PS PRECAST & TILT UP CONCRETE

PURPOSE AND SCOPE
The intent of this document is to eliminate or minimise the risks of fatalities, injuries and events arising from precast and tilt up concrete work at Laing O’Rourke workplaces.

CRITICAL CONTROLS
- There is a certified design for precast and tilt up concrete
- Documented safe erection system
- An approved propping and prop removal methodology is available
- Changes to panel and support system design are approved by the designer
- Personnel are trained and competent
- The lifting clutch is approved by the panel or element manufacturer and matches the cast-in lifting point
- Removal of temporary bracing is effectively managed
- Exclusion zones are in place during erection

ADDITIONAL LOCAL CONTROLS
- Concrete strength test results are available for panels and footing slabs prior to installation
- Lifting operations conducted as per lifting operations plan and schedule of common lifts after a detailed lift study is prepared
- Deadman screw anchors / rock anchors are regularly inspected for damage, uplift or lateral movement
- Inspection programme is in place to monitor panel support systems and temporary barriers to be managed by the Temporary Works Coordinator. Inspection shall take place on a regular basis and after events such as high winds or impact that may cause instability in the support system - in these instance additional exclusion zones may be required.
- SWMS must be in place for work involving concrete elements including:
  - Propping Plan (must be designed and signed off by structural engineer including fixings, deadman footings, etc.)
  - Stripping Plan (must be designed and signed off by structural engineer)
  - Lifting gear and backup slings
  - Components & certifications
- Cranage - positioning, load distribution, point loading, capacity and radius restrictions
- Pre-cast (formwork, pouring concrete, hazardous substances, and petrol powered tools)

- Tilt-up is an engineering system, and design must be done by an engineer specialising in tilt-up, and cannot be changed in the field without the approval of the Engineer
- All variations from the design, relating both to the panel and support system must be checked by the Engineer and either be:
  - Certified by the engineer as being acceptable (i.e. complying with AS 3850) in writing, if the engineer can verify this is the case, or
  - Altered in accordance with the engineer’s written directions so as to comply with AS 3850, within a time frame specified by the Engineer.

- Prior to removing temporary bracing from the panels, a competent person is to inspect the building to ensure that all permanent structural members and brackets have been attached to the panels in accordance with the engineer’s instructions. A sign off procedure should be implemented to verify that this has been done.
- In Western Australia, tilt-up work must be notified to the Commissioner at least 10 days before a panel is cast. The design, transport, erection, bracing and fixing must be carried out in accordance with AS 3850. The work must be directly supervised by a person who has completed an approved tilt-up course (see mandatory training p4). All relevant documentation must be kept at the worksite.
- The Checklist E-T-8-0925 Tilt-up and Precast Concrete Checklist must be used whenever installing precast or tilt-up concrete panels

**ERECTION DOCUMENTATION**

- The erection documentation prepared by the engineer should cover every aspect of the erection process, including the:
  - Erection sequence
  - Orientation (position relative to each other) of the concrete elements
  - Configuration and size of erection braces and, where applicable, knee braces and cross-bracing provided by the engineer
  - Bracing details including type and angle (designed and certified by an engineer)
  - Requirements for erection brace footings (and prop footings if required), brace fixings and concrete
  - Strength of the brace footings (including slabs) at the time of erection (by an engineer)
  - Levelling shims details for erection, and the requirements for grouting, specified by an engineer

Refer to the relevant jurisdiction Code of Practice for more information on:

- Structural Design
- Design for handling, storage and transport

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Let’s all get home safely, every day.
• Lifting inserts
• Structural connections and temporary supports
• Handling and storage
• Impact
• Wind
• Cast in fixings
• Loading
• Suction
• Erection

DESIGN OF PRECAST AND TILT UP CONCRETE SYSTEMS

• For more information on design of precast and tilt up systems refer to HSE Information - Design of Precast and Tilt Up Concrete Systems

ROLES AND RESPONSIBILITIES

COMPETENT PERSONS

• Information, training and instruction relating to hazards, risks and controls must be provided to persons carrying out or supervising tilt-up or precast concrete work. Training should include:
  o Induction into the National Code of Practice and AS 3850
  o Identification of the hazards associated with the use of plant & equipment and the manufacture, transport, storage, erection & demolition of concrete elements
  o Emergency procedures
  o SWMS for concrete element construction work

• The Western Australia Occupational Safety and Health Regulations include mandatory training:
  o Anyone involved in tilt-up or precast concrete construction or manufacture to have completed WorkSafe approved course from the construction training package, CPCCCM1007A Carry out tilt-up work safely, or CPCCCM2011A Carry out tilt-up work safely

PROJECT / WORKPLACE LEADER

• Appoint a Temporary Works Coordinator to oversee the precast / tilt up concrete works

SUPERVISOR

• The Western Australia Occupational Safety and Health Regulations include mandatory training:
  o People who directly supervise tilt-up work or the manufacture of concrete panels must complete the WorkSafe approved course from the construction training package CPCCBC4022A Supervise tilt-up work

• Ensure works are carried out in accordance with the SWMS and the designed erection sequence is followed as per engineers design

TEMPORARY WORKS COORDINATOR

• Review the design of the precast / tilt up system for adequacy

Let's all get home safely, every day.
• Coordinate the inspection programme of the support systems and barriers
• Maintain details of the design and inspections on the Temporary Works Register

ADDITIONAL GUIDANCE
HSE Information - Design of Precast and Tilt Up Concrete Systems

REGULATIONS AND CODES
Work Health & Safety Regulation 2011 (QLD, ACT), 2012 (SA) and 2017 (NSW, NT); Part 3.1 (regs 32-38), Division 3.2.1 (reg39), Division 6.3.2 (regs 299-303)
Occupational Safety & Health Regulation 1996 (Western Australia); Part 3 Division 9 Subdivision 1 – Tilt-up concrete and precast concrete elements
Occupational Health and Safety Regulations 2017 (Victoria); Part 3.5, Plant

CODES AND STANDARDS
National Code of Practice for Precast Tilt-Up and Concrete Elements in Building Construction
Industry Standard (Victorian Code) Precast & Tilt-up Concrete For Buildings
Queensland Tilt-up and Pre-cast Construction Code of Practice
AS 3850 Tilt-up concrete construction

FORMS AND TEMPLATES
E-T-8-0925 Tilt-up and Precast Concrete Checklist