

THE CORPORATION OF THE TOWN OF AMHERSTBURG

BY-LAW NO. 2005-45

**Being a by-law to authorize the signing of an agreement
Between the Corporation of the Town of Amherstburg
And Watech Services Inc.**

WHEREAS the Water Tower is in need of repairs; and

WHEREAS W.M. Slater & Associates Inc. prepared specifications and tender documents for the required work; and

WHEREAS Council of the Corporation of the Town of Amherstburg is of the opinion that the work required for the Water Tower is necessary and desirable;

AND WHEREAS the tendered total cost of the said works is \$151,216.68.

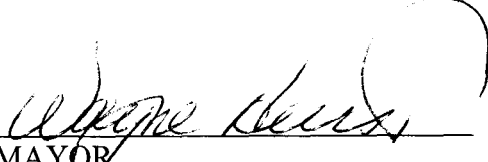
AND WHEREAS an agreement between the Town of Amherstburg and Watech Services Inc. dated May 3, 2005 is attached hereto as Schedule "A" and forms part of this By-law.


NOW THEREFORE THE COUNCIL OF THE CORPORATION OF

THE TOWN OF AMHERSTBURG HEREBY ENACTS AS FOLLOWS:

1. That the Mayor and Clerk be, and they are hereby authorized and instructed, to execute the originals and the copies of the said agreement and to affix the Corporate Seal thereto.
2. That this By-law shall come into force and take effect on the date of final passage thereof.

Read a first, second and third time and finally passed this 24th day of May 2005.


MAYOR


CLERK

1st Reading –

2nd Reading –

3rd Reading –

CONTRACT DOCUMENTS
FOR
WATER TOWER
POST TENSIONING TENDON REPLACEMENT & DOME RING
BEAM REPAIR

TOWN OF AMHERSTBURG

APRIL 2005



WATER TOWER
POST TENSIONING TENDON REPLACEMENT & DOME RING BEAM REPAIR
IN THE
TOWN OF AMHERSTBURG
GENERAL INDEX

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| 4. | AMHERSTBURG WATER TOWER
Technical Document for Post-
Tensioning Tendon Replacement &
Dome Ring Beam Inspection (Stage 3)
(Drawings & Specifications) prepared
by W.M. Slater & Associates Inc.
February 2005 | Separate Document – Attached |

**TENDER FORM
WATER TOWER**

**POST TENSIONING TENDON REPLACEMENT & DOME RING BEAM REPAIR
TOWN OF AMHERSTBURG**

TO: Mayor and Municipal Council
Corporation of the Town of Amherstburg
Municipal Offices
P.O. Box 159,271 Sandwich Street South
Amherstburg, Ontario N9V 2Z3

WATECH SERVICES INC. the undersigned, having examined the locality and site of the Works, Drawings and Specifications as prepared by W.M. Slater & Associates Inc., hereby offer to furnish all materials including all appropriate sales taxes and perform all the work necessary as described in the above documents and in accordance with the said documents under the supervision of the Amherstburg Public Works Department for the sum of

ONE HUNDRED AND FIFTY-ONE THOUSAND, TWO HUNDRED AND SIXTEEN ^{68/100} DOLLARS (\$ 151,216 ^{68/100}) Including G.S.T.)

And made up as follows:

POST TENSIONING WORK

1. Supply 165 ft. long galvanized polystrands fob jobsite and provide stressing equipment for the duration of the project.

Complete at lump sum (each strand) \$ 891⁵⁰ Each X 20 \$ 16,830⁰⁰

2. Supply new double anchorages if required.

Complete at lump sum (each) \$ 330⁰⁰ Each x 10 \$ 3,300⁰⁰

3. Supply labour for lead post tensioner including out of town expenses & travel, pickup truck & miscellaneous tools for 10 hour workday.

Complete at lump sum (each day) \$ 1,815⁰⁰ Day x 15 \$ 27,225⁰⁰

4. Supply labour for additional installers including out of town expenses & travel, miscellaneous tools for 10 hour workday.

Complete at lump sum (each day) \$ 1,485⁰⁰ Day x 5 \$ 7,425⁰⁰

5. Supply labour for Inspection and PT replacement meeting on Site late April including out of town expenses & travel, pickup truck & miscellaneous tools for 8 hour workday.

Complete at lump sum (each day) \$ 2310⁰⁰ Day x 4 \$ 9240⁰⁰

SERVICVES WORK

6. Mobilize/demobilize two (2) person site crew

Complete at lump sum \$ 400⁰⁰ Each x 2 \$ 800⁰⁰

7. Mobilize/demobilize additional person for site crew (if required)

Complete at lump sum \$ 100⁰⁰ Each x 2 \$ 200⁰⁰

8. Supply labour for two person site crew including out of town expenses & travel, pickup truck & miscellaneous tools for 10 hour workday.

Complete at lump sum (each day) \$ 1750⁰⁰ Day x 15 \$ 26,250⁰⁰

9. Supply labour for additional person to site crew including out of town expenses & travel, pickup truck & miscellaneous tools for 10 hour workday (if required)

Complete at lump sum (each day) \$ 467⁰⁰ Day x 15 \$ 7005⁰⁰

10. Mobilize/demobilize ~~100~~¹²⁰ Genie Lift (100 foot reach)

Complete at lump sum \$ 480⁰⁰ Each x 2 \$ 960⁰⁰

11. Supply Genie Lift ~~100~~¹²⁰ foot reach

Complete at lump sum (each week) \$ 6000⁰⁰ Week X 3 \$ 18000⁰⁰

PROVISIONAL WORK

12. Mobilize/demobilize Genie Lift/ Crane (160 foot reach)

Complete at lump sum \$ 450⁰⁰ Each x 2 \$ 900⁰⁰

13. Supply Genie Lift/Crane (160 foot reach)

Complete at lump sum (each week) \$ 9600⁰⁰ Week X 1 \$ 9600⁰⁰
B 1,920⁰⁰/DAY

14. Stand By Rates

(a) Lead post tensioner \$ 935⁰⁰ Day x 1 \$ 935⁰⁰
(b) Installers \$ 880⁰⁰ Day x 1 \$ 880⁰⁰
(c) Two Person site crew \$ 1400⁰⁰ Day x 1 \$ 1400⁰⁰
(d) Additional site crew person \$ 374⁰⁰ Day x 1 \$ 374⁰⁰

15. Contingency Allowance

\$ 10,000.00

SUB TOTAL FOR TENDER

\$ 141,324⁰⁰

7% G.S.T. PAYABLE (ON ABOVE)

\$ 9897⁶⁸

TOTAL FOR TENDER (INCLUDING G.S.T.)

\$ 151,216⁶⁸

The Tenderer declares that this Tender is made without any connection, knowledge, comparison of figures or arrangement with any other company, firm or person making a Tender for the same work and is in all respect, fair and without collusion or fraud.

The Tenderer further agrees to leave this Tender open for acceptance for a period of 30 calendar days from the closing date of Tenders.

The Tenderer further agrees to enter into a Contract with the CORPORATION OF THE TOWN OF AMHERSTBURG for the above work within 10 days after the Contract is awarded.

It is understood that the CORPORATION OF THE TOWN OF AMHERSTBURG is not bound to accept the lowest, any or any particular bid. The criteria to be considered by the Municipality in awarding the contract will include a combination of price, scheduling, expertise; qualifications and such other conditions as may be determined by the Municipality to be in its own best interests. Additions, alterations, deletions or other irregularities in the bid form may, but will not necessarily result in the Municipality's rejection of the bid. The bidder acknowledges that it shall have no claim against, or entitlement to damages from, the Municipality by reason of the Municipality's rejection of its bid or of all bids.

Proof of Liability Insurance will be required before commencement of the work.

A Certificate of Good Standing from the Workplace Safety & Insurance Board will be required before commencement of the work and before final payment is made.

The Tenderer agrees to initiate work within 3 days of receiving notice to commence work and shall work continuously on this project (weather permitting) through completion.

The Tenderer agrees to complete the Works within the time to be known as the "Time of Completion".

TENDERED BY: WATECH SERVICES INC

ADDRESS: 895 VALETTA ST
LONDON ON N6H 2Z4

G.S.T. REGISTRATION NO. 133 725 341 RT

DATED AT LONDON, ON THIS 18TH DAY OF APRIL, 2005.

