

CONTRACT DOCUMENTS

THE CONSTRUCTION OF WATERMAINS
ALONG NORTH PELHAM STREET
IN THE TOWN OF PELHAM, ONTARIO

E.O. 73310

August, 1973

THE PROCTOR & REDFERN GROUP
Consulting Engineers and Planners

75 Eglinton Avenue East
Toronto, Ontario, M4P 1H3

39 Queen Street
St. Catharines, Ontario, L2R 5G6

**THE CONSTRUCTION OF WATERMAINS
ALONG NORTH PELHAM STREET
IN THE TOWN OF PELHAM, ONTARIO**

Project E.O. 73310

August 1973

LIST OF CONTRACT DOCUMENTS

The following shall form the Contract Documents.

	<u>Pages</u>
Bidder's Numbered _____ to _____	1 Page
List of Contract Documents	1 Page
Tendering Information	2 Pages
Form of Tender	1 Page
Agreement	1 Page
Tenderer's Experience in Similar Work (CD-4)	1 Page
Tenderer's Senior Staff (CD-5)	1 Page
Tenderer's Plant (CD-6)	1 Page
Supplementary Conditions	3 Pages
General Conditions of the Contract (CD-1)	2 Pages
Project Specifications	
Section 1A - General	3 Pages
Section 2A - Watermains	5 Pages

DRAWINGS

B-73310-01 North Pelham Street

Town of Pelham Standard Drawings

W-2	Standard Bidding and Installation of Watermains
W-3	Standard Water Service Connection
W-4	Concrete and Brick Manholes
W-5	Standard Hydrant Assembly
	Water Support for Valves

TENDERING INFORMATION

PART 1 DELIVERY AND OPENING OF TENDERS

- A. Sealed tenders, marked with the name of the project, will be received by:

Mr. L.C. Hunt,
Clerk-Treasurer
Town of Pelham
P.O. Box 400
Fonthill, Ontario
L0S 1E0

Up to Noon, Local Time - AUGUST 29th, 1973

- B. The Tenders will be opened publicly as soon after closing time as possible.
- C. Tenders shall be made on the Form of Tender which shall not be detached from the other documents.

PART 2 DISCREPANCIES

- A. If a tenderer finds discrepancies in, or omissions from the contract documents, or if he is in doubt as to their meaning, he shall notify the Engineer, who may issue a written addendum. Neither the Owner nor the Engineer will make oral interpretations of the meaning of the contract documents.
- B. Addenda issued during the Tendering period shall be allowed for by the tenderer.

PART 3 EXAMINATION OF SITE

- A. The Tenderer shall visit the site of the work before submitting his tender and shall, by personal examination, satisfy himself as to the local conditions that may be encountered during construction of the work. He shall make his own estimate of the facilities and difficulties that may be encountered and the nature of the subsurface materials and conditions.
- B. He shall not claim at any time after submission of his tender that there was any misunderstanding of the terms and conditions of the contract relating to site conditions.

PART 4 PROVINCIAL SALES TAX

- A. All prices shall exclude Provincial Sales Tax on all building materials

PART 4 - PROVINCIAL SALES TAX (cont'd)

to be incorporated into the work, except for ready-mix concrete, asphaltic concrete, all machinery and such items as furniture, office equipment and window blinds.

Except as noted above, the Contractor will be required to obtain a special permit from the Retail Sales Tax Branch and may purchase materials exempt from Provincial Sales Tax by supplying with his orders, a purchase exemption certificate. This procedure shall comply with Ruling 21 of the Retail Sales Tax Branch.

The Contractor may be required to submit to the Owner, statements certifying quantities and strengths of ready-mix and asphaltic concretes, so that the Owner may apply for refund of taxes.

PART 5 FEDERAL SALES TAX

- A. All prices shall include Federal Sales Tax on taxable items. No refunds will be obtainable for materials supplied under this contract.

PART 6 PROOF OF ABILITY

- A. The Tenderer shall be competent and capable of performing the various items of work. The Tenderer shall complete the following statement sheets, which shall form a part of the Contract Documents:

Tenderer's Experience

Tenderer's Senior Staff

Machinery and Plant to be used.

The Tenderer may be required to furnish additional statements covering other matters, including financial resources.

PART 7 TENDER DEPOSIT

- A. The tender shall be accompanied by a certified cheque payable to the Owner in the amount of \$500.00

Cheques of unsuccessful tenderers will be returned not later than two weeks following the contract award.

PART 7 - TENDER DEPOSIT (cont'd)

The tender deposit of the successful tenderer will be returned with the first Progress Certificate.

- B. The Tenderer shall keep his tender open for acceptance for sixty (60) days after the closing date. Withdrawal during this period will result in enforcement of the tender deposit.

Upon being notified that his tender has been accepted, the Contractor shall execute copies of the Agreement, supply bonds and insurance documents as specified, and start work as specified.

PART 8 ACCEPTANCE OF TENDERS

- A. The lowest or any tender need not necessarily be accepted by the Owner.

PART 9 EQUIVALENTS

- A. When an article is specified by its trade or other name (whether such name is followed by the phrase 'or approved equal' or not), the Tenderer shall base his tender price on the supply of the named article and no other.

After award of the contract, the Contractor may submit requests to the Engineer for substitution of equivalent material. Such submissions shall be accompanied by complete information on the material proposed for use, together with revisions of cost that would result.

The Contractor shall submit requests for substitution within three (3) weeks of the award of the Contract.

