



**REQUEST FOR PROPOSAL
FOR THE PROVISION OF CONSULTANT SERVICES FOR**

APEX CEMETERY EXPANSION

PROPOSAL CALL: April 6, 2023

PROPOSALS DUE: April 27, 2023, at 3 PM EST

2023-RFP-046

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1. PROJECT OVERVIEW

The City is seeking to retain a Consultant to provide detailed design and construction administration services for the Apex Cemetery Expansion project. The Consultant's team will be retained to provide technical and professional services for the Project.

The City invites individual firms or consortiums of firms to submit Proposals for the above-referenced Project in accordance with the terms and conditions of this Request for Proposal document.

1.1 Background

1.1.1 Location

Iqaluit is the capital of the Nunavut Territory and is located at the south end of Baffin Island near the end of Frobisher Bay (63°45'N latitude and 68°31'W longitude). Access to Iqaluit is provided by regular scheduled commercial aircraft year-round, snowmobile trails from other Baffin Island communities in the winter, and sealift from the port of Montreal and Valleyfield in the summer.

1.1.2 Geology and Terrain

Iqaluit's location is above the tree line and within the permafrost zone of Canada. The region generally consists of glacially scoured igneous/ metamorphic terrain. In some locations, a thin layer of organic material is found.

1.1.3 Climate

Iqaluit has an Arctic climate with an average January temperature of -21.5°C and July average temperature of 8°C. The annual precipitation is made up of 19.2 cm of rainfall and 255.0 cm of snowfall for a total of 43.0 cm of precipitation. The prevailing winds are northwest at 16.7 km/hr.

1.1.4 City Growth and Population

The City is the newest Capital City in Canada and as a result has experienced a period of rapid development and growth. Iqaluit is the seat of government for the Territory of Nunavut and is the home base of many federal and territorial government departments. The City is rapidly developing into a regional center for the territory with many northern businesses in Inuit organizations making it their base of operations. The current population of Iqaluit is estimated at about 7,000 people with an average annual growth rate between three and four percent.

1.1.5 Land Ownership System

Iqaluit has a unique land ownership system. The major land owners in Iqaluit are the Commissioner of Nunavut, the City and the regional Inuit associations. These entities in turn lease land to individuals, corporations and other government departments. The City land is administered by a land acquisition by-law and by a Territorial Statute. Generally speaking, there is no private ownership of land.

1.2 **Definitions**

The following terms and definitions listed shall apply within this RFP:

<i>City/ Client/ Owner</i>	means the Municipal Corporation of the City; means the entity as defined in the Supplementary Conditions, which may be the same entity as the City as defined herein.
<i>City Representative</i>	means the individual, assigned to the Project, who will be representing the City.
<i>City Website</i>	means www.iqaluit.ca .
<i>Class A Estimate</i>	means an estimate that is accurate to +/- 10% that is used to establish cost for the construction of the Project and is based on 99% complete design package which is ready for tender.
<i>Class B Estimate</i>	means an estimate that is accurate within +/- 15% and is based on a 66% design development.
<i>Class C Estimate</i>	means an estimate that is accurate within +/- 20% and is based on a 33% design development.
<i>Class D Estimate</i>	means an estimate that is accurate within +/- 30% and is based on conceptual design sketches.
<i>Closing Time</i>	means the time set out in paragraph 4.1.
<i>Contractor</i>	means the entity who will be providing construction services to perform the work.
<i>Construction Contract</i>	means the executed agreement between the City and the Contractor for the work.
<i>Evaluation Committee</i>	means a committee appointed by the City in order to evaluate all submitted proposals in order to determine a preferred proponent.

<i>Preferred Proponent</i>	means the company or firm that has been selected by the City's Evaluation Committee and who will initially discuss the contract arrangements based upon acceptance of the proponent's proposal.
<i>Consultant</i>	means the Consultant who will provide the technical and professional services defined in the Request for Proposal.
<i>Professional Services</i>	means the technical and professional services to be provided by the Consultant for this contract.
<i>Project</i>	means the Apex Cemetery Expansion project.
<i>Project Manager</i>	means the Project Manager assigned by the City, who will be responsible for managing the execution of the Project.
<i>Project Team</i>	means the group of people which includes the City Representative, the Project Manager, the Discipline Design Leaders and any other person invited from time to time by the City Representative of the Project Manager.
<i>Proponent</i>	means a company or firm intending to submit a Proposal and from whom a Proposal submission was received.
<i>Proposal</i>	means the document submitted in response to the Request for Proposal.
<i>Supplementary Conditions</i>	means the Supplementary Conditions forming APPENDIX B.
<i>This contract</i>	means the Consultant contract for which this Request for Proposal is issued.
<i>User group</i>	means the City or the users of the facility for which the City is responsible.

1.3 Project Scope

The City of Iqaluit's current cemetery is the Apex Cemetery, located east of the main city core in the community of Apex. The cemetery's Phase 1 area was introduced in 2014 and underwent civil/drainage improvements in 2021. The Phase 1 area is estimated to reach its capacity in approximately two (2) years. As such, the City is seeking detailed design and construction administration services for developing the adjacent areas to expand the cemetery. It is expected that this will be the only expansion of the cemetery with the goal of providing sufficient developed space to accommodate ten (10) additional years of operations.

At a high level, the consultant will be responsible for conducting preliminary consultations with City staff, performing site assessments, developing the detailed design, supporting the tender process, and administering the construction contract. The project schedule will consider completing the detailed design in 2023 for the purpose of procuring construction services and carrying out construction in 2024.

More details on the scope and services requested through this RFP can be found in Section 6.

2. INSTRUCTIONS TO PROPONENTS

2.1 Submission

Proponents must submit their proposals by electronic submission (PDF format), through MERX before April 27, 2023, at 3 PM EST. MERX can be accessed via the following website link – <https://www.merx.com/>. Proponents must address proposals to:

City of Iqaluit
Sumon Ghosh
Director of Engineering and Capital Projects
901 Nunavut Drive, P.O. Box 460
Iqaluit, Nunavut, X0A 0H0

Proponents will be required to submit a Technical and Financial Submission as part of their offer, in separate files. Files should be labeled as follows:

Technical Submission: *“TECHNICAL PROPOSAL –Apex Cemetery Expansion – Proponent Name”*

Financial Submission: *“FINANCIAL PROPOSAL – Apex Cemetery Expansion – Proponent Name”*

It is the Proponent's responsibility to confirm successful submission of the proposal to MERX prior to the deadline.

The final decision on whether to accept late Proposals is at the City's discretion.

2.2 Inquiries

All inquiries concerning this RFP are to be directed by email only to:

Jared Wright
Project Manager
Colliers Project Leaders
jared.wright@colliersprojectleaders.com

Jan Rawling
Assistant Project Manager
Colliers Project Leaders
Jan.rawling@colliersprojectleaders.com

To ensure consistency and fairness to all Proponents, all firms who have received the RFP will receive information with respect to significant inquiries in the form of written addenda or clarifications. Verbal explanations or instructions will not be binding.

The deadline for submitting inquiries will be on **April 20, 2023, at 3 PM EST** local Iqaluit time.

2.3 Addenda

If it is determined that an amendment is required to this RFP, a written addendum will be posted via Merx and the City's website. It is the Proponents responsibility to check Merx and the City's website to confirm whether an addendum has been posted. The only way this RFP may be added to or amended in any way is by a formal written addendum. No other communication whether written or oral from any person will affect or modify the terms of this RFP or may be relied upon by any Proponent.

The City may amend, supplement or otherwise modify this RFP at any time and from time to time prior to the Proposal submission date, only by written addenda.

2.4 Proponent Requirements

The successful Proponent must have a valid City of Iqaluit Business License prior to commencement of the Project. The Preferred Proponent shall apply for a license immediately upon notification of award, should they not hold a valid license.

2.5 Opening of the Proposals

There will be no public opening of the Proposals.

2.7 Validity of Offer

The proposals shall remain open for acceptance for a period of not less than sixty (60) calendar days from the closing date of this Request for Proposal.

2.8 Intended RFP Process Schedule

The City estimates the schedule for the Request for Proposal process milestones will be as follows:

Table 1 – RFP Process Schedule

Milestone	Date
Issue RFP	April 6, 2023
Last Day for Proponent Questions	April 20, 2023, at 3 PM EST
Last Date for Issue of Addendum	April 22, 2023
RFP Closes – Submission Deadline	April 27, 2023, at 3 PM EST
Contract Award	May 26, 2023
Project Kick-Off Meeting	June 2, 2023

3. PROPOSAL REQUIREMENTS

Proponent submissions should be prepared in sections, with the content of each section as specified below. Concise submissions which address the section requirements are encouraged. Where a maximum number of pages are specified, each page is based on a single-side of an 8 ½ x 11 sheet, with text no smaller than size 11 Arial font. The technical submission will be limited to twenty (20) pages single-sided with three (3) additional 11" x 17" pages for schedule and level of effort table. There are no page limits or restrictions to the financial submission.

The technical submission must not have any financial details included. If aspects of the financial offer are included in the technical submission, the City may choose to disqualify the Proponent.

3.1 Technical Submission Requirements

3.1.1 Section A – Understanding of the Project (10 points)

Provide a written statement demonstrating the Proponent's understanding of the overall Project, the goals and objectives of this assignment, and its relevance to the overall delivery of the Project. Identify any risks and challenges, based on the Proponents understanding of the Project, based on the information presented in this RFP, and provide mitigation measures which will ensure successful project delivery.

Provide a description of the Proponent's vision for the assignment by comparison and contrast to reference projects which are similar examples of the Proponent's work. The details of each project should be included at Section B. The Evaluation Committee is interested in understanding how these reference projects responded to the project

requirements and how these relate to the Proponent's understanding of the requirements for this assignment.

3.1.2 Section B – Reference Projects (15 points – 5 points per project)

Provide information for Projects completed in the last 10 years that are relevant to this project. Provide three (3) reference projects. The projects listed should illustrate experience in the following areas:

- .1 Conducting site surveys, topographic surveys and other due diligence in the North;
- .2 Providing detailed design and construction administration services for earthworks and drainage-related projects in the North;
- .3 Providing detailed design and construction administration services for the construction of cemeteries; and
- .4 Carrying out public consultations and public engagements on behalf of the client.

The Proponent should describe their roles and responsibilities on each of the projects, whether the projects were joint ventures along with the names of the other parties of the joint venture, and a brief description of the project/ assignment. For each project, identify a Client contact and provide contact information (email and phone number). The Evaluation Committee may consult with the persons indicated as references by the Proponents in order to obtain feedback on the Proponent's performance on previous Projects and to understand the relationship between the Client and the Proponent. The technical ratings may be adjusted, based on the interviews and feedback from reference consultations. Proponents must ensure that phone numbers and e-mail addresses of references are accurate and still valid.

When identifying a reference project, the Proponent should consider how their project relates to the assignment described in this RFP, along with the goals and objectives of the overall Project. Photographs representing each reference project are encouraged.

3.1.3 Section C – Work Plan (25 points)

Provide a work plan detailing the methodology and approach to be taken to deliver the assignment, reflecting the schedule outlined in this Request for Proposal. Identify the proposed schedule along with key milestones for meetings with the City group. Include in this section a schedule for the provision of services, identifying the time required for the Proponent's work and a breakdown of the time (number of hours) allocated for each task and Consultant (if applicable) during the work identified in the Request for Proposal. Include a description of major tasks, sub-tasks, methods/systems and personnel that the firm proposes to use for project management, meetings, engagements, administration, site works, design development, internal reviews, quality control, contract administration, site inspection, reporting, and any other required personnel or teams.

The Proponent shall describe what Inuit, local and Nunavut content, if any, shall be utilized.

3.1.4 Section D – Corporate Qualifications and Experience (5 points)

Provide a statement of qualifications for the Proponent and other major consultant firms included in the Design Team (civil, structural, mechanical, electrical, and process control engineers) including:

- .1 Year founded as current corporate entity;
- .2 Permanent office address; and
- .3 List a maximum of 5 reference Projects (do not provide Project details as these should be listed in Section B.

3.1.5 Section E – Qualifications and Experience (15 points)

Provide an organizational chart describing the Proponent's Project Team for the assignment, which includes all positions. Proponent to include key Sub-Consultant's (if applicable) along with their position within the Project Team. Provide a summary of key Project Team personnel, and include the information below:

- .1 Name;
- .2 Corporate affiliation;
- .3 Role and title on the Project, including the period for which the individual is to be associated with the Project, and the extent of the individual's time that will be devoted to the Project during that period; and
- .4 List any reference Projects provided in Section B (do not provide Project details) and describe the individual's role on each of the Projects.

Include the individual's resume immediately after the individual's summary. It is the City's understanding that the Project Team proposed by the Proponent in this section will be committed to the full delivery of the assignment. Changes to the Proponent's Project Team must be approved by the City.

3.1.6 Section F – List of Sub-consultants

Provide a list of all consultants the Consultant will be looking to engage as "Sub-Consultants" for the execution of the Project.

3.1.7 Section G – Mandatory Submission Requirements (pass/fail)

Provide all mandatory requirements, as identified in Section 4.3. Proponents who fail to submit mandatory items will not proceed to the next phase of evaluation.

3.2 Financial Submission Requirements

3.2.1 Consultant's Professional Fees (30 points)

Submit a completed and unqualified Cost Submission Form, included in Appendix A, along with a Consultant's corresponding level of effort fee table, complete with positions, hours, rates, and fee breakdown, based on the work being requested under this RFP. The level of effort table must be broken up based on major project tasks/ phases (i.e. detailed design phase, tender support, contract administrator/ site inspection, etc.).

The fee table must also include a breakdown on expenses/ disbursements, based on the requirements described in the Terms of Reference. The Proponent must use per diem rates established by the National Joint Council for the Territory of Nunavut. Accommodations will be provided by the City of Iqaluit at a City owned residence. The Proponent will be responsible for transportation requirements and must include this in their fee proposal for expenses/ disbursements. All expenses/ disbursements will be invoices at cost with no mark-up.

The completed Cost Submission Form and level of effort fee table shall form part of the contract document to be used between the City and the Preferred Proponent. The rates included in the fee table will be used in the event the scope of work is changed and provisions of the contract value to be changed during the project period.

The Financial Submission will not be opened until after the evaluation of the technical submission has been completed and satisfied per the required criteria.

4. EVALUATION

4.1 Evaluation Committee

The evaluation of Proposals will be undertaken by an Evaluation Committee appointed by the City. The Evaluation Committee may consult with technical, financial and other advisors, as the Evaluation Committee, in its sole discretion, may decide. The Evaluation Committee will reach a consensus through discussions internal to the Committee.

4.2 Evaluation Stages

Proposals will be evaluated in four stages:

4.2.1 Evaluation of Mandatory Criteria

Proposals that do not meet the mandatory criteria will be rejected (Refer to Section 4.3 below).

4.2.2 Technical Evaluation – Total Value 70 Points

Subject to the Evaluation Committee's right to reject an unacceptable Proposal under Section 4.4, the Evaluation Committee will evaluate and score the Proposal information provided using Table 2 in Section 4.5 as a guide to assign scores. For each criterion, each Proposal will be assessed, and points will be awarded on the basis of the extent to which the requirements of the Request for Proposal documents are satisfied, and the comparative merit of the individual Proposal as compared to other Proposals.

Proposals will be ranked from highest to lowest in terms of meeting the City's requirements and containing technical merit. Proponents are required to achieve a minimum score of 70% (49/70 points) on the Technical Evaluation, in order to qualify for review of the Financial Submission.

4.2.3 Financial Evaluation – Total Value 30 Points

Financial evaluation of cost criteria will be conducted after evaluation of the technical criteria and reference checks.

A total of 30 points will be awarded on the basis of the Financial Proposal, and the distribution of fees to each phase of the Project.

The points for price will be awarded as follows:

The score for the Financial Submission will be in accordance with the following formula:

$$\text{Proponent Score} = \frac{\text{Lowest Financial Offer}}{\text{Proponent Financial Offer}} \times 30 \text{ points}$$

4.2.4 Selection

The Evaluation Committee will rank the Proponents, using the combined Technical and Financial score, from which it will select the Preferred Proponent. The Preferred Proponent's Proposal will be recommended to the City for the award of a contract for Consultant services based on the Proponents standing in the evaluation review process.

4.3 **Mandatory Requirements**

As indicated in Section 1 of this Request for Proposal, Proponents may be individual firms, or consortia of firms. In order for Proponent's Proposals to be considered for further evaluation they must demonstrate in their Proposals that the following mandatory requirements can be met.

Proponents must:

- .1 Provide evidence satisfactory to City from the Proponent's insurer that the Proponent is able to obtain the insurance coverage as specified in APPENDIX E City's Standard Service Agreement;
- .2 Include the submission of the Proponent's latest valid WSCC/ WSIB Certificate of Clearance;
- .3 Include a completed sign-off of Proposal submission, as per the requirements in APPENDIX F; and

4.4 Rejection of Unacceptable Proposals

The Evaluation Committee may at any time reject a Proposal without completing a full evaluation (including a Proposal from a Proponent that complies with the Mandatory Requirements), if in the judgment of the Evaluation Committee further consideration of the Proposal would not be acceptable as the basis for a contract considering the evaluation criteria indicated in Section 4.5 below.

The City reserves the right without liability, cost or penalty, in its sole discretion to disqualify any Proposal before its full evaluation if the Proposal reveals a conflict of interest, incorrect information, or misrepresentation by the Proponent of any information provided in its Proposal. The City further reserves the right without liability, cost or penalty, in its sole discretion to disqualify any Proposal where there is evidence that the Proponent, its employees, agents or representatives colluded with one or more other Proponents or any of their respective employees, agents or representatives in the preparation of the Proposal.

4.5 Evaluation Criteria

The Evaluation Committee will evaluate eligible Proposals to determine the Proposal which best meets the needs of the City, using the weighting criteria indicated in Table 1 below as a guideline.

Table 2 – RFP Evaluation Criteria

EVALUATION CRITERIA	WEIGHTING
Technical Submission	
Section A – Understanding of the Project	10 points
Section B – Reference Projects	15 points
Section C – Work Plan	25 points
Section D – Corporate Qualifications and Experience	5 points
Section E – Qualifications and Experience	15 points
Technical Score Sub-Total:	70 points

Financial Submission	
Consultant Fees – Cost Submission Form	30 points
Financial Score Sub-Total:	30 points
Total RFP Evaluation Score:	100 points

5. TERMS AND GENERAL CONDITIONS

5.1 Terms and Conditions

- 5.1.1 Submission of a Proposal constitutes acknowledgement that the Proponent has read and agrees to be bound by all the terms and conditions of this Request for Proposal.
- 5.1.2 The City will not make any payments for the preparation of a response to this Request for Proposal. All costs incurred by a Proponent will be borne by the Proponent.
- 5.1.3 This is not an offer. The City does not, by virtue of this Proposal call, commit to an award of this Proposal, nor does it limit itself to accepting the lowest price or any Proposal submitted, but reserves the right to award this Proposal in any manner deemed to be in the City's best interest.
- 5.1.4 Proponents may not amend their proposal after the closing date and time but may withdraw their proposal at any time prior to acceptance by the City and issuing a Letter of Intent.
- 5.1.5 The City has the right to cancel this Request for Proposal at any time and to reissue it for any reason whatsoever, without incurring any liability and no Proponent will have any claim against the City as a result of the cancellation or reissuing of the Request for Proposal.
- 5.1.6 The City will not be responsible for any Proposal that does not indicate the Request for Proposal reference, and the Proponent's name.
- 5.1.7 The City will not be responsible for any Proposal that is delivered to any address or in any manner other than that provided in Section 2.1 of this Request for Proposal.
- 5.1.8 If a contract is to be awarded as a result of this Request for Proposal, it will be awarded to the Proponent whose Proposal for each service, in the City's opinion, provides the best potential value to the City and is capable in all respects to perform fully the contract requirements and has the integrity and reliability to assure performance of the contract obligations.
- 5.1.9 If the City decides to award a contract based on a submission received in response to this Request for Proposal, the Successful Proponent will be notified of the intent to award in writing, and the subsequent execution of a written agreement shall constitute the making of a Contract. Proponents will not acquire any legal or equitable rights or privileges whatsoever until a Contract is signed by both parties. In the event of any

inconsistency between this Request for Proposal, and any ensuing contract, the contract shall govern.

- 5.1.10 The contract will be in the form of the City's standard "City of Iqaluit Services Agreement" and it will contain the relevant provisions of this Request for Proposal, the accepted Proposal as well as such other terms as may be mutually agreed upon, whether arising from the accepted Proposal or as a result of any negotiations prior or subsequent thereto. The City reserves the right to negotiate modifications with any Proponent who has submitted a Proposal.
- 5.1.11 A copy of the Services Agreement is included as APPENDIX E.
- 5.1.12 Any amendment made by the City to the Request for Proposal will be issued in writing and sent to all who have received the documents.
- 5.1.13 An Evaluation Committee will review each Proposal. The City reserves the exclusive right to determine the qualitative aspects of all Proposals relative to the evaluation criteria.
- 5.1.14 Proposals will be evaluated as soon as practicable after the closing time. No detail of any Proposal will be made public except the names of all parties submitting Proposals.
- 5.1.15 The proposal and accompanying documentation submitted by the proponents are the property of the City and will not be returned.
- 5.1.16 Proponents must acknowledge receipt of any addenda issued by the City in their Proposal.
- 5.1.17 Proponents shall disclose in its Proposal any actual or potential conflicts of interest and existing business relationships it may have with the City, its elected or appointed officials or employees. The City may rely on such disclosure.
- 5.1.18 Proponents and their agents will not contact any member of the City Council, City Staff or City Consultants with respect to this Request for Proposal, other than the City Representative named in section 2.6, at any time prior to the award of a contract or the cancellation of this Request for Proposal.

5.2 No Collusion

By submitting a Proposal, the Proponent, and each firm, corporation or individual member associated with the Proponent's Proposal submission, represents and confirms to the City, with the knowledge and intention that the City may rely on such representation and confirmation, that its Proposal has been prepared without collusion or fraud, and in fair competition with Proposals from other Proponents. Include confirmation of this under Item 3.1.8 of the Proposal submission.

5.3 Conflict of Interest

Proponents shall disclose any potential conflicts of interest and existing business relationships they may have with Colliers Project Leaders, the City, its elected officials or employees, or any known participants in the Project. The City may rely on such disclosure.

Under Item 3.1.8 of the Proposal submission, include confirmation of the Proponent's agreement to conform to the conflict of interest requirements and disclosures as indicated in Supplementary Conditions SC2 – CONFLICT OF INTEREST.

5.4 Accuracy of Information

While the City has used considerable efforts to ensure an accurate representation of information in the Request for Proposal, the information contained in this Request for Proposal is supplied solely as a guideline for Proponents. The City gives no representation whatsoever as to the accuracy or completeness of any of the information set out in this Request for Proposal, or any other background or reference information or documents prepared by third parties and made available to Proponents. Proponents will make an independent assessment of the accuracy and completeness of such information and will have no claim whatsoever against the City or its representatives, agents, consultants and advisors, with respect to such information.

5.5 Confidentiality

Proponents shall treat all information received through this Request for Proposal process and subsequent contract award as confidential and will not disclose such information to any person except with the prior written consent of the City.

Under Item 3.1.8 of the Proposal submission, include confirmation of the Proponent's agreement to conform to the confidentiality requirements as indicated in Supplementary Conditions SC1 – CONFIDENTIALITY. The Consultant shall ensure that all drawings, specifications and other documentation prepared for the Project and designated as confidential by the Owner, are prominently stamped on each page or sheet of each document with the word "CONFIDENTIAL" prior to release for construction bidding purposes or during the course of the Work.

5.6 Working Language

All Proposals must be written in English.

5.7 Terms of Payment

The Proponent shall be reimbursed monthly for works completed for each service provided. Invoices are to be submitted on a monthly basis, and shall include:

- .1 the project title.

- .2 the service contract number.
- .3 a description of the work completed.
- .4 billing summary, which includes the tasks as set forth in the costing submission, the proposed costs, cost to date, percentage invoiced to date, and the percentage of work completed to date for each task.
- .5 backup for all disbursements (time sheets may be requested).

The monthly invoice should be reviewed as a draft by the Consultant and the Project Manager in order to validate the fee and services being claimed. The Proponent is to update the invoice (as required), as per comments/ feedback received from the Project Manager. The Project Manager and Proponent are to determine at the Project Kick-Off meeting the date which draft monthly invoices are to be reviewed.

The final invoice is to be submitted to the Project Manager for processing with the City. Invoices that are issued directly to the City's Accounts Payable Department will not be processed. Invoices must be submitted for payment by the 15th of every month, for previous months work (e.g. invoice must be submitted by February 15th for work completed up to January 31st).

No payment will be made for the cost of work incurred to remedy errors or omissions for which the contractor is responsible. No additional invoicing will be accepted above and beyond what the City has agreed to as per the contract. At no time shall the contract upset limit be exceeded without prior written authorization from the City.

5.8 Cash Flow Expenditure Forecast

The Proponent is to submit a cash flow expenditure forecast identifying how the Proponent anticipates invoicing the City on a monthly process, based on the established schedule. An update cash flow expenditure forecast is to be submitted with every monthly invoice.

5.9 WSIB/ WSCC Certificate

Under Item 3.1.8 of the Proposal submission, include submission of the Proponent's latest WSIB or WSCC Certificate of Clearance (failure to submit a certificate or letter of exemption from coverage with the Proposal may result in disqualification of the Proposal). Proponents with no WSCC coverage must apply to the Government of Nunavut with 10 working days of starting operations.

5.10 Health and Safety

The successful Proponent shall provide the City a copy of its Health and Safety plan within 5 calendar days of execution of the contract. The successful Proponent shall comply at all times with the City's health and safety requirements while working in Iqaluit.

5.11 Project Reporting

The Consultant will be required to provide monthly status reports, which must communicate the following: assignment status, work completed to date, work remaining, schedule progress (baseline and approved changes), and financial status (original contract value, current contract value, % complete vs. % spent). The report is to be submitted to the City's Project Manager.

6. CONSULTANT SCOPE OF WORK

The City's current developed area of the Apex Cemetery is expected to reach its capacity in approximately two (2) years. As such, the City would like to develop the adjacent area with the intent of allowing the site to operate for an additional approximately ten (10) years. In order to reach this goal, the City is requesting that a consultant perform site assessment/investigation, detailed design, and construction administration services.

The City's plan is to complete detailed design such that construction can be tendered out for completion before the end of 2024.

Below is a screenshot of the approximate area that is to be developed under this scope, however it will be up to the consultant to determine the exact area through consultation with City staff and understanding of operational requirements.



It should be noted that, in the past, the Apex Cemetery has been impacted by flooding as a result of climate change, soil disturbance, and poor drainage. This has caused significant operational burden on City staff as well as distress on citizens and residents

of Iqaluit. Drainage improvements were completed in 2021 and this has significantly improved the situation at the cemetery.

6.1 Assessment/Investigation

Purpose: To study the existing cemetery conditions, consult the City on burial data, conduct due diligence on the cemetery expansion area, and confirm the City's needs and requirements to inform the subsequent phases of the assignment.

The Consultant shall:

- .1 Review background information provided by the City as it relates to standard operating procedures and recent works completed at the Apex Cemetery to gain an understand of current practices as it relates to the subsequent phases of the assignment.
- .2 Consult with the City to determine the precise area to be expanded under this scope, as well as to confirm current practices and aesthetic requirements as it relates to the footprint and extent of development required.
- .3 Complete a topographic survey of the current Apex Cemetery and the expansion area for incorporation into the final design. Although the Consultant shall ultimately determine the scope and level of survey required for this assignment, the following minimum requirements are anticipated:

The Consultant shall:

- Carry out on-site reviews and field work required for, and to complete, the design of this project including survey work required to locate/ identify existing topography, features, utilities, obstructions, etc. and as required to provide measurement for tender quantities.
 - Conduct the survey on a 5 m grid and presented on 1:500 scale Map including delineation of all gravesites, hardscape features, location of any underground utilities, existing watercourses, etc.
 - Carry out complete survey efforts as necessary to establish accurate existing conditions in order to develop the design and define the scope of construction.
 - Establish elevation and position data across the entire work area, while taking into consideration any potential conflicts and existing features potentially affecting the proposed works.
 - Perform detailed inventory of existing areas and features to ensure that construction completion will closely match existing conditions.
- .4 Perform geotechnical investigations using a \$40,000 cash allowance to inform the design as it relates to proper subgrade design and construction

and any other geotechnical considerations. The extent of the scope shall be defined by the proponent in the technical proposal.

- .5 Prepare a conceptual sketch overlaid on the topographic survey results showing the approximate area of development to be considered under the subsequent design, including any proposed perimeter or interior walkways and all burial locations/plots in support of the City's goal to achieve 10 additional years of operation.
- .6 Provide agendas for, chair, and minute any meetings required to complete this phase of the work, excluding the project kickoff meeting that will be chaired by the project manager. Assume 1-3 meetings excluding the kickoff meeting will be held during this phase.
- .7 Prepare a draft and final Preliminary Assessment Report that summarizes the findings of this phase of the assignment and key components that will inform the subsequent detailed design, to be reviewed in meeting with the City for incorporation of feedback to prepare the final deliverable.

A non-exhaustive list of required deliverables for this phase is provided below:

- .1 Preliminary Assessment Report, in both draft and final format, which will include at a minimum:
 - Introduction and problem(s) statement and project goals
 - Description of understanding of City operational requirements and key points that will establish the basis of the design (including but not limited to drainage considerations, aesthetic considerations, topographic considerations, and footprint requirements)
 - Conceptual sketch
 - Topographic survey findings
 - Geotechnical investigation findings
- .2 Agendas and minutes for all meetings excluding the project kickoff meeting.

6.2 Detailed Design

Purpose: To develop the detailed design for the expansion of the Apex Cemetery.

The Consultant shall:

- .1 Develop the detailed design based on input from City staff and findings of Phase 6.1. The final design should consider at a minimum:
 - Amount of space available and site capacity
 - Individual burial space requirements

- Topography and geotechnical considerations as determined by site investigations
 - Required construction efforts
 - Considerations on the impact to permafrost
 - Material specifications for the new finish material for the Cemetery; the finished site should be gravel
 - Specifications for site crowning, raising, and lowering to ensure continuity of the final developed site
 - Grave markers and row markers to maintain an accurate grave plotting and identification system
 - Drainage considerations to ensure proper water flow and diversion as well as site runoff
 - Tie-in to existing developed Apex Cemetery area to ensure continuity of the final developed site
 - Aesthetic features as required by the City to maintain the general theme and appearance of the existing cemetery
 - Constructability and operability
- .2 Prepare a 50% design package, which includes detailed design drawings, construction specifications, detailed complete project schedule, and Class C cost estimate.
- .3 Provide an agenda for, chair, and minute the 50% design review meeting.
- .4 Prepare a 90% design package, which includes detailed design drawings, construction specifications, detailed complete project schedule, and Class B cost estimate.
- .5 Provide an agenda for, chair, and minute the 90% design review meeting.
- .6 Prepare a 100% design package, which includes detailed design drawings, construction specifications, detailed complete project schedule, and Class B cost estimate.
- .7 Provide an agenda for, chair, and minute any additional meetings required throughout this phase of the assignment as required in order to inform the project such that a complete final design is developed to the City's satisfaction.
- .8 Prepare a project summary and notice to be distributed to the public for the purpose of informing them of the status and plan for the project. The consultant shall also be prepared to speak to the public about the project and respond to inquiries received from the public at the discretion of the City.

A non-exhaustive list of required deliverables for this phase is provided below:

- .1 50% design package
- .2 90% design package
- .3 100% design package
- .4 Project Notice, draft and final following City review and feedback

6.3 Construction Procurement

Purpose: (Provisional, pending approval of 2024 Capital Plan) To prepare complete tender documents and support the City during the construction procurement phase of the project, as the City looks to retain a Contractor for construction services.

The Consultant shall:

- .1 Prepare a draft and final IFT package, which shall include the 100% drawings and specifications as well as the City's front-end documents. Final package to be prepared based on input from the City following the submission of the draft package.
- .2 Respond to questions raised by bidders and prepare addenda or clarifications for issue to bidders.
- .3 Act in an advisory role to the Project Manager who will tender the Project. Assist the Project Manager and Evaluation Committee with examining and evaluation of tenders. Advise on acceptance of submissions and provide a recommendation for award.
- .4 Prepare and issue stamped "for construction" documents, revised to include all addenda and changes made during the tender period.

A non-exhaustive list of required deliverables for this phase is provided below:

- .1 RFT package, draft and final
- .2 Technical responses and addenda as required
- .3 Bid Review and Recommendation Memorandum
- .4 Issued For Construction drawings

6.4 Construction Administration

Purpose: (Provisional, pending approval of 2024 Capital Plan) To administer the construction contract, and in particular to inspect the construction to ensure compliance with the design documents.

The Consultant shall:

- .1 Be a representative of the City.
- .2 Advise and consult with the City.
- .3 Have the authority to act on the City's behalf to the extent provided in this RFP and the Contract Documents.
- .4 Have access to the Work at all times wherever it is in preparation or progress.
- .5 Forward all instructions from the City to the Contractor.
- .6 Carry out and coordinate as applicable the General Review/ Field Review of the work.
- .7 Examine, evaluate and report to the City upon representative samples of the work.
- .8 Make weekly site reviews to determine general conformity of the works.
- .9 Keep the City informed of the progress and quality of the work, and report to the City defects and deficiencies in the work observed during the course of the site reviews.
- .10 In the first instance, interpret the requirements of the Contract Documents and make findings as to the performance thereunder by both the City and the Contractor.
- .11 Render interpretations in written and graphic form as may be required with reasonable promptness on the written request of either the City or the Contractor.
- .12 Render written findings within reasonable time, on all claims, disputes and other matters in question between the City and the Contractor relating to the execution or performance of the work or the interpretation of the Contract Documents.
- .13 Render interpretations and findings consistent with the intent of and reasonably inferable from the Contract Documents; showing partiality to neither the City nor the Contractor.
- .14 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.
- .15 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.

- .16 Maintain an electronic log to evidence the status and disposition of Shop Drawings and other required Contractor submittals. The log shall be provided and reviewed at every Project meeting.
- .17 Respond to Requests for Information (RFI) and maintain an electronic log to accurately document the status of all RFI's. The log shall be provided and reviewed at every Project meeting.
- .18 Prepare Contemplated Change Notices and Change Orders for the consideration of the Project Manager and for the City's approval and signature in accordance with the Contract Documents and maintain electronic logs to accurately document the status of all issued and contemplated CCN's and CO's. The logs shall be provided and reviewed at every Project meeting.
- .19 Have the authority to order minor adjustments in the Work which are consistent with the intent of the Contract Documents, when these do not involve an adjustment in the contract price or an extension of the contract time.
- .20 Furnish supplemental instructions to the Contractor with reasonable promptness.
- .21 Receive from the Contractor and forward to the City for the City's review the written warranties and related documents.
- .22 Receive from the Contractor and review and approve the Contractor's as-built drawings and provide to the City a complete set of electronic as-built drawings for all building systems and components.
- .23 Review any defects or deficiencies which have been observed and reported 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.
- .24 Determine the amounts owing to the Contractor under the Contract, based on the observations and evaluation of the Contractor's application(s) for payment.
- .25 Issue certificates for payments in the value proportionate to the amount of the Contract and the Contractor's Schedule of Values, of work performed and products delivered to the place of the Work.
- .26 Determine the date of Substantial performance of the work. Issue the Substantial Performance certificate.

- .27 Verify the validity of the Contractor's application for final payment and issue a certificate of final payment.
- .28 Serve as the "Consultant" as per the CCDC 2 Stipulated Price Contract Agreement inclusive of the Supplementary Conditions between the Owner and the Contractor.
- .29 Prepare agendas for, chair, and minute the construction kickoff meeting and all construction progress meetings.

A non-exhaustive list of required deliverables for this phase is provided below:

- .1 Minutes and agendas for construction kickoff meeting and construction progress meetings
- .2 Shop drawings and submittal log, updated on an ongoing basis as each submittal is issued, responded to, revised, and/or approved
- .3 RFI log, updated on an ongoing basis as each RFI is issued and/or responded to
- .4 SI log, updated on an ongoing basis as each SI is issued
- .5 CO log, updated on an ongoing basis as each CO is initiated priced, submitted to the City, and approved
- .6 Weekly site observation reports, which include at a minimum:
 - Work completed in last week
 - Work planned for next 2 weeks
 - Open RFIs, SIs, COs, and issues
 - Schedule forecast based on contractor's schedule and consultant's estimate of task % completion
- .6 Contractor payment certificates
- .7 Substantial completion inspection deficiency list
- .8 Substantial performance certificate
- .9 Final as-built drawings in both PDF and CAD format, while also ensuring that a hard copy of the documents are delivered to the Director of Public Works

7. SCHEDULE

7.1 Timelines

The Proponent must satisfy the general timelines identified below for the work.

Table 3 – Project Schedule

Milestone	Date
Project Kick-Off Meeting	June 2, 2023
Completion of Topographic Survey and Geotechnical Investigation	July 21, 2023
Submission of draft Preliminary Assessment Report	August 11, 2023
Submission of final Preliminary Assessment Report	August 25, 2023
Submission of 50% Design Package	October 6, 2023
Submission of 90% Design Package	November 10, 2023
Submission of 100% Design Package	December 1, 2023
Submission of draft IFT Package (tentative)	December 22, 2023
Submission of Final IFT Package (tentative)	January 26, 2024
RFT issuance (tentative)	January 26, 2024
Construction Contract Award (tentative)	March 29, 2024
Construction Kick-Off Meeting (tentative)	April 5, 2024
Mobilization (tentative)	July 8, 2024
Substantial Completion (tentative)	September 30, 2024

7.2 Submission Requirements

Proponent to prepare project schedule in the form of a Gantt chart. The schedule is to include dates for the commencement and completion of each major element of the work, as per the requirements of Table 3. The key elements of the schedule will detail the various assignment milestones. The schedule will form the baseline for assignment.

The schedule will form part of the contract documents. Changes to the project schedule must be approved by the Project Manager by means of a change order. A revised schedule must be submitted describing the approved changes.

APPENDIX A – COST SUBMISSION FORM

Proponent's Name: _____

Proponent's Address: _____

Proponent Email/ Telephone: _____

Provide the following cost breakdown for the services detailed herein that the Proponent is proposing to offer the City of Iqaluit.

