



Thunder Bay District  
**Health Unit**

**FORM OF TENDER #002/2011**

<b>DESCRIPTION:</b>	Landscape Restoration and Development
<b>SUBMISSION DETAILS:</b>	Main Reception Desk 999 Balmoral Street Thunder Bay, ON P7B 6E7
<b>MANDATORY SITE VISIT:</b>	4:30 P.M., WEDNESDAY, APRIL 6, 2011; see page 3
<b>RECEIPT OF PROPONENTS QUESTIONS:</b>	4:30 P.M., WEDNESDAY, APRIL 13, 2011
<b>CLOSING DATE:</b>	<b>TUESDAY, APRIL 19, 2011</b>
<b>CLOSING TIME:</b>	Not later than 4:00 P.M. Local Time

I/We, the undersigned, do hereby tender and offer to enter into contract with the Thunder Bay District Health Unit (TBDHU) for Landscape Restoration and Development Services, all in accordance with the attached TBDHU Standard Terms and Conditions and all the specifications and terms of the TBDHU's tender which are set forth below and attached at the prices indicated in the space provided for that purpose, all to the entire satisfaction of the Manager of Finance or her designate.

The prices quoted include all duty, taxes (other than HST and PST), customs, clearances, cartage, freight and all other charges now or hereafter imposed or in force and is a Total Firm Price. Harmonized Sales Tax (HST) and Provincial Sales Tax (PST) to be EXTRA. Taxes must be shown separately on invoicing.

It is understood and agreed that the proponent has by careful examination, satisfied himself as to the nature and location of the work, the quality and quantity of service to be encountered, and the facilities needed in the completion of the work. In signing below, all terms and conditions stated herein are accepted.

I/We hereby estimate to commence Part A in \_\_\_\_\_calendar days after notification of award of tender and complete the job in \_\_\_\_\_calendar days.

I/We offer all necessary labour, equipment and materials for Landscape Restoration and Development, as specified.

AS PER SCHEDULE OF PRICES – See page 5.

**NOTE: This form must be completed, properly signed by an authorized official and received on or before the date and time specified, or your tender will not be considered.**

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Print Company Name Mailing Address

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City Postal Code Phone Number

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Signature of Authorized Official Date Fax Number

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Please Print Name Cellular Number

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E-mail Address

THREE (3) COPIES and ONE (1) ORIGINAL bid form are to be submitted on the forms provided, in a sealed envelope bearing the Submission Label to the Main Reception desk, Thunder Bay District Health Unit, 999 Balmoral Street, Thunder Bay ON P7B 6E7.

THE LOWEST OR ANY TENDER NOT NECESSARILY ACCEPTED  
LATE TENDERS WILL NOT BE ACCEPTED  
FACSIMILE, E-MAIL OR TELEPHONE TENDERS WILL NOT BE ACCEPTED

**SPECIFICATIONS**

**IN GENERAL**

Landscape Restoration and Development services must include all materials and labour required for a complete job as specified. The successful contractor shall be responsible for the supply, delivery, installation, testing and training (if applicable). Contractor must complete the job in a complete and operable manner.

First class quality workmanship and materials are required throughout. No defective, unsound or improper material for workmanship shall enter into the work or be brought on the premises.

The specifications in this tender request are the basic minimum requirements that are necessary to obtain the desired performance, reliability and low cost of operation and maintenance.

The TBDHU shall be the sole judge as to the acceptability of any alternative offered...without recourse or penalty.

Bidders shall fill out confirmation and/or comments of each and every corresponding item as indicated. Failure to complete such confirmation may result in the unacceptability of the tender.

Unless an alternate product is already listed on the attached plans, no substitutions shall be made without the express written consent of the TBDHU. The acceptance of a substitute for one item shall not be interpreted as acceptance for any additional orders or deliveries unless expressly granted by the TBDHU.

Werner Schwar, Landscape Architect, will provide technical/resource services to the TBDHU, and will have the right to inspect the work as required to ensure the best interests of the TBDHU are met.

### **TENDER DEPOSIT**

Each bidder shall include a 10% bid deposit in the form of a Certified Cheque or an Irrevocable Unconditional Bank Letter of Credit, payable to the Thunder Bay District Health Unit. No interest shall be payable. Failure to include such bid deposit shall result in the tender not being considered.

Bid deposits shall be returned to unsuccessful bidders within a reasonable time after consideration and award of the contract. The bid deposit of the successful bidder shall be held until satisfactory completion of all work.

**Confirm/Acknowledge:**

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### **MANDATORY SITE VISIT INFORMATION SESSION**

**It is mandatory for proponents to attend this session before submitting a proposal.**

It is understood that the proponent has, before submitting their bid, visited the site of the work, has made careful study of the work to be done and is thoroughly familiarized with the existing conditions.

There will be a one-time only site visit and meeting to be held on:

**Tuesday, April 5, 2011  
4:30 P.M., Local Time  
Thunder Bay District Health Unit  
999 Balmoral Street  
Thunder Bay, ON**

**NOTE: Bidders must register with the Health Unit representative conducting the site meeting. Failure to attend and to register will result in your bid not being accepted.**

**ATTACHED** are the following Specifications, Scope of Work and Drawings:

Attachment #1 - Approved Landscape Restoration and Development Plan, includes four (4) documents attached separately as L-1.1; L-2.1; L-3.1 and L-3.2.

Attachment #2 – Project Summary

Attachment #3 – Project Specifications – Excavating, Trenching and Backfilling

Attachment #4 – Project Specifications - Top Soil and Finish Grading

Attachment #5 – Project Specifications - Pebble Mulch

- Attachment #6 – Project Specifications - Planting of Trees, Shrubs and Groundcovers
- Attachment #7 – Project Specifications – Sodding
- Attachment #8 – Site Grading
- Attachment #9 – Unit Paving
- Attachment #10 – Tree and Shrub Preservation
- Attachment #11 – Standard Terms and Conditions
- Attachment #12 – Submission Label

### **RIGHTS RESERVED BY THE THUNDER BAY DISTRICT HEALTH UNIT**

The TBDHU reserves the right to award this contract in whole or in part...without recourse or penalty, that which is deemed most advantageous to the TBDHU.

The TBDHU reserves the right to negotiate minor changes or variations to this tender with the successful vendor without recalling the tender.

Inspection: The purchaser reserves the right to reject and return goods to the vendor, at vendor's expense, should any item fail to meet the terms and conditions or specifications as outlined herein.

### **INTERPRETATION OF ESTIMATES**

The quantities shown in this Request for Tender document are estimated only and shall be used as a basis for calculation upon which the award of the contract will be made. These quantities are not guaranteed to be accurate and are furnished without any liability to the TBDHU, whether decreased or increased.

Quantities shown are estimated requirements only and should not be interpreted as either a minimum or maximum commitment.

### **SAFETY REGULATIONS**

All personnel on the job site must be wearing:

- Safety Footwear, CSA Class 1 with sole protection ("Green Patch")
- Safety Hard Hat
- Face Shield and Work Gloves (where applicable)
- Hearing Protection (where applicable)
- Safety Vests (where applicable) shall be worn; safety vests shall be reflective fluorescent and coloured blaze orange or red.

All work performed under this Contract must be carried out in accordance with the terms and conditions of the Occupational Health & Safety Act, R.S.O., 1990, as amended, and with the Corporate Safety Standards and Policies of the Thunder Bay District Health Unit. All persons working on TBDHU contracts shall be required to wear personal safety equipment at all times.

Failure to comply with Safety Regulations may result in the immediate cancellation of this contract.

**Confirm/Acknowledge:**

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**SCHEDULE OF PRICING**

**PART A**

TOTAL FIXED COST – PROJECT #5 \$

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TOTAL FIXED COST – PROJECT #6 \$

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FIXED COST FOR MAINTENANCE OF ALL PLANT MATERIALS  
FOR TWO YEARS AFTER FINAL PLANT INSTALLATION DATE \$

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**PART B – Optional**

These components of the project will be subject to funding, which will not be confirmed until at least September, 2011.

TOTAL FIXED COST – PROJECT #7 \$

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TOTAL FIXED COST – PROJECT #8 \$

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TOTAL FIXED COST – PROJECT #9 \$

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FIXED COST FOR MAINTENANCE OF ALL PLANT MATERIALS  
FOR TWO YEARS AFTER FINAL PLANT INSTALLATION DATE \$

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**QUALIFICATIONS**

Organizations, firms or individuals submitting tenders must demonstrate to the TBDHU, past experience and knowledge in Landscape Restoration and Development services, and that they comprehend the scope of the operations proposed.

List of previous or current services of a similar nature. Include names and contact information:

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**JOB SCHEDULING**

All work is to be scheduled by contacting:

Robert Hookham, Coordinator – Facilities & Fleet  
Phone: (807) 625-8383  
Fax: (807) 625-4827

Note: Work is to be scheduled/completed to ensure minimal disruption of clients and staff of the TBDHU. Regular office hours are 8:30 A.M. to 6:00 P.M., Monday to Friday.

**Confirm/Acknowledge:**

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**TENDER EVALUATION**

For purposes of tender evaluation, the total cost of the base price as specified in the tender will be considered.

**PERMITS** (as applicable)

The contractor is responsible for all applicable permits.

**CANCELLATION OF CONTRACT**

The TBDHU reserves the right to terminate the contract without notice if due to non-performance and unsatisfactory service.

The TBDHU reserves the right to call in alternate supplier if the tenderer is unable to provide the service when it is requested.

### **WITHHOLDING OF PAYMENT**

The TBDHU may withhold any or all payments to the contractors or portions thereof if circumstances where the Contractor is considered by the TBDHU or Contract Administrator to be unreasonably in default of specified times for completion of the work.

### **WORK DELAYS**

If the Contractor is delayed in the performance of the Work by labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized contractors' association, of which the Contractor is a member or to which the Contractor is otherwise bound), fire, unusual delay by common carriers or unavoidable casualties, or without limit to any of the foregoing, by a cause beyond the Contractor's control, then the Contract Time shall be extended for such reasonable time as the Consultant may recommend in consultation with the contractor. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the Contractor agrees to a shorter extension. The Contractor shall not be entitled to payment for costs incurred by such delays unless such delays result from actions by the Owner.

### **INDEMNITY**

The contractor shall indemnify and save harmless the TBDHU from and against all liens, damages, losses, claims, demand payments, suits, actions, recoveries and judgments of every nature and description brought against him and/or the TBDHU by reason of any act or omission of the said contractor, his agents, or employees in the execution of, or as a result of the work or in the guarding of it. All permits and fees applicable shall be acquired and paid for by the contractor.

### **AWARDS**

The TBDHU, unless it otherwise states, reserves the right to award by item, or part thereof, groups of items, or all items of the tender, and to award contracts to one or more bidder submitting identical tenders as to price; to reject any and all submission in whole or in part; to waive technical defects, irregularities and omissions, if in so doing, the best interests of the TBDHU will be served.

### **INTENT OF SPECIFICATIONS**

Should any work or materials be required which are not detailed in the specifications, either directly or indirectly, but which are nevertheless necessary for the proper carrying out of the intent thereof, the Contractor is to understand the same to be implied and required, and shall perform all such work and furnish any such material as fully as if they were particularly delineated or described.

No after claim will be allowed or entertained for obstructions or work necessary to fully complete the work whereon said contractor made tender.

**PROGRESS AND COMPLETION**

The Contractor shall commence the work immediately upon receiving notice of award of the contract and shall complete the work in accordance with the specifications within a reasonable period.

**INSURANCE (From Successful Contractor Only) (If applicable)**

The contractor shall, during the course of any work for the TBDHU, maintain general comprehensive liability insurance coverage in respect to the risks hereunder set out in the amounts stated, and shall file with the Manager of Finance of the TBDHU a certificate issued by the Insurer attesting that he is so insured.

<u>GENERAL LIABILITY</u>	Minimum Requirement
BODILY INJURY	\$2,000,000
PROPERTY DAMAGE	Inclusive

<u>AUTOMOBILE LIABILITY</u>	Minimum Requirement
BODILY INJURY	\$2,000,000
PROPERTY DAMAGE	Inclusive

**Confirm/Acknowledge:**

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**CERTIFICATES REQUIRED (From Successful Contractor Only) (If applicable)**

Prior to the commencement of any work under this contract the contractor will file with the TBDHU, to the attention of the Manager of Finance a Certificate of Insurance and Certificate Undertaking to Comply (Contractor Safety Policy) and WSIB Clearance.

**WORKPLACE SAFETY & INSURANCE ACT  
(From Successful Contractor Only) (If applicable)**

The Contractor shall also furnish evidence of compliance with all requirements of the Workplace Safety & Insurance Act. Independent operators will need CONFIRMATION from the Workplace Safety & Insurance Board (WSIB):

- le.
  - i) Certificate of Clearance
  - ii) Letter of Good Standing
  - iii) Independent Operator Letter

**IN REFERENCE TO WORKPLACE SAFETY & INSURANCE ACT**

The TBDHU requires all contractors and independent operators to have a Status Ruling done from the WSIB prior to any work being carried out for the TBDHU.

The TBDHU may not issue a purchase order to any contractor or independent operator until "Confirmation" from the WSIB is received.

Contractor or independent operators are to STATE if "Confirmation" and "Status Ruling" has been received from the WSIB.

STATE:

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### **CONTRACTOR'S UNDERSTANDING**

It is understood and agreed that the contractor has by careful examination, satisfied himself as to the nature and location of the work, the quality and quantity of materials to be encountered, the character of equipment and facilities needed in the completion of the work.

### **PUBLIC CONVENIENCES AND CONDITION OF SITE**

During the performance of the work, it shall be the contractor's responsibility to protect and not interfere with the public. The contractor shall not deposit any material upon any sidewalks, boulevards, but must remove all rubbish and other materials, clean up and thoroughly restore all such places to as good and tidy a condition as found.

The Contractor shall ensure client and/or staff safety at all times and especially with material storage and machine work. A safety plan is to be reviewed with the TBDHU prior to beginning construction to ensure minimal disruption and safety to clients/staff.

**Confirm/Acknowledge:**

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### **PERMITS**

All construction under this contract must be in strict accordance with all applicable federal, provincial and municipal codes and by-laws.

### **PROTECTION OF EXISTING WORK**

In carrying out the works from their inception until final acceptance, the contractor must be careful to cause as little injury or damage as possible to any adjacent property, public or private, or to any sidewalk, roadways, curbs, boulevards, sodding, trees, shrubs, or any other structures in the vicinity and must make good the same at his own expense.

### **CLEANING UP**

At the end of each day, the Contractor shall leave the site of the work in a clean, tidy condition and completely free of any debris which may have accumulated from his construction activities.

All work performed under this contract shall be in conformity with the Occupational Health & Safety Act, Regulation 691, R.S.O. 1980 – Chapter 321 and latest revisions thereof and with the Corporate Safety Standards and Policies of the TBDHU. All persons working on TBDHU contracts shall be required to wear personal safety equipment at all times.

**WHMIS**

All work performed must comply with WHMIS Legislation & Regulations.

**WARRANTY**

The Contractor, at his own expense, is to amend and make good any faults in work arising from improper or defective materials or workmanship which may appear within a minimum of one (1) calendar year from the date of the final inspection. (Where manufacturer's warranties are of a longer duration, the extended time period shall be honoured by the successful bidder).

Plant material is to be warrantied for two (2) years.

STATE AND/OR CONFIRM WARRANTY:

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**TESTS**

All necessary tests are the responsibility of the contractor. Experienced personnel to be on site during start-up operations and testing. Such tests are to be at NO EXPENSE TO THE TBDHU.

**SAFETY FEATURES**

The equipment supplied must meet all provincial and federal regulations which are in effect on the date of the manufacture of the unit.

**C.S.A. AND ONTARIO HYDRO APPROVED (If applicable)**

All equipment must be approved by the Canadian Standard Association and Ontario Hydro and bear labels as such.

**(IF APPLICABLE)**

Bidders are asked to list the various equipment, materials, model numbers, brands and manufacturers of such being offered.

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**UTILITY LOCATES**

Where applicable, any and all Utility Locates are the responsibility of the successful bidder and must sign all required documentation.

**EXTRA WORK**

All extra work over and above this contract must be authorized by the Manager of Finance.

LIST CURRENT OR PAST USERS OF THE PRODUCTS/SERVICES BEING OFFERED AND THE LOCATIONS WHERE THEY WERE USED.

PLEASE PROVIDE CONTACT NAMES AND PHONE NUMBERS AND SOME DESCRIPTION OF THE LENGTH OF OPERATION AND SCALE.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

**QUESTIONS/INQUIRIES:**

Communications concerning this Tender are to be directed to:

GEORGINA DANIELS, C.A., Manager of Finance

Phone: (807) 625-8349

Fax: (807) 625-4827

E-mail: georgina.daniels@tbdhu.com

Directing inquiries to other than the Manager of Finance or designate may result in your tender being rejected.

