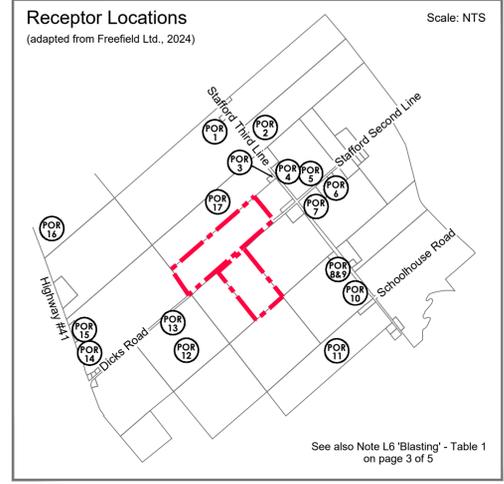
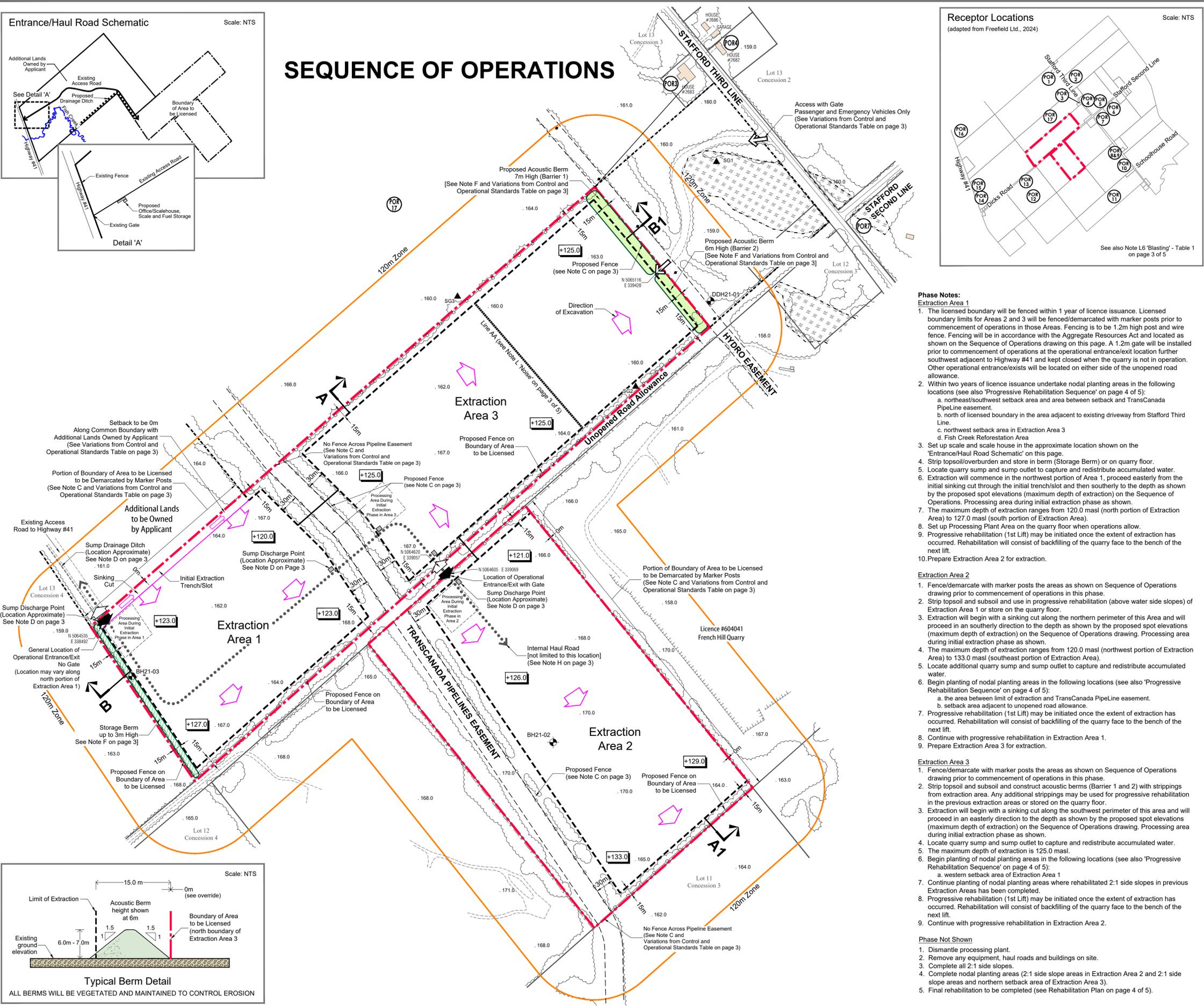


