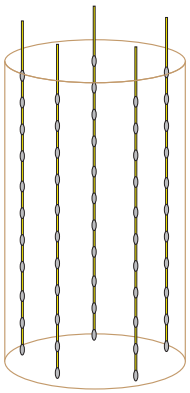
Thermal Wire® Installation Guide



Thermal Wire®

Installed on longitudinal bars

1 wire for each foot of shaft diameter

- DO NOT pretension ThermalWires before tightening cable ties
- DO make sure zip ties are tight, without tensioning the ThermalWire
- Run straight on logintudinal bars
- Do not install facing the inside or outside of the cage
- Avoid cage lift points
- Avoid reinforcements that will be removed later
- Avoid centralizers
- Avoid tie wires that could damage ThermalWire
- Avoid jumping from one bar to another
- Avoid crossing over from one side of a bar to another
- Do not install on or adjacent to CSL tubes
- Avoid walking on, torching or cutting near, and grabbing wires while preparing the cage
- Keep wire coiled up just below top lift point while cage is lifted and lowered into hole

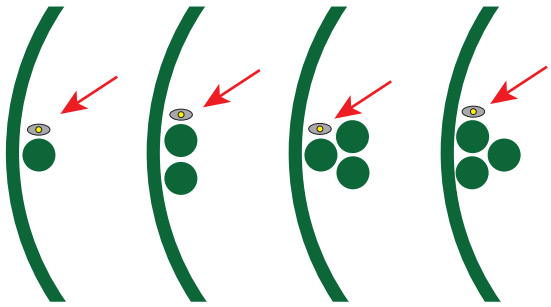
When unspooling the wire, the bottom nodes come off the spool first. The best method is to have the spool at the top end of the cage and pull the wire down to the bottom end of the cage. Then proceed to cable tie from the bottm end of th cage up.

Proper Wire Placement:

90° offset from inside or outside of the cage.

Protects against damage caused by cage bumping side walls during lowering and tremie movements during pour

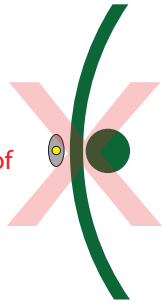
Various cage designs



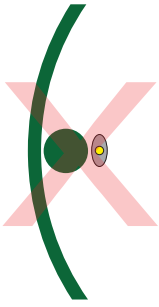
Improper Wire Placement:

Things to avoid

Do not face the outside of the cage

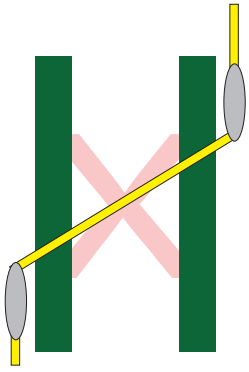


Do not face the inside of the cage



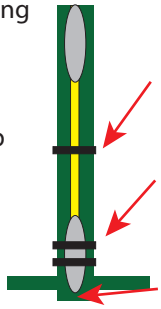
Do not cross from one side of the bar to the other

Do not jump from one bar to another



Proper Installation Method:

When cable tying ThermalWire, work from the bottom of the cage to the top



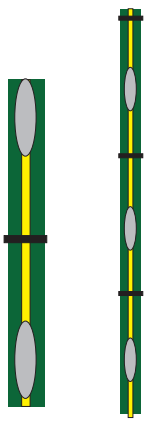
1 cable tie halfway between last and second to last nodes

2 cable ties on last node

1/2" (1.27cm) from bottom

Bottom of Cage

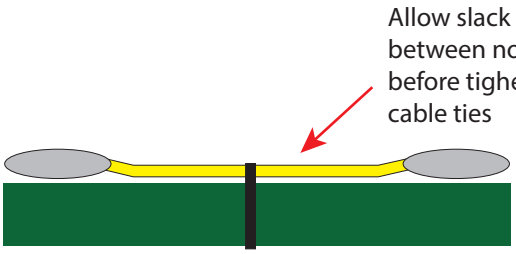
Once the bottom node is locked in, put 1 cable tie approximately halfway between every node