Table A1 Fee Table

TASK	FEE
6.1 Assessment/Investigation – Fixed Fee	
1. Project management, meetings, coordination, and administration	\$
2. Stakeholder engagement, consultations, meetings, background review, and information review	\$
3. Topographic survey – survey activities	\$
4. Geotechnical investigation – site activities	\$
5. Topographic survey and geotechnical investigation – disbursements (flights, hotel, vehicle rental, per diem)	\$
6. Conceptual sketch	\$
7. Preliminary Assessment Report	\$
6.1 Subtotal:	\$
6.2 Detailed Design – Fixed Fee	
8. Project management, meetings, coordination, and administration	\$
9. 50% design package	\$
10. 90% design package	\$
11. 100% design package	\$
6.2 Subtotal:	\$
6.3 (Provisional) Construction Procurement – Fixed Fee	
12. Project management, meetings, coordination, and administration	\$
13. RFT package	\$

TASK	FEE
14. Tender support, bid review, and recommendation	\$
6.3 Subtotal:	\$
<u>6.4 (Provisional) Construction Administration – Fixed Fee and Time & Material</u>	
15. Project management, meetings, coordination, and administration (Fixed Fee)	\$
16. Construction administration – contract administration – 50 hours (Time & Material)	\$
17. Construction administration – site inspection – 50 days x 12 hours per day (Time & Material)	\$
18. Construction administration – engineering support – 100 hours (Time & Material)	\$
19. Construction administration – disbursements (flights, hotel, vehicle rental, per diem) (Time & Material)	\$
20. As-built drawings and project record file (Fixed Fee)	\$
21. Other efforts as determined by the consultant (show in time-task matrix) (Fixed Fee)	\$
6.4 Subtotal:	\$
SUMMARY	
6.1 subtotal	\$
6.2 subtotal	\$
6.3 subtotal	\$
6.4 subtotal	\$
OVERALL SUBTOTAL:	\$
Applicable Taxes (GST):	\$
TOTAL (INCLUDING GST):	\$

Sub-Total: \$ _____

GST: \$ _____

TOTAL: \$ _____



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Fees for changes to the work shall be as agreed upon prior to the commencement of services for the change as set out under the contract. For additional work, the proponent shall use the rates detailed below.

POSITION	TEAM MEMBER	Hourly Rates (\$/hr.)
Principle/ Project Sponsor		
Project Manager		
Project Engineer		
Insert Position (s)		

Consultant to add positions as necessary. Each discipline shall provide names for each position as necessary.

END OF APPENDIX A

APPENDIX B – SUPPLEMENTARY CONDITIONS

Amend the General Conditions as follows:

Add SC1 Confidentiality

SC 1 Confidentiality

- .1 The Consultant and the Consultant's employees and sub-Consultants shall not use, copy, disclose or otherwise communicate and information not available to the general public that was gained by them in the course of their duties related to this Contract, except as is necessary in the proper discharge of those duties. This obligation survives the Contract.
- .2 All information provided by the Consultant is subject to the disclosure and protection provisions of applicable freedom of information and privacy legislation. Such Act allows any person a right of access to records in the Client's custody or control, subject to limited and specific exceptions.

Add SC2 Conflicts of Interest

SC 2 Conflicts of Interest

The Consultant and the Consultant's employees:

- .1 shall conduct their duties related to this Contract with impartiality and shall, if they exercise inspection or other discretionary authority over others in the course of those duties, disqualify themselves from dealing with anyone with whom a relationship between them could bring their impartiality into question;
- .2 shall not influence, seek to influence, or otherwise take part in a decision of the Client, knowing that the decision might further their private interests. Any communication with the City's elected officials before contract award shall result in disqualification of the Proponent.
- .3 shall not accept any commission, discount, allowance, payment, gift, or other benefit that is connected, directly, or indirectly with the performance of their duties relating to this Contract, that causes, or would appear to cause, a conflict of interest, and
- .4 shall have no financial interest in the business of a third party that causes, or would appear to cause, a conflict of interest in connection with the performance of their duties related to this Contract, and if such financial interest is acquired during the term of this Contract, the Consultant shall promptly declare it to the Client.

Add SC3 Project History File

SC 3 Project History File

- .1 All project documentation shall be considered deliverables and shall form the core of the Project History File. A project history file is to be submitted to the Client prior to project closeout. It is the Consultants responsibility to ensure that the requirements for all deliverables be applied to all sub-consultants and vendors.
- .2 All supporting and originating data (calculations, graphs, data, pictures, drawings checks, tables, etc.) that are developed and incorporated into the deliverable documentation shall be included in Project history file.
- .3 All data collected as part of the Project and relating to the deliverables that have been organized into database tables and spreadsheets shall be included electronically as supporting data for the deliverable. This information will be incorporated into the project history file
- .4 The project history file will be submitted electronically in a logical file folder structure.

END OF APPENDIX B

APPENDIX C – SUB-CONSULTANT LIST

The Proponent will engage and fully coordinate the work of the following sub-consultants listed to deliver the work:

Table C1 List of subconsultants

Consultant Name	Project Office Address	Discipline

END OF APPENDIX C

APPENDIX D – INFORMATION PROVIDED BY THE CITY

This schedule forms part of the contract for consulting services for Apex Cemetery Expansion project. The City will provide the following information to the Consultant:

- .1 Municipal Design Guidelines, City of Iqaluit – 2015
- .2 Good Building Practices Guideline, Government of Nunavut – 2020
- .3 April 2021 Apex Cemetery Remediation Final Design Report
- .4 November 2021 Apex Cemetery Remediation Record Survey
- .5 November 2021 Apex Cemetery Remediation As-Built Dwgs

END OF APPENDIX D



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APPENDIX E – CITY OF IQALUIT SERVICES AGREEMENT

BETWEEN: THE MUNICIPAL CORPORATION OF THE CITY OF IQALUIT
(hereinafter referred to as the "CITY OF IQALUIT")
OF THE FIRST PART

AND: <INSERT CONSULTANT NAME>
(hereinafter referred to as the "Consultant")
OF THE SECOND PART

WHEREAS the CITY OF IQALUIT has requested the Consultant to provide engineering services for the
<insert project name/ contract title>;

AND WHEREAS the Consultant has agreed to provide such services to the CITY OF IQALUIT in its proposal
dated <insert proposal date>;

AND WHEREAS the CITY OF IQALUIT and the Consultant wish to set out the terms and conditions relating
to the provision of such services;

THEREFORE the CITY OF IQALUIT and the Consultant agree as follows:

1. SERVICES AND PAYMENT

- 1.1 The Consultant agrees to provide to the CITY OF IQALUIT those services set out in the job description and scope of work provided on <insert proposal date>. A copy of the proposal is attached as Appendix "A".
- 1.2 The CITY OF IQALUIT agrees to pay for the services described above, a total amount not greater than <insert proposal amount>, for the provision of professional services based on the Proposal dated <insert proposal date>.

2. TERM

- 2.1. This Contract shall commence on the <insert contract start date> and terminates on the <insert contract termination date> unless otherwise terminated in accordance with the provisions of this Contract.



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3. NOTICE AND ADDRESS

3.1 Any notice required to be given herein or any other communication required by this contract shall be in writing and shall be personally delivered, sent by facsimile, or posted by prepaid registered mail and shall be addressed as follows:

i) If, to the CITY OF IQALUIT:

Rod Mugford
Chief Administrative Officer
City of Iqaluit
P.O. Box 460 Iqaluit, NU X0A 0H0

Reference: 2023-RFP-046

ii) If to the Consultant at:

<Insert Consultant Representative Name>
<Insert Consultant/ Company Name>
<Insert Address>

3.2 Every such notice and communication, if delivered by hand, shall be deemed to have been received on the date of delivery or if sent by prepaid registered mail shall be deemed to have been received on the seventh day after posting, or if by facsimile, 48 hours after the time of transmission, excluding from the calculation weekends and statutory holidays.

4. COMPLETE AGREEMENT

4.1 This Contract and its attachments constitute the complete Contract between the parties. Except as provided herein, it supersedes and shall take effect in substitution for all previous agreements. It is subject to change only by an instrument executed in writing by the City.

4.2 If this Contract arises from a request for proposals or tender call, the provisions of the request for proposals or tender call and the Consultant's bid or proposal submission are incorporated into this Contract and may be used to clarify, explain or supplement this Contract, but shall not be used to contradict any express terms of this Contract.

4.3 In the event of a conflict between this Contract, the Consultant's bid or proposal submission, and the City's original tender bid instructions or Request for Proposals, the more recently prepared document shall govern to the extent of such inconsistency.



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5. GENERAL TERMS

- 5.1 Any information obtained from or concerning any department of the CITY OF IQALUIT or clients of any department of the CITY OF IQALUIT, by the contractor, its agents or employees in the performance of any contract shall be confidential. The Consultant shall take such steps as are necessary to ensure that any such information is not disclosed to any other person and shall maintain confidential and secure all material and information that is the property of the CITY OF IQALUIT and in the possession of or under the control of the Consultant. This clause survives the termination of this contract.
- 5.2 Time shall in every respect be of the essence. The Consultant shall deliver the services specified in the contract and according to the project schedule on costs. The CITY OF IQALUIT may grant reasonable extensions to the Consultant for delays, if the Consultant can show those delays were caused by circumstances beyond the control of the Consultant.
- 5.3 The Consultant is an independent Consultant with the CITY OF IQALUIT and nothing in this contract shall be construed or deemed to create the relationship of employee and employer or of principal and agent between the CITY OF IQALUIT and the Consultant. The Consultant is solely responsible for payments of all statutory deductions or contributions including but not limited to pension plans, unemployment insurance, income tax, workers' compensation and the Nunavut Payroll Tax.
- 5.4 This contract shall be interpreted and governed in accordance with the laws of Nunavut and the laws of Canada as they apply in Nunavut.
- 5.5 No waiver by either party of any breach of any term, condition or covenant of this contract shall be effective unless the waiver is in writing and signed by both parties. A waiver, with respect to a specific breach, shall not affect any rights of the parties relating to other or future breaches.
- 5.6 The failure of either party at any time to require the performance of any provision or requirement of this contract shall not affect the right of that party to require the subsequent performance of that provision or requirement.
- 5.7 Title to any report, drawing, photograph, plan, specification, model, prototype, pattern, sample, design, logo, technical information, invention, method or process and all other property, work or materials which are produced by the Consultant in performing the contract or conceived, developed or first actually reduced to practice in performing the contract (herein called "the Property") shall vest in the CITY OF IQALUIT and the Consultant hereby absolutely assigns to the CITY OF IQALUIT the copyright in the property for the whole of the term of the copyright. The Consultant shall not be responsible for any loss or damage suffered by the City of Iqaluit or any third parties resulting from any unauthorized use or modification of the property, errors in transmission of the property, changes to the Property by others, the consequences of design defects due to the design of others, or defects in contract documents prepared by others, and the City of Iqaluit agrees to defend, indemnify, and hold the Consultant harmless from and against all claims, demands, losses, damages, liability and costs associated therewith. Subject to the foregoing, the Property may be relied by the City of Iqaluit for design and construction work undertaken by other parties with respect to the Services provided that such parties verify the accuracy and completeness of the Property to their satisfaction.

- 5.8 It is intended that all provisions of this agreement shall be fully binding and effective between the parties, but in the event that any particular provision or provisions or a part of one is found to be void, voidable or unenforceable for any reason whatever, then the remainder of the agreement shall be interpreted as if such provision, provisions, or part thereof, had not been included.
- 5.9 This contract may be extended by the written consent of the parties.
- 5.10 The CITY OF IQALUIT may delegate any of its authority and undertaking pursuant to this contract to any employee or contractor the CITY OF IQALUIT by notice in writing to the Consultant.
- 5.11 This contract shall ensure to the benefit of and be binding on the respective administrators, successors and assignment of each of the parties hereto.

6. CONSULTANT RESPONSIBILITIES

- 6.1 The Consultant shall indemnify and hold harmless, the CITY OF IQALUIT, its officers, employees, servants and agents from and against all claims, actions, causes of action, demands, losses, costs, damages, expenses, suits or other proceedings by whomsoever made, brought or prosecuted in any manner based upon or related to the negligent acts, errors, or omissions of the Consultant under this contract.
- 6.2 The Consultant shall be liable to the CITY OF IQALUIT for any loss or damage to property or equipment that is supplied to or placed in the care, custody or control of the Consultant for use in connection with the contract if such loss or damage is attributable to the negligence or deliberate acts of the Consultant or its employees or agents.
- 6.3 If, in the opinion of the CITY OF IQALUIT acting reasonably, the Consultant is in default in respect of any obligation of the Consultant hereunder, the CITY OF IQALUIT may rectify such default and pursue a claim against the Consultant for any direct costs associated with any such remediation, including a reasonable allowance for the use of the CITY OF IQALUIT's own employees or equipment.
- 6.4 The Consultant may not assign or delegate work to be done under this contract, or any part thereof, to any other party without the written consent of the CITY OF IQALUIT. In the case of a proposed assignment of monies owing to the Contractor under this contract, the consent in writing of the CITY OF IQALUIT must be obtained.
- 6.5 The Consultant shall keep proper accounts and records of the services for a period of 3 years after the expiry or termination of this agreement. At any time during the term of this contract or during the three years following the completion or termination of this agreement, the Consultant shall produce copies of such accounts and records upon the written request of the CITY OF IQALUIT.
- 6.6 The Consultant shall notify the CITY OF IQALUIT immediately of any claim, action, or other proceeding made, brought, prosecuted or threatened in writing to be brought or prosecuted that is based upon, occasioned by or in any way attributable to the performance or non-performance of the services under this contract.

- 6.7 If at any time the Consultant considers their estimates indicate costs will exceed the project budget, they will immediately advise the City of Iqaluit. If in the opinion of the City of Iqaluit, acting reasonably, the excess is due to design, costs factors or matters under the control or reasonably foreseeable by the Consultant, the CITY OF IQALUIT may require the Consultant to do everything by way of revision of the design to bring the cost estimate within the project budget. Costs of completing such revisions shall be based upon a level of compensation reasonably appropriate to the circumstances, including the reason for the revisions.
- 6.8 Except as required in the performance of services set out in this agreement, the Consultant must maintain as confidential all data and information made available to the Consultant, the CITY OF IQALUIT, or any other parties which is generated by or results from the Consultant's performance of the Services described in this Contract. All such data and information is the property of the City of Iqaluit. This clause shall survive the termination of the Contract.

7. TERMINATION

- 7.1 The CITY OF IQALUIT may terminate this contract at any time upon giving written notice to this effect to the Consultant if, in the opinion of the CITY OF IQALUIT, the Consultant is unable to deliver the service as required, the Consultant's performance of work is persistently faulty, in the event that the Consultant becomes insolvent or commits an act of bankruptcy, in the event that any actual or potential labor dispute delays or threatens to delay timely performance of the contract or the (Consultant Contractor) defaults or fails to observe the terms and conditions of the contract in any material respect.
- 7.2 This contract shall terminate as of the day for termination set out in the written notice and the Consultant shall forthwith invoice the CITY OF IQALUIT for work performed to the date of termination.
- 7.3 Any invoice submitted by the Consultant pursuant to clause 7.2 shall be reviewed by the CITY OF IQALUIT to assess the amount which is properly due and owing for work done by the Contractor prior to termination.

8. FINANCIAL

- 8.1 The CITY OF IQALUIT, having given written notice of a breach, may withhold or hold back in whole or in part any payment due the Consultant without penalty, expense or liability, if in the opinion of the Contracting Authority, the Consultant has failed to comply with or has in any way breached an obligation of the consultant. Any such hold back shall continue until the breach has been rectified to the satisfaction of the CITY OF IQALUIT.
- 8.2 The CITY OF IQALUIT may set off any payment due the Consultant against any monies owed by the Consultant to the CITY OF IQALUIT.
- 8.3 The City of Iqaluit will pay the Goods and Services Tax (GST).

- 8.4 Provided all terms and conditions on the part of the Consultant have been complied with, each invoice will be paid thirty (30) calendar days after receipt of the invoice, or thirty (30) calendar days after delivery of the services, whichever is later. Invoices from Nunavut Consultants (as defined by the CITY OF IQALUIT NNI Policy) will be paid twenty (20) calendar days after receipt of the invoice, or twenty (20) calendar days after receipt of the services, whichever is later.
- 8.5 The CITY OF IQALUIT may, in order to discharge lawful obligations or to satisfy lawful claims against the Consultant or a Subconsultant arising out of the execution of work, pay any amount, which is due and payable to the Consultant under the contract, if any, directly to the obligee of and the claimants against the Consultant or Subconsultant.

9. INSURANCE AND LIABILITY

- 9.1 The Consultant's liability to the City of Iqaluit for claims arising out of this Agreement, or in any way relating to the Services, will be limited to direct damages and to the re-performance, without additional compensation, of any Services not meeting a normal professional standard of care and such liability will, in the aggregate, not exceed the amount of \$1,000,000.00. The limitations of liability will apply, to the extent permitted by law, whether Consultant's liability arises under breach of contract or warranty; tort, including negligence; strict liability; statutory liability; or any other cause of action, and will extend to and include Consultant's directors, officers, employees, insurers, agents and sub-consultants.
- 9.2 In no event will either party be liable to the other party for indirect or consequential damages including without limitation loss of use or production, loss of profits or business interruption.
- 9.3 The Consultant shall, without limiting his obligations or liabilities hereto, obtain, maintain and pay for during the period of this agreement, the following insurance with limits not less than those shown:
- a) Workers' Compensation insurance covering all employees engaged in the work in accordance with the statutory requirements of the Territory or Province having jurisdiction over such employees. If the Consultant is assessed any additional levy, extra assessment or super-assessment by a Workers' Compensation Board as a result of an accident causing injury or death to an employee of the Consultant or any sub-consultant, or due to unsafe working conditions, then such levy or assessment shall be paid by the Consultant at its sole cost and is not reimbursed by the CITY OF IQALUIT.
 - b) Employer's liability insurance with limits not less than \$500,000 for each accidental injury to or death of the Consultant's employees engaged in the work. If Workers' Compensation insurance exists, then in such event, the aforementioned Employer's Liability insurance shall not be required but the Comprehensive General Liability policy referred to in item (d) herein shall contain an endorsement providing for Contingent Employers' Liability insurance.
 - c) Motor Vehicle, water craft and snow craft standard liability insurance covering all vehicles and/or craft owned or non-owned, operated and/or licensed by the Consultant and used by the Consultant in the performance of this agreement in an amount not less than one million dollars (\$1,000,000.00) per occurrence for bodily injury, death and damage to property; and with respect to busses limits of not less than one million dollars (\$1,000,000.00) for vehicle hazards and not less than one million dollars (\$1,000,000.00) for Bodily Injury to or death of one or more passengers and loss of or damage to the passengers property in one accident.)



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- d) Comprehensive General Liability Insurance with limits of not less than two million dollars (\$2,000,000.00) (inclusive) per occurrence for bodily injury, death and damage to property including loss of use thereof. Such insurance shall include but not be limited to the following terms and conditions:
- Products & Completed Operations Liability *
 - Consultant's Protective Liability
 - Blanket Contractual Liability
 - Broad Form Property Damage
 - Personal Injury Liability
 - Cross Liability
 - Medical Payments
 - Non-owned Automobile Liability *
 - Contingent Employers Liability *
 - Employees as Additional Insureds *
- *WHERE APPLICABLE*
- e) Professional Liability Insurance with limits of not less than two hundred fifty thousand dollars (\$250,000.00) per claim and five hundred thousand dollars (\$500,000.00) in the annual aggregate, to cover claims arising out of the rendering of or failure to render any professional service under this contract or agreement.

All policies shall provide that thirty days written notice be given to the CITY OF IQALUIT prior to any cancellations of any such policies.

The Comprehensive General Liability Insurance policies shall name the CITY OF IQALUIT and any permitted sub-consultants as additional insureds only with respect to the terms of this contract and shall extend to cover the employees of the insureds hereunder.

The Consultant shall be responsible for any deductibles, exclusions and/or insufficiency of coverage relating to such policies.

The Consultant shall deposit with the CITY OF IQALUIT prior to commencing with the work a certificate of insurance evidencing the insurance(s) required by this clause in a form satisfactory to the CITY OF IQALUIT and with insurance companies satisfactory to the CITY OF IQALUIT.



REQUEST FOR PROPOSAL
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IN WITNESS WHEREOF the parties hereto have set their hand and seals as of the date and year entered below.

FOR THE CITY OF IQALUIT:

FOR THE CONSULTANT:

Name/Title

Name/Title

Signature

Signature

Date

Date

Witness

Witness

END OF APPENDIX E



REQUEST FOR PROPOSAL
Apex Cemetery Expansion
2023-RFP-046



APPENDIX F – SIGNING SHEET

I/We, agree that we have received addenda ____ to ____ inclusive, and the Proposal Pricing includes provisions set out in such addenda.

I/We confirm agreement to conform to the confidentiality requirements as indicated in Supplementary Conditions SC1 – Confidentiality.

I/We confirm agreement to conform to the conflict of interest requirements and disclosures as indicated in Supplementary Conditions SC2 – Conflict of Interest.

Signer must have authority to bind the company.

Signed, and delivered at this ____ day of _____ 2023.

Signature of Name (Authorized official or principal who has authority to bind the company)

Legal Company Name

Address: # Street, Municipality, Province/ Territory, Postal Code

Name: Print or Type

Title

Email

Telephone #

END OF APPENDIX F

END OF RFP



CITY OF IQALUIT

Design Report – Final

Apex Cemetery Remediation

April 2021 – 20-3451



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B	Apex Cemetery Standard Operating Procedures
C	Climate Influences on the Apex Cemetery
D	Communications Summary Report

1.0

Introduction

1.1

Background

Dillon Consulting Limited (Dillon) was retained by the City of Iqaluit (the City) to provide design services in support of the Apex Cemetery remediation improvements. The Apex Cemetery first opened to the public in October 2014, after a three year development program including a site selection, design, and construction. The site selection and design process included extensive consultation with City Staff, Council, Inuit elders, and the community to ensure the cemetery would respect local culture, traditions, and connections to the land.

Located in Apex, the new cemetery site was chosen due to its views of the water, access, topography, geology, and opportunities for future expansion of burial areas. The cemetery has looping pathways, distinct burial areas marked by boulders, and a ceremonial gathering space anchored by an archway of bowhead whale jaw bones that frame the view to Frobisher Bay.

Nonetheless, while recognized for its aesthetic design, the cemetery has been encumbered by drainage issues which have resulted in seasonal flood, localized ponding, and challenges with grave opening and closing. This issue has caused distress for families interring and visiting their loved ones, and challenges for City maintenance crews, undertakers, and faith leaders. The effects of climate change such as warmer temperatures and wetter summers, have anecdotally exacerbated the local site challenges. With a longer and warmer summer season, the active layer – defined as the seasonally thawed layer above permafrost, is believed to melt and infiltrate into pre-dug graves causing unpleasant burial conditions.

In order to improve the functionality of the site, the cemetery requires remediation measures to improve local drainage conditions and lessen the impacts of seasonal precipitation and melted water in the active layer.

1.2

Scope of Work

The purpose of this report is to provide the City a summary of the recommended remediation upgrades to improve the drainage and burial conditions in the Apex Cemetery. This report forms the basis of design of the proposed improvements and strategies. Detailed design drawings were prepared as part of this project and can be found in **Appendix A**. The proposed design considered the following components:

- Consideration to raise the entire site of the Cemetery with specified design height and consideration of maintaining site access from parking areas and pathways;
- Permafrost impacts and mitigation measures (including future climate considerations);
- Specification of fill material and crowning;

- Hydrologic and hydraulic conveyance capacity calculations for the 100-year return period rainfall event;
- Location, size, and dimensions for new or rehabilitated ditches, drainage ways, cemetery pathways/walkways, and parking;
- Summary of photograph and survey of each grave marker to outline improved system for identifying graves; and
- Considerations for future expansion.

To complement the remediation improvements, existing Standard Operating Procedures (SOPs) were also updated with this project and can be found in **Appendix B**.

2.0 Previous Practices

Based on discussions with the City, the operations and maintenance procedures were previously carried out by an independent third party and have recently been re-acquired by the City. The operations and maintenance procedures were to follow the Iqaluit Cemetery Standard Operating Procedures developed by LEES and Associates in 2014. It is unclear to what extent the SOPs previously developed by LEES and Associates were implemented by the independent third party, but it is believed that some of the existing site challenges may be attributed to not following adequate operations and maintenance practices. An example of this, is the sequencing of burial order (from low ground to higher ground) was not followed thus likely leading to leachate and odour problems during funerals.

3.0 Existing Conditions

3.1 Site Conditions

Dillon personnel was on-site at the Apex Cemetery in September of 2020, prior to fall freeze-up. The focus of the site investigation was to identify the drainage issues, carry out topographic survey, and document the location of the existing plot layouts and grave markers.

While on-site, Dillon personnel noted the lack of drainage and pooling of water within the cemetery. The localized ponding and pooling of water on-site results in existing plots being submerged under water during the spring and summer months, as well as pathways throughout the cemetery being inaccessible due to muddy and unstable conditions.



Figure 1: Areas of Ponding within the Cemetery

3.1.1 Current Operational Conditions

Due to the northern climate and tundra, graves must be pre-dug during the warmer months to allow for burial during the winter months. Currently, the City pre-digs approximately 50 plots during the late summer/fall season and these pre-dug graves are causing operational problems for the City staff as the pre-dug graves are accumulating surface and active layer water within the pre-dug grave wooden shoring structures. An example of this can be seen in **Figure 2**. Prior to a burial, this water is required to be pumped out of the pre-dug grave numerous times on the morning of the scheduled burial due to the water within the active layer continuing to rapidly migrate into the pre-dug grave.



Figure 2: Accumulation of Water within Pre-dug Grave

A second site operational challenge the City faces is the presence of human decay leachate in the water that collects in the pre-dug graves. This is believed to happen due to the shallow burials limited to being above the permafrost (active layer), as well as due to previous SOPs not being followed. As mentioned above, another contributing factor is that burials have not always been carried out in a proper plot sequence. That is, they did not follow a lower ground to higher ground order (from downstream locations to upstream locations), causing leachate to cross contaminate pre-dug graves, as they flowed from higher ground to lower ground plots; leading to unpleasant conditions and foul odours during funerals. Human decay leachate can also create adverse impacts to the environment and can be a health and safety risk to community members and City staff that may be exposed to the contaminated water.

3.2 Climate Change

The influences of the changing climate on the Apex Cemetery and its landscape were examined by considering trends in temperatures and precipitation over the past few decades and by incorporating climate change projections looking forward into the future. Both the Iqaluit airport climate data and the most recently updated gridded or mapped and interpolated climate data fields were used in the analyses. The climate change projections were based on 33 of the currently vetted climate change projection datasets from the 5th Intergovernmental Panel on Climate Change (IPCC) Assessment Report released in 2013. Dillon has a climate analysis system that incorporates all updated climate data and climate change projections issued by the IPCC and is currently assessing the next generation of climate change models, the 6th IPCC Assessment Report models, that should become officially available to general users within a couple of years.

Temperature variables were chosen to reflect the influences of climate warming in all seasons on gradual permafrost thaw and of anomalously “hot” summer temperatures on abrupt permafrost thaw and sudden subsidence of soils (sinkholes). All temperature variables were found to be increasing over time with significant increases into the future. The climate study also considered the role of precipitation trends (rainfall and snowfall totals) on flooding events and in exacerbating further permafrost thaw, adding in turn to flooding and drainage concerns. The analysis considered both climate station data and gridded or interpolated climate data and found declining trends in average and precipitation totals for all months except June. The declining trend in precipitation totals is a finding that applies for unknown reasons to other locations in eastern Baffin Island, perhaps reflecting the importance of the Arctic Oscillation and North Atlantic Oscillation phenomenon to the region’s weather patterns. However, more detailed analysis of extreme or more intense rainfall events indicated increases in summer 3-day heavy or extreme rainfall events. The study also examined seasonal and estimated changes in rainfall and snowfall as having a potential role in the changing landscape of the Apex Cemetery.

This climate assessment could benefit from additional considerations of anomalous or hot summer temperature indicators (thawing indices) associated with rapid permafrost degradation, as well as additional analysis of excess rainfall indicators that can capture both of the influences of extreme or intense rainfall events as well as more frequent rainfall events. Studies on changes in seasonality of precipitation patterns and freezing and thawing cycling could also prove informative. In general, it would be informative to undertake a “forensics type” analysis of flooding and drainage issues and their weather and climate links, including “setup” conditions, and to further investigate other practices to remediate the combined impacts of permafrost degradation and flooding.

A detailed explanation and analysis of the climate trends and climate change projections can be found in **Appendix C**.

4.0 Design Considerations

4.1 Mitigation Strategies

Based on Dillon's site investigation, background information collection, and discussions with the City, the challenges of the Apex Cemetery can be categorized into two distinct issues; 1) surface water ponding / saturated soils throughout the site due to poor drainage, and 2) accumulation of active layer water within the pre-dug burial plots due to the seasonal melting of the active layer. The potential solutions for the first item above will be expected to be covered by the City under their capital expenditures program while the potential solutions for the second item will be expected to be covered under their operational program; thus, the following sections of the report have been split into two separate design considerations; capital and operational.

4.1.1 Capital Program Solutions – Grading and Drainage Improvements

To mitigate the local ponding / pooling of water and the resulting saturated soils, the optimal strategy is to improve the site grading and drainage network. A good grading and drainage plan will promote efficient surface water runoff and avoid water from infiltrating into the ground (which exacerbates local drainage challenges). In support of this strategy, Dillon prepared a grading and drainage improvement plan.

The proposed Apex Cemetery drainage plan includes regrading and infilling of the existing site (existing and unused burial plots), upgrading and redefining of the ditch networks, as well as the resetting of the existing culverts. The proposed drainage plan takes into account the *Community drainage system, planning, design and maintenance in northern communities* (CAN/CSA-S503-15) prepared by Canadian Standards Association and applies best management practices to the site. The amount of infill and grading required at the site is based on the need for positive drainage to be achieved and to eliminate any low-lying areas while also allowing for the site to be pedestrian accessible. Raising the crown of the central pathway will allow for positive drainage to be achieved from the central pathway outwards towards both the north and south ditch drainage networks. These networks will convey surface water downstream to the east of the cemetery, and into an existing man-made trapezoidal drainage channel north and east of the site.

The outer pathways (maintenance roads) around the cemetery have been designed to be super-elevated to drain towards the outside. This will result in cemetery runoff to sheet flow across the site, through the outer pathway and into the outer ditch. A ditch system along the inside of the pathway was considered and discussed with the City. However, an inner ditch system would create a physical barrier for pedestrians and would require dedicated intermittent pedestrian and vehicular crossings as well as culverts to convey flows through the crossings. Due to the cold climate, the culverts will likely freeze in the colder and shoulder months, and the City would have to spend considerable maintenance resources to clear the multiple culvert crossings and to keep them from being damaged during the winter months.

The outer ditch concept, while creating sheet flow across the outer pathway and potential icing during the shoulder seasons (spring and fall), will reduce the number of culverts required and is believed to be more resilient to freeze/thaw cycles and may prove to be more effective. Thus, the City did not oppose the outer ditch design concept.

The western boundary of the cemetery contains an existing ditch and culvert system that conveys flows to the south and the north away from the site. Culverts convey flows under existing parking areas and the outer pathway. The intention of the proposed grading improvements is to maintain the west ditch and culvert network. To accommodate the drainage concept, the parking areas and pathways were also designed to be regraded to convey surface runoff away from the parking areas and adjacent pedestrian walking zones while maintaining the existing parking capacity.

Based on the evaluation of the existing topography and discussions with the City, the ceremonial space to the east of the site as well as the scattering garden and the infant burial section to the south-east of the site are not to be disturbed as part of this project.

The drainage design computations for the capacity of the ditch and culvert networks were done using the rational method and included all contributing catchment areas. The drainage calculations were performed using the historical rainfall data, Intensity-Duration-Frequency (IDF) curve, for Iqaluit from Environment and Climate Change Canada. In lieu of using future climate change rainfall design data for the local drainage system design, the drainage systems were designed to accommodate climate change impacts by ensuring excess conveyance capacities in the ditches and culverts. The ditches were designed to accommodate the historical 100-year short duration storm event flows with extra freeboard to provide additional climate change impact resiliency. Similarly, the culverts were designed to convey flows much greater than the historical 100-year design in anticipation of future changes in flows and freezing/thawing conditions associated with climate change.

4.1.2 Operational Program Solutions – Burial Options

To mitigate exposure to the accumulation of contaminated water in the pre-dug burials, two alternative burial options are proposed; Option 1) above ground burial vaults (HDPE Crypts), and Option 2) insulating pre-dug burials. It should be noted that these operational alternatives are not standalone solutions and require the construction of a properly graded drainage plan and routine maintenance to operate properly and effectively. The following sections describe the two burial options in more detail.

4.1.2.1 HDPE Crypts (Burial Option 1)

A high-density polyethylene (HDPE) crypt is a burial vault typically used in below ground burials. After discussion with the City, to avoid encountering the contaminated active layer water, using an HDPE crypt above ground, rather than below ground, is proposed as the first burial option alternative. It is important to note that the proposed HDPE crypts are designed and intended for below ground use and using them for an above ground application may reduce the service life of the crypt. Typically, above ground HDPE products have a maximum life expectancy of approximately 25 years. The effects of

Ultraviolet (UV) deterioration can be expected (e.g. colour fading, warping, etc.) after the 25 year service life. HDPE products shielded from UV exposure can last significantly longer. To help mitigate the effects of UV exposure, the City could consider encasing the HDPE vaults. Options for encasing HDPE crypts could include but are not limited to; concrete structures, stone veneer cladding, granite cladding, as well as the more cost effective faux veneer stone cladding. Options for encasing the HDPE crypt have not been included within this design report or cost estimates.

The proposed HDPE crypt detail is designed to be inset into the ground by 300 mm and set on a granular pad that has a minimum thickness of 150 mm. The granular pad and inset will provide structural support to mitigate any settlement or moving of the crypt. A typical detail of the HDPE crypt is shown in **Figure 3**.

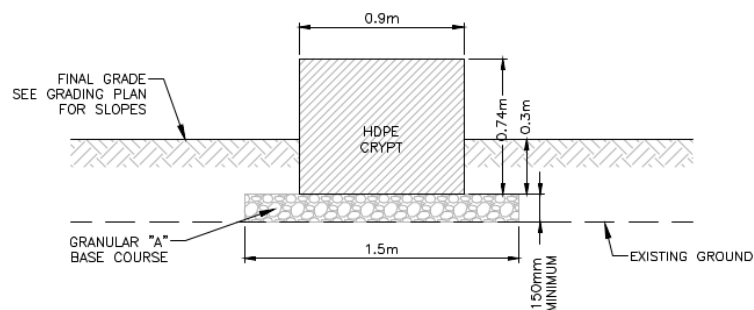


Figure 3: Typical HDPE Crypt Detail

Once the crypt is installed in the designated plot, keeping with traditional burial practices, stone cairns can be added to surround the crypt. This can further stabilize the crypt in place, provide UV protection, while also adding aesthetic accents to each of the burial plots. With the addition of stone cairns, it is important to note that the burial plot capacity within the cemetery is reduced based on how high around the crypt the stone cairns are desired. This is due to the stone cairns having to be placed at an approximate 2:1 slope around the crypt. For example, for the stone cairns to be placed to the top of the crypt, the horizontal spacing would require approximately 900 mm for the single burial plot; this is further illustrated in **Figure 4**.

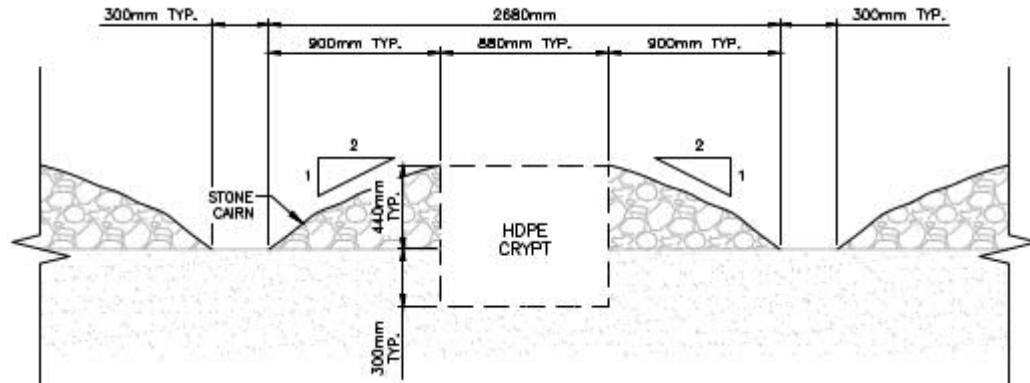


Figure 4: Typical HDPE Crypt Detail with Stone Cairn to the Top

4.1.2.2 Insulating Pre-dug Graves (Burial Option 2)

If in-ground burials are considered, a strategy to avoid contaminated active layer water from accumulating in the pre-dug graves is to insulate the ground around and within the pre-dug graves and keep the active layer frozen during the warmer months. This proposed burial option includes a framed insulation structure installed over top of the exposed pre-dug grave prior to the beginning of the thawing of the active layer in the spring/summer months. A typical detail of this option is shown in Figure 5. This framed insulation option uses 100 mm of rigid insulation that is framed in using 38 mm by 89 mm (2"x 4") pressure treated lumber to allow re-use each year and is shown in Figure 6.

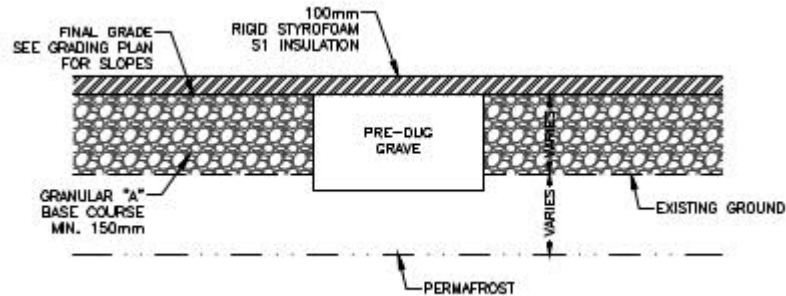


Figure 5: Typical Grave and Insulation Detail

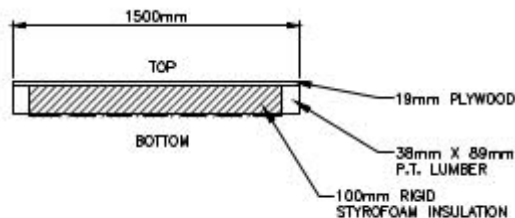


Figure 6: Typical Framed Insulation Detail

Additional insulation within the pre-dug grave can also be installed to further promote the active layer to remain frozen during the warmer months. This would include the installation of 50 mm thick rigid insulation on all four sides of the pre-dug grave between the native material and the wooden bracing inside the pre-dug grave. This additional insulation would only be installed for a one-time use as the insulation would remain in place and filled in during funeral grave backfilling.

4.2 Leachate Management

As mentioned in previous sections, pre-dug grave sites located downslope of existing burial plots appear to contain traces of leachate produced by human decay within the existing burial plots upslope. With this potentially being a health and safety risk to City staff and the public, the City collected water samples from the site and sent to Caduceon Environmental Laboratories for analysis.

Based on the analysis from the laboratory and their preliminary report, the majority of the constituents (colour, turbidity, TSS, metals, phosphorus, and COD) are typical of groundwater and only represent an exposure risk to people or the environment if brought or discharged to the surface. The bacteria and organic content within the leachate are slightly elevated compared to typical groundwater, but as stated above, only represent an exposure risk if in contact with the water or the water is brought to surface. Eliminating surface discharge and potential human contact will address risks associated with the contaminated water.

Leachate water from the cemetery could be collected and treated via standard treatment methods such as UV filtration; however, system optimization would need to be completed. Pre- and post-treatment water testing would also be required to improve system effectiveness. Optionally, the water could also be collected, transported, and treated at the wastewater treatment facility; otherwise it would not be suitable for direct discharge into receiving water bodies. The exact form of treatment should be evaluated following sample collection at the time of leachate water collection.

