SEDIMENT CONTROL FENCE

(a.k.a. Silt fence)

Sediment control fence consists of geotextile material supported by posts and trenched in to the ground. It functions as a settling control by reducing velocity, ponding sheet flows and promoting gravitational settling of suspended sediment. It is also an effective means of redirecting sheet flows towards a treatment area (e.g. sediment control pond or trap). Despite the permeability of the non-woven geotextile fabric used in this type of fencing, it should not be used as a means of filtering sediment laden water as it does not effectively filter out fine particles (< 50 µm).

Figure B2-1: Sediment control fence

There are three primary components that make up sediment control fence: geotextile fabric, structural fencing support, and posts. The structural fencing support, often a page wire fence to which the geotextile is attached, keeps the geotextile fabric upright in between posts, while the posts keep the entire installation upright.

Application

- Along the perimeter of a construction site
- Along the up-gradient side of sensitive areas, streams and river corridors
- Around stockpiles of excavated material, such as topsoil
- Approximately 1.5 metre away from the base of moderate slopes
- Any other areas where sediment laden sheet flow requires treatment, provided that the fencing is installed parallel to the site contours.
- Sediment control fences should ***not*** be used perpendicular to flow in watercourses or other concentrated flow paths.
- Sediment control fence is meant to be used as a treatment measure for sheet flows and does not need to be installed as a means of delineating site boundaries if the area does not receive any sheet flow (e.g. high point). In these areas other types of fencing may be used if desired.
- For installation of sediment control fence on slopes, the grade and slope length must be considered to ensure that flows will not overwhelm the structural stability of the fence. The following are the maximum lengths of slopes on which sediment control fencing should be installed, according to grade.

Slope grade	Maximum slope length for sediment control fence
2H : 1V	15 m
3H : 1V	25 m
4H : 1V	40 m

Design and installation

SEDIMENT FENCE SHOULD NEVER BE…

- used as a filter
- used in a concentrated flow path or in the path of large overland flow volumes
- installed perpendicular to flow in a watercourse
- pre-fabricated with wooden stakes attached
- installed with snow fence as the structural (support) fencing

Materials specifications

- Posts used to support sediment control fence should be sturdy material such as steel t-bar with length ≥ 1.5 m.
- In areas where sediment control fence is being used as a barrier to protect a natural feature, wooden posts (recommended cross-section 10 cm by 10 cm) should be used instead of t-bars. Alternatively, a double row of t-bar supported sediment control fence (Figure B2-2) could be applied in these sensitive areas to provide multiple barriers and a high level of protection.
- Structural support fencing should be a high tensile strength galvanized page wire fence. Recommended specifications are 14 gauge wire thickness and opening size of 10 by 10 cm. Structural support fencing with similar strength, flexibility, and weather resistance is also suitable.
- Prefabricated sediment control fence products with wooden stakes already attached to geotextile should be avoided due to their lack of structural stability and inability to allow deep water ponding.
- Geotextile used in sediment fence should be non-woven and meet or exceed the following specifications:

Material property	Test methods	Minimum value	Type of value
Grab strength (machine direction)	ASTM D4632/D4632M	550 N[1]	Minimum ARV[2]
Grab strength (cross direction)	ASTM D4632/D4632M	450 N[1]	Minimum ARV[2]
Permittivity	ASTM D4491/D4491M	0.05 sec^{-1}	Minimum ARV[2]
Apparent Opening Size (AOS)	ASTM D4751	0.60 mm	Maximum ARV[2]
UV Stability	ASTM D4355/D4355M	70% after 500 hrs of exposure	

[1] Products with tensile strengths up to 10% less than specified minimum may also be considered.
[2] ARV: Average Roll Value

Fence installation

- Support posts should be no more than 2 metres apart and driven into the ground to a depth of at least 90 cm.
- Brace the fence posts diagonally in areas where deep ponding is anticipated.

- Geotextile fabric should be stretched tight across the structural fencing with no sagging and extend up from the ground to a minimum height of 60 cm. Fabric should be fastened to the structural support fencing and support posts with wire ties tied at the posts.
- Where the geotextile is joined to provide a continuous run, the ends should be overlapped at least 50 cm and securely fastened to posts.
- The bottom 30 cm of the geotextile should be tied into soil, using either static slicing or trenching methods, to ensure there is no space between the bottom of the geotextile and the ground. The trench should be constructed to be at least 20 cm deep an 40 cm wide (see Figure B2-3a).

Figure B2-2: Double row sediment control fencing

- The trench should be backfilled and compacted to ensure structural stability of the fence.
- In frozen soil conditions, if trenching cannot be achieved the geotextile should be secured with a filter sock (recommended diameter of 450 mm) staked into place along the upstream side of the fence (see Figure B2-3b)
- Double row sediment control fence should be installed with straw bales or a similar measure to provide structural support in between the fence rows.

