PROCEDURE

PRECAST AND TILT UP PANELS

1. PLANNING

SAFETY ESSENTIALS

The project team are required to review the ***Safety Essentials Protocol*** to ensure that all mandatory risk management requirements are completed: prior to commencement / during completion / at completion of the project.

PROJECT RISK REGISTER

The *Project Risk Registers (OHS and/or Environmental)*, developed by the **Project Manager** at the start of the project, provides project-specific information pertaining to identified high risk works, risks and control measures.

- The Risk Register must be reviewed by the site team to familiarise themselves with identified high risk works to be undertaken.
- For the life of the project, the Risk Register should be reviewed on a regular basis and kept up to date with changes to scope and identified high risk works.

Refer to ***Procedure: Performance Management*** for additional information.

PANEL DRAWINGS

The design for pre-cast or tilt up panels must be verified for compliance with AS 3850 by a qualified Engineer.

Drawings for the erection of the panels must include details on how the panels are to be placed and secured into position. Information to be shown on these drawings includes:

- Date and issue number of the drawing.
- Project location.
- Position of brace connection points on the panel and the ground.
- Brace specifications and/or required capacities.
- Leveling pad details.
- Relative locations of panels.
- Details for brace footings including dimensions, location, anchor type, and concrete strength at time of erection.
- Details on knee and lateral bracing (if applicable).

Design variations for Panels and the support system may only be completed by a suitably qualified Engineer. ^

Panel drawings must confirm:

- The name of the drafter/designer.
- The name of the person that reviewed the drawings.
- Dates (drawing / review) and revision numbering.

ENGINEERING REVIEW

Erection methodology

The subcontractor engaged to erect the panels is required to supply ADCO with a detailed Lift Plan, which must be approved by an Engineer.

The Lift Plan must include, but is not limited to:

- Crane setup position on site (including no-go areas).
- Locations where the panels are to be lifted from and to, with the Crane operating radius of the Crane shown.
- Sequence of panel erection.
- Information panels requiring welding prior to release from the Crane.
- Areas on site where obstacles such as walls or braces may be in the travelling or slew path of the Crane.

Ground conditions and engineered surfaces

Prior to the start of the work activity, written evidence of the suitability of ground conditions and / or engineered surfaces must be obtained by the **Project Manager**, from a suitably qualified Engineer.

The evidence (approval) for the placement of panels, Plant, (etc.), must confirm engineering principles relating to ground bearing capacity (ground), point loads, support requirements, trafficable paths etc.

The information must be provided to relevant subcontractors to assist with their project planning requirements.

SITE PLANNING

Prior to the start of the activity, the ADCO project team and relevant subcontractors must discuss and agree on, but not limited to:

- The location of casting beds (tilt up panels) relative to the erection location for the panels.
- The travel paths for concrete trucks (tilt up panels), semi-trailers (pre-cast panels), mobile cranes (erection), EWP's (bracing inserts, grouting, etc.).
- The required ground / engineered surface conditions for the placement of panels.
- The location of any services (above or below ground) which may impact or be impacted by the activity.
- Any other requirements related to the work activity or required risk controls.

The information must be documented and provided to the ADCO project team and relevant subcontract personnel.

CONTRACTOR COMPETENCY (WA only)

Company

Prior to the start of the work activity, the subcontractor must provide ADCO with written proof that they are currently licenced with WorkSafe WA.

Supervising person

Persons who directly supervise tilt-up work at a construction site require certification in a WorkSafe WA approved course: **Supervise tilt-up work**

Workers

Persons involved in tilt-up or precast concrete construction or manufacture, require certification in any one of the approved WorkSafe WA courses:

- Contribute to safe tilt-up construction.
- Carry out tilt up work safely.
- Identify requirements for safe tilt-up work.

REGULATORY NOTIFICATION (WA only)

When

At least **10 days prior to the casting** of any panels, WorkSafe WA must be notified in writing of the event.

A copy of the WorkSafe WA approval must be supplied to ADCO.

The approved form must be held on site for the duration of the panel manufacturing period.

