

SPECIFIER LOGO  
HERE

**Specifier Company Name**

# **P R O J E C T S P E C I F I C A T I O N**

## **Project Title**

Project Address

Project Suburb

Project City

## **Issued for Tender/Consent**

Date

DP Number of Project

# PROJECT OVERVIEW

## Scope

### Earthquake Repairs - Southern Response - Arrow International

House repair:

- demolish timber deck
- demolish concrete steps
- demolish concrete floor slab to Garage
- demolish timber flooring
- demolish vinyl flooring
- demolish ceramic wall tiles
- demolish bath & bath cradle
- demolish concrete pads in sub-floor
- demolish exposed aggregate driveway
- demolish brick path
- disconnect drainage, plumbing & electrical services to allow for House relevel & repair works, then reconnect & recommission
- localised piling replacement
- relevel timber floor
- replace Garage concrete floor slab
- relevel Living Room concrete floor slab
- relevel timber floor
- reinforced concrete floor slab & steps
- timber framing
- timber decking
- corrugated pre-finished steel roofing repair
- relevel rainwater gutters
- plaster render cladding
- plasterboard internal wall & ceiling lining/bracing refix, repair & replacement
- joinery & trim repair
- compressed fibreboard flooring
- ceramic floor & wall tiling
- vinyl flooring
- carpet uplift, storage & reinstallation
- HDF particleboard flooring
- painting & decorating
- replace concrete exposed aggregate driveway
- replace brick path

**Address**

<b>Site Address</b>	Project AddressProject
<b>Suburb</b>	Suburb
<b>City</b>	Christchurch
<b>Lot #</b>	Lot 2
<b>DP #</b>	DP 123456789

**Site Conditions**

<b>Wind Zone</b>	M - Medium Wind Speed
<b>Earthquake Zone</b>	Zone 2
<b>Exposure Zone</b>	Zone C - Medium
<b>Snow Loading Zone</b>	Zone N4

**Related Parties****Agent**

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**Engineer**

Engineers International, Jeff Jeffson, jf@bigoverseasengineeringcorp.com, My Street, Auckland, Auckland, 1050, 09 999 9999

**Project Manager**

Big Company, Bob Johnson, bob@ilovemanagingprojects.co.nz, My Street, Auckland, Auckland, 1050, 09 999 9999

**Client**

Mr & Mrs Jack & Jill Smith, Project Address, My Street, Christchurch, Christchurch, 1050, 09 999 9999

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# 1 PRELIMINARIES & GENERAL

## 1.1 Project Managers Projects Preliminary & General

### 1.1.1 Works Specifics

#### *Site Safety*

##### **Code Compliance**

Comply with all of the requirements of the New Zealand Building Code, and in particular with Approved Documents F1 - F5 inclusive. Comply with all relevant OSH Codes of Practice, particularly those for construction, and with the Department of Labour's 'Guidelines for the Provision of Facilities and General Safety in the Construction Industry.' Comply with any other relevant safety legislation and/or regulations.

##### **Safe Working Environment**

Take all practical steps to make the site and the contract works safe and to provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the site safety rules and are not unnecessarily exposed to hazards.

##### **Scaffolding Standards**

Comply with all relevant provisions and recommendations of:

- AS/NZS 1576 : Scaffolding equipment.
- AS/NZS 4576 : Scaffolding installation.
- AS/NZS 4994 : Roof edge scaffolding.
- Labour Department : Scaffolding Code of Practice.

##### **Safety Concerns**

Scaffolding shall comply with all Statute and Local Authority Regulations, shall be maintained for the duration, and be removed on completion. The use of ballistic fixings must absolutely comply with all relevant safety recommendations at all times. Portable/personal disc/tape players, radios and iPods must not be used anywhere on site.

##### **No Fires**

No rubbish fires are allowed on site.

##### **Safety Programmes**

In compliance with the Health and Safety in Employment Act 2015 the Contractor shall have:

- a) A safety programme which shall include selection and training standards, monitoring of compliance, safety performance measures and safety rules.
- b) A safety register to record accidents, injuries, operational safety, ACC claims, and so forth.
- c) A health and safety plan specific to the contract works, which will address all of the following:
  - methods of identifying and controlling hazards,
  - protective clothing and equipment to be used,
  - staff training and supervisory requirements,
  - management of subcontractors and their staff,
  - restricted areas and site security.

##### **Smoking on Site**

No smoking on site, except in the designated location in accordance with the Smoke Free Environments Act 1990. Location determined by the Contractor, with the approval of the Principal.

### *Specification*

This Specification covers contract administration, standards, materials quality, workmanship and the scope of works only: the exact nature of the works and all specialist items, descriptions etc. are contained on the drawings which also take full precedence.

All clauses in all specification sections apply to their full extent and meaning to the entire Contract. Trade sections and paragraphs have been introduced into this specification for reference only and it shall not be construed that each trade section is a complete segregation of the materials and labour of that trade. The onus is on all trades to be conversant with any and all clauses which in any way affect their work.

### *Temporary Services*

Power, water and Telecoms services are already laid on to the site. Arrange and pay for adequate temporary connections to these services for the duration of the contract.

### *Dimensions*

Except where they are clearly to the contrary all dimensions are deemed to be to the bare surface of concrete, masonry, timber framing or other basic construction material. All figured dimensions take precedence over scaled sizes.

Where any detail is included in more than one drawing the larger scale detail takes precedence.

Where any ambiguity exists refer to the Project Manager for interpretation.

### *Definitions*

#### **Provide and Fix**

The word '*provide*' and the word '*fix*' used separately in the Documents shall be taken to mean 'provide and fix' unless otherwise stated.

#### **Allow**

When the term '*allow*' occurs in the Documents, except with reference to Monetary Allowances, the cost of the item shall be at the risk of the Contractor.

#### **Approved, Directed, and Selected**

The terms '*approved*', '*directed*', and '*selected*' when used in the Documents refers to the approval, direction or selection of or by the Project Manager. Please give adequate notice of when these decisions are required. '*Project Manager*' shall mean the Project Manager, their representative or any Consulting Engineer engaged by the Project Manager.

## **1.1.2 Project Quality**

### *Protection*

#### **Precautions**

Take all appropriate precautions to protect all third party property, services, etc. and indemnify the Principal against any claims arising from the construction operations. Any damage to third party property caused by construction activities or failure to protect shall be rectified as soon as possible by the person causing the damage, or by appropriately qualified trades-persons employed by the person responsible for the damage if necessary.

#### **Adverse Weather**

Suspend operations during weather which would affect the quality of work in progress. Secure the

works as soon as possible against adverse weather, dust and vandals. Avoid structural damage that is caused by overloading.

**Protect Finished Work**

Adequately protect all finished work and maintain until the date of Practical Completion. Each trade shall protect the work of all other trades, and each trade is responsible for making good any damage they cause to finished works. Arrange special protection as required for windows and doors, finished timber work, plumbing fittings and hardware, and cabinets and other joinery.

*Responsibility***Contractor Responsibility**

The Contractor will be held responsible for the full period of his legal responsibility in connection with this Contract for ensuring that all work execution, materials, and fittings, are completely in accordance with Contract requirements.

**Guarantees**

Contractor is responsible to the Principal for the appropriateness and fitness, in relation to a reasonable expectation or requirement, of all of the materials and workmanship incorporated into the works by himself or his subcontractors; for this reason few specific guarantees are required in these contract documents.

The terms and conditions of any warranty or guarantee required or provided shall not in any way negate the minimum remedies available under common law as if no warranty or guarantee had been furnished.

**Acceptance**

No apparent expression of the Project Manager's reasonable satisfaction shall be deemed to be acceptance of defective materials or workmanship within the terms of the Contract or to be an authority for any Variation except where such variation is authorised as provided for in the Contract. Instructions that are given verbally are deemed to be instructions for proper execution of the works and do not involve extra charges.

**Good Trade Practice**

Workmanship in all trades is required to be equal to or better than recognised good trade practice.

**Notification**

Should any tradesperson consider that the surface finish or general conditions of previous work are unsatisfactory to ensure a proper finish for their own work thereon, that tradesperson shall give immediate notice to the Contractor or Project Manager as appropriate and shall not proceed until necessary improvements have been made. Failing such notice the trade concerned will not be relieved of the responsibility for a poor finish due to such unsatisfactory condition.

**Substrates**

Specialist Finishes Subcontractors are responsible for ensuring that substrates are completely appropriate for them to achieve first class results, and to this end shall, in sufficient time, instruct the Contractor with regard any fixings, primings, sealings or whatever for the substrate that vary in any way from the substrate manufacturer's standard recommendations. The contractor shall advise the Project Manager with regard these variances, and not proceed until the Project Manager has agreed to them.

**Watertightness Detailing**

The Contractor and all Subcontractors affected shall be jointly and severally responsible for completion of the whole of the works in a completely watertight condition and shall therefore examine all details to be satisfied that this condition can be achieved. If any detail is considered

unsatisfactory the Project Manager shall be notified immediately and he will then either interpret the detail to the Contractor's satisfaction, or accept responsibility for watertightness at points in question, always assuming reasonable workmanship.

### **Compatibility**

Ensure that all parts of a construction or finish are compatible and that their individual use is approved by the manufacturers and/or suppliers of other parts of the system.

### *Systems Installation*

For all electronic/electrical/mechanical operating systems all work and all necessary materials and items incidental to the primary item specified, that are incorporated into the works, shall be such as to leave a neat, efficient, easily maintained and robust installation, completely in accordance with all recommendations of the primary items manufacturers. Where appropriate source all parts of a system from a single supplier or manufacturer.

## **1.2 Work Safety Risk Register**

### **1.2.1 Safety Checklist**

#### *Quick Guide*

This WorkSafe New Zealand Health and Safety guide provides a ready checklist for problems on small construction sites - see <http://construction.worksafe.govt.nz/quick-guide/>.

Its aim is to help manage or avoid health & safety risk as well as ensuring the health and safety of the people who work on this project, the clients, and others such as the public.

#### *General Management*

### **Managing a small construction site**

The checklists below cover some things to consider when managing this construction site. They will remain relevant under the Health and Safety at Work Act 2015 (HSW Act) and will impose duties on the 'PCBU'.

### **Person Conducting a Business or Undertaking (PCBU)**

The HSW Act defines 'PCBU'. It is essentially a person conducting a business or undertaking, whether alone or with others and whether for profit or gain or not. The PCBU is in the best position to control risks to work health and safety. The PCBU has primary duty to ensure health and safety as of 4 April 2016.

A PCBU can be a business entity, such as a company, as well as an individual person. An individual person will generally be a PCBU if they are a sole trader or a self-employed person.

Examples of a PCBU include:

- a manufacturing business



- an import business
- an owner-driver of their own courier business
- a self-employed person operating their own business
- a partnership
- a building company, whether a principal contractors or a sub-contractors
- a not-for-profit organisation that employs admin staff.

PCBUs have a number of duties under the Health and Safety at Work Act. PCBUs with overlapping duties must work together to achieve health and safety at work.

The following checklists help PCBUs to meet their duties under the Act.

**Make sure workers:**

- are trained, competent and fit to do the job safely and without putting their own or others' health and safety at risk
- are properly supervised and given clear instructions
- have access to washing and toilet facilities
- have the right tools, equipment, plant and protective clothing
- are involved in discussions about health and safety issues
- are given opportunities to participate in improving health and safety

**When to notify worksafe**

**In an emergency:** call the emergency services by dialling **111**.

A PCBU must notify WorkSafe as soon as possible if any of the following 'notifiable events' occur:

- the death of a person
- a notifiable injury or illness
- notifiable incident

Call the WorkSafe Response Team on freephone **0800 030 040** (24 hours) and choose **option 1**.

Fill in and submit a notification form within 7 days at [worksafe.govt.nz](https://www.worksafe.govt.nz) Reporting: Serious Harm.

Some types of work also require WorkSafe notification. These include:

- where a worker could fall 5 m or more
- some excavation work
- working involving asbestos

- working underground.

For a full list of notifiable work and more information on notifiable events, see the WorkSafe website.

**For a hazardous substances emergency:** call the New Zealand Fire Service on **111** and then the WorkSafe Response Team directly on **0800 030 040**.

### **Do not disturb the scene**

Do not interfere with an accident scene until authorised by a health and safety inspector. Exceptions include certain situations, such as when people or property are at risk. If you require scene clearance or other immediate assistance from a health and safety inspector, call WorkSafe on 0800 030 040.

### **Contracting and subcontracting**

When contracting or subcontracting work:

- check the health and safety performance of the people you plan to use
- give them the health and safety information they need for the work
- talk about the work with them
- hold regular discussions about how the work is going, including safety problems and concerns
- make sure that you have provided everything you agreed (eg safe scaffolds, the right plant, access to toilets and other welfare facilities, etc)
- check their performance and remedy any shortcomings
- **Fill in and submit a notification form within 7 days at [worksafe.govt.nz](https://www.worksafe.govt.nz) Reporting: Serious Harm**

### *Sites and Services*

#### **Access on site:**

- Everyone must be able to get to their place of work safely – and work there safely
- Access routes must be maintained in good condition and clearly signposted
- Edges that people could fall from must have suitable edge protection
- Holes must be protected with clearly marked and fixed covers to prevent falls
- The site must be kept tidy, and materials stored safely
- Lighting must be good (adequate for the tasks to be performed)

#### **Electricity and other services:**

- All necessary services to be provided on site before work begins. Identify existing services present on site (eg electric cables or gas mains) and take effective steps, if necessary, to prevent harm from them
- The supply is to be isolated from earth with a voltage between phase and earth conductors not exceeding 230 volts.
- Electrical extension cords connected to powertools using a Residual Current Device (RCD) or Isolating Transformer.
- Cables and leads to be protected from damage.
- All connections to the system to be properly made and suitable plugs used.
- Tools and equipment to be checked by users, visually examined on site and regularly inspected and tested by a competent person.
- Hidden electricity cables and other services to be located (eg with a locator and plans) and marked, and appropriate precautions are to be made for safe working.
- For any overhead lines, electricity supply to be turned off, or other approved precautions to be taken, such as providing 'goal posts' or taped markers.

**Protecting the public:**

- Worksite to be fenced off from the public.
- Roadworks to have barriers around them and the barriers to be lit.
- The public to be protected from falling material.
- Clear signage to be present to warn people of danger (eg '*Keep out*', '*Asbestos removal in progress*').

**When work has stopped for the day:**

- Secure boundaries.
- Take appropriate steps to prevent any unauthorised access, eg, all ladders to be removed or their rungs boarded so they can't be used.
- Excavations and openings to be securely covered or fenced off.
- All plant to be immobilised to prevent unauthorised use.
- Bricks and materials to be safely stacked.
- Flammable or dangerous substances to be locked away in secure storage places.

**Working at Height**

- Ensure there is appropriate and fit-for-purpose means to prevent workers from falling from height.
- Plan the work properly and identify suitable precautions to make sure work can be carried out safely.
- If possible avoid working at height by using different equipment or a different work method.

- If possible use equipment that will prevent a fall from happening, such as scaffolding or a mobile elevating work platform.
- Put measures in place where possible to reduce the distance and consequences of a fall should one happen, such as nets, soft landing systems or personal fall prevention and protection equipment (eg a harness system).
- Ascertain any weather conditions that may threaten the health and safety of those carrying out the work.
- Consider all the options and be certain that gaining access to height uses the safest means possible.

For more information see [worksafe.govt.nz](http://worksafe.govt.nz) for:

- Best practice guidelines for working on roofs
- Power-operated elevating work platforms – Approved Code of Practice
- Planning a safe approach to working at height
- Selecting the right equipment for working safely at height
- Temporary work platforms
- The safe installation of roof trusses
- Preventing falling through when recladding roofs or installing purlins and tile support systems. Caution – ceiling battens do not provide fall protection

## **Scaffolds**

- Scaffolds to be erected, altered and dismantled by competent people.
- All uprights to be provided with base plates (and, where necessary, timber soleboards).
- All uprights, ledges, braces and out-riggers to be in position.
- Scaffold to be secured to the building or structure in enough places to prevent collapse.
- Double guard rails and toe boards, or other suitable protection, to be provided at every edge to prevent falling.
- Additional guards to be provided to prevent stacked materials such as bricks falling from scaffolds (eg kickboards, toeboards or screens).
- Working platforms to be fully planked, and the planks to be arranged to avoid tipping or tripping.
- Effective barriers or warning notices to be placed to prevent use of an incomplete scaffold, eg where working platforms are not fully planked.
- Scaffold to be strong enough to carry the weight of materials stored on it. Ensure loads on these are evenly distributed.
- Scaffolds to be properly maintained.

- A competent person to inspect the scaffold or proprietary mobile scaffold regularly, eg at least once a week; and always after it has been altered, damaged, and following bad weather.
- Results of such inspections to be recorded.
- Scaffolds to be erected using using safe work methods, and used according to the supplier's and/or manufacturer's instructions.
- Wheels of mobile scaffolds to be locked when in use and platforms empty when moved.
- Gates (including guardrails being used as gates) and hatches across access points to be self-closing.
- Working platforms to be placed as close as practicable to the working face to reduce the risk of people or materials falling through the gap.

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Best practice guidelines for scaffolding in New Zealand (SARNZ publication, published in 2009)
- Scaffolds with screening or containment sheeting and temporary roofs

## Ladders

- Choose the right tool for the job – ascertain whether there is some alternative equipment that would provide a safer means of access.
- Ladders to be in good condition.
- Ladders to rest against a solid surface and not on fragile or insecure materials.
- Ladders to be secured at the top and bottom to prevent sideways and outwards slipping.
- Ladders to rise at least a metre above the landing place. If not, provide other suitable handholds.
- Ladders to be positioned so that users don't have to overstretch.
- If it is necessary to use the top three rungs of a stepladder the stepladder is too short.
- Users to be competent, trained to use the equipment safely.
- Users must be able to maintain three points of contact at all times.
- Materials to be transported safely, ie not carried up a ladder. Caution - Carrying materials up a ladder increases the risk of falling.