SEQUENCE OF OPERATIONS



- Phase Notes:**
- Extraction Area 1**
- The licensed boundary will be fenced within 1 year of licence issuance. Licensed boundary limits for Areas 2 and 3 will be fenced/demarcated with marker posts prior to commencement of operations in those Areas. Fencing is to be 1.2m high post and wire fence. Fencing will be in accordance with the Aggregate Resources Act and located as shown on the Sequence of Operations drawing on this page. A 1.2m gate will be installed prior to commencement of operations at the operational entrance/exit location further southwest adjacent to Highway #41 and kept closed when the quarry is not in operation. Other operational entrance/exits will be located on either side of the unopened road allowance.
 - Within two years of licence issuance undertake nodal planting areas in the following locations (see also 'Progressive Rehabilitation Sequence' on page 4 of 5):
 - northeast/southwest setback area and area between setback and TransCanada Pipeline easement.
 - north of licensed boundary in the area adjacent to existing driveway from Stafford Third Line.
 - northwest setback area in Extraction Area 3
 - Fish Creek Reforestation Area
 - Set up scale and scale house in the approximate location shown on the 'Entrance/Haul Road Schematic' on this page.
 - Strip topsoil/overburden and store in berm ('Storage Berm') or on quarry floor.
 - Locate quarry sump and sump outlet to capture and redistribute accumulated water.
 - Extraction will commence in the northwest portion of Area 1, proceed easterly from the initial sinking cut through the initial trench/slot and then southerly to the depth as shown by the proposed spot elevations (maximum depth of extraction) on the Sequence of Operations. Processing area during initial extraction phase as shown.
 - The maximum depth of extraction ranges from 120.0 masl (north portion of Extraction Area) to 127.0 masl (south portion of Extraction Area).
 - Set up Processing Plant Area on the quarry floor when operations allow.
 - Progressive rehabilitation (1st Lift) may be initiated once the extent of extraction has occurred. Rehabilitation will consist of backfilling of the quarry face to the bench of the next lift.
 - Prepare Extraction Area 2 for extraction.
- Extraction Area 2**
- Fence/demarcate with marker posts the areas as shown on Sequence of Operations drawing prior to commencement of operations in this phase.
 - Strip topsoil and subsoil and use in progressive rehabilitation (above water side slopes) of Extraction Area 1 or store on the quarry floor.
 - Extraction will begin with a sinking cut along the northern perimeter of this Area and will proceed in a southerly direction to the depth as shown by the proposed spot elevations (maximum depth of extraction) on the Sequence of Operations drawing. Processing area during initial extraction phase as shown.
 - The maximum depth of extraction ranges from 120.0 masl (northwest portion of Extraction Area) to 133.0 masl (southeast portion of Extraction Area).
 - Locate additional quarry sump and sump outlet to capture and redistribute accumulated water.
 - Begin planting of nodal planting areas in the following locations (see also 'Progressive Rehabilitation Sequence' on page 4 of 5):
 - the area between limit of extraction and TransCanada Pipeline easement.
 - setback area adjacent to unopened road allowance.
 - Progressive rehabilitation (1st Lift) may be initiated once the extent of extraction has occurred. Rehabilitation will consist of backfilling of the quarry face to the bench of the next lift.
 - Continue with progressive rehabilitation in Extraction Area 1.
 - Prepare Extraction Area 3 for extraction.
- Extraction Area 3**
- Fence/demarcate with marker posts the areas as shown on Sequence of Operations drawing prior to commencement of operations in this phase.
 - Strip topsoil and subsoil and construct acoustic berms (Barrier 1 and 2) with stripings from extraction area. Any additional stripings may be used for progressive rehabilitation in the previous extraction areas or stored on the quarry floor.
 - Extraction will begin with a sinking cut along the southwest perimeter of this area and will proceed in an easterly direction to the depth as shown by the proposed spot elevations (maximum depth of extraction) on the Sequence of Operations drawing. Processing area during initial extraction phase as shown.
 - Locate quarry sump and sump outlet to capture and redistribute accumulated water.
 - The maximum depth of extraction is 125.0 masl.
 - Begin planting of nodal planting areas in the following locations (see also 'Progressive Rehabilitation Sequence' on page 4 of 5):
 - western setback area of Extraction Area 1
 - Continue planting of nodal planting areas where rehabilitated 2:1 side slopes in previous Extraction Areas has been completed.
 - Progressive rehabilitation (1st Lift) may be initiated once the extent of extraction has occurred. Rehabilitation will consist of backfilling of the quarry face to the bench of the next lift.
 - Continue with progressive rehabilitation in Extraction Area 2.

