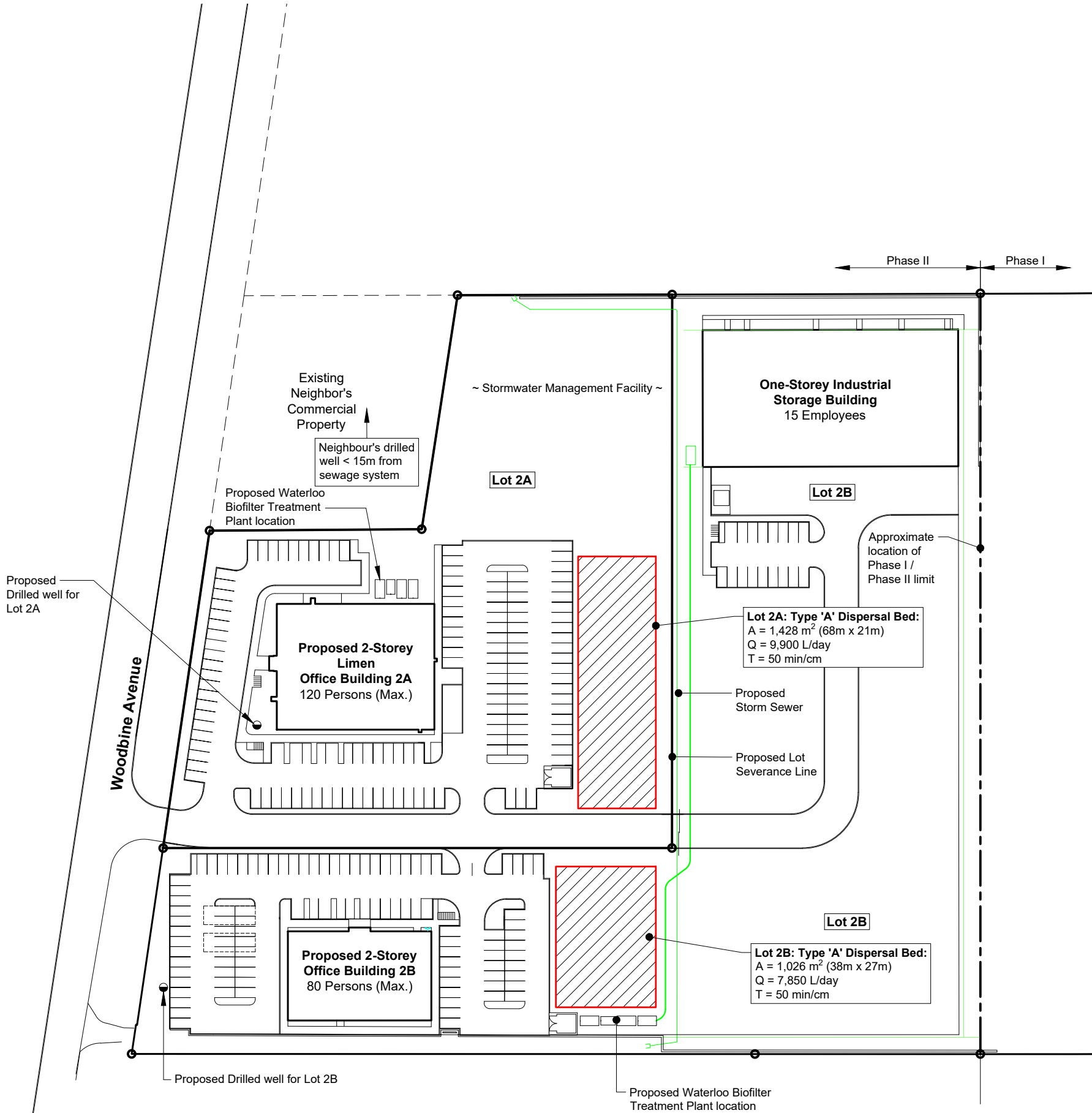


SEWAGE SYSTEM DESIGN PREPARED FOR OP AND ZONING BY-LAW AMENDMENTS. DETAILED SEWAGE SYSTEM DESIGN
'BUILDING PERMIT' DRAWINGS TO BE PREPARED AT TIME OF LOT SEVERANCE AND SITE PLAN APPROVAL

Note: Sewage Flow calculations are based on number of office employees only



Sewage System Details: Waterloo Biofilter Tertiary Treatment
Ontario Building Code Compliance Analysis: Lot 2A

Two Storey Office Building - 2,906 m² (31,280 sf), 120 Employees
Sewage Flow Calculations (Based on OBC Table 8.2.1.3.B (Office Building))
Assume 80% Efficiency of space in Office Building: 2,906 x 0.8 = 2,325 m²
75 L Per 9.3m² of office space: (2,325 / 9.3) x 75 L = 18,750 L/day, OR
75 L Per employee: 120 employees x 75 L = 9,000 L/day, AND
900 L/day contingency / Future allowance

Note: Alternative Solution to be proposed, such that sewage flows are based on number of office employees only

Q = 9,900 L/day [Number of Office Employees governs]: Daily Design Sewage Flow

W.B. Anaerobic Digester:
Anaerobic Digester size = 3 x Daily Design Sewage Flow [To accommodate higher strength sewage: 3 x 9,900L = 29,700 L, Provide 30,000 L (6,800 gal.) single compartment concrete tank (to Waterloo Biofilter specifications).