)
)
)

)
)
)

SEC. TREAS
D. RALPH BEDFORD

Signature of Witness

Signature of Tender

NOTE:

If the Tender is submitted by or on behalf of a Corporation, it must be duly signed in the name of such Corporation by the duly authorized officers and the seal of the Corporation must be affixed. If the Tender is submitted by or on behalf of an individual or a partnership, a seal must be affixed opposite the signature of the individual or partner.

Monthly progress orders for payment shall be furnished to the Contractor by the Engineer in charge and such orders shall not be for more than 90% of the value of the work done and the materials furnished on the site. The paying of the full 90% does not imply that any portion of the work has been accepted. The remaining 10% will be paid 45 days after the final acceptance and completion of the work.

AGREEMENT

THIS AGREEMENT made in triplicate this 3RD day of MAY, 2005.

BETWEEN THE CORPORATION OF THE TOWN OF AMHERSTBURG

(hereinafter called the Corporation) of the first part,

AND

WATECH SERVICES INC.

(hereinafter called the Contractor) of the second part.

WHEREAS the Corporation is desirous that certain works should be constructed, viz., the construction of the:

**WATER TOWER
POST TENSIONING TENDON REPLACEMENT & DOME RING BEAM REPAIR**

in the Town of Amherstburg and appurtenances and has accepted a Tender by the Contractor for the construction, completion and maintenance of such works:

NOW THIS AGREEMENT WITNESSES AS FOLLOWS:

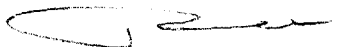
1. The Contractor hereby covenants and agrees to provide and supply at his expense, all and every kind of labour, machinery, equipment and materials for, and to undertake and complete in strict accordance with his Tender dated the 18TH day of APRIL, 2005 and the Contract Documents consisting of the General Conditions of Contract, Drawings, Specifications, Information to Tenderers, Special Provisions of Contract, if any, including all modifications thereof and incorporated in the said documents before their execution prepared by W.M. Slater & Associates Inc. and all of which said documents are annexed hereto and form part of this Agreement to the same extent as if fully embodied herein, the construction of the above noted works for the sum of ONE HUNDRED AND FIFTY ONE THOUSAND, TWO HUNDRED AND SIXTEEN ⁶⁸/₁₀₀ dollars (\$ 151,216⁶⁸).
2. The Contractor further covenants and agrees to undertake and complete the said work in a proper workmanlike manner under the supervision and direction and to the entire satisfaction of the Town of Amherstburg Public Works Department, within the specified time in his Tender. Time shall be deemed the essence of the contract.
3. The Contractor further covenants and agrees that he will at all times, indemnify and save harmless, the Corporation of the Town of Amherstburg and W.M. Slater & Associates Inc., along with their respective officers, servants and agents, from and against all loss and damages whatsoever which may be made or brought against the above listed by reason or in consequence of the non-execution or negligent execution thereof by the Contractor, its servants, agents or employees.
4. The Corporation hereby covenants and agrees that if the said Work is duly and properly executed and materials are provided as aforesaid, and if the said Contractor carries out, performs and observes all of the

requirements and conditions of this Agreement, the Corporation will pay to the Contractor, the price set forth in his Tender, such payment or payments to be made in accordance with the provisions of the General Conditions of the Contract referred to above.

- 5. This Agreement and everything herein contained shall endure to the benefit of and be binding upon the parties hereto, their heirs, executors, administrators, successors and assigns, respectively.

IN WITNESS WHEREOF the parties hereto have hereunto affixed their Corporate Seals, if any, duly attested by the signature of their proper officers in that behalf, respectively.

WITNESS AS TO SIGNATURE OF CORPORATION

 SECRETARY

Contractor's Signature and Seal

WATECH SERVICES INC.

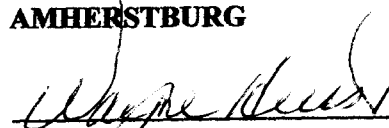
Contractor's Name

895 VALETTA ST. LEWISTON, ON

Contractor's Address

N6H 2Z4

CORPORATION OF THE TOWN OF AMHERSTBURG



Mr. Wayne Hurst, Mayor



Mr. David Mailloux, Clerk

INFORMATION TO TENDERERS

TOWN OF AMHERSTBURG

1.0 TENDERS

Tenders will be received by:

The Corporation of the Town of Amherstburg
Municipal Offices
271 Sandwich Street, P.O. Box 159
Amherstburg, Ontario N9V 2Z3

up until the hour of:

11:00 a.m., Local time, Monday, April 18, 2005

Tenders received after the closing deadline, whether delivered personally, or if mailed, regardless of postal markings, will not be opened.

2.0 AGREEMENT AND GENERAL CONDITIONS

Tenders will be received and contracts awarded only in the form provided, for the completion of the whole work specified. The Contractor agrees to enter into a formal contract with the Municipality upon acceptance of the tender.

All work included in the contract must be completed on or before the date fixed in the contract and must, at the time of completion and final inspection, be in first class condition and comply fully with the specifications.

Final inspection will be made by the Amherstburg Public Works Department within 20 days after the Municipality has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

The Contractor will be held liable for any damage or expenses occasioned by his failure to complete the work on time and for any expenses of inspecting, superintending or re-letting due to his neglect or failure to prosecute the work satisfactorily. Any such expense or damages may be deducted by the Municipality from the amount of the Contract or may be recovered by the Municipality from the Contractor and his sureties.

3.0 INSURANCE

Within ten (10) days after the contract has been awarded to him, the Contractor shall furnish to the Clerk of the Municipality satisfactory evidence that he has insurance to cover risk and liability in accordance with the General Conditions for the period of the execution of the work.

The Liability Insurance shall have a limit of liability of not less than **2 Million Dollars** inclusive for

any one occurrence. It shall be a comprehensive liability insurance covering all operations and liability assumed under the Contract and it shall name the Town of Amherstburg and its officials and W.M. Slater & Associates Inc. as additional insured under the policy and shall also contain a cross liability and save harmless clause for the said Town of Amherstburg and W.M. Slater & Associates Inc.

The liability insurance shall be endorsed to provide that the policy shall not be altered, cancelled or allowed to lapse without 30 days prior written notice to the Municipality. Such copy of this policy is to be submitted to the Clerk of the Municipality prior to commencement of the work.

4.0 WORKPLACE SAFETY & INSURANCE

The Contractor will be required to submit to the Municipality; a Certificate of Good Standing from the Workplace Safety & Insurance Board prior to the commencement of the work and the Contractor will be required to submit to the Municipality, a Certificate of Clearance for the project from the Workplace Safety & Insurance Board before final payment is made to the Contractor.

The Contractor shall provide and maintain the necessary first aid items and equipment as called for under the First Aid Regulations of the Workplace Safety & Insurance Act.

5.0 CONSTRUCTION SAFETY ACT

The Contractor shall comply with all the requirements of the Occupational Health and Safety Act, 1990 and Regulations for Construction Projects and Amendments, as administered by the Ontario Ministry of Labour and all subsequent amendments of the said Act. In the event that the Contractor fails to comply with the requirements of the above mentioned Act, the Municipality may suspend the operation of the work forthwith and the suspension will remain in effect until the Contractor has taken whatever remedies are necessary to comply with the said Act. Suspension of the work by the Municipality on account of the provisions of this clause, shall not allow the Contractor any extension of the Time of Completion and the Contractor may be liable for liquidated damages to the Municipality.

6.0 CONTRACTORS LIABILITY

The Contractor, his agents and all workmen or persons under his control including sub-contractors, shall use due care that no person or property is injured and that no rights are infringed in the prosecution of the work. The Contractor shall be solely responsible for all damages, by whomsoever claimable, in respect to any injury to persons or property of whatever description and in respect of any infringement of any right, privilege or easement whatever occasioned in the carrying on of the work, or by any neglect on the Contractor's part.

The Contractor, shall indemnify and hold harmless the Municipality, their agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the Contractor's performance of the contract.

7.0 ONTARIO PROVINCIAL SALES TAX

The suggestions noted below are for the Tenderer's information in the matter of Ontario Sales Taxes. The successful Tenderer will be completely responsible for complying with all requirements regarding Ontario Provincial Sales Tax and no subsequent claims will be allowed or payments made to the Tenderer by the Municipality with respect to any rebates for Ontario Provincial Sales Tax.