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Safe working with ladders and stepladders

- Stepladder safety

### **Roofwork**

- Edge protection to be provided to stop people or materials falling.
- Safety nets to be installed properly.
- Identify any brittle roof materials, such as cement sheets and roof lights.
- Take appropriate precautions to stop people falling through fragile materials when working on the roof, eg by providing barriers, covers or working platforms.
- People to be kept away from the area below any roof work in progress.
- Roofworkers to be trained and experienced to recognise the risks, and competent to do the work.

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Best practice guidelines for working on roofs
- Be safe working on roofs
- Edge protection
- Roof restoration
- Roof inspection and measurement
- Roofers using chainsaws
- Code of Practice for manual handling

### *Moving Material*

#### **Manual Handling**

Avoid moving heavy materials such as roof trusses, steel beams, kerbstones or bagged products that could cause injury if they have to be moved by hand. With this in mind, if possible:

- Choose lighter materials.
- Use trolleys, hoists, telehandlers and other plant or equipment so that manual lifting of heavy objects is kept to a minimum.
- Order materials such as cement and aggregates in units that are a manageable weight (eg 25 kg bags).
- Avoid the repetitive laying of heavy building blocks or other masonry units (eg weighing more than 20 kg).
- Have people instructed and trained in using lifting aids and other handling equipment safely.
- Have people trained how to lift safely.

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Code of Practice for manual handling
- ACC online tool to help assess risk from manual handling
- [http://www.acc.co.nz/PRD\\_EXT\\_CSMP/fragments/acc19dpirrd/riskReckoner.html](http://www.acc.co.nz/PRD_EXT_CSMP/fragments/acc19dpirrd/riskReckoner.html)

### **Loading and unloading tools**

- Check that the load has not moved or destabilised during the journey to site.
- Create an exclusion zone around the loading/unloading area to keep people who are not involved away from the work.
- Plan method of unloading.
- Lifting equipment to have a current annual certificate.
- If possible, have access to the back of the truck, or if that is not possible, preparation work to be done from ground level. If neither of these options is available:
  - Formulate a safe way of getting up and down from the back of the vehicle.
  - Consider how to prevent workers from falling off the back of the vehicle.
  - Ensure employees are provided with sensible safety footwear with a good grip.

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Rigging – Approved Code of Practice (ACOP) for load-lifting
- Safe operation of vehicle-mounted truck loader cranes

### **Excavations**

- Ensure the stability of the ground against collapse. If ground stability is not known, provide a support system for the excavation to prevent collapse, or slope or batter back the excavation to a safe angle (Note: an excavation more than 1.5m deep that is deeper than it is wide at the top must be notified to WorkSafe).
- Devise a safe method for putting in support without people working in an unsupported trench.
- Provide safe access into the excavation, eg a sufficiently long, secured ladder.
- Provide barriers or other protection to stop people and vehicles falling in.
- Excavation to be fenced off from unauthorised access.
- Properly secured stop blocks to be provided to prevent tipping vehicles falling in.

- Ascertain whether the excavation could affect the stability of neighbouring structures or services, and avoid such an outcome.
- Materials, spoil and plant to be stored away from the edge of the excavation to reduce the chance of a collapse.
- Excavation to be regularly inspected by a competent person.
- Results of such inspections to be recorded.

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Approved Code of Practice (ACOP) for excavation and shafts for foundations
- Guide for safety with underground services

#### *Working with Vehicles and Machinery*

##### **Traffic, Vehicles and Plant**

- Make prestart checks, and deal with any issues that arise.
- Vehicles to be well maintained, and log books and maintenance records present and up-to-date.
- Vehicles are only to be operated by people trained to do so (where applicable) and manufacturer's instructions are to be followed.
- Vehicles and pedestrians to be kept apart.
- If that is not possible, provide barriers to separate them as much possible.
- Display any warning signs deemed necessary.
- Keep people away from slewing vehicles, or, if not possible use a zero tail swing machine.
- Vehicles and plant to be properly maintained, eg: steering, brakes, hydraulics, mirrors and any other vision aid.
- Tyres to be in good condition and at the correct pressure.
- Reversing alarms to be active.
- Reversing to be avoided, eg by using a one-way system or a turning area, or alternatively, properly trained spotters.
- Drivers to be training and competent and fit to use the vehicles or plant they are operating.
- Properly secure loads.
- Passengers to be carried only on vehicles designed to carry them.
- Ensure that plant and vehicles are not used on dangerous slopes.
- If working on or driving across sloping ground, check that the plant and vehicles are safe for that purpose.
- Check that securing pins are in place on excavator quick hitches.



## Tools and Machinery

- Use the right tools or machinery for the right job.
- All dangerous parts to be guarded, eg gears, chain drives, projecting engine shafts.
- Guards to be secured and in good repair.
- Tools and machinery to be maintained in good repair and safety devices to operate correctly.
- All operators to be trained and competent.

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Powder-actuated hand-held fastening tools – Approved Code of Practice (ACOP)
- Working safer and smarter with power cut-off saws

### *Critical Health Risks*

#### **Hazardous Substances**

- Identify all harmful substances and materials, such as asbestos, lead, solvents, paints, cement and silica dust (eg from cutting concrete, bricks, rocks etc).
- Protective clothing and respiratory equipment to be provided.
- Check whether a worker with the relevant approval is needed to deal with asbestos on site (Most work with asbestos requires permission from WorkSafe, although some very limited work with materials that contain asbestos can be done without one).
- Identify and put into place precautions to prevent or control exposure to hazardous substances, by:
  - doing the work in a different way, to remove the risk entirely
  - using a less hazardous material
  - using tools fitted with dust extraction
  - using tools fitted with water suppression
  - installing warning signs to show where work involving hazardous substances is taking place
- Workers to have information and training so they know what the risks are from the hazardous substances used and produced on site, and what they need to do to avoid those risks.
- Procedures to prevent contact with wet cement (as this can cause dermatitis and cement burns) to be implemented.
- Health surveillance for employees exposed to certain hazardous substances are to be provided (eg lead, silica, cement, sensitisers such as twopack adhesives or coatings).

For more information see [worksafe.govt.nz/ construction](https://www.worksafe.govt.nz/construction)

- Respiratory symptoms and asbestos in the workplace
- Repainting lead-based paint
- A guide to respiratory protection
- Silica dust in construction
- Asbestos toolkit

### *Critical Health Risks*

#### **Workers' exposure to noise**

- Provide workers with information and training so they know what the risks are from noise on site, and what they need to do to avoid those risks.
- Noise to be reduced where possible by using different working methods or selecting quieter plant, eg, by fitting breakers and other plant or machinery with silencers.
- Keep people not involved in the work away from the source of the noise.
- Provide suitable hearing protection in noisy areas.
- Have hearing protection zones marked.
- Have health surveillance arranged for employees exposed to high levels of noise.

#### **Personal Protective Equipment**

- Suitable equipment to be provided to protect the head, eyes, hands and feet where appropriate.
- Workers to wear their protective equipment, and wear it correctly.
- Workers to be trained in the safe use, care and storage of protective equipment.

For more information see [worksafe.govt.nz/](https://www.worksafe.govt.nz/) construction

- Noise
- Personal protective clothing and equipment
- A guide to respiratory protection

### *Work Wellbeing*

#### **Emergencies**

Formulate emergency procedures, eg, for evacuating the site in case of fire.

People on site to be informed on emergency procedures and location of the nearest emergency centre.

- Provide means of raising the alarm, and ensure it works.
- Provide a way to contact the emergency services from site.
- Ensure there are enough suitable escape routes and that they are kept clear.
- First aid arrangements adequate for the site are to be provided, along with someone available who can administer first aid if needed.

## **Fire**

- Keep the quantity of flammable materials, liquids and gases to a minimum.
- Ensure they are properly stored, eg gas cylinders to be chained in position.
- Flammable gas cylinders to be returned to a ventilated store at the end of each shift.
- Smoking and other ignition sources are banned in areas where gases or flammable liquids are stored or used.
- Gas cylinders, associated hoses and equipment to be properly maintained and in good condition.
- Gas cylinders not in use are to have valves fully closed.
- Flammable and combustible waste to be removed regularly and stored in suitable bins or skips.
- Suitable fire extinguishers to be provided.

## 2 SITEWORKS

### 2.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 2.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3124:1987(NZS)	Specification for concrete construction for minor works
4455.1:2008(AS/NZS)	Masonry units, pavers, flags and segmental retaining wall units - Masonry units

### 2.3 Demolition & Removal

#### 2.3.1 Demolition

*Demolition Schedule (Edit)*

Demolish the following:

- timber deck
- concrete steps
- concrete floor slab to Garage
- timber flooring
- vinyl flooring
- ceramic wall tiles
- bath & bath cradle
- concrete pads in sub-floor
- exposed aggregate driveway
- brick path

*Demolition Co-ordination*

Co-ordinate demolition works with appropriate Subcontractors to ensure that items scheduled (on the drawings) for reuse are salvaged in the appropriate sequence.

*Items For Re-Use (Edit)*

The following items are to be carefully removed for reinstallation into the new house:

- heat pump inverter
- fence & gates

- trellis
- garage door
- garage rear external door
- toilet
- vanity
- logburner
- wardrobe doors
- mirror
- floor drain
- tub

#### *Contractor's Property*

Apart from the items scheduled for reuse all demolition material becomes the property of the Contractor and together with rubble shall be removed from the site as quickly as possible.

#### *Best Practice Guidelines for Demolition in New Zealand*

All demolition work shall be carried out in accordance with the 'Best Practice Guidelines for Demolition in New Zealand', published by the New Zealand Demolition and Asbestos Association, and in a careful manner to avoid damage to existing constructions or property which is not scheduled for demolition.

#### *Co-operation*

Cooperate with adjacent property owners or occupiers before the use of noisy equipment to determine the timing of this work to minimise inconvenience or disruption.

#### *Protection*

Provide any necessary shoring or strutting or other protection to ensure complete safety and protection throughout the Contract. Protect Council footpaths, gutters, crossings etc. (and keep them free and clear of debris or excavation material) and pay all charges in connection with any damage rectification.

#### *Services*

Remove, disconnect, seal, etc. service lines, e.g. water, sewer, stormwater, gas, electricity, telecoms, etc. to leave the site as if it were a 'green field' site. Refer to specific subcontractors specification sections for providing new or extended service feeds to the new house.

#### *Notify*

Notify the Architect/Designer immediately any services or conditions or constructions are encountered which are inexplicable or not anticipated on the drawings or in this specification. Removal, disconnection, relocation or otherwise for these shall all be as directed and carried out by appropriately qualified tradesmen.

**2.3.2 Trees & Shrubs**

Protect all trees and shrubs not directly affected by the building operations from damage during the works.

**2.4 Driveways & Paths - Repair & Replace**

**2.4.1 Compliance**

*Compliance Documents*

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3114:1987(NZS)	Specification for concrete surface finishes
3124:1987(NZS)	Specification for concrete construction for minor works
NZS/AS 4407.3	Methods of sampling and testing road aggregates
4455.1:2008(AS/NZS)	Masonry units, pavers, flags and segmental retaining wall units - Masonry units

**2.4.2 General**

*Repair Concrete Driveways & Paths*

Demolish as noted.

Excavate for path thickness and hardfill.  
 Remove plants, tree roots and soft fill to firm subgrade.  
 Compact with a plate vibrator to form a level surface of even bearing.  
 Place and compact a layer of basecourse.  
 Reinforcement where scheduled to AS/NZS 4671.  
 Place concrete with a fall of 1:100 (minimum) and construction joints/saw cuts, thickness and finish - plain, embossed or coloured - to NZS 3114 as scheduled and NZS 3124 Specification for concrete construction for minor works.

If the driveway surface to be replaced is greater than 80m<sup>2</sup> then allow for a new type 1 sump to be installed (refer to Figure 8: Type-one Surface Water Sump, page 38, Surface Water Acceptable Solution E1/AS1).

*Repair Chip Driveways & Paths*

Demolish as noted.

Excavate for path thickness and hardfill.  
 Remove plants, tree roots and soft fill.  
 Compact with a plate vibrator to form a level surface of even bearing.  
 Place and compact a layer of basecourse.  
 Form edge restraints.

Cover area with a non woven geotextile fabric filter.  
Place selected chip in a thickness as scheduled and compact.

If the driveway surface to be replaced is greater than 80m<sup>2</sup> then allow for a new type 1 sump to be installed (refer to Figure 8: Type-one Surface Water Sump, page 38, Surface Water Acceptable Solution E1/AS1).

#### *Repair Interlocking Paving*

Loose lay sand using screeds over the prepared basecourse to a depth dependent on the sand and its water content to give a nominal compacted thickness of 30mm. Compact to give a uniform density and thickness. Check the finished level over a small area using paving and then correct the total area before proceeding. Screed the compacted surface to finish completely level.

Lay whole pavers first within the string line grid with joint widths in the range of 2mm to 3mm over 90% of the work and a maximum to minimum of 1mm to 4mm. Using a masonry saw, cut and lay closures to perimeter areas and around penetrations. Compact paving in 2 passes at right angles with a standard plate compactor of 60 to 120 kg static weight and 10-24 KN centrifugal force.

After compaction, spread joint-filling sand dry over the surface and broom in to fill all joints completely. Compact again. Remove any remaining surface sand.

Ensure all cuts are neat and tidy and made with a diamond-tipped saw blade. No paver dimension less than half. Adjust pattern to suit.

## 3 PILING

### 3.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 3.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3109:1997(NZS)	Concrete construction
3602:2003(NZS)	Timber and wood-based products for use in building
3604:2011(NZS)	Timber-framed buildings
3605:2001(NZS)	Timber piles and poles for use in building
3640:2003(NZS)	Chemical preservation of round and sawn timber
4210:2001(NZS)	Masonry construction: Materials and workmanship
NZBC B1	Structure

### 3.3 House Piles

#### 3.3.1 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Check documents for existing underground drains, cables or other buried service within the proposed works area prior to pile excavation. Co-ordinate with trades the locations of new underground drains, pipes and cables etc. where not already installed.

#### 3.3.2 Ordinary Piles

##### *Square Timber Ordinary Piles*

Square Timber Ordinary Piles shall comply with the requirements of NZS 3605, and NZS 3640 timber treatment H5, and comply with and installed to the requirements of NZS 3604 and as shown on the drawings.

Accurately set-out the piles and concrete in place to the required height, true to line and plumb, to the layout and details shown on the drawings.

Excavate pile footings to the required footing plan dimension and depth, with neatly formed sides and flat base to undisturbed good ground. Concrete footing thickness, concrete material and strength, and pile embedment and loading, all in accordance with NZS 3604.

All cut pile surfaces shall be re-treated in accordance with NZS 3604 as required during installation.

Pile-to-bearer connections as noted on the drawings and to the requirements on NZS 3064.



## 4 CONCRETE

### 4.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 4.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3101.1&2:2006(NZS)	Concrete Structures Standard
3104:2003(NZS)	Specification for concrete production
3109:1997(NZS)	Concrete construction
3112.1:1986(NZS)	Methods of test for concrete - Tests relating to fresh concrete
3114:1987(NZS)	Specification for concrete surface finishes
3121:2015(NZS)	Water and aggregate for concrete
3122:2009(NZS)	Specification for Portland and blended cements (General and special purpose)
3124:1987(NZS)	Specification for concrete construction for minor works
3604:2011(NZS)	Timber-framed buildings
4671:2001(AS/NZS)	Steel reinforcing materials

### 4.3 Materials

#### 4.3.1 Damp Proof Membrane

Polythene damp proof membrane shall be 0.25mm thick and shall be continuous under slabs on grade or fill and under foundations. All joints lapped 200mm and continuously sealed with pressure sensitive tape. Tape seal around penetrations. Inspect immediately before pouring concrete and repair any holes or other damage.

#### 4.3.2 Reinforcement

##### *Quality*

Imported reinforcing steel will not be accepted without the prior approval of the Engineer. Reinforcing free of loose rust, mill scale, dirt, paint, oil, etc. and stored clear of the ground. Accurately place reinforcing and tie securely to prevent displacement during pouring of concrete. Tie wires must not project into specified concrete cover. Welding of reinforcing is not permitted unless specifically approved by the Engineer.

### *Installation*

All terminal ends of reinforcing bars shall be hooked. Intersecting walls, beams and foundations shall contain return longitudinal reinforcement, as detailed for the intersecting members, all to NZS 3109 unless shown otherwise on the drawings.

### *Continuous*

Unless detailed otherwise all bars assumed to be continuous, with lap lengths not shown otherwise to be 40 diameters for grade 300 steel, 60 diameters for grade 500 steel, 250mm for mesh. Bars shall generally have minimum bends of five times their diameter.

### *Supports*

Support slab steel at 1 metre maximum centres. Use plastic spacers for fairface concrete. Co-operate with others to accurately place all block/brick starters, as the bending of starters to the core position will not be permitted.

## **4.3.3 Concrete Cover**

Concrete cover not shown otherwise to be:

- Foundations - 75mm where poured against ground, 50mm elsewhere.
- Beams and columns - 40mm (for main reinforcing).
- Slabs - 50mm where poured on ground, 40mm where exposed to weather, 30mm elsewhere.
- Walls - 40mm where exposed or against ground, 30mm elsewhere.

## **4.4 Workmanship**

### **4.4.1 Qualifications**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All work shall be carried out to the latest and best trade practise standards by experienced and competent tradesmen, familiar with the materials specified and installation techniques.

