S P E C I F I C A T I O N S

For the

COMMERCIAL DRIVE CONSTRUCTION

CITY OF SOMERSWORTH, NEW HAMPSHIRE
September 2008

Prepared For:
Engineering Division
Public Works Department
18 Lilac Lane
Somersworth, New Hampshire 03878
(603) 692-4266

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PROJECT PRINTS INCLUDED

INVITATION TO BID

City of Somersworth, New Hampshire

THE CONSTRUCTION OF COMMERCIAL DRIVE

On **October 23, 2008**, the City of Somersworth will accept bids for the construction of Commercial Drive. You are cordially invited to submit a Bid to construct 1,739 linear feet of 32 foot wide roadway with associated drainage and utilities in accordance with the attached specifications, plans, terms and conditions. It is the responsibility of any prospective bidder to read this information over carefully prior to submitting a bid.

All Bids must be submitted with the attached bid certificate, in a **sealed envelope, plainly marked:**

Bid for:

Commercial Drive Construction
Somersworth City Hall
Attn: Scott A. Smith, Director of Finance
One Government Way
Somersworth, NH 03878

All Bids must be received no later than October 23, 2008 at 2:00 pm, at which time they will be publicly opened and read aloud.

The City reserves the right to reject any or all bids, or accept any bid determined to be in the best interest of the City.

Plans and Specifications may be purchased at Infinite Imaging at either location below:

Infinite Imaging – Dover
903 Central Avenue, Ste 4
Dover, NH 03820
(603) 834-6046

Infinite Imaging - Pease
Pease International Tradeport
30 International Drive
Portsmouth, NH 03801
(603) 436-3030

BID FORM
Commercial Drive Construction

Proposal of

_____

hereinafter called "BIDDER", organized and existing under the laws of the state of _____ doing business as_____

(insert "a corporation", "a partnership", or "an individual" as applicable)

to the **City of Somersworth, New Hampshire**, hereinafter called "**OWNER**".

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the project in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the **NOTICE TO PROCEED** and to fully complete the PROJECT within 120 consecutive calendar days thereafter. **If the CONTRACTOR fails to complete the project within the time limit, the OWNER may charge liquidated damages at a rate of $ 100.00 per day for each workday after the completion date.**

The OWNER shall decide whether any bid prices are unbalanced above or below a reasonable cost analysis value determined by the City Engineer. Bids in which bid prices are obviously unbalanced may be rejected.

BIDDER acknowledges receipt of the following ADDENDA (if applicable):

_____

_____

_____

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices:

BID FORM

IN THE EVENT THAT THERE IS A DISCREPANCY BETWEEN THE LUMP SUM OR UNIT PRICES WRITTEN IN WORDS AND FIGURES, THE PRICES WRITTEN IN WORDS SHALL GOVERN.

*- For informal comparison only.

Item No.	Brief Description - Unit or Lump Sum Price (in both words and numerals)	Estimated Quantity	Total Price (in numerals)
	ROADWAY & DRAINAGE		
1.	Mobilization, per lump sum; _____ Dollars and _____ Cents ($_____)	1 LS	$_____
2.	Clear and Grub, per acre; _____ Dollars and _____ Cents ($_____)	2.4 AC	$_____
3.	Traffic Control, per lump sum; _____ Dollars and _____ Cents ($_____)	1 LS	$_____
4.	Unclassified Excavation, per cubic yard; _____ Dollars and _____ Cents ($_____)	10,377 CY	$_____
5.	Erosion Control , per lump sum; _____ Dollars and _____ Cents ($_____)	1 LS	$_____

Item No.	Brief Description - Unit or Lump Sum Price (in both words and numerals)	Estimated Quantity	Total Price * (in numerals)

6. Ordinary Borrow , per cubic yard;

_____Dollars and _____ Cents ($_____)

1,158 CY

$_____

7. 18" Gravel Borrow, per square yard;

_____ Dollars and _____ Cents ($_____)

6,185 SY

$_____

8. 4" Crushed Gravel, per square yard;

_____Dollars and _____ Cents ($_____)

6,185 SY

$_____

9. Fine Grading & Compacting, per square yard;

_____Dollars and _____ Cents ($_____)

11,580 SY

$_____

10. Storm Drain Line 24": RCP, per linear foot;

_____Dollars and _____ Cents ($_____)

260 LF

$_____

11. Flared End 24" RCP, per each;

_____Dollars and _____ Cents ($_____)

8 EA

$_____

12. Roadway Pavement, per ton;

_____Dollars and _____ Cents ($_____)

1,000 TN

$_____

Item No.	Brief Description - Unit or Lump Sum Price (in both words and numerals)	Estimated Quantity	Total Price * (in numerals)

13. 12" Diameter Rip-Rap, per cubic yard;

_____Dollars and _____ Cents ($_____)

50 CY

$_____

14. Landscaping Loam, per lump sum;

_____Dollars and _____ Cents ($_____)

1 LS

$_____

15. Hydroseeding, per lump sum;

_____Dollars and _____ Cents ($_____)

1 LS

$_____

WATER & SEWER

16. 6" gate Valve Class 350, per ea;

_____Dollars and _____ Cents ($_____)

2 EA

$_____

17. Water Line 8" DI Pipe Class 52, per linear foot;

_____Dollars and _____ Cents ($_____)

225 LF

$_____

18. Water Lines 6" DI Pipe Class 52, per linear foot;

_____Dollars and _____ Cents ($_____)

36 LF

$_____

19. Trench Excavation, per linear foot;

_____Dollars and _____ Cents ($_____)

1,015 LF

$_____

Item No.	Brief Description - Unit or Lump Sum Price (in both words and numerals)	Estimated Quantity	Total Price * (in numerals)

20. Trench Bedding, per cubic yard;

_____Dollars and _____ Cents ($_____)

150 QY

$_____

21. Ordinary Borrow, per cubic yard;

_____Dollars and _____ Cents ($_____)

600 QY

$_____

22. Thrust Block, per each;

_____Dollars and _____ Cents ($_____)

3 EA

$_____

23. Water Main Fitting 12” x 8” Reducer Class 350, per each;

_____Dollars and _____ Cents ($_____)

1 EA

$_____

24. Water Main Fitting 8” x 6” x 8” Tee Class 350, per each;

_____Dollars and _____ Cents ($_____)

2 EA

$_____

25. 4” SDR 26 Force Main, per linear foot;

_____Dollars and _____ Cents ($_____)

1,160 LF

$_____

26. Bid Security, 10% of Bid

_____Dollars and _____ Cents ($_____)

10% of Bid

$_____

Item No.	Brief Description - Unit or Lump Sum Price (in both words and numerals)	Estimated Quantity	Total Price * (in numerals)

TOTAL BID_____ *
(Written in Words)

$_____ *
(U.S. Dollars)

Item No.	Brief Description - Unit or Lump Sum Price (in both words and numerals)	Estimated Quantity	Total Price * (in numerals)

NOTE: It is understood that the various unit prices bid will control in any contract which may be awarded arising from this Proposal; that the estimated quantities above are approximate only and used only for the comparison of bids; and are subject to increase or decrease as required to properly complete the Contract Work. It is further understood that any portion, or the entire amount, of any bid item(s) may be deleted in order to meet the allocated budget dollar amount. If any quantity in the BID is increased or decreased by 25% of the amount in the BID SCHEDULE, or any item(s) or work is extended or increased by 25% of the amount in the BID SCHEDULE, the OWNER retains the right to renegotiate the unit price of said item(s).

Bid Submitted by:

_____
Company Name

_____
Address

_____
City/Town State Zip

BIDDER hereby acknowledges by submission of bid that he/she has examined the site and specifications and will perform the completed job for the amounts indicated.

(SEAL – if BID by a corporation)

Attest:_____

_____
Authorized Signature

_____
Name (Please Print)

_____
Title

_____
Date

Item No.	Brief Description - Unit or Lump Sum Price (in both words and numerals)	Estimated Quantity	Total Price * (in numerals)

QUALIFICATION QUESTIONNAIRE

The following information must be submitted at the BID Opening:

List four (4) projects of a similar nature which have been completed:

	NAME OF PROJECT	LOCATION	NAME AND ADDRESS OF OWNER
1.			
2.			
3.			
4.			

List four (4) references who can attest to the BIDDER'S qualifications to construct work of this nature.

1. _____
2. _____
3. _____
4. _____

Date _____ Signed _____
Name of BIDDER

BID CERTIFICATE

The undersigned represents that they are authorized to bind the bidder to the bid amount specified and hereby offers to provided to the City of Somersworth the commodities and services as contained in the attached competitive sealed bid specifications at the price stated in complete accordance with all conditions of the bid specifications. Furthermore, The undersigned certifies that this bid is in all respects bona fide, fair, and made without collusion or fraud with any other person. As used in this section the word "person" means any natural person, joint venture, partnership] corporation or other business or legal entity

_____
Signature/Title

_____
Company

_____ _____
Date Phone Number

Check here if appropriate: _____ NO BID
Any deviations from the above stated specifications must be so noted and any bid prices must be reflective o/ihese deviations

GENERAL CONDITIONS

SECTION 00 300

A. GENERAL CONDITIONS

General bids for the project will be received by the City of Somersworth, at the time and place stated in the Advertisements for Bids, and then at said place publicly opened and read aloud.

Each bid must be submitted in a sealed envelope, addressed to the City of Somersworth. Each sealed envelope containing a bid must be plainly marked on the outside with "Bid for Commercial Drive Construction", the name of the bidder and his address.

After bids are opened and publicly read, the bids will be tabulated for comparison on the basis of the bid prices and quantities (lowest responsible vendor) or by the best value method shown in the Proposal. Until final award of the Contract, the city reserves the right to reject any or all bids, to waive technicalities, and to re-advertise for new bids, or propose to do the work otherwise as determined to be in the best interests of the City of Somersworth.
The following items will be considered when an award is based on best value:

- The purchase price;
- The reputation of the bidder and of the bidder's goods or services;
- The quality of the bidders' goods or services;
- The extent to which the goods or services meet the municipality's needs;
- The bidder's past relationship with the municipality;
- The impact on the ability of the municipality to comply with laws and rules relating to contracting with historically underutilized businesses and nonprofit organizations employing persons with disabilities;
- The total long-term cost to the municipality to acquire the bidder's goods or services; and
- Any relevant criteria specifically listed in the request for bids or proposals.

All bids must be made on the Bid Form included in the specifications. All blank spaces for bid prices must be filled in, in ink or typewritten, and the Bid Form must be fully completed and executed when submitted. Only one set of the bid documents is required.

1. MODIFICATIONS AND WITHDRAWAL OF BIDS

The City of Somersworth may waive any information or minor defects or reject any and all bids. Any bid may be withdrawn prior to the scheduled time for the opening of bids or authorized postponements thereof without forfeiture of the bid bond. Any bid received after the time and date specific shall not be considered. Should there be

reasons why the contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the City of Somersworth and the Bidder.

No part of this bid may be changed/altered in any way. Vendors must submit written requests to change any specifications/conditions with their proposal. Changes made without submission of a written request to this bid will result in disqualification.

2. EXAMINATION OF CONTRACT DOCUMENTS AND SITES

Each bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the contract documents. The failure or omission of any bidder to do any of the foregoing shall in no way relieve any bidder from any obligation in respect to their bid.

Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the contract documents. After bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

The bid specifications contain the provisions required for the construction of the project. Information obtained from an officer, agent, or employee of the City of Somersworth or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the contract.

3. COMPLETING INFORMATION

Bidder must fill in all information asked for in the blanks provided under each item. Failure to comply may result in rejection of the Bid at the City's option.

4. CONTRACT CLAUSE

All bidders understand and agree that the vendor's bid response will become a legally binding contract upon acceptance in writing by the City of Somersworth. This contract may be superseded only if replaced with a more extensive contract that is agreed to by both parties.

5. DEFAULT

In case of default of the successful bidder, the City of Somersworth may procure the articles from other sources and hold the bidder responsible for any excess cost occasioned thereby.

6. INDEMNIFICATION

In case any action in court is brought against the City of Somersworth, or any officer or agent of the City of Somersworth, for the failure, omission, or neglect of the vendor to perform any of the covenants, acts, matters, or things by this contract undertaken; or for injury or damage caused by the alleged negligence of the CONTRACTOR or his subcontractors or his or their agents, or in connection with any claim based on lawful demands of subcontractors, workmen, material men, or suppliers the CONTRACTOR shall indemnify and save harmless the City of Somersworth and any officers and agents thereof, from all losses, damages, costs, expenses, judgments, or decrees arising out of such action.

7. ADDENDA AND INTERPRETATIONS

All questions by prospective bidders as to the interpretation of the Bid Specifications shall be submitted in writing to the City of Somersworth at least five (5) days before the date therein set for the receipt for bids. The City of Somersworth will then respond in writing to Bidders who have taken out the Bid Specifications, at the addresses given by them, not less than five (5) calendar days before said date, interpretations of all questions so raised which, in their opinion, required interpretation.

8. AWARD OF CONTRACT

Each bidder shall sign his name in the space provided therefore. If the bid is made by a partnership or corporation, the name and address of the partnership or corporation shall be shown, together with the names of the partners or the officers. A bid made by a partnership shall be acknowledged by one of the partners; a bid made by a corporation shall be acknowledged by one of the authorized officers thereof, and the corporate seal attached.

A conditional or qualified bid will not be accepted.

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

The low Bidder shall supply the names and addresses of major material Suppliers and Subcontractors when required to do so by the City.

9. BID SECURITY

Every bid shall be accompanied by a bid deposit or security in the form of an approved **bid bond**. (In lieu of a bid bond, a certified check, a bank treasurer's check, or a cashier's check issued by a responsible bank or trust company, payable to the Owner, for the required amount will be accepted. The amount of the bid deposit shall be **ten percent (10%)** of the value of the proposed work as bid in the bidder's Proposal Form.

All bid security or deposits of bidders, except those of the three lowest responsible and eligible bidders, shall be returned within five (5) days, Saturdays, Sundays, and legal holidays excluded, after the opening of the bids. The bid deposits of the three lowest responsible and eligible bidders shall be returned upon the execution and delivery of the contract or, if no award is made, then at the expiration of thirty (30) days after the opening of the bids, Saturdays, Sundays and legal holidays excluded, unless forfeited by failure to sign the contract.

Any bid deposit forfeited due to the bidder's failure to execute the Contract Document as required by these specifications and the Owner shall become the property of the Owner and payable to the Owner.

10. NOTICE TO PROCEED

The Notice to proceed shall be issued within ten (10) days of the bid award. Should there be reasons why the Notice to Proceed cannot be issued within such period; the time may be extended by mutual agreement between the City and CONTRACTOR. If the Notice to proceed has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

Work on the project shall begin no later than November 6, 2008 and shall be completed within 120 calendar days from the date of commencement.

B. DEFINITIONS

Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and the plural thereof:

1. **ADDENDA** - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications or corrections.

2. **BID** - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

3. **BIDDER** - Any person, firm or corporation submitting a BID for the WORK.

4. **CHANGE ORDER** - A written order to the CONTRACTOR authorizing an addition, deletion, or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the Contract Price or Contract Time.

5. **CONTRACT DOCUMENTS** - The contract, and all other items as listed in the agreement.

6. **CONTRACT PRICE** - The total moneys payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

7. **CONTRACT TIME** - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

8. **CONTRACTOR** - The person, firm or corporation with whom the OWNER has executed the Agreement.

9. **DRAWINGS** - The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

10. **ENGINEER** - Shall mean the City Engineer for the City of Somersworth, New Hampshire, and his representative(s).

11. **FIELD ORDER** - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME issued by the ENGINEER to the CONTRACTOR during construction.

12. **OWNER** - Shall mean the City of Somersworth, New Hampshire.

13. **PROJECT** - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

14. **SHOP DRAWINGS** - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, supplier or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

15. **SPECIFICATIONS** - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

16. **SUBCONTRACTOR** - An individual, firm, or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

17. **SUBSTANTIAL COMPLETION** - That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

18. **WORK** - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

19. **WRITTEN NOTICE** - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

C. SCHEDULES

1. The CONTRACTOR shall submit to the OWNER (through the ENGINEER) a progress schedule for the prosecution of the WORK. The CONTRACTOR shall continually update said schedule on a weekly basis. The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK.

2. At the ENGINEER'S discretion, the CONTRACTOR may work on a weekend or City holiday; however, the CONTRACTOR will be billed for the ENGINEER'S overtime rate to have him present for inspection (assume an hourly rate of $75.00).

D. DRAWINGS, SPECIFICATIONS and RECORD DRAWINGS

The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all

incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

Any discrepancies found between the DRAWINGS and the SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

The CONTRACTOR shall maintain a set of drawings in good order and annotated to show all changes made during construction. These record documents will be delivered to the ENGINEER for OWNER at completion of the work.

E. SHOP DRAWINGS

The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS.

F. MATERIALS, SERVICES and FACILITIES

It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified times.

Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection. Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

G. TESTING

All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards as required and defined in the CONTRACT DOCUMENTS.

The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS. The OWNER shall pay for inspection services not required by the CONTRACT DOCUMENTS.

Inspections, tests or approvals by the ENGINEER or others shall not relieve the CONTRACTOR from his obligations to perform the WORK and insure its final suitability.

The ENGINEER and his representatives will at all times have access to the WORK.

If any WORK is covered prior to inspection by the ENGINEER or contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by the ENGINEER or others, the CONTRACTOR will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found defective, the CONTRACTOR will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction.

H. SUBSTITUTIONS

The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for items referenced in the CONTRACT

DOCUMENTS, and if, in the opinion of the ENGINEER such item is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

I. SURVEYS, PERMITS, and REGULATIONS

The ENGINEER shall provide horizontal and vertical information for the CONTRACTOR'S use in establishing all base lines for locating the principal component parts of the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the ENGINEER the CONTRACTOR shall stake-out the project and make all detail surveys needed for construction such as working points, lines and elevations.

The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the CONTRACTOR. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER. The CONTRACTOR shall give notice and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified.

The CONTRACTOR shall notify Dig Safe (1-800-225-4977) **72 hours prior to excavation.** A digging permit will be required for street excavations within the City right-of-way. However, no fees will be charged to the CONTRACTOR for this permit.

J. PROTECTION OF WORK, PROPERTY and PERSONS

The CONTRACTOR will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.

The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, and SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or

the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER, shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby.

K. SUPERVISION BY CONTRACTOR

The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK. The CONTRACTOR shall not replace the supervisor without written notice and approval by the ENGINEER.

L. CHANGES IN THE WORK

The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

Limit of CONTRACTOR’S fees for overhead and profit shall be a mutually acceptable fixed fee for work or if more can be agreed upon, a fee based on the following percent of the various portions of the cost of work: 10% for CONTRACTORs direct work or labor and 5% to the CONTRACTOR for subcontractors work or labor.

M. TIME FOR COMPLETION

It is the intent of the OWNER that this project proceed as quickly and efficiently as possible. The date of beginning and the time for completion of the WORK are essential

conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on the date specified in the NOTICE TO PROCEED.

The CONTRACTOR will proceed with the WORK at such a rate of progress to insure full completion within the contract time. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration average conditions prevailing in the locality of the WORK.

If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

The CONTRACTOR shall not be charged with liquidated damages when the delay in completion of the WORK is due to unforeseeable causes beyond the control of the CONTRACTOR (acts of God, acts of the OWNER) and which the CONTRACTOR has promptly given WRITTEN NOTICE of the delay to the OWNER.

