

MEMO

Date: July 25, 2022 Re: Lots 30-33, Stormwater Management Brief

PROJECT NO. 2262-6328

TO: Bob CareyFROM: Peter Smuczak, P.Eng. - C.F. Crozier & Associates Inc.CC: Michelle Cutts, MCIP, RPP

C.F. Crozier & Associates Inc. (Crozier) has been retained by Angelstone Tournaments Inc. (the Owner) to complete a Stormwater Management Brief for a proposed development of four (4) residential lots along Buckstown Trail (the proposed development), located on Lots 30-33 as part of the approved Draft Plan of Palgrave Estates West Subdivision (21T-88040 C) in the Town of Palgrave. The design package includes a Site Grading design, complete with drainage figures and this Stormwater Management Brief, which contains the stormwater management criteria used in the design of the proposed development.

This Stormwater Management Brief will demonstrate that the proposed layout shown on the draft Subdivision Plan, with the accompanying Grading, Erosion & Sediment Control Plan can be developed in accordance with the Town of Caledon standards.

The reports and design standards reference during the preparation of this memo include:

- Town of Caledon Development Standards Manual, Version 5.0 (2019)
- Palgrave Estates West Subdivision Design, UMA | AECOM Approved Grading Plan (May 29, 2006)

The Stormwater Management Brief should be read in conjunction with the following drawings and figures (attached):

Drawing C101:	Grading, Erosion & Sediment Control Plan (June 30, 2022)
Figure 1:	Pre-Development Drainage Plan (July 20,2022)
Figure 2:	Post-Development Drainage Plan (July 20,2022)
Figure 3:	Drainage Area Sketch of Grading Plan Sheet 2 of 3 (UMA AECOM, May 29, 2006)

The material in this memo reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Site Description

The subject land covers and area of approximately 3.67 ha and currently consists of undeveloped open land. The property is in a residential neighborhood and is not located within a regulated area as defined by the Toronto and Region Conservation Authority (TRCA). However, the subject land is located within a Wellhead Protection Area B as defined by the Source Protection Information Atlas (As of April 28, 2022).

Proposed Development

The proposed development is comprised of four (4) separate residential lots. Each lot will consist of one residential dwelling, with the accompanying septic system and driveway entrance to Buckstown Trail. Buckstown Trail is pre-serviced with water service connections for each lot, per Palgrave Estates West Subdivision design (21T-88040 C).

Existing Drainage Conditions

According to LIDAR data taken from the high-resolution dataset dated 2015 provided by Equator Studios, the general drainage pattern for the site is from east to west towards Block 37 (the Stormwater Management Pond located adjacent to Lot 30). A portion of Lot 33 drains toward Mount Hope Road. Additionally, a portion of Lots 30 to 33 drains towards the catchbasins on Buckstown Trail, which outlet at the Block 37 Stormwater Management Pond. It is assumed that the stormwater ultimately outlets to the stormwater management pond that has quantity and quality controls for the subdivision.

These catchments are displayed the Pre-Development Drainage Plan (Figure 1).

Proposed Drainage Conditions

The drainage conditions for the proposed development have been designed to meet the engineering and drainage criteria as outlined by the Town of Caledon. The drainage conditions of the proposed development follows the Palgrave Estates West Subdivision design completed by UMA | AECOM (May 29, 2006).

As per the Palgrave Estates West Subdivision design, the grading of the proposed development ensures minimal regrading of the lots. The proposed lot grading as depicted on Drawing C101 is consistent with the original Palgrave Estates West Subdivision Design. The Post-Development Drainage Plan (Figure 2) was derived from the Grading, Erosion & Sediment Control Plan (Drawing C101) and consists of two catchments. The catchments drain to Buckstown Trail and the Block 37 stormwater management pond.

Stormwater Management

The Stormwater Management Design is required to comply with the Town of Caledon Development Standards Manual (V5, 2019). Table 1 provides a summary of the stormwater management criteria based on the stormwater management design guidelines.

Control Parameter	Summary				
Quantity Control	Must maintain the grading intent and catchment areas of the Palgrave Estates West Subdivision design. This ensures components of the stormwater management practices in the approved subdivision (21T-88040 C) are operating consistent with design.				
Quality Control	Achieve Ontario Ministry of the Environment, Conservation and Parks (MECP) Enhanced Level of protection (80% total suspended solids (TSS) removal).				
Water Balance	Retain 5 mm rainfall event.				
Erosion and Sediment Controls	Provided during construction and until the site is stabilized.				

Table 1: Summary of Stormwater Management Criteria

Table 2 summarizes the pre-development drainage conditions of the proposed development.