- a) Ontario Provincial Sales Tax on materials that enter into and form part of the works shall be included in the tendered unit prices, including ready mix concrete and hot or cold mix asphalt materials.
- b) Labour charges remaining exempt are:
- 1) Installation of goods that become real property upon installation.
 - 2) Repair and maintenance of real property.
 - 3) Repair and maintenance of goods where replacement parts are not subject to tax.
 - 4) Repair or reconditioning of goods purchased for resale by vendors.

At the request of the Municipality the Contractor shall provide receipts showing the amount of taxes paid for all materials used on this project. Ontario Provincial Sales Tax rebates (where applicable) will be applied for and retained by the Municipality.

8.0 GOODS AND SERVICES TAX

The Contractor should be aware of his responsibility for payment to Revenue Canada of the Goods and Service Tax, which came into effect on January 1, 1991. The Contractor will be required to calculate and include the following in his Tender:

- 1) Tender Price (not including G.S.T.)
- 2) Total Tender Price (including 7% G.S.T.)

For the purposes of evaluating Tenders, Item (2) **must** be the Tender Price plus 7%. If a percentage other than 7% is added, the Tender will be assumed to be in error and will be corrected accordingly.

9.0 LIQUIDATED DAMAGES

Liquidated damages, consisting of additional cost incurred by the Municipality, may be charged to the Contractor if the work is not completed within the specified Time of Completion.

Additional cost incurred by the Municipality to inspect or re-check corrective work, resulting from incorrect work by the Contractor or work not accepted by the engineer, may be charged to the Contractor.

10.0 WORK SCHEDULE

The Contractor is expected to start work on or about April 20th, 2005 and complete the work within a four week time period.

11.0 PAYMENT

Payment for the work shall be made at the unit price or lump sum bid in the Form of Tender and shall be compensation in full for all labour, equipment and material required to carry out the work as outlined in the Technical Document for Post-Tensioning Tendon Replacement & Dome Ring Beam Inspection for the Amherstburg Water Tower prepared by W.M. Slater & Associates Inc. February, 2005.



Workplace Safety & Insurance Board
Commission de la sécurité professionnelle et de l'assurance contre les accidents du travail

200 FRONT STREET WEST
TORONTO, ONTARIO
M5V 3J1 (416) 344-1012

Clearance Certificate Certificat de décharge

CONTRACTOR
L'ENTREPRENEUR

WATECH SERVICES INC
895 VALETTA ST
LONDON ON
N6H 2Z4

The Workplace Safety and Insurance Board (WSIB) hereby waives its rights under Section 141 of the Workplace Safety and Insurance Act to hold the Principal, that is in a contractual agreement with the Contractor named, liable for any Section 141 liability of the Contractor for premiums and levies of the WSIB owing now or within 60 days from the date of this Certificate

Par la présente, la Commission de la sécurité professionnelle et l'assurance contre les accidents du travail (CSPAAT) renonce aux droits qui lui sont conférés en vertu de l'article 141 de la Loi sur la sécurité professionnelle et l'assurance contre les accidents du travail et qui l'autorisent à tenir l'entrepreneur principal, qui a signé une entente contractuelle avec l'entrepreneur dont le nom figure sur le présent certificat, responsable du paiement de tout prime ou de toute somme que l'entrepreneur est tenu de verser à la CSPAAT immédiatement ou dans les 60 jours suivant la date indiquée sur ce certificat.

THIS CERTIFICATE IS VALID FOR ALL CONTRACTS OF THE NAMED CONTRACTOR DURING THE EFFECTIVE PERIOD

LE PRESENT CERTIFICAT EST VALIDE POUR TOUS LES CONTRATS PASSES PAR LEDIT ENTREPRENEUR PENDANT LA PERIODE D'APPLICATION DU CERTIFICAT

Valid only when signed by an authorized Officer of the WSIB.
Non valide sans la signature d'un agent autorisé de la CSPAAT.

Account No. / N° de compte 6982875	Firm No. / N° d'entreprise 230217EJ	
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Rate / Taux	Description	Rate / Taux	Description
4129001	OTHER HEAVY CONSTR		

Contract Description / Description du contrat

Certificate No. / N° de certificat
202082072
15196412268

Contact the WSIB if you question the validity of this document.
Veuillez communiquer avec la CSPAAT si vous doutez de la validité du présent document.

02 May 05 01:53p

Greg Prichard

PAGE 01

MAY-02-2005 11:48AM FROM-Stevenson & Hunt

T-288 P.002/002 F-464

stevenson & hunt

Wellington Square
400 - 250 York Street
London, Ontario N6A 6K2
Tel: (519)-646-5800 Fax: (519)-646-5812

CERTIFICATE OF INSURANCE

This is to Certify to:

W.M. Slater & Associates Inc.
21 Garfield Avenue
Toronto, Ontario
M4T 1E6

The Policies of Insurance as herein described have been issued by the Insurer to the Insured named below and are in force as indicated below

Name of Insured	Watech Services Inc.
Address of Insured	895 Valera Street, London, Ontario N6H 2Z4

Location and/or Operation to Which This Certificate of Insurance Applies

Operations Usual to the Business of the Insured as *Commercial Divers Involving Underwater Engineering and Construction.*

Re: **Water Tower Post Tensioning Tendon Replacement and Dome Ring Repair in the Town of Amherstburg.**

Name of Insurer	Liability Insurers issued through Elliot Special Risk Ltd.			
Type of Coverage	Policy No.	Effective Date	Expiry Date	Limit Canadian Funds
Commercial General Liability	891862	Mar. 13, 2005	Mar. 13, 2006	\$2,000,000.

Name of Insurer	Various Insurance Companies issued through Elliot Special Risk Ltd.			
Type of Coverage	Policy No.	Effective Date	Expiry Date	Limit Canadian Funds
Umbrella Liability	EXT31237	Mar. 13, 2005	Mar. 13, 2006	\$3,000,000.

Notes:
With respect to Commercial General Liability only, The Town of Amherstburg & W.M. Slater & Associates Inc. are added as additional insured **BUT** only with respect to liability arising out of the operations of the "Named Insured" in which the additional insured has an interest.

The Insurance afforded is subject to the Terms, Conditions, and Exclusions of the Policy(s) above cited. This Certificate is issued as a matter of information only and confers no rights on the holder and imposes no liability on the Insurer. The Insurer will endeavour to mail to the holder of this certificate *Fifteen (15) days* written notice of any material change in or cancellation of the Policy(s) above cited but assumes no responsibility for failure to do so.

Stevenson and Hunt Insurance Brokers Limited

May 2, 2005

Dated at London, Ontario

Lee Gallagher, C.A.I.B.

Authorized Representative of Insurer

STEVENSON & HUNT
INSURANCE BROKERS LIMITED

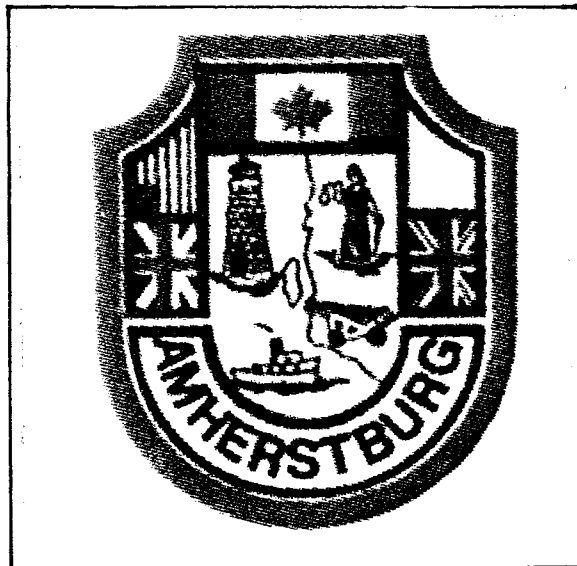
W.M. SLATER & ASSOCIATES INC.

AMHERSTBURG WATER TOWER

TECHNICAL DOCUMENT For POST-TENSIONING TENDON REPLACEMENT & DOME RING BEAM INSPECTION

(Stage 3)

(Drawings & Specifications)



**Authority:
Engineering Authorization:
Date:**

**L. Zarlenga, P.Eng.
January 25, 2005
February 2005**

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1.0 GENERAL

The approximate ½ million gallon elevated water tank is of wire wound prestressed gunite concrete construction and is owned by the Town of Amherstburg and operated by OCWA.

Authorization for the PT replacement contract work will be authorized in writing by the Town of Amherstburg on their Standard P.O./Contract Documents or letter of authorization.