REGULATORY PERMITS

Activities completed external to or on the boundary of a project site may require the issue of a Permit (or approval) by a Regulatory Authority to enable the work activities to proceed.

Activities include, but are not limited to:

- Work on or over roads or footpaths.
- Work in or adjacent to waterways / wetlands / contaminated ground, etc.
- Erection of temporary structures on or over footpaths (e.g. gantries).
- Requirements to use trafficable areas for loading and offloading of plant and equipment.
- Work internal to a site but which impacts on neighbouring properties (e.g. underpinning, excavation adjacent to a building line).
- Requirement to complete works activities outside of standard working hours.

The **Project Manager** must ensure these permits have been acquired and are current.

When A review of the type, number and duration of permits that will be required prior to and during construction activities must be completed by the **Project Manager** prior to the start of any work activities.

By whom Permits are normally obtained by ADCO in conjunction with a company competent in / accredited to obtain the permits.

Notification Any permit obtained from a Regulatory Authority or Council must be:

- Held on site during the completion of the work activity
- Be visibly displayed
- Produced to an authorised person from a Regulatory Authority
- Valid during the completion of the activity

SUBCONTRACTOR NOTIFICATION

The Project Manager / Contracts Administrator are required to:

- Ensure subcontract companies have access to the Project Risk Registers/Project Management Plan via ACONEX.
- Ensure that subcontract companies are advised of project specific risks/hazards and required control measures for consideration and inclusion in their supplied SWMS.
- Ensure other related site-specific information i.e. Asbestos reports, Geotechnical reports, Enviro reports, Traffic reports etc is made available.

2. SITE ACTIVITY MANAGEMENT

WORK AREA INSPECTION

Prior to the start of the work activity, the **Site Manager** together with the subcontractor supervisor must complete an inspection of the work area. The purpose of the inspection is to:

- Review the work area.
- Agree on the work activity, work schedule, risks and control measures.
- Review emergency procedures
- Obtain information required to complete the relevant Checklists and ATW Permit.

CONTRACTOR COMPETENCY

Prior to the start of the work activity, the **Site Manager** must confirm the following:

Erection supervisor

The person supervising the works in possession of a National High-Risk Work Licence:

RI (Intermediate Rigger) or RA (Advanced Rigger)

Workers

Activities relating to the lifting and placement of panels require that some workers involved in the completion of the works are in possession of other National High-Risk Work licence/s such as Crane Driver and Dogman etc.

Evidence is required at the Site Induction.

WA only

Persons involved in tilt-up or precast concrete construction or manufacture, have completed a WorkSafe WA course.

This includes the Supervisor and workers.

CHECKLIST COMPLETION

When

Prior to the start of the work activity, the ***Checklist – Panel Erection*** must be completed regardless if a Permit is required.

The relevant ***Checklist**** must be completed by the **Site Manager** in conjunction with the subcontractor supervisor prior to any permit being issued.

If the **Project Manager** is unavailable to approve the PLANNING section of the checklist, the **Site Manager** must complete and approve in his/or her absence.

Frequency

A new Checklist may be required for each new work area. This is may be determined by:

- Any changes to risk management controls in the *Project Risk Register*.
- Changes to working conditions

Approval

PLANNING	SITE ACTIVITY MANAGEMENT
Prior to the start of the work activity, the **Project Manager** is required to approve the ***Planning*** section of the Checklist. If the **Project Manager** is unavailable to approve the ***Planning*** section of the checklist, the **Site Manager** must complete and approve in his/or her absence.	Prior to the start of the work activity, the **Site Manager** is required to approve the ***Site Activity*** section of the Checklist. **Note**: If assistance is provided by the **S&E Advisor** to complete the Checklist. Consultation between the **Site Manager/Forman/Project Manager** is required before the Checklist is finally approved. Note: if no Checklist has been completed for an activity requiring a Permit, then NO work can proceed.

PLANT CHECKLISTS

Any mobile Plant to be used for / during the work activity must be inspected and approved per requirements of ***Procedure: Operating Plant (mobile plant)***.

