

File 121088

July 18, 2025

John Rodgers
Rhemm Properties Ltd.
119 Fieldcrest Court
Clarksburg, Ontario, N0H 1J0

Re: 372 Grey Road 21, Town of The Blue Mountains
Flood Assessment Brief – East Parcel

Dear John:

Tatham Engineering Limited (Tatham) has been retained by Rhemm Properties Ltd. to complete a flood assessment for the proposed residential development located at 372 Grey Road 21 in the Town of The Blue Mountains. This brief has been prepared to summarize the existing flood conditions at the proposed development site and present recommendations to confirm the development can be constructed in a manner which ensures it will be protected from flooding and mitigate any potential impacts of the proposed development on flooding.

STUDY AREA

The study area encompasses Watercourse 1 and Watercourse 6 from Monterra Road to the watercourse outlets at Georgian Bay with a focus on the west end of the subject property where the residential development is proposed. The proposed development site is bounded by the Georgian Trail to the north, the future Eden Oaks Development to the west, and undeveloped future development lands to the south and east.

BACKGROUND AND DESIGN CRITERIA

This assessment has been prepared to assess the existing flood conditions at the proposed development site and present recommendations to floodproof the proposed development and mitigate any impacts on flooding conditions. The assessment has considered the following applicable guidelines and background documents:

- *Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Ontario Regulation 151/06.* Grey Sauble Conservation Authority (January 13, 2010); and

- *Drainage Master Plan Existing Conditions Report – Town of The Blue Mountains (Draft)*. Tatham Engineering Limited (January 27, 2022).

The main branch of Watercourse 6 flows along the Georgian Trail north of the development site and a tributary of Watercourse 6 is located immediately west of the development site along the perimeter of the future Eden Oaks development. This tributary has a drainage area of approximately 34 ha and was re-routed around the proposed Eden Oak development site via a perimeter ditch. This ditch directs the tributary to the Eden Oak stormwater management (SWM) pond which has been rough graded. The GSCA regulated area associated with the main branch of Watercourse 6 extends onto the proposed development site.

As part of the Town of The Blue Mountains Drainage Master Plan (DMP) project, Tatham completed hydrologic and hydraulic analysis of the watercourses in the vicinity of the study area which will be referred to for this assessment.

PROPOSED DEVELOPMENT

The proposed development includes a total of 47 single family detached homes and 6 semi-detached homes. Road access to the site will be provided by the future Eden Oaks development to the west of the site. The single detached units and semi-detached units will have a minimum lot frontage of 12 m and 9 m, respectively, and varying lot depths around 30 m. The proposed development is shown on the Development Concept Plan (SP01) included in the Functional Servicing Report (FSR) submitted under separate cover.

HYDROLOGIC ANALYSIS

As mentioned, hydrologic analysis of the surrounding area has been completed by Tatham as part of the Town DMP project. The hydrologic analysis considered the entirety of the Watercourse 6 and Watercourse 1 (Townline Creek) watersheds which can potentially impact the subject property. The Watercourse 6 main branch adjacent to the development site has a drainage area of approximately 496 ha and there is a spill from Watercourse 1 which impacts Watercourse 6 at this location. This spill is accounted for in the model. Review of the Visual OTTHYMO hydrologic model created for the DMP determined the Timmins storm event is the governing storm event for the study area. We note the current hydrologic model from the DMP has not been calibrated and thus is generating flows that are believed to be conservative. The Regional (Timmins) Storm peak flows at key points of interest (POI) are as follows:

- Watercourse 6 west branch + east branch south of Georgian Trail: 43.1 cms (POI A);
- Spill from Watercourse 6 over the Georgian Trail: 18.3 cms (POI B);
- Watercourse 6 main branch adjacent to development site: 22.4 cms (POI C);
- Watercourse 6 west branch upstream of development site: 14.3 cms (POI D), potential spill directed towards development site: 4.4 cms;



- Tributary of Watercourse 6 west of development site: 1.7 cms (POI E);
- South property line (Proposed conditions): 2.1 cms (POI F); and
- West property line (Proposed conditions): 2.3 cms (POI G).