The inspection/investigation of the 1 m long crack/spall in the south west of the dome ring beam will be carried out at the same time and in combination with the post-tensioning inspection/replacement with a 160 ft. reach manlift or equal inspection equipment.

Time is of the essence of the contract.

Contract administration and construction services will be provided by the Town's consulting engineers W.M. Slater & Associates Inc. and CH2M Hill.

2.0 REFERENCE DOCUMENTS

2.1 W.M. Slater & Associates Inc.

Reference Drawings

<u>Dwg. No.</u>	<u>Title</u>	<u>Date</u>
SK 80-14-1A	General	October 30/1980
SK 80-14-2	Special Anchorage 2/16 mm	October 24/1980
SK 80-14-3	Details	
8102-1B	Layout (As-Built)	Mar. 15, 1982
8102-2C	Details (As-Built)	Mar. 15, 1982
86-1-2A	Insulation & Cladding (As-Built)	May 27, 1987

2.2 W.M. Slater & Associates Inc.

Reference Documents

2.2.1	Report on 2004 Inspection & Recommendations	December 2004
2.2.2	Post-Tensioning (PT) Cable Inspection Monitoring Procedures	December 2004

3.0 DESCRIPTION & DIVISION OF THE WORK

3.1 General

The PT tendon replacement work will be carried out with the tank in service, possibly at a reduced head, depending on the results of the tendon monitoring, and in stages, single tendons being replaced one at a time, in a specified order.

3.2 PT Contractor

The post-tensioning contractor will provide and be responsible for the supply FOB site of all the PT materials, PT equipment, qualified and specialized PT personnel to remove and replace all existing tendons in stages including but not limited to de-tensioning existing tendons, attaching new steel tendons to old; installing new extruded tendons protected in hoses/tubes around the tank; removing all existing strands and plastic ducts and transporting to an approved disposal site; tensioning new tendons to the specified forces in the specified order; removal and tagging and storage of removed strands for examination by consultants before disposal.

3.3 Services Contractor

The services contractor will be responsible for all safety enforcement instructions, procedures and measures; provision of all safety equipment, harnesses etc., for all personnel; provision and operation of lifting equipment and 160' reach man lift(s) to top of tank wall or equal equipment and labour to assist the PT contractor during the PT cable replacement installation including the cutting out of 2 access ports and assisting in the temporary removal and replacement of the top cladding in the SW location of the dome to allow for the inspection of the 1 m long crack/spall and ring beam face of the dome ring beam, and video recording the condition; and such other tasks as directed by the Town's representatives.

4.0 SPECIFICATION NO. 1

SPEC NO. 1 – PROVISION OF ACCESS TO THE WORK (Services Contractor)

PART 1 - GENERAL

1.1 This work comprises the training and enforcement of safety and rescue procedures and the supply of safety equipment (harnesses etc.) for all personnel, and the supply, maintenance and operation of man lifts or equal during the PT and dome inspection operations; the reconditioning and operation of the existing dome hoist/or supply of alternative hoisting apparatus to lift up the PT contractors cables, jacking equipment, etc.; removal of existing strands and ducts; the cutting out of 2 – 9'-6" high x 6' wide access ports in metal cladding and insulation at PT anchorages at N and S locations and replacing and sealing insulation joints and cutting and fitting 2 new covers over the 2 ports; the removal of cladding/insulation and flashing from the top of the wall to allow inspection of the ring beam at the crack/spall and replace after inspection; and the carrying out of other tasks as directed by the Tower's representatives.

1.2 Sequence

- .1 Cut out 2 access ports to allow access to PT anchorages at N & S and store insulation etc.
- .2 Remove existing 4 port covers at N, S, E and W sides to act as observation ports during the tendon insulation.
- .3 Assist PT contractor in the proof testing of the methodology to install first pair of cables (nos. 5 and 6) and in stressing. Remove existing cables and ducts.
- .4 Assist in the installation of the remaining cables in the order specified.
- .5 Remove cladding/insulation for approximate 2 m length at the top of wall adjacent to the crack/spall in the top of the dome ring beam in order to allow inspection of the top and complete side of the 1'-6" high ring beam. (See WMS December 2004 Report Photo No. 15)
- .6 Replace and seal joints in the insulation and install 6 covers over the 6 ports in the cladding after completion of the work.

2.1 Safety Systems:

Provide all safety hardware (harnesses etc.) for all personnel and safety and rescue equipment all according to current Ontario Labour Safety Acts and Laws or better.

2.2 Man Lift(s) or Equipment:

Provide, maintain and operate man lift(s) or equal and hoisting equipment to reach and allow work to take place at the ring beam at the top of the wall, about 145 feet above grade level.

The cable removal and replacement work will take place at and below 110 feet above grade.

2.3 Hoisting Equipment:

Re-condition the existing hoist on the dome (See WMS Report Photo No. 20) and/or supply alternative hoisting/lifting equipment to allow cable replacement and dome inspection. Estimated maximum weight of two single cable coils or PT jacks and pumps approximately 500 lbs maximum (Check with PT contractor).

2.4 Tools and Hardware for Cutting Access Ports and Replacing Covers:

Provide tools and power leads for cutting 3" rigid insulation, cutting out metal cladding (De Walt or Stihl) saw and blades), stainless steel screws, power drills and screwdrivers, adhesive and duct tape etc., etc. to complete the task of constructing new access ports and fabricating and installing new covers from the metal cladding provided, and replacing all covers after completion of the work.

PART 3 - EXECUTION

3.1 Description

The services contractor will be responsible for the following tasks:

- .1 Provide, maintain and operate all safety equipment, man lifts or equal and lifting hoists.

- .2 Remove and replace existing port covers and insulation.
- .3 Locating, marking and cutting out metal cladding for 2 new access ports at the PT anchorages at the North and South, removing and storing existing insulation and fabricating and installing new covers over the new access ports.
- .4 Assisting and co-operating with PT contractor with the tasks of removing old tendons; installing new tendons; lifting up new cables and lowering down old cables and ducts; lifting up stressing jacks and hydraulic pumps, and generally carrying out other tasks as directed by the PT contractor.
- .5 Provide and maintain and operate a communications system between persons on ground and persons working in the air at all times.

3.2 New Ports

- .1 Remove covers and insulation from the 4 existing small ports first. At south port PT anchorages are visible.
- .2 Cut out new enlarged south port, 9'-6" x 6' wide, according to drawings, centred on south PT anchorages. Make 45⁰ cuts in insulation (to allow re-installation and sealing). Remove and store. Mark and identify location.
- .3 Measure location of centre line of North PT anchorages from centre line of South PT anchorages by measuring around the half circumference of the exterior of the metal cladding in both directions to check. Design circumference = 168'-4" (+/-)
- .4 North Port. Cut out small test port (1'-6" x 1'-6") in cladding and insulation to check that location is opposite North anchorages. Mark out the new 9'-6" high x 6'-0" wide door and cut out and remove the metal cladding. Store. Cut out and remove insulation at 45⁰, mark identification, and store.

3.3 Miscellaneous

- .1 Perform other tasks to assist PT contractor as described in Section 3.1 Description.

3.4 Inspection of Dome Ring Beam

- .1 Remove flashing, cladding and insulation from the top of the wall about 2 m long at the crack/spall in order to expose the full depth of the ring beam (1'-6" deep?).
- .2 Assist Town's representatives to inspect/investigate the ring beam and the crack in the dome. Take record photos.

- .3 After the inspection is completed replace and seal and tape insulation, cladding and flashing.

5.0 SPECIFICATION NO. 2

SPEC. NO. 2 – POST-TENSIONING

PART 1- GENERAL

1.1 Description

- .1 The work comprises the de-tensioning of the 360⁰ external cables, in pairs, in specified order, connecting on new individual single strands to the existing strands and pulling/jacking the existing strands 360⁰ around the tank until the new strands are in their required location.

Old strands and ducts will be removed temporarily stored and investigated. Each new pair of strands will be tensioned, in order, to the specified forces values.

1.2 Sequence

- 1 The sequence of de-tensioning the existing, and installation and stressing the new tendons will be according to Tables 1 and 2 below.

1.3 Standards

- .1 The latest edition of the following codes and standards, except where noted otherwise, shall be followed.

- (1) CSA-G279 Steel for Prestressed Concrete Tendons
- (2) PTI – Post-tensioning Manual

1.4 Submittals

- .1 Submit certificates for pressure gauges and calibrations of post-tensioning jacks certifying effective ram areas to the Consultant and obtain approval before work starts.

