adjustable slide type top section with cover. The cover shall be the drop type with the word "WATER" cast on the top of the pipe. Valve boxes shall be manufactured by Bingham and Taylor, or approved equal.

3. Water Services

Water service piping shall be copper tubing and shall conform to ASTM B88, type "k" Annealed (soft) AWWA Specification 7SOCR or Federal Specification WWT-799. Tubing shall be continuous and shall be supplied and installed as needed with a diameter to match existing service diameter as determined in the field or as directed by the Engineer. Corporation stops and couplings shall be as manufactured by Mueller Co., or approved equal. For a 1-in (25-mm) service, use a 0.75-in (19-mm) stop with a 1 x 0.75 (25 x 19) coupling. For a 2-in (50-mm) service, use a 1.5-in (35.5- mm) stop with a 1.5 x 2 (35.5 x 50) coupling.

4. Trench Excavation

The trench shall be backfilled with approved material or as indicated on the plans.

Where called for on the plans, or as required by the presiding utility authority, all utility crossings shall be supported as necessary. Class "A" concrete supports shall be poured for pipe supports as required or directed by the engineer. Flowable fill and polyethylene wrap shall be used in all locations where utilities cross the existing water main or as determined by the New Britain Water Department. Flowable fill and polyethylene wrap shall be submitted to the NB Water Department for approval.

Utility Identification Tape shall be 4-in (100-mm) wide, designed to withstand underground exposure, colored blue and be durably imprinted with an appropriate warning indicating the presence of the buried pipe.

Excavation Support System:
Sheeting and shoring will be used to protect existing utilities and to protect trenches from excavation cave-ins. The excavation support system shall comply with the requirements as defined by the US Department of Labor OSHA regulations and any other regulation being State, Federal or local agency having jurisdiction including the CT Building Code requirements. If trench boxes are used for excavation support, the box shall be certified by the manufacturer or contractor's engineer before starting work.

Sheeting and boxing for trench excavation shall conform to the requirements of ConnDOT Form 817 Section 7.14.02.

The contractor shall provide dust control measures as necessary to reduce dust as a result of construction activity. Dust control procedures and products shall be approved by the engineer.

Gravel shall conform to Section M.02.02 of the ConnDOT Form 817 Standard Specifications.

5. Sterilization Corporations

Sterilization corporation stops, including gate valves and boxes, pipe, and restraints shall be installed at locations as directed by the Water Department.

6. Air Valves

AirValves shall be installed at all high points on the water main unless otherwise approved by the engineer. Air Valves shall be Wedge Air Vents as manufactured by Wedge Manufacturing or approved equal. Valve boxes for air valves shall be as manufactured by BIBBY STE-STCroix or approved equal.

7. Hydrants

Fire Hydrants shall be Muellar Super Centurian A-425, 5-1/4-inch (131.25-mm) valve opening with pumper, no exceptions, and more specifically as follows:

They shall be breakaway types with safety flange and safety stem coupling design. Breaking point to be below flange. Hydrants will be two way, 5.5 ft (1.7 m) depth of trench, 6-in (150 mm) mechanical joint bell connection with lugs, rubber gasket, gland, cast iron bolts and nuts, outlets nozzle caps and chains. 4.5 in (113-mm) and 5.33-in (135-mm) valve opening with mechanical joint shoe to fit pit cast and centrifugal cast pipe, synthetic rubber ring type main valve open left with two 2.5-in (63-mm) hose nozzles with national standard threads, 1.5-in (38-mm) pentagon operating nut, dry top bonnet, pressure seal, factory filled sealed lubricant, self-lubricating with a Teflon coated anti-friction wash. Operating nut shall show direction of opening. Hydrant will have four large drain openings which are flushed during opening. And closing of hydrant. Drain openings will be brushed with bronze or other type of corrosion-resistant material. There shall be no toggles, springs, linkages or synchronized mechanism of any kind.

Hydrant shall have compression type main valve, closes with pressure. Hydrant waterway shall be bronze. The waterway is defined to include a bronze upper valve plate, a bronze seat ring; and bronze elbow bush and a bronze subseat. Year and date shall be cast on the hydrant. Hydrants shall have no less than 150 psi (1034 kPa) working pressure and no more than 200 psi (1,380 kPa) test pressure AWWA standard. Hydrants shall be painted red and silver, and shall come with a weathercap over operating nut. They shall be capable of having extension installed at ground line and not at the elbow.

Hydrants, valves and fittings shall be of the type specified or shown on the Contract Drawings. All materials shall be approved by the New Britain City Water Department. All work shall be subject to the approval of the New Britain City Water Department.

Concrete shall be Class "A" Concrete.

Interior and exterior coatings shall meet the requirements of the latest revision of AWWA C502, and the color for that portion of the hydrant above the ground line shall be as directed by the City of New Britain Water Department. In addition, that portion of each hydrant below finished grade shall be given a coating of hot bitumastic material, equal to that used for exterior coating of pipe and fittings prior to installation, or protective coating of epoxy type.

A drain outlet is required. Hydrants shall be installed as shown of the plans and shall be approved by the City Water Department.

Ductile iron push-on joint pipe shall meet the requirements of the latest revision of AWWA C151 (ANSI A21.51) and shall be of Thickness Class 52. Pipe coatings shall meet the requirements specified in the pertinent section of these Special Provisions.

Mechanical joint fittings, exterior and interior coatings, and valve boxes shall meet the requirements specified in the pertinent section of these Special Provisions.

All gate valves shall be resilient seal gate valves and shall meet the requirements specified in the pertinent section of these Special provisions.

Concrete, if used, shall meet the requirements of Article M.03.01 of Form 817 for Class "A."

Crushed stone shall meet the gradation requirements specified in Article M.01.01, No. 6 0.75-in (19mm) designation of Form 817.

Mechanical joint retainer glands and coverall pipe joint retainers shall meet the requirements specified in the pertinent section of these Special Provisions.

Sleeves for connecting new hydrant tees to existing water main shall have mechanical joint ends restrained using retainer glands and shall be solid sleeve.

Gravel shall conform to the requirements of Form 817, Subarticle M.02.02.

8. Tapping Sleeves and Tapping Gate Valves with gate boxes

Valve and valve boxes shall conform to the requirements of the item for water main valves and fittings, open right, non-rising stems with "O" ring seals and 2-inch square operating nuts, mechanical joint on valve outlet 300 psi test pressure and 175 working pressure.

Tapping sleeves shall consist of two sections of heavy welded carbon steel ASTM A285 Grade C which bolt together on the pipe and seal against a Grade 60 Concave Wedge Gasket around the tap opening. The gasket shall be compounded to resist oil, natural gas, salts, acids, alkalis, hydrocarbon fluid, water and other chemicals and withstand temperatures to 212 degrees-F. The outlet half shall have a flat faced flange (AWWA C207 Class D, ANSI 150 lb. drilling) that is recessed to mate with standard tapping valves per MSS-SP60. The outlet shall have a ¾-inch NPT Test Plug. Bolts and nuts shall be corrosion resistant high strength low alloy steel with heavy semi-finished hexagon nuts to AWWA C111 (ANSI A21.11) standards. Finish shall be fusion bonded epoxy, coated to an average of 12 mil thickness. Tapping sleeves shall be JCM 412 Tapping Sleeves (JCM Industries) or Rockwell 622 (Rockwell International) or approved equal.

9. Water main Relining

A. The Contractor shall clean and cement mortar line the existing 14-in (350-mm) water main where shown on the contract drawings. Cement mortar lining materials shall meet the requirements of AWWA C602.

CEMENT MORTAR MIXTURE

A. The cement mortar mixture shall meet the requirements of AWWA C602 but shall be one part Type I Portland Cement to one part sand by volume.
B. The mixture shall be composed of cement, sand, and water only.
C. Mortar shall not be retempered by the mixing in of additional water.
D. Mortar shall be used before its initial set.
E. No mortar exhibiting clumping shall be used.
F. Slump tests on the mortar shall be performed by the Contractor in the presence of the New Britain Water Department when requested by the New Britain Water Department. The New Britain Water Department will request slump tests periodically and anticipates that no more than forty tests will be required. Test shall be performed in accordance with ASTM C143.

13.00.03 - Construction Methods:

1. Trench Excavation

All underground utilities shall be located and verified prior to the start of work.

The contractor shall provide all necessary pumps, well points, and drains necessary for removing water from the trenches and shall provide adequate boxing and shoring conforming to latest OSHA regulations.

Trench excavation and backfill shall be performed in such a manner so as to prevent damage to the pipe and to other utilities. Backfill around the pipe or from 6-in (150 mm)

below the pipe to one half the diameter of the pipe shall be with materials as indicated on the plans. All other backfill material shall be placed in 12-in (300 mm) lifts and compacted to 95% maximum density based on ASTM D1557 Method C, or as directed by the Engineer. Backfill material used above the 12-in (300 mm) above the top of the pipe shall be approved by the Engineer. Each layer of material shall be compacted by the use of vibratory compaction equipment or rollers. At such points as cannot be reached by mobile equipment, the materials shall be thoroughly compacted by the use of suitable power-driven tampers.

All trenches shall be filled by the end of the workday. Steel plates shall be used only as permitted by the engineer.

Gravel shall replace unsuitable material in the trench from the top of the pipe to 6-in (150-mm) below the bottom of the proposed pipe, and to 12-in (300 mm) from the edge of the proposed pipe on either side of the pipe.

Process Stone shall be furnished to the trench limits as ordered by the engineer.

