

# SEWAGE SYSTEM LOT ANALYSIS ONLY

**Gunnell Engineering Ltd.**  
1110 Stellar Drive, Unit 106  
Newmarket, ON L3Y 7B7  
bus: 905-868-9400  
www.septicdesign.ca



- LEGEND**
- Primary Filter Bed
  - Reserve Filter Bed Area

All Distribution Piping is to be a minimum of:

- 16.7m from drilled wells
- 31.7m from dug wells
- 4.7m from property lines
- 6.7m from residence

Note: Filter Bed system raised 0.85m above finished grade, therefore increase setbacks by 1.7m.

| Rev. No. | Date        | Description              | CAD |
|----------|-------------|--------------------------|-----|
| Rev. 3   | 11-Jun-2025 | Updated Setbacks         | ZB  |
| Rev. 2   | 17-Mar-2025 | Site Plan Update         | DB  |
| Rev. 1   | 15-Jan-2025 | Re-arrange sewage layout | KB  |

**Proposed Residential Development**  
**City of Pickering**  
**Region of Durham**

**Overall Subdivision Plan**  
**(13 Lots) - Typical Sewage Layouts**

|                    |                 |
|--------------------|-----------------|
| Scale: 1:1,750     | Designed By: ZS |
| Date: 13-JULY-2023 | Drawn By: ZS    |
| Project No.:       | Checked By: EG  |
|                    | Drawing No.:    |

**D3534** **SP-1**

Septic Area  
Soil Percolation Time (T) = 20 min/cm to 30 min/cm (30 min/cm used)  
Loading Rate = 8 L/m<sup>2</sup>/day  
Daily Sewage Flow (Q) = 3,000 L/day (min. required)  
Area (prime + reserve) = 750 m<sup>2</sup> (min.) [3,000 / 8 x 2 areas]  
  
\*Based on Durham Region Health Department Lot Sizing Policy document, dated Oct. 2010

Note: Maximum 4:1 slopes when grading off the edge of filter bed - TYP. all sides.

Note: Filter beds to be orientated such that the mantle is oriented in the direction of effluent flow.

**Conventional Filter Bed: Preliminary Design**  
Q = 3,000 L/day (min. required)  
Septic Tank: 2 x daily flow = 2 x Q = 2 x 3,000 L = 6,000 L  
Provide two compartment septic tank = 6,800 L (1,500 gal.) with gravity flow to Pump Station.  
Pump Station: Provide 3,600 L pump tank to time dose to filter bed.  
Soil Percolation: T = 30 min/cm  
Filter Area: Maximum loading = 75 L/sm/day (i.e.: Q ≤ 3,000 L/day); 3,000 / 75 = 40.0 sm.  
Provide Filter Medium Area = 48.0 sm. (12.0m x 4.0m)  
Base of Filter Medium, extending 300 mm thickness, over area = Q x T / 850 = 3,000 x 30 / 850 = 105.9 sm. Provide extended base contact area = 14.0m x 8.0m = 112.0 sm.  
Loading Requirements - Reference: Table 8.7.4.1.A, & based on a loading rate of 8 L/sm/day (i.e. 20 < T ≤ 35), Loading Rate = Q / Bed Area = 3,000 L / 8 = 375.0 sm. Provide loading area = 378.0 sm (14.0m x 27.0m)  
Mantle - Extending 21.5m from centreline of distribution piping.