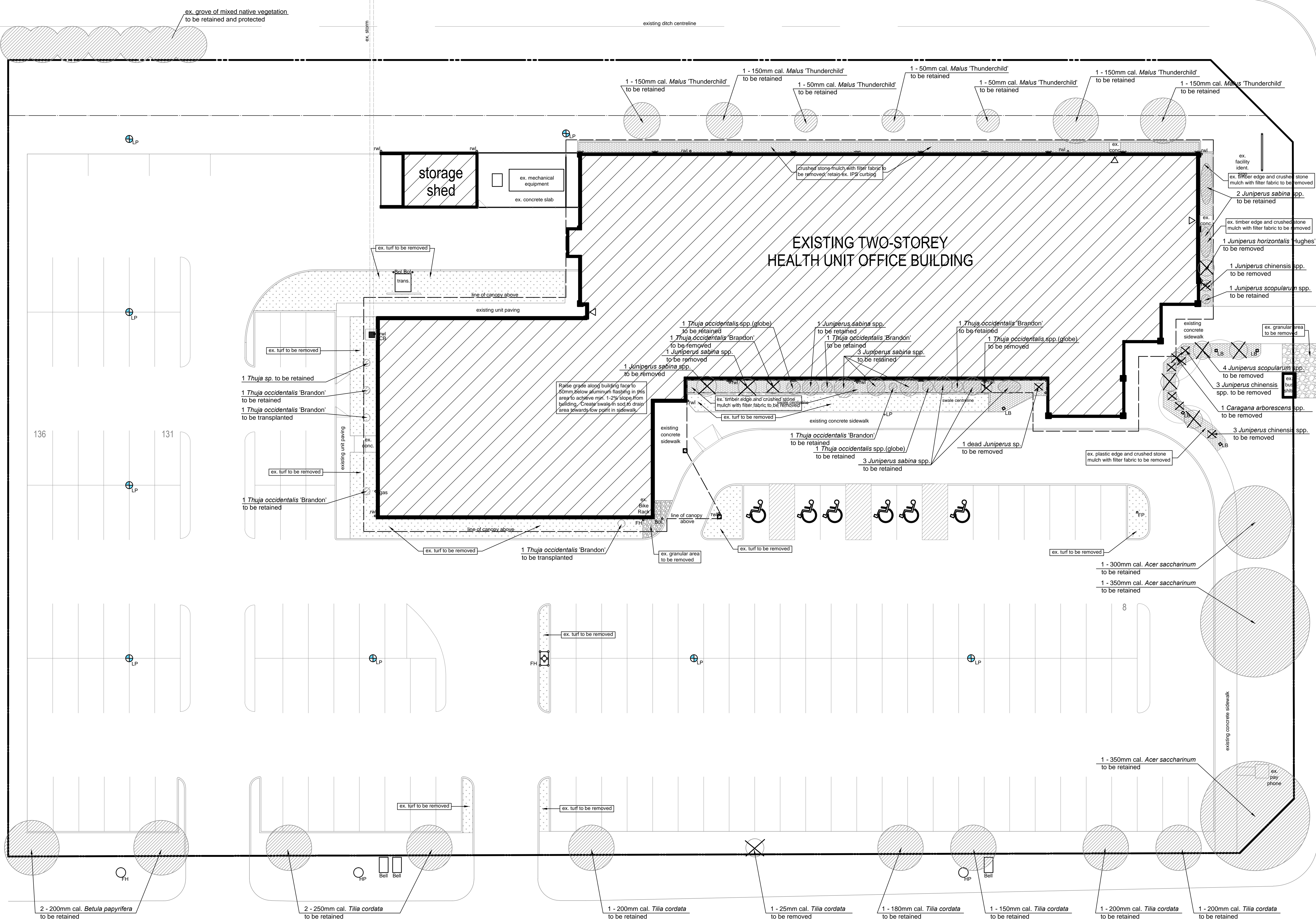
All clarification requests are to be sent, **in writing**, to the individual mentioned above no later than **4:30 p.m., Wednesday, April 13, 2011**. No clarification requests will be accepted by telephone. **Responses to clarification requests will be provided to all interested parties.**

Any and all changes to the Tender will be issued by the Manager of Finance in the form of a written addendum and posted on the TBDHU website. If addenda are issued, their receipt must be acknowledged by the proponent. The TBDHU will assume no responsibility for oral instructions or suggestions.

**PERIOD OF ACCEPTANCE:**

The Terms and Conditions of the proposal offer shall remain firm and open for acceptance by the TBDHU for a period of ninety (90) days for Part A, and **an additional** ninety (90) days for Part B.

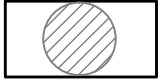
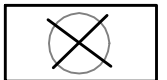
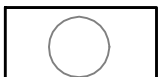

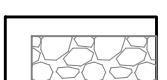
BALMORAL STREET



BARTON STREET

WILLIAM STREET

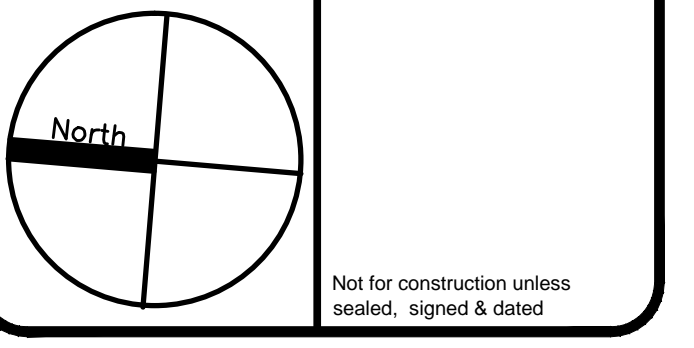
General Notes

- LEGEND**
-  existing trees/ shrubs to remain
  -  existing trees/ shrubs to be removed
  -  existing trees and shrubs to be transplanted
  -  existing areas of crushed stone mulch to be removed
  -  existing areas of soil/ granular to be removed

Source of Base Information:  
 -Site Renovation Plan by Lenard Alfred Wood Architect, project # 05138 and supplemental field work by Werner Schwar Landscape Architect September 2009.

Notes:  
 Contractor to verify all dimensions on site and notify Consultant of any discrepancies.

No.	Revision/Issue	Date
5		
4		
3		
2	Issued for final review	Nov. 16, 09
1	Issued for preliminary review	Oct. 1, 09

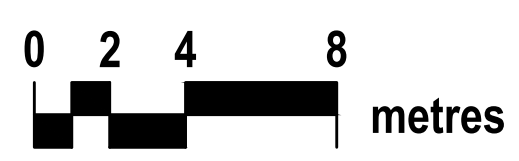


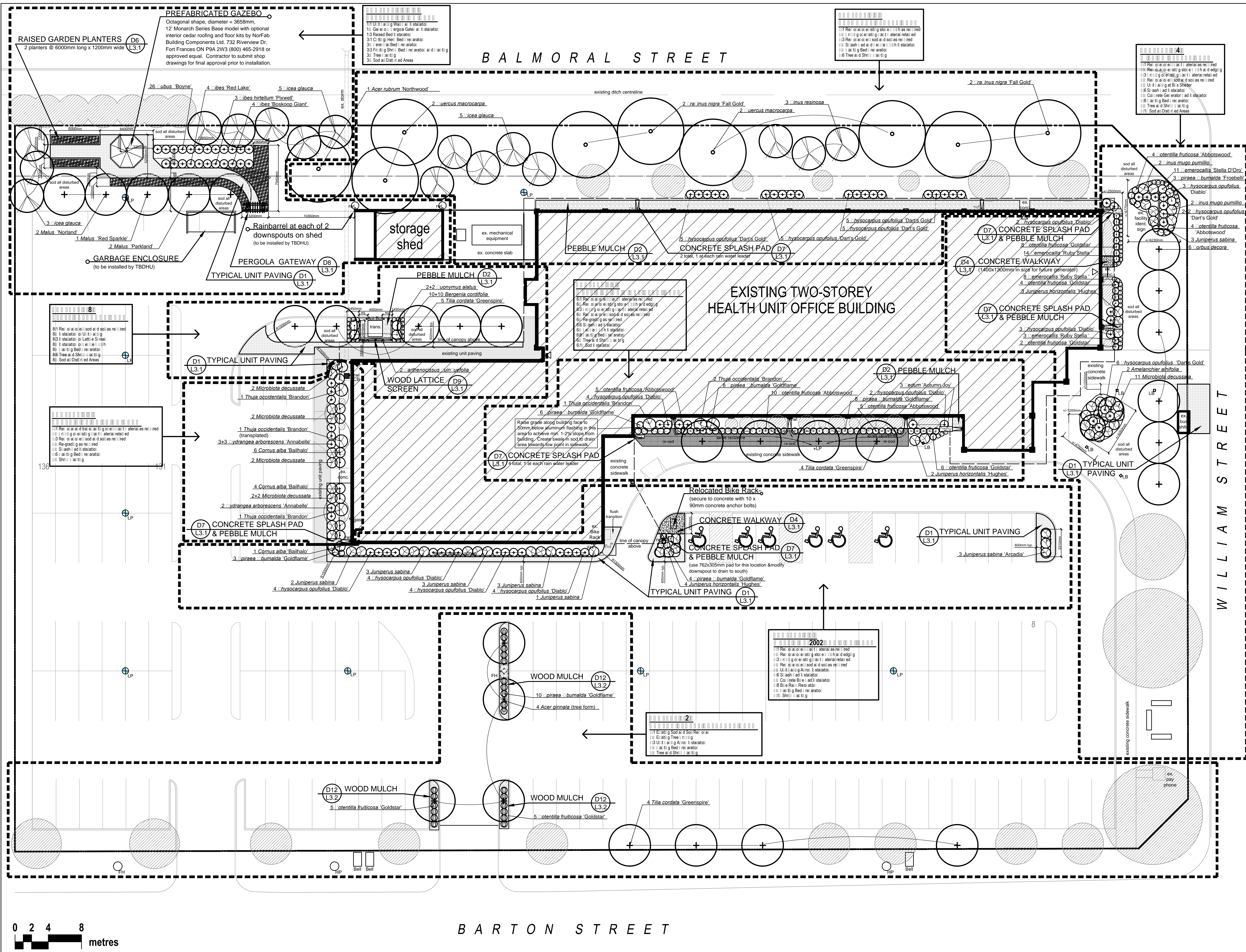
Firm Name and Address  
  
**WERNER SCHWAR**  
**LANDSCAPE**  
**ARCHITECT**  
 P.O. Box 21048, 640 River St.  
 Thunder Bay, ON P7A 3S0  
 (807) 346-0607

Project Name  
**Thunder Bay District**  
**Health Unit**  
**Landscape Restoration Plan**  
 999 Barton Street  
 Thunder Bay, ON

Drawing Title  
**Existing Plant Material**  
**Action Plan**  
 Landscape Plan

Project 09 - 295	Sheet
Date Sept. 2009	<b>L-1.1</b>
Scale 1:200	





**General Notes**

**LEGEND**

- proposed area of unit paving - see D1/L3.1
- proposed area of concrete paving - see D4/L3.1
- proposed area of resodding
- proposed area of pebble mulch - See D2/L3.1

Source of Base Information:  
 -Site Renovation Plan by Lenard Alfred Wood Architect, project # 05138 and supplemental field work by Werner Schwar Landscape Architect September 2009.

**Notes:**  
 Contractor to verify all dimensions on site and notify Consultant of any discrepancies.

No.	Revision/Issue	Date
5		
4		
3		
2	Issued for final review	Nov. 16, 09
1	Issued for preliminary review	Oct. 1, 09

**North**

Not for construction unless sealed, signed & dated

**Firm Name and Address**  
**WERNER SCHWAR**  
**LANDSCAPE**  
**ARCHITECT**  
 P.O. Box 21048, 640 River St.  
 Thunder Bay, ON P7A 3S0  
 (807) 346-0607

**Project Name**  
 Thunder Bay District  
 Health Unit  
 Landscape Restoration Plan

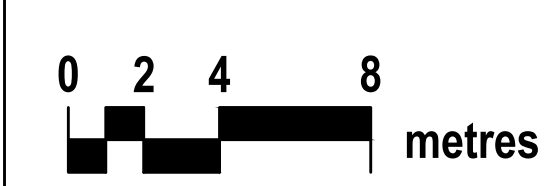
999 Barton Street  
 Thunder Bay, ON

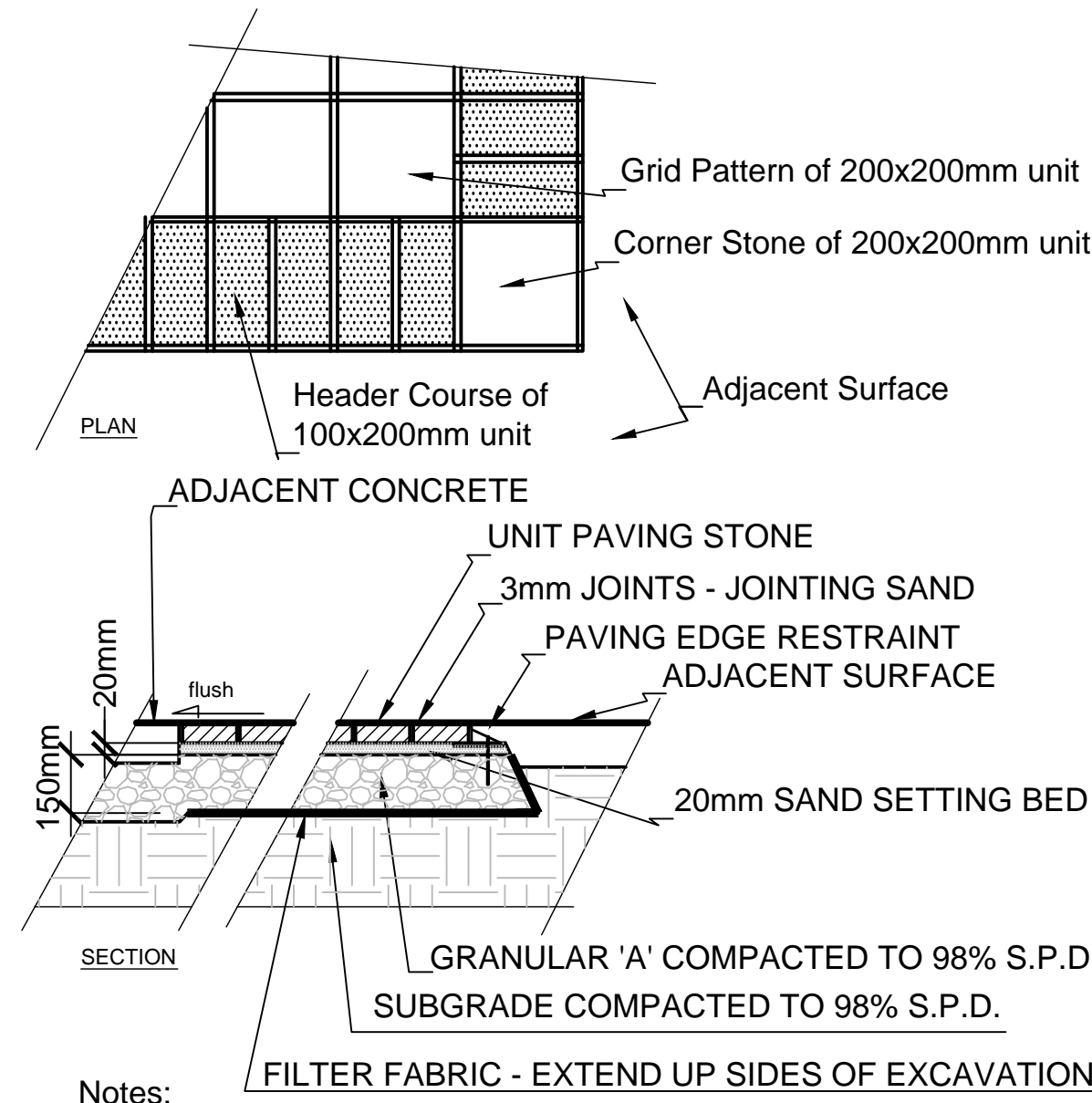
**Drawing Title**  
 Proposed Action Concept Plan  
 Landscape Plan

