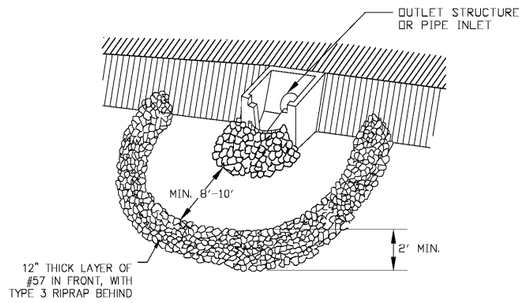
Fr

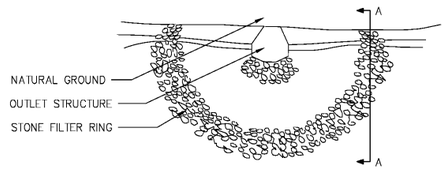
STONE FILTER RING

Figure 6-20.1

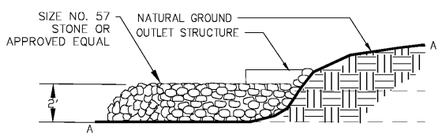
PERSPECTIVE VIEW



PLAN VIEW (NOT TO SCALE)



CROSS SECTION (NOT TO SCALE)



Computed by: William McNamara Date:
Checked by: Dave Skurky Date: 2/26/20

Project Name: PDK 11 RUNWAY INCURSION MITIGATION IMPROVEMENTS
Basin No : Sd3
Total area draining to basin: 7.8 acres
Disturbed area to basin: 1.7 acres

Runoff Coefficient, c, for disturbed area to basin: 0.90
Runoff Coefficient, c, for offsite area to basin: 0.90

Avg. rainfall Intensity for 2-yr storm in region (assume 10min Tc) I: 5.36 in/hr
Avg. rainfall Intensity for 25-yr storm in region (assume 5min Tc) I: 9.32 in/hr

Volume

1. Compute minimum required storage volume (Vs)
   Vs = 67 cy/ac * 7.80 acres = 523 cy or **14,110** cf
2. Compute volume of basin at clean-out (Vc)
   Vc = 22 cy/ac * 7.80 acres = 172 cy or **4,633** cf
3. Determine elevation corresponding to minimum required storage volume, Vs
   Min. riser crest elevation = **986.2** ft (from stage/storage relationship)
   Design riser crest elevation = **986.8** ft (from actual riser crest elevation used)
4. Determine elevation corresponding to clean-out volume, Vc
   Clean-out elevation = **985.3** ft (from stage/storage relationship)
   Note: clean-out elevation shall be clearly marked on the riser or by a post near riser
5. Compute length of riser
   Riser length = Design elevation of riser crest - Lowest elev of pipe at riser
   Riser length = **986.8** ft - **980.6** ft
   Riser length = **6.2** ft

Stormwater Runoff

6. Compute peak discharge from a 2-yr, 24-hr storm event
   Q_2 = **7.8** cfs (taken from Hydrographs)
7. Compute peak discharge from 25-yr, 24-hr storm event
   Q_{25} = **21.53** cfs (taken from Hydrographs)

Surface Area/Configuration Design

8. Compute minimum basin surface area (SAmin)
   SAmin = 0.01 ac/cfs* Q2
   SAmin = 0.01 ac/cfs* 7.80 cfs
   SAmin = 0.078 ac = 43,560 sf/ac * 0.078 cfs = **3,396** sf
9. Check available area at riser crest
   Available Area = **25,757** sf (determined by stage/storage relationship)
   Available area >=SAmin? Yes **X** No
10. Compute required length to achieve 2:1 L:W ration
    Average width = **200 ft**
    Required length = 2 * average width
    Required length = 2 * 200 ft
    Required length = **400 ft**
    Available length = **400 ft**
    2:1 L:W ratio satisfied? Yes **X** No
    If no, refer to figure 6-22.2 for baffle designs. Note any required baffles on E&SC plan and include calculations and details for baffle(s).