Feature Limit Restaked August 10, 2021

Feature Limit Restaked July 11, 2013

Feature Limit Restaked July 11, 2013

Feature Limit Restaked July 11, 2013

Feature Limit Restaked August 10, 2021

Feature Limit Restaked July 11, 2013

5TH CONCESSION ROAD

BLOCK 8 PRIVATE ROAD "B" 0.18ha

BLOCK 9 0.3m Reserve 0.0005ha

BLOCK 7 0.3m Reserve 0.004ha

BLOCK 5 6 m Road Widening 0.32 ha

BLOCK 6 0.3m Reserve 0.004ha

BLOCK 15 OPEN SPACE 1.1ha

BLOCK 3 Water Pumping Station 0.03 ha

BLOCK 4 0.3 m Reserve 0.001 ha

BLOCK 2 PRIVATE ROAD "A" 0.19 ha

BLOCK 1 0.3 m Reserve 0.001 ha

BLOCK 12 Open Space Buffer 0.73 ha

BLOCK 14 Open Space Buffer 0.73 ha

BLOCK 13 OPEN SPACE 9.14ha

BLOCK 11 Open Space 0.08 ha

BLOCK 10 Water Pumping Station 0.04 ha

LOT 12 0.40 ha

LOT 13 0.40 ha

LOT 11 0.40 ha

LOT 10 0.40 ha

LOT 9 0.40 ha

LOT 8 0.50 ha

LOT 7 0.49 ha

LOT 4 0.40 ha

LOT 5 0.37 ha

LOT 3 0.40 ha

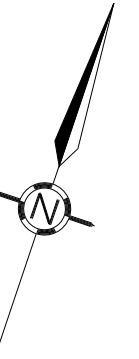
LOT 2 0.4 ha

LOT 6 0.40 ha

LOT 1 0.40 ha

File: Z:\Gunnell Engineering AutoCAD\03534 - PROJECTS\03534 - CD- CONCEPT LAYOUTS (LOT 1,5,7,11)\03534CD-SP1.dwg  
Plotted On: Fri, 13 Jun 2025 11:18am

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Note (1): All topsoil to be excavated

|                           |                                                   |
|---------------------------|---------------------------------------------------|
| <b>Septic Area</b>        |                                                   |
| Soil Percolation Time (T) | = 30 min/cm                                       |
| Loading Rate              | = 8 L/m <sup>2</sup> /day                         |
| Daily Sewage Flow (Q)     | = 3,000 L/day (min. required)                     |
| Area (prime + reserve)    | = 750 m <sup>2</sup> (min.) [3,000 / 8 x 2 areas] |

\*Based on Durham Region Health Department Lot Sizing Policy document, dated Oct. 2010

### Conventional Filter Bed: Preliminary Design

Q = 3,000 L/day (min. required)

Septic Tank:  $2 \times \text{daily flow} = 2 \times Q = 2 \times 3,000 \text{ L} = 6,000 \text{ L}$   
Provide two compartment septic tank = 6,800 L (1,500 gal.) with gravity flow to Pump Station.

Pump Station: Provide 3,600 L pump tank to time dose to filter bed.

Soil Percolation:  $T = 30 \text{ min/cm}$

Filter Area: Maximum loading = 75 L/sm/day (i.e.:  $Q \leq 3,000$  L/day);  $3,000 / 75 = 40.0$  sm. Provide Filter Medium Area = 48.0 sm. (12.0m x 4.0m)

Base of Filter Medium, extending 300 mm thickness, over area =  $Q \times T / 850 = 3,000 \times 30 / 850 = 105.9$  sm. Provide extended base contact area =  $14.0\text{m} \times 8.0\text{m} = 112.0$  sm.

Loading Requirements - Reference: Table 8.7.4.1.A, & based on a loading rate of 8 L/sm/day (i.e.  $20 < T \leq 35$ ), Loading Rate =  $Q / \text{Bed Area} = 3,000 \text{ L} / 8 = 375.0 \text{ sm}$ . Provide loading area = 378.0 sm (14.0m x 27.0m)

Mantle - Extending 21.5m from centreline of distribution piping.

**BALSAM ROAD**

MBW+30

Long Term Stable  
Top of Slope 10m  
Buffer



MBW2

Note: Filter beds to be orientated such that the mantle is oriented in the direction of effluent flow.

Long Term Stable  
Top of Slope

Note: Maximum 4:1 slopes when grading off the edge of filter bed - TYP. all sides.

Feature Limit  
Restaked August  
10, 2021

Reserve Area  
(378.0 m<sup>2</sup>)

$$\text{Filter Bed Area} = 378.0 \text{ m}^2$$

—

Min. 1.5m

**Future  
Residence**  
(Draft footprint  
setbacks only)

Q = 3,000 L/Day

Septic Pump Tank

|      |           |
|------|-----------|
| Tank | Pump Tank |
|------|-----------|

**LOT 1**

Proposed –  
Drilled Well

Proposed Driveway

**PROPOSED ROAD**

| Rev. No. | Date        | Description      | CAD |
|----------|-------------|------------------|-----|
| Rev. 2   | 11-Jun-2025 | Updated Setbacks | ZB  |
| Rev. 1   | 17-Mar-2025 | Site Plan Update | DB  |

