



# C.C. Tatham & Associates Ltd.

## Consulting Engineers

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August 28, 2018

via email: [sam@greenwoodconst.ca](mailto:sam@greenwoodconst.ca)  
CCTA File 114239

### Sam Greenwood

Greenwood Aggregates  
205467 County Road 109  
Amaranth, ON L9W 0V1

Re: Violet Hill Gravel Pit, Town of Mono  
Burnside Review Comments of February 9, 2018

Dear Sam:

We have received the peer review comments provided by RJ Burnside in their letter of February 9, 2018 and offer further commentary below as required. For ease of reference, the Burnside comments are attached.

### **MMA Letter**

We concur that a condition of approval should address the road improvements on Highway 89. We recommend that the condition indicate that the proponent enter into a road improvement agreement with MTO; the agreement in turn would detail the specifics.

### **Existing Traffic Volumes**

Existing traffic volumes on 3<sup>rd</sup> Line East were estimated at 8 vehicles per hour (as noted in the figures previously provided in Appendix A). For the assessment of the intersection of 3<sup>rd</sup> Line East with Highway 89, a minimum volume of 5 vehicles per movement was assumed for those movements between 3<sup>rd</sup> Line East and Highway 89, which translates to 20 vehicles per hour. This ensures a more conservative approach. Regardless, as noted, the operations are not problematic.

### **Highway 89 & 3<sup>rd</sup> Line East Intersection**

We acknowledge that 3<sup>rd</sup> Line East is under the jurisdiction of the Town and improvements to it will be done to the satisfaction of the Town. Likewise, improvements to Highway 89 will be done to the satisfaction of MTO, who have jurisdiction.

### **3<sup>rd</sup> Line East**

We recommend that a condition of approval indicate that the proponent enter into a haul route agreement with the Town. This agreement would then detail the specifics as to the road improvements, the need for approved engineering drawings, geotechnical investigations, responsibility for cost including peer reviews, and securities, etc. This approach is not uncommon.

With respect to local deliveries, it is acknowledged that these would be subject to load restrictions on the area roads. Other restrictions could be considered as appropriate. Again, it is not uncommon to define a haul route but recognize that local deliveries may utilize a different road system (no different to what might be expected if the material were coming from another source).

### **Pit Driveway & Queueing**

Additional details pertaining to the driveway are included in the *Third Line Entrance Drainage Review* letter prepared by C.C. Tatham, dated April 20, 2018. A copy is attached.

### **30 Sideroad**

As previously noted, the access is to be located in excess of 170 metres west of the 'S' curve. As the horizontal geometry is the limiting factor in establishing the sight distance to the east, such has been established from aerial photography. A sight distance of 185 metres, which corresponds to a design speed of 100 km/h, and which exceeds the Town standard of 180 metres, can be achieved. To the west, the sight distance exceeds 200 metres, which is readily apparent via Google Streetview.

We acknowledge that the provision of stopping sight distance may require an oncoming vehicle to come to a stop; this is not considered problematic nor onerous. The provision of 300 metres of sight distance is not possible given the geometry of the road.

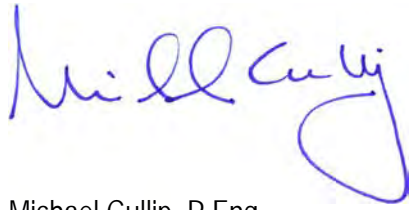
The peer review notes safety concerns with the proposal to pave 30 Sideroad on 20 metres on either side of the proposed crossing. We would ask for further information as to what the safety concern is. As transitions from asphalt to gravel (and vice versa) roads are not uncommon, we deduce that the concern relates to the length of section to be paved. While loose gravel may migrate to the paved section, we do not see this as a safety concern. We are not aware of other similar applications.

If the Town is concerned with the method of winter maintenance given the varied road surface, the crossing can remain gravel. Asphalt was proposed to increase the structural integrity of the crossing and reduce the need for gravel maintenance. In lieu of the asphalt surface, additional granular A can be considered. Maintenance of the crossing could also be addressed in the haul route agreement, so as to minimize the demands on the Town.

Any improvements to 30 Sideroad as they relate to the crossing can be included in the haul route agreement, which in turn would be a condition of approval.

Should you have any questions or comments on the above, please do not hesitate to contact us.

