UNIVERSITY OF MANITOBA | Financial Services

Purchasing Services
Rm 403 Administration Building
Winnipeg, Manitoba
R3T 2N2 Canada

REQUEST FOR PROPOSALS

RFP # FG 130918 AC

CONSULTING SERVICES FOR FORT GARRY CAMPUS RIVERBANK STABILIZATION STUDY AND INFRASTRUCTURE REPAIR

ISSUED SEPTEMBER 13, 2018

IMPORTANT NOTICES

Submissions: The University of Manitoba accepts only electronic submissions of requested proposals, quotations or responses through the Bonfire Submission Portal Service and must be submitted prior to the closing time stated in the RFP at: <https://umanitoba.bonfirehub.ca/>.

Consult the bidding requirements and submission instructions at the above-referenced internet portal service site well ahead of the competition closing date and time to allow sufficient opportunity for preparing a response and for uploading submission files. (Allow at least one hour to upload files).

Dates: For dates, please refer to Section 2.3 Procurement Schedule.

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1 PROJECT SUMMARY

1.1 INTRODUCTION – THE UNIVERSITY OF MANITOBA

The University of Manitoba (UM) is the province's largest university, the first university in Western Canada, and the only medical-doctoral institution in the region. In a typical year, the university has an enrolment of over 29,000 students. The University of Manitoba offers the largest selection of degree programs, including professional and graduate programs, of any university in the province. In all, over 80 degree programs are offered. Most of our academic units offer graduate studies programs leading to masters or doctoral degrees.

As a testament to the strong scientific foundation of the University of Manitoba, the university is ranked among the best in Canada when it comes to the level of research funding it attracts each year. The university currently holds over 40 Canada Research Chairs and is home to a number of research centres and institutes, and Smartpark, a community of innovators that forges collaborations between university and industry. Cutting-edge research is underway at the University of Manitoba in a wide range of disciplines.

- Quick Facts about the University of Manitoba
  http://umanitoba.ca/about/quick_facts/

- Student enrolment and human resources statistics:
  http://umanitoba.ca/admin/oia/media/2014-2015_IS_BOOK_Final_Mar_30_2016.pdf

- Sustainability at the University of Manitoba:
  http://umanitoba.ca/campus/sustainability/

- Strategic Plan:
  http://umanitoba.ca/admin/president/strategic_plan/index.html

For more information on the University of Manitoba visit <www.umanitoba.ca/about>.

1.2 PROJECT SUMMARY (FULL DETAIL ARE PROVIDED AT EXHIBIT 1)

The University has identified the need to perform a comprehensive study to understand our riverbank condition, threats, and risks. We are looking to engage a qualified team to review the current conditions and present recommendations for stabilization and erosion control over the next 15 years. In addition to this study, two sites along the riverbank, Outfall No. 2 on the south side of campus and Culvert No. 108 on the north side are experiencing failed/failing infrastructure and need to be addressed immediately.

1.3 CURRENT STATE SUMMARY

The University lands are comprised of approximately 3.92km of riverbank frontage at the Fort Garry Campus, with 0.57km of this abutting Southwood Lands and 2.1km along the Point Lands (see Appendix 1). The remaining 1.25km abut the main campus lands. Adjacent land use varies across the Fort Garry Campus riverbank frontage. Some sections of the riverbank have seen some level of riverbank stability, erosion protection, and infrastructure renewal works over the years. Outfall No. 2 is located on the south bank of the red river along Freedman Cres., near Drake Centre. A pipe collapse in the Spring of 2018 resulted in emergency construction for a temporary solution to seal the damaged pipe and redirect the water overland.

Culvert No. 108 is located on the north side of campus at the southeast edge of Southwood Lands off Sifton Road, just north of the Wallace building. The area continues to see the effects of undercutting and riverbank erosion.

1.4 PROJECT TERM AND BUDGET SUMMARY

Work on the Riverbank Stabilization Study and Infrastructure Repair project is expected to commence immediately. Design for Outfall No. 2 is top priority, as construction work must take place during the winter of 2018/19. Substantial Performance is targeted for March 15, 2019, subject to requirements from all Authorities Having Jurisdiction. The work on Culvert No. 108 is expected to take place in 2019. Timeline for the Riverbank Stabilization Study will be coordinated with the Consultant Team once the design work on Outfall No. 2 has commenced, but should take place concurrently with the infrastructure repair projects.

Construction Budget:

- Part 1 – Riverbank Stabilization Study: It is the intention that the order of magnitude costing provided with the study will inform budget allocation to implement projects. The phasing strategy will inform when these projects will be targeted.
- Part 2 - Outfall No. 2 Reconstruction: $1.5M
- Part 3 - Culvert No. 108 Investigation and Remediation: $500,000

1.5 DESIRED OUTCOMES SUMMARY

The UofM is inviting proposals from qualified multi-disciplinary teams to prepare a Riverbank Stabilization Study. This request includes a review of the current conditions as well as recommendations for stabilization and erosion control over the next 15 years. Recommendations are to be prioritized with a phasing strategy and include order of magnitude costing. In addition to the Riverbank Stabilization Study, complete design and construction services for the two identified sites, Outfall No. 2 and Culvert No. 108 are to be included.

2 PROCUREMENT INFORMATION

2.1 UNIVERSITY REPRESENTATIVE

The University has designated representatives (listed below) whom are responsible for the conduct of this procurement. All inquiries, concerns, or clarifications regarding this procurement must be submitted to these individuals only in writing by email (no phone calls). Offerors shall not contact any other University employees. Please copy both individuals on all correspondence.

Procurement University Representative - All inquiries regarding the procurement, process, procedures, or submittals must be submitted in writing by email to the individual listed below (and CC the Technical University Representatives):

- Andrew Cramer, Purchasing Consultant, Purchasing Services
  Email: Andrew.Cramer@umanitoba.ca

University Technical Representative - All technical inquiries regarding the project specifics (such as Scope of Work, Current Conditions, Desired Outcomes, etc.) must be submitted in writing by email to the individual listed below (and CC the Procurement University Representative):

- Vanessa Jukes, Project Manager, Architectural and Engineering Services
  Email: Vanessa.Jukes@umanitoba.ca

2.2 INQUIRIES, CLARIFICATIONS, REQUESTS FOR INFORMATION

Offerors are expected to promptly review the Request for Proposal (RFP) document, including all of the attachments, exhibits, and addendum. If discrepancies, inconsistencies, or omissions are found, the Offeror should immediately notify the Procurement University Representative noted in **Section 2.1.** If the Offeror has questions or requires clarification of the scope of work, the University's intent, or any aspect of this procurement, they should notify the Procurement University Representative noted in **Section 2.1.** All questions, inquiries, clarifications, must be emailed by the due date identified in the Procurement Schedule. The University Representative(s) may respond to any such requests by issuing written addenda. Verbal clarifications shall not be binding. Offerors should not rely upon any statements made by any person other than the University Representative(s) noted in **Section 2.1.**

2.3 PROCUREMENT SCHEDULE

The University will make every effort to adhere to the schedule below. However, the University reserves the right to modify these activities and dates at any time.

Activity	When
RFP Release	September 13, 2018
Deadline to Submit Questions / Inquiries	September 24, 2018
Closing Date and Time	October 02, 2018 at 2:00 PM
Clarification Period	October 3th – October 10th
Anticipated Conditional Award	October 10, 2018

2.4 ADDENDA

The University may make changes to the RFP and/or provide clarification to information stated within the RFP by way of issuance of written addenda. All addenda issued prior to the Proposal Due Date will become part of this RFP and will be deemed to have been considered by the Offeror in its proposal.

Offerors should monitor the site where the competition is hosted, i.e. the Bonfire Submission Portal Service at <**https://umanitoba.bonfirehub.ca**> for all addenda to the RFP. It is the responsibility of the Offeror to ensure all addenda were received.

3 SUBMISSION OF THE PROPOSAL

3.1 DATE, TIME, AND LOCATION

Offerors must submit one (1) proposal package electronically through our Bonfire Submission Portal Service system. The electronic submission should be marked with reference to this RFP (RFP Number and Name). All proposal packages MUST be received prior to the date/time indicated in the Procurement Schedule in **Section 2.3**. Proposals received after this deadline will NOT be accepted. The University of Manitoba accepts only electronic submissions through the Bonfire Submission Portal Service and must be submitted prior to the closing time stated in the RFP at: <**https://umanitoba.bonfirehub.ca**>.

Bidding requirements and submission instructions have been provided at the Bonfire Submission Portal Service site: <**https://umanitoba.bonfirehub.ca**>. Consult the bidding requirements and submission instructions at the referenced internet portal service site well ahead of the competition closing date and time to allow sufficient opportunity for preparing a response and for uploading submission files. (Allow at least one hour to upload files).

Any samples or other additional components of the Proposal which cannot reasonably be enclosed in the electronic submission package requires a written request from the Offeror to the Procurement University Representative prior to the deadline for questions and may be packaged separately and delivered or mailed only upon written approval to a confirmed receiving address per published addendum. Any such package shall be clearly marked with the RFP number and name, the Offeror's name and address, and an indication that the contents are part of the Offeror's electronic Proposal submission package.

3.2 FORMAT

All proposals must be formatted for standard 8½ x 11 documents. Offerors must use the templates provided in the required Attachments.

3.3 PROPOSAL PACKAGE CONTENTS

Include the following in your proposal submission:

Attachment A – Proposal Cover Sheet

Attachment B – Proposal Form

Attachment C – Team Qualifications and Capabilities

Attachment D – Project Plan Approach & Summary

Attachment E – Project Plan Details

Attachment F – Risk Assessment Plan Controllable

Attachment G – Risk Assessment Plan Non-Controllable

Attachment H – Value Assessment Plan

Attachment I – Evidence of Qualification: References

Attachment J – Cost Proposal Form

Attachment K – Indigenous Well-Being

Attachment L – Sustainability Initiatives

Attachment M – Insurance Requirements

4 PROPOSAL REQUIREMENTS AND FORMAT

4.1 OVERVIEW

The Offeror selected for award will be the Offeror whose proposal is responsive, responsible and is the most advantageous to the University based on the requirements in this solicitation, as determined by the University in its sole discretion. This contract will be awarded on a best-value basis. The best value process consists of two primary stages: 1) selection, and 2) clarification

Selection: The first stage of the best value process focuses on the Offeror's ability to differentiate itself based upon the ability to identify, prioritize, and minimize risks, add value to the University and show a high level of past performance on behalf of other clients. Instead of focusing on minimum expectations, the University is allowing Offerors to compete based on added value and their ability to maximize the University's satisfaction. Consequently, the submitted proposals should be brief, show differentiation, and allow the University to make a decision on which Offeror's proposal provides the best value to the University. It is imperative that each Offeror realize that what is written in the proposals and discussed in a potential interview will become part of the Offeror's final contract.

Clarification: The second stage of the best-value process occurs prior to award with the anticipated highest prioritized Offeror. This Offeror may be required to clearly present their plan on how they will complete the project on-time, without any cost increases, and meeting the quality expectations of the University. This period of time is provided to the Offeror to ensure that they have properly addressed and accounted for all aspects of the project in their proposal.

4.2 ATTACHMENT TEMPLATES

This RFP contains Attachments, which must be used by the Offerors to submit their proposal. An electronic copy of each Attachment is posted online. The Offeror must download, complete, and submit each Attachment as their proposal. Offerors shall NOT re-create these attachments, create their own attachments, or edit the format of the attachments (page sizing, font type, font size, color, etc.). Any proposal that does not adhere to these requirements may be deemed non-responsive, at the University's sole discretion. Any attachments not answered, or any information not provided, may result in the assignment of a lower evaluation score to the Proposal.

The Offeror shall submit one electronic Proposal package for each distinct solution being offered (if applicable). The package must be marked with reference to this RFP (RFP number and name).

4.3 PROPOSAL COVER SHEET (ATTACHMENT A)

The Offeror must complete all information requested in Attachment A. This document requests information on the following items:

- Company and contact information
- Address
- Collaborative Firm Involvement
- Type of Business
- Acknowledgement of all addenda
- This document must also be signed by the person authorized to contractually obligate the Offeror/Organization

4.4 PROPOSAL FORM (ATTACHMENT B)

The Offeror shall prepare and submit Attachment B. This document requests information on the following items:

- **Identification of the critical project team,** including:
  - Key Project Manager:
    - Will be the daily single point of contact for the University for this project (the University can contact at any time to resolve any issues and answer any questions) and will be the lead for the execution of this project for the entire duration of the project.
    - This individual shall be used by Offeror for the duration of the Contract resulting from this RFP. This individual CANNOT be removed or replaced, unless requested to do so by the University.
    - If there is an addition, deletion, or other change in the members comprising a Offeror, in the key personnel positions of a Offeror or a change of effective control in any Offeror member after a Proposal has been submitted, the Offeror is required to notify the University's project manager for the project, in writing, within five (5) working days of any such change. The University may elect to disqualify a Offeror or terminate any subsequent service level agreement if, in its opinion, the change materially negatively affects or could affect the ability of the Offeror to perform. The University may elect to accept a Proposal despite any such change, or any failure to notify.

- **Completion of all certification and qualifications statements**.

4.5 TEAM QUALIFICATIONS AND CAPABILITIES (ATTACHMENT C)

The Offeror shall prepare and submit Attachment C. The goal of this plan is to allow the Offeror to differentiate their capability to meet the requirements of this project by aligning their expertise. The Offeror is encouraged to describe the team of key personnel that will

be assigned to this project along with key performance metrics (example: how long they have been with your company, years of experience in current position, number of similar projects, average customer satisfaction ratings, performance improvements, awards received, etc.).

Any plan that fails to meet all of the formatting requirements mentioned above, may, at the University's sole discretion, be marked as non-responsive and eliminated from the evaluation process. The University also reserves the right, in its sole discretion, to modify a Proposal to remove non-compliant information.

4.6 PROJECT PLAN APPROACH & SUMMARY (ATTACHMENT D)

The Offeror shall prepare and submit Attachment D. The Project Plan Approach & Summary is a synopsis developed around fulfilling the University's requirements within any known project constraints of cost, time, resources, quality, and expectations as described in this RFP. A brief chronological roadmap that describes, in major activities and tasks, how the Offeror will meet the University's expectations as set forth in this RFP. This should be a concise synopsis of the work and approach that will be taken to complete this project.

4.7 PROJECT PLAN DETAILS (ATTACHMENT E)

The Offeror shall prepare and submit Attachment E. The purpose of the Project Plan Details is to demonstrate to the University that the Offeror can visualize what they are going to do before they do it. The Project Plan Details consists of the following:

- **Project Assumptions**: A brief summary of the major assumptions that have been made in preparing the proposal. This should include items/tasks that the Offeror has assumed the University will perform, items/tasks required from the University, and items/tasks that have not been included in the proposal (items that the Offeror feels are outside the scope of work).

- **Roles, Responsibilities, Expectations**: A brief summary of the expectations and responsibilities that the Offeror has of the University or University personnel.

- **Clarification Period Schedule**: Provide a schedule for the Clarification Period, which includes all activities outlined in Section 6.2 of this RFP.

Project Plan Approach & Summary (Section 4.6, Attachment D) and Project Plan Details (Section 4.7, Attachment E) templates are provided in this document and must be used by all Offerors.

The Project Plan Approach & Summary (Section 4.6, Attachment D), and Project Plan Details (Section 4.7, Attachment E) SHOULD NOT exceed 5 pages (front side of page only) (one page for the Project Plan Approach, one page for the Project Plan Summary, one page for the Project Assumptions, one page for Expectations and Responsibilities, and one page for the Clarification Period Schedule).

Any plan that fails to meet all of the formatting requirements mentioned above may be deemed non-responsive, at the University's sole discretion.

The Project Plan will become part of the final contract (if Offeror is selected for award).

4.8 RISK ASSESSMENT PLANS (ATTACHMENTS F & G)

The Offeror shall prepare and submit Attachments F & G. The Risk Assessment Plans should address risks that may impact the successful delivery of this project/solution/implementation, considering all expectations as described in this RFP. The Offeror should list and prioritize major risk items that are unique and applicable to this project/solution/implementation. This includes areas that may cause the project/solution/implementation to not be completed on time, not finished within budget, generate any change orders, or may be a source of dissatisfaction for the owner. The Offeror should rely on and use their past experience and knowledge of completing similar projects/solutions/implementations to identify these potential risks.

Each risk should be described in non-technical terms and should contain enough information to describe to a reader why the risk is a valid risk. The Offeror must also explain how it will avoid the risk or minimize the chances of the risk occurring. If the Offeror has a unique method to minimize the risk, the Offeror should explain it in non-technical terms. The Risk Assessment plan gives the opportunity for the Offeror to differentiate its capabilities based on its ability to visualize, understand, and minimize or eliminate risk to the University and the risk to a successful implementation of their solution. The Risk Assessment Plan is broken down into two subparts: Assessment of Controllable Risks and Assessment of Non-Controllable Risks.

- **Assessment of Controllable Risks (Attachment F)**: This includes risks, activities, or tasks that are controllable by the Offeror, or by entities/individuals that are contracted to by the Offeror. This includes things that are part of the technical scope of what the Offeror is being hired to do. This may also include risks that have already been minimized before the project begins due to the Offeror's expertise (i.e. risks that are no longer risks due to the Offeror's expertise in delivering this type of project). All risks and strategies to mitigate these controllable risks must be included in the Offeror's total financial contribution.

- **Assessment of Non-Controllable Risks (Attachment G)**: This includes risks, activities, or tasks that are not controllable by the Offeror. This may include risks that are controlled by the University, University's agents or organizations, risks that are caused by outside agencies, or completely uncontrollable risks. Although these risks may not be controlled by the Offeror, the Offeror must identify a strategy that can be followed or used to mitigate these risks. All risks and strategies to mitigate these non-controllable risks MUST NOT be included in the Offeror's total financial projections.

Risk Assessment Plan templates are provided in this document and must be used by all the Offerors. The Risk Assessment Plan should be brief and concise. The Risk Assessment Plan SHOULD NOT exceed 4 pages (front side of page only) (2 pages for the Assessment of Controllable Risks, 2 pages for the Assessment of Non-Controllable Risks). Any plan that fails to meet all of the formatting requirements mentioned above, may be deemed non-responsive, at the University's sole discretion. The Risk Assessment Plans will become part of the final contract (if Offeror is selected for award).

4.9 VALUE ASSESSMENT PLAN (ATTACHMENT H)

The Offer shall prepare and submit Attachment H. The purpose of the Value Assessment Plan is to provide Offerors with an opportunity to identify any value added options or ideas that may benefit the University or service. If the Offeror can include more scope or service within the constraints of the University, the Offeror should provide an outline of potential value added options. This may include ideas or suggestions on alternatives in implementation approach or methodology, use of third party services or products or hosted services, project scope, project timelines, additional functional or non-functional requirements, etc. **The potential impacts to cost/financials should only be listed in the Cost Proposal Form (Section 4.11, Attachment J) as separate items. Prior to award (during the Clarification), the University will determine if the proposed value added items will form part of the contract.**

A Value Assessment Plan template is provided in this document and must be used by all the Offerors. The Value Assessment Plan should be brief and concise. The Value Assessment Plan SHOULD NOT exceed 1 page (front side of page only). Any plan that fails to meet all of the formatting requirements mentioned above, may be deemed non-responsive, at the University's sole discretion.

4.10 EVIDENCE OF QUALIFICATION: REFERENCES (ATTACHMENT I)

As part of the Proposal submission, the Offeror shall provide at least three (3) references (Refer to Attachment I). References shall be for similar value services and services that have similar key aspects. Reference checks may be performed as part of the evaluation. The Offeror agrees that the University may contact listed clients to obtain their opinions

regarding the Offeror's performance and/or the characteristics of the Services or Goods provided. The Offeror absolves listed clients of any liability for any opinions provided to the University.

4.11 COST PROPOSAL FORM (ATTACHMENT J)

The Offeror shall prepare and submit the Cost Proposal (Attachment J), which requests the following information:

- **The Offeror's Overall Total Project Cost**

  The Total Project Cost shall be used in the analysis. The Total Project Cost shall be a firm-fixed cost and shall include the cost for everything that is necessary to meet the intent of the University as described in the RFP. This cost shall include (but is not limited to): materials, products, labor, subcontractors, suppliers, fees, overhead, profits, travel, and all direct and indirect costs (exclusive of all applicable taxes). The Offeror's cost needs to be supplied in Canadian dollars (CAD). The Offeror shall submit estimated costs and schedule impacts (if any) for each value added item from the Offeror's Value Assessment Plan in Attachment H. The University will review any proposed Value Added options separately and reserves the sole right to determine which, if any, Value Added options will be accepted as a part of the contract award. Value Added options will not be considered in the cost evaluation analysis.

  Provide the reimbursable expenses incurred in connection with providing the services specified in the RFP. Reimbursable expenses will be billable to the University if reasonable and approved for this project and included in the contract documents.

Note: The University reserves the right to request additional information to clarify any financial information.

4.12 INDIGENOUS WELL-BEING (ATTACHMENT K)

The Offeror shall prepare and submit Attachment K. The University is committed to considering all social, environmental and economic impacts of all its purchases. Identify, in reasonable detail, the Indigenous Initiatives your team will propose to incorporate into this project, providing examples of where your company and team members have undertaken similar initiatives on past projects, and/or any initiatives your organization is currently undertaking related to Indigenous issues and priorities in Canada through project-specific work or personal involvement.

The Indigenous Well-Being template is provided in this document and must be used by all the Offerors. The Indigenous Well-Being section should be brief and concise. The Indigenous Well-Being SHOULD NOT exceed 1 page (front side of page only). Any plan

that fails to meet all of the formatting requirements mentioned above, may be deemed non-responsive, at the University's sole discretion.

4.13 SUSTAINABLE INITIATIVES (ATTACHMENT L)

The Offeror shall prepare and submit Attachment L. The University is committed to considering all social, environmental and economic impacts of all its purchases. Identify, in reasonable detail, the sustainability aspects your team will propose to incorporate into this project, providing examples of where your company and team members have undertaken similar initiatives on past projects.

The Sustainable Initiatives template is provided in this document and must be used by all the Offerors. The Sustainable Initiatives section should be brief and concise. The Sustainable Initiatives SHOULD NOT exceed 1 page (front side of page only). Any plan that fails to meet all of the formatting requirements mentioned above, may be deemed non-responsive, at the University's sole discretion.

4.14 INSURANCE REQUIREMENTS (ATTACHMENT M)

The Offeror shall prepare and submit Attachment M. As part of their proposal, the Offeror must provide a Certificate of Insurance according to the requirements stated below.

The awarded Offeror must have the following insurance:

The Consultant shall maintain at its own expense and without limiting its liability hereunder, professional liability insurance in an amount equivalent to the value of the Project to a maximum of:

a) $2,000,000.00 (annual aggregate) for projects with a construction value under $5,000,000.00. Insuring against any and all loss, costs or damage, which may result from its performance of services hereunder.

b) $5,000,000.00 (annual aggregate) for projects with a construction value $5,000,000.00 and over. Insuring against any and all loss, costs or damage, which may result from its performance of services hereunder.

The Consultant shall maintain at its own expense and without limiting its liability hereunder, general liability insurance in an amount equivalent to the value of the Project to a maximum of 2,000,000.00 (annual aggregate), insuring against any and all loss, costs or damage, which may result from its performance of services hereunder. The policy shall stay in place until receipt of Contractors General Liability Insurance Certificate.

The Consultant shall, upon request from the University Representative, provide a copy of its insurance policy covering the Project for review.

Such insurance should be maintained throughout the term of the agreement and for not less than twelve (12) months after completion of the services if the insurance policy is written on a claims-made basis and an extended claims reporting period is not provided.

Alternatively, if the Offeror does not currently carry the required insurance, then the Offeror must provide a letter signed by a licensed insurance broker stating that the Offeror is eligible to purchase the required insurance if the Offeror is selected to provide the Services.

All documents related to insurance or bonding (if applicable) must be submitted as Attachment M.

5 EVALUATION PROCESS

5.1 OVERVIEW

The University will determine the potential best-valued Offeror who, in the sole judgment of the University, best meets the RFP requirements. The University reserves the right to clarify, negotiate, or seek additional information, on any Proposal. At any point during the procurement, the University reserves the right to re-scope the project, issue a new solicitation, or cancel the RFP altogether. The University reserves the right to add/delete/modify any requirement in this RFP if the University deems it to be in their best interest (at the University's sole discretion).

5.2 EVALUATION SUMMARY

Proposals will be prioritized based on the categories described below. Note: Only shortlisted Offerors will be evaluated and receive points for Interviews and Client Illustrations.

Evaluation Criteria	Points
Attachment C – Team Qualifications and Capabilities	200
Attachment D – Project Plan Approach & Summary	200
Attachment F – Risk Assessment Plan Controllable	50
Attachment G – Risk Assessment Plan Non-Controllable	150
Attachment H – Value Assessment Plan	50
Attachment J – Cost Proposal Form	300
Attachment K – Indigenous Well-Being	25
Attachment L – Sustainability Initiatives	25
Total	**1,000**

5.3 RESPONSIVE AND RESPONSIBLE

The University will consider and evaluate proposals that are deemed responsive and responsible.

To be considered responsive, at a minimum, Offerors must complete and submit all of the required information that is requested in this RFP and its Attachments, and the Proposal must also be submitted delivered on time and by the correct method as identified in this RFP. Any proposal that is unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may be marked as non-responsive.

The University, in its sole discretion, may reject any proposal in which the Offeror:

- Has been in the last 10 years, or is presently debarred, suspended, proposed for debarment, or declared ineligible for award of a contract by any public entity;
- Has had judgments rendered against them in the last 10 years for fraud, embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or tax evasion.

The University reserves the right to contact any Offeror to clarify any information in its proposal, to request additional information from the Offeror, or to conduct additional investigation about the Offeror not outlined in this RFP. Offerors that do not, or cannot provide the requested information may be considered non-responsive.

The University may take into account, the following:

a) the Offeror's ability to effectively manage and perform the Work,
b) the Offeror's ability to co-operate and work effectively with the University, its consultants, contractors and representatives,
c) the Offeror's understanding of the scope of the Work,
d) the Offeror's ability to complete the Work on an expedited basis,
e) the technical ability of the Offeror,
f) the Offeror's proposed fees including total overall costs to the University,
g) the financial strength and capability of the Offeror,
h) past dealings of the University with the Offeror and its proposed subcontractors and suppliers (where applicable), and
i) the social and environmental responsibility of the Offeror,
all as assessed and perceived by the University.

When evaluating proposals, the University may take into account the total overall costs anticipated during the contract period or all potential costs associated with the Proposal of any Offeror including potential costs for ongoing operation and maintenance, contract administration costs, impact on other operations, and disruptions.
The University may take into account:

a) The quality of technical aspects of the Proposal, the Offeror's track record, relative to successful completion for other projects, and relative to disputed claims for changes, delays and extras;
b) The Offeror's safety record;
c) The depth of resources available to the University (in case, for example, there is a possibility that additional resources might be required, or acceleration of the Work might be required) and other projects that the Offeror is working on or for which Offeror might be bidding,
d) The proficiency and experience of the Offeror and its management and personnel, and;
e) The overall best value to the University and best prospect for successful satisfactory completion of a project,

All as perceived and applied by the University acting in good faith, and applying such reasonable assumptions and determinations as the University may reasonably make (whether or not, so long as the University acts in good faith, one or more Offerors are adversely affected thereby), and weighted or considered and applied according to the needs and reasonable judgement of the University.

Proposals may be judged for overall best value or best bid taking into account the grading or rankings, based on non-price criteria, and prices. The Evaluation Committee may make a judgment as to whether the disparity between or among the candidates' gradings, or the relative overall merits of their respective Proposals, warrants departing from published evaluation criteria for the selection of the successful solution. The University is entitled to exercise business judgement, and to make business decisions as the University considers warranted, in assessing and evaluation of Proposals, and selection of the successful Offeror.

5.4 EVALUATION COMMITTEE

An Evaluation Committee will be used to evaluate specific portions of all responsive Proposals (see Evaluation Summary). The Evaluation Committee will independently review and score the items comparatively to one another based on a 1, 5, 10 scale. A "10" represents that the item being evaluated is dominantly greater (or has more value) than the average. A "5" represents that the item being evaluated is about average (or there is insufficient information to make a dominant decision). A "1" represents that the item being evaluated is dominantly below the average. Once each member has individually scored each item, their scores will be sent to the Procurement University Representative, who will then average the scores together to obtain the final average score for each of the evaluated criteria other than Cost and Past Performance Information.

5.5 SHORTLISTING OFFERORS

The process that the University is expected to follow to shortlist Proposals is outlined below. Note: The University may modify this process if it is in the best interest of the University.

1. All proposals will be reviewed for compliance with the mandatory requirements as stipulated within the RFP. Proposals deemed non-responsive to mandatory requirements will be eliminated from further consideration. Prior to the determination of non-responsiveness the Procurement University Representative or designate may contact Offerors for clarification of the responses.
2. The Procurement University representative or designate will provide evaluation documents to each Evaluation Committee member along with Team Qualifications and Capabilities, Risk Assessment Plans, Value Assessment Plans, and Project Plan Approach & Summary. No cost information or Past Performance Information will be provided to the Committee members.
3. The Committee members will independently evaluate and score the documents and submit their scores back to the Procurement University Representative or designate.
4. The Procurement University Representative or designate will create a linear matrix model to assist in analyzing and prioritizing the responsive Proposals based on the submitted information. The model will analyze the categories described in Section 5.2 Evaluation Summary, other than COST. The Procurement University Representative or designate will present the results of the model to the Evaluation Committee, which will then identify the top highest-ranking proposals, and identify them as the Shortlisted Offerors. The Evaluation Committee reserves the right to increase or decrease the number of proposals in this list based on the competitiveness of the proposals.
5. After the linear matrix-scoring model has been reviewed, the shortlisted Offerors may be required to go through a formal interview process. **If an interview is conducted, the interview scores will become part of the Team Qualifications and Capabilities and Project Plan Approach.** Refer to Section 5.2 (Evaluation Summary). Refer to section 5.6 (Interviews) for additional information.
6. All Offeror's cost documents will be separated from the rest of the proposal. The evaluation committee will only be exposed to non-cost criteria. A short listing of the highest scoring Offerors (based on non-cost criteria) will be identified, and only the short listed Offerors cost documents will be opened and cost scored assigned.

5.6 INTERVIEWS

The University may conduct interviews with each of the Shortlisted Offerors.

The individuals that will be interviewed must be the same person that is identified in the Offeror's Proposal (Attachment B – Proposal Form). No substitutes, proxies, phone interviews, or electronic interviews will be allowed (special circumstances may be

considered at the sole discretion of the University). Individuals who fail to attend the interview will be given a "1" score, which may jeopardize the Offeror's competitiveness.

Note: The University may also request to interview additional personnel

Interviews are expected to last approximately 15 to 20 minutes per individual. No other individuals (from the Offeror's organization) will be allowed to sit in or participate during the interview session. Interviewees may not bring notes or handouts. The University may interview individuals separately and/or as a group. Interviewees will be prohibited from making any reference to their proposed cost proposal or cost information. The University may request additional information prior to interviews.

5.7 PRIORITIZATION OF OFFERORS

The University Procurement Representative or designate will then create a final linear matrix model for the shortlisted Offerors based on all of the criteria outlined in Section 5.2 (Evaluation Summary). Once these Offerors have been prioritized, the University Procurement Representative or designate will perform a cost reasonableness assessment as identified in the next section.

5.8 COST REASONABLENESS AND FINAL PRIORITIZATION

The Procurement University Representative or designate will perform a cost reasonableness assessment of the highest-ranking Offeror in the following manner:

- If the highest ranked proposal did not score the highest total value for non-price qualification and performance criteria the University reserves the right to consider a ranking based on criteria before incorporating price scores
- If the highest ranked Offeror's Total Project Cost is within 5% of the next highest ranked Offeror's Total Project Cost, the University reserves the right to proceed to invite the highest ranked Offeror to the Clarification Period.
- If the highest ranked Offeror's Total Project Cost is 5% higher than the next highest ranked Offeror's Total Project Cost, the University reserves the right to invite the second highest ranked Offeror to the Clarification Period (unless the University concludes that there is dominant information to proceed with the highest ranked Offeror).
- The University reserves the right to first consider proposals with initial costs within the budget. If all proposals are over budget, the University may negotiate with the highest ranked proposal(s), or cancel the procurement.
- The University typically selects the Offeror submitting the highest ranked proposal to proceed to the Clarification Phase. However, the prioritized Offeror will be made on the basis of best overall value as determined by and for the University of Manitoba in its sole discretion.

6 CLARIFICATION AND PRE-AWARD

6.1 OVERVIEW

Prior to award, the apparent best-valued Offeror may be required to perform the clarification period functions as outlined in this section. The intent of this period is to allow the apparent best-valued Offeror an opportunity to clarify any issues or risks, and confirm that their proposal is accurate. The Clarification Period is carried out prior to the signing of the Contract. The University's objective is to have the project completed on time, without any cost/financial deviations, and with high customer satisfaction. At the end of the project, the University will evaluate the performance of the Offeror based on these factors, so it is very important that the Offeror preplan the project to ensure there are no surprises.

It is the Offeror's responsibility to ensure that the Offeror understands the University's subjective expectations. It is not the University's responsibility to ensure that the Offeror understands what its expectations are. The Offeror is at risk, and part of the risk is understanding the University's expectations.

