

Certificate of Training
Achievement Scheme

Prestressing of Precast Concrete

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Foreword

This scheme was originally developed by The Building Products Training Council, which in 2005 transferred to Proskills UK, then National Skills Academy, Materials, Production & Supply, (who were a wholly owned subsidiary of Proskills UK) and recently Proskills Global Limited.

The Scheme for the Certification of Training Achievement (CTA) covers all operational staff including Management/Supervisors, Maintenance Personnel, Bed and Stressing Operatives, and site personnel involved specifically with the Prestressing of Precast Concrete. The Scheme will operate nationally and will provide a record of personnel accredited with the CTA.

All personnel involved with the Prestressing of Precast Concrete who can satisfactorily demonstrate the necessary skills, knowledge and competence levels will be issued with a CTA, which will be recorded upon a national register. Employers, the Health and Safety Executive and other interested bodies and organisations will be able to make enquiries to validate an individual's CTA achievements.

The Scheme has been designed by the industry in conjunction with BPTC and Proskills UK and is now being administered on behalf of the industry from Proskills Global Limited offices. Proskills Global Limited will monitor and review the Scheme and will make any necessary amendments and changes to ensure the scheme remains fit for purpose.

Training is an important element in ensuring the competence of employees, and the Health and Safety Executive sees this scheme as a significant step in contributing to accident reduction in the Prestressing industry.

The Scheme illustrates and supports a commitment to safety standards and the recognition of training achievements, and Proskills Global Limited looks to its success to help promote these ideals across the industry as a whole.

The competencies recognised by way of the CTA are intended to complement any National Vocational Qualifications (NVQs) and Scottish Vocational Qualifications (SVQs) that emerge.

Membership of the CTA Scheme is voluntary and is not required by law for employment purposes. However, some companies state in their company policy that only those holding an appropriate CTA card shall be employed on site in respect of the specific operations identified.

We encourage all companies in the industries served by Proskills Global Limited to use the Scheme.

Health & Safety Executive Foreword

"The Health & Safety Executive welcomes the publication by the prestressed concrete industry in conjunction with Proskills Global Limited of the standards in the Certification of Training Achievement Scheme for Prestressing of Precast Concrete. Accidents during Prestressing still sadly continue to cause severe injuries and amputations.

The Provision and of Use of Work Equipment Regulations 1998, require all employees engaged in working with or alongside machinery to be adequately informed of the risks of the equipment they use, the precautions to be taken by way of information, instruction and training in the safety of the equipment or the safe systems of work to be adopted.

While machinery safeguards continue to improve, they cannot prevent accidents if they are not correctly used and people at risk are not made aware of how the equipment should be properly operated, cleaned and maintained in the widest senses of the words.

This Scheme is commended to the whole of the Prestressing industry as being a significant way that employers can begin to address their duties both in the competence of staff engaged in Prestressing or who supervise or manage such processes."

Rob Pearce
HM Principal Inspector of Health & Safety

Acknowledgements

The following organisations played a major part in the development of this scheme:

Building Products Training Council Ltd (BPTC), Bison Concrete Products Ltd, Tarmac Concrete Products Ltd, Hanson Building Products Ltd, EKC Systems Ltd and Spiroll Precast Ltd.

Certificate of Training Achievement (CTA) for Prestressing of Precast Concrete

1

Introduction

- 1.1 The Certificate of Training Achievement is a scheme for the training, registration and certification of all personnel involved specifically with the Prestressing of Precast Concrete.
- 1.2 The Scheme continues to be developed and will be administered on behalf of the industry by Proskills Global Limited.
- 1.3 The initial Scheme was introduced in 2003. This update became effective from June 2016.
- 1.4 The Scheme will incorporate:
 - Registration of candidates via Proskills Global Limited.
 - On-site training and assessment carried out by Proskills Global Limited accredited trainers.
 - Certification via Proskills Global Limited.
- 1.5 Proskills Global Limited will be the official registering body and will issue Certificates of Training Achievement (CTA) to personnel who meet the criteria and specified standards of performance, as defined within the Industry Guidance Notes and other guidelines, as appropriate.
- 1.6 Review - the scheme will be reviewed by a working party representative of the industry at 5 yearly intervals or as is deemed necessary by the sector.

2

The scheme objectives

- 2.1 To provide a National Registration Scheme.
- 2.2 To identify the training requirements for personnel involved specifically with the Prestressing of Precast Concrete and to define the standards to be achieved. The scheme will include Management/Supervisors, Maintenance Personnel and Operatives.
- 2.3 To facilitate industry approved training to satisfy 2.2 above.
- 2.4 To provide a CTA upon successful completion of the Proskills Global Limited approved training courses.
- 2.5 To provide guidelines to Employers whose personnel participate in the Scheme.
- 2.6 To ensure that all personnel certificated under the Scheme have attained an acceptable standard of safety awareness and the necessary basic skills, in order to comply with the relevant Guidance Notes.
- 2.7 To provide guidelines which enable participating Employers to meet their continuing responsibilities with respect to training.