AUTHORITY TO WORK PERMIT (ATWP)

When

Prior to the start of any work involving the erection of panels, an ***Authority to Work Permit*** must be issued by the **Site Manager.**

The Permit for this activity must not exceed 30 days

Frequency

A new ***ATWP*** may be required to be issued for each new work area.

Refer to ***Procedure: Permit Management*** for additional information.

CONSULTATION

Information relating to the work activity and control measures must be provided to subcontract workers at site induction and through any other forms of consultation utilised on the project (e.g. pre-start meeting, S&E Committee)

MONITORING REQUIREMENTS

TRAFFIC MOVEMENT

The **Site Manager** is required to:

- Update the *Traffic Movement Plan* as required to reflect the site operations.

Refer to ***Procedure: Traffic Management and Movement*** for additional information.

EXCLUSION ZONES

The **Site Manager** is required to ensure:

- Only persons directly involved with the activities are permitted in the area.
- Exclusion zone locations, sizes and demarcation are determined by assessing the risk of the work activity to be completed.
- The exclusion zone is maintained i.e. Controls, during the period of the activities.
- All other trades on site are aware of the activities and dangers within these exclusion zones through daily – pre-start meetings.

EXCLUSION ZONES Cont.

CASTING	ERECTION	BRACING
An exclusion zone - relative to work area around casting beds must be implemented. This provides room for the delivery and placement of reo and concrete, including curing requirements.	The erection area must be fully excluded from other site activities and the exclusion zone must provide access for panel deliveries and Plant movement. An exclusion zone equal to at least 1.3 times the height of the panel to be implemented around all sides of the panels. Where panels are erected on suspended surfaces, exclusion zones must be relative to the height of the panel.	After erection of panels and installation of bracing, an exclusion zone must be implemented on the braced side of the panels. The zone must be of sufficient size to prevent - - contact with operating Plant. Where practicable, consideration must be given to implementing an exclusion zone on the non-braced side of panels, to mitigate contact of Plant with the structure.

WORK AT HEIGHT CONTROLS

The type of fall from height protection or falling objects protection to be implemented during the work activity will be determined by assessing the risk of the work activity to be completed.

Work activity at height is managed using any or all of, but not limited to:

- Installation of proprietary edge protection and / or scaffolding.
- Where required, wrapping edge protection with shade cloth to prevent objects from falling through handrails, etc.
- Use of Elevated Working Platforms (EWP) – e.g. Boom or Scissor Lifts.
- Use of Personnel Protective Equipment (PPE) – e.g. harnesses, static lines.
- Ensuring that working surfaces are slip free.
- Ensuring that access / egress locations are suited to the work activity and are free of obstructions.
- Ensuring protection / covering of surface penetrations / holes.

Refer to ***Procedure: Work at Height*** for additional information.

REGULAR VISUAL INSPECTIONS

Daily and on-going inspections of work areas, Plant, work practices must be completed by the **Site Manager**. Monitoring includes, but is not limited to:

- Ensuring that competent personnel are completing the work and controls are in place.
- Ensuring that a suitably qualified person is present and supervising the work.
- Compliance with the operating requirements of any issued Permits.

Where irregularities or non-conformances are identified:

- Work activities must immediately cease.
- Any non-compliance related to the activity not able to be resolved on site must be referred to the **Project Manager**.
- No work may continue until the non-compliance has been actioned by the **Project Manager/Site Manager**

Observations should be recorded in the ***Weekly Site Inspection.***

OPERATIONAL PLAN UPDATE

The **Site Manger** is required to update project operational plans to reflect site operational conditions *(Traffic Movement Plan, Services Plan, Evacuation Plan etc)*

Set down / trafficable paths

Review access/egress paths to ensure that they remain trafficable and suitable for the loads being transported.

Delivery mechanisms

Frames (used to support concrete elements during transportation) and **walking platforms** (for access around panels) whether an integral part of the transport vehicle or an add-on, must be designed to comply with the National Transport Commission's Load Restraint Guide.