### **4.4.2 Formwork**

#### *Formwork Quality*

Provide all necessary formwork to produce finished concrete to the required dimensions, surface finishes and structural tolerances (NZS 3109 table 4, note that slab surfaces shall not vary by more than 3mm from a 3m straightedge placed anywhere on the surface, and that this maximum variation shall extend over a minimum distance of 1m).

#### *Formwork Construction*

Design and construct formwork to withstand total weights and all construction loads. Formwork constructed tightly to prevent undue slurry leaks, with no wire formwork ties, and no part of the formwork ties left within required concrete cover. 20 x 20mm fillet corners. Any release agents used shall be non staining and shall be compatible with all subsequently applied finishes.

### *Crack Control*

Position construction/crack control joints (except where shown otherwise) under walls or elsewhere as approved, in accordance with the following maximum criteria:

- Slabs on ground - area 50 sq.m, length 7.5m.
- Suspended slabs - area 150 sq.m, length 15m.
- Walls - length 10m, lift 4m.

### *Retarders*

Retarders only to provide a scabbled surface at construction joints.

### *Co-ordination*

Coordinate with all trades to build in all necessary starters, fixings, anchorages, chases, sleeves, bolts, conduits, electrical / plumbing devices etc., and check their exact positioning before pouring.

Coordinate with all trades to form all necessary holes, openings etc. with their positions and sizes exactly as required.

### *Completion*

Strike formwork without shock or vibration, and without disturbing, damaging or overloading the structure. Fill all bolt holes as soon as practicable.

## **4.4.3 Concreting & Curing**

### *Concrete Quality*

All concrete shall be power mixed in a plant approved by the Ready Mixed Concrete Association for required grade. All structural concrete shall have a compressive strength of 25MPa at 28 days. 19mm max aggregate, 80mm slump, and with a maximum water cement ratio of 0.55.

### *Additives*

Where considered desirable the manufacturer may add an air entrainment agent complying with NZS 3109 and 3119. No other additives may be used without specific approval of the engineer. Mixes shall be capable of being readily placed and compacted and finished as specified. The manufacturer shall carry out quality control testing to NZS 3104. All other concrete 20 MPa Ordinary Grade with maximum water cement ratio 0.7.

### *Cold Weather Pouring*

Note that appropriate cold weather pouring and curing techniques MUST be adopted if construction timing/temperatures so dictate.

### *Pouring Quality*

Advise for inspection 24 hours before placing any concrete. Sequence and size of concrete pours to approval. No concrete pouring in wet weather. Clean out all formwork thoroughly before pouring. Handling, placing and vibration/compaction of concrete shall all be exactly to NZS 3109 requirements, and carried out by skilled operatives. Slabs power float finished to NZS 3114 U2 surface by kelly float, with steel troweling to a similar finish in corners etc., and to a U3 finish localized to resilient flooring areas.

*Scabbling*

Scabble the face of construction joints to 20mm from edges.

*Curing Completion*

Cure all concrete for 14 days. Do not use sprayed membranes. As soon as practicable pond all horizontal surfaces, or fully cover with polythene or hessian (kept wet). Periodically hose down all formwork. Stripped vertical surfaces shall be kept wet with perforated hoses or similar.

*Saw Cut Shrinkage Control Joints*

Form shrinkage control joints in concrete floor slabs-on-ground by saw cutting, without chipping, spalling and tearing the surface, to the locations and layout shown on the drawings. Saw cuts shall extend to a quarter of the depth of the slab. Saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20°C, and 48 hours for average ambient temperatures below 20°C.

**4.4.4 Surface Finishes**

*General Floor Slabs*

General floor slabs - U3 finish.

*Locations for Rendering*

Exposed locations for subsequent rendering - F2.

**4.4.5 Documentation**

Concrete delivery dockets shall state job, date and time of mixer loading, grade, strength, and slump. Dockets shall be kept and forwarded to the Architect/Designer. Water must NOT be added after the concrete leaves the plant.

**4.5 Foundation/Slab Crack Repair**

**4.5.1 Repair Criteria**

*Scope*

The repair materials are as specified by the Engineer.

These widths are offered as a guide only. Variations can be made to these parameters in the hands of experienced operators.

Floor slab and perimeter foundation wall crack widths and repair approaches (in the absence of vertical misalignments):

	No action necessary	Repair by epoxy injection	Repair by grout injection	Repair by Stitching OR Break out and recast
Crack widths	Less than 1 mm	Between 1 mm and 10 mm	Between 10 mm and 20 mm	Greater than 20 mm
Considerations	Vertical misalignments across cracks are sufficiently minor to have negligible effect on the finished surface.			

These criteria are for provide guidance, rather than represent absolute criteria. However, professional engineering input into the diagnosis and repair specification is necessary where cracks greater than 5 mm are purely related to earthquake (and don't involve shrinkage considerations) and in all cases where cracks greater than 20 mm wide are encountered.

Repair decisions and specifications should also take into account other structural repairs being undertaken, such as re-levelling. No crack repairs should be undertaken before the re-levelling is completed except where the crack repair is required to contain the grout being used to re-level the slab.

#### **4.5.2 Repair Materials**

##### *General*

##### **Epoxy resin injection**

The majority of professional injection processes offer either low pressure, two-part metering and pumping kits, or batch premixed and pressure pumping kits.

Pre-packaged hand-held self-mixing epoxy resin cartridges are readily available for minor work.

Low viscosity epoxy resin as specified by the Engineers, and applied to their requirements and satisfaction.

#### **4.5.3 Repair Process**

##### *Floor Slabs*

##### **Crack cleaning**

If the crack is recent, clean and dry with no contaminants, proceed directly to surface preparation.

For cracks that are contaminated with sands and silts (liquefaction product), cleaning will require the use of high pressure water and air and a wet vacuum.

Should contamination be involved or suspected, and the crack is fine (say less than 2 mm) and cannot be cleaned with any certainty, chase out to 6 to 10 mm wide and 25 to 30 mm deep with a crack-chasing grinder.

##### **Surface preparation**

Once the crack is cleaned and dried, the adjacent slab surface should be lightly sanded and vacuum cleaned to remove any remaining surface laitance. Care is needed to ensure any material removed from the surface is not allowed to enter the cleaned crack. Careful use of sanders or grinders fitted up to a vacuum will give the required outcome.

If there is a minor vertical offset (<2 mm) across the crack, this may be remedied by grinding the high side of the crack before cleaning and filling is carried out, subject to Engineer's advice. The distance over which the grinding would be required beyond the crack will be determined by the floor covering to be subsequently laid. An alternative would be to use floor-levelling compound to smooth the surface.

##### **Crack injection**

The crack width largely determines the product and process to be used. Engineer to inspect & advise.

#### **Slab breaking out and local recasting**

For cracks that are greater in width than 20 mm and/or involve vertical offsets of greater than 2 mm at the crack, the slab may need to be broken back on either side. The break-back distance will need to be sufficient to achieve a minimum floor slope of 1 in 200 in the repaired area and secondly of sufficient width to allow for the drilling and installing of grouted starter bars where required. Saw cutting should be used to define the extent of breaking out, and to achieve a clean finishing line. Care must be taken to ensure the DPM is not disturbed. Should the DPM be disturbed during the breaking-back process, lay new DPM material over the disturbed area and tape the edges to the existing DPM to restore the vapour barrier.

If no reinforcing steel is encountered in the existing concrete then starter bars are to be epoxy grouted into each construction joint as detailed. Slab repair reinforcing to be as specified in Engineering Structural Design Drawings. Replacement concrete to be in accordance with the Engineering Structural Notes & Details. The finished grade of the slab repair is to be no greater than 1 in 200.

Upon completion construction joints should be flush and of tidy appearance. Fill and grind as required to make good.

#### **Crack Repair - Stitching**

Cracks over 20mm require Engineering input for repair specifications. All releveling work must be completed before work begins on stitching.

#### *Void Fill*

Fill voids under perimeter foundations and concrete slabs as noted on the Engineer's drawings. Work to be by a Specialist contractor using Foamcrete or similar approved low mobility grout.

## 5 CARPENTRY

### 5.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 5.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1080.1:2012(AS/NZS)	Timber - Methods of test - Method 1: Moisture content
1491:1996(AS/NZS)	Finger jointed structural timber
1859.1:2004(AS/NZS)	Reconstituted wood-based panels - Specifications - Particleboard
1859.2:2004(AS/NZS)	Reconstituted wood-based panels - Specifications - Dry-processed fibreboard
2269.0:2012(AS/NZS)	Plywood - Structural - Part 0: Specifications
2271:2004(AS/NZS)	Plywood and blockboard for exterior use
2295:2006(NZS)	Pliable, permeable building underlays
2588:1998(AS/NZS)	Gypsum plasterboard
2589:2017(AS/NZS)	Gypsum linings - Application and finishing
2904:1995(AS/NZS)	Damp-proof courses and flashings
2908.2:2000(AS/NZS)	Cellulose-cement products - Flat sheets
3601:1973(NZS)	Metric dimensions for timber
3602:2003(NZS)	Timber and wood-based products for use in building
3603:1993(NZS)	Timber Structures Standard
3604:2011(NZS)	Timber-framed buildings
3617:1979(NZS)	Specification for profiles of weatherboards, fascia boards, and flooring
3622:2004(NZS)	Verification of timber properties
3631:1988(NZS)	New Zealand timber grading rules
3640:2003(NZS)	Chemical preservation of round and sawn timber
4200.1:2017(AS NZS)	Pliable building membranes and underlays - Part 1: Materials
4200.2:1994(AS/NZS)	Pliable building membranes and underlays - Installation requirements
4859.1:2002(AS/NZS)	Materials for the thermal insulation of buildings - General criteria and technical provisions
NZBC B2	Durability
NZBC E2	External moisture
NZBC E2/AS1	External Moisture

## 5.3 General

This section includes the receiving, stacking and storage of all Carpenter's materials and the fabrication, erection and fixing of all framing, sheathings and finishing timbers, including all work incidental to neatly finishing in other trades and all temporary work and temporary bracing.

The Carpenter shall attend upon all trades, and shall supply and fix all obviously necessary but not specifically mentioned fixings and materials.

## 5.4 Foundations & Floor Slab Replacement

### 5.4.1 General

#### *Scope*

This section relates to the replacement of earthquake damaged concrete floor slabs, the localised replacement of concrete and timber pile foundations, and is largely based on the DBH (MBIE) document 'Revised Guidance on Repairing and Rebuilding Houses Affected by the Canterbury Earthquake Sequence'.

During any foundation and floor relevel the internal timber framing may warp or become out of plumb. As part of the works undertaken in this project all internal doors (including wardrobe/closet doors) are to be Eased & Adjusted should they require it after rectification of any foundation or wall framing.

#### **Qualifications**

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

#### **Supporting Documents**

All work to the DBH document 'Revised Guidance on Repairing and Rebuilding Houses Affected by the Canterbury Earthquake Sequence'. Download copies from <http://www.dbh.govt.nz/guidance-on-repairs-after-earthquake>. Pay particular relevance to 4.3 & Appendix A1 for most TC2 repairs or rebuilds.

#### *Materials*

#### **Concrete Floor Slab**

NZS 3604. Refer to Concrete section.

#### **Concrete Piles**

To NZS 3604. Refer to CONCRETE PILE FOUNDATIONS.

#### **Timber Piles**

To NZS 3604. Refer to TIMBER PILE FOUNDATIONS.

### 5.4.2 Workmanship

#### **Delivery, Storage & Handling**

Take delivery of materials and goods and store on site and protect from damage.

Protect finished surfaces, edges and corners from damage.

Move/handle goods in accordance with manufacturer's requirements.

Reject and replace goods that are damaged.

#### **Disconnect Services**

Locate service entry points to the house and allow for disconnection or relief of these during the



lifting operation. Dig away soil at water, waste, power, gas and telephone connections to allow these to lift with the house.

Upon completion of the lifting process, reconnect any services that had been disconnected prior to the lift. Re-compact soil around the services.

### 5.4.3 Pile Foundation Replacement

#### Localised Pile Foundation Replacement

**Remove** the cladding attached to the exterior piles to expose the piles.

**Demolish** or disconnect from the foundation of the house any chimney foundations, steps or terraces that may prevent the house from being lifted.

**Disconnect** all existing piles from the bearers.

**Fit a multiple lifting system**, (e.g. a house movers jacking system) around the perimeter of the house and within the footprint if the sagging between the perimeter lift points is going to be excessive.

Incrementally jack the house to a common horizontal floor plane sufficiently high above the ground to allow the construction of a new pile system.

**The maximum general height** above the ground required by the house mover is 2.0m, so that their equipment can be used to best advantage beneath the house. Secure the house against possible instability of the temporary supports during the re-piling operation. If there is space on the site, or alternative space nearby to which the dwelling may be temporarily moved, this is another option.

**Pull** together any gaps that had opened in the floor plate during the earthquake and splice joints between ends of joists and bearers that have parted. Repair any tension failures of bottom plates (likely to be at plate joints rather than in an individual piece). This will require removal of either linings or claddings in the area of the failure for access.

**Remove** all piles that have settled more than 100mm beyond the expected new common level or piles raked at an angle greater than 15mm per 1.0m height.

**Establish** whether or not there is adequate ground bearing capacity for pile footings and as specified in the Structural Engineering design (e.g. using a hand-held Scala Penetrometer).

**Replace** removed piles with timber or concrete piles to NZS 3604. Refer to the appropriate pile section.

**Lower** the superstructure onto the completed pile array and connect all piles to bearers to NZS 3604.

**Fit** new baseboards to the perimeter piles.

**Reinstate** the adjacent ground.

### 5.4.4 Concrete Slab on Grade

#### *Concrete Slab*

**Establish** whether or not there is adequate ground bearing capacity for a new floor slab in accordance with the Structural Engineering design (e.g. using a hand held Scala Penetrometer).

**Remove** any fixtures such as toilet pans, and cabinets such as kitchen cabinets and benches that will hinder the lift and lateral shift of the structure.

**Remove** plasterboard linings from one side of the internal walls to a height of about 600mm above the floor. (If it can be determined which side of the wall has the bracing system applied, this should be left untouched and the lining on the other side removed).

**For light and medium weight wall claddings**, remove the plasterboard linings from the inside face of the exterior walls to a height of about 600mm above the floor. (There may be bracing elements included on these wall lines which will require reinstatement once the house is re-established on the new foundation). For heavy-weight exterior claddings, remove all the cladding and leave the lining intact on the inside face.

**Disconnect** all hold down fixings (i.e. bolts or bent bars) to allow the superstructure to lift above the floor slab.

**In both orthogonal directions**, install 200mm x 50mm or 250mm x 50mm timber members through the space created in the walls and screw to the wall framing. The heavy timber members serve to couple the wall frames together and brace the superstructure to allow it to be lifted fractionally off the floor slab.

**Install** a multiple lifting system beneath the temporary bracing members and lift the framing off the floor slab by 150mm and support on blocks. Reinstall the lifting system, now jacking on the underside on the underside of the lifting plates.

**Pull** together any gaps that had opened in the framing during the earthquake and repair any tension failures of bottom plates (likely to be at plate joints rather than in an individual piece).

**Install** steel sliding beams and slide the superstructure to the side of the site to allow the new floor to be constructed. If lack of space on the site prevents the superstructure from being fully removed from the foundation, it will be necessary to shift it first in one direction to undertake a part rebuild of the foundation and then in the other direction to complete the rebuild.

**Construct** new floor slab in accordance with the requirements of the Building Code and the Territorial Authority.

**After 7 days**, slide the superstructure over the new foundation, and lower to its final position. Re-attach the bottom plates to the new floor at the same locations as the removed bolts. Approved proprietary hold down bolts are the best for this purpose, installed at 900mm maximum centres.

**The earlier removal of wall linings** will expose the bracing elements in the structure. For houses built prior to the 1970's, the bracing is more likely to be let in 150 x 25mm diagonal timber members or fitted 100 x 50mm diagonal frames. In this case, no special hold down requirements will be needed.

**Newer houses** will be using sheet bracing (primarily plasterboard) and the bracing elements will need to be identified. Council records should show the positions. In these areas, it will be necessary to reinstate the bracing element by back-blocking the horizontal joint and fixing the replacement linings in accordance with the bracing product manufacturers specification. In other areas, the lower section of removed plasterboard may be replaced with a new section of plasterboard without the back-blocking. See Section 7, Superstructure Assessment and Repair Recommendations; Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence; for guidance.

**Re-stop** the wall linings, refit any trims that were removed and redecorate.

**External sheet cladding connections** and joints must also be checked and re-fixed. If the cladding has a bracing function, the sheet fixings must be checked and, if damaged, fixings must be installed in the intervening gaps. See Section 7, Superstructure Assessment and Repair Recommendations; 'Revised Guidance on Repairing and Rebuilding Houses Affected by the Canterbury Earthquake Sequence', for guidance.

**Cracks** in EIFS claddings can be repaired and repainted, but it may be necessary to apply a new texture coating if the texture match cannot be made during the crack repair. If there is severe cracking in the EIFS cladding, the polystyrene backing will need to be re-nailed to the framing in the affected area.

**Re-lay** the floor coverings.

**Reinstate** the adjacent ground and landscape any areas affected by the lateral shifting of the superstructure.

#### 5.4.5 Completion

##### *Defective or Damaged Work*

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

##### *Completion*

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused and temporary materials and elements from the site.

##### *Protection*

Provide temporary protection of the finished work.

## 5.5 Foundations & Floor Slab Repair

### 5.5.1 General

#### *Scope*

This section relates to the re-levelling of earthquake damaged concrete floor slabs, concrete and timber pile foundations, and is largely based on the DBH (MBIE) document 'Revised Guidance on Repairing and Rebuilding Houses Affected by the Canterbury Earthquake Sequence'.

During any foundation and floor relevel the internal timber framing may warp or become out of plumb. As part of the works undertaken in this project all internal doors (including wardrobe/closet doors) are to be Eased & Adjusted should they require it after rectification of any foundation or wall framing.