3

Scope

- 3.1 The Scheme specifies the training and standards to be achieved by all personnel involved with the Prestressing of Precast Concrete.
- 3.2 The Scheme will apply to new entrants coming into the industry and to existing personnel with previous experience in the occupational areas identified by the Prestressing of Precast Concrete.
- 3.3 The Scheme will stipulate the breadth and depth of the areas it covers and through its guidelines will clearly detail the extent and limitations of coverage by the CTA for the Prestressing of Precast Concrete.
- 3.4 The coverage of the Scheme is intended to relate to RQF/SCQF/SVQs. Therefore, to ensure that there is comparability and consistency of assessment, the competencies promoted by the CTA will be complementary to those of RQF/SCQF/SVQs, which cover the occupational functions of Prestressing of Precast Concrete.
- 3.5 The Scheme will be subject to regular review and any changes to the scope, limitations and extent of its coverage, will be made in response to industry requirements.

4

General Guidelines to Employers

- 4.1 New or inexperienced personnel should not be permitted to engage in the Prestressing of Precast Concrete, unless supervised by a competent person. Upon reaching the required standards, employers may apply for the person concerned to be assessed on their level of skill and attainment, leading to the subsequent issue of a CTA.
- 4.2 Holders of the CTA will be required to be reassessed prior to the expiry of their valid CTAs.

5

Health & Safety

- 5.1 Health and Safety requirements and current safety legislation is of paramount importance, and must be complied with at all times in respect of any employee engaged in any aspect of the operations covered by the Scheme.
- 5.2 Achievement of a CTA by the employees does not absolve the Employer from its obligation and duty to provide continuing and necessary information, instruction and training as required by the 1974 Health and Safety at Work Act.
- 5.3 See Appendix 1 – Legislation, Guidance and Standards relevant to Health and Safety Policy.

6

Training courses

- 6.1 There are 6 modules available, which are listed on page 12 in the guidelines for the Scheme in Section Two "Coverage and Training provision for a CTA". Essentially the modules are designed to develop the skills and knowledge to undertake the various occupational roles identified with the operations involved. The modules will include legislative requirements and any Guidance Notes associated with the area of operations. See Appendix 1 – Legislation, Guidance Notes and standards relevant to Prestressing of Precast Concrete.
- 6.2 Module Delivery
- The Basic Health & Safety Unit/General Stressing Awareness (PS1) should be delivered in conjunction with the participant's role as shown in the matrix (page 13), however in the case of office personnel or others who would benefit from the basic awareness training, this unit can be used in isolation.
- 6.3 The guidelines for the Scheme provide information on the responsibilities of the varied occupational roles and the operations being carried out.

7

Achievement tests

- 7.1 The Scheme requires that all participating personnel shall satisfy the requirements of practical and theoretical safety achievement tests for which training has been undertaken before issue of a CTA. This requirement applies to new entrants and to those persons claiming adequate and appropriate previous experience in the Prestressing of Precast Concrete. Where module 1 has been used as an awareness raiser there will be no practical element, but questions will be asked on completion of the module to confirm understanding
- 7.2 Training, achievement testing and individual assessment will be conducted and administered by trainers accredited for that purpose by Proskills Global Limited (Section 11 refers).

8

Employee Registration & Certification

- 8.1 Proskills Global Limited operate a National Training Register for trained and certificated personnel, detailing employee's personal details, categories and safety training achieved, certificate numbers and expiry dates, together with employer's details.
- 8.2 Upon receipt of a completed Certification form from an accredited training provider, Proskills Global Limited will record all details on the National Training Register. Employers and the Health and Safety Executive etc. can refer to this Register to confirm an individual's achievements.
- 8.3 Certification Forms and details of fees are shown in Appendix 3.
- 8.4 Training and Assessment fees are available from the Approved Training Providers See Appendix 3.

9

Application Procedure for the Issue and Renewal of CTAs for Accredited Training Providers

- 9.1 Certificates of Training Achievement will be issued to employers of operators who have complied with the Scheme criteria and achieved the standards that qualify for the CTA award. A CTA will be dated to expire three years from the date of issue. A new CTA will only be issued after successful completion of the appropriate assessment. Any additional category can be added to the CTA on application to Proskills Global Limited.
- 9.2 On receipt of the completed Certification Request Form* and supporting documentation, Proskills Global Limited will issue a certificate (For candidates who complete PS5 module – a credit card size licence is also issued).
- 9.3 *A passport size photograph, showing the candidates' full face, head and shoulders, must be sent electronically, to Proskills Global Limited to accompany the Registration form.
- 9.4 Lost or damaged CTA's will be replaced on application subject to a fee and verification by Proskills Global Limited.

See Appendix 2 – example of Certification

10

Booking Training and Assessments

- 10.1 Training and Assessments should be booked directly with the Accredited Training Provider – Details are shown in Appendix 3.
- 10.2 To comply with this training scheme, Training and Assessment should only be carried out by the companies listed and the named individuals as shown in Appendix 3.

