NOVATECH
Engineers, Planners & Landscape Architects

M E M O R A N D U M

DATE: JUNE 27, 2019 **PROJECT: 100149**

TO: MATT CRAIG (MVCA), KEVIN HALL (CITY OF OTTAWA)

FROM: MICHAEL PETEPIECE

RE: 2727 CARP ROAD - 1384341 ONTARIO INC.
OUTLINE FOR DETAILED STORMWATER MANAGEMENT
DESIGN BRIEF

CC: BEN HOULE (CAVANAGH DEVELOPMENTS)

This memorandum has been prepared in support of the Draft Plan submission for the Newill Corporation Subdivision located at 2727 Carp Road in the City of Ottawa. A conceptual stormwater management (CSWM) report for this development was previously submitted in 2003. Since this time, the density of lots, the configuration of the road network, and the stormwater management criteria have changed.

The MVCA provided comments on November 14, 2018 requesting that the 2003 Stormwater Management Report be updated to address additional constraints identified through the headwater report and the updated hydrogeological report, and the findings and recommendations of the Carp River Watershed/Subwatershed Study (2004).

This memo provides an update to the stormwater management design criteria and outlines how the proposed design would address the revised criteria and incorporate the findings and recommendations of the above noted studies and reports. The MVCA have agreed (telecon February 25, 2019) that a memo would be sufficient for Draft Approval and that a detailed stormwater management report would be prepared to address draft conditions in support of final approval of the subdivision.

1.0 BACKGROUND INFORMATION AND REPORTS

1.1 Changes since the 2003 CSWM Report

Lot Density and Layout

- Lot density has increased based on average lot size of 0.80ha and the number of lots has increased from 62 to 78.
- The updated hydrogeological report supports the current lot density and layout.
- The proposed lot density is consistent with the “Official Plan for the West Carleton Planning Area, Section 6(10)(b) - Specific Land Use Policies” which governs the minimum lot size requirements for the proposed development.

Outlet to Huntley Creek

- The 2003 layout directed all storm runoff from the development (including upstream drainage) to a new outlet to Huntley Creek at the proposed road crossing of the watercourse.

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- The proposed lot layout and site grading have been revised to accommodate an existing headwater tributary of Huntley Creek, which has resulted in changes to the proposed drainage patterns and outlet locations. The Preliminary Grading Plan (100149-PGR) includes the following outlets to Huntley Creek:
    - The headwater tributary will be realigned to run through the side and rear yard lots of the development, separate from the roadside drainage system, and will tie back into the existing channel in the rear yard of Lot 58 before outletting to Huntley Creek.
    - The roadside ditches on Street 3 east of the high point adjacent to Lots 5 and 19 will connect to an existing outlet to Huntley Creek in the south east corner of the site.
    - A new outlet to Huntley Creek is proposed from the south end of Cyd Street to Huntley Creek, on Lot 33.
    - A new outlet to Huntley Creek may be added on between Lot 52 and Lot 57, depending on the detailed topographic survey and detailed grading and drainage that will be completed to clear draft conditions.

1.2 Carp River Watershed/Subwatershed Study (Robinson, 2004)

Huntley Creek is a tributary of the Carp River. The Carp River Watershed/Subwatershed Study (CRSWS) was completed in 2004 and identifies targets and criteria for the protection of surface and ground water resources in the watershed:

- Huntley Creek is a natural stream with good water quality and coldwater fish habitat, fair water quality based on benthic invertebrate community.
- Most of the site is considered a high or moderate groundwater recharge area. The CRSWS identifies the following groundwater recharge targets:
    - 73 mm/yr infiltration for low recharge areas
    - 104 mm/yr infiltration for moderate recharge areas
    - 262 mm/yr infiltration for high recharge areas
- The CRSWS identifies the following aquatic resource targets:
    - Maintain and restore Tolerant Coldwater/Diverse Warmwater Fish Communities
    - Maximum stream temperature = 25°C (coldwater); 28°C (warmwater)
    - Minimum Dissolved Oxygen = 6 mg/l

1.3 Headwaters Report – 2727 Carp Road (Bowfin, June 2018)

Bowfin Environmental Consulting prepared a Headwater Report for the subject site in accordance with the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (CVC/TRCA, January 2014). The following provides a summary of the findings and recommendations from this report.