All materials and procedures used for dust control shall be approved by the engineer. Dust control shall be performed with suitable equipment as approved by the engineer

The contractor shall provide excavation support and utility crossing support as required. All utilities shall be supported in accord with the presiding utility requirements. Where called for on the plans, all utility crossing shall maintain adequate crossing clearances as required by the presiding utility requirements. All crossing shall be provided with supports, adequately designed by the contractor's engineer. All utility crossing supports shall be approved by the engineer.

Only where approved by the engineer, and as a minimum, the contractor shall provide flowable fill and concrete encasements at utility crossings for pipe supports.

Polyethylene wrap shall be installed in accordance with ANSI/AWWA C105/A21.5-99 Standards. Flowable fill shall be placed according to the manufacturers recommendations.

Rock in Trench Excavation
Rock shall be removed to 6-in (150 mm) from the bottom of the proposed pipe and to 12-in (300 mm) from the edge of the proposed pipe on either side. Gravel shall replace rock material from ½ the diameter of the proposed pipe to 6-in (150 mm) from the bottom of the proposed pipe, and to 12-in (300 mm) from the edge of the proposed pipe on either side of the pipe.

2. Water Main Pipe and Fittings
Ductile iron pipe, fittings and valves shall be installed as detailed and directed, and in full accordance with the latest revision of AWWA C600, manufacture's recommendations, and accepted best practice, with the below listed qualifications and clarifications. The methods employed in performing the work, and all equipment, tools and machinery used in handling material and executing any part of the work shall be the subject to the approval of the Engineer before the work is started and, whenever found unsatisfactory,

shall be changed and improved as required by the Engineer. All equipment, tools and machinery used shall be maintained in a satisfactory working condition.
All salvageable materials shall be taken to the New Britain City Water Department Yard. It shall be the Contractor's responsibility to coordinate his work schedule with that of the City of New Britain's Water Department. No work shall be performed prior to notifying the Water Department at least 48 hours in advance of the start of work. No work shall be performed without a representative of the City staff to oversee the construction of the new pipeline.

At all installations where a connection is to be made by shutting-off gate valves, for gating off sections of a main which are normally open, the contractor shall verify, with the City of New Britain's Water Department, that the gate valves are property restrained prior to shutting-off. The excavation may be required to be made the day before work is to start. At which time the contractor shall have all materials on hand. The work shall be done as quickly as possible so that normal operation of the system is resumed in minimum amount of time. Any required operating of valves for this work would be performed by personnel of the New Britain Water Department. Ample notice shall be given to the Water Department so that a minimum of two (2) full working days' notice may be given to any user whose service will be discontinued for any reason. It may be necessary for the contractor to perform work outside of normal working hours if service interruption is required. The Contractor shall be responsible for coordinating his work with customers and with the Water Department. The Contractor shall be responsible for paying Department employees at their prevailing overtime wage rate as well as prevailing usage rate for vehicles and other equipment which are utilized.

It may be necessary for the contractor to isolate and remove a portion of an existing water main in order to accommodate a new utility. All work in this regard shall be coordinated with the New Britain City Water Department. Where necessary the contractor shall provide temporary water services, gate valves, concrete thrust blocks, bends with restraints, plugs, air valves, blow-off assemblies, sterilization corporations, as necessary and as ordered by the engineer.

Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient performances of the work. Prior to installation, all pipe and fittings shall be brushed and wiped clean from lumps blisters grease and oils. All pipe and fittings shall be examined for defects immediately before installation to final position. All pipe, fittings and valves shall be lowered into the trench with a suitable device that will not damage protective coatings and lining. Under no circumstances shall water main material be dropped or dumped into the trench. Any damage to pipe or fittings shall be repaired or replaced by the contractor.

Every precaution shall be taken to prevent foreign matter from entering the pipe while it is being placed in the trench. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size be placed over each end and left there until the connection is to be made to the adjacent pipe. If necessary, the line shall be swabbed or flushed out to remove all foreign matter prior to testing.

Before joining lengths of push-on pipe, the inside of the bell and the outside of the spigot shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter.

Pipe shall be laid with bell ends being in the direction of laying unless otherwise directed by the Engineer. When pipe is laid on a grade of 10 percent or greater, laying shall start at the bottom and shall proceed upward with the bell ends of the pipe upgrade.

The cutting of pipe joints for inserting valves, fittings or closure pieces shall be done in a neat manner without damage to the pipe or cement lining and so as to leave a smooth end at right angles to the axis of the pipe.

The deflection at pipe joints to accommodate changes in horizontal or vertical alignment shall be in accordance with the recommendations of the manufacturer. Where bends are called for on the plans, a standard bend may be used with any additional deflection required accomplished by deflecting joints on adjacent pipes.

Bends shall be used only at the locations shown on the plans or at other locations approved by the Engineer. All bends shall be restrained with retainer glands, each way, as indicated on the plans, and shall have poured concrete thrust blocks as shown on the detail plans. Joint deflection for pipe shall be limited to 50% of the Manufacturer's recommended maximum allowable deflection.

Valve boxes shall not transmit shock stress to the valve and shall be centered and plumb over the wrench nut of the valve. The valve box cover shall be flush with the surface of the finished pavement or such other level as may be directed.

Valves set with a depth to operating nut greater than 6 ft (1.8 m) shall be equipped with extension stems providing an operating nut depth of 4.5 ft (1.37 m). Extension stems shall be installed such as to preclude accidental disconnection from the valve, shall stand plumb and shall be supported at the upper end with a centering device attached to the stem or valve box. All gate valves shall be restrained one joint each way unless otherwise noted.

Poured concrete thrust blocks shall be provided at all horizontal bends, mechanical joint caps and tees and all locations indicated on the plans. Joints at fittings where thrust blocks are poured shall be wrapped with polyethylene. All mechanical joints (i.e., valves and fittings) shall be restrained by means of ductile iron retainer glands except where rod type restraint is specifically called for on the plans or ordered by the Engineer. Coverall pipe joint restrainers shall be used on all push-on pipe joints for a distance as indicated on the plans, on each side of all retainer glands. Concrete shall be mixed and placed in accordance with the pertinent section of these Special Provisions.

Restraint of push-on joints shall be accomplished by means of coverall pipe joint restrainers. All set screws shall be torqued to manufacturer's recommendations, proceeding alternately on opposite sides of the pipe.

Mechanical joint retainer glands shall be installed by tightening the tee head bolts. All set screws shall be torqued to manufacturer's recommendations, proceeding alternately on opposite sides of the pipe.

All pipe and fittings shall be laid and tested for defects and leakage as approved by and in the Presence of a Water Department representative.

3. Water Main Connections, Temporary Relocations and Abandonment

Where connections are to be made between new water mains and existing water mains, any unspecified materials required for disinfecting and testing the new water main shall be subject to the approval of the Water Department, utilized only after inspection and approval by the Engineer, and shall be at the expense of the contractor. All connections between new mains and existing mains shall be made by only at such times as, and in a manner, approved by the New Britain Water Department. The approximate locations of connections between new mains and existing mains are shown on the drawings; the exact locations will be determined in the field by the Engineer. The contractor shall locate all existing gate valves and adequately restrain them prior to making any connections.

All new water mains shall be disinfected and tested as described herein.

If when making a connection it is required to shut-down a portion of a water main, and such a shut-down is approved by the Water Department, the contractor shall notify all affected property owners of the shut-down.

All temporary relocations of the existing water main shall be approved by the Water Department.

Hydrants to be abandoned are to be cut and capped at the hydrant valve and rodded back to the hydrant tee per City Standard.

The cutting of an existing water main where connection is to be made to a new water main shall be done in a neat manner so as to leave a smooth end at right angles to the axis of the pipe. The open end of the section of existing water main to be abandoned shall be sealed with concrete and capped.

Abandonment of water facilities shall be as shown on the plans. All open ends of abandoned pipelines or conduits which are created or exposed by the Contractor and that will not be removed from the roadway, shall be sealed with concrete or grout and plugged/capped before backfilling. Valves to be abandoned shall be closed, and the valve boxes which are removed from the roadway shall be properly disposed of by the Contractor. The contractor shall properly dispose of all existing pipe, valves, fittings and other appurtenances that are removed from the trench for the installation of the new main.

All existing water main to be abandoned in place shall be cut and plugged at the locations as directed by the Water Department.

4. Disinfection and Testing

Disinfection and testing of the new pipeline shall be performed in accordance with the standards and procedures of the City of New Britain's Water Department.

Pressure testing and leakage testing shall be carried out after the line has been disinfected and shall be in accordance with the appropriate paragraphs of Section 4 of the latest

revision of AWWA/ANSI C600 with the following clarifications and qualifications. 1-in (25 mm) Taps shall be provided for testing.

The testing shall be performed after backfilling the completed pipeline. Before testing, the Contractor shall submit in writing to the Engineer, his proposed method of testing the completed pipeline. Testing shall begin only after approval by the Engineer of the proposed methods. Any required coordination with the Water Department shall be the responsibility of the Contractor.

Disinfection shall be carried out in accordance with Method 2 under Methods of Disinfection Pipe in the Connecticut State Department of Health's Bulletin, "Protection and Disinfection of Water Works Pipes and Structures, as required by section 19-13-B47 of the Connecticut State Sanitary Code.

Coordination with the City of New Britain Water Department will be necessary for all work required and shall be the responsibility of the Contractor.

Mains shall be completely flushed before disinfection test until all evidence of sediments is removed. A sodium hypochlorite solution or a mixture of calcium hypochlorite and water shall be applied, with a proper regulating device at the newly laid pipe. Hypochlorite's utilized in this work shall meet the requirements of AWWA B300 of latest revision.