N. CORRECTION OF WORK

The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re- execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

O. SUBSURFACE CONDITIONS

The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS: **or**

Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

P. RIGHT OF OWNER TO TERMINATE CONTRACT

If the work to be done under this contract is abandoned by the CONTRACTOR; or if this contract is assigned by him without the written consent of the City; or if the CONTRACTOR is adjudged bankrupt, or files for voluntary bankruptcy; or if a general assignment of his assets is made for the benefit of his creditors; or if a receiver is appointed for the CONTRACTOR of any of his property or if at any time in writing to the City determines that the performance of the work under this contract is being unnecessarily delayed, that the CONTRACTOR is violating any of the conditions of this contract, or that he is executing the same in bad faith or otherwise not in accordance with the terms of said contract; or if the work is not substantially completed within the time named for its completion or within the time to which such completion date may be extended; then the City may serve written notice upon the CONTRACTOR and his surety of the City's intention to terminate this contract, unless within five (5) days after the serving of such notice, a satisfactory arrangement is made for continuance, this contract shall terminate. The CONTRACTOR shall be liable to the City for all excess cost sustained by the City by reason of such prosecution and completion. The City may take possession of, and utilize in completing the work, all materials, equipment, tools, and plant on the site of the work, including such materials, etc., as may have been placed on the site by or at the director of the CONTRACTOR. The CONTRACTOR shall at all times conduct all operations under the CONTRACTOR in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. The CONTRACTOR shall promptly take all precautions, which are necessary and adequate against any conditions, which involve a risk of bodily harm to persons or a risk of damage to any property. The CONTRACTOR shall continuously inspect all work, materials and equipment to discover and determine any such conditions and shall be solely responsible for discovery, determination and corrections of any such conditions. The CONTRACTOR shall designate an employee as safety supervisor who is acceptable to the OWNER. The CONTRACTOR shall maintain accurate accident and injury reports. The CONTRACTOR shall furnish safety equipment and enforce the use of such equipment by its employees.

Q. PAYMENTS TO CONTRACTOR

The CONTRACTOR and the ENGINEER will agree daily upon the quantities of pay items which were installed. The CONTRACTOR will sign off on the ENGINEER'S daily report to ensure accuracy and agreement to the quantities.

Once a month the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER shall retain ten percent (10%) of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. When the WORK has reached 80% complete the retained amount may be reduced to five percent (5%).

Upon completion of the WORK the CONTRACTOR shall submit a CERTIFICATE OF COMPLETION stating that the WORK has been completed by him under the conditions of the CONTRACT DOCUMENTS. Upon acceptance by the OWNER the balance found to be due to the CONTRACTOR, **excluding** a two percent (2%) retainage, shall be paid to the CONTRACTOR within thirty (30) days of said acceptance of the WORK. An invoice must be submitted for all payments and refunds of retainage.

The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from any claims growing out of the lawful demands of SUBCONTRACTOR'S, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK.

R. ACCEPTANCE OF FINAL PAYMENT AS 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 other than claims in stated amounts as may be specifically excepted by 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. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the PERFORMANCE BOND.

S. INSURANCE

The CONTRACTOR shall secure and maintain throughout the duration of this contract insurance of such types and in such amount as may be necessary to protect himself and the interest of the City against all hazards or risks of loss as hereinafter specified. The form and limits of such insurance, together with the underwriter thereof in each case, shall be acceptable to the City but regardless of such acceptance it shall be the responsibility of the CONTRACTOR to maintain adequate insurance coverage at all times. Failure of the CONTRACTOR to maintain adequate coverage shall not relieve him of any contractual responsibility or obligation.

Satisfactory certificates of insurance shall be fled with the City prior to starting any construction work on this contract. The certificates shall state that 30 days advance written notice will be given to the City before any policy covered thereby is change or canceled.

The CONTRACTOR shall deliver to the City at the time of execution of the Contract, certificates of all insurance required hereunder and shall be reviewed prior to approval by the City. The certificates of insurance shall contain the description of the Project, and shall state that the companies issuing insurance will endeavor to mail to the City ten (10) days notice of cancellation, alteration or material change of any listed policies. The CONTRACTOR shall keep in force the insurance required herein for the period of the Contract. At the request of the City, the CONTRACTOR shall promptly make available a copy of any and all listed insurance policies. The requested insurance must be written by a Company licenses to do business in New Hampshire at the time the policy is issued.

The CONTRACTOR shall require each Subcontractor employed on the Project to maintain the coverage listed below unless the CONTRACTOR's insurance covers activities of the Subcontractor on the Project.

No operations under this Contract shall commence until certificates of insurance attesting to the below listed requirements have been filed with and approved by the City, and the Contract approved by the City Manager.

a. Workmen's Compensation Insurance
b. Commercial General Liability Limits of Liability
   Bodily Injury: $2,000,000 per occurrence
   $2,000,000 aggregate
   Property Damage: $500,000 per occurrence
   $500,000 aggregate
c. Combined Single Limit, Bodily Injury and Property Damage
   $13 00,000 per occurrence - $1,500,000 aggregate

The CONTRACTOR shall comply with all Federal, State and local laws and ordinances relating to Social Security, Unemployment Insurance, Pensions, etc.

The CONTRACTOR shall indemnify, defend, and save harmless the City of Somersworth and its agents and employees from and against any suit, action or claim of loss of expenses because of bodily injury, including death at any time resulting there from, sustained by any person or persons or on account of damage to property, including loss of use thereof, whether caused by or contributed to by said City of Somersworth, its agents, or employees.

T. CONTRACT SECURITY

The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS. Such Bonds shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the State of New Hampshire.

U. DEFENSE OF SUITS

In case any action in court is brought against the City, or any officer or agent of the City, for the failure, omission, or neglect of the CONTRACTOR to perform any of the covenants, acts, matters, or things by this contract undertake; or for injury or damage caused by the alleged negligence of the CONTRACTOR or his subcontractors or his or their agents, or in connection with any claim based on lawful demands of subcontractors, workmen, material men, or suppliers the CONTRACTOR shall indemnify and save harmless the City and it's officers and agents, from all losses, damages, costs, expenses, judgments, or decrees arising out of such action.

V. ENGINEER'S AUTHORITY

The ENGINEER or Assigns shall act as the OWNER'S representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS. The ENGINEER shall decide all questions of any nature whatsoever arising out of, under, or in connection with or in any way related to or on account of this Contract, including the power to decide breach of contract claims.

The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS. The ENGINEER'S decision shall be conclusive, final and binding on both parties.

The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

W. LAND and RIGHTS-OF-WAY

The OWNER shall obtain all land and rights-of-way necessary for the completion of the WORK pursuant to the CONTRACT DOCUMENTS.

The OWNER shall provide to the CONTRACTOR information which describes the lands owned and rights-of-way acquired.

The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

X. GUARANTEES

In addition to other guarantees due the City, the CONTRACTOR guarantees that the work and services to be performed under the contract, and all workmanship, materials and equipment performed, furnished, used or installed shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Bid Specifications, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion and acceptance of the work unless otherwise specified herein.

If at any time within the said period of guarantee any part of the Work requires repairing, correction, or replacement, the City may notify the CONTRACTOR in writing to make the required repairs, correction, or replacements. If the CONTRACTOR neglects to commence

SUPPLEMENTAL GENERAL CONDITIONS

SECTION 00 350

SPECIFICATION DRAWINGS

The Contract Drawings listed in this Section may be modified by addenda and will be issued for construction purposes. These Drawings may be supplemented or superseded by such additional general and detail drawings as may be necessary or desirable as the WORK progresses. The drawings issued for construction at the time or after the signing of the CONTRACT DOCUMENTS will become the CONTRACT DRAWINGS.

Wherever existing conditions or construction not required as part of the work of the contract are shown, they are so shown as a source of information only. The OWNER, while believing such information is substantially correct, assumes no responsibility therefrom. Before starting any work that might be affected by such existing construction or conditions, the CONTRACTOR (and his SUBCONTRACTORS) shall have made himself (and themselves) familiar with all conditions affecting the nature and manner of performing the work and shall not be entitled to any extra compensation for any work or expense arising from or caused by his (or their) neglect to have verified all existing conditions and requirements.

The drawings are not necessarily to scale. All working dimensions shall be taken from the figured dimensions or by actual measurements at the WORK, and in no case by scaling the prints. The CONTRACTOR (and his SUBCONTRACTORS) shall study and compare all drawings and verify all figures before laying out or constructing the work and shall be responsible for any and all errors in the WORK which might have been avoided thereby. Whether or not an error is believed to exist, deviations from the drawings and the dimensions given thereon shall be made only after approval in writing is obtained from the ENGINEER. The CONTRACTOR (and his SUBCONTRACTORS) shall take all measurements of existing established conditions notwithstanding the figured dimensions on the drawings. When figured dimensions are not in agreement with the CONTRACTOR'S (or his SUBCONTRACTORS') measurements, the ENGINEER shall be immediately notified and the ENGINEER will promptly adjust same.

If the CONTRACTOR (or his SUBCONTRACTORS) during the progress of the WORK, discover any discrepancies between the drawings and the specifications, any errors or omissions on the drawings, or any discrepancies between the physical condition of the WORK and the drawings, then the CONTRACTOR shall immediately notify the ENGINEER, who will promptly adjust same. Any work performed after such discovery without the approval of the ENGINEER shall be at the risk and expense of the CONTRACTOR (or his SUBCONTRACTORS), whoever is responsible. Plans or drawings where the WORK is shown diagrammatically indicate approved working systems. Every piece of material, fittings, fixtures or small equipment is not shown nor every difficulty or interference that may be encountered.

To carry out the true intent and purpose of the CONTRACT DOCUMENTS, all necessary parts to make complete, approved working systems or installation shall be included as if detailed on these drawings.

The location of equipment shown on the drawings, unless exactly dimensioned, shall be considered as approximate only. The CONTRACTOR (and his SUBCONTRACTORS) shall adjust the position of the equipment in accordance with good working practices to meet interferences, provide proper clearance and provide proper access space for operation and maintenance.

Where shown on the drawings, typical details shall apply to each and every item of the contract work where such items are incorporated and the detail is applicable. Unless noted otherwise, such typical details shall be applicable in full.

The OWNER will furnish the CONTRACTOR, without charge, up to six copies of the drawings and specifications for execution of the WORK, including those copies required for permits. Additional copies shall be furnished at the CONTRACTOR'S expense when requested, except that any copies of available plans and specifications returned from bidders in good condition will be furnished to the CONTRACTOR without charge.

All drawings and specifications are the property of the OWNER. The CONTRACTOR shall return all copies if so requested.

DRAWINGS INCLUDED:

T1	Title Sheet
T2	Overall Plan
C-1	Construction Plan – Commercial Drive
C-2	Construction Plan – Commercial Drive
C-3	Construction Profile – Commercial Drive
C-4	Construction Details
XS-1	Cross Sections – Station 0+00 – Station 5+00
XS-2	Cross Sections – Station 5+50 – Station 10+50
XS-3	Cross Sections – Station 11+00 – Station 16+00
XS-4	Cross Sections – Station 16+50 – Station 17+39

INDEX
FOR
TECHNICAL REQUIREMENTS

APPENDIX A

BID DOCUMENTS

SUMMARY OF WORK

SECTION 01 11 00

A. SPECIFICATION ARRANGEMENT

Titles to and arrangements of sections and paragraphs in these Specifications are used merely for convenience and shall not be taken as a correct or complete segregation of the several categories of materials, equipment, and labor, nor as an attempt to outline or define jurisdictional procedures.

B. INTENT

The entire work provided for in these technical specifications and on the drawings shall be constructed and finished in every respect in a good workmanlike and substantial manner. All parts necessary for the proper and complete execution of the work, whether the same may have been specifically mentioned or not or indicated on the drawings, shall be done and furnished and installed in a manner corresponding with the rest of the work as if the same were particularly described and specifically provided for herein. It is not intended that the drawings shall show every detailed piece of material or equipment, but such parts and pieces as may be necessary to satisfactorily complete any system in accordance with the best practices and regulatory requirements, even though not shown, shall be furnished and installed. All materials and equipment shall be new unless specifically stated otherwise in these CONTRACT DOCUMENTS.

C. SCOPE OF WORK

1. The work required by these specifications shall include furnishing all labor, skill, supervision, tools, construction plant, equipment and materials and performing all operations necessary for the properly completed WORK as shown on the drawings, as mentioned in these specifications, and as evidently required with all incidental work necessary and customarily done to the complete satisfaction of the OWNER.

2. General Description of WORK

   This project involves construction of 1,739 feet of road including excavation, base materials, and paving. Utilities included in the WORK are drainage culvert, sewer lines, water mains, and forcemains, and all incidental work necessary for the proper completion of the WORK as described in the plans and these specifications.

D. CONTRACTOR USE OF PREMISES

1. 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 contractors;

    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 this operation, to the end that at all times the site and 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 operation, and to put the site in a neat, orderly condition;

    f. to effect 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 ENGINEER, not to cut or otherwise alter the work of any other contractor.

2. The CONTRACTOR shall not, except after written consent from the proper parties, enter or occupy with men, tools, materials, or equipment, any land outside the rights-of-way or property of the OWNER. A copy of the written consent shall be given to the ENGINEER.

E. SPECIAL REQUIREMENTS FOR WORK

Special requirements for the WORK consist generally of those measures required to assure uninterrupted operation of existing utilities.

F. COMPUTATION OF QUANTITY

Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the OWNER to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damage.

G. COORDINATION

The CONTRACTOR shall coordinate his operations with the OWNER and utility companies: Northern Utilities, New England Telephone, Public Service of New Hampshire, Fairpoint and Comcast 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 others and shall notify the ENGINEER immediately of lack of progress or defective workmanship on the part of others. Failure of the 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 work.

H. CUTTING and PATCHING

1. The CONTRACTOR shall do all cutting, fitting or patching that may be required to make the construction and various parts of items come together properly for the completed work.

2. The CONTRACTOR shall not endanger any work already installed by cutting or alterations.

3. Any cost caused by defective or ill-timed work shall be borne by the CONTRACTOR.

4. Cutting and patching shall be done by workmen skilled in the trade which constructs or installs that type of construction. All cutting, fitting and patching shall be done neatly.

5. All patching shall match adjacent similar surfaces.

6. All cutting, fitting and patching shall be subject to the approval of the ENGINEER.

I. REFERENCE SPECIFICATIONS

Standard specifications such as ASTM, ANSI, NEMA, NFPA, Commercial Standards, State and Federal specifications which are referred to in these specifications shall be the latest revisions thereof and shall include all applicable amendments and revisions which are in effect thirty (30) days prior to the date of submission of bids.

ALTERNATIVES

SECTION 01 23 00

If alternative materials and/or methods are proposed, full substantiation must accompany the bid. Such alternatives must be listed in detail, with accompanying costs along with a concurrent listing of the items and their costs for which the alternatives are being proposed so that an accurate comparison and evaluation may be made by the ENGINEER. The ENGINEER will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without ENGINEER'S prior written acceptance.

PROJECT MEETINGS

SECTION 01 31 19

A. PRE-CONSTRUCTION CONFERENCE

The CONTRACTOR shall not commence work until a conference has been held at which representatives of the CONTRACTOR, UTILITY COMPANIES, ENGINEER, and OWNER are present.

B. DURING CONSTRUCTION

During construction, bi-weekly (every two-weeks) meetings will be held between representatives of the ENGINEER, CONTRACTOR and OWNER at a pre-selected time for the purposes of continual updating of project status and the presentations of an updated schedule.

SUBMITTALS

SECTION 01 33 00

A. CONSTRUCTION SCHEDULES

Planning and progress schedules shall be submitted to the ENGINEER by the CONTRACTOR before starting the WORK and weekly during the progress of the WORK in the form of a bar chart tied to dates with a written description of the methods the CONTRACTOR plans to use in accomplishing the WORK and the various steps he intends to take.

B. SHOP DRAWINGS and PRODUCT DATA

1. Before submittal to the ENGINEER, the CONTRACTOR shall check all shop drawings or samples for conformance with the CONTRACT DOCUMENTS for suitability for satisfactory incorporation in the completed WORK and shall note legibly on the drawings or samples that he has verified its acceptability and that he approved it. If there are any deviations in the shop drawings or samples from the plans and specifications, the CONTRACTOR shall so note these deviations and notify the ENGINEER. The CONTRACTOR shall not commence work on any portion of the contract WORK requiring shop drawings or samples until the drawings or samples have been approved by the ENGINEER.

2. Shop drawings may include general, assembly and detail drawings, diagrams, illustrations, material and equipment schedules with manufacturer's name and catalog numbers and description, performance charts, catalog cuts, brochures and such other information and data as is necessary and required by the ENGINEER.

3. The ENGINEER will review the shop drawings and samples with reasonable promptness. The CONTRACTOR shall allow five (5) days for review. The ENGINEER'S review and approval shall be only for conformance with the design concept of the WORK and with information given in the plans and specifications. The ENGINEER'S approval shall not relieve the CONTRACTOR of responsibility for conforming to the plans and specifications.

4. Four (4) sets of shop drawings will be submitted for review. These drawings shall be submitted sufficiently in advance of commencement of installation of materials and equipment to allow for approval.

5. If the shop drawings are not approved by the ENGINEER, the CONTRACTOR shall correct or make changes as noted and shall submit revised shop drawings until approved by the ENGINEER.

6. Shop drawings shall be submitted for the following items and others as required by the ENGINEER:

SEWER	WATER	DRAIN
Manholes	Curb Stop	Pipe
Frames and Covers	Curb and Gate Boxes	Flared End Sections
	Unions	
	Pipe	
	Gate Valves	
	Fittings	

QUALITY CONTROL - INSPECTION

SECTION 01 45 00

1. The WORK shall at all times be subject to the observation of the OWNER and ENGINEER. Observation or non- observation by the ENGINEER shall not relieve the CONTRACTOR from his contractual obligation to furnish work and material as required and properly complete the WORK in accordance with these CONTRACT DOCUMENTS. If the ENGINEER considers that the WORK is not being properly accomplished he may condemn or reject all or any part of the WORK and any materials or equipment incorporated in it. If any material, equipment or work is condemned or rejected by the ENGINEER, the CONTRACTOR shall bear all expenses of removal and proper replacement of such material, equipment or work required to be provided by the CONTRACT DOCUMENTS. The expense of replacing any work done by others which is adversely affected by removal and proper replacement of improper work done by the CONTRACTOR shall be borne by the CONTRACTOR.

2. The OWNER and ENGINEER shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

3. If work to be done away from the construction site is to be observed by the ENGINEER during its fabrication, manufacture, testing, or shipping, such notice shall be in writing and delivered to the ENGINEER in ample time so that the necessary arrangements for the observation can be made.

4. The CONTRACTOR shall give proper notice to governing departments and inspectors having jurisdiction and shall have all the parts of the work inspected and approved by them as may be required.

5. Approval from the ENGINEER is required prior to any work on weekends or City holidays.

6. **If the CONTRACTOR works on the weekend or City holiday he will be billed for the ENGINEER'S overtime rate (assume $75.00 per hour).**

TEMPORARY FACILITIES AND CONTROLS

SECTION 01 50 00

A. GENERAL

1. All temporary facilities required by the CONTRACTOR (and his SUBCONTRACTORS), including sanitary, shall be furnished by him (or them) and shall meet all local codes and requirements for such temporary installations. All temporary facilities shall be entirely removed upon completion of the work, and the site shall be left in a satisfactory condition.

2. All temporary facilities shall be provided and maintained so as not to create fire hazards or safety hazards.

B. SAFETY

1. The CONTRACTOR (and his SUBCONTRACTORS) shall, at all times, exercise reasonable precautions for the safety of all persons. All rules, regulations and laws, concerning safety that are in effect at the job site, shall be complied with in all respects. The *Manual of Accident Prevention in Construction* published by the Associated General Contractors of America shall be used as a guide for safety provisions regarding eliminating hazards on the job. The CONTRACTOR shall also abide by the provisions of the booklet entitled *Safety Regulations as published by the U.S. Army Corps of Engineers*.

2. The wearing of non-conducting hard, safety hats on the job is mandatory. The CONTRACTOR shall be responsible for and shall enforce the wearing of such safety hats by his personnel and the personnel of his subcontractors.

3. All employees must wear substantial work shoes. Approved safety shoes are preferred unless special shoes for the types of work are required.

