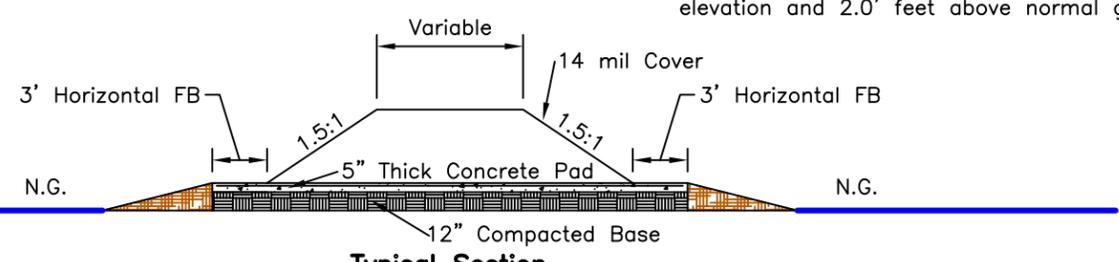
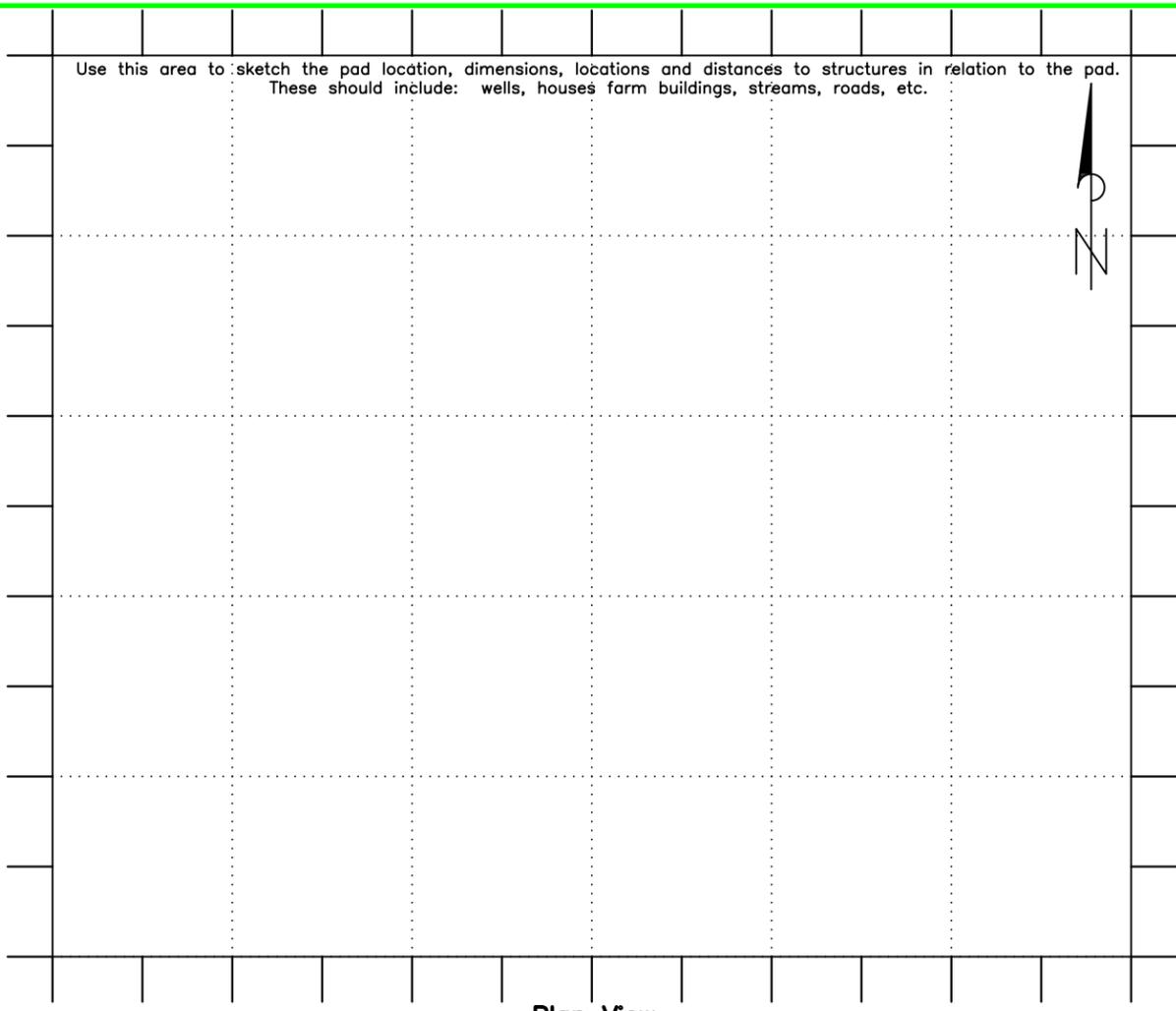