Legal Description
PART LOTS 12 & 13
CONCESSION 3
(former Geographic Township of Stafford)
TOWNSHIP OF LAURENTIAN VALLEY
RENFREW COUNTY

Legend

- Boundary of Area to be Licensed
- Additional Lands to be Owned by Applicant
- Existing Spot Height Elevations
- Building/Structure
- Existing Vegetation
- Excavation Face
- Existing Fence
- Existing Field Access
- Groundwater Monitor
- Field Verified Wetland
- Cross Sections
- Limit of Extraction
- Operational Entrance/Exit
- Direction of Excavation
- Proposed Spot Elevation
- Internal Haul Road
- Acoustic Berm
- Storage Berm
- Proposed Fence
- Receptor Locations

Site Plan Amendments

No.	Date	Description	By

MNR Approval Stamp

Stamp

PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
MHBC
200-540 BRIDGEWAY CENTRE DR, KITCHENER, ON, N2B 3S9 | P: 519-576-3550 | WWW.MHBCPLAN.COM

Applicant's Signature
Phil White
Quality Control Manager
Aggregates & Asphalt

THOMAS CAVANAGH CONSTRUCTION LIMITED
9094 Cavanagh Road, Ashton Ontario, K0A 1B0
Tel: (613) 227-1448

Applicant's Signature
Phil White
Quality Control Manager
Aggregates & Asphalt

Project: Pembroke Quarry

ARA Licence Reference No. _____ Pre-approval review: _____

For Submission to MNR - November 2024

Plot Scale 1:3.0 [1mm = 3.0 units] Model

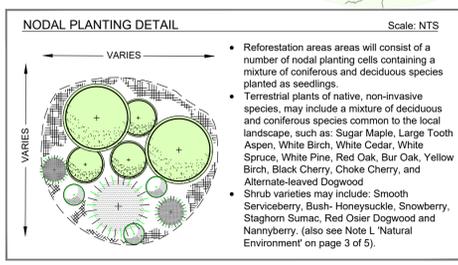
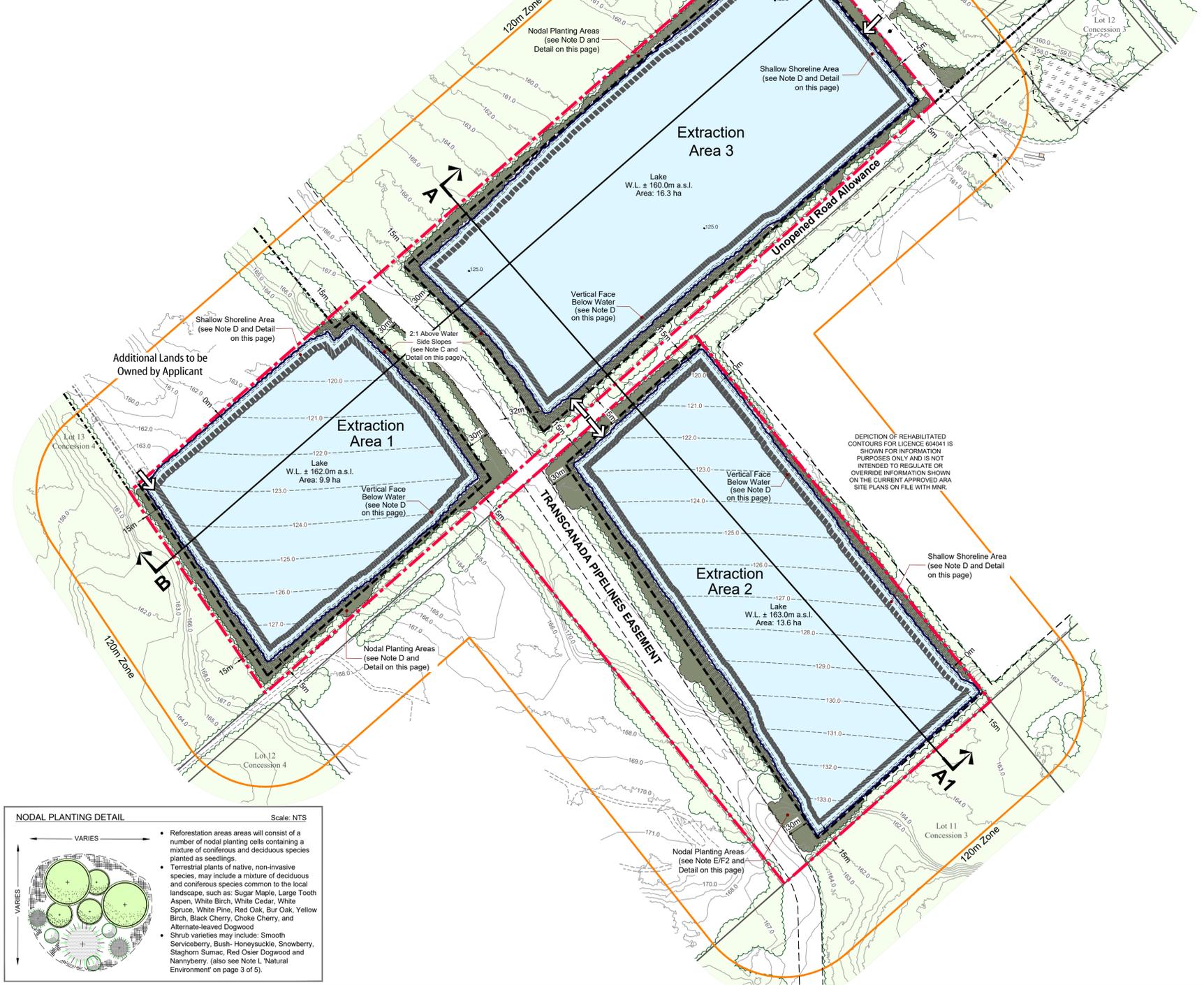
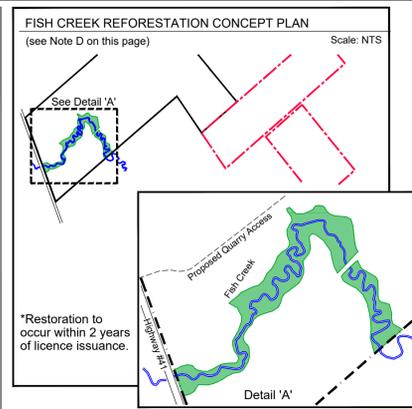
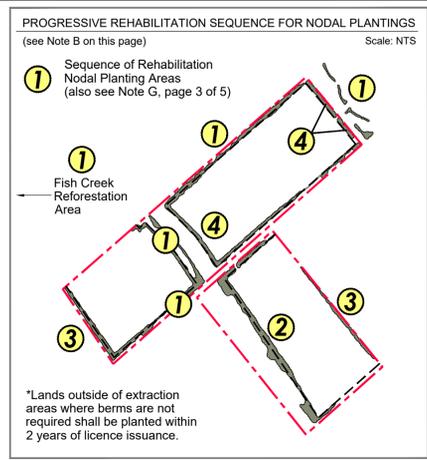
Plan Scale: 1:3,000

SCALE
0 25 50 75 100 150 METRES

Drawn By: D.G.S. File No. 0851J
Checked By: N.D.

OPERATIONAL PLAN
2 OF 5

File Name: _____
Drawing No. _____



Notes:

A. General

- Area Calculations: Licence Area: 55.9 hectares (138.1 acres)
Limit of Excavation: 43.3 hectares (107 acres)
- The rehabilitated landform of this site will include: nodal planting areas (reforestation), 2.1 above water/below water side slopes, shallow shoreline areas and vertical faces below water. Reforestation will also occur to Fish Creek in the Additional Lands Owned by Applicant.