#### **Qualifications**

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

### **Supporting Documents**

All work to the DBH document; '[Revised Guidance on Repairing and Rebuilding Houses Affected by the Canterbury Earthquake Sequence](http://www.dbh.govt.nz/guidance-on-repairs-after-earthquake)'. Download copies from <http://www.dbh.govt.nz/guidance-on-repairs-after-earthquake>

Pay particular relevance to 4.3 & Appendix A1 for most TC2 repairs or rebuilds.

### **5.5.2 Materials**

#### **Concrete Floor Slab**

NZS 3604. Refer to Concrete section.

#### **Concrete Piles**

To NZS 3604. Refer to CONCRETE PILE FOUNDATIONS.

#### **Timber Piles**

To NZS 3604. Refer to TIMBER PILE FOUNDATIONS.

### **5.5.3 Workmanship**

#### **Delivery, Storage & Handling**

Take delivery of materials and goods and store on site and protect from damage.

Protect finished surfaces, edges and corners from damage.

Move/handle goods in accordance with manufacturer's requirements.

Reject and replace goods that are damaged.

#### **Disconnect Services**

Locate service entry points to the house and allow for disconnection or relief of these during the lifting operation. Dig away soil at water, waste, power, gas and telephone connections to allow these to lift with the house.

Upon completion of the lifting process, reconnect any services that had been disconnected prior to the lift. Re-compact soil around the services.

### **5.5.4 Pile Foundation Re-levelling**

**Remove** the cladding attached to the exterior piles to expose the piles.

**Demolish** or disconnect from the foundation of the house any chimney foundations, steps or terraces that may prevent the house from being lifted.

**Disconnect** all existing piles from the bearers.

**Fit** a multiple lifting system, (e.g. a house movers jacking system) around the perimeter of the house and within the footprint if the sagging between the perimeter lift points is going to be excessive.

Incrementally jack the house to a common horizontal floor plane sufficiently high above the ground to allow the construction of a new pile system.

**The maximum general height** above the ground required by the house mover is 2.0m, so that their equipment can be used to best advantage beneath the house. Secure the house against possible instability of the temporary supports during the re-piling operation. If there is space on the site, or alternative space nearby to which the dwelling may be temporarily moved, this is another option.

**Pull** together any gaps that had opened in the floor plate during the earthquake and splice joints between ends of joists and bearers that have parted. Repair any tension failures of bottom plates (likely to be at plate joints rather than in an individual piece). This will require removal of either linings or claddings in the area of the failure for access.

**Remove** all piles that have settled more than 100mm beyond the expected new common level or piles raked at an angle greater than 15mm per 1.0m height and replace with new piles as detailed in the Structural Engineering Design and as per NZS3604: 2011.

**For replacement piles**, establish whether or not there is adequate ground bearing capacity as specified in the Structural Engineering design (e.g. using a hand held Scala Penetrometer).

**Re-level** existing timber or concrete piles according to MBIE Guidelines, and to NZS 3604. Refer to the appropriate pile section.

**Lower** the superstructure onto the completed repaired pile array and connect all piles to bearers to NZS 3604.

**Fit** new baseboards to the perimeter piles.

**Reinstate** the adjacent ground.

#### **5.5.5 Concrete Slab on Grade**

**Establish** whether or not there is adequate ground bearing capacity for a new floor slab as specified in the Structural Engineering design (e.g. using a hand held Scala Penetrometer).

**Remove** any fixtures such as toilet pans, and cabinets such as kitchen cabinets and benches that will hinder the lift and lateral shift of the structure.

**Remove** plasterboard linings, if deemed necessary by the Architect, from one side of the internal walls to a height of about 600mm above the floor (If it can be determined which side of the wall has the bracing system applied, this should be left untouched and the lining on the other side removed).

**For heavy-weight exterior claddings**, if claddings are required to be removed by the Engineer, remove them and leave the lining intact on the inside face.

**Install** a multiple lifting system - mechanical lifting, or screw pile - jacking on the underside of the lifting plates.

**If** the re-leveling method is engineered resin lift, carry out the procedure to the particular Engineered Ground System nominated, Engineer's recommendations, the engineered resin lift procedure detailed

in Housing NZ Technical Report on the Results of Foundation Repair Trials Conducted following the Canterbury Earthquakes: 2014 and MBIE Guidelines.

**Pull** together any gaps that had opened in the framing during the earthquake and repair any tension failures of bottom plates (likely to be at plate joints rather than in an individual piece).

**Re-level** existing floor slab in accordance with the requirements of the Building Code and the Territorial Authority.

**Re-stop** the wall linings, refit any trims that were removed and redecorate.

**Re-lay** the floor coverings.

**Reinstate** the adjacent ground and landscape any areas affected by the lateral shifting of the superstructure.

#### **5.5.6 Completion**

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused and temporary materials and elements from the site.

#### **Defective or Damaged Work**

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

#### **Protection**

Provide temporary protection of the finished work.

## **5.6 Workmanship & Materials**

### **5.6.1 Workmanship**

#### *Supervision*

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner. It is the main contractor's responsibility to ensure that the construction of all structural timber complies in all respects with the drawings and the specification.

All non-restricted building work shall be carried out by or under the direct supervision of competent tradespersons, suitably qualified for the work undertaken, and in accordance with the best and latest trade practice.

### *Timberwork*

All timber shall be worked and cut to be true and square and free from wind and warp with all joints matching and mating to a proper contact fit over the full surface of the joint. All connections whether nailed, screwed, glued, mortised or dovetailed shall be accurately made and properly executed to provide sound satisfactory connections for the class of work required.

Timber containing unacceptable defect or distortion shall not be cramped to provide mating at connections but shall be discarded and replaced by true defect-free timber before connections are made. Distribute any acceptable defects in timber so as not to impair the strength or the appearance of the finished work. Do not cut studs across the grain to straighten them.

The checking and cutting away of timbers shall be avoided where possible and shall be limited to such dimensions as will not prejudice the purpose for which the timber is used. Observe NZS 3604 restrictions on holing and checking of timber joists and beams. Concealed services pipes and wiring shall not project beyond the framing face and where possible shall be beyond the linings/claddings fixings reach.

Neatly punch exposed nailing to the diameter of the nail head below the surface. Completely remove bruises and tool marks, and replace all split timbers and hammer-marked finishing timbers.

Fit a 3-ply bituminous DPC or a single layer high impact polyethylene DPC at all timber to concrete junctions to provide complete separation. Ensure that the DPC material is compatible with the timber treatment.

Clean out framing voids before fixing sheathings or linings. Ensure framing voids are fully vermin proofed to the exterior. Build in as necessary all required flashings (supplied by others) to windows, doors, roof edges, etc.

### *Existing Timberwork*

Check the condition of existing timber framing, flooring, weatherboards/cladding, timber facings and trim, etc., as access is available during the contract, and report any deterioration to the Architect/Designer. Any remedial works to be proceeded with will be directed as Variations to the Contract.

### *Joinery Installation*

Reinstall joinery items (doors, cabinets, shelves, etc.) in the positions shown, accurately aligned, true to level, plumb and square, and securely fastened as noted and in accordance with best trade practice and with due regard for adjacent linings, finishes and trim, and anticipated movements.

Cabinets scribed and/or recessed packers scribed to adjacent surfaces as detailed or directed. Protect all installed Joinery from damage including surface marking and contamination, dirt and dust, and moisture until completion. Do not use Joinery items for working supports or platforms or for storage of materials or tools and equipments.

On completion ensure that joinery item doors and drawers all neatly fit the openings with regular tolerances to all edges, and that all moving components and hardware are correctly adjusted and operating to the required functionality.

### 5.6.2 Timber

#### *Timber Materials*

All timber shall be graded in accordance with NZS 3631 - Structural Grade MSG8 or better for all framing timber - (to meet the requirements of Table 2.3 of NZS 3603 for mechanically graded timber), and Dressing Grade for all finishing timber. Timber that is deemed below standard, in the opinion of the Architect/Designer, shall be removed from the site.

All non-durable timber, including components in manufactured items, shall be appropriately treated against moisture and/or insect decay by treatment plants with recognised quality assurance systems that are administered by the Timber Preservation Council (NZTPC). Treatment of timber and wood-based building products shall be to the requirements of NZS 3602 as an absolute minimum, and all treated timber shall be identified and marked as required.

Ensure that similar timbers with different treatment levels are carefully managed during construction to avoid accidental use of an H1 treated item where H3 hazard class treatment is required by the NZS 3602.

Do not use LOSP (light organic solvent-based preservative) treated timber that has not adequately 'flashed-off'.

Ensure that all cut or drilled surfaces of H4 and H5 hazard class treated timbers are flood coat re-treated, with the product recommended by the original treatment plant, before installation.

All timber shall be seasoned or kiln dried, to the stable moisture content, be straight and true and free from wind, warp and distortion, and in lengths suitable for the members required and the location in the finished construction. All framing timber shall have a moisture content between 12% and 18 % before being installed. If the use of inadequately seasoned timber results in damage or opening joints in the finished building the timber shall be replaced. Fixing of internal linings shall be delayed after closing in until the timber framing has dried back below 20% moisture content and to allow for the maximum settling of substrates.

All kiln dried, dressed and/or finishing timbers shall be stacked under cover on delivery to the site, and all timber shall be full to the nominal sizes shown or specified, subject only to normal cutting and dressing tolerances.

All finishing timber shall have machine marks, stains and roughness removed and shall be sanded smooth.

Ensure that enclosed surfaces and ends of paint-finished exterior finishing timbers are fully primed before fixing. If this trade (Carpentry) carries out the priming it shall be to the specification and standard required of the Painter.

Unless specified otherwise, exposed framing timbers shall be unfinished to the exterior, and be fine bandsawn milled, treated with a minimum of discolouration, handled carefully at all times to avoid



surface damage, and delivered free of crayon or pencil or other markings. Hazard class treatment markings shall be on the ends, NOT on the faces.

#### *Timber Species*

All timber used shall be Radiata pine.

#### *Other Materials*

Materials shall be delivered to site with the packaging and labelling intact, shall be of the same type, finish or colour to maintain continuity, shall be stored, and conditioned if required, in accordance with manufacturer's recommendations, and shall be protected from damage, contamination, and moisture - as appropriate.

Handle all materials in accordance with best practice and the manufacturer's requirements, and in a manner that prevents damage or deterioration to the material. Do not use damaged or defective materials or products, or products that are beyond their designated shelf life.

### **5.6.3 Flooring**

#### *Particleboard Flooring*

20mm high density temporary weatherproofed flooring grade particleboard, installed in accordance with the manufacturer's requirements to the locations shown on the drawings.

Use sheets as large as possible, and set out sheets to approval. Accurately cut sheets to size, with the edges shot as necessary to provide tight butt joints. All handling, observation of requirements to accommodate moisture movement, expansion gaps and off-sets from fixed elements, fixings and adhesives and other aspects of this work shall all be exactly in accordance with the manufacturer's recommendations.

Punch nail fastenings and lightly sand particleboard flooring to an even finish over the entire surface before laying floor coverings or clear finishing, taking care to avoid damage to finished adjacent work - do not over-sand flooring.

### **5.6.4 Fixings**

#### *Nails*

Comply with the requirements of NZS 3604 Section 2.4.4 and the Nailing Schedules of NZS 3604 as applicable. Unless noted or specified on the drawings or elsewhere in this specification, all nails fixing exterior timbers shall be Grade 304 or 316 stainless steel. Nails that will be covered with plaster or any similar material shall be hot-dipped galvanised, unless noted or specified otherwise.

Finishing brads to all finishing timbers shall be set out neatly and punched to the diameter of the nail below the surface. Bore slightly undersize holes for nailing that could cause splitting of the timber.

Power-driven staples are completely unacceptable in finishing timbers.

#### *Screws*

Screw fastenings shall be of suitable gauge, head type, thread design, and length to provide secure fastening into the substrate material, and be suitable for the assembly/construction of the fixed item/element and the substrate material.

Unless noted or specified otherwise, screws exposed to the exterior shall be Grade 304/316 stainless steel or hot-dipped galvanised, and hot-dipped galvanised or similar corrosion resistant for damp

situations.

Self-drilling screws shall be in accordance with AS 3566 for fastener type and corrosion resistance class.

Unless noted or specified otherwise, screws fixing hardware or similar shall be of the same material and finish as the hardware. Except where raised head screws are shown or specified, screws shall be countersunk flush or recessed where stopped/filled.

#### *Bolts*

Where bolts are used they shall be complete with nuts and washers unless specified otherwise. All bolts, nuts and washers shall at least meet the durability requirements of NZS 3604 Table 4.1. Where a higher durability material is specified on the drawings, the higher durability material shall be used. The diameter of a hole for a bolt shall not be less than the bolt diameter nor exceed it by 1.5mm.

For the following bolt diameters use washer sizes as below unless noted otherwise on the drawings:

- up to M8: 25 x 25 x 1.5mm;
- up to M12: 50 x 50 x 3mm;
- up to M20: 65 x 65 x 5mm;
- up to M20: 75 x 75 x 6mm.

Round washers may be used providing they are of a thickness and area not less than those specified above.

Subfloor framing - unless noted otherwise on the drawings, cast-in holding down bolts for subfloor framing fixed to concrete foundation walls shall be M12 Grade 304 stainless steel, embedded minimum 150mm into concrete, to the spacings required by NZS 3604, and located centrally on the timber.

Bottom plates - unless noted otherwise on the drawings, cast-in holding down bolts for bottom plates fixed to a concrete slab shall be M12 galvanised, embedded minimum 120mm into concrete, to the spacings required by NZS 3604, and located centrally on the timber.

Framing - timber/timber and timber/steel - Unless noted otherwise on the drawings, M16, hexagonal head mild steel and with 50 x 50 x 3mm washers.

Timber/concrete (dry situations) - Unless noted otherwise on the drawings, Ramset Trubolts, T12140 at maximum 900mm centres - for damp or exterior situations use stainless steel Trubolts.

Bolts shall be tightened until the washer just indents the timber surface. Exposed bolts shall be re-tightened just prior to Practical Completion to remove any slack consequent on timber shrinkage. Allow to countersink bolt heads and nuts as necessary to clear linings.

#### *Framing Hardware*

Proprietary timber framing hardware and fixings, including multigrips, joist shoes, Z nails, gang nails and similar hardware, may be used where specifically approved, or where required on the drawings or by NZS 3604 schedules, in accordance with the manufacturer's requirements.

Proprietary timber framing structural brackets and ties, including post and bearer brackets, beam supports, angle brackets, tie cleats and similar hardware, shall be as noted on the drawings and installed in accordance with the manufacturer's requirements.

Refer to Metalwork or Structural Steel section of this specification for specific design engineered fabricated steel components that connect structural timber framing.

### *Adhesives*

Aliphatic PVA for dry timber applications - all other adhesives for timber jointing are subject to specific approval or as specified. Check surfaces are in appropriate condition to receive adhesive, and that adhesives are used strictly in accordance with the manufacturer's instructions. Clamp adhesive-jointed timber connections and check alignment of members before the adhesive has set.

#### **5.6.5 Flashings**

Flashing materials shall be in accordance with the requirements of NZBC E2/AS1 Sections 2.2 Materials, 4.0 Flashings, Table 20 - Material Selection, Table 21 - Compatibility of Materials in Contact, and Table 22 - Compatibility of Materials Subject to run-off, and as noted on the drawings.

All flashings around windows, doors and other openings and apertures, at internal and external corners, inter-storey junctions, soffit junctions, and at junctions with other building elements and cladding systems, etc., shall all be carefully constructed, fixed and finished to the details shown on the drawings.

#### **5.6.6 Sealants**

For critical joints such as primary water/weatherproofing seals, precast panels primary seals, structural floor slab control joints, structural glazing, immersion or hydrostatic pressure seals, etc., either use the sealant noted on the drawings or obtain a reputable sealant manufacturer's recommendation for the precise situation, and submit the manufacturer's specifications covering all relevant criteria and characteristics of the proposed sealant, primers, joint surfaces preparation, etc. to the Architect/Designer for review and confirmation to proceed.

If so requested, additionally submit a sample of the proposed sealant made up into a demonstration joint, incorporating the same materials, preparation, finish tooling, etc. After confirmation to proceed with the proposed sealant install a sample joint to approval, length approximately 2% of the overall length of the joints required, with a minimum length of two metres; when accepted this joint becomes the quality control sample for all subsequent similar joints.

For less critical joints such as those in covered or protected situations, and bathroom and kitchen ceramics and sanitaryware etc., either use the sealant noted on the drawings or select the sealant from a reputable manufacturer's range for the substrate materials involved, with due regard for the flexibility required, acid or neutral curing, mould resistance, paintability or clear or standard colours, slumping characteristics, temperature range expected, etc. - silicone, polymer or polyurethane sealants are anticipated.

For all simple gap-filling and draught sealing situations, either use the sealant noted on the drawings or select from a reputable manufacturer's range for a paintable acrylic sealant with good adhesion characteristics for the substrates involved - pay particular care in the sealant selection where bare metal, polycarbonate, polystyrene or similar substrates or where bituminous-based membranes are adjacent or where exposure to solvents is possible.

All joint surfaces preparation and priming and all sealant application work shall be exactly in accordance with the sealant manufacturer's recommendations, and carried out by competent and experienced applicators familiar with the materials and techniques required.

Ensure that the sealant is being used within the manufacturer's stated design parameters, particularly with regard joint design and anticipated cyclic movement.

Check that the joint faces are sound, completely dry, and frost free, clean and free of dirt, rust, oil, grease, laitance, etc., and they are primed to suit the surface porosity - particularly for critical locations.

Insert a polyethylene tape slip layer at the back of the joint or a closed cell polyethylene PEF backer rod where required and to the sealant manufacturer's recommendations. Mask off joint edges where a clean straight finish line is required.

