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TEMPORARY WORKS

HYER STANDARD

PROCEDURE

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PURPOSE AND SCOPE

The purpose of this procedure is to ensure all temporary works is installed, inspected/checked, maintained, and dismantled as per the design without incident or injury to workers or members of the public.

This procedure applies to all temporary works that are designed and executed on HY projects. This includes:

- Earthworks (e.g. trenches, excavations, temporary slopes, piling platforms)
- Structures (e.g. formwork, falsework, propping, façade retention, needling, shoring, edge protection, screens, scaffolding, site hoarding and signage,

covered walkways, gantries/overhead protection, crane landing platforms, site fencing, amenities)
- Equipment/plant foundations (e.g. tower crane bases, crane and hoist ties, groundworks to provide suitable base for plant erection such as mobile plant and piling rigs, covers for pit holes / penetrations / risers / shafts, braces for masonry walls)

RESPONSIBILITIES

HY PROJECT TEAM

- Ensure design documentation and methodologies developed by competent persons have been obtained
- Ensure inspection reports and verifications have been obtained from competent persons where required
- Ensure reports and verifications have been obtained from a geotechnical engineer where required
- Ensure applicable Work Permits are implemented prior to commencing work
- Ensure only trained and competent persons perform work on site
- Ensure designer, inspector and worker competencies and qualifications are verified prior to commencing work
- Ensure that SWMS are provided for any work that involves structural alterations or repairs that require temporary support to prevent collapse

HAZARD IDENTIFICATION RISK ASSESSMENT AND CONTROL (HIRAC)

Temporary Works must be identified as part of the project risk assessment. The risk assessment is to take into consideration factors including, but not limited to:

- Foundations (ability for the ground to carry the load of the temporary works structure without failure)
- Structural Integrity (ability for the temporary works structure itself to carry and transmit loads to the ground via the foundations without failure of the

structural elements) i.e. load bearing capacity of the structure including fixings and connections
- Stability (ability of the temporary works structure to withstand horizontal or lateral loading (e.g. wind) without sway, overturning or sliding failure)
- Permanent works (ensuring that permanent works and temporary works are compatible and that the permanent works can support any loadings from the temporary works)

The following should be considered when identifying controls:

- The design of the temporary works and how the design will be verified
- Inspection of materials and components prior to erection/installation of temporary works
- Verification of the erection/installation of the temporary works (i.e. as per design) prior to use
- Regular inspection and maintenance of the temporary works while it is in use
- Verification that permanent works have attained adequate strength prior to dismantling
- Dismantling (as per methodology)

Temporary works designs can be categorised to indicate the complexity/simplicity of the specific temporary works structure and the potential risk based on the nature of the works, site conditions, and environment of the work area. Categories include:

- Low Complexity – Temporary Works which generally require no design analysis
- Medium Complexity – Temporary Works comprising of proven design solutions and materials
- High Complexity – Temporary works comprised of complex/mixed systems or bespoke solutions

DESIGN

Temporary works must be designed in accordance with recognised engineering principles, standards and legislative requirements. This includes proprietary temporary works equipment.

Temporary works (including support systems and temporary structures) must be:

- Designed by a qualified designer (professional engineer or competent person)
- Detailed on up-to-date drawings and plans

Where changes are required to the design, the changes must be authorised by the designer prior to the change being undertaken.

Designs must be documented on a drawing or plan, kept up to date if approved alterations are made, and communicated to workers.

INSTALLATION OF TEMPORARY WORKS

INSPECTION OF COMPONENTS

Materials and components must be inspected prior to installation of or alterations to temporary works. Inspection must include:

- Checking for compliance with design requirements
- Conducting specific inspections of critical components, as identified by the designer and or HY Engineer

Damaged materials and components must not be used. Damaged components should be marked/sprayed and either removed from site or destroyed. They may also be recorded as an observation in HammerTech. Damaged and/or defective proprietary equipment should be reported to the supplier/manufacturer.

INSTALLATION

Temporary works must be installed as per the design and/or installation instructions by a competent person(s)

Methodology for the installation of temporary works must include controls for the work to be completed safely. Risks associated with installation must be managed as per the relevant HY procedures. A SWMS is required for

installation (and disassembly or removal) that includes high risk construction work. Refer to Work at Heights procedure for requirements with regards to preventing falls and falling objects.

Prior to use, temporary works must be inspected and verified by competent persons as installed in accordance with the manufacturers' instructions, any drawings or plans, and relevant legislation, codes of practice and Australian standards.