Changes in burial practices that eliminate the need to dig into the active layer and/or insulate the active layer could also eliminate the potential for contact with water in the active layer, eliminating the potential for exposure to the water. Exposure to leachate within the active layer can also be reduced by working from the low-lying areas to the higher areas.

5.0 Recommendations

It is important to note that, due to the complexity of the site conditions and limited data available to fully assess the root cause of the problems, the solutions and options provided are not expected to fully solve the two primary problems. Rather, they are meant to mitigate the problems and improve site conditions within practical and low cost means available to the City. To maximize the benefits of the proposed mitigation strategies, each of these recommendations will still require routine maintenance and grading adjustments to promote positive drainage away from the site. Routine maintenance and standard operating procedures for the capital and operational recommendations are provided in the SOP document found in **Appendix B**.

5.1 Capital Program Solutions – Grading and Drainage Improvements

The proposed grading and drainage plan is recommended to be implemented during the upcoming construction season. As mentioned in **Section 4.1.1**, the grading plan is designed to promote more effective surface runoff away from the site and mitigate local ponding of water and saturated soils. Due to the site being an active cemetery, construction strategies and methods must be taken into consideration to protect and respect the existing burials. It is recommended that during construction, fill and compaction techniques applied on existing burial plots be limited to hand placed methods with light equipment used where necessary. Heavy machinery and robust compaction techniques should be limited to the burial plots not currently occupied.

The existing 450 mm corrugated metal pipes (CMPs) on-site appear to be in good condition and are recommend to be re-used and reset at the proposed invert elevations for the implementation of the grading plan. The culverts have been evaluated based on their conveyance capacity for the 100-year short duration storm event flows with excess capacity to provide additional climate change impact resiliency. In addition to the resetting of the existing culverts, it is recommended that flexible high density polyethylene culvert markers be installed on both ends of each culverts. As culverts are buried beneath the snow during the winter months, culvert markers will identify both the inlet and outlet for routine maintenance when ice and snow build up occurs. An example of an installed culvert marker can be seen in **Figure 7**.



Figure 7: Example of a Culvert Marker Installed on a CSP Culvert

As previously stated, the proposed grading plan has been designed to not require the need to regrade the ceremonial space or scattering garden and the infant burial section areas, east of the main cemetery as the water conveyed from the grading plan is captured within the north and south ditches and then conveyed downstream through the existing ditch between the ceremonial space and the infant burial site. This ditch has modest longitudinal slopes; thus, to reduce erosion potential in the ditch and the transfer of sediment into the receiving channel, riprap lining is proposed on that part of the ditch.

5.2 Operational Program Solutions – Burial Options

The two proposed burial options, 1) above ground HDPE crypts and 2) insulated ground burials, are intended to mitigate the exposure of leachate water to community members and City staff and to mitigate potential environmental impacts. Both options are not known to have been used in a northern cemetery setting; thus, to test the effectiveness of the performance of each option and to get public consent, a pilot project is recommended.

To properly control pilot program variables and performance metrics, the pilot project is to be implemented following the completion of the capital grading and drainage plan works. With the drainage improvements in place, both of the proposed burial options should be tested over a full year's time in order to monitor and document the performance and efficiency of each burial option. By testing them over a full year, seasonal changes, in particular the spring freshet, thawing/freezing of the active layer, fall freeze-up, as well as potential extreme weather events (i.e., 100-year return period rainfall events) can be monitored. During the pilot project period it is also recommended that the required maintenance and frequency of maintenance activities are documented and included in the analysis of each option. The City may elect to test Option 2 (insulated burials) this spring / early summer prior to construction and prior to the active layer melting to test the effectiveness of keeping the active layer water frozen. If this occurs, the Option 2 insulation will be in place during construction and will need to be coordinated with the construction logistics.

Prior to the completion of the grading and drainage improvements, the City is expected to follow current burial protocols and as a result, exposure to leachate water in the pre-dug graves may continue. Under these interim conditions, if leachate water is encountered within the pre-dug graves the leachate should be treated prior to being discharged into a receiving water body. This can be accomplished by trucking leachate water to a wastewater treatment plant or facility that can treat to acceptable surface water quality standards. Interim tasks and procedures, including the requirements for leachate treatment, are further described within the SOPs found in **Appendix B**.

6.0 Cost Considerations

The following sections describe Class B cost estimates of both the capital and operational program improvements and recommendations. The capital program improvements, grading, and drainage plan is expected to be implemented during the summer of 2021, with the tender process expected to take place during the spring. During the preparation of tender documents, the cost estimate will be updated to a Class A estimate. The operational program solutions include cost estimates for two scenarios, 1) a contractor completing the work, and 2) City staff completing the work of the two proposed burial options to fully inform the City of Iqaluit as they develop a pilot approach and program.

The Class B cost estimates provided below, for both capital and operational improvements, include the following considerations:

- Material unit costs include annual sealift delivery costs from Montreal to Iqaluit.
- Material costs are based on purchasing in 2021 and do not include inflation for any materials purchased in succeeding years.
- The cleaning and maintenance of the site, including ditches and culverts, is to be completed by the City on a routine basis.

6.1 Capital Program Solutions – Grading and Drainage Improvements (Contractor)

Table 1: Capital Plan Cost Estimate

Items	Quantity	Units	Unit Price	Cost
25mm Granular Machine Placed - Supply, Haul, Placement	885	cu.m	\$50.00	\$44,250
25mm Granular Hand Placed - Supply, Haul, Placement	885	cu.m	\$150.00	\$132,750
Ditching	223	m	\$150.00	\$33,450
Reset of Existing 450 mm Culverts	70	m	\$300.00	\$21,000
Riprap D50=200 mm - Supply, Haul, Placement	30	cu.m	\$380.00	\$11,400
Culvert Markers	12	each	\$60.00	\$720
Sub-Total				\$243,570
Contingency Allowance (15%)				\$36,536
Total				\$280,106

6.2 Operational Program Solutions (Contractor) – Burial Options

The cost estimates provided in this section assume the proposed work is completed by a local contractor with the unit prices provided including the cost of labour as well as any other foreseen cost with the construction. The excavation unit prices provided below are based on discussions with the City and the current costs associated with a local contractor completing the burial activities.

6.2.1 HDPE Crypts (Contractor)

Table 2: Option 1A (HDPE Crypts) - Contractor

Items	Quantity	Units	Unit Price	Cost
HDPE Crypts	250	each	\$800.00	\$200,000
150mm thickness Granular Base (25 mm)	141	cu.m	\$50.00	\$7,031
Excavation	250	each	\$420.00	\$105,000
Sub-Total				\$312,031
Contingency Allowance (15%)				\$46,805
Total				\$358,836

Table 3: Option 1B (HDPE Crypts) - Contractor

Items	Quantity	Units	Unit Price	Cost
HDPE Crypts	164	each	\$800.00	\$131,200
150mm thickness Granular Base (25 mm)	92	cu.m	\$50.00	\$4,613
Stone Cairns (Riprap D50=200 mm)	117	cu.m	\$380.00	\$44,460
Excavation	164	each	\$420.00	\$68,880
Sub-Total				\$249,153
Contingency Allowance (15%)				\$37,373
Total				\$286,525

Table 4: Option 1C (HDPE Crypts) - Contractor

Items	Quantity	Units	Unit Price	Cost
HDPE Crypts	100	each	\$800.00	\$80,000
150mm thickness Granular Base (25 mm)	56	cu.m	\$50.00	\$2,813
Stone Cairns (Riprap D50=200 mm)	126	cu.m	\$380.00	\$47,880
Excavation	100	each	\$420.00	\$42,000
Sub-Total				\$172,693
Contingency Allowance (15%)				\$25,904
Total				\$198,596

6.2.2 Insulating Pre-dug Graves

Table 5: Option 2 (Installation of Insulation) - Contractor

Items	Quantity	Units	Unit Price	Cost
50 mm Rigid Styrofoam Insulation for within Wooden Structure (Optional)	1675	sq.m	\$52.50	\$87,938
100 mm Rigid Styrofoam Insulation for Top	250	sq.m	\$105.00	\$26,250
39 mm x 89 mm Pressure Treated Lumber	503	m	\$15.00	\$7,538
19 mm Pressure Treated Plywood	270	sq.m	\$37.50	\$10,125
Excavation	250	each	\$1,400	\$350,000
Wooden Structure for Inside Pre-dug Grave (Identical to Current Practices)				
38 mm x 235 mm Pressure Treated Lumber	5625	m	\$19.50	\$109,688
19 mm x 38 mm Bracing Stakes	2400	m	\$3.00	\$7,200
			Sub-Total	\$598,738
			Contingency Allowance (15%)	\$89,811
			Total	\$688,548

6.3 Operational Program Solutions (the City) – Burial Options

The cost estimates provided in this section assume the proposed work is completed by City staff with the unit prices provided including only the cost of materials and shipping of the materials to Iqaluit. The construction and labour is assumed to be completed by City staff.

6.3.1 HDPE Crypts

Table 6: Option 1A (HDPE Crypts) – the City

Items	Quantity	Units	Unit Price	Cost
HDPE Crypts	250	each	\$800.00	\$200,000
150mm thickness Granular Base (25 mm)	141	cu.m	\$50.00	\$7,031
			Sub-Total	\$207,031
			Contingency Allowance (15%)	\$31,055
			Total	\$238,086

Table 7: Option 1B (HDPE Crypts) – the City

Items	Quantity	Units	Unit Price	Cost
HDPE Crypts	164	each	\$800.00	\$131,200
150mm thickness Granular Base (25 mm)	92	cu.m	\$50.00	\$4,613
Stone Cairns (Riprap D50=200 mm)	117	cu.m	\$380.00	\$44,460
			Sub-Total	\$180,273
			Contingency Allowance (15%)	\$27,041
			Total	\$207,313

Table 8: Option 1C (HDPE Crypts) – the City

Items	Quantity	Units	Unit Price	Cost
HDPE Crypts	100	each	\$800.00	\$80,000
150mm thickness Granular Base (25 mm)	56	cu.m	\$50.00	\$2,813
Stone Cairns (Riprap D50=200 mm)	126	cu.m	\$380.00	\$47,880
			Sub-Total	\$130,693
			Contingency Allowance (15%)	\$19,604
			Total	\$150,296

6.3.2

Insulating Pre-dug Graves**Table 9: Option 2 (Installation of Insulation) – the City**

Items	Quantity	Units	Unit Price	Cost
<i>50 mm Rigid Styrofoam Insulation for within Wooden Structure (Optional)</i>	1675	sq.m	\$52.50	\$87,938
100 mm Rigid Styrofoam Insulation for Top	250	sq.m	\$105.00	\$26,250
39 mm x 89 mm Pressure Treated Lumber	503	m	\$15.00	\$7,538
19 mm Pressure Treated Plywood	270	sq.m	\$37.50	\$10,125
Wooden Structure for Inside Pre-dug Grave (Identical to Current Practices)				
38 mm x 235 mm Pressure Treated Lumber	5625	m	\$19.50	\$109,688
19 mm x 38 mm Bracing Stakes	2400	m	\$3.00	\$7,200
			Sub-Total	\$248,739
			Contingency Allowance (15%)	\$37,311
			Total	\$286,048

7.0

Closure

This report and recommendations presented herein are based on the site visit and topographic survey conducted by Dillon personnel in September 2020, review of available background documentation, and discussions with City staff. This report has been prepared for the exclusive use of the City of Iqaluit and its agents for the specific application described in this report.

We trust this information provided herein is satisfactory to the City of Iqaluit for the required Apex Cemetery remediation works.

If you have any question or concerns, please contact the undersigned.

Sincerely,

Dillon Consulting Limited



Keith Barnes, P.Eng.
Lead Engineer - Associate



Pablo Lopez, P.Eng.
Project Manager – Associate

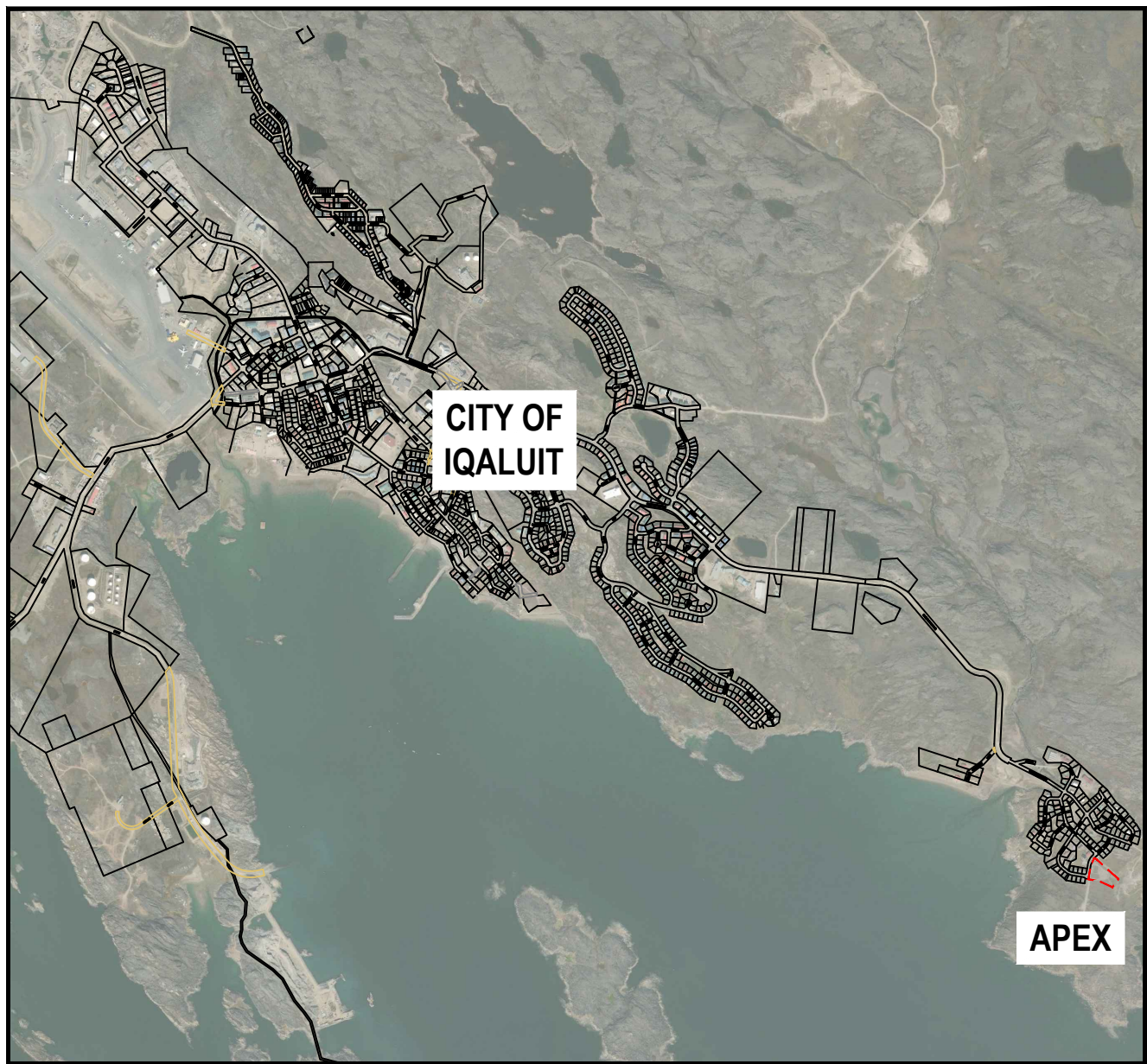
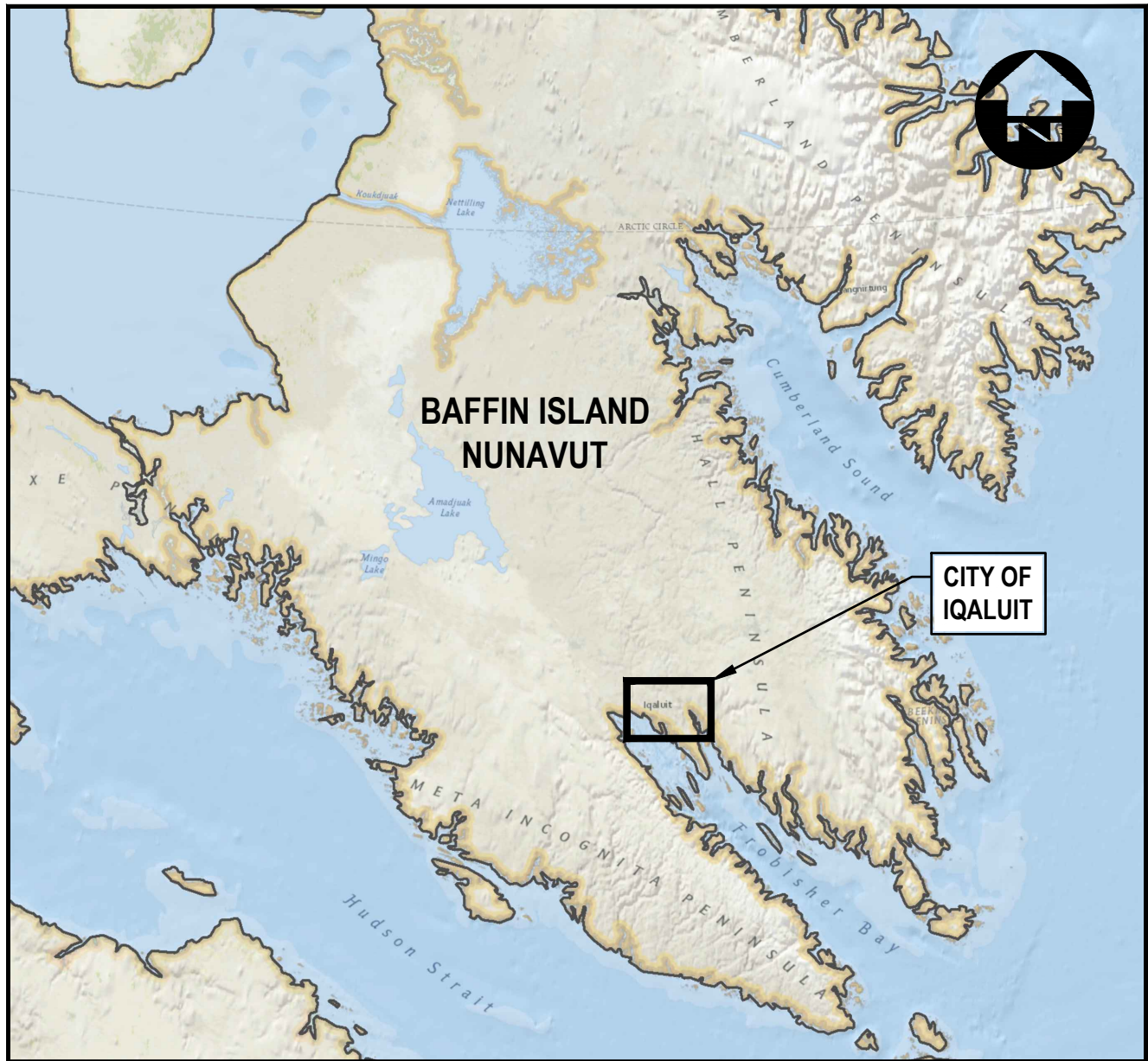
Appendix A

Apex Cemetery Remediation Design Drawings

CITY OF IQALUIT

APEX CEMETERY REMEDIATION

100% DESIGN ISSUED FOR FINAL REVIEW



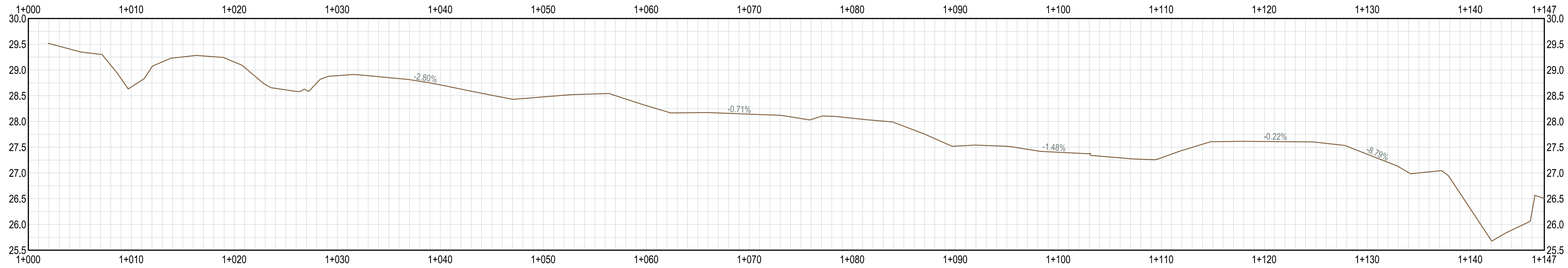
SHEET LIST TABLE	
DWG.	DESCRIPTION
GRADING DESIGN	
E01	EXISTING SITE CONDITIONS
E02	EXISTING SITE PROFILES
G01	PROPOSED SITE PLAN
G02	PROFILES AND SECTIONS INDEX PLAN
G03	SITE DESIGN PROFILES
G04	PERIMETER PATH AND DITCH PROFILES
G05	MAIN SITE GRADING DESIGN - SECTIONS
G06	WEST DITCH AND PARKING PAD - SECTIONS
G07	NORTH PERIMETER PATH AND DITCH SECTIONS
G08	SOUTH PERIMETER PATH AND DITCH SECTIONS
G09	GRADING DESIGN - CUT FILL ANALYSIS
G10	TYPICAL DETAILS
G11	TYPICAL DETAILS
LANDSCAPING DESIGN	
LL-1	CEMETERY PLOT LAYOUT OPTION 1A
LL-2	CEMETERY PLOT LAYOUT OPTION 1B
LL-3	CEMETERY PLOT LAYOUT OPTION 1C
LL-4	CEMETERY PLOT LAYOUT OPTION 2

NOT FOR CONSTRUCTION

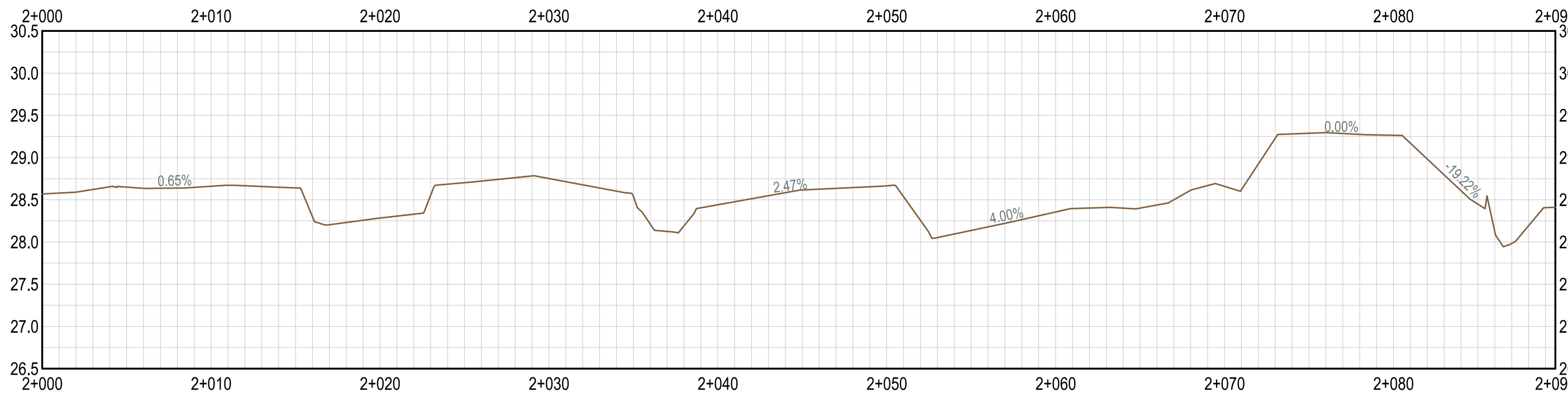
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DATE: 2021-04-23



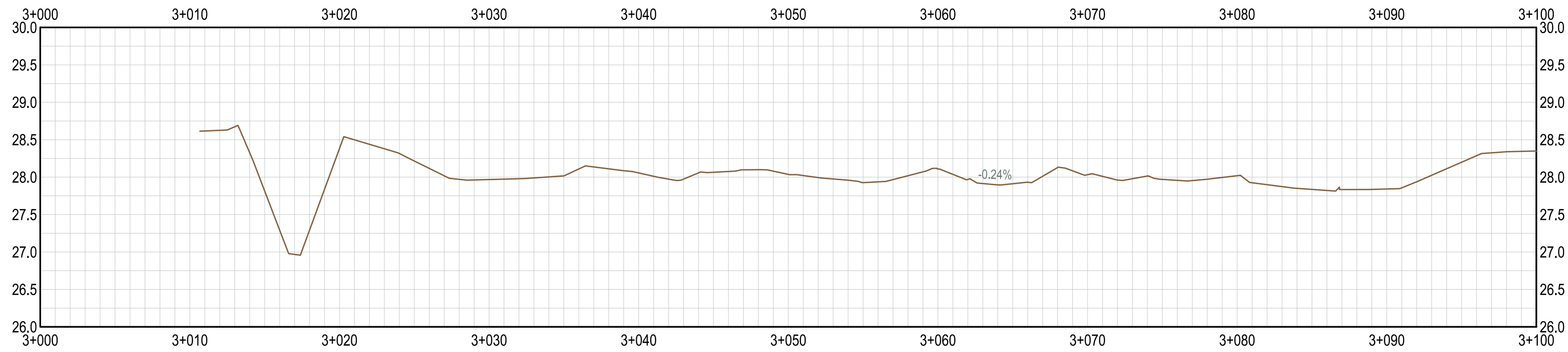
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PLOT DATE: 2024.04.23 8:17:53 AM PLOT SCALE: 1:250 H 1:50 V



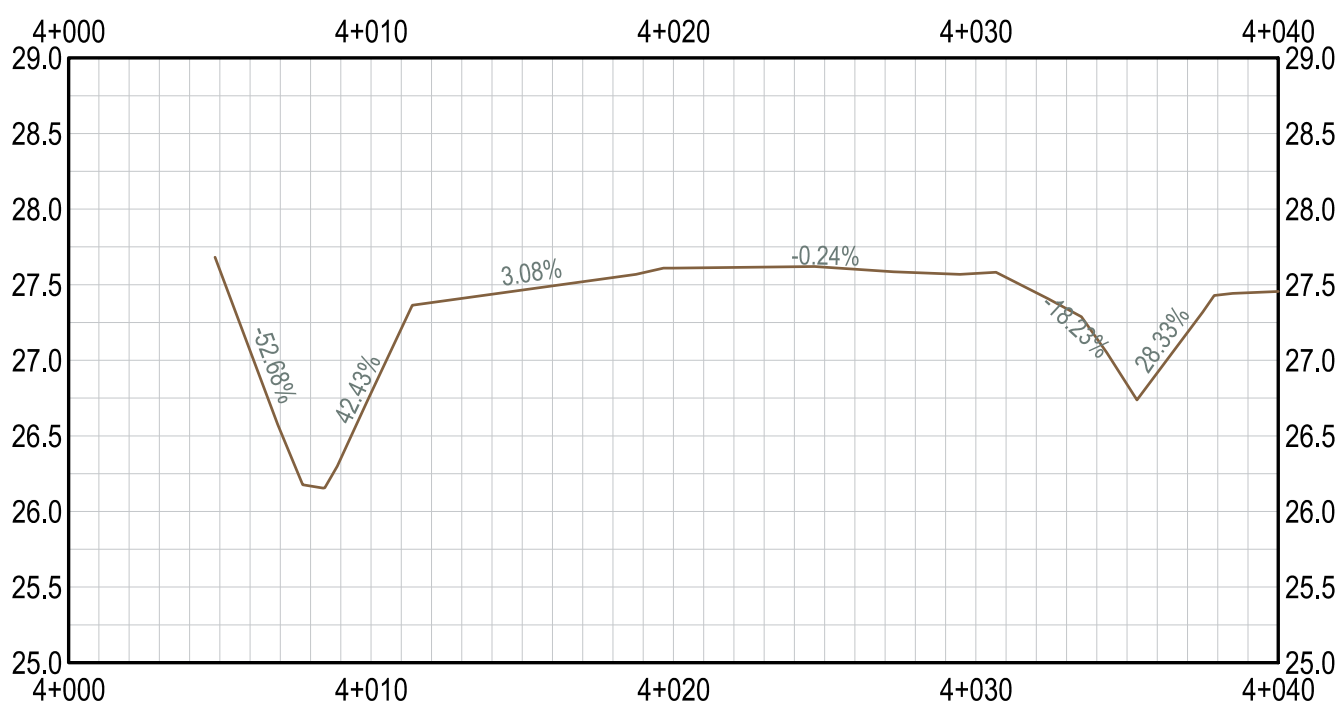
1 SITE CENTER PROFILE 1
E01 1:250H 1:50V



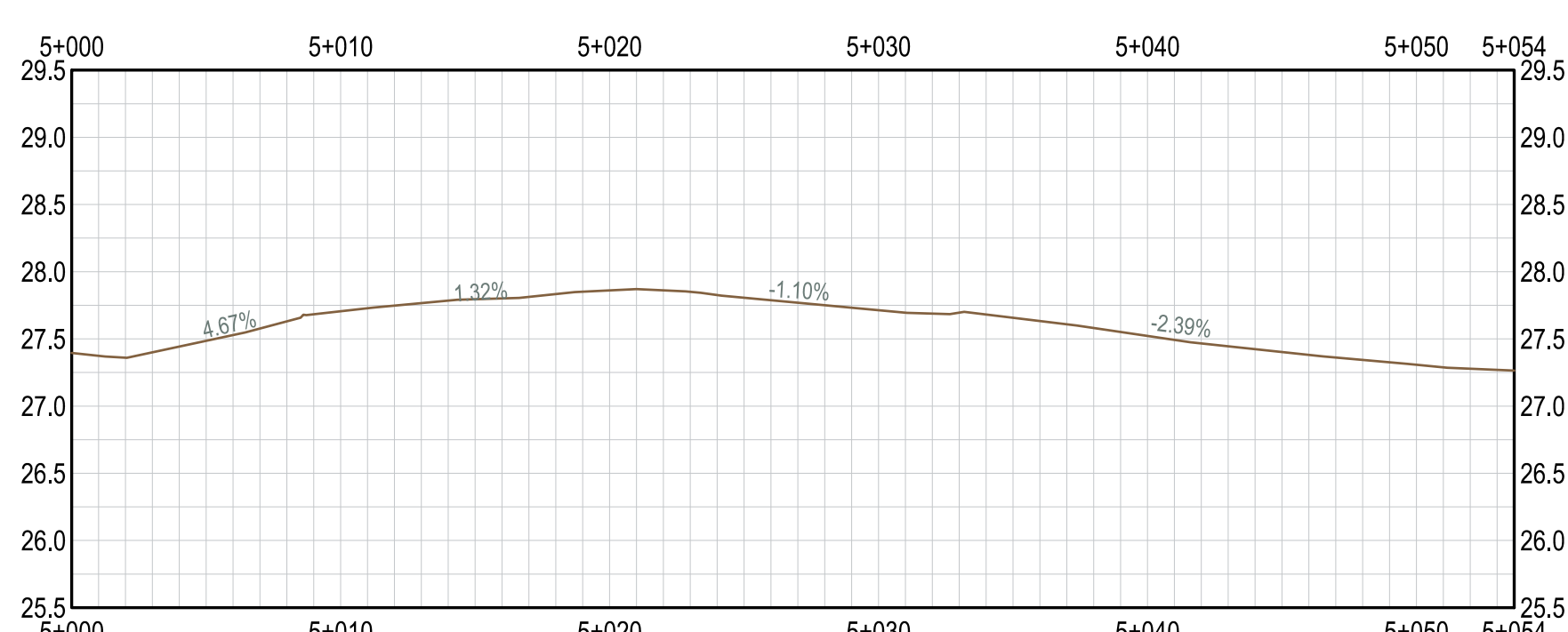
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E01 1:250H 1:50V



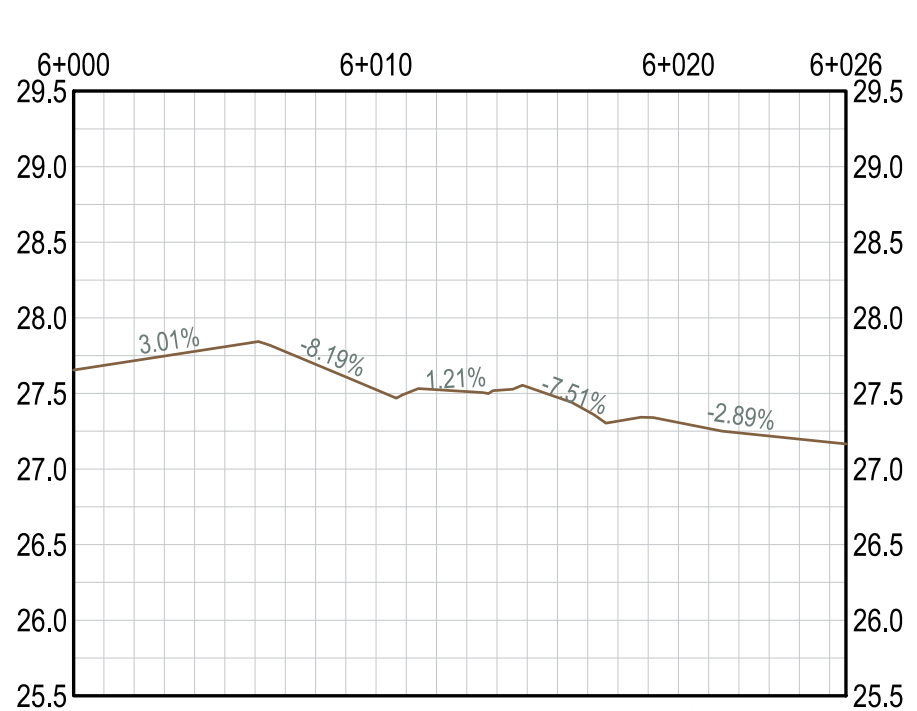
3 EXISTING SITE PROFILE 3
E01 1:250H 1:50V



4 EXISTING CEREMONIAL SITE PROFILE 4
E01 1:250H 1:50V



5 EXISTING INFANT BURIAL SITE PROFILE 5
E01 1:250H 1:50V



6 EXISTING INFANT BURIAL SITE PROFILE 6
E01 1:250H 1:50V

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4	RE-ISSUED FOR 100% CLIENT REVIEW	2021.03.22	PL		
No.	ISSUED FOR	DATE	BY		

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DATE	APRIL 2021		
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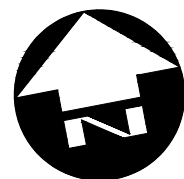
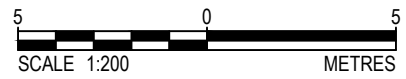
CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

PROJECT NO.
20-3451

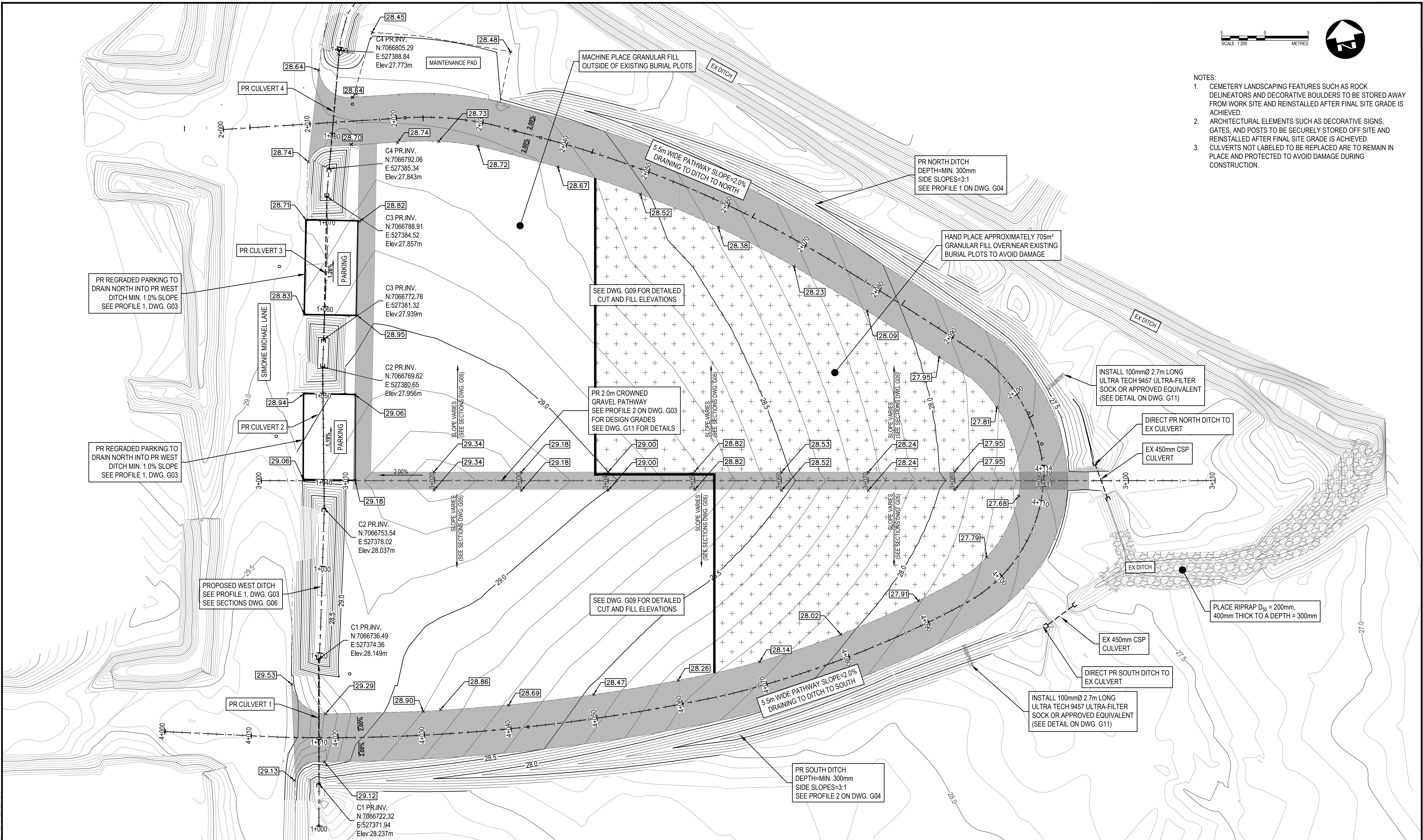
EXISTING SITE PROFILES

SHEET NO.

E02



- NOTES:
- CEMETERY LANDSCAPING FEATURES SUCH AS ROCK DELINEATORS AND DECORATIVE BOULDERS TO BE STORED AWAY FROM WORK SITE AND REINSTALLED AFTER FINAL SITE GRADE IS ACHIEVED.
 - ARCHITECTURAL ELEMENTS SUCH AS DECORATIVE SIGNS, GATES, AND POSTS TO BE SECURELY STORED OFF SITE AND REINSTALLED AFTER FINAL SITE GRADE IS ACHIEVED.
 - CULVERTS NOT LABELED TO BE REPLACED ARE TO REMAIN IN PLACE AND PROTECTED TO AVOID DAMAGE DURING CONSTRUCTION.