Check the toxicity of the selected sealant and handle it appropriately. Check that the temperature during sealant installation is within the manufacturer's guidelines.

Apply the sealant and tool the filled joint's surface smooth and even, utilising a lubricant as necessary and strictly within the manufacturer's guidelines.

Remove any masking tape immediately after tooling, clean up all adjacent surfaces using the recommended cleaning agents as required, and protect the finished joint until the sealant has properly cured.

## **5.7 Timber Framing**

### **5.7.1 Scope**

Supply and install timber framing to the floors, walls, roofs, and other timber framed elements, as identified and detailed on the drawings. All aspects of this work shall be in accordance with NZS 3604, product manufacturers' recommendations, and as shown on the drawings and the specification.

### **5.7.2 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All work shall be carried out to current best trade practise by experienced and competent tradesmen, familiar with the materials and installation techniques, in accordance with NZS 3604 and as shown on the drawings.

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings prior to installing timber framing.

Co-ordinate with other trades to install timber framing as required.

### **5.7.3 Timber Framing**

#### *Timber Grade and Quality*

Unless otherwise noted or specified on the drawings or specification, all framing timber shall be minimum structural grade SG 8 Radiata pine in accordance with NZS 3622.

Framing timber shall be seasoned or kiln dried, and be straight and true and free from wind, warp and distortion, and in lengths suitable for the members required, and shall have a moisture content of between 12% and 18% before installation.

Do not use damaged, faulty or defective materials.

#### *Timber Treatment*

All non-durable timber framing shall be appropriately treated against moisture and/or insect decay by treatment plants with recognised quality assurance systems that are administered by the Timber

Preservation Council (NZTPC). Treatment of timber and wood-based building products shall be to the requirements of NZS 3602 as an absolute minimum, and all treated timber shall be identified and marked as required.

Carefully manage treated framing during installation to avoid accidental use of timber with a lower performance or durability treatment than that required or specified.

#### *Storage & Handling*

Check timber framing upon delivery and reject sub-standard or damaged material.

Store timber framing dry under cover, fillet stacked and well clear of the ground, and protect from damage, moisture, and contamination.

Ensure all appropriate personal protection equipment is worn at all times when handling and cutting treated framing.

#### *Framing Installation*

All timber framing members, including all dwaning, strutting, blocking, bracing etc, shall be sized, setout, fitted and fixed to the requirements of NZS 3604 and as shown on the drawings to accommodate structural loadings, cladding and lining setout and support, and the installation of other building components, fixtures and fittings.

All framing shall be erected without deviation, true to line, level, angle and plumb, and evenly aligned and square, and within the tolerances allowed in NZS 3604 Table 2.1. Framing members accurately cut, lapped, housed, joined, and seated so as to provide full contact over the bearing surfaces.

Temporarily prop, brace, tie, and secure framing members and elements as required until the framing is complete and self supporting. Leave in place for safety purposes as long as required.

Protect timber framing as required during installation against damage and moisture, and against significant variation of moisture content until ready for lining. Avoid ponding of water around floor plates.

#### *Concrete Separation*

Separate timber framing with an approved continuous damp proof course when in direct contact with concrete or masonry. Ensure that the DPC material is compatible with the timber treatment.

Free draining separations to external vertical faces shall be 12mm minimum and as noted on the drawings.

#### *Timber Re-treatment*

All cut or drilled surfaces of H4 and H5 treated timber framing shall be flood coat re-treated, with a suitable product recommended by the original treatment plant, before installation.

#### *Edge Notching and Centre Holes*

The notching, checking, and boring of framing members shall be in strict accordance with the requirements of NZS 3604.

Avoided checking and cutting where possible and keep to such dimensions so as not to prejudice the purpose for which the member is used. Keep edge notching to a minimum and where possible use centrally bored holes instead.

Concealed services pipes and wiring shall not project beyond the framing face and where possible shall be beyond the lining's fixing reach.

#### *Framing Protection*

Protect timber framing as required during installation against damage and moisture, and against significant variation of moisture content until ready for lining. Avoid ponding of water around floor plates.

#### *Built-up Framing Members*

Except for jack studs, bottom plates and top plates, framing members may be substituted with built-up members in accordance with the limitations of NZS 3604 2.4.4.7 with the prior approval of the Architect/Designer only.

### **5.7.4 Steel Fixings**

#### *Fastenings and Connectors*

Unless otherwise noted or specified, timber framing fastenings and connectors shall be as specified in the relevant fixing schedules of NZS 3604 or have an equivalent capacity as specified therein. Timber framing connectors and fixings shall comply with the product information as required in NZS 3604 2.4.6, and shall be used and installed in accordance with the manufacturer's recommendations. Pre-drill nail holes in split-prone framing as necessary.

#### *Durability of Fixings & Fastenings*

Unless otherwise noted or specified, the minimum durability of timber framing fixings and fastenings, excluding nails and screws, shall comply with the durability requirements of NZS 3604 Table 4.1. Galvanised steel fixing components, excluding nails and screws, shall have galvanised coating masses in accordance with NZS 3604 Table 4.2.

Unless noted or specified otherwise, the materials for nails and screws shall be as given in NZS 3604 Table 4.3.

Steel fixings and fastenings in contact with timber treated with copper based timber preservatives (H3.2 or higher) shall be in accordance with NZS 3604 4.4.4.

Stainless steel nails shall be minimum Grade 304 unless otherwise specified or noted.

#### *Bolts and Coachscrews*

Unless specified or shown otherwise, all bolted and coach screwed connections shall be M12 or M16 in accordance with the relevant fixing requirements given in NZS 3604.

Bolted and coach screwed connections shall have either a 50mm x 3mm square, or a 55mm x 3mm round, washer to each head and nut for M12 and M16 fixings. Washers shall be of the same material and durability as the bolt or coach screw.

### **5.7.5 Sub Floor Framing**

#### *Bearers - 2 kPa Floors*

Unless specified or shown otherwise, bearers for 2 kPa floors (wet service) shall be sized in accordance with NZS 3604 Table 6.4(b).

Bearers shall be continuous over two or more spans and jointed over the centre of an ordinary pile or jack stud in accordance with NZS 3604 6.12.7.

Bearers laid so that any crook will straighten under load.

Bearers shall have a minimum support bearing of 90mm, or 45mm when butt jointed.

Built-up bearers formed to the requirements of NZS 3604 6.12.3.

### 5.7.6 Floor Framing

#### *Floor Joists - 1.5 kPa & 2 kPa Floors*

Unless specified or shown otherwise, timber floor joists shall be to the dimensions and spacings given in NZS 3604 Table 7.1.

Floor joists shall be laid on edge true to line and level, have a minimum support bearing of 32mm (except when cantilevered), and so that any crook will straighten under load.

Floor joists shall be jointed over supports (except when cantilevered beyond the support) in accordance with NZS 3604 7.1.1.7.

## 5.8 Thermakraft Underlay, DPM & DPC

### 5.8.1 Scope

Supply and install Thermakraft Underlays and Membranes, as specified herein, to the locations identified on the drawings, complete with all accessories required for proper installation and performance. All aspects of this work shall be in complete accordance with Thermakraft Ltd technical information and installation requirements (check [www.thermakraft.co.nz](http://www.thermakraft.co.nz), or call 0800 806 595 for the latest editions), other relevant product manufacturers' recommendations, and as shown on the design drawings.

No substitutions are permitted for the specified products from Thermakraft Ltd.

### 5.8.2 Requirements

#### *Safety*

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, particularly those for construction and building maintenance.

#### *Warranty*

##### Thermakraft Ltd Product Warranty:

- 15 Years Warranty - for all Thermakraft warranted products installed, according to the warranty conditions.
- Provide the Thermakraft Ltd Product Warranty on the manufacturer's standard warranty form.
- Commence the warranty from the date of permanent installation.

#### *Substitutions*

Thermakraft Ltd products shall be as specified herein and as indicated on the approved drawings. The substitution of Thermakraft branded products for alternative brands is not permitted under any circumstances.

The substitution of a specified Thermakraft product for an alternative Thermakraft branded product by the Contractor shall only be permitted with the Contract Administrator's written authorisation, and shall be at no additional cost to the Principal. Should any resultant extra work and/or redesign work be required to accommodate alternative Thermakraft branded products to satisfy design, performance and compliance requirements, then the cost of these shall be borne by the Contractor.

### 5.8.3 Damp-Proof Membrane

*Thermathene Black (250µm)*

[Thermathene Black](#) (250µm). A 250 micron thick (0.25mm), tear resistant, polyethylene film sheet concrete underlay. Coloured black.

Installed over nominal 10mm (max. 25mm) thick compacted sand blinding layer, over a properly prepared base course, as a moisture vapour barrier under concrete slabs on-ground (prior to concreting), in accordance with the manufacturer's requirements and as shown on the drawings.

All joints lapped 200mm and continuously sealed with Thermakraft [White General Purpose Tape](#). Tape-seal around penetrations. Inspect immediately before pouring concrete and repair any holes or other damage.

Installed Location: Garage floor slab, concrete steps.

### 5.8.4 Damp-Proof Course

*Supercourse 500 DPC*

[Supercourse 500 DPC](#). A 0.75mm thick, high-impact, single-layer Polyethylene film, embossed on both sides. Available in 50mm 75mm, 90mm, 100mm, 150mm, 200mm, 250mm, 300mm, 400mm, 500mm and 1000mm roll widths. Supercourse 500 DPC is suitable for use as separation barrier between most incompatible and dissimilar materials.

Used as a general damp proof course (DPC) for separating timber and wood-based products and metal from concrete, masonry, brick, and stone surfaces, and as a moisture barrier.

Also used as a concealed flashing behind brick veneer cladding in accordance with NZS 4229 and NZBC E2/AS1.

Installed in accordance with the manufacturer's requirements, [BRANZ Appraisal No.329 \(2016\)](#), and as shown on the drawings.

### 5.8.5 Wall Underlay

*Watergate Plus 295 - Synthetic Wall Underlay*

[Watergate Plus 295](#). A fire-retardant, absorbent, breathable, composite non-woven polyolefin synthetic underlay. Nominal weight 110g/m<sup>2</sup>.



Installed as a standalone flexible underlay over timber or steel wall framing in accordance with the manufacturer's requirements and [BRANZ Appraisal No.695 \(2017\)](#), in NZS 3604 Wind Zones up to and including 'Very High'.

Installed as a flexible underlay over a rigid air barrier in accordance with NZBC E2/AS1 9.1.7.2 to the manufacturer's requirements and [BRANZ Appraisal No.695 \(2017\)](#), in NZS 3604 Wind Zones up to and including 'Extra High'.

Watergate Plus can be used with absorbent and non-absorbent direct-fixed wall claddings, and absorbent and non-absorbent wall claddings over a 20mm drained cavity, and masonry veneer cladding over a drained cavity in accordance with NZBC E2/AS1 and [BRANZ Appraisal No.695 \(2017\)](#).

Do not leave Watergate Plus 295 exposed on walls for more than a total of 60 days before covering.

Installed Location: as detailed.

### **5.8.6 Roof Underlay**

*Thermakraft 215 - Bitumen Building Paper*

[Thermakraft 215 Building Paper](#). A self-supporting, absorbent, breathable, bituminous impregnated non-synthetic underlay (non-fire retardant). Heavy class, nominal weight 400g/m<sup>2</sup>.

Installed as a roof underlay over timber or steel roof framing in accordance with the manufacturer's requirements and as shown on the drawings.

Thermakraft 215 Building Paper roof underlay can be used directly under direct-fixed roof claddings, or directly under roof tile battens in accordance with Thermakraft requirements.

Thermakraft 215 Building Paper roof underlay must be installed in a manner that prevents ponding of water. Provide additional support at no more than 300mm centres when Thermakraft 215 Building Paper is installed on roofs with slopes less than 10°.

Do not leave Thermakraft 215 Building Paper exposed on roofs for more than a total of 7 days before covering.

Installed Location: as necessary to roof repair.

### **5.8.7 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install Thermakraft Underlays, DPMs, and DPCs as required.

### **5.8.8 Workmanship**

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation work shall be carried out by experienced and competent tradespersons, familiar with the specified products and installation techniques, in accordance with the manufacturer's requirements, and to fully comply with all warranty requirements.

All cutting, joining, and fixing techniques shall be exactly as recommended by the manufacturer, and carried out with the use of suitable tools and equipment appropriate for the application. All work shall be such as to leave a neat, efficient, and weathertight installation.

#### **5.8.9 Delivery & Handling**

Store underlay rolls on end, undercover, on a flat, clean and dry surface. Keep stored materials dry, out of direct sunlight, and protected from damage and contamination at all times.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the product.

Do not use damaged or defective materials, or products that are beyond their designated shelf life.

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#), as well as the [Best practice guidelines for working on roofs](#) for roofing installations.

#### **5.8.10 Preparation**

##### *General*

Prior to installation, carry out all necessary inspections and preparatory work required, and ensure that all preliminary works by other trades has been completed to specification and as shown on the approved drawings.

Do not commence installation until all necessary preliminary works by others is complete and to the required standard. The commencement of work shall be deemed to indicate full acceptance by the installer that all preliminary works by other trades is complete.

Supporting timber framing shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content of 20% at the time of cladding installation. Allow LOSP treated timber to sufficiently flash-off before installing Thermakraft building underlays and foils.

Supporting light structural steel framing shall comply with the requirements of AS/NZS 4600 or the NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria. Comply with the light structural steel framing fabricator's specifications and requirements for fixing cladding and roofing components.

Supporting heavy steel structures shall comply with NZS 3404.

### *Under-Slab Basecourse*

Under-Slab Basecourse - prior to laying under-slab DPM, check all aspects of preparatory works, including but not limited to:

- Check that the under-slab basecourse has been correctly laid and compacted as specified.
- Check that the surface has been properly prepared and compacted to the required standard, and is smooth and flat.
- Ensure any sand blinding is free of aggregate, sharp protrusions.
- Ensure the final surface is free of hollows and ponded water prior to laying the DPM.

### *Wall Framing*

Wall Framing - prior to wall underlay installation check all aspects of preparatory works, including but not limited to:

- Check that wall framing has been completed as shown on the drawings, complies with the relevant design and construction standards.
- Check that framing is securely fixed, true to line and plane, is plumb and level where required, and is trimmed at edges, openings and penetrations as required.
- Check that there are no projections due to structural bracing and bracketry etc.
- Check that the required clearances from ground, deck, balcony or lower roof to the bottom edge of the underlay/cladding are in accordance with NZBC E2/AS1.

## **5.8.11 Installation - Wall Underlay**

### *Watergate Plus 295 Wall Underlay*

Watergate Plus 295 Wall Underlay shall be installed, printed face out, to the exterior face of the wall framing, run horizontally, starting from the bottom edge and finishing at the top edge, extending 35mm below the bottom plate or bearer, and lapped such that any water will be shed to the outside of the underlay with minimum 150mm horizontal laps and minimum 150mm vertical joint laps made over a stud, and kept taut without sagging or bulging.

Fix at maximum 300mm centres, with 6-8mm stainless steel staples or 20mm large-head galvanised clouts or galvanised proprietary fixings. Provide additional fasteners fixed through Thermakraft Stud Strap around framed openings before cutting Watergate Plus 295 at openings.

Cut window and door openings just prior to joinery installation; cut underlay at 45° angle away from each corner and return full framing depth and fasten to inside of frame. Install Thermakraft Corner Moulded flashings and Thermakraft Window Flashing Tape over the underlay at opening corners and along sill trimmers in accordance with Thermakraft requirements.

For drained cavity wall construction where studs are at greater than 450mm centres, install Thermakraft Stud Strap horizontally at 300mm centres to prevent bulk insulation from pushing the underlay into the cavity space.

Finish Watergate Plus 295 underlay at edges as detailed.

Install all necessary flexible flashing tapes to openings, around pipes, ducts and other services penetrating the underlay, parapet and balustrade junctions, along head flashings and inter-storey

flashings when installed, as required to seal the underlay, in accordance with Thermakraft requirements and as shown on the drawings.

### **5.8.12 Installation - Roof Underlay**

#### *Thermakraft 215 Building Paper*

Thermakraft 215 Building Paper shall be installed without support on roofs with slopes 10° or greater (unless specified otherwise), run horizontally across the roof slope and over the purlins, starting from the gutter/lowest point up to the ridge/highest point, extending maximum 20mm into gutters, with minimum 150mm side and end laps, lapped such that any water will be shed to the outside of the underlay, and sufficiently tensioned without sagging.

The maximum run length shall be no greater than 10 metres.

Fix at maximum 300mm centres to purlins, with 8-12mm stainless steel staples or 20mm large-head galvanised clouts or galvanised proprietary grippers.

For tiled roofs, lay Thermakraft 215 over the anti-ponding board and rafters/trusses, and fix at maximum 300mm centres to the rafters/trusses before the tile battens are installed.

Finish Thermakraft 215 along roof edges and junctions, valley gutters, and at the ridge as shown on the drawings. Carefully cut underlay at roof openings at 45° angle away from each corner and lap-tape closed to framed up-stands, ducts and other services penetrating the underlay in accordance with Thermakraft requirements and as detailed. Leave underlay minimum 50mm distance clear of the outer liner of flue stacks.

### **5.8.13 Completion**

Check that all underlays have been installed correctly and are properly supported, and that all underlay edges, joins and ends are correctly finished prior to closing off with claddings - all in accordance with Thermakraft installation requirements.

Check installed membranes and underlays for defective work and damage - replace and/or repair as necessary to the required standard.

Leave all of this work complete, and free of defects, and to the required standard in accordance with the manufacturer's warranty requirements.

Issue to the Owner a copy of the Thermakraft maintenance requirements and the Thermakraft product warranties for the installed products.