**Proposed Residential  
Development  
City of Pickering  
Region of Durham**

### Typical Lot Layout (Lot 1) Proposed Sewage System

|              |                 |
|--------------|-----------------|
| Scale: 1:500 | Designed By: ZS |
|--------------|-----------------|

|                    |              |
|--------------------|--------------|
| Date: 13-JULY-2023 | Drawn By: ZS |
|--------------------|--------------|

|              |                |
|--------------|----------------|
| Project No.: | Checked By: EG |
|--------------|----------------|

Drawing No.:

**D3534**

**SP-2**

File: Z:\Gunnell Engineering AutoCAD\3534 - PROJECTS\3534 - CD- CONCEPT LAYOUTS (LOT 1,5,7,11)\03534CD-SP3.dwg  
Plotted On: Fri, 13 Jun 2025 8:18am

| DATUM ELEVATIONS: FILTER BED               |        |
|--------------------------------------------|--------|
| Existing Grade = 0.00m (Datum)             |        |
| Base Cut (1):                              | -0.40m |
| Top of Filter Medium (0.75m filter sand) : | +0.35m |
| Top of Stone Layer (0.30m stone layer) :   | +0.65m |
| Top of Landscaping (0.20m topsoil):        | +0.85m |

Note (1): All topsoil to be excavated

All Distribution Piping is to be a minimum of:

- 16.7m from drilled wells
- 31.7m from dug wells
- 4.7m from property lines
- 6.7m from residence

Note: Filter Bed system raised 0.85m above finished grade, therefore increase setbacks by 1.7m.

Septic Area

Soil Percolation Time (T) = 30 min/cm  
Loading Rate = 8 L/m<sup>2</sup>/day  
Daily Sewage Flow (Q) = 3,000 L/day (min. required)  
Area (prime + reserve) = 750 m<sup>2</sup> (min.) [3,000 / 8 x 2 areas]

\*Based on Durham Region Health Department Lot Sizing Policy document, dated Oct. 2010

#### Conventional Filter Bed: Preliminary Design

Q = 3,000 L/day (min. required)

Septic Tank: 2 x daily flow = 2 x Q = 2 x 3,000 L = 6,000 L  
Provide two compartment septic tank = 6,800 L (1,500 gal.) with gravity flow to Pump Station.

Pump Station: Provide 3,600 L pump tank to time dose to filter bed.

Soil Percolation: T = 30 min/cm

Filter Area: Maximum loading = 75 L/sm/day (i.e.: Q ≤ 3,000 L/day); 3,000 / 75 = 40.0 sm. Provide Filter Medium Area = 48.0 sm. (12.0m x 4.0m)