4. Safety glasses shall be worn by all workmen when performing operations hazardous to the eyes.

5. All tools and devices that require electric power shall be properly grounded.

6. If any blasting for rock ledge or large boulder removal is required for the WORK and is allowed by the proper authorities, then all blasting and handling of explosives shall be done in accordance with all applicable safety regulations and ordinances concerning such work and shall be done in a manner so as to provide for the safety of all persons and so as not to damage property.

The CONTRACTOR shall provide adequate equipment and facilities as are necessary and required, in the case of an accident, for first aid service to any person who may be injured in the prosecution of the work under this contract whether they are his own personnel, his subcontractor's personnel, the ENGINEER, or other persons who may for any reason enter within the limits of the contract work. Also the CONTRACTOR shall have standing arrangements for or have effective written procedure on site, to obtain and provide adequate emergency medical care, and for removal and hospital treatment of any person who may be injured. Such equipment or facilities and arrangements shall be satisfactory to the ENGINEER.

7. The CONTRACTOR will be required, at his own expense, to maintain adequate signage to inform the public of the construction on the site. The signage must meet the approval of the Community Services Director and the Police Department at the pre-construction meeting.

C. FIRE PREVENTION

All operations on the OWNER'S premises shall be so performed that no fire hazards are needlessly created or permitted to exist. Particular care shall be exercised with regard to the disposition of waste materials, the nature or quantity of which might create or increase a fire hazard. The CONTRACTOR shall make sure that persons employed directly or indirectly by him, while on the OWNER'S premises, comply with any fire prevention regulations of the OWNER. The CONTRACTOR shall be responsible for compliance by personnel of his organization for their cooperation in fire prevention, fire reporting, and protection measures to minimize loss.

D. TEMPORARY ENCLOSURES

The CONTRACTOR shall provide all temporary wall, door and window closures, as necessary, to keep out weather or intruders and the CONTRACTOR shall take all necessary precautions so that the work may be properly and satisfactorily done during adverse weather and against the possibility of adverse weather.

E. TREE, PLANT, and OTHER PROPERTY PROTECTION

1. Care shall be exercised to avoid damaging existing trees, shrubbery, poles, signs, fences, walls, lawns, etc., not in the immediate work area, and any damage to these facilities or features as a result of work performed by the CONTRACTOR shall be promptly repaired or replaced by the CONTRACTOR at his expense to the satisfaction of the ENGINEER.

2. Under this Contract, the CONTRACTOR shall be required to protect all property on which the WORK is done and all adjoining property and to satisfactorily repair or replace such properties damaged or destroyed by him or his employees through the construction operation.

F. EROSION CONTROL

The CONTRACTOR shall comply with the requirements of New Hampshire Department of Environmental Services that requires that sufficient precautions be taken to minimize the run-off, due to construction, of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride or other polluting materials harmful to humans, fish, or other life, into the water supplies and surface waters of the State. Unless otherwise permitted by the Commission, control measures must be adequate to assure that turbidity in the receiving water will not be increased to more than 10 *Jackson Turbidity Units (J.T.U.)* in waters used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 *J.T.U.* unless otherwise permitted by the Commission. Special precautions shall be taken in the use of construction equipment to prevent operations which promote erosion. The CONTRACTOR shall obtain the necessary permits regarding erosion control.

G. AIR POLLUTION CONTROL

The CONTRACTOR shall conduct his operations so as not to violate any applicable ordinances in effect in the locality pertaining to air pollution.

H. TEMPORARY DRAINAGE

As necessary, provisions for temporary drainage shall be provided by the CONTRACTOR to keep the working area dry.

I. PRESERVATION OF NATURAL RESOURCES

All construction operations, contract work, cleanup, and the condition of the adjacent terrain upon completion of the work shall fully comply with all applicable rules, regulations and laws concerning the preservation of natural resources. All regulations relating to preservation of wetlands shall be strictly observed.

J. PREVENTION OF WATER POLLUTION

The CONTRACTOR shall take all such precautions in the conduct of his operations as may be necessary to avoid contaminating water in adjacent water courses or water storage areas whether natural or man-made. All earthwork, moving of equipment, water control of excavations, and other operations likely to create silting, shall be conducted so as to minimize pollution of water courses or water storage areas. Water used during the contract work which has become contaminated with oil, bitumen, harmful or objectionable chemicals, sewage, or other pollutants shall be discharged so as to avoid affecting nearby waters. When water from adjacent natural sources is used in the contract work, intake methods shall be such as to avoid contaminating the source of supply.

K. FIELD OFFICE

Space will be made available at the site for the temporary field office of the CONTRACTOR and for storage of construction materials. The CONTRACTOR shall provide all necessary temporary fencing and gates to protect materials from pilferage. The location and type of temporary buildings shall be subject to the approval of the OWNER.

MATERIAL AND EQUIPMENT

SECTION 01 60 00

A. INSTALLATION

1. All materials and equipment shall be installed in accordance with the recommendations of the manufacturer and these specifications, and are to perform properly in the completed contract work.

2. All systems shall be competed and left in working order by the CONTRACTOR.

B. STORAGE and PROTECTION

1. Attention shall be directed to the General Conditions concerning protection of property. All materials and equipment at the job site that are to be incorporated in the contract work and that are the responsibility of the CONTRACTOR, shall be adequately stored and protected from damage until completion of the contract work.

2. The CONTRACTOR shall be responsible for protecting all materials and equipment furnished by him and for protecting materials and equipment for the WORK which are furnished by the OWNER or Others. Responsibility shall be vested in the CONTRACTOR for materials and equipment furnished by the OWNER when they have been delivered to the job site by the transporting vehicle. The CONTRACTOR shall report in writing to the ENGINEER, within 24 hours after receipt at the job site of the materials and equipment, whether there is shortage or damage. Unless specified otherwise in these Specifications, responsibility shall be vested in the CONTRACTOR for materials and equipment furnished by others when such items are ready to be incorporated in or connected to the work of the CONTRACTOR.

3. The CONTRACTOR shall be responsible for all damage to any of the work covered by the CONTRACT DOCUMENTS before the final acceptance of the work.

C. STANDARD PRODUCTS and SUBSTITUTIONS

1. Unless otherwise mentioned in these Specifications or shown on the drawings, the materials, fixtures and equipment to be furnished for the WORK shall be standard products of those manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest design. All materials, fixtures and equipment shall comply with the requirements of these Specifications and shall be suitable for proper performance in the completed contract work.

2. No request for substitutions will be considered after submission of proposals except for written emergency requests made because of nonavailability of specified items, delay in delivery, or to adjust to unforeseen field conditions. The written emergency

request for substitution shall be accompanied with a photocopy of the letters from the supplier and manufacturer stating the reasons that they are unable to furnish the specified materials. No substitutions for those items mentioned in these specifications or shown on the plans shall be incorporated in the finished work unless written approval is received from the ENGINEER before purchase of those items.

3. Whenever in the Plans and Specifications any item of equipment or material is designated by reference to a particular brand, manufacturer, or tradename, it is understood that an approved equal product, acceptable to the ENGINEER may be substituted by the CONTRACTOR. In the event of acceptance of any alternate or substitution, it shall be the responsibility of the CONTRACTOR to coordinate such alternate or substitute items with all other items to be furnished to assure the proper fitting together of all items. Any additional cost incidental to the coordination and/or fitting together of alternate or substitute items shall be borne by the CONTRACTOR at no extra cost to the OWNER. Similar responsibility applies to items which are left to the CONTRACTOR'S option.

D. DISPOSAL OF UNDESIRABLE and SURPLUS MATERIALS

All surplus excavated materials, except unsuitable excavation and construction debris, shall remain the property of the OWNER until the CONTRACTOR is notified by the ENGINEER that said material is no longer needed. The surplus material shall be used to fill the areas indicated on the plans. The surplus excavated material shall also remain on site to replace any material deemed unsuitable during excavation. Once said material is deemed as excess by the ENGINEER it will be removed from the OWNER'S property and properly disposed of at no cost to the OWNER.

All unsuitable and waste material shall be disposed of, off the OWNER'S property in approved locations, in accordance with all rules, regulations and ordinances governing such disposal. All excess materials that are not the property of the CONTRACTOR shall be disposed as directed by the ENGINEER and all excess materials belonging to the CONTRACTOR shall be removed from the OWNER'S property. Unsuitable, waste, excess, or other undesirable material shall not be disposed of in a manner so as to become a nuisance to other property users or owners, shall not be disposed of so as to cause a health hazard or ecological damage, and shall not be disposed of so as to cause an eyesore to the public.

PROJECT CLOSEOUT

SECTION 01 77 00

At all times, the CONTRACTOR (and SUBCONTRACTORS) shall keep the WORK area free from the accumulation of waste material or rubbish caused by construction operations. At the completion of the WORK, the CONTRACTOR shall remove all waste materials and rubbish from the OWNER'S property as well as all tools, construction equipment, machinery and surplus materials and shall leave the work area "broom clean". The CONTRACTOR shall leave surfaces of the contract work free from foreign matter. The exterior and interior of all equipment and systems shall be kept clean at all times.

Equipment delivered to the job site with temporary protective coating shall have these removed and the equipment cleaned up satisfactorily.

If the CONTRACTOR fails to clean up, the OWNER may do so, and the cost thereof shall be paid by the CONTRACTOR.

Before completion of the WORK, ruts and scars caused by construction operations under this contract shall be obliterated. Damage to features of the land resulting from the CONTRACTOR'S operations shall be corrected and the land and its features restored as nearly as practicable to its original condition or to any approved changes indicated on the drawings, before final acceptance of the WORK. Any hazardous conditions that could endanger or hinder the OWNER'S utilization of the land shall be corrected immediately. Any drainage ditches plugged due to the CONTRACTOR'S operations shall be restored to allow free flow and removal of surface water. The CONTRACTOR shall be entirely responsible for any unnecessary or excessive damages to lands resulting from his operations.

GENERAL PROVISIONS

SECTION 30 10 00

A. CONTRACT DOCUMENTS

This Section of these Specifications is a part of the CONTRACT DOCUMENTS. All applicable parts of the balance of the CONTRACT DOCUMENTS are equally as binding for this Section as for all other parts of these Specifications.

B. WORK INCLUDED

1. The Work of this Section covers earthwork for the construction of water main, storm drains, drain manholes, and catch basins, consisting of stripping and stockpiling of topsoil, excavation of all materials encountered, trenching and maintenance of excavation, installation of utilities, backfill, fill, providing borrow, compaction and grading.

2. Without limiting the generality of the above, earthwork for the following items is included, but, other earthwork not mentioned here that is indicated or reasonably implied in the drawings shall be included in the work of this Section; unless specifically stated as under the scope of other sections or as by others.

C. PROTECTION

1. Extreme care shall be exercised to avoid existing trees, shrubs, facilities, construction, and utilities that are to remain and all necessary precautions taken to preclude damage to these items, either shown on the drawings, apparent from a field inspection or inherent in the nature of the work. Any damage to these items as a result of work performed by the CONTRACTOR shall be repaired by the CONTRACTOR at his expense.

2. Existing utilities, if and when encountered, shall be supported and protected, and the ENGINEER shall be notified. Entrance, opportunity, and ample time shall be allowed for such measures as may be required for the continuance of such services. Services to be abandoned within excavated areas shall be removed by the CONTRACTOR. Permanent existing utilities near the excavation and/or construction work shall be protected during construction work and any damage to such permanent utilities shall be repaired by the CONTRACTOR without expense to the OWNER.

3. **The CONTRACTOR shall notify Dig Safe (1-800-225-4977) 72 hours prior to excavation.** The CONTRACTOR shall coordinate his construction activities with all public and private utility companies or governmental departments or commissions, prior to commencement of construction, in order to locate all utilities and assure that there will be no damage done to such utilities. The ENGINEER shall not be

responsible for any damage done to such utilities either expressed or implied and the CONTRACTOR shall restore and repair any resultant damage without additional compensation.

4. Rules and regulations governing the respective utilities shall be observed. Active utilities shall be adequately protected from damage, and shall not be removed or relocated except as indicated or directed.

5. Any existing property boundary makers, control points and datum elevation markers or bench marks shall be preserved, and all such established survey points which are displaced of destroyed by the CONTRACTOR shall be replaced at the expense of the CONTRACTOR.

D. GRADES and ELEVATIONS

The Drawings indicate, in general, the alignment and finished grade elevation and underground utility and piping invert grades. The ENGINEER, however, may make such adjustments in grades and alignment as are found necessary in order to avoid interference and to adapt the piping to other special conditions encountered. Grading between indicated final grades shall be smooth, even surfaces, except as otherwise required.

E. TOPSOIL CONSERVATION

All topsoil existing within the areas in which earthwork will be done, shall be removed and stockpiled in areas free from interference with the work. The material shall be kept free of trash, brush, roots and other excavated material.

F. EARTH EXCAVATION

1. All excavation work whether cut, general excavation, or trenching shall conform to the following provisions as applicable.

   a. Excavation shall be performed to elevations and dimensions providing sufficient space to permit proper construction and inspection of the WORK.

   b. The CONTRACTOR shall excavate all materials of whatever nature encountered. Immediately after excavation has been carried to the required grades, and has been observed by the ENGINEER, the exposed horizontal surfaces shall be properly prepared and construction continued.

   c. If unsuitable bearing material is found the CONTRACTOR shall immediately notify the ENGINEER and shall not proceed further until instructions are given.

   d. No pipe or structure shall rest partially on rock and partially on soil. If rock is encountered as part of the bottom of the excavation the rock shall be over-

excavated by six inches (6") and replaced with approved material suitably compacted.

e. Excavation beyond necessary limits shall be refilled with approved material and suitably compacted at no cost to the OWNER.

f. The CONTRACTOR shall control the grading around the project such that the ground shall be pitched in order to prevent water from running into the excavated areas to prevent damage to the WORK. Excavation shall be performed in a manner and sequence that will provide drainage at all times.

2. Trench widths shall be sufficient to permit proper installation of the WORK. Trench excavation shall be to depths and widths not greater than necessary for laying and thorough bedding of pipe. All piping shall be properly bedded as described in these Specifications for the type of material being installed. The run of trenches shall be sloped where required for proper functioning of the pipe.

G. MAINTENANCE OF EXCAVATIONS

1. The CONTRACTOR shall shore and brace excavations, provide all sheet piling, and protect all slopes and earth banks to prevent cave-ins, to protect persons and adjacent construction, and to permit proper execution of the WORK. Shoring and sheeting shall be removed, unless approved otherwise, before backfilling is completed, but not until permanent supports are in place. All sheeting, shoring and bracing shall have sufficient strength and rigidity to withstand the pressures exerted and maintain the walls of the excavation properly in place and protect all persons or property from injury or damage. When excavations are made adjacent to existing structures, or in paved areas, particular care shall be taken to adequately sheet, shore and brace the sides of the excavation to prevent any undermining of or settlement beneath the structures or the pavement. Underpinning of adjacent structures or pavement, when necessary, shall be done in an approved manner. The removal of sheeting, shoring, and bracing shall be done in such a manner as not to endanger or damage either the WORK or any existing structure or property, and so as to avoid cave-ins or sliding of the banks. If for any reason the CONTRACTOR leaves in place any sheeting, shoring or bracing, no payment will be allowed for such material left in place. All costs for sheeting, shoring or bracing shall be included in the unit price for the pipe. Separate payment will not be made. All holes or voids left by the removal of sheeting, shoring or bracing shall be satisfactorily filled and compacted.

2. The CONTRACTOR shall perform all pumping, dewatering, and drainage and provide any well points or other means necessary to keep the excavations dry, protect persons and property, and permit proper excavation of the WORK. The CONTRACTOR shall remove any water from any source which may accumulate during construction. Care shall be taken to prevent soil from entering completed pipes or existing drainage systems. The CONTRACTOR shall have available at all

times sufficient equipment in proper working order for doing the work herein required. All water removed shall be disposed of so as not to create any problems.

H. ROCK EXCAVATION

1. For the purposes of this contract, rock shall be defined as any stone or boulder one cubic yard or more in volume, and any hard natural material or rock ledge that will withstand removal by the usual mechanical methods and that normally requires blasting or continuous drilling for removal. The ENGINEER shall be the sole judge as to whether material encountered shall be classified as rock in accordance with the above description. No rock shall be removed until approved by the ENGINEER.

2. Rock in trenches for pipes and appurtenances shall be excavated a minimum of six inches (6") below the required grade and one foot (1') beyond the outside of the pipe or manhole on each side or a minimum width of three feet (3'), whichever is larger, and backfilled appropriately.

I. BLASTING

If blasting is required and allowed, it shall be done in a safe manner, and the CONTRACTOR shall take all precautions necessary for the protection of persons and property. No blasting shall be performed without permission from all governing authorities and the ENGINEER. Any blasting work approved shall be done conforming to all applicable safety regulations including all State and local regulations. Ample warning shall be given of all blasts. Experienced personnel shall do all blasting operations. Any damage caused by blasting shall be corrected by the CONTRACTOR at no additional expense to the OWNER. No blasting shall be done after 2:00 pm on any given day; also under no circumstances will blasting be allowed during the weekend or a City holiday.

J. DISPOSAL OF UNDESIRABLE and SURPLUS MATERIALS

All surplus excavated materials, except unsuitable excavation and construction debris, shall remain the property of the OWNER until the CONTRACTOR is notified by the ENGINEER that said material is no longer needed. The surplus material shall be used to fill the areas indicated on the plans. The surplus excavated material shall also remain on site to replace any material deemed unsuitable during excavation. Once said material is deemed as excess by the ENGINEER it will be removed from the OWNER'S property and properly disposed of at no cost to the OWNER.

All unsuitable and waste material shall be disposed of, off the OWNER'S property in approved locations, in accordance with all rules, regulations and ordinances governing such disposal. All excess materials that are not the property of the CONTRACTOR shall be disposed as directed by the ENGINEER and all excess materials belonging to the CONTRACTOR shall be removed from the OWNER'S property. Unsuitable, waste, excess, or other undesirable material shall not be disposed of in a manner so as to become

a nuisance to other property users or owners, shall not be disposed of so as to cause a health hazard or ecological damage, and shall not be disposed of so as to cause an eyesore to the public.

K. FILL and BACKFILL

1. No unsuitable material shall be incorporated in the WORK. Suitable materials from the excavation which conform to the requirements herein or are approved by the ENGINEER shall be used except where more stringent or special requirements are stated. No frozen material may be used. Material from rock excavation shall not be used as backfill. All fills and backfills shall be made with materials available which are acceptably graded, containing sound stone, gravel and sand without a large percentage of silts or clays, or too wet for proper placement. Fill and backfill material shall not contain individual roots, vegetation masses, peat, muck, or other organic or undesirable material. Fill and backfill material shall not contain any debris, wood, broken glass, metal, granite blocks, broken concrete, masonry rubble or other objectionable material. The material within two feet (2') of finish grade in any areas to be paved and within five feet (5') horizontally of any structure shall contain no stone having any dimension exceeding six inches (6"). Unless stated otherwise, gravel shall be used.

2. Materials placed shall be specially compacted by depositing in approximately horizontal layers not exceeding the thickness hereinafter stated but in no case thicker than 12" before compaction. Each layer shall be compacted by suitable vibratory tampers which will secure the required degree of compactness as defined in Section 30 10 00, General Provisions, Paragraph L, of these Specifications.

    a. Around structures the fill and backfill shall be placed in layers not more than 12" thick. No heavy machinery shall be allowed within 5' of the structure during placing. Material shall not be placed until the structure can satisfactorily withstand the loads imposed by fill and backfill. Backfill at structures shall be brought up evenly on all sides to avoid damage to the structure by uneven loading.

    b. In trenches after pipe has been installed, bedded, tested, inspected, and approved, material of fine gravel or sand shall be carefully placed and tamped in thin layers around and to a level 12" above the top of the pipe. The remaining excavation shall be backfilled in layers not more than 12" in depth before compacting. No heavy equipment shall be allowed over the pipe until at least four feet (4') of backfill has been placed.