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3	ISSUED FOR 100% CLIENT REVIEW	2021.01.18	PL
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	PL
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.27	PL

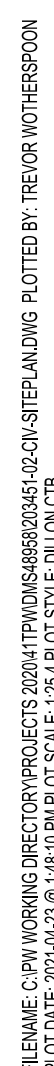
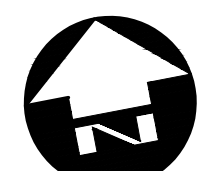
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DRAWN	TP/WBS	CHECKED BY	JH
DATE	APRIL 2021		
SCALE	1:200		

CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

PROPOSED SITE PLAN

PROJECT NO.
20-3451

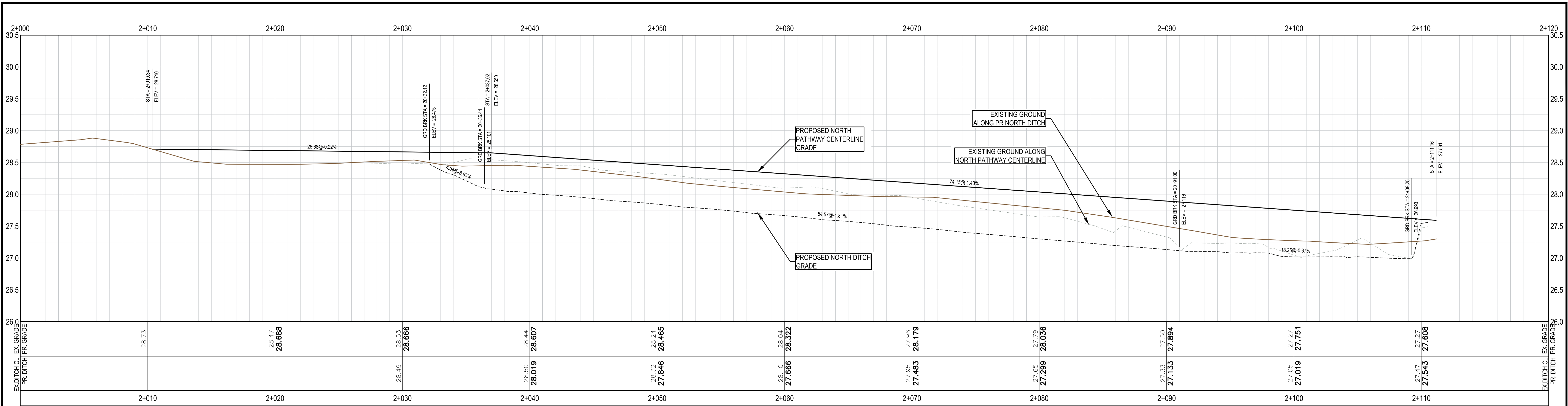
SHEET NO.
G01



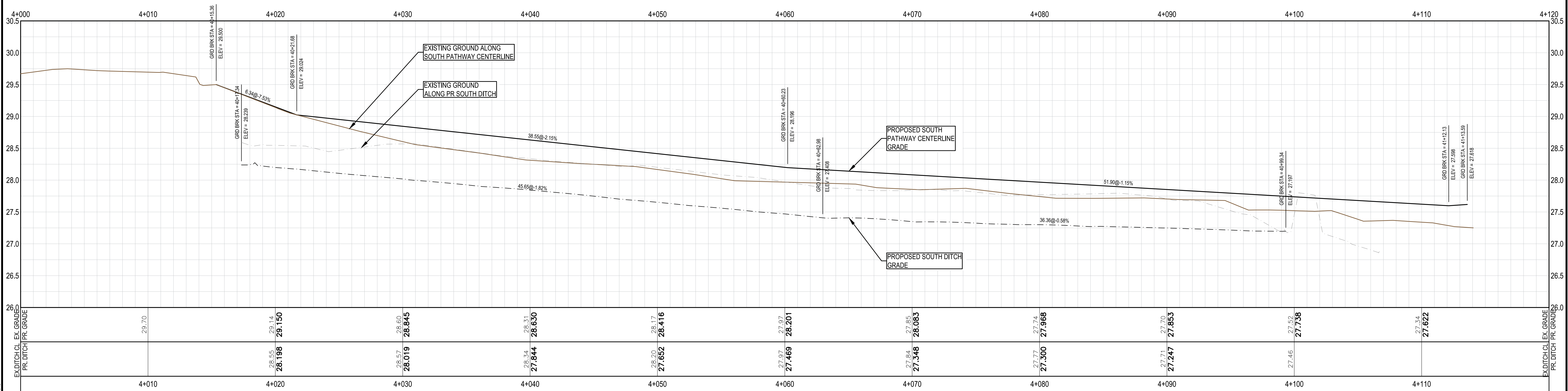
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No.	ISSUED FOR		DATE		FX

G02



1 NORTH PERIMETER PATH AND DITCH PROFILE



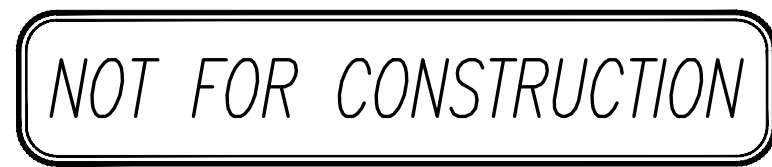
2 SOUTH PERIMETER PATH AND DITCH PROFILE

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DRAWN	CHECKED BY
TPW	JH
DATE	
APRIL 2021	
SCALE	
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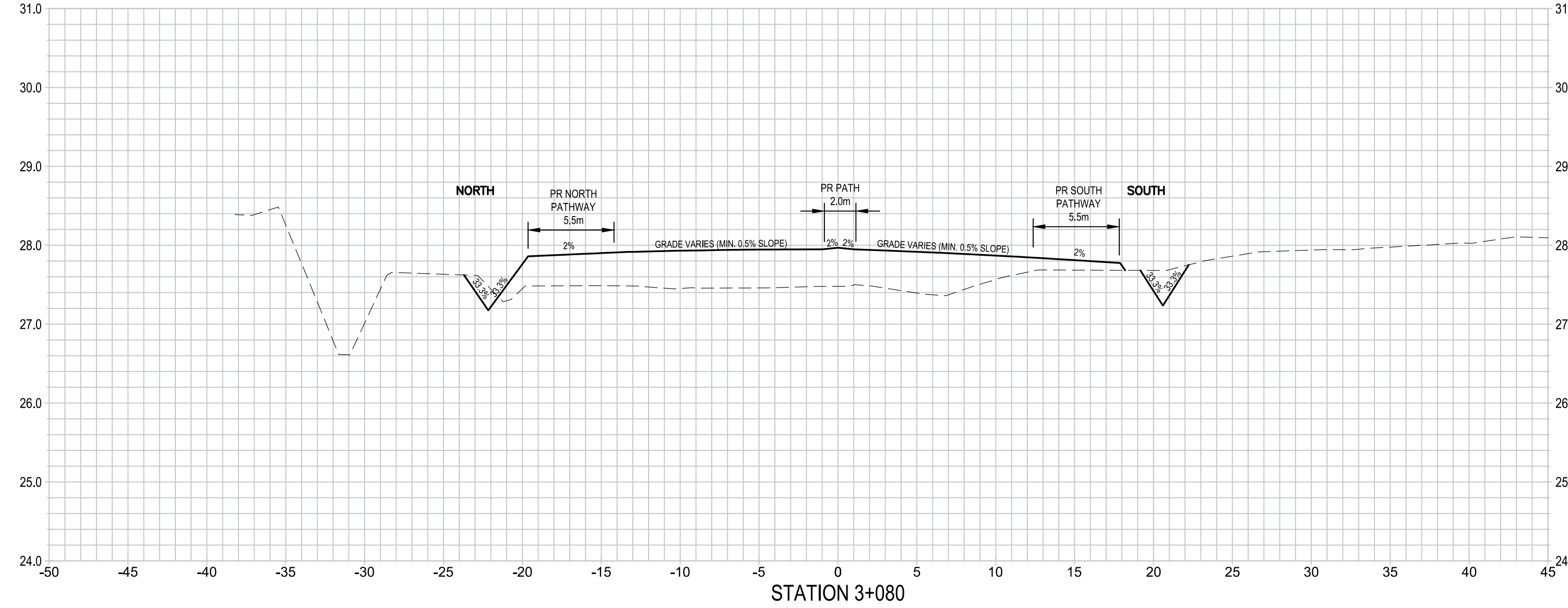
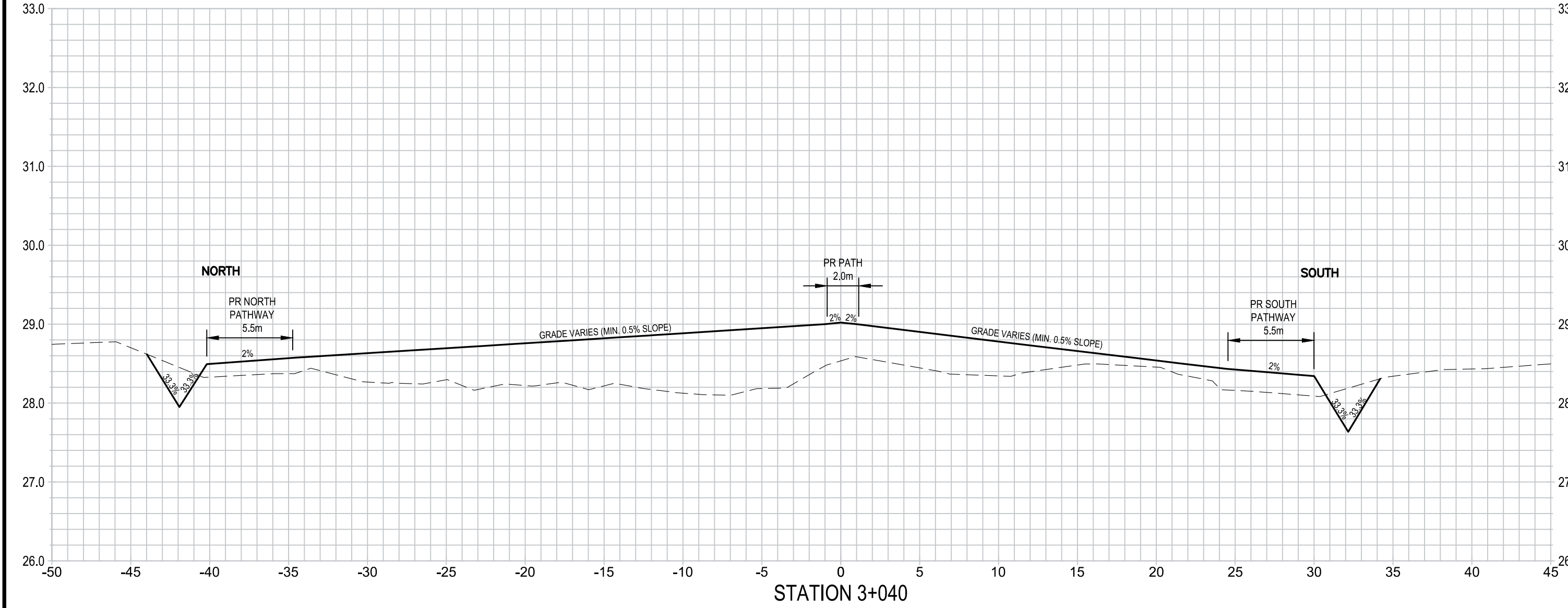
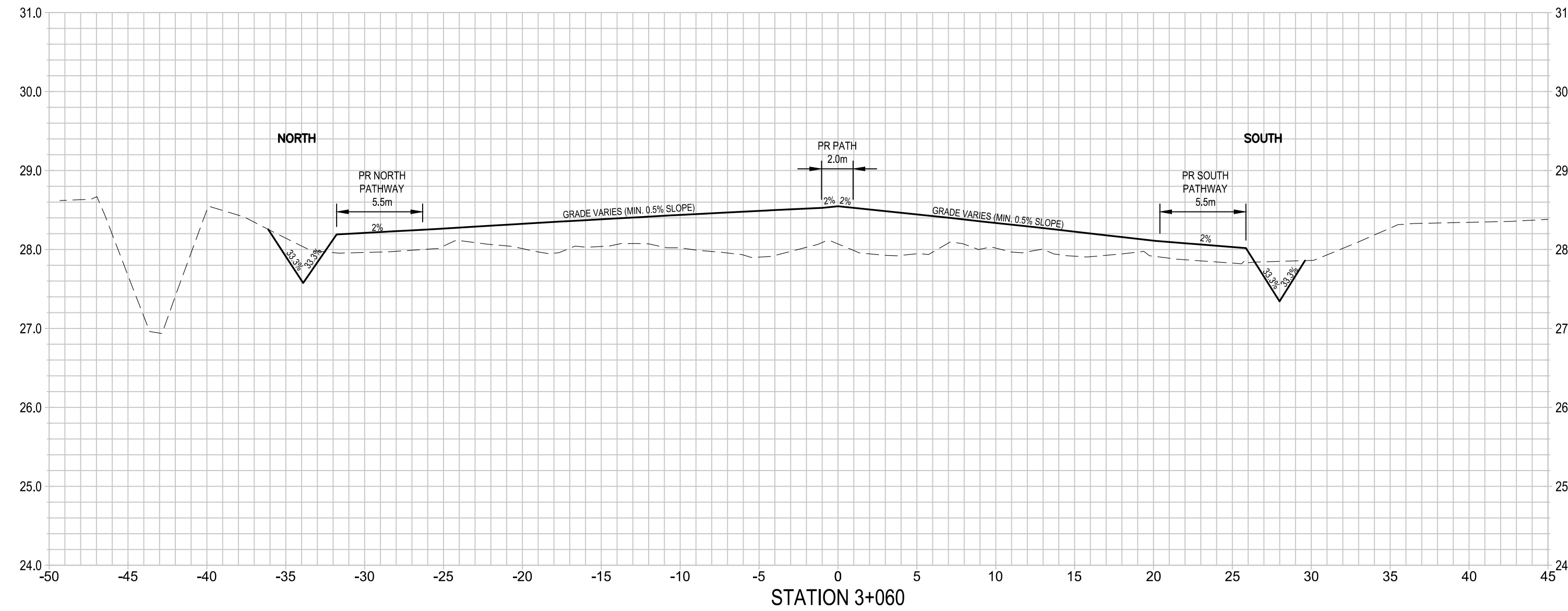
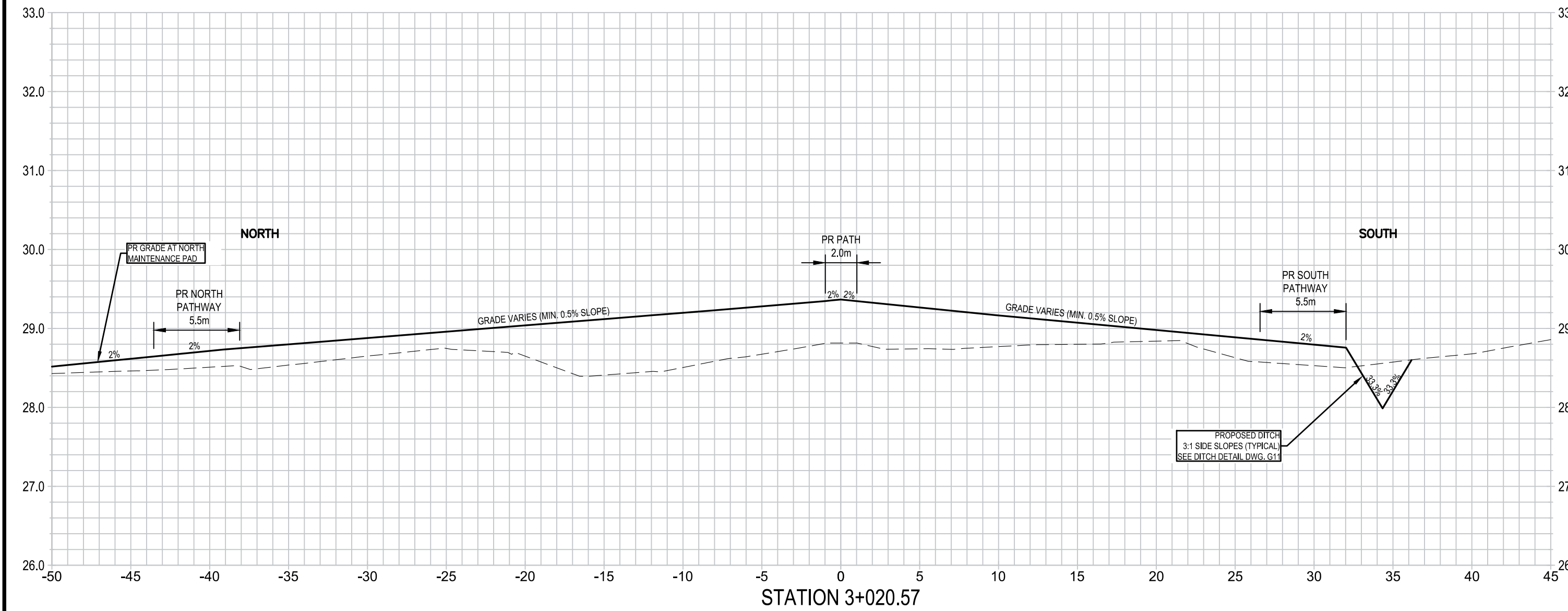
CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

PERIMETER PATH AND DITCH PROFILES

PROJECT NO.
20-3451

SHEET NO.

G04



NOTE:
SEE ALIGNMENTS ON DWG.G02 FOR STATIONS

LEGEND:
--- EXISTING GRADE
— PROPOSED GRADE

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5	100% DESIGN ISSUED FOR FINAL REVIEW	2021.04.23	PL
4	RE-ISSUED FOR 100% CLIENT REVIEW	2021.03.22	PL
3	ISSUED FOR 100% CLIENT REVIEW	2021.01.18	PL
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	PL
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.27	PL

DESIGN	JH	REVIEWED BY	PL
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DATE	APRIL 2021		
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CITY OF IQUALUIT
IQUALUIT APEX CEMETERY REMEDIATION

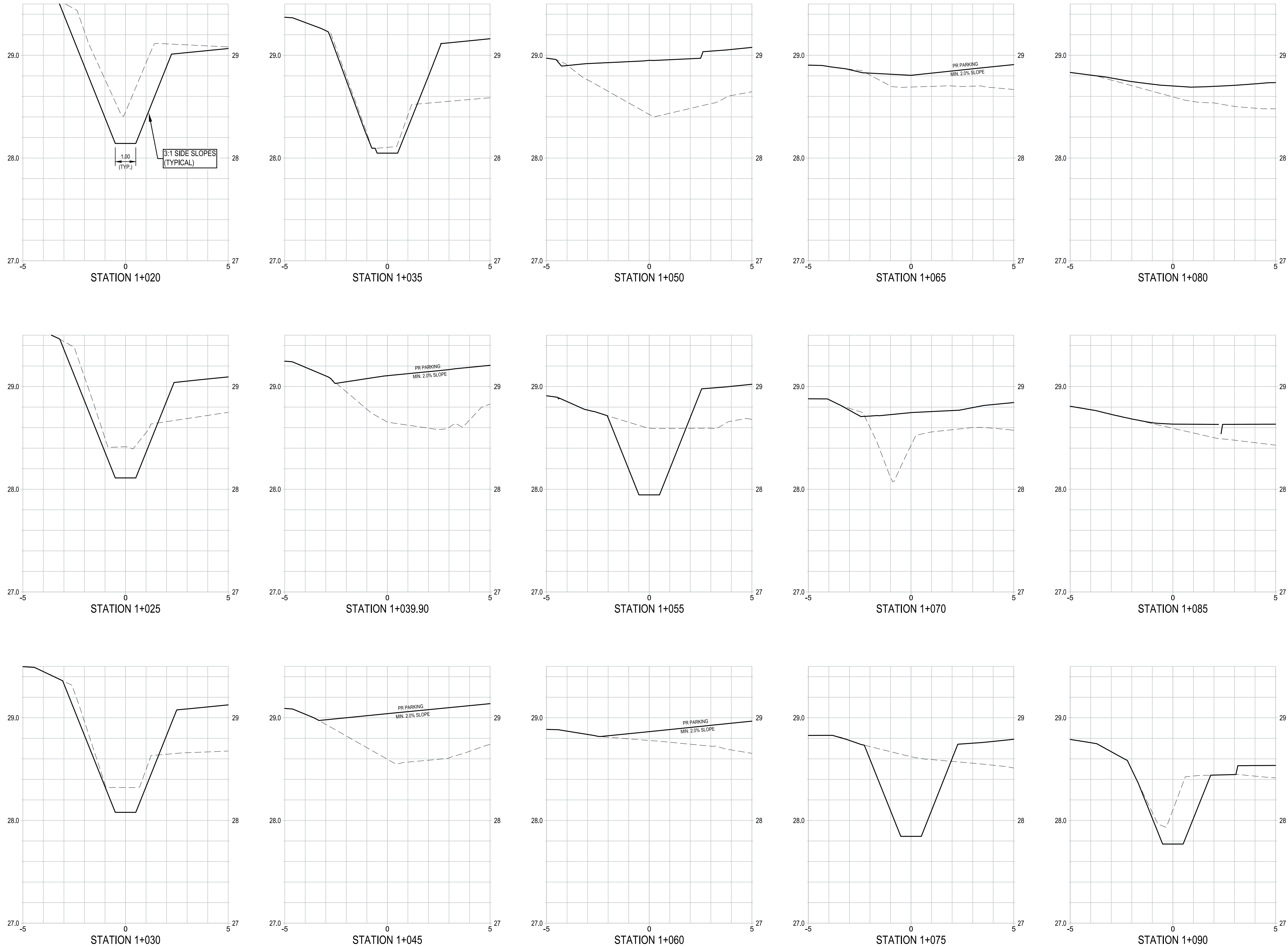
MAIN SITE GRADING DESIGN - SECTIONS

PROJECT NO.
20-3451

SHEET NO.

G05

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2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	PL
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.27	PL
No.	ISSUED FOR	DATE	BY

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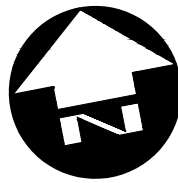
CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

WEST DITCH AND PARKING PAD - SECTIONS

PROJECT NO.
20-3451

SHEET NO.

G06



ELEVATIONS SHOWN ARE THE DIFFERENCE
FROM THE EXISTING SURVEY TO THE
FINAL DESIGN GRADE SURFACE

ELEVATIONS TABLE				
No.	MIN. ELEVATION (m)	MAX. ELEVATION (m)	AREA (m²)	COLOR
1	-0.81	0.00	666	
2	0.00	0.84	5384	

NET CUT = 138m³
NET FILL = 1,830m³

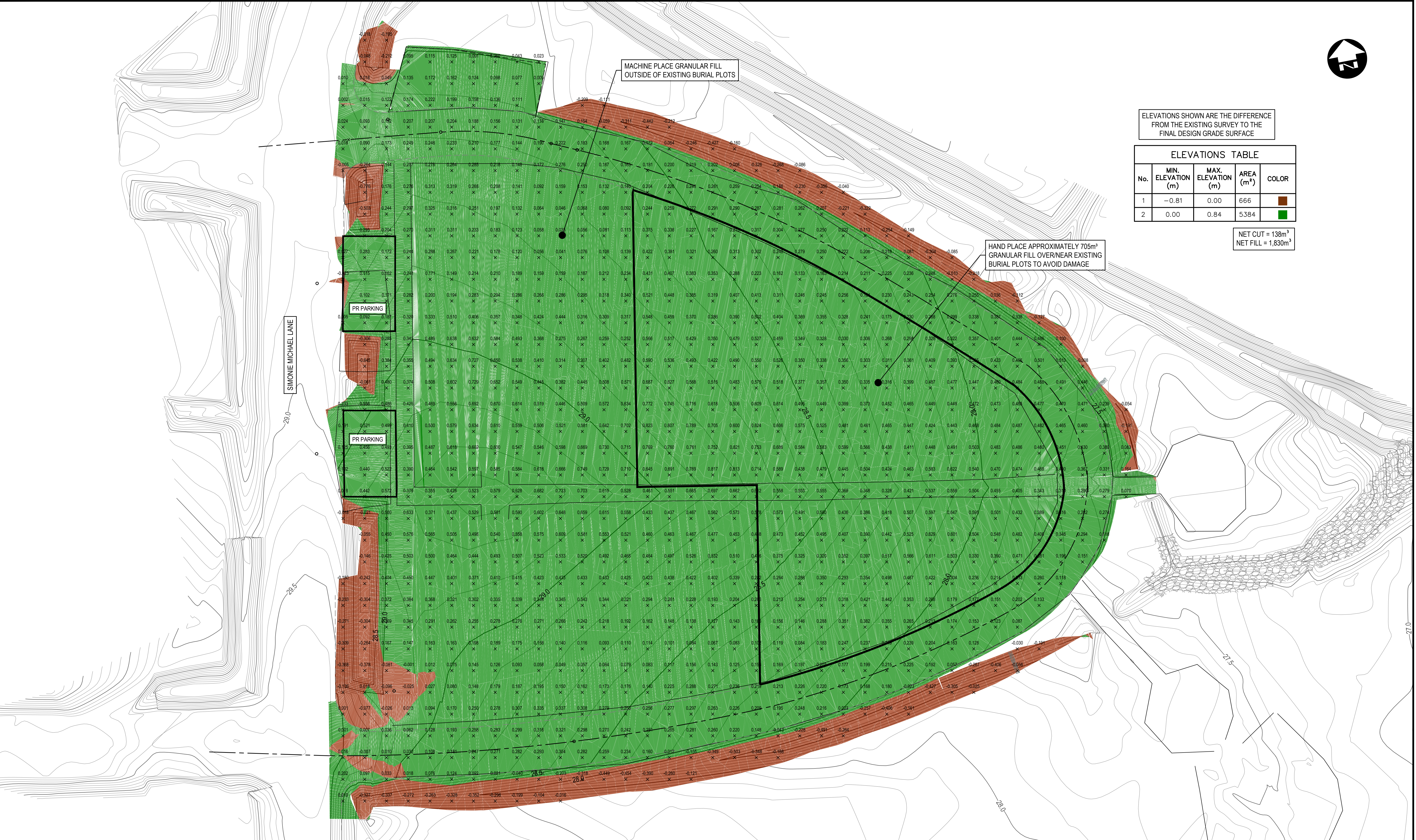
MACHINE PLACE GRANULAR FILL
OUTSIDE OF EXISTING BURIAL PLOTS

HAND PLACE APPROXIMATELY 705m³
GRANULAR FILL OVER/NEAR EXISTING
BURIAL PLOTS TO AVOID DAMAGE

PR PARKING

PR PARKING

SIMONIE MICHAEL LANE



Conditions of Use
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5	100% DESIGN ISSUED FOR FINAL REVIEW	2021.04.23	PL
4	RE-ISSUED FOR 100% CLIENT REVIEW	2021.03.22	PL
3	ISSUED FOR 100% CLIENT REVIEW	2021.01.18	PL
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	PL
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.27	PL

DESIGN	REVIEWED BY
JH	PL
DRAWN	CHECKED BY
TP/WBS	JH
DATE	APRIL 2021
SCALE	1:200

CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

GRADING DESIGN - CUT FILL ANALYSIS

PROJECT NO.
20-3451

SHEET NO.
G09

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G10



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4	RE-ISSUED FOR 100% CLIENT REVIEW	2021.03.22	PL	
3	ISSUED FOR 100% CLIENT REVIEW	2021.01.16	PL	
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	PL	
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.27	PL	
No.	ISSUED FOR	DATE	BY	

DESIGN	JH	REVIEWED BY	PL
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DATE	APRIL 2021		
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CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

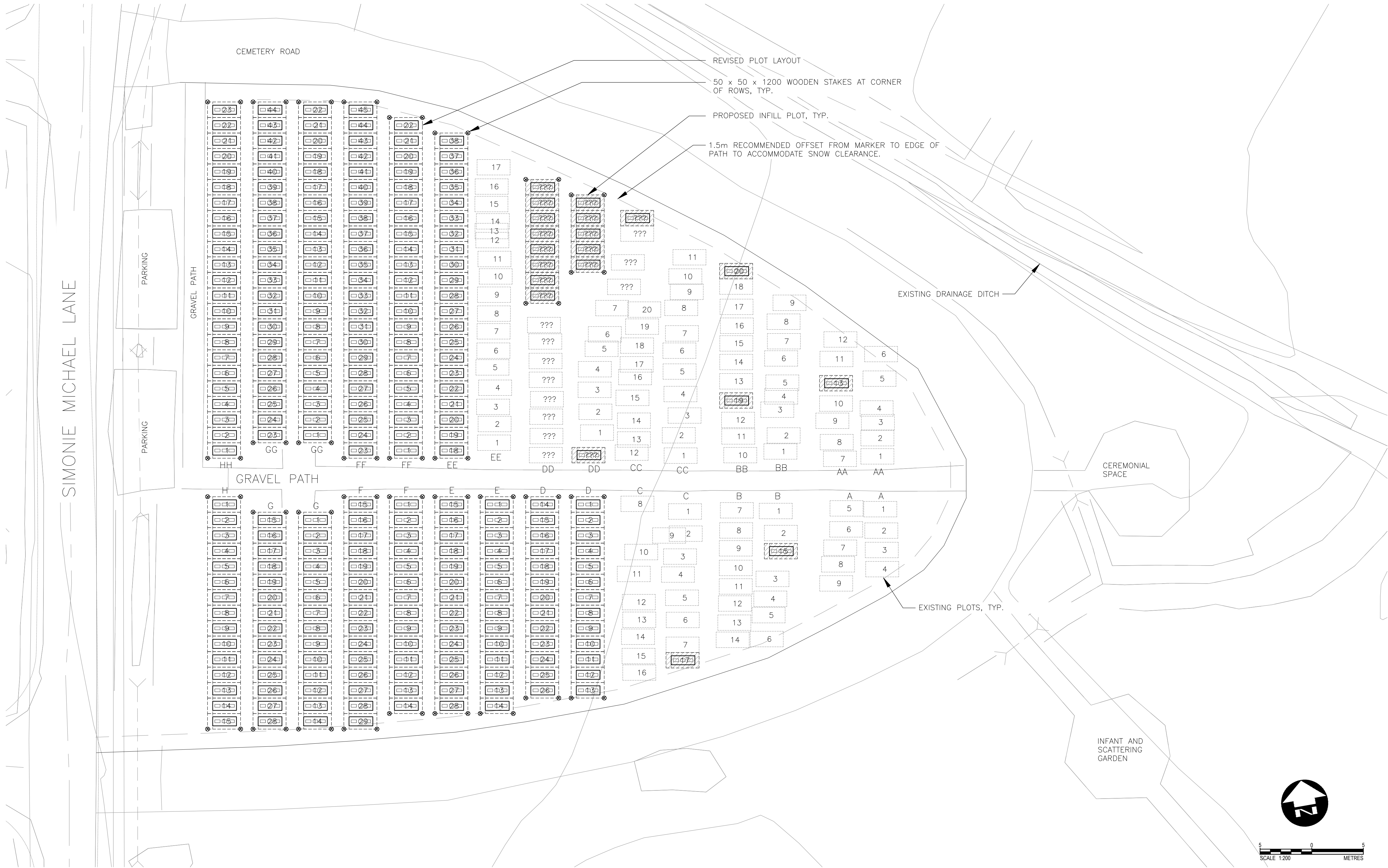
TYPICAL DETAILS

PROJECT NO.
20-3451

G11

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KIT



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No.	ISSUED FOR	DATE	BY
3	ISSUED FOR 100% CLIENT REVIEW	2021.01.18	CB
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	CB
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.16	CB

DESIGN	REVIEWED BY
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CB	PL
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CITY OF IQUALUIT
IQUALUIT APEX CEMETERY REMEDIATION

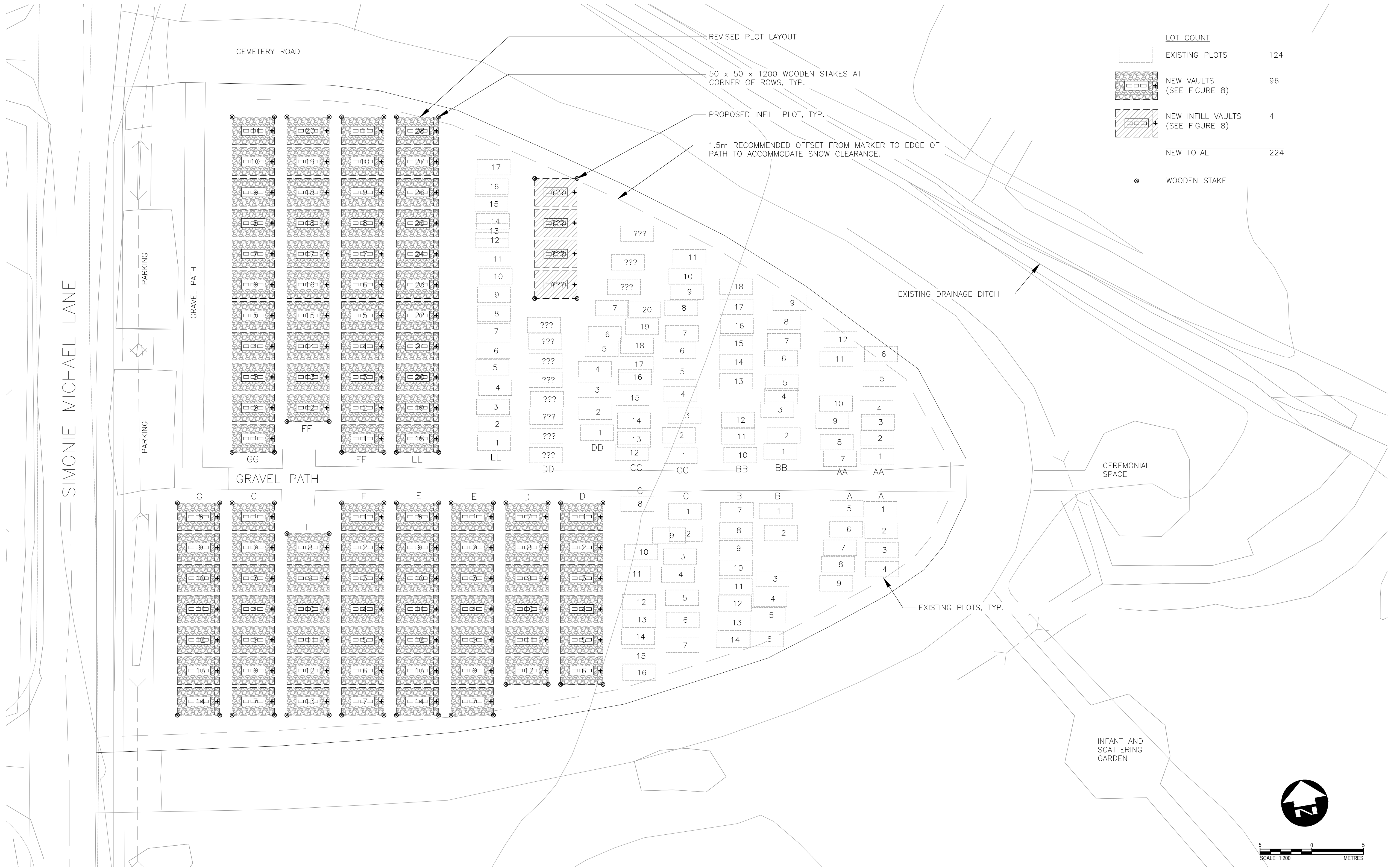
CEMETERY PLOT LAYOUT OPTION 1A
ABOVE GROUND LAWN CRYPTS
(WITHOUT MEMORIAL CAIRN)

PROJECT NO.
20-3451

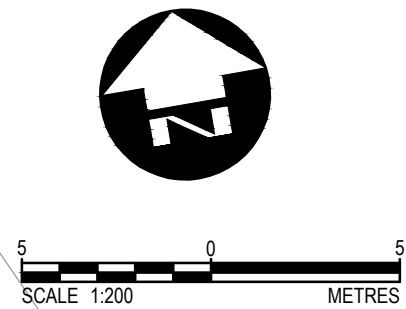
SHEET NO.
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KIT



LOT COUNT		
	EXISTING PLOTS	124
	NEW VAULTS (SEE FIGURE 8)	96
	NEW INFILL VAULTS (SEE FIGURE 8)	4
NEW TOTAL		224
	WOODEN STAKE	



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No.	ISSUED FOR	DATE	BY
3	ISSUED FOR 100% CLIENT REVIEW	2021.01.18	CB
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	CB
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.16	CB

DESIGN	REVIEWED BY
CB	JH
DRAWN	CHECKED BY
CB	PL
DATE	JAN. 2021
SCALE	1:200

CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

CEMETERY PLOT LAYOUT OPTION 1B
ABOVE GROUND LAWN CRYPTS
(INCLUDING 900mm OFFSET FOR MEMORIAL CAIRN)

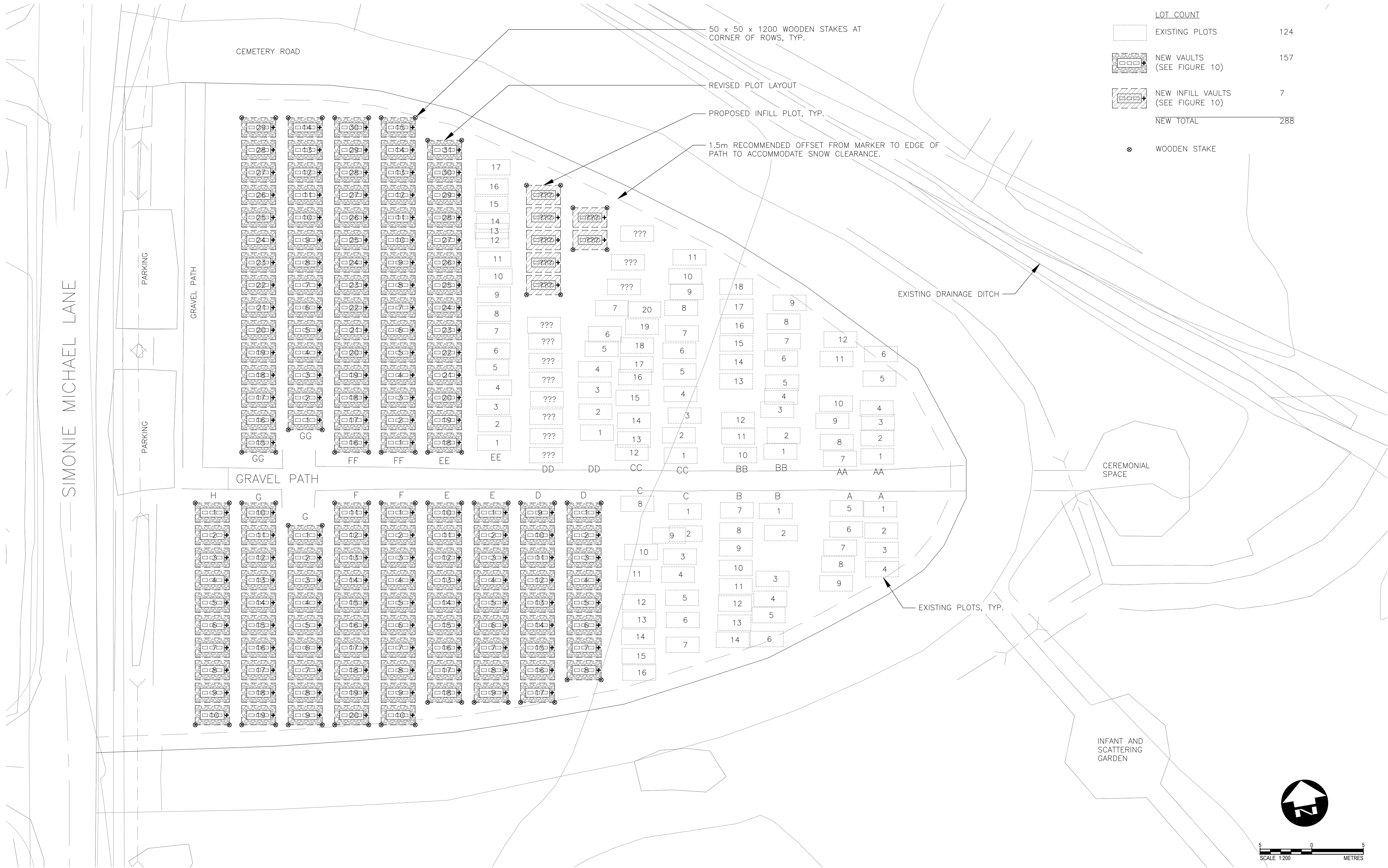
PROJECT NO.
20-3451

SHEET NO.