Yours truly,  
C.C. Tatham & Associates Ltd.

A handwritten signature in blue ink that reads "Michael Cullip". The signature is written in a cursive style with a large, looping flourish at the end of the name.

Michael Cullip, P.Eng  
Director, Manager – Municipal & Transportation Engineering  
MJC:mjc

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February 9, 2018

**Via: Email**

David Trotman  
Director of Planning  
Town of Mono  
347209 Mono Centre Road  
Mono, ON L9W 6S3

Dear David:

**Re: Greenwood Pit - Town of Mono  
Peer Review – Traffic Study  
Project No.: 300039415.0000**

On behalf of the Town of Mono, R.J. Burnside & Associates Limited (“Burnside”) has reviewed C.C. Tatham & Associates Ltd. (“Tatham”) response dated January 19, 2018 (“Tatham Response”) to our peer review comments dated December 18, 2017 (“Burnside Comments”) with respect to the traffic submission that was submitted for an aggregate extraction pit on Part Lots 30, 31, and 32, Concession 4 E.H.S. in Mono. Greenwood Aggregates Limited propose to develop the site located south of Highway 89 between 4<sup>th</sup> Line East and 3<sup>rd</sup> Line East. The pit also extends south of 30 Side Road.

Since the Burnside Comments review, additional transportation information has been provided including the following:

- Letter regarding Violet Hill Gravel Pit, Town of Mono Public Meeting Comments, C.C. Tatham & Associates Ltd., February 6, 2018
- Letter regarding Violet Hill Gravel Pit, Town of Mono Burnside Review Comments, C.C. Tatham & Associates Ltd., January 19, 2018 (Tatham Response)
- Letter regarding Provincial One Window Technical Review, Ministry of Municipal Affairs of Ontario, January 16, 2018 (“MMA Letter”)
- Letter regarding Greenwood Aggregates Limited Proposed Official Plan Amendment (OPA 2016-01) – Part of Lots 30, 31 and 32, Concession 4 EHS, Town of Mono (on behalf of County of Dufferin), WSP, January 19, 2018 (“County Review”)
- Letter regarding Violet Hill Pit – Part Lots 30, 31, 32, Concession 4 E.H.S., Town of Mono Erosion Hazard Study – Update, C.C. Tatham & Associates Ltd., January 19, 2018 (“Erosion Update”)

The following transportation documents were reviewed as part of the Burnside Comments:

- Proposed Violet Hill Gravel Pit, Town of Mono Traffic Review letter, C.C. Tatham & Associates Ltd. (“Tatham”), June 15, 2015

- Violet Hill Gravel Pit, Town of Mono, Site Access Options letter, Tatham, December 22, 2016
- MTO Comments – Greenwood Aggregates Application – Site Access memorandum, Ministry of Transportation (“MTO”), February 8, 2017
- Proposed Violet Hill Gravel Pit, Town of Mono Traffic Review letter, Tatham, July 5, 2017
- Operations Plan, Rollings Hyland Consulting, July 7, 2017
- OPA 2016-01 and ZBA 2016-02 Violet Hill Aggregate Pit, Greenwood Aggregates letter, Upper Grand District School Board, November 22, 2017

### County Review

The County Review indicates *“the entrance is now proposed along 3<sup>rd</sup> Line, and that all trucks leaving the site will travel north along 3<sup>rd</sup> Line and then east or west along Highway 89, depending upon their destination point. Therefore, it is our understanding that Dufferin roads will not be directly impacted as a result of the application, and Dufferin Public Works has no comments at this time.”*

### MMA Letter

The MMA Letter includes comments from the Ministry of Transportation of Ontario (“MTO”). They indicated *“MTO is only supportive of the proposed development proposal if acceptable site access and haul route is achievable and the proposed quarry does not negatively impact the operational functionality of Highway 89.”* MTO identified a number of outstanding items from the July 5, 2017 Tatham traffic study including:

- *“Page 6, last sentence: For speeds greater than 60 km/h, GDSOHM E.7.1 recommends a right turn taper with a parallel lane (a total length of 165 m). this will need to be evaluated and discussed further.*
- *Page 7, last sentence of first paragraph: A 1.2 Down Grade Factor must be applied to the deceleration length, equaling a total length of 326 m for the left turn lane. The total distance between the CL (centerline) of 3<sup>rd</sup> Line East and CL of 3<sup>rd</sup> Line is 335 m.*
- *Page 7, first bullet: A 1.5 m offset beyond the intersection is also required for the runout lane.*
- *Page 10: Suggests consideration for staged road improvements. MTO is not supportive of staged improvements, as the traffic mitigation measures (turning lanes etc.) are required to be in place before truck traffic is moving to and from the development site.*
- *Analysis: If the proposed development application commences, further details related to design including (but not limited to) sight line analysis and road geometry will need to be conducted and submitted as part of the Environmental Assessment and design.”*

MTO identified that a number of permits would be required prior to commencement of any site activities.

It is our recommendation should the application proceed that the MTO items above should be incorporated into the approval conditions including that the applicant satisfies MTO and the Town of Mono (“Town”) and obtains the appropriate permits prior to commencement of any site activities.

## Review of Tatham Response January 19, 2018 Letter

Summarized below is our review of Tatham response to the traffic study peer review. We have not repeated our previous comments, but have identified if they have addressed the concern or there remains items to address.

### *Truck Size and Traffic Projections*

Tatham provided the fleet size proposed to be used, which ranges from a 23 tonnes triaxle dump truck to a 41 tonnes A or B train trailers. Based upon their expected distribution of truck size, the average capacity per truck would be 32.4 tonnes. Their initial assessment was based upon 34 tonnes per truck; however, they have also provided an analysis with 30 tonnes per truck. The initial assessment would result in 162 loaded trucks per day during the peak season and that would increase to 184 loaded trucks per day with an average of 30 tonnes per truck. This results in an additional 2 to 3 loads per hour (4 to 6 trips per hour). To get the number of trips, one would double the number of loads as there would be a trip in to get loaded and the trip out with the load.

Tatham's conclusion is "*that it is not significant and will have no bearing on the traffic operations or results of our (Tatham) traffic review.*" Although the number is small, there could be a 12% increase in truck traffic compared to the original analysis, and the challenge is the time it takes for trucks to accelerate to travel speed. At the peak, there could be 14 truck trips per hour turning onto Highway 89, which is a trip approximately every four minutes. Considering also the empty trucks returning to reload, there could be a trip turning to or from Highway 89 approximately every two minutes. It is easier for an unloaded truck to accelerate quicker; however, this truck would be turning onto 3<sup>rd</sup> Line East.

It will be necessary to have appropriate lanes constructed to limit the impact of traffic flow on Highway 89.

Estimates have not been provided for the volume of material to be imported, but they identify that any imported material could be considered as part of the 1M tonne license. For example, if they import 100,000 tonnes, they could only export 900,000 tonnes. This would result in the same traffic volumes estimates as provided in the report. Should the application be approved, this should be made a condition of the license.

### *Existing Traffic Volumes*

Tatham provided the traffic counts they used to base their traffic numbers on, which were August 2014 traffic volumes recorded by MTO 0.9 km west of Dufferin Road 18. Tatham indicate the count data is provided in Appendix A; however, they provided their summary spread sheets of the traffic volumes in Appendix A and not the actual count data. They utilized the highest observed traffic volumes along Highway 89, which results in a conservative analysis.

They did not obtain traffic counts at 3<sup>rd</sup> Line East. Tatham relied upon a daily volume quoted in Burnside's Municipal Engineering comments dated December 21, 2017 to justify the traffic volume. Tatham indicate that their 3<sup>rd</sup> Line East assessment is based upon 20 vehicles per hour, which represents approximately 10% of the daily traffic volume. There is an inconsistency in the traffic volumes shown in Appendix A. The traffic volume has been reduced to 8 vehicles per hour based upon the numbers provided in Appendix A, which would not be representative of

a 10% peak hour. However, the operation analysis still appears to be based upon the original 5 existing turning vehicles for each of the turning movements.

### *Highway 89 / 3<sup>rd</sup> Line East Intersection Improvements*

Tatham attached Plans 1 and 2 to the submission that were omitted from the July 5, 2017 letter.

They identify that MTO has jurisdiction over the intersection and that comments provided from Burnside as essentially for information and that improvements will be designed to the satisfaction of MTO.