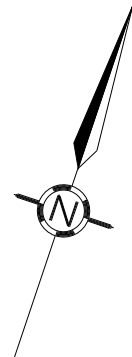
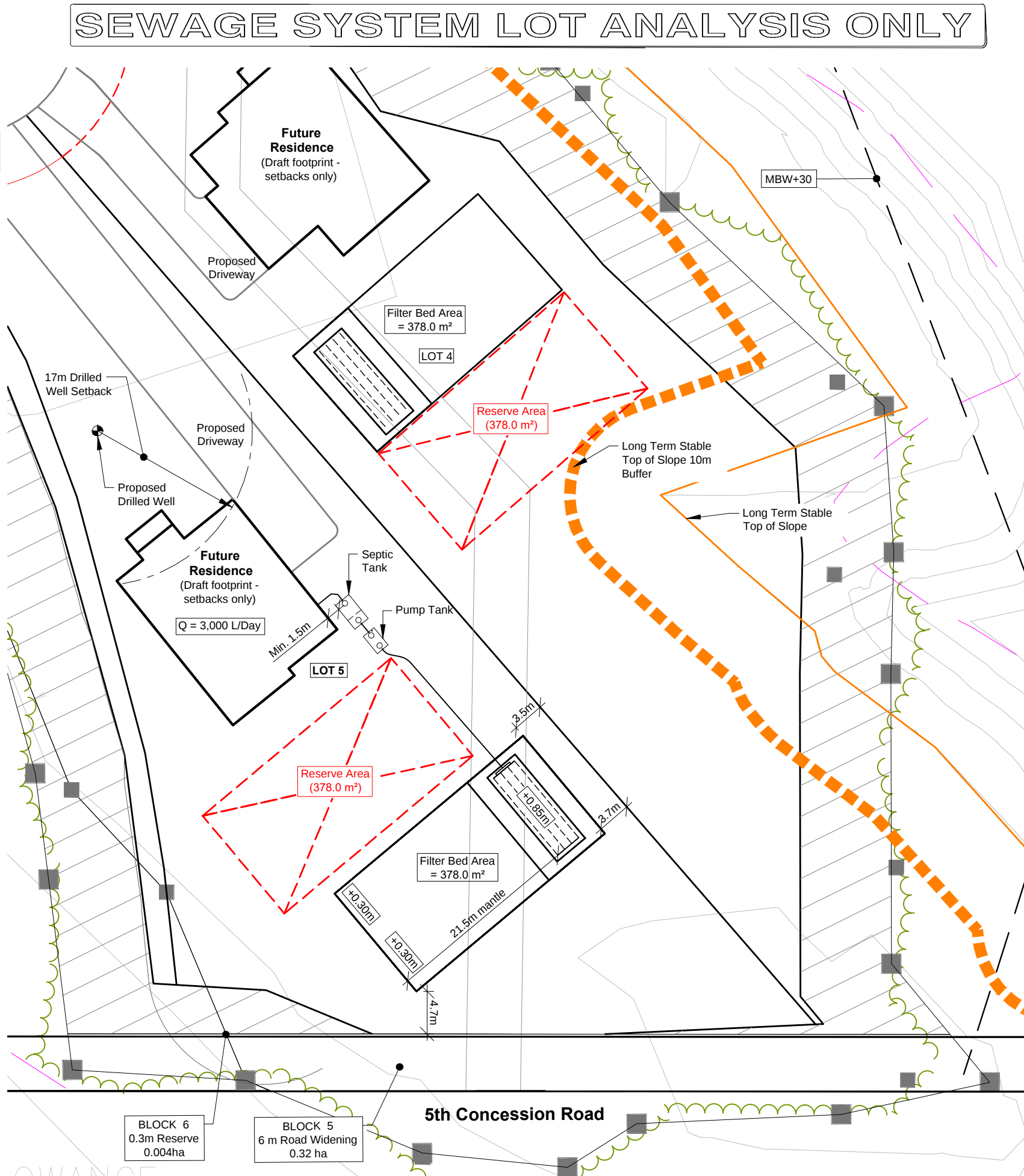
Base of Filter Medium, extending 300 mm thickness, over area = Q x T / 850 = 3,000 x 30 / 850 = 105.9 sm. Provide extended base contact area = 14.0m x 8.0m = 112.0 sm.

Loading Requirements - Reference: Table 8.7.4.1.A, & based on a loading rate of 8 L/sm/day (i.e. 20 < T ≤ 35), Loading Rate = Q / Bed Area = 3,000 L / 8 = 375.0 sm. Provide loading area = 378.0 sm (14.0m x 27.0m)

Mantle - Extending 21.5m from centreline of distribution piping.

Note: Filter beds to be orientated such that the mantle is oriented in the direction of effluent flow.

Note: Maximum 4:1 slopes when grading off the edge of filter bed - TYP. all sides.



| Rev. No. | Date        | Description      | CAD |
|----------|-------------|------------------|-----|
| Rev. 2   | 11-Jun-2025 | Updated Setbacks | ZB  |
| Rev. 1   | 17-Mar-2025 | Site Plan Update | DB  |

**Proposed Residential Development**  
**City of Pickering**  
**Region of Durham**

**Typical Lot Layout (Lot 5)**  
**Proposed Sewage System**

|                    |                 |
|--------------------|-----------------|
| Scale: 1:500       | Designed By: ZS |
| Date: 13-JULY-2023 | Drawn By: ZS    |
| Project No.:       | Checked By: EG  |
| <b>D3534</b>       | <b>SP-3</b>     |

File: Z:\Gunnell Engineering AutoCAD\03534 - PROJECTS\03534 - 3225 Con 5 Rd - Pickering\CAD\CD- CONCEPT LAYOUTS (LOT 1,5,7,11)\03534CD-SP4.dwg  
Plotted On: Fri, 13 Jun 2025 9:18am

| DATUM ELEVATIONS: FILTER BED               |        |
|--------------------------------------------|--------|
| Existing Grade = 0.00m (Datum)             |        |
| Base Cut (1):                              | -0.40m |
| Top of Filter Medium (0.75m filter sand) : | +0.35m |
| Top of Stone Layer (0.30m stone layer) :   | +0.65m |
| Top of Landscaping (0.20m topsoil):        | +0.85m |

Note (1): All topsoil to be excavated

All Distribution Piping is to be a minimum of:

- 16.7m from drilled wells
- 31.7m from dug wells
- 4.7m from property lines
- 6.7m from residence

Note: Filter Bed system raised 0.85m above finished grade, therefore increase setbacks by 1.7m.

