COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
COWETA	CSMSL-0007-00(956)	87	106

Temporary Sediment Basin Design Sheet

Project Name: Newnan Park and Ride Lot — Computed By: MBG — Date: 02/27/2009
Project Number: 1528.4037 — Checked By: GBS — Date: 03/05/2009
Basin No.: Initial Phase Sd3

Total Area Draining To Basin = 8.65 acres

Disturbed Area Draining To Basin = 8.65 acres

Volume:

1. Compute minimum required storage volume (V_s).
   V_s = 67 cy/acre * 8.65 acres = 580.00 cy 15660 cf
2. Compute volume of basin at clean-out (V_c).
   V_c = 22 cy/acre * 8.65 acres = 190.00 cy 5130 cf
3. Determine elevation corresponding to minimum required storage volume, V_s
   Minimum riser crest elevation = 837.00 feet (determined by stage/storage relationship)
4. Determine elevation corresponding to clean-out volume, V_c
   Clean-out elevation = 836.00 feet (determined by stage/storage relationship)
   Note: *Clean-out elevation shall be clearly marked on the riser or marked by a post near the riser.*
5. Compute Length of riser.
   Riser length = Minimum elevation of riser crest - Lowest elevation of pipe at riser
   Riser length = 837.00 feet - 835.00 feet
   Riser length = 2.00 feet

Stormwater Runoff:

6. Compute peak discharge from a 2-yr, 24-hr storm event.
   Q_2 = 26.99 cfs (Attach runoff computation sheet)
7. Compute peak discharge from a 25-yr, 24-hr storm event.
   Q_{25} = 47.06 cfs (Attach runoff computation sheet)

Surface Area/Configuration Design:

8. Compute minimum basin surface area (SA_{min})
   SA_{min} = 0.01 ac/cfs * Q_2 cfs
   SA_{min} = 0.01 ac/cfs * 26.99 cfs
   SA_{min} = 0.27 ac * 43560 sf/ac = 11755.97 sf
9. Check available area at elevation of riser crest.
   Available Area = 11859.00 sf (determined by stage/storage relationship)
   Available Area ≥ SA_{min}? Yes/No: **YES**
10. Compute required length at elevation of riser crest.
    Average Width = 77.00 ft
    Required length = 2 * average width
    Required length = 2 * 77.00 ft = 154.00 ft
    Required length = 154.00
    Available Length = 154.00 ft
    2:1 L:W ratio satisfied? YES
    If "no," refer to Figure 6-22.2 for baffle designs.
    Note any required baffles on ESSC plan and include calculations and details for baffle(s).

Principal Spillway (ps)

11. Determine maximum principal spillway capacity.
    Q_{ps} = Q_2 = 26.99 cfs
12. Compute the vertical distance between the centerline of the outlet pipe and the emergency spillway crest (H).
    H = 4.80 ft (Determine From Table 6-22.1)
13. Compute the total pipe length of the principal spillway, L, using Figure 6-22.3.
    L = [A+(B+C)/2][Zu+Zd]+T+E
    A = 0.00 ft Top Of Dam Elevation
    B = 0.00 ft Lowest Elevation of Pipe At Riser
    C = 0.00 ft Lowest Elevation of Pipe At Outlet
    E = 0.00 ft Extended length of pipe beyond toe of dam
    T = 0.00 ft Top Width of Dam
    Zu = 0.00 Upstream Side Slope
    Zd = 0.00 Downstream Side Slope
    L = 39.50 ft
14. Determine diameter of principal spillway (D_{ps}) and flow through the principle spillway (Q) from Table 6-22.1 using H and Q_{max}.
    D_{ps} = 30.00 in Q_{max} = 42.10 cfs (value directly from table)
15. Compute actual flow through the principal spillway, using Table 6-22.1 to determine the correction factor for pipe length, L.
    Qps = Q * correction factor
    Factor = 1.14
    Q_{ps} = 30.77
16. Compute riser diameter (D_r).
    D_r = 1.5 * D_{ps}
    D_r = 1.50 * 30.00 in
    D_r = 48.00 in
17. Compute trash rack diameter (D_t).
    D_t = 1.4 * D
    D_t = 1.40 * 48.00 in
    D_t = 72.00
18. Determine the minimum distance between the riser crest and the emergency spillway crest,h, using Table 6-22.2, D_r and C_{ES}.
    h = 0.80 feet