6.2 REQUIRED ACTIVITIES / DELIVERABLES

The Offeror may be required to preplan the project in detail to ensure that there are no surprises. The Offeror may be required to perform the following (including, but not limited to):

1. **Perform a detailed cost verification**
   a. Provide a detailed cost breakdown
   b. Identify why the cost proposal may be significantly different from competitors
   c. Review big-ticket items
   d. Review value added options
   e. Identify how payments will be made and all expectations regarding finances

2. **Align expectations**
   a. Identify any potential deal breakers
   b. Clearly identify what is included and excluded in the proposal
   c. Review any unique requirements with the University
   d. Review interview statements
   e. Clearly identify University roles and responsibilities
   f. Review and approve all contract terms and conditions
   g. Introduction of the Offerors critical personnel to the University team
   h. Provide a transitioning plan/schedule
   i. Provide plan for critical staff retention and plan if these individuals leave

3. **Provide detailed product information**
   a. Identify how product/system meets technical requirements
   b. Demonstrate any additional features

4. **Carefully preplan the project in detail**
   a. Coordinate the project/service with all critical parties
   b. Prepare a tentative project schedule identifying critical milestones
   c. Prepare a detailed project plan

5. **Identify all assumptions**
   a. Prepare a list of all proposal assumptions (with associated impacts)
   b. Identify and mitigate all project risks
   c. Address all client concerns and risks
   d. Address all risks identified by other proposers
   e. Address all risks that occurred on previous past projects

6. **Identify and mitigate all uncontrollable risks**
   a. Identify all risks or activities not controlled by the Offeror
   b. Identify the impact of the risks
   c. Identify what the University can do to mitigate the risks
   d. Address how unforeseen risks will be managed

7. **Performance reports and metrics**
   a. Identify how the Offeror will track and document their progress and performance
   b. Review the Weekly Risk Report
   c. Review key business drivers and identify specific and measurable key success factors that can be used to assess project performance.

Kickoff Meeting

The University will require the Offeror to conduct a kickoff meeting at the outset of the Pre-Award Clarification Period. The Offeror will lead the kickoff meeting and is expected to be prepared to present the following information:

- Description of their plan for project execution and management
- High-level schedule for project delivery
- Address any major concerns provided by University
- Identify and address any major deal breakers
- Address all project/service assumptions

- Explain why their cost/financial Proposal may be different from the budget and/or competitors.
- Identify major risks to project delivery (focusing on risks that the Offeror does not directly control) and the associated risk mitigation strategy.
- Clearly identify any information or actions needed from the University to support successful project delivery.
- Propose a meeting schedule for items that must be reviewed in detail and resolved during the Pre-Award Clarification Period.

Summary Meeting

The potential best-valued Offeror may be required to hold a final summary meeting at the end of the Pre-Award Clarification Period. This meeting is to present a summary of the final details that were discussed and resolved during the clarification period. This meeting is not a question-and-answer meeting.

The Offeror will lead the meeting to present the entire Proposal, project execution plan, and identified risks and mitigation plans.

6.3 CLARIFICATION DOCUMENT

The potential best-valued Offeror will be required to submit a Clarification Document, that will contain (at a minimum) the information outlined in the previous section. This document will only be performed by the Offeror that is invited to (and successfully completes) the Clarification Period. Any invitation will not constitute a legally binding offer to enter into a contract on the part of the University to the Offeror.

6.4 NEGOTIATION PERIOD

The University reserves the right to negotiate with the potential best-valued Offeror during the Clarification Period. This may include, but is not limited to, modifying the scope of the project (time, cost, quality, expectations, etc.). Any negotiations will not constitute a legally binding offer to enter into a contract on the part of the University or the Offeror.

6.5 RESULT OF NEGOTIATION PERIOD

When the Negotiation Period has been completed, the Offeror shall submit a Final Clarification Document, which shall include all agreed upon changes to the proposal based on the negotiations with the University.

6.6 FAILURE TO ENTER INTO AN AGREEMENT

At any time during the Clarification Period, if the University is not satisfied with the progress being made by the invited Offeror, the University may terminate the Clarification Period activities and then commence or resume a new Clarification Period with an alternative Offeror. If the Offeror and University fail to agree to terms, or fail to execute a contract, the University may commence a new Clarification Period with an alternative Offeror. There will be no legally binding relationship created with any Offeror prior to the execution of a written agreement. Any Offeror's proposal, terminated in accordance with this article, is removed from further participation in this Request for Proposal.

6.7 NOTIFICATION OF INTENT TO AWARD

No action of the University other than a written notice from an authorized Procurement representative of the University to the Offeror, advising of acceptance of the proposal and the University's intent to enter into an Agreement, shall constitute acceptance of the proposal.

Before any contract or obligation relative to the subject matter herein becomes binding on the University, approval thereof by the proper signing officers of the University must first be obtained.

7 POST AWARD (IF APPLICABLE)

7.1 POST AWARD AND PERFORMANCE METRICS

The awarded Offeror is required to monitor and track all risks on the project on a weekly basis and monitor and track project progress.

7.2 POST PROJECT EVALUATION

Upon completion of the project, the University will evaluate their overall satisfaction of the project. This includes (but is not limited to): overall quality, ability to manage the project, ability to minimize complaints, ability to minimize University efforts, ability to minimize project delays, and ability to minimize cost increases.

8 ADDITIONAL CONDITIONS AND REQUIREMENTS

8.1 AGREEMENT, TERMS AND CONDITIONS

The University and Offeror will execute the standard form Design Consultant Agreement (the "Contract") provided in Appendix 6 By submitting a proposal, the Offeror is deemed to have accepted the Contract and its Terms and Conditions. Should an Offeror object to the Contract or any of its Terms and Conditions, the Offeror must identify their objection and propose specific alternative language. This must be done in writing to the Procurement University Representative noted in 2.1 by the due date specified in the Procurement Schedule. The University may or may not accept such alternative language. It shall be understood and agreed that if any provisions (including, without limitation, any term, condition, meaning, attachment or deliverable) contained in a proposal is inconsistent with or in conflict with the Terms and Conditions, the provisions of the Terms and Conditions shall prevail and govern.

Any proposed alternatives to these terms and conditions must be stated in the Offerors response, or the Offerors response will be considered as acceptance of these terms and conditions.

8.2 PAYMENT TERMS

8.2.1 Standard payment terms are net 30 days after satisfactory receipt of products and/or services. Any change to standard payment terms will be mutually agreed upon between the University and the Successful Offeror and documented in the subsequent Agreement executed.

8.2.2 **All invoices must reference the applicable Purchase Order or Contract number, which will be provided after contract signing**.

8.2.3 All invoices should be submitted through Ariba for efficient processing.

Note: The University of Manitoba will not provide prepayment for any order.

8.3 BRAND NAMES (IF PRODUCT REQUIREMENTS STATE BRAND NAMES)

Unless otherwise stated, if, and when, the product requirements state a brand name, make, name of manufacturer, trade name, or vendor catalogue number, it is for the purpose of establishing a grade or quality of material only. It is not intended to rule out competition from equal brands or makes. If however, a product other than that specified

is offered, it is the Offeror's responsibility to name such a product in its submission. Evidence of equality in the form of samples or specifications may be requested.

8.4 INCURRED COST

The University is neither liable nor responsible for any costs incurred by the Offeror in the preparation, submission or presentation of its proposal. The Offeror will not be reimbursed for any costs associated with the procurement of this project.

8.5 NO OBLIGATION

This procurement in no manner obligates the University to issue an award. The University reserves the right, in its sole and absolute discretion, to: accept any proposal, reject any proposal or any part thereof, reject all proposals, and accept a proposal which is not the highest scoring proposal.

8.6 RIGHT TO MAKE MODIFICATIONS

The University reserves the right in its sole discretion to waive minor irregularities, make modifications to the procurement, or make modifications to the requirements.

8.7 PRE QUALIFICATION (IF APPLICABLE)

If any pre-qualification or similar process has preceded the RFP, then the University may rely upon the information provided by the Offeror in response or in connection with that process, and the same shall be deemed to be carried forward as and form part of Offeror's Proposal.

If any pre-qualification or similar process has preceded the RFP, and a Proposal is submitted by an entity (including a joint venture or partnership) that was not the prequalified or selected entity, then despite any contrary statement or indication in connection with the pre-qualification or similar process, the University may nevertheless accept the Proposal if the entity that submitted the Proposal (including a partnership or joint venture) is, in the determination of the University, related to or sufficiently associated with the pre-qualified entity. Despite any pre-qualification of Offerors or pre-qualification or pre-selection process, Fee is not the sole criteria for award, and the University reserves the right to differentiate among prequalified or pre-selected Offerors based on their relative strengths and based on the University's determination of the relative strengths, merits and any grading applying non-financial criteria as described herein.

8.8 RIGHT TO NEGOTIATE

The University shall have the right to negotiate with any Offeror to remedy technical deficiencies or minor non-compliances in the proposal

The University shall have the right to negotiate with any Offeror to amend the scope, nature, quantity or schedule for any products, service, work, terms and conditions, and/or prices offered in the proposal to better meet the requirements of the University.

The University shall have the right to negotiate with one or more shortlisted Offerors without being obligated to offer the same opportunity to any other Offerors. Negotiations may be concurrent and will involve each Offeror individually. The University shall incur no liability to any Offeror as a result of such negotiations.

8.9 OWNERSHIP OF PROPOSALS

All proposals and documents submitted in response to the RFP will become the property of the University.

8.10 OFFEROR RESPONSIBILITY

Any contract that may result from this RFP shall specify that the Offeror is solely responsible for fulfillment of the contract with the University. The Offeror shall be responsible for their subcontractors, suppliers, or any other parties that they contract with. The Offeror shall be wholly responsible for the entire performance whether or not subcontractors are used.

Each Offeror, by submitting a Proposal, accepts all of the conditions and stipulations set out herein, and acknowledges and agrees that: (i) the University will have no liability or obligation to any Offeror except only the party or parties, if any, awarded the Contract(s) by the University, and agrees that, if not awarded the Contract, then, whether or not any express or implied obligation has been discharged by the University, the University shall be fully and forever released and discharged of all liability and obligation in connection with the RFP (including these Instructions to Offerors) and all related matters.

8.11 DISCLOSURE OF PROPOSAL CONTENTS

During the procurement process, proposals will not be made public. The University reserves the right to make specific proposal or evaluation information available after award has been made.

8.12 DEBRIEFING

The University will make its best attempt to provide a debriefing on the evaluation and award of this project to all Offerors within ninety (90) days of award on request. The purpose of the debriefing is to provide general feedback on the evaluation process, including strengths and weaknesses of all proposals in general.

8.13 CONFLICT OF INTEREST

The Offeror warrants to the best of their knowledge, that no potential Conflict of Interest exists with any University of Manitoba staff, either in the RFP proposal and/or evaluation process, nor would any potential Conflict of Interest exist with any University staff, if awarded the contract under this RFP, as defined in the University's Conflict of Interest Policies and Procedures, as amended from time to time on the website:

http://www.umanitoba.ca/admin/governance/governing_documents/community/248.htm

8.14 SUPPLIER NON-RESIDENT

Services performed in Canada by any non-resident (individual, sole proprietor, organization, corporation, or partnership) is subject to a 15% Non-Resident Withholding Tax. A non-resident may be able to obtain a waiver or a reduction in the withholding tax. Additional information is available at:

http://www.cra-arc.gc.ca/tx/nnrsdnts/cmmn/rndr/pyr-eng.html

Non-resident suppliers are required to identify non-resident status and acknowledge obligations in Attachment B – Proposal Form and provide a price outline of services performed in Canada in Attachment J – Cost Proposal Form.

All invoices must separately itemize services performed in Canada or otherwise the total invoice amount may be subject to Non-Resident Withholding Tax.

8.15 FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT

Supplier acknowledges that the University of Manitoba is a public body under *The Freedom of Information and Protection of Privacy Act* ("FIPPA" or "the Act") and that all records in the control or under the custody of the University of Manitoba may be subject to the access to information provisions within the Act. This would include all records created during the Request for Proposal process, including communications, submissions, and contracts. For further information, contact the University of Manitoba's Access and Privacy Office at (204) 474-9462 or fippa@umanitoba.ca or by mail to: Access and Privacy Office, University of Manitoba, 233 Elizabeth Dafoe Library, Winnipeg, Manitoba, R3T 2N2.

8.16 CONFIDENTIALITY AND OWNERSHIP OF INFORMATION

Information provided to the supplier by the University or acquired by the supplier during the course of the work is confidential. Such information shall not be used or disclosed in any way without the prior written authorization from the University.

8.17 GOVERNING LAW

This procurement and any award that may result shall be governed by the laws of the Province of Manitoba. This RFP and any subsequent Agreement shall be exclusively governed by, and construed in accordance with the laws of the Province of Manitoba and any applicable the federal laws of Canada. The application of 1980 United Nations Convention on Contracts for the International Sale of Goods and The International Sale of Goods Act (Manitoba) are expressly excluded.

8.18 USE OF ELECTRONIC VERSIONS OF THIS RFP

This RFP is being made available by electronic means. The Offeror acknowledges and accepts full responsibility to ensure that no changes are made to the RFP. In the event of conflict between a version of the RFP in the Offeror's possession and the version maintained by the University, the version maintained by the University shall govern.

8.19 LAWS, REGULATIONS AND PERMITS

The Offeror shall give all notices required by law and comply with all applicable federal, University, and local laws, ordinances, rules and regulations relating to the conduct of the work. The Offeror shall be liable for all violations of the law in connection with work furnished by the Offeror, including the Offeror's subcontractors. Offeror guarantees all items, and services, meet or exceed those requirements and guidelines established by the Occupational Safety and Health Act. Offeror warrants that neither supplier nor its principals is presently debarred, suspended or proposed for debarment by the Federal Government.

8.20 DURATION OF OFFER

It is the University expectation that any selected Offeror will negotiate in good faith and the terms agreed upon in any resulting Final Clarification Document, including proposal prices, and services and will be considered firm and available for 200 days to conclude an executed contract.

8.21 SAFETY ORIENTATION

All personnel of the Offeror and/or sub-contractors working on construction projects at any University of Manitoba are expected to have attended the University's Safety & Orientation session. This session is approximately two hours long. To register for contractor orientation, please use the registration form provided at the link below. Registration can be submitted by e-mailing the form to facilities.safety@umanitoba.ca, or by fax at 204-474-7547. Further information is available at:

https://umanitoba.ca/campus/physical_plant/health_safety/contractor/1032.html

8.22 SERVICE QUALITY ASSURANCE

If applicable, this will be discussed in the Clarification phase. However, the prioritized supplier will be required to supply the following documentation:

- Supplier's Laboratory Quality Assurance and Control Procedures
- Certificates that demonstrate education in Laboratory Technology, if available
- Training records of staff performing the work for the past 3 years
- Any improvement and stop work orders received within the past 5 years
- Any quality awards or recognition received in the past 5 years

8.23 INSPECTION

All items or goods supplied under a resulting contract shall be subject to inspection by the University to the extent practicable prior to acceptance. In cases where items or goods are defective in material or workmanship or otherwise not in conformity with the requirements of this contract, the University shall have the right to reject them or to require their correction without additional change within 30 days from the last shipment.

8.24 WARRANTY

Support within warranty period is required and must be detailed in the Project Plan Approach & Summary and Project Plan Details sections

8.25 ACCESSIBILITY STANDARDS

In accordance with *The Accessibility for Manitobans Act*, (Manitoba) ("AMA")

The University of Manitoba will comply with the requirements of the AMA and its associated standards enacted through regulation, as well as all related University Policies when procuring goods, services and facilities. Where applicable, procurement documents will specify the desired accessibility standards to be met and provide guidelines for the evaluation of proposals in respect of those standards.

Offerors are required to comply with the AMA's accessibility standards, University of Manitoba policies, practices, and procedures related to accessibility, which may be in effect during the Term of the Agreement and which apply to the deliverables to be provided by the Offeror.

EXHIBIT 1-PROJECT OBJECTIVES AND SCOPE

1.0 BACKGROUND INFORMATION/CURRENT CONDITIONS

The University of Manitoba (UM) comprises the Fort Garry and Bannatyne campuses, as well as the William Norrie Centre and other research stations. The main Fort Garry campus is approximately 279 hectares (690 acres) in total area. It is situated in the southernmost portion of Winnipeg, approximately thirteen kilometres south from Downtown, in an area characterized by suburban neighbourhoods generally built between the 1950s and 2000s. The Red River forms the eastern edge of the campus, while Pembina Highway, a major traffic thoroughfare and commercial corridor, sits along the western edge of the campus.

The University has identified the need to perform a comprehensive study to understand our riverbank condition, threats, and risks. We are looking to engage a qualified team to review the current conditions and present recommendations for stabilization and erosion control over the next 15 years. In addition to this study, two sites along the riverbank, **Outfall No. 2*** on the south side of campus and **Culvert No. 108**** on the north side are experiencing failed/failing infrastructure and need to be addressed immediately.

The University lands are comprised of approximately 3.92km of riverbank frontage at the Fort Garry Campus, with 0.57km of this abutting Southwood Lands and 2.1km along the Point Lands (see Appendix 1). The remaining 1.25km abut the main campus lands.

Adjacent land use varies across the Fort Garry Campus riverbank frontage. Some sections of the riverbank have seen some level of riverbank stability, erosion protection, and infrastructure renewal works over the years. For reference, sections of the riverbank are divided in to a few reaches. Please note that reach 1, 3, and parts of 4 comprise a section of the campus ring road, which extends along the top of the bank and also forms part of the City of Winnipeg's primary dike system.

(a) Reach 1 – Campus proper south side. Parallel to campus ring road – Freedman Cres. as well as small section of King's Dr. Adjacent land use includes but not limited to, parking lot 'R', outfall no. 1, **no. 2***, no. 8, no. 9, and no. 3. The riverbank area includes a few buildings (Plant Science Field Station, storage buildings, etc.), utilities including hydro corridor, a designated impacted site (former location of the Waterworks Building), and greenfield sites. Small sections of the riverbank through this area were improved with stabilization works and protected with riprap as part of Flood Pump Station No. 1 remedial works in 2008, and the emergency repair work on Outfall No. 2 in the spring of 2018. Infrastructure repairs include among others, the installation of new reinforced concrete storm sewer pipe along Freedman Crescent from Flood Pump Station 1 west to Kings Drive in 2016. Work remains to expand the pipe from Outfall No. 1 to the river.

(b) Reach 2 – Point Lands. Large section of riverbank includes riparian corridor (see Appendix 3 - Biodiversity Study). Adjacent land use includes but not limited to, Culvert

no. 105, no. 104, no. 103, and no. 102, and research crops. A future recreation path is proposed along the riverbank (refer to Visionary (re)Generation Master Plan).

(c) Reach 3 – Campus proper north side. Parallel to campus ring road – Dysart Rd. Adjacent land use includes but not limited to, Outfall no. 10, no. 4, no. 5, no. 6, Culvert **no. 108**** and no. 107. Drainage infrastructure and outfall for IGF is located within this area. The riverbank area includes the Wallace Building (a recent geotechnical review for this area will be made available to the awarded proponent), Chancellor's Hall, utilities, informal recreation paths and picnic areas. A future multi-use path is proposed in this area.

(d) Reach 4 – Southwood Lands. Past use of the site was a golf course. Future multi-use development area. It is estimated that if medium- or high-density living spaces are developed in this area, approximately 6,000 residents may eventually reside within the Southwood precinct. In the short term, the Southwood precinct is available for light recreational use, but not organized events. Such recreational use includes birdwatching, walking and cycling.

Note: *Details and information related to previous works along the riverbank will be made available to the successful proponent.*

***Outfall No. 2** is located on the south bank of the red river along Freedman Cres., near Drake Centre. A pipe collapse in the Spring of 2018 resulted in emergency construction for a temporary solution to redirect the water. Past project documentation was reviewed to determine a solution including the review of a field investigation program from the 2013 Watermain Upgrade Program, which included the installation and monitoring of instrumentation directly southwest of Outfall No. 2.

Construction included sealing the damaged outfall pipe at the inlet and outlet, temporarily pumping out water from the manhole to the river via over land pipes, restoring an eroded riverbank slope with riprap and filling in a sinkhole with a flowable cement fill. The construction was completed on March 28th and 29th, 2018. The Consultant team collected monitoring data in this area on the riverbank before and after construction and based on the data, the riverbank is actively moving. The pump is active on site and will remain in place until reconstruction of the outfall takes place.

****Culvert No. 108** on the north side of campus at the southeast edge of Southwood Lands off Sifton Road, just north of the Wallace building continues to see the effects of undercutting and riverbank erosion. This area sees heavy volumes of vehicular traffic along Sifton Road, as well as cyclists and pedestrians entering campus from Southwood Lands.

2.0 PROJECT SUMMARY/GOALS AND EXPECTATIONS

2.1 Project Summary:

The UofM is inviting proposals from qualified multi-disciplinary teams to prepare a Riverbank Stabilization Study. This request includes a review of the current conditions

for the area identified in Appendix ‘1 as well as recommendations for stabilization and erosion control over the next 15 years. Recommendations should be broken down into, but not exclusive to the following categories: immediate 0-1 year, short term 1-3 years, long term 5+ years with a priority ranking for all categories. Recommendations are to include order of magnitude costing. The University of Manitoba Biodiversity Baseline Study and Assessment (see Appendix ‘3) includes a number of observations and recommendations, which are to be incorporated into the Riverbank Stabilization Study. It should also be noted that a Wildlife Management Plan is underway, and results and findings from this project will be shared with the successful proponent for consideration within this study. Recommendations within the Riverbank Stabilization Study should favour the restoration of the riparian corridor and seek a naturalized solution wherever possible.

In addition to the Riverbank Stabilization Study, complete design and construction services for the two identified sites, Outfall No. 2 and Culvert No. 108 are to be included.

Outfall No. 2:

Reconstruction of Outfall No. 2 is top priority for this project’s schedule. The temporary solution that is currently in place must be replaced with a permanent solution. Preliminary design should include an investigation of options for reconstruction and consideration for adjacent land drainage*.

**A land drainage study for the Fort Garry campus is currently underway, which will provide supporting documentation for the drainage review associated with the Riverbank Stabilization Study.*

Culvert No. 108:

Stabilization of the riverbank and infrastructure renewal for Culvert No. 108 should take into account the pedestrian and cycling desire paths and stakeholder interest in constructing a multi-use pathway for this area. The Consultant Team will be responsible for preparing recommendations for how to safely move pedestrians and cyclists from Southwood lands either along the north side of Sifton Rd., through Parking Lot Q or via an alternate route identified by the Consultant Team. Any proposed pathway is to connect to existing infrastructure safely.

The infrastructure repairs noted above are top priority for this project, but consideration should be made to review these locations within the context of the entire riverbank condition.

All recommendations and design solutions are to take into consideration ongoing campus initiatives, including but not limited to projected underground infrastructure renewal work (for reference purposes only see Appendix ‘2 as an example of existing documentation), future campus wide service upgrade project, lighting upgrades, campus road renewal program, land drainage study, pedestrian and cycling plan, biodiversity

study, wildlife management plan, urban forest management, as well as the information presented in Visionary (re)Generation Master Plan.

As the data collected and presented in the Riverbank Stabilization Study and Infrastructure Repair project will assist us in updating our campus inventory and will be incorporated into the UofM's Asset Management Program (VFA database), all systems and cost data are to be classified according to Uniformat II – G Sitework clarified to an appropriate level. In addition, report data should include replacement costs and life expectancy of systems.

2.2 Project Goals and Expectations Summary:

(a) Review the existing conditions info (in addition to the appendices included in this RFP, UofM to provide existing services drawings in AutoCAD format, photos, historical data (as available) for maintenance and repair as well as other additional items if available and deemed appropriate and beneficial to the successful completion of the project).

(b) Perform an onsite evaluation of the UM Fort Garry campus riverbank condition (area identified in Appendix 1), which includes a visual inspection and review.

(c) Preparation of Riverbank Stabilization Study:
- Determine the current state of the campus riverbank;
- Identify all impacts, threats and risks from adjacent land use, existing infrastructure, etc.;
- Monitoring and instrumentation services;
- Incorporate all inspection/evaluation and applicable project data;
- Identify preventative maintenance opportunities;
- Submission of a draft report for UofM review;
- Inclusion of UofM comments into the Final Report;
- Final submission of one (1) hard copy and an editable digital copy of the final Riverbank Stabilization Study report. The final report shall:
  - Identify the methodology and criteria used in the assessment.
  - Discuss and detail current condition, recommended funding levels, priority rating, time of need and rehabilitation strategy, etc.
  - Provide recommendations for bank stability and erosion control.
  - Identify opportunities to improve the University's connection with the river corridor as identified in Visionary (re)Generation.
  - Identify how the recommendations in the Biodiversity Study can be implemented in future riverbank stabilization projects.
  - Provide phased implementation plan including timing and budget estimates.

(d) Design and Construction services for Outfall No. 2 and Culvert No. 108:
- Preliminary Design through to Construction Documents, Tender, Contract Administration (including Site Resident duties with a minimum of four (4) hours per day minimum of time on site) and Post Construction Services (including post construction summary report). Also refer to UM DCA.

- Includes complete drawings and specifications to be reviewed at milestone dates determined and agreed to by the Project Team (e.g. 30%, 60%, and 90%). All document submissions to be accompanied by corresponding costing exercises as detailed in this request.

2.3 Consultant Team:

The University is requesting the services of a multi-disciplinary team for this project. Consultant Teams are to include Professional Consulting Engineering Services (Geotechnical, Civil, Mechanical, Electrical, and Structural) and Landscape Architectural Services. Multi-disciplinary teams are to also include an Ecologist, Biologist, and other specialists deemed to be appropriate and identified by the Consultant Team. At least one member of the team should have expertise in public consultation (e.g. IAP2 or other). Team members not specifically listed above should be identified and included in the base fee or recommended and included on the value added services form.

2.4 Construction Schedule – Critical Dates:

- Outfall No. 2 construction work must take place during the winter of 2018/19.
  - Substantial Performance by March 15, 2019, subject to requirements from all Authorities Having Jurisdiction.
  - Tender ready documents for UM review must be completed by December 15, 2018. Exact schedule to be coordinated with the awarded Consultant Team.
- The work on the Culvert No. 108 is expected to take place in 2019.
- Timeline for the Riverbank Stabilization Study* will be coordinated with the Consultant Team once the design work on Outfall No. 2 has commenced.

  * Consultant Teams should be reminded that the Riverbank Stabilization Study should take place concurrently with the work on Outfall No. 2 and the Culvert No. 108, but that these two infrastructure projects take priority in the schedule.

3.0 SCOPE OF WORK/DESIRED OUTCOMES

The study area is identified on the site plan in Appendix 1 and extends along approximately 3.92km of riverbank. The current project encompasses riverbank with varying stratigraphic conditions, morphological characteristics and hydraulic considerations. There is evidence of varying stages of erosion along the entire length of the project area, and slope instabilities have significantly impacted the bends and transitions sections of the riverbank.

The primary intent of the project is to investigate conditions and provide recommendations for erosion protection along the entire length of riverbank. The Consultant Team is also asked to identify opportunities to enhance the campus experience and improve the University's connection to the river corridor. The Riverbank Stabilization Study will serve as a planning resource and guide the University in the implementation of the recommendations. The study results will be used to inform projects initiated to improve the stability of the riverbank.

Recognizing that there are varying types of land use along the riverbank, and varying conditions, it is conceivable that the erosion protection will vary in type from an engineered solution to a naturalized solution.

The Consultant Team will be responsible to select sites to investigate, monitor and assess riverbank conditions and stability. It is expected that the Consultant Team will identify remedial works at various sites and prepare a list of priority sites. The project shall be considerate of the natural environment and balance the project objectives while minimizing adverse impacts to the unique topography and riparian habitat. Recommendations within the study are to be ranked for priority with a phasing strategy and include order of magnitude costing.

3.1 Scope of Work

The services provided shall be in accordance with the University of Manitoba DCA found in Appendix 6 and consist of those services identified in RFP sections 1.0, 2.0, 3.0 and the following:

3.1.1 Advisory and Consulting Services:

Part 1 - Riverbank Stabilization Study*

Consultant Team will execute tasks as required and outlined in this request to develop a comprehensive Riverbank Stabilization Study for the University of Manitoba Fort Garry Campus (See Appendix 1 location map). Scope includes but is not limited to:

i. A review of all pertinent background information,
ii. A geotechnical field investigation,
iii. Topographic surveys as required to supplement existing information,
iv. Installation of slope inclinometers and piezometers the riverbank frontage,
v. Monitoring of the instrumentation (minimum of 5 times for one-year period),
vi. An interim instrumentation monitoring report, and
vii. Evaluate the stability of the existing slope along the riverbank. Conduct stability analyses to identify reaches of the riverbank requiring new or supplementary stabilization considering all existing infrastructure including those requiring repair and under threat. Analysis shall be performed on several cross sections representative of the range of topographic and subsurface conditions.
viii. Consultant Teams should account for one (1) public consultation event such as a public open house (scope and scheduling for the event to be coordinated with the awarded Consultant Team based on recommendations that suit this project).
ix. A final report of the findings and summary of the project process with order of magnitude costing for recommended conceptual riverbank improvements complete with phasing strategy.

***** Note: *Investigative work through Part 1 Riverbank Stabilization Study is to inform the infrastructure renewal projects as noted as Part 2 and Part 3 of this project.*

3.1.2 Design and Construction Services:

Part 2 - Outfall No. 2 Reconstruction

AND

Part 3 - Culvert No. 108 Site Investigation and Remediation

I. Preliminary Design

a) Review all existing documentation.
b) Review of pertinent background information including but not limited to: LiDAR digital elevation model, GIS mapping, existing reports, survey data, monitoring data and photos.
c) Undertake a field program including site reconnaissance, survey, geotechnical site investigation, and monitoring as required to carry out the project, and taking into account the existing and available information.
d) Utility Assessment:
    i. Identify any and all underground and above ground utility infrastructure that may be impacted by the work. Coordinate with the University and outside utility agencies throughout the project for any protection, modification or relocation that may be required.

II. Schematic Design

(a) Once the priorities have been determined and approved, the Consultant Team will prepare schematic design documents that build on the deliverables from previous phase and will serve as the basis of design. Basic drawings showing project intent are expected; along with an outline specification and order of magnitude costing is required.
(b) Prepare and submit a Waterway application in the requisite form and with supporting documentation pursuant to the City's Waterway By-law including the design report with hydraulic assessment.
(c) Prepare/submit requisite documentation and application(s) to the satisfaction of the Department of Fisheries and Oceans, on behalf of the University of Manitoba pursuant to The Fisheries Act.

III. Design Development

(a) Once Schematic Design is approved, Consultant Team will move forward with design development integrating all key design requirements. Review with and approvals from Authorities Having Jurisdiction, is to be included. An approved Class 'C' costing will be required prior to the start of Construction Documents.

IV. Construction Documents

(a) The Consultant Team will describe and detail the construction of the project as developed, including a detailed review of existing conditions for tying in, the provision of all design drawings, detailed and coordinated Contract Documents necessary for tender under a CCDC2 contract. Costing control and updates will be required throughout the process culminating in a updated Class 'A', Pre-bid cost. Three drawing and at least two cost submissions (e.g. 30%, 60% and 90%) of the construction documents will be required for PP review (Digital format: WORD, CAD & PDF) following all UM CAD standards and any existing UM specifications (e.g. UM front end specifications), which will be provided to Consultant, by UM, at the beginning of the project).
(b) The construction documents shall be detailed to include, but not limited to, the following:

i. Compliance with applicable standards and documentation as identified, but not limited to those listed in 3.1.9 Reference Documentation below and any necessary modifications to meet code requirements or equivalencies approved by Authorities Having Jurisdiction.
ii. All signage (if required), to existing UofM standards.
iii. As part of the commissioning service the consultant must coordinate and ensure contractors and sub-contractors provide all necessary documentation as well as training of University personnel to competently operate and maintain the equipment, component or system as required.
iv. Restoration of all areas affected by the construction.

V. Bidding Phase

(c) The Consultant will work with Physical Plant and Purchasing Services to tender the project, including digital copies of Tender Documents (CAD, WORD & PDF) and coordinating with Physical Plant and Purchasing for issuing addenda during the tender period. Digital copies (CAD, WORD & PDF) of Tender.
(d) Documents updated with any addenda must be provided in a timely manner following the close of tender in order to meet the construction timeline.
(e) Competitive bidding is to be conducted in accordance with the University of Manitoba Purchasing Policy.

VI. Contract Administration Services

Typical duties shall include but not be limited to:

a) Attend all required construction meetings, site inspections and review during construction, submission of bi-weekly site reports, review of shop drawings, product data/samples, substantial performance report including deficiencies, certifications and commissioning for the entire project must be included. Also refer to University of Manitoba Design Consultant Agreement.
b) Includes all associated field work
c) Site Resident duties shall include but not be limited to:
    i. Co-ordination of day-to-day site activities;
    ii. Full-time inspection (minimum 4 hours/day);
    iii. Field and/or laboratory testing and verification of construction material quality;
    iv. Field measurement and verification of construction material quantities in a manner so as to minimize contract disputes;
    v. Provision of periodic and timely updates to the Project Manager on progress, including daily log.
    vi. Representation of the University to stakeholders in a professional manner
    vii. Coordinate traffic management and construction work.