The points of interest described above are shown on the markup of the 2D Model Hydraulic Analysis Schematic (Markup of Drawing 2D-REG) enclosed for reference.

HYDRAULIC ANALYSIS

For this assessment, existing conditions and proposed conditions hydraulic models were created and compared to demonstrate that the proposed development can be constructed with no negative impact to flood levels or extents on adjacent properties. Due to the complexity of the study area hydraulics and the flood spills identified, a 2D HEC-RAS hydraulic model was used for assessment of the study area.

Existing Conditions

As discussed, the existing conditions 2D HEC-RAS hydraulic model developed for the Town of The Blue Mountains DMP project was used to determine the existing flood conditions in the study area. To improve the accuracy of the existing conditions model at the subject property, the DMP model terrain was updated to reflect the topographic survey information collected on the proposed development property and the existing ditch conveying the tributary of Watercourse 6 along the south limit of the Eden Oak development site. An additional update was made to the model to add the flows of the west branch of Watercourse 6 into the model at a location further upstream to better assess if a spill from the west branch towards the proposed development site could occur.

Based on the above analysis, we confirmed that under existing conditions the proposed development site is potentially subject to flooding due to flow spilling from the existing tributary of Watercourse 6 along the Eden Oak property line and flow spilling from the west branch of Watercourse 6 south of the site. The maximum flood elevation in the Watercourse 6 main branch adjacent to the development site ranges from 182.21 at the southeastern extent to 181.75 at the northwestern extent. Based on these flood elevations, under existing conditions there is a small area (approximately 80 m²) located at the rear of proposed lots 50 and 49 which would be subject to minor flood inundation at the maximum flood elevation of 181.87 adjacent to these lots.

Proposed Conditions

The proposed conditions hydraulic model was created by updating the existing conditions 2D HEC-RAS hydraulic model with the proposed development plan. The model terrain was updated to reflect the preliminary proposed site grading. To address local drainage and protect the proposed development from flooding, the following measures are proposed:

- The existing interceptor ditch which conveys the tributary of Watercourse 6 along the south property line of the Eden Oak Development lands should be improved to prevent flows from spilling from this



ditch and proposed 900 mm diameter smooth walled culverts will be installed across the proposed street and SMWF maintenance trail as part of the construction of the proposed street connecting from the Eden Oak Development to ensure flow in this tributary is conveyed to the SWMF in accordance with the area drainage plan;

- It is expected the site grading will be raised above the existing ground level along the western and southern property lines. Proposed swales will be provided 0.5 m from the western and southern property lines along the bottom of the slope down from the raised grading. The proposed raised grading and swales will direct external surface runoff and spill flow northwards along the western property line back into the main branch of Watercourse 6 and eastwards along the southern property line back into the main branch of Watercourse 6;
- An inlet structure consisting of 2 – 600 mm x 1200 mm Ditch Inlets in Type 'B' configuration per OPD 706.031 will capture drainage from the western property line south of the proposed street connecting from the Eden Oaks development and twin 600 mm Ø concrete storm sewers will convey this drainage back into Watercourse 6 as occurs under existing conditions;
- A proposed 2010 x 1530 mm CSPA culvert embedded with 0.48 m of natural substrate will be installed as part of the construction of the proposed Georgian Trail connection through the park block (Block 54) to convey flow from Watercourse 6. This proposed trail connection will be graded to allow flow from Watercourse 6 to spill over the trail to the west, mimicking existing conditions; and
- The grade along the rear of lots 52-46 will be raised to a minimum of 182.20 m to prevent flood inundation from encroaching onto these properties and provide freeboard from the rear of these lots to the maximum flood elevation. This raised grading will result in a total of approximately 8 m³ of fill being placed below the Regional flood elevation.

