

# Selectable Sloping Sand Filter

How to use the table to make a selection

# Introduction

- Given the increasing popularity of sloping sand filters the Department has developed a selectable table for consideration to be added to the Standard.
- This will allow QPs to select this type of system. All requirements of the Standard must be met as with current QP selections.
- Although the selection is available to Engineers, they can continue to design systems as currently defined by the Standard.

# Considerations

- The worst-case filter sand speed was used in the calculations. This aligns with the existing selectable systems.
- A minimum 15m length was used.
- Some system lengths were increased to meet basal area for all selectable soil types, including silty clay. This results in basal area being met for all selections.
- A system cannot be selected for clay as that must be deemed permeable.

# Using the selection table

- The next few slides will describe the table and demonstrate how to navigate through it to arrive at a selection.
- The values from the selection table can be entered into the cross-section drawing.
- The selection must be built as per the cross section with the toe of the system being at grade.

Selected flow as per Standard

Determined from test pit. Depth to groundwater, bedrock or too permeable soil, not including the organic mat.

Ground slope: Measure of lot slope at proposed trench location.

Heel cut: This is how far down to excavate at the heel. Does not include organic mat. Heel cut of zero is a system built entirely at grade.

Selected Flow (lpd)	Min. depth to confining layer	Ground Slope %																Heel cut (m)
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1000	0.55 - 0.84	L = 15 W = 2																0
	0.85 - 1.14	X	X	X	L = 15 W = 2													0.3
					5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	
	1.15 - 1.44	X	X	X	X	X	X	L = 15 W = 2										0.6
								5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	
1.45 - 1.74	X	X	X	X	X	X	X	X	X	X	L = 15 W = 2						0.9	
											5%	6%	7%	8%	9%	10%		11%
≥ 1.75	X	X	X	X	X	X	X	X	X	X	X	X	X	L = 15 W = 2				1.2
														5%	6%	7%	8%	

Sand filter bottom slope: Included to help with system construction.

These are the selectable dimensions for the distribution trench. A minimum length of 15 m was used for selections. Some lengths were increased to ensure basal area requirements were met for all selectable soil conditions.

1. Determine lot slope at location of proposed distribution trench

2. Select flow as per Section 3 of the Standard

Selected Flow (lpd)	Min. depth to confining layer	Ground Slope %																Heel cut (m)
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1000	0.55 - 0.84	L = 15 W = 2																0
	0.85 - 1.14	X	X	X	L = 15 W = 2													0.3
					5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	
	1.15 - 1.44	X	X	X	X	X	X	L = 15 W = 2										0.6
								5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	
1.45 - 1.74	X	X	X	X	X	X	X	X	X	X	L = 15 W = 2						0.9	
											5%	6%	7%	8%	9%	10%		11%
≥ 1.75	X	X	X	X	X	X	X	X	X	X	X	X	X	L = 15 W = 2				1.2
														5%	6%	7%	8%	

3. Determine depth to confining layer from test pit.

4. Move right across the table until you intersect the lot slope. At this depth to confining layer a selection is not available.

