Kollaard Associates
Engineers
210 Prescott Street, Unit 1
P.O. Box 189
Kemptville, Ontario K0G 1J0

Civil • Geotechnical •
Structural • Environmental •
Hydrogeology •

(613) 860-0923
FAX: (613) 258-0475

SERVICING BRIEF

PROPOSED COMMERCIAL BUILDINGS
3904 MARCH ROAD
CITY OF OTTAWA
ONTARIO

Prepared For:
Dog World Bedrock Kennels
3904 March Road
Carp, Ontario
K0A 1L0

PROJECT #: 190622

DISTRIBUTION

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TABLE OF CONTENTS

1 INTRODUCTION

Kollaard Associates Inc. was retained to complete the site grading, stormwater management design and on-site septic system design for the proposed site works at 3904 March Road, Carp Ontario. The proposed civil engineering designs include site servicing, grading and stormwater management.

This brief will summarize the servicing requirement aspects of the proposed development with respect to water and sanitary requirements and summarize the water and sanitary design intended to meet the proposed development requirements. The brief will also provide a summary of the stormwater management design.

1.1 Background

For the purposes of this report, March Road is considered to be oriented along an east west axis. The site is part of a property located along the south side of March Road and is currently occupied by the existing Dog World Bedrock Kennel Facility and the main residential dwelling of the Facility owners. The subject site is part of a property that is relatively rectangular in shape with an average width of about 180 metres and a total surface area of about 9.6 hectares. The gravel driveways and buildings occupy about 2% of the property. The land cover of the property currently consists of about 44% grass and 54% woodland. The majority of the area that is affected by the existing and proposed development is within the grass covered portion of the property.

The portion of the property considered to be potentially affected by the existing and proposed developments will be referred to as the site. The site has an area of 4.206 hectares and is currently occupied by the main dwelling with a foot print of about 229 m^2. The site also contains various dog kennels, outbuildings and storage sheds which have a combined area of about 1441 m^2 and is used as a dog boarding, training centre, and grooming facility. The buildings occupy 0.2% of the lot area. The buildings are serviced by existing gravel surfaced driveways that have a combined surface area of about 2638 m^2.

The occupancy of the existing facility consists of an existing dog kennel having 20 runs, and an existing barn/dog kennel having 9 runs. There are currently 12 employees.

The existing facility is provided with private water and sanitary services. The sanitary service consists of a Class 4 – Conventional Leaching Bed complete with a double chamber septic tank all designed for a flow rate of 2700 Litres/day. The existing conventional leach bed is located at the north east corner of the site. The existing bed will remain in place to receive sanitary effluent from the existing dwelling only.

The private water services provide potable water from an existing well located within the footprint of the existing dwelling. This well will be replaced with a drilled cased well located southwest of the existing building.

There are no stormwater management facilities associated with the existing development. Runoff from the existing development is directed to the ground surface adjacent the building and parking surfaces and disperses by means of sheet flow to the undeveloped portions of the property.

1.2 Proposed Development

The project consists of the construction of two additional commercial buildings for the dog boarding and training facility. The buildings are to be constructed in phases. The phase 1 building is to consist of a 445 m^2 Indoor Dog Gym/Play Area. The phase 2 building is to consist of a 153 m^2 Dog Kennel. The driveway will be expanded to provide fire truck access to the proposed new development. Both phases of the development are being considered in this report.

The proposed dog kennel will contain an additional 20 runs. The proposed development will result in an additional 6 employees.

Both of the proposed buildings will be constructed in the gravel and grass surfaced yard area south of the existing buildings currently used by Dog World. Due to the presence of the existing buildings and roadway network, there are no significant grade changes proposed within the area of development.

Water services will be provided by means of a drilled cased well installed in September of 2020.

Sanitary services for the Dog Kennel Facility (including both the existing and proposed buildings) will be provided by means of a conventional leaching bed installed about 18 metres south of the existing bed. The proposed bed will be designed for a daily sewage flow of 5025 Litres per day.

A stormwater management facility will be constructed to provide both quantity and quality control in order to meet criteria provided by the City of Ottawa and the Mississippi Valley Conservation Authority.

2 SANITARY SERVICES

As previously indicated, the existing residential dwelling and kennel facility is serviced by conventional septic system designed for a sewage flow of 2700 Litres/day. Also as previously indicated, it is proposed that a new septic bed will be constructed to service the existing kennel and proposed expansion independent of the existing residential dwelling.

The design flow for the proposed septic bed is calculated using the Ontario Building Code 8.2.1.3. and is summarized in the following table:

Establishment Item	Daily Volume / Item L/Day/Item	Quantity of Items	Flow (L/day)
Existing Kennel			
per cage	75	20	1500
per employee	75	6	450
Existing Barn / Kennel			
per cage	75	9	675
per employee	75	6	450
Proposed Kennel			
per cage	75	20	1500
per employee	75	6	450
Total			5025

It is noted that the proposed gym/indoor play area will not result in additional runs or employees.