It is noted the spill flows and external overland flow which could enter the existing development site are surface water spill flows and therefore the site is not considered floodplain and the external flows do not have to be accepted by the development property. As such, the proposed solution of raising the site with cut-off swales along the bottom of slopes will serve to direct drainage along the periphery of the development site to appropriate outlets to Watercourse 6 to mimic existing conditions. The proposed flood mitigation measures and flooding extents are illustrated on the Flood Hazard Plan (FH-1) enclosed for reference. The proposed conditions hydraulic model confirms the site itself is not floodplain and the proposed development can be safely floodproofed with the implementation of the measures described above and will have no negative impact on flooding conditions elsewhere in Watercourse 6 or on neighbouring properties.

CLOSING

A flood assessment was completed for the proposed development located at 372 Grey Road 21 to establish the existing flood conditions and determine flood mitigation measures for the proposed development. The existing analysis determined there is the potential for existing flooding of the



development site due to a potential spill from the existing re-aligned tributary of Watercourse 6 west of the site, a potential spill from the west branch of Watercourse 6 south of the site, and some minor inundation at the rear of proposed lots 50 and 49. To address local drainage and protect the proposed development from flooding, improvements should be made to the existing interceptor ditch at the south limit of the Eden Oak Development and proposed 900 mm Ø culverts will be installed to convey flow to the SWMF. Site grading will be raised and swales will be provided along the bottom of slope 0.5 m within the western and southern property limits of the site and an inlet structure with twin 600 mm Ø storm sewers will be constructed to convey spill flow from the western property line across the proposed street back into Watercourse 6 per existing conditions. A proposed 2010 x 1530 mm CSPA culvert will be installed to convey flow from Watercourse 6 through the proposed Georgian Trail connection to the subject property. Additionally, site grading will be raised to a minimum of 182.20 m along the rear of lots 52-46 to ensure the lots are not subject to flood inundation. With implementation of the measures described above, the development will be safely floodproofed and will not adversely impact flood conditions elsewhere in Watercourse 6 or on neighbouring properties.

We trust this assessment is sufficient for your review and approval of the proposed development at 372 Grey Road 21 from a flooding perspective. In the meantime, if you have any questions or require further information, please do not hesitate to contact the undersigned.

Yours truly,

Tatham Engineering Limited



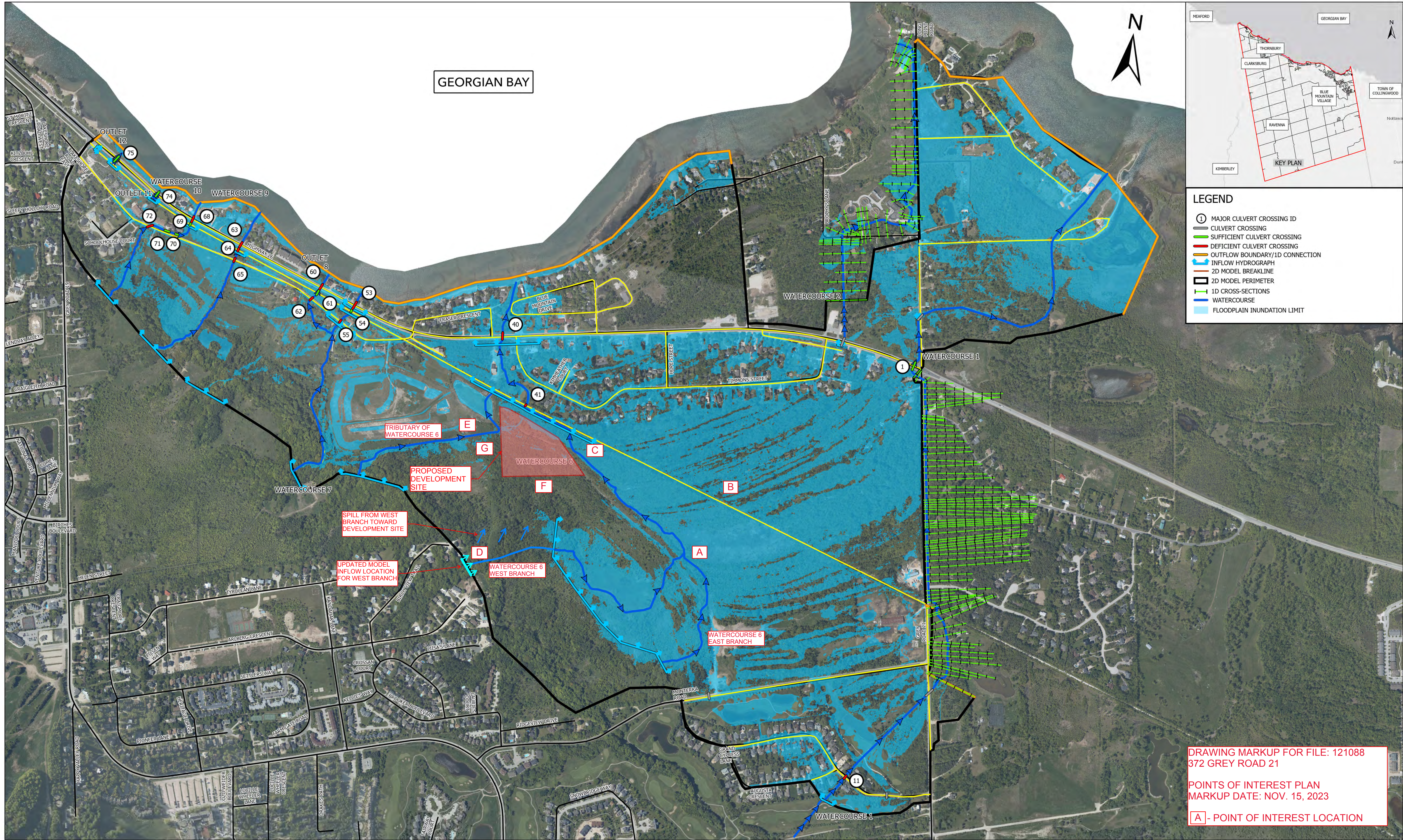
Grace Trombino, B.Eng.
Engineering Candidate
GT/DJH:rlh
Encl.



