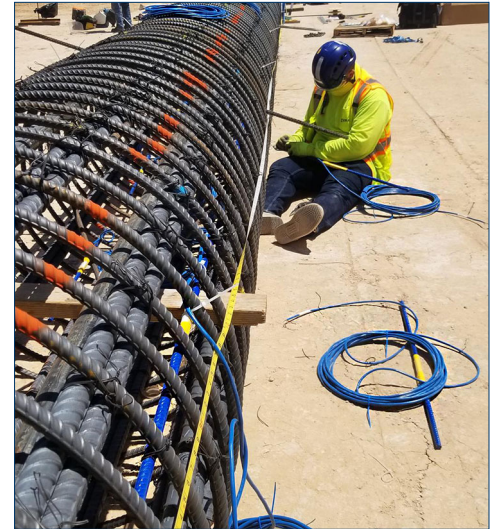




Sister bar strain gauges set to measure compression (yellow), midrange (blue), and tension (red).



This rebar cage is instrumented with both sister bar strain gauges and thermal wires for TIP testing.



Tape measure guides the accurate placement of the sister bars, which is important for analysis.

Applications

Sister bars strain gauges are used to monitor strain in steel-reinforced concrete. Typical applications include:

- Determining the distribution of stress in bored piles.
- Monitoring the performance of slurry walls and diaphragm walls.

Installation

Sister bars are tied to axial members of the rebar cage, often on opposite sides of the members, so that strains due to bending moments can be separated from strains due to axial loading.

Signal cables from the sister bar are routed to the top of the cage. The rebar cage is lifted carefully to avoid excessive bending, installed into the boring or trench, and concreted.

Operation

The sister bar is a vibrating wire strain gauge built into in a three-foot length of rebar. The length of the rebar ensures good contact so that so that strains in the concrete are fully transferred to the strain gauge.

Readings are obtained with a data logger. Changes in strain are calculated by subtracting the initial reading from the current reading and multiplying by a gauge factor supplied with the sister bar.

Advantages

Easy to Install: Sister bars are simply wired to the axial members of the rebar cage. No welding or protection is needed.

High Survival Rates: The durable rebar body and simple installation give sister bars high survival rates.

Reliable Performance: The 3-foot span of rebar ensures transfer of strains even if there are local cracks or mixed size aggregate in the concrete.

Predictable Response: Sister bars measure strain in the steel rebar, which has a controlled diameter and modulus.

Specifications

Sensor Type: Vibrating wire.

Range: 3000 microstrain, maximized for the application with strain gauges set to measure compression, tension, or at midrange.

Resolution: 0.4 microstrain.

Accuracy: $\pm 0.25\%$ F.S.

Thermistor: 3k ohm, $\pm 0.5^\circ\text{C}$ accuracy

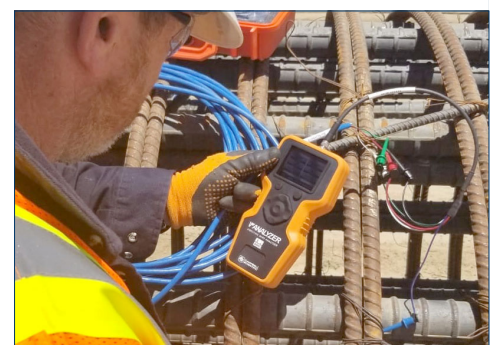
Rebar: #5 rebar, 3 ft length (16 x 914 mm).

Color Coding: Blue for mid-range, yellow for compression, red for tension.

Signal cable: factory attached at specified lengths. Four 22-gauge conductors in two twisted pairs, drain wire, and PU jacket.



Sister bar strain gauges can be installed on H-beams using welded-on tie-points.



Pre-installation check with portable VW reader.