11

Accredited Trainers

- 11.1 Only trainers deemed competent and accredited by Proskills Global Limited may carry out the training and assessment of the Scheme.
- 11.2 Proskills Global Limited will only accredit trainers who can demonstrate satisfactory knowledge of operational techniques used in the Prestressing of Precast Concrete and who are able to provide all aspects of training, and conduct achievement tests under the Scheme.
- 11.3 The initial accreditation process for trainers will be based on CVs plus evidence of competence in the following:
- Instructional competence
 - Assessment competence
 - Health & Safety competence
 - Operational skills
 - Satisfactory performance of a training session as assessed via a Proskills Global Limited Assessor.
- 11.4 Following the initial accreditation, trainers will be continuously monitored via a process of annual assessment of performance by a Proskills Global Limited approved assessor plus customer/client feedback. See Appendix 3
- 11.5 Accredited trainers will be required to register annually with the Proskills Global Limited. See Appendix 3
- 11.6 The Trainer/Training Provider is responsible for all aspects of the course provision, which will include:
- Liaison with the client company, arranging dates, times, etc.
 - Determining the needs, prior knowledge and experience of the participants and adjusting the course to meet these requirements.
 - Gathering information on the clients' activities and any pressing issues for inclusion in the course.
 - Delivery of the training modules.
 - Briefing participants on the assessment requirements.
 - Assessing participants, giving feedback and advice.
 - Recommending successful completion of CTA.
 - Completing Certification application.
- 11.7 Training Providers employing Accredited Trainers/Assessors will automatically be granted provisional Approved Status.

12

Scheme Limitations

12.1 Certificates of Training Achievement issued through the Scheme are not intended to be categorised as a certificate of competence. Employers are required to determine competence based upon the combination of training received and experience gained relevant to the individual employee's job specification and the particular operational requirements.

13

Scheme Review

13.1 The operation of the Scheme will be monitored continually by a Steering Committee representing the industry and amendments and changes necessary will be introduced to Scheme meets industry requirements.

14

Appeals Procedure

14.1 There are no special arrangements under the scheme for appeals. Questions arising should be submitted to: Proskills Global Limited in writing, support@proskillsglobal.co.uk

15

Equal Opportunity

15.1 Candidates will normally be selected and nominated for the course by their Employers. The Proskills Global Limited fully support Equal Opportunities therefore the course is open to all staff involved in Prestressing.

16

Implementation of the Scheme

16.1 The scheme is managed and monitored by Proskills Global Limited on behalf of the Industry and a register maintained of applicants, awards and accredited trainers.

Cover & Training Provision for the Certificate of Training Achievement for Prestressing of Precast Concrete

1

Introduction

- 1.1 The Certificate of Training Achievement (CTA) is aimed at all operational staff including Management/Supervisors, Maintenance, Bed and Stressing Operatives and site personnel involved specifically with the Prestressing of Precast Concrete. These are personnel who are directly involved with the prestressing operations.

2

Training Courses

- 2.1 The following certificated courses are currently available for Management/Supervisors, Maintenance, Bed and Stressing Operatives:

Modules Reference Module Title

- PS1 Basic Health and Safety/General Stressing Awareness
- PS2 Maintenance of Stressing Equipment
- PS3 Receipt, Handling, Storage and Inspection of Stressing Tendons
- PS4 Bed Operative Procedures
- PS5 Stressing Operative Procedures
- PS6 Management of Site Safety in the Prestressing of Precast Concrete

Modules /Personnel	General Awareness PS1	Maintenance PS2	Receipt, Handling, Storage PS3	Bed Operatives PS4	Stressing Operatives PS5	Management PS6
All Personnel involved (including Indirects)	✓					
Bed Operatives	✓		✓	✓		
Stressing Operatives	✓		✓	✓	✓	
Maintenance Fitters	✓	✓	✓	✓	✓	
Foreman	✓	✓	✓	✓	✓	✓
Sub Contractor cleaning etc	✓	✓		✓		
Off loading Yard Services Stores/ Drivers	✓		✓			
Works Management	✓					✓
Maximum Numbers on course	10	4	8	8	8	8
Assessment Type	Test	Test/Practical	Test	Test/Practical	Test/Practical	Test
Pass mark	70%	70%	70%	70%	70%	70%

The delivery time of the courses is dependent upon the number of delegates and the units which need to be covered, the delivery will be tailored to the need of the individual employers/employees as required

Note: Length of course is set out as a guideline for the numbers as shown; this may vary if numbers are decreased or increased. Candidates achieving over 70% and less than 100% should be given the opportunity to re-sit the assessment, those achieving less than 70% should undergo further training.

PS1

Basic Health & Safety/General Stressing Awareness (PS1)

Aim

To provide a general awareness of safety issues relating to work in a prestressing environment.