Dan Hurley, B.A.Sc., P.Eng., LEED AP
President

O:\Collingwood\2021 Projects\121088 - 372 Grey Road 21\Documents\Reports\Flood Assessment - West\L - 372 Grey Road 21 - Flood Assessment - West.docx





DRAWING MARKUP FOR FILE: 121088
372 GREY ROAD 21

POINTS OF INTEREST PLAN
MARKUP DATE: NOV. 15, 2023

A - POINT OF INTEREST LOCATION

DISCLAIMER AND COPYRIGHT
THE INFORMATION CONTAINED IN THIS DRAWING IS SOLELY FOR THE USE OF THE TOWN OF THE BLUE MOUNTAINS FOR THE PURPOSE FOR WHICH IT HAS BEEN PREPARED AND TATHAM ENGINEERING LTD. UNDERTAKES NO DUTY OR ACCEPTS ANY RESPONSIBILITY TO ANY THIRD PARTY WHO MAY RELY UPON THIS DRAWING.

THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE TOWN OF THE BLUE MOUNTAINS AND TATHAM ENGINEERING LTD. NOR MAY ANY DETAIL OR ELEMENT OF THIS DRAWING BE REPRODUCED, REPRODUCED ELECTRONICALLY STORED OR TRANSMITTED IN ANY FORM WITHOUT THE EXPRESS WRITTEN CONSENT OF THE TOWN OF THE BLUE MOUNTAINS.