3. Materials

a. Bank Run Gravel - shall be composed of hard, durable stone and coarse, fine sand, free from loam and clay and undesirable organic matter, well graded and containing no stone having a dimension greater than 6"; 25-70% shall pass the No. 4 sieve, and not more than 12% of the material passing the No. 4 sieve shall pass a No. 200 sieve. All borrow material shall be gravel unless otherwise specified.

b. Crushed Stone - shall be durable, crushed rock consisting of the angular fragments obtained by breaking and crushing solid, natural rock, and reasonably free from thin, flat, elongated, or other objectionable pieces. Crushed stone shall further meet the requirements of the NHWS&PCC.

c. Sand - shall be well-graded coarse sand without excessive fines, free from loam, clay and organic matter. The allowable amount of material passing the #4 sieve shall be between 70-100%. The allowable amount of material passing a #200 sieve shall not exceed 12% by weight. Beach sand shall not be used.

d. Crushed Gravel - shall be well graded, 95-100% shall pass the 2" sieve, 27-55% shall pass the No. 4 sieve. Also, not more than 12% of the #4 sieve shall pass the #200 sieve.

e. Suitable Granular Backfill - shall consist of stones, rock fragments, and fine hard durable particles resulting from the natural disintegration of rock. The material shall be free from injurious amounts of organic matter. The wear shall be not more than 60 percent (60%). Not more than 15 percent (15%) of the material passing the No. 4 sieve shall pass the No. 200 sieve and shall meet the following gradation:

95% to 100% passing the 3 inch sieve
25% to 70% passing the No. 4 sieve

L. COMPACTION

1. All fills and backfills shall be compacted sufficiently so that structures, paving, and other construction shall not settle and so that they shall not allow movement of earth and shall prevent subsequent settlement.

   The OWNER will require compaction tests performed to determine the actual in-place densities being attained. Tests on the bank run and crushed gravel will be required **one (1) every one-hundred feet.** All compaction testing shall be at the CONTRACTOR'S expense.

   If any field tests fail to meet the required density then the CONTRACTOR shall remove all of the earthwork in that portion of the work involved and shall replace it to the required density.

2. Compaction shall be to the following densities based upon maximum dry density of the optimum moisture content as established by Method D of AASHTO Standard T180 (ASTM D1557) (Modified Proctor) and verified by AASHTO Standard T147 (ASTM D1556):

   Under structures.....98%
   Beside structures..... 95%
   Top 2' under pavement.... 95%
   Below 2' under pavement. 95%
   All other areas..... 90%

M. GRADING

1. Rough grading - shall be reasonably even and free from irregularities, and shall provide positive drainage away from structures without ditching or pools. Proper allowances shall be made for paving.

2. Fine grading - shall bring the surface to the true line and grade required. The areas fine graded for loaming and seeding shall be raked to remove all stones and other unsatisfactory materials and shall be suitably compacted.

N. TEST PITS

1. The work covered under this Section includes furnishing all plant, labor, equipment, appliances and materials, and performing all operations in connection with the excavation and refill of test pits to establish the location of existing pipelines and utilities, or any other buried items for which the exact location is required at locations indicated, directed by the OWNER, or requested by the CONTRACTOR and approved by the ENGINEER.

2. Excavate and backfill exploratory test pits ahead of the work where and as directed or approved using special care, including hand excavation to avoid damage to any underground structures or utilities.

3. Test pits shall be backfilled immediately after their purpose has been accomplished with suitable excavated material and/or with Bank-Run Gravel as directed, placed in two (2)-foot layers each thoroughly compacted by power tamping wherever practical.

4. Maintain the surface of the pit in a satisfactory condition for travel until the excavation of the trench reaches the pit. This maintenance may require steel plates or other cover, as determined by the ENGINEER. No payment will be made for placing, maintaining and removing such steel plates or covers.

EARTHWORK

CLEARING & GRUBBING

SECTION 31 11 00

A. WORK INCLUDED

This work shall consist of clearing, grubbing, removing and disposing of all vegetation and debris within the limits shown on the plans or specified below, except such objects as are designated to remain or are to be removed in accordance with other sections of these specifications. This work shall also include the preservation from injury or defacement of all vegetation and objects designated to remain.

B. JOB CONDITIONS

1. Requirements of Regulatory Agencies: State and local codes shall control the disposal of organic material. No cutting or disturbing of trees or shrubs in a public way shall be performed until such time as the CONTRACTOR has obtained a permit from the local governing authority.

2. Protection: Protect the area beyond the limit of clearing from damage by erecting barricades, fencing, wrapping or other protective methods.

3. Burning: No burning shall be allowed unless a permit from the controlling agency has been issued to the CONTRACTOR.

C. MATERIALS

Materials shall be at the CONTRACTOR's option.

D. CLEARING

1. Clearing shall consist of the felling, trimming and cutting into sections and the satisfactory disposal of such trees and limbs as well as the cutting and satisfactory disposal of bushes, brush and other vegetation within the designated areas. This work shall include the removal and disposal of down timber, rubbish and debris found existing within the areas to be cleared. All timber of marketable value shall become the property of the CONTRACTOR. Disposal shall be the responsibility of the CONTRACTOR.

2. Clearing as required to accommodate the construction shall be performed. Certain trees located at the edge of slopes may be designated by the ENGINEER to be saved. Clearing shall not extend beyond the limits of clearing as designated on the Construction PLANS.

3. Timber as defined as logs 8’ to 16’ in length, plus appropriate trimming allowance, having a diameter inside the bark at the small end, of approximately 10” or greater shall become the property of the CONTRACTOR. All other wood suitable for firewood shall remain the property of the City. Firewood shall be cut into 4’ lengths and neatly stacked on the roadway ROW accessible to a truck. Removal of the stacks shall be by the City during or after the duration of this Contract.

E. GRUBBING

1. All stumps and large roots within the limits of the roadbed shall be completely removed to a depth of 3 feet below subgrade unless a greater or lesser depth is specified on the plans. Stumps within the limits of the roadbed below such depth, and stumps under embankments or outside the roadbed shall be cut off within 6 inches of the existing ground surface except in the area to be rounded at the top of backslopes, where stumps are to be cut off flush with the surface of the final slope line, or removed.

2. The limits of grubbing shall coincide with the limits of clearing. All stumps and trees shall be removed by the CONTRACTOR.

3. Unless otherwise shown on the plans, clearing and grubbing shall extend 10 feet beyond the excavation or embankment slopes.

4. Except in areas to be excavated, excavation caused by grubbing operations shall be filled with suitable material which shall be compacted to conform to the surrounding ground.

F. DISPOSAL

All organic material, rubbish and debris of whatever nature shall be removed from the site in a timely fashion. A stump dump will be provided on City property as indicated on the plans.

If allowed under City and State ordinances, burning will be allowed under the constant care of competent watchmen at such times and in such a manner that the surrounding vegetation or anything designated to remain on the right of way will not be jeopardized. Ultimate disposal of any cleared and grubbed materials and waste shall be the responsibility of the CONTRACTOR.

EARTHWORK

GRADING

SECTION 31 22 13

A. WORK INCLUDED

Provide ALL labor, materials, equipment and incidentals necessary to accomplish the excavating, filling and grading required to attain the rough grade of the roadbed as shown on the Drawings.

B. JOB CONDITIONS

1. Provide for safe and efficient work conditions during the progress of the work. Apply water and/or calcium chloride to prevent dust from being a nuisance to the public or the workers both on and near the job site and on and near all off-site borrow areas.

2. Use all means necessary to protect all materials, living matter, utilities, pavements and structures. Particular care shall be exercised to protect tree root systems and tree trunks. In the event of damage, immediately make all repairs and replacement necessary to the approval of the ENGINEER and at no additional cost to the OWNER.

C. SUBMITTALS

1. Material: Representative samples of all materials which require approval of the ENGINEER shall be submitted five (5) days prior to the date of anticipated use.

2. Drainage Work: All surface water encountered on the site shall be accommodated by satisfactory drainage. Where the Contract Documents do not specifically provide for a drainage problem encountered during the progress of work, the method and details for providing for such drainage shall be submitted to the ENGINEER for approval prior to beginning this work.

D. PRODUCTS and MATERIALS

1. All fill materials shall be as specified or as indicated in the Drawings. They shall be unfrozen and free of organic material, trash, ice or other objectionable material. Excess or unsuitable material shall be removed from the job site by the CONTRACTOR.

2. Fill materials shall be of the composition and gradation specified under Section 31 23 33 Trenching, Backfilling and Compacting.

E. EXECUTION

1. Become thoroughly familiar with the site, the site conditions and all portions of the work falling within the Section before beginning work.

2. Confirm that finish elevations and lines are adequately set and staked out prior to doing any grading.

3. Ascertain that all areas of the construction site when the Drawings indicate that existing physical features will be changed have been cleared and grubbed in accordance with Section 31 11 00 – Clearing and Grubbing; and are ready for grading.

F. GRADING

1. Grading areas to be loamed and seeded:

   a. Perform all rough grading required to attain the elevations indicated on the Drawings or as required.

   b. Excavate to grades shown on the Drawings or as required to accommodate the construction of the Access Road sewer and Water Main installation. Backfill and compact all other excavated areas at no additional cost to the OWNER. Remove all material, including rocks and boulders to a point at least 4 inches below the finished grade of landscaped areas to be loamed and seeded.

   c. Remove all ruts, hummocks and other uneven surfaces by surface grading prior to placement of fill. Do not place, spread or compact any fill material during unfavorable weather conditions and do not conduct further fill operations until compaction tests indicate acceptable results in previous layers. Do not use frozen materials or place a successive layer of fill on frozen material. Use only on approved fill material, free of stumps, trees, trash or other unsuitable material.

   d. Spread approved fill material in uniform layers not exceeding 12 inches thickness per layer and compact with heavy machinery as required. Begin the fill layers at the deepest part of the fill. Fill should extend to the point where a relatively uniform layer of topsoil or loam not less than 4 inches deep will produce final grade.

2. Grading areas to be paved or surfaces:

   a. Perform all rough grading, including excavation, formation of embankments, shaping, sloping, compaction, construction of ditches, disposal of surplus or unsuitable material, and any work necessary to prepare the subgrades of all roadways, walks, and parking areas. Grading shall be brought to the bottom of the sub-base course under paved areas and to the finished grade on side slopes and/or embankment areas.

b. Accomplish all excavation and fill within the slope and grade lines as indicated on the Drawings unless otherwise authorized in writing by the ENGINEER. The roadway shall be graded to full cross section width at subgrade before placing any type of subbase or pavement except that partial width construction is permissible where necessary for the maintenance of traffic.

c. Do not use frozen material in the construction of embankments and do not place embankments or successive layers of embankment upon frozen material. Placement of material shall stop when the sustained air temperature, below 32 degrees F., prohibits the obtaining of the required compaction. If the material is otherwise acceptable, it shall be stockpiles and reserved for future use when its condition is acceptable to the ENGINEER for us in embankments.

d. Place all material being placed in embankments in horizontal layers of uniform thickness across the full width of embankment except when it is impractical to construct full width of the embankment and partial width layers are authorized by the ENGINEER. Do not allow or place stumps, trees, rubbish or other unsuitable material in embankments. Begin layers of embankment at the deepest part of the fill.

e. Areas of soft, yielding or otherwise unsuitable material that will not meet compaction requirements shall be removed, replaced with suitable material and properly compacted.

f. Place embankments for paved or surfaced areas in horizontal layers of depth which will result in layers of compacted material not exceeding 6 inches. Compact each layers as specified before placing each new layer. Use effective spreading equipment on each layer to obtain uniform thickness prior to compacting. Each layer shall be kept crowned to shed water to the outside edges of embankment and continuous leveling and manipulating will be required to assure uniform density. Construction equipment shall be routed uniformly over the entire surface of each layer.

g. If, during the construction of the embankments, there is any indication that serious bulging, cracking, or unstable movement may occur; the placing of fill shall be stopped or retarded to allow the material to stabilize.

h. All ditches and drains shall be constructed so they will effectively drain the roadway or designated area before any subbase or surface course material is placed. In handling materials, tools and equipment, the CONTRACTOR shall protect the subgrade from damage. In no case shall vehicles be allowed to travel in a single track and form ruts. If ruts are formed, the subgrade shall be reshaped and compacted and any pockets of clay, sand, or soft material that may have been left in the subgrade shall be removed, replaced with approved material and properly compacted at the CONTRACTOR's expense. The subgrade shall be

kept in such condition that it will drain. The Subbase, base or surface material shall not be deposited on the subgrade until the subgrade has been checked and approved by the ENGINEER. After the subgrade has been approved, hauling shall not be done nor equipment moved over the subgrade which will distort the cross section. A tolerance of ½ inch above or below the finished subgrade will be allowed provided that this ½ inch above or below subgrade is not maintained for a distance longer than 50 feet, and that the required cross section is maintained.

3. Compaction under paved and surfaced areas:

   a. The entire area of each layer shall be uniformly compacted to at least the required minimum density by use of compaction equipment consisting of rollers, compactors or a combination thereof. Earth-moving and other equipment not specifically manufactured for compaction purposes will not be considered as compaction equipment. Each layer for its full width shall be compacted to not less than 90 percent of the maximum dry density as determined by the Standard Methods of Test for Moisture-Density Relations of Soils, ASTM-D698, Method C, except that the material in the top two feet of any embankment, immediately below the subgrade shall be compacted to not less than 95 percent of the maximum dry density. The field density determination will be made in accordance with the Standard Method of Test for Density of Soil In Place by either the Sand-Cone Method, ASTM D1556 or by the Rubber-Ball on Method, ASTM D2167.

   b. In no case shall the moisture content in each layer under construction vary more than 3 percent from the optimum moisture content.

   c. When the moisture content of the material in the layer under construction is less than the amount necessary to obtain satisfactory compaction by mechanical compaction methods, water shall be added. Water may also be added in excavation or borrow pits.

   d. In areas inaccessible to power rolling, the embankment material shall be placed in uniform horizontal layers not more than 4 inches in depth and compacted by means of approved mechanical tampers to the density requirements herein specified.

4. Compaction under loamed and seeded areas:

   In areas to be loamed and seeded, except for roadway embankments and slopes, a reasonable compaction shall be accomplished by heavy machinery or mechanical tamps.

EARTHWORK

TRENCHING, BACKFILLING & COMPACTING

SECTION 31 23 33

A. WORK INCLUDED

Furnish all labor, materials, equipment and incidentals necessary to perform all excavation, backfill, fill and grading required to complete the WORK shown on the Drawings and specified herein. The WORK shall include, but not necessarily be limited to layout, clearing and grubbing, precutting of pavement, exploratory excavation, trench excavation, structure excavation, backfill, bedding and restoration materials, compaction, drainage, excavation below normal grade, disposal of material, protection of property, restoration of trench surfaces, maintenance and clean-up.

B. JOB CONDITIONS

1. Dust Control:

   Use all means necessary to control dust on and near the WORK and/or calcium chloride to prevent dust from being a nuisance to the public or workers.

2. Protection:

   Use all means necessary to protect all materials, living matter, utilities, pavements and structures. Particular care should be exercised to protect tree root systems and tree trunks. In the event of damage, immediately make all repairs and replacement necessary to the approval of the ENGINEER and at no additional cost to the OWNER.

3. Traffic Control:

   Direct traffic throughout the project by warning signs and flagman to provide maximum safety for workmen, residents and traffic.

4. Maintenance of Road Surface:

   All road surfaces shall be broomed and/or hose cleaned at the end of each work day.

5. Maintenance of Open Trench:

   CONTRACTOR shall not allow excessive lengths of open trench. The ENGINEER shall be the judge of determining a reasonable length of open trench. For active working hours the length of open trench may not exceed 25% of the average daily

length of pipe laid. The CONTRACTOR shall accept full liability for his WORK and the length of trench left open.

C. SUBMITTALS

1. Submit 40-50 lb. Sample in individual wood boxes, marked with type, pit location and name for all materials: crushed stone bedding, sand cushion, crushed gravel, bank run gravel, and common fill.

2. Compaction Methods:

   a. The ENGINEER will consider compaction by mechanical methods as specified or water jetting.

   b. The CONTRACTOR shall submit proposed compaction method(s) in writing at the pre-construction meeting. Submittal shall be detailed description of proposed method(s), including manufacturers specifications performance characteristics, and operating instructions.

   c. Maximum allowable lifts specified herein and shown on the Drawings shall not be exceeded unless documentation for larger lifts is submitted in writing. Documentation will consist of manufacturer's literature, compaction test results, etc., but will be subject to review and approval by the ENGINEER.

D. MATERIALS

3. Common Fill:

   a. Common fill shall not contain stones, rock, concrete or other rubble larger than 10 (10) inches in diameter. Common fill used around pipes from invert to one (1) foot above pipe shall have a maximum stone size of two (2) inches in diameter. It shall have physical properties which allow it to be easily spread and compacted.

   b. Common fill shall be unfrozen and free of organics, trash, ice, wood, wet or soft plastic soils and other objectionable materials which may be compressible or which cannot be compacted properly.

4. Gravel (Bank-run)

   Gravel shall be well-graded sandy gravel having the following gradation:

US Sieve Size	Percent Passing by Weight
6 – inch	100
No. 4	25 – 70
No. 200	0 – 8

5. ¾" Crushed Stone:

US Sieve Size	Percent Passing by Weight
3/4 – inch	100
3/8 – inch	20 – 55
No. 200	0 – 5

6. Sand:

   Sand shall consist of clean mineral aggregate with particle size limits as follows:

US Sieve Size	Percent Passing by Weight
No. 4	100
No. 100	0 – 30
No. 200	0 – 12

7. ¾" Crushed Bank Run Gravel:

   Crushed bank run gravel shall consist of clean mineral aggregate with particle size limits as follows:

US Sieve Size	Percent Passing by Weight
1 – inch	100
3/4 – inch	85 – 90
1/2 – inch	70 – 85
No. 4	35 – 55
No. 200	0 – 15

8. Screened Gravel:

   Screened gravel shall consist of clean mineral aggregate with particle size limits as follows:

US Sieve Size	Percent Passing by Weight
1 – inch	100
3/4 – inch	90 – 100
3/8 – inch	20 – 55
No. 4	0 – 15
No. 8	0 – 5

9. Crushed Gravel:

   Crushed gravel shall have the following grading and at least 50 percent of the materials retained on the 1 inch sieve shall have a fractured face:

US Sieve Size	Percent Passing by Weight
3 – inch	100
2 – inch	95 – 100
1 – inch	55 – 85
No. 4	27 – 52
No. 200	0 – 12

(Based on the fraction passing the No. 4)

   As a substitute for the above, the following material may be used if the total project requirement is less than 200 cubic yards of crushed gravel:

US Sieve Size	Percent Passing by Weight
1-1/2 – inch	100
No. 4	0 – 55
No. 200	0 – 15

(Based on the fraction passing the No. 4)

10. Granular Backfill/Granular Borrow:

    Granular backfill/borrow shall consist of stones, rock fragments and fine, hand durable particles. The material shall comply with the New Hampshire Standard Specifications for Road Construction with the following particle size limits:

US Sieve Size	Percent Passing by Weight
3 – inch	95 – 100
No. 4	25 – 70
No. 200	0 – 15

11. Other Material:

    All other material required for completion of the work, but not specified herein, shall conform to the New Hampshire Standard Specifications for Highway and Bridge Construction and shall meet with the ENGINEER's approval.:

E. INSPECTION

1. Become thoroughly familiar with the site, site conditions and all portions of the WORK falling under this Section.

2. Inspect all physical features within and adjacent to the project. Report to ENGINEER all deviations or discrepancies from information shown on the Drawings.

F. PREPARATION

1. Field Measurements:

    a. Establish center line of trenches.
    b. Set elevations for WORK.
    c. It is the intent of this contract to excavate for and place the pipe in the locations shown on the plans.