Fence placement

- In sensitive areas (e.g. within or adjacent to natural features) consider whether sediment control fence installation will create excessive ground disturbance. In these cases, a different type of sediment control barrier may be advisable or recommended by the local Conservation Authority.
- Maintain a vegetated buffer of at least 3 m down gradient of sediment control fencing. Larger buffers are required adjacent to natural features based on defined limits of development, as described under “Vegetated buffer strips”.
- Consider installing additional sediment controls, double row sediment control fence, or sediment control fence supported by wooden posts in areas within or adjacent to natural features.
- Always install sediment fence:
  - along the contour and not on up and down slopes;
  - with end sections constructed up the slope to stop runoff from flowing around the ends of the fence; and
  - on the flat area at least 1.5 m away from the toe of a slope.
- Place wisely to avoid using more fencing than needed, resulting in additional waste sent to landfill. Installing sediment fence upgradient of sediment sources should be avoided if possible, with other simpler and more reusable types of fence used when the only objective is delineating boundaries.

Inspection and maintenance

- Inspect the entire length of sediment fence weekly, and before and after significant rainfall (see definition in Section 10.1.2) or snowmelt events, and keep a record of the inspection.
- Inspect the fence to look for any signs of damage to the geotextile or compromising of the structural integrity of the fence. Ensure the fence has been properly installed as defined under "Design and Installation" section above.
- Remove and properly dispose of sediment before it reaches approximately 30% of the height of the fence, or sooner if not functioning as intended.
- A supply of sediment control fence materials should be kept on site to allow for quick repairs or the installation of additional fencing as needed.
- Where fence continues to fail on an ongoing basis, consider reinforcing problem areas or replacing with an alternative sediment retention device. If failure is a result of concentrated flows being directed to the fence, consider re-designing surface water flow paths to reduce volumes being directed to the problem area.
- Any repair or maintenance needs identified should be repaired within 48 hours or sooner if natural receptors are at imminent and foreseeable risk of adverse impact. Higher priority should be assigned to repair of sediment fence installed upgradient of natural features.

Decommissioning

- Ensure removal and proper disposal of accumulated sediment.
- All materials associated with the sediment fence must be removed once the site has been restored and disturbed areas have been stabilized.
- All sediment fence materials should be removed from the site. Reusable components can be salvaged for future use and others should be disposed of at an appropriate waste facility.