- .2 Two (2) copies of the mill certificate and two (2) copies of the stress strain curves representative of each lot of material to be used for new prestressing strands shall be submitted to the Consultant for approval.

1.5 Storage and Handling

- .1 Store new post-tensioning tendons in a clean dry place, prevent water from entering sheaths at all times, and protect from damage.

1.6 Replacement

- .1 If any post-tensioning materials are found to have deteriorated or are damaged during normal handling during installation, they shall be replaced with new materials.

2.2 Materials

- .1 Tendons shall be seven wire 0.6" (15 mm) diameter low relaxation galvanized or epoxy coated strand to CSA-G279 (GUTS = 260kN = 58.6 Kips).
- .2 Plastic sheaths shall be new extruded polyethylene free of visible striations or extruded plastic and with minimum wall thickness of 1.5 mm on greased strand.
- .3 No-corrode tendon protection grease shall conform to Table 3.2.1, page 207, of the PTI Post-Tensioning Manual, Fourth Edition, or better.
- .4 The extruded strand tendons with PE sheath will be pushed into approved thick wall rubber/neoprene hoses or PE pipe to protect the tendon sheaths from damage from rubbing against the rough gunite surface during installation and stressing.
- .5 All post-tensioning hardware such as anchorages etc. shall be hot dip galvanized.
- .6 New, unused, prestressing wedges tested for use with 15 mm dia., 260 kN (58.6k) ultimate coated strand shall be used.
- .7 Use grease tape to seal outer sleeves over sheaths at anchorage and PVC tape to repair sheaths.
- .8 Anchorage blocks shall be: The existing anchorages cleaned and touched up with zinc rich paint and new ducts and grips.

OR D.S.I. Ring Type for 1-15 mm strand or equal to fit as shown, and epoxy coated or hot dip galvanized to CSA G164.

- .9 Sheathing connections to anchorages shall have double protection using grease filled short outer sleeves placed over the inner sheath and sealed with grease tape to the total assembly shall be water tight inside the ducts.

- .10 The outer polyethylene pipe ducts shall be manufactured to the CSA Standard for 75 psi (525 kPa) maximum cold water pressure pipe.

2.3 Equipment

.1 Tensioning Equipment

Tensioning shall be carried out using a jack to fit anchorages and within the ports and the air gap.

2.4 Concrete Anchors

Threaded stainless steel, or galvanized Hilti anchors used to fasten post-tensioning hardware to wall shall be secured in drilled holes only, up to 6' height above floor level.

PART 3 – EXECUTION

3.1 Qualifications

- .1 Ensure that post-tensioning operators have three years' experience on tanks or silos (minimum).

3.2 Fabrication

.1 Anchorage

New anchorage assemblies shall be galvanized or epoxy coated and all components shall be permanently protected against corrosion.

.2 Tendons

The 15 mm greased galvanized or epoxy coated strand tendons shall be coated with continuous extruded plastic sheaths and shall be fabricated and coiled in a plant qualified by the PTI to fabricate unbonded tendons. The space between the strands and the sheathing shall be completely filled with grease of the specified type. The tape to tie and hold fabricated tendons together on coils during transportation shall be fibre reinforced adhesive tape not wire.

The sheathed tendons will be pushed into plastic tubes or hoses so that the strands are double walled for protection.

3.3 Transportation

- .1 Coiled tendons shall be loaded on truck flat to prevent vibration damage to the sheathing.
- .2 Tendons arriving on site either damaged or with torn casings shall be rejected.

3.4 Installation

- .1 Uncoil and carefully sheathed tendons in approved ducts for protection.
- .2 Repair sheathing with a triple wrap of PVC adhesive tape.
- .3 Failed Strands (No. 6 from top): Inspect ends of strand No. 6 at the anchorage to determine whether an anchorage (chuck and wedge) has failed (released)? If so, connect new strand to existing and pull around tank. If not, strand No. 6 has broken. Pull both ends out, remove, and investigate cause of break. Install new tendon No. 6 as described in 3.4.5 after new No. 5 is installed.
- .4 Strand Forces and Elongations – See Table 2
NOTE: Initial force in top 6 strands (Nos. 1 to 6) is 10 kips and elongation is 2 ¼".
Initial force in middle 12 strands (Nos. 7 to 18) is 46.9 kips with a total elongation of 11 inches.
- .5 New No. 5 Strand: Remove existing and replace with new. De-tension existing No. 5 at both ends (elongation 2 ¼"). Connect new No. 5 strand to old strand using pipe connections over strands or braze/weld ends together. See 3.4.6 below. Pull/jack new tendon No. 5 (and No. 6 fish wire) around tank into existing angle supports. Inspect that travel and fit around is OK through 4 small ports.
- .6 New strand No. 6: If existing No. 6 strand is broken, then the new No. 6 tendon must be pulled around with a "fish" cable attached to and pulled around with the new No. 5 tendon.
- .7 Tension No. 5 and No. 6 strands each to 10K.
- .8 Proceed with de-tensioning and removing remaining existing strands and ducts one at a time and installing and stressing new tendons one at a time in the order specified in Table 1.

NOTE: De-tension, remove, replace, and stress each single strand in order before de-tensioning the next strand in order.

- .9 Sheathing at the anchorage shall be trimmed to length and inserted in an outer waterproof plastic adapter sleeve and the joints sealed with waterproof grease tape to prevent any intrusion of water or grout into the sheathing.
- .10 Drilling into vertical face of wall above 6' above top of floor is not permitted.

3.5 Stressing

- .1 Stress each 15 mm strand from both ends of each strand in the order and to the values in Table 1 following:

TABLE 1
0.60 DIAMETER MONOSTRAND
POST-TENSIONING FORCES AND ELONGATIONS
 (Refer to Contract Drawings for tendon numbers and locations re installation)

	Order	Tendon No. (from top)	Initial Force		Total Elongation
			Kips	kN	
SOUTH ANCHORAGES	1	6	10		To be calculated by the Contractor and approved by the Consultant before installation
	2	5	10		
	3	9	47		
	4	10	47		
	5	13	47		
	6	14	47		
	7	17	47		
	8	18	47		
	9	1	10		
	10	2	10		
NORTH ANCHORAGES	11	3	10		
	12	4	10		
	13	7	47		
	14	8	47		
	15	11	47		
	16	12	47		
	17	15	47		
	18	16	47		
	19	19	24		
	20	20	24		

TABLE 2
NUMBERING OF TENDONS IN PAIRS FROM TOP AND
REMOVAL AND STRESSING ORDER

S = South N = North

Tendon No.	Removal & Stressing Order	Anchorage	Initial Force		Comments
			Kips	kN	
1	9	S	10		Tendon Failure
2	10	S	10		
3	11	N	10		
4	12	N	10		
5	2	S	10		
6	1	S	10		
7	13	N	47		
8	14	N	47		
9	3	S	47		
10	4	S	47		
11	15	N	47		
12	16	N	47		
13	5	S	47		
14	6	S	47		
15	17	N	47		
16	18	N	47		
17	7	S	24		
18	8	S	24		
19	19	N			
20	20	N			

3.5 Stressing (continued)

- .2 Elongation and pressure shall be measured and recorded at each stage. Variation of +/-5% shall be permitted.
- .3 Submit records of pressures and elongations measured to the Consultant as soon as possible for approval, before trimming strand ends.
- .4 Cap ends to provide permanent protection against corrosion.