Examples of written verification for temporary structures include:

- Inspection certificates/checklists
- Handover certificates
- Scaffold/Safe for Use tags
- Engineer inspection and design report

The written verification for installation must include the name of the competent installer and competent person issuing the verification (if different from the installer).

INSPECTION AND MAINTENANCE

Temporary works must be regularly inspected as per the designer's requirements, manufacturer's requirements, relevant legislation, Codes of Practice, Australian standards and/or drawing/plan. Temporary works must also be inspected following any events that may affect its stability (e.g. weather events). The relevant HRCW Planning checklist in HammerTech is to be used to record periodic inspections. Any relevant drawings/plans are to be uploaded to the checklist by the relevant subcontractor.

DISMANTLING TEMPORARY WORKS

Temporary works with complex removal sequencing or which are load bearing systems (such as beam jacks, falsework, formwork, props, etc.) require an engineer to visually inspect in person and verify, and HY authorisation prior to the works commencing.

Prior to removing or dismantling any temporary works, it must be verified that the permanent works are constructed, are in a stable condition and self-supporting (i.e. all permanent load paths have been established) and that the temporary works are no longer required. The following must also be considered:

- Possible impact on permanent works and existing structures
- Hold Points or items critical to the safety of the works that need to be met, including but not limited to minimum concrete strengths, stressing records, loading conditions, back propping etc.
- Any additional risks due to the removal of the temporary works
- Any specific removal sequencing as documented

Risks associated with dismantling temporary works must be managed as per the relevant HY procedures. A SWMS is required for dismantling that includes high risk construction work. Refer to Work at Heights procedure for requirements with regards to preventing falls and falling objects.

HOARDINGS, GANTRIES AND TEMPORARY FENCING

Temporary Fencing does not require an engineered design, however, evidence by way of test certificates from a NATA approved supplier is required to verify that the load and impact ratings as per AS 4687 Temporary fencing and hoardings.

Hoardings, gantries and temporary fencing is installed as a control to reduce the risk associated with falling objects. They must be able to prevent an object that is reasonably expected to hit it from entering the adjoining area and be appropriately designed and erected for the circumstances in which it is used. Gantries must be designed for 10kpa live loads during construction.

Hoarding and gantries must comply with relevant local council requirements and required approvals must be obtained prior to erection.

Hoardings, gantries and temporary fencing must be installed plumb and comply with regional wind categories. Adequate bracing is to be installed to maintain the integrity of the systems and a handover certificate shall be completed by the installer to verify the system has been installed in accordance with relevant

standards. They must be inspected regularly as part of Site HSE Inspections to ensure the integrity and stability of the systems have not been altered or deteriorated.

Hoarding, gantries and temporary fencing must only be erected, altered and removed by competent persons, who have been trained in the supplier's relevant installation manual/documentation or instructions and are aware of the associated hazards and risks.

SITE SHEDS, AWNINGS AND WALKWAYS

Site sheds, awnings and walkways must be designed and constructed to resist potential severe weather conditions for the specific site location, including to resist uplift and lateral wind loads. They should be freestanding, unless the supporting structure and connection points have been assessed by a competent person (typically a structural engineer) as being able to support the temporary structure.

FORMWORK/FALSEWORK

Formwork drawings must include:

- Plans, elevations and sections to show the actual on-site arrangement of the formwork and to identify and locate all members and components including bracing
- Wall and column form details
- Maximum point loadings to be applied
- Component types and spacings
- Maximum jack extensions
- Bearer and joist timber type, the dimensions and spacings
- Prop sizes and maximum extensions
- Methods for tying the structure together and spacing between ties (if required), and
- Formply size
- Loading areas, specified live loads and the direction of the concrete pour and rate of rise for columns and walls
- Edge protection systems

- Perimeter screens and methodology
- Crane lifting points for wall-forms, columns, formwork perimeter screens and table-forms

The design must include clear access and egress for persons and material to formwork decks, including for emergencies. This may include the combination of stretcher and/or single stair access, man/material hoists or ladders as a last resort.

FORMWORK ERECTION

Formwork must be erected on a stable base to prevent the risk of collapse. Base plates or sole boards must be provided under props and formwork frames unless specified.

Frames, bearers and joists on formwork systems should be installed progressively from below to prevent falls from height, working from a minimum of 2 planks 450mm wide. In situations where a deck is at a height that would require persons to stand at heights of two metres or more to install bearers and joists for the formwork deck, a “false” deck, which is a full deck the same area as the area being formed, must be provided both inside and between formwork frames. Gaps between the decks shall not exceed 225mm where vertical members pass through.