Principal Spillway (ps)

11. Determine maximum principal spillway capacity Qmax = Q2 = 7.8 cfs
12. Compute the vertical distance between the centerline of the outlet pipe and the emerg. spillway crest (H)
    H = **8.4 ft**
13. Compute the total pipe length of the principal spillway, L, using Figure 6-22.3
    L = [A-(B+CY2][Zu+Zd] + T + E A = 989.40 Zu =
    Lreq = **10 ft** B = 980.60 Zd =
    Lactual = **57 ft** C = 980.10
14. Determine diameter of principal spillway (Dps) and flow through principal spillway (Q) from Table 6-22.1 using H and Qmax
    Dps = **24 in** **Q =** **27.00** cfs (actual value from 6-22.1)
    Note: Table 6-22.1 is for CMP, this is RCP, see equation 6-4 in GSMM for flow rate
15. Compute actual flow through principal spillway, using Table 6-22.1 determine the correction
    878
    Qps = Q * correction factor = 27.00 * 1.00 (RCP, not CMP)
    Qps = **27.00 cfs** > Qa = **21.53**
    Therefore Principal Spillway is adequate to handle the 25-year storm
    an emergency spillway is for redundancy only
16. Compute riser diameter (Dr)
    Dr >= 1.5 *
    Dr >= 1.4 * 24 in
    Dr = 48 in
    Dr = **48 in**
17. Compute trash rack diameter (DD)
    DD = 1.4 * Dr
    DD = 1.4 * 48 in
    67.2 in
    DD = **54 in**
18. Determine minimum distance between the riser crest and the emergency spillway crest, h, using table 6-22.2, Dr, and Qps
    h = **0.8 ft**
    Actual Qa= **21.5** < 27.00 (Qps)

Concrete Riser Base Design -

19. Determine the volume of concrete per vertical foot of riser height needed from Table 6-22.3 to prevent flotation.
    Required volume of concrete per vertical foot = **6.18 cf/vf**
20. Compute total volume of concrete required
    Total required volume of concrete = Require volume per vertical foot * Riser Length
    Total required volume of concrete = 6.18 cf/vf * 6.2 ft
    Total volume of concrete required = **38.32 cf**
21. Assume base thickness (usually 18") (B)
    B = **18** in = **1.5 ft**
22. Compute required surface area
    Required surface area = Total volume required / B
    Required surface area = 38.32 cf / 1.5 ft
    Required SA = **25.5 sf**
23. Compute riser base length (l) and width (w) (assume square base).
    l = w = (required SA)$^{1/2}$
    l = w = **5.05** ft = 12in/ft * **5.05 ft** = **61 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.

_____ The settled height of the dam is greater than 15 feet.
x The principal spillway diameter (D_{ps}) is smooth pipe larger than 8".
_____ The principal spillway diameter (D_{ps}) is corrugated metal pipe larger than 12".

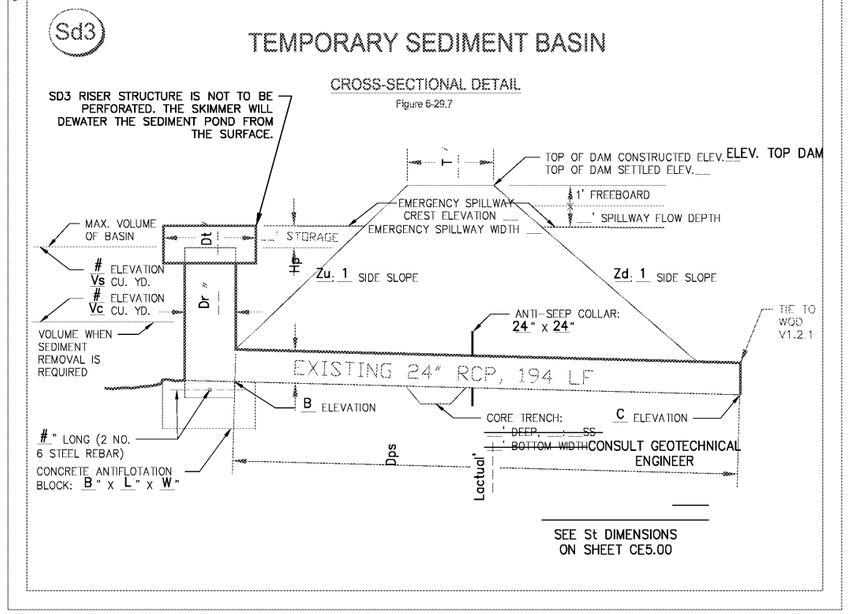
25. Determine if anti-seep collar is required.
X 18-inch projection (for heads (H) less than or equal to 10 feet).
_____ 24-inch projection (for heads (H) greater than 10 feet).

