Façade Work| Mirvac Minimum Requirements

1. Purpose & Scope

The purpose of this document is to eliminate or minimise the risk of injury when undertaking façade works, so far as is reasonably practicable.

Façade works refer to any unitised curtain wall, window wall, cladding elements or specialist glazing elements (skylights, awnings, lobby glazing and roof features) and embellishments attached to these façade types, such as sunshades or architectural features on buildings over 3 storeys.

This document is to be read in conjunction with the Design, Procurement and Delivery Guideline - Facades, which includes process maps for each phase of the façade works and identifies key hold points for review at critical stages of the process.

This document applies to all workplaces under the control of a Mirvac entity.

2. Minimum Requirements

Mirvac personnel and Service Providers must have processes in place to ensure compliance with:

- the Critical Controls (refer Section 3);
- relevant Forms (refer Section 4);
- all relevant Legislation, Codes of Practice and Standards (refer Section 7); and
- product guidelines for installation, use or maintenance from the Original Equipment Manufacturer (OEM).

3. Critical Controls

Risk Assessment:

All risks associated with the design, manufacturing, transport, handling, installation, use and maintenance of façade elements must be identified both in the **temporary** and **permanent** state, assessed and controlled in accordance with the hierarchy of controls (refer examples in the Hierarchy of Controls Triangle in Section 9). The system should ensure adequate controls including, but not limited to the following:

- prevention of design and manufacturing errors;
- protection of persons while transporting, unloading, handling, installing, commissioning and maintaining façade elements;
- prevention of persons, materials and equipment falling from height;
- management of cranes, plant & equipment while handling, lifting, installing and maintaining façade elements;
- the rescue or retrieval of workers or plant specific to the scope of works; and
- the protection of the public during works.

Design of Façade Elements:

The design of all façade elements must be undertaken and certified by a suitably qualified Façade Design Engineer with a minimum of 10 years relevant experience in the façade industry to reflect the scope of works. As a minimum, the following is required of the design and the Façade Design Engineer:

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- a design report that details the design approach, first principles design calculations, assessment of permanent and temporary installations applicable to the site conditions and installation methodology for all façade components;
- incorporate any items identified through the DOOR process;
- provide a copy of the certificate of compliance for the façade design, to certify the design complies with all codes, standards and regulations;
- provide a copy of the certificate of compliance confirming the facade elements have been manufactured in accordance with the approved workshop drawings and design report;
- design calculations and detailed procedures for handling façade elements, including shipping and road transport and site lifting procedures such as packaging, handling, lifting and fixing details;
- approval from the Structural Engineer on the adequacy of the floor slabs and fixings to cater for additional construction loads from operating plant and equipment and material storage;
- approval from the Structural engineer on the interaction of the façade on the structure including the adequacy of floor slabs and fixings;
- Third Party Engineer review of the design, the manufacturing facility and the installation methodology; and
- review and assessment of the façade system by Mirvac Asset Management through all stages of the DOOR process (applicable to Office and BTR Projects) for the façade access strategy, maintenance and replacement strategies.

Planning:

A lift study is to be undertaken for transport, handling, lifting and installation, including replacement for each façade type on a project (reference is to be made to the Cranes & Lifting MMR).

The JSEA/SWMSs should address workplace and environment-specific variations to work activities and set out the safe working procedures and must be approved by the Mirvac Site Supervisor (or equivalent), Project HSE Representative and the Workplace Manager including:

- protection of persons under and around the unloading, handling and installation, including replacement of façade elements;
- prevention of persons, materials and equipment falling from height;
- pre-launch inspection to verify panels have been manufactured in accordance with the design;
- cranage and plant equipment requirements for erecting elements into position;
- rescue and retrieval of workers, materials and equipment; and
- protection of persons and property during works.

A safe system of work must be in place to ensure the required hold points are assessed and verified as being effective through each phase of the activity. Project and façade element specific Inspection and Test Plans (ITP's) must be developed by the Façade Subcontractor and approved by Mirvac that incorporates the design, manufacturing, handling, lifting and installation (including replacement) of façade elements.

Lifting and Installation:

The Installation Subcontractor is to nominate one person in the erection crew to be responsible for the direction and coordination of the lifting and erection sequence, following detailed consultation with Mirvac, the Structural Engineer, Façade Design Engineer and the system supplier. This person is to be an intermediate qualified rigger with a minimum of 10 years experience in the façade industry.

Prior to commencing works, the following is to be undertaken:

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- the sequence of installation (including replacement) and construction methodology must be reviewed by Mirvac, the Façade Design Engineer and a Third Party Engineer;
- the lifting method and cranes, plant and equipment to be used in the execution of the works must be reviewed and approved by Mirvac, the Façade Design Engineer and a Third-Party Engineer;
- a high-risk workshop must be undertaken and re-visited where work phases or elements change;
- there is to be an agreed Inspection and Test Plan (ITP) signed off by the Installer, Façade Subcontractor, Façade Design Engineer, Third Party Engineer and Workplace Manager which covers the pre and post installation phase of the works for each façade element;
- a physical exclusion zone as large as practicable is be established below and around the work area where required;
- review of perimeter protection to be in place during all phases of the façade works;
- completion of the Façade Installation Permit.

Verifications and Inspections:

At key hold points during the design and construction phases of the project, the following inspections are to be undertaken to verify that the design, manufacture, transport, lifting, handling, installation, including replacement, use and maintenance of façade elements has been carried out in accordance with all applicable codes, standards and legislation.