FORM OF TENDER

PART 1 - TENDER PRICE

1. Offer by: NAME - M.J. STORM LIMITED

ADDRESS - P.O. Box 251, Fort Erie

DATE - August 28th, 1973

Resubmission: August 30th, 1973 (AC Watermain)

2. TO THE CORPORATION OF THE TOWN OF PELHAM

A. We, the undersigned, having examined the site of the work, having carefully investigated the conditions pertaining to the work and having secured all the information necessary to enable us to submit a bona fide tender, and having inspected all the Contract Documents, hereby agree to enter into a contract and to perform all the work in a good and workmanlike manner in accordance with the Contract Documents to the satisfaction of the Engineer for the total tender price of TEN THOUSAND, TWO HUNDRED AND SIXTY-TWO - - - - -

- - - - - 49/00 Dollars (\$ 10,262.49)

PART 2 - CONTINGENCIES AND ALLOWANCES

A. We agree that the tender price includes the contingency sum of \$1,000. and that no part of this sum shall be expended without the written direction of the Engineer, and any part not so expended shall be deducted from the tender price.

PART 3 - QUANTITIES

A. The tender price is compiled from the Schedule of Tender Prices included hereinafter. The quantities in the Schedule being approximate, we agree that the final valuation will be made on the basis of actual quantities measured during and on completion of the work at the prices in the Schedule.

PART 4 - ADDITIONS AND DEDUCTIONS

A. We agree that the valuation of additions to, and deductions from the Contract shall be made as follows:

PART 4 - ADDITIONS (cont'd)

1. The prices in the Schedule of Tender Prices shall apply where appropriate.
2. If the prices in the Schedule of Tender Prices are not appropriate, the prices in the Table of Prices shall apply where appropriate.
3. If the prices in Subsections 1 and 2 are not appropriate, valuation will be made by one of the following methods:
 - (A) The Engineer may ask the Contractor for a quotation for the proposed work.
 - (B) If the quotation referred to in (A) above is not accepted by the Engineer, the actual cost of the work will be determined as the total of only the following:
 - (1) Actual cost of labour, including such items as Workmen's Compensation and Unemployment Insurance.
 - (2) Actual cost of materials to be incorporated into the work, including such items as freight and taxes.
 - (3) For work done by the Contractor, an amount equal to 15 percent of the totals from Subsections (1) and (2) above, which shall constitute overhead and profit of the Contractor.
 - (4) For work done by Sub-contractors, an amount equal to 20 percent of the totals from Subsections (1) and (2) above, which shall constitute overhead and profit of the Contractor and Sub-contractors.
 - (5) Rental of equipment and plant having a new value greater than \$300.00. Rental rates shall be as set out in the current edition of D.H.O. Form 527.
4. Whenever extra work is being performed under Subsection 3(B) above, we agree to submit daily reports in writing, indicating the total chargeable costs incurred for the day. Valuation of the extra work being so performed will be made only on the basis of the approved daily reports.

PART 5 - ADDENDA

- A. We agree that we have received Addenda 0 to 0 inclusive, and the tender price includes the provisions set out in such Addenda.

PART 6 - COMPLETION

- A. We agree to commence work as specified, to proceed continuously to the completion and to complete all work by

PART 7 - SCHEDULE OF TENDER PRICES

- A. This Schedule is referred to above in PART 3.

Item No.	Description	Unit	Quantity	Unit Price	TOTAL
1.	Supply and install 8-inch Ductile Iron Class II watermain including connection to existing main (and including all necessary excavation, fittings, plugs, concrete thrust blocks and encasement, Class 'B' bedding, specified backfill and restoration).	Lin.Ft.	880	\$ 7.30	\$ 6,424.00
2.	Supply and install Hydrants including tee off main, secondary valves, bedding and thrust blocks as shown on standard drawing	Each	2	\$ 741.38	\$ 1,482.76
3.	Supply and install 8-inch gate valve including cast iron valve box complete	Each	2	\$ 314.04	\$ 628.08
4.	Supply and place 3/4 inch Type K Copper Service including connection to main, curb stop and extension box	Lin.Ft.	150	\$ 4.03	\$ 604.50
5.	Connect existing water services to proposed 8" watermain	Each	3	\$ 41.05	\$ 123.15
6.	Contingency Allowance				\$ 1,000.00
TOTAL CONTRACT PRICE BID					\$ 10,262.49

MAILING ADDRESS
P.O. BOX 251
FORT ERIE, ONTARIO

M. J. STORM LIMITED

Excavating and Grading Contractors

PHONE 871-5831

OFFICE ON SPEAR ROAD
(NORTH OF G. E. WAY)
FORT ERIE, ONTARIO

TO Proctor & Redfern Ltd.,
39 Queen St.,
St. Catharines, Ont.

DATE August 30/73

INVOICE NO.