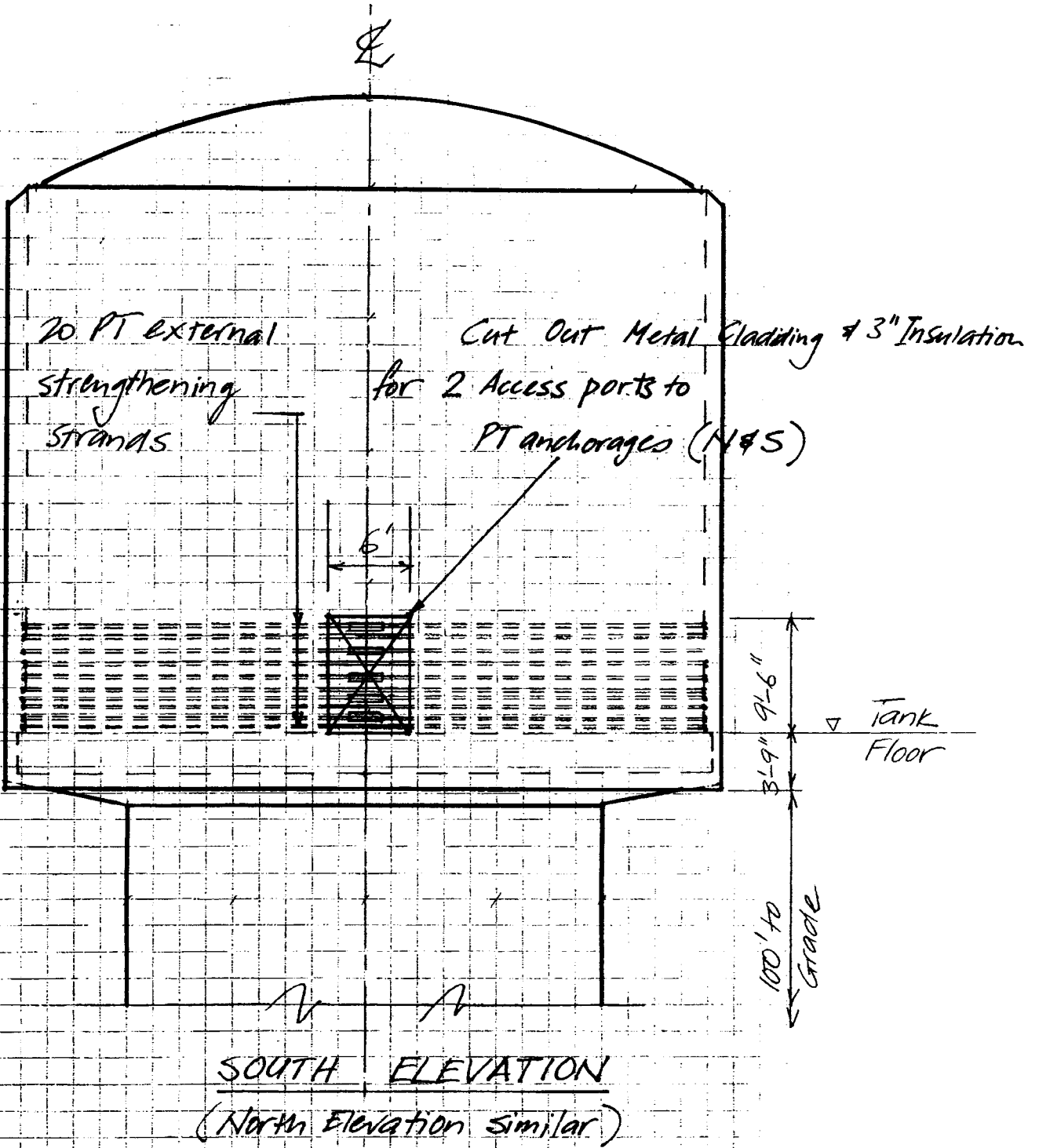
3.7 Investigations

- .1 Failed strands will be inspected to determine whether the failures were at the anchorages or within the strands themselves. The cause of failure will be determined (corrosion etc.?)
- .2 Each strand removed will be permanently tagged with the identification listed number in Table 2.
- .3 Ducts will be collected and disposed of in an approved area.
- .4 Removed strands will be temporarily stored in a covered area for examination and photographing by the Consultants. OCWA to assist.
- .5 After examination, the strands will be disposed of.