Although the intersection is under MTO's control, 3<sup>rd</sup> Line East is a Town road and as such any changes to 3<sup>rd</sup> Line East would be under the Town's jurisdiction. Furthermore, the residents in the vicinity of the proposed pit have expressed to the Town their concerns on how they will be impacted by the proposal and as frequent users of the local highway they will potentially be affected by delays. As such, our previous comments should still be carried forth.

### *3<sup>rd</sup> Line East*

To address our comments, Tatham "*recommend that as a condition of approval, further investigations be required to investigate the existing road conditions and suitability of such to accommodate future truck traffic. The investigations would consider road structure, road width, road surface and drainage, and provide recommendations accordingly. Should improvements be required including the need to pave 3<sup>rd</sup> Line East, engineering drawings would be prepared for approval by the Town. Any such recommendations can be a condition of approval or part of the haul route agreement (as could the need for appropriate securities).*" It is our view that additional details are required to be provided at this time. Should approval be granted prior to all details being known, this would be a necessary condition and that securities be part of the condition. Securities would need to be provided for the Town reviews including Peer Reviews as well as construction securities. We understand that it may not be possible to have the above as a condition of approval given legal and planning requirements, which are beyond the scope of our review.

Tatham is suggesting "*The designated haul route should be established as 3<sup>rd</sup> Line East from the site access to Highway 89, with the exception of local deliveries.*" This is acceptable, but a definition should be provided on what would constitute local deliveries including geographic restrictions and subject to any load restrictions on the local roads.

There is a risk to the Town in that what is required is unknown. As listed in our previous correspondence, we continue to suggest the following prerequisites should approval be granted

- Confirmation that 3<sup>rd</sup> Line East is structurally sufficient or the upgrades required to accommodate the traffic between Highway 89 and the pit access point.
- Confirmation on how they will deal with dust and mud tracking along 3<sup>rd</sup> Line East.
- Confirmation that two vehicles can pass safely on 3<sup>rd</sup> Line East (i.e. sufficient road width)
- Confirmation that any improvements and drainage can be accommodated within the existing right-of-way
- Arrangements and limitations for haul routes leading to local deliveries in the Town of Mono that are in proximity to the pit.
- Design, securities, and construction of any improvements identified.

- Acceptance of the recommendations, design, securities, and construction by the Town.

Securities should include any costs incurred by the Town for reviews including Peer Reviews as well as cost of construction.

### *Pit Driveway Design and Queuing*

Tatham proposes to provide details for the driveway and its intersection with 3<sup>rd</sup> Line East following approval of the application as such are not normally part of a traffic review and that it can be established as a condition of approval. If Tatham do not want to address the comment at this stage and want it prior to approval that is fine; however, there is substantial grade difference of approximately 30 m between 3<sup>rd</sup> Line East and the top elevation along the boundary of the pit and this needs to be better understood.

The Erosion Update illustrates on Drawing AR-1 a profile of the driveway. The profile has stationing, but the plan view does not provide stationing; therefore, it is not possible to coordinate between the plan and profile.

The driveway proposes to rise at a grade of 7% from near 3<sup>rd</sup> Line East to where it cuts through the land to access the pit. The driveway rises about 20 m in elevation to where it cuts through the land, which rises another 10 m. If we assume that the edge of 3<sup>rd</sup> Line East is at station 1+1000, then the driveway starts to rise at 7% about 20 m from the edge 3<sup>rd</sup> Line East. Once additional details are provided, it can be reviewed.

We note that comments have been raised by other peer reviewers that may cause material changes to the design that we have reviewed.

Tatham have identified comments on the fencing and weigh scale will be addressed through the operations plan.

### *30 Sideroad*

Tatham identified that traffic volumes crossing 30 Sideroad is unknown at this time, but could be as much as the volume of traffic entering and exiting the pit as a worst case. They have identified that no access to / from 30 Side Road will be permitted. They do not foresee any operational issues given the limited volume of traffic.

The driveway will be approximately 170 m from the s-curve to the east and 480 m east of 3<sup>rd</sup> Line East. It appears, Tatham have used images from Streetview to come to the conclusion that there will be acceptable sight distances. Confirmation should be provided through a field verification or review of as-built drawings. In addition, there are mature trees along the corridor that may limit sightlines.

