PCI Plant Quality Talk
Quality Enhancement Committee

PCI
Precast/Prestressed Concrete Institute

SERIES 1, ISSUE 12 – DETENSIONING

The term "detensioning" refers to the removal of tension in the uncast portions of strand. It occurs once the transfer strength of the concrete has been achieved. The process can be a high-risk activity, so care is necessary and normal stressing precautions need to be taken. Prestressing of concrete members requires cutting or releasing of the tensioned strands outside the ends of the member, which transfers the load in the strand from the anchoring abutments to the concrete.

Best Practices

- Detensioning must not be done until the required minimum compressive strength has been reached.
- Detensioning where the strands are cut with a gas torch or other mechanical cutter should be carried out with care because the unrestrained ends of the strands have a tendency to retract suddenly and splay out in an unpredictable way. Extreme care must be taken when cutting strands; employees should be positioned so that the retracting wires will not strike them upon release.
- The strands should be detensioned in a side-to-side symmetrical pattern about the centerline of the strand pattern.
- The top strand should typically be detensioned first. (Depressed elements may require a special detensioning sequence.)
- The same strand between all panels (full length of the form) should be cut at the same time and manner.
- Detensioning sequences should be listed on the shop drawings or available from QC.
- Cutting is done on each strand simultaneously at both ends of the prestressing bed and preferably at all spaces between the ends of adjacent members. Where spaces between the ends of adjacent members are short, simultaneous cutting at all spaces between members may not be required; however, any cutting must be done according to the approved sequence.
- When detensioning is done with a cutting torch, the flame should initially be applied over several inches of the strand. The strand should be heated in such a manner that the individual wires fail distinctly and independently. If multiple wires fail simultaneously, the strand was heated too quickly.
- Detensioning should take place while the member is still warm and moist. If the concrete is permitted to dry and cool before detensioning, dimensional changes take place that may cause cracking in the concrete due to restraint. This is especially true if hold-downs are used to deflect strands. Therefore, detensioning should be done immediately following the curing period and when test cylinder strengths indicate that the required minimum compressive strength has been obtained.

Multiple Strand Release

- The strands may be released simultaneously by hydraulic jacking.
- The total force is taken from the header by the jack and gradually released.
- Minimal sliding of the members on the bed may occur.
- Structural members stressed by this method are required to be free from all restrictive movement, other than sliding friction on the bed.

Draped Strands

Unless the plans or specification indicate otherwise:

- Release the tension in the strands at the ends of the structural member(s) by heating each strand until failure. The strands are cut using heat in accordance with the approved sequence.
- All hold-down devices for the draped strands are released and the hold-down bolts within the members removed, typically before any detensioning occurs.

Precast/Prestressed Concrete Institute
Phone: 312-786-0300 | www.pci.org | qualityprograms@pci.org

Series 1, Issue 12 February 2019
QA19x3669 PCI Plant Quality Talk

PCI Plant Quality Talk
Quality Enhancement Committee

Precast/Prestressed Concrete Institute

Note: Please complete this form and return to the Quality Control Manager. All crew members should be observant and report to their foreman anything out of the ordinary on a project. *See something, say something.*

NOTES	ATTENDEE SIGNATURES
DATE _____	_____
PRESENTER _____	_____
	_____
	_____
	_____
	_____

Precast/Prestressed Concrete Institute
Phone: 312-786-0300 | www.pci.org | qualityprograms@pci.org

Series 1, Issue 12 February 2019
QA19x3669 PCI Plant Quality Talk