VII. Post Construction Services

(a) Inspection prior to warranty expiry is required to determine that deficiencies have been resolved to the satisfaction of the consultant and the University.
(b) Monitor geotechnical instrumentation at regular intervals for a period of 2 years following the completion of construction and as required by Authorities Having Jurisdiction.
(c) Prepare and submit a final construction and monitoring report at the end of the monitoring period.
(d) Summary report – a brief (three to five page) description of:
    o Introduction – description/summary of scope, time, and cost of project

- Tender/Award – bids received and award
- Construction - description of the scope of works, key issues that arose and resolutions, changes, final or projected final construction cost
- Appendices to include in report:
    - Photographs - typical pre-construction, during construction, and post-construction photographs
    - Cost summary
    - Tabulation of tenders
    - Change orders
    - Summary of progress payments
    - Final progress payment
    - Contract schedule
    - Subcontractor list
    - Daily or weekly reports
    - Meeting minutes
    - Shop drawings/submittals
    - Instructions
    - Contractor request for information & responses
    - Material test reports
    - Guarantees Certificates of substantial and total performance
    - Record drawings

3.1.3 For Parts 1, 2, and 3 as required:

(b) Topographic Surveys:

i. Carry out detailed topographic surveys, inspections and site information gathering. Topographic survey requirements to be estimated and itemized as a disbursement.

(c) Geotechnical Investigation and Assessments:

i. The Consultant shall review existing slope monitoring data obtained subsequent to the 2013 water main upgrade and the 2018 emergency slope stabilization works. This information will be made available to the successful proponent or can be requested.

ii. Assess the results of the ongoing slope monitoring.

iii. Conduct a geotechnical investigation as required to supplement existing geotechnical information. The Proposal shall include the methodology and justification for the proposed geotechnical investigation program. The proposed geotechnical investigation shall be sufficient to conduct detailed design of any feasible alternative. The geotechnical investigation program shall be proposed and an estimated budget provided separately from the base fee and identified under disbursements.

(d) Regulatory Review:

i. Determine regulatory approval requirements including those with City of Winnipeg Waterways, Provincial Waterways, Manitoba Water Stewardship, Manitoba Conservation, Department of Fisheries and Oceans (DFO), Transport Canada and requirements for any other regulatory approvals that may be necessary.

(e) Transportation Study:

i. Recommendations within the Riverbank Stabilization Study and design solution for Culvert 108 shall address pedestrian and cycling requirements.

ii. Explore whether any required riverbank stabilization work can be combined with integration of pedestrian and cycling facilities in a cost effective manner.
iii. Consider various cycling treatments including but not limited to multi-use pathways, separated cycling and pedestrian facilities, shared roadways.
iv. Consider cycling connections to existing and proposed facilities in the context of the broader study area.
v. Pedestrian and cycling facilities shall be in accordance with the University of Manitoba Pedestrian and Cycling Plan and applicable industry standards.

(f) Transportation Design Requirements:
i. It is anticipated that roadways will remain unchanged in both profile and alignment following construction. Modifications of some areas of roadway pavement, land drainage, curbs and sidewalks may be required to facilitate the proposed works.
ii. Consider impacts to street lighting. Liaise and coordinate with the University as may be required for relocation or adjustment of street lights.
iii. Pathways, ramps and other features shall be designed in accordance with the City of Winnipeg Accessibility Design Standard (latest edition).

(g) Landscape considerations:
i. Review and provide recommendations for the naturalization of the riverbank area.
ii. Assess the impact on existing riverbank trees and riparian corridor.
iii. Identify opportunities to enhance the campus experience, keeping in line with the goals of the University.

3.1.4 University Project Team:

(a) The Project Team will be comprised of representatives from the University of Manitoba Physical Plant as well as internal stakeholders, to be identified as required.

3.1.5 Cost & Schedule

(a) The University of Manitoba as a publicly funded institution must operate within a system of financial accountability which necessitates strict compliance with all stated limits and approval processes in respect of the Project Budget.
(b) Cost and schedule control are to be maintained by the Consultant throughout the process; Consultant shall notify UofM Project Manager immediately of any deviations from approved cost (including fees) and schedule.
(c) The University is a busy environment with high volumes of vehicular, pedestrian, and cyclist traffic. In order to minimize the impact on University operations maintain strict compliance with all stated limits regarding schedules, project milestones, and set deadlines.
(d) Construction Budget:
i. Part 1 – Riverbank Stabilization Study: It is the intention that the order of magnitude costing provided with the study will inform budget allocation to implement projects. The phasing strategy will inform when these projects will be targeted.
ii. Part 2 - Outfall No. 2 Reconstruction: $1.5M
iii. Part 3 - Culvert No. 108 Site Investigation and Remediation: $500,000

3.1.6 Code

(a) Code compliance including statutes, regulation and by-laws, as well as applicable documentation listed in 3.1.9 Reference Documentation of this RFP are to be included in the base fee. This service will also include review with Authorities Having Jurisdiction and the application for consent, approvals, licenses and permits necessary for the Project.

3.1.7 Presentation

(a) Drawings and associated costing will be required throughout all phases of the project.
(b) The Consultant will prepare and distribute minutes of all design meetings.

3.1.8 Hazardous Material

(a) University of Manitoba has identified the presence of various friable and non-friable asbestos-containing materials as being present throughout many of the buildings, tunnels and grounds owned, leased and/or otherwise occupied by the University of Manitoba.

3.1.9 Reference Documentation

(a) The following documents are to be considered where applicable (in no particular order):
    i. Taking Our Place: University of Manitoba Strategic Plan 2015 - 2020
    ii. Visionary (re)Generation Master Plan (Fort Garry Campus)
    iii. University of Manitoba Accessibility Audit (in progress)
    iv. City of Winnipeg Standard Construction Specifications – current edition;
    v. University of Manitoba Tree Protection Specification
    vi. City of Winnipeg's Accessibility Design Standard – current edition;
    vii. The University of Manitoba Biodiversity Baseline Study and Assessment
    viii. The University of Manitoba Wildlife Management Plan (in progress)
    ix. Appropriate geometric standards set by the Transportation Association of Canada (TAC);
    x. City of Winnipeg Transportation Standard – current edition;
    xi. City of Winnipeg's Tree Planting Details and Specifications Downtown Area and Regional Streets – current edition;
    xii. Sustainability Strategy 2016-2018
    xiii. Sustainable Transportation Strategy (in progress)
    xiv. University of Manitoba Pedestrian and Cycling Plan
    xv. University of Manitoba Wayfinding Signage Design Guidelines
    xvi. University of Manitoba Indigenous Planning and Design Principles

3.1.10 Warranty

(a) Provide warranty review services once final commissioning has been completed. Also refer to UM DCA.

3.1.11 Professional Liability Insurance

Refer to the University of Manitoba DCA, repeated here for convenience and reference purposes only:

(a) The Consultant shall maintain at its own expense and without limiting its liability hereunder, professional liability insurance to a maximum of:

i. $2,000,000.00 (annual aggregate) for projects with a construction value under $5,000,000.00. Insuring against any and all loss, costs or damage, which may result from its performance of services hereunder.

(b) The Consultant shall maintain at its own expense and without limiting its liability hereunder, general liability insurance to a maximum of 2,000,000.00 (annual aggregate), insuring against any and all loss, costs or damage, which may result from its performance of services hereunder. The policy shall stay in place until receipt of Contractors General Liability Insurance Certificate.

3.1.12 Consultant Performance Evaluation

(a) The successful Consultant Team will be evaluated throughout the lifecycle of the project. The Consultant Team will be assessed in terms of performance expectations and overall design and construction project management, focusing on key areas as identified in the Consultant Performance Evaluation (Appendix 7).

(b) The University will review evaluations on an ongoing basis and will use this information when soliciting consultant services for future projects.

PROPOSAL ATTACHMENTS (Responses)

ATTACHMENT A – PROPOSAL COVER SHEET

Offerors are NOT allowed to re-create, re-format, or modify this template.

COMPANY AND CONTACT INFORMATION

Prime Consultant's name (provide complete legal name)	Collaborative Firm(s) if any
Street Address	Street Address
Mailing Address	Mailing Address
City, Province Postal Code	City, Province Postal Code
Contact Person/Title (Individual than can contractually obligate the offeror/firm)	Contact Person
Phone No. Fax No. E-mail address	Phone No. Fax No. E-mail address
G.S.T Registration No.	G.S.T Registration No.

Collaborative Firm involvement (%)

	Prime Consultant	Collaborator # 1	Collaborator # 2
Pre-Design	%	%	%
Design	%	%	%
Contract Documents/Tender	%	%	%
Contract Administration	%	%	%

The rights of the successful Offeror under the Contract and in connection with the Request for Proposal may not be assigned without the prior written consent of the University.

If the Offeror is comprised of more than one person, then the obligations of the said persons will be joint and several.

Indicate organization's operating name, if different than legal name.

Type of Business:

- Sole Proprietorship
- Partnership
- Corporation
- Other _____

Names and titles of owners, officers, partners, principals:

_____
_____
_____
_____
_____

ADDENDA ACKNOWLEDGEMENT

Offeror acknowledges receipt of the following addenda, and has incorporated the requirements of such addenda into the proposal (*List all addenda dates issued for this RFP and initial*):

Reviewed Addenda #: _____to____

The Offeror warrants and declares to the University that the Offeror has followed the forms without alteration (unless clearly marked and highlighted, or expressly permitted). The Offeror agrees that the University is entitled to assume that otherwise no alterations have been made. It is understood and agreed that the addition to, or changing of, any words in this form or the failure to comply with and complete all items may be cause for rejection without consideration of the Proposal.

The Offeror confirms that by submitting this Proposal the Offeror accepts and agrees to be bound by all of the terms and conditions set out in the Instructions to Offerors or elsewhere in this Request for Proposal documents including this Proposal Form. Anything contained in a Proposal

that contradicts or is at variance with any of the terms of the Contract Documents will not be binding on the University unless explicitly accepted and adopted in writing by the University.

The undersigned has reviewed all documents, including all relevant information regarding Conflict of Interest , all addenda, terms and conditions, and without limitation of the foregoing, agrees with and accepts the information contained in the RFP document and indemnify and save harmless the University, its officers, employees, agents and representatives from any loss, damage, cost or expense arising from any failure by our company and/or our employees, agents, contractors and representatives to comply with any requirements set forth by this document as evidenced by the signature below.

Where a Offeror is a corporation the Proposal must be signed by an officer authorized to bind the corporation into contract. A certified copy of a resolution naming the person or persons as authorized to sign the Contract for and on behalf of the Corporation shall be forthwith submitted to the University if and when requested.

For a partnership or joint venture, all parties are to execute (or sufficient in the judgment of the University such that the Proposal is binding on the requisite parties as determined by the University).

Attach additional copies of this SIGNATURE page if required so that all persons or other entities making up the Offeror (if more than one) have executed.

SIGNATURE

This entire proposal must be signed by the person authorized to contractually obligate the organization.

Printed Name	
Signature	
Date Signed	

ATTACHMENT B – PROPOSAL FORM

Offerors are NOT allowed to re-create, re-format, or modify this template.

CRITICAL TEAM MEMBERS

Name of Key Account/Project Manager: _____

[1]The Account/Project Manager is the individual who will be the daily point of contact throughout this project. This individual cannot be removed or replaced from this position for the duration of the contract.

CERTIFICATIONS

No	Criteria	Response*
1.	The Offeror has read the entire RFP and clearly understands the intent of the scope.	True / False
2.	The Offeror is presently engaged in the business of providing the services & work required in this RFP.	True / False
3.	The Offeror is willing and able to comply with and accept all terms and requirements described in the RFP including reference to any standard form agreement including section 8.1 and its terms and conditions. Any proposed changes to any of these referenced documents must be provided on the same document and returned to the University with Attachment A. Failure to comply with this requirement may result in the disqualification of the Offeror's proposal.	True / False
4.	The Offeror confirms that it has the financial strength to perform the services required under this RFP.	True / False
5.	The Offeror can provide (if requested) financial records for the organization for the past three years.	True / False
6.	The Offeror certifies that it is not currently debarred, suspended, proposed for debarment, or declared ineligible for award by any Public entity.	True / False
7.	Within the past five years, the Offeror certifies that they have not been convicted or had civil judgment rendered against them for: fraud,	True / False

	embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or tax evasion.	
8.	The Offeror has not had any contracts terminated by the University of Manitoba (within the past five years).	True / False
9.	The Offeror certifies that has reviewed the University's Policy and procedures relating to Conflict of Interest and does not have a possible conflict of interest with any employee involved in this solicitation and/or ensuing contract.	True / False
10.	a) The Offeror certifies that the Offeror (individual, sole proprietor, organization, corporation, or partnership) is a resident of Canada as defined by Canada Revenue Agency. OR b) The Offeror certifies that the Offeror (individual, sole proprietor, organization, corporation, or partnership) is a Non-Resident and therefore subject to a withholding tax on payments unless Offeror obtains from Canada Revenue Agency and presents to the University a waiver or a reduction in the withholding tax (refer to the section 8.15).	True/False OR True/False
11.	The Offeror certifies that there is no pending litigation against the Offeror.	True / False

***** *Failure to answer or answering "False" may be grounds for disqualification. Please attach additional information on any subject where the Offeror responded "False" to a question above.*

ATTACHMENT C – TEAM QUALIFICATIONS AND CAPABILITIES

Offerors are NOT allowed to re-create, re-format, or modify this template.

1.0 Firm Qualifications

Size of Each Firm (list name, number of staff, typical no. of projects per year, average project size, largest project size (size is to be stated in construction value), all based on a time period of five years prior to the date of this Statement).

Prime Consultant	No. Staff	No. Projects/Year	Largest Value

2.0 Team Qualifications

No	Criteria	Key Project Manager	Other Key Personnel (if applicable)
1	Total years of experience in the engineering and design consulting services area?		
2	Total years of experience in the current position?		
3	How long has the individual been employed at your organization?		
4	How many similar projects has the individual performed?		

3.0 Criteria for Evaluation

If you wish to provide different information for each of the 4 projects in this RFP, please attach additional sheets in the following format, clearly identifying which information is for which project**.**

3.1 Consultant Team Experience

Only reference projects with direct involvement by each listed firm.

For each of, and only, the disciplines noted below, please list your four (4) most relevant constructed projects that illustrate your qualifications for the proposed project. Projects identified can include projects that are currently under construction. Include the name of the project, its location, the construction value, the construction completion date as well as a current client contact who can verify this information. At minimum, the four Prime Consultant projects should include a one or two page project sheet that illustrates, in a written and graphic form, the key

design aspects of the project, including cost and square footage, these sheets must be attached in Attachment C. Examples provided should highlight your expertise and past involvement in projects that are comparable to this project.

The four Prime Consultant and Architectural Design projects are to be referenced for Section 3.3 - Cost Control Experience, Section 3.4 - Schedule Control Experience and Attachment I – Evidence of Qualification: References. Please note, preference will be given to local firm representation, more recent projects (within the last ten years), and local projects for out-of-town firms.

3.1.1 Prime Consultant Firm Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.2 Geotechnical Engineering Firm Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.3 Civil Engineering Firm Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.4 Mechanical Engineering Firm Name _____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.5 Electrical Engineering Firm Name _____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.6 Structural Engineering Firm Name _____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.7 Landscape Architecture Firm Name _____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.8 Ecologist Firm Name _____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)
1			$				
2			$				
3			$				
4			$				

3.1.9 Biologist Firm Name _____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.	Project Sheet (√)

1			$				
2			$				
3			$				
4			$				

3.2 Proposed Key Team Members' Experience

For each of, and only, the team members noted below, please list the four (4) most relevant constructed projects that illustrate their qualifications. Include the name of the project, its location, the construction value, the construction completion date as well as a current client contact who can verify this information. All team members should include a one or two page curriculum vitae. It is expected that the Prime Consultant or members of the team have experience in the design of riverbank stabilization and erosion control as well as civil underground services design and construction. Please note, preference will be given to local firm representation, more recent projects (within the last ten years), and local projects for out-of-town firms.

3.2.1 Project Manager Name _____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.2 Geotechnical Engineer Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.3 Civil Engineer Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.4 Mechanical Engineer Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.5 Electrical Engineer Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.6 Structural Engineer Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.7 Landscape Architect Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.8 Ecologist Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.2.7 Biologist Name_____

No.	Project Name	Location	Value	Date	Contact Name	Phone No.
1			$			
2			$			
3			$			
4			$			

3.3 Cost Control Experience

For each of the four (4) Prime Consultant and Architectural Design projects listed in Section 3.1, provide the following cost and change order information. In the corresponding notes section indicate reasons for the cost variance, if any, and an indication of each client's perception of cost control on the project (good, satisfactory or less than satisfactory). This information will be verified by contacts.

3.3.1 Cost Control

No.	Project Name	Class 'D' Cost	Class 'C' Cost	Class 'A' Cost	Contract Value	Change Orders	Final Cost
1		$	$	$	$	$	$
2		$	$	$	$	$	$
3		$	$	$	$	$	$
4		$	$	$	$	$	$

3.3.2 Notes

No.	Project Name	Cost Substantiation	Client Feedback
1			
2			
3			
4			

3.4 Schedule Control Experience

For each of the four (4) Prime Consultant and Architectural Design projects listed in Section 3.1, provide the following schedule information. In the corresponding notes section indicate reasons for the schedule variance, if any, and an indication of each client's perception of schedule control on the project (good, satisfactory or less than satisfactory). This information will be verified by contacts.

3.4.1 Schedule Control

No.	Project Name	Design Completion		Construction Documents Completion		Construction Completion	
		Scheduled	Actual	Scheduled	Actual	Scheduled	Actual
1							

2							
3							
4							

3.4.2 Notes

No.	Project Name	Cost Substantiation	Client Feedback
1			
2			
3			
4			

3.5 Capabilities and Resources

In the spaces below, please indicate availability of team members that are to be assigned to this project.

Resources Available within 2 weeks of award of project (refer to Section 2.3 - Procurement Schedule).

Team Member	Name	Date Available	Percentage of time on a weekly basis
Project Manager			

Geotechnical Engineer			
Civil Engineer			
Mechanical Engineer			
Electrical Engineer			
Structural Engineer			
Landscape Architect			
Ecologist			
Biologist			

This information is being collected under the authority of The University of Manitoba Act. It will be used to assess the qualifications of architectural firms who wish to do business with the University. Please refer to the RFP confidentiality statement.

ATTACHMENT D – PROJECT PLAN APPROACH & SUMMARY

Offerors are NOT allowed to re-create, re-format, or modify this template.

SECTION 1 – PROJECT PLAN APPROACH (1 Page Maximum)

Note: Project Plan Approach to include proposed project schedule with anticipated milestones.

SECTION 2 – PROJECT SUMMARY (1 Page Maximum)

ATTACHMENT E – PROJECT PLAN DETAILS

Offerors are NOT allowed to re-create, re-format, or modify this template.

SECTION 1 – PROJECT ASSUMPTIONS (1 Page Maximum)

SECTION 2 – RESPONSIBILITIES (1 Page Maximum)

SECTION 3 – CLARIFICATION PERIOD SCHEDULE (1 Page Maximum)

ATTACHMENT F – RISK ASSESSMENT PLAN CONTROLLABLE

Offerors are NOT allowed to re-create, re-format, or modify this template.

Offeror may add/delete additional rows to identify additional risks, but do not exceed the page limit

ASSESSMENT OF CONTROLLABLE RISKS (2 Page Maximum)

Risk 1:

Why is it a Risk:

Solution:

Risk 2:

Why is it a Risk:

Solution:

Risk 3:

Why is it a Risk:

Solution:

Risk 4:

Why is it a Risk:

Solution:

Risk 5:

Why is it a Risk:

Solution:

ATTACHMENT G – RISK ASSESSMENT PLAN NON-CONTROLLABLE

Offerors are NOT allowed to re-create, re-format, or modify this template.

Offeror may add/delete additional rows to identify additional risks, but do not exceed the page limit

ASSESSMENT OF NON-CONTROLLABLE RISKS (2 Page Maximum)

Risk 1:

Why is it a Risk:

Solution:

Risk 2:

Why is it a Risk:

Solution:

Risk 3:

Why is it a Risk:

Solution:

Risk 4:

Why is it a Risk:

Solution:

Risk 5:

Why is it a Risk:

Solution:

ATTACHMENT H - VALUE ASSESSMENT PLAN

Offerors are NOT allowed to re-create, re-format, or modify this template.

Offeror may add/delete additional rows to identify additional risks, but do not exceed the page limit

VALUE ADDED OPTIONS (1 Page Maximum)

Item 1: _____

Item 2: _____

Item 3: _____

Item 4: _____

Item 5: _____

ATTACHMENT I – EVIDENCE OF QUALIFICATION: REFERENCES

Offerors are NOT allowed to re-create, re-format, or modify this template.

Provide the contact information for references in the format below. The Offeror agrees that the University may contact listed clients to obtain their opinions regarding the Offeror's performance and/or services provided. The Offeror absolves listed clients of any liability for any opinions provided to the University. References shall be for similar value service contracts and service contracts that have similar key aspects of scope, size, complexity, and value from three previous or current clients of large organizations that are ideally not-for-profit and preferably Canadian Universities.

PRIME CONSULTANT

Three (3) references should describe in detail:

- Name of the client organization
- Service timeframe
- Nature of the services provided
- Personnel who were active participants in this engagement and the role they played
- Current status of the engagement
- Name, address, telephone number and email address of a senior member of the client organization that can be contacted as a reference.

No.	Client Organization	Contact Name, Telephone Number & Email Address	Service TimeLine	Nature of the Service Provided	Personnel	Status of Engagement
1						
2						
3						

SUB-CONSULTANT (IF ANY)

Three (3) references for each sub-consultant should describe in detail:

- Name of the client organization

- Service timeframe
- Nature of the services provided
- Personnel who were active participants in this engagement and the role they played
- Current status of the engagement
- Name, address, telephone number and email address of a senior member of the client organization that can be contacted as a reference

No.	Client Organization	Contact Name, Telephone Number & Email Address	Service TimeLine	Nature of the Service Provided	Personnel	Status of Engagement
1						
2						
3						

UNIVERSITY OF MANITOBA

Detail any previous services of similar nature your organization (or individuals within your organization) may have provided the University of Manitoba in the spaces provided below.

No.	Location	Date	Service	Contact Name
1				
2				
3				

ATTACHMENT J – COST PROPOSAL FORM

Offerors are NOT allowed to re-create, re-format, or modify this template.

Costs must be in Canadian Currency (CAD) before applicable taxes

SECTION 1 – TABLE 1 – Fees

Basic consulting services for the above-noted project as outlined in the RFP.
Propose fixed fee on Part 1, and percentage (%) fee on Part 2 and Part 3 below, as defined by the University of Manitoba Design Consultant Agreement, with the University of Manitoba Amendment, for this project, based on a Stipulated Sum General Contract project delivery method. In other words:

PART 1 - Riverbank Stabilization Study (Fixed Fee)

Please provide a fixed fee based on the scope of work as detailed in the RFP. Our Part 1 Total Fixed Fee for consulting and advisory services will be equals to a Total Fixed Fee of $_____) (fees are exclusive of taxes and disbursements)

PART 2 - Outfall No. 2 Reconstruction (Percentage based fee)

This percentage is based on an estimated construction cost of: $1,500,000.00

In other words, if the cost of construction is **$1,500,000.00** our percentage fee for Part 2 design and construction services as detailed in this request and the UM DCA, will be calculated as follows:
$1,500,000.00 x ____% equals to Part 2 Total Percentage Fee of $ _____ (fees are exclusive of taxes and disbursements)

PART 3 - Culvert No. 108 Site Investigation and Remediation (Percentage based fee)

This percentage is based on an estimated construction cost of: $500,000.00

In other words, if the cost of construction is **$500,000.00** our percentage fee for Part 3 design and construction services as detailed in this request and the UM DCA will be calculated as follows:
$500,000.00 x ____% equals a total fee of $ _____ (fees are exclusive of taxes and disbursements)

Please provide a total combined cost for Part 1, Part 2 and Part 3: $_____ (fees are exclusive of taxes and disbursements).
Disbursement Fees (CAD$): Standard disbursement costs will be billable to the University, if reasonable and approved for this type of project. Provide itemized cost as per the following table.

Please note that the University does not accept mileage claims for within the City of Winnipeg as per the DCA.

Item	Unit of Measure	Unit Fee	Quantity	Extended Fee
i.e. Flights	*Flight*	*$A / Flight*	*B*	*$A x B*
Transportation				
Meals				
Flights				
Accommodation				
Printing				
Courier				
Presentation materials				
Topographic Survey				
Geotechnical Investigation				
Other (if applicable)				
Total Disbursement Fees:				CAD$

Fee Breakdown for Parts 2 and 3(For Information Purpose Only):

Pre-Design: _____% of the total fee

Schematic Design: _____% of the total fee

Design Development: _____% of the total fee

Construction Documents: _____% of the total fee

Bidding: _____% of the total fee

Construction - Contract Administration: _____% of the total fee

Post-Construction including 1 year Warranty Period:_____% of the total fee

Total: 100 %

Exclusions:

_____

_____

Note: If applicable, provide information regarding reimbursable expenses.

Part 1: Project Completion: _____

Part 2: Project Completion: _____

Part 3: Project Completion: _____

SECTION 3 – Price Outline for Services Performed in Canada for Non-Resident Suppliers

This information is collected to comply with Canada Revenue Agency requirements (Section 8.17). **All non-resident suppliers** are required to provide a price outline for the portion of work performed in Canada in the table format below.

Check one and complete Table if a Non Resident of Canada:

☐ **APPLICABLE (Non Resident of Canada as defined by Canada Revenue Agency)**

☐ **NOT APPLICABLE (Resident of Canada as defined by Canada Revenue Agency)**

Type of Work or Services	**Itemized Total Net Price**	**Portion of Work Performed in Canada**	**Scheduled Date of Work**
	CAD $ (Unless otherwise specified)		**MM/YYYY**
Total			

ATTACHMENT K – INDIGENOUS WELL-BEING

Offerors are NOT allowed to re-create, re-format, or modify this template.

The University is committed to considering all social, environmental and economic impacts of all its purchases. Identify, in reasonable detail, the Indigenous Initiatives your team will propose to incorporate into this project, providing examples of where your company and team members have undertaken similar initiatives on past projects, and/or any initiatives your organization is currently undertaking related to Indigenous issues and priorities in Canada through project-specific work or personal involvement.

No.	Project Name	Indigenous Well-being Initiative	Projected Result	Actual Result Achieved

For each of the team members proposed on the project team, please identify what involvement each has had working with Indigenous peoples and communities and how they have contributed to the betterment of Indigenous people.

Team Member Name	Indigenous Community Contribution and Involvement

ATTACHMENT L – SUSTAINABLE INITIATIVES

Offerors are NOT allowed to re-create, re-format, or modify this template.

The University is committed to considering all social, environmental and economic impacts of all its purchases. Identify, in reasonable detail, the sustainability aspects your team will propose to incorporate into this project, providing examples of where your company and team members have undertaken similar initiatives on past projects and/or any initiatives your organization is currently undertaking related to sustainable initiatives through project-specific work or personal involvement

Project Name	**Sustainable Aspects**	**Project Team Members**	**Considerations in Relation to this Project**
Project: XXX	Designed building so that 80% of the floor areas had access to natural light.	Project Architect, Interior Designer	Improved occupant well-being and reduced need for artificial light.

For each of the team members proposed on the project team, please identify what involvement each has had working towards sustainability and how they have contributed to this cause.

Team Member Name	**Sustainability Contribution and Involvement**

ATTACHMENT M – INSURANCE REQUIREMENTS

Please attach your insurance/bonding documents as instructed in section 4.14.

9 APPENDICES

APPENDIX 1 – Map: Study Area

APPENDIX 2 – Historic Data: Underground Infrastructure Renewal Forecast Example – Water Mains

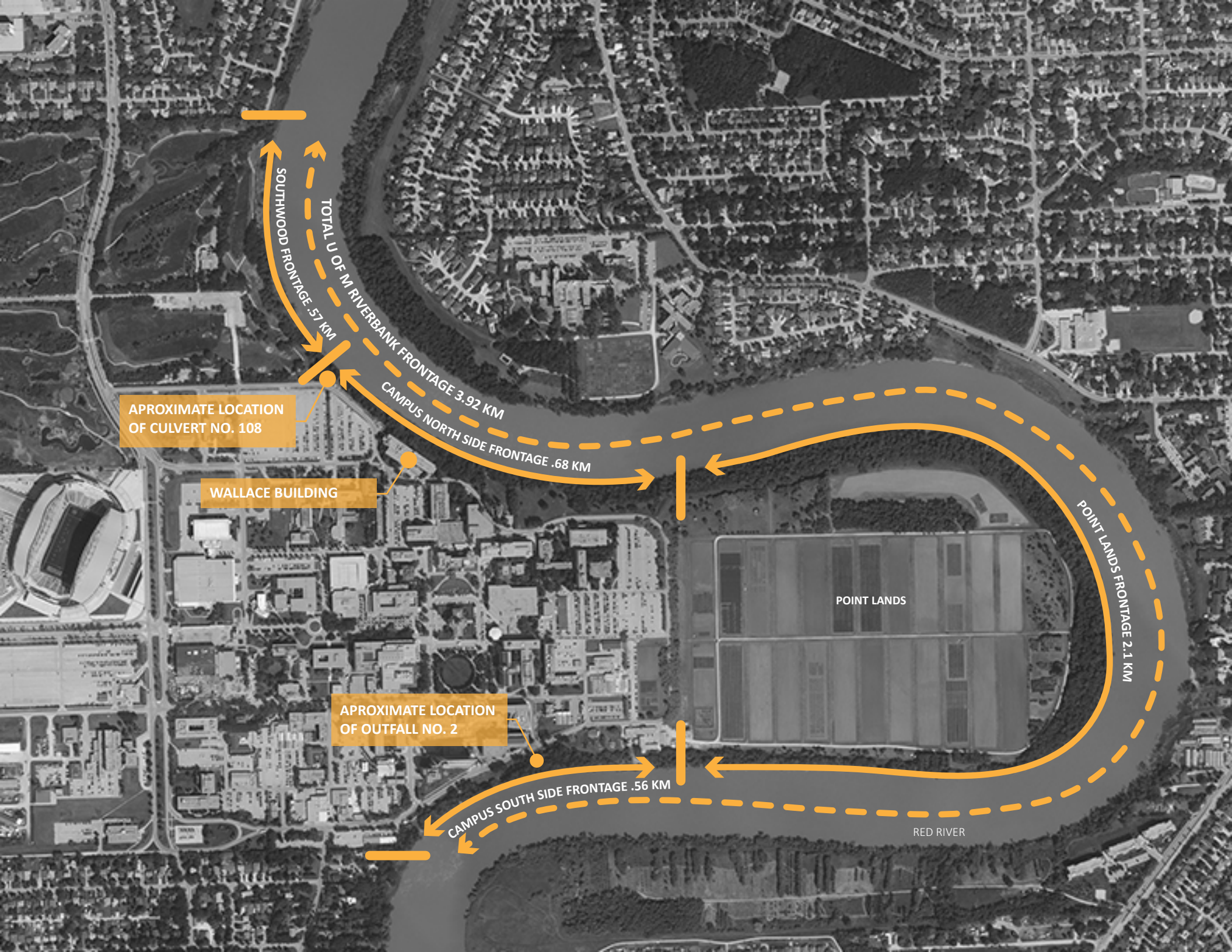
APPENDIX 3 – Historic Data: The University of Manitoba Biodiversity Baseline Study and Assessment

APPENDIX 4 – Historic Data: Campus Map

APPENDIX 5 – Reference: Uniformat G Sitework

APPENDIX 6 – Reference: University of Manitoba Design Consultant Agreement (DCA) Example

APPENDIX 7 – Reference: Consultant Performance Evaluation Template


SOUTHWOOD FRONTAGE .57 KM
TOTAL U OF M RIVERBANK FRONTAGE 3.92 KM
CAMPUS NORTH SIDE FRONTAGE .68 KM
APROXIMATE LOCATION OF CULVERT NO. 108
WALLACE BUILDING
POINT LANDS
POINT LANDS FRONTAGE 2.1 KM
APROXIMATE LOCATION OF OUTFALL NO. 2
CAMPUS SOUTH SIDE FRONTAGE .56 KM
RED RIVER

2016
2016
2018
2018
2014
2015
2016
2014
2018
2017
2017
2019
2015
2016
2015
2014
2016

RED RIVER

LINE COLOUR LEGEND

- 1998 Watermain Upgrade / renewed PV C-900
- Asbestos Cement Pipe
- Cast Iron - universal joints - corked joints
- Water line - not known
- 2014 Watermain Upgrade/ renewed PV C-900
- 2015 Watermain Upgrade/ renewed PV C-900

PHASE 2 - 2015 - UNDER CONSTRUCTION	15/08/26	2
PHASE 1 - 2014 - AS BUILT	15/08/26	1
Revision	**Date**	**No.**

UNIVERSITY OF MANITOBA

Physical Plant Department

ARCHITECTURAL ENGINEERING SERVICES

Physical Plant 89 Freedman Crescent Winnipeg, MB

PROJECT TITLE:

FORT GARRY CAMPUS
DCW DISTRIBUTION

SHEET TITLE:

PHASE DIAGRAM

SCALE:	DESIGNED:
1:1750	AP
DATE:	DRAWN:
JULY 2015	

REQUISITION NO. & PROJECT NO.	SHEET NO.
815C130429-51	A1

BIODIVERSITY BASELINE STUDY AND ASSESSMENT

FINAL REPORT SUBMITTED TO:

UNIVERSITY OF MANITOBA
OFFICE OF SUSTAINABILITY

January 29, 2018

SUBMITTED BY:

SCATLIFF + MILLER + MURRAY

visionary urban design + landscapes

ARCHITECTURAL & ENGINEERING SERVICES

LEGEND

OVERHUNG BLDGS.
ABOVEGROUND BLDGS.
UNDERGROUND STRUCTURES

POWER POLE ....
LIGHT & POLE - STREET ....
LIGHT STANDARDS - PEDESTRIAN ......
LIGHT STANDARDS - STREET ....
CODE BLUE EMERGENCY PHONE ....
LIGHT - TRAFFIC SIGNAL ....
LIGHT - CROSS WALK..........................
LIGHT - FLOOD ....
POLE GUY ANCHOR ....