The proposed sanitary service will be provided by an onsite sewage disposal system consisting of a conventional system designed in accordance with Part 8 of the Ontario Building Code.

Details of the onsite sewage disposal system are provided on Kollaard Associates Inc. drawing # 190622-1 and in the septic system application prepared for the Ottawa Septic System Office.

Since the combined daily design flow rate of the residential dwelling and Kennel facility is (2700 + 5025) = 7725 L per day is less than 10,000 Litres per day the septic system design is governed by the Ontario Building Code and an application will be made with the Ottawa Septic System Office.

3 WATER DESIGN

3.1 Well Installation

As previously indicated, the existing well will be replaced with a drilled cased well installed in September 2020.

The well was drilled to a total depth of 18.3 metres below the existing ground surface and has been grouted and cased to a depth of about 6.4 metres below the existing ground surface, according to information provided on the well record. The well is physically separated from the driveway by at least 3 metres.

The well casing must extend to greater than 400 millimetres above grade at the time of construction. It should be verified that the top of the well casing is at least 400 millimetres above the finished grade at the well location.

Additionally, the ground surface shall be graded such that the well is the highest point on the ground surface within 3 metres radially from the exterior of the well casing and shall ensure that water does not collect or pond near the well head. With these measures in place, it is considered that an adequate amount of wellhead protection is going to be in place to protect the water supply for the proposed commercial use of the property. The well location is also appropriate for access in case of repairs and well maintenance.

3.2 Water Demand

The water demand is calculated using the information from the sewage system daily design flow and the City of Ottawa Water Distribution Guidelines, 2010. The calculations are as follows:

Commercial Daily sewage design flow:

- Existing (29 cages plus 12 employees) and Proposed Dog Kennel (plus additional 20 cages and 6 employees)
- 75 litres per cage x 49 cages = 3,6755 L/day
- 75 litres per employee x 18 employees = 1350 L/day
- Total Commercial design flow = 5,025 L/day

Existing Residential Water demand:

- 4 bedroom home, per person water demand based on 450 L/day per person = 2,250 L/day
- MHD = 5 x 3.75 L/min/person = 18.75 L/min

TOTAL WATER DEMAND = 7,275 Litres Per Day

Since sewage system design is based on the maximum expected daily use, it is equivalent to the Average Daily Demand (ADD). The ADD is based on an eight hour operation schedule (i.e. full day occurs over an eight hour period and not over 24 hours).

City of Ottawa calculates the Maximum Hour Demand (MHD) for a commercial or industrial demand to be 1.8 x MDD.

MDD Commercial = 5,025 litres / day x 1 day / 8 hours x 1 hour / 60 minutes
= 10.5 litres / minute

MHD = 1.8 x MDD
= 1.8 x 10.5 litres / minute
= 18.9 litres / minute

Alternatively, the City of Ottawa Water Distribution Guideline Section 4.2.8 indicates the average water demand for commercial usage is 28,000 L/gross ha/day. The gross area of the site is 9.6 hectares. However, this is not an appropriate way to calculate the commercial water demand on the site as the site is very sparsely developed over its area. The total building footprint after development (based on the Stormwater Report) is 1,440 square metres, with some 2,640 square metres of gravel surfaced areas. As such, the total developed area (including parking) for the commercial use is 4,080 square metres (0.4 ha). This represents only 4% of the site area. That is the area used for the following calculation.

ADD = 0.4 ha x 28,000 L/gross ha/day
= 7.8 L/min
MDD = 1.5 x ADD
= 11.7 L/min
MHD = 11.7 L/min x 1.8 = 21.1 L/min

Using the more conservative figure for groundwater usage, the City of Ottawa predicated water usage for MDD and MHD of 11.7 L/min and 21.1 L/min, respectively, are used. As the well is

also supplying water for residential demand, the peak residential demand rate is also considered as an additional water demand of 18.75 L/min. It should be noted that these peaks are unlikely to coincide as residential peaks occur usually early in the morning and in the early evening, whereas commercial water demand is typical throughout the daily operations between 8 am and 5 pm.

The Maximum Hourly Demand (MHD) for the site based on its proposed use is expected to be about ~39.9 litres/minute.

3.3 Available Water Supply

The well was developed by the well drillers at a rate of about 45 litres per minute for a period of 1 hour. During the this time the water level in the well dropped by about 0.15 metres.

The well was pumped during testing for six hours at a pumping rate of about 57 litres per minute. Over the course of the pumping test, the water level in the well dropped some ~0.4 metres. At the end of the pumping test, about 3 hours and 10 minutes was required for 100 percent recovery of the total drawdown in the static water level created during pumping. Over the course of the six hour test, some ~20,450 litres of water was pumped from the well and only 3% of the available drawdown was used. The available drawdown at the well is about 12.9 metres (based on recommended pump intake and static water level at the time of the test). As the expected maximum daily water demand is about 7,275 litres per day, the expected drawdown at the well is well within the available drawdown for the well.

Based on the development and pump testing, the yield of the drilled cased well installed in September of 2020 is sufficient to meet the commercial and residential demands at the site.