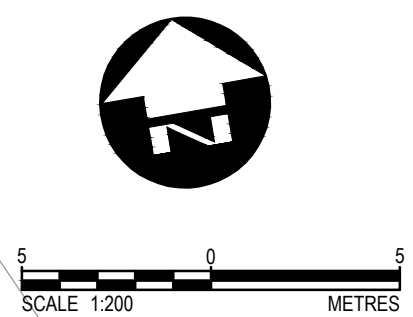
LL-2

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KIT



LOT COUNT		
	EXISTING PLOTS	124
	NEW VAULTS (SEE FIGURE 10)	157
	NEW INFILL VAULTS (SEE FIGURE 10)	7
NEW TOTAL		288
WOODEN STAKE		



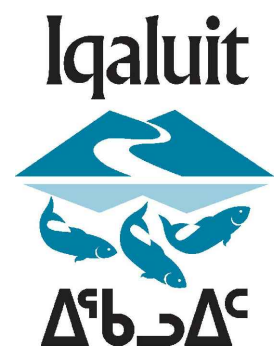
Conditions of Use

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No.	ISSUED FOR	DATE	BY
3	ISSUED FOR 100% CLIENT REVIEW	2021.01.18	CB
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	CB
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.16	CB

DESIGN	CB	REVIEWED BY	JH
DRAWN	CB	CHECKED BY	PL
DATE	JAN. 2021		
SCALE	1:200		

CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

CEMETERY PLOT LAYOUT OPTION 1C
ABOVE GROUND LAWN CRYPTS
(INCLUDING 500mm OFFSET FOR MEMORIAL CAIRN)

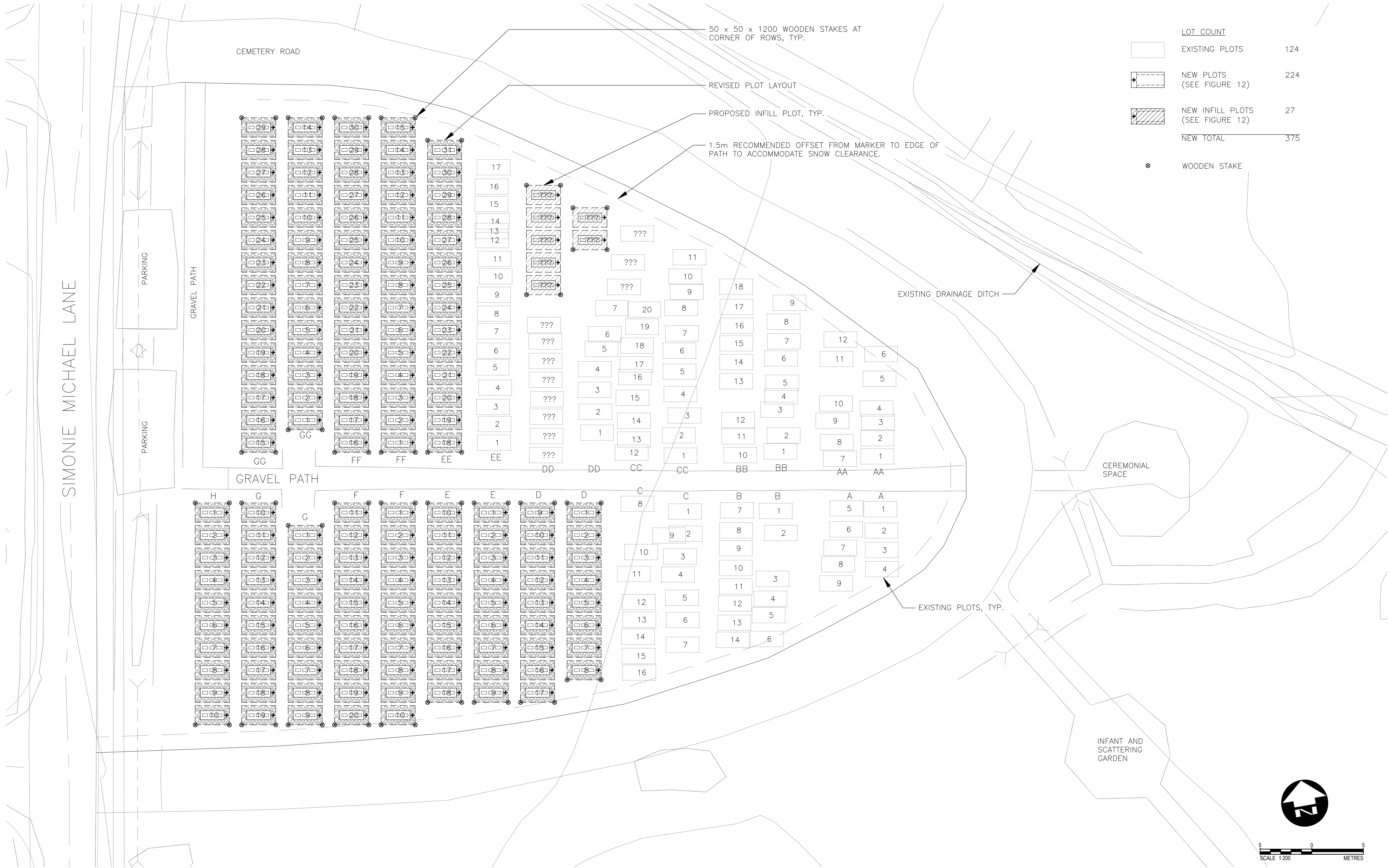
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SHEET NO.

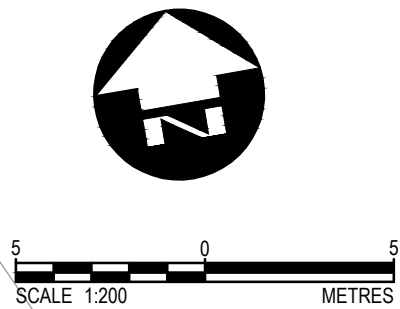
LL-3

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KIT



LOT COUNT		
	EXISTING PLOTS	124
	NEW PLOTS (SEE FIGURE 12)	224
	NEW INFILL PLOTS (SEE FIGURE 12)	27
	NEW TOTAL	375
	WOODEN STAKE	



Conditions of Use

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				DESIGN	CB	REVIEWED BY	JH
				DRAWN	CB	CHECKED BY	PL
				DATE	JAN. 2021		
				SCALE	1:200		
No.	ISSUED FOR			DATE	BY		
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2	ISSUED FOR 99% CLIENT REVIEW			2020.12.21	CB		
1	ISSUED FOR 66% CLIENT REVIEW			2020.11.16	CB		

CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

PROJECT NO.
20-3451

CEMETERY PLOT LAYOUT OPTION 2
IN-GROUND CASKET BURIAL

SHEET NO.

LL-4

Appendix B

Apex Cemetery Standard Operating Procedures



CITY OF IQALUIT

Apex Cemetery

Standard Operating Procedures

April 2021 – 20-3451



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Standard Operating Procedures

These operating procedures have been modified from the previous version of this document (Iqaluit Cemetery Standard Operating Procedures, dated December 16, 2014) as needed based on recommendations presented in the Iqaluit Apex Cemetery Remediation design report and drawings and existing good management practices intended to maximize the environmental, fiscal and operational sustainability of any Cemetery.

This document illustrates two approaches for interment at Apex Cemetery: in-ground burial using pre-built insulation templates to mitigate active layer thaw and above-ground interment via burial vaults made of High Density Polyethylene (HDPE). The City of Iqaluit intends to investigate both approaches prior to deciding on a preferred approach going forward. All options have been presented in this Standard Operating Procedures manual with the understanding that only one will be ultimately selected.

To minimize operational risks and the on-site challenges currently being experienced by the City, it is essential to ensure the Standard Operating Procedures outlined in this document are followed and adhered to.

Annual Preparation for Summer Interments

2.1 Above Ground Burial Vaults

1. See Figure 7 for installation details.
2. Purchase number of burial vaults equal to number of interments from previous two years + 10%. Subtract any unused burial vaults from previous years.
3. Optional: round number of interments anticipated up to the nearest full row of plots.
4. Layout wooden stakes at corners of rows as per Figure 3 – 5.
5. Excavate to 450mm depth within area defined by pre-installed wooden stakes marking corner of rows and place and compact 150mm depth gravel base (see Figure 7), leaving 300mm below final grade for burial vaults.
6. Assemble and place burial vaults centred on individual plots (see figure 7, 8 or 10 for spacing dimensions, depending on preferred arrangement of burial vaults), backfill around burial vault with topsoil to original finished grade and compact.

Closure of previous year's plots not required. Note number of unused burial vaults for calculations noted in step 1 for future years.

Equipment: Backhoe, Pickup Truck, wooden stakes (50 x 50 x 1200), Burial vaults, granular 'A' base material, topsoil, hand tamper.

Tools: handheld GPS

2.2 In-Ground Burials

2.2.1 Preparation of New Pre-Dig Area

1. Preparation of new pre dig area should occur in fall to early winter (September 1st – November 30th) to mitigate thawing of active layer during the following summer's interments.
2. Number of pre-dug plots should be based on average number of interments over previous two years + 10%.
3. Order and install raised wooden bar/stake that can be viewed above snow cover. Install at corners of rows. See Figure 6.
4. Pre-dig the plots to dimensions specified in Figure 12.

5. Install shoring as per Figure 13.
6. Do not backfill. Plot to remain open until interment.
7. Lay insulation template over pre-dug graves and secure in place (See Figure 13).
8. GPS and record grave locations.

Equipment: Backhoe, Pickup Truck, insulation template, wooden stakes (50 x 50 x 1200)

Tools: Sod Cutter, handheld GPS

2.2.2 Closure of Previous Year's Pre-Dig Area

1. Plots not used during the year to be left as is: covered with insulation and counted towards the next year's pre-dug inventory.
2. Review area for differential settlement and ponding. Topsoil and compact noted areas to restore previous year's pre-dig area to original topography.
3. Ensure plot markers are positioned in straight line, aligned with wooden stakes.

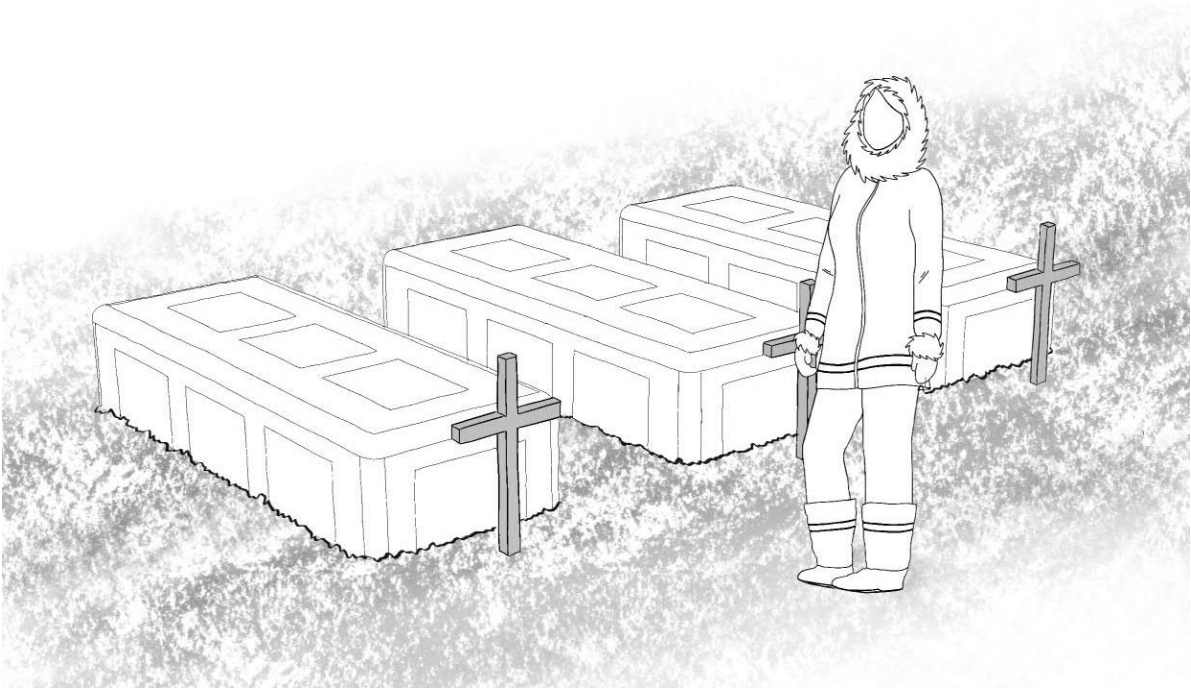
Equipment: Backhoe, Pickup Truck, Watering truck

Tools: Rake

At-Need Burial Procedures

3.1 Above-Ground Burial vaults

The operating procedures outlined below will differ depending on if the City opts to proceed with option 1A, 1B or 1C as presented in the detailed design drawings and the appendices at the end of this document.



3.1.1 ADMINISTRATION (Take Order for Plot Opening)

1. Receive order for plot opening from City Clerk (telephone) with 48 hour notice.
2. City Clerk chooses the next available burial plot location.
3. Recommended interment/burial order: See recommended burial order (Figure 1)
4. City Clerk to record Section, Row, and Lot number on burial form (see Appendix A).

Equipment: N/A

Tools: Cellphone, Burial Form, burial sequence plan.

3.1.2

LAYOUT PLOT PRIOR TO OPEN/CLOSE CEREMONY

1. Spot burial vault location with two people plus supervisor, using cemetery map and row markers. First person spots location; second person individually spots and verifies the first person spotting.
2. Confirm location (Section, row, number) of burial vault on burial form.
3. Report and verify any discrepancies from the burial order by telephone with City Clerk.
4. After marking the burial vault, both the supervisor and lead hand double check to verify that the correct lot and grave number has been marked out.
5. Confirm equipment access route (see Figure 1). Lay plywood (or MUD-TRAKS[®]) to protect existing adjacent burial vaults and/or plots

Equipment: N/A

Tools: Cell Phone, Min. ¾" plywood or "MUD-TRAKS"

3.1.3

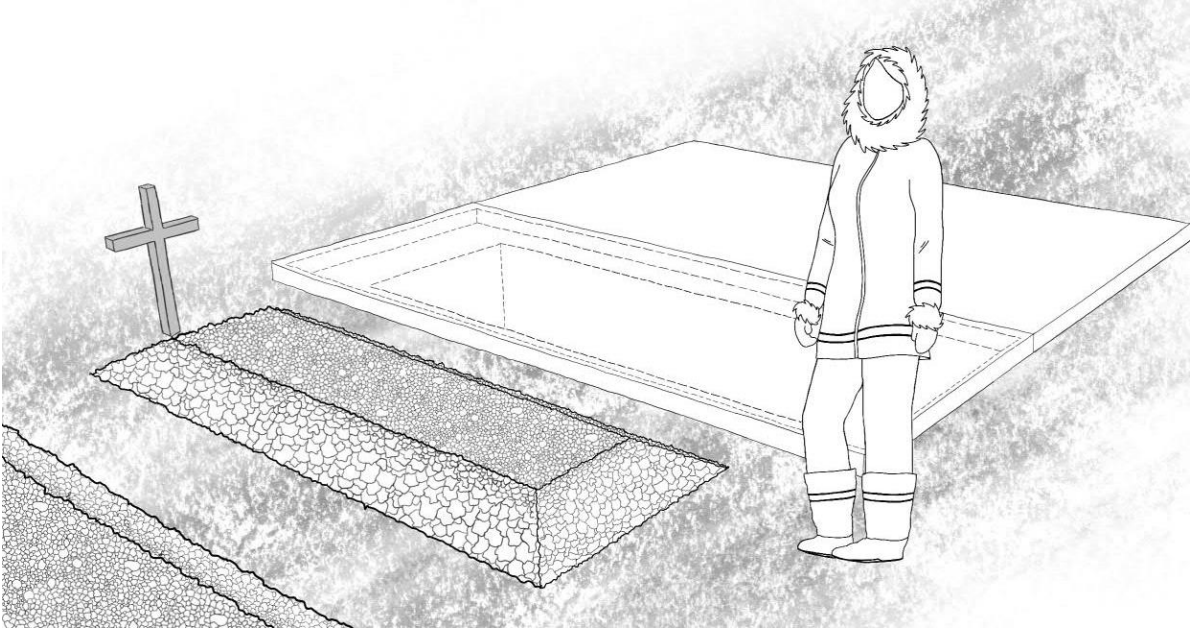
OPENING PROCEDURES

1. Place plywood board to protect existing ground. Ensure size is adequate to accommodate stones for placement around burial vault. See Figure 7, 8 or 10 depending on configuration desired.
2. Provide a support for the lowering device to rest on. A strong frame of 2" x 10" [39mm x 235mm] wood planks can be assembled for this purpose (see Figure 14), or a purpose built aluminum plank system can be purchased.
3. Place greens to cover the wood frame and stones piled beside the open grave (see Figure 14). Alternatively, exterior carpet can be used as a cover, either loose or attached to the wood frame (Attached cover will wear out and dirty sooner than a loose cover).
4. Set up casket lowering device on the stable frame created with the planks (see Figure 14). Ensure lowering device is clean, and place safety straps in position. Install with trip lever at the foot of the burial vault.
5. Place requested memorial cross (depending on desired configuration) in clean appropriate container nearby.
6. Check area for tidiness. Clean area of debris and light snow at graveside and along funeral route. Check time of funeral and ensure equipment is out of sight during the service.
7. Seal casket prior to placing into the burial vault with caulking.
8. After lowering casket into burial vault, seal burial vault along seams with caulking. Water drainage openings at bottom of burial vault to remain unsealed to allow water to infiltrate into soil.
9. Place cross/plot marker as per Figure 9 or 11 depending on desired configuration.
10. Allow visitors to place stones along all sides of burial vault. Depending on desired configuration, see Figure 9 or 11 for maximum height of placed stones (i.e. max height of 255mm or 440mm).

Equipment: Pickup Truck, Lowering Device, Wooden or Aluminum Supports, Greens, 3-4" diameter blast rock or river rock.

Tools: Caulk Sealant

3.2 In-Ground Burials



3.2.1 ADMINISTRATION (Take Order for Plot Opening)

1. Receive order for plot opening from City Clerk (telephone) with 48 hour notice.
2. City Clerk chooses the next available burial plot location.
3. Recommended interment/burial order: See recommended burial order (Figure 2)
4. City Clerk to record Section, Row, and Lot number on burial form (Appendix A).

Equipment: N/A

Tools: Cellphone, Burial Form, burial sequence plan.

3.2.2 LAYOUT PLOT PRIOR TO OPEN/CLOSE CEREMONY

1. Spot grave location with two people plus supervisor, using cemetery map and row markers.
First person spots location; second person individually spots and verifies the first person spotting. Second person may be the machinery operator who will dig the grave.
2. Find wooden stakes marking corners of row.
3. Measure along line connecting stakes to determine location of plot.
4. Confirm location (Section, row, number) on burial form.

5. Report and verify any discrepancies from the burial order by telephone with City Clerk.
6. After marking out grave, both the supervisor and lead hand double check to verify that the correct lot and grave number has been marked out.
7. Confirm equipment access route (see Figure 2). Lay plywood (or MUD-TRAKS[®]) to protect plots along route.

Equipment: N/A

Tools: Cell Phone, Wood Template, Edger Shovel, Min. ¾" plywood or "MUD-TRAKS"

3.2.3

OPENING PROCEDURES

1. Safety is a prime concern. If visitors are present when a grave is opened or any type of machinery is being used, it is the responsibility of the machine operator to ensure that everyone (including all field staff) is at a safe distance before proceeding.
2. Set up digging equipment. Digging equipment not to be placed on insulation template.
3. Remove framed insulation and store in a designated area until the succeeding use. Leave shoring in place.
4. Confirm plot is dug to a depth of least 4' [1.2m] deep. Ensure there is a minimum 2' [0.6m] cover over the top of the casket.
5. No person is to enter a grave unless it has been shored.
6. Pump out any excess water that seeps into plot opening after it is dug. Water should be pumped out a minimum of 1 hour before casket and family arrive at the cemetery to allow site cleanup and removal of non-essential equipment. Water is potentially hazardous to the public as well as the environment. Pumped water should be contained and delivered to the wastewater treatment plant for treatment.
7. Water pumped from open plot to be disposed of at an approved water treatment site, at the direction of the City. Any water pumped from the Cemetery cannot be discharged into an open water course without prior water treatment for contamination.
8. Recommended PPE for handling potentially hazardous water as per procedures for handling sewage: Nitrile gloves and CSA safety glasses minimum.
9. Provide a support for family to stand on around the open grave, in case the sides collapse. A strong frame of 2" x 10" [39mm x 235mm] wood planks can be assembled for this purpose (see Figure 14), or a purpose built aluminum plank system can be purchased.

10. Place greens to cover the wood frame and soil piled beside the open grave (see Figure 14).
Alternatively, exterior carpet can be used as a cover, either loose or attached to the wood frame (Attached cover will wear out and dirty sooner than a loose cover).
11. Set up casket lowering device on the stable frame created with the planks (see Figure 14).
Ensure lowering device is clean, and place safety straps in position. Install with trip lever at the foot of the grave.
12. Place requested shovels and memorial cross by soil in clean appropriate container.
13. If the grave opening is prepared the night before, the insulation template can be left in place. Alternatively, a temporary grave cover can be constructed of a 2"x4" [39mm x 89mm] frame with 2"x4" [39mm x 89mm] cross members and covered with a thick plywood deck.
The cover should be approx. 1½ times the length and width (~4.0m x 1.5m) of the grave to allow the frame to sit on solid ground, away from near the edge of the grave.
14. Check area for tidiness. Clean area of debris and light snow at graveside and along funeral route. Check time of funeral and ensure equipment is out of sight during the service.
15. Place all removed soil in a neat pile, to west side of pre-dug area, a short distance from grave – to allow family four sides of access to grave, but not too far for them to use to help fill in grave.
16. If backfill material freezes, use heat mats or remove and store backfill soil in heated location until funeral.

Equipment: Gas powered sump pump, Backhoe, Pickup Truck, Safety Gloves, Safety Glasses.

Tools: Min. ¾" plywood or "MUD-TRAKS", Wood planks, Greens & mats, Broom, Lowering device and key, Safety straps, Long handled shovels, Wood planks, Plywood sheets, Snow blower

3.2.4

CLOSING PROCEDURES

1. Wait until funeral service at graveside has ended. Lay plywood or MUD-TRAKS® along route for equipment, as needed to minimize impact to surrounding plots.
2. Ensure backfill is mounded at top to maximum 200-250mm above adjacent ground level to accommodate settling.
3. Backfill from placed stockpile
4. Return the burial information form to the City Clerk – signed by both spotters, and dated.
5. Clean area, including memorial cross. Fill in any ruts and markings left by equipment.

6. Return equipment and tools to yard. Clean the lowering device, planks, greens and tools and store in a dry place.

Equipment: Backhoe, Pickup Truck.

Tools: Min. ¾" plywood or "MUD-TRAKS", Rake, Shovel, Broom

3.2.5 TOP DRESS AND FINE GRADING

1. Revisit the grave site approximately 2 weeks after interment. Level and tamp the grave and top dress with surplus backfill from excavation.
2. Once capacity has been reached on a full row of graves, temporarily remove and protect plot markers and fine grade to ensure positive drainage as per the cemetery grading plans.
3. Place plot markers back in order as per the cemetery's burial records. Bury to 1/3 depth.

Equipment: Backhoe, Pickup Truck,

Tools: Hand or gas powered tamper, Rake, Shovel, Broom

3.3 Additional Procedures for Infant and Cremation Plots

3.3.1 Infant and Cremation Burial

Procedures for the burial of infant or cremated remains are similar to casket burial, with the following exceptions:

1. The framed insulation template is not used. Pre-dug infant and/or cremation plots should be backfilled with sand, as per existing operating procedures.
2. Burial depth for cremation urns does not have to be 4' [1.22m] deep. 4' burial depth still recommended for infant caskets.
3. Backfill mound height to be max. 1/3rd the length of the shorter of: length of the plot or width of the plot.
4. Instead of a backhoe, the grave can be opened in one of two ways:
 - 4.1. With a 12 inch auger, or
 - 4.2. With a spade or shovel.

Equipment: 12" Auger

Tools: Spade or Shovel

3.4

Interim Operating Procedures for In-Ground Burials

Prior to completion of the proposed capital grading works at Apex Cemetery, standard operating procedures will generally be as per the previous section “In-Ground Burials”.

1. When pumping water from an opened plot prior to a funeral service, water is not to be discharged overland into an existing water body.
2. Pump water into a sewage transport truck and remove off site to the nearest waste water treatment plant.

Equipment: Sewage truck, equipment as per “In-Ground Burials” above

Tools: as per “In-Ground Burials” above

Maintenance Program

4.1 Weekly Tasks

1. Clear snow from roadway and pedestrian pathways in winter, as needed.
2. Remove garbage and debris. Clear any obstacle on the road or on a grave whenever in the cemetery.
3. Remove any old flowers or decorations that are a safety hazard or are unsightly.
4. Make note of any maintenance or safety issue that should be brought to the attention of cemetery administration.
5. If re-establishing surface vegetation, water regularly for the first growth season minimum. Watering for two growth seasons (2 years) recommended.

4.2 MONTHLY TASKS

1. Compact and top up gravel roadway and shoulder materials affected by water ponding, snowmelt or washouts.
2. Inspect interred in-ground burial plots for settlement at opening/excavation footprint and re-topsoil and compact as needed to ensure positive surface drainage.
3. Inspect above-ground burial vaults for scratches, cracks and damage. Repair cracks with scrap HDPE material. Refinish visible scratches.
4. Check memorial crosses, monuments for damage.

4.3 YEARLY TASKS

1. Pre-dig cemetery plots and close previous section (see Pre-dig Closure Checklist, above).
2. Clean out and inspect culverts at the cemetery each spring and fall before snow flies, and after snowmelt. If culverts are frozen shut, clear them to ensure free flowing conditions.
3. Inspect drainage swales annually and remove sediment build-up within the ditches. Inspect sediment filter socks within the ditches and replace as needed.
4. Inspect metal work hardware and repair any loose fasteners.
5. Install winter staking to mark the location of grave lot markers prior to snowfall (use min. 18" wooden stakes painted at end).

4.4 INTERMENT TASKS

1. Grave opening and closing – recommend minimum two City staff plus supervisor. See At-Need Burial Procedures above for detailed instructions.

4.5 HDPE BURIAL VAULT TASKS

1. HDPE products used above ground (i.e. exposure to sunlight) have a max. life expectancy of approximately 25 years. After this, advanced UV deterioration can be expected (colour fading, warping, etc.).
2. HDPE products shielded from exposure will last significantly longer due to reduced UV damage. If the Burial Vault is fully encased, colour deterioration may no longer be a concern.
3. Options for encasing Burial Vaults: Concrete walls, stone veneer cladding, granite cladding.
4. Concrete or stone cladding/veneer for burial vaults will have to be constructed independently of the burial vault itself.
5. Minimum of one 3/8" dia. Hole (two or three recommended for redundancy) to be drilled into vault and any outside cladding/casing to allow for ventilation.

Cemetery Equipment List

5.1 Recommended Items

Backhoe, Small	Kubota or equivalent for digging and backfilling a casket grave
Burial Form	Maintain a record of reserved or occupied plots.
Cell phone	Confirming the location of grave row and lot number with City Clerk prior to digging
Edger and shovel	Cutting around grave opening
Gas powered sump pump	Pumping out any excess water from grave prior to funeral
Graveside greens (synthetic turf)	Exterior carpet covering the wood frame beside the open grave
Hand held tamper	Compacting topsoil
Handheld GPS	Global Positioning System device used to establish latitude and longitudinal coordinates of interred plot markers.
HDPE Burial vault	Above-ground burial vault made from high density polyethylene. Maximus Burial Vault by Polyguard (or approved equivalent).
Insulation template	Void foam insulation sheet sized to cover full plot opening (1.0m x 2.7m) plus a 1.2m offset on all sides.
Long-handled shovels	Backfilling of the grave (if done by the family)
Lowering device with safety straps	Lowering of casket into grave or burial vault (lowering device should be on raised feet to accommodate above-ground burial vaults).
Pickup Truck	For transporting topsoil, fill material, etc. to cemetery
Plywood (¾") or MUD-TRAKS	Temporary protection of the tundra from equipment
Rake	Levelling and scarifying new topsoil
Safety Glasses	Hard plastic, CSA certified glasses meant for shielding eyes from physical damage or chemicals.
Safety Gloves	Non-latex, nitrile sanitary gloves to mitigate contact with hazardous chemicals.
Shovel, rake, broom	Cleaning grave area and filling in any ruts or markings left by equipment
Snow blower	Clearing snow from graveside and processional route prior to funeral
Wood (2" x 10") / or aluminum planks	Providing a support for family to stand on around the open grave.
Wood planks and plywood sheets	Temporary cover if grave is prepared the night before
Wooden stake	50 x 50 x 1200 (2" x 2" x 48") stake to mark corners of plot rows for layout purposes.

5.2 Discretionary Items

15' x 15' portable shade structure	Graveside set up
Small shed	On site storage of hand tools