PARKING METERS .... PM
PARKING LOT POSTS - CONCRETE .....
PARKING LOT POSTS - WOOD ....
PARKING LOT POSTS - METAL ....
ELECTRICAL PANEL .... EP
PADMOUNT TRANSFORMER................. T
CATHODIC PROTECTION ANODE .... #1

FENCE POSTS - METAL ....
FENCE POSTS - WOOD ....
STEEL BOLLARDS....................................
CURB CUT ....
TREE GRATE ....

MANHOLES..
CATCH BASINS......................................
CURB DRAINS..
HYDRANT...
VALVES..
LAWN SPRINKLER HEADS...................
CAP...

MANITOBA TELEPHONE SYSTEM BOX.. MTS
MANHOLE - POWER / COMMUNICATION.

CATHOTIC PROTECTION	CAT
CHILLED WATER LINE	CWS
CHILLED WATER RETURN LINE	CWR
COMPUTER OVERHEAD LINE	CO
COMPUTER UNDERGROUND	CU
CORRUGATED STEEL PIPE	CSP
ELECTRICAL LINE OVERHEAD	EO
ELECTRICAL UNDERGROUND	EU
FIBRE OPTIC UNDERGROUND	FOU
FO AND TELEPHONE UNDERGROUND	
GAS LINE	G
LAWN SERVICE	LS
OIL LINE	OIL
SANITARY SEWER	SA
STORM SEWER	ST
STEAM LINE	STM
TELEPHONE LINE OVERHEAD	TO
TELEPHONE UNDERGROUND	TU
TELEVISION OVERHEAD	TVO
TELEVISION UNDERGROUND	TVU
WATER LINE	W
COMPRESSED AIR LINES	CA
FENCE LINE	
DITCH - CENTER LINE	

NOTICE:
INFORMATION SHOWN MAY NOT ACCURATELY REFLECT INSTALLED SERVICES. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY THE EXACT LOCATION OF ALL SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK

Aug 1, 2018

UNIVERSITY OF MANITOBA

ARCHITECTURAL ENGINEERING SERVICES
Physical Plant Department
89 Freedman Crescent Winnipeg, MB

TRADITIONAL TERRITORIES ACKNOWLEDGEMENT

The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Métis Nation.

We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.

UNIVERSITY OF MANITOBA

EXECUTIVE SUMMARY

A biodiversity baseline study and assessment was initiated by the University of Manitoba's Office of Sustainability in support of the University's commitment to environmental sustainability in the summer of 2017 (The Study). The Study focused on riverbottom forest habitat in four assessment areas owned and managed by the University. Two assessment areas, Southwood Lands and Point Lands, are situated on the Fort Garry campus in Winnipeg, Manitoba while two sites are situated on rural research farms in Glenlea and Carman, Manitoba. The current report has been developed as a companion document to the Field Study Report to provide directed recommendations to guide the University in the protection and enhancement of riverbottom forest health and biodiversity.

The findings of the field investigation strongly suggest that invasive species represent the main threats to long term forest health. Noxious weeds such as European buckthorn and Canada thistle are prevalent throughout much the surveyed forests and adjacent lands. These weed species can displace native plant species and degrade the terrestrial habitat. Additionally, much of the forest habitat surveyed was characterized by large amounts of green ash. This tree species has become a much more prominent and important component of these forests because of the ongoing loss of American elm trees to the effects of Dutch elm disease. The recent arrival of the Emerald Ash Borer beetle has major implications on long term forest health, the extent to which is not well understood.

Targeted recommendations have been made within the current report to strengthen the capacity of the University to respond to these forest health concerns. Recommended protection measures focus on supressing invasive weeds within and adjacent to forest habitat while strategic forest plantings opportunities have been recommended to reinforce or expand forest habitat. Forest habitat that is suitable for conservation has been identified and considerations for monitoring and maintenance are provided. Finally, general environmental protection measures are outlined to help guide future development planning within, or adjacent to, these valued environmental assets and suitable plant species are identified to assist in revegetation planning and design.

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Background

In support of the University's dedication to sustainable operations, the Office of Sustainability (OOS) initiated a biodiversity baseline study and assessment of the riverbottom forests situated within University lands (the Study). As a companion document to the Field Study report submitted as a deliverable for this project, the current report seeks to provide recommendations for management of their riverbottom forests. Additional background rationale has been included for the consideration of the University of Manitoba. This report includes a general discussion on threats to the health of riverbottom forests, as well as more direct recommendations for preserving and enhancing forest health within the assessment areas. Recommendations within the current report consider:

- Monitoring and maintenance,
- Areas where corrective activities are recommended,
- Areas suitable for habitat conservation,
- Areas suitable for forest expansion,
- Priorities and phasing, as well as
- Environmental protection measures relevant to construction and development in proximity to the assessment areas.

Additional information has been provided as appendices relating to plant species selection for forest plantings as well as weed control approaches tailored to the main species of concern within the assessment areas.

2.0 THREATS TO FOREST HEALTH

The expansion of agriculture as well as urban and suburban development has significantly influenced the distribution and overall health of the riverbottom forests throughout southern Manitoba. The riverbottom forests characterized during the current study are no exception. Over time, these important habitats have undergone considerable change in terms of their spatial extent, as well as their structure and function. While large amounts of riparian habitat have been lost and degraded due to clearing and development, the remaining forests are at an increased pressure from various invasive species, disease and pests. The following section details the most common external pressures influencing the overall health and normal functioning of the riverbottom forests characterized by the Study.

LOSS OF BIODIVERSITY

Ecosystem resilience is the capacity of a natural system to withstand and recover from disturbance and environmental change. The notion of resilience, and its influence on ecosystem health, is complicated, as natural systems are constantly responding to internal and external environmental stimuli over time. Biologically diverse ecosystems that are characterized by a functional redundancy of important plant community members tend to exhibit a high degree of resilience to stress caused by a natural disturbance. When biodiversity is lost, the capacity of a system to recover from disturbance diminishes. The main factors affecting the loss of biodiversity within the assessment areas of the Study are discussed below.

DISEASE AND PESTS

Disease and insect damage are a normal part of natural and anthropogenic landscapes. When foreign pathogens or insects are introduced, their effects can range from benign and unobservable to dramatic, potentially leading to loss of diversity and degradation of forest health. Dutch elm disease (DED) is one such disease that has dramatically affected local plant communities in southern Manitoba, including the riverbottom forests assessed in the Study.

In these forests, significant numbers of American elm (*Ulmus americana*) trees have died or have been removed due to DED infection, leading to changes in canopy composition. This change is most readily observable within the floodplain zone of the riverbottom forests, where elm trees have been replaced by other species, most commonly green ash (*Fraxinus pennsylvanica*). Over the past several decades, the Point Lands and Southwood Lands assessment areas have experienced this shift in canopy dominance. This change is readily detected by comparing the riparian assessment conducted in 2000 by Mumby's Tree Service with the current study. Whereas American elm was a main canopy component in 2000, now it is almost non-existent in the mature canopy (Mumby & Heartwood, 2000).

The ability of green ash to replace American elm within the forest canopy is an example of how functional redundancy in an ecosystem can impart resilience to an external pressure. That being said, as species are lost from the system its capacity for resilience decreases. When species are lost that cannot be realistically replaced with other community members, dramatic changes in community structure and function may occur. The impending arrival and potential impact of the Emerald Ash Borer (EAB) creates a level of uncertainty about the urban and riparian forests throughout southern Manitoba. Green ash dominates portions of the forest canopy within the floodplain zone of all assessment areas, where it also represented a major understory component in the shrub and groundcover layers. A relative few remaining native tree species are capable of occupying the same position and role in these riparian environments as green ash.

The resilience of these forest communities to the effect of EAB, is not well understood. Nor are the potential cummulative effects well understood of losing green ash in additon to the already declining American elm in these habitats. Changes in forest structure and composition will be tied to the capacity of other native riparian species, which include Manitoba maple (*Acer negundo*), basswood (*Tilia americana*) and plains cottonwood (*Populus deltoides*), to replace green ash in the forest canopy. Furthermore, tree regeneration following the loss of ash trees will be directly affected by the expansion of weedy species into the riverbottom forests. Large scale, and potentially rapid, loss of green ash will significantly increase light penetration in the forest environment and will stimulate the growth of certain plant species. Weeds like Canada thistle are abundnat along the forest edges and ready to expand into newly created forest canopy gaps. This will create yet another challenge to long term forest health and functionality.

Invasive weeds present along the forest edges wil naturally take advantage of this change in light conditions and expand into the forest. Without methods of control in place, these invasive weeds have the capacity to reduce native biodiversity and interfere with the capacity of desirable forest shrub and canopy species to regenerate. Further background information on common diseases and pests of relevance to the current study is provided as Appendix A.

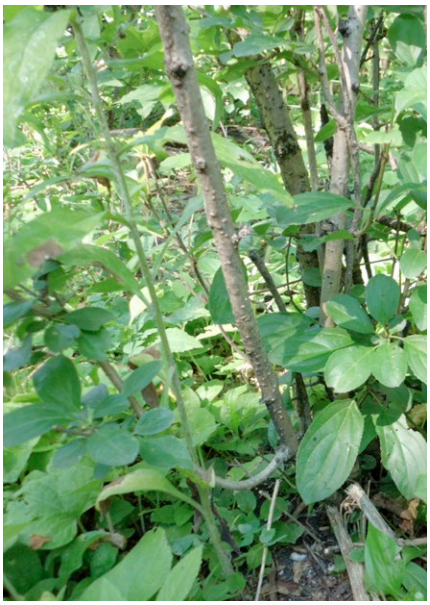
Weed species such as Canada thistle (Cirsium arvense) take advantage of openings in the forest canopy to expand into these habitats.

INVASIVE PLANT SPECIES

Biological invasions of non-native species are one of the most serious threats to the health and functioning of natural ecosystems. Persistent invasive weeds move quickly into disturbed habitat and gradually spread into adjacent areas. A number of invasive plant species were noted in the study areas. The most problematic weeds noted during the Study include:

- Canada thistle (*Cirsium arvense*),
- European buckthorn (*Rhamnus cathartica*),
- Leafy spurge (*Euphorbia esula*), and,
- Common burdock (*Arctium minus*).

These invasive species have the capability to invade and dominate significant parts of normal forest understory, compete with regenerating native shrubs and canopy species and interfere with natural forest succession. Due to their competitive attributes and environmental preferences, if allowed to persist, these species can entirely replace native species, reduce biodiversity and degrade healthy ecological functioning of riverbottom forests.



European buckthorn (Rhamnus cathartica) was present at three of the four assessment areas surveyed during the Study.

European buckthorn was documented primarily in the Point Lands and Ian N. Morrison Research Farm assessment areas. European buckthorn is one of the most problematic woody invasive species affecting riparian and upland forests in southern Manitoba. This medium to tall shrub grows very aggressively and is capable of displacing all shrub and tree species in the understory and eventually monopolizing the groundcover layer. This weed was found dispersed sporadically throughout these assessment areas and in certain locations large infestations were documented.

Canada thistle was found in all assessment areas to varying degrees. Infestations were commonly noted along the edges of riparian forest habitat at Point Lands, Southwood Lands and Glenlea. In these assessment areas, Canada thistle was also documented inside the riverbottom forest where gaps in the tree canopy allowed suitable light conditions for its establishment. In some cases, Canada thistle formed thick stands capable of suppressing and excluding native tree and shrub regeneration, however this situation was only observed in areas with full light conditions (i.e. on exposed riverbanks or adjacent to the forest).

Canada thistle is capable of invading and dominating exposed riverbanks.

Leafy spurge was only documented at the Ian N. Morrison Research Farm and was found primarily along the forest edge. Leafy spurge is not well suited to wet soil conditions and therefore was not found adjacent to the riverbanks. Once established, like Canada thistle, this species will expand into areas where gaps in the canopy develop due to branch breakage or wind fall of aging or decayed trees. In these situations, leafy spurge has the potential to out-compete native tree and shrub seedlings and negatively affect forest regeneration. Shaded conditions keep spurge somewhat supressed but will not eradicate it.

Common burdock was documented in the Point Lands assessment area occupying edge habitat where light conditions were favourable for its growth. Burdock is an exotic, biennial species with large leaves that readily shade out adjacent groundcover. In its first year of growth, plants produce a vegetative rosette growth form and in year two, a flowering stalk emerges producing large burs. The burs are readily dispersed by attaching to passing animals or humans.

3.0 MANAGEMENT & ENHANCEMENT OF FOREST HEALTH

3.1 Monitoring and Maintenance

A simple, yet critical first step towards preserving the integrity of the University of Manitoba's riverbottom forests is to develop and implement a monitoring and maintenance program tailored to these environments.

The frequency and intensity of the monitoring program would depend on the assessment area being surveyed as well as the overall objectives of the program. That being said, all riverbottom forests should be monitored at a minimum each year in order to identify any new or emerging concerns and threats. The timing of monitoring events can be designed to maximize the likelihood of observing general forest health issues, or tailored to capture specific existing conditions.

Regular monitoring intervals allow for the initiation of any corrective activities that are necessary to address threats to forest health. For example, invasive weed species can establish and expand rapidly under certain environmental conditions. Early identification of any incidences of invasive weed establishment dramatically improves the ability to control these species and limit their expansion into other natural areas. Likewise, early identification and rapid response to newly invading invasive species can dramatically reduce the amount of resources necessary to achieve weed control. Monitoring should be done by an experienced surveyor who is capable of identifying common invasive weed species as well as characteristic symptoms of pests and disease that may occur within the environment.

Monitoring is also an important element of any credible management plan and should accompany any landscape alteration or management activity that occurs in these environments. Undertaking forest monitoring to assess the efficacy of management or maintenance activities can inform and improve future site works through adaptive management. For example, noting the efficacy of a particular weed control treatment can assist in developing subsequent treatments in comparable situations.

The primary form of maintenance that will be required on a regular basis to preserve or enhance forest health and sustainability is weed control, and more specifically management of invasive weed species. While it is unrealistic to expect to control the full range of non-native weed species that may invade the University's riverbottom forests, managing the presence of the most problematic weed species from a forest health perspective is achievable. For the riverbottom forests characterized in the Study, the main invasive species of concern are European buckthorn, Canada thistle, leafy spurge and common burdock. These species each have unique habitat preferences and growth capabilities, and will require slightly different approaches to manage.

RECOMMENDATIONS FOR MONITORING AND MAINTENANCE

- Develop and implement site specific annual monitoring and maintenance programs for each assessment area.
- Explore available resources to accomplish annual monitoring and maintenance utilizing in-house capabilities of the University of Manitoba.
- Build internal capacity to accomplish annual monitoring and maintenance activities.
- Determine objectives and overall priorities of the monitoring and maintenance programs; plan and allocate resources as necessary to realize annual objectives.
- Manage weeds in adjacent areas to prevent seed dispersal into the forest habitat.
- During any construction activities, keep work site free of weeds and revegetate any disturbed areas as soon as possible using site appropriate native plant species.

3.2 Areas Requiring Corrective Measures

An important step in preserving and enhancing forest health is to first address existing issues afflicting the riverbottom forests. The most apparent issues affecting forest health documented during the field were infestations of invasive plant species. The main invasive species of concern within the assessment areas were Canada thistle and European buckthorn. Eradication of these weeds requires a multi-faceted weed management strategy that makes use of both mechanical and chemical means of control (see Appendix B for further detail on control of these species). Several areas were identified as being candidates for corrective activities seeking to control and eliminate these invasive species, and these have been identified in Figures 1 and 2.

The largest infestations of Canada thistle were noted at the Southwood Lands and Point Lands assessment areas where it was found occupying continuous sections of the riparian zone (Figure 1). In these areas, thistle was likely left to flourish following construction related disturbances (outfall construction/repair) without a management strategy in place to limit its establishment and spread.

European buckthorn was documented in two assessment areas; the Point Lands and the Ian N. Morrison Research Farm. At the Ian N. Morrison Research Farm the European buckthorn occurred in several survey plots (IM08 and IM09) as well as in transit between plots. Similar distribution of European Buckthorn was documented at the Point Lands assessment area. In addition, a significant infestation occurred in the vicinity of survey plots PL05, PL06 and PL07. This infestation is identified in Figure 2 as a candidate site for remedial activities.

Controlling the growth of invasive plant species throughout these areas may allow the forest to regenerate naturally over time, saving the need to invest resources in active revegetation and reforestation. By removing the impediment to forest regeneration presented by these invasive species, natural recruitment of native species from adjacent forest areas will occur over time. Establishment of a competitive native plant community well-suited to the site conditions will present a barrier to future weed invasion and help preserve forest health.

Figure 1. A large infestation of Canada thistle identified at the Point Lands assessment area.

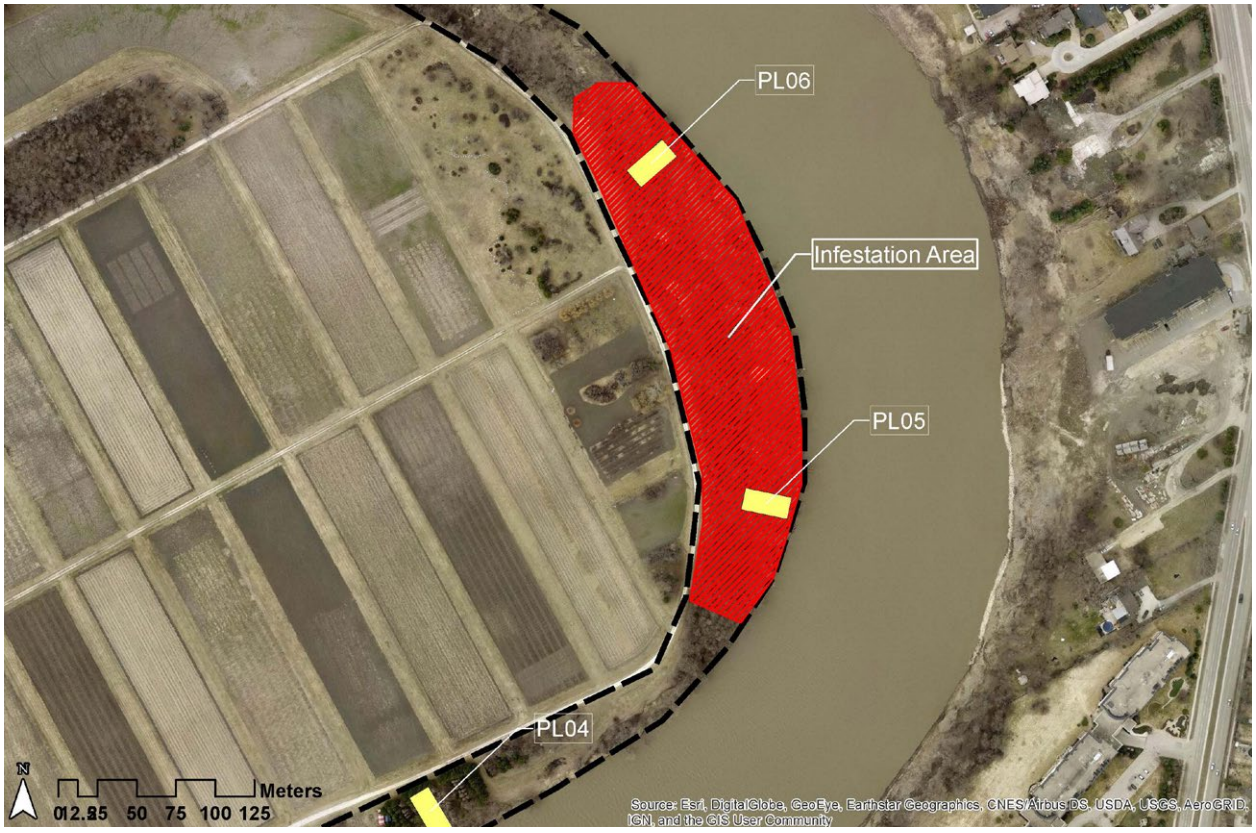


Figure 2. European buckthorn infestation area identified at the Point Lands assessment area.

RECOMMENDATIONS FOR AREAS REQUIRING CORRECTIVE MEASURES

- Take aggressive steps towards the removal of European buckthorn and Canada thistle from all assessment areas, beginning with areas that contain mature, seed producing plants (see Appendix B for operational details on control of these species).
- Anticipate multiple years of routine weed control treatments in order to achieve desired level of weed control.
- Implement weed management strategies for perennial weeds throughout all assessment areas, including areas adjacent to the forest habitat. For example, regular brush cutting of established vegetation will weaken the plants and prevent seed production.
- Actively monitor areas of significant invasive weed establishment and track efficacy of the control activities to help inform future site works.

3.3 Areas Recommended for Habitat Conservation

Determining priority areas for habitat conservation must carefully consider conservation objectives as well as the specific habitat and the species that depend on it. Habitat conservation is a critical element of environmental sustainability and is a vital step in protecting plant and animal species of concern, in sustaining high levels of local biodiversity, as well as in generating ecological goods and services tied to these habitats. In considering the riverbottom forest habitat areas owned and managed by the University of Manitoba, we recognize that prioritization of areas for conservation should be based on:

- Preserving high quality habitat,
- Retaining habitat features that contribute to high local biodiversity, and,
- Preserving rare or unique plant species and species of cultural importance.

With these criteria in mind, we have identified two general areas that we consider a priority for habitat conservation, these are: (1) Glenlea Research Station assessment area (in its entirety) and (2) the Point Lands Terrace Forest Remnant.

GLENLEA RESEARCH STATION – ENTIRE ASSESSMENT AREA

The Glenlea Research Station assessment area represents a 24.9 ha riverbottom forest that remains largely unaltered by development and changes in adjacent land use. The Glenlea assessment area is the largest riverbottom forest owned and managed by the University of Manitoba, almost twice the size of any other assessment area. This assessment area exhibits the least amount of human disturbance, limited largely to the presence of a treatment wetland and machine access paths. Size is an important consideration in habitat conservation and with that in mind, conserving the largest area of riparian forest habitat characterized during the Study presents the opportunity to yield the greatest overall effect.

The Glenlea riverbottom forest contains high levels of plant diversity and a relative few invasive weed species, making an opportune candidate for conservation.

At the interface with the Red River, the Glenlea assessment area is characterized by significant amounts of channel shelf habitat, ranging in width from approximately 20 m to more than 40 m. When this habitat type was observed at the other assessment areas, it was far more limited in size, and tended to be dominated by more non-native plant species as compared to the Glenlea location. This channel shelf zone not only represents important habitat for nesting birds, small mammals and aquatic life, but also contributes to other ecological services such as sediment capture, protection against bank erosion, nutrient capture as well as carbon sequestration.

The Glenlea Research Station site further differs from the three other assessment areas in the relative amount of interior forest habitat present on the forest terrace. In fact, the majority of the assessment area (approximately 2/3) is comprised of mature oak forest that would be exposed to flooding during only the most significant flood events. This forest area was some of the most biologically diverse characterized during the Study and also showed the least amount of non-native plant establishment (both in terms of number of non-native species as well as in terms of the relative cover occupied by non-native species).

This mature forest has a healthy and highly diverse shrub layer that provides high quality forage and nesting habitat for resident wildlife. Numerous native shrub species were observed in the Glenlea assessment area, many being unique to this surveyed assessment area. Arguably more important than what was documented, is what was not. The Glenlea assessment area was the only assessment area surveyed that did not appear to have any incidence of European buckthorn.

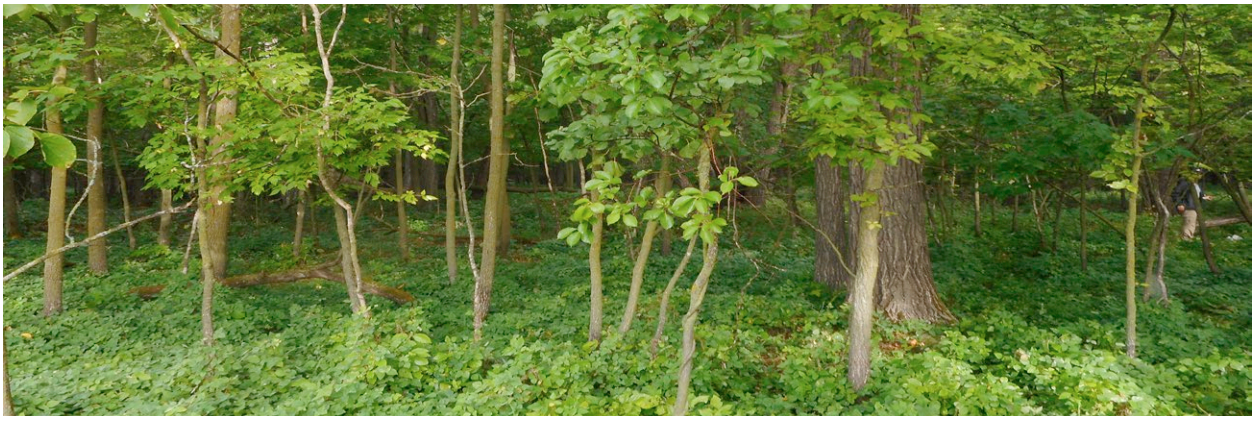
UNIVERSITY OF MANITOBA POINT LANDS – TERRACE FOREST REMNANT

The terrace forest remnant adjacent the Point Lands assessment area is identified in Figure 3. This forested area represents relatively high quality forest and is characterized as a basswood dominant stand with a rich shrub layer composed primarily of chokecherry and upper canopy tree regeneration (maple and basswood being the most common trees in the shrub layer). Black knot was present on many of the chokecherry shrubs but the shrub layer was otherwise in good condition. Minimal non-native vegetation was present, with the exception of one small area where European buckthorn was present.

Establishing this area as a priority for habitat conservation presents the opportunity to maintain a contiguous stand of relatively high quality forest within an assessment area that is characterized by narrow riparian forests and moderate to high levels of non-native plant establishment. Moreover, this portion of the Point Lands assessment area presents a candidate location to expand outwards, connecting this forest stand to the remainder of the Point Lands riparian forest. In doing so, the University could triple the width of the riverbottom forest in this portion of the Point Lands, creating valuable habitat that could sustain greater biological diversity. With that goal in mind, it is worth noting that active revegetation efforts are significantly strengthened when they occur adjacent to high quality reference environments. Revegetation efforts adjacent to undisturbed environments allows for greater natural recruitment of native plant species that are endemic and well suited to the prevailing ecological site conditions. Favourable site conditions created on the fringes of established forest (e.g. shelter, increased soil moisture, etc.) can likewise hasten revegetation and lead to a better result over time.

RECOMMENDATIONS FOR AREAS RECOMMENDED FOR HABITAT CONSERVATION

- Establish recommended habitat conservation areas; inform involved and affected stakeholders of the implications of this classification.
- Develop and implement annual monitoring programs designed to provide early detection and rapid response to the arrival of any invasive plant species.



The Glenlea riverbottom forest contains high levels of plant diversity and a relative few invasive weed species, making an opportune candidate for conservation.

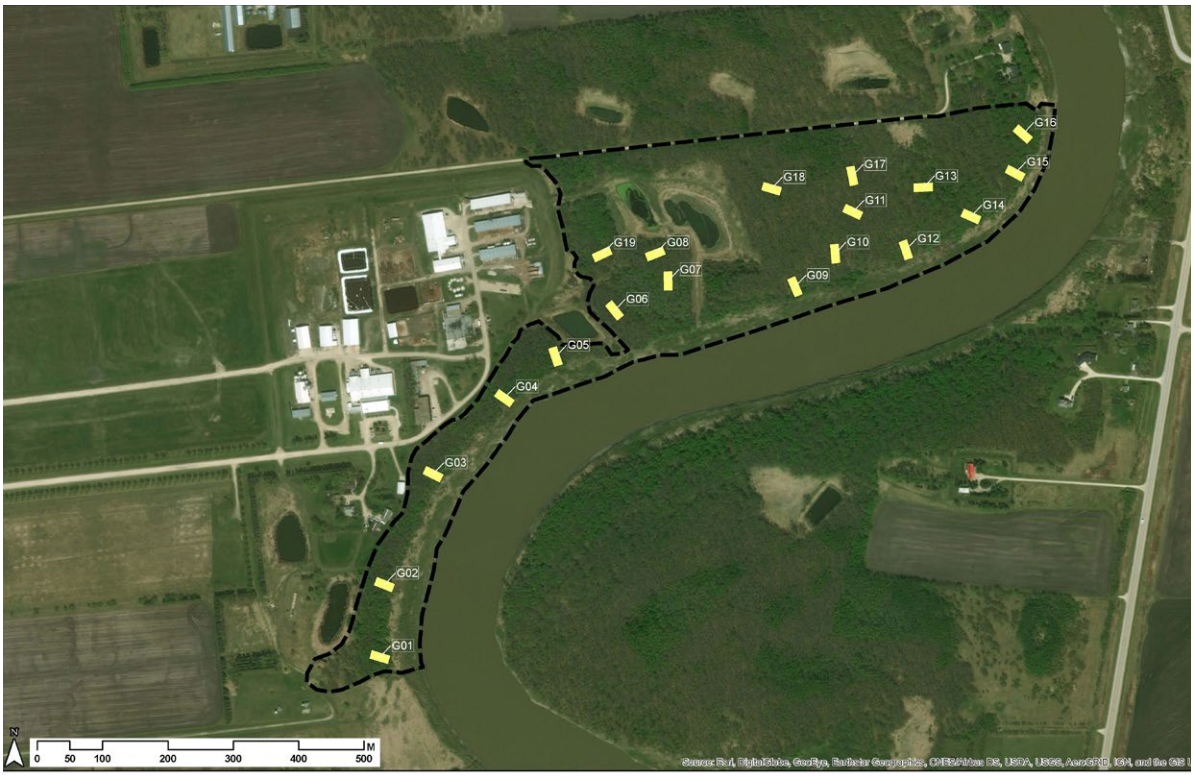


Figure 3. Glenlea Research Station assessment area recommended for conservation.

Figure 4. Terrace forest remnant recommended for conservation at the Point Lands assessment area.

3.4 Areas Recommended for Forest Expansion

Reforestation plantings are recommended for the Point Lands, Southwood Lands and Ian N. Morrison Research Farm sites to improve or enhance existing forest habitat particularly where the forest is narrow or where there are gaps forest coverage. Benefits of reforestation plantings may include;

- Restoring forest continuuity where significant gaps have formed,
- Creating or enhancing the contiguity of interior forest habitat,
- Increasing plant biodiversity and forest productivity,
- Reduction in regular maintenance requirements, long term (i.e. mowing),
- Augment carbon sequestration capacity by converting underutilized land to forest habitat.

There are significant opportunities for forest expansion plantings at the Point Lands and Southwood Lands assessment areas, and to a lesser degree, at the Ian N. Morrison Research Farm. The Glenlea riverbottom forest on the other hand is characterized by contiguous forest habitat in comparably good health. For this reason, resources available for forest planting would be best directed towards the Point Lands, Southwood Lands and Ian N. Morrison Research Farm assessment areas.

Recommended forest planting areas are divided into three areas of priority based on the proximity of forest gaps to the riverbank. These priority ares are depicted in Figure 5 using the combned Point Lands and South Wood Lands assessment areas as examples. These priority planting areas described as follows;

PRIORITY 1: FOREST GAPS WITHIN 20 METERS OF THE RIVER BANK

Priority 1 plantings should be undertaken where the riverbottom forest is less than 20m in width, or where there are significant gaps in the forest canopy within 20m of the river. Closing in the forest canopy and establishing a minimum forest width of 20m will restore habitat connectivity. Perennial vegetation will also contribute to bank stability.

Approximately 1.2 hectares of Priority 1 sites have been identified at the Point Lands and South Wood Lands combined. At the Ian Morrison Research Farm, approximately 0.10 hectares of Priority 1 planting area has been identified.

PRIORITY 2: FOREST GAPS 20 - 40 METERS METERS OF THE RIVER BANK

Priority 2 plantings should be undertaken, where possible, to expand the riverbottom forest width to a minimum of 40m. According to Ranney et al (1981), any linear habitat patches with a width of less than 30m will be dominated by edge conditions and present no effective interior habitat. In order to create interior forest habitat, and support increased local biodiversity, a minimum width of 40m is recommended (Moffat, 2002). Approximately 1.3 hectares of Priority 2 planting area has been identified at the South Wood Lands and Pointe Lands combined. At the Ian Morrison Research Farm, approximately 0.90 hectares of suggested Priority 2 planting area has been identified.

PRIORITY 3: REFORESTATION OF UNDER-UTILIZED SITES >40METERS FROM THE RIVERBANK

Priority 3 plantings are recommended to be undertaken in strategic locations to connect forest patches and convert under-utilized lands back into forest. Forest expansion plantings in these areas will substantially increase overall forest habitat and help bolster valuable interior forest habitat. Connecting isolated forest patches will also serve to decrease the total amount of forest edge and add continuity to forest cover. Suggested sites for Priority 3 planting areas in the Pointe Lands and South Wood Lands are shown in Figure 5. A similar approach is recommended for the Ian Morrison study area.