**Concrete Pad Detail**

Geo-Fabric Waste Storage Facilities shall be constructed on 1.0 foot of compacted earthfill, structures located in floodplains must be built above the 25YR-24HR storm elevation and 2.0' feet above normal ground.

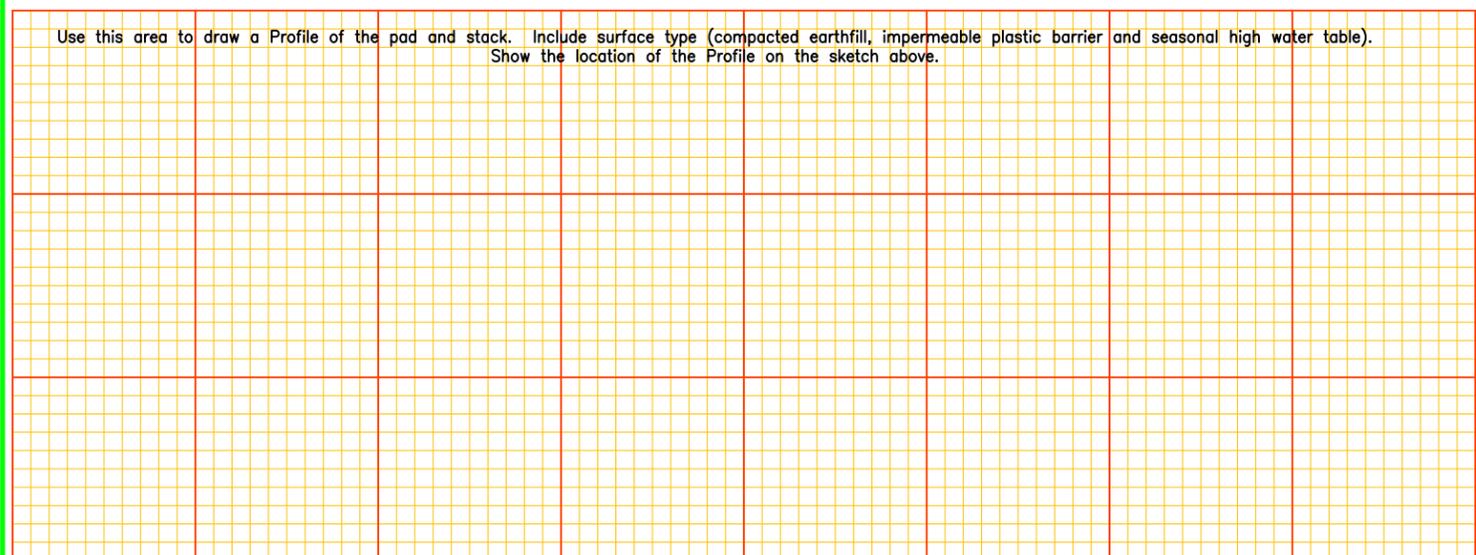


**Typical Section**



Use this area to sketch the pad location, dimensions, locations and distances to structures in relation to the pad. These should include: wells, houses, farm buildings, streams, roads, etc.

**Plan View**



Use this area to draw a Profile of the pad and stack. Include surface type (compacted earthfill, impermeable plastic barrier and seasonal high water table). Show the location of the Profile on the sketch above.