Concrete Riser Base Design

19. Determine the volume of concrete per vertical foot of riser height needed, from Table 6-22.3 to prevent floatation.
    Required volume of concrete per vertical foot: = 10.98 cfv.f
20. Compute total volume of concrete required.
    Total volume of concrete required = Required volume per vertical foot * Riser length
    Total volume of concrete required = 10.98 cfv.f * 2.00 ft
    Total volume of concrete required = 21.96 cf
21. Assume base thickness, B (usually 18")
    B = 18.00 in = 1.50 ft
22. Compute required surface area.
    Required surface area = Total volume required/B
    Required surface area = 21.96 cf / 1.50 ft
    Required surface area = 14.64 sf
23. Compute riser base length (l) and width (w) (assume square base).
    l = w = (required surface area)^1/2
    l = w = 3.83 ft
    l = w = 45.91 in

Anti-Seep Collar Design

24. Determine if anti-seep collar is required. If yes to any of the following conditions, a collar is required:
    N The settled height of the dam is greater than 15 feet.
    N The principal spillway diameter (D_{ps}) is smooth pipe larger than 8".
    Y The principal spillway diameter (D_{ps}) is corrugated metal pipe larger than 12".
25. Determine size of anti-seep collar required.
    X **18-inch projection** (for heads (H) less than or equal to 10 feet).
    24-inch projection (for heads (H) greater than 10 feet).

Emergency Spillway (es)

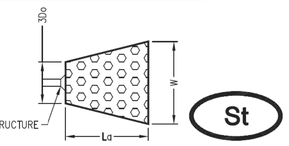
26. Compute minimum capacity of emergency spillway (Q_{es}).
    Q_{es} = Q_{25} - Q_{ps}
    Q_{es} = 16.29 cfs
27. Determine stage (H_e), bottom width (b), velocity (V), and minimum exit slope (S) using Table 6-22.4 and Q_{es}.
    H_e = 0.80 ft
    b = 10.00 ft
    V = 3.30 fps
    S = 3.30 %
28. Actual entrance channel slope.
    S_e = 33.00 %
29. Actual exit channel slope.
    S_a = 50.00%
    Is S_a Steeper than S (from Table 6-22.4)? YES
    If Yes, calculate new exit velocity (V_a)
    $V_a = V * (S_a/S)^{1/2}$ fps
    V_a = 3.30 fps * 50.00 % / 3.30 %)^1/2
    V_a = 7.46 fps
    Note: Refer to Channel Stabilization (Ch) to determine the proper lining for the emergency spillway.
    Stabilize Channel With: Rip-Rap

Design Elevations

30. **Riser Crest Elevation** = 837.00 ft
31. Compute minimum emergency spillway crest elevation.
    Minimum emergency spillway crest elevation = Riser crest elevation + h (or 1 whichever is greater)
    Minimum emergency spillway crest elevation = 837.00 ft + 1.00 ft
    Minimum emergency spillway crest elevation = 838.00 ft
32. Determine design high water elevation.
    Design high water elevation = Minimum emergency spillway crest elevation + Stage elevation (H_e)
    Design high water elevation = 839.80 ft
33. Determine elevation of top of dam
    Elevation of top of dam = Design high water elevation + 1 ft freeboard
    Elevation of top of dam = 839.80 ft + 1.00 ft
    Elevation of top of dam = 839.80

PLEASE NOTE THAT DESIGN VALUES DETERMINED BY THIS SHEET REPRESENT THE MINIMUM REQUIREMENTS FOR A TEMPORARY SEDIMENT BASIN.

DESIGN OF OUTLET PROTECTION



STRUCTURE	30_o (ft)	W (ft)	L_a (ft)	d_{min} (in)	d_{50} (in)	d_{max} (in)	THICKNESS (in)
SD3	7.5	25.2	22.7	5	9	14	21
PIPE ø (in) = 30	PIPE VELOCITY V_{25} (ft/s) = 9.29			FLOW RATE Q_{25} (cfs)= 42.10			
ST-A1	9	27.7	24.7	5	9	14	21
PIPE ø (in) = 36	PIPE VELOCITY V_{25} (ft/s) = 6.86			FLOW RATE Q_{25} (cfs)= 28.25			
ST-B1	6	21.1	19.1	4	8	12	18
PIPE ø (in) = 24	PIPE VELOCITY V_{25} (ft/s) = 5.99			FLOW RATE Q_{25} (cfs)= 12.30			
ST-C1	4.5	17.2	15.7	4	7	11	17
PIPE ø (in) = 18	PIPE VELOCITY V_{25} (ft/s) = 5.54			FLOW RATE Q_{25} (cfs)= 7.02			
DN1	27	35	25	5	9	14	14
PIPE ø (in) = 18	PIPE VELOCITY V_{25} (ft/s) = 7.2			FLOW RATE Q_{25} (cfs)= 42.1			

