SpencerHolmes
engineers - surveyors - planners

TECHNICAL SPECIFICATION

FOR

PROPOSED NEW TOILETS

AT

GOLDFIELDS MALL
100 MARY STREET
THAMES

FOR

GFSC LIMITED

Spencer Holmes Limited
P O Box 588
WELLINGTON
Phone (04) 472 2261

Reference 140869S01
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SECTION I
PRELIMINARY

1.0 Scope of Work

The Contract Works include the supply of all labour, specified materials, plant and equipment for the "Proposed New Toilets" and other building works at "Goldfields Mall" building, 100 Mary Street, THAMES for "HCSC Limited".

The construction of the proposed new toilets and other building works are located as shown on the drawings on the South side of Goldfields Mall.

Building works will generally consist of demolishing the existing toilet facilities and Cinema rooms to create new toilet and sanitary facilities and a new retail tenancy space of approximately 933m2.

The building works will generally include the construction and alterations of the following items;

- Erect hoardings around building works to protect the safety of the public
- Demolish the existing Cinemas 1 / 2 and associated projection and plant room floors, walls, ceilings and seating. Existing ceilings to remain where possible in "Tenancy space 101". Existing ceilings to be made good where walls have been removed (generally to existing men's and women's toilets and cinema 2 – from grids 1/A-3/D). Retain Electrical Switch Room.
- Construction of new toilets and associated services.
- Construction of new "Tenancy space 101" shop front walls and roller shutter doors and associated building works.
- Demolish existing toilets on the completion of the new toilet block and once a Public Use Certificate has been approved (if required) by Council.

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- Foundation work includes cutting a trench into the existing slab for new drainage work, backfilling and repairing existing reinforcing concrete slab.
- Structural Steelwork to support Roller Shutter Door,
- Carpentry work includes;
  - New timber framed walls and ceilings, linings and finishing trims, doors and the fitting of hardware and signage,
  - Installation of Toilet cubicle partitioning and hardware,
  - New suspended ceiling system framed and braced back to structure.
  - Supply and installation of new automatic roller shutter door,
  - Supply and install new "Tenancy Space 101" timber framed and lined walls and shopfront glazing,
  - Making to good existing ceilings and walls,
- Joinery items include internal doors D1 – 6 inclusive, cabinetry items to First Aid Room, Parents Room, supply Toilet cubicle partitioning, fitting grilles to existing doors, and all 'Other Fixtures' as per Schedule of Materials.

- Painting work includes painting of all new walls and ceilings. Making good to areas where damage has been caused by new work, Painting of new walls and ceilings to the Tenancy space 101 and Corridor. Painting of existing un-lined masonry walls between grids 1/D - 3/G.
- Signage to Toilets and Shopfront
- Floor Coverings includes supply and installation of floor tiles and Vinyl flooring as well as making good to floor tiles (by replacing with new to match existing) where walls have been removed,
- Plumbing: supply and install new water main, new 300litre HWC, and associated hot and cold pipework. Supply and install new sanitary fixtures, toilets, wash hand basins, cleaners sink, accessible floor wastes, all wastepipes, vent pipes and traps, including all associated tapware. Install roof flashings as detailed.
- Drainage: locate existing sewer drain, confirm existing foundation depth (at grid 1/E and 2/E and external wall south side) and provide proposed shop drawing for Engineers approval prior to commencing work, install new inspection chamber, sewer drainage including gully trap, over flow relief gully and drain vents including all cleaning eyes, and floor wastes. Backfill as required. Sleeve all drains 200mm below footings as recommended by Engineer.
- Mechanical services – Install air conditioning units and associated ducting to toilets as shown on plans including all roof plant, supports and associated flashings,
- Electrical – supply and install power, lighting and outlets to new toilet and corridor areas / tenancy space 101 with new switchboard including power to automatic roller shutter door, power to new HWC / supply and installation of new emergency exit signs & lighting as per Fire Report.
- Fire services; - Upgrade the existing Specified Systems and fire protection systems (within the area of new building works) for the automatic sprinklers, emergency warning devices, emergency lighting, mechanical ventilation, and signs as further noted within the fire report.

For the full scope of works for each trade refer to the relevant sections of this specification.

The building works for Goldfields Mall, 100 Mary Street, THAMES shall be carried out in accordance with this "Specification" and "Contract Drawings".

2.0 Referenced Documents

Throughout this specification, reference is made to various New Zealand Building Code (NZBC) acceptable solutions and verification methods for criteria and / or methods used to establish compliance with the New Zealand Building Act.

Reference is also made to various Standards produced by Standards New Zealand (NZS, AS/NZS, NZS/AS), to overseas standards and to listed Acts, Regulations, and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise.