**Profile**

Design Width \_\_\_\_\_(ft) Length \_\_\_\_\_(ft) Height \_\_\_\_\_(ft).  
 As-Built Width \_\_\_\_\_(ft) Length \_\_\_\_\_(ft) Height \_\_\_\_\_(ft).  
 Volume = \_\_\_\_\_(cuft)  
 Weight = \_\_\_\_\_(tons)

The Following Specifications are incorporated by reference and may be located @ [http://www.ar.nrcs.usda.gov/technical/engineering\\_construction\\_specs.html](http://www.ar.nrcs.usda.gov/technical/engineering_construction_specs.html)

1. AR-23C Earthfill- Class C.
2. AR-32 Concrete for minor structure.
3. AR-97 Flexible Membrane Liner.

This Practice does or does not Meet NRCS Standards & Specification

NRCS Representative \_\_\_\_\_

COMMENTS: \_\_\_\_\_

DATE: \_\_\_\_\_

ARKANSAS ENGINEERING STANDARD DRAWING	
/s/	Standard Drawings shall NOT be altered without State Conservation Engineer Approval
Walt Delp, SCE	
STANDARD DWG NO.	AR-ENG-422-Concrete Pad
DATE	1/11 SHEET 1 OF 2



Date	
Designed	
Drawn	
Checked	
Approved	

Geo-Fabric Waste Storage Facility (Concrete Pad)  
 Project Name \_\_\_\_\_  
 Landowner \_\_\_\_\_  
 County \_\_\_\_\_, Arkansas



File Name	AR-ENG-422
	WSF_Concrete.dwg
Drawing Name	Waste Storage Pad
	Concrete Pad
Sheet	1 of 2

**Geo - Fabric Waste Storage Facility with Concrete Pad Construction**

**Notes**

- The waste storage pad shall be constructed of 5 inches of concrete on 12" of compacted earthfill.
- Pads located in flood plains shall be built above 25 Yr 24 HR storm elevation and 2.0' above Normal Ground.
- The waste storage pad shall be located 100' from water bodies or wells.
- The pad site must be free draining. Surface water shall be diverted away from the pad site. The distance from the bottom of the stored waste to the high water table shall not be less than 2.0'.
- The waste storage facility shall be anchored by placing weights every 5 to 10 feet around the perimeter of pile or other acceptable method.
- Non-Cropland areas disturbed during construction, including disposal areas, shall be seeded in accordance with Conservation Practice Standard 342 Critical Area Planting.
- Compacted earthfill shall be placed in accordance with Construction Specification Earthfill, AR-23C Earthfill - Class C Compaction which includes routing the hauling and spreading equipment such that all points of the fill are traversed by at least one tread track of the loaded equipment traveling parallel to the centerline of the fill.
- 3.0' of horizontal freeboard shall be left on all sides of the pad.
- All Geo-Fabric shall be overlapped by 1.0' and stitched for reinforcement and be installed in accordance with Construction Specification AR-97 Flexible Membrane Liner or other acceptable method.
- Cover shall have a minimum thickness of 14 mil (0.36mm) ASTM D5199.
- All concrete shall have a minimum strength of 3,000 psi and meet Construction AR-32 Concrete for minor structures. Construction joints spacing shall not exceed 25' and have a length-to-width ratio of 1.0 to 1.25.
- Reinforcing wire shall be 12"x12" - W9 x W9 or a reinforcing wire that has an equivalent steel cross-sectional area per foot (e.g. 6 x 6 - W5.5 x W5.5, 4 x 4 - W2.9 x W2.9).
- Fiber-Reinforced Concrete may be used in lieu of Wire Mesh. Concrete mixture must comply with ASTM - C1116/C 1116M Standard Specification for Fiber-Reinforced Concrete.

**EXAMPLE**

**Geo-Fabric Pad Sizing Computations\***

Volume = ((Ab + 4Am + At) X H)/6 ; Ab = Area of bottom in sq. ft., Am = Area of middle in sq. ft., At = Area of top in sq. ft, h = height in ft.  
 Example: Width = 40', Length = 100', h = 8', and s:s = 1.5:1, weight 59 cu ft/ton  
 Volume = ((40 X 100) + 4 X (28 x 88) X (16 X 76)) X 8.0/6  
 Volume = (4000 + 9856 + 1216) X 8.0/6  
 Volume = 20,096 cu ft, Weight = 341 tons  
 Stack Width = 40 + 6 Ft = 46.0 Ft Pad Width  
 Stack Length = 100 + 6 Ft 106.0 Ft Pad Length