## **5.9 GIB Lining & Bracing**

### **5.9.1 Scope**

#### *Supply & Install*

Supply and install the selected GIB® Plasterboard sheets, complete with all accessories, as sheet lining material to the walls, ceilings and other elements identified on the drawings. All aspects of this work

shall be in complete accordance with Winstone Wallboards Ltd technical literature and installation guidelines (call Winstone Helpline on 0800 100 442 or check [www.gib.co.nz](http://www.gib.co.nz) for the latest editions) and other relevant product manufacturers' recommendations.

Substitution of any specified GIB® system, GIB® System component or GIB® plasterboard is not permitted.

#### *Electrical Fittings*

As part of the general internal linings repair, remove and re-install all electrical fittings, including light and power switches. Where they need to be replaced, replace with items to match existing, as approved.

#### *Heating Units*

Allow to remove existing:

- Heat Pump
- Night Store
- Heated Towel Rail

Store for the duration of other repair work, then reinstall and recommission to manufacturer's recommendations.

### **5.9.2 Co-operation**

#### *Other Trades*

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Co-ordinate with other trades to ensure that appropriate clearances are allowed from adjacent internal linings, fixtures, products, and associated services, etc, that the sheets correctly allow for door and window installation, and that services penetrations are correctly handled to maintain sheet integrity.

### **5.9.3 Level of Plasterboard Finish**

#### *Level of Finish*

NOTE: Unless stated otherwise, Level 4 is the default Level of Finish. Additionally, comply with all relevant aspects of Winstone Wallboards Ltd literature and AS/NZS 2589, complete with all system accessories, and other relevant product manufacturers' recommendations.

### **5.9.4 Preparation**

#### *Framing, Finish & Junctions*

Check that the timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and otherwise in accordance with the specified Level of Finish and Winstone Wallboards Ltd requirements. Framing shall be plumb and in true alignment, complete and suitable for the sheets, and maximum moisture content 18% or as recommended by

Winstone Wallboards Ltd. Ensure that the framing is true to line and plane and with no projections due to structural and bracing bracketry etc. Ensure that all framing brackets, plates, braces and holddowns

etc. are correctly installed.

Check that the building has been completely finished to all penetrations including doors, windows, services, etc so that the sheets can be installed without being affected by any weather conditions.

Check junctions to all other building elements and ensure that all necessary works have been completed eg. flooring, setout of services, etc. that will enable the sheets and accessories to be installed. Clear building debris and rubbish from framing voids and keep clean until GIB sheet linings are installed.

### **5.9.5 Workmanship**

#### *Experienced Tradesmen*

All installation work shall be carried out by experienced tradesmen familiar with the techniques and materials specified and in accordance with the current requirements of Winstone Wallboards Ltd.

#### *Delivery & Handling*

Store GIB® plasterboard sheets undercover inside a watertight building and keep sheets dry at all times. Stack sheets flat on a dry level surface in accordance with Winstone Wallboards Ltd recommendations. Avoid damage to sheet edges, ends, and surfaces. Carry all sheets on edge. Do not use damaged or faulty sheets.

#### *Installation*

Store GIB® plasterboard sheets undercover inside a watertight building and keep sheets dry at all times. Stack sheets flat on a dry level surface in accordance with Winstone Wallboards Ltd recommendations. Avoid damage to sheet edges, ends, and surfaces. Carry all sheets on edge. Do not use damaged or faulty sheets.

#### *Fixings*

Fix sheets with adhesive and GIB® Grabber® drywall screws in accordance with Winstone Wallboards Ltd requirements.

GIBFix® All-Bond adhesive. Use to adhere the sheets and accessories to the framing in accordance with Winstone Wallboards Ltd requirements.

### **5.9.6 Plasterboard**

#### *Product*

- GIB® Standard plasterboard, 10mm thick.
- GIB® Standard plasterboard, 13mm thick.
- GIB Aqualine® plasterboard, 10mm thick.
- GIB Aqualine® plasterboard, 13mm thick.
- GIB Braceline® / GIB Noiseline® plasterboard, 10mm thick.
- GIB Braceline® /GIB Noiseline® plasterboard, 13mm thick.

## 5.9.7 Completion

### *Check & Clean-up*

Ensure that the sheets have been cut, fitted and joined, and fixed correctly. Check for damage and replace as necessary.

Clean up thoroughly on completion and remove all waste and rubbish from site.

Provide a copy of the Winstone Wallboards Ltd maintenance requirements to the owner.

## 5.10 Joinery & Trim

### 5.10.1 General

#### *Scope*

Repair or/and replace Internal Joinery and Trim where directed in the Plans and Specifications.

Ensure work is undertaken at the correct phase of the remedial works.

During any foundation and floor relevel the internal timber framing may warp or become out of plumb. As part of the works undertaken in this project all internal doors (including wardrobe/closet doors) are to be Eased & Adjusted should they require it after rectification of any foundation or wall framing.

#### *Internal Doors*

Where directed to "Ease & Adjust Door" remove architrave (if present) and wall linings to access the door frame.

Undertake remedial works to reinstate the door into a fully functional door that swings without catching floor coverings and latches correctly into its latching mechanism.

Ensure the door and frame are plumb and straight.

If hinges are moved in the frame, fill the void left with appropriate filler, sand and advise the painter. Ensure hinges are correctly fastened into the frame and the door. If the screws have worked loose use an appropriate Epoxy Glue to secure the fastenings. Prop and/or clamp the door or frame while the glue hardens.

Replace wallboard and architraves and remove any debris from the site.

#### *Window Repair*

Where directed to "Ease & Adjust Windows" remove architrave (if present) and wall linings to access the window frame.

Undertake remedial works to reinstate the window into a fully functional window that opens with ease and latches correctly into its latching mechanism.

Ensure the window sash and frame are plumb and straight.

If hinges are moved in the frame, fill the void left with appropriate filler, sand and advise the painter. Ensure hinges are correctly fastened into the frame and the opening sash. If the screws have worked loose use an appropriate Epoxy Glue to secure the fastenings. Prop and/or clamp the sash or frame while the glue hardens.

Replace wallboard and architraves and remove any debris from the site.

#### *Trim*

Where directed in the Plans or Specification repair, or remove and replace trim.

Any Trim removed to access internal framing shall be replaced if broken during the de-construction.

Where possible the Trim should be replaced with material matching the existing.

Trim shall be prepared to the same specification and quality as existing material, fixing and finishing. All nailing/fixing holes shall be filled and lightly sanded in preparation for painters.

## **5.11 James Hardie Flooring**

### **5.11.1 Scope**

#### *18mm HardiePanel Compressed Sheet (Interior)*

Supply and install James Hardie 18mm thick HardiePanel Compressed Sheet as a fibre-cement sheet flooring material to the floors identified on the drawings, complete with all accessories, ready to be overlaid with a trafficable flooring product. All aspects of this work shall be in complete accordance with James Hardie Flooring Installation Manual (check [www.jameshardie.co.nz](http://www.jameshardie.co.nz), or call 0800 808 868 for the latest edition) and other relevant product manufacturers' recommendations.

### **5.11.2 Co-operation**

Co-ordinate with other trades to ensure that appropriate clearances are allowed from adjacent linings, framing, and associated elements, that the sheets correctly allow for the trafficable flooring product installation, and that services penetrations are correctly handled to maintain full watertightness and sheet integrity. Confirm with the trafficable flooring applicator that the specified flexible sealant is fully compatible with the trafficable flooring products.

Ensure that other trades are aware of the James Hardie Safe Working Practices.

### **5.11.3 Preparation**

#### *HardiePanel Compressed Sheet*

Check that the timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and in accordance with James Hardie requirements. Framing shall be in true alignment, complete and suitable for the sheets, and maximum moisture content as per NZS 3602. Check junctions to all other building elements and ensure that all necessary works have been completed that will enable the sheets and all accessories to be installed.



#### **5.11.4 Flexible Sealant**

##### **Sikaflex AT Facade**

Flexible silicone sealant to be Sikaflex AT Facade. Use to seal the sheets and accessories in accordance with the sealant manufacturer's recommendations and to James Hardie requirements. Ensure sealant compatibility with overlay.

#### **5.11.5 Solvent Adhesive**

##### *Adhesive for HardiePanel Compressed Sheet*

Solvent adhesive to be SIKA Supergrip 30 Mins Adhesive. Use to adhere the sheets to the aluminium 'T'-socket over the framing in accordance with the adhesive manufacturer's recommendations and to James Hardie requirements.

#### **5.11.6 Workmanship**

All installation work shall be carried out by an LBP, or supervised by an LBP, in accordance with James Hardie Flooring Installation Manual and other relevant product manufacturers' recommendations.

#### **5.11.7 Delivery & Handling**

Carry all sheets on edge. Stack sheets flat on a level platform off the ground ie. use the supplied delivery pallet on level ground (if no pallet then evenly spaced bearers on level ground at 600mm crs maximum). Keep sheets and accessories dry at all times. Avoid damage to sheet edges, ends, and surfaces. Keep accessories out of direct sunlight, and store all accessories on flat and avoid damage to any. All installers to be familiar with and comply with the James Hardie Safe Working Practices in the Installation Manual, to use appropriate safety gear, and in particular to be aware to avoid breathing silica dust. Do not use any damaged or blemished sheets or accessories.

#### **5.11.8 Installation**

##### *HardiePanel Compressed Sheet*

Install the sheets to the framing in accordance with the Installation Manual, complete with all accessories eg. mouldings, sealant, underflashings, etc.

Control joints to be formed on framing to the locations identified on the drawings, in accordance with the Installation Manual.

#### **5.11.9 Fixings**

##### *HardiePanel Compressed Sheet, Interior*

Fix sheets with 50mm x 10g countersunk Grade 316 stainless steel screws in accordance with James Hardie requirements.

#### **5.11.10 Completion**

Ensure that the sheets have been fixed correctly, and that all joints and accessories and penetrations have been completed correctly. Check that no damage has occurred to any installed sheet element or associated component, replace as necessary. Ensure that the sheets are overlaid with the trafficable

floor finishing product within 90 days of the sheet installation, complete with all accessories. Hand over a copy of the latest edition of the James Hardie Flooring Product Warranty to the client. Hand over a copy of the latest James Hardie Flooring Installation Manual to the client for their maintenance information.

## **5.12 Deck**

### **5.12.1 Preparation**

Ensure that all bolts, nails, screws and structural brackets as noted for use in the deck construction are appropriate for the Exposure Zone, timber treatment etc. Ensure that all cut or drilled surfaces of H4 and H5 treated timbers are flood coat re-treated, with the product recommended by the original treatment plant, before installation. All foundations taken down to firm undisturbed ground, concrete 20MPa, and with all aspects as specified in Concretor. Bearers spaced off adjacent supporting walls and fixed as detailed, and sill junction to adjacent access doors drained, flashed, sealed and finished as detailed.

### **5.12.2 Installation**

Accurately set up, temporarily brace, and fix as noted or detailed all timber posts, beams, joists, braces, etc. as shown on the drawings, with all joints neatly fitted to ensure close contact over the full surface of the joint. Bolt holes 1mm larger than the bolt, and bolts re-tightened just prior to completion to remove any slack consequent on timber shrinkage. Very slightly arris timber edges where appropriate to avoid splintering, and cut any required rebates, grooves, etc. before erection.

### **5.12.3 Decking**

90x19mm H3.2 Radiata Decking set out and fixed as noted, with butt joints staggered, slightly undercut, and drilled for nailing tread side up.

Apply Osmo Anti-Slip Decking Oil to manufacturer's recommendations. See Support Documents for product data.

## 6 PLASTERWORK

### 6.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 6.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2908.2:2000(AS/NZS)	Cellulose-cement products - Flat sheets
3103:1991(NZS)	Specification for sands for mortars and plasters
3121:2015(NZS)	Water and aggregate for concrete
3604:2011(NZS)	Timber-framed buildings
3640:2003(NZS)	Chemical preservation of round and sawn timber
4251.1:2007(NZS)	Solid plastering - Cement plasters for walls, ceilings and soffits
4534:2006(AS/NZS)	Zinc and zinc/aluminium-alloy coatings on steel wire
4680:2006(AS/NZS)	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles

### 6.3 Stucco Plaster Cladding

#### 6.3.1 Scope

##### *Stucco Plaster Cladding over a Rigid Backing*

Supply, install and finish the selected materials to the specified finish as Stucco Plaster Cladding over a Rigid Backing, complete with all accessories, to the walls identified on the drawings. All aspects of this work shall be in accordance with the referenced documents, product manufacturers' recommendations, and as shown on the drawings.

#### 6.3.2 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works, including membranes, wraps, rigid air barriers, flashings, and trims, and any other related works are completed to specification and as shown on the drawings.

Co-ordinate with other trades the locations of control joints, and pipes, outlets, cables, meter boards and other fittings installed by others, and to install stucco plaster cladding as required.

#### 6.3.3 Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All work shall be carried out to the latest and best trade practise standards by experienced and competent tradesmen, familiar with the materials specified and installation and finishing techniques, in accordance with NZS 4251.1, and to the layout and details shown on the drawings.

Protect all surrounding surfaces and work from plaster droppings and splashes as necessary, and protect plasterwork from exposure to sun, wind and rain, and from damage from other works as the works progress and until fully cured and complete. Conform to NZS 4251.1 guidelines regarding restrictions of plastering in cold and hot conditions.

Prepare a sample panel for approval if requested.

Store materials undercover and off the ground on pallets or gluts, and kept dry and protected from contamination and damage.

Do not use contaminated, damaged or faulty materials and products, or products beyond their expiry date.

#### **6.3.4 Preparation**

##### *Timber Frame - Rigid Backing*

Check all aspects of preparatory works, including but not limited to:

Check that the timber wall framing complies with NZS 3604, has studs at maximum 600mm centres and dwangs at maximum 800mm centres, is plumb and in true alignment, includes all blocking required for cavity battens, and fixing at openings, joints, corners and soffits etc., and has a maximum moisture content of 18% at the time of cladding installation.

Check that the building wrap as specified has been installed in accordance with NZBC requirements and the manufacturer's recommendations, and with all finishing tapes, flashings etc. at windows, doors, corners and penetrations all correctly incorporated to provide a continuous seal.

Where the studs are at greater than 450mm centres, check that appropriate additional restraint is correctly installed to the wrap, to keep bulk insulation from pushing the wrap into the cavity.

Check that all preparatory materials are lapped such that any water will run down to the exterior.

#### **6.3.5 Backing Material**

##### *Plywood Sheet Rigid Backing - Timber framing*

Plywood sheet rigid backing shall comply with AS/NZS 2269, treated to H3.1 Group B of NZS 3640, and comply with NZS 4251.1 Table 6 requirements.

Plywood sheets installed in accordance with NZS 4251.1. Sheets gapped 3mm, fixed at 150mm centres around edges and 300mm centres elsewhere with 2.8mm thick hot dip galvanised flat head nails, penetrating minimum 35mm into the timber framing through the cavity battens.

Manufacturer, brand name & thickness: Ecoply 12mm thick.

### **6.3.6 Plaster Material**

#### *Sand*

Sand shall be to correct grading and compliant with the requirements of NZS 4251.1 and NZS 3103, be from a single source, and uniform in composition and colour.

Keep sand dry or slightly damp and store in a manner to prevent contamination.

#### *Cement*

Cement shall comply with the requirements of NZS 3122 and 4251.1.

#### *Admixtures*

Chemical admixtures shall comply with NZS 4251.1 and AS 1478, and be used in strict accordance with the manufacturer's instructions.

Hydrated lime shall comply with AS 1672.1 in accordance with NZS 4251.1.

Bonding Agents shall comply with NZS 4251.1 and be used in strict accordance with the manufacturer's instructions.

Mineral oxides and pigments shall comply with NZS 3117 in accordance with NZS 4251.1.

Synthetic fibre type, size and useage shall be in strict accordance with NZS 4251.1, and shall be clean, dry, and free of any coating that will adversely affect the plaster bond to the fibres.

Lightweight aggregates (exfoliated vermiculite and expanded perlite) shall comply with the requirements of NZS 4251.1 and the relevant sections of AS 2758.1.

Stones used in roughcast finishing coats shall comply with the requirements of NZS 3121 and NZS 4251.1.

Water shall comply with NZS 3121, drinkable local authority water for domestic use is suitable.

### **6.3.7 Plaster Finish**

#### *Rough Cast Finish*

Rough Cast Finish to match existing; cement based plaster applied to a uniform thickness, trowel applied, floated off then evenly textured with a finishing mix thrown on to the surface with a scoop or trowel to the required effect, in accordance with NZS 4251.1.

### **6.3.8 Installation**

#### *Rigid Backing*

Install and fix the cavity battens directly over studs into the timber framing as noted to the required layout.

Carefully set-out and fix the rigid backing sheets over the cavity battens to the timber studs through the cavity battens, level along the base line minimum 50mm, or as detailed, below the bottom plate or floor structure.

Keep rigid backing sheets protected from distortion from exposure to rain and moisture until overlaid with the slip layer.

Install all necessary galvanised metal beads and edge trim as required and as shown on the drawings. Install slip layer underlay, reinforcing spacers, and galvanised metal reinforcing in accordance with NZS 4251.1, and as detailed, in preparation for plastering.

All flashings around windows, doors and other openings, at corners and control joints, inter storey and soffit junctions, and pipe penetrations, shall all be carefully constructed, fixed, sealed and finished to the details shown on the drawings. Confirm the location of all control joints before commencing installation.

#### *Plaster Batching & Mixing*

All plaster ingredients batched by volume using accurate gauge boxes or containers.

Mix plaster to a uniform consistency by hand or machine in accordance with NZS 4251.1. Re-tempering or remixing plaster after stiffening is not permitted under any circumstances. Premixed materials shall be mixed in accordance with the manufacturer's instructions.

#### *Plaster Application & Curing*

Arrange plastering sequence to avoid unsightly join marks or badly set out joints.