Water from the existing distribution system entering the newly laid pipe shall be controlled to flow slowly during the application of hypochlorite. The rate of sodium hypochlorite application shall be in such proportion to the rate of water flowing through the pipe that the treated water entering the newly laid pipe will have a concentration of chlorine residual of 50 parts per million. There shall be a retention period of at least 24 hours and preferably more. The non-spore forming organisms shall be destroyed, and the chlorine residual after the retention period at the extremity of the pipe shall be at least ten parts per million. When disinfecting newly laid water pipe involving more than one valved section, all valves shall be operated while pipeline is filled with the disinfecting agent. Hydrants and other appurtenances shall also be operated for disinfection. After disinfection, the pipe section shall be flushed until, upon test, the quality of the water, both chemically and bacteriologically, is equal to that of the quality of the water served the public from the existing water supply. The procedure shall be repeated if necessary until the water from the pipe section is satisfactory.

Tests to determine the chlorine residual and the quality of the water in the new pipeline will be performed by the City of New Britain Water Department. It shall be the responsibility of the Contractor to coordinate with the Water Department to arrange for the testing at the proper time. No less than 24 hours notice shall be given when tests are to be performed.

Where connections are to be made between new water mains and existing water mains after disinfection and flushing are completed, new materials shall be swabbed with a suitable hypochlorite solution.

Alternative methods of disinfection shall be submitted in writing to the Engineer or City Water Department for approval.

A format pressure/leakage test will be required of the water main, valve and fittings in the system. Where any section of a main is provided with concrete thrust block, the test shall not be made until at least five days have elapsed after the concrete was placed. If high-early strength cement is used in the concrete thrust block, the test shall not be made until at least 2 days have elapsed. The pipeline or sections thereof shall be filled with water, and subjected to a pressure/leakage test with water under a hydrostatic pressure of 200-psi (1,379 kPa) unless otherwise specified. This pressure shall be maintained for the duration of the test which shall be 2 hours. Air valves may be used for test connections. Any excessive indicated leakage, as determined by the engineer, shall be located and repaired. The total leakage per day from the pipe line or sections thereof shall not exceed the amounts allowable under AWWA C600-82 Section 13.7. Should the pipeline or sections thereof not come within the permissible leakage limits, the contractor shall be require to excavate and locate the source of leakage and make repairs. After the contractor has notified the engineer that repairs have been made, the test will be repeated until the pipe line or sections thereof are made to satisfactory.

All mains, valves, hydrants, hydrant connections and other appurtenances built under this contract shall upon completion be disinfected in accordance with AWWA Standard C601-81 and the requirements of the Water Department.

Unless otherwise specified, upon flushing the new main, the contractor, under the supervision of the engineer or water department shall take samples of the water and have it tested by an approved laboratory. If said testing proves unsatisfactory, the contractor shall again disinfect the main and retest. Said procedure shall be repeated until satisfactory results are obtained.

The contractor shall furnish all labor, materials, tools and equipment necessary for or incidental to satisfactory disinfecting and leakage testing, and shall be responsible for any damage to the pipeline or to adjoining property due to this work.

The City Water Department will furnish free water for flushing, disinfecting and testing the pipeline.

In order for the Water Department to take samples after the disinfection of the new mains, the contractor shall install 1-in (25-mm) services. Each composed of a corporation stop, bushing, flared fitting, shutoff valve and pipe, of the length and at the locations as ordered by the engineer. After disinfection, efficient time must be allowed, to for the chlorine residual to reach normal. The engineer will then order the services to be turned on, allowed to run for one hour at which time the Water Department will take its samples. The water department reserves the right to allow 24 hours for the testing of each sample. Taking water samples for testing from the hydrants will not be permitted.

5. Tapping Water Main for Service Connections:

All service taps and connections shall be made only at such times as, and in a manner approved by the Water Department. The tap locations will be determined in the field by the Engineer.

6. Water Services

Copper water services shall be provided with 4.5 ft (1.37 m) of cover, together with corporation stops, couplings, gate valves and gate boxes.

All existing service laterals shall be either removed or abandoned in place. If the service is to be abandoned in place, the service shall be cut and plugged at the main and at the building or as directed by the engineer.

7. Hydrants

Unless otherwise specified all hydrants shall be located as shown on the Contract Drawings, or as directed, in such a manner as to provide complete accessibility.

Hydrants shall be placed behind the curb unless otherwise shown on the Contract Drawings. When placed behind the curb, the hydrant shall be set so that no portion of the hose nozzle cap will be less than 6-in (150-mm) or more than 12-in (300-mm) from the gutter face of the curb. When set in the lawn space between the curb and the sidewalk, or between the sidewalk, and property line, no portion of the hydrant or nozzle cap shall be within 6-in (150-mm) of the sidewalk.

Unless otherwise specified, all hydrants shall stand plumb and shall have their nozzles 90 degrees apart and shall be set with the hose nozzles parallel to the curb and the pumper nozzle facing the curb at an angle of 90 degrees. Hydrants shall be set to the established grade, with nozzles at least 16-in (400-mm) above the ground, as shown or as directed by the Engineer.

Each Hydrant shall be connected to the main by mechanical joint fittings, with a 6-in (150-mm) ductile iron branch controlled by an independent 6-in (150-mm) gate valve.

Whenever the hydrant is set on pervious soil, a drainage pit shall be provided at the base of the hydrant by placing coarse gravel or crushed stone mixed with course sand, from the bottom of the trench to at least 6-in (150-mm) above the waste opening in the hydrant. The diameter of this drainage pit will be minimum of 24-in (600-mm) greater than the hydrant barrel. Felt tar paper or 6 mil polyethylene plastic shall be place on top of the stone to prevent fines from entering the stones.

Whenever a hydrant is set in clay or other impervious soil, a drainage pit 24-in (600-mm) in diameter and 36-in (915-mm) deep shall be excavated below each hydrant and filled with compacted course gravel or crushed stone mixed with course sand. Compacted course gravel or crushed stone mixed with course sand shall also be placed under and around the elbow of the hydrant to a level of 6-in (150-mm) above the waste opening. No drainage pit shall be connected to a sewer. Felt tar paper or 6 mil polyethylene plastic shall be placed on top of the stone to prevent fines from entering the stones.

The hydrant base elbow shall be set on a 4-in x 8-in x 16-in (100-mm x 200-mm x 400-mm) solid concrete thrust block. A concrete thrust block shall be poured between the base elbow and the undisturbed trench wall.

Hydrants shall be restrained from the hydrant to the tee.

Trench excavation and backfill, installation of water main and appurtenances, testing, disinfection, pavement repair and surface restoration will be carried out as defined in the pertinent sections of these Special Provisions.

Where excavations are to be made in grass covered areas, loam and topsoil shall be carefully removed and separately stored to be used again. Or, if the Contractor prefers not to separate surface materials, he shall finish, as directed, loam and topsoil at least equal in quality to that excavated.

Fire hydrants shall be provided and installed at locations shown on the plans or as directed by the Engineer. Installation shall be as detailed on the plans and as defined in these Special Provisions. All fittings in hydrant assemblies shall be restrained from the tee, and shall be provided with concrete thrust block as shown on the plans.

Gate valve shall be set in accordance with the requirements of the pertinent section of these Special Provisions. Depth of bury shall be as shown on the plans.

All mechanical joints in hydrant leads shall have ductile iron retainer lands. All push-on joints in hydrant leads shall have coverall pipe joint restrainers.
Concrete masonry unit thrust blocks shall be provided beneath and concrete thrust blocks behind the hydrant bottom. The blocks shall rest against undisturbed earth and shall not obstruct the hydrant drain.

The Contractor shall place and secure a burlap bag over each new hydrant and shall be responsible for maintaining this covering until the hydrant is put into service, at which time the cover shall be removed and disposed of.

All existing hydrants which are removed or replaced shall be salvaged. The hydrant shall be delivered to the Water Department facilities. The Contractor shall be responsible for properly unloading all salvaged materials. All open ends of abandoned pipelines which are created or exposed by the Contractor and will not be removed from the roadway shall be sealed with concrete and capped or plugged before backfilling.

Where the plans call for existing hydrants to be removed, the existing hydrants shall be removed and salvaged. The valve box shall be removed from the road and the open ends of the existing hydrant lead shall be sealed with concrete.

Remove Hydrant
All existing hydrants to be removed at locations shown on the plans shall be removed along with the branch, valve and valve box.

8. Tapping Sleeves/Tapping Gate Valves and Gate Boxes
The Contractor shall obtain and pay for all City required permits.

The location of the taps shall be where indicated on the plans or as directed by the Engineer. Tapping sleeves shall not be installed until said locations are verified and approved by the Engineer and no work shall be performed without a representative of the City's Water Department present at the tap location.

It shall be the Contractor's responsibility to determine the class, type and outer diameter of the existing water main at the location of each tap. Tapping Sleeves are to be mounted on the water main and properly supported and aligned with the side flange bolts taken up evenly and uniformly. The tapping valve shall be properly supported and positioned and a hydrostatic test of both units conducted before the tap is made.

The existing water main shall be kept in service at all times during the tapping operation. All taps shall be made by the Water Department, City of New Britain, at the contractor's expense. Contractor is to provide tapping sleeve and tapping valve per City of New Britain Standards. Contractor shall excavate hole, shore trench, clean off pipe and New Britain Water Department will install tapping sleeve and valve, air test and do wet tap for $925. The Contractor is then responsible to finish hydrant installation per City of New Britain Standards.

Shop drawings of the tapping sleeves and valves shall be submitted to the Engineer for approval before any installation is made.