Prior to use (including allowing access to proceeding trades), a handover inspection must be completed by the formworker to verify the system has been installed as per design. Similarly, an inspection of the system must be completed by a qualified designer prior to concrete placement.

Where multi-level perimeter screens are installed, a handover certificate must be provided to verify the systems has been installed in accordance with the design.

LIVE DECKS

Safe/designated access and egress must be provided to live decks using:

- Designated stair type access
- Enclosed system type scaffold stair/access ladder

- Ladders secured through live deck

Cautionary signage to be placed adjacent all formwork access/egress points. Live ends must be protected against unauthorised access. Protective mesh to be placed to allow safe access & egress over top reinforcement where required e.g. over deep beams.

Consideration should be given to areas where a work zone or walkway is located beneath a live deck and whether solid barriers should be erected directly above the area to prevent dropped objects.

FORMWORK DISMANTLING

Drop stripping is not allowed on HY projects.

Prior to formwork being dismantled, a Strip Formwork work permit is required to verify the concrete has sufficiently cured and where applicable, post tension stressing results are adequate. This is to be verified in person by an engineer prior to stripping formwork.

SCAFFOLDS

SCAFFOLD LICENCE CLASSES

The scaffolding high risk work licence classes are:

Basic scaffolding licence—required for scaffolding work involving:

- modular or prefabricated scaffolds
- cantilevered materials hoists with a maximum working load of 500 kilograms
- ropes
- gin wheels
- fall arrest systems including safety nets and static lines, and
- bracket scaffolds (tank and formwork).

Intermediate scaffolding licence—required for scaffolding work involving:

- cantilevered crane loading platforms
- cantilevered scaffolds
- spur scaffolds

- barrow ramps and sloping platforms
- scaffolding associated with perimeter safety screens and shutters
- mast climbing work platforms, and
- tube and coupler scaffolds including tube and coupler covered ways and gantries.

Advanced scaffolding licence—required for scaffolding work involving:

- cantilevered hoists
- hung scaffolds including scaffolds hung from tubes, wire ropes or chains, and
- suspended scaffolds.

SCAFFOLD PLAN

The need for a scaffold plan must be assessed and documented as part of the Project Risk Assessment. A scaffold plan must be provided for complex scaffolds, including:

- Scaffolding >20m in height (>4m height in QLD)
- Suspended scaffolds
- Perimeter catch scaffold or fan scaffold
- Hung scaffold
- Spur scaffold
- Scaffolding for demolition work (heavy duty loading platform/material containment/edge protection)
- Scaffold designed as overhead protection for public/workers safety (i.e. 10kpa rated or above)
- Cantilever scaffold
- Any non-standard scaffold assembly significantly outside the configuration specified by the manufacturer
- Scaffold used as falsework (e.g. birdcage)
- Swing stage scaffold

The scaffold plan must be developed by a qualified person and detail:

- Plans, elevations and sections to show the general arrangement of the scaffold
- Foundations, ground conditions, geo tech report, size of sole boards
- Supporting structure
- Tying
- Bracing

- Type of scaffold, and
- Edge protection

Changes to the scaffold design are to be signed off and approved by a qualified person.

SCAFFOLD SPECIFICATIONS

A minor scaffold:

- Is maximum height of 1.2 metres (twice minimum base dimension) to platform level
- Must not be used within two metres of the edge of a building structure where there is a potential for objects to fall to another level
- Must have handrails fitted to all sides and at base
    - unless secured to a wall that extends 900mm above the scaffold deck and the gap between the wall and scaffold deck is no greater than 225mm

The maximum height of a free-standing scaffold is three (3) times its least base dimension. Wherever practicable access to scaffolds over 2.0 metres must be via an internal access.

All scaffolds (other than minor scaffolds) require:

- Two handrails and a kickboard, or
- One handrail and a screen

ERECTING AND DISMANTLING SCAFFOLDS

Scaffolding must only be erected, altered, or dismantled by competent, appropriately licenced persons.

A scaffold from which a person or object could fall more than 4 metres must not be used until:

- It has been inspected by a competent person (i.e. a person who holds a scaffolding high-risk work licence). Written confirmation of the inspection must be provided by the competent person that the scaffold has been completed. A handover inspection certificate must be completed and provided to HY and scaffold tag fixed to the scaffold before the scaffold is used.