2. Perform all necessary clearing and grubbing.

3. Strip topsoil from all areas which will be substantially disturbed by or during construction. Avoid mixing topsoil with subsoil and stockpile it in areas on site as approved by the ENGINEER. Topsoil shall be stockpiled free from brush, trash, stones and other extraneous material and protected until it is placed. Whether or not the CONTRACOR stores topsoil, he shall be required to replace topsoil to its original depth or 5 inches in depth, whichever is greater. Any deficiency in topsoil material shall be made up with acceptable topsoil approved by the ENGINEER at no additional cost to the OWNER. Additional topsoil shall be considered a cost incidental to the installation of pipe and compensation shall be included under the bid prices for pipe in the Proposal. Any topsoil remaining after all WORK is in place shall be disposed of by the CONTRACTOR as approved by the ENGINEER. The disposal site is the responsibility of the CONTRACTOR.

4. All pavement shall be saw cut with saws or approved power tools, excavated, and removed from the site for disposal as approved by the ENGINEER. The disposal site is the responsibility of the CONTRACTOR.

G. TRENCHING

1. Excavation shall be made to the widths and depths necessary for sheeting, bracing, pumping, draining and for all other WORK required. Any deviation from the trench dimensions shown on the Drawings must be approved by the ENGINEER.

2. Where bedding is specified, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not more than slightly disturbed.

3. Where pipe is to be laid directly on the trench bottom, the lower part of the trench shall not be excavated to grade by machinery, the last of the material being excavated manually in such a manner that will give a flat bottom true to grade so that pipe can be evenly supported on undisturbed material. Bell holes shall be made as required.

4. Excavated material shall be stockpiled in such a manner as to prevent nuisance condition. Surface drainage shall not be hindered.

Should conditions make it impracticable or unsafe to stock material adjacent to the trench, the material shall be hauled and stored at a location provided by the CONTRACTOR. When required, it shall be re-handled and used in backfilling the trench.

Such WORK, and reuse of excavated material, shall be considered a cost incidental to installation of pipe and compensation shall be included under the bid prices for pipe in the Proposal.

H. DRAINAGE

1. The CONTRACTOR shall at all times during construction provide and maintain proper equipment and facilities to remove promptly and dispose of properly all water entering excavations, and keep such excavations dry so as to obtain a satisfactory, undisturbed, subgrade foundation condition. The de-watering method used shall prevent disturbance of earth below grade and prevent saturation of otherwise suitable in situ material for backfilling.

2. All water pumped or drained from the WORK shall be disposed of in a suitable manner without undue interference with other WORK, without damage to surrounding property, and in accordance with pertinent rules and regulations.

3. No construction, including pipe laying, shall be allowed in water. No water shall be allowed to contact masonry or concrete within 24 hours after being placed. The CONTRACTOR shall constantly guard against damage due to water and flotation and shall take full responsibility for all damage resulting from his failure to do so.

I. BACKFILLING and COMPACTING

1. As soon as practicable after pipe has been positioned, jointed, tested, and approved by the ENGINEER for backfilling, backfilling shall begin and continue expeditiously. Should any of the WORK be backfilled prior to approval, it shall be uncovered for inspection at no cost to the OWNER.

2. From the bottom of the trench to mid-diameter of the pipe, bedding material shall be installed as specified and shown on the Contract Drawings, and shall be thoroughly compacted to 100% maximum density.

3. From mid-diameter to 1 foot above top of pipe, install cushion material as specified and shown on the Contract Drawings. Cushion material shall be placed in 12-inch layers and compacted to 95% maximum density.

4. In roadways, shoulders, sidewalks and other traveled areas, the in situ material shall be replaced and compacted in 6-inch lifts from 1 foot above the pipe to subgrade of the granular base material. In situ material shall conform to the specifications and be

compacted to 93% maximum density. When in situ material is unacceptable for backfill through negligence of the CONTRACTOR, common fill shall be supplied at no additional cost to the OWNER. Additional fill, where required, shall be considered a cost incidental to the installation of pipe, and compensation shall be included under the bid prices for pipe in the Proposal.

5. In lawn areas and other areas to be topsoiled and seeded, backfill shall consist of in situ material or common fill placed and compacted in 12-inch lifts from foot above the pipe to topsoil subgrade, and be compacted to 90% maximum density.

6. In areas designated, in writing by the ENGINEER, as cross-country, in situ material or common fill shall be backfilled in 24-inch lifts from 1 foot above the pipe and mounded 6-inches above the existing grade, or as directed. Backfill shall be compacted to 85% maximum density.

7. Backfilling shall be completed to original grades or as indicated on the Drawings. Settlement shall be corrected immediately.

8. All road surfaces shall be broomed and hose-cleaned immediately after backfilling. Dust control measures, as specified under Section 33 10 00, shall be employed at all times.

J. FIELD QUALITY CONTROL

1. Soil Compaction Tests:

   a. Specified compaction shall be verified by in-place density tests. Percent (%) compaction shall be maximum density as determined by Standard Proctor Density Test (ASTM D 698). The ENGINEER shall determine frequency of testing.

   b. Routine testing of the compacted fill and backfill for compliance with these Specifications shall be performed at the expense of the OWNER.

   c. Any extra testing required because of changes in materials requested by the CONTRACTOR or occasioned by the CONTRACTOR's failure to meet specification requirements shall be at the CONTRACTOR's expense.

   d. If the fill does not met the minimum density requirements, the fill shall be removed and/or recompacted to the required density. The cost of this additional WORK shall be borne by the CONTRACTOR.

K. DISPOSAL of MATERIALS

1. Excavated material shall be stacked without excessive surcharge on the trench bank or obstructing free access to hydrants and gate valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.

2. It is expressly understood that no excavated material shall be removed from the site of the WORK or disposed of by the CONTRACTOR except as directed by the ENGINEER. Surplus excavated material which in the opinion of the ENGINEER is suitable for use in backfilling or for replacing excavated rock and boulders shall be stockpiled at a satisfactory site to be obtained by the CONTRACTOR to be used as required. Satisfactory or unsatisfactory surplus material including paving, rock or boulders and other materials, as directed by the ENGINEER, shall be disposed of by the CONTRACTOR, first, in areas for the City within a three-mile haul designated by the ENGINEER, and second, in approved areas designated by the CONTRACTOR.

3. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided by the CONTRACTOR. When required, it shall be re-handled and used in backfilling the trench.

   Such WORK, and reuse of excavated material, shall be considered a cost incidental to the installation of pipe and compensation shall be included under the bid prices for pipe in the Proposal.

L. RESTORING TRENCH SURFACE

1. Where the trench occurs in streets, shoulders, sidewalks, and in other traveled ways, the CONTRACTOR shall thoroughly consolidate the backfill and shall maintain the surface as the WORK progresses. If settlement takes place, the CONTRACTOR shall immediately deposit additional fill to restore the level of the ground. In an adjacent to street and highways, the top layer of trench backfill shall consist of compacted gravel. Gravel shall be installed as specified, to the depth indicated on the plans, or as directed by the ENGINEER. Gravel shall be installed in 6-inch lifts and thoroughly compacted at 95% maximum density. Pavement shall be installed as indicated on the plans and specified in Section 32 14 00, Trench Patching.

2. The surface of any driveway or any other area which is disturbed by trench excavation and which are not a part of the paved highway shall be restored by the CONTRACTOR to a condition at least equal to that existing before WORK began.

3. In sections where pipe passes through grassed areas, the CONTRACTOR shall, at his own expense, remove and replace the soil, or shall loam and seed the surface to the satisfaction of the ENGINEER. The dept of loam replaced shall be at least equal to that removed by the CONTRACTOR in his trenching operations, but in no event

shall it be placed less than 5-inches in depth. Loaming and seeding shall be completed as specified in Section 32 90 00, Landscaping.

M. PROTECTION

Guard rails, curbing, mail boxes, signs, shrubs, trees and fencing in the vicinity of the CONTRACTOR's operations shall be adequately protected and, if necessary, removed and restored after backfilling. Any curbing, mail boxes, signs, shrubs, trees, fencing, or guard rails which were damaged during construction shall be replaced with material fully equal to that existing prior to construction at the CONTRACTOR's expense.

EARTHWORK

EROSION CONTROL

SECTION 31 25 00

A. GENERAL

This section covers specific erosion control measures required during the installation of storm drain discharges to protect the wetlands and passing streams. All other drainage and erosion control measures necessary during the construction of roadway, structures, sidewalks, or trench operations are covered in Section 33 40 00 Drainage.

Erosion control measures include the installation of silt fence, sand bags to channel flow in the stream during installation of the culvert end section, all dewatering pumping operations, filters and sedimentation basins to remove particles from water prior to discharge to the stream, haybales, and all other measures as may be required or directed by the ENGINEER.

B. CONSTRUCTION METHODS

Prior to any construction the CONTRACTOR shall have installed a silt fence to the limits shown on the plans unless otherwise directed by the ENGINEER. The silt fence shall include support stakes installed at intervals according to manufacturer's directions. The silt fence shall meet the minimum requirements of GTF 180 from Linq Industrial Fabrics, Inc. Additional hay bales shall be used to support the silt fence at very steep slopes as directed by the ENGINEER. Additional silt fence at other locations may be necessary if required by the ENGINEER, and at no additional cost to this item. The CONTRACTOR shall be responsible to maintain the silt fence in a sturdy, upright position throughout the project. It shall be repaired, supported and replaced if deemed necessary by the ENGINEER.

All water removed from excavations shall be disposed of in an approved manner so as not to create unsanitary conditions, nor to cause injury to persons or damage to the work in progress or to other property, and shall not be directed onto adjacent property. The CONTRACTOR shall build sedimentation basins and filters to remove sediments from the water prior to discharge back into the stream. Other measures, such as soil stabilization practices and protective layers of straw or hay mulch shall be employed as needed and/or directed by the ENGINEER, to prevent erosion and to prevent highly turbid water from being entering the stream.

C. MEASUREMENT and PAYMENT

Measurement for the erosion control measures described in this section shall be on a lump sum basis. The ENGINEER shall determine if the erosion control measures, such as installation and maintenance of the silt fence, sedimentation during any dewatering operation, and all other measures described above, has occurred satisfactorily. Payment shall include all labor, materials and equipment to install and maintain the silt fence, provide erosion control measures, and all other erosion protection measures as required by the ENGINEER. Payment will be on percent complete basis of the lump sum amount as determined by the ENGINEER.

EARTHWORK

SHEETING AND SHORING

SECTION 31 40 00

A. GENERAL

Where necessary to maintain trench walls or to safeguard personnel from construction, the CONTRACTOR shall provide sheeting and bracing. While the CONTRACTOR is responsible for the safety of trenches, the ENGINEER may order additional support for trench walls, to include sheeting, walling and bracing, whenever in his opinion safety of personnel, utilities or property requires it. Sheeting and bracing shall be removed when no longer required, except where complete removal would leave voids below the pipe, sheeting shall be cut off and left below the top of the pipe. Where feasible, an OSHA certified movable "box" shoring system and/or sloped trench walls shall be used to avoid sheeting.

B. MEASUREMENT and PAYMENT

No separate payment will be made for any sheeting and bracing, whether removed or left in place. Costs for sheeting and shoring shall be included in the unit costs for applicable bid items.

EXTERIOR IMPROVEMENTS – 32 00 00

ROADWAY CONSTRUCTION

SECTION 32 10 00

A. WORK INCLUDED

The Work under this Section consists of the installation, materials and compaction for roadway base courses and bituminous paving. This work also includes sawcutting bituminous pavements and application of emulsified asphalt for tack coat.

B. MATERIALS

1. The base courses shall consist of stones, rock fragments, and fine, hard, durable particles resulting from the natural disintegration of rock. At the CONTRACTOR's option, asphalt that is removed or milled on this project may be blended into the base courses provided that the material gradations listed below are met. All materials shall be free from injurious amounts of organic material and shall conform to Division 300, Section 304 of the Standard Specifications for Road and Bridge Construction, excluding asphalt stabilized bases when used, or other materials approved by the ENGINEER, as follows:

    a. Bank Run Gravel - 25% to 70% shall pass the No. 4 sieve and not more than 12% of the material passing the No. 4 sieve shall pass the No. 200 sieve. No stones shall have a dimension greater than 6".

    b. Crushed Gravel - All shall pass the 1-1/2" sieve but no more than 55% shall pass the No. 4 sieve. Also, not more than 15% of the No. 4 sieve shall pass the No. 200 sieve.

2. A hot bituminous pavement shall be placed and compacted over the gravel base course in two courses. It shall consist of a binder course and a finish wear course as specified by Division 400 of the Standard Specifications for Road and Bridge Construction.

    a. The bottom layer shall be a Type "B" - 3/4" aggregate binder course mix, 2-inches thick. (minimum).

    b. The top layer shall be Type "E " - 1/2" aggregate wearing course mix, 1-inch thick. (minimum)

C. BASE COURSE CONSTRUCTION

Roadway base course construction, excluding asphalt-stabilized bases, shall be as follows:

1. The CONTRACTOR shall insure that all trench excavation and backfill has been completed as required and as specified, before the roadway base construction has begun.

2. Base Course Cross-Section

   The compacted depths of the base course shall be as shown on the typical roadway cross-section detail of the Plans. The bank run gravel shall be wider than the pavement width and shall extend a minimum of 2 feet into each shoulder.

3. Installation

   a. Base course materials shall not be placed upon wet or frozen subgrade. The subgrade shall be to the specified crown and grade, and maintained in a smooth condition, free from holes and ruts.

   b. Blading, scarifying, and rolling shall be required to provide a smooth, even and uniformly compacted base course conforming to the required grade and cross section.

   c. The top 4" of the base course shall not contain stones over 3" in diameter.

4. Drainage

   At all times during construction, the subgrade and ditches shall be constructed and maintained so that the roadbed will be effectively drained to prevent erosion.

5. Compaction

   a. All base courses shall be compacted to 95% of the optimum density. Compaction shall proceed at a maximum of 6" layers. Water shall be uniformly applied over the base materials during compaction in the amount necessary for proper consolidation.

   b. Any portion of the base course material which is not accessible to means of proper compaction with rolling equipment, shall be compacted thoroughly by methods satisfactory to the ENGINEER.

   c. Sieve analyses of all base materials will be required, and compaction tests every one hundred feet will be required on base and subbase materials.

6. Side Slopes

   Grading for side slopes shall not exceed one-foot vertical rise per two feet horizontal length without a retaining structure or other special consideration.

7. Inspection and Acceptance

   a. Samples and gradation analyses of all materials used in the work will be required for approval and acceptance by the ENGINEER.

b. The CONTRACTOR shall provide at his expense compaction tests when required by the ENGINEER to determine the actual in-place densities being attained.

c. Base courses not meeting these specifications shall be removed, compacted, regraded, or otherwise made acceptable to the ENGINEER at the CONTRACTOR'S expense.

8. Dust Control

The CONTRACTOR shall apply water and/or calcium flakes for dust control everyday when no wet conditions exist and as often as necessary to prevent dust from becoming airborn as a result of the roadway construction or utility installation. At the direction of the ENGINEER, dust control measures shall be used, and at no additional cost to work being performed.

D. PAVING

1. General

a. Pavement thickness shall conform to the wear course and binder course thicknesses required by the plans. Paving shall also conform true to line, elevation, pitch and sections shown on the plans.

b. Pavement shall slope evenly between grades and contours as shown on the plans and to the nearest catch basin.

2. Dates

Paving shall be done within the dates of April 15 and November 15. In special instances, when the ENGINEER determines that it is in the best interest of the OWNER, he may waive this requirement.

3. Undesirable Conditions

The mixture shall not be placed on a wet or frozen base. Paving shall be placed only when the underlying surface is dry, when the atmospheric temperature in the shade is 40 degrees Fahrenheit, and when the weather is not foggy or rainy. However, the ENGINEER may permit, in the case of sudden rain, the placing of the mixture then in transit from the plant, if laid at proper temperature and if the roadbed is free from pools of water. Such permission shall in no way relax the requirements for quality of the pavement and smoothness of surface. No load shall be sent out so late in the day that spreading and compaction cannot be completed during daylight.

4. Placing

a. All courses shall be spread and finished to the required thickness by a mechanical, self-propelled spreading and finishing machine of an approved type. The paver shall be

capable of spreading the mixtures to a smooth, true to the required cross section, uniform in density and free from hollows, tears, gouges, corrugations, and other irregularities; and shall be capable of spreading the finishing courses to the required thicknesses and lane widths.

b. The material being placed next to a previously placed lane shall be tightly crowded against the face of the abutting lane. The finishing machine shall be positioned so that in spreading, the material will overlap the edge of the first lane by 1" to 2" and shall be left sufficiently high to match the first laid lane after compaction.

5. Compaction

a. The material shall be compacted with a minimum ten-ton tandem roller.

b. Any displacement occurring as a result of the reversing of the roller, or from other causes, shall be corrected at once by the use of lutes and addition of fresh mixture when required. Care shall be exercised in rolling so as not to displace the line and grade of the edges of the bituminous mixture.

c. Where the pavement contacts existing paved surfaces, the pavement shall be finished flush with the adjacent undisturbed pavement surfaces.

d. The finished surface shall be such that it will not vary more than 1/4" from a 10-foot straight edge applied to the surface paralleled to or at right angles to the centerline.

6. Inspection and Acceptance

a. The ENGINEER may use a testing lab for inspection services.

b. Any pavement with excessive pitting, irregular or uneven surfaces, as described above, or surfaces in which water stands shall be corrected at the CONTRACTOR'S expense.

7. Miscellaneous Bituminous Leveling

Miscellaneous bituminous paving, such as required when marrying driveways to street pavement shall be thoroughly tamped and compacted.

E. EMULSIFIED ASPHALT FOR TACK COAT

Tack coat shall be applied on all surfaces that have been cut or milled prior to the addition of bituminous concrete pavement. All cut or milled surfaces shall be broomed swept prior to application of the tack coat, and shall not be wet nor applied when weather conditions would prevent proper application and curing of the coat. The bituminous material shall conform to the requirements of AASHTO M 140 of M 208. It shall be applied according to the methods given in Section 410 of the New Hampshire Standard Specifications for Road and Bridge Construction.

F. CLEANUP

1. Any bituminous material splashed or sprayed onto exposed surfaces of curbs, sidewalks, or other masonry structures shall be removed by sand blasting at the CONTRACTOR'S expense.

2. On completion of the work, the area shall be cleaned up to the satisfaction of the ENGINEER, including removal of all spoil from the construction, clean up of materials and repair of planted areas. Restoration of the area to its original condition, as nearly as possible, shall be accomplished before departure from the site.

G. MEASUREMENT AND PAYMENT

1. Rough grading is incidental to the bid item for Site Work.

2. Bank run and crushed gravel shall be measured and paid for by the cubic yard installed as required by the plans. The price shall include trucking and leveling.

3. Fine grading shall be measured and paid for as stated in the Bid Schedule. This work shall include dust control measures as needed or requested by the ENGINEER to keep dust from becoming airborn up to the start of laying the bituminous concrete.

4. Pavement, both binder and wear courses, shall be measured and paid for by the ton installed.

5. No separate payment will be made for saw cutting bituminous pavement. Saw cutting bituminous pavement shall be considered incidental to other pay items.

6. No separate payment will be made for emulsified asphalt. Emulsified asphalt for areas such as butt joints and trench patch shall be considered incidental to the work.

EXTERIOR IMPROVEMENTS – 32 00 00

TRENCH PATCH
PATCHING OF EXISTING BITUMINOUS CONCRETE PAVEMENT

SECTION 32 14 00

A. WORK INCLUDED

The Work under this Section consists of saw cutting, treating and patching any and all utility trenches.

B. INTENT

It is the intent of this Section to set the guidelines for the cutting and patching of all utility trenches. **All trenches must be patched on each Friday unless prior approval is received from the ENGINEER.** When trenches are left unpaved, it will be the responsibility of the CONTRACTOR to control dust and settlement.