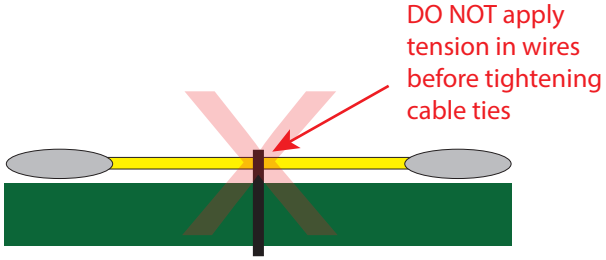
IMPORTANT NOTE:

Any node wrapped with red electrical tape IS NOT a temperature sensor. Do not factor these in when counting nodes above concrete or at splices

Proper Installation Method:



Improper Installation Method:



Thermal Integrity Profiling: Wire Method – Quality Assurance Plan

I. Thermal Wire System
- ☐ Thermal Integrity Profiler – TIP Main Unit
- ☐ TAP (Thermal Access Port) Note: One TAP Box required for each embedded Thermal Wire® cable USB cable to attach TAP to TIP
- ☐ Thermal Wire® cables

II. Required Equipment
- ☐ Zip Ties to attach Thermal Wire® cable to cage
- ☐ Tape measure
- ☐ Snips to remove any temporary Zip Ties

III. Required Forms
- ☐ Thermal Field Log (included in TIP manual appendix)
- ☐ Concrete Log (with volume vs. depth measurements)
- ☐ Shaft Installation Records
- ☐ Relevant Boring Logs

IV. Procedures
- ☐ Verify correct date and time on TIP Main Unit– update time and time zone if necessary
- ☐ While coiled on the spool, verify each Thermal Wire® cable is operational by attaching to a TAP
    - i. Fast intermittent green light followed by slow green intermittent light indicates normal functionality
- ☐ Evenly space the wires around the perimeter of the cage and attach via zip ties to longitudinal bars.
- ☐ Avoid cage lift points and centralizers
    - ii. Avoid locations where inner cage supports will be removed during placement via torching
    - iii. Do not attach to CSL Access tubes
    - iv. Do not run the cable laterally or on an angle between longitudinal bars
- ☐ Generally, it is best to locate the cables on the "side" face of rebar 90° to the shaft diameter to avoid contact with the shaft wall and the tremie pipe
- ☐ Start at the top of the cage and unspool and feed the bottom sensor through the cage to the base
    - i. Do not attempt to pull the Thermal Wire® cable free if a sensor gets snagged during installation
- ☐ Position bottom sensor 1 to 3 inches from the bottom of the cage and affix with 2 zip ties
- ☐ Zip ties should be placed 1.5 inches above and below each sensor
- ☐ Start at the base and then fix the cable from the base of the cage to the top. Do not tension or pull all of the slack out of the cable. The cable should simply "lay" in position along the longitudinal bars. Pulling out all of the slack or tensioning the cable may result in damage.
- ☐ Coil any remaining sensors and cable at the top of the cage so it will be out of the way during installation
    - i. During concrete or grout placement, position the coiled section of wire on the outside of the cage to avoid contact with the tremie
    - ii. During the extraction of casings, position the coiled section of wire on the inside of the cage to avoid contact with the casing
- ☐ After affixing the wires to the cage, retest Thermal Wire® cables by attaching to a TAP Take preliminary data reading with the TIP Main Unit after placement
- ☐ If a TAP is flashing red try connecting another TAP to see if the issue persists
    - i. If possible, visually observe the cable for cuts or other damage
- ☐ Thermal Wire® cables should be connected to a TAP soon after placement is complete
- ☐ Leave the TAP connected until peak temperature is achieved, generally 12-48 hours depending on diameter Data may be collected and assembled without prior TIP Main Unit setup. When in doubt, connect the Thermal Wire® cable to a TAP and collect data during the hydration process.