B. Phasing

- The proposed quarry will be rehabilitated on a progressive basis, corresponding to the operational progression of the quarry excavation, to form landforms shown as final rehabilitation.
- Progressive and final rehabilitation will be completed in direct correlation to the development of the quarry as the extraction limits are reached and enough area is available to ensure that rehabilitation activities will not interfere with the production, stockpiling and processing of aggregate materials. Progressive rehabilitation will consist of the backfilling of side slopes after extraction of first lift and the planting of nodal planting areas within two years of licence issuance or as extraction progresses. Progressive rehabilitation will commence along the west and east limits of Extraction Area 1 as extraction progresses southerly. Interim perimeter slopes will be established following the completion of extraction of the first lift in each Extraction Area. The perimeter slope will be established 'on-grade' (floor of the first lift) before the following lift reaches the limit of extraction. Therefore, the minimum rehabilitation treatments for the perimeter of the quarry will be completed prior to the completion of the final (bottom) lift. The sequence is further described in Note G on page 3 of 5 and as shown on the 'Progressive Rehabilitation Sequence' on this page.
- Setback and above water side slope areas will be vegetated and will include nodal tree and shrub plantings in suitable locations to introduce a diversity of native vegetation types and species that are anticipated to spread around the rehabilitated side slopes (see Note C and 'Nodal Planting Detail').

C. Slopes and Grading

- As extraction of the first lift is completed, backfill material, including overburden and excess soils will be placed along the perimeter of the limit of extraction to create a 2:1 side slope. This will be completed as extraction proceeds across the site and prior to extraction of the bottom lift. Final quarry landform will be in accordance with the drawing as shown on this page.
- Topsoil and overburden will be used in the progressive rehabilitation of the side slope areas. Overburden and/or imported material will be used to backfill quarry faces to create the topography of the side slopes (i.e. 2:1 slope). Above water side slope areas that will be vegetated will be covered with a minimum 15 cm of topsoil/organic matter prior to planting.
- Importation of excess soil:
 - Excess soil, as defined in Ontario Regulation 244/97 may be imported to this site to facilitate the following rehabilitation:
 - Establish final grades
 - Top dressing to establish vegetation
 - Liquid soil, as defined in Ontario Regulation 406/19 under the Environmental Protection Act, is not authorized for importation to the site.
 - The quality of excess soil imported to the site for final placement must be equivalent to or more stringent than the applicable excess soil quality standards as determined in accordance with Ontario Regulation 244/97 as amended from time to time and must be consistent with the site conditions and the end use identified in the approved rehabilitation plan.
 - Where a qualified person is retained or required to be retained in accordance with Ontario Regulation 244/97, the quality, storage, and final placement of excess soils shall be done according to the advice of the qualified person.
 - Excess soil imported to facilitate rehabilitation as described on this site plan shall be undertaken in accordance with Ontario Regulation 244/97 under the Aggregate Resources Act, as amended from time to time.
 - The cumulative total amount of excess soil that may be imported to this site for rehabilitation purposes is 200,000 m³.

D. Proposed Vegetation and Rehabilitated Features

- Rehabilitation of this site includes:
 - Fish Creek reforestation - 2.1 ha
 - Reforested areas on the Site - 6.1 ha
 - Above water side slopes (meadow) - 3.5 ha
 - Shallow shoreline area/below water table side slopes which extends from the water edge to up to a depth of 2m below water (wetland) - 4.1 ha
- All planting and seeding will consist of native species. All ground covers on side slopes will be established as part of the phased stripping operations that proceed extraction and will be maintained and replaced as soon as possible if the vegetative cover fails to establish itself to control erosion.
- Side Slope and Setback Areas**
Side slopes will be covered with a minimum 15 cm of topsoil/organic matter and planted/seeded. Any undisturbed setback areas not subject to reforestation will also be seeded with Ontario Native Grassland Seed Mix.
- Nodal Plantings**
 - Terrestrial nodal plantings in the reforestation areas shall include a mixture of coniferous and deciduous tree and shrub species to promote species diversity and provide a variety of species to compensate for any substrate deficiencies (see 'Nodal Planting Detail' on this page). Recommended species are outlined in the species planting list. The establishment of nodal planting areas will occur progressively and follow the rehabilitation sequence and side slope/setback grading and seeding. Lands outside of the extraction areas where berms are not required shall be planted within two years of licence issuance. Nodal planting areas are conceptually shown on the drawing.
 - Soil movement and duration of storage should be kept to a minimum to maintain viability of the soils to be used for reforestation;
 - Fish Creek Reforestation Area:**
 - Top of Slope (and onto a portion of the tablelands in the agricultural fields, if opportunities exist):
 - White pine (*Pinus strobus*)
 - Black cherry (*Prunus serotina*)
 - Trembling aspen (*Populus tremuloides*)
 - Largetooth aspen (*Populus grandidentata*)
 - Red oak (*Quercus rubra*)
 - Shrubs (similar species as reforestation areas)
 - Mid-slope (above the lower/toe of slope as the area floods)
 - Red maple (*Acer rubrum*)
 - Bur oak (*Quercus macrocarpa*)
 - Black willow (*Salix nigra*)
 - Balsam poplar (*Populus balsamifera*)
 - White cedar (*Thuja occidentalis*)
 - Shrubs (similar species as reforestation areas)