**Septic Area**  
Soil Percolation Time (T) = 30 min/cm  
Loading Rate = 8 L/m²/day  
Daily Sewage Flow (Q) = 3,000 L/day (min. required)  
Area (prime + reserve) = 750 m² (min.) [3,000 / 8 x 2 areas]

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#### Conventional Filter Bed: Preliminary Design

Q = 3,000 L/day (min. required)

Septic Tank: 2 x daily flow = 2 x Q = 2 x 3,000 L = 6,000 L  
Provide two compartment septic tank = 6,800 L (1,500 gal.) with gravity flow to Pump Station.

Pump Station: Provide 3,600 L pump tank to time dose to filter bed.

Soil Percolation: T = 30 min/cm

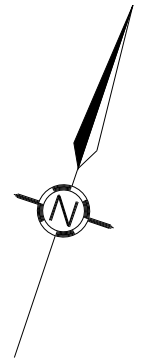
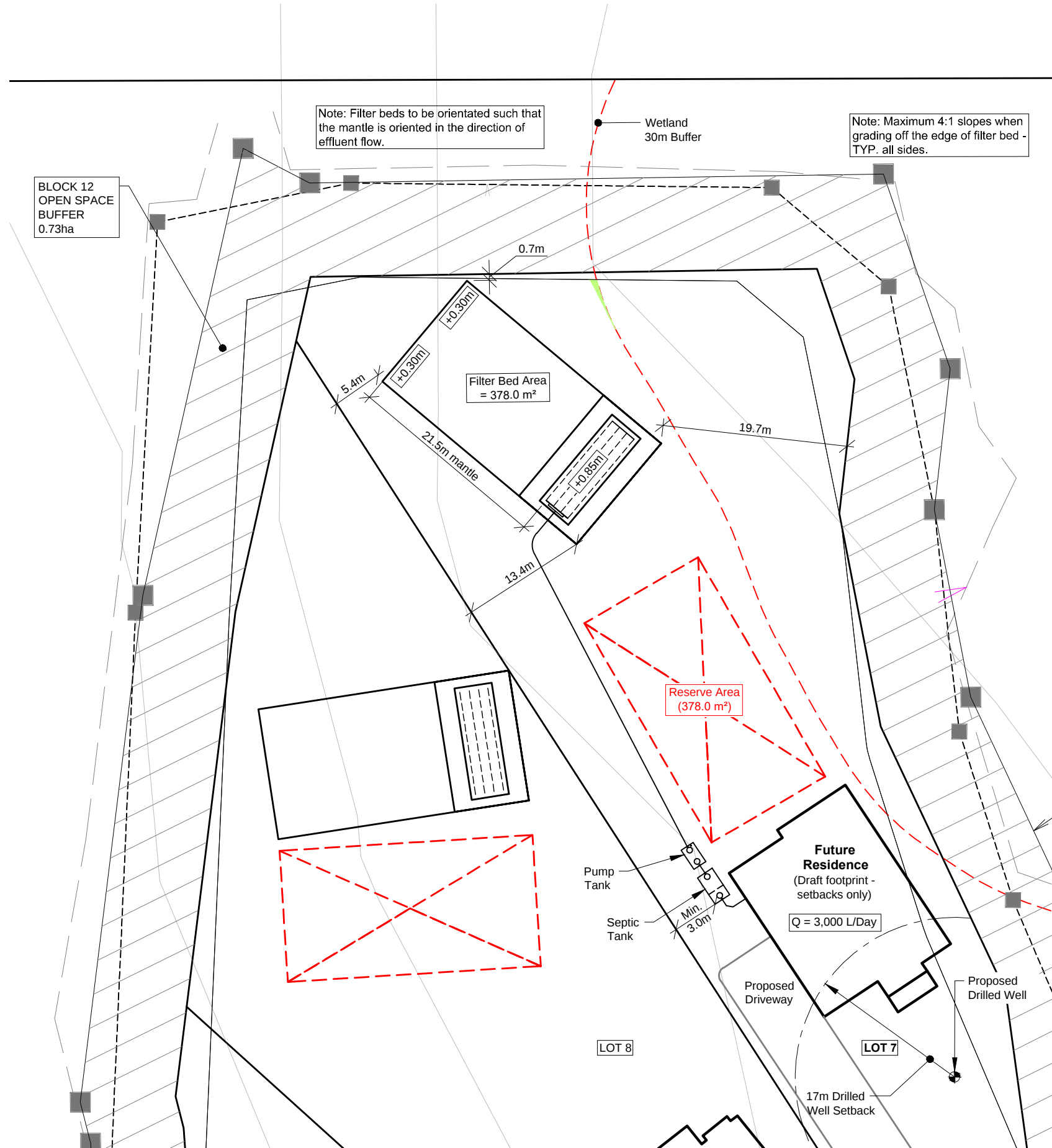
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Mantle - Extending 21.5m from centreline of distribution piping.