Figures

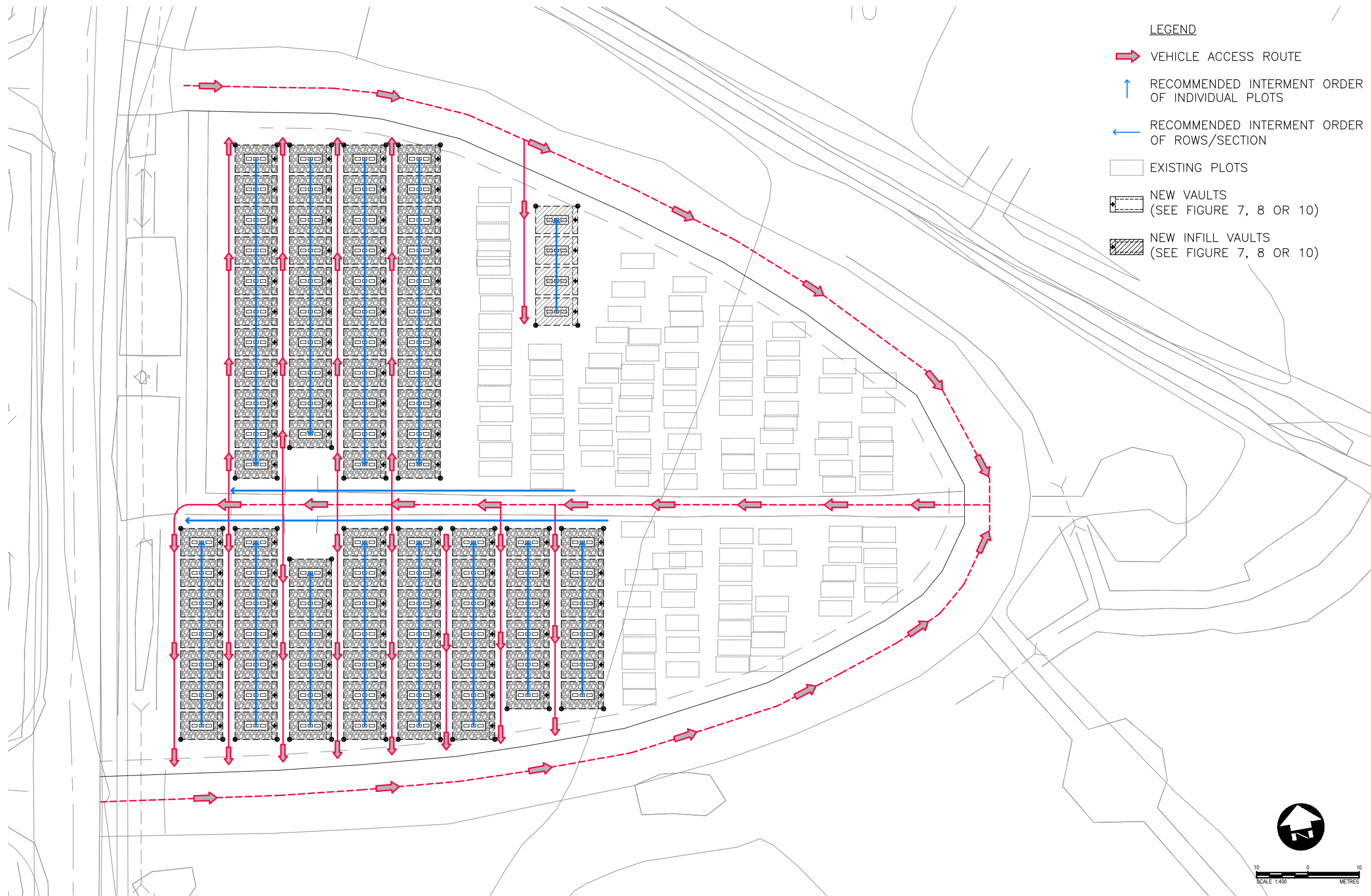


FIGURE 1: MAINTENANCE ACCESS PLAN - BURIAL VAULTS

IQALUIT APEX CEMETERY REMEDIATION

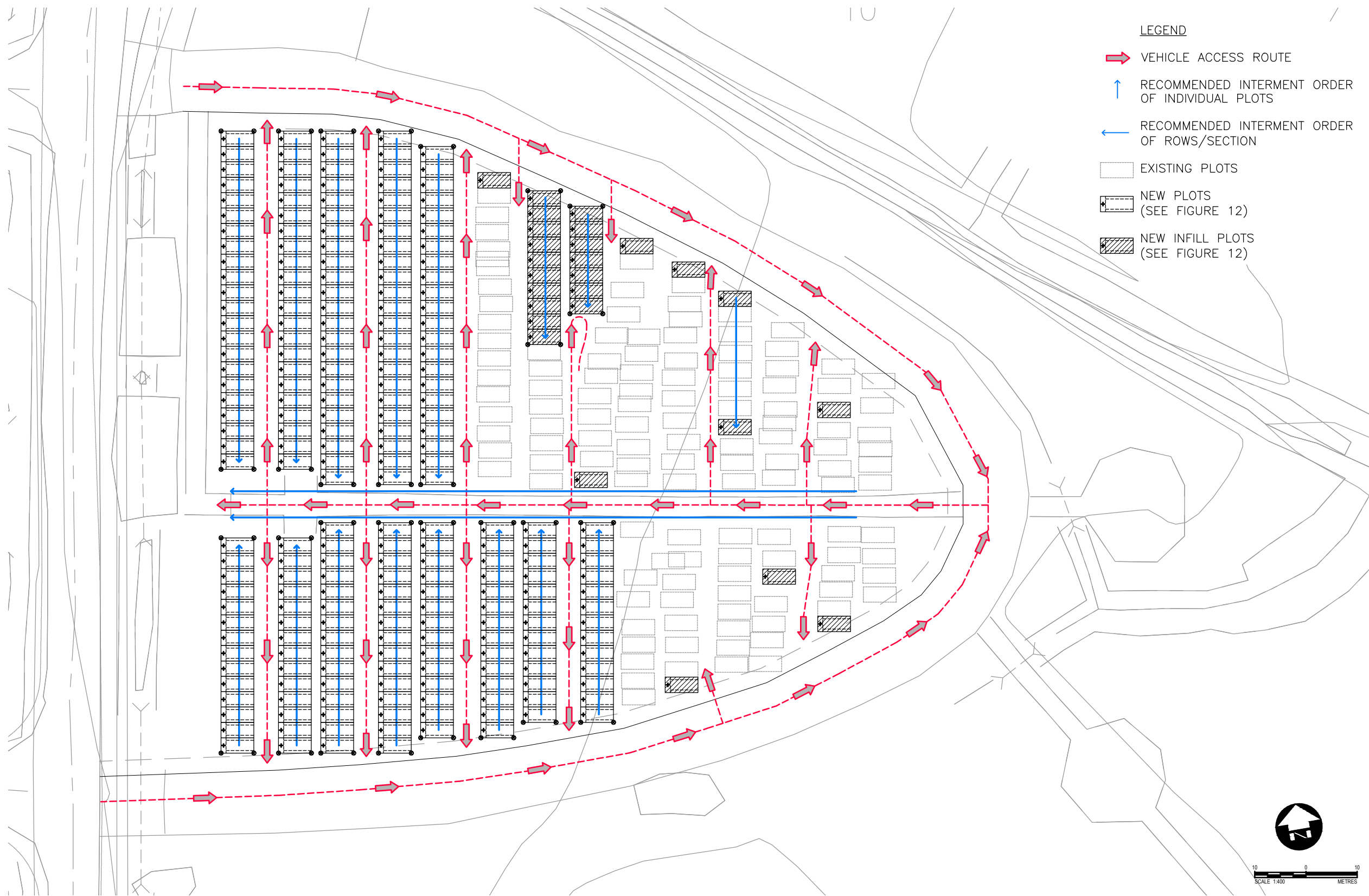


FIGURE 2: MAINTENANCE ACCESS PLAN - BURIALS

IQALUIT APEX CEMETERY REMEDIATION

OPTION 1A - ABOVE GROUND BURIAL VAULTS, NO MEMORIAL CAIRN

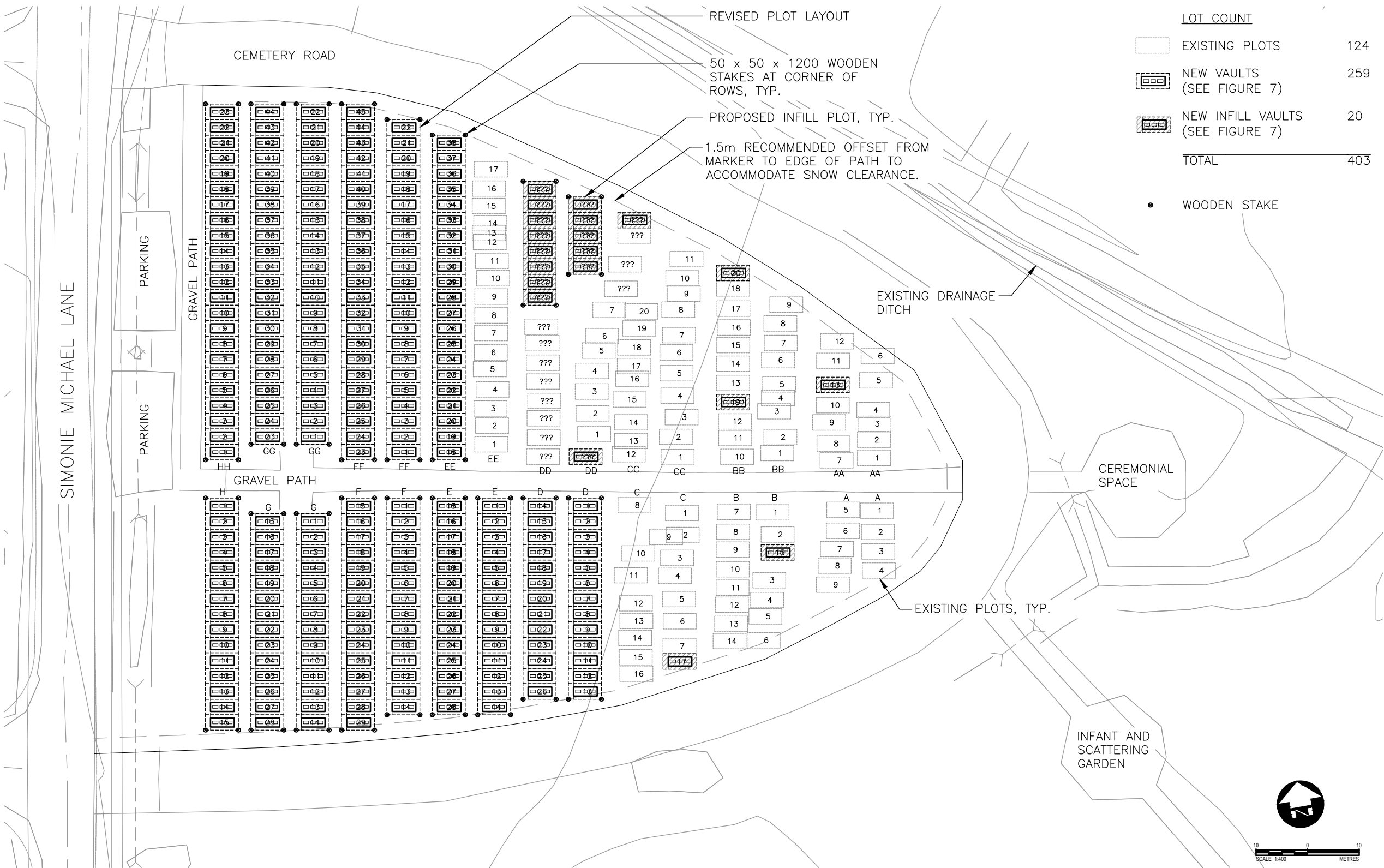


FIGURE 3: LOTTING LAYOUT

IQUALUIT APEX CEMETERY REMEDIATION



OPTION 1B - ABOVE GROUND BURIAL VAULTS /W SMALL MEMORIAL CAIRN

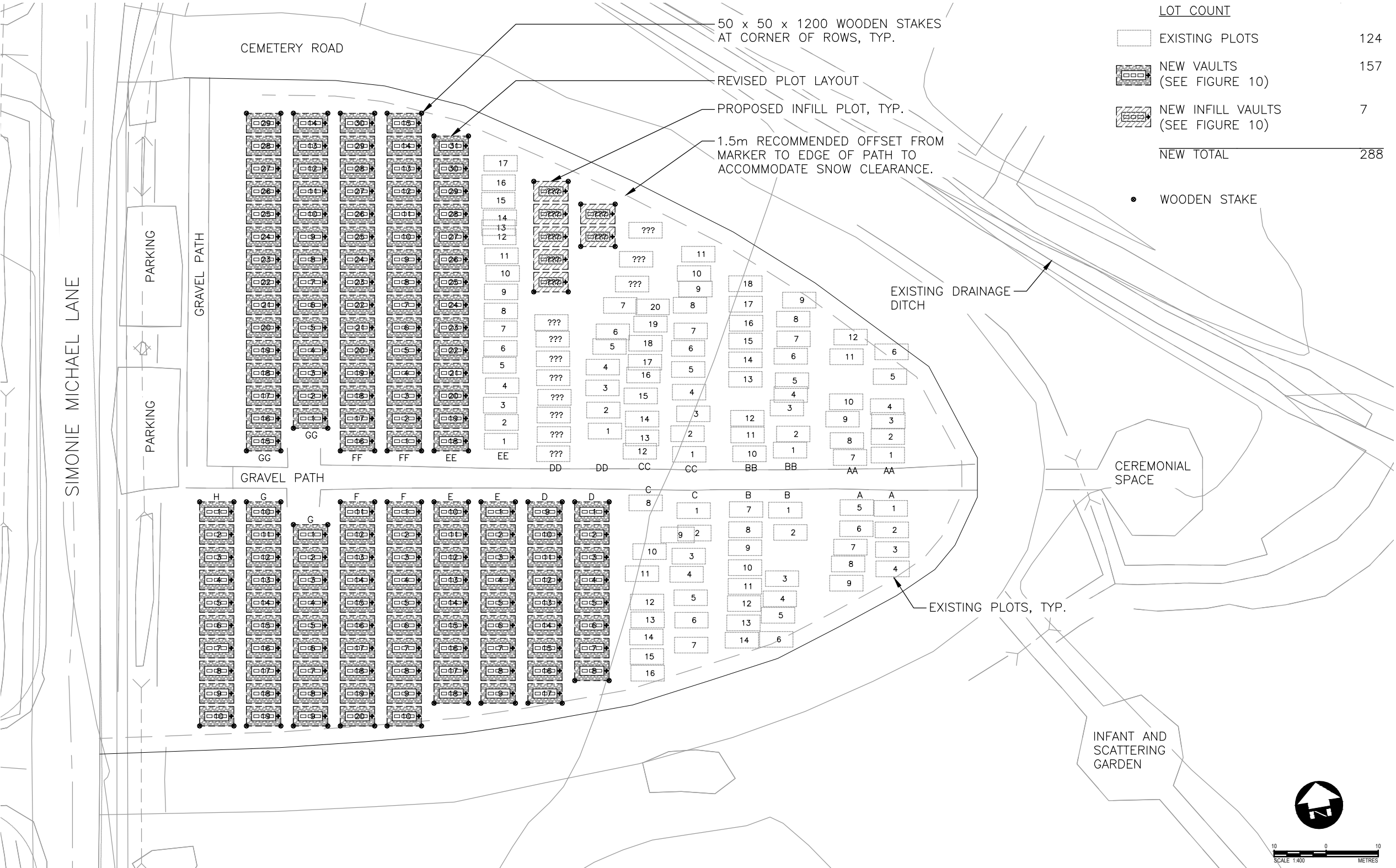


FIGURE 4: LOTTING LAYOUT

IQUALUIT APEX CEMETERY REMEDIATION



OPTION 1C - ABOVE GROUND BURIAL VAULTS /W LARGE MEMORIAL CAIRN

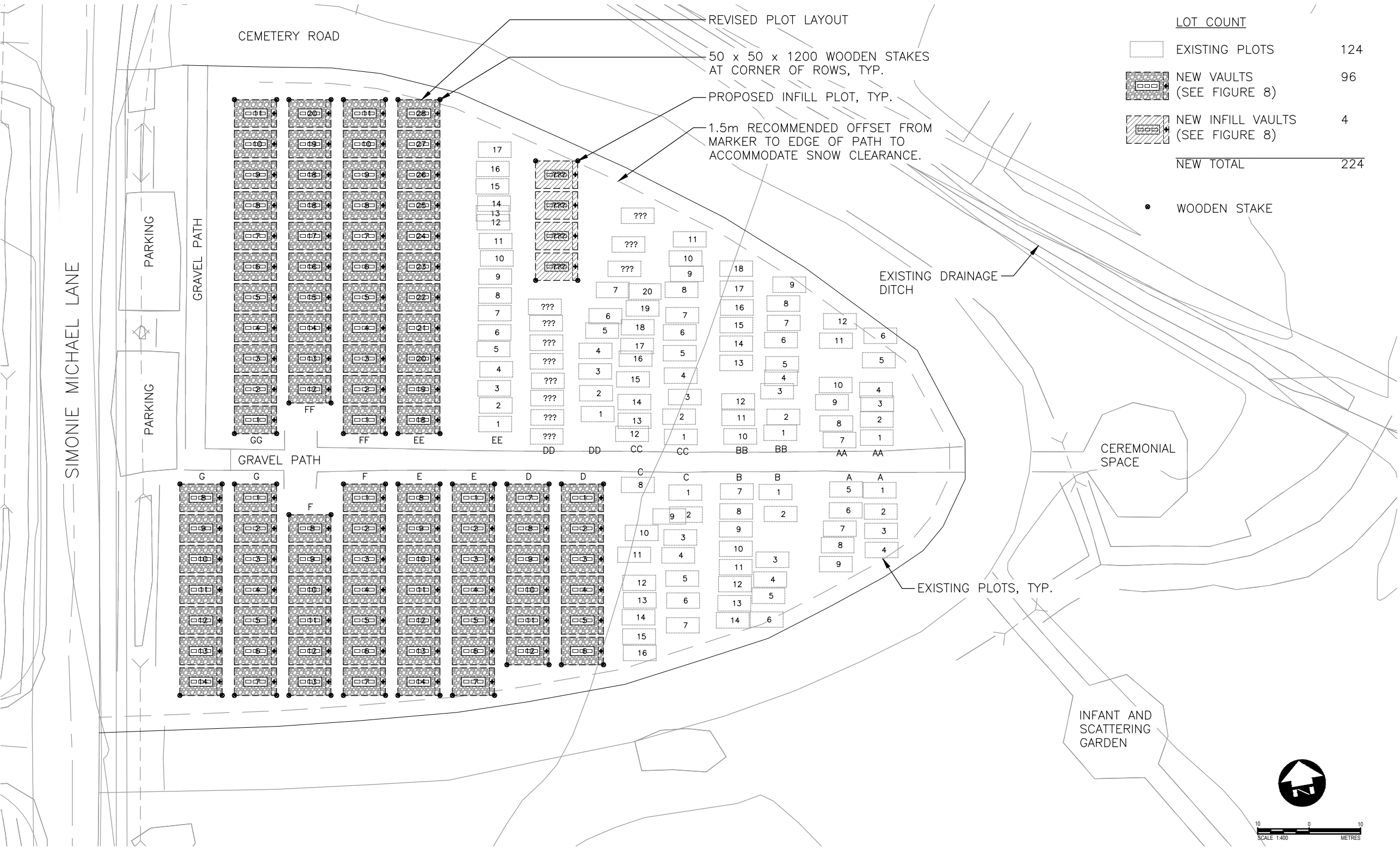


FIGURE 5: LOTTING LAYOUT

IQUALUIT APEX CEMETERY REMEDIATION

OPTION 2 - IN-GROUND BURIAL WITH INSULATION

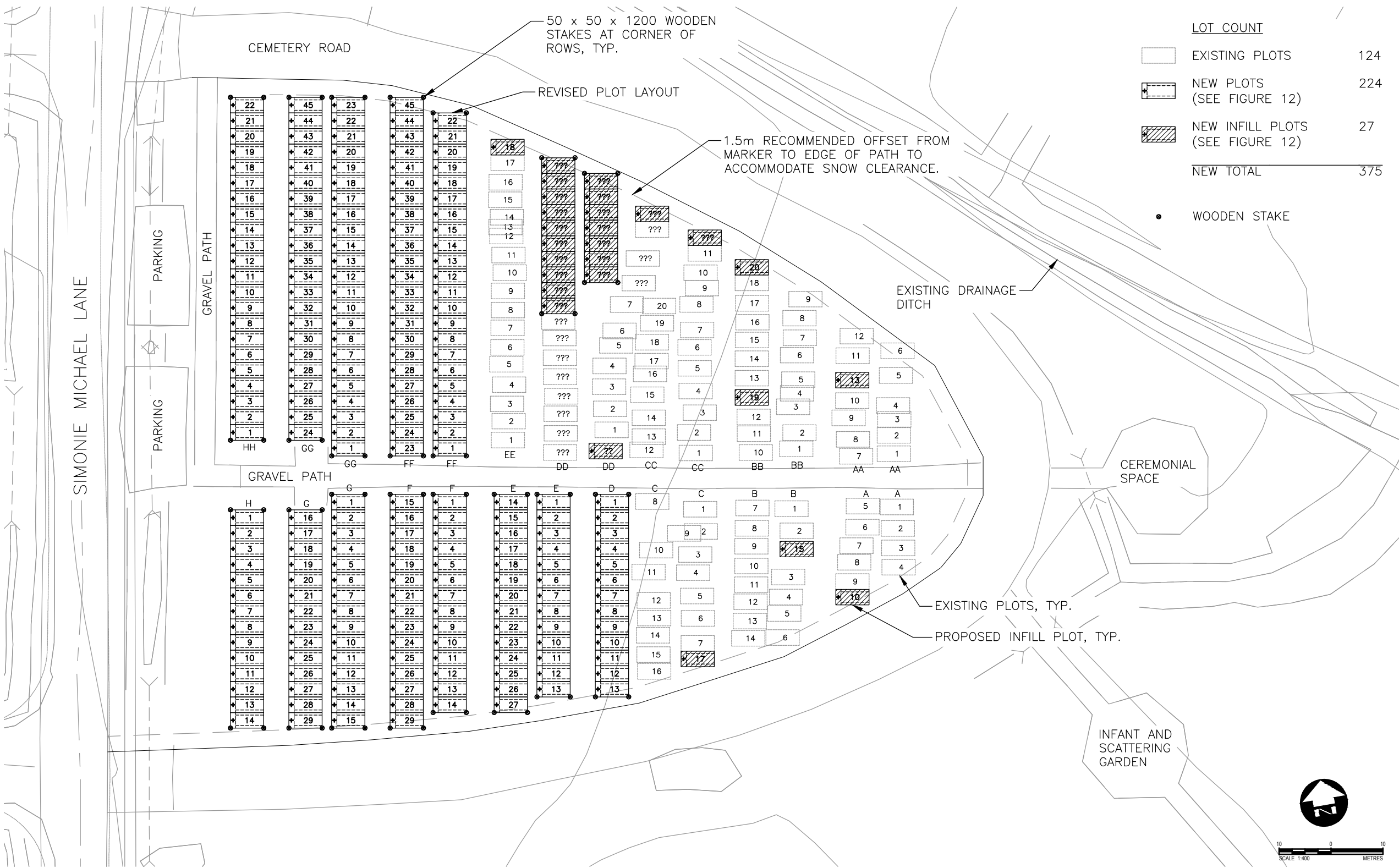
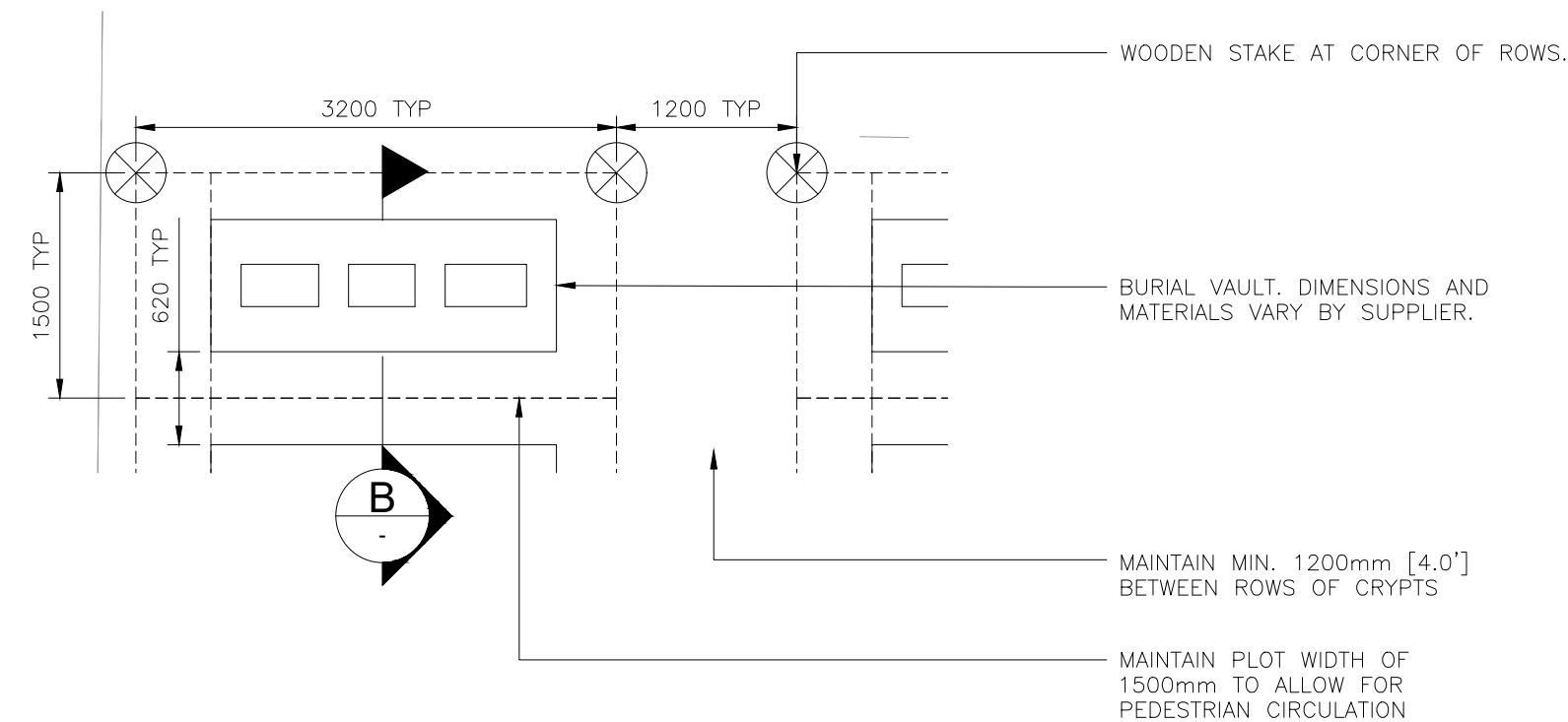


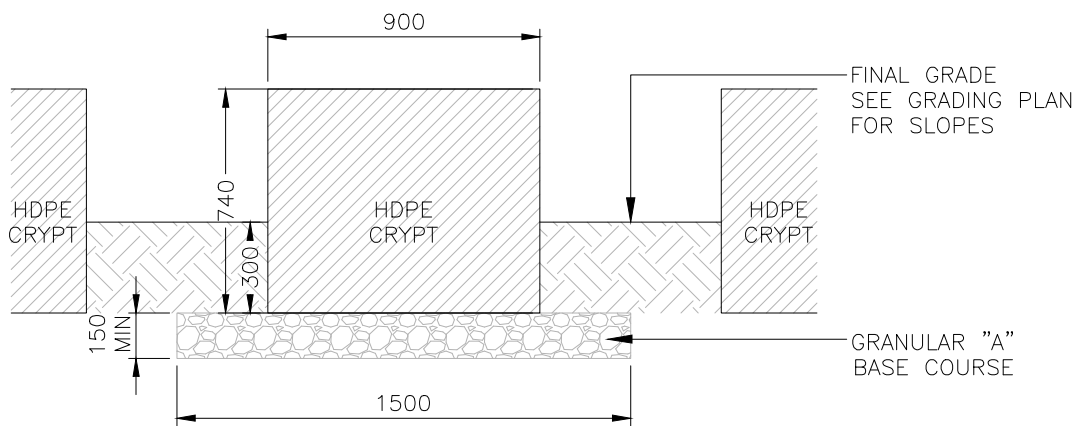
FIGURE 6: LOTTING LAYOUT

IQUALUIT APEX CEMETERY REMEDIATION

OPTION 1A - ABOVE GROUND BURIAL VAULTS, NO MEMORIAL CAIRN



PLAN VIEW



SECTION B - ABOVE GROUND BURIAL VAULTS - OPTION 1A: FRONT VIEW

FIGURE 7: TYPICAL PLOT DIMENSIONS AND INSTALLATION DETAIL

IQUALUIT APEX CEMETERY REMEDIATION



OPTION 1B - ABOVE GROUND BURIAL VAULTS /W SMALL MEMORIAL CAIRN

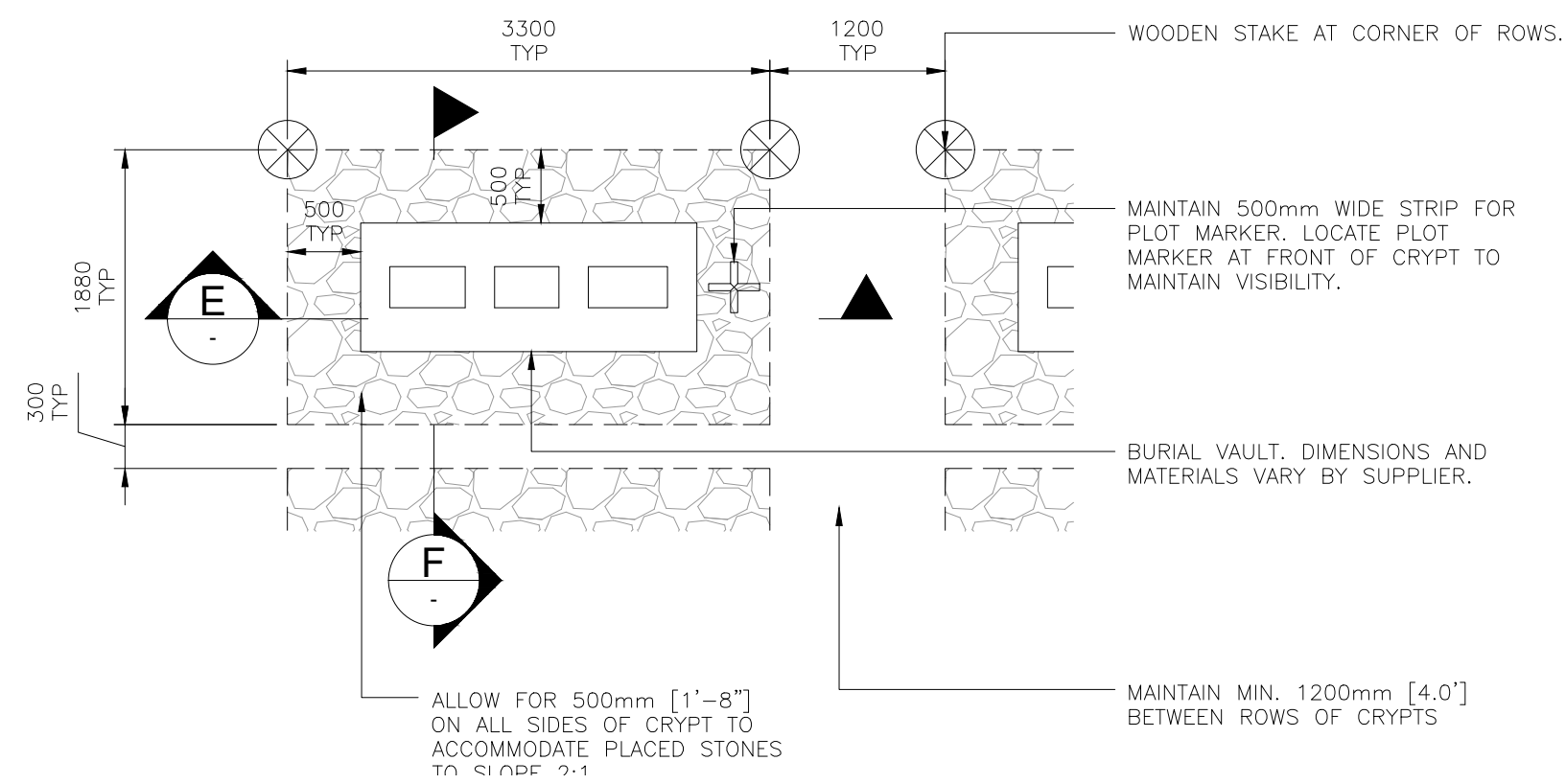
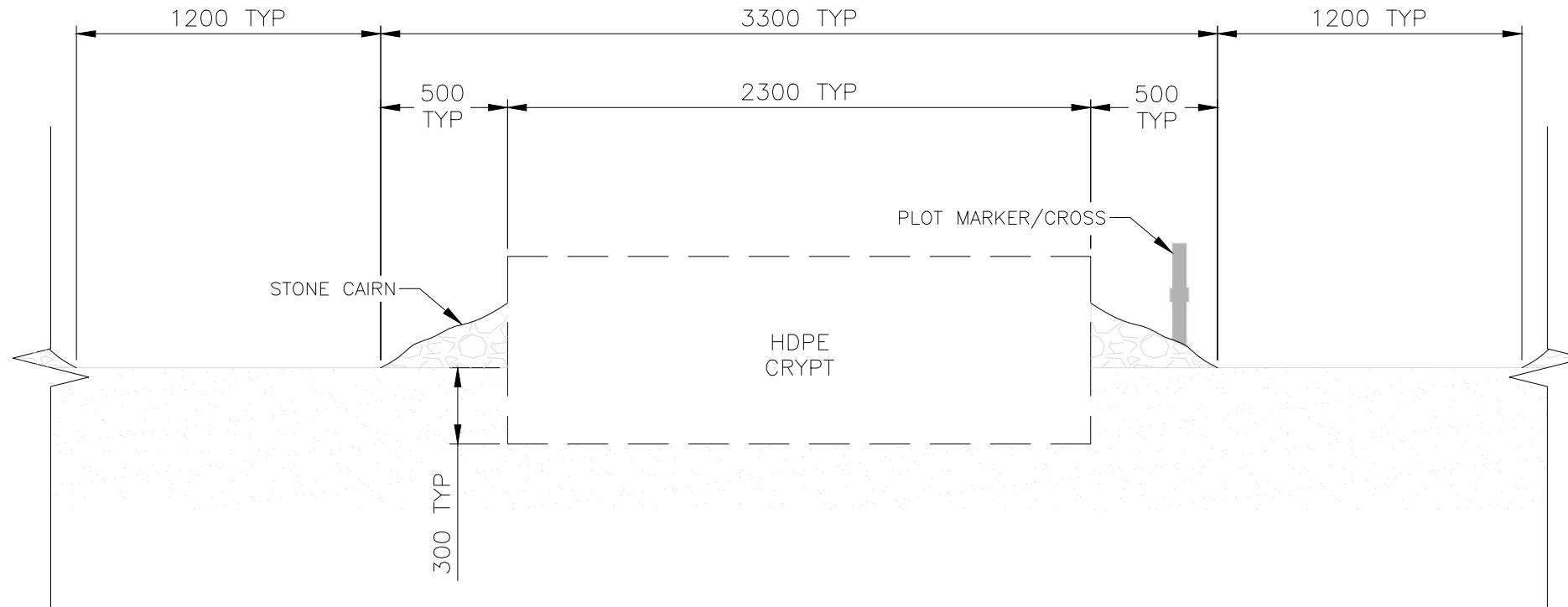
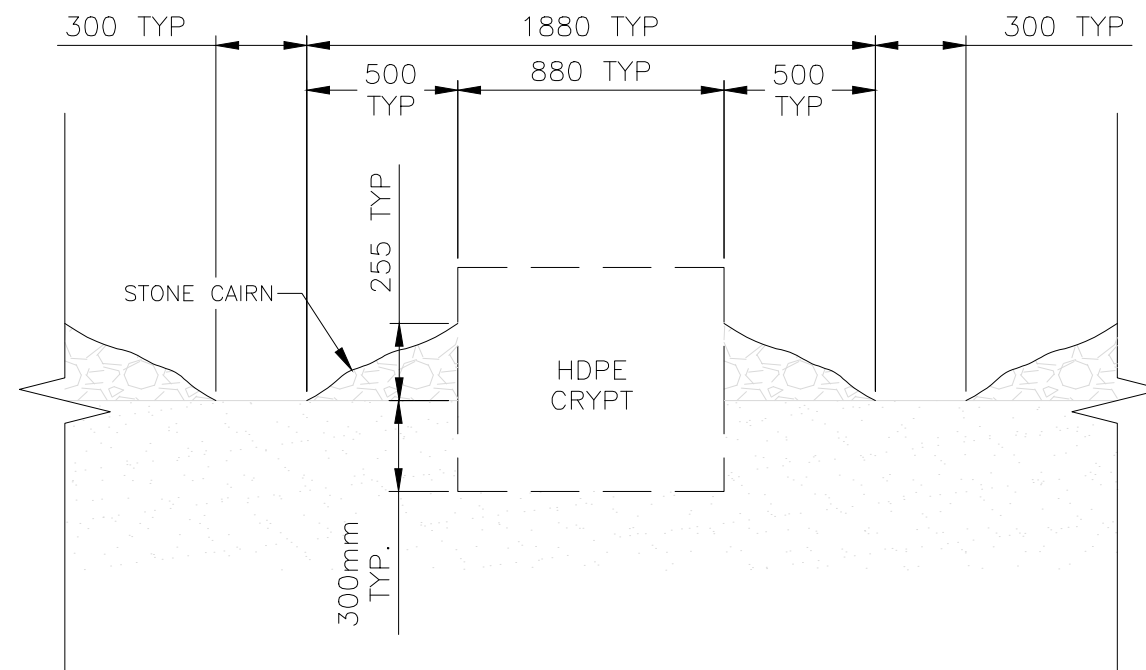


FIGURE 8: TYPICAL PLOT DIMENSIONS
IQUALUIT APEX CEMETERY REMEDIATION

OPTION 1B - ABOVE GROUND BURIAL VAULTS, /W SMALL MEMORIAL CAIRN



SECTION C - ABOVE GROUND BURIAL VAULT - OPTION 1B: SIDE VIEW



SECTION D - ABOVE GROUND BURIAL VAULT - OPTION 1B: FRONT VIEW

FIGURE 9: INSTALLATION DETAIL

IQALUIT APEX CEMETERY REMEDIATION

OPTION 1C - ABOVE GROUND BURIAL VAULTS /W LARGE MEMORIAL CAIRN

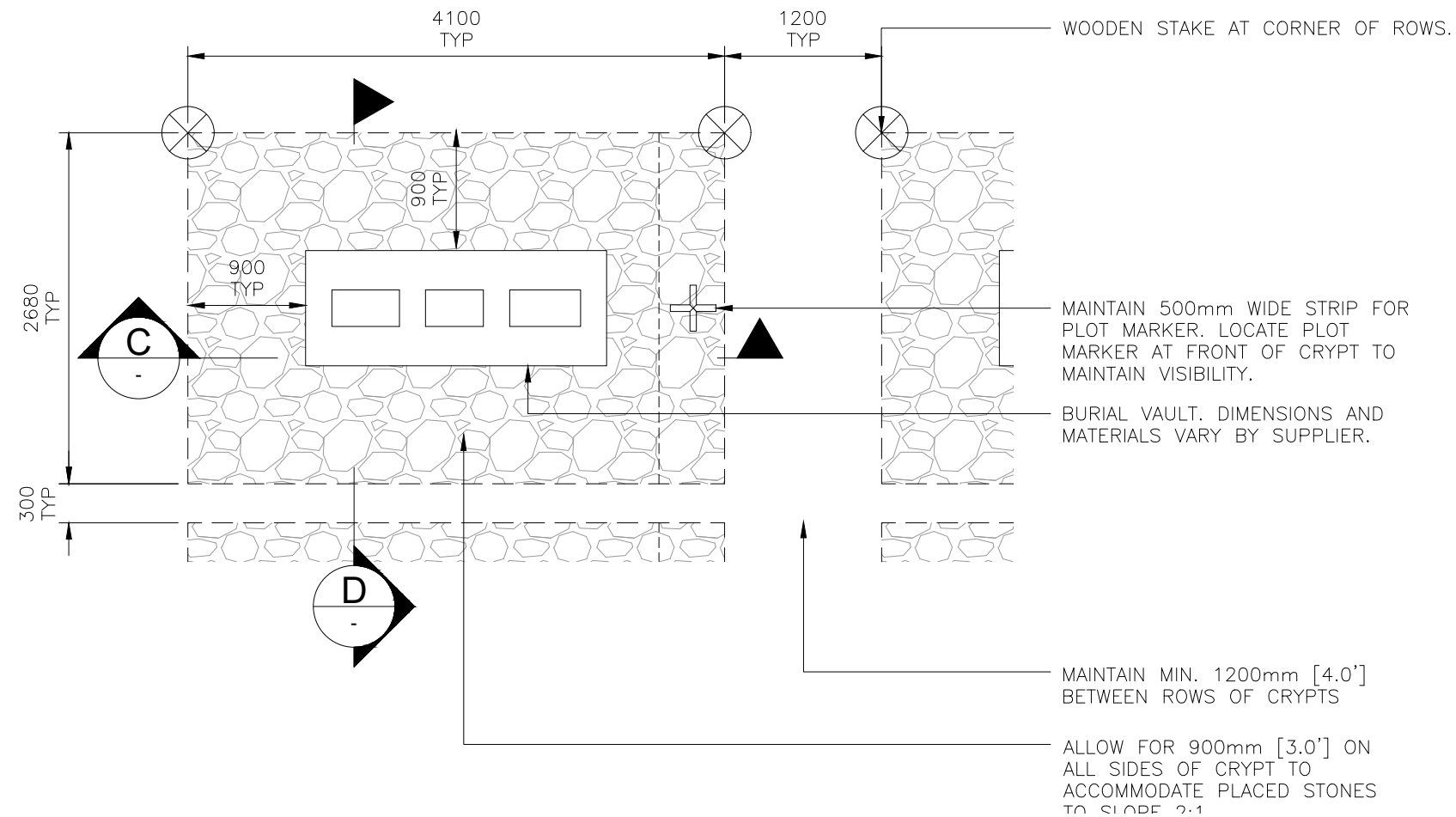
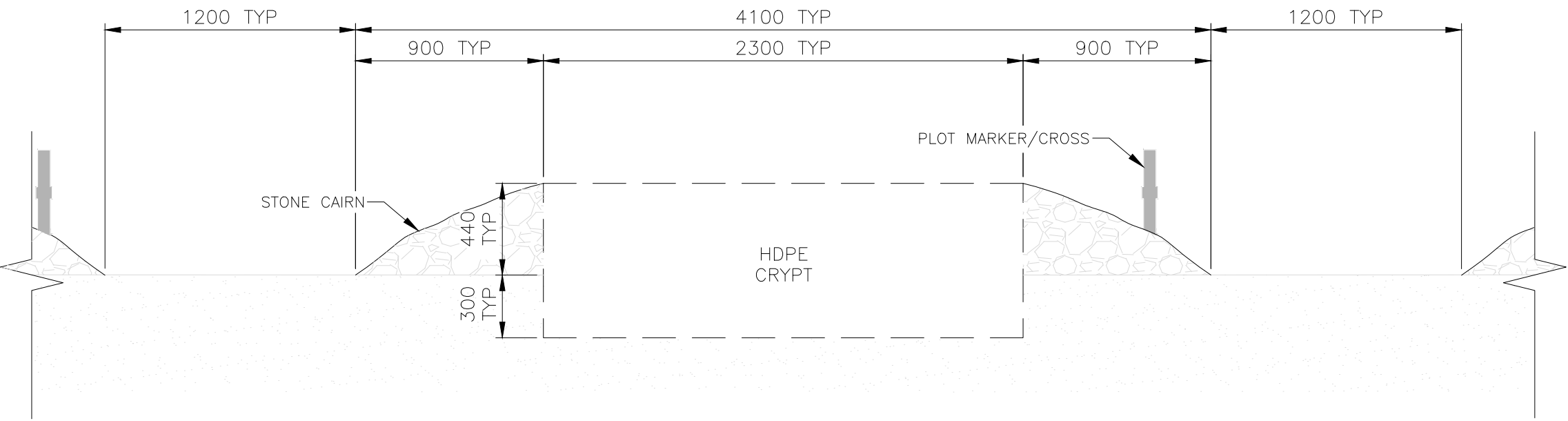