TERMS

YOUR ORDER NO. Re: Watermains, North Pelham St. in the Town of Pelham
New Quote as of Aug. 30/73

Item	Description	Qty	Unit	Cost
1.	8" A.C. class 200 watermain	880	\$7.30	\$6424.00
2.	Hydrants	2	\$741.38	\$1482.76
3.	8" gate valve	2	\$314.04	\$ 628.08
4.	3/4" Type K copper service	150	\$4.03	\$ 604.50
5.	connect existing water Serv.	3	\$41.05	\$ 123.15
6.	Contingency Allowance	L.S.		<u>\$1000.00</u>
				\$10262.49

TOTAL CONTRACT PRICE BID \$ 10,262.49

OFFERED ON BEHALF
OF THE CONTRACTOR

M.J. Storm
Signature

Signature


Contractor's Seal

M.J. Storm Limited

Company Name

P.O. Box 251, Fort Erie, Ontario

Address

M.L. Burgess
Witness

Sept 14, 1973
Date

PART 8 -TABLE OF ADDITIONAL UNIT PRICES

A. This Table is referred to above in PART 4 - A - 2.

Item No.	Description	Unit	Unit Price
1.	Excavation and backfill to 10 feet deep	Cu.Yd.	\$ 3.27
2.	Granular 'A' (compacted) for trench backfill	Cu.Yd.	\$ 6.65
3.	Supply and place 3000 p.s.i. concrete	Cu.Yd.	\$ 42.26
4.	Supply and place calcium chloride	Ton	\$ 125.00
5.	Working Foreman	Hour	\$ 7.00
6.	Labourers	Hour	\$ 5.00
7.	Rock Excavation	Cu.Yd.	\$ 22.00
8.	Supply and install 12-inch CMP Culverts	Lin.Ft.	\$ 7.00

THE CONSTRUCTION OF WATERMAINS
ALONG NORTH PELHAM STREET
IN THE TOWN OF PELHAM, ONTARIO
AGREEMENT

This Agreement made in triplicate this
between

day of September, 1973,

M.J. STORM LIMITED

hereinafter called "The Contractor",

AND

THE TOWN OF PELHAM

hereinafter called "The Owner".

WITNESSETH, that the Contractor agrees with the Owner to perform all the work in accordance with the contract documents referred to in the tender of the Contractor dated the 28th * day of August 1973 (which shall be deemed to form part of this Contract) to the satisfaction of the Engineer for the total contract price of \$ 10,262.49 which contract documents are attached hereto and which are hereby expressly made part of this Contract.

The Owner hereby agrees with the Contractor, that in consideration of the work being performed by the Contractor as specified, the Owner shall pay the Contractor for said work in accordance with the prices set out in the Form of Tender attached hereto, and in accordance with the provisions set out in the attached contract documents.

IN WITNESS WHEREOF the parties hereto have set their hands and seals the day and year first written above.

EXECUTION BY OWNER -

EXECUTION BY CONTRACTOR -

Name TOWN OF PELHAM

Company Name M.J. STORM LIMITED

Officers *A. Black*

Signatures *M.J. Storm*

Sam S

Witness *M.C. Burger*

Date *Sept 25/73*

Date *Sept. 14, 1973*

Seal

Seal

Form CD-20 June 1970

TENDERER'S EXPERIENCE IN SIMILAR WORK

YEAR COMPLETED	DESCRIPTION OF CONTRACT	FOR WHOM WORK PERFORMED	VALUE

Proctor & Redfern Limited
Consulting Engineers
June 11, 1969
AS:hs

TENDERER'S SENIOR STAFF

NAME	APPOINTMENT	QUALIFICATIONS AND EXPERIENCE

TENDERER'S PLANT

The Tenderer shall list the plant, machinery and equipment he proposes to use on the work.

PLANT UNDER TENDERER'S CONTROL:

PLANT TO BE RENTED:

PLANT TO BE PURCHASED:

Proctor & Redfern Limited
Consulting Engineers
June 11, 1969
AS:hs

GENERAL CONDITIONS OF THE CONTRACT

These General Conditions of the Contract shall apply to all contracts entered into by the Contractor and the Owner, whether the contract is for a lump sum or for a unit price basis, and whether the contract is for a fixed fee or for a variable fee.

The Contractor shall be responsible for obtaining all necessary permits, licenses, and approvals from the appropriate authorities. The Contractor shall also be responsible for obtaining all necessary insurance and bonds required by the Owner.

The Contractor shall be responsible for the safety of all personnel and property on the project site. The Contractor shall also be responsible for the protection of the environment and for the preservation of any historical or cultural resources that may be encountered during the project.

The Contractor shall be responsible for the timely completion of the project and for the quality of the work. The Contractor shall also be responsible for the proper handling and disposal of all waste materials generated during the project.

The Contractor shall be responsible for the payment of all subcontractors and suppliers. The Contractor shall also be responsible for the payment of all taxes and fees that may be applicable to the project.

The Contractor shall be responsible for the maintenance of accurate records of all project activities, including but not limited to, time, materials, and costs. The Contractor shall also be responsible for the timely submission of all required reports and documents to the Owner.

The Contractor shall be responsible for the coordination of all project activities with the Owner and with any other parties involved in the project. The Contractor shall also be responsible for the resolution of any disputes that may arise during the project.

The Contractor shall be responsible for the compliance with all applicable laws, regulations, and standards. The Contractor shall also be responsible for the implementation of any safety and health programs that may be required by the Owner.

The Contractor shall be responsible for the protection of the confidentiality of all information that may be disclosed to the Contractor by the Owner. The Contractor shall also be responsible for the proper handling and disposal of all confidential information.

The Contractor shall be responsible for the timely completion of the project and for the quality of the work. The Contractor shall also be responsible for the proper handling and disposal of all waste materials generated during the project.

The Contractor shall be responsible for the payment of all subcontractors and suppliers. The Contractor shall also be responsible for the payment of all taxes and fees that may be applicable to the project.