Dosing Pump Station: Provide 13,500 L (3,000 gal.) pump tank, c/w timed dosing to Waterloo Biofilter Treatment System.

Waterloo Biofilter: Sewage Treatment System (based on Q = 9,900 L / day):
Waterloo Biofilter - Configuration AD-BA100, based on CAN/BNQ 3680-600 Certificate No. 2312. Treatment system is to demand dose (time dosed via pump station) into Type 'A' Dispersal Bed, with recirculation to W.B. Anaerobic Digester.

Soil Percolation: T = 50 min/cm - Native clay soils found during Test Pit Investigation undertaken by Gunnell Engineering Ltd. on November 16, 2021.

Type 'A' Dispersal Bed: (Based on Q = 9,900 L/day, T = 50 min/cm)
1) Washed Stone Layer = Maximum loading = 50 L/sm (Q > 3,000 L); Q / 50 = 9,900 / 50 = 198 m². Designed area: TBD.
2) Absorption Bed (Sand Contact Area): = Q x T / 400 = 9,900 x 50 / 400 = 1,237.5 m². Provide 68m x 21m = 1,428 m².
3) Mantle = TBD

Sewage System Details: Waterloo Biofilter Tertiary Treatment
Ontario Building Code Compliance Analysis: Lot 2B

Two Storey Office Building - 1,876 m² (20,193 sf), 80 Employees
One Storey Industrial Storage Building - 252m² (2,712.5 sf) office area, 15 Employees
Sewage Flow Calculations (Based on OBC Table 8.2.1.3.B (Office Space))
80.0% Efficiency of space in Office Building: 1,876 x 0.80 = 1,501 m²
75 L Per 9.3m² of office space: ((1,501 + 252) / 9.3) x 75 L = 14,137L/day, OR
75 L Per employee: (80 + 15) employees x 75 L = 7,125 L/day, AND
725 L/day future / contingency allowance

Note: Alternative Solution to be proposed, such that sewage flows are based on number of office employees only

Q = 7,850 L/day [Number of Office Employees governs]: Daily Design Sewage Flow

W.B. Anaerobic Digester:
Anaerobic Digester size = 3 x Daily Design Sewage Flow [To accommodate higher strength sewage: 3 x 7,850 L = 23,550 L, Provide 30,000 L (6,600 gal.) single compartment concrete tank (to Waterloo Biofilter specifications).

Pump Station: Provide 13,650 L (3,000 gal.) pump tank, c/w timed dosing to Waterloo Biofilter Treatment System.

Waterloo Biofilter: Sewage Treatment System (based on Q = 7,850 L / day):
Waterloo Biofilter - Configuration AD-BA80, based on CAN/BNQ 3680-600 Certificate No. 2312. Treatment system is to demand dose (time dosed via pump station) into Type 'A' Dispersal Bed, with recirculation to W.B. Anaerobic Digester.

Soil Percolation: T = 50 min/cm - Native clay soils found during Test Pit Investigation undertaken by Gunnell Engineering Ltd. on November 16, 2021.

Type 'A' Dispersal Bed: (Based on Q = 7,850 L/day, T = 50 min/cm)
1) Washed Stone Layer = Maximum loading = 50 L/sm (Q > 3,000 L); Q / 50 = 7,850 / 50 = 157 m². Designed area: TBD.
2) Absorption Bed (Sand Contact Area): = Q x T / 400 = 7,850 x 50 / 400 = 981.25 m². Provide 38m x 27m = 1,026 m².
3) Mantle = TBD

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Rev. No.	Date	Description	CAD
Rev. 3	22-MAR-2023	Revised Flow Analysis	TK
Rev. 2	13-FEB-2023	Revised Building Flows	JK
Rev. 1	19-MAY-2022	Amended Sewage Flows	JK

**Proposed Limen Office
Buildings 2A & 2B
Woodbine Avenue
15123 Fortecon Drive
Town of Stouffville**

**Site Plan: Phase II
Sewage System Layouts**

Scale: 1:1,250	Designed By: JK
Date: 31-MAR-2022	Drawn By: JK
Project No.:	Checked By: EG
D3389	SP-1