C. MATERIALS

1. **BANK RUN GRAVEL** - shall conform to Section 32 10 00, Paragraph B, of these Specifications (18-inches, minimum).

2. **CRUSHED GRAVEL** - shall conform to Section 32 10 00, Paragraph B, of these Specifications (4-inches, minimum).

3. **BINDER COURSE MIX** - shall be **Type "B"**, (3/4") aggregate course mix (3-inches, minimum).

4. **WEAR COURSE MIX** - shall be **Type "F"**, (3/8") aggregate course mix (1-inch, minimum).

5. Blotter material shall be natural sand composed of hard, durable particles, free from loam, showing uniform resistance to abrasion. Blotter material shall be sand so graded that 100 percent (100%) will pass a No. 4 sieve.

6. Bituminous materials for tack coats shall conform to the requirements specified in State of New Hampshire Standard Specifications, Section 702, Tables 3, 4 and 5.

D. COMPACTION

1. All fills and backfills shall be compacted sufficiently so that structures, paving, and other construction shall not settle and so that they shall not allow movement of earth and shall prevent subsequent settlement.

2. The OWNER will require compaction tests performed to determine the actual in-place densities being attained. Tests on the bank run and crushed gravel will be required **one (1) every one-hundred feet on the main line, and at each service trench.** All compaction testing shall be at the CONTRACTOR'S expense.

3. If any field tests fail to meet the required density then the CONTRACTOR shall remove all of the earthwork in that portion of the work involved and shall replace it to the required density at the CONTRACTOR's expense.

4. Compaction shall be to the following densities based upon maximum dry density of the optimum moisture content as established by Method D of AASHTO Standard T180 (ASTM D1557) (Modified Proctor) and verified by AASHTO Standard T147 (ASTM D1556):

Under structures	98%
Beside structures	95%
Top 2' under pavement	95%
Below 2' under pavement	95%
All other areas	90%

E. PROCEDURE

After the trench has been properly compacted and brought to grade and the edge of the existing hot top has been saw cut and cleaned to the satisfaction of the ENGINEER, the tack coat shall be applied on all edges of the trench. After completing the application of the tack coat a binder course mix shall be placed and compacted. Another application of the tack coat shall be applied to the edges before placement of additional courses. After the 1" wear course has been properly compacted, a final application of the tack coat, along the seams of the trench, shall be applied. Blotter sand should then be sprinkled over tack coat to prevent the tracking of bituminous material by vehicular traffic over the trench. The patch thickness shall be a minimum of 4 inches (4").

F. DESIRABLE CONDITIONS

1. The mixture shall not be placed on a wet or frozen base. Paving shall be placed only when the underlying surface is dry, when the atmospheric temperature in the shade is 40 degrees Fahrenheit, and when the weather is not foggy or rainy, provided, however, that the ENGINEER may permit, in the case of sudden rain, the placing of the mixture then in transit from the plant, if laid at proper temperature and if the road bed is free from pools of water. Such permission shall in no way relax the requirements for quality of the pavement and smoothness of surface. No load shall be sent out so late in the day that spreading and compaction cannot be completed during daylight.

2. All courses shall be spread and finished to the required thickness. The finished surface shall be smooth, true to the required cross section, uniform in density and free from hollows, tears, gouges, corrugations, and other irregularities.

3. The finished surface shall be such that it will not vary more than 1/4" from a 10 foot straight edge applied to the surface paralleled to or a right angles to the centerline.

4. Any pavement with excessive pitting, irregular or uneven surfaces, as described above, or surfaces in which water stands shall be corrected at the CONTRACTOR'S expense.

G. MEASUREMENT

Trench patch shall be measured by the linear foot installed. The width of the trench is the responsibility of the CONTRACTOR.

H. PAYMENT

1. Payment for trench patch shall be at the unit price per linear foot in place as stated in the BID SCHEDULE for Bituminous Concrete Trench Repair, and shall include all testing, saw cutting, compaction, installation of base materials, tack coats, and paving as required for proper trench patching.

2. In areas where the centerline of the pipe is from 0-3 feet off the original pavement, payment will be 1/2 the price for the pavement item. If the centerline of the pipe is greater than 3 feet off the pavement, no payment will be made for the pavement restoration.

3. Measurement for side trenches will be from the edge of the mainline trench patch to the edge of pavement along the sideline.

EXTERIOR IMPROVEMENTS – 32 00 00

LANDSCAPING

SECTION 32 90 00

A. GENERAL

1. Work under this Section includes the furnishing of all labor, equipment, appliances and materials; and in performing all operations in connection with furnishing and applying loam, seed, fertilizer, lime, mulch, wood chips; and with watering and maintaining grassed areas until their acceptance, in accordance with the specifications and the drawings as required for satisfactory completion. Also included is the installation of ornamental shrubs or trees as shown on the plans.

2. All disturbed areas in this contract (not being paved or noted otherwise) will be loamed and seeded.

3. Materials shall conform to the "Standard Specifications" as follows:
   a. Loam: Section 641.
   b. Grass seed: Section 644, Park Seed Type 15.
   c. Mulching Hay for Seeded Areas: Section 645.3.1.
   d. Wood chips: Chips shall be 1 to 2 inch size.

B. CONSTRUCTION METHODS

1. Handling, placing, preparing, finish grading and compacting of loam shall conform to Section 641 of the "New Hampshire Standard Specifications". Depth of loam shall be 6 inches in its final position. Any topsoil stockpiled on the site from earthwork operations shall be utilized, and all additional loam required shall be provided by the CONTRACTOR. Loam shall be placed under any wood chip mulch.

2. Preparation of seed bed and application of lime, fertilizer and seed shall conform to the "Standard Specifications", Section 644.3.4 and 3.3 respectively. The CONTRACTOR is responsible for reseeding areas that erode due to run-off once the original seeding has been done.

3. Mulching shall be done on all seeded slopes, and shall conform to the "Standard Specifications".

C. MEASUREMENT and PAYMENT

1. Loam shall be measured and paid as specified in the Bid Schedule, and shall include all grading and compaction work done in conjunction with placing the loam.

2. Hydroseeding shall be measured and paid as specified in the Bid Schedule, and includes all labor, equipment, and materials used for seeding.

WATER MAINS

SECTION 33 11 00

A. WORK INCLUDED

Work under this Section includes construction modifications to the water distribution system as required for roadway construction including the relocation of existing hydrants and curb stops, and any required piping or fittings, water service piping, disinfection, inspection and testing as herein specified, and as directed.

B. MATERIALS

1. Cement-lined DI Pipe - shall be cement-lined Class 52 push type joints with rubber O-rings not exceeding 20 feet (20') in section length.

2. Ductile iron tees, elbows and fittings - shall be mechanical, bolt-locking cement-lined DI Class 350. All tees for hydrants shall be “anchor tees”. All DI caps shall be restrained with grip rings or megalugs.

3. Gate Valves shall meet or exceed the requirements of AWWA C500.

    a. Gate valves 6-inch through 10-inch shall be either:

        a1. double disk type manufactured by Clow or Mueller

        a2. resilient seat type manufactured by Kennedy or American-Flow Control.

    b. Water valves 12-inch or greater shall be resilient wedge type manufactured by Clow, Mueller, Kennedy or American-Flow Control ONLY.

    c. All valves must open counterclockwise.

    d. All valves shall have stainless steel nuts and bolts on the bonnet.

    e. All hydrant gate valves and hydrants shall be restrained with grip rings.

4. Sand cushion 6" below, around and over pipe, to 12" above the top of the pipe shall be clean sand as specified in Section 31 23 33, Trenching, Backfilling and Compacting, Paragraph D.6, of these Specifications.

5. Tapping sleeve shall be stainless steel. All nuts, bolts and washers must also be stainless steel.

6. Concrete for thrust blocks and encasing shall be Class A concrete conforming to the requirements of Standard Specifications for Road and Bridge Construction of the

New Hampshire Department of Public Works and Highway, Section 520, as to materials and methods.

7. Polyethylene wrap shall be 8-mil. thick, either sheet or tube, installed tightly around pipe and fittings as per manufacturer's specifications.

8. a. Valve boxes shall be 6-foot (6') adjustable sliding cast iron road boxes.

   b. Cross-country mains shall have the valve boxes left one foot above finish grade.

9. Curb box shall be sliding Erie type with rod.

10. Corporation and curb stop shall be Hayes, Ford or McDonald manufacture.

11. Copper pipe shall be type K.

12. Mechanical joint adapters used to join gates to a fitting shall be a mechanical joint Foster adapter or approved equal

C. HANDLING PIPE

Pipe shall be handled in an approved manner, using slings or other approved devices. No pipe shall be dropped from trucks or into trenches. Each pipe unit shall be moved into position in the trench only in such a manner, and by such means, as the ENGINEER approves as satisfactory. No holes shall be allowed in the pipe for lifting or other purposes, except the connection of services.

D. LAYING PIPE

1. The pipe shall be laid to plan line and to grade such that a minimum of five feet (5') of cover is achieved. There shall be a bed of six inches (6") of clean sand under the pipe. The sand will surround the pipe to a depth of 12 inches (12") above the pipe. With approval of the ENGINEER, where five feet (5') of cover cannot be achieved, rigid insulation shall be installed over the pipe.

2. Pipe shall be laid in the dry and trench backfilled as stated in Section 31 23 33, Trenching, Backfilling and Compacting of these Specifications.

3. Concrete thrust blocks shall be installed at all DI fittings and other locations as directed by the ENGINEER and as per manufacturer's recommendations. Concrete must not cover bolts that would prevent removal of joint. Joints must be protected by felt roofing paper prior to placing concrete. Place concrete against undisturbed material, and do not cover joints, bolts or nuts or place concrete so as to interfere with the subsequent removal of any fitting. Provide wooden scale forms for thrust blocks. Thrust blocks shall be placed behind all hydrants installed. Restrained joint ductile iron fittings may be used in lieu of concrete thrust blocks. Approved

shop drawings by the Engineer is required prior to the use of restrained mechanical joint ductile iron fittings.

4. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of the DI pipe shall be beveled to conform to the manufactured spigot end. DI cement lining shall be undamaged.

5. Sequencing water main construction shall be such that the use of couplings be minimized.

6. All pipe ends will be plugged with concrete or by other approved method if abandoned. Existing water pipe will not be removed unless specifically shown on the plans or directed by the Engineer.

7. Water boxes shall be left flush with the pavement.

E. TAPS

1. Installations shall be made under pressure and the flow of water through the existing main shall be maintained at all times. The diameter of the tap shall be a minimum of 1/4 inch or less than the inside diameter of the branch line.

2. Service saddles shall be stainless steel double-strap and will be required on 2 inch or larger services on DI pipe.

F. INSPECTION and TESTING

1. All sections of the water main including taps must be inspected and approved by the ENGINEER.

2. Air release corporations shall be required at all high points to release trapped air before testing.

3. Flushing, testing, and chlorinating of the pipeline shall closely follow pipe laying work. As the pipeline is installed, it shall be tested approximately every 1,000 feet, or between line valves, whichever is less, as directed by the ENGINEER. Should the pipelines fail to be flushed, tested, and chlorinated as specified, the pipe laying work shall be suspended until the flushing, testing, and chlorinating is done.

4. The Somersworth Utility Division must be notified at 603-692-4266 prior to discharging into the City system.

5. Prior to filling the mains with water for flushing, hydrostatic testing, and chlorination, the CONTRACTOR shall have exercised preventive and corrective measures during construction to minimize contamination. It is intended that all

materials, equipment, and procedures utilized for disinfecting new or existing water mains and appurtenances shall be in full compliance with the latest revision of AWWA Standard C601. All chlorination shall be done in the presence of the ENGINEER. The method of chlorination shall be either the Continuous Feed Method or the Slug Method, as approved by the ENGINEER. The CONTRACTOR shall consult with the ENGINEER to identify acceptable locations(s) for discharging the heavily chlorinated water, which will result from the chlorination procedures. At least three (3) days prior to commencing chlorination, the CONTRACTOR shall submit to the ENGINEER a proposed comprehensive plan for flushing, hydrostatic testing, and disinfecting (chlorinating) the main(s) together with Manufacturer's Material Safety Data Sheets. The plan shall consist of a written narrative or summary, and appropriate sketches to completely describe the proposed procedures, hypochlorite materials, pumping and metering equipment, source(s) of water, and points(s) of discharge of initial flushing and chlorinated water. Flushing shall not commence until the ENGINEER has approved the proposed comprehensive plan. Final acceptance of the water main(s) shall be based on successful (negative) results to bacteriological tests, which shall be done on samples taken from the main(s) following chlorination and final flushing. Locations of samples shall be as directed by the ENGINEER.

6. All new water systems shall be thoroughly flushed and disinfected a maximum of every 1,000 feet before being placed in service.

7. Disinfection should only be performed by someone experienced in the use of chlorine or other disinfecting agents.

8. Chlorine and water solutions are fed into the main being disinfected to a concentration of at least 50mg/l available chlorine. To insure that the required concentration is maintained, chlorine residual samples must be obtained. This chlorinated water solution should remain in the pipe for at least 24 hours, at the end of which period the chlorine concentration should be at least 25mg/l. If this is achieved, final flushing can then be accomplished and chlorine residuals checked to determine that the heavily chlorinated water has been removed from the pipeline.

9. If sufficient manpower and equipment are not provided to prosecute this phase of the work, the ENGINEER together with the OWNER may engage an independent firm to perform the flushing, testing, and chlorinating work. The cost for this work will be deducted from payments due to the CONTRACTOR and HE shall not place any claims against the OWNER, ENGINEER, or said independent contractor for any leaks, damages to public or private property, production loss, profits, etc., incurred by this work

10. The CONTRACTOR, with the assistance of the Utility Division, shall fill mains as slowly as practicable so as not to cause dirty water and serious pressure drops within the existing system.

11. The CONTRACTOR shall vent air from the mains during the filling process and supply adequate manpower and make taps on the mains as directed.

12. After the mains have been flushed and then filled, the controlling gate valve shall be closed and the new main(s) kept isolated from the existing system.

13. Flushing: All new water mains, and existing water mains that have been drained and cut into for making connections, shall be thoroughly flushed prior to pressure or leakage testing or final chlorination. Each section of main shall be slowly filled with water. Flushing shall be accomplished by partially opening and closing valves, hydrants, and blow-offs, etc., several times, under expected line pressure with flow velocities of not less than 2.5 feet per second in the main(s). (See Table 1 below for the size and number of hydrant outlets or main taps to provide the required flow at 40 psi residual pressure).

TABLE 1

MINIMUM REQUIRED FLOW AND OPENINGS TO FLUSH PIPELINES
40 psi Residual Pressure in Water Mains

Pipe Diameter (in)	Flow required to produce 2.5 fps velocity in main (gpm)	Minimum size of taps on main (in)	Outlets Hydrant Number	Outlets Size (in)
6	220	1-3/8	1	2
8	390	1-7/8	1	2
10	610	2-5/16	1	2
12	880	2-13/16	1	2

14. If less than a 40-psi residual is available in the main, with the size tap shown in Table 1, then larger or more tap(s) or hydrant outlets will be required as directed by the ENGINEER. The length of time for flushing at or above the minimum allowable velocity shall be computed to allow a minimum of 3 times the total volume of water stored in the main(s) to be flushed to waste. Flushing shall be done in the presence of the ENGINEER.

15. Pressure testing: All new water mains or any valved sections thereof shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure that will exist at the point of testing or 150 psi whichever is greater.

16. Test pressure restrictions: Test pressures shall:
    a. be of at least a 2 hour duration.

b. be not less than 1-1/2 times the expected system working pressure or 150 psi at the highest point along the test section, whichever is greater.

c. not exceed pipe or thrust-restraint design pressures.

d. not vary by more than +/- 5 psi for the duration of the test.

e. not exceed 2 times the rated pressure of the valves or hydrants when the pressure boundary includes closed gate valves or hydrants.

Note: Valves shall not be operated in either direction at differential.

17. Air removal: Following flushing and before applying the specified test pressure, air shall be completely expelled from the pipes, valves, and hydrants. After all air has been expelled, the air blowoffs can be closed and the test pressure applied.

18. Pressure Test: Each valved section of pipe shall be slowly raised to the specified test pressure for two separate periods. The first period shall be for 15 minutes, after which the pressure in the main(s) shall be allowed to drop slowly back to system pressure. The pressure shall then be slowly raised again to the specified test pressure and maintained for 2 hours. The test pressure as defined above, shall be based on the elevation of the lowest point of the pipe or section under test and shall be corrected to the elevation of the test gauge, as directed by the ENGINEER. The test pressure shall be applied by means of a pump connected to the pipe, in a manner satisfactory to the ENGINEER and which will prevent any backflow into the existing system. Valves shall not be operated in either the closing or opening direction at differential pressure greater than the rated pressure.

19. Examination: Any exposed pipe, fittings, valves, hydrants, and joints shall be carefully examined during the test. Any damaged or defective pipe, fittings, hydrants, or valves discovered following or as a result of the pressure test shall be repaired or replaced with sound material. If faulty materials are removed and replaced, the pressure test(s) shall be repeated until satisfactory to the ENGINEER.

20. Leakage Test: The leakage test shall be conducted concurrently with the pressure test.

    a. Leakage shall be defined as the quantity of water that must be pumped into the new main or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the main(s) have been filled with water and all air has been expelled. Leakage shall be recorded to the nearest 1/10th of a gallon, by means of a calibrated test meter. If allowed by the ENGINEER, drawdown may be measured in a calibrated barrel. All records and charts shall become the property of the OWNER. The CONTRACTOR shall employ qualified personnel throughout the testing. Leakage shall not be measured by a drop in pressure over a period of time.

    b. Allowable Leakage: No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD(P^{0.5})}{133200}$$

Where, L = allowable gallons of leakage per hour
S = the length of pipe tested, in feet
D = the nominal pipe diameter in inches
P = the average test pressure during the test, in psi

This formula is based on the allowable leakage of 11.65 gallons per day per mile of pipe per inch, (nominal) of pipe diameter, at a pressure of 150 psi. Allowable leakage at various pressures for various pipe diameters is shown in Table 2 below.

If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.

b1. When testing against closed metal seated valves, an additional leakage shall be allowed per closed valve, of 0.0078 gallons per hour, per inch of nominal valve diameter.
b2. When hydrants are in the test section, the test shall be made against the closed hydrant(s).
b3. Zero leakage will be allowed on bridge crossings or jackings or borings.

TABLE 2

ALLOWABLE LEAKAGE PER 1000 FEET OF PIPELINE
NOMINAL PIPE DIAMETER - INCHES

Average Test Pressure	Pipe Sizes								
psi	6	8	10	12	16	20	24	30	36
450	0.95	1.27	1.59	1.91	2.55	3.18	3.82	4.78	5.73
400	0.90	1.20	1.50	1.80	2.40	3.00	3.60	4.50	5.41
350	0.84	1.12	1.40	1.69	2.25	2.81	3.37	4.21	5.06
300	0.78	1.04	1.30	1.56	2.08	2.60	3.12	3.90	4.68
275	0.75	1.00	1.24	1.49	1.99	2.49	2.99	3.73	4.48
250	0.71	0.95	1.19	1.42	1.90	2.37	2.85	3.56	4.27
225	0.68	0.90	1.13	1.35	1.80	2.25	2.70	3.38	4.05
200	0.64	0.85	1.06	1.28	1.70	2.12	2.55	3.19	3.82
175	0.59	0.80	0.99	1.19	1.59	1.98	2.38	2.98	3.58
150	0.55	0.74	0.92	1.10	1.47	1.84	2.21	2.76	3.31
125	0.50	0.67	0.84	1.01	1.34	1.68	2.01	2.52	3.02
100	0.45	0.60	0.75	0.90	1.20	1.50	1.80	2.25	2.70

c. Due to the nature of the work (ie, relocation of hydrants and curb stops), leakage testing shall consist of a visual inspection of the connections, with the water system at normal operating pressure, prior to back fill. The ENGINEER shall be present to observe all joints/connections at operating pressures, prior to backfill.