Objectives

At the end of the course the participants will be able to:

1. Background to Prestressing

- Definition of Prestressing
- Understands the benefits and the reasons for prestressing
- Rubber band analogy
- Terminology
 - Live end
 - Dead end
 - Barrel
 - Wedge
 - Jack
 - Abutments
 - Tendons
 - Button heading
 - Calibration
 - Isolation
 - Extension
 - Ferrule
 - Grillage plate
 - Grips
 - Multi-stressing
 - Piab system (crane and pulleys)
 - Prestressing
 - Pre-tensioning (prior to multi-tensioning)
 - TDS
 - UTS
 - Hazardous area
 - Deflected strand
- What happens if a wire flies -video
- High level of stored energy

2. Types of Hazards Associated with a Prestressing Plant

2.1 Non-Machinery – these relate to the environment in which the work is carried out and the hazard/ risks associated with each of the following:

- Wire breakages – what could happen?
- Damage to abutments
- Problems associated with wires and coils
- Button end malfunction/damaged
- General housekeeping
 - Oil on beds
 - Hand tools/equipment (PUWER regulations)
 - Slips, trips & falls
- Slippage on barrels of wedges
- Manual handling
- Noise
- Accidents, injuries and occupational diseases

2.2 Machinery

- Overstressing - use of jacks
 - Lock-off systems
 - Multi stressing
- Hot work on or near strand/wire
- Machines used in stressing/manufacture/moving machinery
- Hazards associated with work at live stressing end (factory specific)
- Noise
- Vibration whole body, vibration white finger (vwf), tools associated with this.
- Guarding of machinery
 - Why use guards?
 - Different types of guard including dead end/live end guards
 - Rules around guarding including Provision and Use of Work Equipment Regulations (1998)

3. Danger of Exclusion Zones

- Exclusion zones during stressing – live end & dead end absolute
- Rules for access to stressed beds
- Specific areas to be avoided
- Rules around using a platform to cross a bed
- Position of personnel to include operatives and visitors when prestressing operations are underway
- Authorisation
- What to do when hearing or seeing the audible & visual warning system
- Rules for visitors to site
- Safety around wire payout area
- Safety around wire management area

4. Personal Protective Equipment (PPE)

- To raise awareness of the PPE required by the site rules and any relevant requirements in relation to Risk Assessment or Safe System of Work (SSOW)
- Importance of wearing, maintaining and storing PPE correctly

5. Risk Assessment (RA) & Safe Systems of Work (SSOW)

- Awareness of Risk Assessment and SSOW
- Legal responsibilities
- Where the RA and SSOW are kept (site and job specific)

6. Safe Access (entry) & Egress (exit)

7. Warning Audible and Visual

- What is a warning?
- What Audible and Visual systems are in place?
- Are they manually activated or automatic?
- Duration of warnings
- What each warning means and what you should do

7.1 Work in Progress

- What the sirens mean
- The post stressing 'amber' period

7.2 Power Failure

- What to do if power fails
- Considerations - is the bed stressed, part stressed
- What to do

Safety Legislation

At the end of the course the participant will have awareness of the company's responsibilities and the individuals' responsibilities in relation to the Health & Safety at Work Act and Relevant Statutory provision.

This unit should be delivered in conjunction with the specific unit relating to the employees' job role it is not aimed at training in isolation for any of the above. However, there are some employees where the PS1 Unit might be taken as a stand-alone Unit. Examples are office personnel who are required to access factory floor.

PS2

Maintenance of Stressing Equipment (PS2)

Aim

This course is aimed at Maintenance Engineers, Foremen and Fitters and any personnel carrying out maintenance operations.

Objectives

At the end of the course the participants will be able to:

1. Explain the hazards and risks associated with:

- Tools and Materials
- Substances that may be hazardous to health that will be used during maintenance and cleaning (COSHH)

2. Explain and demonstrate the lock off (Hydraulic and Electrical) and isolation procedures used at the place of work.

3. Explain the relevant safety/inspection checks laid down by either the manufacturer or the SSOW and demonstrate them as required.

4. Explain and demonstrate how to carry out the following tasks (where applicable) paying particular attention to SSOW and relevant guidance, including how to conclude all relevant tasks safely and in line with Standard Operating Procedures and SSOW.

5. Explain and demonstrate the procedures for the inspection and maintenance of abutments.

6. Explain the consequences of changes to abutments and deflection of strands and who these operations should be referred to.

7. Explain the relevant quality control requirements including calibration.

8. Be aware of and able to complete any relevant records (if required).

Equipment to include (where applicable):

- Pumps and Jacks – Calibration
- Jack Counterbalance Device
- Proving Rings and Load Cells
- Abutments
- Stressing Frames
- Bridges
- Safety Chains
- Deflection Plates
- Button Headers
- Tendon Pull Systems/Tendon Guides
- Tendon Cutting System
- Drum Reeling System
- Lifting straps and chains
- Guards
- Lights and Sirens
- Strand Pusher
- Wedge Removing Tools
- Double Ended Joiners
- Splicing Equipment
- Pumps/Jacks
- Anchor Grips/Barrels and Wedges

Regulations

- Provision and Use of Work Equipment Regulations 1998 (PUWER)
- Control of Substances Hazardous to Health (COSHH) Regulations 2002
- The Personal Protective Equipment at Work Regulations 1992
- The Management of Health & Safety at Work Regulations 1999

Guidelines to COSHH (2002)

The employer should have carried out risk assessments relating to any substances and relevant information, instruction, and training in the use of these substances should have been given to the employees outside this scheme.