It is the responsibility of the Contractor to be familiar with the materials and competent in the techniques quoted in these publications.

Documents cited both directly and within other cited publications are deemed to form part of this specification. However, this specification takes precedence in the event of it being at variance with the cited documents, with the resolution of any variances being confirmed by the Contract administrator in writing and then notified to the Building Consent Authority for consent prior to any work proceeding.

3.0 Wind Speed

The wind speed is noted as "HIGH" on the Thames Coromandel District Councils IntraMap web. This should be considered as guidance only.

For all non specific aspects of structural design complying with the requirements of NZS 3604: 2011, a "HIGH" wind speed zone should be considered by an Engineer.

4.0 Health and Safety

The contractor shall comply with New Zealand Health and Safety Act regulations, requirements, policies and approved codes of practice. Comply with OSH Best Practice Guidelines for working at height in NZ.

5.0 Temporary Propping

The contractor shall be responsible for providing all appropriate temporary works for the project to be undertaken and completed in a safe and secure manner.

Prevent debris or construction materials from overloading any part of the structure. Do not remove supports until the new work is strong enough to support the structure. Ensure all work remains structurally stable and sound.

6.0 Proprietary Products

All proprietary products are to meet the performance requirements of the manufacturer's specification.

All proprietary products should be installed strictly as per the manufacturer's requirements.

The engineer is to be informed and is to confirm the use of any proprietary product that differs from what is shown on the plans or specification.

7.0 Inspection Schedule

Spencer Holmes Limited have been engaged to undertake construction monitoring to Level CM3 in accordance with ACENZ Conditions of Engagement of the structural aspects which have been specifically designed, notably;

- Foundations prior to placing concrete

- Existing structure upon opening up,
- New structural elements before closing in
- Structural steel
- Final structural

A number of these aspects of construction may require more than one inspection as the works proceed in the various areas of the building.

On completion of these works a Producer Statement PS4 Construction Review, along with copies of the site inspection reports, will be provided on completion of the structural works.

8.0 Drawings and Contract Documents

Detail or other drawings supplied to the Contractor during the course of the contract shall not be taken as authority for extra work. Should the Contractor deem the work involved by such detail to be beyond that contracted for, they shall notify the Engineer and shall not proceed with the work until ordered in writing to do so.

9.0 Subcontractors

The tenderer is expected to assume full responsibility for all subcontractors in the project. The tenderer shall identify all subcontractors, if any, and provide full particulars of the subcontractors. The client may request the replacement of any subcontractor for good reasons. The Contractor shall bring this condition to the notice of all subcontractors.

The Contractor shall be fully responsible for the performance in all respects, including time, of all their subcontractors. The Contractor's programme of work shall be agreed with subcontractors, including nominated subcontractors.

A full list of all subcontractors is to form part of the Tender Documents.

10.0 Local Authority

Note that the local authority is the Thames Coromandel District Council.

11.0 Building Consents, Fees and documents

The building consent fee is to be paid by the Principal.

The Contractor is to allow for the Footpath Damage Deposit (Bond) portion of the consent fee to be claimed against the first progress claim by the Principal thereby binding the Contractor to ensure that no footpath damage occurs. The Contractor is to apply and pay for all other permits etc. as specified in the Special Conditions of Contract.

Where applicable, the Contractor shall comply with all requirements and bylaws of the various territorial authorities.

Approved Building Consent documents shall remain on site.

The contractor shall ensure that a Certificate of Public Use (CPU) is approved by the Local Authority prior to commencing building work on site and that all conditions of the CPU are maintained at all times. All fire safety systems shall remain in operation during the building works. The contractor shall take all precautions to protect the public and manage any special risks (eg: means of escape from fire) during the contract.

12.0 Programme of Work

A detailed programme of work shall be submitted to the Engineer prior to commencing on site activities. The programme is to include a critical path indicating when all major items of work are to be completed.

13.0 Authority for Extra Work or Deductions

Where work involves any reduced or extra cost, the Engineer will issue a Notice of Variation which shall be priced by the Contractor and approved before work starts. Confirmation of the change in cost will be issued in the form of written, numbered and signed instructions "Change Order No. ....."

Instructions from the Engineer to the Contractor headed "Site Instruction" and detail drawings, both of which will be handed to the Contractor from time to time to explain the detail nature of the work, shall not be taken as authority for extra work unless noted "Notice of Variation" to follow.

No extra work will be recognised unless the Engineer's written authority has been given. No deviation from the drawings or Specification will be allowed without the previous authority of the Engineer.
Variations of a minor nature may be discussed and agreed at site meetings. If these variations are agreed, the minutes of the site meeting will reflect acceptance by the Principal for the extra work to be undertaken, either at the agreed price or at a cost to be agreed.