9. Water main Relining

All work done under this section shall be done in accordance with AWWA C602, Standard for Cement-Mortar lining of water pipelines in place – 4 inches (100 mm) and larger, as amended in the appendices, unless otherwise started herein. Any conflict between AWWA C602 and this specification will be resolved at the discretion of the New Britain Water Department.

OBSTRUCTIONS

A. An Obstruction is defined as any bend, fitting, or other item in the pipeline which hinders the cleaning and lining operation and is not shown or noted on the Drawings or has not been previously field identified.

B. The Contractor shall make additional openings at Obstructions in order to proceed with the Work.

C. No additional payment will be made to the Contractor for each Obstruction in accordance with Part 4 of this Section. Payment for all work required removing or line from the Obstruction including pipe repair, backfilling, permits, traffic control, etc. will be included in the cost of re-lining the water main.

WATER MAIN OPENINGS

A. The Contractor shall open the water mains at:

1. Each end of section to be cleaned and lined
2. At approximate 500 – ft (152 – m) intervals within any section to be lined.
3. Each location where a new valve or fitting is to be installed.
4. Each hydrant lateral.
5. Obstructions and mismarked mains.
6. Tees, wyes, crosses, branches, and similar fittings.

7. Any other location necessary to perform the Work or directed by the OWNER.

B. Openings shall be made by:

1. Guillotine saw cuts.
2. A power operated pipe cutter.
3. Removing existing couplings or sleeves, or other approved method resulting in the cut ends of pipe being square and true.

C. At openings in sections under pressure or in service, the Contractor shall install adequate blocking to prevent movement during the time the pipe is open.

CONDITION OF WATER MAIN

A. After opening the water main, the owner will determine if the structural condition of the main is suitable for cleaning and lining. If the main exhibits such poor condition (i.e. deteriorated) that cleaning and lining is not justified, the OWNER may either direct the CONTRACTOR to relay the main or to close the main until future restoration work by the OWNER is undertaken.

PIPE CLEANING

A. Pipe cleaning shall be accomplished by methods which do not include the use of water and which do not score or otherwise damage the pipes.

B. All rust, corrosion products, tubercles, deposits, old coatings, oil, grease, dirt, debris and other foreign materials shall be removed by the Contractor to produce a surface satisfactory to the OWNER for application of cement mortar lining.

C. Old bituminous coatings, shown on the drawings to be lined over, and if satisfactorily adhered to the pipe, may be left in place providing there are no sharp edges between coated and uncoated areas, nor any tuberculation.

D. Several passages of the cleaning apparatus, in both directions, may be required to produce the specified results. A prover shall be used with the cleaning apparatus.

E. Nothing shall be left on the pipe surfaces which in any way, or at any time, may harm the cement mortar lining or cause it to be less adherent.

F. All standing water shall be removed from the pipe.

G. Material removed from the pipe shall not be discharged to any street gutter system, storm sewer, water course, or sanitary sewer.

H. Material removed from the pipe and proposed to be used as a portion of the backfill shall be completely dried before such use. This material may not constitute more than 5% of any backfill lift and shall be thoroughly mixed with approved native or borrow backfill materials.

I. Over-excavation of holes used for pipe cleaning will be permitted to the extent

necessary to contain materials cleaned from the pipe and to keep their level below the water main invert. Such over excavation and additional backfill material required therefore will be provided by the Contractor at no additional cost.

J. At his option, the Contractor may remove the solids cleaned from the mains entirely out of the project area. The Contractor shall dispose of these solids in accordance with applicable laws and ordinances.

K. The Contractor may also pump the solids to a filtering mechanism at street level. Clean discharge, i.e. Discharge with no color tint or visible solids, from the filter may be discharged to the storm sewer system.

L. Hand cleaning of short sections of pipe and at fittings is permitted.

M. The use of swabs will be permitted to remove remaining loose debris and standing water from the main after cleaning.

N. After pipe cleaning but before the lining operation begins, the OWNER will clear ("Blow-Back") all service laterals on the section of pipe to be lined. The laterals will be back flushed with potable water. Disposal of water accumulating in exactions from the back-flushing is the responsibility of the Contractor. This water shall be considered cleaning residue and shall be handled in accordance with Paragraph G above. The Contractor shall give adequate notice to the OWNER regarding the scheduling of the back-flushing.

CEMENT MORTAR LINING

A. The existing 14-in (350-mm) water main shall receive a 0.25-in (6.25-mm) cement mortar lining. In all instances, tolerance for lining thickness shall be plus 0.33-in (8-mm) and minus 0.0625-in (1.56-mm).

B. Tees, crosses, wyes, and similar branch fittings may be lined through but, in the case of existing fittings allowed to remain by the OWNER, must be exposed for hand cleaning, lining, and inspection. In general, the fittings as discussed herein shall be replaced.

C. Hydrant laterals will not be cleaned and lined.

D. As soon as practically possible after a section has been cleaned by the Contractor and blow-back by and to the satisfaction of the OWNER, it shall be cement mortar lined. No lining shall be placed unless the OWNER is present and has inspected the cleaned pipe.

E. The lining shall consist of one course of continuously applied cement mortar placed by a centrifugal machine. Such machine shall project the mortar against the wall of the pipe without rebound and at a sufficient velocity to cause the mortar to be densely packed and to adhere in place. Hand lining may be used on short pipe pieces and on fittings.

F. The Contractor shall limit the maximum distance of a cement lining run to approximately 500 – ft (152 – m).

G. The mortar shall be mechanically troweled or dragged to produce a satisfactorily and consistently smooth surface, which is on constant thickness.

H. All openings to the pipe section shall be kept closed by airtight and watertight pipe plugs to prevent air circulation in order to create a moist atmosphere for adequate curing.

I. The OWNER will inspect all pipelines immediately after the completion of the lining run and notify the Contractor as to acceptability.

J. Defects including, but not limited to, sand pockets, voids, over sanded areas, excessively cracked areas, areas with lining thinner than specified or exceeding thickness tolerances, and areas of inconsistent, rough, or otherwise unsatisfactory surface finish will be reason for rejection of the lining run unless repaired by the Contractor.

K. Repair of defective linings shall be total removal of the defective area from the pipe segment before the lining reaches its initial set. The pipe segment shall then be relined with new cement mortar.

L. Upon completion of the removal of any defective lining, the Owner shall attempt to clear ("blow back") all service laterals on the affected pipe segment. Should the Owner be unable to blow back any service lateral on the affected pipe segment, the Owner shall attempt to notify the Contractor as to which service laterals remain plugged so Contractor may take appropriate restorative action. Any such action will be at Contractor's expense, and any damage caused by said restorative action will be the sole responsibility of the Contractor.

M. After the lining operation is completed, and after an approximate 2-hour initial cure, but before final cure, the OWNER will clear ("Blow-Back") all service laterals on the newly lined main. The laterals will be back flushed with potable water. Disposal of this "clean" water for pipelines or excavations is the responsibility of the Contractor.

PIPE CLOSURE

A. In general, same size pipe-to-pipe connections shall be made with epoxy coated couplings supplied non-restrained flexible couplings. Restrained mechanical joint sleeves shall be installed at the OWNER's option. Unless noted otherwise on the plans, new air cocks and blow-offs shall be installed at the locations of existing ones.

B. The pipeline shall be closed and filled by the Contractor within 24 to 48 hours after the completion of the lining. No water pressure other than that imposed by static head elevations shall be applied.

C. All closure piping work shall be done in the presence of the OWNER.

PERFORMANCE C-FACTOR TESTING

A. The Contractor shall make loss of head tests on all newly lined mains after the mains under this Contract have been cleaned and cement-mortar lined. Testing will be performed in order to determine coefficient "C" in the Hazen-Williams formula for the various diameter mains. In addition, the Contractor shall perform up to a total of five C-factor tests prior to cleaning at various times during the project as directed by the OWNER.

B. Testing shall be coordinated with the OWNER shall be performed continuously during the Contract, and in general shall be performed during flushing associated with OWNER disinfection. The OWNER will operate all street valves.

C. All testing shall be completed prior to any release of retainage or final payment.

D. In general, testing will be between hydrants. Static and friction head losses shall be measured with pressure gauges. Flow will be measured by piezometer or OWNER supplied water meter. The Contractor shall supply all piping, fittings, gages, and other materials required for testing.

E. The Contractor is required to guarantee all cleaned and cement-lined water mains, to the following coefficient "C" class in the Hazen Williams formula, all based on nominal pipe diameter with proper allowance being made for bends and fittings, in accordance with accepted practice.

	Guaranteed Coefficient "C"
Nominal Pipe Diameter	Hazen-Williams Formula
<20" C.I.	130
16" – 20" C.I.	125
12" C.I.	120
10" C.I.	115
8" C.I.	110
6" C.I.	100

F. For the purpose of establishing "C" coefficients on mains where it is not practicable to carry out the loss-of-head test through the full extent of the cleaned and lined main, the several sections thereof shall be tested and the weighted average coefficient "C" shall be considered to be acceptable for the whole of the cleaned and lined main.

G. For such cleaned and cement-mortar lined water mains that fail to meet the coefficient "C", determined by loss of head tests, two percent will be deducted from the contract price after the drop of coefficient "C" from one to four points below the guarantee and a one percent additional deduction from the contract price for each two-point drop in coefficient "C" thereafter.

H. For such cleaned and cement-mortar lined water mains that fall below the guaranteed coefficient "C" to the extent of ten points or more because of poor workmanship, the OWNER shall decide whether the deduction in payment shall be made in

accordance with the terms indicated above, or if the cement-mortar lined at no added expense to the OWNER.

