



Installation beneath aboveground storage tanks with secondary containment

Anode Layout

The anode should be placed as deep as possible, preferably, directly on the polymer liner. Shallower placements will reduce the spread of CP current. Begin the layout at the ring wall next to the access port and work toward the center of the tank. When using a stepped spiral array, the first loop will be a complete circle located at half the anode spacing distance, s , away from the ring wall. At the end of this loop, the anode steps over to start the second loop located a distance s from the first loop. The radius of the bend between the loop and the step shall be no smaller than 6 inches (15 cm) to avoid damaging the anode. The step does not have to be perpendicular to the anode; an offset of 30° to 45° is optimum. When using other array designs, layout details should be as specified by the CP system designer. Embedded reference electrodes should be placed mid-way between anode strings. Other sensors, such as 4-wire resistivity probes or ER probes, should be located close to the reference electrodes.

Anode power leads are connected to both ends of the anode strings. Tee-end lead wires are used to provide intermediate power feeds. Distance between power feeds must not exceed 1000 feet (300 m). Remove the protective vinyl caps when ready to connect individual anode sections or power feeds. Press the ends firmly together to ensure the connector is fully seated; the PVC housing flanges should be about 1 – 2 mm apart. Tighten the securing nut hand tight. Anodes can be held in position by either directly taping the joints to the polymer liner or using small sandbags. Cover the anode by pouring fine dry sand directly on the mesh and ensuring that it penetrates to encapsulate the anode. The sand should be finer than 0.6 mm (#30 sieve) and cover the mesh by about ½ inch (1.5 cm). When doing end-to-end continuity checks, each anode has a resistance of about ¼ Ω; lead wire resistance is about ½ Ω per 100 ft. (30 m).

Backfilling and Installing Tank Floor

The anode array is covered with sand to the depth specified by the CP system designer. If the sand is too dry, this can cause problems during commissioning because the resistivity will be too high to permit passage of adequate current to polarize the tank bottom. Adding moisture to the sand after it has been graded but before the floor has been installed will make it possible to properly commission the system.

All cathodic protection systems can be easily damaged at this stage of construction. If mechanized equipment is used, extreme care must be taken to ensure that the system is not damaged. Wires can be severed, reference electrodes can be crushed, and sections of the anode can be dragged out of their intended position. *The CP installer should continuously monitor electrical continuity on the anode circuits during sand installation so that any damage can be located and quickly corrected.*