The Contractor shall be responsible for the maintenance of accurate records of all project activities, including but not limited to, time, materials, and costs. The Contractor shall also be responsible for the timely submission of all required reports and documents to the Owner.

APPLICATION FOR RELEASE OF SUBCONTRACTOR'S HOLDBACK

Name

Address

City

Country

Subcontract No.

Subcontractor

I, the undersigned, hereby certify that the work under the Subcontract was completed on the _____ day of _____, 19____, and hereby request the release of the holdback of _____% of the Subcontract price of _____.

Date _____

I, the undersigned, hereby certify that the work under the Subcontract was completed on the _____ day of _____, 19____, and hereby request the release of the holdback of _____% of the Subcontract price of _____.

APPLICATION FOR RELEASE OF CONTRACTOR'S HOLDBACK

Owner

Project

BO

WAT

1000000000

and Contractor

It is hereby certified that the work substantially completed is defined in the
Mechanical and Electrical

It is hereby certified that the work substantially completed is defined in the
Mechanical and Electrical

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Mechanical and Electrical

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Mechanical and Electrical

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Mechanical and Electrical

SECTION 1A - GENERAL

PART 1 - GENERAL

Part 1.01 DESCRIPTION OF WORK

1. This contract is for the construction of watermains and related appurtenances along North Pelham Street in the Town of Pelham.

Part 1.02 LIMITS OF SITE

1. The limits of site are:
 - A. The road or street allowances on which work is to be performed.
 - B. Such areas or private property adjacent to road or street allowances on which the Contractor is directed, in writing, to enter to carry out work.

Part 1.03 SETTING OUT OF THE WORK

1. The Engineer will set such stakes as are necessary to mark the location, alignment, elevation and grade of the work. Adequate notice shall be given by the Contractor of the need for such setting out.

All stakes, lot pins, marks and reference points shall be carefully protected and preserved, and, if destroyed or removed by the Contractor, shall be replaced at his expense.

The Contractor shall provide grade stakes, masts, scaffolds, batter boards, straight edges, templates and other equipment as may be necessary for laying out and inspecting the work.

Wherever necessary, work shall be suspended temporarily to permit the Engineer to inspect and check the line and grade of any portion of the work.

Part 1.04 CONSTRUCTION SCHEDULE

1. The Contractor shall within two (2) weeks after being awarded the Contract, submit his proposed construction schedule to the Engineer for approval. The schedule shall show proposed progress in weekly stages for the main sections and sub-sections of the work.

PART 2 - PRODUCTS

Part 2.01 TESTS

1. Where required by the Engineer, the Contractor shall supply certified copies of all tests upon all materials to be used in the construction of the works, indicating that the materials comply with an approved testing laboratory and shall be at the Contractor's expense.

Part 2.02 CANADIAN MATERIALS

1. Unless otherwise specifically approved, the Contractor shall use materials and equipment of Canadian manufacture in constructing the works.

PART 3 - EXECUTION

Part 3.01 WORK ON ROADS

1. No work shall be performed on public rights-of-way without the approval of the road authority.

Part 3.02 TRAFFIC

1. Traffic control on streets shall be performed in accordance with the rules of the appropriate road authority. Flagmen shall wear fluorescent red or orange safety vests, arm bands and hats.
2. One lane of traffic shall be maintained at all times.
3. Reasonable access to adjacent properties shall be maintained for pedestrians and vehicles.
4. All traffic signs shall be maintained in their original positions, and shall not be obscured.

Part 3.03 NOTIFICATIONS

1. When traffic is restricted, the appropriate fire and police departments shall be notified, giving at least seven days notice of the restriction.
2. When restrictions are removed, the fire, police and bus authorities shall again be notified.

E.O. 73310 SEC. 1A - GENERAL

Part 3.04 USE OF HYDRANTS

1. Fire hydrants shall be kept accessible and free of obstructions.
2. Fire hydrants may be used as a source of water only with the approval of the water authority, and subject to its rules and conditions.

Part 3.05 INCLEMENT WEATHER

1. Adequate protection shall be made and precautions taken at times of inclement weather.
2. Inclement weather or extra work caused by such weather will not be accepted as reason for additional payment.

Part 3.06 MUD AND DUST

1. Streets and other construction areas shall be kept clean.
2. Dust shall be laid by the use of water or calcium chloride, or both.

Part 3.07 ADJACENT STRUCTURES AND UTILITIES

1. Temporary and permanent support and temporary relocation and replacement of underground or overhead utilities shall be performed as part of the contract and as detailed in the General Conditions.
2. Permanent relocation of underground or overhead utilities will be carried out by others, if necessitated by coincidence of lines or grades, or both.

Part 3.08 INSPECTORS

1. Inspectors may be present during the construction of the work. They have the power to order the contractor to stop work if the work, in their opinion, is not being done in accordance with the set lines and grades or to the drawings and specifications.

SECTION 2A - WATERMAINS

PART 1 - GENERAL

Part 1.01 Measurement for Payment

1. Watermains will be measured straight through specials, valves and other appurtenances in the line.
2. An hydrant set shall include the hydrant, 6-inch secondary valve, valve box, lead from main, and tee off main, all as shown on the standard drawing.
3. All special fittings shall be included in the unit price of the watermain.

Part 1.02 Basis for Payment

1. Payment for watermain and appurtenances will be made at the unit or lump sum prices in the Schedule of Tender Prices.
2. The unit rates in the Form of Tender for 8-inch watermain shall include the connection to the existing 6-inch watermain.