I. During flow testing, the Contractor shall protect public and private property from damage which may result from flows out of the hydrants or as discharged water runs down curb-lines.

13.00.04 - Method of Measurement:

Water main and water service Trench Excavation

The water main and water service trench shall be excavated to the proposed pipe grades as shown on the contract drawings. Trench excavation will not be measured for payment.

Backfill and bedding material, including sand, process stone and crushed stone, along with utility identification tape, flowable fill, polyethylene wrap, trench compaction and concrete cradles and thrust blocks will not be measured for payment.

Utility Support, excavation support and dust control will not be paid for separately. Rock in Trench Excavation will be measured for payment as detailed in Section 02.05 for Form 817.

Water main

Water main will be measured by the meter of the particular size completed, in place and accepted. Measurement will be along the centerline of pipe and fittings.

Miscellaneous fittings including blow-off assemblies, sterilization corporations, or step couplings, retainer glands, and coverall pipe joint restrainers, plugs or caps of various sizes, concrete thrust blocks, removal of existing water main pipe including fittings and appurtenances, disconnecting existing water main and reconnecting of new main, cutting and capping or plugging of existing water mains will not be measured for payment

Disinfection and Testing

Disinfection and Testing of water mains and appurtenances and providing Taps and /or temporary thrust restraint associated with testing will not be measured for payment.

Water Services

Water services will be measured by the unit, each completed, in place and accepted. Each shall include tapping the main, the corporation, the copper service pipe, the curb stop, and the service curb box with rod, as required for the complete installation of the service.

Temporary water service pipe will not be measured for payment.

Hydrants

Fire hydrant assemblies will be measured as units, complete and accepted. Measurement shall be from and inclusive of the tee at the water main to the back of the hydrant. Units measured under this item shall include both the installation of new hydrant assemblies and the replacement/relocation of existing hydrant assemblies.

Removal of existing hydrant assemblies and transporting each Hydrant to the New Britain City Water Department Facility shall be included in the unit price for "Remove Hydrant (Water Main)" item.

Excavation, backfill, abandonment of existing hydrant leads, thrust blocks, connecting sleeves, retainer glands, coverall pipe will not be measured separately for payment.

Tapping Sleeves/Tapping Gate Valves/ Butterfly Valve Assembly and gate boxes
Tapping Sleeves, Tapping Gate Valves with boxes and Butterfly Valve Assembly shall be included in the cost of Hydrant Assembly (Water Main), completed, in place and accepted. The tapping gate valve shall include the valve box and extension stem. The Butterfly Valve Assembly shall include epoxy coated coupling.

Water main Relining

A. Cleaning and Lining – This work will be measured for payment by the actual number of water main cleaned and cement mortar lined and accepted and measured in place.

B. Performance C-Factor Testing – The Contractor will receive no separate additional payment for C-Factor testing.

C. Obstructions – The Contractor will receive no separate additional payment for obstructions removed by the Contactor.

D. For removal and disposal of cleaned pipe material, the Contractor will receive no separate additional payment.

13.00.05 - Basis of Payment:

Water main
All materials including ductile iron pipe water main, ductile iron fittings, air valves, retainer glands and coverall joint pipe restrainers, concrete anchors or thrust blocks, blow-off assemblies, sterilization corporations, step couplings or connecting sleeves, plugs or caps, and all other fittings of various sizes will be paid for at the contract unit price per foot for "Ductile Iron Pipe" of the various size complete and in place.

All work, materials, equipment and excavation necessary to complete the work, including cutting and capping or plugging existing water mains, removal and disposal of existing water main and fittings and appurtenances, disconnecting and reconnecting of the new main to the existing, gravel and process stone, sand and crushed stone backfill material, backfilling the trench, filter fabric, utility identification tape, flowable fill, polyethylene wrap, compaction, concrete thrust blocks, utility support, and all tools, labor, equipment, materials, testing and bedding material shall be included in the contract unit price for "Ductile Iron Pipe (Water main)" of various sizes.

Gate Valves, including boxes, will be paid for at the contract unit price each for "Gate Valve" of the particular size, complete and in place.

Water Services

All service taps and connections shall be paid for at the contract unit price for each Water Service. The price shall include all work, materials, equipment and excavation necessary to complete the work, including tapping, corporation, copper service pipe, curb stop, service curb box and rod, disconnecting and reconnecting the new service to the new main, excavation, backfilling, sand backfill material, filter fabric, and bedding material shall be included in the contract unit price for each "Water Service".

All work, materials and equipment used for temporary service connections will not be paid for separately, but shall be included in the cost of "Water Service".

All cost for work, materials and equipment used in Utility Support, Excavation and Dust Control will not be paid for separately but shall be included in the cost of the water main pipe.

All water services shall be installed from the main to the building unless otherwise directed by the engineer.

The cost for removing an existing water service and cutting and plugging existing services to be abandoned in place, shall be included in the price of the new water service.

Disinfection and Testing

Disinfection and Testing of water mains and providing taps and thrust restraint associated with testing will not be paid for separately, but shall be included in the cost the water main pipe.

Sterilization Corporations

Sterilization Corporations will not be paid for separately, but shall be included in the cost the water main pipe.

Rock in Trench Excavation

Rock in trench excavation work will be paid for at the Contract price for cubic yards of "Rock in Trench Excavation (water main)". This price shall include all tools, labor, and equipment necessary to complete the excavation in conformance with the plans as ordered. It shall also include disposing of surplus materials. No additional payment will be made for shoring, bracing, sheeting, pumping, and bailing or for materials or equipment used in satisfactory completing the work.

Hydrants

Furnishing and installing Fire Hydrants complete with thrust block, pipe, fittings, tapping sleeves, tapping valves, mechanical joint retainer glands, coverall pipe, joint restrainers, concrete masonry units, drainage stone, backfill, including labor and equipment used for trench excavation shall be paid for at the Contract Unit Price for each Hydrant Assembly (Water Main)".

All work related to removing, salvaging and delivering to the Water Department's Facility any hydrants with fittings shall be included in the unit price for "Remove Hydrant (Water Main)" item.

Air Valves

Air Valves will be paid for at the contract unit price "each", complete and in place. The price shall include the gate box and cover.

Tapping Sleeves/Tapping Gate Valves/ Butterfly Valve Assemblies and gate boxes

Tapping Sleeves, Tapping Gate Valves with boxes and Butterfly Valve Assemblies shall be included in the cost of Hydrant Assembly (Water Main), complete and in place. The price for tapping gate valves shall include the gate box and cover. The price for Butterfly Valve Assembly shall include the epoxy coated coupling.

Water main Relining

The cleaning and cement-mortar lining of the existing 14-in (350-mm) water main shall be paid for at the contract unit price per meter for "water main relined" complete, in place and accepted. The price shall include Performance C-Factor Testing, obstruction removed by the Contractor.

Pay Item	**Pay Unit**
Remove Hydrant (Water Main)	EA
Hydrant Assembly (Water Main)	EA

ITEM #1500209A - RESET MANHOLE (TELEPHONE)

DESCRIPTION

The work under this Section shall consist of the adjustment of existing telephone manhole frames and covers to match the proposed roadway or unpaved area grade. Adjustments shall be made by adding or removing brick to bring the cover to the required finish grade.

The work also includes the removal and replacement of new or existing cones and/or risers, if necessary, to allow the frame and cover to meet the proper finish grade to the satisfaction of the Engineer.

MATERIALS

Concrete building brick for manholes shall conform to the requirements of ASTM C55-11, Grade S II, as amended. Precast concrete grade rings may be used in place of, or in tandem with, concrete brick if directed by the Engineer.

Masonry concrete units for manholes shall conform to the requirements of ASTM 139-11, as amended.

Clay brick for manholes shall conform to the requirements of ASTM C32-11, as amended. Clean used, used paving or building brick, which meet these Specifications, or radial brick or concrete meeting the requirements herein given may be used for sewer structures.

Mortar for masonry in manholes shall be 1:2 cement sand mix, provided that hydrated lime be substituted for and not exceed 10% by weight of the cement.

CONSTRUCTION METHODS

When brick or concrete units are used for structures, they shall be laid with joints completely filled with mortar. Horizontal joints shall not exceed ½–inch, vertical joints ¼-inch, on the interior face. In building structures, lay all bricks or blocks as headers, breaking the joints between courses. Strike the interior joints smooth with the face of the wall. Plaster the exterior of sanitary manholes, constructed of brick or masonry units with 1:2 cement mortar, ¾-inch thick.

Manhole frames shall be set with the tops conforming accurately to the grade of the pavement or the finished ground surface, as indicated on the Drawings, or as directed. Frames shall be set concentric with the top of the masonry and in a full bed of mortar, so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around the bottom flange and have a slight slope to shed water away from the frame.

When directed by the Engineer, the Contractor shall use concrete brick or grade rings under the manhole frame to adjust the manhole frame or replace the existing brick.

METHOD OF MEASUREMENT

The quantity to be measured for payment under this Item shall be actual number of existing manhole frames and covers that are reset to meet the proposed pavement grade after full depth pavement reconstruction and/or milling and overlay operations or to meet the existing unpaved grade. The manhole frame and cover shall be set to meet the final pavement grade or surrounding unpaved area grade, unless otherwise directed by the Engineer.

