Fields Stockwater Projects

ABBREVIATIONS

Ex  Existing
Gal  Galvanized
Gage  Gauge
Grnd  Grouted
Max  Maximum
Min  Minimum
Sched  Schedule

GENERAL NOTES

1. All construction shall be in accordance with these drawings and the following NRCS Practice Requirements and/or Specifications: Concrete (091), Pipeline (191), Wastewater Facility (005), Pumping Plant (533), Spring Development (574) and Geotextile Fabric (905).

2. Landowner shall be responsible for obtaining any required permits, easements, and/or right-of-ways, and meeting all legal requirements.

3. Landowner shall be responsible for locating and protecting all utilities. Special safety precautions shall be taken when working in the vicinity of gas, oil, and electrical lines.

4. Cal-OSHA safety requirements shall be in effect during all construction.

5. All lines and grades shown on these drawings are approximate. The proposed structure locations, excavation limits, and fill requirements will be staked in the field by NRCS engineer.

6. Contact the Natural Resources Conservation Service (NRCS) at least 7 days prior to construction at (805) 434-0396, ext 117.

CULTURAL RESOURCES

1. If any commonly recognized cultural resources, such as human formed artifacts older than 50 years, including projectile points, grinding stones, bowls, baskets, historic bottles, cans or iron deposits, are encountered during construction, then work is to stop immediately. Call NRCS to assess the significance of the find and to ensure that the resources are avoided.

2. If human remains are encountered, work is to stop and the Carneros/Sheriff is to be notified immediately. Notify NRCS of the determination of the County Coroner.

ENDANGERED SPECIES

If California red-legged frog, California tiger salamander, western pond turtle or burrowing owl are encountered, no work shall occur until the frog, salamander, turtle or owl has left the area on its own accord or until a qualified wildlife biologist is consulted and appropriate arrangements are made with U.S. Fish & Wildlife Service and the California Department of Fish & Wildlife. Ground disturbing activities cannot occur within 50 feet if burrows are present where tiger salamander or burrowing owls are sighted.
CONSTRUCTION NOTES

1. All trough pipe and fittings above ground shall be galvanized steel pipe (GSP) or Schedule 40 PVC. Schedule 40 pipe above ground must be wrapped or painted for UV protection.

2. For Project 1, pipe shall be installed below ground and shall be 1.25" Sch 40 PVC pipe. Minimum cover of pipe shall be 18".

Pipe and fittings shall be installed according to manufacturer’s recommendation. Compaction of backfill shall be equivalent to adjacent undisturbed soil.

3. Air vents shall be placed at all high points and as designated on drawings. Air vents shall be a combination air vent/release/vacuum relief valve with a minimum pressure rating of 150 psig. An example is the 2" dual acting air/vacuum relief valve from Agricultural Products, Inc. (API). Obtain NRCS engineer approval prior to purchase of vents.

4. Air vents shall be protected by plastic or concrete valve boxes placed in the ground or brought up next to wood fence post.
CONSTRUCTION NOTES

1. All trough pipe and fittings above ground shall be galvanized steel pipe (GSP) or Schedule 80 PVC.

2. For Projects 2 & 3, all pipe shall be above ground 1.25" PE4710 WR 9 (252 psi).

3. All PE pipe and fittings shall be fusion welded.

4. Allow for 4 feet of expansion/contraction or slippage of pipe for every 1,000 feet due to expansion and contraction forces.

5. Air vents shall be placed as designated on drawings and staked in field by NRCS engineer. Air vents shall be a combination air vent/air release/vacuum relief valve and shall have a minimum pressure rating of 160 psi.

An example vent is the "Gravel" 0-040 2" dual acting air/vacuum relief valve from Agricultural Research, Inc. (ARI). Obtain NRCS engineer approval prior to purchase of vents. See Table 2 Schedule, Sheet 4.

6. Air vents shall be protected by plastic or concrete valve boxes placed in the ground or brought up next to wood fence post. See Details Sheet 9.

Pipe installed on the ground surface shall be staked at 50-feet maximum intervals in areas used heavily by cattle and where cattle may damage the pipeline, in other areas, the pipe shall be staked upstream and downstream of all changes in pipe direction and at 200 feet maximum intervals.

For above ground pipe, the pipe stakes may be fashioned from rebar. Other methods of staking pipe shall be approved by NRCS engineer in advance. Stakes shall be installed in such a manner that does not pose an impairment hazard.
CONSTRUCTION NOTES

1. Gravel shall extend beyond trough at least 2 1/2 feet in all directions. Use pilz on 2 feet, 3 inches maximum size rock. Gravel depth shall be 6 inches. As per NRCS Specification Geotextile (903), 6 oz Nonwoven geotextile (filter fabric) shall be placed beneath gravel.