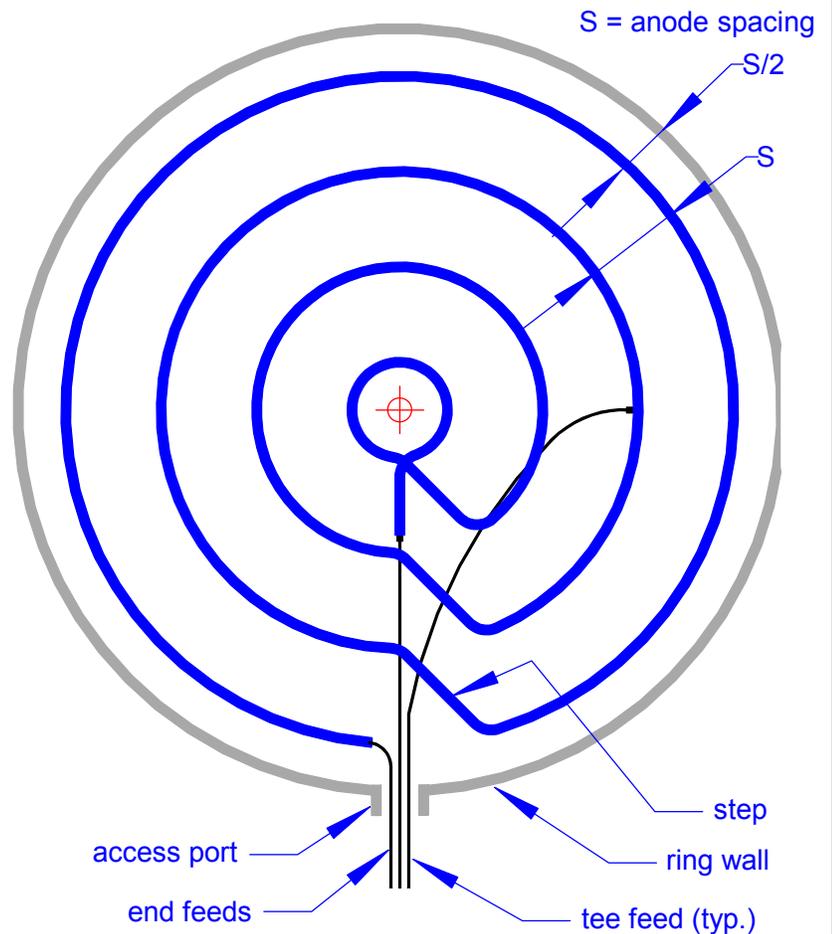
Commissioning

Before commissioning the system, there must be sufficient product in the tank to ensure that the bottom is in complete contact with the sand. If the sand bed is damp enough to conduct current, the system can be commissioned by setting the rectifier to produce the desired shift in the tank floor potential. Once that has been attained, no further adjustment should be made to the rectifier output voltage. Note: rectifier voltage should not exceed 25V. As the system operates, the sand will dry out making the environment less corrosive. When this happens, current output will be reduced. When the sand re-wets due to rain or flooding, the current will return to the level necessary to provide protection.

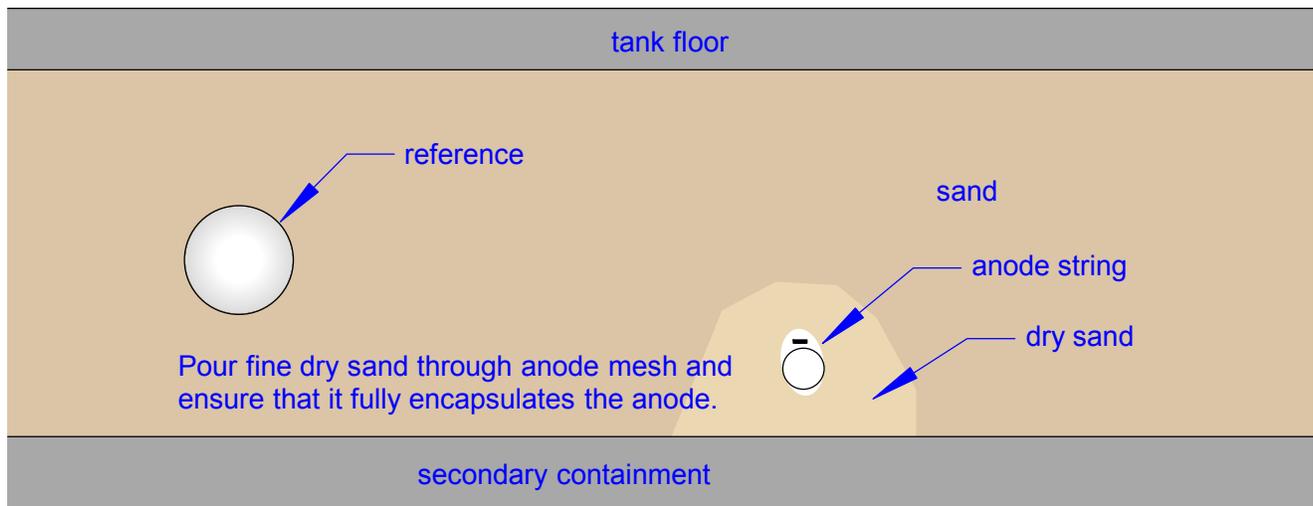
Stepped Spiral Array

Begin anode layout at the ringwall and work toward the center.

Lead wires are connected to both ends of the anode string. Tee End lead wires are used for intermediate power feeds. Distance between power feeds must not exceed 1,000 feet (300 m).



Installation Detail



Undertank Anode Installation

SCALE	NONE
DRAWN BY	FJA
DATE	23 APR 2015
DRAWING NUMBER	ATAPP-3