\* Computations made using the Prismoidal Formula

TABLE 1 Geo-Fabric Waste Storage Facility						
Width (ft)	Length (ft)	Side Slope	Height (ft)	Horizontal FB (ft)	Volume (Cuft)*	Weight (tons)**
40	100	1.5:1	8	3	20096	341
40	110	1.5:1	8	3	22336	379
40	120	1.5:1	8	3	24576	417
40	130	1.5:1	8	3	26816	455
40	140	1.5:1	8	3	29056	492
40	150	1.5:1	8	3	31296	530
40	160	1.5:1	8	3	33536	568
40	170	1.5:1	8	3	35776	606
40	180	1.5:1	8	3	38016	644
40	190	1.5:1	8	3	40256	682
40	200	1.5:1	8	3	42496	720
40	210	1.5:1	8	3	44736	758
40	220	1.5:1	8	3	46976	796
40	230	1.5:1	8	3	49216	834
40	240	1.5:1	8	3	51456	872
40	250	1.5:1	8	3	53696	910
40	260	1.5:1	8	3	55936	948
40	270	1.5:1	8	3	58176	986
40	280	1.5:1	8	3	60416	1024
40	290	1.5:1	8	3	62656	1062
40	300	1.5:1	8	3	64896	1100

\*Computations made using the prismoidal formula.  
 \*\*Weight computed using 59 cu ft/ton.

**Cover Width Computations:**

sh = stack height (ft); stw = stack top width (ft).  
 Cover Width = 6 + sqrt ((sh)<sup>2</sup> + (1.5 X sh)<sup>2</sup>) X 2 + stw(ft).  
 Cover Width = 6 + sqrt ((      )<sup>2</sup> + (      )<sup>2</sup>) X 2 +       .  
 Cover Width =        ft.

**Cover Length Computations:**

sh = stack height (ft); stl = stack top length (ft).  
 Cover Length = 6 + sqrt ((sh)<sup>2</sup> + (1.5 X sh)<sup>2</sup>) X 2 + stl(ft).  
 Cover Length = 6 + sqrt ((      )<sup>2</sup> + (      )<sup>2</sup>) X 2 +       .  
 Cover Length =        ft.

**FINAL COMPUTATIONS**

**Geo-Fabric Pad Sizing Computations**

Volume = ((Ab + 4Am + At) X H)/6 ; Ab = Area of bottom in sq. ft., Am = Area of middle in sq. ft., At = Area of top in sq. ft, h = height in ft.  
 Width = W, Length = L, height = h, and s:s = 1.5:1, weight 59 cu ft/ton  
 Volume = ((W X L) + 4 X (W-1.5h) X (L-1.5h) + (W-3h) X (L-3h)) X h/6  
 Volume = ((      ) + 4 X (      ) X (      ) + (      ) X (      )) X       /6  
 Volume = (       sq. ft. +        sq. ft. +        sq. ft.) X        ft./6  
 Volume =        cu ft, Weight =        tons  
 Stack Width =        + 6 Ft =        Ft Pad Width  
 Stack Length =        + 6 Ft =        Ft Pad Length

TABLE 2 Concrete Pad				
Base (cuyd)	Width (ft)	Length (ft)	Width (ft)*	Length (ft)*
75	46	106	51	111
82	46	116	51	121
89	46	126	51	131
97	46	136	51	141
104	46	146	51	151
111	46	156	51	161
118	46	166	51	171
125	46	176	51	181
132	46	186	51	191
139	46	196	51	201
146	46	206	51	211
153	46	216	51	221
160	46	226	51	231
168	46	236	51	241
175	46	246	51	251
182	46	256	51	261
189	46	266	51	271
196	46	276	51	281
203	46	286	51	291
210	46	296	51	301
217	46	306	51	311

\* All measurements are in place 3-5% may need to be added to widths and lengths for seams and overlaps.

**Concrete Pad Computations:**

Volume = (Length (ft) X Width (ft) X Thickness (ft)) + 27  
 V = (        X        ) X 0.417 + 27  
 V =        Cu. Yds.