All plaster coatings shall be applied, finished, and cured in accordance with NZS 4251.1 to the required thickness.

Complete all surfaces, control joints, edges, corners, rebates, angles, arrises, reveals, and drips, true to line, plumb, level, and to the details shown on the drawings and to the tolerances of NZS 4251.1. Properly cure all plaster to prevent shrinkage or druminess, and leave all plastered surfaces clean, sound, smooth, even and with a true finish free from blemishes.

### **6.3.9 Completion**

Check that all plaster has been correctly applied and finished, and is cured to the required strength. Check that all surfaces, edges, corners, rebates, angles, reveals, and drips are true to line, plumb, level, and to the details shown on the drawings and to the tolerances of NZS 4251.1. Check that all control joints and expansion joints are sealed and completed correctly.

Check for damage and faults and replace or repair as necessary.

Leave all surrounding surfaces and works clean and free of contamination. Remove all rubbish and excess materials from the site.

Issue to the owner a copy of the maintenance requirements and all necessary warranties for the completed works.

## 7 ROOFING

### 7.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 7.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

### 7.3 Profiled Metal Roofing Repair

#### 7.3.1 Compliance

##### *Codes & Standards*

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1397:1993(AS/NZS)	Steel sheet and strip - hot-dipped, zinc-coated or aluminium/zinccoated
1562.1(AS)	Design and installation of sheet roof and wall cladding - Metal
3500.3:2003(AS/NZS)	Plumbing and drainage - Stormwater drainage
3604:2011(NZS)	Timber-framed buildings
NZS/AS 3566:1988	Screws - Self-drilling - For the building and construction industries
NZS/AS 3566:1988A1	Screws - Self-drilling - For the building and construction industries: Amendment 1
NZS/AS 2728:2013	Prefinished/prepainted sheet metal products for interior/exterior building applications
NZS/AS 1170.2:2011	Structural design actions - Wind actions

#### 7.3.2 Scope

##### *Repair Existing*

Inspect existing pre-finished corrugated steel roofing including flashings to roof penetrations, and report with repair methodology. Once agreed, repair to match existing as noted on the Drawings.

All handling and fixing techniques, and all jointing and sealing materials and techniques, shall be exactly as recommended by the roofing manufacturer.

Colour to match existing.

### *Qualifications*

All installation work shall be carried out by experienced and competent tradesmen who are familiar with the techniques and materials specified. All handling and fixing techniques, and all jointing and sealing materials and techniques, shall be exactly as recommended by New Zealand Steel.

### *Preparation*

Co-operate to ensure that roof framing has appropriate spacings and fixings, is in accordance with NZS 3604, and coordinate to ensure that all timber members required for ridges, hips, valleys, barges, penetrations, junctions with vertical faces, etc. are correctly in place. Lap sheets away from the prevailing wind.

Set-out the roofing sheets exactly square to the building axis and maintain this throughout the works.

### *Installation*

Install the specified underlay running up and down the slope with minimum 300mm side laps. Do NOT install any fixings to the underlay (to avoid dissimilar metals/electrolysis) - install the underlay length by length as the roofing proceeds and ensure it is taut and evenly lapped when the roofing screws are installed.

### *Colorsteel Fixings*

Screw fix, screws to comply with AS3566 (Self-drilling construction screws) Class 3 or 4. (Do NOT use stainless steel screws). Use only low carbon (<15%) non-conductive sealing washers. Screw at centres as advised by the local Rollformer, to fully comply with the Wind Zone requirements, purlins spacings etc. Screws for Colorsteel should be factory prepainted for an accurate colour match. Use fixing systems that will accommodate thermal expansion for long lengths and/or dark colours.

### *Flashing*

Ridges, hips, valleys and barge flashings etc. shall all be matching Colorsteel galvanized steel, and as detailed. Soft edge flashings very neatly dressed down where required, plumbing penetrations custom flexible rubber flashed (fully sealed), and instruct the Plumber that no copper (or brass) pipes are to discharge on to the roof.

### *Completion*

Protect the galvanizing from damage at all times; replace the whole sheet where a significant depth of the coating has been damaged. Completely clean off all drill and power saw swarf and pop-rivet shanks as the work proceeds (at least daily, and keep them and other rubbish out of the spoutings).

## **7.4 Rainwater Goods Repair**

### **7.4.1 Existing Spouting & Downpipes**

#### *Scope*

Repair standard profile longrun prefinished steel spouting as necessary with flanged downpipe droppers siliconed into the gutter to take existing downpipes. Standard external spouting brackets at approximately 600mm centres. Disconnect from existing stormwater drains and remove downpipes to allow other repair work, then reinstall & reconnect.





## 8 TILING

### 8.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 8.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2358:1990(AS)	Adhesives - For fixing ceramic tiles
3103:1991(NZS)	Specification for sands for mortars and plasters
3122:2009(NZS)	Specification for Portland and blended cements (General and special purpose)
3661.2:1994(AS/NZS)	Slip resistance of pedestrian surfaces - Part 2: Guide to the reduction of slip hazards
3958.1:2007(AS)	Guide to the installation of ceramic tiles
4586:2004(AS/NZS)	Slip resistance classification of new pedestrian surface materials
BRANZ Good Practice Guide	Tiling
NZBC B2/AS1	Durability
NZBC D1/AS1	Access Routes
NZBC E3/AS1	Internal Moisture

### 8.3 Tiling

#### 8.3.1 Scope

Supply, install and finish all Tiling works to match existing, complete with all necessary components and accessories required for proper installation and performance, as specified herein and to the locations, layouts and details shown on the approved drawings. All aspects of this work shall be carried out to comply with the New Zealand Building Code and relevant standards, and in accordance with the approved project design documentation, and with any relevant product manufacturers' technical literature.

#### Extent of Work

The following is a list and a general description of the extent of Tiling work, which are more specifically defined in the contract documents, required for the completion of the contract works:

- floor tiles:
  - Entry
- wall tiles:

○ Bathroom

### 8.3.2 Requirements

#### *Quality Assurance*

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of Tiling work are carried out to the highest standard.

#### *Inspection & Acceptance of Tiling Work*

Carry out all necessary pre-installation, installation and finishing inspections of Tiling for each area of work in accordance with the requirements of industry best practice recommendations and code of practice guidelines.

Complete all necessary Pre-Installation/Application Checklists prior to installing proprietary under-tile waterproofing systems and heating systems and floor levelling systems, and relevant Installation/Application Checklists.

Complete all necessary Installation/Application Sign-Off Certificates and before undertaking subsequent work or handing over.

#### *Defective Materials & Work*

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected Tiling materials and work shall be repaired and/or replaced to the satisfaction of the Architect/Designer, without delay and at no additional cost to the Principal.

#### *Evidence of Slip Resistance*

If requested, provide certified evidence of the slip resistance classification for each floor tile specified.

#### *Tile Samples*

Submit a clearly identified full-size sample of each tile specified, including colour/pattern, for signed approval by the Architect/Designer - do not proceed until the samples have been approved.

### 8.3.3 Performance

#### *Slip-Resistance Performance of Access Routes*

Slip-Resistance Performance of Access Routes. The slip-resistance performance of tiled access routes, ramps and stairs shall comply with the requirements of NZBC D1/VM1 and NZBC D1/AS1.

### 8.3.4 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install tiling as required, and to ensure that:

- appropriate tolerances and clearances allow for adjacent finishes, fixtures and fittings, etc; and
- penetrations for piped and cabled services are correctly located to maintain tile integrity and tiling performance.

### **8.3.5 Workmanship**

Where required by the NZ Building Act 2004, it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All Tiling work shall be carried out to best trade practice by qualified and experienced tradespersons, familiar with the specified materials and installation and finishing techniques, in accordance with AS 3958.1 and relevant product manufacturers' technical literature, to the layout and details shown on the approved drawings, and to fully comply with all warranty requirements.

Submit evidence of experience on request, e.g. National Certificate in Floor and Wall Tiling, or certified member of Master Plasterers and Tilers Association.

All substrate preparation, tile laying and tiling accessories application and finishing techniques shall be exactly as recommended by the specified product manufacturer. All work shall be such as to leave a neat, efficient and robust installation.

Interior wet-area tiling shall be waterproof and installed over a waterproof membrane as shown on the drawings.

Exterior floor tiling shall be waterproof and weathertight, and where necessary installed over a waterproof membrane as shown on the drawings.

As recommended by the tile manufacturer, use only an approved adhesive that is compatible with the specified tile, its substrate and its application/use.

Where necessary, delay tiling to allow maximum curing and settling and initial creep of the substrates, particularly to load bearing structural elements.

Do not cover or bridge movement control joints with tiles and tile underlay.

Tiling shall not be undertaken when the ambient and surface temperatures are outside the specified product manufacturer's permissible temperature range.

Where necessary, mask off and protect from contamination adjacent surfaces, joinery, fixtures and finished work before commencing.

Exterior tiling shall not be undertaken during inclement weather. As necessary and in accordance with the manufacturer's requirements, protect exterior tiling from rain, hot dry winds and direct sunlight to aid proper drying and curing.

Leave all tiled surfaces clean, sound, and free from blemishes of any kind.

### **8.3.6 Delivery & Handling**

Upon delivery to site, inspect the tile packs and reject those items that are found to be damaged, defective or contaminated. Contact the supplier for replacement of rejected items at time of delivery to site.

Do not use damaged, defective or contaminated materials, or products that are beyond their designated shelf life.

Store all tiling materials undercover, in a weatherproof environment, off the floor, on a flat, even and level surface in accordance with the manufacturer's requirements. Keep products and materials dry, out of direct sunlight and protected from damage, moisture and contamination at all times.

Handle tiling materials in accordance with the manufacturer's requirements and in a manner that prevents damage to and contamination of the materials and works.

Installers shall be familiar with and comply with all associated product Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

Installers shall conform with all relevant [WorkSafe NZ](#) Guidelines and Codes of Practice - including the [OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry](#).

### **8.3.7 Preparation**

#### *New Compressed Fibre Cement Sheet Floor*

New Compressed Fibre Cement Sheet Floor - check all aspects of preparatory works, including but not limited to:

- Check that the sheets have been installed, jointed and fixed in accordance with the manufacturer's requirements and indicated on the drawings, and that all sheet edges are fully supported.
- Check that the sheet joints are flush and even, and that all fixings are countersunk and filled with a compatible filler.
- Using a proprietary levelling compound, repair flush with smooth, feathered edges any damaged areas in the floor surface.
- Mechanically sand to remove all surface irregularities and contaminants likely to affect adhesion.
- Leave the surface completely clean and free of dust and contaminants.

#### *General*

All substrates to be tiled shall be structurally sound, even and smooth, clean, dry, and free from dirt, dust, grease, oil, wax, paint residue, loose plaster and laitance, curing compounds and other materials and contaminants likely to affect the bonding and performance of the specified tile adhesive and grout.

Carry out all necessary moisture readings of substrates. Do not commence installation until the moisture readings for the whole area are below the required level.

Carry out all necessary substrate inspections and preparatory work in accordance with the relevant product manufacturer's recommendations prior to application.

Check that the substrate is free of voids and depressions, and is in correct alignment - true to line, level and/or plumb, and to the falls indicated on the drawings.

Check that all fixtures, fittings and embedded items are correctly installed, and that all substrate edges are completed as detailed.

Confirm the location of any movement control or crack control joints prior to commencement of the works, and ensure that they are appropriately trimmed. Do not cover or bridge movement control joints with tiles, adhesive and grout.

Allow self-levelling underlayments and mortar screeds to properly cure in accordance with the manufacturer's recommendations before commencing tiling.

Allow new concrete substrates to cure for at least four weeks prior to tiling.

Ensure that the back of each tile is clean and free from dust or other contaminants prior to laying.

The commencement of work on each section/area shall be deemed to indicate full acceptance by the Tiler that all preparatory works by other trades are appropriate to achieve the required finished results.

#### *Plasterboard Wall Lining*

Plasterboard Lining - check all aspects of preparatory works, including but not limited to:

- Check that the plasterboard sheets have been installed in accordance with the manufacturer's requirements, are supported on all edges on framing, are securely fastened, and that all joints and junctions have been stopped flush with reinforcing tape embedded in the jointing compound.
- Check junctions with all other substrates and elements, ensuring that all necessary works have been completed as detailed.
- Check that all apertures, openings, edges and expansion and movement control joints are completed as detailed.

### **8.3.8 Installation**

#### *Floor Tiles*

Floor Tiles. Install floor tiles by direct-stick method to clean, dry and properly prepared substrates in accordance with AS 3958.1 and the adhesive manufacturer's instructions. Accurately set-out and lay tiles to the layout and details shown on the drawings. Confirm the floor tile layout and pattern requirements prior to installation.

As required by the adhesive manufacturer, seal or prime porous substrates or substrates where dusting or powdering exists. The use and application of adhesive shall be exactly to the adhesive manufacturer's instructions.

All tile cutting, boring and shaping shall be carried out using appropriate tools and equipment and methods suitable for the tile type and in accordance with the tile manufacturer's recommendations. Only install cut tiles that have smooth, uniform cut edges - do not use tiles with jagged or flaked edges.

Mechanically mix powdered adhesive at the recommended ratio with clean potable water to a smooth, lump-free paste in accordance with the manufacturer's requirements. Do not mix more than can be used within the specified open time.

Apply tile adhesive evenly using a suitably notched trowel to properly prepared substrates in accordance with the manufacturer's instruction.

- Do not apply more adhesive than can be covered within the specified open time.
- Do not over spread the adhesive, and avoid surface skinning - particularly when used in unfavourable conditions such as direct sunlight, wind and/or high temperatures.
- Ensure to follow the adhesive manufacturer's recommended setting and curing periods.

Lay floor tiles into adhesive to achieve maximum contact and bonding before skinning occurs. Re-trowel any adhesive that has skinned - do not apply water to skinned adhesive. Where necessary, back-butter tiles with adhesive to ensure maximum contact and bonding - do not spot-fix floor tiles.

Floor tiles shall be laid so that the finished surface and edges are true and even, level and/or to the falls shown on the drawings, and finished flush with adjoining finished work as appropriate or as detailed.

Tile joints shall be to the required layout, uniform, accurately aligned, straight and true to line, and set even and parallel to the specified joint width.

Where indicated on the drawings, return floor tiles along walls, upstands, toe spaces, etc., to the height and details shown on the drawings.

Remove excess adhesive from tile joints as each tile is laid to ensure full depth grouting can be achieved, and leave the tile surface completely clean.

#### *Wall Tiles*

Wall Tiles: Install wall tiles by direct-stick method to clean, dry and properly prepared substrates in accordance with AS 3958.1 and the adhesive manufacturer's instructions. Accurately set-out and lay tiles to the layout and details shown on the drawings. Confirm the wall tile layout and pattern requirements prior to installation.

As required by the adhesive manufacturer, seal or prime porous substrates or substrates where dusting or powdering exists. The use and application of adhesive shall be exactly to the adhesive manufacturer's instructions.

All tile cutting, boring and shaping shall be carried out using appropriate tools and equipment and methods suitable for the tile type and in accordance with the tile manufacturer's recommendations. Only install cut tiles that have smooth, uniform cut edges - do not use tiles with jagged or flaked edges.

Mechanically mix powdered adhesive at the recommended ratio with clean potable water to a smooth, lump-free paste in accordance with the manufacturer's requirements. Do not mix more than can be used within the specified open time.

Apply tile adhesive evenly using a suitably notched trowel to properly prepared substrates in accordance with the manufacturer's instruction.

- Do not apply more adhesive than can be covered within the specified open time.
- Do not over spread the adhesive, and avoid surface skinning - particularly when used in unfavourable conditions such as direct sunlight, wind and/or high temperatures.
- Ensure to follow the adhesive manufacturer's recommended setting and curing periods.

Press wall tiles into adhesive to achieve maximum contact and bonding before skinning occurs. Retrowel any adhesive that has skinned - do not apply water to skinned adhesive. Where necessary, back-butter tiles with adhesive to ensure maximum contact and bonding - do not spot-fix wall tiles.

Wall tiles shall be installed so that the finished surface and edges are true and even, level, and finished flush with adjoining work as appropriate or as detailed.

Tile joints shall be to the required layout, uniform, accurately aligned, straight and true to line, level and plumb, and set even and parallel to the specified joint width. Use proprietary tile spacers, sized for the specified joint width, to ensure accurate jointing.

Form internal and external wall corner junctions true and plumb and with tile joints continued around corners level and true.

Remove excess adhesive from tile joints as each tile is laid to ensure full depth grouting can be achieved, and leave the tile surface completely clean.

#### *Edge Trim*

Edge Trim. As required to match existing, install all necessary tiling edge trim - including edge cappings, corner mouldings, transition strips, etc., - all neatly finished, accurately aligned and true, to the required layout and as detailed on the drawings.

#### *Grouting*

Grouting. Grouting shall be in accordance with the grout manufacturer's requirements and recommendations. Coloured grout shall be to the colour specified.

Prior to grouting, ensure that the tile adhesive has completely set, and that the tile joints are clean, dry and free from excess adhesive and any foreign material. Rake out any excess adhesive from joints to ensure a maximum, uniform grout joint is achieved. Tile spacers must be removed prior to grouting.

Mechanically mix powdered tile grout with clean water at the required ratio to a smooth, lump-free paste in accordance with the manufacturer's requirements. Do not mix more than can be used within the manufacturer's specified open time. Ensure to follow the manufacturer's recommended drying and curing periods.

Apply tile grout evenly with a rubber squeegee or grouting float, ensuring that the tile joints are completely filled and smoothed to a dense, uniform surface. Do not spread more grout than can be



cleaned within the specified open time. Remove excess grout immediately. In hot or windy conditions, dampen the joints to prevent the grout from drying out too quickly.