# SEWAGE SYSTEM LOT ANALYSIS ONLY



| Rev. No. | Date        | Description      | CAD |
|----------|-------------|------------------|-----|
| Rev. 2   | 11-Jun-2025 | Updated Setbacks | ZB  |
| Rev. 1   | 17-Mar-2025 | Site Plan Update | DB  |

## Proposed Residential Development City of Pickering Region of Durham

### Typical Lot Layout (Lot 7) Proposed Sewage System

|                    |                 |
|--------------------|-----------------|
| Scale: 1:500       | Designed By: ZS |
| Date: 13-JULY-2023 | Drawn By: ZS    |
| Project No.:       | Checked By: EG  |
|                    | Drawing No.:    |

**D3534**

**SP-4**

File: Z:\Gunnell Engineering AutoCAD\3534 - PROJECTS\3534 - 3225 Con 5 Rd - Pickering\CAD\CD- CONCEPT LAYOUTS (LOT 1,5,7,11)\3534CD-SP5.dwg  
Plotted On: Fri, 13 Jun 2025 8:18am

Conventional Filter Bed: Preliminary Design

Q = 3,000 L/day (min. required)

Septic Tank: 2 x daily flow = 2 x Q = 2 x 3,000 L = 6,000 L  
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Soil Percolation: T = 30 min/cm

Filter Area: Maximum loading = 75 L/sm/day (i.e.: Q ≤ 3,000 L/day); 3,000 / 75 = 40.0 sm. Provide  
Filter Medium Area = 48.0 sm. (12.0m x 4.0m)

Base of Filter Medium, extending 300 mm thickness, over area = Q x T / 850 = 3,000 x 30 / 850 =  
105.9 sm. Provide extended base contact area = 14.0m x 8.0m = 112.0 sm.

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378.0 sm (14.0m x 27.0m)