Tatham have used the premise that stopping sight distance is available, which requires 135 m for 80 km/h. They are using the posted speed limit (note 30 Sideroad is unposted, but would be assumed to have a speed limit of 80 km/h under the Highway Traffic Act); where as, standard practice would utilize a design speed of 100 km/h, which results in a minimum stopping sight distance of 185 m. The Town's minimum stopping sight distance requirement is 180 m. The sight distance to the east as report by Tatham at 170 m would be slightly short. However, this only allows an approaching vehicle to stop, it does not provide the time necessary for a vehicle



to cross the street without interfering with traffic on 30 Sideroad. For that to happen, 300 m of sight distance would be required for a large transport truck to cross and not interfere with traffic travelling on 30 Sideroad.

Tatham suggest any improvements to 30 Sideroad be a condition of approval. They do recommend the crossing be constructed to include a minimum of 2 lifts of asphalt, 150 mm Granular A and 450 mm Granular B. They also recommend the approaches on 30 Sideroad should be paved a minimum of 20 m in either direction to provide a means of transition between the existing gravel surface and the proposed paved surface of the crossing. We have safety concerns with this approach and request examples of where this has been done in the past and also any safety research on the safety aspects of this with providing a short section of paved area on a road that is unpaved. It would also result in the Town having to utilize a different maintenance vehicle for that section of road. They currently use a grader with an ice blade during the winter. An ice blade can not be used on asphalt. The paving of either side of the 30 Sideroad crossing will cause considerable long term maintenance issues for Public Works. We request Tatham to investigate further alternative options.

As a condition of the license, the weigh scales should always be located north of 30 Sideroad to prevent trucks with the ability to turn on or off 30 Sideroad should the scales be located south of 30 Sideroad.

#### Review of Tatham Response February 6, 2018 Letter

Tatham identified that the truck traffic is expected to be lower as it is anticipated that only 40% to 60% of the annual license limit of 1M tonnes per year will be achieved. The application is for 1M tonnes per year and that is what the assessment needs to be based upon. They go further to premise that Violet Hill gravel pit production will be offset by reductions in export levels from other pits and quarries. Thus their assumption is that if there is not net change overall, there would not be a change in truck traffic to / from the area. There would be increased truck traffic on 3<sup>rd</sup> Line East, but the truck traffic on Highway 89 may be somewhat less. As they have not identified any pit closures or reduction in license limits at the other pits, we can only assess the application before the Town. Also unless the pits are in the immediate area, there will be changes as truck traffic will depend upon the pit location and destination for the aggregate.

They reiterate that all improvements to Highway 89 will be completed to the satisfaction of MTO in accordance with the study recommendations and MTO requirements.

Their support of the 30 Sideroad crossing is reiterated and the curve approximately 170 m to the east is not considered problematic. We will not reiterate our concerns on the 30 Sideroad driveway, which have been previously discussed in this letter.

#### Summary

In summary, Tatham have addressed some items, but there are still many components that would be left subject to condition of approval that are presently unresolved. It is our view that additional details should be provided at this time. The following should be provided before any approvals are granted:

- A condition of the license is any annual imported material tonnage is to be subtracted from the annual tonnage limit for the pit (ie. import of 100,000 tonnes of material would reduce that year's export to 900,000 tonnes of material).
- Provide details on where they propose to relocate the street name sign on Highway 89 and what mitigation measures might be required
- Highway 89 / 3<sup>rd</sup> Line East Intersection
  - Provision of left turn lanes on Highway 89
  - Provision of acceleration lanes on Highway 89
  - Provision of an eastbound right turn taper
  - Vehicle turning movement modelling for the design
- 3<sup>rd</sup> Line East
  - Confirmation that 3<sup>rd</sup> Line East is structurally sufficient or the upgrades required to accommodate the traffic between Highway 89 and the pit access point.
  - Confirmation on how they will deal with dust and mud tracking along 3<sup>rd</sup> Line East.
  - Confirmation that two vehicles can pass safely on 3<sup>rd</sup> Line East (i.e. sufficient road width)
  - Confirmation that any improvements and drainage can be accommodated within the existing right-of-way
  - Arrangements and limitations for haul routes leading to local deliveries in the Town of Mono that are in proximity to the pit.
  - Design, securities, and construction of any improvements identified.
  - Acceptance of the recommendations, design, securities, and construction by the Town.
- Inclusion of MTO items / conditions and that appropriate permits are obtained
- Provide further details on the driveway design given the grade difference of approximately 30 m
- 30 Sideroad:
  - Driveway details at 30 Sideroad
  - Paving 30 Sideroad for a short distance on either side of the driveway will result in long term maintenance and safety concerns for the Town and Tatham shall investigate alternative solutions that are acceptable to the Town
  - Review of sightlines and incorporation of any mitigation measures deemed necessary
  - Confirmation that the road is structurally adequate or implementation of remediation measures
  - Acceptance by the Town of findings, recommendations, designs, securities, and construction
- A license condition should be the weigh scales should always be located north of 30 Sideroad

Any solutions presented by Tatham will need to be acceptable to the Town.