- a review of the Subcontractor's design by a Third Party Engineer prior to the final approval of workshop drawings;
- Where there is a non-conformance (NCR) identified during the manufacturing process, the following additional procedures are to be incorporated and verified by Mirvac:
    - ensure the manufacturer's certificate of compliance records and the NCR are provided with the façade element. The façade element is to be inspected and verified by the Façade Subcontractor, Façade Design Engineer and Mirvac for compliance with the approved design prior to installation.
- a review of the manufactured façade elements by the Facade Design Engineer and a Third Party Engineer prior to façade elements being installed on site, including replacement of panels;
- a review of the lifting methodology and equipment by a Third Party Engineer prior to lifting any facade elements on site;
- a review of the installed façade elements by the Facade Design Engineer and a Third Party Engineer, including a sign off that the system is structurally adequate in its temporary and permanent states; and
- a copy of the certificate of compliance confirming the facade elements have been installed in accordance with the approved workshop drawings and design report from the Façade Design Engineer and the installer.

4. Mirvac Forms

Checklists and Permits are to be completed and then authorised by Mirvac representative prior to work

- Façade Pre-commencement Installation Permit – to be used at the following key stages of works:
    - prior to **any** works commencing on the façade;

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- then prior to works commencing on:
  - podium or carpark façades;
  - roof features;
  - atrium glazing;
  - crane, alimak and loading bay infills;
  - plantroom or roof areas (post screen removal);
  - lobby glazing;
  - awnings; and
  - any atypical façade elements.

- Inspection and Test Plan / Pre-Launch Inspection Checklist:
  - This checklist is to be a comprehensive step by step sign off at key inspection and hold points prior to the installation of any façade element and include a post installation sign off by the Façade Subcontractor, Façade Installer, Subcontractor's Façade Design Engineer, a Third Party Façade Engineer and the Workplace Manager.
  - For Residential Apartments and Build to Rent Projects, this checklist is to be signed off per apartment.
  - For Office Projects, this checklist is to be signed off per unitized curtain wall panel.
  - For roof features, atrium glazing, podium and carpark facades, lobby glazing and awnings, this checklist is to be signed off per section.

5. Roles and Responsibilities

The Mirvac Workplace Manager of each workplace over which Mirvac has control is responsible to ensure workers at the site are aware of and adhere to the performance requirements of this document and responsible to ensure workers are equipped with adequate tools, training, competency and licensing to undertake the work.

6. Training and Competency

Minimum Training Requirements for Riggers & Installers	
Type of Activity	**Required Training**
Lifting and Placement of Panels (single lift)	High-Risk Work Licence in Basic Rigging
Lead dogman for Lifting and Placement of Panels	High-Risk Work Licence in Intermediate Rigging

7. Relevant Legislation, Codes of Practice and Standards

Document Title
NSW: Work Health and Safety Act 2011 (NSW)

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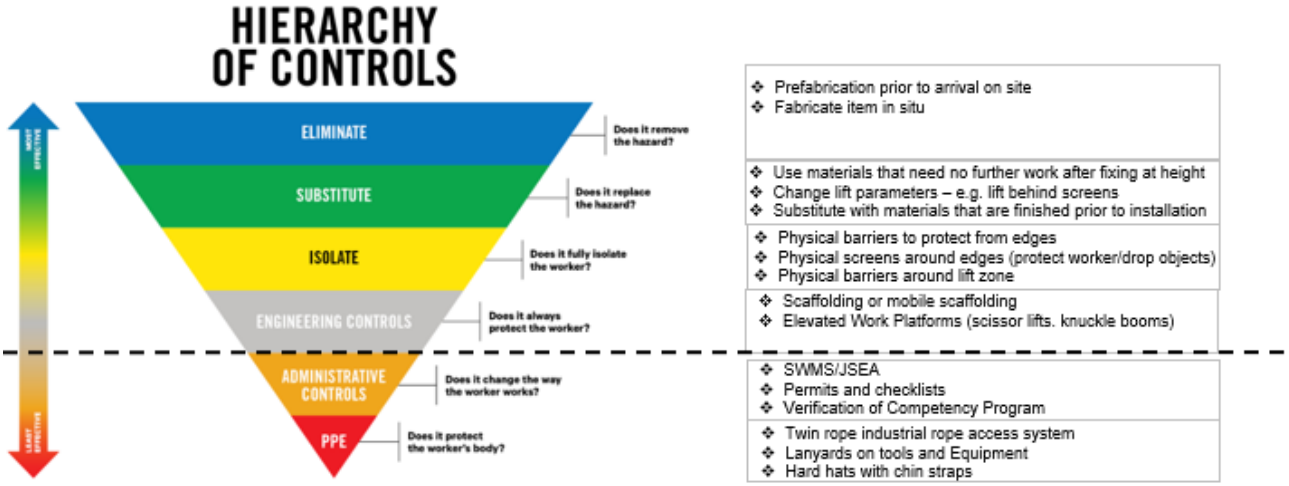
	Work Health and Safety Regulation 2017 (NSW)
Vic:	Occupational Health and Safety Act 2004 (Vic) Occupational Health and Safety Regulations 2017 (Vic)
Qld:	Work Health and Safety Act 2011 (Qld) Work Health and Safety Regulation 2011 (Qld)
ACT:	Work Health and Safety Act 2011 (ACT) Work Health and Safety Regulation 2011 (ACT)
WA:	Occupational Safety and Health Act 1984 (WA) Occupational Safety and Health Regulations 1996 (WA)
AS4284 Testing of Building Facades	

8. Additional Information

- Working at heights MMR;
- Cranes & lifting MMR;
- Temporary works – Design and Installation MMR;
- Façade Pre-commencement Installation Permit
- Design, Procurement and Delivery Guideline - Facades
- Façade Demarcation Schedule
- Façade Inspection and Test Plan's;(external link)
- Façade quality control flowchart and checklist; (external link)

9. Hierarchy of Controls



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