Figure 5. Example of forest expansion planting opportunities and priority zones at the Point Lands and South Wood Lands assessment areas. A similar approach is recommended for the Ian Morrison Research Farm near Carman Manitoba..

Opportunities for expansion of forest habitat into adjacent under-utilized areas at the Point Lands assessment area (above and below).

Roughly 9.6 hectares of Priority 3 plantings have been identified at South Wood Lands and Point Lands Combined. The suggested Prioity 3 planting sites depicted in Figure 5 should not be regarded as being exhaustive. At the Ian Morrision site, roughly 0.30 hectares of Priority 3 planting area has been identified.

Priority 3 planting areas should be strategic and efficient. For example, reinforcement tree planting into an area that is already partially treed in order to reconnect two adjacent forested areas is an efficient appraoch to plating (Figure 6). This corridor can potentially be widened in future planting phases.

Some areas suggested for Priority 3 plantings are currently maintained in a bare ground or fallow condition (Figure 6). In this case an appropriate native ground cover should be integrated into tree planting plans as a measure to restrict the establishment of noxious weeds which would otherwise interfere with tree planting establishment and productive growth.

The Office of Sustainability will need to work with managers in other departments of the University to explore the opportunities suggested here, and potentially identify new opportunites for forest expansion. The forest expansion opportunities described are intended to provide general direction in future management of the natural areas of the University. Reforestation within these areas will require an upfront capital investment, in addition to some alteration in terms of regular landscape maintenance practiced by the University. Over time, investments made in forest expansion will return value in the form of increased and enhanced ecological goods and services as well as in terms of decreased landscape maintenance requirements for areas converted from turf to forest. By investing resources wisely, and by taking advantage of existing in-house resources available at the University, these landscape changes are realistic and achievable.

FORT GARRY CAMPUS - POINT LANDS

In total, approximately 9.5 ha have been identified as candidate locations for forest reinforcement and expansion plantings in and around the Point Lands assessment area. This area estimate includes gaps in the existing forest, thinly forested areas, as well as open lawns (Figure 6). Undertaking forest plantings in these areas can to build on existing forest and re-establish connectivity between remnant forest stands. For example, the narrow riverbank forest can be re-connected to an existing terrace forest remnant (Figure 4) by undertaking approximately 2.28 ha of forest planting. Reconnecting these two forested areas creates a large, contiguous forest that can better resist weed invasion and provide valuable habitat to resident wildlife. It should be noted that some of the areas recommended for forest expansion are being used to store materials and equipment. In order to initiate forest expansion into these areas, the University will need to relocate this equipment and explore alternative locations for storage.

Opportunities for expansion of forest habitat into adjacent under-utilized areas at the Ian N. Morrison assessment area.

FORT GARRY CAMPUS - SOUTHWOOD LANDS

Similarly, at the Southwood Lands assessment area, woody plantings can take advantage of existing sparse tree cover to expand the forest and improve habitat quality. Forest plantings in the Southwood Lands assessment area should consider that this site is characterized by significant weed establishment, with some areas being densely colonized by Canada thistle (see Field Report for further detail). Heavy weed presence can present a problem for future regeneration of desirable riverbottom forest species and can undermine any active revegetation efforts. Forest planting approaches for this assessment area must focus on controlling weed establishment and growth in addition to establishing desirable overstory species that can effectively compete with weedy herbaceous vegetation. To that end, forest planting approaches may make use of caliper-sized plant material where competition from weeds is anticipated as opposed to bare root or small container specimens. Approximately 1.7 hectares have been identified for forest expansion plantings at the Southwood Lands assessment area (Refer to Figure 5).

Figure 6. An example of forest expansion opportunities at the Point Lands assessment area where forest connectivity can be re-established.

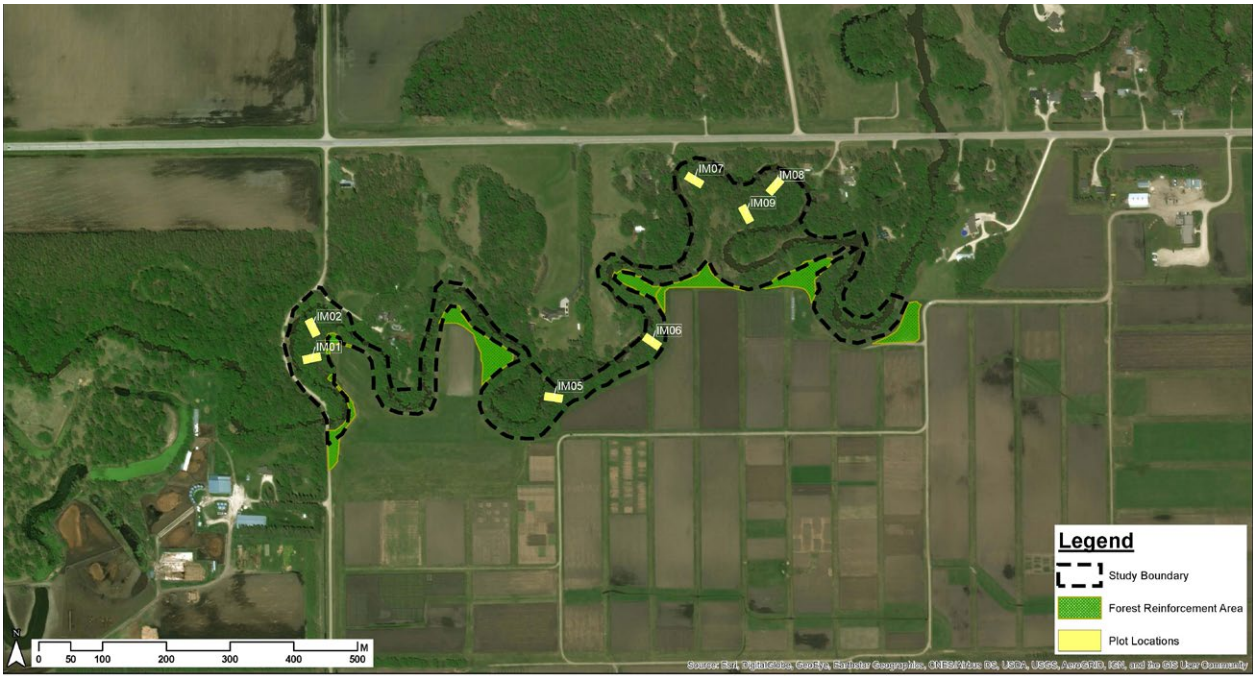


Figure 7. Approximately 1.4 hectares of recommended forest expansion areas at the Ian N. Morrison assessment area. .

IAN N. MORRISON RESEARCH FARM

Approximately 1.5 ha have been identified for forest expansion at the Ian N. Morrison Research Farm assessment area (Figure 7). A more detailed breakdown of this area is provided in the Geo-database. Expansion of forest cover into these areas may be accomplished through active planting of rooted plant material, or passively, by creating and maintaining favorable conditions for the natural regeneration of forest vegetation. In order to encourage natural forest regeneration, weed control as well as periodic maintenance to alleviate competition with grassy groundcovers is necessary. A passive approach to forest expansion does not require the same level of upfront capital investment as active planting approaches, but forest development is markedly slower. In some cases, a combination of passive regeneration and active planting can yield favorable results. It should be noted that some of the areas recommended for forest expansion are being used to store equipment. In order to initiate forest expansion into these areas, the Research Farm will need to relocate this equipment and explore alternative locations for storage.

Species of trees, shrubs, grasses and forbs recommended for use in forest expansion plantings are presented in Appendix C. These lists are not considered exhaustive and specific species selection should be done by experienced ecologists or revegetation specialists as part of the detailed design of forest expansion plantings.

RECOMMENDATIONS FOR FOREST EXPANSION AREAS

- Undertake strategic reinforcement of existing forests in the Point Lands, Southwood Lands and Ian N. Morrison Research Farm to create contiguity of forest habitat,
- Undertake strategic native groundcover plantings where feasible, to increase local biodiversity and create better conditions for planted tree and shrub productivity,
- Plant a diversity of native trees and shrubs that are not considered to be at significant risk of diseases or pests.

4.0 PRIORITIZATION AND PHASING

The ability of the University to implement the recommendations made within this report will depend on the availability and efficient use of resources dedicated to the work. Therefore, prioritization and phasing of the landscape management recommendations must seek to maximize the benefit of these efforts while conserving resources dedicated to the work. In considering the recommendations made, the main criteria used in assessing where efforts should be directed was the need for action to protect existing biological resources. Priority steps recommended for the University of Manitoba to help protect the ecological integrity of the riparian forest resources investigated in this study fall broadly into the following broad categories;

(1) Establishment of forest habitat conservation areas
(2) Remediation of degraded forest habitat through control of invasive weeds
(3) Expansion of forest habitat through forest plantings
(4) Develop and implement an on-going monitoring and maintenance program

Each assessment area differed in terms of the tasks required to conserve and enhance forest health therefore prioritization of recommendations have been provided for each of the assessment areas.

GLENLEA RESEARCH STATION ASSESSMENT AREA

The riverbottom forest at the Glenlea Research Station assessment area was characterized by the greatest plant species diversity, the lowest incidence of non-native species, and the largest amount of contiguous forest habitat. In fact, this was the only assessment area where European buckthorn was not documented by the survey. Based on the perceived high quality of this forest habitat relative to the remaining forests surveyed in the Study, this area was recommended for conservation.

By establishing this forest as a conservation area, the University acknowledges the value of this habitat and must take steps towards assuring the long term stability and health of the forest. To this end, the main action recommended for the Glenlea assessment area is to develop and implement a site specific annual monitoring and maintenance plan. This monitoring and maintenance plan should identify:

- Realistic and achievable management goals and objectives,
- specific tasks and timelines related to the target objectives,
- Potential risks or challenges associated with these objectives and,
- Implications relating to major campus planning policies and guidance documents.

The monitoring and maintenance plan should serve as a living document that is updated as conditions change and new information becomes available. Sufficient resources should be dedicated to the Glenlea assessment area to allow for annual forest health monitoring and ongoing weed control, as needed to control invasive species.

SOUTHWOOD LANDS AND POINT LANDS ASSESSMENT AREAS

The Southwood Lands and Point Lands assessment areas are situated on the University of Manitoba Fort Garry Campus and are major natural landscapes that provide riparian forest habitat as well as opportunities for education and engagement with the university population. These assessment areas were characterized by relatively high amounts of invasive weeds, most notably European buckthorn and Canada thistle. While these forests were typically narrow, rarely exceeding 50m in width, underutilized adjacent lands present favorable opportunities for forest expansion and conservation.

Recommended tasks for the Southwood Lands and Point Lands span each of the four main categories identified above. That being said, the most pressing need for these forests is aggressive remediation of the areas that are infested with European buckthorn and Canada thistle. The full extent of these species within the forests should be further documented and an integrated management approach should be developed for their control. This integrated management plan should describe the areas requiring remediation, short and long term objectives, treatment methods, as well as monitoring and adaptive management approaches. Controlling these invasive weed populations will favor the passive re-establishment of native plant populations present within the existing seedbank. If healthy forest regeneration is not observed in these areas following weed control, some active forest planting may be necessary.

The portion of the Point Lands forest that was identified as a candidate for conservation should be preserved through development and implementation of an annual monitoring and maintenance program. Forest plantings throughout adjacent underutilised areas can radiate outwards from this conservation area. Under this approach, the total area dedicated to an individual forest expansion planting is flexible and can be determined based on the availability of resources in a given planting season. Forest expansion plantings should always extend outward from the existing forest fringes, seeking to connect the forest habitat and close in gaps in the forest canopy. Numerous discrete areas of variable size are identified throughout the Southwood Lands and Point Lands assessment areas for forest expansion; specific area estimates can be accessed within the Study geo-database.

Independent of the other recommendations made for these assessment areas, the University should develop and initiate an annual monitoring and maintenance program for the Southwood Lands and Point Lands assessment areas as soon as possible. This plan will be specific to the assessment areas and should identify:

- Realistic and achievable management goals and objectives,
- Specific tasks and timelines related to the target objectives,
- Potential risks or challenges associated with these objectives and,
- Implications relating to major campus planning policies and guidance documents.

Again, the monitoring and maintenance plan should serve as a living document that is updated as conditions change and new information becomes available. Sufficient resources must be dedicated to these assessment areas to allow for annual forest health monitoring and ongoing weed control, as needed to control invasive species.

IAN N. MORRISON RESEARCH FARM ASSESSMENT AREA

Similarly to the Southwood and Point Lands assessment areas, the priority tasks recommended for the Ian N. Morrison assessment area include remediation of existing invasive weed issues, forest expansion, as well as ongoing annual monitoring and maintenance.

The main invasive weed documented at this site during the field investigation was European buckthorn, occurring sporadically throughout the forest and more densely in one infested area. Addressing European buckthorn early in establishment requires significantly less effort than once large infestations exist. That being the case, initiating remedial work targeting buckthorn is recommended as the top priority for this assessment area.

As described in Section 3.0, forest expansion at the Ian N. Morrison assessment area may be achievable through passive and active reforestation approaches. Passive forest expansion requires very little overall investment and should therefore be phased into site operations as soon as possible. Based on the outcomes of passive forest expansion at this site, active forest planting may be necessary to expand the forested area into adjacent underutilized areas. Several growing seasons of passive forest expansion should precede moving forward with active forest expansion plantings.

As outlined for all other assessment areas, independent of other recommended site activities, the University should develop and initiate an annual monitoring and maintenance program for the Ian N. Morrison Research Farm forests. This plan will be specific to the assessment areas and should identify:

- A reduction in forest edge decreases susceptibility to weed invasion,
- Realistic and achievable management goals and objectives, specific tasks and timelines related to the target objectives,
- Potential risks or challenges associated with these objectives and,
- Implications relating to major campus planning policies and guidance documents.

5.0 ENVIRONMENTAL PROTECTION MEASURES

Construction projects and other land disturbances in or adjacent to, the riparian forests described in the Study have the potential to disrupt forest vegetation and soils directly, and indirectly. Potential effects of construction and land disturbance on these forest components are outlined below with beneficial management practices provided to help mitigate these effects.

5.1 Vegetation

1. Removal of native vegetation in the assessment area due to clearing, disease or mortality.

- Limit clearing, wherever possible, to minimal area required for safe and efficient construction and operation,
- Consider developing a plan for dealing with increased tree removal that may be necessary if the emerald ash borer (EAB) arrives in southern Manitoba
- Liaise with City of Winnipeg Urban Forestry Branch and Manitoba Sustainable Development Forestry Branch to take advantage of any additional resources dedicated to forest pest issues, specifically EAB.

2. Damage to adjacent trees and tree root structure during construction

- Protect trees from injury, wherever possible,
- Set-up durable fencing around protected tree specimens as far out from the trunk as possible. At a minimum, the fence should be situated 0.3m from the trunk for each 2.5 cm of trunk diameter (Matheny and Clark, 1998),
- Do not pile soils up against root-flare of protected specimens.

3. Removal of plant species of conservation concern due to clearing

- A reduction in forest edge decreases susceptibility to weed invasion,
- Determine the location and extent of occurrences of plant species of conservation concern to the greatest degree feasible,
- Explore construction options to avoid locations where these species occur,
- Investigate species specific strategies to re-locate established plant specimens.

4. Removal of plant species of cultural importance due to clearing

- A reduction in forest edge decreases susceptibility to weed invasion,
- Determine the location and extent of plant species of cultural importance to the greatest degree feasible,
- Explore construction options that avoid locations where these species occur in abundance,
- Investigate species specific strategies to establish culturally important plants in the assessment areas as part of revegetation works.

5. Establishment of exotic and invasive weed species in the assessment area

- A reduction in forest edge decreases susceptibility to weed invasion,
- Manage weed establishment throughout construction with a site specific integrated weed management strategy,
- Revegetate disturbed areas with site appropriate native plant species as soon as possible,
- Limit weed seed brought to the site by cleaning construction equipment before it reaches site and through quality control during seed sourcing,
- Employ well designed planting mixes that are optimized for maximum resistance to weed encroachment,
- Phase-in revegetation efforts to minimize exposure of graded soils to weeds,
- Ensure that revegetation extends all the way to the undisturbed adjacent habitat.

5.2 Soils

1. Degradation and loss of topsoil/organic resources

- Preserve and stockpile topsoil/organic resources wherever possible and deploy during revegetation efforts,
- Evaluate soil erosion potential based on slope, soil, and climate related factors,
- Employ proven erosion and sediment control methods and materials,
- Monitor erosion potential throughout construction,
- Prioritize revegetation efforts on erosion prone sites and establish long-lived/sustainable perennial vegetation as soon as feasible.

2. Soil compaction

- Clear construction zone in winter with equipment that minimizes soil compaction,
- Avoid equipment operation on clay soils during wet conditions,
- Fracture and loosen soils prior to revegetation to allow for unrestricted root growth,
- Work outside of tree protection buffers.

3. Impact to soils through chemical release

- Designated fuelling areas should be lined with impermeable membranes and controlled fuel storage with secondary containment measures in place,
- Spill control and emergency spill response kits should be equipped and accessible at all designated construction sites,
- Emergency spill response plans should be in place with spill containment/clean-up procedures at construction site,
- Develop an integrated weed management strategy in advance of revegetation efforts to limit the requirement for herbicide,
- Herbicide applications should be conducted by a licensed applicator following established best practices.

6.0 REFERENCES

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APPENDIX A **RELEVANT FOREST DISEASES AND PESTS**

DUTCH ELM DISEASE

Dutch elm disease is a fungal disease prevalent throughout southern Manitoba, including all of the assessment areas characterized in the Study. This disease affects many species of the Ulmus genus, including the native American elm (*Ulmus americana*). Certain elm species and varieties, including Siberian elm (*Ulmus pumila*) and Discovery elm (*Ulmus davidiana* var. *japonica*), show resistance to the disease and are commonly planted where a comparable planting option to American elm is desired.

Dutch elm disease is primarily spread by the native elm bark beetle. This beetle feeds on elm branches in the spring and breeds under the bark of stressed elm wood, firewood, or under fresh pruning cuts. For this reason, in Manitoba it is illegal to prune elm trees between April 1st and July 31st. If beetles emerge from a DED infected tree they can readily transfer the disease, via fungal spores, to new elm trees. This disease negatively affects health by disrupting water movement through the tree, over time leading to death. Symptoms of DED include the inward leaf curl of green leaves followed by the leaves turning a yellow colour then yellow-brown colour. The leaves will eventually turn completely brown and in some cases, may cling to the branches into the winter.

EMERALD ASH BORER

The emerald ash borer (EAB) (*Agrilus planipennis*) is an exotic beetle that inflicts rapid and devastating damage to ash trees (species of the Fraxinus genus). Introduced inadvertently to North America from its origin in Asia, this beetle was first identified in Southern Michigan in 2002. Since that time, EAB has spread to 31 states in the USA as well as the provinces of Ontario and Quebec in Canada (EABIN, 2017) causing widespread damage. As of November 30, 2017 the City of Winnipeg and the Canadian food Inspection Agency have confirmed the presence of EAB beetle in Winnipeg**.** The habitat characteristics and climate of southern Manitoba are considered suitable to the EAB. It is therefore anticipated that the EAB will spread throughout Southern Manitoba causing significant damage to forests in which ash trees are a significant component of plant community structure.

Adult EAB feed on ash foliage but inflict minimal damage to the tree as a result, rather it is the larval stage of the beetle that inflicts the greatest damage to ash trees. EAB larvae are laid under the bark of ash trees, and as they emerge they feed on the vascular tissue of the tree, cutting off its nutrient and water supply and ultimately killing the host tree. This invasive pest is responsible for killing hundreds of millions of ash trees in North America and currently there is no viable solution to stemming its destruction (EABIN, 2017). When the EAB reaches Southern Manitoba, populations of all ash species will be under immediate and significant threat. The anticipated loss of large numbers of ash trees will lead to a dramatic shift in the composition our urban and riverbottom forests, including those assessed in the current study.

BLACK KNOT

Black knot is a symptom of a common fungal disease that infects trees and shrubs of the Prunus genus and was found sporadically throughout all study sites. This disease is caused by the plant pathogen *Dibtryon morbosum*, and it is widespread throughout Canada. The disease is characterized by rough, black growths that develop and eventually kill diseased portions of the plant.

In Manitoba, black knot is commonly observed on chokecherry trees and shrubs as well as on mayday (*Prunus padus*) trees. Rapid response through timely pruning is main method of control but diligence is required to stay on top of the infection as it spreads rapidly. If left untreated, the disease will continue to grow and the tree will become highly stressed and disfigured, ultimately resulting in early mortality. Relatively high levels of black knot were noted in the Point Lands and Ian N. Morrison assessment areas where chokecherry (*Prunus virginiana*) was a main component of the understory.

Black knot fungus was commonly found on chokecherry shrubs at all assessment areas.

APPENDIX B RECOMMENDED MANAGEMENT STRATEGIES FOR NOXIOUS WEEDS

Weed control is a critical and ever expanding aspect of responsible land management and stewardship. At the scale of the University of Manitoba, this represents a significant allocation of resources, both in terms of time and money. This also represents an excellent opportunity for improving efficiencies by allocating the right resources at the right time to maximize the effect of treatments on the target weed species. The following appendix outlines approaches to controlling the primary invasive weeds documented during the Study.

Canada thistle infestation that has been allowed to produce viable seed.

CANADA THISTLE (*CIRSIUM ARVENSE*)

Canada thistle is a persistent perennial weed that aggressively reproduces through spreading rhizomes as well as through highly mobile seed. Viable seeds are formed 8-10 days after flower emergence and are dispersed primarily by wind; seeds typically survive 3-6 years in the seed bank but have been found to persist up to 20 years. New plants can be produced from root pieces as small as 1/8" (3mm) thick and 3/8" (8mm) long.

CONTROL:

Canada thistle control can be achieved by employing a multi-faceted weed management strategy that employs mechanical, chemical and ecological methods of control.

- Season-long mowing of plants to prevent seed production and weaken root reserves.

Well-timed mowing operations are an effective means of weakening thistle root reserves and preventing plants from setting viable seed. During the early summer (late June-early July) Canada thistle plants should be mowed low to the ground using brush cutters before the plants form a flower bud. The interruption of growth sets the plants back and disrupts flower production. The first mow should be followed by a second mowing operation in early to mid-August that will further disrupt any plants that try to flower during the growing season. As the plants recuperate from the mow they will produce rosette growth forms (cluster of leaves) instead of trying to again produce flowers, due to the limited day light hours remaining during the season.

Canada thistle plant forming a rosette.

> Administer a properly timed herbicide application in late fall.

The thistle rosette growth form is an indication that the plants are preparing to over winter and at this point, an appropriate herbicide application will have the highest efficacy (if applicable).

> Establish overstory competition.

In addition to mechanical and chemical controls, planting large caliper tree specimens will further assist in limiting the thistle infestation by providing competition to the weeds. Planted tree specimens can be protected from competing thistles by mowing and mulching around the base of each specimen. As the planted specimens form a canopy, thistle will be under competition for light, nutrients and water and the stand will be weakened as a result. Thistles are best suited to fully lit conditions and as the canopy grows, the thistle stand will begin to dissipate.

> Establish a competitive groundcover.

Annual cover crops pose an inexpensive option to establish groundcover competition to a thistle infestation. The annual sowing of a tame species like common oats will compete with thistles for space, light and nutrients and as the thistle infestation decreases, a perennial native grass cover can be planted. Native grass seed mixes can be designed to accommodate future tree growth while occupying the groundcover and preventing further infestations.

EUROPEAN BUCKTHORN (*RHAMNUS CATHARTICA*)

European buckthorn is included in the schedule of noxious weeds under the Manitoba Noxious Weeds Act. It is a long-lived, woody noxious weed that can attain the height of a small canopy tree. Buckthorn is native to Eurasia and is found in eastern North America hardwood forests.

Buckthorn possesses numerous characteristics that give it a significant competitive edge over native forest vegetation. It is highly shade tolerant, initiates growth early in the year before most other native tree and shrub species and continues metabolizing and storing energy later into the year. Buckthorn grows at a high rate and produces relatively large quantities of fruit which forms a massive seedbank that can remain viable in the soil for up to 6 years. Buckthorn alters the nutrient dynamic in forests owing to its high growth rate and relatively high nitrogen requirements.

Its ability to withstand shade enables it to persist and grow through the lower canopy eventually shading out other native vegetation including forbs, shrubs and regenerating trees. Buckthorn may reduce native plant regeneration by 90%. The result is that European buckthorn can come to completely dominate the mid canopy levels in the forest and replace most species, including native canopy trees. The capacity for European buckthorn to out-compete and replace native species results in a lack of diversity which in turn results in degraded eco-system functioning. Buckthorn is also a significant risk to rural agricultural lands. Buckthorn is an alternate host to oat crown rust (*Puccinia coronata*), a pathogen affecting oat seed yield and quality, and a host for the soybean aphid (*Aphis glycines*).

European buckthorn sapling.

CONTROL:

The biology of European Buckthorn, its ecological implications and several techniques used to remove this invasive shrub are detailed at length in, 'European Buckthorn Best Management Practices – a manual for managers and stewards of natural areas (Nature Manitoba, 2014). This document was written and edited as a collaborative effort between the City of Winnipeg and Nature Manitoba. The following briefly describes a strategy for removing this shrub where a significant infestation has occurred and the process of removing this weed is likely to require several years.

European buckthorn tree producing berries.

> Target the seed producers first.

Buckthorn is a dioeceous species, meaning that the male flowers and female flowers occur on different plants. Only female plants, plants that have ovary-bearing flowers, produce fruit. Buckthorn is a highly prolific seed producer and the seeds exhibit good viability. This means that a significant proportion of the seed can produce a seedling that can reach maturity. The seeds will remain viable for up to 6 years in the seed bank. Where resources are limited, it is therefore critical that the female fruit-bearing specimens be targeted first to stop the production of viable seed. Buckthorn does not produce rigorous underground lateral root and sucker. Therefore cutting off seed production is a very effective control method.

> Try to undertake management activities when the plant is most visible.

Buckthorn breaks dormancy and 'flushes-out' early in the spring and holds onto its leaves and seeds well into late fall. Undertaking management when the plant stands out in the forest and is easy to find enables greater removal efficiency.

> Protect significant patches of desirable species.

Depending on the site, desirable vegetation will begin regenerating; sometimes fairly quickly. Pull buckthorn (or any invasive weed) away from desirable vegetation. This helps ensure that those desirable species area able to persevere and continue to contribute to biological diversity and may be able to spread back into areas previously occupied by buckthorn. This strategy helps to passively revegetate areas previously occupied by heavy buckthorn encroachment. Revegetation after buckthorn removal is a key aspect of restorative work because ground that is left unoccupied is likely to become re-occupied by weeds.

> Use tools that remove the entire plant.

Mowing does not kill buckthorn. Mowing will instead leave a series of short stems low to the ground which regenerate new growth from the crown and are very difficult to grip with tools that are designed specifically to lift buckthorn roots out of the ground. The main root ball must be removed to destroy the plant. Tools used for removing buckthorn are described in the practitioner's manual referred to above. A skid steer or small excavator may be required to remove large specimens.

Target low shrubs and new seedlings simultaneously.
Once larger specimens have been removed and lighter equipment such as shovels can be used comfortably, start targeting smaller shrubs as well as seedlings regenerating from the seed bank. Removal of roots is critical to ensuring that the buckthorn plant will not regenerate from the crown. In moist conditions not long after a rain, many small to medium sized plants can be removed by hand. In most cases however, a light but sturdy shovel makes the work easier and more effective. Seedlings have very shallow roots and are generally easier to remove with work gloves in damp soil conditions.

> Be prepared to monitor the site regularly and undertake further seedling removal work.

Older buckthorn infestations will have produced a significant seed bank. Expect significant activation of the seed bank in the years even where all or most mature buckthorn plants have been removed. Plan to monitor and revisit previously managed sites periodically for several years.

LEAFY SPURGE (*EUPHORBIA ESULA*)

Leafy spurge is a persistent perennial weed and one of the most difficult noxious weeds to control. Leafy spurge plants have well developed storage systems in their roots making them extremely tolerant to weed control treatments such as tilling, mowing and herbicide. Infestations in an area should be documented and monitored throughout treatments to ensure that they are not able to gain a foothold. While effective control can be achieved by targeting plants at a young age, if established plants are left uncontrolled, leafy spurge can be extremely tough to eradicate from an area.

Leafy spurge plant in flower.

CONTROL:

- Dig plants out of the ground where possible and carefully remove all root pieces.
- Repeatedly mow plants throughout growing season.

As part of a season-long mowing strategy, mow leafy spurge low to the ground at numerous periods during the growing season to limit growth and weaken plants making them more susceptible to environmental stresses and competition.

- Apply herbicide using products registered for control of leafy spurge.

This method of control requires a persistent approach to ensure leafy spurge is not able to regenerate following applications. Currently three herbicides are registered for leafy spurge control in Manitoba they are; Amitrol-T, 2,4-D amine and Banvel II. These herbicides are effective (to varying degrees) in controlling leafy spurge but will likely need to be applied as part of a multi-year control effort.

COMMON BURDOCK (*ARCTIUM MINUS*)

Common burdock is an exotic, biennial weed that grows on moist and fertile soils along roadsides, ditches, pastures, disturbed sites, riparian corridors and edge habitats. Common burdock plants can reach 2 metres in height and reproduce by seed production.

CONTROL:

- Mow plants to prevent seed production

Mowing is an effective long-term control method for common burdock due to the plants biennial life cycle. In the first year of growth, common burdock develops a rosette growth form before going dormant in the fall. In year two, the plant sends up a branching flowering stalk which produces seed before the host plant eventually dies in the fall. Mowing operations can prevent seed production eventually killing host plants while flushing new seed that may be in the seed bank. If mowing operations are continued the seed bank will become depleted allowing other groundcover to occupy its place.

- Properly timed herbicide application

Several herbicide formulations are registered for common burdock control. Group 4 herbicides have high efficacy in controlling this weed. Herbicides achieve the highest efficacy when applied pre-flower or in the fall when 1st year plants are going dormant.

APPENDIX C PLANT SPECIES RECOMMENDED FOR FOREST EXPANSION AND NATURALIZED PLANTINGS

With the pending threat of an Emerald Ash Borer outbreak in southern Manitoba in addition to the further spread of DED, it is well-advised for university land managers to begin diversifying tree plantings adjacent the riparian forests where green ash is a major canopy component. Including species like Eastern cottonwood and basswood in future planting plans serves a two-fold purpose to help mitigate effects of EAB;

(1) These species are well-suited to the riparian soils and,
(2) These species have highly mobile seed that can invade areas where forest canopy die-back may occur.

Establishing these species adjacent the forested area will provide the plants with full light conditions, promoting rapid growth and hastening seed production. When canopies in the riparian zone begin to dieback these species will be present and ready to infiltrate the forests and establish in areas where light conditions allow for their establishment.

Lists of recommended tree, shrub and groundcover species for forest expansion and naturalized plantings at the University of Manitoba are provided as Tables 1- 4.

The species recommended for use in forest expansion and naturalized plantings are characteristic of the natural regional landscape and many have traditional indigenous use and importance. Incorporating species such as these into landscape design projects supports major University planning documents and strategies and is keeping with the University's Indigenous Planning and Design Principles. Whenever undertaking forest expansion or naturalization plantings, design and planting approaches should be provided by professionals with specialized knowledge and a thorough understanding of the methods and processes necessary to effectively implement native revegetation work.

TABLE 1. TREE SPECIES SUITABLE FOR FOREST EXPANSION AND NATURALIZED AREA PLANTINGS

Common Name	**Scientific name**
Manitoba maple	*Acer negundo*
silver maple	*Acer saccharinum*
amur maple	*Acer ginnala*
white birch	*Betula papyrifera*
hackberry	*Celtis occidentalis* 'Delta'
tamarack	*Larix sibirica*
white spruce	*Picea glauca*
Swiss stone pine	*Pinus cembra*
scots pine	*Pinus sylvestris*
balsam poplar	*Populus balsamifera*
eastern cottonwood	*Populus deltoides*
large-toothed aspen	*Populus grandidentata*
trembling aspen	*Populus tremuloides*
bur oak	*Quercus macrocarpa*
peach-leaved willow	*Salix amygdaloides*
basswood	*Tilia americana*
American elm*	*Ulmus americana*
discovery elm	*Ulmus davidiana* var. *Japonica* 'Discovery'
Siberian elm	*Ulmus pumila*
nannyberry	*Viburnum lentago*

** Plant in reduced numbers, select only species or varieties with known resistance*

TABLE 2. SHRUB SPECIES SUITABLE FOR FOREST EXPANSION AND NATURALIZED AREA PLANTINGS.

Common Name	**Scientific Name**
green alder	*Alnus crispa*
speckled alder	*Alnus rugosa*
saskatoon	*Amelanchier alnifolia*
lead plant	*Amorpha canescens*
false indigo	*Amorpha fruticosa*
fragrant false indigo	*Amorpha nana*
river birch	*Betula occidentalis*
red-osier dogwood	*Cornus sericea*
American hazelnut	*Corylus americana*
beaked hazelnut	*Corylus cornuta*
round-leaved hawthorn	*Crataegus chrysocarpa*
bush honeysuckle	*Diervilla lonicera*
twining honeysuckle	*Lonicera dioica* var. *glaucescens*
shrubby cinquefoil	*Potentilla fruticosa*
American plum	*Prunus americana*
Canada plum	*Prunus nigra*
wild black currant	*Ribes americanum*
wild red currant	*Ribes triste*
prickly rose	*Rosa acicularis*
smooth rose	*Rosa blanda*
woods' rose	*Rosa woodsii*
beaked willow	*Salix bebbiana*
pussy willow	*Salix discolor*
downy arrowwood	*Viburnum rafinesqueanum*
high bush cranberry	*Viburnum trilobum*

TABLE 3. GRASS SPECIES SUITABLE FOR FOREST EXPANSION AND NATURALIZED AREA PLANTINGS.