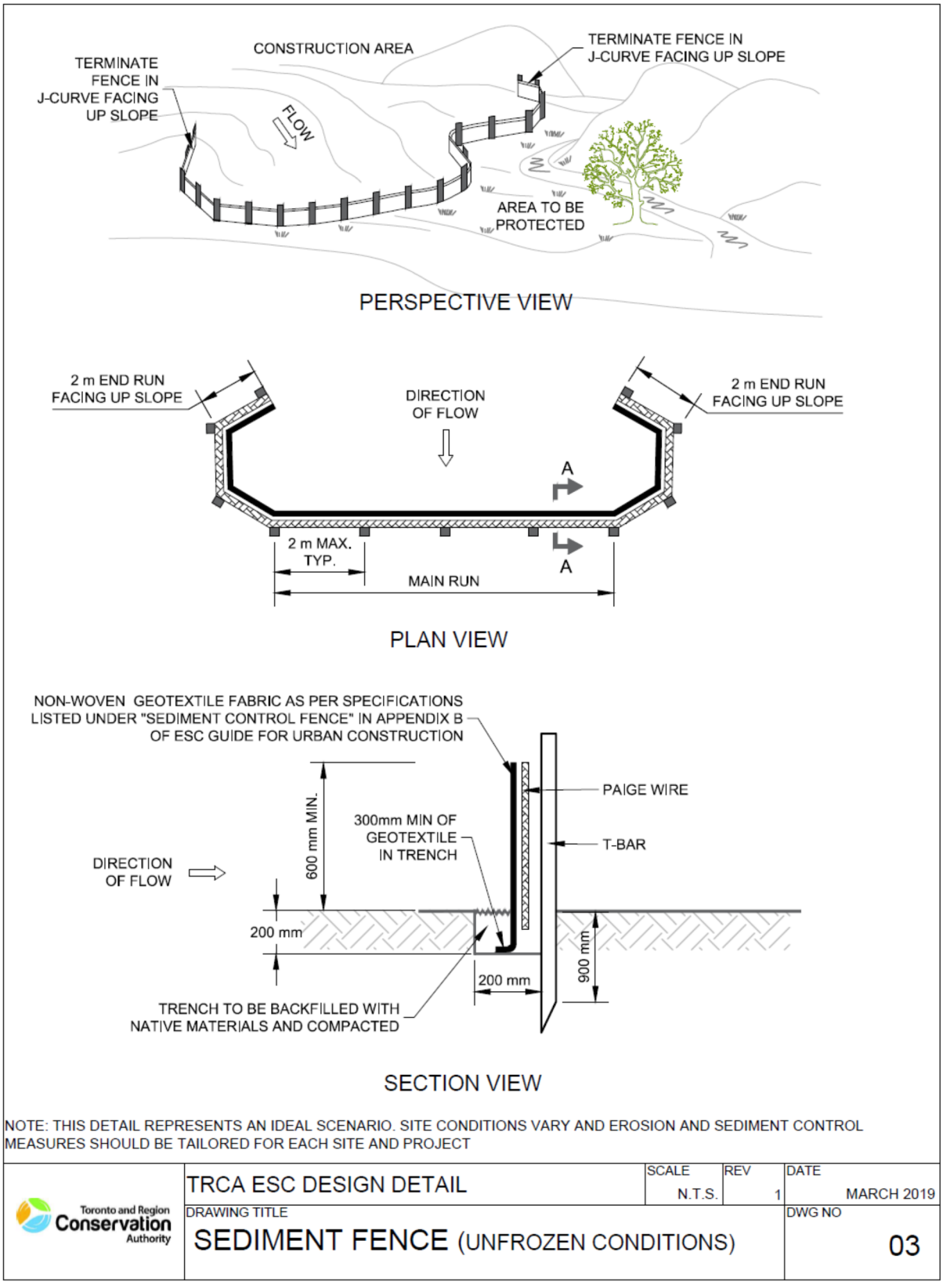

Figure B2-3a: Design detail for sediment control fence (unfrozen conditions).

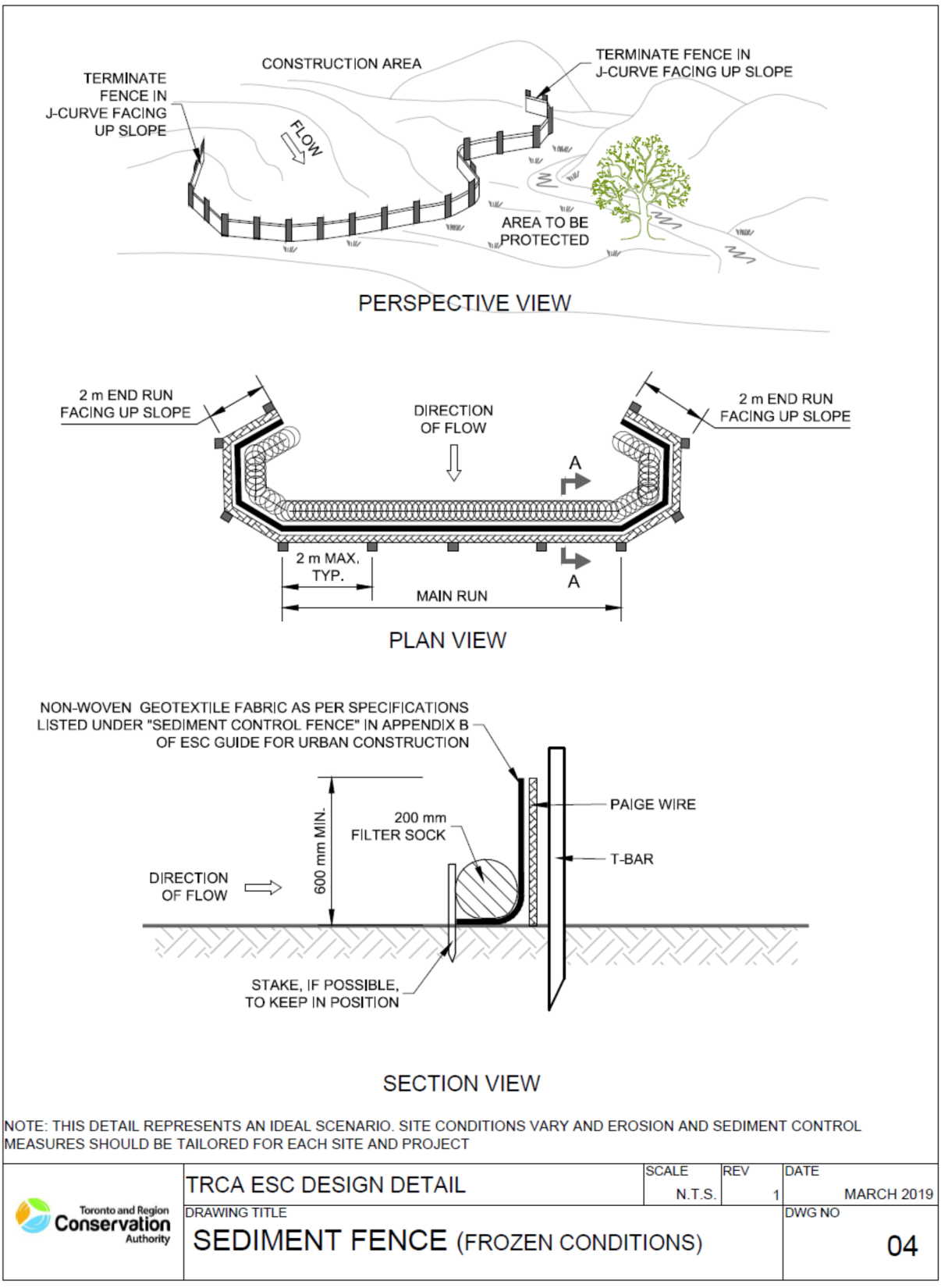

Figure B2-3b: Design detail for sediment control fence (frozen conditions).