PART 2 - PRODUCTS

Part 2.01 Watermains

1. Ductile Iron watermain shall be Class II, material conforming to A.S.T.M. A536 Grade 60-42-10 manufactured in accordance with A.S.A. A21.51. Joints shall be Tyton in accordance with A.S.A. A21.11.

Part 2.02 Hydrants

1. Fire hydrants shall be Canada Valve Limited 'Century' B-50-B-18 or equal complying with A.W.W.A. Specification C502 and C.S.A. nozzle threads. Shut-off shall be compression, gate type inlet connection with 6" mechanical joints. There shall be two 2-1/2" dia. hose nozzles. Depth of bury shall be 6'0". Hydrants shall open counter-clockwise, operating and cap nuts shall be Province of Ontario standard, and hydrants shall be painted red.

Part 2.03 Valves and Valve Boxes

1. Valves shall be iron body bronze mounted gate valves with inside screw, non-rising spindle, opening counter-clockwise with 2" square operating nut. Stem packing shall be 'O' ring and joints shall be mechanical joints. Valves shall be Canada Valve No. 55, Jenkins Bros. Fig. 398, McAvity No. 20075-O or equal.
2. Valve boxes shall be cast iron, auger type similar to Fergusson No. 101 and adjustable to 5'6" of bury.

Part 2.04 Concrete

1. All concrete work shall be carried out in accordance with C.S.A. A23 'Standard for Concrete and Reinforced Concrete' using normal Portland cement.
2. Unless otherwise noted, all concrete shall be 3000 p.s.i. with air entrainment according to C.S.A. A23, Table 6.

Part 2.05 Granular Materials

1. Granular 'A' and 'B' materials for pipe bedding and/or backfill shall comply with D.H.O. Form 314.
2. Sand Cushion for pipe bedding material shall comply with D.H.O. Form 316.

PART 3 - EXECUTION

Part 3.01 Line and Grade

1. The Contractor shall supply, erect and maintain approved batter boards and site rails to ensure accurate line and grade of all pipes. At least three batter boards shall be in use at all times, placed not more than 50 feet apart.
2. No deviations from the established line and grade will be tolerated, except where laying of pipe along a curve is limited by the pipe manufacturer's tolerances for joint deflections.

PART 3 - EXECUTION (cont'd)

Part 3.02 Trench Excavation

1. All excavations for watermains and appurtenances shall be of sufficient extent to allow the installation of the work, and shall extend no more than 30 feet in advance of the installation of the work, or as the Engineer shall permit.
2. The minimum width of trench shall be one foot greater than the outside diameter of the pipe plus an allowance for shoring where required, and the maximum width of trench shall be two feet greater than the outside diameter of the pipe.
3. 'Rock' whenever used as the name of an excavation material shall only mean boulders or masonry exceeding 1/3 cubic yard in volume or solid ledge rock, which, in the opinion of the Engineer requires drilling and blasting, wedging, slogging or barring for its removal. Only the above-described materials will be measured and paid for as rock excavation. All other material will be classed as earth excavation. Rock shall be removed to a point 6 inches below and one foot on any side of a watermain or appurtenant structure.
4. Areas in the bottom of trenches which have been over-excavated by the Contractor, without being ordered to do so by the Engineer, shall be brought up to proper grade with material as directed by the Engineer, compacted and levelled to receive the pipe, all at the Contractor's expense.
5. Where, in the opinion of the Engineer, the sub-grade is unsatisfactory to support the pipe, the Engineer will instruct the Contractor as to the required procedure, which will include excavation to solid material, placing 2" crusher run by hand below bedding grade and compacting to 95 percent Standard Proctor Density.
6. All slides and caves shall be repaired at the Contractor's expense and in a manner satisfactory to the Engineer.

7. Any shoring required and support for utilities shall be included in the unit price for the pipe. All trench work including sheeting and shoring if required, shall be installed in strict accordance with the Trench Excavator's Protection Act, and local requirements.
8. Excess excavated material shall be placed on the site by the Contractor to a disposal area approved by the Engineer.
9. De-Watering
 - (a) Excavations shall be maintained free of water and protected from the action of surface water at all times and, where necessary, pumps of sufficient capacity shall be maintained. The Contractor shall provide for the disposal of the water removed in such a manner as shall not injure the public health, private property, public streets, sewers or the works under construction, as may be directed by the Engineer.
 - (b) Where inconvenience or blockage occurs because of these operations, the Contractor shall provide relief at his own expense.
 - (c) The Contractor shall, at his own expense permanently and temporarily provide for and maintain the flow, where required of all sewers, drains, ditches, house or inlet connections and all water courses which may be met with during the progress of the work.
 - (d) The ditches shall be kept open at all times for surface drainage. Damming or impounding of water in ditches or other waterways will not be permitted except where the Engineer shall consider it necessary.
 - (e) The Contractor shall not direct any flow of water across or over pavements, except through approved pipes or properly constructed troughs, and he shall when required by the Engineer, provide pipes or troughs of such sizes and lengths as may be required, and place the same as may be directed, at his own cost and expense.

Part 3.03 Installation of Pipe

1. All pipe shall be laid in Class 'B' bedding using Granular 'B' material compacted to a minimum of 95 percent Standard Proctor Density.
2. Installation of pipe shall be in accordance with the manufacturer's specifications. Deflections in joints shall only be made after the pipe has been jointed and shall not exceed the manufacturer's recommendations.
3. All foreign material shall be removed from the inside of the pipe before it is joined.
4. Concrete thrust blocks shall be installed at all bends, tees and plugs along the watermain.