Catchment	Outlet Description	Area (ha)
101	Buckstown Trail	0.33
102	Stormwater Pond	3.34
Total	•	3.67

Table 2: Summary of Pre-Development Drainage Areas

Table 3 summarizes and compares the post-development drainage conditions of the proposed development based on the Grading, Erosion & Sediment Control Plan (Drawing C101) and the Grading Plan Sheet 2 of 3 (UMA | AECOM, May 29, 2006).

Catchment	Outlet Description	Proposed Drainage Conditions (SEE FIGURE 2) Area (ha)	Palgraves Estates West Subdivision Design Grading Plan (Sheet 2 of 3) (SEE FIGURE 3) Area (ha)	Change in Area (ha)
201	Buckstown Trail	1.30	1.32	0.2 ha
202	Block 37 Stormwater Pond	2.37	2.35	-0.2 ha
Total	-	3.67	3.67	0.0 (NET)

Table 3: Summary of Post-Development Drainage Areas

The post-development drainage areas of the Grading, Erosion & Sediment Control Plan (Drawing C101) were compared to the post-development drainage areas of the Grading Plan Sheet 2 of 3 (UMA | AECOM, May 29, 2006). The drainage area towards Buckstown Trail, represented in Catchment 201. The area to Block 37 Stormwater Management Pond, Catchment 202, has decreased by 0.02 ha. Catchment 201 and 202 ultimately drain to the Block 37 Stormwater Management Pond. With a net change of 0.0ha between Catchment 201 and 202, the design of the grading is in general conformance with the original master grading plan of the Palgrave Estates West Subdivision. Therefore, no additional stormwater management requirements are needed as the proposed development maintains the Palgrave Estates West Subdivision design practices.

It is assumed that the stormwater quality control and water balance measures for the Palgrave Estates West Subdivision design was done through the operation of the Stormwater Management Pond on Block 37. Therefore, the proposed development of Lot 30 to 33 will not require additional lot level controls to achieve water quality and water balance criteria.

As per Grading Plan Sheet 2 of 3 (UMA | AECOM, May 29, 2006), there is a Regional Storm Line with an elevation of 293.35 m. Grading, Erosion & Sediment Control Plan C101 shows this contour elevation within Lot 30. The proposed structures and septic system contain elevations higher than the Regional Storm Line. This was done so the Regional storm will not impact the useability of the lot. This includes the Regional storm not flooding into the septic bed and building. Disturbances within the floodplain have been approved within the Palgrave Estates West Subdivision Design. Since the Stormwater Management Pond adjacent to Lot 30 was constructed within the floodplain, we do not anticipate any floodplain issues within Lot 30.

Lot Level Measures

Lot level measures can be applied at the individual Plot Plan stage of each lot to further promote at-source retention of stormwater. These measures include:

- Disconnecting and redirecting roof leaders to rain barrels or to grassed/landscaped areas.
- Grassed swales and vegetated filter strips

We recommend that these techniques be incorporated into the building permit stage of development to further promote the natural infiltration of stormwater runoff.

Erosion and Sediment Controls During Construction

Erosion and sediment controls will be installed prior to the start of any construction activities and will be maintained until the site is stabilized or as directed by the Site Engineer or the Town of Caledon. The contractor is to inspect the ESC after each significant rainfall event to ensure they are maintained in proper working condition.

Sediment Control Fencing

Sediment control fencing in accordance with Town of Caledon Standard Drawing 304 will be installed on the perimeter of the site to intercept sheet flow. Adjacent to the sensitive EPA lands, double silt fence with straw bales will be installed for additional protection. Based on field decisions, the Site Engineer and the Owner may add additional sediment control fencing prior to, during, and following construction.

Sediment Control for Catchbasins

Sediment control device will be installed in the existing nearby storm sewer catch basins. The sediment control device will provide sediment control to prevent silt and sediment from entering the stormwater system.

Conclusion and Recommendations

Based on the information provided by this brief, we offer the following conclusions:

- As part of Palgrave Estates West Subdivision application 21T-88040 C, Oak Ridges Moraine Conservation Plan policies has been satisfied and has received Toronto and Region Conservation Authority (TRCA) approval.
- Post-development drainage conditions are consistent to pre-development drainage conditions.
- Stormwater surface drainage from the proposed development is conveyed to two (2) separate areas: Buckstown Trail, and the Block 37 Stormwater Management Pond west of the property as per drainage design found on Sheet 2 of 3 Grading Plan (UMA | AECOM, May 29, 2006)
- The Grading, Erosion & Sediment Control Plan (Drawing C101) follows the grading intent of Sheet 2 of 3 Grading Plan (UMA | AECOM, May 29, 2006) and employs the same stormwater management strategies that were approved by the Town of Caledon.
- The stormwater quality control and water balance for the site is satisfied through the subdivision design of the Palgrave Estates West Subdivision (21T-88040 C).