Certification that the support frames are compliant is required from a suitably qualified Engineer and must be supplied to ADCO prior to the offloading of any panels.

Erected panels

- Confirm that the correct concrete strength has been achieved prior to erection.
- Inspect panels prior to off-loading for evidence of cracking, concrete fatigue, incorrect placement of inserts, etc.
- Ensure that erection is completed in compliance with the approved lifting plan.
- Where applicable, ensure panel identification is visible.
- Ensure that propriety (certification plate attached) and approved braces (min 2 per panel) have been installed.
- Ensure that brace locking pins are in place.

END OF SHIFT INSPECTION

At the end of each shift / close of each day, the **Site Manager** is required to review / inspect the work area to confirm that required control measures are in place and, that the work area is safe / secure.

Observations should be recorded in the ***Weekly Site Inspection.***

*Note: The **Site Manager/Forman** are responsible for completing the Daily Site Reports on the Portal and submitting all relevant information (i.e. Weekly Site Inspection, Daily Pre-Start Meetings, Site numbers, Incidents, labour hire etc)*

3. ACTIVITY COMPLETION

ENGINEERING APPROVAL

	WORK AREA	BRACING / PROPPING REMOVAL
Description	After work activity completion, confirmation of structural integrity may be required to confirm that the work area is safe for access by other persons.	At an approved stage of the works, bracing / propping installed on the panels must be removed.
Timing	After completion of each stage of panel erection.	**At no stage may temporary bracing / propping be removed without the prior written approval of an Engineer. This includes situations where temporary removal is required (e.g plant movement).**
By whom	After inspection of the panels (etc.), certification should be issued by a suitably qualified Engineer engaged by ADCO or by the subcontractor who has completed the activity. The written certification must be issued to the ADCO Project Manager prior to any further work in the area being permitted to commence.	After inspection of the panels (etc.), certification must be issued by a suitably qualified Engineer engaged by ADCO or by the subcontractor who has completed the activity. The written certification must be issued to the ADCO Project Manager prior to any further work in the area being permitted to commence.

WORK AREA REVIEW

When At completion of work activities for which an ***ATWP*** has been issued.

By whom The **Site Manager** and the subcontractor supervisor.

Review Inspect the work environment to ensure that the work activity is complete and no further hazards / risks exist.

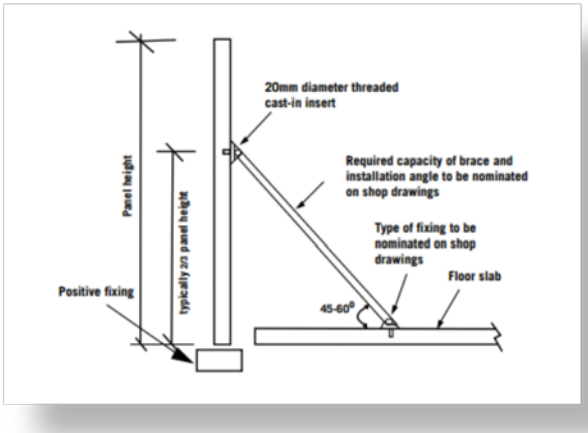
Evidence Observations should be recorded in the ***Weekly Site Inspection***.

DOCUMENTATION CLOSE OUT

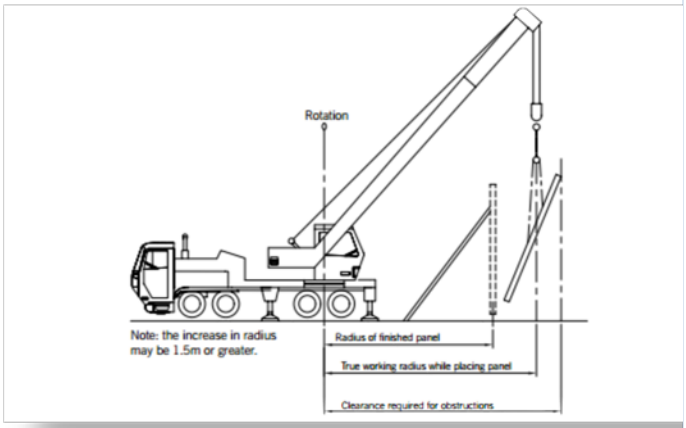
After completion of the work, the **Site Manager** is required to close out the ***ATWP***.