Part 3.04 Backfill of Trenches

1. Watermain trenches shall be backfilled with select native soil, unless otherwise specified, to 6 inches below final grade. The top 12 inches will be backfilled with Granular 'A'. All backfill will be compacted to 95 percent Standard Proctor Density.
2. The backfill shall be free from brush, large stones or frozen material.

Part 3.05 Cleaning, Testing and Disinfection of Watermain

1. After the watermain has been partially backfilled, the pipe line shall be flushed clean with potable water until turbidity-free water is obtained at all ends.
2. Following cleaning of the main, the Contractor shall apply a hydrostatic pressure test on the length of main to be tested. The main shall be tested at 150 p.s.i. for a duration of not less than one hour. Before applying pressure to the main, the Contractor shall ensure that all air has been expelled from the pipe line.
3. The Contractor shall repair all leaks and defective material at his own expense and shall supply all labour and equipment necessary to perform the pressure tests.

4. The acceptable rate of leakage under 150 p.s.i. test pressure shall not exceed 25 Imperial gallons per inch diameter per 24 hours per mile of pipe.
5. Following testing of the works, the watermains shall be disinfected using a continuous feed method hypochlorite solution that will produce an initial free chlorine residual of 50 p.p.m. and a 24-hour residual of 25 p.p.m.
6. The chlorine solution shall then be flushed from the system with potable water.
7. The Contractor shall make an allowance in his price bid for installing watermain for providing sufficient water for flushing and testing purposes and for providing sufficient hypochlorite solution to disinfect the main. Before obtaining potable water from the local water utility, the Contractor shall make arrangements with the utility for operating valves or hydrants.

Part 3.06 Restoration

1. All asphalt driveways shall be reinstated with 3 inches of HL-3 Hot-Mix Asphalt over Granular 'A' base. All joints shall be properly cut and painted with bituminous emulsion.
2. All disturbed lawn areas shall be reinstated with No. 1 nursery sod.
3. All roadway areas will be topped with 12 inches of Granular 'A' compacted to 95 percent Standard Proctor Density.
4. All disturbed surface treated areas shall be resurfaced with a double application of RS1K emulsion applied at the rate of 1/3 gallon per square yard and 3/8" stone chips applied at the rate of 25 pounds per square yard for each application.
5. Only existing culverts located parallel to and within 5 feet of the watermain will be paid for under the List of Additional Unit Prices. Any other culverts that are damaged shall be reinstated by the Contractor at his expense.

FINISHED GRADE .

BACKFILL AND SURFACE
FINISH AS DIRECTED
BY THE TOWN

5'6" MINIMUM

$\frac{W}{2}$

BEDDING

D.H.O. GRANULAR "A"
PLACED AND TAMPED
IN 6" LIFTS
SIMULTANEOUSLY ON
BOTH SIDES OF PIPE.

12" MINIMUM

TOP OF PIPE

LEVELLING LAYER 4" MIN.

D" DIA. PIPE.

D.H.O. GRANULAR "A"
FIRMLY TAMPED IN PLACE.

