

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
ARIZONA

CONSTRUCTION SPECIFICATION 636F
WATER HARVESTING CATCHMENT
ASPHALT-FABRIC SURFACING

1 SCOPE

The work shall consist of applying asphalt-fabric membrane to catchment aprons, berms and spillways, including all preparation of the catchment area and furnishing of materials.

2 GENERAL

The attached construction specifications required to complete the system, such as the watering facility (614), pipeline (516), structures for water control (587), etc. shall be considered a part of this specification. Installation shall be in accordance with the approved drawings, specifications and per product manufacturer or supplier's recommendations where applicable.

3. INSTALLATION

Installation shall be in accordance with the approved drawings, specifications and per product manufacturer or supplier's recommendations where applicable. No changes are to be made to the drawings or specifications without prior approval of NRCS.

3.1 Foundation Preparation: The apron and dike foundation shall be cleared of all trees, stumps, roots, brush, rocks, debris, and vegetation. A minimum of soil shall be removed from the foundation to construct a smooth surface to the area as staked in the field. Hand raking shall be required to remove loose sticks, roots, and rocks larger than 1-1/2 inches in diameter from the surface area of the apron and dikes. Objectionable soil materials shall be covered with a two-inch minimum layer of sandy soil. All waste material shall be disposed of at locations designated by the landowner. Disposal shall consist of burning, burying or removal from visibility at the construction site.

3.2 Compaction: The entire catchment area and dikes shall be compacted. The catchment area and foundation for dike and spillway shall be compacted by one pass of a rubber-tired vehicle over the entire area. Fills (dike, pipe ramp and spillway) shall be compacted in layers not exceeding six inches with three to five passes over the full width of each lift with rubber-tired vehicles. Compaction shall be done when soil moisture is sufficient to obtain adequate density.

3.3 Soil Sterilization: All areas to receive asphalt-fabric shall be treated with soil sterilant (Krovar soil sterilant, or an approved equal). It shall be applied at a rate recommended by the manufacturer. The sterilant shall be a type that is immobilized within the soil profile and will not contaminate the runoff water.

3.4 Latex-Asphalt Fiberglass Soil Stabilization:

The areas to receive latex-asphalt fiberglass shall be stabilized with bituminous material conforming to the requirements of AASHTO M 81, Grade RC-70. Application shall be at a temperature between 105° F and 185° F for RC-70 at a rate specified by the manufacturer, unless otherwise determined by the engineer. Atmospheric temperature shall be above 60° F. Application shall not be performed when wind velocities will cause drifting of the material. Care shall be taken to prevent puddling of the material, carelessly spilling onto structures, or spilling or dumping outside of the apron, berm, or spillway area.

3.5 Supporting Framework: Wooden framework supporting the metal above ground can be used in lieu of gravel sub-base if approved by the engineer or as shown on the drawings. Materials and installation shall be as specified on the drawings. Catchments supported on framework shall be protected from wind damage.

3.6 Fencing: The fence shall be located as shown on the drawings or as staked in the field. It shall be woven wire with two strands of barbed wire (top wire 46" above ground for a 4-foot fence).

All wooden line posts shall be 3-1/2 -inch (minimum) top diameter and corner and brace posts 5 inches (minimum) top diameter. Wood bracing required at all corners shall be 4-inch (minimum) diameter or 3-inch by 4-inch sawed.

Wooden posts (except juniper, honeylocust, white oak, osage orange, redwood, pitch pine or red cedar) shall be treated with creosote or pentachlorophenol (a minimum of 36 inches on the butt end). Steel post (1.33 lbs/ft. exclusive of anchor plate) may be used. Post spacing for a 4-foot fence shall be 20 feet (maximum) for line posts and 8 feet (maximum) for brace posts. Depth of post setting for a 4-foot fence shall be 24 inches for line posts and 30 inches for brace posts.

Barbed wire shall have two strands of 12-1/2 -gauge line wires with 14-gauge barbs spaced at approximately 4 inches. Woven wire shall be 32 inches high consisting of 8 horizontal wires, 6-inch (maximum) spacing, and 14-1/2 -gauge wires except top and bottom wire shall be 11-gauge. Barbed and woven wire shall conform to requirements of Federal Specification RR-F-221. All wire shall be zinc or aluminum coated. Staples shall be 9-gauge and 1-1/2 inches in length.