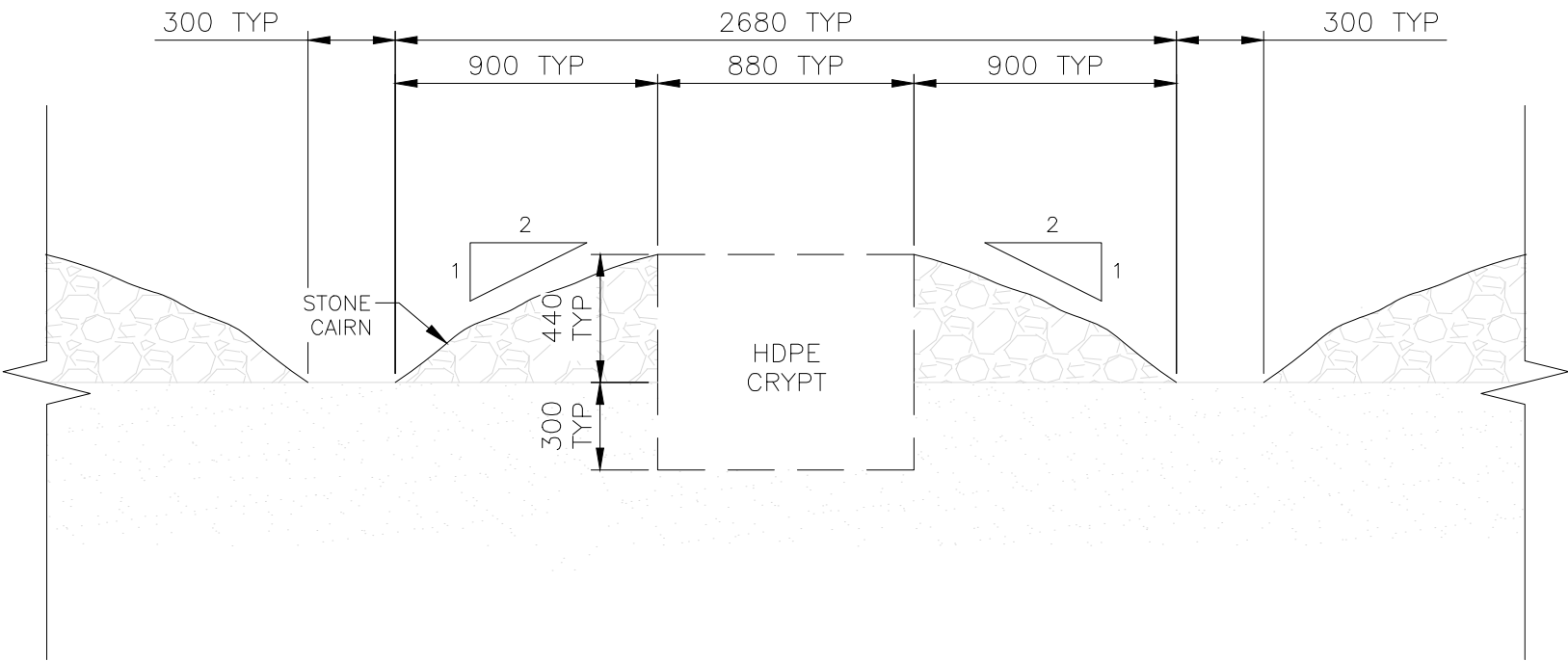
FIGURE 10: TYPICAL PLOT DIMENSIONS

IQALUIT APEX CEMETERY REMEDIATION

OPTION 1C - ABOVE GROUND BURIAL VAULTS /W LARGE MEMORIAL CAIRN



SECTION E - ABOVE GROUND BURIAL VAULT - OPTION 1C: SIDE VIEW



SECTION F - ABOVE GROUND BURIAL VAULT - OPTION 1C: FRONT VIEW

FIGURE 11: INSTALLATION DETAIL

IQALUIT APEX CEMETERY REMEDIATION



OPTION 2 - IN-GROUND BURIAL WITH INSULATION

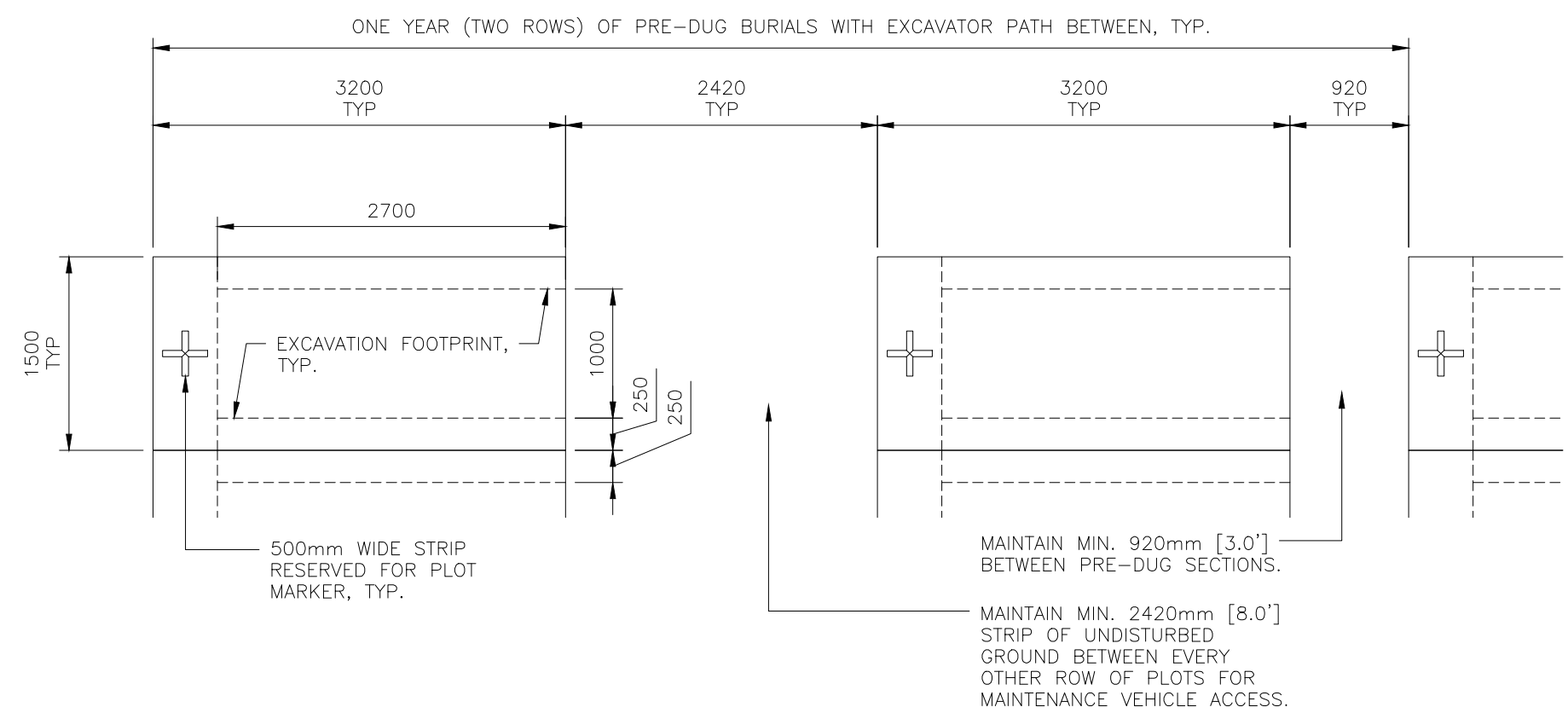
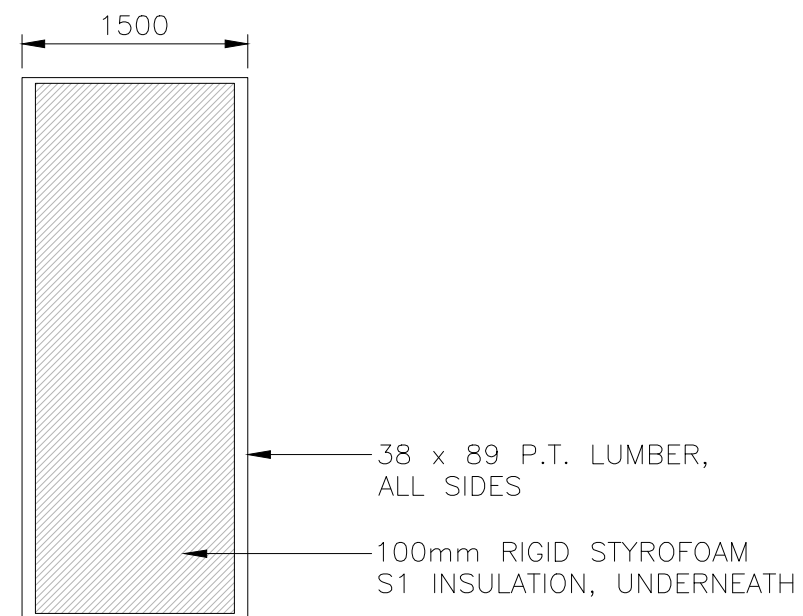
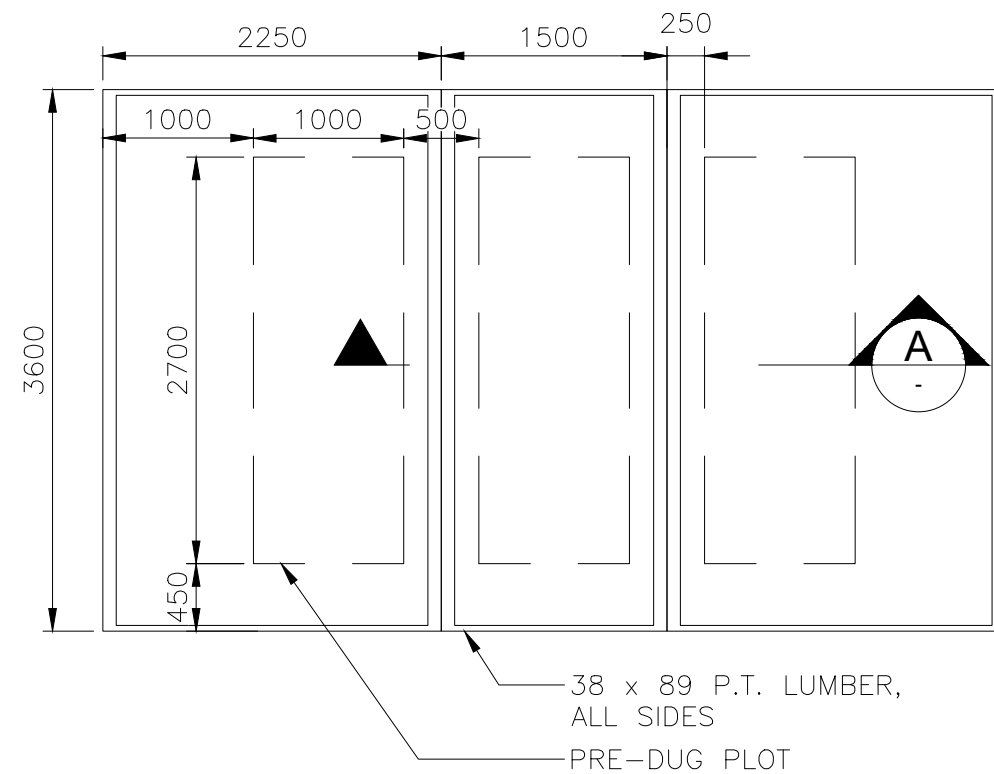


FIGURE 12: TYPICAL PLOT DIMENSIONS

IQUALUIT APEX CEMETERY REMEDIATION

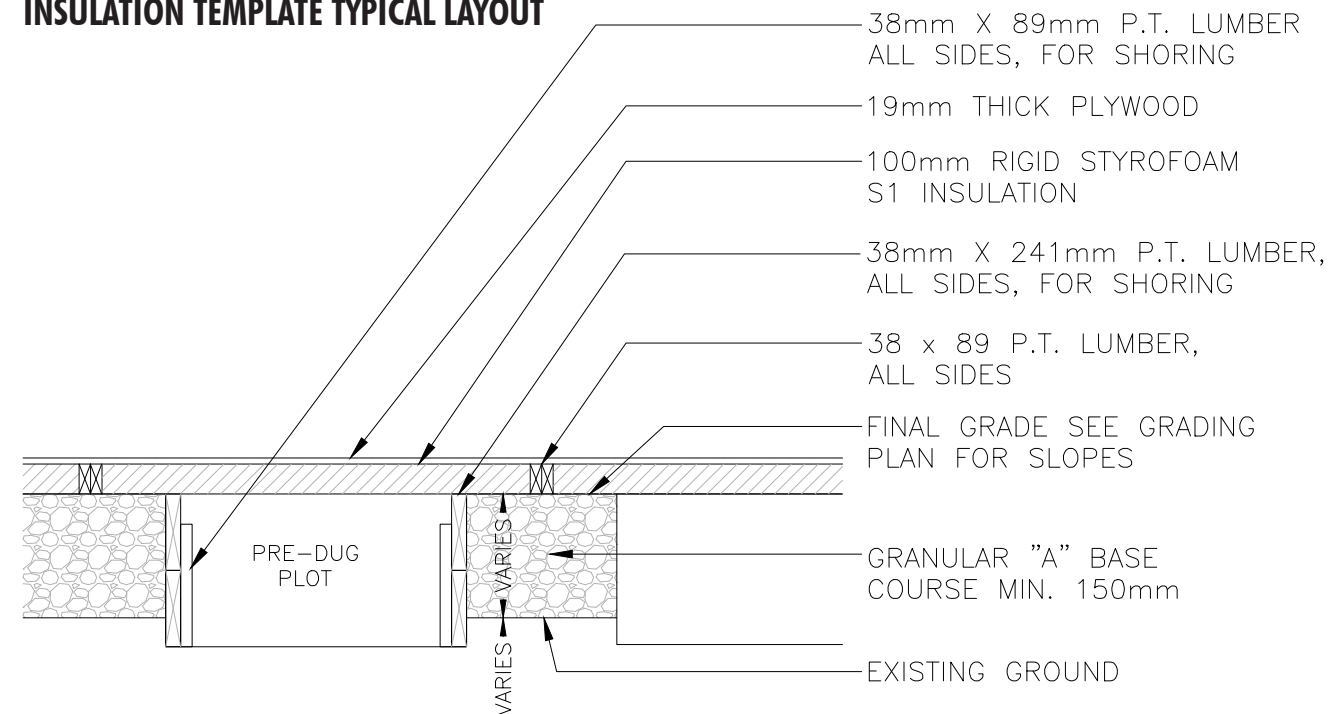


OPTION 2 - IN-GROUND BURIAL WITH INSULATION



INSULATION TEMPLATE PLAN VIEW

INSULATION TEMPLATE TYPICAL LAYOUT



SECTION A - INSULATION OVER IN-GROUND BURIAL

FIGURE 13: INSTALLATION DETAIL

IQALUIT APEX CEMETERY REMEDIATION



FIGURE 14: EXAMPLE PHOTOS OF TYPICAL OPEN/CLOSE SETUP

IQALUIT APEX CEMETERY REMEDIATION

Appendix A

Burial Form

Burial form

NAME OF DECEASED: _____

FUNERAL DATE AND TIME: _____

PLOT LOCATION

Section : _____ Row : _____ Lot # : _____

PLOT WAS OPENED ON THE _____ DAY OF _____, 20____.

PLOT DEPTH : _____ FEET

CEMETERY STANDARD OPERATING PROCEDURES WERE FOLLOWED.

☐ YES ☐ NO

CARE WAS TAKEN TO MINIMIZE IMPACTS TO THE TUNDRA DURING GRAVE DIGGING.

☐ YES ☐ NO

PLOT LOCATION WAS SPOTTED WITH TWO PEOPLE (SPOTTER AND MACHINERY OPERATOR).

☐ YES ☐ NO

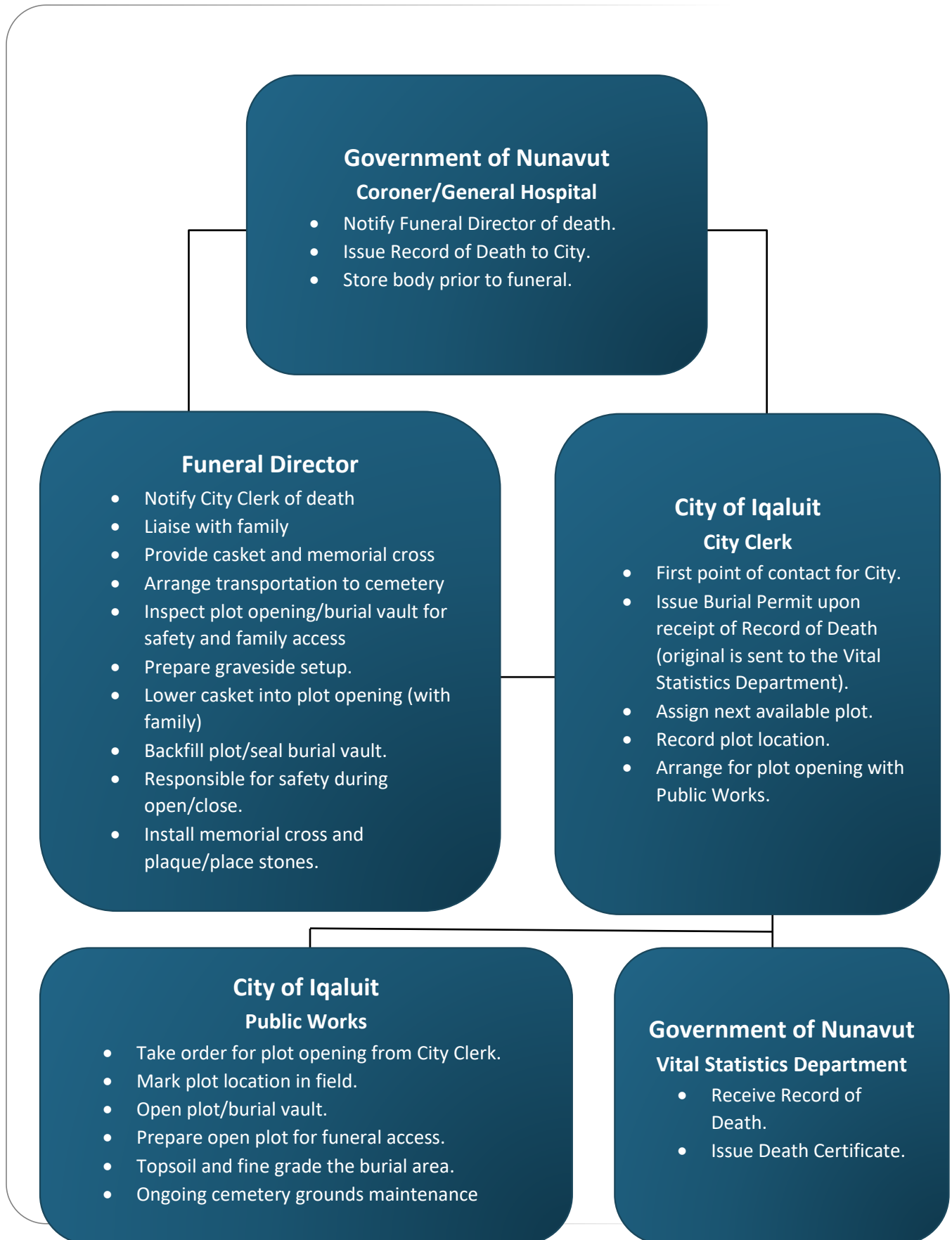
_____	_____	_____
Name (Spotter)	Initials	Date

_____	_____	_____
Name (Machinery Operator)	Initials	Date

Return completed form to the City Clerk.

Appendix B

Organizational Chart



References

1. Iqaluit Cemetery Standard Operating Procedures, Lees + Associates, December 16, 2014.
2. Consolidation of Cemetery Regulations R-038-2019, Public Health Act, January 9, 2020.
3. City of Iqaluit, New Cemetery Project drawings, Issued for Construction - Sept. 10, 2013

Appendix C

Climate Influences on the Apex Cemetery

Climate Influences on the Apex Cemetery: A Summary

The influences of the changing climate on the Apex Cemetery and its landscape were examined by considering trends in temperatures and precipitation over the past few decades and by incorporating climate change projections looking forward into the future. Both the Iqaluit airport climate data and the most recently updated gridded or mapped and interpolated climate data fields were used in the analyses. The climate change projections were based on 33 of the currently vetted climate change projection datasets from the 5th Intergovernmental Panel on Climate Change (IPCC) Assessment Report released in 2013. Dillon has a climate analysis system that incorporates all updated climate data and climate change projections issued by the IPCC and is currently ingesting the next generation of climate change models, the 6th IPCC Assessment Report models, that should become officially available to general users within a couple of years.

Temperature variables were chosen to reflect the influences of climate warming in all seasons on gradual permafrost thaw and of anomalously “hot” summer temperatures on abrupt permafrost thaw and sudden subsidence of soils (sinkholes). All temperature variables were found to be increasing over time with significant and increasing increases into the future. The climate study also considered the role of precipitation trends (rainfall and snowfall totals) on flooding events and in exacerbating further permafrost thaw, adding in turn to flooding and drainage concerns. The analysis considered both climate station data and gridded or interpolated climate data, and found declining trends in average and precipitation totals for all months except June. The declining trend in precipitation totals is a finding that applies for unknown reasons to other locations in eastern Baffin Island, perhaps reflecting the importance of the Arctic Oscillation and North Atlantic Oscillation phenomenon to the region’s weather patterns. However, more detailed analysis of extreme or more intense rainfall events indicated increases in summer 3-day heavy or extreme rainfall events. The study also examined seasonal and estimated changes in rainfall and snowfall as having a potential role in the changing landscape of the Apex Cemetery.

This climate study could benefit from additional considerations of anomalous or hot summer temperature indicators (thawing indices) associated with rapid permafrost degradation, as well as additional analysis of excess rainfall indicators that can capture both of the influences of extreme or intense rainfall events as well as more frequent rainfall events. Studies on changes in seasonality of precipitation patterns and freezing and thawing cycling could also prove informative. In general, it would be informative to undertake a “forensics type” analysis of flooding and drainage issues and their weather and climate links, including “setup” conditions, and to further investigate other practices to remediate the combined impacts of permafrost degradation and flooding.

The Changing Climate and the Landscape

Recent research studies have indicated that ice rich permafrost soils in parts of the Canadian Arctic are thawing some 70 years earlier than initially indicated. Initially, it was assumed that climate warming would bring a slow, steady erosion of permafrost that could be measured in centimeters of additional thawing over decades to centuries, with a similar pace for its carbon release. But, where ground ice content is high, recent research and observations from Arctic latitudes have indicated that abrupt thaw can happen in centimeters to meters in a matter of months following an anonymously “hot” summer. The rapid transfer of heat from air to soil in Arctic environments has been observed in a number of recent studies in Canada’s Arctic (e.g., Farquharson et al, 2019), where a single short-lived but intense “hot” summer event can force widespread permafrost active layer deepening and ongoing landscape degradation and subsidence lasting for decades.

Generally, as the ice that holds the soils together disappears under rapid thaw, it can result in sinkholes (thermokarsts) in ice rich soils. This rapid thaw and subsidence persists and can expand over the next several decades, as shown in **Figure A-1**. In most cases, the “sinkholes” are also associated with flooding risks, especially under intense rainfall events that also, in turn, speed up the permafrost thawing and subsidence. The permafrost degradation is also associated with ground disturbance and can result in increased coastal erosion risks. A scientific concern with this cycle is that rapid thawing of permafrost also could release large quantities of stored greenhouse gases, unleashing a feedback loop that could, in turn, fuel even faster climate changes over the Arctic (and planet).

Heavy rainfall summers are associated with Arctic flooding hazards and with additional permafrost thaw and subsidence in ice rich soils. A study from Fairbanks, Alaska that monitored longer term rainfall and permafrost thaw in ice rich soils (Douglas et al, 2020) indicated that an additional 7 mm of permafrost thaw is likely for every 10 mm of summer rainfall exceeding average summer amounts, regardless of whether the rainfall was the result of an intense and heavy rainfall or many wet days. It is likely that permafrost thawing or degradation from excess summer rainfall would be more sensitive in the Apex Cemetery area than in Fairbanks due to less vegetative cover and generally colder permafrost conditions. The addition of thick gravel cover could help to buffer for permafrost thaw sensitivity and improve drainage.

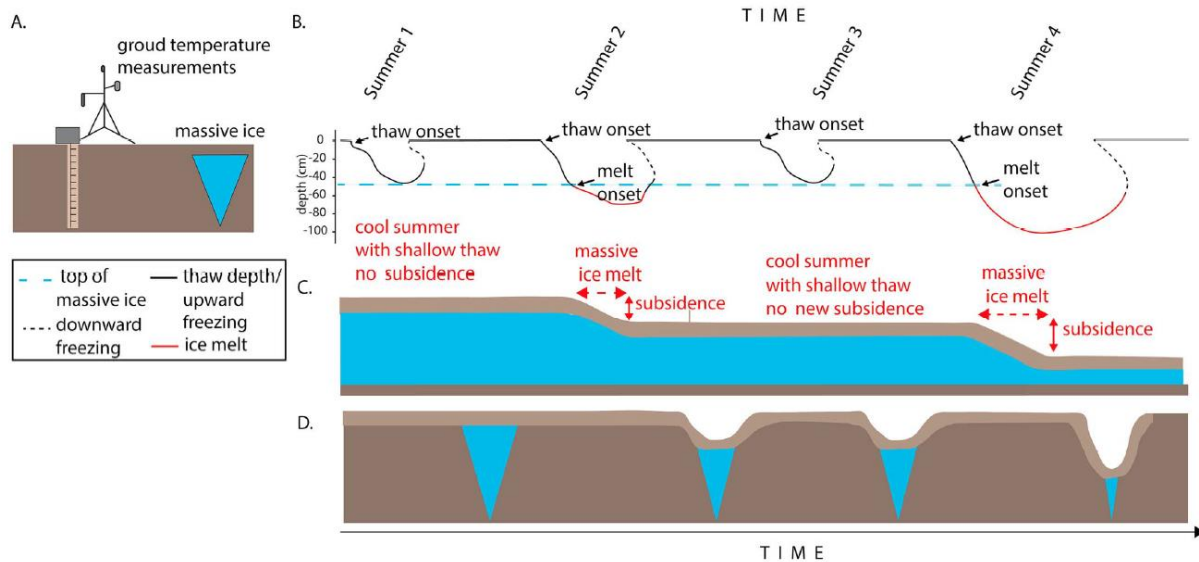


Figure A-1. Schematic showing how the first very warm summer and others that follow lead to rapid ice-wedge permafrost degradation in High Arctic regions.

Climate Trends

Like other parts of Nunavut, the climate of the Apex Cemetery area is warming consistently over all seasons. As shown in **Appendix 1**, mean annual temperatures over the Iqaluit area have warmed steadily since 1981 and are projected to continue warming into the future under climate change. By the 2050s period (2041-2070), mean annual temperatures are projected to warm by around 5°C relative to climate projection baseline values for the period 1981-2010. Periods of anomalous winter warmth and freeze-thaw cycling are also becoming more frequent during many years.

Careful analysis of climate station and gridded climate data indicates that seasonal and annual precipitation amounts from snowfall and rainfall have been declining in the area since the 1970s. The exception in the historical records is the month of June, where trends are slightly increasing. These trends in precipitation for eastern Nunavut and eastern Baffin Island in particular differ from those of other parts of Nunavut and their cause is not clear. Multi-decadal atmospheric oscillations due to a global phenomenon known as the Arctic Oscillation and North Atlantic Oscillation are important influences on weather patterns in eastern Baffin Island and may be driving these recent precipitation trends. Climate change model projections for the next 30 year call for increases in rainfall and snowfall amounts as seen in **Appendix 2**, although there is a small possibility that climate change models may not be yet able to capture these trends and other dynamics in play.

Concurrent to these trends in precipitation have been shifts in the seasonality of the precipitation types and amounts. Due to recent changes in precipitation measurements (i.e., recent automated measurements do not differentiate rainfall from snowfall amounts) and to general declines in the quality and types of climate data, it is difficult to discern the contributions to trends from rainfall and from

snowfall. Based on analysis of daily minimum and maximum temperatures and daily total precipitation amounts, it is estimated that the annual snowfall totals in the Iqaluit area have been decreasing recently while annual rainfall totals have remained mostly steady or at least declined more slowly.

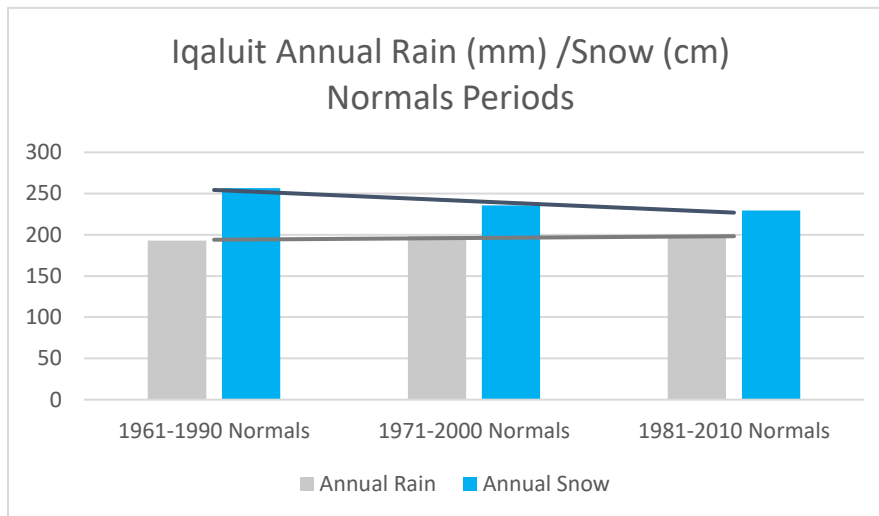


Figure A-2. Estimated trends in snowfall amounts relative to rainfall amounts based on successive 30-year climate average periods (called Climate Normals).

Trends for heavier or more intense rainfall *events* can be captured through the extreme 3-day summer precipitation amounts for each year. **Figure A-3** below shows small increases in 3-day extreme rainfall amounts each year, especially representative of the most recent years. Note that the climate record for 3-day rainfall extremes at Iqaluit Airport is quite variable from summer to summer and has significant missing data gaps. Nonetheless, the available data does highlight the near record summer rainfall of July, 2016 (>80 mm over 3 days) that resulted in the overflow of the Apex River and wash out of the Apex Bypass Road. A record rainfall amount of over 131 mm was measured at the Iqaluit Airport in July, 2016, as seen in **Appendix 2**. Heavy 3-day rainfalls of 50 mm were also noted in July, 2020 and in the summer of 2018 (missing data). Local newspaper reports indicate that ongoing flooding, drainage, and sinkhole issues at the Apex Cemetery were notable during the 2016, 2018, and 2020 rainfall summers.

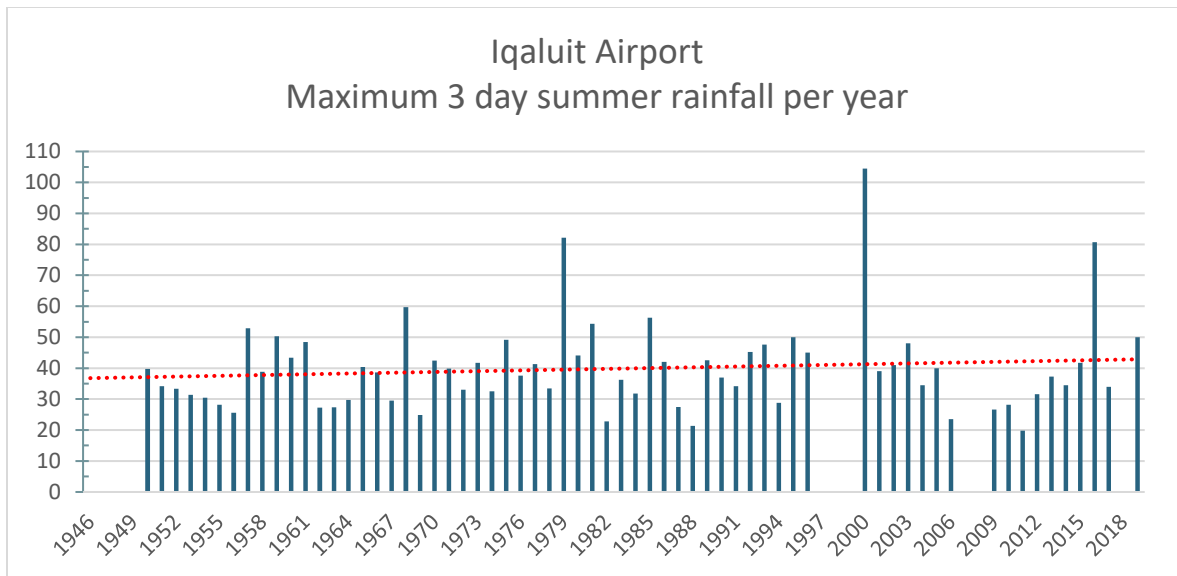


Figure A-3: Iqaluit Airport - Maximum 3 day Summer Rainfall per Year

Climate Change Projections

The climate projections shown in **Appendix 1 and 2** are based on an ensemble of 33 peer reviewed or internationally vetted climate change model sets developed for the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report that was released in 2013. The climate change projections for the Iqaluit area used here assume the higher “business as usual” greenhouse gas emission scenario known as RCP8.5. Dillon is currently in the process of collecting and assessing the next generation of IPCC AR6 climate models that should be released officially with the 6th IPCC Assessment Report, expected officially within the next year or two.

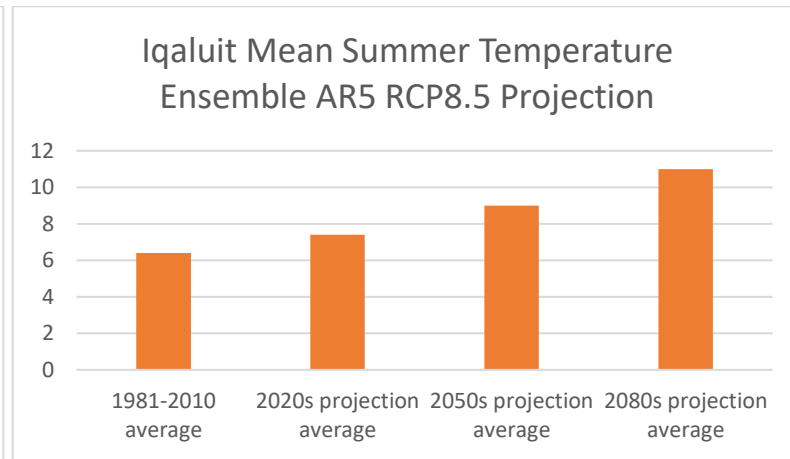
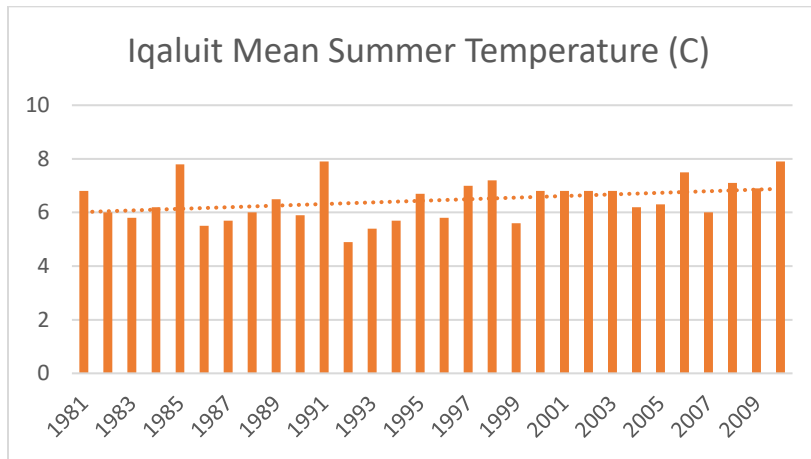
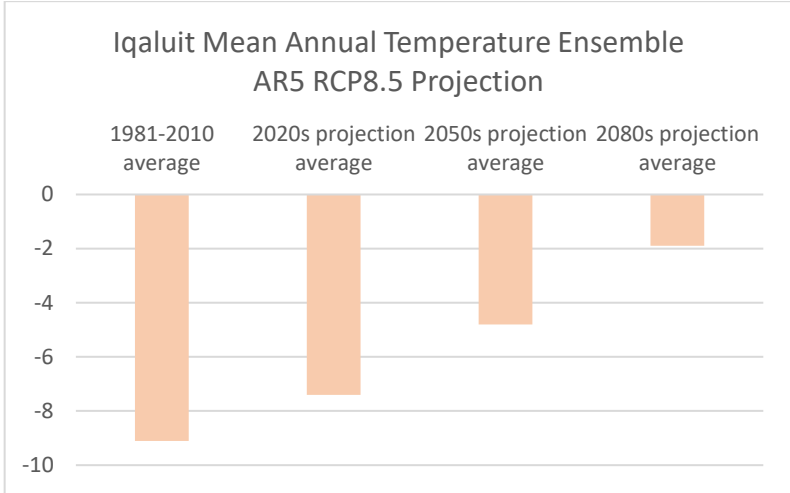
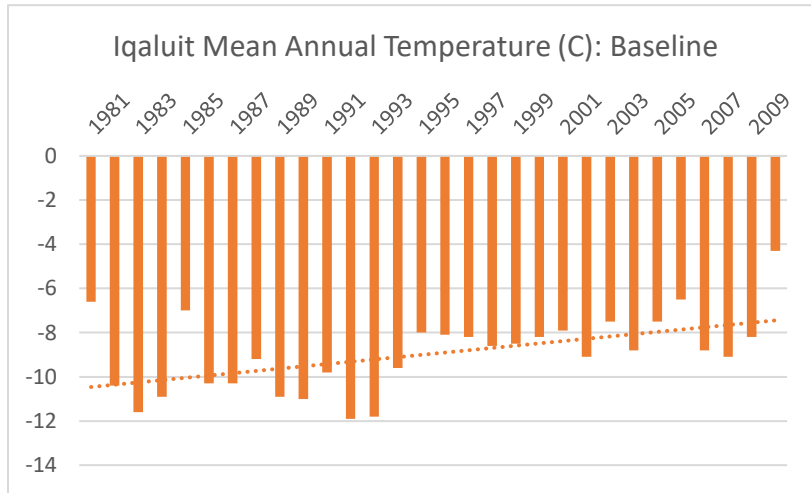
All climate change projections use gridded data outputs, and these outputs vary in scale. All of the model outputs were calibrated to a common grid that meshes with the baseline or current climate field, 1981-2010. The climate change projections then represent changes from this current or baseline climate. For the projections shown in the **Appendix 1 and 2**, climate change outputs from the 33 IPCC climate model sets were combined as an ensemble to reflect a future 2020s period (2011-2040), 2050s period (2041-2070), and a 2080s period (2071-2100).

References

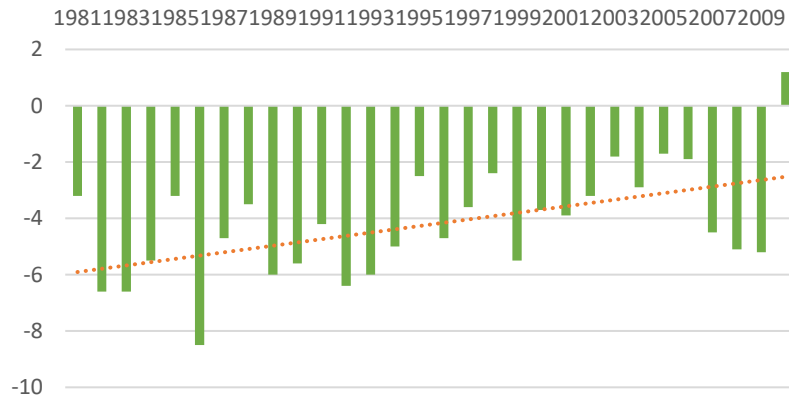
Douglas, T.A., Turetsky, M.R. & Koven, C.D. Increased rainfall stimulates permafrost thaw across a variety of Interior Alaskan boreal ecosystems. *Nature npj Clim Atmos Sci* 3, 28 (2020).
<https://doi.org/10.1038/s41612-020-0130-4>

Farquharson L M, Romanovsky V E, Cable W L, Walker D A, Kokelj S and Nicolsky D, 2019: Climate change drives widespread and rapid thermokarst development in very cold permafrost in the Canadian high arctic. *Geophys. Res. Lett.* 4 6681–9.