INLET ID: C2

1. Drainage Area = 0.93 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.93
   Required sediment storage = 62.31 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 62.31 cy / 2.00 ft
   SA_{min} = 841.19 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 41.50 ft
   width = 21.00 ft
   (If applicable) diameter= N/A ft

INLET ID: A2.1

1. Drainage Area = 0.59 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.59
   Required sediment storage = 39.53 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 39.53 cy / 2.00 ft
   SA_{min} = 533.66 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 33.00 ft
   width = 16.00 ft
   (If applicable) diameter= N/A ft

INLET ID: A4.A

1. Drainage Area = 0.39 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.39
   Required sediment storage = 26.13 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 26.13 cy / 2.00 ft
   SA_{min} = 352.76 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 27.00 ft
   width = 13.50 ft
   (If applicable) diameter= N/A ft

INLET ID: A5

1. Drainage Area = 0.38 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.38
   Required sediment storage = 25.46 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 25.46 cy / 2.00 ft
   SA_{min} = 343.71 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 26.50 ft
   width = 13.50 ft
   (If applicable) diameter= N/A ft

INLET ID: A7.1

1. Drainage Area = 0.16 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.16
   Required sediment storage = 10.72 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 10.72 cy / 2.00 ft
   SA_{min} = 144.72 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 17.50 ft
   width = 9.00 ft
   (If applicable) diameter= N/A ft

INLET ID: B2

1. Drainage Area = 0.83 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.83
   Required sediment storage = 55.61 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 55.61 cy / 2.00 ft
   SA_{min} = 750.74 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 39.00 ft
   width = 19.50 ft
   (If applicable) diameter= N/A ft

INLET ID: D1

1. Drainage Area = 0.73 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.73
   Required sediment storage = 48.91 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 48.91 cy / 2.00 ft
   SA_{min} = 660.29 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 36.50 ft
   width = 18.50 ft
   (If applicable) diameter= N/A ft

INLET ID: A3

1. Drainage Area = 0.57 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.57
   Required sediment storage = 38.19 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 38.19 cy / 2.00 ft
   SA_{min} = 515.57 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 32.50 ft
   width = 16.50 ft
   (If applicable) diameter= N/A ft

INLET ID: A4.B

1. Drainage Area = 1.00 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 1.00
   Required sediment storage = 67.00 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 67.00 cy / 2.00 ft
   SA_{min} = 904.50 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 43.00 ft
   width = 21.50 ft
   (If applicable) diameter= N/A ft

INLET ID: A6

1. Drainage Area = 0.51 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.51
   Required sediment storage = 34.17 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 34.17 cy / 2.00 ft
   SA_{min} = 461.30 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 35.00 ft
   width = 15.50 ft
   (If applicable) diameter= N/A ft

INLET ID: A8.1

1. Drainage Area = 0.63 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.63
   Required sediment storage = 42.21 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00 ft
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 42.21 cy / 2.00 ft
   SA_{min} = 569.84 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 34.00 ft
   width = 17.00 ft
   (If applicable) diameter= N/A ft

INLET ID: B4

1. Drainage Area = 0.83 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.83
   Required sediment storage = 55.61 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 55.61 cy / 2.00 ft
   SA_{min} = 750.74 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 39.00 ft
   width = 19.50 ft
   (If applicable) diameter= N/A ft

INLET ID: D2

1. Drainage Area = 0.23 ac
2. Required sediment storage = 67 cy/ac * drainage area
   Required sediment storage = 67 cy/ac * 0.23
   Required sediment storage = 15.41 cy
3. Assume excavation**depth** (minimum 1.5 feet) = 2.00 ft
4. Assume **slope of sides** (shall not be steeper than 2:1) = 2.00
5. Determine required surface area.
   SA_{min} = Required sediment storage / excavation depth
   SA_{min} = 15.41 cy / 2.00 ft
   SA_{min} = 208.04 sf
6. Assume shape of excavation and determine dimensions.
   (A rectangular shape with 2:1 length to width ratio is recommended)
   Shape = Rectangular
   Dimensions
   length = 20.50 ft
   width = 10.50 ft
   (If applicable) diameter= N/A ft

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REVISIONS

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE OF INNOVATIVE PROGRAM DELIVERY

ESPC CALCULATIONS

NEWNAN SR 34 AND HOLLZ PKWY
PARK AND RIDE LOT

51-02
DRAWING No.