An existing tributary of Huntley Creek flows across the southern portion of the proposed development. This watercourse serves as the outlet for rural residential subdivision west of William Mooney Road. The channel is straight and contains culverts to facilitate agricultural access. There are no signs of erosion in the existing channel. There is extensive canopy cover at the upper end of the site and no canopy cover near the confluence with Huntley Creek.

The watercourse has a management recommendation of “Conservation” and is to be incorporated into the overall subdivision design in accordance with the *Guidelines*.

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1. Recommend that the channel be maintained, relocated or enhanced. If relocated, it should be done following natural channel design principles.
2. Maintain or replicate existing groundwater and/or wetland contributions. Any loss of drainage area should be restored using lot level controls, as feasible.
3. Maintain or replace on-site flows if necessary.
4. Maintain or replace external flows; and
5. Drainage feature must connect to downstream drainage.

1.4 Natural Hazard Mapping / Development Setbacks (MVCA)

MVCA has developed regulation mapping for Huntley Creek, which delineates the 100-year floodplain, meander belt, and erosion hazard limits for the site. The revised lot layout and concept plan indicates that all development will be located outside the hazard areas, with the exception of the proposed road connection to Carp Road which is located within the 100-year floodplain. A preliminary cut/fill analysis has been completed to demonstrate that compensation can be provided for the construction of the road. At detailed design, it will be demonstrated that there is no impact to velocity, storage, or increased erosion associated with any of the works inside the MVCA regulation limits.

2.0 SWM CRITERIA AND GUIDELINES FOR DEVELOPMENT

The SWM Criteria from the 2003 report have been revised and updated to reflect the new lot layout and to incorporate the findings and recommendations of the Carp River Watershed/Subwatershed Study and the Headwaters Report.

2.1 Development Setbacks

- Ensure no site disturbances within the greater of:
    - 30m from the normal high water level;
    - Meander belt;
    - 100-year floodplain.

2.2 Quantity Control

- Provide on-site quantity control to limit post-development peak flows to pre-development levels for all storms up to and including the 100-year design event.

2.3 Erosion & Flood Protection

- Ensure the developed area of the proposed lots are outside the natural hazard limits identified in the MVCA regulatory mapping.
- Complete a cut/fill analysis to demonstrate that compensation can be provided for all proposed works within the 100-year floodplain.

2.4 Quality Control

- Provide an *Enhanced* level of water quality treatment corresponding to 80% long-term removal of total suspended solids.

2.5 Water Balance and Temperature

- Incorporate measures to maximize infiltration and minimize water temperature increases to address the targets of the CRSWS.

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2.6 Headwater Drainage Feature

- Incorporate the headwater drainage feature into the overall subdivision design, including measures to help mitigate run off impacts on the creek corridor and ensure the baseline flow of the headwater feature. Typical rural residential development Best Management Practices (BMPs) would be sufficient.

2.7 Erosion and Sediment Control

- Minimize erosion and the volume of sediment during and after construction.

3.0 PROPOSED DRAINAGE AND STORMWATER MANAGEMENT DESIGN

The stormwater management design will reflect the new lot layout and road pattern and address the SWM criteria and guidelines for lot development described in Section 2.0.

Lot Development and Constraints Plan

- The proposed design will ensure no site disturbances within the development setbacks shown on the Lot Development and Constraints Plan (refer to Drawing 100149-LDC).
- The Preliminary Grading Plan (refer to Drawing 100149-PGR) has been prepared to show the proposed road grading and preliminary drainage patterns.