Based on the above conclusions, we recommend the development of the proposed residential development on Lots 30 to 33, Town of Palgrave from a stormwater management perspective.

Sincerely,

C.F. CROZIER & ASSOCIATES INC.

Peter Smuczak, P.Eng. **Project Engineer**

PS/cj

Encl.

C.F. CROZIER & ASSOCIATES INC.

Rob Babic, P.Eng. Project Manager

Grading, Erosion & Sediment Control Plan Drawing C101: Figure 1: Pre-Development Drainage Plan Figure 2: Figure 3:

Post-Development Drainage Plan Drainage Area Sketch of Grading Plan Sheet 2 of 3 (UMA | AECOM, May 29, 2006)

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	Check	P.S.	Check	T.E.	Scale 1	1:500 Dwg.	FIG.2





Block 38, Block 38,
Project: PalgraveCreated By: OSDate: 2022.04.18Project No.: 2262-6328Checked By: PSUpdated: 2022-05-10

	Residentic	al Sewage Sys	tem Design			
Data Inputs:						
	Number of Bedrooms	5	Number of bed rooms, if there is a den			
	Finished Floor Area	392.57 m ²	Reference Alliance Homes House Plan			
	Number of Fixture Units	44 units	See attached fixture unit worksheet			
	Soil Percolation Rate ('T' Time)	50 min/cm	Design percolation rate			
Design Flow	, Q:					
-	Base Flow	2,500 L/day				
+	Additional Flow	0 Bedrooms ov	ver 5			
		0 L/day				
or +	Additional Floor Area	1, 926 L/day	193 sq.m above 200 sq.m, 100 L/d per 10 sq.m			
		0 L/day	0 sq.m above 400 sq.m, 75 L/d per 10 sq.m			
		0 L/day	0 sq.m above 600 sq.m, 50 L/d per 10 sq.m			
		1,926 L/day				
or +	Additional Fixture Units	1,200 L/day	24 fixtures above 20 fixtures			
	Q =	4,426 L/day	Total daily design flow			
	Q =	4,500 L/day	Design Flow			
eptic Tank	Sizing:		-			
Size f	for two times the daily flow of	4,500 L/day				
	Required septic tank size	9,000 Litres				
Recommended septic tank size		10,000 Litres	Constructed as per OBC 8.2.2.3.			
		2.200 Imp. Gal.				
'reatment a	nd Disposal System					
			Por Waterlee Biefilter 2017 (Orangeville			
	Angerobic Digester Size:	11.300 Litres	Precast)			
	Treatment:	Waterloo Biofilter AD-I	3A45•			
	Disposal:	Type A Dispersal Bed				
Viennaal Sva	tom	Type / Dispensar bea				
hsposal sys	Stope Laver					
	Sione Layer:	200				
	min. depin =	200 mm				
	min. dred –	Q/50	Based on Q>3,000L			
		90.0 sq.m	Law with Since min great 50, 2 congrete			
	Provided (2x):	9.0 m	stope lavers are required			
		5.0 m	Width siene layers are required.			
		90.0 sq.m	Area			
	Sand Layer:					
	min. depth =	300 mm				
	min. area =	QT/400	Since native T is greater than 15 min/cm			
			Mantle must extend 15 m from distributior			
		562.5 sq.m	pipe			
	Provided:	28.5 m	Length			
		20.0 m	Width			
		570.0 sa.m	Area			



Project:Block 38, PalgraveCreated By:OSProject No.:2262-6328Checked By:PS

Residential Sewage System Design

Fixture Units:

OBC Reference: Table 7.4.9.3 Minimum Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures

Fixture		Load	blank	Basement	1st Floor	2nd Floor	blank	Units
Tub/S	Shower	1.5		1		1		3.0
Whir	rlpool	1.5				1		1.5
То	pilet	4.0		1	1	3		20.0
Lave	atory	1.0						0.0
Bio	det	1.0						0.0
Kitche	en Sink	1.5			2			3.0
Othe	er Sink	1.5		1	1	5		10.5
Connected	d Dishwasher	0.0			1			0.0
Separate	Dishwasher	1.0						0.0
Shc	ower	1.5				2		3.0
Bathroo	om Group	6.0						0.0
Clothes	s Washer	1.5			1			1.5
Laundry Tub/Sink		1.5			1			1.5
50mm Fl	loor Drain	2.0						0.0
75mm Fl	loor Drain	3.0						0.0
Othor	Sauna	0.0						0.0
Oner.	Fridge	0.0						0.0
						TOTAL FIX	TURE UNITS	44.0