"W"
WIDTH OF TRENCH

D" + 1 1/4" MINIMUM ①

D" + 2 1/4" MAXIMUM ②

① INSIDE OF SHEETING

② OUTSIDE OF SHEETING

TOWN OF PELHAM STANDARD

August 13th, 1970

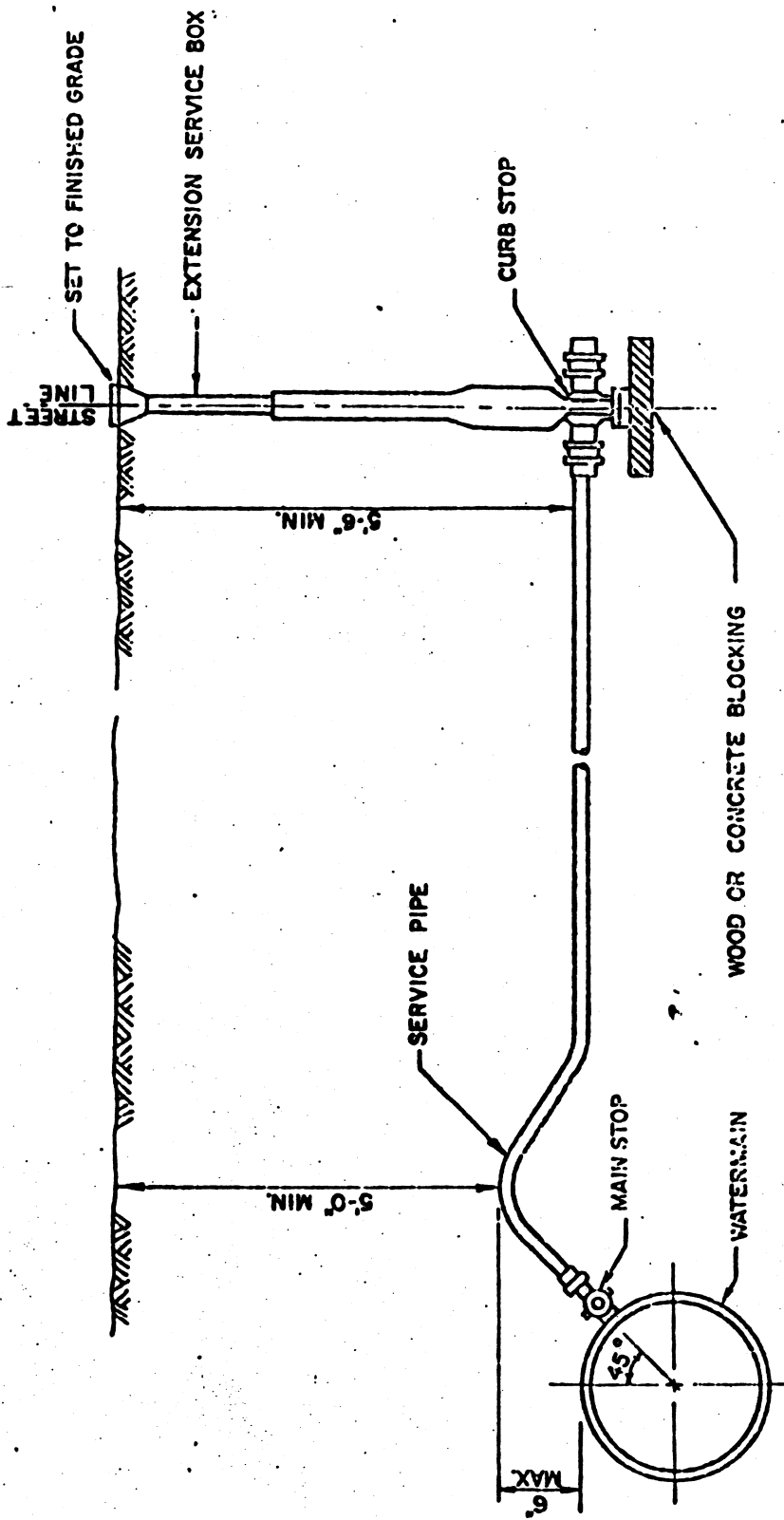
NOTE

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- (1) GRANULAR MATERIAL SHALL MEET D.H.O. GRANULAR "A" SPECIFICATIONS (FINE TRAFFIC BOUND OR SCREENINGS) THROUGHOUT EXCEPT WHERE WATER IS ENCOUNTERED 3/4" CLEAR CRUSHED STONE SHALL BE SUBSTITUTED.
- (2) WHERE THE BOTTOM OF THE TRENCH IS FOUND TO BE UNSTABLE OR OTHERWISE UNACCEPTABLE IT SHALL BE EXCAVATED TO THE WIDTH AND DEPTH ORDERED BY THE INSPECTOR AND REFILLED AND COMPACTED TO THE BOTTOM OF THE PIPE WITH 2" CRUSHER RUN CRUSHED STONE.
- (3) IN NO CASE SHALL FROZEN MATERIAL BE USED FOR BEDDING OR BACKFILLING.

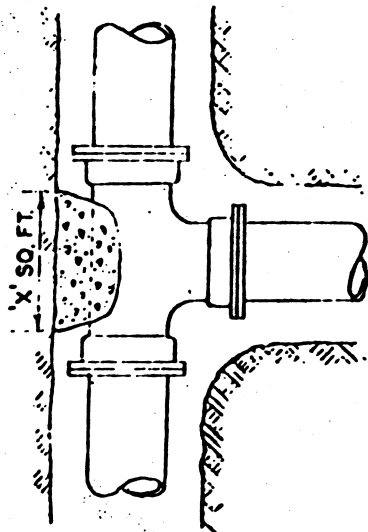
August 13th, 1970

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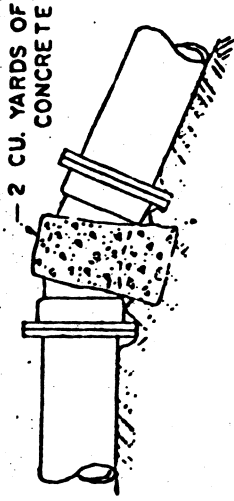


STANDARD WATER SERVICE CONNECTION

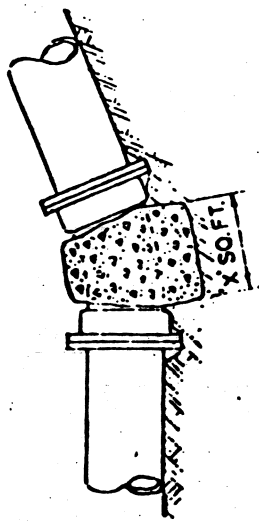
NOTE: CONCRETE FOR THRUST BLOCKS TO BE 3000 P.S.I. LAID TO UNDISTURBED GROUND.