**Project** 09 - 295 **Sheet**

**Date** Sept. 2009 **L-2.1**

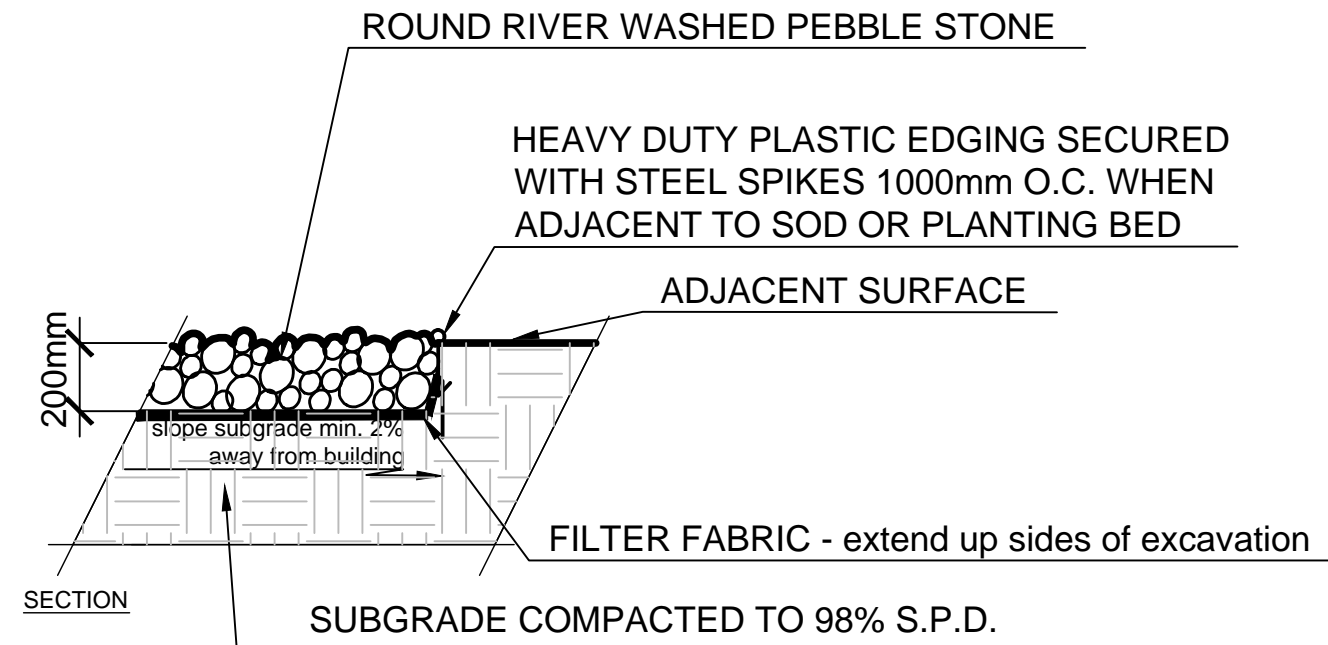
**Scale** 1:200





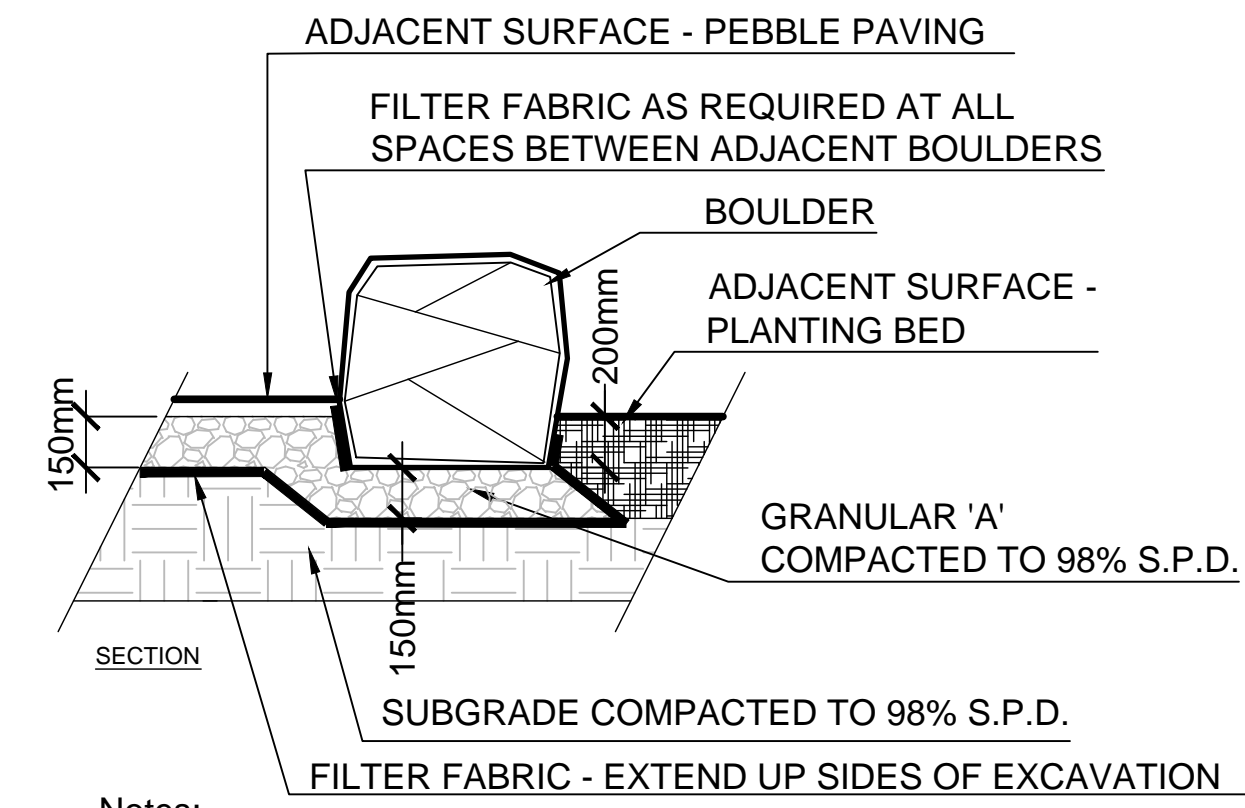
**Notes:**  
 -Unit Paving: 200x200x60mm Holland Square Stone, colour to be Desert Buff & 100x200x60mm Holland Stone, colour to be Antique Brown by Barkman Concrete Ltd. (204) 326-3445 or approved equal.  
 Paving Edge Restraint: by Pavetech or approved equal  
 Filter Fabric: Soil Separator Terrafix 360R or approved equal

**D1 TYPICAL UNIT PAVING**  
 Not to Scale



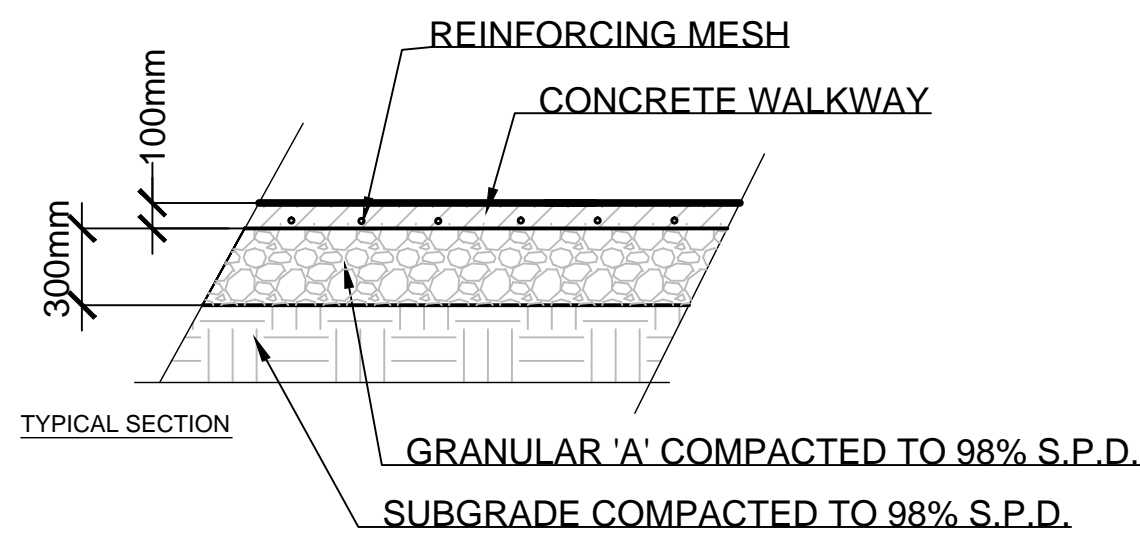
**Notes:**  
 -Filter Fabric: Soil Separator Terrafix 360R or approved equal  
 -Plastic Edging: Black Diamond by Valleyview or approved equal  
 -Pebble Mulch: 25mm minimum, - 75mm maximum diameter round granitic stone - sample to be approved by Consultant prior to installation

**D2 PEBBLE MULCH**  
 Not to Scale



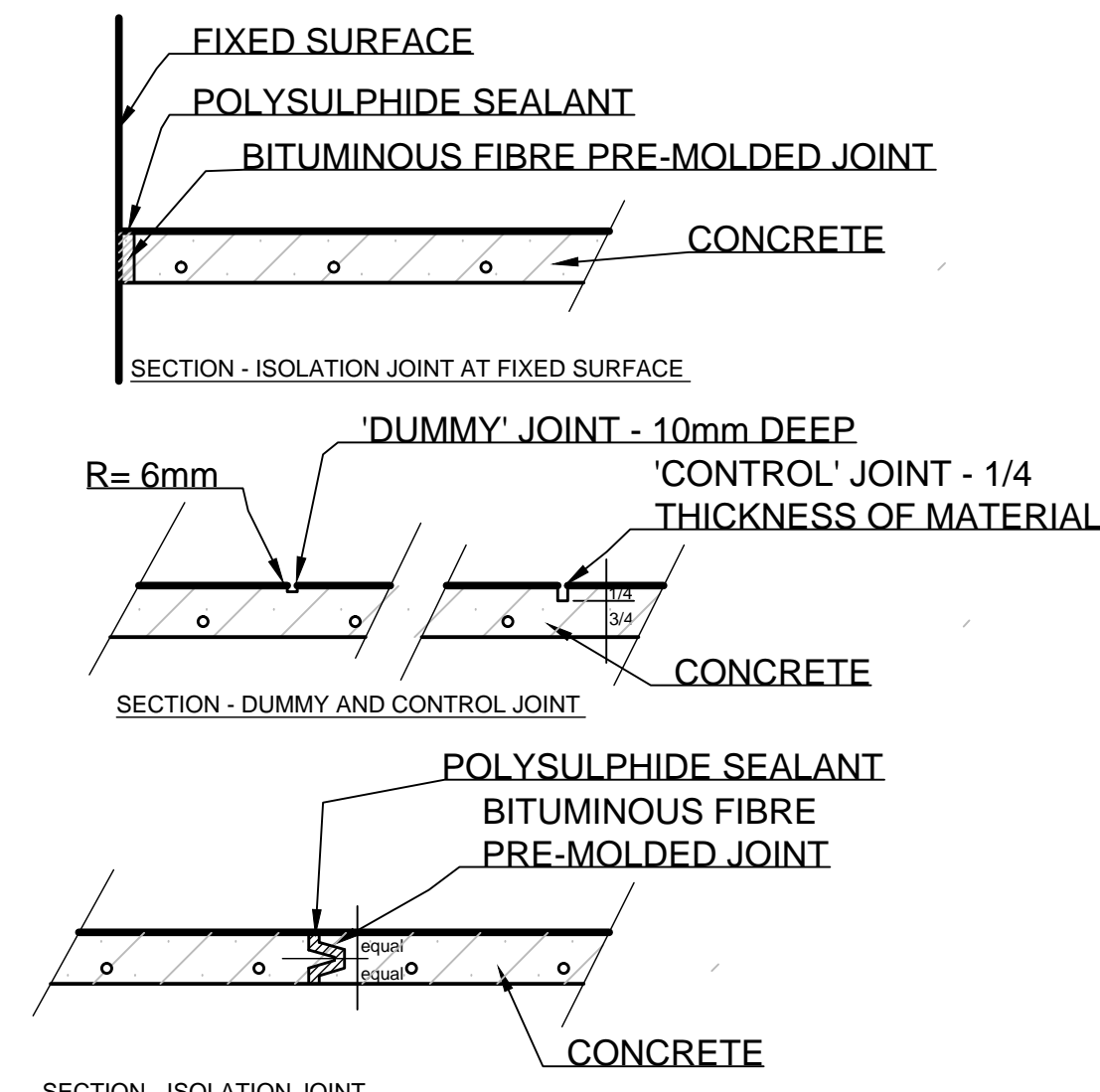
**Notes:**  
 -Filter Fabric: Soil Separator Terrafix 360R or approved equal  
 -Boulders: Utilize existing Granite Boulders found on site, and a random mix of Granite Flat-topped Boulders in the following sizes: small +/-600x500x450mm, medium +/-1000x900x600mm & large +/-1500x1200x900mm. Individual stone selection and final placement to be directed by Consultant on site. Good face, or face of interest to face side viewed most often.

**D3 BOULDER PLACEMENT**  
 Not to Scale



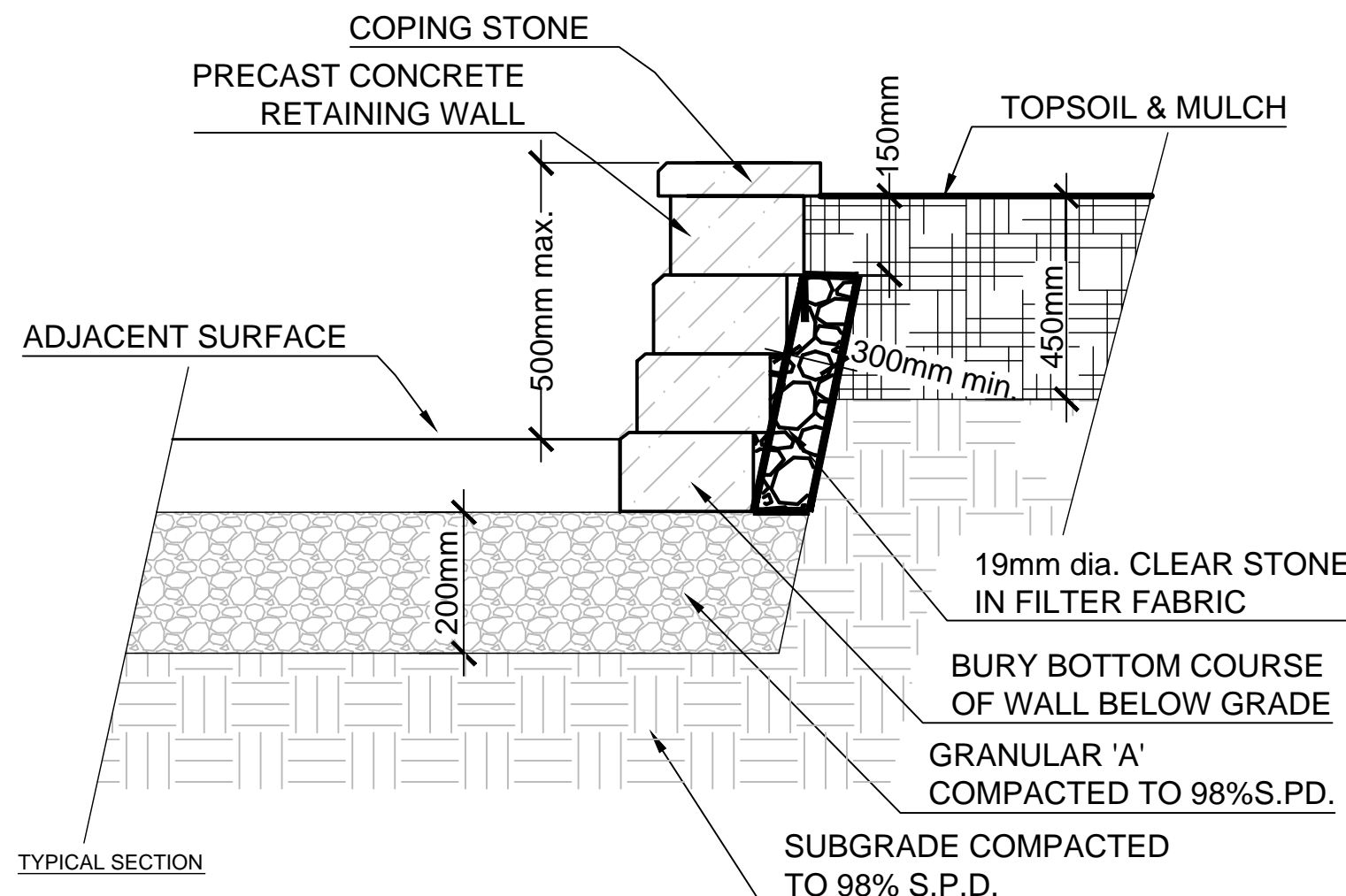
**NOTES:**  
 -concrete to be 30 MPa with 7% air entrainment.  
 -concrete to be wood float finished and lightly broomed to provide a textured non-slip surface.  
 -reinforcing to be 12x12 - 2/2 welded wire mesh on chairs 300mm o.c. both ways.  
 -slope as per plan.

**D4 CONCRETE WALKWAY**  
 Read together with 'Joints for Concrete' Not to Scale



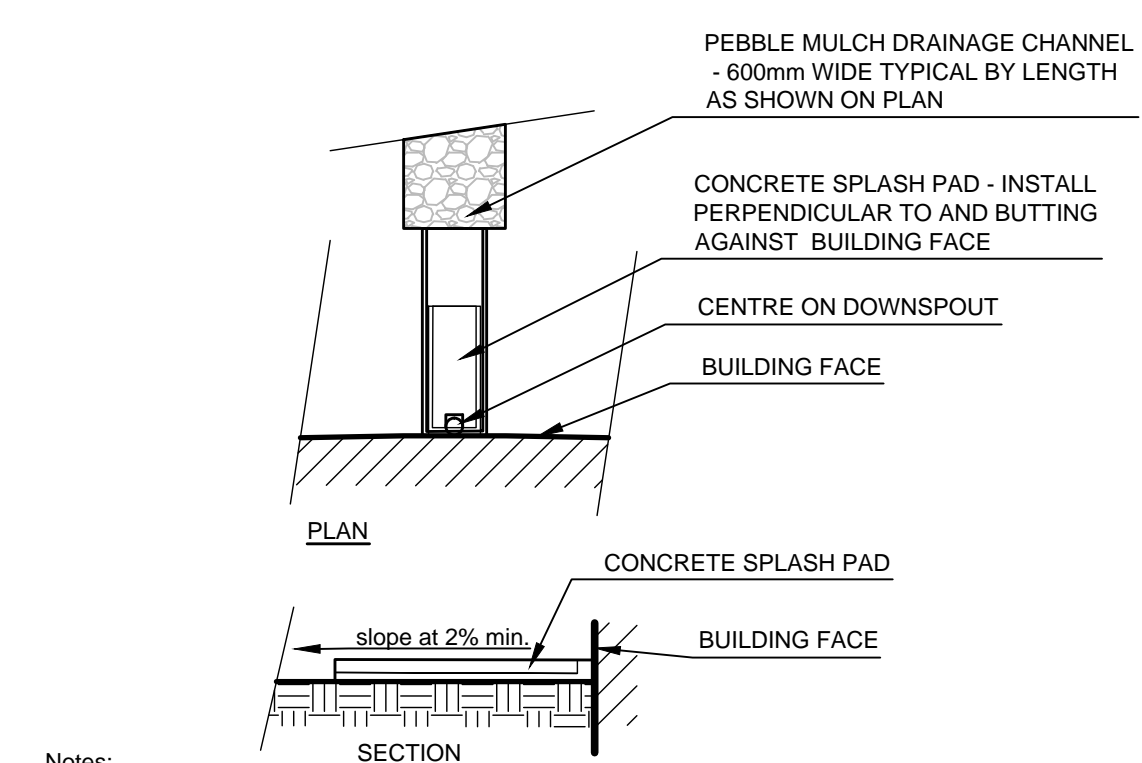
**NOTES:**  
 -all joints and edges to be hand tooled using and edging tool with a 6mm radius.  
 -Dummy joint - 6mm radius and 10mm deep - equal spacing at 1500mm o.c.  
 -Control joint - 6mm radius and 25mm deep - every 6000mm o.c.  
 -Isolation joint - every 12000mm max. o.c.