Manual Handling Operations Regulations (1992)

The employee should have been provided with relevant information, instruction and training in manual handling outside of this scheme.

Maintenance Guidelines

These guidelines are aimed at the relevant equipment used on plant.

Records to include:

- Maintenance Logs as required under PUWER (1998)
- Job Sheets
- Check sheets

Personal Protective Equipment

Relevant PPE to be worn at all times.

Assessment

Assessment will be carried out by direct observation within the delegates workplace and will include an assessment of multiple choice questions. Practical training and audits will also be carried out to support these activities:

Receipt, Handling, Storage, Inspection of Stressing Tendons (PS3)

PS3

Stressing Tendons (PS3)

Aim

To provide the participants with the skills and knowledge to perform their job roles safely and competently.

Objectives

At the end of the course the participants will be able to:

Explain:

- What a wire/strand/tendon is
- Its properties and uses
- The limitations of use
- Problems that may occur and their remedial actions

1. Undertake relevant checks within their remit with regard to receipt of material, these to include, where relevant:

- Paperwork
- Test Certificates
- Load Quantity
- Load Type, Size etc.
- Are Coils etc. Identifiable?
- Visible Damage
- General Condition

2. Explain the Hazards and Risks associated with:

- Tools/Materials/COSHH
- Safe Handling of Coils to include directional markers and visual inspection
- Storage of Coils to include environment
- Untrained Personnel

3. Explain the safe system of work (SSOW) relating to the lifting and handling of prestressing tendons.

4. Explain the safety checks required prior to the handling/lifting of prestressing tendons.

(please see Important note on page 20)

Suitable Handling/Lifting Equipment:

- Fit for Purpose
- Tested
- Capacity
- Visual Damage

5. Explain the relevant quarantine requirements and the reasons for them and demonstrate what is required, including reporting

- Damage
- Unidentified Coils
- Lack of Paperwork e.g. Test Certification
- General Condition

6. Explain the storage requirements laid down by the factory SSOW and the reason behind these

- Stock Rotation
- Storage position – benefits of storing off the ground
- Environmental impact on stock including damage and contamination
- Benefits of covered storage
- Use of storage systems, i.e. racking systems or lobster pots

Assessment

Assessment will be based on multiple choice questions and observation of the delegate.

Legislation

- Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
- Control of Substances Hazardous to Health Regulations (2002) (COSHH)
- Personal Protective Equipment at Work Regulations 1992 (PPE)
- Manual Handling Operation Regulations 1992
- Risk assessments should have been carried out in relation to the above as required by the Management of Health and Safety at Work Regulations 2013.

Personal and Protective Equipment

Relevant and correct PPE should be worn at all times.

Important Note

- Operations using specialised plant i.e. cranes or lift trucks should be trained outside this scheme and the operators should hold the relevant CTA or similar.
- Although manual handling is not covered by the scheme, correct handling techniques should be demonstrated throughout the training, and where required, evidence of having attended a manual handling course may be requested.

PS4

Bed Operatives Procedures (PS4)

This unit will form the core of the training and is suitable for Casting, Specials and Unit Handling

Aim

To understand the safety issues relating to a bed operative and to be able to carry out the operations safely.

Objectives

At the end of the course the participants will have knowledge of:

1. The risks and hazards associated with the operations

- Housekeeping
- The machinery used during the manufacturing process
- Other non-machinery hazards
- Working on or around tendons with live loads i.e. tying rebar

2. The importance of cleaning the work area

- Casting area operatives should have a clear understanding of the importance of cleaning the casting area in preparation for the process.
- The use of work area cleaning tools e.g., squeegee mops.
- The use of releasing agents and the issues relating to COSHH and PPE.

3. Tendon patterns

- The different types of tendon pattern.
- Tendon drawings showing tendon positions and how to apply them.

4. Tendon Displacement, Bed Wiring and Pullers

- The tendon guides should be explained in depth, covering the various patterns used for varying product designs.
- The positioning of tendons along the casting area and preparation for the stressing operation to take place.
- The correct systems for coupling the tendons to the 'dead end' and the 'live end' of the casting area
- The correct method for pulling the tendon from the coil and the directional issues.
- The importance of continual visual checks on the tendon coils.
- The points and dangers to be aware of during pulling tendons.
- The positioning of tendon safety restraint systems and reasons for their use.
- The importance of inspection of the tendons and the potential problems.