14.0 As-Built Services Drawings

The Contractor shall provide the Principal or their agent with as-built services drawings accurately setting out the actual position, as constructed, of the sanitary drainage, concealed plumbing, underground services etc. Where practical, such drawings shall be prepared by the actual subcontractor or specialist who carried out the work and are to be submitted prior to release of maintenance retentions. The final account will not be paid until suitable as built drawings have been provided.

15.0 Lighting Barricades and Hoardings

The Contractor shall erect sufficient barricades, hoardings, warning lights and signs where the works could constitute a public hazard, to give clear warning of the danger.

16.0 Temporary Services

The Contractor shall provide for all sheds etc. they may need. All sheds shall be of an acceptable standard and compatible with the area.

The Contractor shall arrange for a telephone and pay all the charges arising there from. A cellular telephone is acceptable.

The Contractor shall provide all temporary electricity and water supplies etc, they require to the requirement of the relevant authorities. They will also pay for all charges for use of electricity, water etc. consumed on the job during the course of the contract.

The Contractor shall allow in their Tender for the provision of a sign board indicating project name**,** Goldfields Mall logo, design consultants, and contact numbers. The Contractor and their Subcontractors may combine to produce one single board carrying their names, such sign being to the Engineer's approval. The Principal will not permit signs other than this one to be displayed at the site (except warning and directional signs).

The Contractor shall carry the sole responsibility for the design and construction of their temporary works and for the results obtained using these works in conjunction with the plant and equipment which they elect to use for construction.

The Tender shall be deemed to have allowed for all costs in connection with the temporary works.

17.0 Contractor to Inspect Site

The Contractor shall check and verify all dimensions and conditions on site prior to starting any work.

18.0 Dimensions

Drawings are not to be scaled off.

19.0 Setting Out

The Contractor will be responsible for the accurate setting out of the works true to line and level. The Contractor shall employ qualified staff to do this work. The Contractor shall use the site datum, the position of which will be indicated by the Engineer prior to construction.

20.0 Site Measurements

The Contractor is entirely responsible for verifying all dimensions by checking against actual site measurements. In particular, this responsibility includes their Subcontractors' measurements of as-built dimensions to enable them to fabricate accurately.

21.0 Quality of Workmanship and Materials

Unless expressly stated otherwise, all materials and workmanship shall comply with the appropriate New Zealand Standard and, where none is applicable, the appropriate British Standard specification.

Workmanship is to be in accordance with the best trade practice. Work is to be accurately set out, structurally sound, true to line, neatly executed and finished.

22.0 Materials

Where proprietary brand names or items are specified on the drawings or in the specification, a similar alternative may be offered for approval to the Engineer, provided that the alternative offers the required properties and standard to that specified.

Refer to the "Schedule of materials" within the Appendices at the back of this specification.

23.0 Warranties

Warranties for all products supplied shall be provided to the Engineer / Owner on completion of all works along with any recommended maintenance procedures. Warranties agreements must be submitted before practical completion along with all product information, details, including recommended maintenance procedures.

The minimum warranty period for any product supplied by the contractor shall not be less than 2 years.

Full removal and replacement costs of any items failing to meet their warranty periods shall be at the costs of the contractor.

24.0 Origin and Testing of Materials

Should the Engineer so require, the Contractor shall produce such vouchers and / or other documents as may be necessary to prove that the materials are of the origins and qualities specified.

25.0 Contractor's Working Area

The Contractor shall be responsible for the safe storage of all materials and equipment on site.

At the end of the contract period the stockpile areas shall be left in a clean and tidy condition. Unless otherwise agreed, all surplus materials, rubbish and debris resulting from the Contractor's activities on site shall be removed from the site at the completion of the Contract.

25.0 Inspection

Adequate notice shall be given to the Engineer to enable him to make all necessary inspections whenever required.

26.0 Scaffolding

The Contractor will provide and build all scaffolding necessary for carrying out the work of all trades in accordance with the Scaffolding Act.

All scaffolding shall be erected to the satisfaction of the Scaffolding Inspector and shall comply with AS/NZS 1576 Scaffolding.

27.0 Site Meetings

These will be held once weekly or at timing to be agreed. The Engineer will preside over and minute the meetings which will be attended by the Contractor's Contract Manager and the site foreman. The Principal may attend if timing is suitable. The Contractor shall provide suitable facilities for the holding of such meetings. From time to time, subcontractors may be required by the Engineer to attend, (but this should be rare, since the Contractor is expected to solve their sub-contractors problems outside such meetings).

