Drainage
FACTSHEET

BRITISH COLUMBIA
Ministry of Agriculture and Food

Order No. 532.100-1
Agdex: 752
Revised March 2001

SUBDRAIN SYSTEM DESIGN NOMOGRAPH

A multiple correlation graph to simplify sub-surface drainage system design and layout is shown on the backside of this factsheet. The graph uses most recent test information on roughness coefficients of corrugated plastic tubing (CPT).

The graph shows relations between:

- area drained (A)
- maximum allowable length of drainline (L)
- spacing between drain laterals (S)
- drainage rate (R), slope of the drainline (SL), drain pipe inside diameter (ID)
- drain tube hydraulic capacity (Q).

The usefulness of the graph can be illustrated by the following examples:

Drain Tube Capacity & Diameter (Example 1)

For an area A = 5.0 ha and drainage coefficient R = 12 mm/day the drain tube discharge capacity must be at least 6.8 L/s. At a slope of 0.5% a corrugated plastic tube with diameter ID = 150 mm is required.

Minimum Drain Tube Slope (Example 2)

For a drainline area A = 3 ha, drainage coefficient R = 12 mm/day and CPT diameter ID = 100 mm, the minimum slope SL = 0.9%.

Maximum Length of All Laterals

To determine the maximum cumulative length of all laterals draining into a 200 mm ID CPT collector with slope SL = 0.1% drainage coefficient R = 12 mm/day and spacing S = 20 m. From the graph, observe that 5.3 ha can be drained and the cumulative length of all laterals draining into the collector is 2600 m.

Maximum Length & Area of a Lateral (Example 3)

For a CPT lateral with ID = 100 mm at slope SL = 0.1% and drainage coefficient R = 12 mm/day. The graph gives a maximum area A = 1.0 ha. For a spacing S = 15 m the maximum allowable length is L = 650 m.

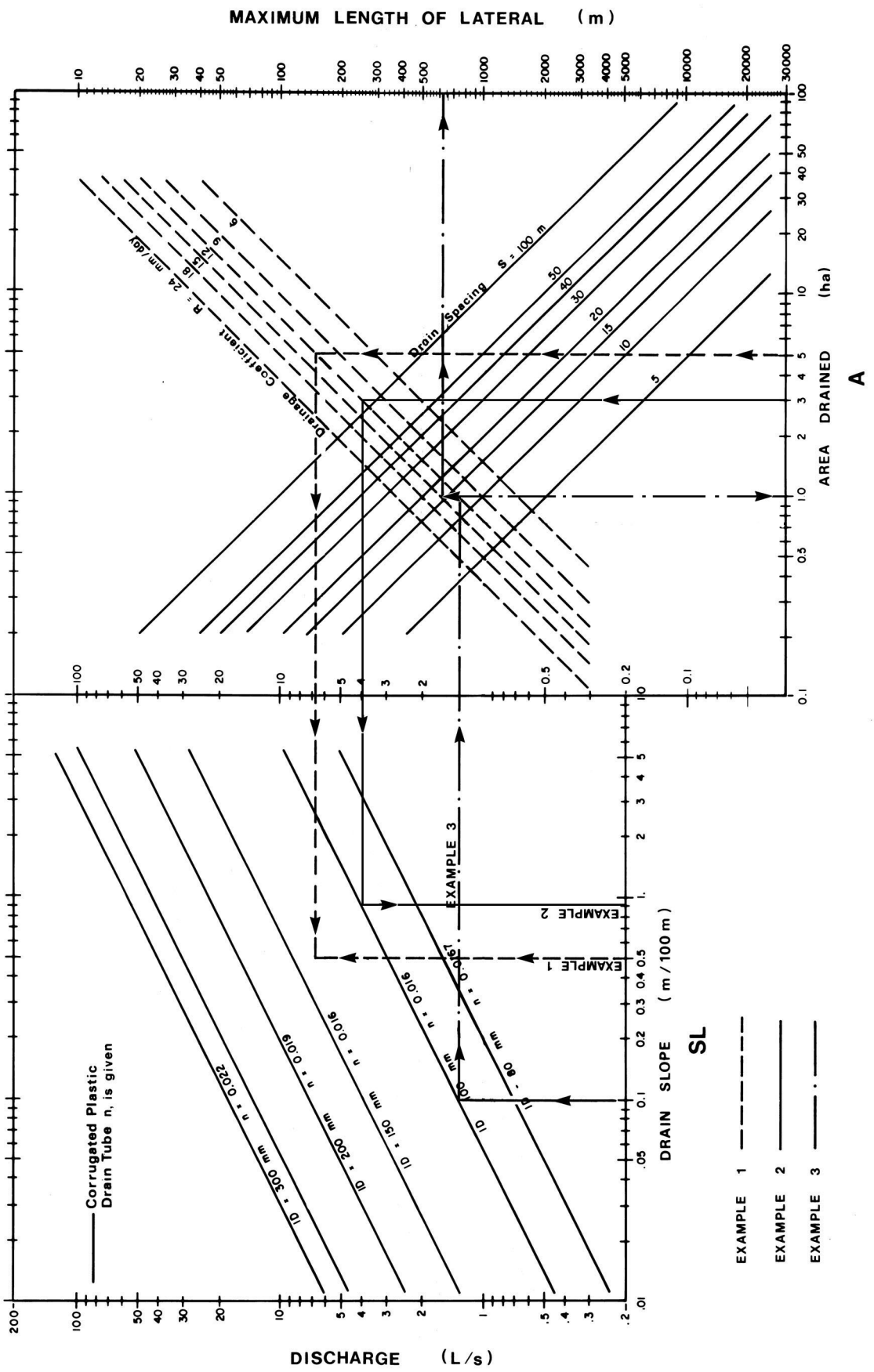
If the spacing is 20 m, L = 500 m.

Some Useful Conversion Factors

1 m = 3.28 ft = 39.37 inches
1 ha = 2.47 acres
1 L/s = 15.85 US gpm
1 L/s = 0.03532 $ft.^3$/sec
1 in. = 25.4 mm

Reference

CHIENG, S-T, R.S. BROUGHTON, and S.R. AMI, 1981. Graphical Solutions to Drainage Equations. Can. Agric. Eng. 23:91-96



FOR FURTHER INFORMATION, CONTACT:
Janine Nyvall, Water Management Engineer
Phone: (604) 556-3113
Email: Janine.Nyvall@gems5.gov.bc.ca

RESOURCE MANAGEMENT BRANCH
Ministry of Agriculture and Food
1767 Angus Campbell Road
Abbotsford, BC CANADA V3G 2M3