Water and Sediment Control Basin (WASCoB) Design Information Sheet (Multiple WASCoB System)

Note: Use this Design Information Sheet for each WASCoB if more than one WASCoB is to be constructed and drained through a single subsurface tile outlet. Start at uppermost WASCoB.

WASCoB Number _____of _____

1. Watershed area   _____ha   _____ac

2. Watershed slope   _____%

3. Runoff curve number from Tables 2.2 – 2.4   _____

4. Peak flow from watershed for 10-year storm from Table 4.25-M to 4.31-M (4.25-I to 4.31-I)
   _____m^3/s_____ft^3/s

5. Peak flow from watershed for 25-year storm from Table 4.25-M to 4.31-M (4.25-I to 4.31-I)
   _____m^3/s_____ft^3/s

6. Obtain the storm duration for a 10-year storm from Table 4.25-M to 4.31-M(4.25-I to 4.31-I)
   _____hrs

7. Obtain the storm volume expected for a 10-year storm from Table 4.25-M to 4.31-M (4.25-I to 4.31-I)
   _____m^3 _____ft^3

8. Determine slope of ponding area upstream from storage berm from field measurements
   _____%

9. Determine slope of side of ponding area upstream from storage berm from field measurements. If side slopes are different use the average of the two slopes.   _____%

10. Determine soil loss expected above ponding area from Table 4.32-M (4.32-I)
    _____tonnes/ha/yr_____tons/ac/yr

11. Storage required for eroded soil for 15-year life expectancy
    - Line (10)_____ x Line (1)_____ x 15 = _____tonnes x 0.68 m^3/tonne = _____m^3
    - Line (10)_____ x Line (1)_____ x 15 = _____tons x 21.7 ft^3/ton = (_____ft^3)
      _____m^3 _____ft^3

12. Total pond storage
   - Line (7)_____ + Line (11)_____ = _____m³ (_____ft³)

   _____m³ _____ft³

13. Determine volume factor
   - Line (12)_____ x Line (8)_____ x Line (9)_____ = _____m³ (_____ft³)

   _____m³ _____ft³

14. Obtain pond depth (design berm height) from Table 4.33-M (4.33-I)

   _____m _____ft

15. Determine pond length
Line 14_____ ÷ Line 8_____ x 100 = _____x 100 = _____m (_____ft)

   _____m _____ft

16. Determine maximum pond width
Line 14_____ ÷ Line 9_____ x 200 = _____ x 200 = _____m (_____ft)

   _____m _____ft

If pond side slopes vary by more than 50%, the calculated pond width will be different than the actual field pond width. For accuracy, separate the sides and calculate individually.

17. Obtain maximum flooding time from Table 4.34   _____hrs

18. Determine outlet capacity
Line (7)_____ ÷ Line (17)_____ - Line (6)_____ x 0.000277 = _____m³/s (_____ft³/s)

   _____m³/s_____ft³/s

19. Horizontal pipe capacity required (this WASCoB from Line (18))   _____m³/s_____ft³/s

20. Riser pipe diameter required (this WASCoB) from Table 4.19-M to 4.20-M (4.19-I to 4.20-I)

   _____mm _____in.

21. Maximum flow through riser pipe (this WASCoB) from Table 4.19-M to 4.20-M (4.19-I to 4.20-I)

   _____m³/s_____ft³/s

22. If applicable, orifice plate diameter used (this WASCoB) from Table 4.21-M to 4.22-M (4.21-I to 4.22-I) (attempt to equal or slightly exceed Line (19) value)   _____mm _____in.

23. If applicable, maximum flow through riser pipe orifice plate (this WASCoB) from Table 4.21-M – 4.22-M (4.21-I – 4.22-I)   _____m³/s_____ft³/s

24. Horizontal pipe flow from Line (31) for upper WASCoB(s)(enter 0 if this is the upper WASCoB)

   _____m³/s_____ft³/s

25. Minimum horizontal pipe flow (below this WASCoB, i.e., including this WASCoB + upper WASCoB flows)

Line (19)_____ + Line (24)_____ = _____m³/s (_____ft³/s)

_____m³/s_____ft³/s

26. Minimum horizontal pipe slope (below this WASCoB)   _____%

27. Horizontal pipe size required (below this WASCoB) using flow from Line (25), pipe slope from Line (26) and Table 4.18-M (4.18-I), Figure 4.31 or OMAFRA Publication 29, Drainage Guide for Ontario

_____mm _____in.

28. Maximum possible flow in horizontal pipe using pipe size from Line(27), pipe slope from Line (26) (below this WASCoB) and Figure 4.31   _____m³/s_____ft³/s

29. Extra horizontal pipe capacity (below this WASCoB)

Line (28)_____ – Line (24)_____ = _____m³/s (_____ft³/s)

_____m³/s_____ft³/s

30. Restricting flow (identify as the smallest value of Line (21), Line (23)(if applicable; ie. an orifice plate is used) and Line (29)). If no orifice plate used, Line (23) = Line (21), do not insert 0 value

_____m³/s_____ft³/s

31. Horizontal pipe flow transferred to lower WASCoB

Line (30)_____ + Line (24)_____ = _____m³/s (_____ft³/s)

If the value from Line (31) is considerably less than Line (28), consider increasing water inflow (ie. increase riser pipe size at this WASCoB location up to maximum value of Line (28)).

_____m³/s_____ft³/s

32. Surface water transfer from Line (33) for upper WASCoB(s) Enter 0 if this is upper WASCoB

_____m³/s_____ft³/s

33. Surface water transfer to lower WASCoB

Line (32)_____ + Line (5) (this WASCoB)_____ = _____m³/s (_____ft³/s)

_____m³/s_____ft³/s

34. Check emergency overflow spillway type to be used   ☐   ☐

35. Determine emergency overflow spillway capacity from Line (33)

_____m³/s_____ft³/s

36. Determine emergency overflow spillway notch dimensions from Table 4.35-M (4.35-I) to meet capacity requirements from Line (35)
- notch width (L)   _____m _____ft
- notch depth (D)   _____m _____ft

37. Actual berm height (Note: Freeboard is 10% of Line (14) to maximum of 0.15 m (6 in.))
Line (14)_____ + freeboard_____ + notch depth(D)(Line (36))_____ =

_____m _____ft

38. Actual berm length
Line (37)_____ ÷ Line (9)_____ x 200 = _____ x 200 = _____m (_____ft)

_____m _____ft

39. Berm side slope (minimum 2:1, maximum 8:1)   _____ :1

40. Top width of berm (Note: Default width of 1.2 m (4 ft))   _____1.2 m _____4 ft

41. Bottom width of berm
Line (40)_____ + (2 x Line (37)_____ x Line (39))_____ = _____m (_____ft)

_____m _____ft

42. Earth volume for berm from Table 4.36-M to 4.38-M (4.36-I to 4.38-I)

_____m^3 _____yd^3

Proceed with the design of the next (lower) Water and Sediment Control Basin. Complete a separate Water and Sediment Control Basin (WASCoB) Design Information Sheet (Multiple WASCoB System).