28.0 Repairing Damage

The Contractor shall repair and make good to the satisfaction of the Engineer and local authorities any damage that may be caused to existing streets, buildings, fences, services, etc., within the duration of the contract and they shall indemnify the Principal against any claims made by adjoining owners in respect of damage caused by the Contractor's operations.

29.0 Cleaning and Protection of Finished Work

Each trade shall protect the work of all other trades. Should damage occur, the Contractor responsible shall make good to the satisfaction of the Engineer.

The Contractor shall keep the site free from rubbish and litter at all times. All reasonable precautions must be taken to protect finished surfaces from damage.

On completion the site is to be left clear and clean, so as to be ready for occupation.

30.0 Notification of Neighbours

The contractor shall notify the adjoining tenancy space within the mall by way of a letter drop to advise them of the works, and contact phone numbers should they have any questions.

SECTION II
DEMOLITION

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

Demolition and Building work should not commence until a Public Use Certificate has been approved (if required) by Council.

This section includes the demolition and removal of the existing Cinemas 1 / 2 and associated projection and plant room floors, walls, ceilings and seating. Demolition also includes walls and part ceilings as shown on the demolition plan to the corridor and tenancy areas.

Stage two of the demolition will include demolition of the existing toilets on the completion of the new toilet block.

Demolition shall include all incidental demolition required for the completion of the proposed building works.

Erect hoardings around building works to protect the safety of the public.

3. Standards

Except as modified by this section, all workmanship shall comply with the appropriate NZ Standard, and the Department of Labour Safety in Construction No 23 Demolition. The Contractor's particular attention is drawn to the requirements of the Health and Safety in Employment Act with respect to the demolition works.

4. Setting Out

The Contractor shall be responsible for setting out the work and, where appropriate, providing temporary works as shown on the drawings.

5. Site Safety

The Contractor shall pay particular attention to the safety requirements in the Preliminary and General section of this specification, with respect to this component of the works.

6. Existing Services

The Contractor is to liaise with the relevant supply authorities to have all existing services which are to be abandoned, in association with the building works disconnected or capped prior to undertaking any demolition work. The costs associated with

disconnecting and capping these services is to be allowed for within the demolition contractor's price.

The drawings show the existing services, as per local supply authority records. The existence or otherwise of any underground services is the responsibility of the Contractor to ascertain from the relevant supply authorities.

7. Service Mark Out

The main contractor shall arrange with the relevant supply authorities for water, drainage, sewer and stormwater, power, telecom and gas to provide a mark out of services in the immediate vicinity of the demolition works.

8. Adjoining Tenancies

The Contractor shall protect adjoining tenancies, and in no way compromise the stability or support of adjoining buildings or site during the demolition. The relevant requirements of the local authority with respect to nuisance (including hours of work, dust and noise) shall be fully allowed for within the demolition contractor's price.

9. Ownership of Materials

Material from the demolition becomes the property of the demolition contractor.

10. Asbestos

The removal of asbestos is to be in accordance with the OSH Guidelines. No allowance is to be made in the tender price, and if asbestos is encountered the Contractor shall seek instruction from the Engineer prior to proceeding.

11. Completion

On completion, the site shall be left in a clean and tidy state with all rubble resulting from the demolition works removed and back-filling undertaken so the site is suitable for the commencement of building works.

12. Recycling

Where possible, all demolition material shall be disposed of to a recycling company, rather than dumping.

SECTION III
CONCRETE WORK

1. Preliminary

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions which are equally binding to all trades. This section of the Specification shall be read in conjunction with all other Sections.

2. Scope

This section includes manufacturing, supplying, forming, positioning and placing of all concrete associated with repair and backfilling of the existing reinforced concrete slab and any foundations removed to install the proposed sewer drainage within the building.

All other work attached to or embedded in the concrete necessary for the completion of the structure as shown on the plans or specified herein.

3. Standards

Except as modified by this section, all materials and workmanship shall comply with the appropriate current NZ Standard.

The following standards are particularly relevant to this trade;

NZS 3101	Code of Practice for the design of Concrete Structures
NZS 3103	Sands for Mortars and Plasters
NZS 3104	Concrete Production - High Grade and Special Grade
NZS 3108	Concrete Production - Ordinary Grade
NZS 3111	Methods of test for water and aggregate for concrete
NZS 3112	Method of tests for concrete:
Part 1	Tests relating to fresh concrete.
Part 2	Test relating to determining the strength of concrete.
Part 3	Tests other than strength
Part 4	Tests relating to grout.
NZS 3113	Chemical admixtures for concrete
NZS 3114	Concrete surface finishes
NZS 3117	Specification for pigments for Portland Cement and Portland Cement Products
NZS 3121	Water and aggregate for concrete
NZS 3122	Portland cement (ordinary, rapid hardening and modified).
NZS 3151	Specification for Precast Lightweight Concrete Panels and Slabs
SAA/SNZ HB84	Guide to Concrete Repair and Protection

4. Materials

All materials shall comply with the current relevant NZ Standard.

a. Cement

Unless otherwise specified cement shall be Type GP, General Purpose Portland cement, complying with the requirements of NZS 3122.