2. All above-ground pipe and fittings shall be galvanized steel pipe (OGP), or Schedule 80 PVC.

3. Pressure Treated 6"x6" or Railroad Ties held with #8 rebar or 1" Pipe with 1 foot embedment into ground may be used to retain gravel. Top of Retainer shall beflush with existing grade.

4. All troughs shall have a wildlife escape ramp. Ramp shall be constructed from expanded steel welded to a rigid frame and extend to the bottom of the trough. Ramp shall be securely fastened to the edge of trough or float cover. The ramp shall either extend from one edge of trough to the opposite, as shown on drawing, or shall be flush against one side of the trough with the opposite side of the ramp having the edge of the ramp extend down into the water.

5. All below-ground pipe shall be SCH40 PVC (or GSP, DW-11 or thicker walled PE4408, PE80, or PE4710). Refer to NRCS Construction Specification S16.

6. Pipe shall be buried a minimum depth of 18", and at least 36" beneath know use areas and water courses. Refer to NRCS Construction Specification S16.

7. Geotextile fabric shall be placed with a minimum 4" over run on the sides and all seams shall lap a minimum of 1 foot. Refer to NRCS Construction Specification S16.

8. Overflow shall extend a minimum of 20 feet and drain away from to a stable outlet.


10. Float guard shall be constructed of painted wood or metal and securely to trough to resist breakage impacts.

11. Floats shall be as specified in Table 1, Sheet 4.
Construction Notes:

1. This detail sheet shall only be used with plastic tanks. Refer to NRCS Construction Specification 614. Pad requirements differ for other tank types.

2. Tank sites shall be graded, leveled and compacted to allow for a retainer filled with gravel. The retainer shall be constructed of pressure treated lumber or Railroad Tie held with #6 rebar or 1" Pipe with 1 foot embedment into ground (or similar method approved by NRCS).

3. The retainer shall be filled with #4 run gravel, with a 3" minus size. Gravel depth shall be at least 6". As per NRCS Specification Geotextile Fabric (905), 6 oz nonwoven geotextile (filter fabric) shall be placed beneath gravel.

4. Unless specified otherwise on this sheet, all above-ground pipe and fittings shall be galvanized steel pipe (GSP), Schedule 80 PVC or polyethylene (PE) and valves shall be brass or Sch. 80 PVC. Refer to NRCS Construction Specification 516.

5. Unless specified otherwise on this sheet, all pipe and fittings shall be of equal or greater nominal diameter than the specified buried pipe diameter.

6. Provide a flexible hose, pipe or tubing in this vicinity to allow for settling. The flexible pipe shall have a pressure rating equivalent to the pressure rating of the water source pipe.

7. Overflow shall extend a minimum of 20 feet and drain away from tank to a stable outlet.

8. For both projects 1 & 2, the Float shall be the 3/4" FK80 90G float or NRCS approved equivalent.

9. Air vent shall provide air and vacuum relief. Use standard 90° elbows or a standard air vent. Continuous acting air relief is not required. The Netafim Guardian (any size) or approved equivalent may be used. The vent shall be installed at an elevation higher than the normal water surface elevation when the tank is full.

10. Tank and all exposed plumbing shall be protected from livestock by wood or barbed wire exclusion fence. Refer to NRCS Construction Specification 362.

11. All needed fittings may not be detailed on this sheet.
**Table 3 Solar pump specifications**

<table>
<thead>
<tr>
<th>Bankoff Solar Pump</th>
<th>Design Flow (gpm)</th>
<th>160 Watt Panels (gpm)</th>
<th>Number of Panels</th>
<th>Watts</th>
<th>Wiring of Panels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Force 3040</td>
<td>9.4</td>
<td>3.06</td>
<td>5 Panels</td>
<td>580</td>
<td></td>
</tr>
</tbody>
</table>

**Construction Notes**

1. Installation of all components and wiring shall meet the manufacturer's recommended requirements.

2. As shown in Table 3 below, the solar pump shall be the Bankoff Solar Force 3040 or NRCS approved equivalent. The system shall require 4-200 watt panels. Pump design is based on TPH = 120 ft of 1” spm.

3. The pump shall have a minimum tilt angle range of 20° to 60° from horizontal. Typical for this latitude is around 30°.