Common Name	**Scientific Name**
big bluestem	*Andropogon gerardii*
rough hairgrass	*Agrostis scabra*
slough grass	*Beckmannia schyzigachne*
blue grama	*Bouteloua gracilis*
fringed brome	*Bromus ciliatum*
nodding brome	*Bromus porteri*
Canada wild rye	*Elymus canadensis*
northern wheatgrass	*Elymus lanceolatus* ssp. *lanceolatus*
awned wheatgrass	*Elymus trachycaulus* var. *subsecundum*
slender wheatgrass	*Elymus trachycaulus* var. *trachycaulus*
Virginia wild rye	*Elymus virginicus*
green needle grass	*Nassella viridula*
western wheatgrass	*Pascopyron smithii*
fowl blue grass	*Poa palustris*
Nuttall's alkali grass	*Puccinellia nuttalliana*
little bluestem	*Schizachyrium scoparium*
Prairie cord grass	*Spartina pectinata*

Note: These species are recommended to be seeded into prepared sites using appropriate seeding methods.

TABLE 4. FORB SPECIES SUITABLE FOR FOREST EXPANSION AND NATURALIZED AREA PLANTINGS.

Common Name	Scientific Name
common yarrow	*Achillea millefolium*
giant blue hyssop	*Agastache foeniculum*
Canada anemone	*Anemone canadensis*
indian-hemp	*Apocynum cannabinum*
wild sarsaparilla	*Aralia nudicaulis*
prairie sagewort	*Artemisia frigida*
swamp milkweed	*Asclepias incarnata*
dwarf milkweed	*Asclepias ovalifolia*
showy milkweed	*Asclepias speciosa*
Lindley's aster	*Aster ciliolatus*
heath aster	*Aster ericoides*
smooth aster	*Aster laevis*
New England aster	*Aster novae-angliae*
white upland aster	*Aster ptarmicoides*
small blue aster	*Aster simplex*
hornwort	*Ceratophyllum demersum*
purple prairie clover	*Dalea purpurea*
Philadelphia fleabane	*Erigeron philadelphicus*
joe-pye weed	*Eupatorium purpureum*
great-flowered gaillardia	*Gaillardia aristata*
Northern bedstraw	*Galium boreale*
sweet-scented bedstraw	*Galium triflorum*
three-flowered avens	*Geum triflorum*
common sneezeweed	*Helenium autumnale*
showy sunflower	*Helianthus laetiflorus*
narrow-leaved sunflower	*Helianthus maximiliani*
meadow blazingstar	*Liatris ligulistylis*
wood lily	*Lilium philadelphicum*
blue flax	*Linum lewisii*

TABLE 4 (CONT.) . FORB SPECIES SUITABLE FOR FOREST EXPANSION AND NATURALIZED AREA PLANTINGS.

Common Name	Scientific Name
two-leaved Solomon's-seal	*Maianthemum canadense*
ostrich fern	*Matteuccia struthiopteris*
common mint	*Mentha arvensis*
mitrewort	*Mitella nuda*
wild bergamot	*Monarda fistulosa*
small-flowered buttercup	*Ranunculus abortivus*
long-headed coneflower	*Ratibida columnifera*
wild red raspberry	*Rubus idaeus*
black-eyed Susan	*Rudbeckia hirta*
snakeroot	*Sanicula marilandica*
star-flowered Soloman's-seal	*Smilacina stellata*
Canada goldenrod	*Solidago canadensis*
stiff goldenrod	*Solidago rigida*
woundwort	*Stachys palustris*
tall meadow-rue	*Thalictrum dasycarpum*
veiny meadow-rue	*Thalictrum venulosum*

Note: For best results, it is recommended that these species be installed as 'plugs' into appropriate range site conditions. Avoid planting these species into established tame perennial grass cover.

G SITEWORK

Site Construction Performance Requirements	01 89 00	

NUMBER	TITLE	MF NUMBER	EXPLANATION
G10	**SITE PREPARATION**		
	Site Preparation Performance Requirements	01 89 13	
G1010	**Site Clearing**	31 10 00	Includes: Removal of vegetation from the site, including stripping of sod and soil, and tree pruning for site clearing.
G1010.10	Clearing and Grubbing	31 11 00	
G1010.30	Tree and Shrub Removal and Trimming	31 13 00	
	See Also: *Shrub and Tree Transplanting: G2080.* *Temporary Tree and Plant Protection: Z1050.*		
G1010.50	Earth Stripping and Stockpiling	31 14 00	
	Soil Stripping and Stockpiling	31 14 13	
	Sod Stripping and Stockpiling	31 14 16	
G1020	**Site Elements Demolition**		Includes: Removal of above and below grade site improvements.
	See Also: *Demolition: F30.*		
G1020.10	Utility Demolition		
G1020.30	Infrastructure Demolition		
G1020.50	Selective Site Demolition	02 41 13	
G1030	**Site Element Relocations**		
	See Also: *Structure Moving: F3050.*		
G1030.10	Utility Relocation		Includes: Relocation of utility systems.
G1050	**Site Remediation**	02 50 00	Includes: Remediation of contaminated sites.
	Site Remediation Performance Requirements	01 89 13	
	See Also: *Decontamination Equipment: E1090.60.* *Facility Remediation: F20.* *Contaminated Site Special Procedures: Z1020.70.*		
G1050.10	Physical Decontamination	02 51 00	Includes: Soil decontamination by physical treatment processes.
	Coagulation and Flocculation Decontamination	02 51 13	
	Reverse-Osmosis Decontamination	02 51 16	
	Solidification and Stabilization Decontamination	02 51 19	
	Mechanical Filtration Decontamination	02 51 23	
	Radioactive Decontamination	02 51 26	
	Surface Cleaning Decontamination	02 51 29	
	Surface Removal Decontamination	02 51 33	
G1050.15	Chemical Decontamination	02 52 00	Includes: Soil decontamination by chemical treatment processes.
	Chemical Precipitation Decontamination	02 52 13	
	Ion Change Decontamination	02 52 16	
	Neutralization Decontamination	02 52 19	
G1050.20	Thermal Decontamination	02 53 00	Includes: Soil decontamination by thermal treatment processes.
	Incineration Decontamination	02 53 13	

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Thermal Desoption Decontamination	02 53 16	
	Vitrification Decontamination	02 53 19	
G1050.25	Biological Decontamination	02 54 00	Includes: Soil decontamination by biological treatment processes.
	Aerobic Processes Decontamination	02 54 13	
	Anaerobic Processes Decontamination	02 54 16	
	Bioremediation Decontamination	02 54 19	
	Soil Washing through Separation/Solubilization	02 54 23	
	Organic Decontamination	02 54 26	
G1050.30	Remediation Soil Stabilization	02 55 00	Includes: Insiu and exsitu soil stabilization for remediation.
G1050.40	Site Containment	02 56 00	Includes: Containment of contaminated site materials.
	Waste Containment	02 56 13	
	Gas Containment	02 56 19	
G1050.45	Sinkhole Remediation	02 57 00	Includes: Remediation of underground voids in soluble rock created by groundwater.
	Sinkhole Remediation by Grouting	02 57 13	
	Sinkhole Remediation by Backfilling	02 57 13.13	
G1050.50	Hazardous Waste Drum Handling	02 86 00	Includes: The handling of drums containing material contaminated with toxic and hazardous materials.
G1050.60	Contaminated Site Material Removal	02 60 00	Includes: Removal and disposal of contaminated site materials.
	Removal and Disposal of Contaminated Soils	02 61 00	Includes: Removal of toxic and hazardous site materials including polychlorinate biphenyl, asbestos, and organically contaminated soils.
	Hazardous Waste Recovery Processes	02 62 00	Includes: Removal of hazardous and toxic materials from soil.
	See Also: *Transportation and Disposal of Hazardous Materials: F2010.10.*		
	Underground Storage Tank Removal	02 65 00	Includes: Removal of underground tanks and appurtenances which have been used to store toxic and hazardous materials.
	Landfill Construction and Storage	02 66 00	Includes: Construction of landfills and storage of hazardous materials.
G1050.80	Water Remediation	02 70 00	Includes: Remediation of contaminated water.
	Groundwater Treatment	02 71 00	
	Water Decontamination	02 72 00	
G1070	**Site Earthwork**	31 20 00	Includes: Moving earth to establish new contours and elevations.
	Site Earthwork Performance Requirements	01 89 13	
	Degree of Compaction	01 89 13	
G1070.10	Grading	31 22 00	Includes: Earthmoving to reshape contours.
	Rough Grading	31 22 13	
	Fine Grading	31 22 16	
	Finish Grading	31 22 19	
G1070.20	Excavation and Fill	31 23 00	Includes: Excavation and fill for foundations, structures, pavement, railways, ditches, channels, culverts, drains, and utilities.
	See Also: *Building Substructure Excavation: A9010.* *Building Backfill and Compaction: A9010.10.*		

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Excavation	31 23 16	
	Rock Removal	31 23 16.26	
	Fill	31 23 23	
	Backfill	31 23 23.13	
	Compaction	31 23 23.23	
	Flowable Fill	31 23 23.33	
	Geofoam	31 23 23.43	
	Trenching and Backfilling	31 23 33	
G1070.30	Embankments	31 24 00	Includes: Soil and rock embankments for support or containment and protection purposes.
	Roadway Embankments	31 24 13	
	Railway Embankments	31 24 16	
G1070.35	Erosion and Sedimentation Controls	31 25 00	Includes: Construction of permanent erosion checks and controls.
	See Also: *Temporary Erosion and Sediment Control: Z1050.50.*		
G1070.40	Soil Stabilization	31 32 00	Includes: Addition and integration of material in and on soil to stabilize and strengthen soil material and the construction of which it is a part. Includes fully grouted, passive (non-tensioned) soil nails used to resist failure forces on slopes.
	Soil Mixing Stabilization	31 32 13	
	Chemical Treatment Soil Stabilization	31 23 16	
	Geosynthetic Soil Stabilization	31 32 19	
	Pressure Grouting Soil Stabilization	31 32 23	
	Shotcrete Soil Slope Stabilization	31 32 33	
	Soil Nailing	31 32 36	
G1070.45	Rock Stabilization	31 33 00	Includes: Various technologies to make an unstable rock slope more stable.
	Rock Bolting and Grouting	31 33 13	
	Rock Slope Netting	31 33 23	
	Rock Slope Wire Mesh	31 33 26	
	Shotcrete Rock Slope Stabilization	31 33 33	
	Vegetated Rock Slope Stabilization	31 33 43	
G1070.50	Soil Reinforcement	31 34 00	Includes: Various technologies to reinforce the strength and stability of soils.
	Geosynthetic Soil Reinforcement	31 34 19	
	Fiber Soil Reinforcement	31 34 23	
	See Also: *Reinforced Soil Retaining Walls: G2060.60*		
G1070.55	Slope Protection	31 35 00	Includes: Various technologies to protect slopes from erosion.
	Geosynthetic Slope Protection	31 35 19	
	Slope Protection with Slope Paving	31 35 23	
	Containment Barriers	31 35 26	
G1070.60	Gabions	31 36 00	Includes: Wire baskets filled with rock used for a variety of purposes.
	Gabion Boxes	31 36 13	
	Gabion Mattresses	31 36 19	
	See Also: *Gabion Retaining Walls: G2060.60.*		
G1070.65	Riprap	31 37 00	Includes: Cover of rock used to stabilized slopes subject to water erosion intended to be permanent.

NUMBER	TITLE	MF NUMBER	EXPLANATION
G1070.70	Wetlands	32 70 00	Includes: Construction and restoration of excavated basis with purposely placed wetland vegetation to enhance pollutant removal from stormwater runoff.
	Constructed Wetlands	32 71 00	
	Wetlands Restoration	32 72 00	
G1070.80	Earth Dams	35 73 13	Includes: Dams constructed of earth.
	See Also: *Storm Drainage Ponds and Reservoirs: G3030.70*		
G1070.90	Site Soil Treatment	31 31 00	Includes: Soil treatment to resist invasion of adjoining structure by pests and growth of vegetation.
	Rodent Control	31 31 13	
	Termite Control	31 31 16	
	Vegetation Control	31 31 19	
	See Also: *Soil Treatment: A9040.*		
G20	**SITE IMPROVEMENTS**		
	Site Improvements Performance Requirements	01 89 16	
	See Also: *Site Improvements Grounding: G4010.70.*		
G2010	**Roadways**		Includes: Pavement, curbs and gutters, appurtenances, lighting, and vehicle fare collection for roadways. May Include: Site earthwork.
	Roadways Performance Requirements	01 89 16	
	Live Load Capacity	01 89 16	
	Lighting Levels	01 89 16	
	See Also: *Site Earthwork: G1070.* *Parking Lots: G2020.* *Pedestrian Plazas and Walkways: G2030.* *Airfields: G2040.* *Athletic, Recreational, and Playfield Areas: G2050.* *Temporary Roads: Z1050.35.*		
G2010.10	Roadway Pavement	32 10 00	
	Roadway Base Courses	32 11 00	Includes: Prepared and compacted soil and granular layers placed before installation of roadway pavement.
	Flexible Roadway Pavement	32 12 00	Includes: Finished roadway pavement of granular and asphaltic materials. Seal coats and restoration of existing pavements.
	Rigid Roadway Pavement	32 13 00	Includes: Finished roadway pavement with high bending resistance, usually of concrete.
	Roadway Unit Pavement	32 14 00	Includes: Blocks or tiles used for roadway pavement. Includes unit pavers set in mastic, sand, or mortar.
	See Also: *Unit Pavers: B3040.*		
	Roadway Aggregate Surfacing	32 15 00	

NUMBER	TITLE	MF NUMBER	EXPLANATION
G2010.20	Roadway Curbs and Gutters	32 16 13	Includes: Construction at perimeter of roadway pavements to separate pavements from adjacent surfaces, provide vehicular restraint, and facilitate drainage.
G2010.40	Roadway Appurtenances	32 17 00	Includes: Accessories for roadway construction.
	Speed Bumps	32 17 16	
	Pavement Snow Melting Systems	32 17 43	
	See Also: *Snow Melting: D3070.10.*		
	Roadway Construction	34 71 00	
	Vehicle Barriers	34 71 13	
	Impact Attenuating Devices	34 71 16	
	Vehicle Delineators	34 71 19	
	Traffic Signage	10 14 53	
	Roadway Signaling and Control Equipment	34 41 00	
	Traffic Signals	34 41 13	
	Traffic Control Equipment	34 41 16	
	Roadway Monitoring Equipment	34 41 23	
	Pavement Markings	32 17 23	
G2010.70	Roadway Lighting	26 56 19	
	See Also: *Site Lighting: G4050.*		
G2010.80	Vehicle Fare Collection	34 52 00	Includes: Equipment associated with the control of movement of vehicles on roadways and is integral system with equipment to dispense tickets and collect fares for vehicles.
	Vehicle Ticketing Equipment	34 52 16	
	Vehicle Fare Collection Equipment	34 52 26	
	Vehicle Fare Gates	34 52 33	
G2020	**Parking Lots**		Includes: Pavement, curbs and gutters, appurtenances, lighting, and parking control equipment for parking lots. May Include: Site earthwork.
	Parking Lots Performance Requirements	01 89 16	
	Live Load Capacity	01 89 16	
	Lighting Levels	01 89 16	
	See Also: *Site Earthwork: G1070.* *Roadways: G2010.* *Pedestrian Plazas and Walkways: G2030.* *Airfields: G2040.* *Athletic, Recreational, and Playfield Areas: G2050.* *Temporary Parking Areas: Z1050.35.*		
G2020.10	Parking Lot Pavement	32 10 00	
	Parking Lot Base Courses	32 11 00	Includes: Prepared and compacted soil and granular layers placed prior to installation of parking lot pavement.
	Flexible Parking Lot Pavement	32 12 00	Includes: Finished parking lot pavement of granular and asphaltic materials.
	Rigid Parking Lot Pavement	32 13 00	Includes: Finished parking lot pavement with high bending resistance, usually of concrete.

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Parking Lot Unit Pavement	32 14 00	Includes: Blocks or tiles used for parking lot pavement. Unit pavers set in mastic, sand, or mortar.
	See Also: *Unit Pavers: B3040.*		
	Parking Lot Aggregate Surfacing	32 15 00	
G2020.20	Parking Lot Curbs and Gutters	32 16 13	Includes: Construction at perimeter of parking lot pavement to separate pavement from adjacent surfaces, provide vehicular restraint, and facilitate drainage.
G2020.40	Parking Lot Appurtenances	32 17 00	Includes: Accessories for parking lot construction.
	See Also: *Bicycle Racks: G2060.*		
	Parking Bumpers	32 17 13	
	Pavement Snow Melting Systems	32 17 43	
	See Also: *Snow Melting: D3070.10.*		
	Parking Lot Traffic Signage	10 14 53	
	Parking Lot Pavement Markings	32 17 23	
G2020.70	Parking Lot Lighting	26 56 16	
	See Also: *Site Lighting: G4050.*		
G2020.80	Exterior Parking Control Equipment	11 12 00	Includes: Equipment associated with the control of movement of vehicle parking.
	Exterior Parking Key and Card Control Units	11 12 13	
	Exterior Parking Ticket Dispensers	11 12 16	
	Exterior Parking Meters	11 12 23	
	Exterior Parking Fee Collection Equipment	11 12 26.13	
	Exterior Parking Gates	11 12 33	
	See Also: *Interior Parking Control Equipment: E1010.30.*		
G2030	**Pedestrian Plazas and Walkways**		Includes: Pavement, curbs and gutters, appurtenances, lighting, and pedestrian control equipment for pedestrian plazas and walkways. Includes exterior steps and ramps. May Include: Site earthwork.
	Pedestrian Plazas and Walkways Performance	01 89 16	
	Lighting Levels	01 89 16	
	See Also: *Site Earthwork: G1070.* *Roadways: G2010.* *Parking Lots: G2020.* *Airfields: G2040.* *Athletic, Recreational, and Playfield Areas: G2050.*		
G2030.10	Pedestrian Pavement	32 10 00	Includes: Prepared and compacted soil and granular layers placed before installation of pedestrian pavement.
	Pedestrian Pavement Base Courses	32 11 00	
	Flexible Pedestrian Pavement	32 12 00	Includes: Finished pedestrian pavement of granular and asphaltic materials.
	Rigid Pedestrian Pavement	32 13 00	Includes: Finished pedestrian pavement with high bending resistance, usually of concrete.

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Pedestrian Unit Pavement	32 14 00	Includes: Blocks or tiles used for pedestrian pavement. Unit pavers which may be set in mastic, sand, or mortar.
	See Also: *Unit Pavers: B3040.*		
	Pedestrian Aggregate Surfacing	32 15 00	
G2030.20	Pedestrian Pavement Curbs and Gutters	32 16 13	Includes: Construction at perimeter of pedestrian pavements to separate pavement from adjacent surfaces and facilitate drainage.
G2030.30	Exterior Steps and Ramps		Includes: Steps and ramps in exterior locations including applied finishes such as coatings and tile and railings.
	See Also: *Snow Melting: D3070.10.* *Stair: B1080.*		
G2030.40	Pedestrian Pavement Appurtenances	32 17 00	Includes: Accessories for pedestrian pavement construction.
	Pavement Markings	32 17 23	
	Tactile Warning Surfacing	32 17 26	
	Pavement Snow Melting Systems	32 17 43	
	See Also: *Snow Melting: D3070.10.*		
G2030.70	Plaza and Walkway Lighting	26 56 33	
	See Also: *Site Lighting: G4050.*		
G2030.80	Exterior Pedestrian Control Equipment	11 14 00	Includes: Equipment associated with the control of movement of pedestrians.
	Exterior Pedestrian Gates	11 14 13	
	Exterior Money-Changing Equipment	11 14 16	
	Exterior Pedestrian Fare Collection Equipment	11 14 26	
	Exterior Pedestrian Detection Equipment	11 14 43	
	Exterior Pedestrian Security Equipment	11 14 53	
	See Also: *Exterior Security Gates: B2050.70.* *Electronic Safety and Security: D70.* *Interior Pedestrian Security Equipment: E1010.70.* *Security Equipment: E1040.60.* *Security Procedures: Z1020.70.* *Temporary Security Barriers & Enclosures: Z1050.40.*		
G2040	**Airfields**		Includes: Pavement, curbs and gutters, appurtenances, lighting, and airfield signally and control equipment for airfields. May Include: Site earthwork.
	Airfields Performance Requirements	01 89 16	
	Live Load Capacity	01 89 16	
	Lighting Levels	01 89 16	
	See Also: *Site Earthwork: G1070.* *Roadways: G2010.* *Parking Lots: G2020.* *Pedestrian Plazas and Walkways: G2030.* *Athletic, Recreational, and Playfield Areas: G2050.* *Airport Special Procedures: Z1020.70.*		

NUMBER	TITLE	MF NUMBER	EXPLANATION
G2040.10	Aviation Pavement	32 10 00	Includes: Prepared and compacted soil and granular layers placed before installation of airfield pavement.
	Aviation Pavement Base Courses	32 11 00	
	Flexible Aviation Pavement	32 12 00	
	Rigid Aviation Pavement	32 13 00	
	Aviation Aggregate Surfacing	32 15 00	
G2040.20	Aviation Pavement Curbs and Gutters	32 16 13	Includes: Construction at perimeter of airfield pavements to separate pavement from adjacent surfaces and facilitate drainage.
G2040.40	Aviation Pavement Appurtenances	32 17 00	Includes: Accessories for aviation pavement construction.
	Airfield Pavement Markings	32 17 23	
	Pavement Snow Melting Systems	32 17 43	
	See Also:		
	Snow Melting: D3070.10.		
	Airfield Traffic Signage	10 14 53	
G2040.70	Airfield Lighting	26 56 00	
	See Also:		
	Site Lighting: G4050.		
G2040.80	Airfield Signaling and Control Equipment	34 43 00	Includes equipment associated with airfield signaling, landing, and traffic control including weather observation equipment.
	Airfield Signals	34 43 13	
	Airfield Landing Equipment	34 43 16	
	Airfield Traffic Control Tower Equipment	34 43 19	
	Weather Observation Equipment	34 43 23	
	Airfield Control Equipment	34 43 26	
G2050	**Athletic, Recreational, and Playfield Areas**		Includes: Surfacing, fencing, equipment, grandstands and bleachers, and lighting for athletic, recreational, and playfield areas. May Include: Site earthwork.
	See Also: *Site Earthwork: G1070.* *Roadways: G2010.* *Parking Lots: G2020.* *Pedestrian Plazas and Walkways: G2030.* *Airfields: G2040.*		
G2050.10	Athletic Areas		Includes: Exterior surfacing, fencing, equipment, and lighting for athletic areas.
	Athletic Areas Performance Requirements	01 89 16	
	Lighting Levels	01 89 16	
	Athletic Surfaces	32 18 00	
	Baseball Field Surfacing	32 18 23.13	
	Field Sport Surfacing	32 18 23.23	
	Running Track Surfacing	32 18 23.33	
	Tennis Court Surfacing	32 18 23.53	
	Athletic Court Fencing		
	Tennis Court Fences and Gates	32 31 13.26	
	Tennis Court Wind Breaker	32 31 13.29	
	Athletic Equipment		
	Athletic Field Equipment	11 68 33	
	Exterior Athletic Equipment	11 68 23	
	Exterior Scoreboards	11 68 43	

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Exterior Athletic Lighting	26 56 68	
	See Also: *Athletic Flooring: C2030.80.* *Athletic Equipment: E1070.50.* *Athletic Rooms: F1010.50.* *Grandstands and Bleachers: F1020.40.* *Athletic & Recreational Special Construction: F1060.* *Site Lighting: G4050.*		
G2050.30	Recreational Areas		Includes: Exterior surfacing, fencing, equipment and structures, and lighting for recreational areas.
	Recreational Areas Performance Requirements	01 89 16	
	Lighting Levels	01 89 16	
	Recreational Surfaces	32 18 00	
	Recreational Court Surfacing	32 18 23.43	
	Recreational Court Fences and Gates	32 31 13.23	
	Recreational Area Lighting	26 56 00	
	See Also: *Site Lighting: G4050.*		
G2050.50	Playfield Areas		Includes: Exterior surfacing, equipment and structure, and lighting for playfield areas.
	Play Areas Performance Requirements	01 89 16	
	Lighting Levels	01 89 16	
	Playfield Surfacing		
	Synthetic Resilient Surfacing	32 18 16	
	Playfield Equipment and Structures	11 68 00	
	Playground Equipment	11 68 13	
	Play Structures	11 68 16	
	Playfield Lighting	26 56 00	
	See Also: *Site Lighting: G4050.*		
G2060	**Site Development**		
G2060.10	Exterior Fountains	13 12 13	Includes: Exterior decorative or functional manufactured fountains.
	Exterior Fountains Performance Requirements	01 89 16	
	Exterior Fountain Plumbing Systems	22 52 00	
	Exterior Fountain Equipment		
	Exterior Fountain Water Treatment	22 52 19	
	Exterior Fountain Pumps	22 52 16	
	Exterior Fountain Equipment Controls	22 52 23	
	Exterior Fountain Piping System	22 52 13	
	Exterior Fountain Specialties		
	See Also: *Interior Fountains: F1050.20.*		
G2060.20	Fences and Gates	32 31 00	Includes: Exterior fences and gates. Also includes cattle guards.
	Fences and Gates Performance Requirements	01 89 16	
	Security Level		
	Gate Operators	32 31 11	
	Chain Link Fences and Gates	32 31 13	
	Welded Wire Fences and Gates	32 31 16	
	Decorative Metal Fences and Gates	32 31 19	
	Plastic Fences and Gates	32 31 23	
	Wire Fences and Gates	32 31 26	
	Wood Fences and Gates	32 31 29	

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Cattle Guards	32 31 53	
	See Also:		
	Exterior Gates: B2050.70		
	Interior Gates: C1040.50		
	Temporary Fencing: Z1050.40.		
G2060.25	Site Furnishings	12 93 00	Includes: Manufactured site furniture and fixtures.
	See Also:		
	Planting Accessories: G2080.		
	Tree Grates: G2080.		
	Bicycle Racks	12 93 13	
	Trash and Litter Receptors	12 93 23	
	Planters	12 93 33	
	Site Seating and Tables	12 93 43	
G2060.30	Exterior Signage	10 14 00	Includes: Exterior signs with the exception of roadway and parking lot signage.
	See Also:		
	Traffic Signage: G2010.		
	Parking Lot Traffic Signage: G2020.		
	Temporary Project Signage: Z1050.70.		
G2060.35	Flagpoles	10 75 00	Includes: Flagpoles of metal, wood, and fiberglass, including concrete bases and accessories.
	Flagpoles Performance Requirements	01 89 16	
	Wind Load Capacity	01 89 16	
	Automatic Flagpoles	10 75 13	
	Ground-Set Flagpoles	10 75 16	
	Nautical Flagpoles	10 75 19	
	Wall-Mounted Flagpoles	10 75 23	
	See Also:		
	Interior Flags and Banners: C1090.90.		
G2060.40	Covers and Shelters	10 73 00	Includes: Manufactured covers and shelters.
	See Also:		
	Parking Lot Appurtenances: G2020.		
	Covers and Shelters Performance Requirements	01 89 16	
	Load Capacity	01 89 16	
	Attendant Booths		
	Site Constructed Attendant Booths		
	Manufactured Attendant Booths		
	Car Shelters	10 73 23	
	Walkway Coverings	10 73 26	
	Transportation Stop Shelters	10 73 43	
G2060.45	Exterior Gas Lighting	10 84 13	
	See Also:		
	Interior Gas Lighting: C1090.45.		
G2060.50	Site Equipment		Includes: Equipment located on the site, such as car washing, banking, theater equipment, and other freestanding equipment.
	Banking Equipment		
	Automatic Banking Systems	11 17 16	
G2060.60	Retaining Walls	32 32 00	Includes: Retaining walls associated with site construction. Includes Subdrainage.
	Retaining Walls Performance Requirements	01 89 16	
	Lateral Earth Pressures	01 89 16	
	Cast-In-Place Concrete Retaining Walls	32 32 13	
	Precast Concrete Retaining Walls	32 32 16	

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Unit Masonry Retaining Walls	32 32 19	
	Segmental Retaining Walls	32 32 23	
	Metal Crib Retaining Walls	32 32 26	
	Timber Retaining Walls	32 32 29	
	Reinforced Soil Retaining Walls	32 32 34	
	See Also:		
	Reinforced Soil: G1070.50.		
	Gabion Retaining Walls	32 32 36	
	See Also:		
	Gabions: G1070.60.		
	Soldier-Beam Retaining Walls	32 32 43	
	Stone Retaining Walls	32 32 53	
	Retaining Wall Subdrainage	33 46 33	
	See Also:		
	Subdrainage: G3030.60.		
G2060.70	Site Bridges	32 34 00	Includes: Fabricated and constructed brides for foot and vehicular travel on a facility site.
	Site Bridges Performance Requirements	01 89 16	
	Live Load Capacity	01 89 16	
	Pedestrian Bridges	32 34 13	
	Vehicular Bridges	32 34 23	
	See Also:		
	Temporary Bridges: Z1050.25.		
G2060.80	Site Screening Devices	32 35 00	Includes: Self-supporting walls for noise control and privacy.
	Screens and Louvers	32 35 13	
	See Also:		
	Louvered Equipment Screens: B2010.60.		
	Exterior Door Louvers: B2050.90.		
	Exterior Fixed Grilles and Screens: B2080.10.		
	Interior Louvers: C1090.15.		
	Interior Door Louvers: C2030.90.		
	Sound Barriers	32 35 16	
G2060.85	Site Specialties	32 39 00	
	Metal Bollards	32 39 13	
G2080	**Landscaping**		
	See:		
	Horticultural Equipment: E1090.40.		
G2080.10	Planting Irrigation	32 84 00	Includes: Excavation and backfill, piping, equipment, and accessories.
	Planting Irrigation Performance Requirements	01 89 16	
	Irrigation Pumps	32 82 00	
	Drip Irrigation	32 84 13	
	Sprinkler Systems	32 84 23	
	See Also:		
	Agricultural Irrigation: E1090.40.		
	Site Irrigation Water Distribution: G3010.50.		
G2080.20	Turf and Grasses	32 92 00	Includes: Lawns and grasses including seeding and sodding.
	Hydro-Mulching	32 92 13	
	Plugging	32 92 16	
	Seeding	32 92 19	
	Sodding	32 92 23	
	Sprigging	32 92 26	

NUMBER	TITLE	MF NUMBER	EXPLANATION
G2080.30	Plants	32 93 00	Includes: Ground covers, plants and bulbs, shrubs, and trees. Includes planting accessories such as tree grates and prefabricated planters.
	Ground Covers	32 93 13	
	Plants and Bulbs	32 93 23	
	Shrubs	32 93 33	
	Trees	32 93 43	
G2080.50	Planting Accessories	32 94 00	Includes: Accessories to separate and protect exterior plants.
	Landscape Edging	32 94 13	
	Landscape Timbers	32 94 16	
	Planters	32 94 33	
	Tree Grates	32 94 43	
	Tree Grids	32 94 46	
	Decorative Landscape Boulders		
	Vertical Planting Nets and Grids		
G2080.70	Landscape Lighting	26 56 26	
	See Also: *Site Lighting: G4050.*		
G2080.80	Landscaping Activities		
	Planting Preparation	32 91 00	
	Transplanting	32 96 00	Includes: Relocation of existing shrubs and trees including excavation and replanting.
	See Also: *Tree and Shrub Removal and Trimming: G1010.* *Temporary Tree and Plant Protection : Z1050.*		

G30 LIQUID AND GAS SITE UTILITIES

	Site Plumbing Utilities Performance	01 89 19	
	See Also: *Utilities Grounding: G4010.70.*		
G3010	**Water Utilities**	33 10 00	Includes: Water distribution for domestic consumption, fire fighting, and irrigation for a facility site and for multiple facilities. Includes trenching and backfilling. Includes Liquid and Gas Site Utilities Supplementary Components as appropriate.
	See Also: *Trenching and Backfilling: G1070.20.* *Supplementary Components: G3090.10.*		
G3010.10	Site Domestic Water Distribution		Includes: Supply wells, piping, equipment, storage tanks, and water ponds and reservoirs.
	Site Domestic Water Distribution Performance Requirements	01 89 19	
	Water Utility Service		
	Water Supply Wells	33 21 00	
	Water Distribution Piping	33 11 00	
	Water Distribution Equipment	33 12 00	
	Water Service Connections	33 12 13	
	Water Distribution Valves	33 12 16	
	Fire Hydrants	33 12 19	
	Water Pumping Stations	33 12 23	
	Water Metering	33 12 33	

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Disinfecting of Water Distribution	33 13 00	
	Water Storage Tanks	33 16 00	
	Water Distribution Ponds	33 47 19.13	
	Water Distribution Pond Liners	33 47 13.13	
	Water Distribution Pond Covers	33 47 16.13	
	See Also: *Domestic Water Distribution: D2010.*		
G3010.30	Site Fire Protection Water Distribution		Includes: Supply wells, piping, equipment, storage tanks, and water ponds and reservoirs.
	Site Fire Protection Water Distribution	01 89 19	
	Water Utility Service		
	Water Supply Wells	33 21 00	
	Water Distribution Piping	33 11 19	
	Water Distribution Equipment	33 12 00	Includes: Systems for transmission and distribution of fire protection water outside the building. Utility piping materials, utility structures, valves, hydrants, excavation, bedding, backfill, and compaction. Testing and flushing.
	Water Service Connections	33 12 13	
	Water Distribution Valves	33 12 16	
	Fire Hydrants	33 12 19	
	Water Pumping Stations	33 12 23	
	Water Metering	33 12 33	
	Water Storage Tanks	33 16 00	
	Fire Protection Water Ponds	33 47 19.33	
	Water Pond Liners	33 47 13.13	
	Water Pond Covers	33 47 16.13	
	See Also: *Water Based Fire-Suppression: D4010.10.*		
G3010.50	Site Irrigation Water Distribution		Includes: Supply wells, piping, equipment, storage tanks, and water ponds and reservoirs.
	Site Irrigation Water Distribution Performance	01 89 19	
	Water Utility Service		
	Irrigation Water Wells	33 21 16	
	Water Distribution Piping	33 11 00	
	Water Distribution Equipment	33 12 00	
	Water Service Connections	33 12 13	
	Water Distribution Valves	33 12 16	
	Water Pumping Stations	33 12 23	
	Water Metering	33 12 33	
	Water Storage Tanks	33 16 00	
	Water Ponds and Reservoirs	33 47 19	
	Water Pond and Reservoir Liners	33 47 13	
	Water Pond and Reservoir Covers	33 47 16	
	See Also: *Planting Irrigation: G2080.10.*		
G3020	**Sanitary Sewerage Utilities**	33 30 00	Includes: Sanitary sewerage for a facility site and for multiple facilities. Includes piping, septic tanks that serve multiple facilities, structures, and lagoons. Includes trenching and backfilling. Includes Liquid and Gas Site Utilities Supplementary Components as appropriate.