Cement in storage shall be kept dry and on a platform at least 225 mm above the ground.

Cement which has become lumpy or partially set shall be condemned and removed from the works immediately. Cement shall be ordinary Portland cement complying with NZS 3122, so stored and handled as to be protected from moisture or any contamination.

The Engineer may at any time require tests or analysis to be carried out in accordance with the Standards. Any cement not approved shall be removed from the site or from the place of manufacture.

b. Aggregates

Aggregates and their grading shall comply with NZS 3121.

The source of the aggregates shall be approved prior to commencement of manufacture and neither the source of the aggregate nor the grading shall be changed during the course of the contract without approval.

When requested by the Engineer, the supplier shall submit the results of sieve analyses carried out by a laboratory qualified and equipped for such work.

The use of pumps for concrete placement shall not constitute an acceptable justification for reduction in aggregate size.

c. Water

Water shall comply with NZS 3121 and shall be free from significant amounts of deleterious impurities.

d. Additives

Air Entrainment

Where the manufacturer considers it desirable, an air entrainment agent may be added providing the use complies with the requirements of NZS 3109 and NZS 3119 are complied with.

The target air content shall never exceed the maximum target air content specified in NZS 3109.

Where a super plasticiser is used no air entrainment shall be adjusted for the air entraining effects of the super plasticiser.

Super plasticiser

Where specified, a super plasticiser of Daracem 100 (or similar approved) as manufactured by WR Grace shall be used at the rate recommended by the manufacturer sufficient to increase the slump from an initial of 50mm to 140mm.

Other Additives
No other additives shall be used without the approval of the Engineer. Approved admixtures shall comply with NZS 3113 and their use in concrete shall be in accordance with that code.

Admixtures shall not contain calcium chloride, nor shall they adversely affect the reinforcement or any protective coating thereon.

5. Manufacture of Concrete

5.1 General
All concrete shall be as per the mix designs given at the end of this Section.

The Contractor shall notify the Engineer in writing before commencing the works whether he intends to use ready-mixed or site-mixed concrete. Site mixing of concrete will not be permitted where ready-mixed concrete is available unless approved by the Engineer. Ready-mixed concrete shall comply with the requirements of NZS 3104, and shall be supplied by an approved supplier from a plant approved by the New Zealand Ready Mixed Concrete Association for the manufacture of the nominated grade of concrete. This approval is to be sought prior to the commencement of the works.

Manufacture shall comply with the requirements of NZS 3104 and all details of the proposed concrete supply as required by NZS 3109 clause 6.9 and 6.10 shall be submitted to the Engineer for approval prior to commencement of supply.

Trial mixes shall be made for concrete containing super plasticisers. As the use of super plasticisers increases the strength of the concrete, the test strength of test cylinders taken from the trial mix shall be used as the target strength for the future mixes. No reduction in cement content will be permitted through the use of the super plasticiser.

No reduction in cement content will be permitted through the use of the super plasticiser.

Concrete mixes shall be stipulated in the Schedule of Concrete Mixes at the end of this section of the specification.

5.2 Manufacturer's Control Testing
The Contractor shall allow for all costs incurred by the manufacturer in order to carry out quality control testing as required by NZS 3104. Results shall be forwarded to the Engineer within 7 days of testing.

6. Delivery of Concrete to Site

Concrete shall be delivered from the batching plant to the site in accordance with NZS 3104. Concrete shall be transported without loss of mortar or segregation. Delivery dockets shall show the job, date and time of loading the mixer drums, grade, specified strength and slump.

The time between adding the ingredients to the mixer and discharging at the site shall in no case exceed 90 minutes, or 300 revolutions, whichever comes first or such shorter time as directed by the Engineer.

The addition of water to the mix after dispatch from the ready mix plant is strictly forbidden.

Copies of all delivery dockets shall be collected by the foreman.

7. Handling & Placing

7.1 General

All concrete shall be handled and placed in cleaned and prepared formwork in accordance with NZ Standards, with care being taken to avoid segregation and to minimise the time between manufacture and placement. Methods of concrete placement and pour sequences to be approved by the Engineer before work commences.

The Engineer shall be advised at least 24 hours before any concrete is to be placed so that he may inspect the formwork, reinforcement, foundations, construction joints and discuss proposed placing methods before placing commences.

Work on the section to be poured shall be complete in all respects before pouring starts.