**D5 JOINTS FOR CONCRETE**  
 Not to Scale



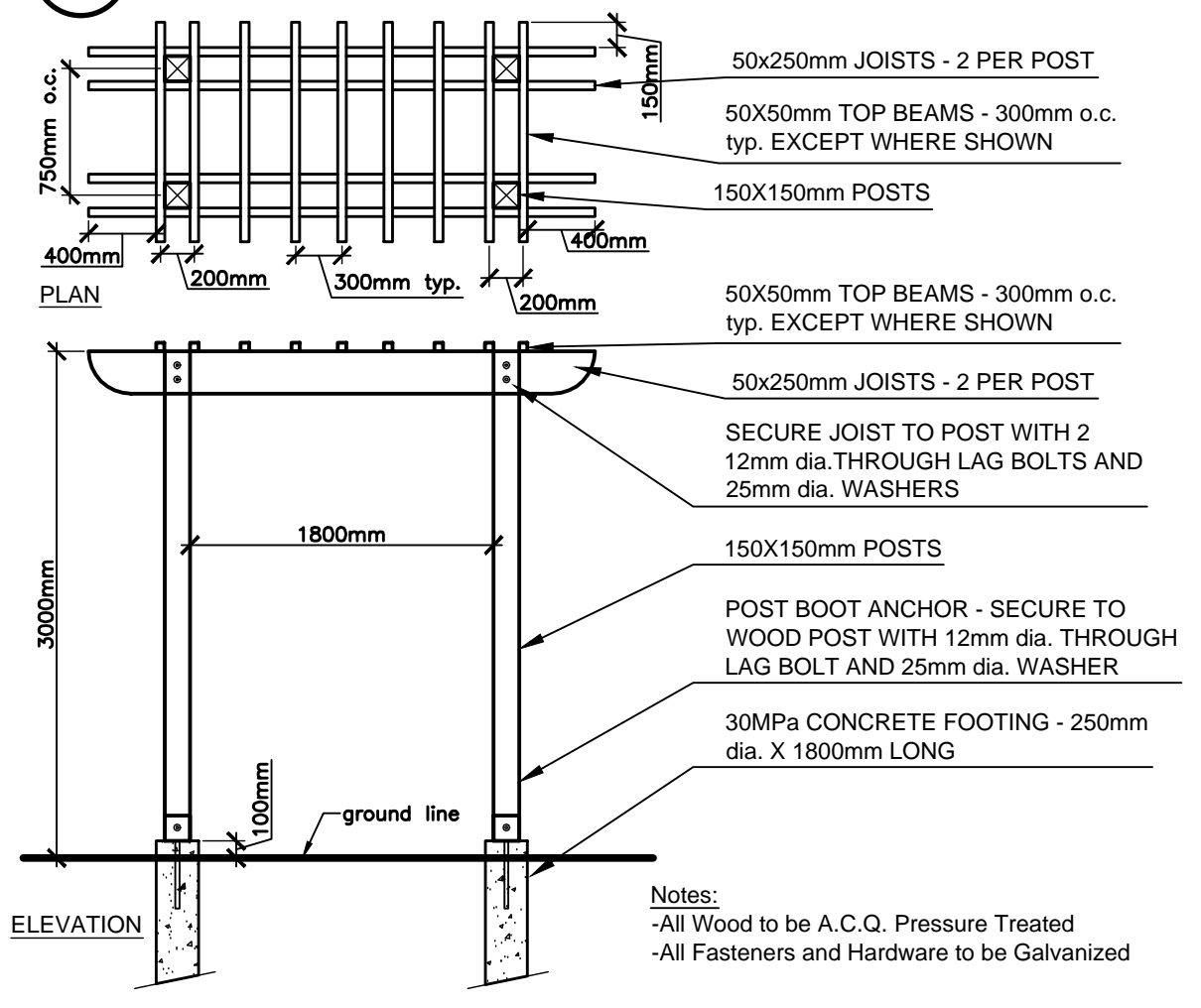
**NOTES:**  
 -retaining wall units to be Roman Pisa including coping by Barkman Concrete (204) 326-3445 or approved equal. Secure top course, all copings and all corners with Sika SL-15 concrete adhesive or approved equal. Install to manufacturer's specifications. Colour to be Sierra Grey.  
 -filter fabric to be Soil Separator Terrafix 360R or approved equal

**D6 PRECAST CONCRETE RETAINING WALL**  
 Not to Scale



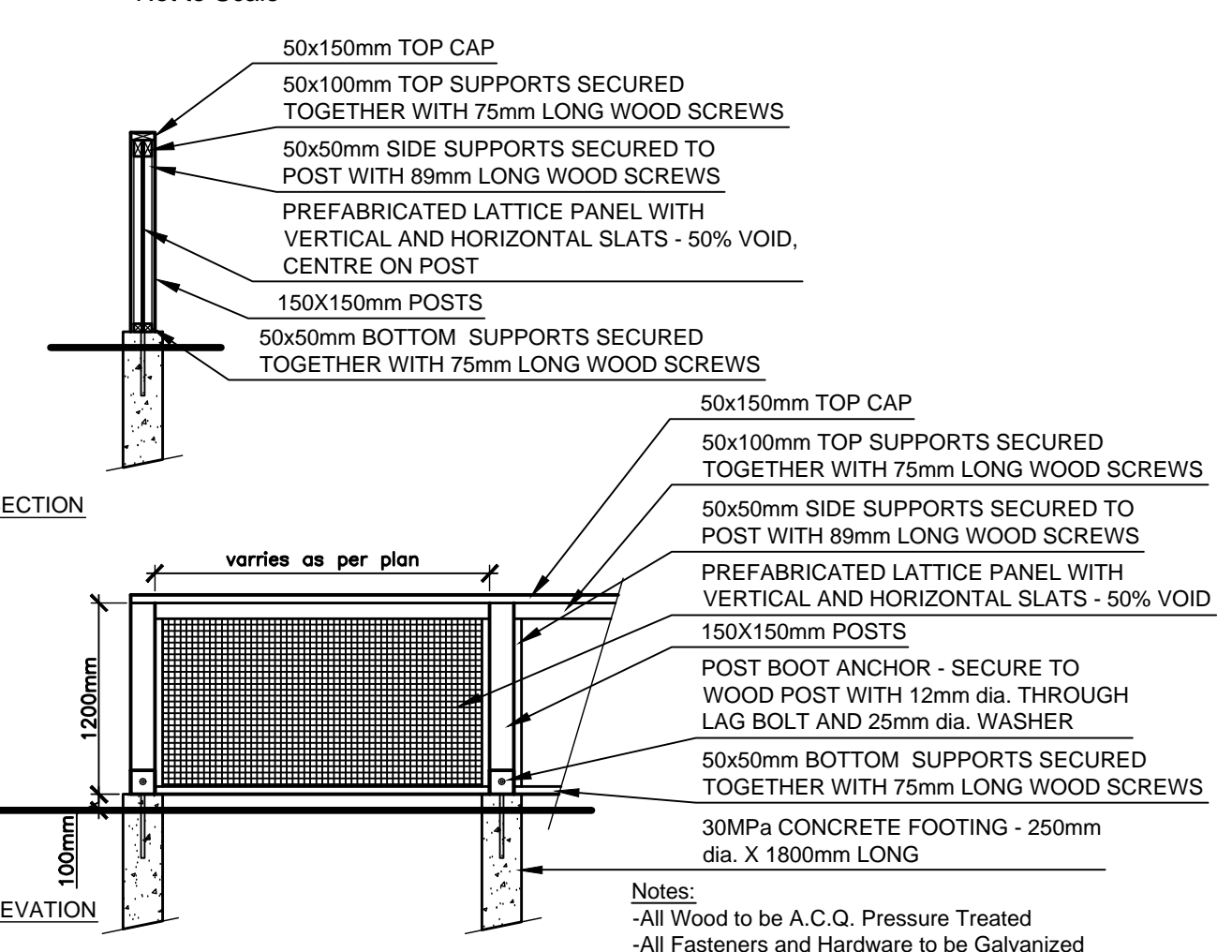
**Notes:**  
 -Precast Concrete Splash Pad by Barkman Concrete, sizes = model 45-41000 48" Pebblestone Finish 1220mm long x 381mm wide x 102mm high is typical model 45-40100 30" Pebblestone Finish 762mm long x 305mm wide x 102mm high (one used only where noted)  
 Barkman Concrete Products (800) 461-2278 www.barkmanconcrete.com

**D7 CONCRETE SPLASH PAD & PEBBLE MULCH**  
 Not to Scale



**Notes:**  
 -All Wood to be A.C.Q. Pressure Treated  
 -All Fasteners and Hardware to be Galvanized

**D8 PERGOLA GATEWAY STRUCTURE**  
 Not to Scale



**Notes:**  
 -All Wood to be A.C.Q. Pressure Treated  
 -All Fasteners and Hardware to be Galvanized

**D9 WOOD LATTICE SCREEN**  
 Not to Scale


General Notes

LEGEND

**Notes:**  
 Contractor to verify all dimensions on site and notify Consultant of any discrepancies.

No.	Revision/Issue	Date
5		
4		
3		
2	Issued for tender	xx/xx/09
1	Issued for final review	Nov. 15, 09

Not for construction unless sealed, signed & dated

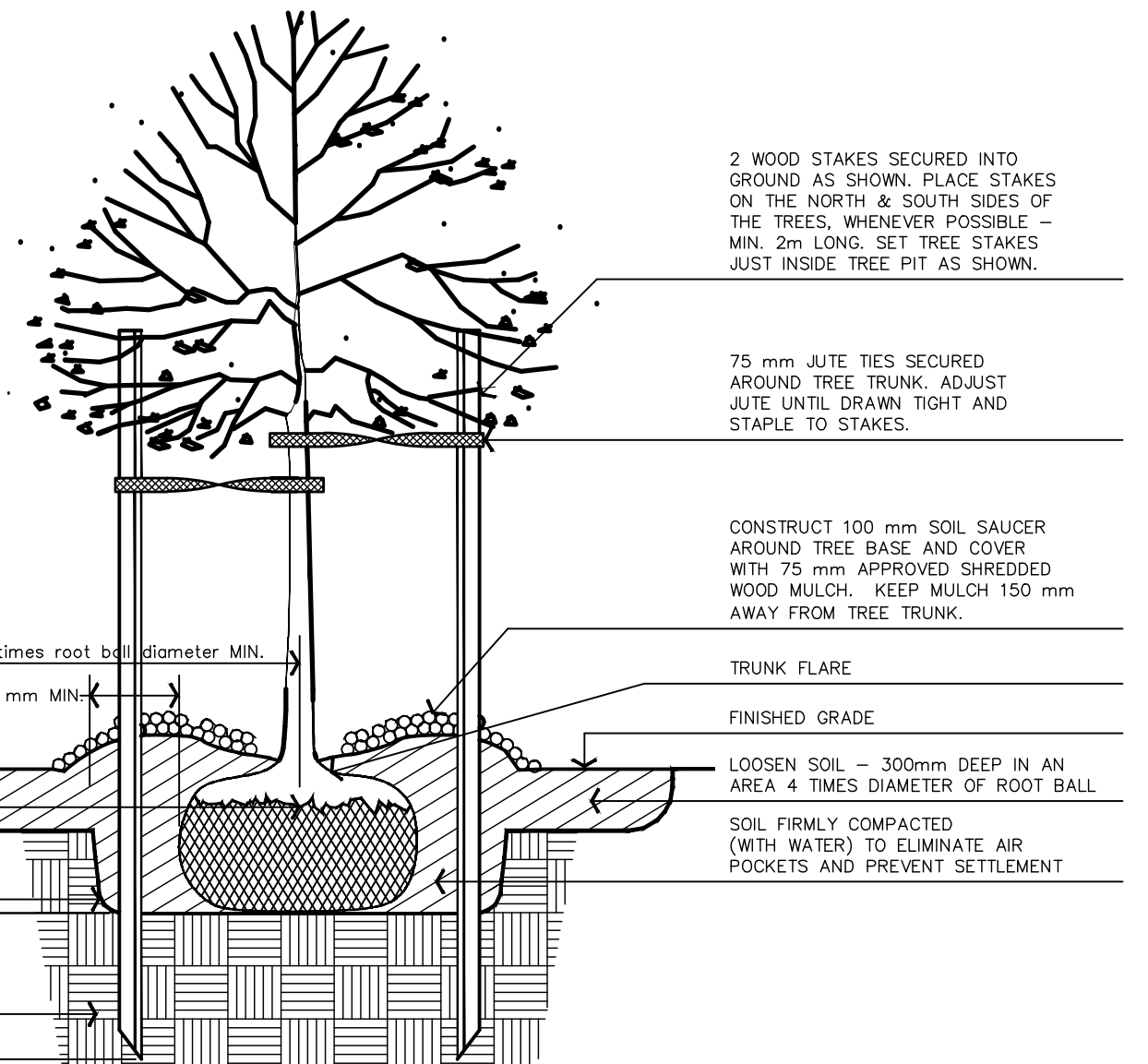
Firm Name and Address  
  
**WERNER SCHWAR**  
**LANDSCAPE**  
**ARCHITECT**  
 P.O. Box 21048, 640 River St.  
 Thunder Bay, ON P7A 3S0  
 (807) 346-0607

Project Name  
**Thunder Bay District**  
**Health Unit**  
**Landscape Restoration Plan**  
 999 Barton Street  
 Thunder Bay, ON

Drawing Title  
**General Site Details**  
 Landscape Plan

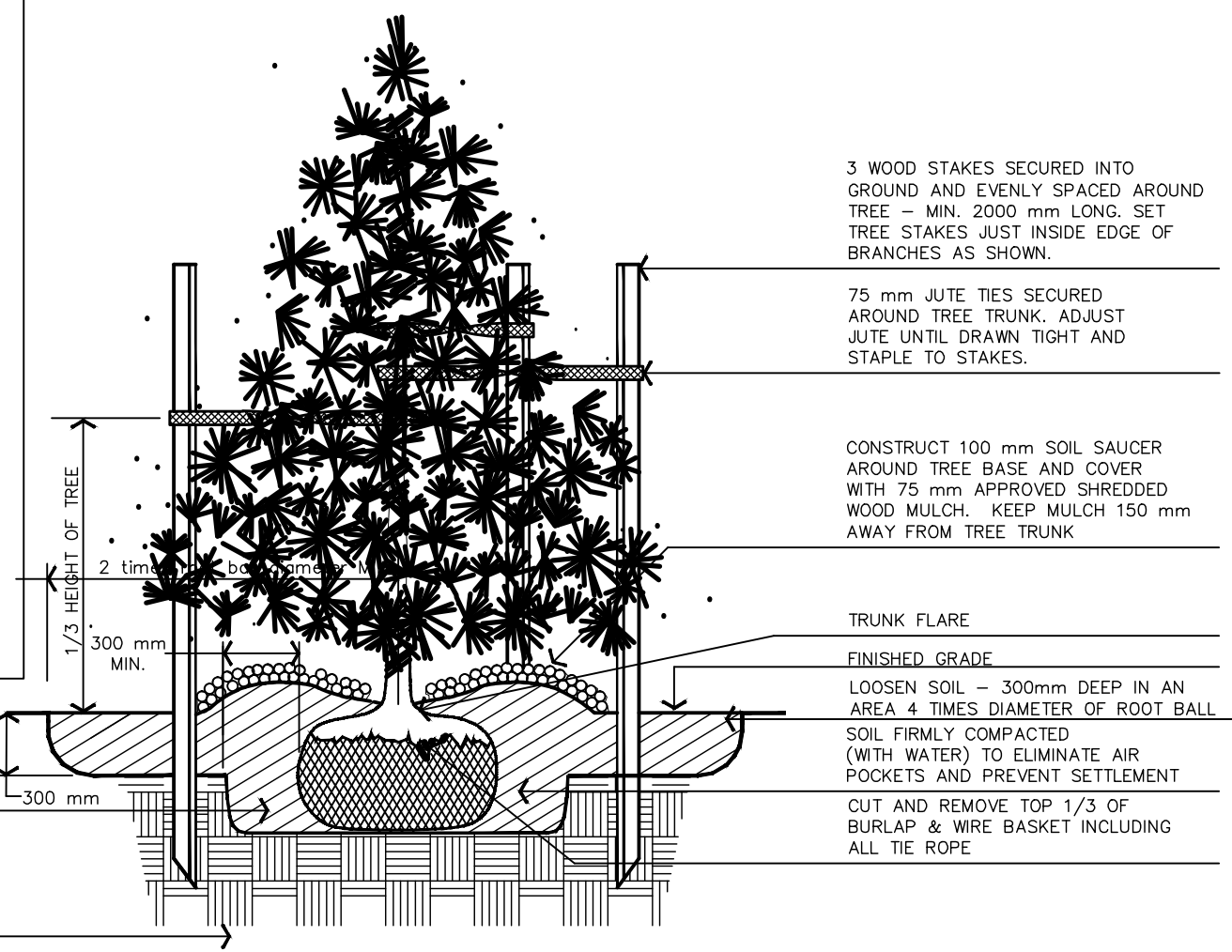
Project 09 - 295	Sheet
Date Sept. 2009	<b>L-3.1</b>
Scale not to scale	

- NOTES:**
- Pruning shall be limited to dead or broken branches after planting. Maintain original shape of tree, do not prune or damage leader branch.
  - Confirm underground utilities before installing wooden stakes.
  - Wooden stakes MUST be installed at the same time as the tree.
  - If necessary, remove soil from root ball to uncover trunk flare. The trunk flare is where the roots spread at the base of the tree.
  - In loamy or sandy soils, the root ball should be set so that the trunk flare is exactly at grade.
  - In clay or poorly drained soils, set tree 50 mm higher than adjacent finished grade to allow for settlement.
  - Caliper measured at 300 mm from grade level.
  - Back fill tree pit with native soil - amend if required.
  - All dimensions in millimetres minimum & maximum. Allowances are given.

