

Armorwire Cable Barrier

Post Foundation On-Site Testing Procedure



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Objective

To enable the Armorwire wire rope safety barrier to perform as designed when impacted by an errant vehicle the post needs to be able to yield with limited movement of the surrounding ground. The Armorwire post is installed into a concrete foundation or footing to increase the resistance of the post against soil rotation and to aid quick replacement of any posts should they become damaged in the impact. Accordingly, the post foundation has two main functions:

1. Strengthen the ground surrounding the Armorwire post to help avoid dynamic movement
2. Enable repair of the Armorwire after an impact without having to repair the ground

To determine if a constructed Armorwire foundation is suitable for use a non-destructive test is completed. When a post is impacted by an errant vehicle the loads are applied at a dynamic loading rate. The dynamic strength of soil is typically shown to be higher than the static strength. To avoid the need to undertake the testing of the sockets at dynamic loading rates, this testing procedure uses a reduced load (less than the failure load of the post) and applies the loading at a static loading rate.

Equipment

The following equipment will be needed to complete the testing.

- Armorwire Post
- 1000 kg rated load chain (or larger)
- 1000 kg rated D-Shackle (or larger)
- 1000 kg rated lever hoist (or larger)
- Rigid anchor point (load rated)
- String line and packets
- Stake or peg
- Calibrated Loadcell (1000 kg min)
- Calibrated tape measure or rule



Figure 1.0 Test Equipment

Methodology

- a) Ensure that the concrete has cured for at least 7 days and that the concrete strength is a minimum of 25MPa prior to conducting the load test.
- b) Place a post into the plastic socket of the concrete foundation, with the middle cable support slot located on the opposite side of the post to the direction in which the loading will be applied.
- c) Attach a D shackle, or equivalent, in the middle wire slot. Attached a load rated chain and calibrated electronic load cell to the shackle. The shackle and chain must be structural load rated for a capacity in excess of 1000 kg.
- d) Attach a lever hoist with a rated capacity of 1000 kg or more to the other end of the loadcell and secure it to a rigid mounting point. Suitable anchor points would include a rated attachment point on a parked vehicle or excavator.
- e) Ensure the mounted height at the attachment point of the chain to the post and to the rigid mounting point are approximately 640 mm (± 5 mm).
- f) Installed a datum point above the rear side of the concrete socket, by stretching a string line between the posts on either side of the post being testing. It will be necessary to pack the string line off the face of the posts to ensure it is clear from contacting the post being tested. The string line should be approximately 100 mm from the top surface of the concrete socket.
- g) Using a calibrated metal ruler, obtain a baseline reading in the vertical direction from the string line to the surface of the concrete socket. Record the measurement to the nearest 1 mm. If the top of the concrete socket shows any roughness, mark the location on the surface where the measurement was completed.
- h) Install a second datum point in front of the concrete sockets by driving a peg into the soil approximately 100 mm in-front of the front edge of the concrete. Care should be taken to ensure the peg is vertical.
- i) Place a mark on the concrete on the top surface of the concrete socket and using a calibrated metal rule obtain a horizontal distance measurement from the mark on the concrete to the leading edge of the peg. Record the measurement to the nearest 1 mm. If the edge of the peg shows any roughness, mark the location on the edge where the measurement was completed.
- j) Ensure the loadcell is reading zero load and then using the lever hoist slowly increase the load up to a minimum load value of 650kg (-0, +10).
- k) Whilst the system is loaded, repeat the measurement of the vertical distance (step g) and horizontal measurement (step i). Care must be taken to use the same measurement points when repeating the measurements. Record the measurement to the nearest 1 mm.

- l) A series of photographs should be taken on each loaded post. The photographs should clearly show the load application, the post being loaded and the value of the applied load. Ideally, photographs should also be completed of the horizontal and vertical measures (pre and post loading).
- m) Remove the loading until the loadcell reads zero. Repeat the measurement of the vertical distance (step g) and horizontal measurement (step i) to obtain a residual deflection measurement. Care must be taken to use the same measurement points when repeating the measurements. Record the measurement to the nearest 1 mm.



Figure 2.0 Set up prior to testing

Results

Calculate the change in vertical and horizontal measurements from the two readings.

- a) If the change in horizontal distance and vertical distance are both less than 10 mm the socket is considered to have sufficient static capacity.
- b) If the change in horizontal distance or vertical distance is greater than 10 mm the socket is considered suspect and additional investigations should be undertaken or advice obtained from a qualified Geotechnical engineer.

It is understood that ground conditions can vary sufficiently, even within a single construction site. As such a suitable pass/fail rate should be determined with the project engineer before any testing is completed. As general guidance, it will typically be acceptable if 3 readings from 10 exceed the 10 mm maximum limit, however no results should exceed 20 mm movement in either the vertical or horizontal directions.

Testing Frequency

A suitable testing frequency should be determined between the project engineer and installer.

Load Testing Report: Wire Rope Safety Barrier – Post Foundation Rev 1 - 2013

Installation Company: _____

Date: _____

Company Contact: _____

Project Number: _____

Road Name: _____

Road Location: _____

Product: _____

Installation Length: _____

General Soil Classification: _____

of Tests Conducted: _____

Test Passes/Failed: _____

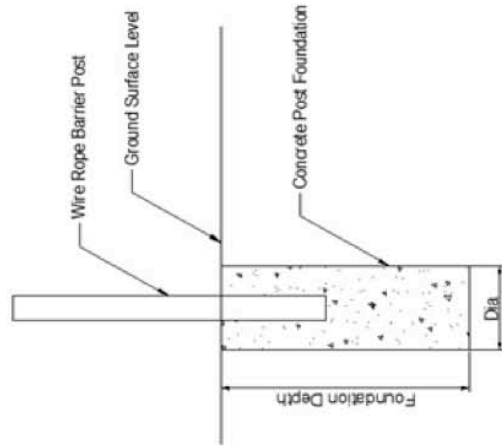
Comments: _____

Installation Company Representative: _____

Name: _____ Signature: _____

Client/Authority Representative: _____

Name: _____ Signature: _____



Post Foundation Sizes:

Depth/s: _____ mm

Foundation Dia's: _____ mm

Concrete Strength: _____ MPa