- It has been inspected by a competent person after an incident (e.g. severe storm or impact by mobile plant), after any repairs, alterations and additions, and at least every 30 days. Inspections must be completed on a Scaffold Inspection Checklist/Certificate. Inspections are to be verified on a Scaffold Tag which is to be attached to the scaffold access point.

Any changes to the installation design must be authorised and signed off by a competent person prior to the changes being made.

Unauthorised access to scaffolding that is incomplete and left unattended must be prevented (e.g. attaching danger tags and warning signs at appropriate locations).

Scaffold must be:

- Erected on a stable base to prevent the risk of collapse. Sole boards and base plates of minimum 500mm x 200mm must be provided to distribute loads, unless otherwise specified
- Erected and dismantled in one (1) metre lifts (max) with full perimeter fall protection
- Erected from a platform at least 450mm wide to erect components above. Edge protection must be installed progressively so workers are not exposed to falls from the scaffold.

Scaffold installers must have a fully decked platform beneath them at a distance no greater than 2m. Gaps between the scaffold and building structure shall not exceed 225mm.

During erection and dismantling, exclusion zones must be provided with appropriate signage to worn others of the hazards above. A SWMS is to be provided by the scaffolding contractor for erection, alteration and dismantling of scaffolds where there is a risk of a person falling more than 2 metres. A HY scaffold permit to strip must be raised prior to dismantling a scaffold from which a person or object could fall more than 4 metres.

MOBILE SCAFFOLDS

Mobile scaffolds must be erected on a firm base, with castors locked when in use. Mobile scaffolds must not be moved with workers on the scaffold and access must be via internal ladders.

FABRIC/SHADE CLOTH

Where a temporary structure form part of the perimeter of a building (e.g. scaffold, formwork screens) and includes the use of fabric or shade-cloth, the material must be flame retardant.

MASONRY

Masonry walls and structures, particularly freestanding walls not yet attached to a permanent structure are subject to instability due to wind or other lateral forces throughout construction. Masonry mortar strengthens between 3-7 days after application. During this time, masonry structures are most at risk of collapse or failure. Prior to construction, a structural engineer or competent person is to assess the risks and make recommendations to temporarily brace the structure, taking into consideration:

- The wall height at stages throughout construction
- Reduced mortar strength during construction
- Freestanding walls without returns or cross walls for added stability
- Likely wind forces to be imposed on the structure

Masonry walls/structures are to be supported and be able to withstand the effects of weather and wind loads likely to be imposed on it. Methods for support include, but aren't limited to:

- Steel reinforcement and core filling as construction progresses
- Using adequate external props
- Other means as advised by the structural engineer or competent person

EMERGENCY RESPONSE

Where temporary works are in place, the procedures for the response to an emergency related to the work must be included in the Emergency Response Plan and SWMS. When establishing emergency procedures, the following must be considered:

- Injury during erection and dismantling of temporary works
- Collapse of temporary works
- Damage to permanent works

- Access to affected areas
- Maintaining emergency access and egress to/from/through work zones

The Subcontractor performing the temporary works will be responsible for developing the Emergency Response Plan relevant to work they are performing.

DEFINITIONS AND ABBREVIATIONS

Competent Person – A person who has acquired through training, qualification, licensing, or experience, the knowledge and relevant technical skills to carry out the task in accordance with the respective provider's standards or legislative requirements.

Temporary works – parts of the works that allow or enable construction of, protect, support or provide access to, the permanent works and which might not remain in place at the completion of the works

REFERENCES

- Work Health & Safety Regulation 2011 (QLD), 2012 (SA/TAS) and 2017 (NSW) – Chapter 6 Construction work
- Occupational Health and Safety Regulations 2017 (Victoria) – Part 5.1 Construction
- AS 4687: Temporary fencing and hoardings
- Scaffolding (QLD Code of Practice)
- AS 4576: Guidelines for scaffolding
- Federal Safety Commission (FSC) Audit Criteria – H5 Structural Alterations/Temporary Support Structures
- AS 3700: Masonry Structures

ASSOCIATED DOCUMENTS

- HYer Standard – Temporary Works
- Quick Guide – Formwork and Falsework (https://www.hyworkzone.com.au/formwork-and-falsework-quick-guide/)
- Quick Guide – Scaffold (https://www.hyworkzone.com.au/scaffold-quick-guide/)

- Work at Heights procedure (https://www.hyworkzone.com.au/work-at-height-procedure/)

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