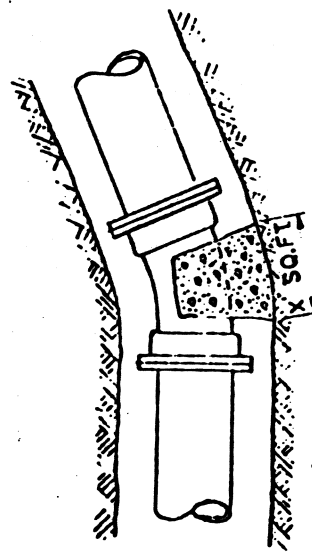
TEE JUNCTION



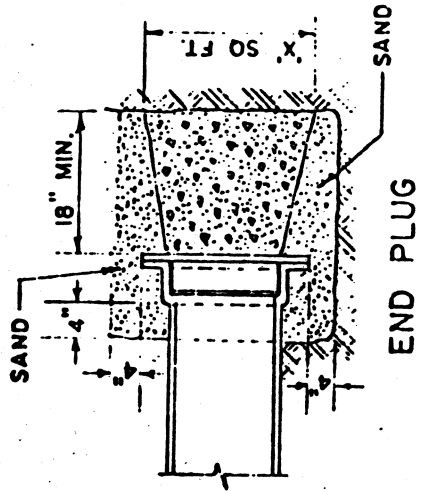
1/6 VERTICAL BEND-DOWN



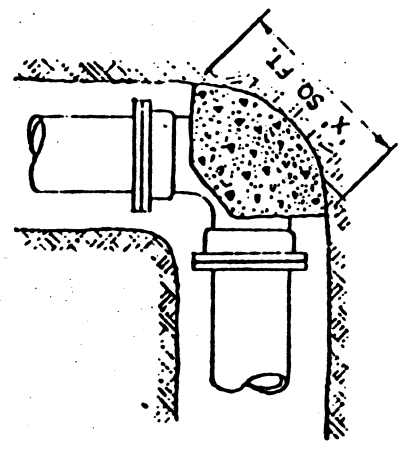
1/6 VERTICAL BEND-UP



1/6 HORIZONTAL BEND



END PLUG



1/4 HORIZONTAL BEND

SIZE OF THRUST BLOCKS

TYPE OF SOIL	'X' SQ. FT.																																			
	1/16 BEND								1/8 BEND								1/4 BEND								TEE, CROSS & END PLUG											
	4"		6"		8"		10"		12"		16"		4"		6"		8"		10"		12"		16"		4"		6"		8"		10"		12"		16"	
SOFT SOIL OR CLAY		1	2	3	4								2	3	5	7																				
LOOSE SAND & GRAVEL		1	1	2	2								1	2	3	4																				
COMPACT SAND & GRAVEL OR FIRM CLAY		1	1	1	1								1	1	2	2																				
SHALE OR ROCK		1	1	1	1								1	1	2	2																				

CONCRETE THRUST BLOCKS TO FITTINGS

August 13th, 1970

[Signature]

TOWN OF PELHAM STANDARD

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NOTE: HYDRANT TO BE SET PLUMB WITH STEM
EXTENSIONS TO SUIT DEPTH OF LEAD.
LEAD TO BE SET LEVEL.

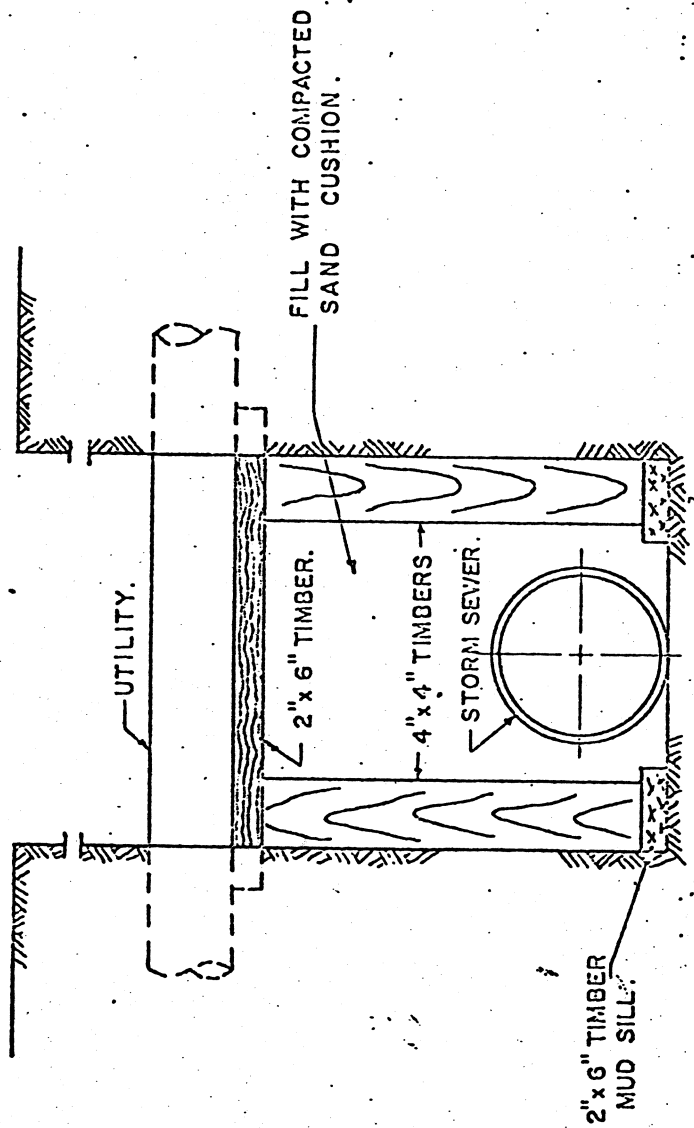
TOWN OF PELHAM STANDARD

Aug. 13th, 1970.....

DETAILS OF HYDRANT AND LEAD

WITH SECONDARY VALVE

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NOT TO SCALE.

NOTES. 1. TO BE USED EXCEPT WHERE SPECIFIC REQUIREMENTS
OF UTILITY OWNER MUST BE MET.

2. COST TO BE INCLUDED IN UNIT PRICE OF SEWER.

TIMBER SUPPORT
FOR UTILITIES.