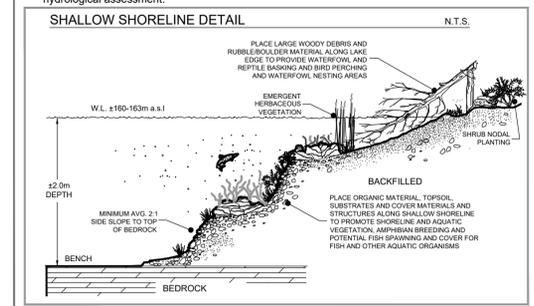
The proposed rehabilitation includes an opportunity to enhance the biological diversity of the local landscape by providing features that will attract migratory waterfowl and terrestrial and aquatic habitat features that will be of value to locally resident and migratory wildlife, including: three lakes with an area of 39.8 ha, 11.7 ha terrestrial landform (comprised of reforested areas, above water table side slopes, as well as setback areas outside of TransCanada PipeLine right-of-way and 2.1 ha of reforestation area around Fish Creek). The final landform will be in accordance with the drawing as shown on this page.

E. Drainage

- Final surface drainage will follow the rehabilitated contours as shown and be directed towards the post-extraction lake areas.

F. Final Rehabilitation

- No buildings or structures will remain on site.
- No haul roads will remain on site. Accesses into the site area as shown on the Rehabilitation Plan.
- The post-extraction ground water table, is as shown on pages 1, 4 and 5 of 5 as per hydrogeological/hydrological assessment.



Legal Description
PART LOTS 12 & 13
CONCESSION 3
(former Geographic Township of Stafford)
TOWNSHIP OF LAURENTIAN VALLEY
RENFREW COUNTY

Legend

- Boundary of Area to be Licensed
- Additional Lands to be Owned by Applicant
- Existing Fence POST & WIRE FENCE UNLESS OTHERWISE NOTED
- Contour with Elevation METRES ABOVE SEA LEVEL
- Building/Structure LOCATION AND USE FOR BUILDINGS ON-SITE AND WITHIN 120m ARE SHOWN
- Existing Field Access
- Existing Vegetation
- Field Verified Wetland CAMBIUM INC.
- Cross Sections SEE PAGE 5 OF 5 FOR EXISTING AND REHABILITATED CROSS SECTIONS
- Limit of Excavation ALL SETBACKS ARE DRAWN TO SCALE AND SHOW LABELED DISTANCES
- Proposed Contour METRES ABOVE SEA LEVEL
- Proposed Elevation REHABILITATED ELEVATION
- Post Extraction Lake
- Nodal Planting Areas LOCATION APPROXIMATE

Site Plan Amendments

No.	Date	Description	By

MNR Approval Stamp

Stamp

Applicant's Signature

THOMAS CAVANAGH CONSTRUCTION LIMITED
9094 Cavanagh Road, Ashton Ontario, K0A 1B0
Tel: (613) 227-1448

Project
Pembroke Quarry

ARA Licence Reference No. _____ Pre-approval review: _____

For Submission to MNR - November 2024

Plot Scale 1:3.0 [1mm = 3.0 units] Model

Plan Scale: 1:3,000

SCALE
0 25 50 75 100 150 METRES

Drawn By: D.G.S. File No.: 0851J
Checked By: N.D.

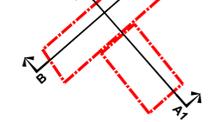
File Name: **REHABILITATION PLAN**
Drawing No.: **4 OF 5**

K:\0851J-Thomas Cavanagh Construction-Pembroke\A\Cavanagh Pembroke Quarry Rehaplan 4of5 November2024.dwg

Legal Description
 PART LOTS 12 & 13
 CONCESSION 3
 (former Geographic Township of Stafford)
 TOWNSHIP OF LAURENTIAN VALLEY
 RENFREW COUNTY