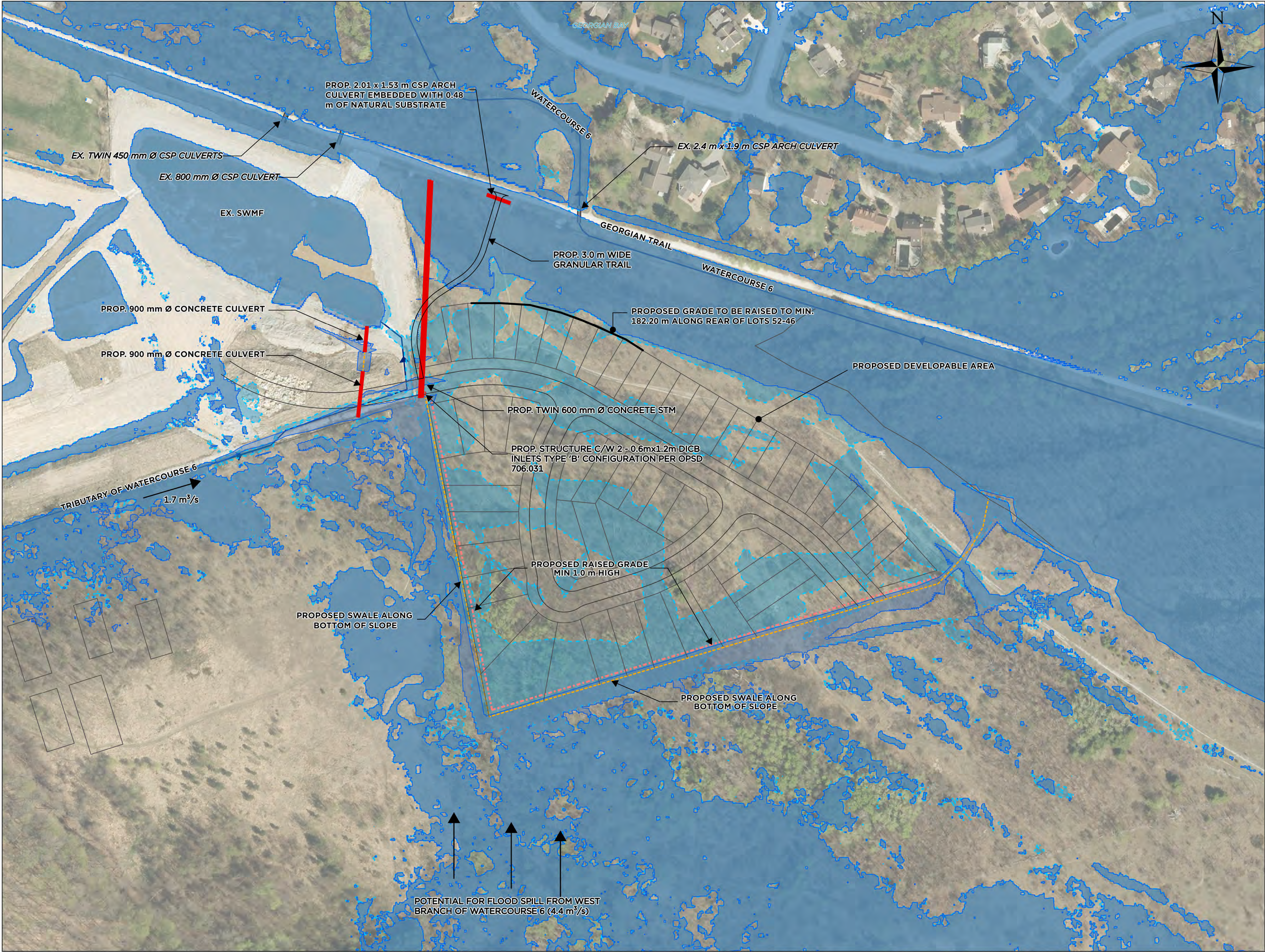
NOTE
THIS MAP IS NOT A REGULATORY FLOODMAP. THIS MAP HAS BEEN PREPARED TO ESTIMATE THE EXTENT OF FLOODING IN THE AREA SHOWN FOR THE TOWN OF THE BLUE MOUNTAINS DRAINAGE MASTER PLAN ONLY.