5. Correct method for fitting barrels and wedges:

- Explain the common issues related to barrels and wedges to include typical faults and related hazards.
- Correct storage methods for barrels and wedges.
- The correct use of barrels and wedges and the different types of tendon connectors.
- The importance of inspection for each component and awareness of the relevant problems (practical examples of both acceptable and unacceptable quality should be used).
- The methods used for the separation of unacceptable components.
- The use of grip release spray and the reasons for using it.
- The use of double ended couplers.

6. Fitting the Button Ends

- Explain the relevant faults and issues regarding button ends.
- The storage methods for ferrules and their use.
- The inspection of button ending equipment and test requirements.
- Know how to inspect the button end and the qualities required (provide examples of acceptable and unacceptable quality).
- the correct methods of cropping tendons before proceeding with the manufacture of the button end.

7. Tendon Jointing

Where joints in the tendons are made, the following should be explained:

- The correct operation of the tendon jointer (practical demonstration should be given) including essential safety requirements.
- Points to be aware of during the jointing procedure.

8. Guards and warnings

- Relevant and adequate guards.
- Position and type of notices.
- Use of relevant audible warnings during Prestressing operations.

9. Safe Systems of Work

- The course should make specific reference at all times to the procedures set out in the relevant Safe System of Work as authorised by the Factory Manager.
- The above elements of the course are subject to discussion and change. The course providers should relate to site-specific procedures as these may differ by location and company.

Assessment

Assessment will be by observation, oral and written multiple choice questions. Relevant practical use of equipment and audits will also form part of the assessment where applicable

PS5

Prestressing of Precast Concrete Stressing Operative Procedures (PS5)

This module is to be completed in conjunction with Module 4 (Bed Operatives) for all operatives involved in stressing activities.

Aim

To provide Stressing Operatives with the relevant skills and knowledge to enable them to carry out their duties in a safe manner.

Objectives

At the end of the course the participants will be able to:

1. Explain the basic theory of prestressing.
2. Explain the method(s) of prestressing and the equipment used at the factory.
3. Explain what is meant by:
 - Prestressing load
 - Extension
 - De-tensioning
 - Pre-tensioning
4. Explain the different types of anchor used at the factory.
5. Explain and demonstrate de-tensioning method(s).
6. Explain the hazards and risks with:
 - Prestressing operations
 - Tools and equipment used in prestressing
 - The working environment
 - Materials used during prestressing (COSHH)
7. Explain and demonstrate the equipment used during prestressing operations.
8. Explain and demonstrate the relevant checks required by:
 - Process
 - Pre-start
 - On-going
 - Completion
 - De-tensioning
 - Calibration of single strand and multi-stressing
 - Principles
 - Frequency
 - Responsibilities

9. Know their responsibility and how to check:

- The equipment is suitable for use.
- The tendons are in their correct position and free from damage.
- The calibration of equipment.
- Ensuring that equipment is cleaned, well maintained and in a serviceable condition.

10. Explain the dangers and preventative measures relating to various modes of tendon failure.**11. Explain the Near Miss / Incident Reporting Procedure.****12. Explain the Safe System of Work in use at the factory.****Assessment**

Assessment will be carried out by direct observation in the delegates' workplace and multiple choice questions. Practical training and audits will also be carried out to support these activities, familiarity with the equipment and its use will be taken into account

PS4/PS5

Guidance notes for Bed (PS4) and Stressing Operatives (PS5)

To be used in conjunction with the above modules

It is accepted that different companies may work differently and that the range of jobs covered by the bed and stressing operatives may vary dependent on a range of factors. It is important to remember that the Stressing Operative must be a competent operative.

The guidelines below are flexible and should cover all working practices.

The Guidance Notes do not replace any Safe Systems of Work provided by the company and should be used in conjunction with the SSOW.

Note:

Cleaning of the bed is outside the scheme unless requested

RISK assessments should have been carried out by the employer as required by the Management of Health & Safety at Work Regulations 1999 (Regulation 3).

Personal Protective Equipment - at all stages of the process correct PPE must be worn by the operatives to comply with the PPE regulations.

Bed/Stressing Operatives

Where applicable operations to cover:

1. Equipment:

- | | |
|---|---|
| a. Jack Internal Stressing Grips Anchor Grips | j. Jack Counterbalance Recording Device |
| b. Barrels and Wedges | k. Wedge removing tools |
| c. Double ended joiners | l. Strand pusher |
| d. Pumps and Jacks | m. Stressing frames |
| e. Abutments | n. Bridges |
| f. Wire Pull systems/Wire Guides | o. Proving rings/load cells |
| g. Guards | p. Deflection plates |
| h. Safety Chains | q. Drum reeling system |
| i. Lifting straps and chains | r. Wire cutting system |
| | s. Lights and sirens |