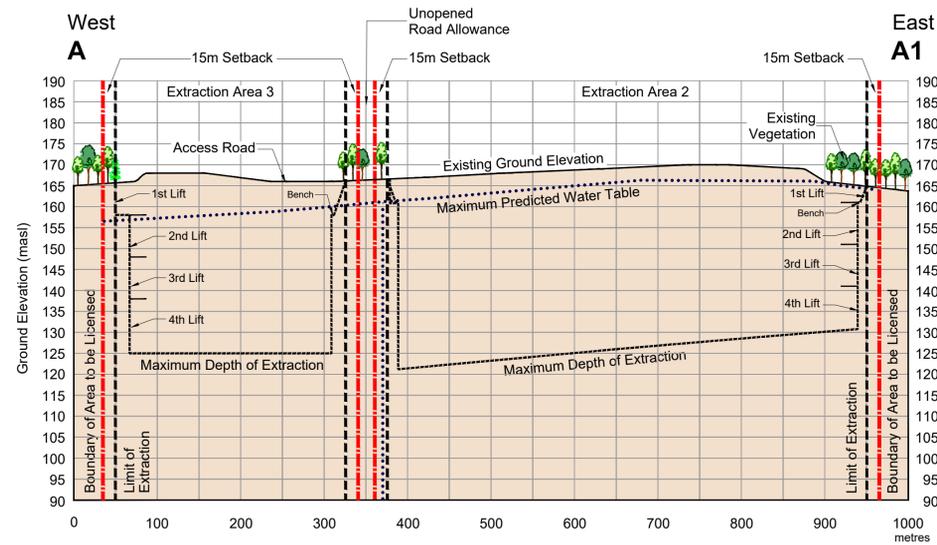
Legend

- Boundary of Area to be Licensed
- Limit of Extraction
- Vegetation/Trees EXISTING AND/OR PROPOSED AS INDICATED ON CROSS SECTIONS
- Maximum Predicted Water Table (SEE NOTE D1 ON PAGE 1 OF 5 AND NOTE L2 ON PAGE 3 OF 5)
- Maximum Depth of Extraction