BASIS OF PAYMENT

The unit price for this Item shall include earth excavation and support, removal, storage and replacement of existing frame and cover, removal of existing brick/mortar courses to allow for the lowering of the frame and cover if necessary, furnish and install new brick and mortar courses to raise or reinstall the frame and cover if necessary, backfill (gravel in paved areas) and compaction, and all materials, labor and equipment necessary to reinstall the manhole frame and cover to the line and grade shown on the Drawings or to meet the final finished grade as determined by the Engineer.

PAY ITEM	PAY UNIT
Reset Manhole (Telephone)	Each

BID PROPOSAL SUBMITTAL DOCUMENT

for the

PHASE VI STREETSCAPE
MYRTLE STREET / EAST MAIN SREET

BID No. 3972

STATE PROJECT No. L088-002

CITY OF NEW BRITAIN, CONNECTICUT

HONORABLE ERIN E. STEWART, MAYOR

BID PROPOSAL SUBMITTAL PACKAGE

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STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder

   1A. Corporation __
   Partnership __
   Individual __
   Joint Venture __
   Other __
   (Check One)

2. Bidder's FEDERAL Tax Identification Number.

3. Permanent main office address, telephone number(s) and fax number(s).

4. Date organized?

5. If a corporation, answer the following:

   5.1 Date of incorporation:
   5.2 State of incorporation:
   5.3 President's name:
   5.4 Vice-President's name(s):
   5.5 Secretary's name:
   5.6 Treasurer's name:

6. If a partnership, answer the following:

   6.1 Date of organization:
   6.2 Name and address of all partners (State whether general or limited partnership):

7. If other than a corporation or partnership, describe organization and name principals:

8. How many years have you been engaged in construction under your present firm or trade name?

   8.1 Under what other or former names has your organization operated?

9. Contracts on hand:(Schedule these, showing name of project, owner, architect and/or engineer, gross amount of each contract, percent complete and the scheduled dates of completion).

9a. Please provide company name, address, telephone number and contact person for at least two installations which you have completed similar in complexity and facility usage to that which you are proposing in response to Public Bid _____ that have been in service for at least three years.

10. General character of work performed by you and work normally performed with your own forces:

11. Have you ever failed to complete any work awarded to you? If so, note when, where, why:

12. Within the last five years, has any officer or partner of your organization ever been an officer or partner of another organization when it failed to complete a construction contract? If so, attach a separate sheet of explanation.

13. Have you ever defaulted on a contract? If so, where and why?

14. List the major projects your organization has completed in the past five years, giving the name of project, owner, architect and/or engineer, contract amount, date of completion, and percentage of the cost of the work performed with your own forces.

15. List your major equipment available for this contract, stating which is owned and which will be leased.

16. Experience in work similar in importance to this project and when completed by you.

17. State the number of years of background and experience of the principal members of your organization, including the officers and the nature of business activity.

18. Trade References:

19. Give Bank references and credit available $_____.

20. Name of Bonding Company and name and address of agent:

21. Attach a financial statement, audited if available, including Contractor's latest balance sheet and income statement showing the following items:

A. Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials, inventory and prepaid expenses):

B. Net fixed assets:

C. Other assets:

D. Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries, and accrued payroll taxes):

E. Other liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus, and retained earnings):

F. Name and address of firm preparing financial statement and date thereof:

21.1. Is this financial statement for the identical organization named in #1?

If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

21.2. Will this organization act as guarantor of the contract for construction?

Note regarding financial Statement:

The Bidder financial information will be maintained in confidence pursuant to C.G.S. provision Section 1-19(b)(5), provided that:

a. Bidder clearly indicates in writing a request that the financial information be maintained in confidence by the City of New Britain; and,

b. Submission of financial information is made in a separate, sealed envelope clearly marked "Financial Information - to be maintained in confidence".

22. Will you, upon request, furnish any other information that may be required by the City of New Britain?

23. The undersigned hereby authorizes and requests any persons, firms, or corporations to furnish any information requested by the City of New Britain in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated this _____ day of _____ , _____

Bidder's Name: _____

By: _____ Official Address:

Title: _____ _____

(**Note:** the above signature must be notarized on following page.)

NOTARY'S CERTIFICATE:

STATE OF _____)

COUNTY OF _____)

_____ , being duly sworn, deposes and says that he is _____ of _____ , and that the answers to the foregoing questions and all statements therein are true and correct.

Subscribed and sworn before me this _____ day of_____, ____.

Notary Public

My Commission Expires:

PROSPECTIVE VENDOR'S RESIDENCY
and TAX PAYMENT CERTIFICATION

The City of New Britain Code of Ordinances, Sec. 2-575, reads as follows:

> **Sec. 2-575. Rejection of bid where bidder is in default to City**
>
> **The agent shall not accept the bid of a contractor who is in default on the payment of taxes, licenses or other monies due the city.**
>
> **The agent shall include in the bid document a form to be executed by a bidder certifying that said bidder is not in default on the payment of taxes, licenses or other monies due the city.**
>
> **As used in this section, (1) a "principal" of a contractor shall mean an individual who is a director, an officer, an owner, a limited partner, or a general partner; and (2) "default in the payment of taxes" shall mean failure to pay taxes by the date such taxes are due and payable or the failure to be current with respect to a delinquent taxes payment schedule as set forth in a written agreement with the Tax Collector.**

In accordance with this provision, the prospective vendor submitting the accompanying bid for City of New Britain Bid No. **3972** hereby makes the following certifications with respect to the residencies of his firm and the principals thereof:

Firm Name: _____

Complete Business Address
of Submitting Office: _____

Complete Business Address
of Main Office (if different): _____

The persons listed on the following pages (make and use additional copies of page "RTC - 2___ of 3", if necessary, filling in the "___" in the page number and before the name as appropriate,) including their residency address, and all other requested information, represent all of the principals, as defined previously herein, of the above-named prospective vendor:

1. Name: _____

Residency Address: _____

Mailing Address (if different): _____

List below the addresses of any (other) properties located within the City of New Britain which the above-named principal owns in whole or in part, or otherwise has an interest in; reply with ‘none’ if applicable:

_____

_____

List below the names and addresses of any (other) business entities using a New Britain address of which the above-named principal is also a principal; reply with ‘none’ if applicable:

_____

_____

2. Name: _____

Residency Address: _____

Mailing Address (if different): _____

List below the addresses of any (other) properties located within the City of New Britain which the above-named principal owns in whole or in part, or otherwise has an interest in; reply with ‘none’ if applicable:

_____

_____

List below the names and addresses of any (other) business entities using a New Britain address of which the above-named principal is also a principal; reply with ‘none’ if applicable:

_____

_____

3. Name: _____

Residency Address: _____

Mailing Address (if different): _____

List below the addresses of any (other) properties located within the City of New Britain which the above-named principal owns in whole or in part, or otherwise has an interest in; reply with ‘none’ if applicable:

_____

_____

List below the names and addresses of any (other) business entities using a New Britain address of which the above-named principal is also a principal; reply with ‘none’ if applicable:

_____

_____

CERTIFICATION IS HEREBY MADE THAT _____

(The prospective vendor named above) AND THE _____ (total number of principals) PRINCIPALS THEREOF, AS LISTED HEREIN, ARE NOT IN DEFAULT ON PAYMENT OF TAXES, LICENSES, OR OTHER MONIES DUE THE CITY OF NEW BRITAIN AS OF THE DATE OF BID SOLICITATION.

Signature and Title of authorized principal of named prospective vendor: Date:

_____ _____

Review by Tax Collector (to be completed for successful bidder only):

Signature of Tax Official: Date:

_____ _____

CERTIFICATION OF NONSEGREGATED FACILITIES

This Bidder certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The Bidder certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The Bidder agrees that a breach of his certification will be a violation of the Equal Opportunity clause in any Contract resulting from acceptance of his Bid. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, color, religion or natural origin, because of habit, local custom or otherwise. The Bidder agrees that (except where he has obtained identical certification from proposed Subcontractors for specific time periods) he will obtain identical certifications from proposed Subcontractors prior to the award of Subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

Date: _____ Signed: _____

Title: _____

CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F. R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or sub-contract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

CERTIFICATION BY BIDDER

Bidder's Name: _____

Address and Zip Code: _____

_____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. ___ Yes ___ No (If answer is yes, identify the most recent contract.)

_____

2. Compliance reports were required to be filed in connection with such contract or subcontractor.

___ Yes ___ No (If answer is yes, identify the most recent contract.)

_____

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.

___ Yes No None Required

4. If answer to item 3 is "No", please explain in detail on reverse side of this certification.

Certification - The information above is true and complete to the best of my knowledge and belief.

Name and Title of Signer (Please Type) _____

_____ _____

Signature Date

CERTIFICATION BY PROPOSED SUBCONTRACTOR REGARDING EQUAL EMPLOYMENT OPPORTUNITY

NAME OF PRIME CONTRACTOR _____ BID No. 3938

INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or sub-contract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the subcontractor has not filed a compliance report due under applicable instructions, such subcontractor shall be required to submit a compliance report before the owner approves the subcontract or permits work to begin under the subcontract.

SUBCONTRACTOR'S CERTIFICATION

Subcontractor's Name: _____

Address: _____

_____

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. ___ Yes ___ No

2. Compliance reports were required to be filed in connection with such contract or subcontract. ___ Yes ___ No

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.
___ Yes ___ No ___ None Required

4. If answer to item 3 is "No", please explain in detail on reverse side of this certification.

Certification - The information above is true and complete to the best of my knowledge and belief.

