

## ARAB CENTRE FOR ENGINEERING STUDIES - INSTRUMENTED TEST PILES.

### Project Outline.

ACES (*Arab Center for Engineering Studies*) are a quality driven specialist engineering Service Company. Services includes site & geotechnical investigation, materials testing, quality control of projects, special studies, environmental studies, and land & marine surveying.

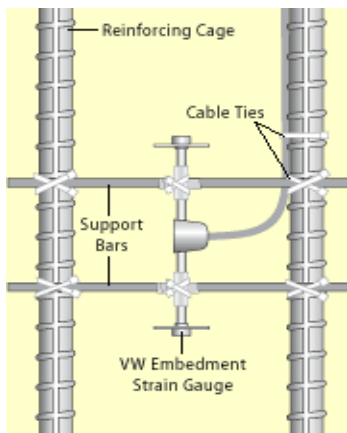


**Gage Technique International** has been working professionally with **ACES** for a number years supplying Strain Gauges and other geotechnical instruments. In this instance **Gage Technique International** were contracted to supply embedded strain gauges for pile tests. Also required were the services of a strain gauge specialist to oversee the installation.

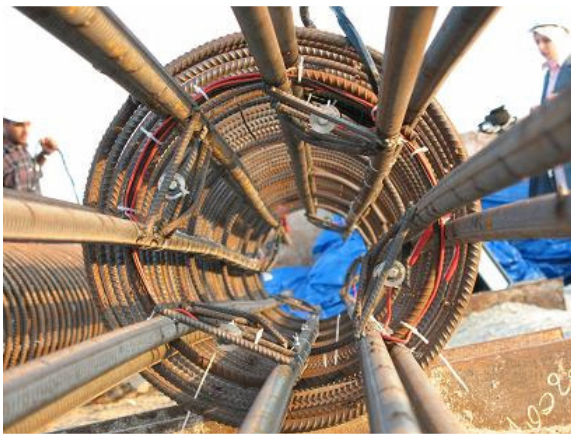
### Installation Overview.



**Above Left & Above Right:** A photo showing the layout of the site. There are a number of reinforcement cages to be fitted with four instruments at each location. It is important that care is taken to organise the cables otherwise it would be unclear which results were attributed to which sensors depth and position.



**Above Left & Above Right :** The diagram to the left shows a correctly installed strain gauge. There is no need to weld anything in this installation as everything is secured with cable ties. Installing using this method means that the installation is fast and straight forward, it also allows for adjustments to be made to the instrument positioning after they have been initially attached.



**Above Left :** The fully instrumented reinforcement cage complete and ready for the next phase. The cage is later lifted, by site crane, and has to be lowered into the borehole. Careful attention must be paid to the reinforcement cage during the lowering process, if the cage is left to “rattle” down the borehole there is the possibility that the instruments will get damaged.

**Above Right :** The reinforcement cage after it has been lowered into the borehole, the final phase of the installation is to fill the borehole with concrete.

## Product Information.

### Operation

The strain gauge operates on the principle that a tensioned wire, when plucked, vibrates at a frequency that is proportional to the strain in the wire. The gauge is constructed so that a wire is held in tension between two end flanges. Loading of the concrete changes the distance between the two flanges and results in a change in the tension of the wire. An electromagnet is used to pluck the wire and measure the frequency of vibration. Strain is then calculated by applying calibration factors to the frequency measurement.

### Advantages

**Permanently Attached Coils:** The coils used to excite and read the vibrating wire cannot be accidentally separated from the body during installation and wiring operations.

**Reliable Signal Transmission:** The arc-weldable strain gauge provides a strong signal which can be transmitted reliably over long distances with properly shielded cable.

**Custom Gauge Lengths:** Order gauge lengths from 50 to 250 mm (2 to 10 inches).

