

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

SI Units

This worksheet is a supplement to Publication 832: Agricultural Erosion Control Structures: A Design and Construction Manual.

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 Identification Number _____ of _____

Section 1: Watershed Data Input

No.	Description	Input Value
1	Watershed area	_____ ha
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	_____ m ³ /s
5	Peak flow from watershed for 25-year storm from Table 4.25-M to 4.31-M	_____ m ³ /s
6	Obtain the storm duration for a 10-year storm from Table 4.25-M to 4.31-M	_____ hrs
7	Obtain the storm volume expected for a 10-year storm from Table 4.25-M to 4.31-M	_____ m ³

Section 2: Storage and Pond Dimensions

No.	Description	Input Value
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	_____ tonnes/ha/yr
11	Storage required for eroded soil for 15-year life expectancy	Line (10) _____ x Line (1) _____ x 15 = _____ x 0.68 m ³ /tonne = _____ m ³
12	Total pond storage	Line (7) _____ + Line (11) _____ = _____ m ³

(Storage and Pond Dimensions Table continued on next page)

Section 2: Storage and Pond Dimensions *(continued)*

No.	Description	Input Value
13	Determine volume factor	Line (12) _____ x Line (8) _____ x Line (9) _____ = _____ m ³
14	Obtain pond depth (design berm height) from Table 4.33-M	_____ m
15	Determine pond length	Line (14) _____ ÷ Line (8) _____ x 100 = _____ m
16	Determine maximum pond width Note: For Line 16, 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.	Line (14) _____ ÷ Line (9) _____ x 200 = _____ m

Section 3: Outlet Design

No.	Description	Input Value
17	Obtain maximum flooding time from Table 4.34	_____ hrs
18	Determine outlet capacity	Line (7) _____ ÷ (Line (17) _____ - Line (6) _____) x 0.000277 = _____ m ³ /s
19	Horizontal pipe capacity required (this WASCoB) from Line (18)	_____ m ³ /s

Section 4: Pipe and Flow Specifications

No.	Description	Input Value
20	Riser pipe diameter required (this WASCoB) from Table 4.19-M to 4.20-M	_____ mm
21	Maximum flow through riser pipe (this WASCoB) from Table 4.19-M to 4.20-M	_____ m ³ /s
22	If applicable, orifice plate diameter used (this WASCoB) from Table 4.21-M to 4.22-M (attempt to equal or slightly exceed Line (19) value)	_____ mm
23	If applicable, maximum flow through riser pipe orifice plate (this WASCoB) from Table 4.21-M – 4.22-M	_____ m ³ /s
24	Horizontal pipe flow from Line (31) for upper WASCoB(s) (enter 0 if this is the upper WASCoB)	_____ m ³ /s
25	Minimum horizontal pipe flow (below this WASCoB, i.e., including this WASCoB + upper WASCoB flows)	Line (19) _____ + Line (24) _____ = _____ m ³ /s

(Pipe and Flow Specifications Table continued on next page)

Section 4: Pipe and Flow Specifications *(continued)*

No.	Description	Input Value
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 Figure 4.31	_____ mm
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 ³ /s
29	Extra horizontal pipe capacity (below this WASCoB)	Line (28) _____ – Line (24) _____ = _____ m ³ /s
30	Restricting flow. (Identify as the smallest value of Line (21), Line (23) (if applicable, i.e. an orifice plate is used) and Line (29)). If no orifice plate used, Line (23) = Line (21). Do not insert 0 value	_____ m ³ /s
31	Horizontal pipe flow transferred to lower WASCoB: Note: If the value from Line (31) is considerably less than Line (28), consider increasing water inflow (i.e. increase riser pipe size at this WASCoB location up to maximum value of Line (28)). _____ m ³ /s	Line (30) _____ + Line (24) _____ = _____ m ³ /s
32	Surface water transfer from Line (33) for upper WASCoB(s). Enter 0 if this is upper WASCoB	_____ m ³ /s
33	Surface water transfer to lower WASCoB	Line (32) _____ + Line (5) (this WASCoB) _____ = _____ m ³ /s

Section 5: Emergency Spillway Design & Final Berm Construction

No.	Description	Input Value
34	Emergency overflow spillway type to be used (check one)	Grass Lined Rock Lined
35	Determine emergency overflow spillway capacity from Line (33)	_____ m ³ /s
36	Determine emergency overflow spillway notch dimensions from Table 4.35-M to meet capacity requirements from Line (35)	Notch width (L) _____ m Notch depth (D) _____ m
37	Actual berm height (Note: Freeboard is 10% of Line (14) to maximum of 0.15 m)	Line (14) _____ m + freeboard _____ m + notch depth (D) (Line (36)) _____ m = _____ m

(Emergency Spillway Design & Final Berm Construction Table continued on next page)

Section 5: Emergency Spillway Design & Final Berm Construction *(continued)*

No.	Description	Input Value
38	Actual berm length	Line (37) _____ ÷ Line (9) _____ x 200 = _____ m
39	Berm side slope (minimum 2:1, maximum 8:1)	_____ :1
40	Top width of berm (Note: Default width of 1.2 m)	_____ m
41	Bottom width of berm	Line (40) _____ + (2 x Line (37) _____ x Line (39) _____) = _____ m
42	Earth volume for berm from Table 4.36-M to 4.38-M	_____ m 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)