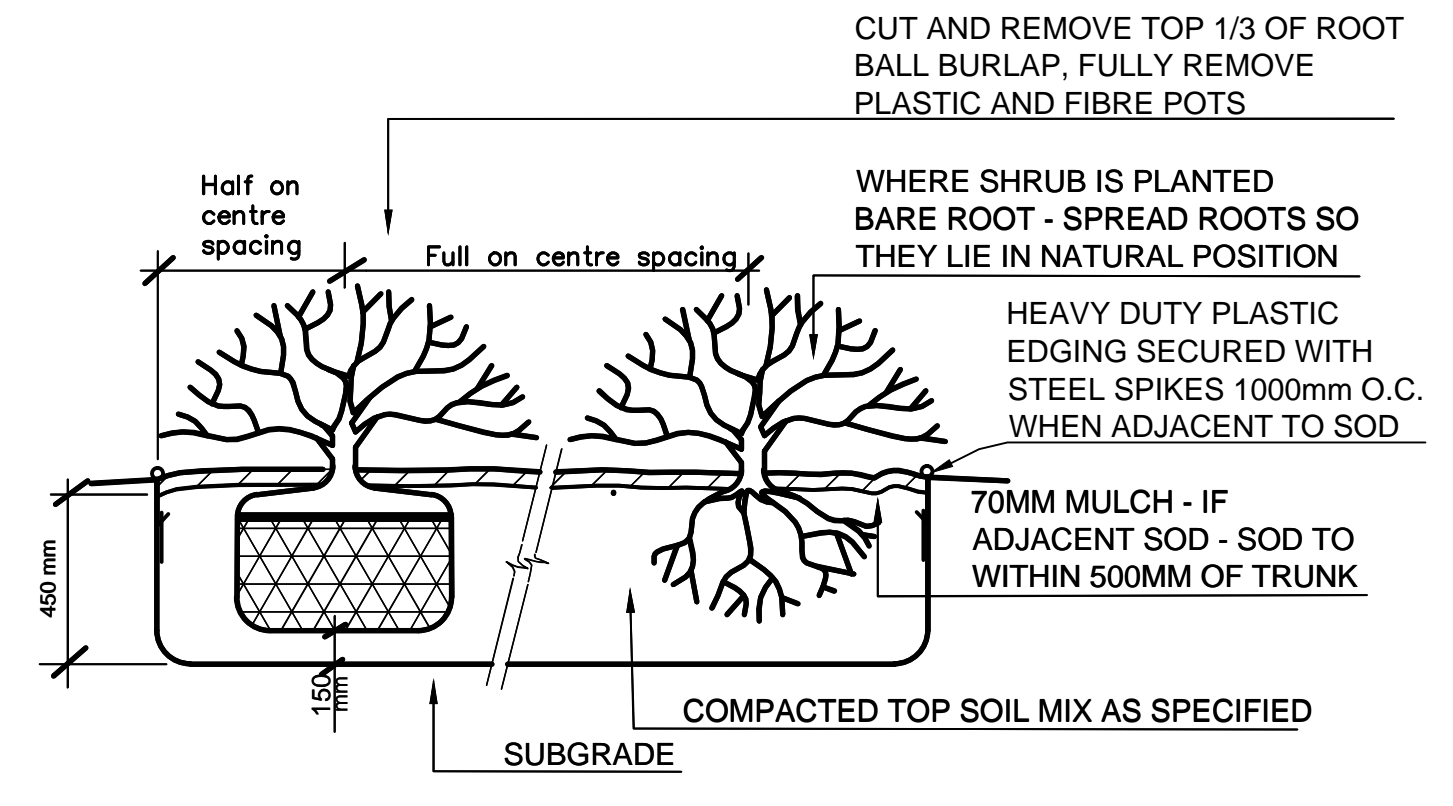


**D10** TYPICAL DECIDUOUS TREE PLANTING  
Not to Scale, this tree does not represent any particular species

- NOTES:**
- Tree shall be measured to height of previous years growth.
  - Pruning shall be limited to dead or broken branches after planting. Maintain original shape of tree, do not prune or damage leader branch.
  - If necessary, remove soil from root ball to uncover trunk flare.
  - In loam or sandy soils, the root ball should be set so that the trunk flare is exactly at grade. The trunk flare is where the roots spread at the base of the tree.
  - In clay or poorly drained soils, set tree 50 mm higher than adjacent finished grade to allow for settlement.
  - Back fill tree pit with native soil - amend if required.
  - All dimensions in millimetres minimum & maximum. Allowances are given.
  - Confirm underground utilities before installing wooden stakes.
  - Wooden stakes must be installed at the same time as the tree.



**D11** TYPICAL CONIFEROUS TREE PLANTING  
Not to Scale, this tree does not represent any particular species



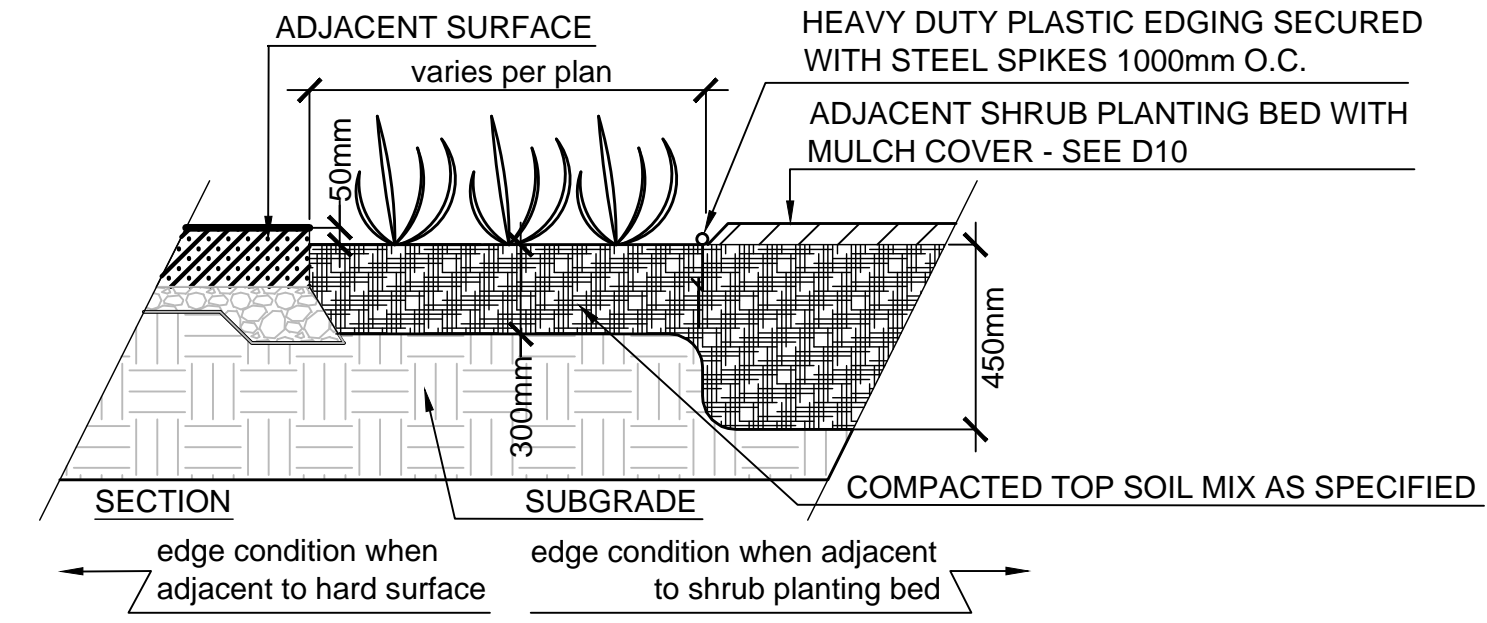
**D12** TYPICAL SHRUB PLANTING  
Not to Scale

MULCH - "SHREDDED RED CEDAR" OR APPROVED EQUAL

SHRUBS SHALL BARE THE SAME RELATION TO FINISHED GRADE AS THEY BARE TO PREVIOUS EXISTING GRADE

ALL SHRUBS IN BEDS. NO INDIVIDUAL PITS EXCEPT WHERE INDICATED. REPLACE EXISTING SOIL TO REQUIRED DEPTH WITH NEW TOPSOIL AS SPECIFIED. IN AREAS OF EXISTING PLANTS TO BE RETAINED ENSURE EXISTING SOIL IS RETAINED SO AS NOT TO DISTURB EXISTING ROOT SYSTEMS.

THIS SHRUB DOES NOT REPRESENT ANY PARTICULAR SPECIES



**D13** TYPICAL ANNUAL PLANTING BED  
Not to Scale

**Note:**

- Replace existing soil to required depth with new topsoil as specified for all annual planting beds.
- Annual Planting species plan as shown on L-6 series of drawings

**Tree Protection Standards**

- The contractor will be responsible for implementing the following specifications to ensure protection of existing trees within the construction zone.
- A tree protection zone will be established around each tree involved within and immediately adjacent to proposed construction areas. The tree protection zone will extend to at least the "drip-line" of the tree or a minimum of 3000mm radius from the stem of the tree.
- Trees involved within and immediately adjacent to proposed construction areas shall require strapping or a double wrap of wood slat snow fencing, or other suitable wood planks strapped to the tree trunk to completely protect the tree trunk from impact damage. The minimum size of strapping will be 25x150x2440mm.
- For designated areas, a snow fence or other barrier shall be erected and maintained around the tree protection zone.
- No equipment or materials shall be allowed to hit, abrade or otherwise damage the trunk or branches of a tree.
- No heavy equipment shall be driven over the tree protection zone.
- No soil or construction materials shall be piled over the tree protection zone or around the trunks.
- No disposal of any liquid such as concrete slush, gas or oil shall occur within the tree protection zone.
- No trenching shall occur within the tree protection zone, however where excavation and backfill must occur, approval must be received from the Consultant. Low-impact methods such as the hydrovac system and trenchless methods such as directional drilling under existing trees will be the recommended method of underground installations. Open trenches at the base of trees are not acceptable. Destroying roots in this zone will make the tree structurally unsound and subject to topping.
- In event of major reconstruction efforts, the Contractor shall root prune along the length of the work in an approved manner, such as with a chain saw or root pruner. A clean severance of the root system is required. The depth of the cut shall be the same depth as the excavation at the maximum distance from the tree trunk allowed by the construction.
- Backfilling within the tree protection zone to a depth of 300mm of the finished grade shall be with a 1:1:1 soil mix of top soil, sand and peatmoss to allow for proper root regeneration.
- During the course of construction, the Contractor is to inform the Consultant of any significant damage to a tree. All remedial action must be performed by a qualified tree service firm, subject to approval by Consultant.
- If a tree is damaged beyond repair, the Contractor will be responsible for a replacement tree of similar species to the largest transferable caliper.
- No additional compensation will be paid for the protection of trees in the work zone.

**PROJECT # 2 - Barton Street Entrance Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
4	<i>Acer glabrum</i> (Tree Form)	Amur Maple Tree Form	50mm	W.B.	dense, full specimen
4	<i>Yucca cordata</i> 'Greenaspire'	Greenaspire Yucca Leaf Linden	50mm	W.B.	dense, full specimen
10	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	40 cm	2 gal.	1200 mm o.c.
10	<i>Spirea alba</i> 'Ballalab'	Ivory Halo Dogwood	50 cm	2 gal.	1200 mm o.c.

**PROJECT # 3 - Healthy Living Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
8	<i>Pinus glabra</i>	White Spruce	180mm	W.B.	dense, full specimen
2	<i>Malus floribunda</i>	Flowering Apple	25mm	pothole	dense, full specimen
2	<i>Malus purshiana</i>	Pinkflowering Apple	25mm	pothole	dense, full specimen
1	<i>Malus</i> (Red Spire)	Red Spire Apple	25mm	pothole	dense, full specimen
4	<i>Ribes</i> (Blackberry)	Blackberry	50cm	2 gal.	1000 mm o.c.
4	<i>Ribes</i> (Red Spire)	Red Spire	50cm	2 gal.	1000 mm o.c.
2	<i>Prunella</i> (Purple)	Purple	40 cm	2 gal.	1000 mm o.c.
20	<i>Spirea</i> (White)	White Spirea	40 cm	2 gal.	1000 mm o.c.

**PROJECT # 4 - William Street Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
2	<i>Artemisia arbuscula</i>	Shrub Sage	35mm	W.B.	dense, full specimen
4	<i>Spirea</i> (White)	White Spirea	50mm	W.B.	dense, full specimen
3	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
3	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
11	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
4	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
4	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
10	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
8	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
8	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
14	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
3	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
25	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
11	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.

**PROJECT # 5 - West Side 2002 Addition Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
4	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
12	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
8	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
1	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
16	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
7	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.

**PROJECT # 6 - West Side Original Building Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
4	<i>Yucca cordata</i> 'Greenaspire'	Greenaspire Yucca Leaf Linden	50mm	W.B.	dense, full specimen
2	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50mm	2 gal.	1200 mm o.c.
3	<i>Yucca cordata</i> 'Greenaspire'	Greenaspire Yucca Leaf Linden	180cm	B*46	1500 mm o.c.
6	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	40 cm	2 gal.	1000 mm o.c.
20	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	50 mm	2 gal.	1200 mm o.c.
22	<i>Spirea alba</i> 'Ballalab'	Ivory Halo Dogwood	50 cm	2 gal.	1200 mm o.c.
3	<i>Sedum</i> (Autumn Joy)	Autumn Joy Stonecrop	pothole	1 gal.	500 mm o.c.

**PROJECT # 7 - North side Building Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
10	<i>Microbiota decussata</i>	Russian Cypress	30cm	2 gal.	1200 mm o.c.
24	<i>Yucca cordata</i> 'Greenaspire'	Greenaspire Yucca Leaf Linden	180cm	B*46	1500 mm o.c. (1 ex. transplanted)
10	<i>Coronilla alba</i> 'Ballalab'	Ivory Halo Dogwood	50 cm	2 gal.	1200 mm o.c.
8	<i>Hydrangea arborescens</i> 'Annabelle'	Annabelle Hydrangea	n/a	2 gal.	1000 mm o.c.

**PROJECT # 8 - Staff Entrance Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
5	<i>Yucca cordata</i> 'Greenaspire'	Greenaspire Yucca Leaf Linden	50mm	W.B.	dense, full specimen
4	<i>Encyonema alatum</i>	Burning Bush	50 cm	2 gal.	1200 mm o.c.
20	<i>Bergenia ciliolata</i>	Heartleaf Bergenia	pothole	1 gal.	500 mm o.c.

**PROJECT # 9 - Ballmorat Street Area - PLANT LIST**

QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND.	REMARKS
1	<i>Acer glabrum</i> 'Northwood'	Northwood Red Maple	50mm	W.B.	dense, full specimen
4	<i>Prunella nigra</i> 'Fall Gold'	Fall Gold Black Ash	50mm	W.B.	dense, full specimen
3	<i>Pinus glabra</i>	White Spruce	180mm	W.B.	dense, full specimen
4	<i>Quercus macrocarpa</i>	Bur Oak	50mm	W.B.	dense, full specimen
20	<i>Physocarpus opulifolius</i> 'Diablo'	Diablo Ninebark	40 cm	2 gal.	1000 mm o.c.