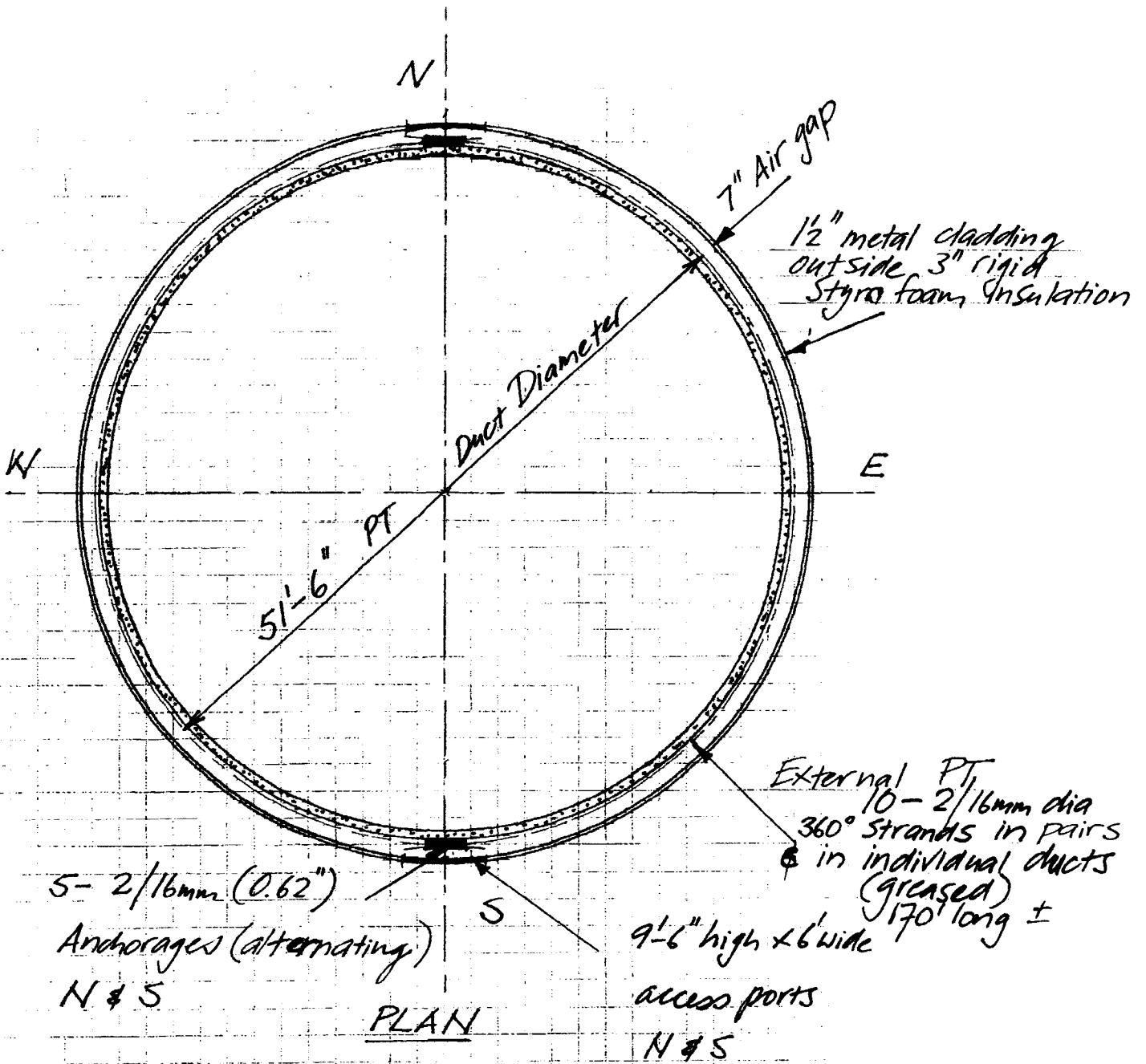
6.0 APPENDICES

APPENDIX 6.1 PT Tendon Replacement Drawings

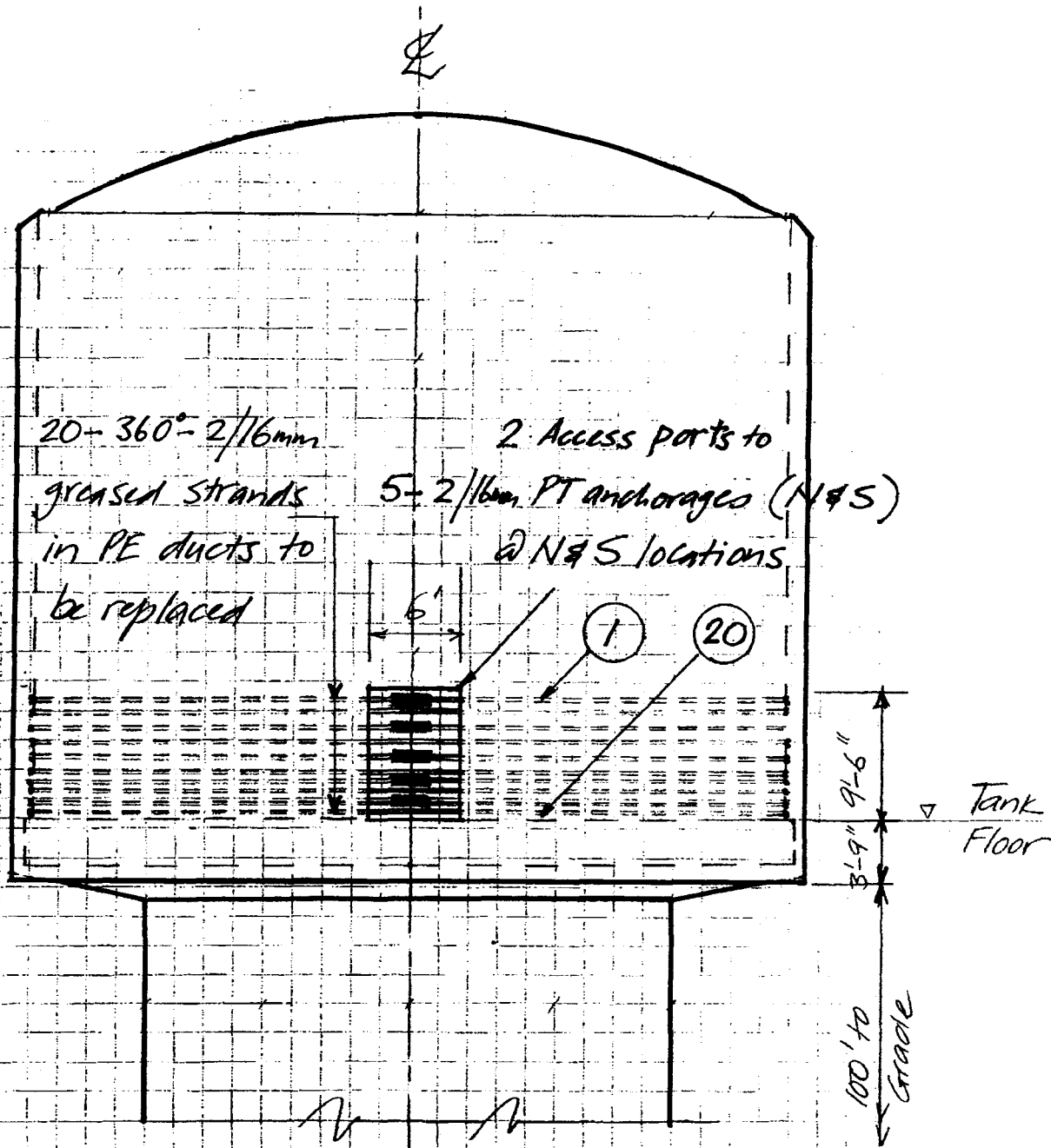
<u>Dwg. No</u>	<u>Title</u>
SK 5-1	South Elevation
SK 5-2	Plan
SK 5-3	Details
SK 80-14-2	Anchorage Details 2/16 mm
SK 80-14-3	Details



W.M. SLATER & ASSOCIATES INC.	AMHERSTBURG WATER TOWER	
	PT TENDON REPLACEMENT	
	SOUTH ELEVATION	
	December 2004	Dwg. No SK4-1



W.M. SLATER & ASSOCIATES INC.	AMHERSTBURG WATER TOWER	
	PT TENDON REPLACEMENT	
	PLAN	
	December 2004	Dwg. No SK4-2

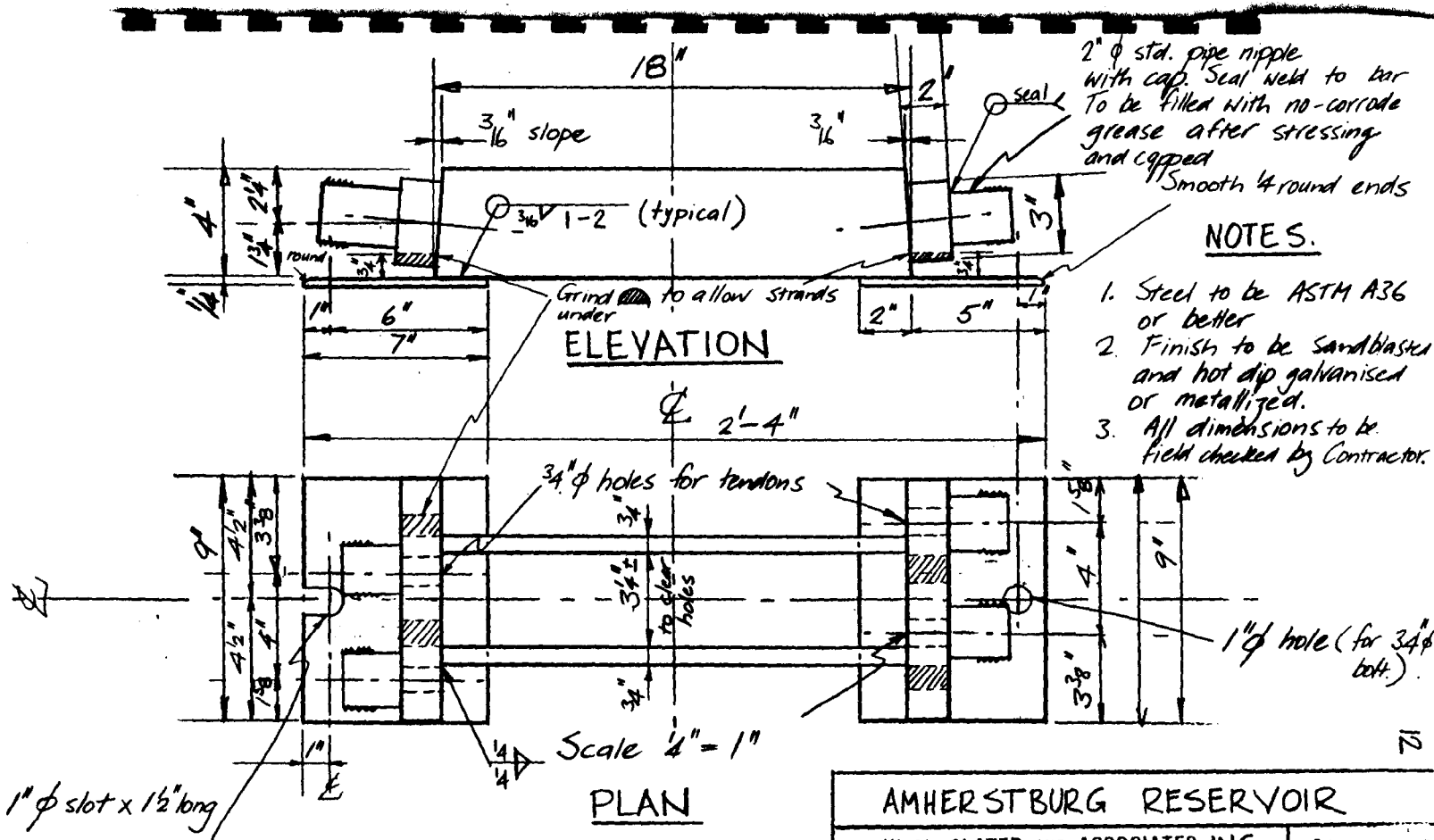


SOUTH ELEVATION

(North Elevation Similar)

(N) PT Tendon Nos. from top

W.M. SLATER & ASSOCIATES INC.	AMHERSTBURG WATER TOWER	
	PT TENDON REPLACEMENT	
	DETAILS	
	December 2004	Dwg. No SK4-3



2" ϕ std. pipe nipple
with cap. Seal weld to bar
To be filled with no-corrode
grease after stressing
and capped
Smooth & round ends

NOTES.

1. Steel to be ASTM A36 or better
2. Finish to be sandblasted and hot dip galvanized or metallized.
3. All dimensions to be field checked by Contractor.