NAME AND TITLE OF SIGNER (Please Type) _____

_____

Signature Date

CERTIFICATION OF NON-COLLUSION

The Undersigned certifies, under penalties of perjury:

That this Proposal has been made by the Proposer independently, and has been submitted without collusion, and without any agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment, or services described in this procurement document, designed to limit independent bidding or competition;

That the contents of the proposal have not been communicated by the Proposer or its employees or agents to any person not an employee or agent of the Proposer or it's surety or any bond furnished with the proposal, and will not be communicated to any such person prior to the official awarding of this procurement.

That I have fully informed myself regarding the accuracy of the statement made in the certificate.

SIGNATURE: _____

NAME: _____

FIRM: _____

TITLE: _____

DATE: _____

FORM OF BID

The undersigned bidder hereby submits the following bid for the **Phase VI Streetscape, Myrtle Street / East Main Street, Bid No. 3972**, in accordance with the Bid Documents for said project. The undersigned has carefully examined and understands all Bid Documents, as listed in Article 3 of the Instructions to Bidders of the "Bid Requirements and Conditions Document"; and has complied with all the provisions thereof in the preparation of his bid. The Undersigned also offers to furnish all plant, labor, material, supplies, equipment and other facilities for or incidental to the construction of said project as required by, and in strict accordance with, the Improvement Drawings and Specifications, and all addenda issued by the Owner and mailed to the undersigned by registered mail, with return receipt requested, prior to the date of bid opening, whether received or not, for the following unit bid prices.

The Bid Unit Price for each item and the Total Amount Bid must be written in words and figures for the Base Bid and any Alternate Bids.

The undersigned bidder acknowledges receipt of the following:

Addendum #	Date	Acknowledged
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

The total amount of the Base Bid based on the estimated quantities shown herein and as computed by the undersigned Bidder for the **Phase VI Streetscape, Myrtle Street / East Main Street, Bid No. 3972**, is:

ITEMIZED WORK / QUANTITIES

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0201001 A	1	LS	CLEARING AND GRUBBING THE LUMP SUM PRICE OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0202000	5390	CY	EARTH EXCAVATION THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0202451 A	20	CY	TEST PIT EXCAVATION THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0202503 A	1230	LF	REMOVAL OF CONCRETE CURBING THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0202513 A	1300	SY	REMOVAL OF CONCRETE SIDEWALK THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0202529	2100	LF	CUT BITUMINOUS CONCRETE PAVEMENT THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0205004	25	CY	ROCK IN TRENCH EXCAVATION (0 - 10' DEEP) THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0209001	7710	SY	FORMATION OF SUBGRADE THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0212000 A	2610	CY	SUBBASE THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0213100 A	25	CY	GRANULAR FILL THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0219001	900	LF	SEDIMENTATION CONTROL SYSTEM THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0219011 A	35	EA	SEDIMENT CONTROL SYSTEM AT CATCH BASIN THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0304002 A	1410	CY	PROCESSED AGGREGATE BASE THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0404100 A	40	SY	BITUMINOUS CONCRETE PATCHING - FULL DEPTH THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0406002 A	40	SY	TEMPORARY PAVEMENT THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0406170	1910	TON	HMA S1.0 THE PRICE PER TON OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0406171	1700	TON	HMA S0.5 THE PRICE PER TON OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0406236	1270	GAL	MATERIAL FOR TACK COAT THE PRICE PER GALLON OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0406275 A	6110	SY	FINE MILLING OF BITUMINOUS CONCRETE (0 - 4") THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0406999 A	EST	EST	ASPHALT ADJUSTMENT COST THE ESTIMATED PRICE OF $ TWENTY THOUSAND DOLLARS AND NO CENTS ($ 20,000.00)	$ 20,000.00
0507758 A	12	EA	RESET MANHOLE (STORM) THE PRICE EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0586001 .10	11	EA	TYPE "C" CATCH BASIN 0'-10' DEEP THE PRICE EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0586001 .20	1	EA	TYPE "C" CATCH BASIN 0'-20' DEEP THE PRICE EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0586013 .10			OFFSET TYPE "C" CATCH BASIN 0'-10' DEEP THE PRICE EACH OF $ _____ DOLLARS AND _____ CENTS	
	2	EA	($ _____)	$ _____
0586701			CONVERT CB TO TYPE 'C-L' CATCH BASIN THE PRICE EACH OF $ _____ DOLLARS AND _____ CENTS	
	3	EA	($ _____)	$ _____
0586703			CONVERT CB TO MANHOLE THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
0586750			TYPE "C" CATCH BASIN TOP THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	2	EA	($ _____)	$ _____
0586790 .10			REMOVE DRAINAGE STRUCTURE 0'-10' DEEP THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	10	EA	($ _____)	$ _____
0612994			CONCRETE CYLINDER CURING BOX THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
0686000 .12			12" R. C. PIPE 0'-10' DEEP THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	60	LF	($ _____)	$ _____
0686002 .12			12" R. C. PIPE (CLASS V) 0'-10' DEEP THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	24	LF	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0686200 .12	50	LF	12" PVC PIPE 0'-10' DEEP THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0686201 .12	30	LF	12" PVC PIPE 0'-20' DEEP THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0811001 A	320	LF	CONCRETE CURBING THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0813021 A	2900	LF	6" GRANITE STONE CURBING THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0813031 A	650	LF	6" GRANITE CURVED STONE CURBING THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0921001 A	14200	SF	CONCRETE SIDEWALK THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0921005 A	1500	SF	CONCRETE SIDEWALK RAMP THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
0921024 A	13700	SF	BRICK PAVER SIDEWALK THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0921050 A			DETECTABLE WARNING CAST IRON PAVER THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	18	EA	($ _____)	$ _____
0921098 A			FLEXI-PAVE PAVEMENT AT EXISTING TREE THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS	
	300	SF	($ _____)	$ _____
0922002 A			TEMPORARY BITUMINOUS CONCRETE SIDEWALK THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS	
	40	SY	($ _____)	$ _____
0922501			BITUMINOUS CONCRETE DRIVEWAY THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS	
	120	SY	($ _____)	$ _____
0924006 A			CONCRETE DRIVEWAY RAMP THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS	
	550	SF	($ _____)	$ _____
0942001			CALCIUM CHLORIDE FOR DUST CONTROL THE PRICE PER TON OF $ _____ DOLLARS AND _____ CENTS	
	5	TON	($ _____)	$ _____
0944101 A			PLACING TOPSOIL THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS	
	310	CY	($ _____)	$ _____
0949000 A			TRIPLE SHREDDED HARDWOOD MULCH THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS	
	100	CY	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0949572 A			ZELKOVA SERRAA - VILLAGE GREEN ZELKOVA, 3 1/2"-4", B & B THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	37	EA	($ _____)	$ _____
0950005			TURF ESTABLISHMENT THE PRICE PER SQUARE YARD OF $ _____ DOLLARS AND _____ CENTS	
	1300	SY	($ _____)	$ _____
0970006			TRAFFIC PERSON (MUNICIPAL POLICE OFFICER) AN ESTIMATED COST OF $ TWO HUNDRED THIRTY THOUSAND DOLLARS AND NO CENTS	
	EST	EST	($230,000.00)	$ 230,000.00
0970007			TRAFFIC PERSON (UNIFORMED FLAGGER) THE PRICE PER HOUR OF $ _____ DOLLARS AND _____ CENTS	
	200	HR	($ _____)	$ _____
0971001 A			MAINTENANCE AND PROTECTION OF TRAFFIC THE LUMP SUM PRICE OF $ _____ DOLLARS AND _____ CENTS	
	1	LS	($ _____)	$ _____
0975004			MOBILIZATION AND PROJECT CLOSE-OUT THE LUMP SUM PRICE OF $ _____ DOLLARS AND _____ CENTS	
	1	LS	($ _____)	$ _____
0976002			BARRICADE WARNING LIGHTS - HIGH INTENSITY THE PRICE PER DAY OF $ _____ DOLLARS AND _____ CENTS	
	2100	DAY	($ _____)	$ _____
0978002			TRAFFIC DRUM THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	20	EA	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
0979003			CONSTRUCTION BARRICADE TYPE III THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	12	EA	($ _____)	$ _____
0980001			CONSTRUCTION STAKING THE LUMP SUM PRICE OF $ _____ DOLLARS AND _____ CENTS	
	1	LS	($ _____)	$ _____
0981100			42" TRAFFIC CONE THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	25	EA	($ _____)	$ _____
1001001			TRENCHING AND BACKFILLING THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	75	LF	($ _____)	$ _____
1001004			ROCK IN TRENCH EXCAVATION (0'-4' DEEP) THE PRICE PER CUBIC YARD OF $ _____ DOLLARS AND _____ CENTS	
	20	CY	(_____)	$ _____
1002015			ROCK IN FOUNDATION EXCAVATION THE PRICE PER VERTICAL FOOT OF $ _____ DOLLARS AND _____ CENTS	
	15	VF	($ _____)	$ _____
1002130 A			INSTALL CITY FURNISHED LIGHT STANDARD FOUNDATION THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	38	EA	($ _____)	$ _____
1002202			TRAFFIC CONTROL FOUNDATION - MAST ARM THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	3	EA	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1002203	_____		TRAFFIC CONTROL FOUNDATION - PEDESTAL - TYPE I THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	4	EA	($ _____)	$ _____
1002208			TRAFFIC CONTROL FOUNDATION - CONTROLLER - TYPE IV THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
1008115			2" RIGID METAL CONDUIT IN TRENCH THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	100	LF	($ _____)	$ _____
1008117			3" RIGID METAL CONDUIT IN TRENCH THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	15	LF	($ _____)	$ _____
1008127 A			2" PVC, SCHEDULE 80 CONDUIT THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	3000	LF	($ _____)	$ _____
1008129 A			3" PVC, SCHEDULE 80 CONDUIT THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	350	LF	($ _____)	$ _____
1008215			2" RIGID METAL CONDUIT UNDER ROADWAY THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	525	LF	($ _____)	$ _____
1010001			CONCRETE HANDHOLE THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	3	EA	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1010011	7	EA	CONCRETE HANDHOLE - TYPE I THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1010021	4	EA	CONCRETE HANDHOLE - TYPE II THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1010052 A	10	EA	CAST IRON HANDHOLE COVER THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1010054 A	4	EA	CAST IRON HANDHOLE COVER - TYPE II THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1017034 A	1	EA	INSTALL SERVICE THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1102002 A	3	EA	8' ALUMINUM PEDESTAL THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1102009 A	1	EA	10' ALUMINUM PEDESTAL THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1104028 A	2	EA	30' STEEL MAST ARM ASSEMBLY THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1104033 A			40' MAST ARM ASSEMBLY THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
1105101 A			1 WAY, 1 SECTION MAST ARM TRAFFIC SIGNAL THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	4	EA	($ _____)	$ _____
1105103 A			1 WAY, 3 SECTION MAST ARM TRAFFIC SIGNAL THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	6	EA	($ _____)	$ _____
1105303 A			1 WAY, 3 SECTION PEDESTAL MOUNTED TRAFFIC SIGNAL THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
1106001 A			1 WAY PEDESTRIAN SIGNAL POLE MOUNTED THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	2	EA	($ _____)	$ _____
1106003 A			1 WAY PEDESTRIAN SIGNAL PEDESTAL MOUNTED THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	4	EA	($ _____)	$ _____
1107011 A			ACCESSIBLE PEDESTRIAN SIGNAL AND DETECTOR (TYPE A) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	6	EA	($ _____)	$ _____
1108118 A			NEMA TS2, TYPE 2 TRAFFIC CONTROLLER AND CABINET THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1108727 A			PHASE SELECTOR (AUDIO) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
1108843 A			12-POSITION WALL MOUNTED FIBER OPTIC PATCH PANEL THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
1111201 A			TEMPORARY DETECTION (SITE No. 1) THE LUMP SUM PRICE OF $ _____ DOLLARS AND _____ CENTS	
	1	LS	($ _____)	$ _____
1111451 A			LOOP DETECTOR SAWCUT THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	140	LF	($ _____)	$ _____
1111600 A			EXTENSION BRACKET THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	2	EA	($ _____)	$ _____
1112207 A			SIREN DETECTOR THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	2	EA	($ _____)	$ _____
1112242 A			FIBER OPTIC SPLICE ENCLOSURE (SIGNAL) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____
1112284 A			VEHICLE DETECTION MONITOR THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	1	EA	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1112286 A	2	EA	360 DEGREE CAMERA ASSEMBLY THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1112289 A	1	EA	360 DEGREE CLOSED LOOP SYSTEM VIDEO DETECTION PROCESSOR THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1113004	125	LF	2 CONDUCTOR No. 8 AWG TYPE SE STYLE THW THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1113030 A	750	LF	12 STRAND FIBER OPTIC INTERCONNECT CABLE THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1113050	300	LF	2 CONDUCTOR No. 14 CABLE THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1113102	800	LF	5 CONDUCTOR No. 14 CABLE THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1113103	700	LF	7 CONDUCTOR No. 14 CABLE THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1113104	300	LF	9 CONDUCTOR No. 14 CABLE THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1113725 A			23 AWG 4 TWISTED PAIR CATEGORY 6 CABLE THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	300	LF	($ _____)	$ _____
1118012 A			REMOVAL AND/OR RELOCATION OF TRAFFIC SIGNAL EQUIPMENT THE LUMP SUM PRICE OF $ _____ DOLLARS AND _____ CENTS	
	1	LS	($ _____)	$ _____
1205202			TYPE DE-2 DELINEATOR THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	2	EA	($ _____)	$ _____
1206023 A			REMOVAL AND RELOCATION OF EXISTING SIGNS THE LUMP SUM PRICE OF $ _____ DOLLARS AND _____ CENTS	
	1	LS	($ _____)	$ _____
1208931 A			SIGN FACE - SHEET ALUMINUM (TYPE IX RETRO-REFLECTIVE SHEETING) THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS	
	380	SF	($ _____)	$ _____
1209114			HOT-APPLIED PAVEMENT MARKINGS 4" YELLOW THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	2000	LF	($ _____)	$ _____
1209124			HOT-APPLIED PAVEMENT MARKINGS 4" WHITE THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	1000	LF	($ _____)	$ _____
1210101			4" WHITE EPOXY RESIN PAVEMENT MARKINGS THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	3300	LF	($ _____)	$ _____