EXAMPLES

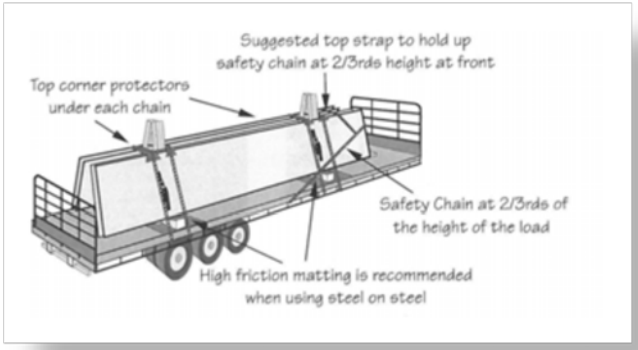
PANEL BRACING



CRANE LIFTING



SUPPORT FRAMES



TILT UP PANELS AND CASTING BED

ADDITIONAL INFORMATION

Legislation reference	**National**	http://www.safeworkaustralia.gov.au/sites/swa/model-whs-laws/model-cop/pages/model-cop

Competent person - general	A person who has acquired through training or experience the knowledge and skills and holds a certification in relation to the specified VET course for the work activity.
Competent person – concrete panels	A "competent person" is a person: • Who has significant industry experience in the reading of Tilt Panel drawings and the construction and management of such systems. • Who has appropriate training and knowledge to perform on-site inspections of Tilt panel system. • Other than a Professional Engineer or Panel Designer. A "competent person" is a person who must be able to certify that the Panel construction and erection satisfies the details on the Engineer's specifications and drawings. Where the "competent person" is not a Professional Engineer: • They can only verify that the specifications and drawings have been complied with. • They are not permitted to authorize variations to the design. • They are permitted to require corrections to the system if some details do not pass as indicated on the construction checklist. Such corrections may be completed through written instructions or remedial action. Note: Persons providing design certification are to be Professional Engineers with suitable experience to provide specific signed statements about the compliance of the system with legal requirements.
Crane capacity - lifting concrete panels	Cranes used to lift panels must have a maximum rated capacity of at least three times the mass of the heaviest panel.

Panel information		
Propriety	*Components*	Components carrying a trademark or registered name.
	Documentation	Documents prepared specific to a proprietary item, a component or a system of components and concrete elements forming a building or structure. Includes drawing, instructions for the erection, installation, operation, inspection and testing of items, components or system.
Storage	• Must not have direct contact with the ground *(i.e. place bearers under)*. • Must not be capable of collapsing or falling. • Must not be stacked higher than twice the element width. • Must not be stacked on suspended floors unless an Engineer has provided approval in writing.	
Lifting	• The panel number and weight must be clearly marked on the panel. • Panels should be suspended with their face as near to vertical as practicable. • Braces, whenever possible should be attached to the concrete panel prior to lifting. • The bottom edges of panels should be horizontal. • Lifting clutch release lines to be fitted so that the clutches can be disengaged without the need for workers to climb on top of the panel. • Dowel pins to be fitted into the bottom edge of the panels or into the footings prior to lowering. • Crane supports are to be maintained until all braces have been installed and effectively secured to the panel and footings.	
Rotating	• The distance from the auxiliary winch rope lifting point to the end of the panel is not to exceed 1/4 of the panel length. • The included angle between the main hoist rope and auxiliary hoist rope is not to exceed 45 degrees. • Panels to be rotated so that the panel is suspended in its rotated position by the main winch *(if one Crane used)*, or the larger capacity Crane *(if two Cranes are used)*. • Panel to be adequately reinforced to withstand the lifting stresses. If the conditions above cannot be complied with an Engineer must verify the minimum required capacity of the hoist ropes.	