Ditches and Culverts

- Conveyance of storm runoff will be provided using roadside ditches and culverts. The drainage system will be sized to ensure that storm runoff is confined within the rights-of-way and to meet safe access criteria as per MVCA regulation policies.
    - Driveway culverts will be sized to convey the 5-year event peak flows and will have a minimum size of 500mm, unless otherwise required for stormwater quantity control.
    - Road crossing culverts will be sized to convey the 10-year event peak flows and will have a minimum size of 600mm.
    - Subdrains will be installed under the roadside ditches in suitable areas to promote infiltration and groundwater recharge.
    - Roadside ditches will have a minimum slope of 0.5%.

Stormwater Quality Control

- The proposed development will incorporate a treatment train of Best Management Practices (BMPs) to provide an *Enhanced* level of water quality treatment, including:
    - Flat-bottomed grassed swales
    - Enhanced grassed swales with subdrains
    - Vegetated filter strips
    - Reduced lot grading
    - Directing roof and driveway runoff to grassed areas
- Storm runoff from the roadways will be treated before discharging to the headwater feature.

Stormwater Quantity Control

- Flow attenuation will be provided using storage in the roadside ditches.

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- A hydrologic analysis will be completed as part of the detailed design to establish allowable release rates and demonstrate that the on-site ditches will provide sufficient storage to meet the quantity control targets.

Water Balance and Temperature

- The stormwater management design will incorporate Low Impact Development (LID) design features in select areas to promote infiltration and groundwater recharge. Proposed LID features would include designing some section of the roadside ditches as bioretention swales with subdrains.
- The design and location of LID features will be based on soils information from the geotechnical investigation.
- The proposed BMPs and LID features will reduce temperature impacts on the receiving watercourses and will help maintain the coldwater fish habitat in Huntley Creek.
- A water balance will be completed to evaluate the impact of development on the hydrologic cycle and demonstrate that the proposed stormwater management design will meet the annual infiltration targets identified in the CRSWS.

Headwater Drainage Feature

- The existing headwater feature will be realigned to run through the side and rear yard lots of the development and will be designed following natural channel design principles (refer to Drawing 100149-LDC).
- Disturbed areas will be replanted with locally grown native species.
- The proposed alignment for the headwater feature maintains the length of the existing channel.
- The headwater feature will maintain existing drainage patterns and will continue to receive and convey runoff from the lands west of William Mooney Drive.
- Best management practices will be incorporated into the design of the subdivision to maintain groundwater contributions to the headwater feature.
- The realigned headwater feature will tie back into the existing channel upstream of the confluence with Huntley Creek. There are no proposed modifications within the 30m setback from Huntley Creek.

4.0 CONCLUSIONS

This memo provides an overview of the drainage and stormwater management criteria that will govern the design of the Newill Corporation Subdivision, including the findings and recommendations of the headwater report, the updated hydrogeological report, and the Carp River Watershed/Subwatershed Study.

A stormwater management report will be prepared in support of the detailed design submission to demonstrate how the proposed design addresses the SWM criteria and incorporates the proposed design features outlined in this memo.

Attachments

- Lot Development and Constraints Plan (100149-LDC, revision 8)
- Preliminary Grading Plan (100149-PGR, revision 1)

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LEGEND

- 30m SETBACK LINE (FROM NHWM)
- MEANDER BELT (PROVIDED BY MVCA)
- 1:100 YR FLOODPLAIN (PROVIDED BY MVCA)
- REGULATORY LIMIT (PROVIDED BY MVCA)
- PROPOSED PHASE LIMITS
- PROPOSED REALIGNED HEADWATER FEATURE
- PROPOSED 30m CORRIDOR WIDTH
- PROPOSED SPLIT RAIL FENCE
- PROPOSED RAISED SEPTIC SYSTEM
- PROPOSED BUILDING ENEVELOPE (2500ft²)
- PROPOSED WELL LOCATION
- EXISTING TEST WELL LOCATION
- EXISTING MONITORING WELL LOCATION
- EXISTING BUTTERNUT TREE LOCATION WITH 25m SETBACK

PROPOSED SEPTIC SYSTEM DETAILS:

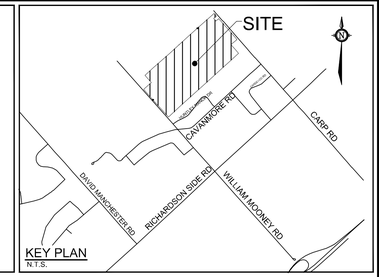
LOCATION	DESIGN FLOW (L/day)	# OF RUNS	LENGTH OF RUNS	IMPORTED SAND (min/cm)	SIDE SLOPES	LOADING RATE (L/m2/day)	LOADING AREA REQUIRED (m2)	LOADING AREA PROVIDED (m2)
LOTS 1-78	3500	8	17.5	8	3:1	4	875	877
BLOCK 79 AND 82	1635	6	12	8	3:1	4	408	618
BLOCK 80	1050	6	8	8	3:1	4	262	542
BLOCK 81	2785	8	15	8	3:1	4	696	877

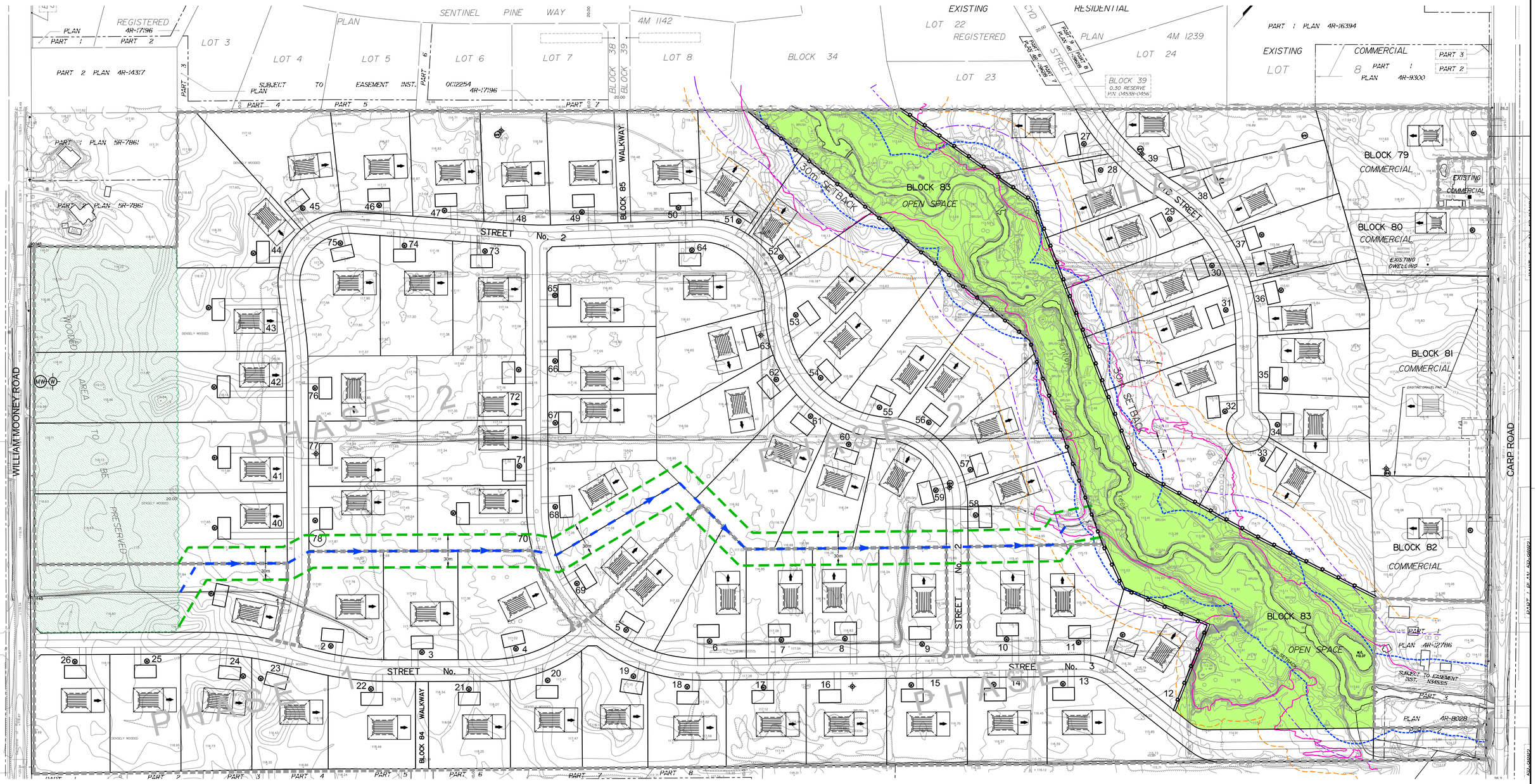
RR4 and RC9 Zoning Provisions

I	II	III	IV	V	VI		VII	VIII	IX	X	XI
ZONING MECHANISMS	**Minimum Lot Area (m2)**	**Minimum Lot Width (m)**	**Minimum Front Yard Setback (m)**	**Minimum Rear Yard Setback (m)**	**Minimum Interior Side Yard Setback (m)**		**Minimum Corner Side Yard Setback (m)**	**Maximum Height (m) -Principal Building**	**Maximum Lot Coverage (%)**	**Landscaping of Yards**	**Outdoor Storage**
					Abutting a residential zone	All other zones					
RC9	4000	30	10	10	4.5	3	6	11	25	required front and corner side yards to be landscaped, except for driveways crossing the front or corner side yard leading to a parking area	outdoor storage permitted in interior side and rear yard only; must be screened and concealed from view from abutting streets and from abutting non-commercial or non-industrial zones
RR4	4000	30	7.5	15	4.5		3	4.5	11	N/A	N/A

NORTH

KEY PLAN
N.T.S.





NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
8	REVISED PER COMMENTS	JUN 27/19	LAB
7	ISSUED FOR COORDINATION	MAY 28/19	LAB
6	ISSUED FOR COORDINATION	MAY 9/19	LAB