**General Notes**

**LEGEND**

5		
4		
3		
2	Issued for tender	xx/xx/09
1	Issued for final review	Nov. 16, 09

**No.**      **Revision/Issue**      **Date**

**Notes:**  
Contractor to verify all dimensions on site and notify Consultant of any discrepancies.

Not for construction unless sealed, signed & dated

**Firm Name and Address**

**WERNER SCHWAR**  
**LANDSCAPE**  
**ARCHITECT**

P.O. Box 21048, 640 River St.  
Thunder Bay, ON P7A 3S0  
(807) 346-0607

**Project Name**

Thunder Bay District  
Health Unit  
Landscape Restoration Plan

999 Barton Street  
Thunder Bay, ON

**Drawing Title**

Planting Details  
Landscape Plan

**Project** 09 - 295      **Sheet**

**Date** Sept. 2009      **L-3.2**

**Scale** not to scale



Thunder Bay District  
**Health Unit**

**FORM OF TENDER #002/2011  
Landscape Restoration and Development**

**ATTACHMENT 2 - PROJECT SUMMARY**

The TBDHU developed a comprehensive grounds beautification plan as well as multi-year implementation recommendations based on budget availability. **Projects are to be completed in accordance with the Landscape Restoration Plan provided in Attachment #1.**

Project #5 – West Side 2002 Addition

- Removal of existing sod, soil and plant materials as required;
- Supply and installation of concrete walkway;
- Supply and installation of Unit paving stones;
- Planting Bed preparation, including supply of bedding topsoil as specified, and finish grading;
- Supply and installation of various shrubs and groundcovers per plan specifications identified in Attachment #1;
- Supply and installation of pebble mulch in accordance with size requirements identified in Attachment #4;
- Relocation of Existing bike racks;
- Sod/restore all disturbed areas;
- Plant warranty information;
- Maintenance of all plant materials, including those that may be existing and remaining, for two (2) years subsequent to the final plant installation date.

Project #6 – West Side – Original Building

- Removal of existing sod and soil;
- Removal and pruning of existing plant materials as required;
- Supply and Installation of fill;
- Installation of concrete splash pads;
- Planting Bed preparation, including supply of bedding topsoil as specified, and finish grading;
- Supply and installation of various shrubs and groundcovers per plan specifications identified in Attachment #1;
- Supply and installation of pebble mulch in accordance with size requirements identified in Attachment #4;
- Sod/restore all disturbed areas;
- Plant warranty information;
- Maintenance of all plant materials, including those that may be existing and remaining, for two (2) years subsequent to the final plant installation date.

Project #7 – North Side 2002 Addition Area

- Removal of existing sod and soil;
- Supply and installation of concrete splash pads;
- Planting Bed preparation, including supply of bedding topsoil as specified, and finish grading;
- Supply and installation of various shrubs and groundcovers per plan specifications identified in Attachment #1;
- Supply and installation of pebble mulch in accordance with size requirements identified in Attachment #4;
- Sod/restore all disturbed areas.

Project #8 – Staff Entrance Area

- Removal of existing sod and soil;
- Supply and installation of Unit paving stones;
- Supply and installation of wood lattice screen as specified;
- Planting Bed preparation, including supply of bedding topsoil as specified, and finish grading;
- Supply and installation of pebble mulch in accordance with size requirements identified in Attachment #4;
- Supply and installation of various trees, shrubs and perennials/groundcovers per plan specifications identified in Attachment #1;
- Sod/restore all disturbed areas;
- Plant warranty information;
- Maintenance of all plant materials, including those that may be existing and remaining, for two (2) years subsequent to the final plant installation date.

Project #9 – Balmoral Street Area

- Removal of existing sod and soil;
- Removal of existing granular material;
- Pruning of existing plant material;
- Installation of concrete splash pads;
- Planting Bed preparation, including supply of bedding topsoil as specified, and finish grading;
- Supply and installation of various trees and shrubs per plan specifications identified in Attachment #1;
- Supply and installation of pebble mulch in accordance with size requirements identified in Attachment #4;
- Sod/restore all disturbed areas;
- Plant warranty information;
- Maintenance of all plant materials, including those that may be existing and remaining, for two (2) years subsequent to the final plant installation date.

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## ECAVATING, TRENCHING AND BACKFILLING

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□ **GENERAL**

### 1.1 RELATED SECTIONS

- .1 Topsoil and Finish Grading Section 02921

### 1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
- .1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D422-63/2002, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D698-00a/1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m<sup>3</sup>).
  - .5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700 kN-m/m<sup>3</sup>).
  - .6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

### 1.3 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
- .1 Rock: solid material in excess of 1.00 m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m<sup>3</sup> bucket. Frozen material not classified as rock.
  - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil:
- .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
  - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

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**ECAVATING, TRENCHING AND BACKFILLING**

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- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 Unsuitable materials:
  - .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
    - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 : Sieve sizes to CAN/CGSB-8.1.

.2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

.3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

1.4 SUBMITTALS

- .1 Make submittals as required and noted on drawings.

1.5 QUALITY ASSURANCE

- .1 Qualification Statement: submit proof of insurance coverage for professional liability.
- .2 Health and Safety Requirements:
  - .1 Do construction occupational health and safety in accordance with Thunder Bay District Health Unit Health and Safety Requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling.

**ECAVATING, TRENCHING AND BACKFILLING**

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1.7 EXISTING CONDITIONS

- .1 Buried services:
  - .1 Before commencing work establish location of buried services on and adjacent to site.
  - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: Pay costs of relocating services.
  - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
  - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
  - .5 Prior to beginning excavation Work, notify applicable authorities having jurisdiction. Establish location and state of use of buried utilities and structures.
  - .6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
  - .7 Where utility lines or structures exist in area of excavation, obtain direction of Consultant before re-routing.
  - .8 Record location of maintained, re-routed and abandoned underground lines.
  - .9 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
  - .1 Conduct, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
  - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Consultant.
  - .3 Where required for excavation, cut roots or branches in accordance with Section 02905 - Tree and Shrub Preservation.

□ **PR D CTS**

2.1 MATERIALS

- .1 Type 1 and Type 2 fill: properties to the following requirements:
  - .1 Crushed, pit run or screened stone, gravel or sand.
  - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1
  - .3 Table:

Sieve Designation	% Passing	
	Type 1	Type 2
75 mm	-	100
50 mm	-	-
37.5 mm	-	-

**ECAVATING, TRENCHING AND BACKFILLING**

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Sieve Designation	% Passing	
	Type 1	Type 2
25 mm	100	-
19 mm	75-100	-
12.5 mm	-	-
9.5 mm	50-100	-
4.75 mm	30-70	22-85
2.00 mm	20-45	-
0.425 mm	10-25	5-30
0.180 mm	-	-
0.075 mm	3-8	0-10

□ **EXECUTION**

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of local by-laws.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/PROTECTION

- .1 Protect existing features with temporary barriers and enclosures in accordance with applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.

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**ECAVATING, TRENCHING AND BACKFILLING**

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- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Consultant approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage. Protect buried services that are required to remain undisturbed.

**3.4 STOCKPILING**

- .1 Stockpile fill materials in areas designated by Owner.
  - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

**3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING**

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with the Health and Safety Requirements in the Health and Safety Act for the Province of Ontario.
  - .1 Where conditions are unstable, Consultant to verify and advise methods.
- .2 Construct temporary Works to depths, heights and locations as indicated.
- .3 During backfill operation:
  - .1 Unless otherwise indicated or directed by Consultant, remove sheeting and shoring from excavations.
  - .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
  - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.
- .4 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .5 Upon completion of substructure construction:
  - .1 Remove cofferdams, shoring and bracing.
  - .2 Remove excess materials from site.

**3.6 DEWATERING AND HEAVE PREVENTION**

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Consultant's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

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**ECAVATING, TRENCHING AND BACKFILLING**

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- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
  - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water to approved runoff areas and in a manner not detrimental to public and private property, or portion of Work completed or under construction.
  - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

**3.7 EXCAVATION**

- .1 Advise Consultant at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated.
- .3 Remove any rubble material and other obstructions encountered during excavation.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Do not disturb soil within branch spread of trees or shrubs that are to remain.
  - .1 If excavating through roots, excavate by hand and cut roots with sharp saw.
- .6 For trench excavation, unless otherwise authorized by Owner in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15m at end of day's operation.
- .7 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Consultant.
- .8 Restrict vehicle operations directly adjacent to open trenches.
- .9 Dispose of surplus and unsuitable excavated material off site.
- .10 Do not obstruct flow of surface drainage or natural watercourses.
- .11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .12 Notify Consultant when bottom of excavation is reached.
- .13 Obtain Consultant approval of completed excavation.
- .14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Consultant.

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**ECAVATING, TRENCHING AND BACKFILLING**

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- .15 Correct unauthorized over-excavation as follows:
  - .1 Fill under bearing surfaces and footings with Type 2 fill compacted to not less than 100% of corrected Standard Proctor maximum dry density.
  - .2 Fill under other areas with Type 2 fill compacted to not less than 95% of corrected Standard Proctor maximum dry density.
  
- .16 Hand trim, make firm and remove loose material and debris from excavations.
  - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
  - .2 Clean out rock seams and fill with concrete mortar or grout to approval of Consultant.
  
- .17 Install geotextiles as indicated.

### 3.8 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698.
  - .1 Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill. Compact base course to 100%.
  - .2 Retaining walls: use Type 2 fill to subgrade level on high side for minimum 500 mm from wall and compact to 95%.

### 3.9 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place and compact granular material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

### 3.10 BACKFILLING

- .1 Utilize Vibratory compaction equipment.
- .2 Do not proceed with backfilling operations until completion of following:
  - .1 Consultant has inspected and approved installations.
  - .2 Consultant has inspected and approved of construction below finish grade.
  - .3 Inspection, testing, approval, and recording location of underground utilities.
  - .4 Removal of concrete formwork.
  - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

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**ECAVATING, TRENCHING AND BACKFILLING**

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- .4 Do not use backfill material which is frozen or contains ice, snow or debris.
- .5 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to required grades. Compact each layer before placing succeeding layer.
- .6 Backfilling around installations:
  - .1 Place bedding and surround material as specified elsewhere.
  - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
  - .3 Place layers simultaneously on both sides of installed Work to equalize loading.
  - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
    - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Consultant.
    - .2 If approved by Consultant, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Consultant.
- .7 Install drainage system in backfill as indicated.

**3.11 RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris off site, trim slopes, and correct defects as directed by Consultant.
- .2 Replace topsoil as indicated.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Consultant.
- .6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**END □ □ SECTI □ N □**

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**TOPSOIL AND FINISH GRADING**

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□ **GENERAL**

1.1 RELATED SECTIONS

- .1 Section 02210: Site Grading.

1.2 PAYMENT PROCEDURES

- .1 Testing of topsoil: Contractor will pay for cost of tests as required.

1.3 REFERENCES

- .1 Agriculture and Agri-Food Canada  
.1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment  
.1 PN1340-2005, Guidelines for Compost Quality.
- .3 Canadian Green Building Council (CaGBC)  
.1 LEED Canada-NC Version 1.0-December 2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System For New Construction and Major Renovations.
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water  
.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 DEFINITIONS

- .1 Compost:  
.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.  
.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.  
.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 50, and contain no toxic or growth inhibiting contaminants.  
.4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category A.

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**TOPSOIL AND FINISH GRADING**

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1.5 SUBMITTALS

- .1 Provide submittals as required in accordance with drawings.
  
- .1 Quality control submittals :
  - .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
  - .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 QUALITY ASSURANCE

- .1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with local regulations.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Consultant.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

□ **PRDCTS**

2.1 TOPSOIL

- .1 Topsoil for planting, seeded and sodded areas: mixture of mineral particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.
  - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 45 % sand, 35 % silt, and 20 % organic matter by weight.
  - .2 PH value 6.5 to 8.0.
  - .3 Contain no toxic elements or growth inhibiting materials.
  - .4 Finished surface free from:
    - .1 Debris and stones over 50 mm diameter.
    - .2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
  - .5 Consistence: friable when moist.

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**TOPSOIL AND FINISH GRADING**

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2.2 SOIL AMENDMENTS

- .1 Fertilizer to be added as required to achieve the following minimum standards:
  - .1 Fertility: major soil nutrients present in following amounts:
  - .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
  - .3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.
  - .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
  - .5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
  - .6 PH value: 6.5 to 8.0.
  - .7 Fertilizer containing phosphorus may only be applied subsurface.
  - .8 Surface application of fertilizer may only be conducted using phosphorus-free fertilizers.
  
- .2 Peatmoss:
  - .1 Derived from partially decomposed species of Sphagnum Mosses.
  - .2 Elastic and homogeneous, brown in colour.
  - .3 Free of wood and deleterious material which could prohibit growth.
  - .4 Shredded particle minimum size: 5 mm.
  
- .3 Sand: washed coarse silica sand, medium to coarse textured.
  
- .4 Organic matter: compost Category A in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
  
- .5 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.
  
- .6 Limestone:
  - .1 Ground agricultural limestone containing minimum calcium carbonate equivalent of 85%.
  - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
  
- .7 Bone Meal:
  - .1 Finely ground with a minimum analysis of 20% phosphoric acid.
  
- .8 Manure:
  - .1 Well rotted and aged a minimum of three years.
  - .2 May be sheep or steer manure.
  
- .9 Mushroom Compost:

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**TOPSOIL AND FINISH GRADING**

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2.3 SOURCE QUALITY CONTROL

- .1 Advise Consultant of sources of topsoil to be utilized with sufficient lead time for testing, a minimum of 7 days in advance of starting work.
- .2 Contractor is responsible for soil analysis and requirements for amendments to supply topsoil as specified.
- .3 Soil testing by recognized testing facility for PH, P and K, and organic matter.
- .4 Testing of topsoil will be carried out by testing laboratory approved by Consultant.
  - .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

□ **E E C T I O N**

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of brush, weeds and grasses and removed from site.
- .2 Strip topsoil to depths as indicated.
  - .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as directed by Consultant.
  - .1 Stockpile height not to exceed 4 m.
- .4 Do not handle topsoil while in a wet or frozen condition or in any manner in which soil structure is adversely affected.
- .5 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.
- .6 Protect stockpiles from contamination and compaction.

## **TOPSOIL AND FINISH GRADING**

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### 3.3 PREPARATION OF EXISTING GRADE

- .1 Verify that grades are correct.
  - .1 If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
  - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
  - .2 Remove debris which protrudes more than 50 mm above surface.
  - .3 Dispose of removed material off site.
- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
  - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

### 3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

- .1 Place topsoil after Consultant has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm over unfrozen subgrade free of standing water.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil to following minimum depths after settlement and 80% compaction.
  - .1 100 mm for seeded areas.
  - .2 100 mm for sodded areas.
  - .3 300 mm for annual and perennial beds.
  - .4 450 mm for shrub beds.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

### 3.5 FINISH GRADING

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
  - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Consultant.
  - .1 Leave surfaces smooth, uniform and firm against deep foot printing.

### 3.6 ACCEPTANCE

- .1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

**TOPSOIL AND FINISH GRADING**

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3.7 SURPLUS MATERIAL

- .1 Dispose of materials except topsoil not required where directed by Consultant off site.

3.8 CLEANING

- .1 Ensure all excess material on hard surfaces to be cleaned and washed away.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END □□ SECTION**

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**PEBBLE MULCH**

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1.1 RELATED SECTIONS

.1 Section 02210 – Site Grading

1.2 MEASUREMENT PROCEDURES

.1 Measure pebble mulch in cubic metres of material placed.

1.3 SUBMITTALS

- .1 Submit samples as required in accordance with drawings.
- .2 Submit sample of stone in a full range of size and colours.

1.4 PROTECTION

.1 Prevent damage to buildings, landscaping, curbs, sidewalks, trees, fences, roads and adjacent property. Make good any damage.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Fold up metal banding, flatten and place in designated area for recycling.
- .4 Divert left over aggregate materials from landfill to local facility for reuse as approved by Consultant.
- .5 Divert left over geotextiles to local plastic recycling facility as approved by Consultant.

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2.1 STONE

.1 Pebble Mulch: Round, smooth river washed granitic stone in sizes ranging from a minimum diameter of 25 mm to a maximum diameter of 75mm. Clean and free from soil and/ or other granular or debris material.

2.2 BLACK PLASTIC EDGING:

.1 Black Diamond by Valleyview with steel spikes.

2.1 GEOTEXTILE FILTER

.1 Soil Separator Terrafix 360 R by Terrafix Geotextiles.

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**PEBBLE MULCH**

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**3.1 SUBGRADE**

- .1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of pebble mulch.
- .2 Ensure subgrade slopes away from building as per detail.

**3.2 EDGING**

- .1 Install edging true to grade and straight, where pebble mulch is not contained by concrete or building face.
- .2 Attach all pieces together with plastic dowel connectors and ensure dowel is centered in the connecting joint.
- .3 Ensure underground lip is located to the outside of the pebble mulch.
- .4 Drive steel spikes through underground lip into subgrade soil with one spike every 1000mm. Spike adjacent to each side of any joint.
- .5 Where required at 90 degree corners utilize a 90 degree corner connector piece.

**3.3 PEBBLE MULCH**

- .1 Place pebble mulch to 200mm thickness as indicated.
- .2 Ensure the different sizes of stone are randomly distributed throughout the entire area of pebble mulch.

**END □□ SECTI□N**

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**PLANTING OF TREES, SHRUBS AND GROUNDCOVERS**

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□ **GENERAL**

1.1 SUMMARY

.1 Section Includes:

- .1 Materials and installation for plant material, accessories, mulch, planting, tree support, mulching and maintenance.