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Sanitary Sewerage Utility Performance	01 89 19	
	See Also: *Sanitary Drainage: D2020.* *Trenching and Backfilling: G1070.20.* *Supplementary Components: G3090.10.*		
G3020.10	Sanitary Sewerage Utility Connection		
G3020.20	Sanitary Sewerage Piping	33 31 00	
	Low Pressure Sanitary Sewerage	33 33 00	
	Sanitary Sewerage Force Mains	33 34 00	
G3020.40	Utility Septic Tanks	33 36 00	Includes: Systems for collecting sanitary waste on-site. Piping materials, excavation, bedding, backfill, compaction, and testing.
	Septic Tanks and Effluent Wet Wells	33 36 13	
	Septic Tank Effluent Pumps	33 36 16	
	Drainage Field	33 36 33	
	See Also: *Facility Septic Tanks: D2020.10.*		
G3020.50	Sanitary Sewerage Structures	33 39 00	
	Sewerage Manholes, Frames, and Covers	33 39 13	
	Sewerage Cleanouts	33 39 23	
G3020.60	Sanitary Sewerage Lagoons	33 47 23	
G3030	**Storm Drainage Utilities**	33 40 00	Includes: Storm drainage for surface or combination of surface and subsurface water for a facility site or for multiple facilities. Includes piping, culverts, water drains, drainage pumps, Subdrainage, and storm drainage ponds and reservoirs. Includes trenching and backfilling. Includes Liquid and Gas Site Utilities Supplementary Components as appropriate.
	Storm Drainage Utility Performance	01 89 19	
	See Also: *Trenching and Backfilling: G1070.20.* *Supplementary Components: G3090.10.*		
G3030.10	Storm Drainage Utility Connection		
G3030.20	Storm Drainage Piping	33 41 00	
G3030.30	Culverts	33 42 00	
	Pipe Culverts	33 42 13	
	Concrete Culverts	33 42 16	
G3030.40	Site Storm Water Drains	33 44 00	
	Area Drains	33 44 13	
	Trench Drains	33 44 16	
	Storm Water Treatment	33 44 19	
	See Also: *Facility Stormwater Drains: D2030.30.*		
G3030.50	Storm Drainage Pumps	33 45 00	
G3030.60	Site Subdrainage	33 46 00	Includes: Subdrainage for interception and removal of water.
	Subdrainage Piping	33 46 16	
	Drainage Layers	33 46 23	

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Geotextile Subsurface Drainage Filtration	33 46 26	
	See Also: *Foundation Drainage: A6010.10.* *Underslab Drainage: A6010.20.* *Retaining Wall Drainage: G2060.60.*		
G3030.70	Storm Drainage Ponds and Reservoirs	33 47 26	
	Stabilization Ponds	33 47 26.13	
	Retention Basins	33 47 26.16	
	Leaching Pits	33 47 26.19	
	Water Pond and Reservoir Liners	33 47 13	
	See Also: *Earth Dams: G1070.*		
G3050	**Site Energy Distribution**		Includes: Energy distribution for a facility site or multiple facilities. Includes hydronic heating, steam energy, and hydronic cooling distribution. Includes trenching and backfilling. Includes Liquid and Gas Site Utilities Supplementary Components as appropriate.
	See Also: *Facility Distribution Systems: D3050.* *Trenching and Backfilling: G1070.20.* *Supplementary Components: G3090.10.*		
G3050.10	Site Hydronic Heating Distribution	33 61 00	Includes: Hot water piping, valves, piping specialties, pumps, and other components serving a facility site or multiple facilities.
	Site Hydronic Heating Distribution Performance Requirements	01 89 23	
	Heating Utility Connection		
	Underground Heating Distribution	33 61 13	
	Aboveground Heating Distribution	33 61 23	
G3050.20	Site Steam Energy Distribution	33 63 00	Includes: Steam and condensate piping, valves, piping specialties, and other components serving a facility site or multiple facilities.
	Site Steam Distribution Performance Requirements	01 89 23	
	Steam Utility Connection		
	Underground Steam and Condensate	33 63 13	
	Aboveground Steam and Condensate	33 63 23	
G3050.40	Site Hydronic Cooling Distribution	33 61 00	Includes: Chilled condenser piping, valves, piping specialties, pumps, and other components serving a facility site or multiple facilities.
	Site Hydronic Cooling Distribution Performance Requirements	01 89 23	
	Cooling Utility Connection		
	Underground Cooling Distribution	33 61 13	
	Aboveground Cooling Distribution	33 61 23	

NUMBER	TITLE	MF NUMBER	EXPLANATION
G3060	**Site Fuel Distribution**		Includes: Gas, fuel-oil, gasoline, diesel fuel, and aviation fuel distribution for a facility site or multiple facilities. Includes trenching and backfilling. Includes Liquid and Gas Site Utilities Supplementary Components as appropriate.
	See Also: *Facility Fuel Systems: D3010.* *Trenching and Backfilling: G1070.20.* *Supplementary Components: G3090.10.*		
G3060.10	Site Gas Distribution	33 41 00	Includes: Gas piping, valves, piping specialties, pumps, storage tanks, and other components serving a facility site or multiple facilities.
	Site Gas Distribution Performance Requirements	01 89 23	
	Gas Utility Connection		
	Natural-Gas Distribution	33 51 00	
	Liquefied Petroleum Gas Distribution		
	Compressed Gases Storage Tanks	33 56 23	
	See Also: *Fuel-Gas Detection and Alarm: D7050.30.*		
G3060.20	Site Fuel-Oil Distribution	33 52 13	Includes: Fuel-oil water piping, valves, piping specialties, pumps, storage tanks, and other components serving a facility site or multiple facilities.
	Site Fuel-Oil Distribution Performance	01 89 23	
	Fuel-Oil Piping	33 52 13.13	
	Fuel-Oil Pumps	33 52 13.23	
	Fuel-Oil Storage Tanks	33 56 00	
	See Also: *Fuel-Oil Detection and Alarm: D7050.40.*		
G3060.30	Site Gasoline Distribution	33 52 16	Includes: Gasoline piping, valves, piping specialties, pumps, storage tanks, and other components serving a facility site or multiple facilities.
	Site Gasoline Distribution Performance	01 89 23	
	Gasoline Piping	33 52 16.13	
	Gasoline Pumps	33 52 16.23	
	Gasoline Storage Tanks	33 56 00	
G3060.40	Site Diesel Fuel Distribution	33 52 19	Includes: Diesel fuel piping, valves, piping specialties, pumps, storage tanks, and other components serving a facility site or multiple facilities.
	Site Diesel Fuel Distribution Performance	01 89 23	
	Diesel Fuel Piping	33 52 19.13	
	Diesel Fuel Pumps	33 52 19.23	
	Diesel Fuel Storage Tanks	33 56 00	
G3060.60	Site Aviation Fuel Distribution	33 52 43	Includes: Aviation fuel piping, valves, piping specialties, pumps, storage tanks, and other components serving a facility site or multiple facilities.
	Site Aviation Fuel Distribution Performance	01 89 23	
	Aviation Fuel Piping	33 52 43.13	
	Aviation Fuel Pumps	33 52 43.23	
	Aviation Fuel Grounding	33 52 43.19	
	Aviation Fuel Storage Tanks	33 56 43	

NUMBER	TITLE	MF NUMBER	EXPLANATION
G3090	**Liquid and Gas Site Utilities Supplementary Components**		Includes: Common work results for utilities and instrumentation and control to be included in liquid and gas utility elements above as appropriate.
G3090.10	Supplementary Components		
	Common Work Results for Utilities	03 05 00	
	Manholes and Structures	03 05 13	
	Utility Structures	03 05 16	
	Pressure Piping Tied Joint Restraint System	33 05 19	
	Trenchless Utility Installations	03 05 23	
	Utility Identification	03 05 26	
	Instrumentation and Control	03 09 00	
G40	**ELECTRICAL SITE IMPROVEMENTS**		
	Site Electrical Utilities Performance	01 89 26	
G4010	**Site Electric Distribution Systems**		Includes: Equipment and related facilities for site transformation from site service voltage to site distribution voltage, including unit substations, transformers, circuit breakers, interrupter switches, cutouts and fuses, associated switchgear and accessories, concrete foundations, metal framing, fence enclosures, line structures, surface pavement, insulators, lightning arrestors, and grounding systems.
	Site Electric Distribution System Performance Requirements	01 89 26	
	See Also: *Building Electrical Service and Distribution: D5020.* *Demonstration and Training: Z1070.* *Startup and Adjusting: Z1070.*		
G4010.10	Electrical Utility Services	33 71 73	
G4010.20	Electric Transmission and Distribution	33 71 00	Includes: Structures and wiring to distribute electrical power to and across sites.
	Electrical Utility Towers	33 71 13	
	See Also: *Towers: F1020.70* *Towers Grounding: G4010.70.* *Communications Towers: G5010.10.*		
	Electrical Utility Poles	33 71 16	
	See Also: *Communications Utility Poles: G5010.10.*		
	Underground Ducts and Manholes	33 71 19	
	Insulators and Fittings	33 71 23	
	Transmission and Distribution Equipment	33 71 26	
	Wiring	33 71 39 33 71 49	
	Direct Current Transmission	33 71 53	
	Transmission and Distribution Specialties	33 71 83	
G4010.30	Electrical Substations	33 72 00	Includes: Assembly of structures, switches, circuit breakers, buses, and transformers to switch circuits and convert power from transmission voltages to distribution voltage.
	Deadend Structures	33 72 13	
	Structural Bus Supports	33 72 23	

NUMBER	TITLE	MF NUMBER	EXPLANATION
	Substation Bus Assemblies	33 72 26	
	Control House Equipment	33 72 33	
	Substation Control Wiring	33 72 43	
G4010.40	Electrical Transformers	33 73 00	Includes: Transformers for substation applications to transform transmission voltage to distribution voltage.
G4010.50	Electrical Switchgear and Protection Devices	33 75 00 33 77 00	
	Circuit Breakers		
	Fusible Interrupter Switchgear	33 77 26	
	Cutouts	33 77 33	
	Fuses		
	Surge Arresters		
	Shunt Arresters		
	Reclosers	33 77 53	
G4010.70	Site Grounding	33 79 00	Includes: Conducting connection between an element and a ground electrode placed in the earth to provide a safe path for the dissipation of fault currents, lightning strikes, static discharges, EMI and RFI signals and interference.
	See Also: *Facility Grounding: D5020.70.*		
	Site Improvements Grounding	33 79 13	
	See Also: *Site Improvements: G20.*		
	Tower Grounding	33 79 16	
	See Also: *Towers: F1020.70.*		
	Utilities Grounding	33 79 19	
	See Also: *Liquid and Gas Site Utilities: G30*		
	Utility Substation Grounding	33 79 23	
	See Also: *Electrical Substations: G4010.20.*		
	Site Grounding Conductors	33 79 83	
	Site Lightning Protection	33 79 93	
	See Also: *Lightning Protection: D5080.10.*		
G4010.90	Electrical Distribution System Instrumentation and	33 09 70	
G4050	**Site Lighting**	26 56 29	
G4050.10	Area Lighting	26 56 23	Includes: Underground and overhead electric feeders and branch circuits. Transformers, wire, conduits, ductbanks, manholes, poles, luminaries, controls, grounding system, excavation, backfilling, and compaction.
	Area Lighting Performance Requirements Lighting Levels *See Also:* *Interior Lighting: D5040.* *Roadway Lighting: G2010.70* *Parking Lot Lighting: G2020.70.* *Pedestrian Plaza and Walkway Lighting: G2030.70.* *Airfield Lighting: G2040.70.* *Athletic, Recreation, and Playfield Area Lighting: G2050.* *Landscape Lighting: G2080.70.*		

NUMBER	TITLE	MF NUMBER	EXPLANATION
G4050.20	Flood Lighting	26 56 36	
G4050.50	Building Illumination		
G4050.90	Exterior Lighting Supplementary Components		
	Lighting Poles and Standards	26 56 13	
	Site Lighting Instrumentation and Controls	26 09 00	
G50	**SITE COMMUNICATIONS**		
G5010	**Site Communications Systems**	33 80 00	Includes: Communications distribution for a facility site or multiple facilities.
	See Also: *Data Communications Systems: D6010.* *Voice Communications Systems: D6020.* *Audio-Video Communications: D6030.* *Distributed Communications and Monitoring: D6060.*		
G5010.10	Site Communications Structures	33 81 00	Includes: Structures for aboveground and underground distribution of communications cables and signals.
	Communications Transmission Towers	33 81 13	
	Antenna Towers	33 81 16	
	See Also: *Towers: F1020.70* *Electrical Utility Towers: G4010.20.* *Towers Grounding: G4010.70.*		
	Communications Utility Poles	33 81 19	
	See Also: *Electrical Utility Poles: G4010.20.*		
	Aerial Cable Installation Hardware	33 81 23	
	Communications Underground Ducts, Manholes, and Handholes	33 81 26	
	Communications Vaults, Pedestal, and Enclosures	33 81 29	
	Communications Blowers, Fans, and Ventilation	33 81 33	
G5010.30	Site Communications Distribution	33 82 00	Includes: Copper and optical fiber outside cable plant.
	Copper Communications Distribution Cabling	33 82 13	
	Optical Fiber Communications Distribution	33 82 23	
	Coaxial Communications Distribution Cabling	33 82 33	
	Grounding and Bonding for Communications	33 82 43	
	Cable Pressurization Equipment	33 82 46	
	Cleaning, Lubrication, and Restoration Chemicals	33 82 53	
G5010.50	Wireless Communications Distribution	33 83 00	Includes: External wireless communications systems.
	Laser Transmitter and Receivers	33 83 13	
	Microwave Transmitter and Receivers	33 83 16	
	Infrared Transmitter and Receivers	33 83 19	
	UHF/VHF Transmitter and Receivers	33 83 23	
For Site Electronic Safety and Security Systems			
	See Also: *Access Control and Intrusion Detection: D7010.* *Electronic Surveillance: D7030.* *Detection and Alarm: D7050.* *Electronic Monitoring and Control: D7070.*		

NUMBER	TITLE	MF NUMBER	EXPLANATION
G90	**MISCELLANEOUS SITE CONSTRUCTION**		
	Other Site Construction Performance	01 89 29	
G9010	**Tunnels**	31 70 00	Includes: Vehicular, pedestrian, and service tunnels. Includes tunnel boring, bracing and jacking work, linings and casing, grouting support systems, boring machines, and control and spoil removal systems. Includes Tunnel Construction Related Activities as appropriate.
	Tunnel Performance Requirements	01 89 29	
G9010.10	Vehicular Tunnels		Includes: Tunnels to allow for movement of vehicles.
	Vehicular Tunnel Support Systems	31 72 00	
	Rock Reinforcement and Initial Support	31 72 13	
	Steel Ribs and Lagging	31 72 16	
	Vehicular Tunnel Grouting	31 73 00	
	Cement Tunnel Grouting	31 73 13	
	Chemical Tunnel Grouting	31 73 16	
	Vehicular Tunnel Construction	31 74 00	
	Cast-In-Place Concrete Tunnel Lining	31 74 13	
	Precast Concrete Tunnel Lining	31 74 16	
	Shotcrete Tunnel Lining	31 74 19	
	Shaft Construction	31 75 00	
	Cast-In-Place Concrete Shaft Lining	31 75 13	
	Precast Concrete Shaft Lining	31 75 16	
	Vehicular Submersible Tube Tunnels	31 77 00	
G9010.20	Pedestrian Tunnels		Includes: Tunnels to allow for the movement of pedestrians.
	Pedestrian Tunnel Support Systems	31 72 00	
	Rock Reinforcement and Initial Support	31 72 13	
	Steel Ribs and Lagging	31 72 16	
	Pedestrian Tunnel Grouting	31 73 00	
	Cement Tunnel Grouting	31 73 13	
	Chemical Tunnel Grouting	31 73 16	
	Pedestrian Tunnel Construction	31 74 00	
	Cast-In-Place Concrete Tunnel Lining	31 74 13	
	Precast Concrete Tunnel Lining	31 74 16	
	Shotcrete Tunnel Lining	31 74 19	
	Shaft Construction	31 75 00	
	Cast-In-Place Concrete Shaft Lining	31 75 13	
	Precast Concrete Shaft Lining	31 75 16	
	Pedestrian Submersible Tube Tunnels	31 77 00	
G9010.40	Service Tunnels		Includes: Tunnels to house utility systems and to connect different facilities on site.
	Service Tunnel Support Systems	31 72 00	
	Rock Reinforcement and Initial Support	31 72 13	
	Steel Ribs and Lagging	31 72 16	
	Service Tunnel Grouting	31 73 00	
	Cement Tunnel Grouting	31 73 13	
	Chemical Tunnel Grouting	31 73 16	
	Service Tunnel Construction	31 74 00	
	Cast-In-Place Concrete Tunnel Lining	31 74 13	
	Precast Concrete Tunnel Lining	31 74 16	
	Shotcrete Tunnel Lining	31 74 19	
	Shaft Construction	31 75 00	
	Cast-In-Place Concrete Shaft Lining	31 75 13	
	Precast Concrete Shaft Lining	31 75 16	
	Service Submersible Tube Tunnels	31 77 00	

NUMBER	TITLE	MF NUMBER	EXPLANATION
G9010.90	Tunnel Construction Related Activities		Includes: Tunnel excavation and other activities related to tunnel construction to be included with tunnel construction above as appropriate.
	Tunnel Excavation	31 71 00	
	Shield Driving Tunnel Excavation	31 71 13	
	Tunnel Drilling and Blasting	31 71 16	
	Tunnel Boring Machine	31 71 19	
	Tunnel Cut and Cover	31 71 23	

UNIVERSITY OF MANITOBA

DESIGN CONSULTANT AGREEMENT

Date:

Requisition Number:

PROJECT:

CONSULTANT:

UNIVERSITY OF MANITOBA

Version February 2018

Index

UNIVERSITY OF MANITOBA

DESIGN CONSULTANT AGREEMENT

THIS AGREEMENT is made this day of , .

BY AND BETWEEN:

THE UNIVERSITY OF MANITOBA
(the "University")

AND

(the "Consultant")

FOR professional design consultant and related services required to develop a plan, a suitable design and to facilitate construction of:

(.... insert a concise description of the essential elements of the intended structure, its location, purpose, etc....)

(the "Project")

to be performed in accordance with the RFP issued date by the University together with all amendments thereto, the Consultant's Response(s) dated , and subsequent Responses to any clarifications, all of which are hereby incorporated into, and form part of this Agreement.

The University and the Consultant agree as follows:

ARTICLE I - DEFINITIONS

Where the following words or phrases appear in this document, they shall mean:

1.1 **Additional Consultants** – professional consultants other than the Consultant, retained directly by the University for the Project.

1.2 **Agreement -** the undertaking between the University and the Consultant to perform their respective duties, responsibilities and obligations set out herein.

1.3 **Authorized Budget -** the amount, at any given point in time, which the University has approved to cover the cost of any aspect or all of the Project Budget.

1.4 **Completion Date -** is the date for satisfactory performance of all services required under this Agreement justifying issuance under Article 6.18 of the **Consultant's Final Completion Certificate**.

1.5 **Contract Time** - the time agreed to by the University in the Contract for completion of the construction of the Project by the Contractor which time is thereafter to be reflected in the Project Schedule.

1.6 **Construction Budget** - the amount established by the University from time to time within which the Construction of the Project shall be completed.

1.7 **Construction Cost** – subject to Articles 6.15 and 6.16 of this Agreement, the Construction Cost shall be the Contract price(s) payable for all elements of the Project designed and specified by or on behalf of the Consultant including applicable taxes other than the GST ***and shall exclude*** permit fees, bonding costs, the cost of machinery or equipment for any part of the Project required for production, manufacturing, treatment or processing not designed or specified by or on behalf of the Consultant, compensation to any and all consultants including the Consultant, construction management fees, the cost of land including rights of way and all other costs which are the responsibility of the University and are not expressly included above. ***For purposes of this Project***, the following ***amendments*** to the above definition of 'Construction Cost' shall apply:

Additions

Deletions

1.8 **Contract -** the undertaking between the University and the Contractor for construction of the Project in accordance with the Contract Documents.

1.9 **Contract Documents** – the executed Contract between the University and the Contractor including drawings, specifications, general and supplementary conditions, and all other documents so defined within the Contract.

1.10 **Contractor -** the prime contractor retained by the University under the Contract to provide labour, material, equipment and to oversee sub-trades for execution of the Work.

1.11 **Program of Requirements -** a written statement issued by the University to the Consultant, now attached as **Schedule "A"** to this Agreement, describing the objectives of the University for the Project including the Target Date and setting out essential criteria for the design, construction and use of the Project. Schedule "A" may be modified from time to time as the Project progresses.

1.12 **Project Budget** - the University's authorized total expenditure for development and completion of the entire Project including consultant fees, the cost of construction, construction manager fees where applicable, costs of land, rights of way, and all other costs to the University for completion of the Project.

1.13 **Project Schedule -** the time schedule for development and completion of the Project approved from time to time by the University.

1.14 **Quality Commissioning Program -** a series of systematic, integrated and documented quality control processes prepared by the Consultant to verify the performance of building systems and components in terms of design, specification, installation, operation and maintenance. The Program shall be initiated prior to the Pre-design Phase and shall be concluded Post-Construction with an evaluation report which confirms that all building systems and components perform to the level of the design specifications and requirements or, where more stringent, to the most stringent of the manufacturer’s specifications or industry standards.

1.15 **Request for Proposals –** the University's request including all amendments and clarifications issued to the Consultant, calling for a proposal for the performance of the services contemplated by this Agreement, sometimes referred to herein as "the RFP".

1.16 **Sub-Consultants** - professional consultants registered with the requisite bodies and entitled to carry on their practices in Manitoba, and all other parties retained by the Consultant to provide architectural, engineering, costing, or other services for preparation of Contract Documents, evaluation of Tenders and administration of the Contract hereunder.

1.17 **Sub-Contractor** - a party with a direct contract with the Contractor for the performance of a part or parts of the Work or for supply of product(s) specially designed for the Work.

1.18 **Substantial Performance of the Work** - is the stage of the construction of the Work, which is prescribed by *The Builders' Liens Act* of Manitoba, and shall be so certified by the Consultant.

1.19 **Supplier** - a party with a direct contract with the Contractor for supply of product(s) or material(s) not worked to a special design for the Work.

1.20 **Target Date** – the date specified in Schedule "A" Program of Requirements, and thereafter revised from time to time, by which the University seeks to have the Work Substantially Performed.

1.21 **University Representative** - the person designated herein or by a subsequent notice to the Consultant in writing, who shall serve as the liaison between the parties to this Agreement.

1.22 **Warranty Period** – the University's standard one (1) year Warranty Period for the Work, and associated requirements for Post-Construction services by the Consultant may be extended or reduced by terms of the Contract.

1.23 **Work** - the construction and related services required by the Contract Documents.

ARTICLE II
STANDARD OF PERFORMANCE

2.1 The Consultant, being a registered member in good standing with the requisite bodies and being entitled to carry on its professional practice in Manitoba, shall exercise all reasonable skill, care, efficiency and diligence in the performance of its duties under this Agreement and shall carry out all of its responsibilities in a competent manner, in accordance with recognized professional standards and sound industry practices, in a manner satisfactory to the University Representative. In all matters hereunder, the Consultant shall act as a faithful advisor to the University. Insofar as any of its duties under this Agreement are discretionary, the Consultant shall act fairly as between the University and any third parties.

2.2 The Consultant shall retain full and unseverable responsibility for all the services, which it is obliged to provide under this Agreement. Where the Consultant uses the services of Sub-consultants or others to perform portions of its obligations, the Consultant shall be fully responsible to the University for performance of such work to the standards set out above.

2.3 No acceptance or approval by the University, whether express or implied, shall be deemed to relieve the Consultant, its principals, employees or agents of or from their professional or technical responsibility for the plans, specifications, drawings, calculations or other material prepared or assembled by or on behalf of the Consultant for the Project.

ARTICLE III
PERFORMANCE SCHEDULE

3.1 The Consultant shall complete performance of the following aspects of its service obligations by the following date(s):

a) Programming Phase by ;

b) Pre-design Phase by ;

c) Schematic Design Phase by ;

d) Design Development Phase by ; and

e) Construction Documents Phase by .

3.2 The balance of the Project Schedule including any changes to theTarget Date shall be established from time to time and agreed upon in writing by the University and the Consultant.

3.3 The Consultant shall use its best efforts to diligently complete its Scope of Services on a timely basis, without sacrificing quality, to ensure that total performance of the Construction Phase of the Project is achieved on or before the Target Date, and that all Post Construction Consultant services are performed in a competent manner, on a timely basis.

ARTICLE IV
CONSULTANT SERVICES AND RESPONSIBILITIES

General Provisions

Information Sufficient

4.1 The Consultant agrees to promptly give notice to the University's Representative in the event that the University has not provided adequate discussion and access to sufficient information to enable the Consultant to undertake the services contracted for and to complete same within the time and cost limits contemplated for the Project.

Cost Control

4.2 The Consultant acknowledges that the University, as a publicly funded institution, must operate within an inflexible system of financial accountability, which necessitates strict compliance with all stated limits and approval processes in respect of the Project Budget provided by the University.

4.3 If at any time the Consultant estimates that costs will exceed the Authorized Budget for the Project or for specific component(s) at issue, the Consultant shall immediately advise the University Representative, and if, in the opinion of the University Representative, the excess is due to design, cost factors or other matters within the control of or reasonably foreseeable by the Consultant, the University Representative may require the Consultant, at its expense and at no additional expense to the University, to promptly revise the design or take such other steps as may be necessary to bring that cost estimate within the Authorized Budget.

4.4 If the lowest tender for any part or phase or for the total Project in respect of which the Consultant prepared the design or estimates exceeds the Authorized Budget, the Consultant, at its own expense and at no additional cost to the University, shall, if so required by the University Representative, do all things necessary, including re-design within the University's prescribed standards, to bring the cost of the tendered work within the Authorized Budget.

4.5 In the event that the Consultant does not promptly comply with, or fails to meet the requirement to re-design or otherwise comply with the Authorized Budget, the work may be taken out of the Consultant's hands and, without prejudice to the University's rights under this Agreement or otherwise at law, the University Representative may take all such action considered necessary by the University Representative for the prompt and economical completion of the Project, and any fees thereafter payable to the Consultant shall be determined in accordance with Article VI of this Agreement.

Quality Commissioning

4.6 The Consultant shall have in place a quality control process to ensure that the level of service provided meets or exceeds industry and professional standards.

4.7.1 The Consultant shall provide a commissioning service that is integrated with the design and construction of the Project. This service shall be initiated with preparation of a commissioning plan and schedule that outlines the necessary tasks for the design and construction phases of the Project. The process shall include, but not be limited to, assembling design intent documentation based on the Owner's Performance Criteria, design reviews and approvals to confirm conformance with intent, identification of roles and responsibilities, scheduled interfaces with the design and construction activities, installation checklists, functional performance test descriptions, documentation of the tests with approval forms and final summary Project evaluation report. The summary report must verify that the building performance meets or exceeds the University's performance criteria and design intent.

4.7.2 The University shall be entitled to engage other professionals to carry out portions of the Quality Commissioning Program where, in the University's opinion, persons independent from the Consultant should instead provide such Commissioning Services, in which event, where applicable, the Consultant's fee shall be reduced accordingly.

4.8 As part of the commissioning service the Consultant must coordinate and ensure that the Contractor and Sub-contractors provide documentation and training for University personnel to ensure that the University can competently operate and maintain the equipment, component or system post completion of the Project.

Professionals Approved

4.9 The Consultant shall submit for approval the name, address and a resume stating the qualifications and experience of all professional persons including principals, employees, agents and Sub-consultants that the Consultant intends to utilize in the performance of the Consultant's duties under this Agreement. The Consultant shall thereafter notify and obtain the approval of the University Representative to effect any additions or changes to the approved list.

Time Schedule for Services

4.10 The Consultant shall submit to the University Representative for approval a detailed time schedule for the performance of its services for the Project. The Consultant shall adhere to the approved time schedule, and in the event that a change in the approved time schedule may become necessary, the Consultant shall so report on a timely basis to the University Representative and request revision to the approved schedule.

Basic Services

4.11 The Consultant shall provide and be responsible as prime consultant for the University for all design consultant services necessary to the satisfactory completion of the Project and, subject to prior approval by the University Representative, shall engage and be responsible for all associated professional services required within the original scope of the Project including but not limited to cost control services, commissioning services, structural, mechanical and electrical engineering services and all architectural services.

4.12 The Consultant's Basic Services shall include the co-ordination required to integrate all parts of the Project, including services and materials furnished directly by the University.

4.13 The Consultant shall schedule Project Meetings with the University Representative and such others as may from time to time be required, including Sub-Consultants, Additional Consultants, the Contractor, Sub-Contractors, and Suppliers commencing with the execution of this Agreement, and continuing thereafter as required, and normally at least bi-weekly. The Consultant shall attend as Chair and shall report the results of all such meetings by providing Minutes of each meeting to the University Representative, with copies to all other attendees, which Minutes shall be circulated within five (5) days of each meeting, to be followed with any corrections or amendments required thereto.

4.14 The Basic Services to be provided by the Consultant shall proceed through the Phases set out below.

Programming Phase

4.15 Unless provided by Additional Consultants, or by the University, the Consultant shall develop a 'Building Program' document for the Project involving a process leading to the statement of an architectural problem and the requirements to be met in offering solutions. The Consultant shall:

a) review and evaluate all information, objectives and the Program of Requirements for the Project;
b) meet with representatives of all user groups to gather information on the functions of the various spaces;
c) record all data gathered on individual room data sheets which indicate a conceptual space layout, required space dimensions, adjacency requirements with other spaces, any built-in equipment/furnishings and all required services;
d) provide block plans which illustrate the required working relationships between individual spaces;
e) identify and record the requirements for the form and quality of the Project and its' components;
f) summarize the area requirements of all spaces on a spreadsheet, grouped according to adjacency requirements, showing;
    i) total net area by department;

ii) total net area of all departments;
iii) assumed area for services;
iv) assumed area for circulation;
v) assumed area for wall assemblies; and
vi) final net to gross ratio;

g) review applicable statutes, regulations, codes and by-laws for impact on Project planning and quality;
h) on the basis of the area summary, and considering the form and quality requirements, provide a Class 'D' cost estimate, complete with allowances for site development, any demolitions and all soft costs; and
i) provide an outline schedule of the basic phases necessary for completion of the Project.

Pre-design Phase

4 .16 The Consultant shall:

a) review and evaluate all information, objectives and the Program of Requirements for the Project provided by or on behalf of the University;
b) review and evaluate the characteristics of the designated site;
c) advise of the need for any further information or data including surveys, borings, soundings, soil reports and/or existing record drawings and equipment data information;
d) furnish estimates of the time needed to complete the Project;
e) comment upon the University's Construction Budget in relation to its Program of Requirements;
f) review alternate approaches to the design of the Project, and, if appropriate, options for scheduling and procurement as well as optional types of construction contracts; and
g) review applicable statutes, regulations, codes and by-laws and where necessary review same with the authorities having jurisdiction.

Schematic Design Phase

4.17 The Consultant shall take into account all Pre-design Phase revisions and amendments made to the original Program of Requirements, the Project Schedule and Construction Budget, and then shall:

a) prepare and provide as required by the University's Representative, copies of schematic design options in sufficient detail to reveal and illustrate the outline of the Consultant's design proposal;
b) illustrate the scale and character of the Project and how the functional parts of the Project inter-relate;

c) prepare and submit a Construction Cost estimate based on the current area and volume of unit costs anticipated;
d) comment on any anticipated impact upon the University's Project Schedule of the design proposal; and
e) modify the outline of the Consultant's design proposal as required to obtain the University's approval to proceed.