NO CONCRETE SHALL BE PLACED UNTIL THE ENGINEER HAS APPROVED THE FOUNDATIONS, REINFORCING STEEL, FORMWORK AND CONSTRUCTION JOINT PREPARATION.

7.2 Unfavourable Conditions

Concrete shall not be placed on frozen ground, nor shall concrete be placed in unfavourable conditions which may be detrimental to the quality and finish of the concrete in the structure, unless adequate precautions are being taken. Unfavourable conditions shall be deemed to include low temperatures (below 5 degrees with temperature descending or below 2 degrees with temperature ascending), excessively hot dry conditions, excessively wet conditions or any conditions making it impracticable to work or finish concrete adequately.

When the pouring of concrete is interrupted by rain, the area shall be covered immediately and the pour shall then be terminated at properly formed construction joints in positions approved by the Engineer.

7.3 Handling and Placing

The method of placing concrete shall be approved by the Engineer prior to placing concrete, but such approval will not absolve the Contractor from providing dense homogeneous concrete.

Dropping of concrete through a free fall greater than 2 metres shall not be permitted unless otherwise approved. For tall vertical elements the maximum fall of concrete shall be limited to 1.5m/100mm of member thickness.

Concrete shall be transported, handled and placed in a manner which will avoid segregation and shall be placed before initial set occurs. Where reverberations of any layer fails to cause the concrete to become plastic, no fresh concrete shall be placed over it and the surface of the layer shall be treated as a construction joint. No concrete shall be placed over any layer in which initial set has already taken place.

As far as possible the placing of concrete shall be controlled to ensure that any free fall is entirely clear of reinforcement.

Concrete shall be placed directly in corners, at ends and at 1.5m intervals along the formwork. The depth of each layer shall not exceed 500mm and it shall be well worked into the preceding layer.

The Contractor shall submit a proposal for the handling and placing of concrete to all wall and column pours and obtain the Engineers approval of such methods prior to the commencement of formwork fabrication.

Care shall be taken to avoid shock or vibration to newly set concrete.

The depositing of a large quantity of concrete at any point with the intention of moving it along the forms will not be permitted.

The use of troughs, chutes and pipes to aid in depositing concrete to its final position shall be permitted provided that they are kept clean and free of any coating of hardened concrete.

The use of water to facilitate the movement of concrete along the troughs, chutes or pipes will not be permitted.

7.4 Construction Joints

Where new concrete is to be bonded to old concrete the surface of the old concrete shall be prepared by chipping back to expose fresh aggregate and covering with a coat of epoxy resin adhesive just before concrete is placed.

The concrete placing shall be carried out continuously between construction joints and in such a manner that a plastic concrete face is maintained. Where the location of construction joints are shown on the drawings, they shall neither be relocated nor eliminated without the approval of the Engineer. Where no construction joints are shown on the Contract Drawings and such are required, their location shall be to the approval of the Engineer.

8. Vibration

Unless specifically instructed otherwise, all concrete shall be vibrated to produce a dense uniform mass with at least two approved high frequency immersion vibrators (not less than 133 Hz) operated by experienced workmen.

The vibration shall be sufficiently intense to cause the concrete to settle rapidly into place and to positively affect the concrete over a radius of at least 500mm. The vibrator shall be uniformly inserted, not further apart than the vibration is visibly effective and sufficiently close to the forms to effectively vibrate the concrete at the formed surface.

Vibration shall be such that expulsion of entrapped air and settlement of the concrete is visibly evident over all areas of the surface and shall continue until this action ceases and until coarse aggregate at the surface is embedded. Vibration shall not be prolonged

beyond the time at which this condition is reached and care is to be taken to avoid vibration of reinforcing steel or formwork and to withdraw the spud slowly.

Concrete in all wall and column pours shall be revibrated just prior to the initial set to ensure that plastic slumping does not result in plastic cracking in the upper portion of the pour.

9. Curing

9.1 General

Freshly cast concrete surfaces shall be protected from premature drying and excessively hot or cold temperatures or damage from rain. Curing shall be commenced as soon as the exposed surface has hardened sufficiently but not later than two hours after finishing.

All concrete surfaces shall be cured for a minimum of 14 days. Curing may consist of maintaining the concrete surface wet by periodic hosing or a continuous fine water spray for 14 days or by periodic hosing for the first 7 days followed by the use of a sprayed membrane for a further 7 days.

Polythene or hessian may be used to reduce water loss. All plastic sheeting must be fully lapped at joints and sealed at the edges.

Where form work is removed from vertical surfaces within the specified curing period, the exposed concrete surface shall be fully cured.