No.	REVISION DESCRIPTION	DATE	ENGINEERS STAMP
1.	EXISTING CONDITIONS REPORT (30% SUBMISSION)	NOV 2021	
2.	EXISTING CONDITIONS REPORT (60% SUBMISSION)	SEPT 2022	

**TOWN OF THE BLUE MOUNTAINS
DRAINAGE MASTER PLAN**

2D MODEL HYDRAULIC ANALYSIS
SCHEMATIC

TATHAM ENGINEERING		
DESIGN: DAM	FILE: 121076	DWG:
DRAWN: KKS	DATE: OCT 2021	2D-REG
CHECK: DRT	SCALE: 1:5,500	



- LEGEND**
- FLOW ARROW
 - EXISTING CULVERT
 - PROPOSED CULVERT
 - WATERCOURSE
 - - - PROPOSED BERM/RAISED GRADE
 - - - PROPOSED SWALE
 - PROPERTY LINES
 - PROPOSED LOTS
 - PROPOSED INTERNAL STREETS
 - PROPOSED REGIONAL FLOOD EXTENTS
 - EXISTING REGIONAL FLOOD EXTENTS

DISCLAIMER AND COPYRIGHT
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.
TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N

No.	REVISION DESCRIPTION	DATE
1.	DRAFT PLAN PRE-CONSULT	JUL. 2024
2.	DRAFT PLAN APPROVAL	JUL. 2025

ENGINEERS STAMP

372 GREY ROAD 21 - WEST
TOWN OF BLUE MOUNTAINS

REGIONAL (TIMMINS) STORM
FLOOD HAZARD PLAN



DESIGN: GT	FILE: 121088	DWG:
DRAWN: GT	DATE: DEC. 2023	
CHECK: DJH	SCALE: 1:1,000	

FH-1

Project Details

372 Grey Road 21

121088

Prepared By

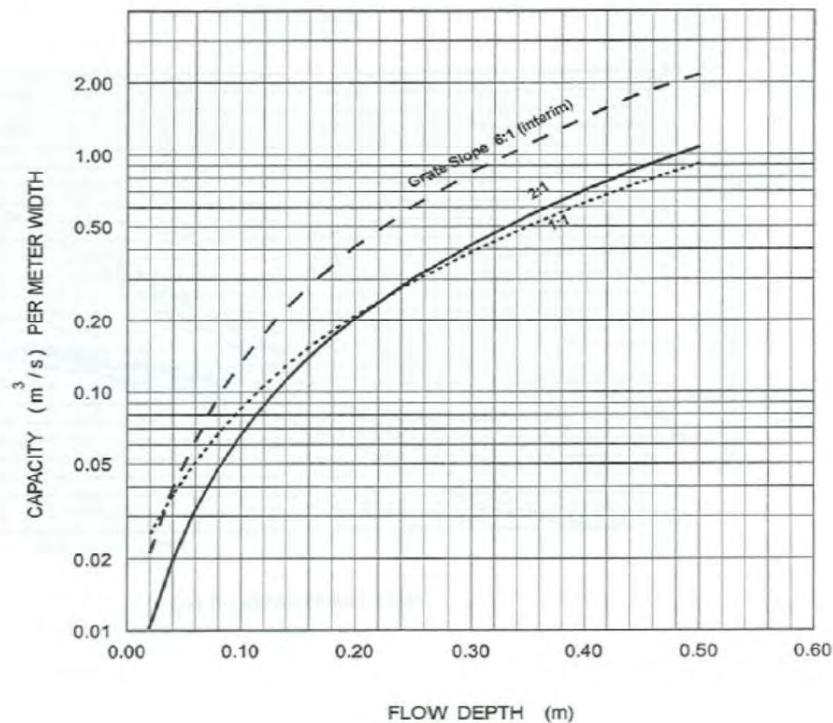
JM

December 7, 2023

Municipality

Town of The Blue Mountains

Design Chart 4.20: Ditch Inlet Capacity



Inlet Configuration: 2 - 0.6 m x 1.2 m Type 'B' Ditch Inlet (2.4 m total width per chart 4.20)

Grate Slope (H:V): 2:1

Inlet Capacity Function: $Q = 3.7753d^2 + 0.2546d + 0.0026$ (flow per metre width)

Inlet Capacity (50% Obstruction): $Q = 1.2 \times (3.7753d^2 + 0.2546d + 0.0026)$ (50% Obstruction, 1.2m m width available)

Regional Flow (m³/s): 2.20

Required Ponding Depth (m): 0.95

Capacity with 50% Obstruction (m³/s): 2.20