The hydrogeology report should be referenced with respect to water treatment recommendations.

3.4 Fire Fighting Supply and Storage

Fire water supply and storage on site is a requirement under Part 3 of the Ontario Building Code. Since the proposed buildings are located more than 20 metres from any existing structure, have a combined area under 600 square metres and have a major occupancy of D, the buildings are considered to be Part 9 Buildings with respect to the Ontario Building Code. As such, onsite fire water supply and storage is not required for this site.

The individual proposed buildings will be spaced greater than 8 metres apart. Based on the exposed face area and area of unprotected openings between the two proposed buildings, the limiting distance is 3 metres. As such the proposed spacing exceeds the limiting distance.

4 STORMWATER DESIGN

The stormwater design for the proposed development is provided the report prepared by Kollaard Associates Inc.: *Stormwater Management Proposed Commercial Development 3904 March Road, Carp, Ontario* dated April 5, 2022.

The stormwater management facility will consist of a series of level spreader dams which will be located all around the proposed area of development. The level spreader dams will be constructed parallel to the existing contours of the ground surface at the limit of the proposed development. Where the level spreader dams are discontinuous, they will slightly overlap to ensure that all runoff from the development area will directed through and over the level spreaders.

The stormwater management facility has been designed to provide both quantity control and quality control in accordance with criteria provided by the City of Ottawa and the Mississippi Valley Conservation Authority.

The runoff from the site will be controlled such that the post-development runoff will be less than or equal to the pre-development runoff for all storm events up to and including the 100 year storm event. The facility has been designed to ensure a minimum treatment level corresponding to an enhanced level of treatment and to ensure runoff does not convey contamination related to canine sanitary waste from the site.

4.1 Design Summary

As previously indicated, the site is part of a property located on March Road in the City of Ottawa with a total area of 9.6 hectares. For the purposes of the stormwater management, the portion of the property considered to be potentially affected by the existing and proposed developments will be referred to as the Site. The site has an area of 4.206 hectares and is currently occupied by assorted buildings and a gravel surfaced roadway for the dog training and boarding facility (known as Dog World). The City Ottawa criteria states that the pre-development conditions will consider the existing dwelling, and driveway as the existing impervious surfaces. Therefore any existing assorted buildings and associated gravel surfaced areas related to the assorted buildings on the site with the exception of the dwelling were not considered in the pre-development calculation.

Peak Flow for runoff quantities for the Pre-Development and Post-Development stages of the project were calculated using The hydrologic modeling software, Visual OTTHYMO (V2.6.3) as well as the modified rational method for comparison.

For the purposes of this storm water management design, the site has been divided into uncontrolled and controlled areas. The controlled areas are defined as area CA1 and uncontrolled areas are defined as UA1. The uncontrolled area consists of the area between the level spreader dams and the property lines as well as the grassed surfaced area between the development and March Road down gradient of the proposed development. The remainder of the area within the site is considered to be controlled.

Stormwater runoff originating within the developed area of the site will be directed by sheet flow the level spreaders around the development. The level spreader dams are intended to reduce the runoff rate and runoff volume by promoting infiltration and redistributing any concentrated runoff from the development area to match existing runoff patterns. The level spreader dams will ensure that the post-development runoff conditions will match the pre-development runoff conditions.

The level spreaders will provide sufficient storage to ensure the post-development runoff is less than or equal to the pre-development runoff for all storm events from both a runoff rate and a runoff volume perspective.

The proposed development will have no negative effect to the adjacent lands outside the limit of development.

The stormwater management design will ensure that an enhanced level of treatment corresponding to 80 percent total suspended solid removal is attained for all runoff by means of sedimentation and filtration.

Canine sanitary waste will be managed and disposed of in a manner which will ensure that stormwater runoff from the site will not convey contamination related to canine sanitary waste off the site.

5 EROSION AND SEDIMENT CONTROL

An erosion and sediment control plan will be prepared and implemented at least equal to the stated minimum requirements and to the satisfaction of the City of Ottawa and Mississippi Valley Conservation Authority, appropriate to the site conditions, prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and during all phases of site preparation and construction in accordance with the current best management practices for erosion and sediment control. It is considered to be the owners and/or contractors responsibility to ensure that the erosion control measures are implemented and maintained.

6 CONCLUSIONS

The water and sanitary demands for the proposed development will be met by private services.

The sanitary requirements will be met with an onsite sewage disposal system consisting of a conventional system designed in accordance with Part 8 of the Ontario Building Code.

The water demand will be met by a drilled cased well installed in September of 2020.

Stormwater management will be completed by providing attenuation and treatment within shallow level spreaders. The post-development flow will be less than or equal to pre-development flows for corresponding storm events. An enhanced level of treatment will be provided.

Erosion and sedimentation shall be controlled during development.

We trust that this brief provides sufficient information for your present purposes. If you have any questions concerning this brief please do not hesitate to contact our office.

Sincerely,
Kollaard Associates, Inc.

Steven deWit, P.Eng.