4. The mounting pole shall be secured in ground with concrete.

5. All electronic components shall be housed in a weather resistant enclosure (National Electrical Manufacturers Association (NEMA) 3R or equivalent).

6. Electronic components shall be installed in accordance with NEC requirements and manufacturer’s recommendations, the negative PV conductor, the array mounting structure, and all other metal components of the system shall be grounded directly to earth as required by NEC Articles 690 and 695.

7. Panels, control and all other components shall be fenced to protect from cattle.

8. The pump shall be connected to a concrete pad. The pad shall be installed according to NRCS Specification Concrete (90). Use M10 bars 4” spacing. Steel shall have 2” clearance against formed sides and 3” clearance when formed against bare earth.
1. All construction shall be in accordance with the following NRCS Specifications: Spring Box Development (574), Geotextile Filter Fabric (905), Pipeline (516), and Critical Area Planting (1424).

2. All lines and grades are approximate.

   - Spring box shall be constructed of corrugated metal, polyethylene pipe, concrete tile, redwood, reinforced concrete, masonry, or other durable material. The box shall be perforated. The minimum diameter shall be 24 inches.

   - Geotextile filter fabric shall be non-woven and 4 ounces per square yard and installed according to specification.

   - Washed drain rock shall be contained in non-woven geotextile fabric. Excavate hole through water bearing layer so that it extends a few inches into the impervious layer, but not through it. Line hole with filter fabric. Position spring box on a 4-6" thick bed of drain rock placed on top of the filter fabric. Backfill washed drain rock, combined with filter fabric, not less than 1 foot thick around upstream sides of spring box and for the depth of the water bearing layer. Drain rock shall be large enough to bridge any penetrations in the spring box (1 1/2" min). If filter fabric is not used, substitute sand-gravel filter, conforming to Calif. Trans Class 2 permeable drain rock. Cover top of sand-gravel filter with 20 mil plastic sheet. Drain rock or sand-gravel filter shall be composed of clean, hard particles.

   - A "threecake" type spring box cover shall be constructed from welded steel plate, 1/4" minimum thickness, or redwood lumber, and hit securely.

   - A cutoff wall of tamped clay, redwood lumber, concrete, masonry, or other water tight material shall be constructed on the downstream side of the spring box to capture spring flow. The cutoff wall shall be keyed into the impervious layer on the bottom and two sides to minimize water loss. Attach 20 mil sheet to upstream face as needed.

8. Outlet pipe shall be 1 1/2" minimum diameter, galvanized steel (GSP) or PVC Schedule 40 or 80.

9. The overflow pipe shall be 1/2" diameter, galvanized steel (GSP) or PVC Schedule 40 or 80. The height of the overflow above the outlet pipe shall be 3 feet RH. Route the overflow water to a location that optimally enhances wildlife habitat.

10. All areas disturbed by construction shall be revegetated as per NRCS Specification Critical Area Planting (1424).

11. The spring development shall be fenced to prevent damage and contamination by live stock.
1. All pipe trenches and backfill shall be free of debris and foreign material. Moisture shall be maintained to achieve compaction. Refer to NRCS Construction Specification 903.

2. All above-ground pipe and fittings shall be galvanized steel pipe (GSP), or Schedule 80 PVC. All exposed Schedule 40 PVC shall be wrapped or painted for UV protection. Refer to NRCS Construction Specification 516.

3. All below ground pipe shall be Schedule 40 PVC or Schedule 80 PVC. Refer to NRCS Construction Specification 516.

4. Pipe shall be buried a minimum depth of 18" and at least 36" beneath heavy use areas and water courses. Refer to NRCS Construction Specification 516.

5. All air vents shall be placed as designated on drawing and stated in field by NRCS engineer. Air vents shall be a combination air vent/air release/vacuum relief valve and, with the exception of the air vent on Pipeline 3 which shall be rated to at least 300 psig, shall have a minimum pressure rating of 160 psig. Air Vents shall be cast iron. An example is the "Barak" 6-40GC 2" dual acting air/vacuum relief valve from Agricultural Research, Inc. (ARI). Obtain NRCS engineer approval prior to purchase of vents. See Table 2, Sheet 4.

For ease of maintenance, install a valve just upstream of all air vents.

All above ground plumbing shall be protected from wildlife and livestock. Use wood posts, steel posts or underground vault boxes are acceptable.

All troughs shall have a wildlife escape ramp. Ramps shall be constructed from expanded steel welded to a rigid frame and extend to the bottom of the trough. Ramp shall be securely fastened to the edge of trough or float cover.