2. Lubrication

- a. Considerations
 - a. Correct type of lubrication
 - b. Frequency of use

3. The Process

- a. Wiring the Beds
 - a. Preparation
 - b. Pulling Wires

- Anchors/Button Heading/Wire Splicing
- b. Pre-Stressing Checks covering the following
 - Extension checks
 - Wire checks
 - Size
 - Wire patterns
 - Wire position – crossed wires, kinks
 - Check button heads/Ferrules
 - Anchor checks/Button checks
 - Safety methods, Restraining Straps etc
 - Guards in place
 - Warning systems
 - Wire pulling
 - Crane movement alarm
 - Decant warning (bed stripper) hollow core
 - Stressing alarm
- c. Personnel checks – clear hazardous areas to safe zones
- d. Stressing
 - Use of pump and jack, Multi stressing
 - Position and Protection during stressing
 - Extension/Load checks
- e. De-tensioning checks
 - Strength of concrete
 - Remove obstructions
 - Safety covers /guards
 - Warning Systems
 - Personnel checks
 - Sequence
 - Use of Pump and Jack, Multi stressing or cutting equipment
 - Relevant documentation completed or checked
 - Protection and storage
 - Damage to tendons
- f. General Issues
 - Welding/Gas Cutting close to tendons
 - Lifting and Handling Equipment close to stressed tendons
 - Where abrasive wheels and/or oxy-acetylene burners are used training should be given under the PUWER regulations, which is outside this scheme. Evidence of such training may be required.
 - Where an employee needs to use any equipment which is not covered in this scheme as part of both preparation and stressing activities the employee should have received relevant information, instruction and training as required by the H&S regulations.

Legislation

- Management of H&S at Work Regulations 1999 - HSG65 (2013)
- Provision and Use of Work Equipment Regulations 1998 (PUWER)
- Personal and Protective Equipment at Work Regulations 1992
- The Noise at Work Regulations 2005 where applicable

PS6

Management of Site Safety in the Prestressing of Precast Concrete (PS6)

Aim

To ensure that Managers, Supervisors and Health and Safety representatives are adequately trained, To explain the importance of training due to the complexity and safety implications associated with prestressing operations.

This course can be run as a separate day course for Managers, Supervisors and Health and Safety representatives from different companies off site at various locations throughout the country (Quarterly or six monthly).

Objectives

At the end of the course the participants will be able to:

1. Explain the Manager's responsibilities with regard to the prestressing operation.

- Duties under H&SAWA for safe place of work, suitable and sufficient training, safe plant and machinery etc.
- The manager's responsibilities for ensuring that all operations are covered by a suitable and sufficient risk assessment and safe system of work.
- Enforcing the use of suitable Personal Protective Equipment
- The manager's responsibility with regard to the PUWER regulations:
 - Maintenance procedures
 - Maintenance periods
 - Maintenance records
 - Suitability of equipment

2. Explain the different types of stressing:

- Stressing with a jack
- Stressing with a hoist and piab
- Multi-Stressing
- Stressing by load
- Stressing by extension
- Benefits of pre-tensioning for safety and design purposes

3. Explain the operational hazards on a prestressing plant:

- Wire breakages
- Machinery and equipment
 - Misuse
 - Mismatched
 - Unsuitable
 - Untrained personnel
- Interaction with other operations or machinery movement in close proximity
- Housekeeping
- COSHH
- Space and product movement

4. Explain the importance of lock off/isolation procedures.

5. Explain the correct storage procedures of wire and strand:

- Quarantine requirements
- Stock rotation
- Environmental issues re storage as per PS3

6. Explain quality and traceability requirements for prestressed wire/strand:

- Checks on receipt of material
- Documents and records

7. Review and explain Emergency plans and procedures:

- Emergency de-tensioning
- Audible and visual warning
- Power failure
- Suspect tendon procedures
- Isolation of materials or equipment

8. Explain the benefits and requirements of the prestressing safety scheme:

- Continuous improvement
- Traceability of training to nationally recognised standard
- Trained and competent workforce
- Skills improvement
- Improved safety awareness
- All personnel involved with prestressing operations attend training identified within the scheme and meet relevant assessment criteria before receiving certification to the appropriate skill group
- All personnel identified above are trained in accordance with the prestressing training matrix contained within the scheme

9. Carry out safety audits on prestressing operations.

Assessment

Assessment – Written questions and direct questioning/observation of the delegate, review/update of the site procedures in operation on the delegates site

Legislation

- Management of H&S at Work Regulations (1999) - HSG65 (2013)
- Provision of Use of Work Equipment Regulations 1998 (PUWER)
- Personal and Protective Equipment Regulations 1992
- The Noise at Work Regulations (2005)
- Control of Substances Hazardous to Health (2002) (COSHH)

Appendix 1

Relevant Legislation, Guidance and Standards

Health and Safety at Work Act 1974 and relevant statutory provisions regulations

- **PUWER** - Provision and Use of Work Equipment Regulations (1998)
- **HSG65** - Management of Health & Safety at Work (2013) replaces (1999)
- **PPE** - Personal Protective Equipment Regulations (1992)
- **MHOR** - Manual Handling Operations Regulations (1992)
- **COSHH** - Control of Substances Hazardous to Health (2002) as amended
- **CNWR** - Control of Noise at Work Regulations (2005) replaces (1999)
- **LOLER** - Lifting Operations and Lifting Equipment Regulations (1998)
- **WHSW** - Workplace (Health, Safety & Welfare) Regulations 1992
- **HSG 246** - Safety in the Storage and Handling of Steel and Metal Stock
- **HSE Guidance note GS49** - Prestressed Concrete - (2014)
- **BS 8110 Part 1**: 1997
- **BS 5896**: 1980

Please note:

This list may change after publication and you should consult the HSE website at: www.hse.gov.uk for up to date information.