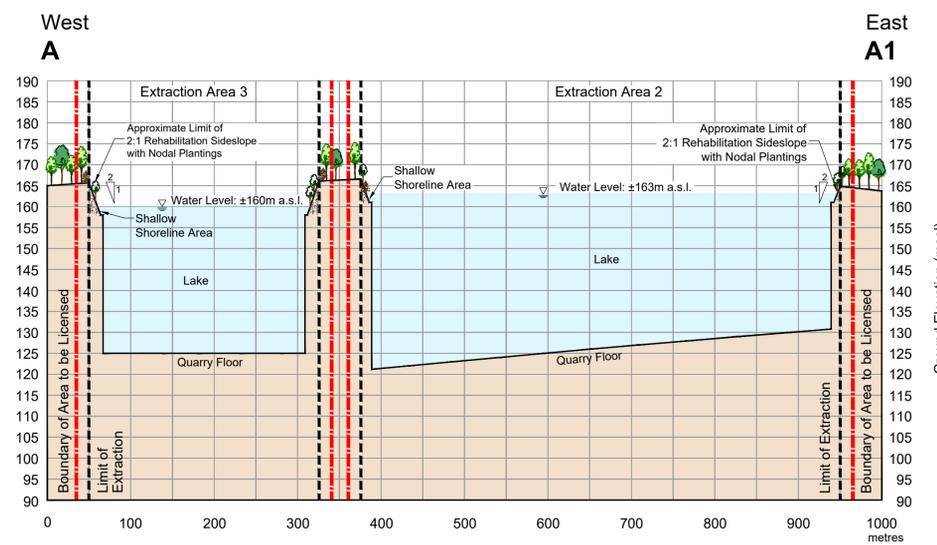


Cross Sections
 SEE PAGES 1, 2 & 4 OF 5 FOR PLAN VIEW LOCATION OF CROSS SECTIONS

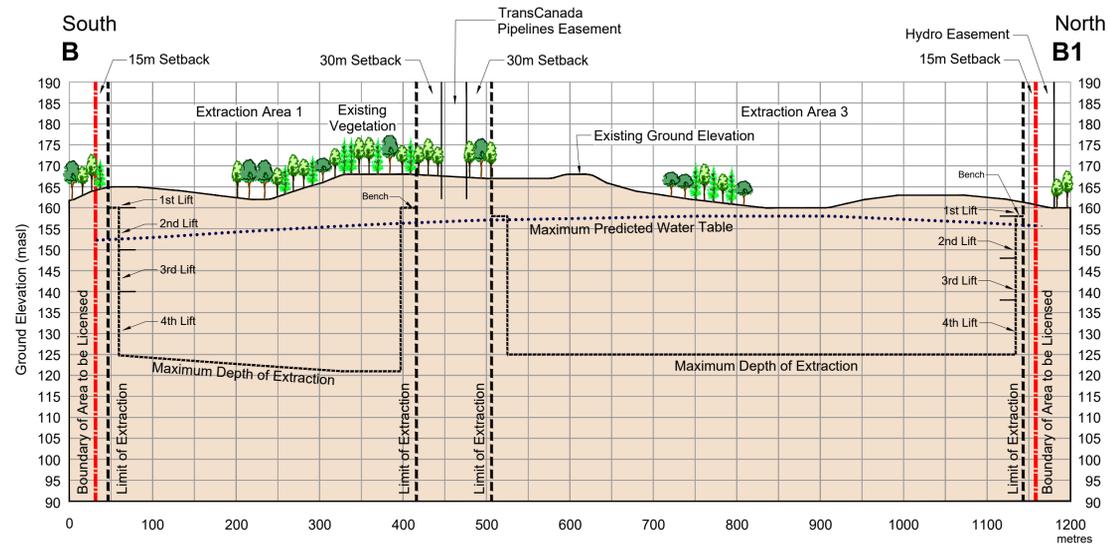
Section A-A1 Existing Conditions



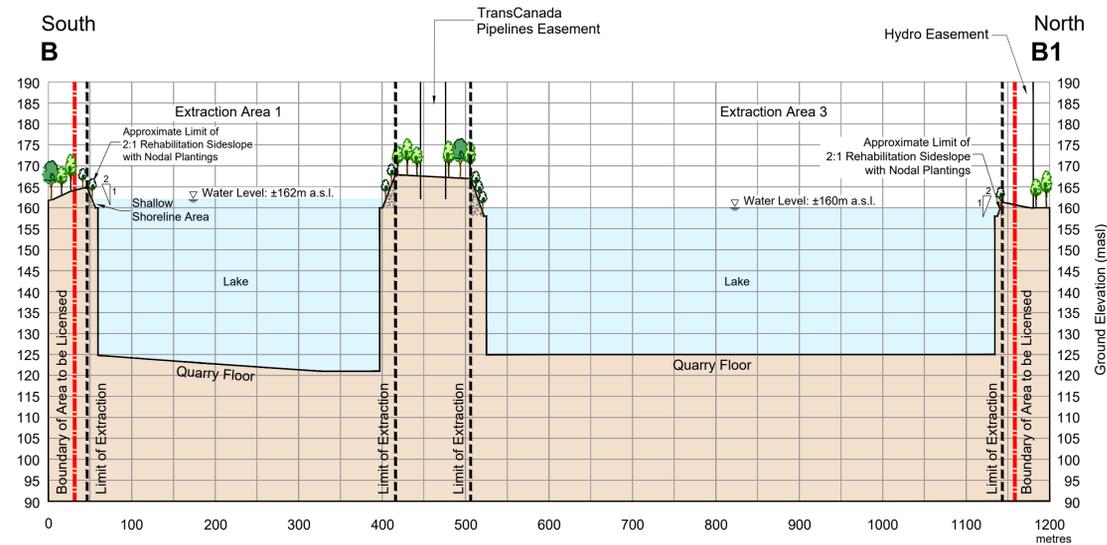
Section A-A1 Rehabilitated Conditions



Section B-B1 Existing Conditions



Section B-B1 Rehabilitated Conditions



For all Cross Sections
 Horizontal Scale - 1:4,000
 Vertical Scale - 5x Exaggeration

Site Plan Amendments

No.	Date	Description	By

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
 200-540 BINGEMANS CENTRE DR. KITCHENER, ON, N2B 3X9 | P: 519.576.3650 | WWW.MHBCPLAN.COM

MNR Approval Stamp Stamp

THOMAS CAVANAGH CONSTRUCTION LIMITED
 9094 Cavanagh Road, Ashton Ontario, K0A 1B0
 Tel: (613) 227-1448

Applicant's Signature

 Phil White
 Quality Control Manager
 Aggregates & Asphalt

Project: Pembroke Quarry

ARA Licence Reference No. _____ Pre-approval review: _____

For Submission to MNR - November 2024

Plan Scale: 1:4,000 (Horizontal) / 5x Exaggeration (Vertical) Plot Scale: 1:4.0 [1mm = 4.0 units] Model

HORIZONTAL SCALE
 0 25 50 100 200 METRES

Drawn By: D.G.S. File No. 0851J
 Checked By: N.D.

CROSS SECTION PLAN
5 OF 5