21. Acceptance: Acceptance shall be determined on the basis of allowable leakage. If any test of pipe discloses leakage greater than that specified above, the CONTRACTOR shall at HIS own expense, locate and make repairs as necessary until the leakage is within the specified allowance.

a. All visible leaks are to be repaired regardless of the amount of leakage.
b. All water mains shall be pressure and leakage tested in the presence of the ENGINEER in order to qualify for acceptance.

G. FINAL CLEAN-UP

On completion of the work, the area shall be cleaned up to the satisfaction of the ENGINEER, including removal of all spoil from the construction, clean-up of materials and temporary construction of structures, repair of pavement and planted areas, or anything else damaged in the construction. Restoration of the area to its original condition, as nearly as possible, shall be accomplished before departure from the site.

H. MAINTENANCE OF EXISTING UTILITIES

The CONTRACTOR will at all times be responsible for maintaining existing water, sewer and drain mains and services. When connecting from the new water main to the existing water system, the Contractor shall coordinate with the City of Somersworth Utility Division (603-692-4266) as to how to shut off the existing main to make the connection. A minimum advance notice of 48 hours is required. In the event that the utility system is damaged by the CONTRACTOR'S activities, the CONTRACTOR will immediately notify the Utility Division. It will be the responsibility of the CONTRACTOR to make repairs to the system under the supervision of the Somersworth Utility Division. The CONTRACTOR will be responsible for payment of any overtime by Utility Division personnel. It is also to be understood by the CONTRACTOR that he is not to use City water for any part(s) of the construction.

I. MEASUREMENT and PAYMENT

1. Water main will be measured and paid by the linear foot installed as measured by the ENGINEER. The cost will reflect all aspects of excavation, pipe laying, backfilling, testing and polywrap, except ledge excavation. The cost will also reflect all aspects of installing, removing and inspection of blow-off, injection, air release equipment and temporary connections.

   Full payment will not be made until all testing and subsequent repairs have been completed. For payment purposes, ten percent (10%) of the unit prices as stated in the BID SCHEDULE shall be withheld for testing.

2. All water fittings shall be measured as per each installed and paid as specified in the Bid Schedule. Installation, bedding, thrust block construction, restraining glands, and restraints shall be considered incidental to the work being performed.

3. Hydrants shall be measured and paid as specified in the Bid Schedule. Costs for installation; excavation, bedding, glands and thrust blocks and backfill shall be considered incidental to the hydrant installation.

4. Relocate existing hydrants shall be measured as per each hydrant relocated as stated in the BID SCHEDULE. All materials, equipment, labor, and accessories needed including 6-inch ductile iron piping, fittings, thrustblock, removal and relocation of existing hydrant, maintaining flows, bedding and backfill shall be considered incidental to the hydrant relocation.

5. Water service piping shall be measured and paid by the linear foot installed as stated in the BID SCHEDULE. Excavation, bedding, backfill, all fittings required to make the connection to existing piping and all necessary work and equipment needed for the installation shall be considered incidental to the work being performed.

6. Water valves shall be measured as per each installed and paid as specified in the Bid Schedule. Valves used in conjunction with tapping sleeves are paid in a different bid item. Installation of gate boxes and glands are to be considered incidental to this item.

SANITARY SEWER PIPING

SECTION 33 31 00

A. WORK INCLUDED

1. General. Attention shall be directed to Section 01 11 00, Summary of Work.

2. Included. Work under this section includes construction of:

   a. Ductile iron, polyvinyl chloride (PVC), reinforced concrete pipe (RCP), and high-density polyethylene (HDPE) pipe for gravity sewers;

   b. Ductile iron or polyvinyl chloride (PVC), service connections;

   c. Ductile iron pipe and fittings for force main; including wyes, tees; excavation (except rock); backfill and refill; furnishing, laying and jointing pipe; maintaining existing sewers and service connections; connecting existing sewers and services to new sewers; abandonment of existing sewers; cleanouts; chimneys; and inspection and testing; as shown on the plans, as herein specified, and as directed by the ENGINEER.

B. MATERIALS

1. Polyvinyl Chloride (PVC) Pipe

   a. PVC gravity sewer pipe with nominal diameters 4-15 inches shall be type SDR-35 pipe conforming to the requirements of ASTM Specification D-3034 or ASTM Specification F-789, current editions. PVC gravity sewer pipe with nominal diameters 18-27 inches shall conform to the requirements of ASTM Specification F-679, and shall also meet the requirements of Specification UNI-B-7, current edition, of the Uni-Bell Plastic Pipe Association. The minimum pipe stiffness at 5 percent deflection shall be 46 PSI for pipe with nominal diameters 15-27 inch when tested in accordance with ASTM Specification D 2412. Manufacturer's certificates of compliance shall be furnished for all pipe prior to installation and pipe shall be furnished as required for laboratory testing. Methods of shipping shall be acceptable to the ENGINEER and shall be such as to avoid injurious impact on the pipe. Damaged pipe shall be removed from the job. Pipe lengths shall be the longest available.

      a1. Gaskets shall be elastomeric, oil resistant gaskets, acceptable to the ENGINEER and conforming to ASTM D1869 and F477. Pipe materials and fittings shall be in conformance with Uni-Bell Plastic Pipe Association Specifications Uni-B-9. Pipe shall be series 46 Perma-loc by J-M Manufacturing, or equal.

a2. Service connection shall be factory made tees or wyes only. Field fabricated fittings will no be allowed.

a3. All manhole connections shall be factory made connectors only.

a4. Field cutting of pipe will not be allowed without the approval of the ENGINEER.

a5. Stone bedding shall be hand compacted in 6 inch lifts to the top of the pipe. Stone bedding shall conform to ASTM Designation C33, Gradation No. 67 (3/4" to No. 4). Sand Blanket shall extend 1 foot above the top of the pipe.

a6. The CONTRACTOR shall take special precautions when using sheeting, bracing or trench boxes to avoid extending below the springline of the pipe. If sheeting is used below the springline of the pipe and has to be pulled, stone bedding material shall be placed on each side of the pipe for a distance of at least two pipe diameters.

b. Joints shall be elastomeric, oil resistant gasket joints, acceptable to the ENGINEER. PVC resin compound shall conform to ASTM D1784 and elastomeric rings shall conform to ASTM D1869 and F477. Joints for PVC pipe and fittings with nominal diameter 18-27 inches shall meet the requirements of ASTM Specification D-3212, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric seals, and the requirements of Uni-Bell Plastic Pipe Association Specification UNI-B-1, Standard Specification for Thermoplastic Pipe Joints, Pressure and Non-Pressure Applications. Manufacturer's details and recommendations for installation shall be furnished for approval before delivery, and samples shall be furnished as required.

c. PVC gravity sewer tee branches, wyes and fittings shall be the same type and class as the pipe on which they are used and shall conform to the applicable ASTM Specifications. Install as per ASTM D 2321, Class I Bedding.

d. Bedding and cover over PVC pipe shall be as indicated on the drawings. Bedding shall be installed in accordance with the requirements of ASTM Specification D2321, Class I.

2. Force Main shall be SDR-26 PVC pipe conforming to the requirements of ASTM Specification D-3034 or ASTM Specification F-789, current editions.

3. Magnetic Locating Tape. Detectable tracer tape shall consist of a continuous aluminum foil core inseparably bonded on both sides with tough high-density cross-laminated plastic films, pigmented in orange, blue or other warning colors. Bond strength of the tracer tape must be such as to prevent pitting or degradation after 300 hours of continuous testing as per ASTM B-117.

a. Detectable tracer tape shall be the type that can be located by the inductive method and does not require electrical connection to be made to the tape itself.

b. The tape shall be compatible for use with the metal detectors which are currently in use in the City / Town.

c. The tape shall be six (6) inches in width and shall have the words "Buried Sewer Line Below" permanently and indelibly printed on it.

d. Prior to purchase of the tape and acceptance by the ENGINEER, a sample of the tape shall be furnished to the City / Town and field-tested by City / Town personnel. No tape is to be purchased until it has been approved by both the OWNER and the ENGINEER.

C. HANDLING PIPE

1. Storage of pipe shall be as approved so as not to create nuisance or expose the pipe to damage. Damaged pipe shall be removed from the job site immediately.

2. Pipe shall be handled in an approved manner, using slings or other approved devices. No pipe shall be dropped from trucks or into trenches.

D. LAYING PIPE

1. All new sewer pipe shall be either PVC, D.I., or RCP as specified herein unless otherwise indicated on the Contract Drawings. The use of other pipe material shall be in locations where existing lines are connected to the new line and replacement pipe is approved by the ENGINEER.

2. Pipe shall be laid accurately to line and grade and according to the "Standard Trench Section" as shown on the Contract Drawings except as noted below. Bedding in earth shall be a minimum of 6-inches, greater where noted, below the outside of the pipe barrel. Bedding in rock shall be a minimum of 6-inches or one-fourth (1/4) the outside diameter of the pipe (whichever is greater) below the outside of the pipe barrel. Bedding shall extend up to the spring line of the pipe. Material around and to a height of one foot above the top of the pipe shall be sand. Bedding and sand cushion shall be compacted by mechanical tamping.

3. Pipe shall be laid with the spigot ends pointing in the direction of flow.

4. Joints shall be made up in accordance with the approved factory recommendations.

5. Pipe shall be fully encased or cradled in Class A (3000 psi) concrete where indicated in the Contract Drawings or in other cases as ordered by the ENGINEER.

Concrete shall meet all requirements for Class A concrete as defined in the New Hampshire Department of Public Works and Highways Standard Specifications.

6. Completed pipelines shall be free from offsets or deviations from grade when examined with lights or mirrors. Visible leaks, broken pipes, etc., shall be repaired or replaced.

7. Pipe shall be laid in the dry and provisions shall be made for plugging with a watertight plug at night or when work is suspended. Sewers shall not be used to carry groundwater from the trench. The CONTRACTOR shall clean all soil deposits from sewers at the completion of the work.

E. SERVICE CONNECTIONS

1. A chimney, wye or tee, or a wye-tee, as directed by the ENGINEER, shall be provided for each new service, or anticipated future service. All materials and procedures shall conform to the chimney detail as included in the Contract Drawings.

2. All components of service connections shall be of the same type and class as the sewer pipe. Adaptors for connection to existing services shall be as approved by the ENGINEER.

3. A test tee with plug shall be provided and installed at the end of each service provided by the CONTRACTOR.

4. All service connections shall be constructed to the property line or, where the sewer crosses private property, to the limit of the permanent easement or to meet existing house connections as directed by the ENGINEER. The service connection shall be six (6) feet below existing grade at the property line or easement line unless otherwise directed by the ENGINEER, shall be located by three intersecting ties by the ENGINEER before being backfilled and shall be marked with a 4" PVC, extending from the connection invert to one inch below existing grade and with metal tape or a metal marker suitable for detection with a metal detector.

F. MAINTAINING EXISTING SEWERS AND SERVICE CONNECTIONS

1. All existing sewers and service lines, encountered during construction, shall be maintained at all times. Sewage disposal from all residences, businesses or other establishments, within or outside construction limits, serviced by Town facilities or individual systems, shall not be interrupted or inconvenienced at any time.

G. ABANDONMENT OF EXISTING SEWERS

1. Existing sewers shall be abandoned where shown on the plans. This will be accomplished by removing at least one length of the pipe at existing manholes. The

end of the sewers shall be capped with a watertight plug and then encased in concrete to protect the plug by resisting earth pressure. The plug dimensions shall be as approved by the ENGINEER. Care should be taken to preserve the integrity of the remainder of the abandoned sewer line when removing the first piece and the CONTRACTOR shall remove any additional pieces which are damaged before placing the end-cap. When a pipe length is removed at a manhole, and the manhole is not to be abandoned, the hole in the manhole from the discontinued pipe should be sealed with a watertight and structurally sound plug, and the manhole invert altered to accommodate the change.

2. Sewers shall not be abandoned until all connecting branch sewers and service lines are connected to the new replacement sewer.

H. INSPECTION AND TESTS

1. Before acceptance of the completed sewers, the pipes will be inspected by shining light between manholes, and any imperfections such as cracks, displaced joints, objectional variation from line or grade, or leaks shall be repaired to the satisfaction of the ENGINEER.

2. Sewers shall pass infiltration (or exfiltration) tests prior to acceptance. The maximum measured leakage shall be less than 100 gallons per day per inch of inside diameter per mile of pipe for any section tested.

3. Full payment for sewers will not be made until testing and any required repairs have been completed. Testing of sewer segments and manholes shall be completed as soon as is practical after installation. In no case shall the total amount of untested sewer line exceed 1000 feet.

4. When the groundwater level is at or above the crown of the pipe, the infiltration test may be used. The section being tested shall be isolated by watertight plugs, and a clay dam placed in the pipe at the downstream end. After conditions have stabilized, leakage shall be measured by collecting flow from a pipe through the clay dam, by measurement with a vee-notch weir, or other acceptable means.

5. Where groundwater is below the crown of the pipe, the exfiltration test or the low-pressure air test shall be used. Where the exfiltration test is used, the test section shall be isolated and filled with water to an elevation two feet above the crown of the pipe at the upstream manhole. The amount of water necessary to maintain this level in the sewer shall be measured.

6. Live sewers, those with existing services connected, shall be tested by means of low-pressure air in order to expedite the testing procedure. The CONTRACTOR may desire to make an air test prior to backfilling for his own purposes, but the "Line Acceptance" test shall be conducted after backfilling has been completed in

accordance with other portions of this specification. The low-pressure air test shall be performed as follows:

a. All ends of lateral stubs shall be suitably capped to withstand the internal test pressures. Caps shall be easily removable for future lateral connections or extensions. Connected sewer services (existing) shall be plugged at the test tee with pneumatic plugs.

b. After a manhole to manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs. The design of the pneumatic plugs shall be such that they will hold against the line test pressure without requiring external blocking or bracing. One of the plugs shall have three hose connections. Air for inflation of the triple connection pneumatic plug shall be supplied through a factory-equipped control panel. There shall be three hose connections from the control panel to the pneumatic plug. One hose shall be used for inflation of the plug. The second hose shall be used for continuously reading the air pressure in the sealed line. The third hose shall be used for introducing low pressure air into the sealed line.

c. There shall be a 3-1/2" or larger diameter, 0-30 psig gauge mounted on the control panel for reading of the internal pressure in the line being tested. Calibrations from the 0-10 psig range shall be in tenths of pounds and the 0-10 psig portion shall cover 90% of the complete dial range.

d. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 2 psig greater than the average back pressure of any ground water that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the third hose shall be quickly disconnected from the control panel.

e. The portion of line being tested shall be accepted if the portion under test does not lose air at a rate greater than 0.003 cfm per square foot of internal pipe surface when tested at an average pressure of 3.0 psig greater than any back pressure exerted by ground water that may be over the pipe at the time of the test.

f. The above requirement shall be accomplished by performing the test as follows:

   f1. The time required in minutes for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time shown for the given diameters in the following tables:

Pipe Diameter in Inches	Minutes
4	2.0
6	3.0
8	4.0
10	5.0
12	5.5
15	7.5
18	8.5
21	10.0
24	11.5
27	13.0
30	15.0

g. Immediately prior to the performance of the line acceptance test the ground water level shall be determined. The height in feet over the pipe shall be divided by 2.3 to establish the pounds of pressure that will be added to all readings. For example, if the height of water is 11-1/2 feet, then the added pressure will be 5 psig. This makes the 3.5 psig to be 8.5 psig, and the 2.5 psig to be 7.5 psig. The one (1) pound allowable drop and the timing remain the same.

h. If the installation fails to meet this requirement, the CONTRACTOR shall determine at his own expense the source of leakage. He shall repair or replace all defective materials and / or workmanship.

7. Tight, leak-proof sewers are of the essence of this contract. Testing shall be carried out as sewers are constructed, and plugs and other necessary materials shall be on hand at the start of the work. No more than 1,000 feet of sewer may be constructed at a time without testing in areas not previously sewered. Testing shall be conducted manhole to manhole in areas previously sewered where existing sewers are being abandoned.

8. All PVC and / or high density polyethylene gravity sewer pipe installed under this Contract shall be subject to a deflection test 30 to 60 days after installation of the pipe or after adequate compaction is assured.

9. The deflection test shall be performed by passing a mandrel (supplied or available from pipe supplier or manufacturer) through the pipeline on the basis of a "Go-No Go" condition. If the mandrel does not pass through the pipeline the entire section shall be excavated and relayed and after backfilling and adequate compaction is assured the pipeline shall be retested. The maximum allowable deflection measured diametrically shall be 5% for PVC and high-density polyethylene pipe.

I. MEASUREMENT AND PAYMENT (Refer to Division 1)

SANITARY UTILITY SEWERAGE STRUCTURES

SECTION 33 39 00

A. GENERAL

1. The work covered by this section includes the furnishing of all plant, labor, equipment, appliances and materials, and performing all operations in connection with the satisfactory resetting of manhole frames and grates, and all incidental work, complete, in strict accordance with the specifications and applicable drawings and standard details, and conditions of the contract.

2. The CONTRACTOR shall provide the ENGINEER with shop drawings of all pre-cast material, manhole covers, frames, grates, and a description of all methods of jointing he proposes to use on this portion of the contract.

3. All design, construction and installation of manholes for this project will be as indicated in the Contract Documents.

4. It is the intention of these specifications that the manhole, including all component parts, have adequate space, strength and leakproof qualities considered necessary for the intended service. Space requirements and configurations shall be as shown on the drawings. Manholes may be an assembly of precast sections with steel reinforcement, and approved jointing, or concrete cast monolithically in place with reinforcement. In any approved manhole, the completed structure shall be of such material and quality as to withstand loads of 8 tons (H20 loading) without failure and prevent leakage in excess of one gallon per day per vertical foot of manhole, continuously for the life of the structure. A period generally in excess of 25 years is to be understood in both cases. It is further intended that any pointing of joints shall be accomplished after leakage tests have been satisfactorily completed except as noted in Part 5 "Leakage Tests", of this Section.

B. DESCRIPTION

1. Manhole frame and rates shall be reconstructed at the locations, to the elevations, and in accordance with notes and details shown on the drawings as well as the standard details.

    a. Horizontal joints between sections of pre-cast concrete barrels shall be of a type approved by the ENGINEER, which type shall, in general, depend for water-tightness upon an elastomeric or mastic like sealant.

    b. Pipe to manhole joints shall be only as approved by the ENGINEER and, in general, will depend for water-tightness upon an approved flexible manhole sleeve as shown on the Contract Drawings.

C. MATERIALS

1. Materials shall be as follows:

   a. Manhole frame and cover shall conform to the requirements of the New Hampshire Department of Environmental Services and shall provide a 30" diameter clear opening. The cover shall have the word "SEWER" in 3" letters cast into the top surface, except that where manholes are indicated on the drawings as being storm drain manholes, the cover shall have the word "DRAIN" in 3" letters cast into the top surface.

      a1. The castings shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined at the foundry, before shipment to prevent rocking of covers in any orientation. Cover pick holes shall not be through holes when cover is seated.

      a2. All castings shall be thoroughly cleaned and subject to a careful hammer inspection.

      a3. Castings shall be at least Class 30 conforming to the ASTM Standard Specification for Gray Iron Castings, Designation A48.

      a4. Before being shipped from the foundry, castings shall be sandblasted and given two coats of coal-tarpitch varnish, applied in a satisfactory manner so as to make a smooth coating, tough, tenacious, and not brittle or with any tendency to scale off. Coatings damaged in transit or handling shall be repaired or replaced by the CONTRACTOR to the satisfaction of the ENGINEER.

      a5. Locking Covers. Manholes located in cross-country areas (i.e. not in street or paved areas) shall be provided with locking covers as indicated on the drawings. The covers shall include one standard lock ear and one tumbler-type lock. The locks shall be Type 2 as manufactured by E. L. LeBaron Foundry Company, Brockton, Massachusetts. Lifting and unlocking rods shall be provided for the locking manhole covers. A minimum of three (3) lifting and unlocking rods shall be provided.

      a6. Watertight manhole frames and covers shall be provided where indicated on the Contract Drawings. Watertight frames and covers shall be type LBW 328 as manufactured by E. L. LeBaron Foundry Company, Brockton, Massachusetts or approved equal.

b. Bricks - see Part 6 of this Section for brick and mortar.

c. Shallow Manholes. When the manhole depth is less than 6 feet and where it is indicated on the Contract Drawings, a reinforced concrete slab top shall be used in lieu of a cone section. The reinforced concrete slab top shall have an eccentric entrance opening and shall be capable of supporting H-20 loads. Refer to Shallow Manhole Detail on the Contract Drawings.