Appendix 2

Example certificate



Proskills
GLOBAL

Certificate of Training Achievement

PRESTRESSING OF PRECAST CONCRETE

This is to certify that

NAME

of

COMPANY

Has successfully completed a course of instruction in accordance with the training requirements and obligations contained in the relevant Health and Safety at Work Acts and other legislation as applicable and has completed an achievement test as recommended in the Guidance Notes issued by Proskills Global Limited in

PS1 Basic Health & Safety / General Stressing Awareness

PS2 Maintenance of Stressing Equipment

PS3 Receipt, Handling, Storage & Inspection Of Stressing Tendons

PS4 Bed Operatives Procedures

PS5 Stressing Operatives Procedures

PS6 Management of Site Safety in the Prestressing of Precast Concrete

Certificate Reg No: **xx/xx/xx**

Date of Training: **xxxxxxx**

Expiry Date: **xxxxxxx**

Signed:



Claire Cousins
Managing Director

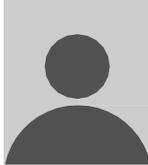
Proskills Global Limited
Approved Partner Logo

Proskills Global Limited, 35 Loyd Road, Didcot, Oxon, OX11 8JZ
Email: support@proskillsglobal.co.uk www.proskillsglobal.co.uk

Appendix 2

Example licence


CERTIFICATE OF TRAINING ACHIEVEMENT
PRESTRESSING OF PRECAST CONCRETE



Company: XXXXX XXX

Forename: XXXX

Surname: XXXX

Reg no: ****

[ATP LOGO]

Module details	Expires
PS1: Basic Health & Safety / General Stressing Awareness	03/04/2019
PS2: Maintenance of Stressing Equipment	03/04/2019
PS3: Receipt, Handling, Storage & Inspection of Stressing Tendons	03/04/2019
PS4: Bed Operatives Procedures	03/04/2019
PS5: Stressing Operatives Procedures	03/04/2019
PS6: Management of Site Safety in the Prestressing of Precast Concrete	03/04/2019

This card is used by and remains the property of Proskills Global Limited
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Tel: +44 (0)1235 432035 www.proskillsglobal.co.uk

Appendix 3

Booking Training and Assessments

Training should be booked directly with any of the approved training partners below.

Accredited Training Partners delivering Prestressing of Precast Concrete training:

EKC Systems Limited

Partner Agreement Number: 201920-03/009

Approved Trainer: Mr Mark Wilson

Spiroll Precast Services Ltd

(CCL Stressing Systems Ltd)

Partner Agreement Number: 201920-03/018

Approved Trainer: TBC

Litecast HomeFloors

Partner Agreement Number: 201920-08/050

Approved Trainer: Mr Mark Barratt

Stress-Tec (UK) Limited

Partner Agreement Number: 202021-02/055

Approved Trainer: Mr Frank Howarth

EKC Systems Limited

Address:

78C Walkley Lane

Heckmondwicke

Yorkshire

WF16 0NL

Approved Trainer: Mr Mark Wilson

Tel: 01924 411604

Email: mark@ekcsystems.co.uk

Spiroll Precast Services Limited

Address:

CCL Stressing Systems Ltd

Unit 8 Millennium Drive,

Leeds

West Yorkshire

LS11 5BP

Approved Trainer: TBC

Tel: 0113 270 1221

Email: sales@cclint.com

Litecast HomeFloors

Address

Unit 6 Pool Road Business Centre
Pool Road
Camp Hill Industrial Estate
Nuneaton
CV10 9AE

Approved Trainer: Mr Mark Barratt

Tel: 02476 356 161

Email: sales@litecast.co.uk

Stress-Tec Limited

Address:

1, Uplands
Keighley
BD20 6LG

Approved Trainer: Mr Frank Howarth

Tel: +44 (0)7954 174 069

Email: sales@stress-tec.co.uk

Assessment papers, trainee registration forms and all certification will be dual branded with Proskills Global Limited's and the relevant training partner's branding.

CTA Replacement Fees:

Replacement CTA's are issued subject to verification by Proskills Global Limited and on receipt of a £30 + VAT fee.

Customer Service:

For further information and advice please contact:

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Oxfordshire
OX11 8JZ

Tel: +44 (0)1235 432035

Email: support@proskillsglobal.co.uk