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

Imperial 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	_____ 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-I to 4.31-I	_____ ft^3/s
5	Peak flow from watershed for 25-year storm from Table 4.25-I to 4.31-I	_____ ft^3/s
6	Obtain the storm duration for a 10-year storm from Table 4.25-I to 4.31-I	_____ hrs
7	Obtain the storm volume expected for a 10-year storm from Table 4.25-I to 4.31-I	_____ ft^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-I	_____ tons/ac/yr
11	Storage required for eroded soil for 15-year life expectancy	Line (**10**) _____ x Line (**1**) _____ x 15 = _____ x 21.7 ft^3/ton = _____ ft^3
12	Total pond storage	Line (**7**) _____ + Line (**11**) _____ = _____ ft^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**) _____ = _____ ft^3
14	Obtain pond depth (design berm height) from Table 4.33-I	_____ ft
15	Determine pond length	Line (**14**) _____ ÷ Line (**8**) _____ x 100 = _____ ft
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 = _____ ft

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 = _____ ft^3/s
19	Horizontal pipe capacity required (this WASCoB) from Line (**18**)	_____ ft^3/s

Section 4: Pipe and Flow Specifications

No.	Description	Input Value
20	Riser pipe diameter required (this WASCoB) from Table 4.19-I to 4.20-I	_____ in
21	Maximum flow through riser pipe (this WASCoB) from Table 4.19-I to 4.20-I	_____ ft^3/s
22	If applicable, orifice plate diameter used (this WASCoB) from Table 4.21-I to 4.22-I (attempt to equal or slightly exceed Line (**19**) value)	_____ in
23	If applicable, maximum flow through riser pipe orifice plate (this WASCoB) from Table 4.21-I – 4.22-I	_____ ft^3/s
24	Horizontal pipe flow from Line (**31**) for upper WASCoB(s) (enter 0 if this is the upper WASCoB)	_____ ft^3/s
25	Minimum horizontal pipe flow (below this WASCoB, i.e., including this WASCoB + upper WASCoB flows)	Line (**19**) _____ + Line (**24**) _____ = _____ ft^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	_____ ft
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	_____ ft^3/s
29	Extra horizontal pipe capacity (below this WASCoB)	Line (**28**) _____ – Line (**24**) _____ = _____ ft^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	_____ ft^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**)). _____ ft^3/s	Line (**30**) _____ + Line (**24**) _____ = _____ ft^3/s
32	Surface water transfer from Line (**33**) for upper WASCoB(s). Enter 0 if this is upper WASCoB	_____ ft^3/s
33	Surface water transfer to lower WASCoB	Line (**32**) _____ + Line (**5**) (this WASCoB) _____ = _____ ft^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**)	_____ ft^3/s
36	Determine emergency overflow spillway notch dimensions from Table 4.35-I to meet capacity requirements from Line (**35**)	Notch width (L) _____ ft Notch depth (D) _____ ft
37	Actual berm height (Note: Freeboard is 10% of Line (**14**) to maximum of 0.5 ft)	Line (**14**) _____ ft + freeboard _____ ft + notch depth (D) (Line (**36**)) _____ ft = _____ ft

(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 = _____ ft
39	Berm side slope (minimum 2:1, maximum 8:1)	_____ :1
40	Top width of berm (Note: Default width of 4 ft)	_____ ft
41	Bottom width of berm	Line (**40**) _____ + (2 x Line (**37**) _____ x Line (**39**) _____) = _____ ft
42	Earth volume for berm from Table 4.36-I to 4.38-I	_____ 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)