.2 Related Sections:

- .1 Section 02210 - Rough Grading.  
.2 Section 02921 - Topsoil and Finish Grading.

1.2 REFERENCES

- .1 Agriculture and Agri-Food Canada (AAFC).  
.1 Plant Hardiness Zones in Canada-2000.  
.2 Canadian Nursery Landscape Association (CNLA).  
.1 Canadian Standards for Nursery Stock-2001.

1.3 DEFINITIONS

- .1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.4 SUBMITTALS

- .1 Make submittals as required.  
.2 Submit product data for:  
.1 Fertilizer.  
.2 Mycorrhiza.  
.3 Anti-desiccant.  
.4 Guying assembly including stakes and jute.  
.5 Mulch.  
.3 Submit samples for:  
.1 Mulch.  
.2 Mycorrhiza.

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**PLANTING OF TREES, SHRUBS AND GROUNDCOVERS**

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1.5 QUALITY ASSURANCE

.1 Health and Safety:

- .1 Do construction occupational health and safety in accordance with Thunder Bay District Health Unit Health and Safety Policies and Procedures.

1.6 STORAGE AND PROTECTION

- .1 Protect plant material from frost, excessive heat, wind and sun during delivery.
- .2 Immediately store and protect plant material which will not be installed within 1 hour after arrival at site in storage location approved by Consultant.
- .3 Protect plant material from damage during transportation:
  - .1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
  - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
  - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .4 Protect stored plant material from frost, wind and sun and as follows:
  - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sawdust or topsoil and watering to full depth of root zone.
  - .2 For pots and containers, maintain moisture level in containers.
  - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Heel in root balls and maintain moisture level in root zones.
- .5 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with local regulations.
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling.
  - .4 Separate for reuse and recycling and place in designated containers Steel, Metal, and Plastic waste.
  - .5 Place materials defined as hazardous or toxic in designated containers.
  - .6 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.
  - .7 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.
  - .8 Fold up metal and plastic banding, flatten and place in designated area for recycling.

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**PLANTING OF TREES, SHRUBS AND GROWDCOVERS**

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- .9 Divert discarded plastic plant containers materials from landfill to plastic recycling facility approved by Consultant.
- .10 Dispose of unused fertilizer at official hazardous material collection site approved by Consultant.
- .11 Dispose of unused anti-desiccant at official hazardous material collections site approved by Consultant.
- .12 Divert unused wood and mulch materials from landfill to composting facility approved by Consultant.

**1.7 SCHEDULING**

- .1 Obtain approval from Consultant of schedule 7days in advance of shipment of plant material.
- .2 Schedule to include:
  - .1 Quantity and type of plant material.
  - .2 Shipping dates.
  - .3 Arrival dates on site.
  - .4 Planting Dates.

**1.8 WARRANTY**

- .1 The Contractor hereby warrants that plant material as itemized on plant list will remain free of defects in accordance with General Conditions (GC) - CCDC GC 12.3, for         after planting providing adequate maintenance has been provided.
- .2 End-of-warranty inspection will be conducted by Consultant.
- .3 Consultant reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

**PR  D  CTS**

**2.1 PLANT MATERIAL**

- .1 Type of root preparation, sizing, grading and quality: comply with Canadian Standards for Nursery Stock.
  - .1 Source of plant material: grown in Zone 4 in accordance with Plant Hardiness Zones in Canada.
  - .2 Plant material must be planted in zone indicated as appropriate for its species.
  - .3 Plant material in location appropriate for its species.
- .2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

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**PLANTING OF TREES, SHRUBS AND GROUNDCOVERS**

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- .3 Trees: with straight trunks, well and characteristically branched for species except where specified otherwise.
  - .4 Plant material: root pruned regularly, but not later than one growing season prior to arrival on site.
  - .5 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.
  - .6 Collected stock: maximum 40 mm in caliper, with well developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.
- 2.2 WATER
- .1 Free of impurities that would inhibit plant growth.
- 2.3 STAKES
- .1 Wood, pointed one end, 38 x 38 x 2300 mm.
- 2.4 GUYING COLLAR
- .1 75mm wide Jute affixed to stake with 12mm long steel staples.
- 2.5 TRUNK PROTECTION
- .1 Burlap: clean, minimum 2.5 kg/m<sup>2</sup> mass and 150 mm wide, and twine fastener.
  - .2 Tar impregnated crepe paper and twine fastener.
- 2.6 MULCH
- .1 Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees, such as 'Shredded Red Cedar', or approved equal.
- 2.7 FERTILIZER
- .1 21g Scott's Agriform tablets or approved equal. The Scotts Company LLC, 1(800) 492-8255.
  - .2 Fertilizer containing phosphorus may only be applied subsurface.
  - .3 Surface application of fertilizer may only be conducted using phosphorus-free fertilizers and scheduled fertilizing may only be conducted using phosphorus-free fertilizers.

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**PLANTING OF TREES, SHRUBS AND GROUNDCOVERS**

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2.8 ANTI-DESICCANT

- .1 Wax-like emulsion.

2.9 MYCORRHIZA

- .1 Powdered form soil additive.
- .2 Myke Pro Landscape or approved equal. PremierTech Biotechnologies (800) 606-6926
- .3 Application at the following rates:
  - .1 #1 container = 65ml (0.25 cup)/plant
  - .2 #2 container = 125ml (0.5 cup)/plant
  - .3 #3 container = 195ml (0.75 cup)/plant
  - .4 #5 container = 250ml (1 cup)/plant
  - .5 #7 container = 500ml (2 cups)/plant
  - .6 #10 container = 750ml (3 cups)/plant
  - .7 #15 container = 875ml (3.5 cups)/plant
  - .8 #20 container = 1000ml (4 cups)/plant
  - .9 25-40mm cal. = 1000ml (4 cups)/plant
  - .10 41-50mm cal. = 1500ml (6 cups)/plant
  - .11 51-65mm cal. = 2000ml (8 cups)/plant
  - .12 66-75mm cal. = 2500ml (10 cups)/plant
  - .13 76-100mm cal. = 3000ml (12 cups)/plant.
  - .14 125-150cm ht. = 1000ml (4 cups)/plant
  - .15 151-180cm ht. = 1500ml (6 cups)/plant
  - .16 181-240cm ht. = 2000ml (8 cups)/plant

2.10 SOURCE QUALITY CONTROL

- .1 Obtain approval from Consultant of plant material prior to planting.
- .2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

**E□EC□TI□N**

3.1 PRE-PLANTING PREPARATION

- .1 Do construction occupational health and safety in accordance with Thunder Bay District Health Unit Health and Safety Policies and Procedures.
- .2 Ensure plant material acceptable to Consultant.
- .3 Remove damaged roots and branches from plant material.
- .4 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

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**PLANTING OF TREES, SHRUBS AND GROWDCOVERS**

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**3.2 EXCAVATION AND PREPARATION OF PLANTING BEDS**

- .1 Establishment of sub-grade for planting beds is specified in Section 02210 - Rough Grading.
- .2 Preparation of planting beds is specified in Section 02921 - Topsoil and Finish Grading.
- .3 For individual planting holes:
  - .1 Stake out location and obtain approval from Consultant prior to excavating.
  - .2 Excavate to depth and width as indicated.
  - .3 Remove subsoil, rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.
  - .4 Scarify sides of planting hole.
  - .5 Remove water which enters excavations prior to planting. Notify Consultant if water source is ground water.

**3.3 PLANTING**

- .1 For bare root stock, place 50 mm backfill soil in bottom of hole. Plant trees and shrubs with roots placed straight out in hole.
- .2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
- .3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .4 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.
- .5 Add mycorrhiza around root ball prior to backfilling as per manufacture's recommended application rate.
- .6 For trees and shrubs:
  - .1 Fertilize: for shrubs two 21g Agriform tablets or approved equal for each shrub in bed; for trees two Agriform tablets or approved equal for each 25mm of tree caliper.
  - .2 Backfill soil in 150 mm lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
  - .3 Form watering saucer as indicated.
- .7 For ground covers and perennials backfill soil evenly to finish grade and tamp to eliminate air pockets.

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**PLANTING OF TREES, SHRUBS AND GROUNDCOVERS**

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- .8 Water plant material thoroughly and in such a way as to prevent surface erosion.
- .9 After soil settlement has occurred, fill with soil to finish grade.
- .10 Dispose of burlap, wire and container material off site.

3.4 TRUNK PROTECTION

- .1 Install trunk protection on deciduous trees as indicated.
- .2 Install trunk protection prior to installation of tree supports when used.

3.5 TREE SUPPORTS

- .1 Install tree supports as indicated.
- .2 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.6 MULCHING

- .1 Ensure soil settlement has been corrected prior to mulching.
- .2 Spread mulch as indicated.

3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following maintenance operations from time of planting to acceptance by Consultant.
  - .1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
    - .1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.
    - .2 Remove weeds as required.
    - .3 Replace or respread damaged, missing or disturbed mulch.
    - .4 For non-mulched areas, cultivate as required to keep top layer of soil friable.
    - .5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Consultant prior to application.
    - .6 Remove dead or broken branches from plant material.
    - .7 Keep trunk protection and tree support in proper repair and adjustment.
    - .8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

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**PLANTING OF TREES, SHRUBS AND GROUNDCOVERS**

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3.8 ACCEPTANCE

- .1 Plant material will be accepted by Consultant 90 days after planting operation is completed providing that plant material exhibited healthy growing condition and is free from disease, insects and fungal organisms.
- .2 Plant material installed less than 90 days prior to frost will be accepted in the following spring, 30 days after start of growing season provided that acceptance conditions are fulfilled.

3.9 MAINTENANCE DURING WARRANTY PERIOD

- .1 From time of acceptance by Consultant to end of warranty period, perform following maintenance operations.
  - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
  - .2 Reform damaged watering saucers.
  - .3 Remove weeds as required.
  - .4 Replace or respread damaged, missing or disturbed mulch.
  - .5 For non-mulched areas, cultivate as required to keep top layer of soil friable.
  - .6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Consultant prior to application.
  - .7 Apply fertilizer in early spring as indicated by soil test.
  - .8 Remove dead, broken or hazardous branches from plant material.
  - .9 Keep trunk protection and tree supports in proper repair and adjustment.
  - .10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.
  - .11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.
  - .12 Submit monthly written reports to Consultant identifying:
    - .1 Maintenance work carried out.
    - .2 Development and condition of plant material.
    - .3 Preventative or corrective measures required which are outside Contractor's responsibility.

**END □□ SECTI□N**

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**SODDING**

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□ **GENERAL**

1.1 RELATED SECTIONS

- .1 Section 02921 - Topsoil Placement and Grading.

1.2 SUBMITTALS

- .1 Samples.
  - .1 Submit samples as required in accordance with drawings.
  - .2 Submit:
    - .1 Sod for each type specified.
      - .1 Install approved samples in one square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.
  - .3 Obtain approval of samples by Consultant.

1.3 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.4 SCHEDULING

- .1 Schedule sod laying to coincide with preparation of soil surface.
- .2 Schedule sod installation when frost is not present in ground.

## **SODDING**

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### 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Consultant.
- .3 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

### □ **PR□**D**□**CT**S**

### 2.1 MATERIALS

- .1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.
  - .1 Turf Grass Nursery Sod types:
    - .1 Number One Kentucky Bluegrass - Fescue – Rye Sod: Nursery Sod grown solely from seed mixture of: 30% Kentucky Bluegrass cultivars, 40% Chewing Fescue or Creeping Red Fescue cultivars, and 30% Perennial Ryegrass cultivars.
  - .2 Turf Grass Nursery Sod quality:
    - .1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.
    - .2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.
    - .3 Mowing height limit: 35 to 65 mm.
    - .4 Soil portion of sod: 6 to 15 mm in thickness.
- .2 Water:
  - .1 Supplied by Contractor at designated source.
  - .2 Potable, free of impurities.
- .3 Fertilizer:
  - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
  - .2 Complete, synthetic or organic, slow release with 65 % of nitrogen content in water-insoluble form.
  - .3 Fertilizer containing phosphorus may only be applied subsurface prior to sodding.
  - .4 Surface application of fertilizer may only be conducted using phosphorus-free fertilizers and scheduled fertilizing may only be conducted using phosphorus-free fertilizers.

### 2.2 SOURCE QUALITY CONTROL

- .1 Obtain approval from Consultant of sod at source.
- .2 When proposed source of sod is approved, use no other source without written authorization from Consultant.

## **SODDING**

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### **E E C T I O N**

#### **3.1 PREPARATION**

- .1 Verify that grades are correct and prepared in accordance with Section 02921 - Topsoil Placement and Grading. If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.
- .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
- .3 Fine grade surface free of humps and hollows to smooth, even grade and elevations indicated, to tolerance of plus or minus 8 mm, for Turf Grass Nursery Sod, surface to drain naturally.
- .4 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.
- .5 Cultivate fine grade approved by Consultant to 25mm depth immediately prior to sodding.

#### **3.2 SOD PLACEMENT**

- .1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.
- .2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
- .3 Roll sod as directed by Consultant. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

#### **3.3 SOD PLACEMENT ON SLOPES**

- .1 Start laying sod at bottom of slopes.
- .2 Lay sod sections longitudinally, along contours of slopes.

#### **3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following operations from time of installation until acceptance.
- .2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100mm.
- .3 Cut grass to 50mm when or prior to it reaching height of 75mm. Remove clippings which will smother grassed areas.

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## SODDING

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- .4 Maintain sodded areas weed free to a minimum of 95%.
- .5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

### 3.5 ACCEPTANCE

- .1 Turf Grass Nursery Sod areas will be accepted by Consultant provided that:
  - .1 Sodded areas are properly established.
  - .2 Sod is free of bare and dead spots.
  - .3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50mm.
  - .4 Sodded areas have been cut minimum 2 times prior to acceptance and within 24 hours prior to acceptance.
- .2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

### 3.6 MAINTENANCE DURING WARRANTY PERIOD

- .1 Perform following operations from time of acceptance until end of warranty period:
  - .1 Water sodded Turf Grass Nursery Sod areas at weekly intervals to obtain optimum soil moisture conditions to depth of 100 mm.
- .2 Repair and resod dead or bare spots to satisfaction of Consultant.
- .3 Cut grass and remove clippings that will smother grass to height as follows:
  - .1 Turf Grass Nursery Sod:
    - .1 50 mm during normal growing conditions.
    - .2 65 mm at end of growing season and during periods of high temperature and low precipitation.
  - .2 Cut grass at intervals so that approximately one third of growth is removed in single cut.
  - .3 Fertilize sodded areas one month after sodding with 2:0:1 ratio fertilizer. Spread evenly at a rate of 0.5kg of Nitrogen/ 100m<sup>3</sup> and water well. Spread half of required amount of fertilizer in one direction and remainder at right angles.
  - .4 Eliminate weeds by mechanical or manual means to extent acceptable to Consultant.

### 3.7 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END □□ SECTI□N□

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## SITE GRADING

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### □ GENERAL

#### 1.1 RELATED SECTIONS

- .1 Section 02223 - Excavation, Trenching and Backfilling.
- .2 Section 02905 - Tree and Shrub Preservation.
- .3 Section 02921 – Topsoil and Finish Grading.

#### 1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM D698-91(1998), Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m<sup>3</sup>).

#### 1.3 EXISTING CONDITIONS

- .1 Examine subsurface investigation report which is available for inspection bound into specification.
- .2 It is the responsibility of the Contractor to locate all underground and surface utility lines and buried objects that may not be indicated on site plan.
- .3 Refer to dewatering in Section 02223 - Excavating Trenching and Backfilling.

#### 1.4 PROTECTION

- .1 Protect and/or transplant existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement and surface or underground utility lines which are to remain as directed by Consultant. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

### □ PRODUCTS

#### 2.1 MATERIALS

- .1 Fill material: in accordance with of Section 02223 - Excavating, Trenching and Backfilling.

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## SITE GRADING

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- .2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Consultant.

### □ **E□EC□TI□N**

#### 3.1 STRIPPING OF TOPSOIL

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Consultant.
- .2 Commence topsoil stripping of areas as indicated after area has been cleared and removed from site.
- .3 Strip topsoil to depths as directed by Consultant. Rototill and retain as topsoil on site. Avoid mixing topsoil with subsoil.
- .4 Stockpile in locations as directed by Consultant. Stockpile height not to exceed 4 m.
- .5 Dispose of unused topsoil off site.

#### 3.2 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Rough grade to following depths below finish grades:
  - .1 100 mm for grassed areas.
  - .2 300 mm for annual or perennial beds.
  - .3 450 mm for shrub beds.
  - .4 280 mm for concrete paving
  - .5 230 mm for unit paving
- .3 Slope rough grade away from building 1:50 minimum.
- .4 Grade ditches to depth as indicated.
- .5 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .6 Compact filled and disturbed areas to corrected maximum dry density to ASTM D698, as follows:
  - .1 85% under landscaped areas.

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**SITE GRADING**

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.2 98 % under paved and walk areas.

.7 Do not disturb soil within branch spread of trees or shrubs to remain.

**3.3 TESTING**

.1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by ULC. Costs of tests will be paid under a Cash Allowance.

.2 Submit testing procedure, frequency of tests and testing laboratory as designated by ULC or certified testing personnel to Consultant for approval.

**3.4 SURPLUS MATERIAL**

.1 Remove surplus material and material unsuitable for fill, grading or landscaping off site.