D. BRICK MASONRY

1. This section applies to brick masonry, for the shelf, invert and grade adjustment.

   a. Brick. The brick shall be sound, hard and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the ENGINEER. Brick shall comply with ASTM Standard Specifications for Sewer brick (made form clay or shale), Designation C32, for Grade SS, hard brick.

      Rejected brick shall be immediately removed from the work.

   b. Mortar. The mortar shall be composed of portland cement, hydrated lime, and sand, in the proportions of 1 part cement to 1/2 part lime to 4-1/2 parts sand, (by volume). The proportion of cement to lime may vary from 1:1/4 for hard brick, but in no case shall the volumes of sand exceed three times the sum of the volume of cement and lime.

   c. Cement shall be Type II portland cement conforming to ASTM C-150, Standard Specifications for Portland Cement.

   d. Hydrated lime shall be Type S conforming to the ASTM Standard Specification for Hydrated Lime for Masonry Purposes, Designation C207.

   e. Sand shall consist of inert natural sand conforming to the ASTM Standard Specifications for Concrete (Fine) Aggregates, Designation C33 as follows:

GRADING:

Sieve	Percent Passing
# 3/8	100
4	95 -100
8	80 -100
16	50 - 85
50	10 - 30
100	2- 10

Fineness Modulus 2.3 - 3.1

f. Laying Brick. Only clean bricks shall be used in brickwork for manholes. The brick shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.

Each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and shall be thoroughly bonded as directed.

g. Curing. Brick masonry shall be protected from too rapid drying by the use of burlaps kept moist, or by other approved means, and shall be protected from the weather and frost, all as required.

E. SETTING FRAMES AND COVERS

1. Manhole frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings. 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 minimum of 2 courses and a maximum of 6 courses of brick masonry shall be set between the manhole frame and top of concrete manhole wall. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and be sloped to shed water away from the frame.

    a. Manhole covers shall be left in place in the frames upon completion of other work at the manholes.

F. CONNECTING EXISTING SEWERS

1. The CONTRACTOR shall connect existing sewer lines to new sanitary sewer manholes where indicated on the Contract Drawings or as directed by the ENGINEER. The CONTRACTOR shall excavate, remove and replace all existing pipe that is damaged. The existing pipe shall be removed back to solid pipe which is undamaged and free of defects in the opinion of the ENGINEER. The existing pipe shall be disconnected at a joint or sawn to give a smooth end to permit a clean butt joint with connector. The new pipe shall be the same size as the existing pipe. The new pipe shall be connected to the existing pipe with watertight split-ring or other approved repair couplings. Connections for each type of pipe shall be submitted to the ENGINEER for approval prior to the start of work.

DRAINAGE

SECTION 33 40 00

GENERAL

The CONTRACTOR shall perform all pumping, dewatering and draining and provide well points or other means necessary to keep the excavations dry, protect persons and property, and permit proper excavation of the work. The CONTRACTOR shall remove immediately any surface or seepage water or water from sewers, drains, creeks, or other sources, which may accumulate during the excavation and construction work. Care shall be taken to prevent soil from entering completed pipes or existing drainage systems. The CONTRACTOR shall have available at all times sufficient equipment in proper working order for doing the work herein required. All water removed from excavations shall be disposed of in an approved manner so as not to create unsanitary conditions, nor to cause injury to persons or damage to the work in progress or to other property, and shall not be conducted onto adjacent property. The CONTRACTOR shall control the grading around the structures so that the ground shall be pitched in order to prevent damage to other structures or work. Water shall not be conducted onto adjacent property. Excavation shall be performed in a manner and sequence that will provide drainage at all times. The CONTRACTOR shall build sediment traps, construct stream by-passes, apply vegetative soil stabilization practices, spread protective layers of straw or hay mulch, terrace or scarify slopes, provide gravel inlet filters for storm drains and ditches, and/or employ other means, as directed by the ENGINEER, to prevent erosion and to prevent highly turbid water from being discharged to streams and lakes.

No additional payment will be allowed for any drainage control work with the exception of payment for erosion control measures described in Section 31 25 00 Erosion Control. Unless the erosion control measure to be used is specifically described in Section 31 25 00, the CONTRACTOR shall factor the costs of anticipated drainage control measures into the cost for the bid item being constructed.

DRAINAGE – 33 40 00

STORM DRAINS

SECTION 33 42 00

A. WORK INCLUDED

Work under this Section includes construction of HDPE Corrugated Plastic, PVC and RCP Storm Drains, excavation (except rock), backfill, refill, furnishing, laying and jointing pipe, testing and inspection, as shown on the plans, as herein specified, and as directed.

This section also includes the abandonment of existing drain lines, and the installation and connection of house drainpipe to the proposed drain line.

B. MATERIALS

1. PVC Pipe - shall be SDR 35 type pipe. Oil resistant rubber rings shall be used to seal the joints of the pipe. Manufacturer's details and recommendations for installation shall be furnished.

2. HDPE Pipe – Corrugated High Density Polyethylene (HDPE) shall conform to the requirements of AASHTO M 294, type S. The HDPE shall be double walled with a smooth interior wall. All fittings and joints shall be silt tight type joints.

3. Reinforced concrete pipe shall be CLASS III minimum. Jointing shall be with rubber O-rings or mortar as approved by the ENGINEER.

4. DI Pipe - shall be class 52, push type joints with rubber O rings.

5. Underdrains shall be 6-inch diameter, high-density polyethylene pipe (HDPE), with 2 holes facing down in the bottom half of the pipe. Underdrain cleanout or flushing basin shall be HDPE pipe of dimensions shown in the standard details. A cast cover shall attach firmly to the top of the cleanout such that no loose mater will enter it while the cover is on.

6. Prior to shipping any type of pipe, the methods of shipping shall be acceptable to the ENGINEER and shall be such as to avoid injurious impact on the pipe. Damaged pipe shall be removed from the job. Pipe lengths shall be the longest available.

7. Sand cushion and bedding material around and over the pipe to 12 inches above the pipe shall be clean sand as specified in Section 31 23 33, Trenching, Backfilling and Compacting, of these Specifications.

C. HANDLING PIPE

Pipe shall be handled in an approved manner, using slings or other approved devices. No pipe shall be dropped from trucks or into trenches. Each pipe unit shall be moved into its position in the trench only in such manner, and by such means, as the ENGINEER approves as satisfactory. No holes shall be allowed in the pipe for lifting or other purposes, except for the connection of foundation drains.

D. LAYING PIPE

1. Pipe shall be laid accurately to line and grade by use of a laser.

2. Bedding in earth shall be a minimum of 6 inches below the outside of the pipe barrel. Bedding in rock shall be a minimum of 6 inches or one-fourth (1/4) the outside diameter of the pipe (whichever is greater) below the outside of the pipe barrel. Bedding shall extend up to the spring line. Materials around and to a height of one foot above the pipe shall be sand backfill. Bedding and sand cushion shall be compacted by mechanical tamping.

3. Pipe shall be laid with the spigot ends pointing in the direction of flow. Completed pipelines shall be free from offsets or deviations from grade when examined with lights or mirrors. Visible leaks, broken pipes, etc. shall be repaired.

4. Pipe shall be laid in the dry and provision shall be made for a filtering agent at the head of the last laid pipe length at night or when work is suspended. The purpose of the filtering agent is to prevent soil deposits and debris from entering the storm drain. The agent shall constitute hay bales or the like as approved by the ENGINEER. If water is in the trench when work is resumed, the filtering agent shall not be removed until all danger of earth or other materials entering the pipe has passed. The CONTRACTOR shall clean all soil deposits from storm drains at the completion of the work.

E. INSPECTIONS and TESTS

The pipeline shall be made as watertight as practicable. Should the sections under test fail to meet the requirements, the CONTRACTOR shall do all work of locating and repairing leaks and retesting as the ENGINEER may require without additional compensation. Before acceptance of the completed storm drains, the pipes will be inspected by shining light between catch basins, or storm manholes, and any imperfections such as cracks, displaced joints, objectionable variations from line or grade, or leaks shall be repaired to the satisfaction of the ENGINEER.

The following tests shall not be performed until a minimum of 30-days have passed after installation:

1. Alignment Tests

   a. Perform tests for the correctness of horizontal and vertical alignment on each and every length of storm drain pipeline between catchbasins or drainage manholes.

   b. Beam a source of light acceptable to the ENGINEER, through the pipeline and directly observe the light in the catch basin or drainage manhole at the opposite end of each test section.

2. Deflection Tests:

   a. Deflection test all PVC and HDPE pipe. Deflection not to exceed five percent (5%) in the first 90 days after installation.

   b. Perform test by using a deflectometer or a properly sized "go-no-go" mandrel. For HDPE pipe, the mandrel diameter shall be the specified pipe diameter minus the inside diameter tolerance (1.5% x specified pipe diameter or a maximum tolerance of 0.5") minus the allowable deflection (5% x Specified Pipe Diameter).

   c. Maximum deflection: five percent (5%).

F. FINAL CLEAN-UP

On completion of the work the area shall be cleaned up to the satisfaction of the ENGINEER, including removal of all spoil from the construction, cleanup of materials and temporary construction of structures, repair of pavement and planted areas, as a result of the construction. Restoration of the area to its original condition, as nearly as possible, shall be accomplished before departure from the site.

G. UNDERDRAIN

1. The Work covered by this Section includes the furnishing of all plant, labor, equipment, appliances, and materials, and performing all operations in connection with the satisfactory installation of underdrain and underdrain cleanouts.

2. The CONTRACTOR shall provide the ENGINEER with shop drawings of all underdrain pipe and cleanouts.

3. Underdrains shall be constructed at the locations, to the elevations, and in accordance with notes and details shown on the plans and standard details. Underdrain cleanouts, or flushing basins, shall be constructed as shown in the standard details of the plans.

4. Underdrain pipe shall be surrounded by 6-inches of clean crushed stone on all sides. The stone shall be surrounded by a filter fabric, Ling 140 EX or equal. The filter fabric shall overlap a minimum of 12-inches. Underdrain cleanouts or flushing basins shall be erected vertically with the grate covering brought up to grade. Crushed stone and filter fabric shall be brought up to and around the base of the cleanout.

H. ABANDONMENT OF EXISTING DRAIN LINE

Any existing drain line shall be filled with a concrete slurry or sand to capacity so as to insure that the possibility of future pipe collapse is minimized for any pipe with diameter 12-inches or greater and of depth 6-feet or shallower. Otherwise, drain lines shall be abandoned by plugging the end of the pipe at the manholes with concrete grout. Any drainpipe that is removed from a trench during installation of the new drain line is incidental to the installation of the new drain line. Any existing pipe within 5 feet of the center of the trench line for the new utility main shall be removed from the trench at no additional cost.

If flowable fill is used, it shall be low-density concrete from a ready-mix supplier. It shall be a lightweight concrete with an ovendry unit weight of 50 pcf or less, and compressive strength between 100 to 1,000 psi. The CONTRACTOR shall have the flowable fill pumped into pipes to be abandoned to ensure that the pipe is completely filled with the product.

I. MEASUREMENT and PAYMENT

1. Storm drains will be measured and paid as specified in the BID SCHEDULE. Measurement will be by the linear foot as the horizontal projection of the distance between structures, from inside face to inside face of structure walls, or inside face of structure to end of connection. Plugs and stubs cast into storm drain structures will be considered as incidental work and will not be measured for separate payment. Each price and payment shall constitute full compensation for excavation, bedding, backfill and refill and for furnishing and constructing, including all sheeting, shoring, walling, bracing, and pumping, and for all labor, materials, equipment and incidental work necessary to the satisfactory completion of these items.

2. Bedding material and trench excavation, backfill and refill including disposal of excavated material unsuitable for backfilling and furnishing and placing refill, and furnishing and placing refill around and over pipes, will not be measured for

separate payment, but all costs in connection therewith shall be included in the unit prices bid for storm drains. All costs in connection with selection of furnishing, placing and compacting the sand cushion around and over the storm drainpipes shall be included in the unit prices bid for storm drains.

3. Concrete flared ends shall be measured and paid as specified in the BID SCHEDULE and shall include all work including grading for the complete installation of the flared end.

4. Rip Rap shall be measured and paid as specified in the Bid Schedule and shall include all work including grading for the complete installation of the stone per plan.

5. Connection of drainpipe to existing DMHs shall be considered incidental to the work.

AGREEMENT FORM – 00 52 13

THIS AGREEMENT, made this _____ day of _____**,2008**__, by

and between **THE CITY OF SOMERSWORTH**, herein called "Owner", acting herein through its **CITY MANAGER**

and _____
Strike Out (a corporation)
Inapplicable

doing business as (Terms)_____

OF _____County of _____and

State of _____, hereinafter called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the **OWNER**, the **CONTRACTOR** hereby agrees with the **OWNER** to commence and complete the construction described as follows:

CONSTRUCTION OF COMMERCIAL DRIVE

hereinafter called the project, for the unit prices plus the lump sum price as set forth in the Proposal and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his/her (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendency, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, Supplemental General Conditions, Water and Sewer Specifications, the plans, which include all maps, plates, blue prints, and other drawings and printed or written explanatory matter thereof, the specifications and contract documents therefore as prepared by Chris Jacobs, City Engineer, herein entitled the Engineer, and is enumerated in Paragraph 1 of the Supplemental General Conditions, all of which are made a part hereof and collectively evidence and constitute the contract.

The Contractor hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner, to meet the requirements of the project by the **Final Contract Completion Date of _____.**

The **OWNER** and **CONTRACTOR** recognize that time is of the essence. They also, recognize the delays, expense and difficulties involved in a legal or arbitration proceeding the actual loss suffered by the Owner if the work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner Two Hundred dollars ($200.00) for each day that expires after the time of completion until work is substantially complete.

The **OWNER** agrees to pay the **CONTRACTOR** in current funds for the performance of the contract, subject to additions and deductions, as provided in the General Conditions of the Contract, and to make payments on account thereof as provided in Paragraph 25, "Payments to Contractor", of the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in Four (4) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

(Seal)
ATTEST: **City of Somersworth**
(Owner)

_____ By_____
(City Clerk) (name).

_____ **CITY MANAGER**
(Title)

(Seal)

_____ _____
(Contractor)

_____ By_____
(Secretary)

_____ By _____
(Witness) (Title)

_____

(Address and Zip Code)

NOTE: City Clerk for the Owner should attest. If Contractor is a corporation, Secretary should attest.

PERFORMANCE BOND – 00 61 13.13

KNOW ALL MEN BY THESE PRESENTS: That we _____
(Contractor)
a _____ hereinafter called "Principal" and
(Corporation, Partnership, or Individual)

_____ of

_____,
(Surety)

State of _____ hereinafter called the "Surety",

are held and firmly bound unto the **CITY OF SOMERSWORTH**, **NH**
(City) (State)

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 OBLIGATION is such that Whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20___, a copy of which is hereto attached and made a part hereof for the construction of:

COMMERCIAL DRIVE

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 extension thereof which may be granted by the Owner, with or without notice to the Surety, and if s/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, 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 change, 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 ways affect its obligations on this bond, and it does hereby waive notice of any such change extension 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 four (4) counterparts, each one of which shall be deemed an original, this, the _____ day of _____, 20____.

ATTEST:

_____
Principal

_____
(Principal) Secretary

(SEAL)

By_____(S)

_____
Address-Zip Code

_____
Witness as to Principal

_____
(Address-Zip Code)

_____
Surety

ATTEST:

By_____
Attorney-in-Fact

_____
(Surety) Secretary

(SEAL)

_____ _____
Witness as to Surety (Address-Zip Code)

_____
(Address-Zip Code)

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

PAYMENT BOND – 00 61 13.16

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

_____a_____
Contractor) (Corporation, Partnership, or

_____hereinafter called "Principal" and
Individual)

_____of _____,
(Surety)

State of _____hereinafter called the "Surety",

are held and firmly bound unto **CITY OF SOMERSWORTH**, **NH**
(City) (State)

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 OBLIGATION is such that Whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 2008, a copy of which is hereto attached and made a part hereof for the construction of:

COMMERCIAL DRIVE

NOW, THEREFORE, if the Principal 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 change, 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 ways affect its obligations on this bond, and it does hereby waive notice of any such change extension 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 four (4) counterparts, each one of which shall be deemed an original, this, the _____ day of _____, 2008.

ATTEST:

_____
Principal

_____
(Principal) Secretary

(SEAL)

By_____(S)

_____
Address-Zip Code

_____
Witness as to Principal

_____
(Address-Zip Code)

_____
Surety

ATTEST:

By_____
Attorney-in-Fact

_____
(Surety) Secretary

(SEAL)

_____ _____
Witness as to Surety (Address-Zip Code)

_____
(Address-Zip Code)

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

NOTICE OF AWARD – 00 51 00

To: _____

_____

_____

PROJECT Description: **The CONSTRUCTION OF COMMERCIAL DRIVE.**

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for
Bids dated_____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount $_____

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you. If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.
Dated this _____th day of _____, 2008

City of Somersworth
Owner

By_____
(NAME)

Title _____**City Manager**_____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by_____

this the _____day of _____, 2008.

By_____

City Clerk:_____

NOTICE TO PROCEED – 00 55 00

To: _____

_____

_____

_____

Date: _____

Project: **The CONSTRUCTION OF COMMERCIAL DRIVE.**

You are hereby notified to commence WORK in accordance with the Agreement dated

_____, on or before _____,

and you are to complete the WORK by the Contract Completion Date of_____.

City of Somersworth
Owner

By_____
(NAME).
Title **City Manager**

ACCEPTANCE OF NOTICE

Receipt of the above **NOTICE TO PROCEED** is hereby

acknowledged by_____

this the _____ day of _____,2008.

By_____

City Clerk_____

CHANGE ORDER – 00 63 13

Order No.:
Date: , 2008

Agreement Date: , 2008

NAME OF PROJECT: **The CONSTRUCTION OF COMMERCIAL DRIVE**

OWNER: **City of Somersworth**

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification:

Change to CONTRACT PRICE:

Original CONTRACT PRICE:

Current CONTRACT PRICE adjusted by previous
CHANGE ORDER:

The CONTRACT PRICE due to this CHANGE ORDER will be

(increased/decreased) by:

The new CONTRACT PRICE including this CHANGE ORDER will be:

Change to CONTRACT TIME:
The CONTRACT TIME will not be changed by this Change Order.
The date for completion of all work will be .

Requested by:_____

Recommended by:_____

Accepted by: _____
City Manager

Certificate of Acknowledgment – 00 74 01

For CONTRACT BONDS

State of _____)
) ss.
County of _____)

On this _____ day of _____, 2008, before me personally came _____to me known, who being by me duly sworn, did depose and say as follows:

That s/he resides at _____

and is the _____

of _____

the corporation described in and which executed the foregoing instrument, that s/he knows the corporate seal of said corporation; that the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation; and that by the like order s/he signed thereto his/her name and official designation.

_____
Notary Public (Seal)

My commission expires_____