Clean the tiles with a damp sponge when the grout joints have firmed, making sure not to wash-out the joints. Finish grout joints to a smooth, uniform effect and leave grout free of pin holes and blemishes.

Allow grout joints to dry before cleaning with a clean, dry, soft cloth, to completely remove any grout haze and residue from the surface of the tiles.

#### *Protection*

Protection. Take all necessary measures to protect exterior tiling from the extremes of weather and climate during the fixing and grouting operation and for as long as possible thereafter.

Keep the working area cordoned off during the whole tiling installation. Protect completed tiling from excessive loads, damage and contamination until hand-over or as directed.

Restrict foot traffic from completed floor tiling in accordance with the tile manufacturer's time frames for 'set-to-light-foot-traffic' and 'ready-for-service-use'.

Where necessary, cover completed floor tiling with a heavy-duty temporary floor protection such as Ovaboard, Ram Board, Buffalo Board; laid in accordance with the manufacturer's requirements.

Protect exterior tiling, immediately after laying and grouting, from rain and moisture for at least 24 hours, and from frost and strong sunlight after laying in accordance with the tile adhesive and grout technical specifications.

### **8.3.9 Completion**

Check that all Tiling work has been correctly installed to the required layout, and that all tile joints, edge-trimming and other detailing is correctly finished, grouted and sealed.

Check all Tiling installations for damage, marks and defects - repair or replace as necessary. Carry out any repairs to the required standard.

Thoroughly clean tiled surfaces in accordance with the manufacturer's recommended procedures and techniques. Lightly buff where appropriate.

Leave this work complete and to the required standard, and in accordance with the associated warranty requirements.

Clean up thoroughly, and leave adjacent surfaces and finished work clean and free of damage and contamination. Remove all associated rubbish from site.

Protect the completed installation from damage, trafficable dirt and grime, and stains as necessary until hand-over as scheduled or directed.

Issue to the Owner a copy of all relevant product manufacturers' maintenance requirements, and a copy of relevant manufacturer Product Warranties and the installer/applicator Installation Warranty for the installed products and completed works.

## 9 PAINTING & DECORATING

### 9.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 9.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

### 9.3 Project Managers Projects Painting

#### 9.3.1 Compliance

##### *Compliance Documents*

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2310:2002(AS/NZS) Glossary of paint and painting terms

2311:2009(AS/NZS) Guide to the painting of buildings

AS 1580 Methods of test for paints

BRANZ IB 257 Wood primers

#### 9.3.2 General

##### *Co-operation*

Co-operate with all trades and attend upon Concretor, Joiner, Carpenter, etc. to ensure that the surfaces provided by these trades are completely suitable for the Painter works that are required.

##### *Preparation*

No painting or varnishing or other surface coating work shall be undertaken unless the surfaces to be coated are in a correct and proper condition to ensure first class results.

Inspect the works of other trades on which Painter work is scheduled and report to the Main Contractor and the Project Manager any defects or irregularities that would affect the permanency or finish of the painting work, and do not proceed until the defects or irregularities have been completely rectified. Failure to examine and report will be construed as an acceptance that all preparatory works are completely satisfactory.

This clause does not relieve the Painter of any of the usual preparatory work to surfaces customarily performed by this trade.

Clean down all surfaces with sugar soap, strippers, mould killers, etching agents, etc. as required.

Sand or rub all sharp edges off exterior timbers and other materials as appropriate before painting.

Finish rub down ALL surfaces. Ensure that the moisture content of all substrates is appropriate.

Remove locks, fastenings, and similar hardware before painting and refix on completion. Remove all

electrical switch and power plates before painting and refix them on completion. Mask adjacent surfaces as required to a true line and remove the masking on completion. Dust and wipe down all surfaces for Painter work and completely remove all dust, rubbish, dirt etc. from areas involved immediately prior to commencement. To each area of the works complete all surface preparation before applying paint to any surface.

#### *Protection*

Take adequate precautions to prevent paint spots falling on prefinished or similar surfaces, and extreme care to keep absorbent materials (e.g. cedar, sawn framing, decking, paving) completely clean during all adjacent painting work. Correction of any such disfigurement shall be to the Project Manager's approval.

#### *Qualifications*

All work by the Painting Subcontractor shall be of the highest reasonable standard, and executed by experienced and competent tradesmen to the Project Manager's approval.

#### *Workmanship*

Strictly adhere to all Manufacturers' instructions.

Strictly observe Manufacturers' requirements with regard to surface and air temperatures for painting. No work shall be carried out on surfaces that are not completely dry, and no external work shall be carried out during damp or wet conditions.

In all finishes any irregularities or brushmarks or dust etc. in each preceding coat shall be rubbed down to provide a smooth clean surface for the following coat. Each coat shall be finished over all surfaces before a further coat is applied, and each coat shall be completely dry before subsequent coats. Finish broad areas before painting trim, paint ceilings before walls and walls before joinery, trim and other items.

Each coat and the full completed system shall be of uniform finish, colour, texture and sheen, shall have proper covering of thin edges, corners, end grain etc. and shall be free of blemishes such as runs, sags, fat edges, entrained hairs, brush marks, starved patches etc.

#### *Extent*

The schedules indicate the general extent of the works to be carried out but are in no way exhaustive in their description of the actual items for painter work. Complete all work necessary for the proper and entire completion of the works. All items and portions of items reasonably inferable but not specifically mentioned are deemed included, i.e. cupboard interiors, the top and bottom of doors, unseen cabinetry tops, etc. All doors shall have equal painter work on ALL surfaces.

Where timber work is specified for priming before fixing the priming shall be thoroughly brushed in to

all surfaces, and all exterior timber work for paint finishing shall be fully primed within one week of fixing. Should more than one month elapse between priming and undercoating the timber shall be fully reprimed.

Stopping up work shall be carried out immediately the priming or sealing coat is dry, and shall be solidly placed to finish clean and dry. Stopping tinted to match the timber for clear finished work.

Paint putties within one month of glazing timber frames; paint to impinge on glass to assist sealing.

*Materials*

All Painter materials shall be ready mixed and delivered in unopened containers. Materials shall be used only for the purpose and in the manner intended by the manufacturer; any apparent scheduled discrepancy in this respect shall be referred to the Project Manager immediately for clarification.

Where surfaces are specified to be finished in a particular manner or material, all preparatory work, priming, or undercoating, that is necessary to ensure a proper finish shall be provided, irrespective of any apparent omission herein.

Thinning shall only be to manufacturer's specification. Thoroughly stir as required to lift any settled pigment and ensure the paint is homogeneous. Paints shall be factory or shop tinted to the colour required. Undercoats shall be fully tinted to match the final colour scheduled. All paints shall have the finished film thickness that is specified by the manufacturer (checked by monitoring the coverage per litre).

*Completion*

Allow to touch up to approval any Painter work which is damaged during the finishing works of other trades. Replace all hardware, remove all masking, covers, containers etc., thoroughly clean all affected surfaces, and leave all spaces ready for immediate occupation. Avoid scratching or abrading glass or hardware during any cleaning.

## 10 FLOOR COVERINGS

### 10.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

### 10.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1884:2013(NZS AS)	Floor coverings - Resilient sheet and tiles - Installation practices
4586:2004(AS/NZS)	Slip resistance classification of new pedestrian surface materials
NZBC D1/AS1	Access Routes

### 10.3 Residential Vinyl Flooring from Jacobsen

#### 10.3.1 Scope

Supply and install the specified Residential Vinyl Flooring from Jacobsen to the locations, layouts and details shown on the drawings, complete with all associated components and accessories. All aspects of this work shall be in complete accordance with the manufacturers' technical literature (check [jacobsens.co.nz](http://jacobsens.co.nz), or call 0800 800 460 for the latest editions), other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Residential Vinyl Flooring from Jacobsen.

#### 10.3.2 Vinyl Sheet

*Studio Elite 3m*

[Tarkett Studio Elite 3m](#). A printed, heterogeneous vinyl sheet floor covering with a tough, wear and scratch-resistant PUR surface. Incorporates Tarkett Extreme Protection and Tarkett MatEffect surface treatments. Installed in accordance with the manufacturer's installation requirements and NZS/AS 1884, to the locations and layout shown on the drawings.

Wear layer thickness: 0.35mm.

Total thickness: 2.4mm.

Sheet (roll) width: 3.0m.

Total weight: 1.73 kg/m<sup>2</sup>.

Classification (EN 685): Domestic: 23. Commercial: 32.

Slip resistance (DIN 51130): R10.

Acoustic impact noise reduction: 19 db.

Reaction to Fire (EN 13501-1): BI-s1.

Underfloor heating: suitable for use over underfloor heating systems - max. 27°C temp.

Colour: to be selected

Installed location: Bathroom, Laundry, WC.

### **10.3.3 Trim & Accessories**

#### *Transition Strip*

Transition Strip - to match existing. Installed as a transition strip between the vinyl and adjacent floor covering in accordance with the manufacturer's requirements to the locations and details shown on the drawings.

### **10.3.4 Underlayment**

#### *MDF Sheet Underlay*

Medium Density Fibreboard (MDF) Thin-Sheet Underlay - as specified below. Minimum 4.75mm sheet thickness. Installed as an underlay over new or existing solid timber strip flooring or wood-based sheet flooring, for subsequent vinyl floor coverings, in accordance with the manufacturer's requirements to the locations and details shown on the drawings.

Manufacturer & brand name: GoldenEdge Thinline

Thickness: 4.5mm

Substrate construction/material: particleboard flooring.

### **10.3.5 Adhesive**

Adhesives for vinyl floor coverings shall be as recommended by the floor covering manufacturer, and must be compatible with the specified floor covering product and its application - including substrate construction and material, and the product's end-use and environment. All adhesives shall be used and applied in strict accordance with the adhesive manufacturer's instructions. Where required by the adhesive manufacturer, seal or prime porous substrates in accordance with the manufacturer's instructions.

### **10.3.6 Samples**

#### *Vinyl Sheet*

Vinyl Sheet. Submit a clearly identified 300mm x 300mm product sample of each vinyl sheet brand and colour specified, for signed approval by the Architect/Designer - do not proceed until the samples have been approved.

Where a colour has not been specified, submit a clearly identified 300mm x 300mm product sample of each colour of the brand name specified, for colour selection and signed approval by the Architect/Designer - do not proceed until the samples have been approved and the colour(s) specified.

#### *Vinyl/Carpet Transition*

Vinyl/Carpet Transition Strip. Submit a clearly identified sample of the specified product, for signed approval by the Architect/Designer - do not proceed until the samples have been approved.

Where a colour has not been specified, submit a clearly identified sample of each colour for the product specified, for colour selection and signed approval by the Architect/Designer - do not proceed until the samples have been approved and the colour(s) specified.

**10.3.7 Co-operation**

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install the specified Residential Vinyl Flooring from Jacobsen as required.

**10.3.8 Workmanship**

All installation work shall be carried out to best trade practice by experienced and competent installers, familiar with the products specified and installation techniques, under the direct supervision of a Registered National Flooring Association (NFA) Member, to fully comply with Jacobsen warranty requirements, in accordance with the manufacturer's installation requirements and NZS/AS 1884.

As recommended by the floor covering manufacturer, use only an approved adhesive that is compatible with the specified floor covering, its substrate and its application/use.

The building must be fully enclosed and weathertight, with all associated edge trim, doors, joinery, etc., installed prior to laying the specified floor coverings.

All work shall be such as to leave a neat and efficient installation.

Do not cover or bridge movement control joints with the specified floor coverings - use only proprietary movement control joints specifically designed for the application and floor covering.

**10.3.9 Delivery & Handling**

Upon delivery to site, inspect the specified products and reject those items that are found to be damaged, defective or contaminated. Contact Jacobsen for replacement of rejected items at time of delivery to site.

Store the specified products and materials undercover, in a weatherproof environment, off the floor, on a flat, even and level surface in accordance with the manufacturer's requirements. Keep products and materials dry, out of direct sunlight and protected from damage, moisture and contamination at all times.

Do not use damaged, defective or contaminated materials or products, or products that are beyond their designated shelf life.

Handle the specified products in accordance with the manufacturer's requirements and in a manner that prevents damage to and contamination of the product.

Allow the specified floor coverings to properly condition for at least 24 hours prior to laying in accordance with the manufacturer's requirements. Maintain the temperature of the installation site, vinyl flooring and adhesive between the range of 18°C to 35° C for at least 24 hours before installation. Do not commence the installation if the room or substrate temperature is below 18°C.



Installers shall be familiar with and comply with all associated product Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

### **10.3.10 Preparation**

#### *New Particle Board Floor*

New Particle Board Floor - check all aspects of preparatory works, including but not limited to: Do not commence preparatory works or vinyl laying until the floor is surface-dry and at the required moisture level over the entire area.

Check for moisture content over the entire area in accordance with NZS/AS 1884, Appendix A.

Moisture content readings at time of surface preparation and vinyl laying shall be: 8 - 12% for air-conditioned spaces, 10 - 14% for intermittently heated spaces, and 12 - 16% for unheated spaces.

Check that the sheets have been installed, jointed and fixed as specified and shown on the drawings, and that all sheet edges are fully supported.

Check that the sheet joints are flush and even, and that all fixings are countersunk and filled with a compatible filler.

Using a proprietary levelling compound, repair flush with smooth, feathered edges any damaged areas in the floor surface.

Mechanically sand to remove all surface irregularities and contaminants likely to effect adhesion.

Leave the surface completely clean and free of dust and contaminants, then fully prime the substrate with an appropriate primer in accordance with the particle board manufacturer's recommendations.

#### *General*

All substrates to be shall be structurally sound, even and smooth, clean, dry, and free from dirt, dust, grease, oil, wax, paint residue, loose plaster and laitance, curing compounds and other materials and contaminants likely to affect adhesion.

Carry out all necessary moisture readings of substrates. Do not commence installation until the moisture readings for the whole area are below the required level.

Carry out all necessary substrate inspections and preparatory work in accordance with the manufacturer's recommendations prior to application.

Subfloors must have no deviations greater than 3mm over a 3.0m straightedge in any direction, and no deviations at all over a 200mm straightedge in any direction.

Check that all fixtures, fittings and embedded items are correctly installed, and that all substrate edges are completed as detailed.

Confirm the location of any movement control joints prior to commencement, ensuring that all joints are trimmed with a proprietary expansion control joint as indicated on the drawings.

Allow floor levelling compounds and mortar screeds to properly cure in accordance with the manufacturer's recommendations before commencing.

The commencement of work on each section/area shall be deemed to indicate full acceptance by the Floor Covering Subcontractor that all preparatory works by other trades are appropriate to achieve the required finished results.

### **10.3.11 Installation**

#### *MDF Sheet Underlay*

**MDF Thin-Sheet Underlay:** Allow the underlay sheets to condition before installation in accordance with the manufacturer's requirements.

Sheet underlayment installation shall be in accordance with NZS/AS 1884, with the sheets installed closely in a staggered (brick) pattern, perpendicular to the direction of the subfloor. Joins in the underlayment sheets shall not coincide with joints in the timber or sheet subfloor. Sheet edges shall be accurately cut to the shape of adjacent walls with sufficient allowance for expansion and contraction.

Fix sheet with divergent staples in accordance with the manufacturer's requirements.

Underlay sheets installed over an existing plywood or particle board subfloor shall be fixed with a compatible adhesive in conjunction with staples.

Set staple heads below the sheet surface, sand all sheet joints flush and even, and vacuum clean to remove all dust.

#### *Vinyl Sheet Flooring*

**Vinyl Sheet Flooring:** Install vinyl sheet floor coverings by direct-stick method to clean, dry and properly prepared substrates in accordance with the manufacturer's recommended installation requirements and NZS/AS 1884. Confirm the vinyl sheet layout and pattern requirements and the location of all seams and joins prior to laying.

As required by the adhesive manufacturer, seal or prime porous substrates or substrates where dusting or powdering exists. The use and application of adhesive shall be exactly to the adhesive manufacturer's instructions.

Allow vinyl sheet floor coverings to properly condition in accordance with the manufacturer's recommendations prior to laying.

Plan the laying sequence so as to avoid any cross joins in vinyl sheet flooring. Where cross joins are unavoidable, obtain written approval from the Architect/Designer of all cross join locations before proceeding. Cross joins in vinyl sheet flooring are not acceptable in wet-areas.

Accurately lay vinyl sheet floor coverings to the layout pattern indicated on the drawings, ensuring that each sheet is correctly fitted and jointed and fully bonded to the substrate, free of air bubbles and distortion. Vinyl sheet floor coverings must be installed in a consecutive sequence from the same roll and in the same direction.

Thoroughly roll newly laid vinyl sheet with a suitably weighted roller to ensure maximum adhesion.

*Edge Trim*

Edge Trim: As required to match existing, install all necessary edge trim - all neatly finished, accurately aligned and true, to the required layout and details shown on the drawings.

*Protection*

Protection: Keep the working area cordoned off during installation and protect completed work from traffic, damage and contamination until hand-over or as directed.

**10.3.12 Completion**

Check that the specified vinyl flooring coverings and associated trims have been correctly installed to the required layout, with all joins, seams, edge-trimming and other detailing correctly finished.

Check the vinyl flooring installation for damage, marks and defects - repair or replace as necessary. Carry out any repairs in accordance with the manufacturer's instructions and to the required standard.

Thoroughly clean the installed vinyl flooring in accordance with the manufacturer's recommended procedures and techniques.

Leave this work complete and to the required standard in accordance with Jacobsen requirements. Leave adjacent surfaces and finished work clean and free of damage. Remove all associated rubbish from site.

Protect the completed installation from damage, trafficable dirt and grime, and stains as necessary until hand-over as scheduled or directed.

Issue to the Owner a copy of the manufacturer's maintenance requirements and a copy of the manufacturer's Product Warranty and the installer's Installation Warranty for the products and installation.