Emergency Spillway (es) Provided in case Principle Spillway clogs.

26. Compute minimum capacity of emergency spillway (Qes)
    Qes = Q_{25} - Qps = 21.53 - 27.00
    Qes = **-5.47 cfs** Therefore, Size for Q25 (redundancy) Qes= **21.53 cfs**
27. Determine stage (Hp), bottom width (b), velocity (V), and minimum exit slope (S) using Table 6-22.4 and Qes.
    Hp = **0.5 ft** **b =** **40 ft**
    V = **2.7 fps** **S =** **3.2 %**
28. Actual entrance channel slope, Se = **5.0** %
29. Actual exit channel slope, So = **5.0** %
    Note: If So is steeper than S (from Table 6-22.4), then the velocity in the exit channel exit channel will increase.
    a) Calculate the new exit velocity (Vo)
    Vo = V(So/S)$^{1/3}$
    Vo = **3.1 fps** < **5** fps; therefore,
    Refer to Channel Stabilization (Ch) to determine proper lining for emerg. spillway
    Grass _____ **Rip-rap** _____ **Concrete** **X**
    Therefore, use: CONCRETE (TAXIWAY)

Design Elevations

30. **Riser crest elevation =** **986.8 ft**
31. Compute minimum emergency spillway crest elevation
    Min. emergency spillway crest = riser crest elevation + h
    Min. emergency spillway crest = 989.6
    Min. emergency spillway crest = **987.6 ft**
    Design emergency spillway crest = **990.0 ft**
32. Determine design high water elevation
    Design high water elevation = emerg. spillway crest + 1/2 design depth (Hp)
    Design high water elevation = 990.0 + 0.5
    Design high water elev. = **990.5 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 = 989.4 + 1ft freeboard
    Elevation of top of dam = **990.4 ft**
    Actual Elevation of top of dam = **990.5 ft**



BASIN I.D.	RISER BOX & PRINCIPLE SPILLWAY											EMERGENCY SPILLWAY				DAM					SEDIMENT STORAGE				
	Dps (in)	Dr (in)	Dt (in)	Riser Elev.	Length, L (ft)	Inv Elev. (Up)	Inv Elev. (Down)	Storage, h (ft)	AF Block B (in)	AF Block L (in)	AF Block W (in)	Crest Elev	Bottom Width (ft)	Hp (ft)	Lining	T (ft)	SS1 (H:1V)	SS2 (H:1V)	Freeboard (ft)	Top of Dam Elev.	Drainage Area (ac)	Maximum Vs Elev.	Maximum Volume, Vs (cf)	Clean-Out Vc Elev.	Clean-Out Volume, Vc (cf)
Sd3	24	48	54	986.8	57	980.6	980.1	0.8	18	61	61	990.0	40	0.5	RETE (TAX	10.00	0.00	0.00	-0.1	990.5	7.80	986.8	14,110	985.3	4,633

DEKALB PEACHTREE AIRPORT
DEKALB COUNTY, GEORGIA

Michael Baker INTERNATIONAL

Designer: **G. SUMMERS**
Technician: **W. MCNAMARA**
Checked by: **D. SKURKY**
Project Number: **174297**

GEORGIA REGISTERED PROFESSIONAL ENGINEER No. 033238 DAVID A. SKURKY 2/26/20
GSWCC LEVEL II DESIGN PROF. #0000072532 EXP. 10/21/2022

AULICK ENGINEERING LLC
HYDRAULICS & HYDROLOGY | EROSION CONTROL
AIRFIELD DESIGN | CONSTRUCTION MANAGEMENT

Notes:

REVISIONS

No.	Description	Date	By

Project Name:
RUNWAY INCURSION MITIGATION IMPROVEMENTS (PDK 11)

Drawing Name:
ES&PCP DETAILS NO. 4

ITB# 20-101257

Date: **FEBRUARY, 2020**
Sheet Number: **22** of **24**
Scale: **1" = 50'**
Drawing Number: **ECD-4**