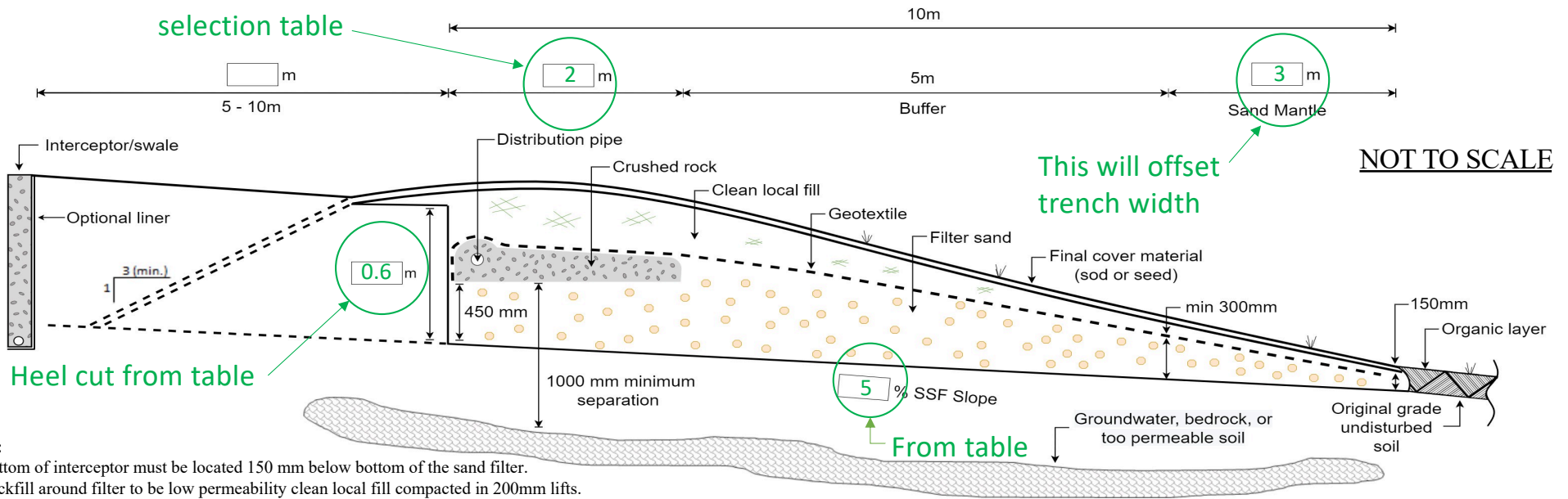
5. If no selection move up the column to find a selection and get system dimensions.

6. From the selected option move to the right to determine the heel cut to be used in system construction.

Selected Flow (lpd)	Min. depth to confining layer	Ground Slope %																		Heel cut (m)
		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
1000	0.55 - 0.84	L = 15 W = 2																		0
	0.85 - 1.14	X	X	X	L = 15 W = 2															0.3
					5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%			
	1.15 - 1.44	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.6
	1.45 - 1.74	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.9
≥ 1.75	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1.2	

7. The table will also provide the filter bottom slope the system must be constructed to.

## Appendix D-18: Detailed Cross Section



- Notes:**
- Bottom of interceptor must be located 150 mm below bottom of the sand filter.
  - Backfill around filter to be low permeability clean local fill compacted in 200mm lifts.

DISPOSAL FIELD REQUIREMENTS			
100 Min	mm	Final cover material, seed or sod	
200 to 350	mm	Clean local permeable backfill	
Required over crushed rock and filter sand		Barrier material	
75	mm	Crushed rock above pipe	
15	mm	Distribution pipe diameter	
15	m	Distribution pipe length	
125	mm	Crushed rock below pipe	
	m	Interceptor/swale depth	
	m/s	Filter sand permeability	Minutes at 20°C

SELECTION CRITERIA	
Flow (L/d):	1000
Lot Slope:	11 %
Soil Type:	
Soil depth (mm):	
Applicant:	
Notification No:	
Location:	
Qualified Person:	

**General Conditions**  
 Contractor shall verify location of all wells, watercourses, lot boundaries, and all elevations prior to construction (within 30 m from the location of disposal system).

Roof, foundation and lot drainage must be directed away from disposal field, septic tank and pump (siphon) chamber.

Steps must be taken to ensure that the proposed disposal field area is not subject to vehicular traffic or any other disturbance such as excavation, or stockpiling of excavated material etc..

It is the applicant's responsibility to assure that the construction of foundations, driveway, well or any other development on the lot will not impact on the feasibility of on site sewage disposal field installation.

Disposal System must be installed by a contractor licensed to install on-site sewage disposal systems in Nova Scotia.