The use of curing compounds may be approved depending on the type of member concerned, expected weather conditions, and possible effects on applied finishes. A curing compound may be approved only if acceptable test records in an independent Telarc approved laboratory in accordance with ASTM C156 and meets the requirements of ASTM C309. Evidence shall also be submitted to show that any compound proposed will not impair the subsequent application of finishes. It should be noted that many P.V.A. or resin based compounds will not meet the requirements of the above Standard.

10. Tests During Construction

Tests shall be carried out during construction to check the compliance of the concrete with the specification. The tests required shall be carried out in accordance with NZS 3112, Parts 1 and 2 and NZS 3109 by an independent Telarc registered laboratory properly trained in the techniques required. The Contractor shall provide and keep on site all equipment necessary for the making of all tests required by the specification.

10.1 Slump Tests

Frequency of Tests

A slump test shall be made immediately concreting is commenced and at all times when compression test samples are taken. Selected snatch slump tests shall be made at all times that the slump appears excessive and at such other times when directed by the Engineer.

Procedure

Slump tests shall be carried out in accordance with Section 5 of NZS 3112 Part 1.

Evaluation
For acceptance, the results of slump tests shall have a value within the tolerance limits stipulated in table 9.1 of NZS 3109 as appropriate to the type of sampling adopted.

Concrete which fails to comply within the tolerance limits will be liable for rejection at the discretion of the Engineer and the ready mix plant shall be notified accordingly.

10.2 Air Content Test for Air Entrained Concrete

Frequency of Tests
Where air entrained concrete is used on the work, air content tests shall be carried out at the plant for each mix proposed for the work and site tests shall be carried out when directed by the Engineer.

Procedure
Air content tests shall be carried out in accordance with Section 9.4 of NZS 3112 Part 1.

Evaluation
For acceptance, the results of an air test shall have a value within the tolerance limits stipulated in table 9.4, NZS 3109 as appropriate.

Concrete which fails to comply within the tolerance limits will be liable for rejection at the discretion of the Engineer.

10.3 Cylindrical Compression Tests

Frequency of Tests
Notwithstanding that the ready mix plant may be carrying out tests at the plant, one sample shall be taken each day concrete is placed for each 75 cubic metres of concrete or part thereof unless otherwise directed by the Engineer.

Procedure
Each compression test sample shall consist of three test cylinders sampled, cured and tested in accordance with clause 9.5.6 of NZS 3109.

Where a compression test sample does not meet the acceptance criteria, the extent of and location of the concrete represented by the sample shall be established. No further concrete shall be placed where it would prejudice the subsequent removal of the suspect concrete unless authorised by the Engineer.

The Contractor may arrange to have confirming tests made of hardened cores of concrete from the part of the structure in question. The taking and testing of cores shall be carried out by a TELARC registered laboratory in accordance with Section 9 of NZS 3112 Part 2 and cores shall be taken at positions approved by the Engineer after the reinforcement has been located using a profometer.

The subject concrete will be accepted as structurally adequate providing the requirements of NZS 3109, Clause 9.5.7 are satisfied.

11. Falsework And Forms

Shall be used whenever necessary to support, confine and shape the concrete to required dimensions.

11.1 Design

Falsework and formwork shall be designed in accordance with sound engineering principles to support in safety all loads arising from freshly placed concrete, with due allowance for the effects of vibration and construction loads anticipated according to the method and rate of placing proposed and so that construction joints may be easily and properly prepared.

No change from the proposed method and rate of placing shall occur unless the adequacy of the formwork and falsework is checked.

Formwork shall be securely braced and have sufficient strength and rigidity to maintain the specified dimensional tolerances under the design loads.

Falsework loadings to the structure shall be controlled and arranged so as to not result in overloading of the building or any part thereof.

11.2 Erection

Formwork shall be erected true to line taking care to avoid abrupt deviations at joints.

Joints shall be without gap when concrete is poured. Allow for using foam plastic strips in all joints.

Prior to pouring, through bolts shall be retightened near construction joints to limit abrupt deviations.

All falsework shall be founded on material or construction which is capable of carrying the loads placed upon it, in addition to any load already being supported, without permissible stresses or deflections being exceeded.

11.3 Surface Preparation

All forms shall be cleaned before use or re-use. The interior surfaces of forms shall be treated with a release agent to prevent adhesion of concrete, except formwork for surfaces which are to receive an applied finish, which shall not be treated with release agents.

No part of the reinforcement or construction joints shall be coated with the release agents.

11.4 Rough Sawn Boxing Formwork

Rough sawn boxing formwork shall be free of holes and capable of providing a surface finish complying with the specified tolerances.

11.5 Fairface Plywood Formwork

Formwork shall be plywood, as new sanded smooth.

