

# 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 <sup>3</sup> /s | _____ ft <sup>3</sup> /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 <sup>3</sup> /s | _____ ft <sup>3</sup> /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 <sup>3</sup>    | _____ ft <sup>3</sup>    |
| 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<br>Line (10) x Line (1) x 15 = _____ x _____ x 15<br>= _____ tonnes x 0.68 m <sup>3</sup> /tonne = _____ m <sup>3</sup><br>( _____ x _____ x 15<br>= _____ tons x 21.7 ft <sup>3</sup> /ton = ( _____ ft <sup>3</sup> )  | _____ m <sup>3</sup>    | _____ ft <sup>3</sup>    |
| 12. Total pond storage<br>Line (7) + Line (11)<br>= _____ + _____ = _____ m <sup>3</sup> ( _____ ft <sup>3</sup> )  | _____ m <sup>3</sup>    | _____ ft <sup>3</sup>    |
| 13. Determine volume factor<br>Line (12) x Line (8) x Line (9)<br>= _____ x _____ x _____ = _____ m <sup>3</sup> ( _____ ft <sup>3</sup> )  | _____ m <sup>3</sup>    | _____ ft <sup>3</sup>    |
| 14. Obtain pond depth (design berm height) from Table 4.33-M (4.33-I)   | _____ m                 | _____ ft                 |
| 15. Determine pond length<br>$\frac{\text{Line 14}}{\text{Line 8}} \times 100 = \text{_____} \times 100 = \text{_____ m ( _____ ft)}$   | _____ m                 | _____ ft                 |
| 16. Determine maximum pond width<br>$\frac{\text{Line 14}}{\text{Line 9}} \times 200 = \text{_____} \times 200 = \text{_____ m ( _____ ft)}$<br><br>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. | _____ m                 | _____ ft                 |
| 17. Obtain maximum flooding time from Table 4.34  | _____ hrs               |                          |

|  |                                      |                                     |
|--|--------------------------------------|-------------------------------------|
| 18. Determine outlet capacity<br>$\frac{\text{Line (7)}}{\text{Line (17)} - \text{Line (6)}} \times 0.000277 = \frac{\quad}{\quad} \times 0.000277$ $= \quad \text{m}^3/\text{s} (\quad \text{ft}^3/\text{s})$   | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 19. Horizontal pipe capacity required (this WASCoB from Line (18))   | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /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)   | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /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)  | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 24. Horizontal pipe flow from Line (31) for upper WASCoB(s) (enter 0 if this is the upper WASCoB)  | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 25. Minimum horizontal pipe flow (below this WASCoB, i.e., including this WASCoB + upper WASCoB flows)<br>Line (19) + Line (24)<br>= _____ + _____ = _____ m <sup>3</sup> /s ( _____ ft <sup>3</sup> /s)   | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /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, <i>Drainage Guide for Ontario</i>  | _____ 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   | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 29. Extra horizontal pipe capacity (below this WASCoB)<br>Line (28) – Line (24)<br>= _____ - _____ = _____ m <sup>3</sup> /s ( _____ ft <sup>3</sup> /s)   | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /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  | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 31. Horizontal pipe flow transferred to lower WASCoB<br>Line (30) + Line (24)<br>= _____ + _____ = _____ m <sup>3</sup> /s ( _____ ft <sup>3</sup> /s)<br>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)). | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 32. Surface water transfer from Line (33) for upper WASCoB(s)<br>Enter 0 if this is upper WASCoB   | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 33. Surface water transfer to lower WASCoB<br>Line (32) + Line (5) (this WASCoB)<br>= _____ + _____ = _____ m <sup>3</sup> /s ( _____ ft <sup>3</sup> /s)  | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /s            |
| 34. Check emergency overflow spillway type to be used  | <input type="checkbox"/> Grass lined | <input type="checkbox"/> Rock lined |
| 35. Determine emergency overflow spillway capacity from Line (33)  | _____ m <sup>3</sup> /s              | _____ ft <sup>3</sup> /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.))<br>Line (14) + freeboard + notch depth (D) (Line (36))<br>= _____ + _____ + _____ = _____ m ( _____ ft)  | _____ m                              | _____ ft                            |

|  |                      |                       |
|--|----------------------|-----------------------|
| 38. Actual berm length<br>$\frac{\text{Line (37)}}{\text{Line (9)}} \times 200$<br>= _____ x 200 = _____ m (_____ ft)        | _____ m              | _____ ft              |
| 39. Berm side slope (minimum 2:1, maximum 8:1)   | _____ :1             |                       |
| 40. Top width of berm<br>(Note: Default width of 1.2 m (4 ft))   | 1.2 m                | 4 ft                  |
| 41. Bottom width of berm<br>Line (40) + (2 x Line (37) x Line (39))<br>= _____ + (2 x _____ x _____)<br>= _____ m (_____ ft) | _____ m              | _____ ft              |
| 42. Earth volume for berm from<br>Table 4.36-M to 4.38-M (4.36-I to 4.38-I)  | _____ m <sup>3</sup> | _____ yd <sup>3</sup> |

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).