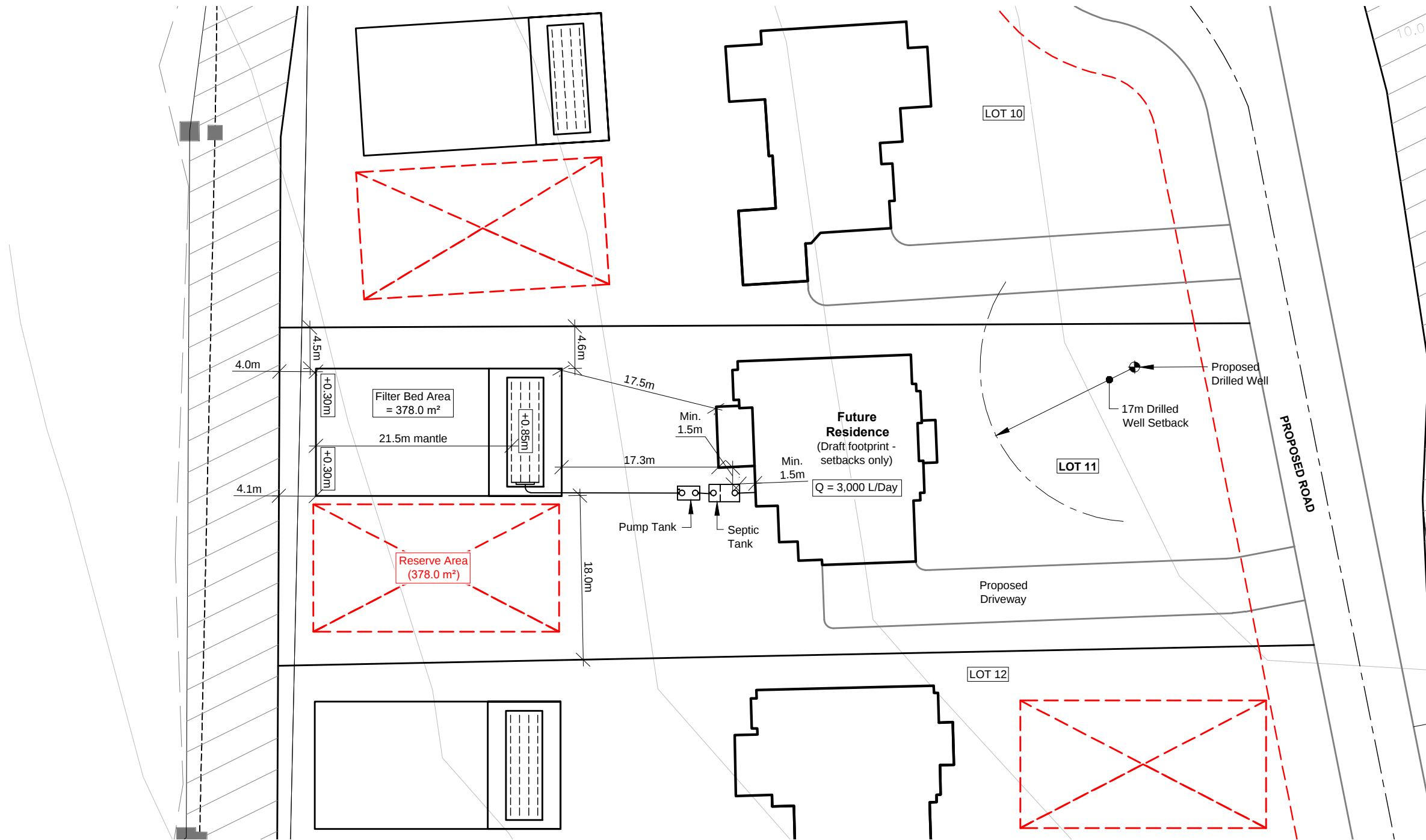
Mantle - Extending 21.5m from centreline of distribution piping.

Septic Area  
Soil Percolation Time (T) = 30 min/cm  
Loading Rate = 8 L/m²/day  
Daily Sewage Flow (Q) = 3,000 L/day (min. required)  
Area (prime + reserve) = 750 m² (min.) [3,000 / 8 x 2 areas]

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Note: Filter beds to be orientated such that  
the mantle is oriented in the direction of  
effluent flow.

Note: Maximum 4:1 slopes when  
grading off the edge of filter bed -  
TYP. all sides.



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DATUM ELEVATIONS: FILTER BED

Existing Grade = 0.00m (Datum)  
Base Cut (1): -0.40m  
Top of Filter Medium (0.75m filter sand) : +0.35m  
Top of Stone Layer (0.30m stone layer) : +0.65m  
Top of Landscaping (0.20m topsoil): +0.85m

Note (1): All topsoil to be excavated

All Distribution Piping is  
to be a minimum of:  
- 16.7m from drilled wells  
- 31.7m from dug wells  
- 4.7m from property lines  
- 6.7m from residence  
Note: Filter Bed system  
raised 0.85m above finished  
grade, therefore increase  
setbacks by 1.7m.

| Rev. No. | Date        | Description      | CAD |
|----------|-------------|------------------|-----|
| Rev. 2   | 11-Jun-2025 | Updated Setbacks | ZB  |
| Rev. 1   | 17-Mar-2025 | Site Plan Update | DB  |

**Proposed Residential  
Development  
City of Pickering  
Region of Durham**

**Typical Lot Layout (Lot 11)  
Proposed Sewage System**

|                    |                 |
|--------------------|-----------------|
| Scale: 1:500       | Designed By: ZS |
| Date: 13-JULY-2023 | Drawn By: ZS    |
| Project No.:       | Checked By: EG  |
|                    | Drawing No.:    |

**D3534**

**SP-5**