**END □□ SECTION□**

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## UNIT PAVING

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### 1.1 SECTION INCLUDES

- .1 Materials and installation for sand-set unit paving without mortared joints for pedestrian or light vehicular traffic.

### 1.2 RELATED SECTIONS

- .1 Section 02210 – Site Grading.

### 1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C117-95, Standard Test Method for Material Finer Than 75-[mu] m (No.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C136-01, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM C902-02, Standard Specification for Pedestrian and Light Traffic Paving Brick.
  - .1 ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>(600kN-m/m<sup>3</sup>)).
  - .2 ASTM E11-01, Standard Specification for Wire-Cloth Sieves for Testing Purposes.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International).
  - .1 CSA A23.1/A23.2-00, Concrete Materials and Methods of Construction/Methods of Test for Concrete.
  - .2 CSA A179-94(R1999), Mortar and Grout for Unit Masonry.
  - .3 CSA-A231.1-99, Precast Concrete Paving Slabs.

### 1.4 SUBMITTALS

- .1 Submit following product test data:
  - .1 Sieve analysis for gradation of bedding and joint material.
  - .2 Unit paver test data.
- .2 Indicate layout, pattern and relationship of paving joints to fixtures and project formed details.

## UNIT PAVING

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- .3 Submit samples as required in accordance with drawings.
- .4 Submit full size sample of each type of paving unit in a full range of colours.

### 1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard and packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused concrete materials from landfill to local facility as approved by Consultant.
- .5 Divert unused aggregate materials from landfill to facility for reuse as approved by Consultant.
- .6 Fold up metal banding, flatten and place in designated area for recycling.

□ **P**□□□□□□□□

### 2.1 MATERIALS

- .1 Unit Pavers: uniform in material, colour, size and from one manufacturer to CSA-A231.2. by Barkman Concrete Limited, P.O. Box1179 Steinbach MB R5G 1A4, (204)326-3445 [www.barkmanconcrete.com](http://www.barkmanconcrete.com) in the following sizes:
  - .1 200mm x 200mm x 60mm Holland Square Stone in Desert Buff colour, standard finish.
  - .2 100mm x 200mm x 60mm Holland Stone in Antique Brown colour, standard finish.
- .2 Granular 'a' base
  - .1 Sound, hard, durable, angular crushed aggregate, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
  - .2 Gradations: within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1 rather than ASTM E 11.

**UNIT PAVING**

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.3 Table

Sieve Designation	% Passing
53 mm	-
37.5 mm	-
26.5 mm	100
19 mm	95 - 100
13.2 mm	78 - 92
9.5 mm	68 - 83
4.75 mm	44- 64
2.36 mm	29 - 66
0.425 mm	12 - 20
0.075 mm	2 - 6

.4 Liquid Limit ASTM D 4318 Maximum 25

.5 Plasticity Index ASTM D 4318 Maximum 6

.3 Bedding Sand: washed, clean, hard, durable, crushed stone particles, conforming to gradation of concrete sand as specified in CAN/CSA A23.1. Sand: free from clay lumps, cementation, organic material, frozen material and other deleterious materials.

.1 Do not use limestone screenings or stone dust.

.2 Do not use mason sand or sand conforming to CSA A179 for the bedding sand.

.3 Gradations: Sieve according to CSA-A23.2 and conform to the grading requirements of CSA-A23.1-FA1 as shown with modifications in table below:

Sieve Designation	% Passing
10 mm	100
5 mm	95 - 100
2.5 mm	80 - 100
1.25 mm	50 - 90
0.630 mm	25 - 65
0.315 mm	10 - 35
0.160 mm	2 - 10
0.075 mm	0 - 1

## UNIT PAVING

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- .4 Jointing Sand for Unit paving: to CSA A179, washed, clean, hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
  - .1 Product to be EnviroSAND Stabilized Joint Sand. Envirobond Products Corp. 85 Howard Place, Kitchener, ON N2K 2Z4 1 8666 ENVIRO [www.envirobond.com](http://www.envirobond.com) .
  - .2 Gradations: Sieve according to CSA-A23.2 and conform to the grading requirements of CSA A179 as shown with modifications.

Sieve Designation	% Passing
5 mm	100
2.5 mm	90 - 100
1.25 mm	85 - 100
0.630 mm	65 - 95
0.315 mm	15 - 80
0.160 mm	0 - 35
0.075 mm	0 - 1

- .5 Plastic Paving Edge Restraint: Pavetech 2400mm long lengths or approved equal, with 250mm long galvanized spiral spikes.
- .6 Geotextile: Soil Separator Terrafix 360 R by Terrafix Geotextiles or approved equal.

**E** □□□□□□□□

### 3.1 PROTECTION

- .1 Prevent damage to any adjacent areas. Make good any damage.
- .2 Provide access to building at all times. Coordinate paving schedule to minimize interference with normal use of premises.

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## UNIT PAVING

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### 3.2 SUBGRADE

- .1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base.

### 3.3 GEOTEXTILE

- .1 Install geotextile filter continuous over subgrade as indicated.
- .2 Ensure geotextile filter extends up side of excavation.

### 3.4 GRANULAR BASE

- .1 Base minimum thickness: 150 mm.
- .2 Spread and compact granular 'a' base in uniform layers not exceeding 100 mm compacted thickness.
- .3 Compact base to a density of not less than 98 % Standard Proctor Density in accordance with ASTM D698.
- .4 Shape and roll alternately to obtain smooth, even and uniformly compacted granular base and ensure conformity of grades with finish surface.
- .5 Apply water as necessary during compaction to obtain specified density. If granular base is excessively moist, remove it and install more granular material to rid it of sponginess.
- .6 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.
- .7 Ensure top of granular base does not exceed plus or minus 10 mm over a 3 m straightedge.

### 3.5 EDGING

- .1 Install edging true to grade, in location where unit paving is not contained by concrete or building edge
- .2 Snap and spike all pieces together at tongue and groove connections.
- .3 Snip back tie with diagonal cutters to allow for inside and outside radius curves
- .4 Spike paving edge restraint down on top of compacted granular base with one spike every 600 mm for straight sections and every 300 mm for curved sections.

### 3.6 BEDDING SAND

- .1 Place and spread bedding sand to 20 mm thickness as indicated.
- .2 Ensure sand bedding layer is dry (4-8% moisture content) prior to placement of unit pavers.
- .3 Do not disturb screeded sand once laid.
- .4 Use material other than bedding sand to compensate for depressions that exceed specified tolerances in surface of base.
- .5 Do not use joint sand for bedding sand.

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**UNIT PAVING**

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**3.7 SURFACE COURSES**

- .1 Unit Paving
  - .1 Ensure bedding sand and granular base is not saturated prior to placement of unit pavers.
  - .2 Install unit paving true to grade on the bedding sand, in location, layout and pattern as indicated.
  - .3 Where required, cut units accurately without damaging edges using diamond blade power saw. Guillotine type cutters are not permitted.
  - .4 Lay pavers in pattern shown on drawings. Place units hand tight without using hammers. Make horizontal adjustments to placement of laid pavers with rubber hammers and pry bars as required.
  - .5 Joints between pavers to be 3 mm wide. No more than 5% of the joints shall exceed 5 mm wide to achieve straight bond lines.
  - .6 Joint lines shall not deviate more than plus or minus 10 mm over 15 m from string lines.
  - .7 Fill gaps at the edges of the paved area with cut pavers.
  - .8 Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and joint sand.
  - .9 Prior to compaction, sweep clean entire surface clean from any debris such as stones, paver chips and dirt.
  - .10 Use a low amplitude plate compactor capable of at least minimum 18 kN at a frequency of 75 to 100 Hz to vibrate the pavers into the bedding sand until pavers are true to grade and free of movement. Compact in 2 directions to ensure all areas are compacted. Remove any cracked or damaged pavers and replace with new units.
  - .11 Simultaneously spread, sweep and compact dry joint sand into joints continuously until full. Repeat until no additional jointing sand can be vibrated into joints.
  - .12 Remove all excess jointing sand from the surface by sweeping.
  - .13 Fully saturate jointing sand using a continual fine mist. Care must be taken to not wash jointing material out of joints
  - .14 Allow jointing sand to dry for 2 to 24 hours prior to allowing access to unit paving.

**END □□ SECTI□N**

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**TREE AND SHRUB PRESERVATION**

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□ **GENERAL**

1.1 SUMMARY

.1 Section Includes:

- .1 Materials and installation for fertilizing and preserving root systems of plants affected by changing grades or excavation or in the vicinity of construction.

.2 Related Sections:

- .1 Section 02117 - Tree Pruning.  
.2 Section 02921 – Topsoil and Finish Grading.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International).

- .1 CSA G30.5-[M1983(R1998)], Welded Steel Wire Fabric for Concrete Reinforcement.

.2 Department of Justice Canada (Jus).

- .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.  
.2 Fertilizers Act (R.S. 1985, c. F-10).  
.3 Fertilizers Regulations (C.R.C., c. 666).  
.4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.3 Health Canada - Pest Management Regulatory Agency (PMRA).

- .1 National Standard for Pesticide Education, Training and Certification in Canada (1995).

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

- .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

.1 Submit monthly written reports on maintenance during warranty period, to Consultant identifying:

- .1 Maintenance work carried out.  
.2 Development and condition of plant material.  
.3 Preventative or corrective measures required which are outside Contractor's responsibility.

1.4 QUALITY ASSURANCE

.1 Health and Safety:

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**TREE AND SHRUB PRESERVATION**

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- .1 Do construction occupational health and safety in accordance with Thunder Bay District Health Unit health and Safety Policies and Procedures.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

- .1 Separate waste materials for reuse and recycling in accordance with local regulations.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling.
- .4 Separate for reuse and recycling and place in designated containers.
- .5 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Consultant.
- .6 Divert unused wood materials from landfill by composting or mulching approved by Consultant.
- .7 Divert unused stone and aggregate materials from landfill to local facility approved by Consultant.
- .8 Divert unused plastic materials from landfill to local recycling facility approved by Consultant.
- .9 Place materials defined as hazardous or toxic in designated containers.
- .10 Dispose of unused fertilizer material at official hazardous material collections site approved by Consultant.
- .11 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.
- .12 Do not dispose of unused fertilizer material into sewer system, into streams, lakes, onto ground or in any other location where they will pose health or environmental hazard.
- .13 Ensure emptied containers are sealed and stored safely.
- .14 Fold up metal banding, flatten and place in designated area for recycling.

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**TREE AND SHRUB PRESERVATION**

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1.6 SCHEDULING

- .1 Obtain approval from Consultant of schedule indicating beginning of Work.

1.7 MAINTENANCE DURING WARRANTY PERIOD

- .1 From time of acceptance by Consultant to end of warranty period, perform following maintenance operations.
  - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
  - .2 Apply pesticides in accordance with National Standard for Pesticide Education, Training and Certification in Canada, Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain product approval from Consultant prior to application.
  - .3 Apply fertilizer in early spring at manufacturer's suggested rate.
  - .4 Remove dead, broken or hazardous branches from plant material. Dispose of debris through composting or mulching.

□ **PRDCTS**

2.1 MATERIALS

- .1 Peatmoss:
  - .1 Derived from partially decomposed species of Sphagnum Mosses.
  - .2 Elastic and homogeneous.
  - .3 Free of wood and deleterious material which could prohibit growth.
  - .4 Shredded minimum particle size: 5 mm.
- .2 Fertilizer:
  - .1 To Canada Fertilizer Act and Fertilizers Regulations.
  - .2 Complete, commercial, slow release with 35 % of nitrogen content in water-insoluble form.
  - .3 Fertilizer containing phosphorus may only be applied subsurface.
  - .4 Surface application of fertilizer may only be conducted using phosphorus-free fertilizers and scheduled fertilizing may only be conducted using phosphorus-free fertilizers.
- .3 Anti-desiccant: commercial, wax-like emulsion.
- .4 Filter Cloth:
  - .1 Type 1: 100 % non-woven needle punched polyester, 2.75 mm thick, 240 g/m<sup>2</sup> mass.
  - .2 Type 2: biodegradable burlap.
- .5 Metal T-Bars: 38 x 38 x 2400 mm length, painted flat black.
- .6 Wood Posts: 38 x 89 x 2400 mm length, untreated wood.

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**TREE AND SHRUB PRESERVATION**

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- .7 Welded wire fabric (WWF) Farm Fence: 1000 mm high, MW 150 mm x MW 450 mm, to CSA G30.5.
- .8 Snow Fencing: Purpose made, synthetic plastic fencing, orange colour 1200 mm high.

□ **E E C T I O N**

3.1 IDENTIFICATION AND PROTECTION

- .1 Do construction occupational health and safety in accordance with Thunder Bay District Health Unit Health and Safety Policies and Procedures.
- .2 Identify plants and limits of root systems to be preserved as approved by Consultant.
- .3 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by Consultant.
- .4 Ensure no pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT) as approved by Consultant.

3.2 PROTECTIVE FENCING SYSTEM

- .1 Identify plants and limits of root systems to be preserved as approved by Consultant.
- .2 Prune exposed roots cleanly during construction. Pruned ends to point obliquely downwards.
- .3 Install metal t-bar posts and welded wire farm fence at dripline of vegetation to be retained.
- .4 Securely attach orange snow fence to welded wire farm fence.

3.3 ROOT CURTAIN SYSTEM

- .1 Identify limits for required construction excavation as approved by Consultant.
- .2 Prior to construction excavation, dig trench minimum 500 mm wide x 1500 mm deep, along perimeter of excavation limits.
- .3 Prune exposed roots cleanly at side of trench nearest plants to be preserved. Pruned ends to point obliquely downwards.
- .4 Install wooden posts and welded wire fabric against construction edge of trench.
- .5 Securely attach Type 2 filter fabric on plant side of wire mesh.

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**TREE AND SHRUB PRESERVATION**

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- .6 Prepare homogeneous mixture of fertilizer, parent material and organic matter.
  - .1 Add organic matter to mixture to achieve 7-9% organic matter content by weight.
  - .2 Incorporate with mixture grade 2:12:8 ratio fertilizer (dry) at rate of 1.5 kg/m<sup>3</sup>.
- .7 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 150 mm in depth. Compact each layer to 85% Standard Proctor Density.
- .8 Protect root curtain from damage during construction operations.
- .9 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.
- .10 Protect root curtain before and during backfill operations. Ensure root curtain is cut down to 300 mm below finished grade and remove cut material.

### 3.4 DURING CONSTRUCTION CARE

- .1 Tree protection notes for trees to be retained in the vicinity of construction: Using the services of a qualified tree service firm under the direction of an Accredited Arborist to carry out the following program of care for the trees to be retained:
  - .1 Pre-construction Start-up:
    - .1 Prune only to remove dead, diseased or dying wood or to structurally improve the trees.
    - .2 Feed the trees by liquid injection (low pressure below grade deep watering) with Nitroform water-soluble slow release fertilizer. Calibrate feeding for each tree based upon caliper of tree and its requirement. The fertilizer is produced by Nutrite.
    - .3 Provide care and feeding for trees within dripline area.
  - .2 During Construction:
    - .1 Maintain protective fencing in place during the entire construction period.
    - .2 Do not store materials, place equipment, or move equipment over roots system or through set back protection area.
    - .3 No rigging cables shall be wrapped around or installed in trees.
    - .4 Do not burn waste near trees or flush concrete bricks, or cement mixing machines over root systems.
    - .5 Areas where root systems are directly exposed shall have roots pruned and then backfilled with good native loam and soil.
    - .6 Damaged trees must be immediately repaired at Contractor's expense.
    - .7 Monitor the requirements of the trees and provide water and maintenance care as may be required.

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**TREE AND SHRUB PRESERVATION**

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- .8 Where limbs or portions of trees must be removed to accommodate construction, they will be removed carefully as approved by the Consultant.

**3.5 MAINTENANCE DURING WARRANTY PERIOD**

- .1 From time of acceptance by Consultant to end of warranty period perform the following maintenance operations:
  - .1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
  - .2 Apply organic, non-chemical pesticides in accordance with Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease. Obtain product approval from Consultant prior to application.
  - .3 Apply fertilizer in early spring at rate of 0.025 kg of nitrogen/m<sup>2</sup>.
  - .4 Remove dead, broken or hazardous branches from plant material.

**3.6 PRUNING**

- .1 Prune in accordance with Section 02117 - Tree Pruning.
- .2 Prune crown to compensate for root loss while maintaining general form and character of plant. Dispose of debris through composting and mulching.

**3.7 ANTI-DESICCANT**

- .1 Apply anti-desiccant to foliage where applicable and as directed by Consultant.

**3.8 CLEAN UP**

- .1 Remove from site metal t-bar and wood posts, wire farm fence and orange snow fence when construction is complete.

**END □□ SECTI□N**

**SUBMISSION LABEL**

**From:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
**Contact:** \_\_\_\_\_  
**Telephone:** \_\_\_\_\_

**Deliver to:**

**Thunder Bay District Health Unit  
999 Balmoral Street  
Thunder Bay, ON P7B 6E7  
Attn: G. Daniels, C.A., Manager of Finance**

**SEALED Tender:  
TENDER # 002-2011  
DESCRIPTION: Landscape Restoration and Development**

**CLOSING DATE: 4:00 p.m. Local Time, Tuesday, APRIL 19, 2011**

<b>For Office use only</b>
<b>Date Received:</b> _____
<b>Time Received:</b> _____
<b>Received By:</b> _____