Smooth bracing wire shall be new, zinc or aluminum coated, and not less than 14-gauge.

Wire gates shall have the same type, size and spacing of wire as the fencing. Gate end wooden stays shall be three inches in diameter with intermediate wooden stays of two inches in diameter. One gate end stay shall be fastened to the fence post with 3 wires (9-gauge). The other gate end stay shall have top and bottom wire loops (9-gauge) for fastening to fence post.

4. MATERIALS

4.1 Fabric: The fabric shall have a grab strength of 110 lbs. (ASTM D-1682); puncture (tearing) strength of 60 lbs. (ASTM D-751); be resistant to ultraviolet radiation (sunlight), acids, and alkalis, be chemically compatible with asphalts, and not swell or wrinkle when coated. The fiber-binding agent shall be sufficiently water soluble to permit the fabric to conform to the catchment surface irregularities when prewetted with water or saturated with asphalt emulsion. The fabric shall be temperature stable with less than 1 percent shrinkage after placement on the catchment surface.

4.2 Asphalt Emulsion: The asphalt emulsion shall be a hydraulic foundation clay-based emulsion having a minimum of 48 percent solids and an added oxidation retardance. The asphalt emulsion shall not be stored for periods greater than 3 months and in temperatures less than 40 degree F.

4.3 Application: Fabric. Strips shall be 12' to 16' wide, installed with minimum overlap (shingling effect) of four inches. Each strip shall be coated with a complete and even coverage of asphalt emulsion base coat at a rate of 1/2 to 3/4 gallon per square yard before the next strip is laid. Lap joints shall be coated carefully to insure a good bond. The asphalt may be applied with asphalt spray equipment, or poured and spread with soft-bristled industrial floor brooms. Fabric shall be installed with a minimum of 1 ft/100ft. (1 percent) slack in all directions. All laps in fabric shall be positioned so that water flows over the lap and not against the seam. Any holes, breaks, or joint openings shall be repaired by

covering with fabric and asphalt emulsion. Edges of fabric around the berm and spillway shall be covered with soil and compacted after the base coat is applied.

Asphalt emulsion shall not be applied until manufacturer's recommendations on temperature, humidity and rate of air movement is followed. The fabric shall be prewetted with water containing a household detergent (one cupful per 200 gallons) or wetting agent, applied uniformly to the fabric at a rate of $\frac{1}{4}$ gal./yd.² immediately before application of the asphalt. Apply two separated coatings of asphalt. The first coat (base coat) shall penetrate and saturate the fabric at a rate of $\frac{1}{2}$ to $\frac{3}{4}$ gal. yd.². All lap joints shall be inspected at this point for excessive material wrinkles or bubbles and be repaired by cutting them lengthwise and sealing the edges down in an overlap. The second coating (seal coat) shall be applied after the base coat has completely set (minimum of 2 days) and shall seal the surface of the membrane, and be applied at a rated of $\frac{1}{4}$ to $\frac{1}{2}$ gal./yd.². After the seal coat is applied, the anchor trench shall be completely backfilled and the soil compacted.

5. CONSTRUCTION OPERATIONS

Construction operations shall be performed in such a manner that erosion and air and water pollution are minimized and held within legal limits. The owner, operator, Contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property. The completed job shall be workmanlike and present a good appearance. The job site shall have a neat appearance when finished.

6. MEASUREMENT AND BASIS OF ACCEPTANCE

The completed Practice shall be measured to the nearest one yard for payment purposes and converted to the nearest one one-hundredth of an acre (0.01 acre) for "As-Built" records. The acceptability of the practice shall be determined by inspections to check compliance with all the provisions of these specifications with respect to the design of the paraffin wax surfacing, physical appearance of the materials, markings, the appurtenances used and the minimum installation requirements.

The installing contractor shall certify that installation complies with requirements of these specifications. A written guarantee shall be furnished that protects the owner against defective workmanship and materials for not less than 1 year and that identifies the manufacturer and markings of the paraffin wax used.

7. ITEMS OF WORK AND CONSTRUCTION DETAILS FOR THIS PROJECT