5	REVISED FOR COORDINATION	JUL 11/18	LAB
4	REVISED FOR COORDINATION	APR 06/18	LSC
3	ISSUED FOR COORDINATION - REVISED NTW LOCATIONS	JUL 21/17	SM
2	ISSUED FOR COORDINATION	MAY 12/17	DJC
1	ISSUED FOR COORDINATION	MAY 10/17	DJC

SCALE
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0 15 30 45 60

DESIGN DJC
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FOR REVIEW ONLY

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CITY OF OTTAWA
2727 CARP ROAD

LOT DEVELOPMENT AND CONSTRAINTS PLAN

PROJECT No. 100149-00
REV REV # 8
DRAWING No. 100149-LDC

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LEGEND

- PROPOSED ELEVATION
- *EXISTING ELEVATION*
- PROPOSED HIGH POINT
- PROPOSED LOW POINT
- PROPOSED SLOPE
- PROPOSED CULVERT
- PROPOSED DITCHES/SWALES AND DIRECTION OF FLOW
- PROPOSED EDGE OF ASPHALT
- 30m SETBACK LINE (FROM NHWM)
- MEANDER BELT (PROVIDED BY MVCA)
- 1:100 YR FLOODPLAIN (PROVIDED BY MVCA)
- REGULATORY LIMIT (PROVIDED BY MVCA)
- PROPOSED PHASE LIMITS
- PROPOSED REALIGNED HEADWATER FEATURE
- PROPOSED 30m CORRIDOR WIDTH

NORTH

KEY PLAN
N.T.S.

SITE
SYCAMORE RD
CARP RD
DAVID MANCHESTER RD
RICHARDSON SIDE RD
WILLIAM MOONEY RD

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No.	REVISION	DATE	BY
1	ISSUED FOR COORDINATION	MAY 28/19	LKS

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CITY OF OTTAWA
2727 CARP ROAD

PRELIMINARY GRADING PLAN

PROJECT No. 100149-00
REV REV # 1
DRAWING No. 100149-PGR