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1210102			4" YELLOW EPOXY RESIN PAVEMENT MARKINGS THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	3600	LF	($)	$
1210103			6" WHITE EPOXY RESIN PAVEMENT MARKINGS THE PRICE PER LINEAR FOOT OF $ _____ DOLLARS AND _____ CENTS	
	3000	LF	($)	$
1210105			EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS	
	3100	SF	($)	$
1211001			REMOVAL OF PAVEMENT MARKINGS THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS	
	100	SF	($)	$
1220027			CONSTRUCTION SIGNS THE PRICE PER SQUARE FOOT OF $ _____ DOLLARS AND _____ CENTS	
	370	SF	($)	$
1302046 A			RESET MANHOLE (WATER) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	4	EA	($)	$
1302054 A			REPLACE CURB BOX THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	5	EA	($)	$
1302061 A			ADJUST GATE BOX (WATER) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS	
	10	EA	($)	$

ITEM NUMBER	Est Quantity	UNIT	Brief Desription: Unit or Lump Sum Bid (in both words and figures)	Ext. Total in Figures
1302062 A	10	EA	ADJUST GATE BOX (GAS) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1303195 A	3	EA	REMOVE HYDRANT (WATER MAIN) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1303204 A	3	EA	HYDRANT ASSEMBLY (WATER MAIN) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1403501 A	12	EA	RESET MANHOLE (SANITARY SEWER) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____
1500209 A	20	EA	RESET MANHOLE (TELEPHONE) THE PRICE PER EACH OF $ _____ DOLLARS AND _____ CENTS ($ _____)	$ _____

BID

TOTAL AMOUNT BID IN WORDS: _____

DOLLARS

TOTAL AMOUNT BID IN FIGURES: **$** _____

It is understood and agreed to by the bidder that:

1) The itemization of the Bid, and the selection of the Bid Items used therein, is at the Owner's discretion, and solely for the Owner's convenience in evaluating and comparing the submitted bids and administering the Contract.

2) The Unit Price bid for each item, and the aggregate sum of the Unit Prices multiplied by the corresponding estimated quantity as applied to the project as a whole, includes all plant, labor, material, supplies, equipment, and other facilities necessary for, and incidental to, the construction of said item, complete, fully functional, and properly finished, as required by, and in strict conformance with these Bid Documents, and for the use (or uses) and appearance intended by the Owner.

3) The price bid per unit quantity of work in the various items above shall control in contract award herein.

4) The quantities noted above are approximate, only being estimated solely for use in comparing bids.

5) The Total Bid Amounts entered above, and the bid amount for each item (obtained by multiplying the unit price by the estimated quantity), are included solely for the purpose of checking this proposal and for the convenience of the Bidder.

6) The above prices are to be paid for the actual quantities of the items of work in the completed work or structure. Should the dimensions of any part of the work or the quantities of materials used or work performed be different than those designated in this Form of Bid, or on the Improvement Drawings, the actual quantities only will be allowed in measurement.

7) In submitting this Bid, the Bidder understands that the Owner reserves the right to reject any and all bids, and to waive any informality in the bidding. The Owner further reserves the right to make the award on the basis of the above bid.

8) If written notice of the acceptance of this bid is mailed, telegraphed, or delivered to the undersigned after the opening thereof, the undersigned agrees to execute and deliver any Agreement in the prescribed form and furnish the required bonds within ten (10) days after the Agreement is presented to him for his signature.

9) The Bidder is enclosing a statement of his qualifications.

10) The Owner reserves the right to delete any of the bid items in total or to increase or reduce the quantity of any bid items.

11) The Bidder shall comply with all provisions of the Bid Documents in his prosecution of the Project if awarded the Contract; and all provisions will be enforced by the Owner.

Dated this ____ day of _____ , _____

Bidder's Name: _____

By: _____Official

Address _____

_____

Title: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____, as Principal, and _____, as Surety, are hereby held and firmly bound unto The City of New Britain, as Owner, in the penal sum of _____Dollars ($ _____) lawful money of the United States, for the payment of which sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns firmly by these presents.

The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain Bid, attached hereto, and made a part hereof by reference, to enter into a contract in writing for the project entitled **East Main Street and Myrtle Street Downtown Streetscape Improvements – Phase VI, Bid No. 3972.**

NOW THEREFORE,

(a) if said Bid shall be rejected, or in the alternate,

(b) if said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract (properly completed in accordance with said Bid) attached hereto, and shall furnish the Owner with proper bonds for his faithful performance of said contract and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then this obligation shall be void. Otherwise, the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of his obligation as herein stated.

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

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporation seals to be hereto affixed, and these presents to be signed by their proper officers.

Made and entered into this ____ day of _____, _____.

PRINCIPAL:

By: _____

SURETY:

By: _____