We understand that making 3<sup>rd</sup> Line Road improvements, which have not been determined at this point, a condition of approval may not be possible from a planning and legal approval, which is beyond our scope.

Please call should you have any questions.

Yours truly,

**R.J. Burnside & Associates Limited**



David Argue, P.Eng., PTOE  
Vice President - Transportation  
DA:

cc: Gord Feniak, R.J. Burnside & Associates Limited (enc.) (Via: Email)

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# C.C. Tatham & Associates Ltd.

## Consulting Engineers

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April 20, 2018

via e-mail ([sam@greenwoodconst.ca](mailto:sam@greenwoodconst.ca))  
CCTA File 114239

### Sam Greenwood

Greenwood Aggregates  
205467 County Road 109  
Amaranth, ON L9W 0V1

**Re: Violet Hill Gravel Pit, Part Lots 30, 31, 32, Concession 4EHS, Town of Mono  
Third Line Entrance Drainage Review**

Dear Sam:

As requested, C.C. Tatham & Associates Ltd. (CCTA) has completed an assessment of the potential drainage implications associated with constructing the access road to the pit as proposed off Concession 3. The plan and profile and road cross-section for this access road construction has previously been submitted in support of the pit application and is enclosed.

We note that the design and construction of the access road should be completed in such a manner that drainage patterns are generally maintained and that drainage is conveyed to the same outlets that it does during existing conditions. Furthermore, the drainage design should be implemented to ensure that erosion is not exasperated and an appropriate level of treatment is provided.

### Site Location

The development site is located on the south side of Highway 89 between 3<sup>rd</sup> Line East and 4<sup>th</sup> Line East in the Town of Mono, Dufferin County. The site is bounded by each of the noted roads and is also bisected by 30 Sideroad. The site constitutes part lots 30, 31 and 32 of Concession 4. Access to the site has been identified off Concession 3 approximately 480 m south of Highway 89.

### Existing Drainage Conditions

Drainage in the area of the proposed access road drains east to west via overland flow through a natural draw in the topography to Concession 3. A culvert conveys the surface runoff under Concession 3 and the surface runoff ultimately drains into Sheldon Creek to the east.

The subject property is separated from Sheldon Creek by Concession 3 and is not located in the floodplain of Sheldon Creek (a permanent watercourse). Further, in consultation with the Niagara Escarpment Commission, it was confirmed that the east boundary of their plan area coincides with the west right-of-way of 3<sup>rd</sup> Line east. As a result, there are no changes proposed to the lands under the jurisdiction of the Niagara Escarpment Commission.

## **Proposed Condition**

The design of the access road has been completed by CCTA and is illustrated on the Access Road Plan (Drawing AR-1) enclosed. The access road enters the site and traverses up the natural draw in the topography at a slope of approximately 7% until it reaches the floor of the first phase of extraction.

Drainage from the area of the access roadway will continue to be directed from east to west down the natural draw in the topography through constructed swales/ditches adjacent to the access roadway towards Concession 3 as it does currently. The surface runoff will continue to drain to the culvert under Concession 3 and ultimately to Sheldon Creek in a manner mimicking existing conditions. The total drainage area draining to the culvert will be less under proposed conditions than existing conditions due to the proposed access road construction.

The driveway location has been selected to follow the natural draw in the topography. This location was selected because there is already an existing entrance constructed off Concession 3 and driveway has been partially constructed through the natural draw.

To ensure no erosion occurs along the driveway path, appropriate erosion control measures will be installed in the roadside ditches along the access roadway. Where necessary rip-rap protection in the ditches will be provided to prevent erosion and grassed ditches will be stabilized with seed, mulch and erosion control matting to ensure no erosion occurs. The establishment of a vegetated and stable grassed slope adjacent to the driveway will be important to ensure the maintenance of the drainage condition in a manner that protects existing water quantity and quality.