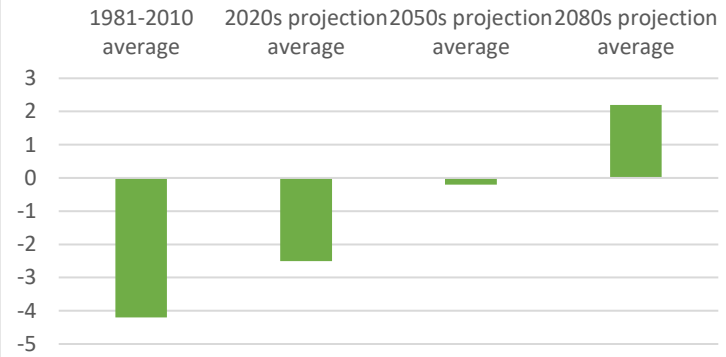
Appendix 1: Temperature Trends and Future Projections under High Greenhouse Gas Emission Assumptions



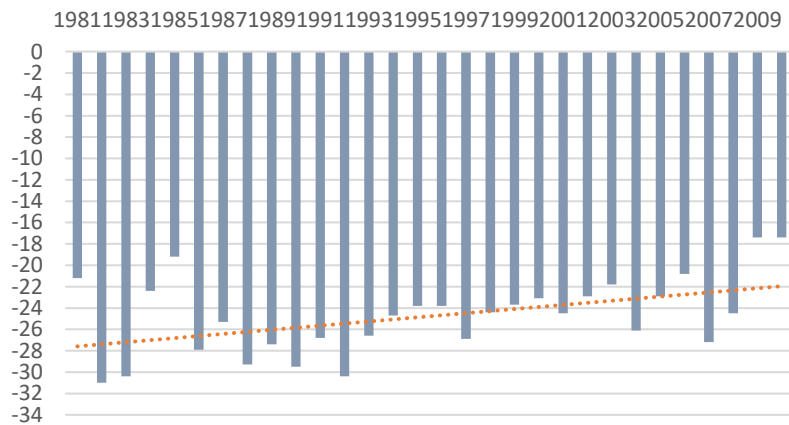
Iqaluit Mean Autumn Temperature (C)



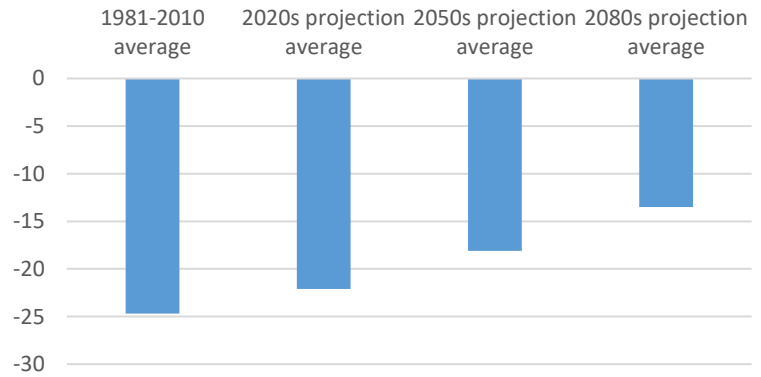
Iqaluit Mean Autumn Temperature Ensemble AR5 RCP8.5 Projection



Iqaluit Mean Winter Temperature (C)

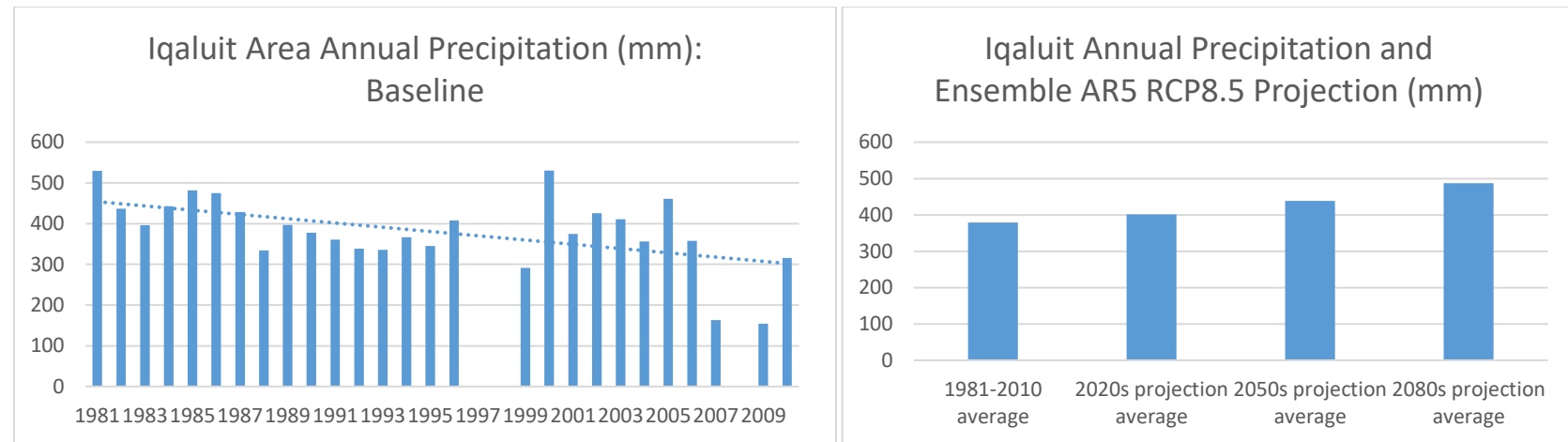


Iqaluit Mean Winter Temperature Ensemble AR5 RCP8.5 Projection

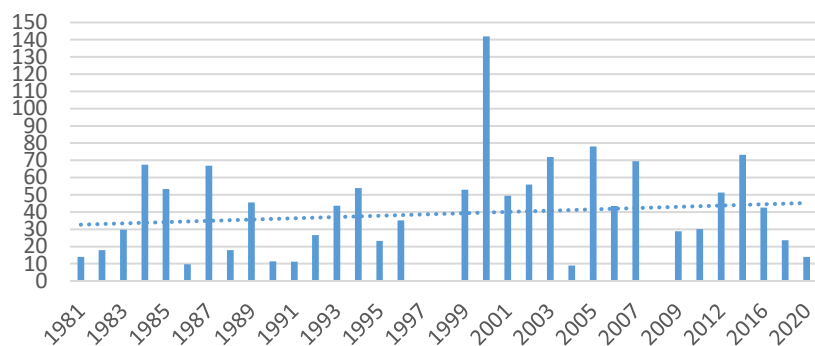


Appendix 2: Precipitation Trends and Future Projections under High Greenhouse Gas Emission Assumptions

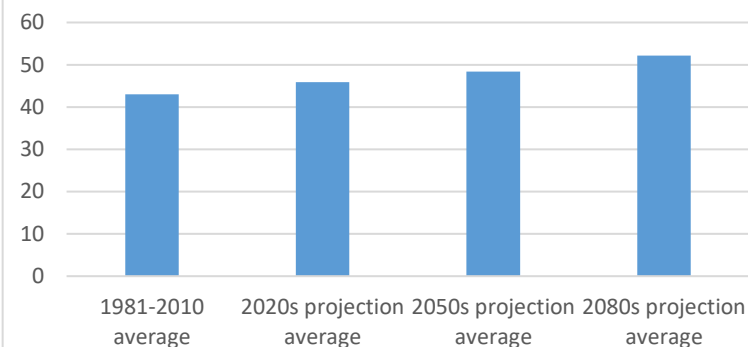
The following precipitation trend figures differ in format from those provided in **Appendix 1** for temperatures and focus on annual and monthly summer rainfall trends (June, July, and August). Note that recent summer precipitation (rainfall) trends from 1981-2020 for all seasons/months other than June are downwards, but climate change projects from an ensemble of 33 climate models indicate future increases in all seasons. Gaps in climate data records and particularly in precipitation records have become significant since the mid-1990s, explaining the blank records shown in the figures below.



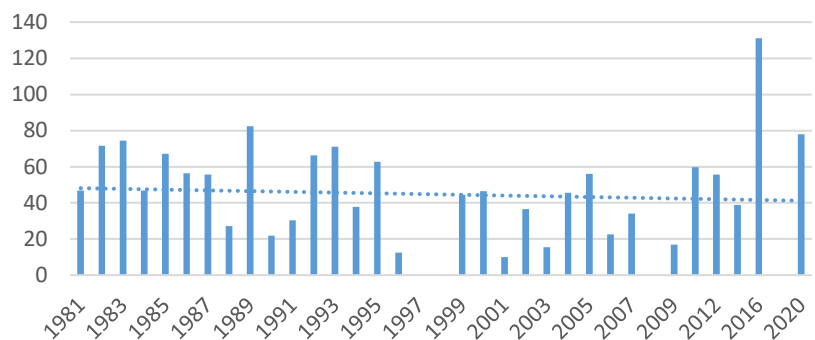
June - total (mm): Iqaluit Area (Iqaluit Airport after 2010)



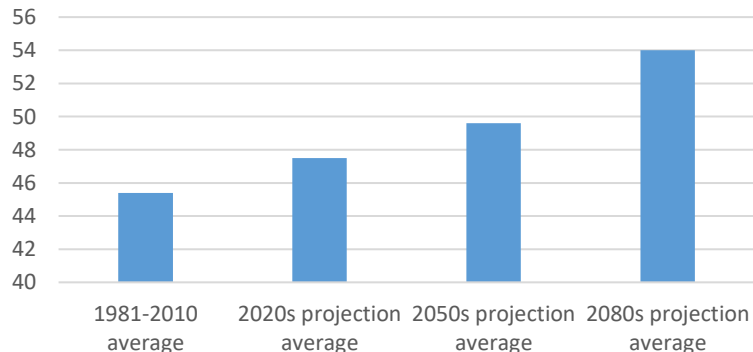
Iqaluit Area June Precipitation and Ensemble AR5 RCP8.5 Projection (mm)



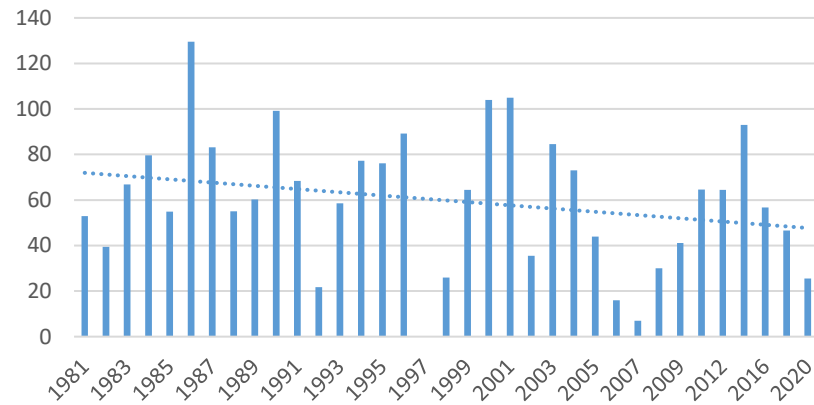
Iqaluit Airport July Precipitation Trends - 1981-2020 Monthly Totals (mm)



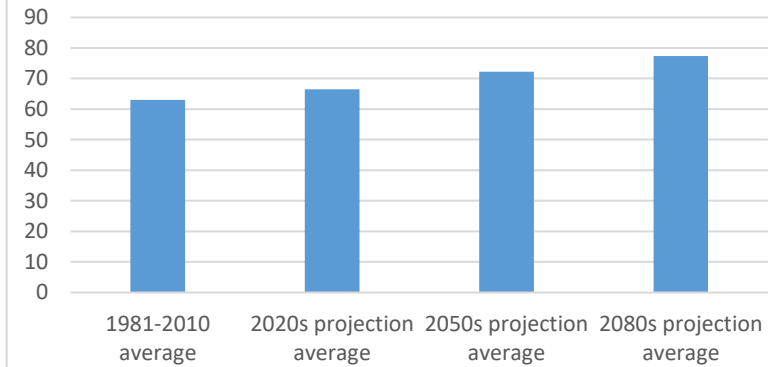
Iqaluit Airport July Precipitation and Projected Ensemble AR5 RCP8.5 Projection (mm)



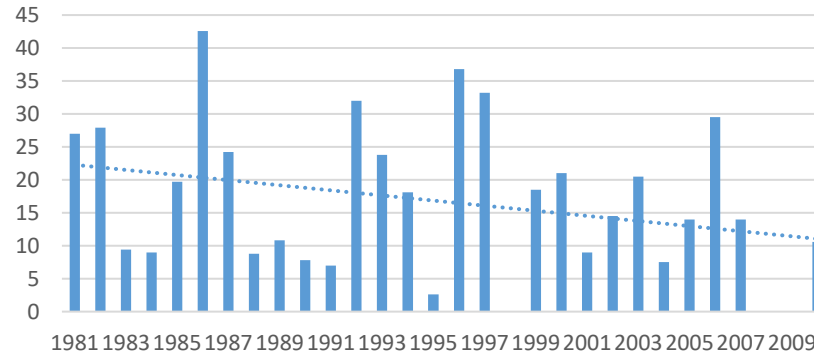
August - total (mm)



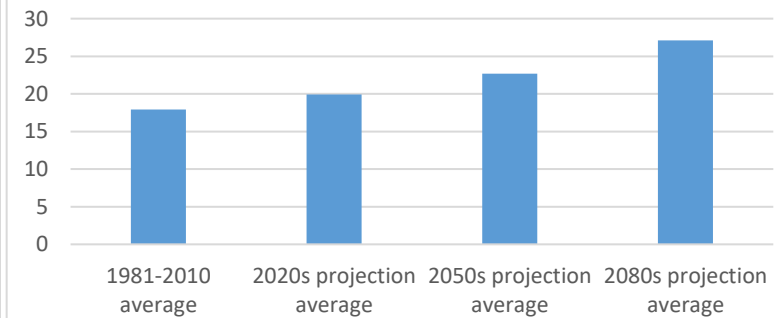
Iqaluit August Precipitation and Ensemble AR5 RCP8.5 Projection (mm)



Iqaluit Area January Precipitation (mm)



Iqaluit Area January Precipitation and Ensemble AR5 RCP8.5 Projection (mm)



Appendix D

Communications Summary Report



CITY OF IQALUIT

Apex Cemetery Remediation

Communications Summary



April 2021 - 20-3451

1.0 Introduction

Dillon Consulting Limited (Dillon) was engaged by the City of Iqaluit (the City) to develop plans to address ongoing water and drainage issues at the Apex Cemetery. As part of this work, options for the cemetery were presented to Elders and citizens for their feedback and to inform the City's decision on how to proceed. In a Cemetery Advisory Committee Meeting on February 18, 2021, the Committee presented to Council the public consultation process and the proposed improvements to the Apex Cemetery. This was approved unanimously with Motion #21-03. This report provides a summary of the feedback collected through the public consultation between February 19, 2021 and March 5, 2021. This includes distribution of an information sheet and public service announcements on the City website, Facebook and Twitter; a public radio call-in show; an in-person meeting with Elders; and correspondence to the City via email, mail, and a phone line.

2.0 Cemetery Advisory Committee Meeting

On February 18, 2021, a Cemetery Advisory Committee meeting took place where Chief Administrative Officer Amy Elgersma explained the design and remediation of the Apex Cemetery and Communications and Customer Service Manager Lisa Milosavljevic presented the public consultation process. The committee approved the public consultation process with Motion #21-03. Committee members present at the meeting were Joanasie Akumalik, Councillor, City of Iqaluit; Jodi Durdle-Awa, Director of Policy Services, Department of Family Services – via Teleconference; Ross Paterson, Manager of Infrastructure Programs, Community & Government Services – via Teleconference; and Kenny Bell, Mayor of Iqaluit, ex officio. Present from City Administration were Amy Elgersma, Chief Administrative Officer; Tammy Ernst-Doiron, City Clerk; Lisa Milosavljevic, Communications and Customer Service Manager; Jeanie Eeseemailee, Senior Interpreter/Translator; Rod Mugford, Municipal Enforcement Chief; Shane Turner, Superintendent Water/Sewer; and Ainiak Korgak, City Community Liaison.

3.0 Information Sheet

To outline proposed improvements to the Apex Cemetery, Dillon and the City developed a plain language, two-page information sheet which described both this summer's work to address the cemetery's drainage issues, and pilot program options to reduce water in the graves. The options were shown using design drawings and conceptual sketches to give readers an idea of how each option would look in practice, and a table listed the pros and cons of each option (including graphic depictions of the relative cost, and number of graves that the cemetery could hold using each option). Methods and a timeline for the public to provide their input to the City were also listed, including email and mailing addresses, a dedicated info phone line with hours to call, and a CBC Radio call-in show. The sheet was

posted on the City's website on February 19, 2021, with feedback accepted until March 5, 2021. The information sheet was also available for pick-up at City Hall for interested residents. A copy of the final version of the information sheet is appended to this report.

4.0 CBC Radio Show

On February 23, 2021, the City took part in a phone-in show on CBC Radio's Nipivut program over the noon hour to describe the proposed work at Apex Cemetery and answer questions from the public. Taking part on behalf of the City were Councillor Joanasie Akumalik, CAO Amy Elgersma and Communications Community Liaison Ainiak Korgak.

Councillor Akumalik provided a brief overview on the capital work proposed for the summer of 2021, which includes raising the height of the cemetery by half a metre with sloping down to the perimeter of the cemetery, upgrading the existing drainage system to capture water build-up so that it drains away from the cemetery, and raising the ground where the existing graves are, which will be done by hand. This overview also included a description of how future burials may be carried out, by using vaults or insulated graves.

During the call-in portion of the radio show, 7 people called in with their comments. A summary of the comments can be found below.

Comment	Response
With water from the cemetery draining into Tarr Inlet, will this affect if people can harvest clams from the clam beds at the inlet?	The City has not yet considered this, however there will be periodic testing in the future.
Good to hear that the raising of graves will be done by hand.	N/A
Who selected the current cemetery site?	The City hired consultants who made recommendation to former City engineers and then City Council made a decision. The City has different consultants to assist with this project and the City is very involved, as is the Cemetery Advisory Committee.
The current cemetery is getting full already, is the City considering another site? Family members buried in the old Iqaluit Cemetery are hard and impossible to find where they are buried. Who is responsible for finding where people are buried?	N/A
Embalming should not be done. Adding gravel will not help with the current water issues. Tarr Inlet has clams, sculpins and seaweed that people harvest.	N/A

Knows that the area where the Apex Cemetery is located is wet, as her children played there. Perhaps the old cemetery can still be used for burials, where the area is used for parking and walkways. Need benches to sit on, especially for elders.	N/A
Daughter is buried at the Apex Cemetery and appreciates that raising of existing graves will be done by hand.	N/A

Note: There was a primary public radio call-in show that took place to inform Nunavummiut about the cemetery remediation project on September 17, 2020. Cemetery Advisory Committee members City Councillor Akumalik, Martha Nowdlak (Health Systems Navigator, Nunavut Tunngavik Inc.), and City of Iqaluit's Chief Administrative Officer, Amy Elgersma, took part in a two-hour CBC radio show to hear about experiences and concerns from residents on the Apex Cemetery and explain the remediation project.

5.0 Qammaq Elders Info Session

On February 26, 2021, the City held an in-person info session with local Elders to describe the plans for improving the Apex Cemetery. In general, the comments on the proposed plans were positive and attendees were generally in favour of shallower or above-ground graves with rocks alongside. The importance of being able to locate loved ones was also raised. A summary of comments provided by the Elders on this subject is provided below.

Comments from Elders' Info Session
Can we do a test area before a large scale work is done to the site? (referring to the raising of the site/adding fill)
Graves do not have to be dug to 5 feet depth. Shallow burials work better.
We don't want to lower coffins into water.
The graves are dug too deep.
I learned from my grandmother (from Pangnirtung) to put 6 rocks on each side of the coffin to be buried, so that it doesn't sink. We did this for my daughter and my husband.
I want to be buried above ground.
When I am buried, I don't want to wash away to the sea.
We have a difficult time locating loved ones in the old cemetery. There are no markers in some cases.
We want to be able to find our loved ones in the cemetery.

6.0

Emailed Feedback

The City invited feedback from the public on the proposed improvements by email to info@iqaluit.ca between February 19th and March 5th. Two emails were received during this period, and each is summarized below.

Email #1 – Conor Goddard

The respondent had a generally negative view of the proposals for future burials, noting that he feels none of the proposed options are adequate, and he doesn't want to be buried in a "rubber maid vault." The respondent wondered if the consultants met with the Inuit community in any sort of meaningful way or hired an Elder for their perspective, and suggested that instead of the proposed options, no excavation be done and that traditional surface cairns be explored as an option. They did acknowledge that there may be litigious barriers to such a solution, but at least hoped it would be ruled out as an option before proceeding.

Email #2 – Jeremy Debicki

This respondent also had a generally negative view of the proposals, deeming both "unacceptable," but focused more on the environmental perspective of "shipping up plastic tubs or putting insulation in the ground." They stated that the land is riddled with plastic pollution and now in death we are considering adding more waste, and noted that the idea of slowly rotting in a sealed container is not appealing, and that sealing a body in plastic would prevent the natural return of the body to the land. They suggested doing more research into burials that are environmentally friendly, and wondered if the City has talked to other municipalities in Nunavut and other northern countries for advice and knowledge for dealing with burials in the tundra. The respondent also suggested that the proposed solution seems commercialized and not societal, stating they would prefer to be buried in a shroud covered by rocks placed by family members. They also suggested that if the current location is unsuitable, to consider walking with knowledge holders to find another location, but if we have to build up the graveyard with gravel, then let's build it up. Finally, they pointed out the need to create a burial ceremony that works, as running a generator and pump is undignified during a funeral service.

7.0

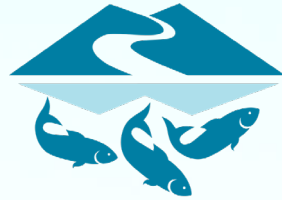
Summary

In summary, the feedback received by the City on the proposed improvements to Apex Cemetery was generally positive, aside from the two emails submitted by residents. Participants of the radio call-in show and the Elders info session seemed to be generally supportive of the City's plans, while bringing up points for consideration around the importance of being able to locate family members' graves, and impacts of water run-off into Tarr Inlet on clams and other sea life. Testing the improvements on a small area first, as mentioned in the Elders session, may also help to reinforce public opinion. While two

emails were received in opposition to the proposed approaches, the lack of other public response suggests a general acceptance of the proposed options, particularly given the considerable effort put in to communicating the proposed work to the public.

Appendix A

Information Sheet



The City of Iqaluit is looking for your input on proposed improvements to the Apex Cemetery

The Apex Cemetery location is a peaceful place for reflection overlooking Tarr Inlet, but the site has struggled with **drainage problems**.

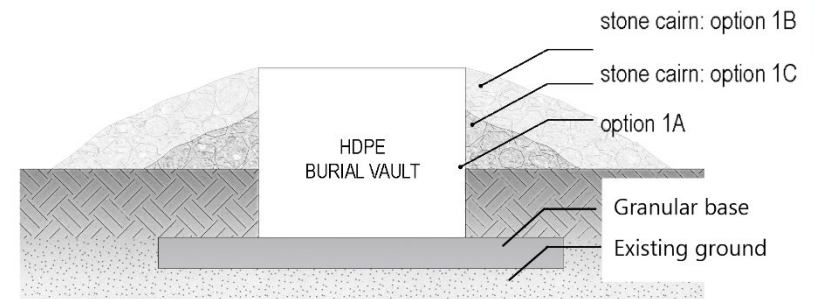
This summer, work will take place to raise the ground at the cemetery by adding granular material and by improving ditching to help with drainage conditions. Improvements to the cemetery's parking lot and pathways will also be made.

To reduce the amount of water accumulating in graves, the City is also considering options for future burial design. These options would be **unique to Iqaluit** and are examples of adapting to **site conditions** and a **changing climate**.

Each option differs in cost and design of the site. The City's cemetery operation and maintenance procedures will be updated to reflect the chosen design. These designs would be reflected in future burials only.

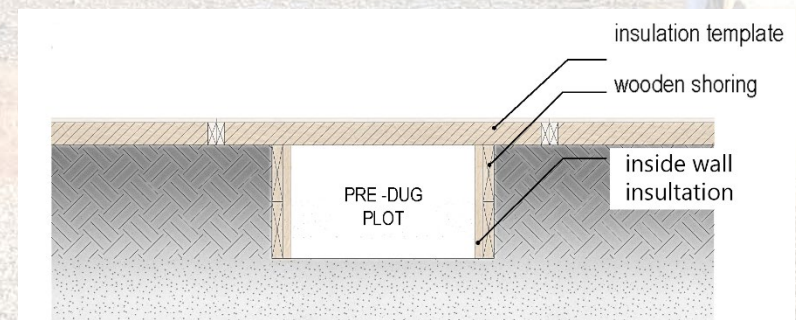
Option 1: Burial Vaults

This option would use above-ground burial vaults made of an industrial plastic called High-Density Polyethylene (HDPE) that are partially inset into the ground. The intent of the above-ground burial vaults is to avoid disturbing the active layer above the permafrost. There are three designs to choose from, with the main difference being the height of the stone cairn alongside the graves.

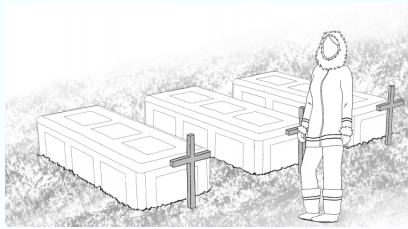
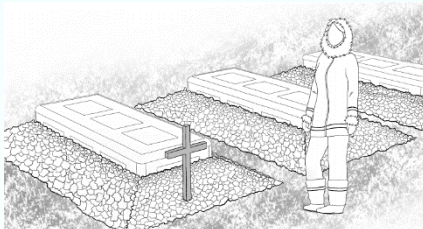
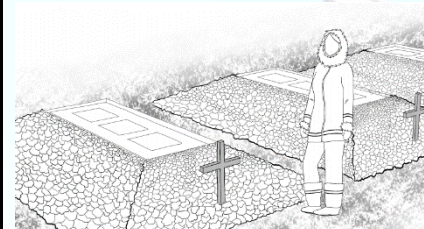
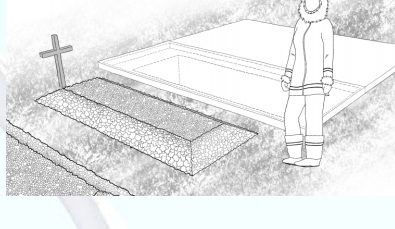


Option 2: Insulated Graves

This option would continue to use the current in-ground wooden burial boxes but with additional insulation. This insulation material would line the top and sides of a pre-dug grave. After a funeral, the surface of a grave would look very similar to existing graves.



Option:

	1-A: Burial Vault with no Stones alongside	1-B: Stones alongside part of the Burial Vault	1-C: Stones alongside to the full height of Burial Vault	2: Insulated Graves
				
ADVANTAGES	<ul style="list-style-type: none"> Eliminates water in graves during funerals Low maintenance requirements 	<ul style="list-style-type: none"> Eliminates water in graves during funerals Low maintenance requirements 	<ul style="list-style-type: none"> Eliminates water in graves during funerals Low maintenance requirements Lowest cost option 	<ul style="list-style-type: none"> Reduces water in graves during funerals No reduction in the amount of graves the cemetery will be able to hold Visually similar to current cemetery
DIS-ADVANTAGES	<ul style="list-style-type: none"> Burial vault more exposed to the elements 	<ul style="list-style-type: none"> Fewer graves can be accommodated at the site due to the space taken up by stones alongside burial vaults 	<ul style="list-style-type: none"> Lowest amount of future graves at the site due to stones alongside burial vaults 	<ul style="list-style-type: none"> Most expensive option Requires most site maintenance May not fully eliminate water in graves
COST	\$	\$\$	\$\$\$	\$\$\$\$
NUMBER OF GRAVES	□ □ □ □ □	□ □ □ □	□ □ □	□ □ □ □ □ □ □

Give Us Your Thoughts:

- Send an Email: info@iqaluit.ca
- Write a Letter:
City of Iqaluit, PO Box 460
Iqaluit, NU, X0A 0H0

- Call our info line:
867-979-5603
9 – 11:30 a.m.
Monday - Friday

- Radio call-in show:
February 23rd, 12 – 1 p.m.
Nipivut CBC Radio 91.1 FM
867-979-6100

The City of Iqaluit will accept feedback until
March 5th at 4:30 p.m.



CITY OF IQALUIT
APEX CEMETERY REMEDIATION
ISSUED FOR TENDER



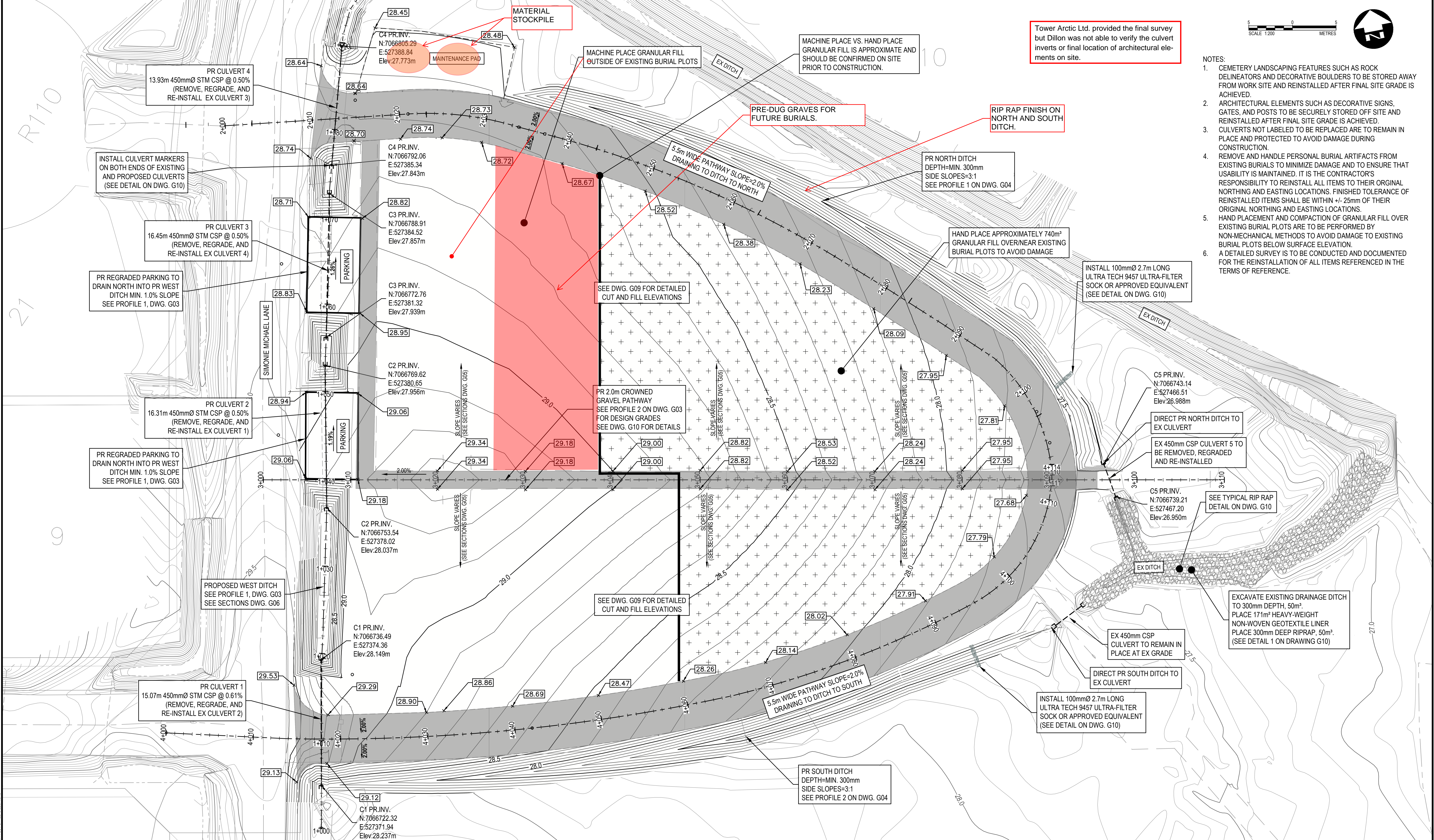
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DRAWING	DESCRIPTION
GRADING DESIGN	
E01	EXISTING SITE CONDITIONS
E02	EXISTING SITE PROFILES
G01	PROPOSED SITE PLAN
G02	PROFILES AND SECTIONS INDEX PLAN
G03	SITE DESIGN PROFILES
G04	PERIMETER PATH AND DITCH PROFILES
G05	MAIN SITE GRADING DESIGN - SECTIONS
G06	WEST DITCH AND PARKING PAD - SECTIONS
G07	NORTH PERIMETER PATH AND DITCH SECTIONS
G08	SOUTH PERIMETER PATH AND DITCH SECTIONS
G09	GRADING DESIGN - CUT FILL ANALYSIS
G10	TYPICAL DETAILS

Project As-Built Dwgs.
Nov 2021

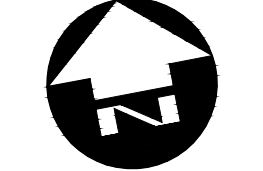
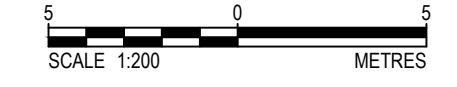
ISSUED FOR TENDER

DILLON PROJECT: 203451
DATE: MAY 2021





- NOTES:
- CEMETERY LANDSCAPING FEATURES SUCH AS ROCK DELINEATORS AND DECORATIVE BOULDERS TO BE STORED AWAY FROM WORK SITE AND REINSTALLED AFTER FINAL SITE GRADE IS ACHIEVED.
 - ARCHITECTURAL ELEMENTS SUCH AS DECORATIVE SIGNS, GATES, AND POSTS TO BE SECURELY STORED OFF SITE AND REINSTALLED AFTER FINAL SITE GRADE IS ACHIEVED.
 - CULVERTS NOT LABELED TO BE REPLACED ARE TO REMAIN IN PLACE AND PROTECTED TO AVOID DAMAGE DURING CONSTRUCTION.
 - REMOVE AND HANDLE PERSONAL BURIAL ARTIFACTS FROM EXISTING BURIALS TO MINIMIZE DAMAGE AND TO ENSURE THAT USABILITY IS MAINTAINED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REINSTALL ALL ITEMS TO THEIR ORIGINAL NORTHING AND EASTING LOCATIONS. FINISHED TOLERANCE OF REINSTALLED ITEMS SHALL BE WITHIN +/- 25mm OF THEIR ORIGINAL NORTHING AND EASTING LOCATIONS.
 - HAND PLACEMENT AND COMPACTION OF GRANULAR FILL OVER EXISTING BURIAL PLOTS ARE TO BE PERFORMED BY NON-MECHANICAL METHODS TO AVOID DAMAGE TO EXISTING BURIAL PLOTS BELOW SURFACE ELEVATION.
 - A DETAILED SURVEY IS TO BE CONDUCTED AND DOCUMENTED FOR THE REINSTALLATION OF ALL ITEMS REFERENCED IN THE TERMS OF REFERENCE.



Tower Arctic Ltd. provided the final survey but Dillon was not able to verify the culvert inverts or final location of architectural elements on site.

FILENAME: C:\WORKING\PROJECTS\2021\TOWER ARCTIC LTD\2021\AS BUILT SITE PLAN.DWG PLOTTED BY: THERIAULT/NOTES:SP00N
PLOT DATE: 2021.05.28 @ 1:25 PM PLOT SCALE: 1:25 PLOT STYLE: DILLON.CTB

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Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

ISSUED FOR TENDER



No.	ISSUED FOR	DATE	BY
6	ISSUED FOR TENDER	2021.05.28	PL
5	100% DESIGN ISSUED FOR FINAL REVIEW	2021.04.26	PL
4	RE-ISSUED FOR 100% CLIENT REVIEW	2021.03.22	PL
3	ISSUED FOR 100% CLIENT REVIEW	2021.01.18	PL
2	ISSUED FOR 99% CLIENT REVIEW	2020.12.21	PL
1	ISSUED FOR 66% CLIENT REVIEW	2020.11.27	PL

DESIGN	JH	REVIEWED BY	PL
DRAWN	TP/WBS	CHECKED BY	JH
DATE	MAY 2021		
SCALE	1:200		

CITY OF IQALUIT
IQALUIT APEX CEMETERY REMEDIATION

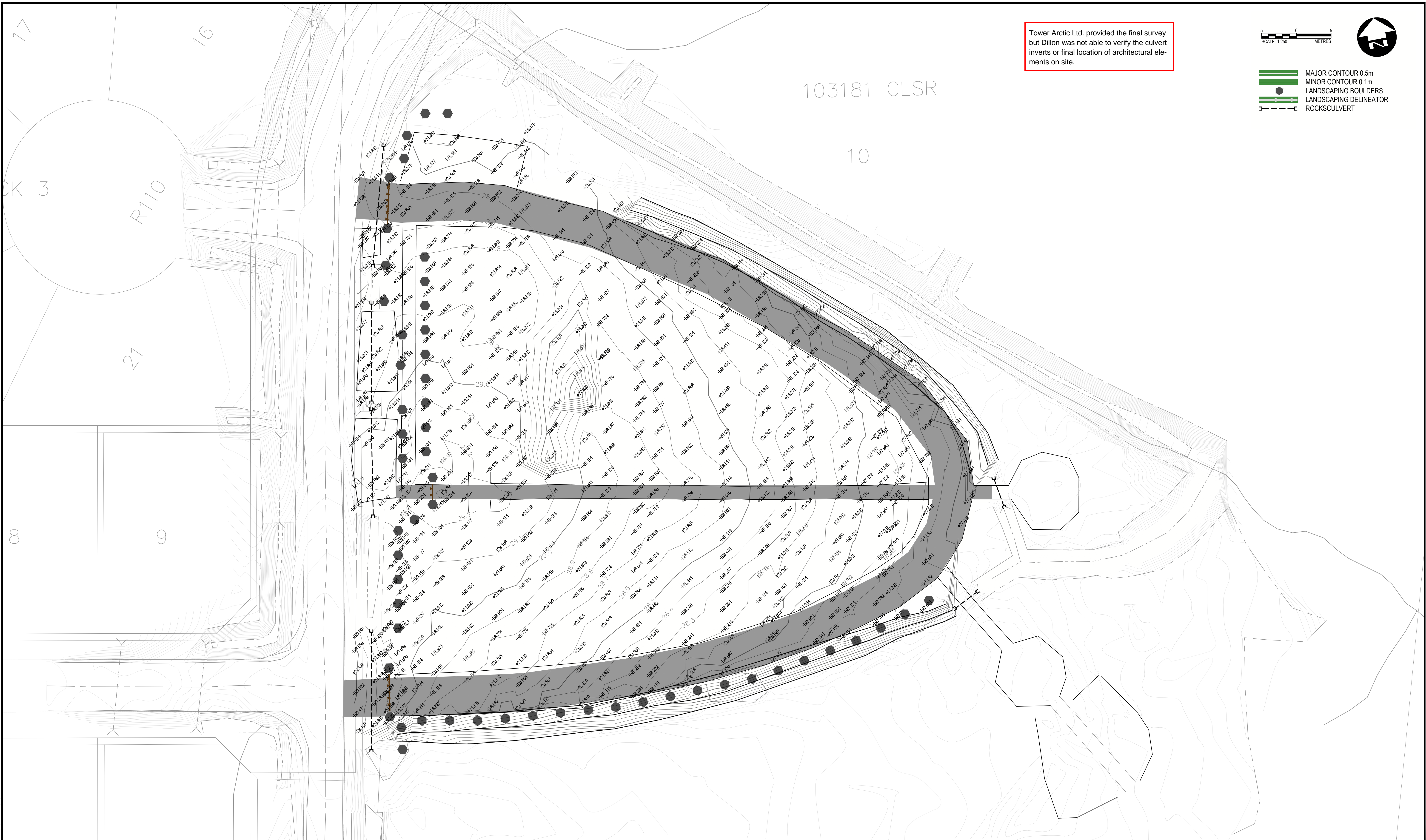
AS BUILT SITE PLAN

PROJECT NO.
20-3451

SHEET NO.
G01

103181 CLSR

10



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			DESIGN		REVIEWED BY		CITY OF IQUALUIT IQUALUIT APEX CEMETERY REMEDIATION				PROJECT NO. 20-3451	
			DRAWN TPW		CHECKED BY		AS BUILT SURVEY ELEVATIONS				SHEET NO. H01	
			DATE NOVEMBER 2021									
			SCALE 1:200									
1 ISSUED FOR INTERNAL REVIEW			11/03/21		JH							
No. ISSUED FOR			DATE		BY							