Design Development Phase

4.18 Based upon University approval of a schematic design, the University's Authorized Budget for Construction Costs, and the Project Schedule of the University then in effect, the Consultant shall:

a) prepare and provide preliminary drawings, specifications and any other design development documents including but not limited to the architectural, structural, mechanical and electrical systems, necessary to show layout elevations and sections, all in detail and at scales sufficient to show the size and character of the entire Project, the intent of the design proposal and to indicate the type of materials and all other items pertinent to the construction of the Project;
b) ensure that the design development documents comply with all statutes, regulations, codes and by-laws applicable to the Project;
c) obtain the required permits, consents and approvals for all services required by the design development documents; and
d) prepare and submit to the University Representative a revised Construction Cost estimate.

Construction Document Phase

4.19 Based upon the University's approval of the design development documents with any modifications made by the University to its Program of Requirements, Authorized Budget and Project Schedule, the Consultant then shall:

a) prepare in detail final drawings, specifications and any additional design documents necessary for procurement of prices and construction of the Project within the Authorized Budget for Construction Costs;
b) ensure that the final design documents comply with all statutes, regulations, codes and by-laws applicable to the Project and where necessary review same with the authorities having jurisdiction;
c) make application and obtain all necessary consents, approvals, licences and permits on a timely basis;
d) advise the University of any and all changed requirements or general market conditions, which necessitate adjustment to the Program of Requirements, to the Authorized Budget for Construction Costs, and/or to the final design documents;

e) advise the University respecting its selection of the most appropriate procurement process(s);
f) prepare necessary bidding information and bidding forms; and
g) advise the University on forms including conditions appropriate to the Construction Contract award.

Bidding or Negotiating Phase

4.20 Following approval by the University of the construction documents, the Consultant shall:

a) advise and assist the University with all aspects of the tender or other selected procurement process(s);
b) review and evaluate all tenders or proposals received in respect of construction of the Project and, proceeding fairly, advise the University in respect of apparent merits or defects in same;
c) re-design as directed by the University's Representative to seek and, if possible, obtain pricing within the Authorized Budget for Construction Costs;
d) advise and assist the University in the fair conduct of all required negotiations with contractors;
e) prepare and attend to obtaining the timely execution by the University and by the Contractor of all contracts for construction of the Project.

Construction Phase - Contract Administration

4.21 The Consultant shall review the Project during the Construction Phase to ensure that construction is done in conformance with the general design concept and intent of the drawings and specifications included in the Contract Documents and that construction services are performed in accordance with the Project Schedule and provisions of the Contract.

4.22 The Consultant shall:

a) advise and consult with the University Representative;
b) have access to the Work at all times during the currency of this Agreement;
c) forward all instructions from the University to the Contractor;
d) examine, evaluate and report to the Representative of the University upon representative samples of the Work;
e) keep the University Representative informed of the progress and quality of the Work, and submit a written report to the University Representative at least bi-weekly respecting the progress, defects and deficiencies in the Work observed during the course of site reviews;

f) determine the amounts owing to the Contractor under the Contract based on the Consultant's observations and evaluation of the Contractor's application(s) for payment;

g) issue certificates for payment in the value proportionate to the amount of the Contract, of work performed and products delivered to the Place of the Work;

h) in the first instance, interpret the requirements of the Contract Documents and make findings in good faith as to the performance thereunder by both the University and the Contractor;

i) render interpretations in written and graphic form as may be required, including the provision of further scale construction details as necessary to explain, clarify and indicate services required to be done to complete the Project and do so with reasonable promptness on the request of either the University or the Contractor;

j) render written findings within a reasonable time and in good faith, on all claims, disputes and other matters in question between the University and the Contractor relating to the execution or performance of the Work or the interpretation of the Contract Documents;

k) render interpretations and findings consistent with the intent of and reasonably inferable from the Contract Documents, showing partiality to neither the University nor to the Contractor, with no liability for the result of any interpretation or finding rendered in good faith in such capacity;

l) have the authority to reject work, which does not conform to the Contract Documents, and whenever, in the Consultant's opinion, it is necessary or advisable for the implementation of the intent of the Contract Documents, have the authority to require special inspection or testing of work, whether or not such work has been fabricated, installed or completed;

m) review and take other appropriate action with reasonable promptness upon such Contractor's submittals as shop drawings, product data, and samples, for conformance with the general design concept of the Work as provided in the Contract Documents;

n) advise the University Representative on the appropriateness and validity of all requests for changes in the Work;

o) prepare Proposed Change Notices and Change Directives for review and approval by the Representative of the University;

p) review and advise the Representative of University respecting the reasonableness of all pricing for proposed changes;

q) recommend to the Representative of the University the preparation and issuance of required Change Orders, review Change Orders thereafter drafted by the University, and sign off on same when the costing and description of the change conform to the Consultant’s recommendations

r) furnish supplemental instructions to the Contractor with reasonable promptness or in accordance with a schedule for such instructions agreed to by the Consultant and the Contractor;

s) participate in the commissioning of all aspects of the equipment and building operations for the Project;

t) determine the date of and certify Substantial Performance of the Work;
u) list and value all deficiencies required to be completed by the Contractor prior to final completion of the Construction Phase of the Project and provide the list to the Contractor and to the University Representative;
v) receive from the Contractor and review for completeness and accuracy all written warranties , guarantees, operating manuals and related documents, prior to forwarding same to the Representative of the University;
w) verify the validity of the Contractor's application for final payment and issue a certificate of final payment;
x) ensure compliance with Manitoba statutory holdback and release requirements;
y) carry out such further inspections as are necessary to ensure that all deficiencies are rectified prior to issuance of the certificate of final completion; and
z) prior to the end of the Contract warranty period, or any extension thereof, review any defects or deficiencies which have been reported or observed during that period, and notify the Contractor in writing of those items requiring attention by the Contractor to complete the Work in accordance with the Contract.

4.23 The Consultant acknowledges that in its dual roles as Project designer and interpreter of the Contract Documents the potential exists for the Consultant to be in a conflict of interest position and hence the Consultant expressly undertakes and agrees to disqualify itself from the role of interpreter of the Contract Documents in any particular circumstance where either the University Representative or the Consultant reasonably forms the opinion that the Consultant, through error or omission, neglected to adequately disclose in the Contract Documents the University's intent as required by the Program of Requirements. Upon failing to disqualify itself and proceeding to make a determination in such circumstances, the Consultant shall be deemed not to be acting in good faith.

Post Construction Services

4.24 The Consultant shall review a complete set of Record Documents, completed by the Contractor, to ensure conformance with the Project, and University CAD standards.

4.25 Not less than thirty (30) days prior to the end of the Warranty period provided in the Construction Contract or any extension thereof, the Consultant shall inspect the Work to ensure that the Contractor has remedied all defects and failures in the Work and, when the University's Representative and the Consultant are both satisfied to this effect, shall confirm to the University in writing that all defects and failures have been satisfactorily remedied.

Additional Services and Reimbursable Expenses

4.26 The Consultant agrees to provide such Additional Services and Reimbursable Expenses as are described and for the compensation provided in **Schedule "B"** to this Agreement.

ARTICLE V
RESPONSIBILITIES OF THE UNIVERSITY

Project Requirements

5.1 The University will provide to the Consultant information respecting the University's objectives for the Project including the Program of Requirements set out in Schedule “A” and shall be at liberty to modify or abandon its Program of Requirements at any time on written notice to the Consultant.

Budget Limits

5.2 The University shall provide to the Consultant:

a) such particulars respecting the Project Budget as the University deems necessary;
b) parameters respecting the Budget anticipated for Construction Costs as they become available; and
c) not later than commencement of the Construction Document Phase the University shall provide the Construction Budget provided that the University shall at any subsequent time be entitled for reasonable cause and with written notice to the Consultant, to revise the Construction Budget.

Site Assessment

5.3 The University shall provide to the Consultant, with appropriate qualifications as to their accuracy and completeness:

a) surveys available for the Project site describing legal limitations, utility locations, grades, lines of streets, alleys, pavements, adjoining property and structures, adjacent drainage, rights of way, restrictions, easements, encroachments, zoning, boundaries, contours of the site, data pertaining to existing buildings, other improvements and trees;
b) subsurface investigation reports available including test borings, test pits, determination of soil bearing values, percolation tests, a list and evaluations of toxic and hazardous substances and materials present at the Project site, ground corrosion and

resistivity tests, including necessary operations for anticipating subsoil conditions and appropriate professional recommendations;

c) air and water pollution tests, tests for toxic and hazardous substances and materials, structural, mechanical, chemical, and other laboratory and environmental tests, inspections, laboratory and field tests and reports required by the authority having jurisdiction or the Contract Documents, if available; and

d) digital site plan and existing building outline drawings.

5.4 The University may request, whereupon the Consultant shall arrange for Additional Consultants and others to be retained by the University to conduct surveys, investigations and reports as required.

Project Services

5.5 The University shall be entitled to audit and verify the values certified by the Consultant for payment, and the uses made of all Project monies paid by or on behalf of the University.

5.6 The University may provide legal, accounting and insurance counseling services for the Project as it deems fit.

5.7 The University Representative shall prepare, obtain appropriate signatures and shall distribute all approved Change Orders.

University Representative

5.8 The University hereby authorizes the following person to act as its Representative for all purposes described in this Agreement:

Name
Position

5.9 The University shall give notice in writing of any change in the appointment of its Representative for the purposes of this Agreement or for specific aspects of the Project.

Permits

5.10 The University shall pay the cost of all required consents, approvals, licences and permits necessary for the development and use of the Project site.

Decisions

5.11 The University will give due consideration to all sketches, drawings, specifications, tender terms and documents, proposals, Contract and other documents; to all notices of claims or disputes; and will endeavor to provide such instructions, acceptances, information, advice or decisions as are required, in a

timely manner, and where appropriate, in writing, to enable the Consultant to proceed in accordance with the Project Schedule and the University's Budget.

ARTICLE VI
PAYMENT FOR SERVICES

6.1 The University will pay for the services rendered under this Agreement in the following manner, provided that the Consultant performs the services contemplated herein to the completion of the Project in a manner satisfactory to the University's Representative**.**

Basic Services Fee Options

6.2 The University and the Consultant have agreed that the Consultant's Basic Services Fee shall be calculated in accordance with the option selected below:

Percentage Fee

6.3 The Basic Services Fee shall be % of the lesser of :

i) the Construction Cost, or

ii) the approved Construction Budget.

OR

Fixed Fee

6.4 The Basic Services Fee shall be $.

OR

Time Rates

6.5 The Basic Services Fee shall determined as follows:

a) for the work of the principals of the Consultant named in Schedule "B" to this Agreement, as amended from time to time, the Consultant shall be paid a per diem rate of $;

b) for the work of professional and non-professional staff of the Consultant, the Consultant shall be paid payroll costs approved by the University Representative multiplied by a factor of ;

c) overtime will not be paid in respect of principals subject to a per diem rate;

d) authorized overtime will be paid on the basis of payroll costs for normal working hours multiplied by the above factor plus the additional salary cost paid to the staff person(s) by the Consultant. The multiplying factor will not be applied to these additional or premium salary costs; and

e) if traveling is done in normal working hours, the time so used is chargeable as time worked. If traveling is done outside of normal working hours the time is chargeable up to a maximum of 3 hours per day. In any event, not more than 8 hours in any one day shall be claimed for an individual's time spent traveling.

Payment Stages for Basic Services Fee

For a Fixed or Time Rate Fee

6.6 The Consultant shall submit at monthly or at other approved intervals during performance of this Agreement, an account detailing the services performed for review and, if satisfactory, for certification and approval for payment by the University Representative.

For a Percentage Fee

6.7 The Consultant's approximate Basic Services Fee shall be calculated on the basis of the University's estimated Construction Costs until the time of the Contract award, and adjusted to actual thereafter in accordance with the provisions of Article 6.3 above

6.8 The approximate Basic Services Fee shall be apportioned for advances (and reconciliation when the actual Basic Services Fee is finally determined) according to Phases of the Consultant's performance as follows:

a) upon completion of the Pre-Design, if applicable %;

b) upon completion of the Schematic Design Phase %;

c) upon completion of the Design Development Phase %;

d) upon completion of the Construction Documents Phase %;

e) upon completion of the Bidding or Negotiating Phase %;

f) upon completion of the Construction Phase %;

g) Post-Construction including – 1 year Warranty Period %;

6.9 The advances or interim payments specified in Article 6.8 above become payable upon approval by the University Representative.

Failed Procurement

6.10 If, for reasons within the control of, or reasonably foreseeable by the Consultant, no tender or proposal is received upon issuance of the Construction Documents

for an amount within the University's Construction Budget, the Consultant shall not be entitled to receive any payment in respect of fees except the payments, if any, already made pursuant to Article 6.8 above.

Abandonment of the Project

6.11 If the University should decide not to call for tenders or not to award a contract for the construction of the Project or for any portion thereof within 120 days of the date of acceptance and approval of the Construction Documents by the University Representative, the Consultant shall account for all Basic Services Fee advances or interim payments received and shall be entitled to such additional amount as may be required to pay not more than 3/4 of the total Basic Services Fee agreed. The Basic Services Fee shall be based, for the purpose of this Article, on the lesser of the lowest acceptable tender or proposal received and the Construction Budget.

Additional Service Fees

6.12 In addition to the Basic Services Fee, the University shall pay the Consultant for Additional Services in accordance with **Schedule "B"** attached to this Agreement.

Reimbursable Expenses

6.13 The University will pay the Consultant for expenditures listed and accordance with provisions set out in **Schedule "B"** attached to this Agreement.

Time for Payment

6.14 The University will pay all approved fees and expenses within 45 days of the invoice date. Where approval is delayed or denied within this period, the University Representative will so advise the Consultant providing reasons for the rejection or delay.

Errors, Omissions and Change Order Costs

6.15 Notwithstanding any other provision of this Agreement, no fee payment will be made by the University for the cost of consultant services incurred to remedy errors or omissions for which the Consultant is responsible.

6.16 The Consultant’s fees payable under this Agreement shall not increase under any fee option selected in relation to the cost of Change Orders for the Work unless those Changes result from:

a) unforeseen conditions discovered post Contract Award; or
b) University changes to the Program of Requirements, post-Tender.

Changes in Design After Construction Documents

6.17 If the University requires changes in design or revisions after approval of the Construction Documents for reasons other than design and cost factors within the control of the Consultant, the University will accordingly adjust the Construction Budget, or, at its option, pay the Consultant for the extra services required a further amount to be negotiated between the parties.

Satisfactory Issuance of the Consultant's Final Completion Certificate

6.18 For all purposes if this Agreement, including Article 6.8 (g) above, the term **'Consultant's Final Completion Certificate'** shall mean:

a) "as built" or Record Documents have been completed by the Contractor, reviewed by the Consultant, drawing and specification deficiencies have been resolved by the Contractor, as required;
b) all deficiencies and outstanding warranty issues have been resolved with the Contractor;
c) the Consultant has provided satisfactory proof that its financial obligations on the Project have been fully paid; and
d) the Consultant has provided a final report, which has satisfied the University Representative that all Consultant services on the Project are fully complete.

ARTICLE VII
GENERAL CONDITIONS

Insurance

7.1 The Consultant shall maintain at its own expense and without limiting its liability hereunder, professional liability insurance to a maximum of:

a) $2,000,000.00 (annual aggregate) for projects with a construction value under $5,000,000.00. Insuring against any and all loss, costs or damage, which may result from its performance of services hereunder.
b) $5,000,000.00 (annual aggregate) for projects with a construction value over $5,000,000.00. Insuring against any and all loss, costs or damage, which may result from its performance of services hereunder.

7.2 The Consultant shall maintain at its own expense and without limiting its liability hereunder, general liability insurance to a maximum of 2,000,000.00 (annual aggregate), insuring against any and all loss, costs or damage, which may result from its performance of services hereunder. The policy shall stay in place until receipt of Contractors General Liability Insurance Certificate.

7.3 The Consultant shall, upon request from the University Representative, provide a copy of its insurance policy covering the Project for review.

Ownership and Use of Documents

7.4 All surveys, reports, drawings, calculations, designs, plans, specifications and other data, information and material collected, compiled, drawn or produced by computer, hard copy or otherwise pursuant to this Agreement are the property of the University including the copyright and all moral rights in same, which vest in the University.

7.5 The Consultant may retain one complete set of the material described above for its records and the University will make the originals available to the Consultant for all proper and reasonable purposes following termination or completion of the Consultant's services under this Agreement.

7.6 No further use of the material will be made by any person unless the Consultant's name and any professional seal are obliterated or are discussed and left in place with the consent of both parties to this Agreement. The Consultant shall not be deemed to warrant the fitness of the material for such further use, nor shall any future use by the University or others authorized by the University constitute an infringement of copyright or of any other right, nor shall the University or others it may so authorize be obligated in any way to compensate the Consultant for such use or uses, with or without obliterations.

Conflict of Interest

7.7 The Consultant represents and hereby declares that it presently has no pecuniary or other conflicting interest, which could compromise or impair the Consultant's objective performance of its duties under this Agreement. Furthermore, the Consultant undertakes to immediately disclose to the University Representative any such interest arising during the course of its performance and thereafter, to address the conflicting interest as the University Representative may require and direct.

University Employee Policies

7.8 The Consultant acknowledges that in the event that any of its principals, employees, or Sub-consultants may be or become an employee of the University during the course of the Project, that person's service obligations hereunder shall not be undertaken on the University's time or using the University's facilities or resources. All such University employee relations shall be disclosed to the University Representative and the University's Policy 609 "Additional Payments to Employees" shall apply.

Dispute Resolution

7.9 In the event that any dispute arises between the Consultant and the University in respect of this Agreement:

a) the University Representative and the Project representative of the Consultant shall promptly enter into discussions, and shall exert commercially reasonable efforts to reach a reasonable and equitable resolution of the issue;

b) if the above representatives are unable to resolve the issue within 10 days, the matter shall be referred to a member of senior administration of the University and a member of senior management of the Consultant, who shall use commercially reasonable efforts to reach a reasonable and equitable resolution of the issue within 5 days, failing which;

c) the matter shall be decided by the Vice-President, Administration of the University whose decision shall be final; and

c) where the Consultant is dissatisfied with such final determination, recourse may be had to the Court of Queen's Bench of Manitoba, or to any alternative method of dispute resolution agreed to by the parties.

Suspension

7.10 The University may, at any time, by notice in writing, suspend all or any part of the services of the Consultant under this Agreement whereupon:

a) the Consultant shall immediately minimize payroll costs and operating expenses, and within 10 days of the notice, shall deliver to the University Representative a schedule of net expenses for the suspension period in respect of which a claim will be made; and

b) the University Representative will give due consideration to the claim and will approve such payment as is, in the opinion of the University Representative, fair and appropriate.

Termination

7.11 The University may terminate this Agreement at any time by a notice in writing mailed, faxed or delivered to the Consultant, and the Consultant's entitlement to payment thereafter shall be limited to:

a) services actually performed up to the time notice is given, calculated in accordance with and pursuant to the terms of this Agreement; and

b) such further amount as will, in the opinion of the University Representative, whose decision shall be final, compensate the Consultant for reasonable expenses actually incurred after the date of termination, which amount shall be certified and approved as a condition precedent to becoming payable.

Set-Off

7.12 The University shall be entitled to exercise a right of set-off under this Agreement which right may be exercised to recover costs or expenses resulting from an act of default or negligence by the Consultant. Any payment approved or made in respect of a Phase or part of a Phase of the Consultant's services hereunder shall not be deemed a waiver of this right. At no time shall the University be obliged to pay fees for services, which have not been performed, to the satisfaction of the University Representative, acting reasonably.

Indemnity

7.13 The Consultant shall defend, indemnify and save harmless the University from and against all claims, losses, damages, costs, actions and proceedings arising from any negligent act or alleged negligent act of the Consultant or of any person for whom the Consultant has responsibility under this Agreement. This indemnity shall not be limited by the maximum coverage available under the professional liability insurance policy and the general liability insurance policy, which the Consultant is required by Article 7.1 and 7.2 above to maintain.

Notices

7.14 Any notice or other communication required to be given under this Agreement shall be given in writing and delivered by hand, prepaid courier, email or by facsimile transmission to the persons and addresses set out below:

a) To the University Representative:

Name

Title and Address

Address

Email Address
Fax No. 204-474-7565

b) To the Consultant:
Firm Name

Representative

Address
Address

Email Address
Fax No.

7.15 All notices shall be deemed received the first business day following confirmed delivery by any of the methods set out above.

Amendments

7.16 No amendment to this Agreement shall be binding unless made in writing, dated, and executed by representatives of both parties, duly authorized in that behalf.

Entire Agreement

7.17 This Agreement represents the entire agreement between the University and the Consultant and supercedes all prior negotiations, representations and agreements, written and oral.

Governing Law

7.18 This Agreement shall be governed by and construed in accordance with the laws of Manitoba, and the parties further agree that they will attorn to the jurisdiction of the Manitoba Court of Queen's Bench (Winnipeg Centre) in all actions taken with respect to this Agreement.

Interpretation

7.19 All Schedules, Appendices, Amending documents and other attachments hereto duly dated and signed by both parties shall be deemed to be part of this Agreement. To resolve any conflict between these Articles of Agreement and various attachments hereto, the following guides to interpretation shall apply:

a) the intention of the parties shall first be drawn from the Articles hereof;

b) exceptions, additions or amendments to the basic obligations of the parties as set out in the Articles may be provided in Schedules, Appendices or other properly executed attachments to this Agreement, and should therefore be given force and effect if clear in such intent, PROVIDED ALWAYS that

   i) the relevant term(s) in the latest document to be signed by the parties shall prevail; and

   ii) the Consultant shall be bound to provide services in accordance with the intent of the University as set out in the RFP UNLESS the Consultant has expressly deviated therefrom in a written Response which has been incorporated into and made part of this Agreement.

7.20 If any provision of this Agreement is found by a court of competent jurisdiction to be null or void, the remainder of the Agreement shall continue in full force and effect.

7.21 The Ownership and Use of Documents, Set-off, Indemnity, Governing Law and Interpretation provisions of this Agreement shall survive termination or expiry of this Agreement.

Successors and Assigns

7.22 This Agreement:

a) may not be assigned in whole or in part without the written consent of the University Representative;

b) enures to the benefit of and is binding upon the University, its successors and upon the Consultant, its successors and permitted assigns.

ARTICLE VIII
ADDITIONAL TERMS

8.1 The following terms are added to this Agreement by the parties and shall form part of this Agreement.

IN WITNESS WHEREOF the Parties hereto have executed this Agreement by the hands of their duly authorized, proper officers as of the date first above written.

(Name of the Consultant)

_____ Per:_____
Officer authorized

Witness

THE UNIVERSITY OF MANITOBA

Per:_____

Jaret Klymchuk

UNIVERSITY OF MANITOBA

DESIGN CONSULTANT AGREEMENT

SCHEDULE "A"
Program of Requirements

SCHEDULE "B"

Additional Services/Reimbursable Expenses

Schedule A
Program of Requirements

Schedule B
Reimbursable Expenses and Additional Services

B1 REIMBURSABLE EXPENSES

B1.1 The percentage added to the reimbursable expenses for administrative services shall be 0%.

B1.2 Reimbursable expenses include only those reasonable expenses incurred by the Consultant for the particular Project(s) of this Agreement, but excluding general items such as cell phone charges, local facsimile and phone charges. Acceptable reimbursable expenses can include

- Travel, meals and accommodation for trips beyond 20 kilometers of the Winnipeg perimeter, as defined by the perimeter highway. Automobile travel to be charged at $0.30 per kilometer. (Note: where a portion of the Consultant team is not based in Winnipeg, all their respective travel, meals and accommodation must be included in the Basic Services fee.)
- Courier charges, postage.
- Photocopy, laser printing and facsimile printouts @ $0.10/page.
- Long distance telephone and long distance facsimile transmissions.
- Photographs, for one set of prints and the negatives (turned over to the University) and one set of prints retained by the Consultant.
- Check print plotting for University reviews as requested or at a minimum of Schematic design, Design Development, 30% Contract Documents, 60% Contract Documents and Pre-bid Contract Documents. Plotting to be charged at $1.60/sq. ft.
- Normal printing of above plots for review and/or coordination by Consultant Team, University, Code authorities, Special Consultants, etc. Printing to be charged at $0.15/sq. ft.
- Colour printing for milestone project presentations and handouts.

B1.3 All reimbursable expenses must be supported by receipts and/or summary logs, attached to each progress payment claim form, and clearly summarized by category on a separate sheet, c/w sub-totals.

B2 PROVISION OF ADDITIONAL SERVICES

B2.1 The additional services described in this schedule are not included in the Consultant's basic services unless identified in Schedule A or the University's Request for Proposal. The Consultant shall only provide these additional services if authorized by the University.

B3 ADDITIONAL PROJECT REPRESENTATION

B3.1 Providing more exhaustive or continuous on site review or representation.

1. If more extensive representation at the site, other than as described in Article IV, Consultant Services and Responsibilities, Construction Phase, Sentences 4.21, 4.22, 4.23, is required, the University may require that the Consultant provide one or more Project representatives to assist in carrying out such additional site review responsibilities.
2. Such Project representatives shall be selected, employed, and directed by the Consultant, and the Consultant shall be compensated as agreed in writing by the University and Consultant.

B4 OTHER ADDITIONAL SERVICES

B4.1 Providing special costing studies beyond the Cost Control responsibilities described in Article IV.

B4.2 Providing alternate site evaluations, planning surveys, or comparative studies of prospective sites.

B4.3 Providing special surveys, environmental studies and submissions and other related services required for approval by authorities having jurisdiction over the Project, except for those set out in Article IV Consultant Services and Responsibilities, including submission for zoning changes, variances from by-laws or site plan approvals necessary for proceeding with the Project.

B4.4 Providing services relating to future facilities, systems and equipment, except for future planning considerations required in Schedule A and/or the RFP.

B4.5 Providing detailed inventories of material and equipment, or analyses of owning and operating costs.

B4.6 Providing graphic design, signage design and other consulting services required for or in connection with the selection, procurement or installation of furniture, furnishings and related equipment.

B4.7 Preparing models or architectural renderings specifically commissioned by the University.

B4.8 Preparing documents for sequential bids or providing extra services in connection with bidding, negotiation, or construction prior to the completion of the construction documents phase.

B4.9 Co-ordinating construction work performed by separate contractors or by the University's own forces and co-ordinating the services required in connection with construction performed and equipment supplied by the University.

B4.10 Providing services in connection with the Work of a construction manager, or separate consultants retained by the University.

B4.11 Providing services after expiry of the period of one year following the date of Substantial Performance of the Work, except for the correction of deficiencies.

B4.12 Revising or providing additional drawings, specifications or other documents which are:

1. caused by instructions that are inconsistent with instructions or written approvals previously given by the University;
2. caused by the enactment or revisions of statutes, regulations, codes or by-laws, subsequent to the preparation of such documents;
3. caused by an interpretation by the authorities having jurisdiction which differs from the Consultant's interpretation of statutes, regulations, codes and by-laws, which difference the Consultant could not have reasonably anticipated, or
4. due to changes required as a result of unreasonable delays in decisions rendered by the University.

B4.13 Providing services required because of significant changes in the Project including size, quality, complexity, or the method of bidding or negotiating and contracting for construction. Where the Agreement is based on a percentage fee, and the approved Project value is increased due to increased size, quality or complexity, the percentage fee shall be adjusted downward in accordance with fee percentage rates suggested by the MAA Fee Guidelines.

B4.14 Preparing drawings, specifications and supporting data and other services in connection with evaluating significant changes or substitutions to the Project, proposed by the Contractor.

B4.15 Making detailed inventories of materials and equipment, valuations and detailed appraisals of existing facilities.

B4.16 Providing services made necessary by the default of the Contractor, by major defects or deficiencies in the Work of the Contractor, or by failure of performance by either the University or Contractor under the Contract.

B4.17 Providing consultation concerning replacement of any work damaged by fire or other cause during construction and furnishing services as may be required in connection with the replacement of such work.

B4.18 Providing services in support of the University in connection with any public hearing, mediation, arbitration proceeding, or legal proceeding.

B4.19 Providing for services of consultants for other than the architectural, structural, mechanical and electrical engineering portions of the Project provided as a part of the Consultant's basic services.

B4.20 Translating documents into a language other than the language of this Agreement.

UNIVERSITY OF MANITOBA | Physical Plant
Architectural & Engineering Services

89 Freedman Crescent
Winnipeg, Manitoba
Canada, R3T 2N2

CONSULTANT PERFORMANCE EVALUATION

Consultant

Project:

Type of Work:

Consultant Contact

Role of Consultant

Date:

Req#:

AES Rep

Original Bid Value:	$0.00
# of Change Orders:	0
$ of Change Orders:	$0.00
Final Value w/ CO's:	$0.00
% Over Orig Const Value:	0.00%

Scope of Work: *Provide brief description*

Performance Evaluation **Contractor Evaluation Total Score:** **0%**

Questions are to be answered Y/N, if the question is not relevant at the time of review please indicate N/A. A single rating is given for the overall section. Comments must be added to support and justify your rating.

	Section 1 - Project Work (Design)	**Y / N**
1	Did the Contractor promptly commence the work?	
2	Did the Consultant have a capable Project Manager throughout the project?	
3	Did the Consultant maintain a single full-time Project Manager during the project?	
4	Did the Consultant adequately staff the project to meet the schedule?	
5	Did the Consultant accurately utilize the University of Manitoba CAD standards?	
6	Were existing site conditions fully investigated by the Consultant team?	
7	Were documents submitted in accordance with agreement requirements?	
8	Did the Consultant work to actively resolve design challenges and cooperate with User Groups?	
9	Did the Consultant suggest solutions and display initiative when dealing with challenges?	
10	Did the Consultant manage and coordinate the work of sub-consultants?	
11	Did the Consultant proactively manage the Scope, Schedule and Budget?	

Level 1	Level 2	Level 3	Level 4	
0 - 59	60 - 69	70 - 89	90 - 100	0%
			% of Overall (Max 30)	**0%**

Comments *Evaluator must provide comments to support and justify the rating*

Project Work (Construction)		Y / N
1	Did the Consultant have a capable Contract Administration person assigned to the project?	
2	Did the Consultant work proactively to investigate, resolve challenges and coordinate the Contractor?	
3	Did the Consultant review shop drawings and other submittals in a timely manner?	
4	Did the Consultant comply with U of M and Contractor policies and procedures while on site?	
5	Did the Consultant promptly coordinate with the Contractor to identify and address deficiencies?	

Level 1 0 - 59	Level 2 60 - 69	Level 3 70 - 89	Level 4 90 - 100	0%
			% of Overall (Max 20)	**0%**

Comments *Evaluator must provide comments to support and justify the rating*

Section 3 - Communication & Documentation		Y / N
1	Did the Consultant provide an accurate schedule prior to commencing work?	
2	Did the Consultant communicate effectively with the AES representatives?	
3	Did the Consultant effectively organize and manage RFI's throughout the project?	
4	Did the Consultant prepare clear and accurate PCN's, CO's, SI's etc., throughout the duration of the project?	
5	Did the Consultant communicate effectively and efficiently with all Authorities Having Jurisdiction (AHJ)?	
6	Did the Consultant coordinate building permit applications and submissions effectively and efficiently?	
7	Did the Consultant ensure the sub-consultants had appropriate representation at meetings?	
8	Did the Consultant lead project meeting communications to provide clarity and effectively resolve conflict or d	
9	Did the Consultant submit accurate and timely certificates of payment with required supporting documentatio	
10	Did the Consultant regularly maintain and adjust schedule to reflect changes?	
11	Did the Consultant provide regular, timely and detailed site reports to UofM standards?	

Level 1 0 - 59	Level 2 60 - 69	Level 3 70 - 89	Level 4 90 - 100	0%
			% of Overall (Max 30)	**0%**

Comments *Evaluator must provide comments to support and justify the rating*

Section 4 - Project Closeout		Y / N
1	Did the Consultant follow up with the contractor regarding as-built drawings prior to the final inspection?	
2	Did the Consultant submit Substantial Performance and Total Performance documentation in a timely manne	
3	Did the Consultant coordinate final inspection in a timely manner?	
4	Did the Consultant prepare deficiencies and/or a warranty list and follow up with the Contractor in a timely m	
5	Is the Consultant promptly following up with the contractor to address warranty issues?	

Level 1	Level 2	Level 3	Level 4	0%
0 - 59	60 - 69	70 - 89	90 - 100	
			% of Overall (Max 20)	**0%**

Comments

Evaluator must provide comments to support and justify the rating

Contractor Evaluation Total Score: **0%**

Scoring Results

Level	*Range*	*Category*	*Detail*
4	***90% - 100%***	**Exceeds Job Expectations (EE)**	***Performance expectations and requirements are consistently and significantly exceeded in many areas of responsibility.***
3	***70% - 89%***	**Meets Job Expectations (ME)**	***Performance expectations and requirements are consistently met in all areas of responsibility.***
2	***60% - 69%***	**Partially Meets Expectations (PM)**	***Performance expectations and requirements are not consistently met in all areas of responsibility. Further development and improvement in some areas of***
1	***below 59%***	**Does Not Meet Expectations (NM)**	***Performance consistently fails to meet expectations. Requires immediate and significant improvement.***

Consultants will receive a letter along with the completed evaluation form detailing their performance on the project.