There is not expected to be an increase in the quantity of drainage to Concession 3 as the overall drainage area is reduced under proposed conditions. Nonetheless, an additional measure is proposed to provide further erosion and quantity control. This includes installing rock check dams in the ditches as per OPSD 219.21 (approximately every 20 m or as required) to promote the filtration of water and reduce the velocities and volumes of runoff. This will further ensure runoff is conveyed to the Concession 3 ditch in a manner that mimics existing conditions.

## **Summary**

Based on our review, the entrance road can be implemented in a manner that does not adversely affect the area surface water resources provided proper implementation of erosion control measures occurs during construction. In closing, we trust that the above has confirmed that drainage generated

from the proposed access road will not adversely affect the adjacent drainage systems. If you have any questions or comments on the above please do not hesitate to contact the undersigned.

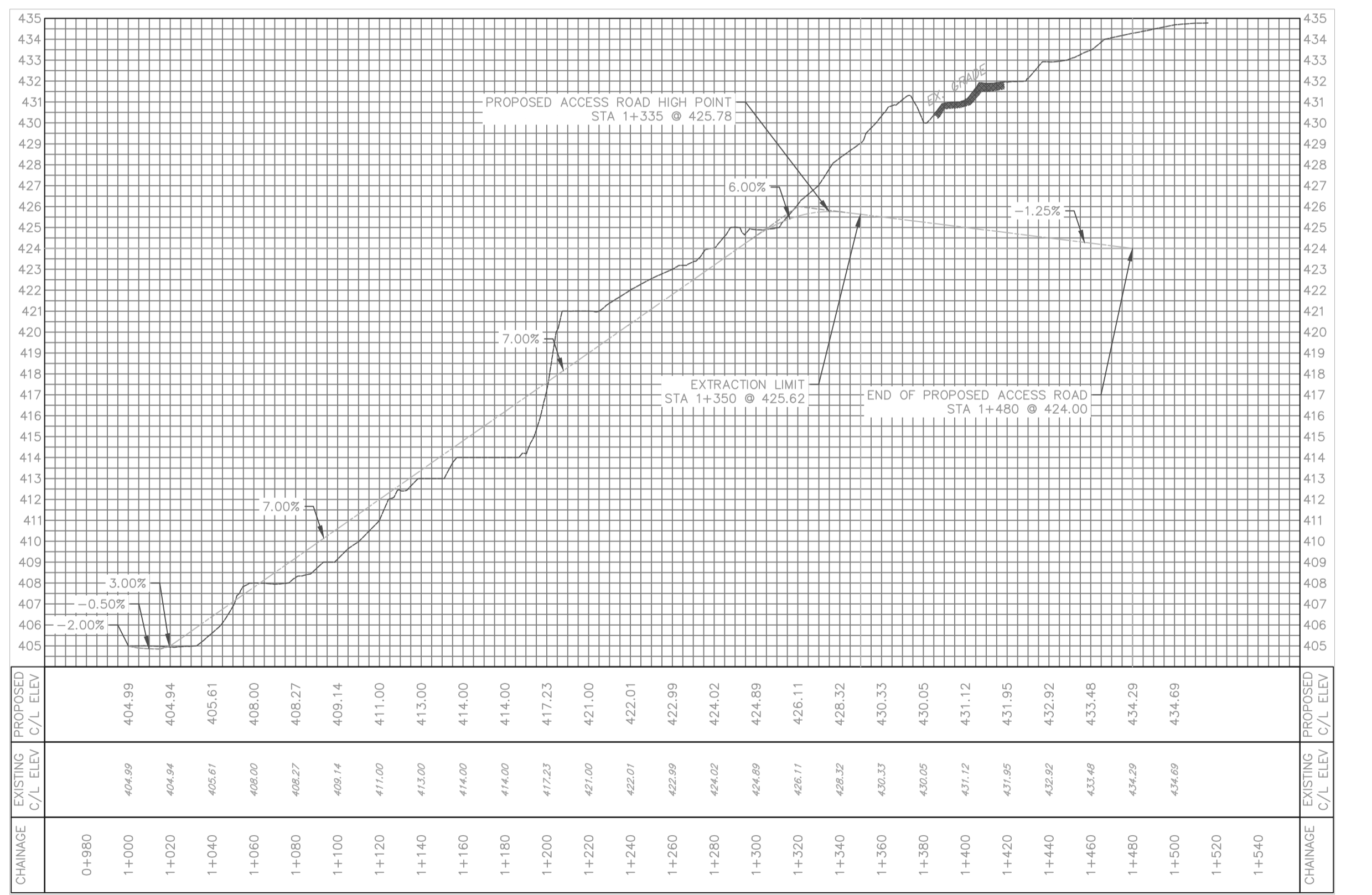
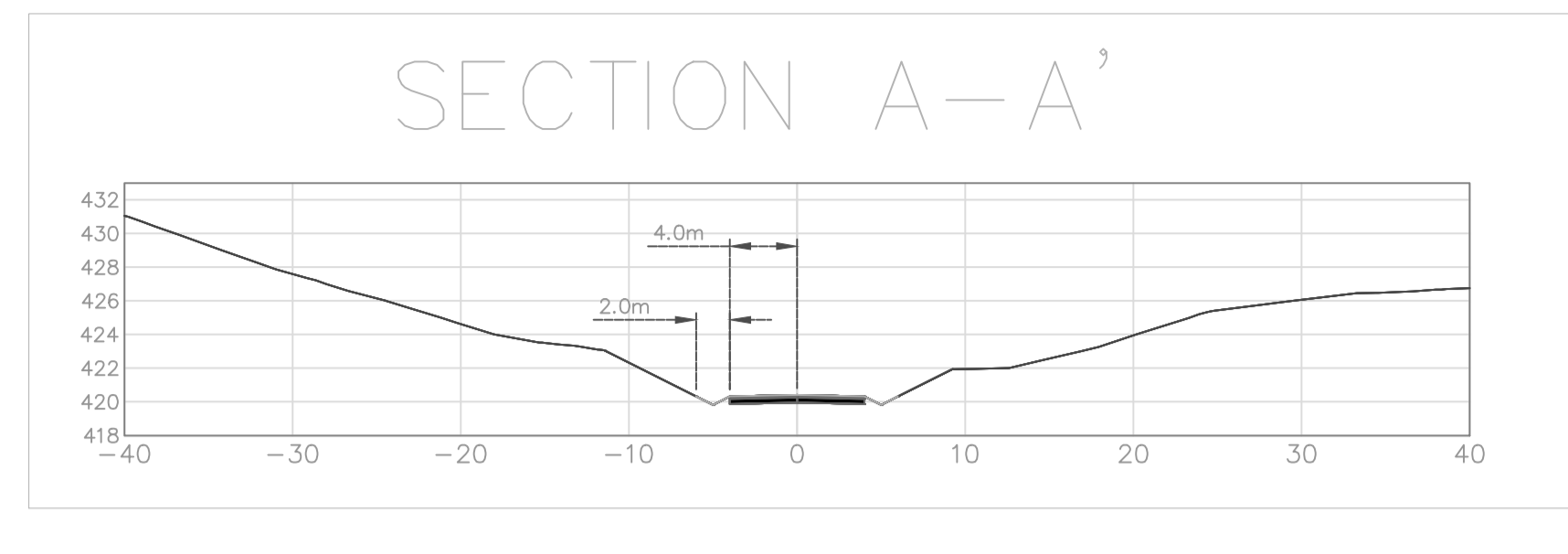
Yours truly,  
C.C. Tatham & Associates Ltd.



For: Dan Hurley, B.A.Sc., P.Eng., LEED AP  
Vice President, Manager – Water Resources Engineering  
DJH:rlh

Copy: Craig Laing, Aggregate Management Services, via e-mail (claingams5@gmail.com)

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**LEGEND**  
**CONTRACT DRAWINGS**  
 CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.  
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NO.	REVISIONS	DATE	INITIAL

APPROVED

**GREENWOOD AGGREGATES**  
**VIOLET HILL PIT**

ACCESS ROAD PLAN



**C.C. Tatham & Associates Ltd.**  
 Consulting Engineers

Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:750	JOB NO. 114239
DESIGN: EF	CHECKED: DWT
DRAWN: EF	DATE: JAN/18
DWG. <b>AR-1</b>	