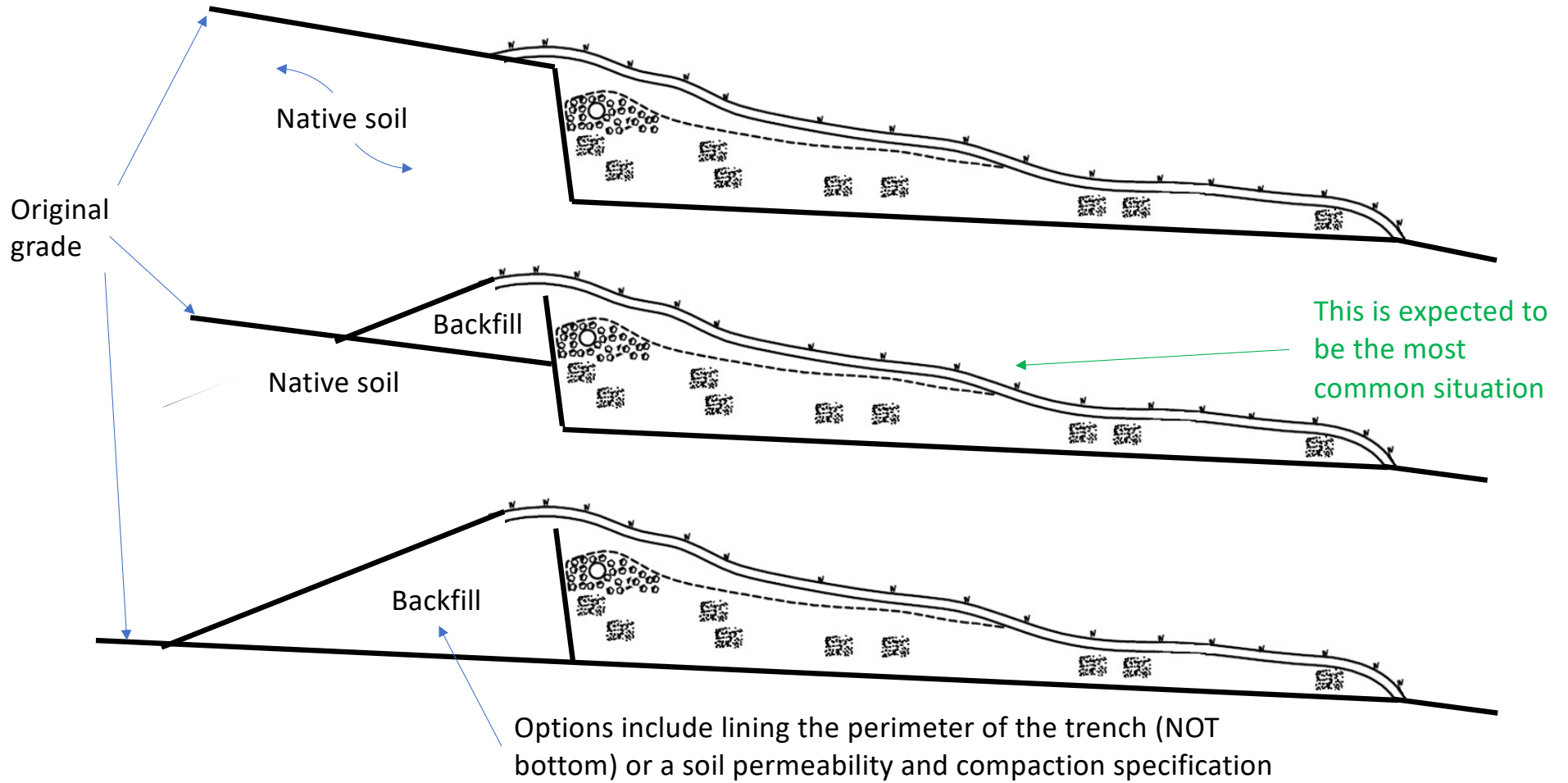
**All work must be completed in accordance with the Nova Scotia On-Site Sewage Disposal Systems Standard.**



## In ground versus above grade systems

- To maintain the calculated filter bottom slopes some systems may need to be built up above grade, depending on the lot slope.
- This will result in backfill being placed upslope of the heel.
- To ensure effluent flows through the filter sand and not through the sides of the filter before it has a chance to be treated, backfill around the filter must be lower permeability than the filter sand and compacted.



# In ground versus above grade systems



# Sample questions to consider

- Is the process easy to follow?
- Do you feel confident completing the notification form based on the table and cross-section?
- Do the sizes make sense?
- Is it buildable?

# Submitting comments

- Comments are requested by November 10th, 2021
- Submit comments by:
  -  Email: [onsite@novascotia.ca](mailto:onsite@novascotia.ca)
  -  Fax: (902) 424-0501
- Questions may also be directed to [onsite@novascotia.ca](mailto:onsite@novascotia.ca) or by calling 902-225-0704.