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AMHERSTBURG RESERVOIR

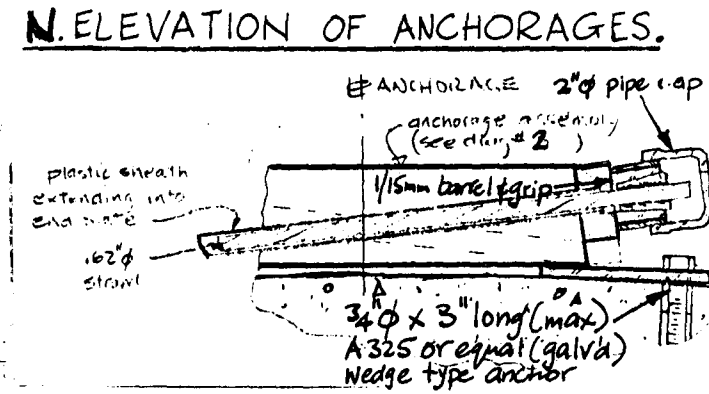
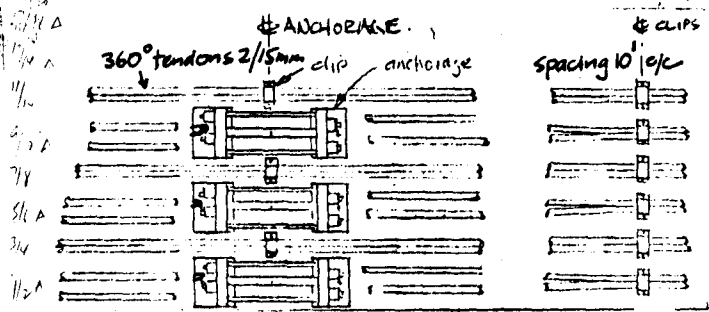
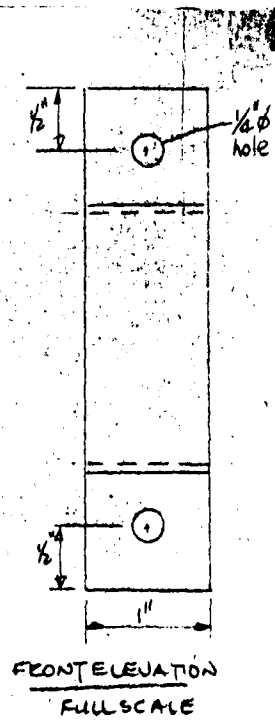
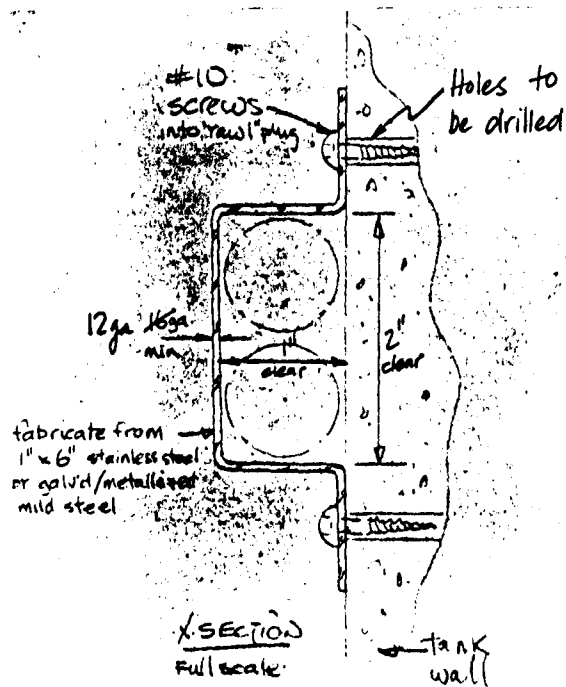
W. M. SLATER AND ASSOCIATES INC

SK 80-14-2

24 OCT 80

6REQ

SPECIAL ANCHORAGE 2/16mm



RETAINER CLIPS FOR TENDONS.

(100 REQ. APPROX.)
SPACING AT 10 FT/C/C.

DETAILS

AMHERSTBURG RESERVOIR	
W. M. SLATER AND ASSOCIATES INC.	SK 80-14-3
<i>WMS</i>	24 OCT 80

APPENDIX 6.2

**PT Cable Inspection/Monitoring Procedures – December 17, 2004
(3 pages)**

AMHERSTBURG WATER TOWER POST-TENSIONING (PT) CABLE INSPECTION/MONITORING PROCEDURES.

1.0 GENERAL

1.1 OBJECTIVES

The objectives of these procedures are as follows:

- .1 To alert Town's representatives of any additional PT cable failures.
- .2 To outline the proposed monitoring details, schedule and requirements to the services contractor and to all parties.
- .3 To specify the photographic records and technical observations to be made and transmitted to the Town's consultants.
- .4 To report on any unusual changes in the leakage rates or other characteristics in the tank operations.

1.2 DESCRIPTION

- .1 During an inspection of the 20 PT cables through the North port on November 23, 2004, one cable (No. 6 from the top) was observed to be loose (looped) indicating failure. (See WMS Report Dec. 2004 – Photos 3 and 4)
- .2 All functioning tensioned cables should be tight against the concrete tank wall.
- .3 The monitoring work comprises the supply, maintenance and operation of equipment and labour to remove and replace the N port cover and insulation, and to inspect, record, and transmit photos and results of the monitoring observations of the 20 external post-tensioning cables on the tank during 3 monitoring inspections.

1.3 SCHEDULE

Three (3) scheduled monitoring inspections, roughly 8 weeks apart, are proposed. The first two (2) will be carried out by the services contractor and the third monitoring in early May will be with the post-tensioning contractor and Town's representatives and consultants. The 3 actual monitoring target dates will be determined by weather outlook and within the periods as follows:-

First Inspection: January 2005: Last week (24th to 31st)
Second Inspection: March 2005: Last week (24th to 31st)
Third Inspection: (with all parties): May 2005 First week (2nd to 9th)

Advise T. Hearn, OCWA and WMS Inc. of actual dates

W.M. SLATER & ASSOCIATES INC.

Terry Hearn

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1.4 REFERENCES

1.4.1 W.M. Slater & Associates Inc. Reference Drawings. Copies available at Water Plant.

Dwg. No.	Title	Date
SK 80-14-1A	General	October 30, 1980
SK 80-14-2	Special Anchorage 2/16 mm	October 24, 1980
1K-80-14-3	Details	
8102-1B	Layout (As-Built)	March 15, 1982
8102-2C	Details (As Built)	March 15, 1982
86-1-2A	Insulation and Cladding (As-Built)	May 27, 1987

1.4.2 W.M. Slater & Associates Inc. Reference Report

2004 Inspection and Recommendations – December 2004

2.0 INSPECTION PRODUCTS AND EQUIPMENT

- 2.1 **Safety Equipment:** Carry out all safety procedures and provide all safety and rescue equipment.
- 2.2 **Man Lift:** Provide 125 ft. reach man lift for first two (2) inspections and 160 ft. man lift(s) (to reach dome also) for third inspection.
- 2.3 **Lights & Mirror:** Provide powerful flash lights (See OCWA) to light up air gap down 9 ft. to bottom cable (No. 20). Provide 6" x 6" mirror to allow 45° reflected viewing from man lift.
- 2.4 **Cameras and Photographs:** Take video, digital and 35 mm photo records of 20 cables. Transmit digital photos by email same day to wslater@rogers.com and remainder by courier.

3.0 EXECUTION

3.1 **DESCRIPTION:** The inspection/monitoring through the North port is to observe (and record) if there are any more loose (failed) cables additional to No. 6 from the top. If any more are observed then WMS is to be advised immediately. Cables to be numbered from top down, 1 to 20. Email: wslater@rogers.com. Phone: 416-487-9508

3.2 PORTS – PREPARATION & REPLACEMENT

- .1 The first two (2) inspection/monitorings will be through the North port only (slightly west of North).
- .2 For the third inspection/monitoring all four ports at north, south, east and west will be removed and stored.
- .3 Replace insulation and covers after all inspection/monitorings are completed.

W.M. SLATER & ASSOCIATES INC.

Terry Hearn

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3.3 INSPECTION PROCEDURES

- .1 Inspector to place head in port, shine light beam to left and right of vertical to observe that all 20 cables are tight. Note to right of centre that No. 6 from top is loose. Report if there are any other loose cables observed.
- .2 Drop light down on rope to provide additional light.
- .3 Carefully search down along wall if there are any other cables which are not tight against the wall. If so, note location and number down from top and report to WMS.
- .4 Photo Records. Take video, digital and 35 mm photographic records of cables in air gap to illustrate location and condition.
- .5 Despatch (email) observations and records to W. Slater, P.Eng. and T. Hearn, P.Eng. as soon as they become available.
- .6 Any further loose cables and locations should be reported immediately.