The location of form ties and positioning of joints shall be to a definite and uniform pattern conforming to the line of the structure and to the Engineer's approval.

11.6 Fillets

Unless specified otherwise forms shall be radiused, filleted or chamfered at all sharp edges and re-entrant angles, and shall be given a slight bevel at all projections to ensure easy removal without damage to concrete.

Unless otherwise specified fillets shall be 20mm across the diagonal face.

The surface of fillets shall match that of the forms.

11.7 Cleanliness

Immediately before any concreting is commenced, formwork shall be cleaned to ensure that all dirt, shavings, sawdust and other debris is removed.

11.8 Stripping

The Engineers approval shall be obtained before the stripping of all formwork.

In general, formwork shall not be stripped until the minimum periods set down in table 5 of NZS 3109, with due allowance for cold weather, have elapsed, or such extended time as the Engineer considers necessary.

Where the Contractor wishes to strip at earlier ages the contractor shall arrange for field cured tests. Field cured tests shall be in accordance with NZS 3109 and the results of such tests will be considered by the Engineer in approving a reduction in stripping times.

After approval, forms shall be removed without shock or vibration and in such a manner as to permit the concrete to take the superimposed loads gradually.

Unless otherwise approved by the Engineer, concrete members shall not be assumed capable of supporting any superimposed loading until the concrete has reached the specified strength after which time the superimposed loading shall at no time exceed the design loading.

Immediately after stripping, surfaces requiring curing shall be treated as specified above.

11.9 Safety

At regular intervals during the pour the foreman shall inspect the falsework and forms for undue settlement, bulging or other defects. Should any defect occur, the Contractor shall cease pouring until all necessary corrective measures have been taken.

Before the pour is recommenced the Engineer shall be notified.

12. Surface Finish

12.1 General

Surface finishes shall be as set out in the Schedule of Surface Finishes at the end of this section of the specification.

Surface finishes shall comply with the requirements of NZS 3114 for the class of surface finish nominated.

All surfaces shall be finished true to line and level as shown on the Drawings and shall be free of bony or porous areas and excessive depressions or projections. Horizontal surfaces shall be finished with a wood or steel float as required to achieve the tolerances specified in NZS 3109.

The Contractor shall be responsible for determining the method of producing the specified finish and for ensuring that the execution of the work at all times is carried out and supervised by personnel skilled in the production of the class of finish specified.

12.2 Formed Surfaces

The following applies to all surface finishes unless otherwise specified.

Normal air bubble surface blemishes are to be reduced by:

Placing concrete in layers not exceeding 500 thick.

Effecting optimum compaction by inserting the spud for sufficient time and at sufficiently close intervals to produce full vibration. More vibration will be required as the placing nears the top of the walls.

Surface tolerances, colour variation and physical irregularities shall comply with the requirements of NZS 3114 for the class of finish specified in the schedule of surface finishes.

Precast units shall be dense, watertight and uniform in respect of colour and texture.

Bolt holes shall be filled in accordance with the treatment specified.

When the surface finish does not comply with the requirements of the specified surface finish, and minor surface defects exist, the surface dressing treatment for minor repairs shall be carried out as specified below.

12.3 Unformed Surfaces

Surface tolerance, colour variation and physical irregularities comply with the requirements of NZS 3114 for the class to finish specified in the schedule of surface of surface finishes.

Floor surfaces shall have no abrupt deviations, and gradual deviations shall not vary by more than 3mm from a 3 metre straight edge placed anywhere on the surface, and such maximum variation shall extend over a minimum distance of 1 metre.

13. Protection

Protect all new concrete work and ensure that no heavy loads are placed on or moved over the finished concrete until twenty eight days old.

14 Slabs On Ground

14.1 Preparation

Cast external slabs in a pattern sequence.

Before casting slabs, be sure that:

- The ground surfaces are at the correct level to provide full slab thickness of the whole area.
- Formwork for construction joints is placed and adequately supported.
- The membrane is complete and undamaged.
- The steel is placed and adequately supported.

Firmly fix screeds so that movement cannot take place during a pour. Ensure that the top surface is dressed timber fixed at finished level.

Dryers shall not be used and additives may be used only with the Engineers authority.

Concrete in a given slab shall not be placed until a minimum of three days in temperate weather and seven days in cold weather have elapsed since the pouring of the adjacent slab

Lay floor slab in strips as indicated on the drawings and when the concrete has obtained its optimum strength saw cut joints as shown.

After all floor slabs are at least 2 months old and preferably as late in the contract as possible saw cut construction joints taking care to follow the construction joint.

14.2 Construction Joints

Lay floor slab in strips as indicated on the drawings. Where these are not shown on the drawings the layout of construction joints are to be nominated by the Contractor and confirmed with the Engineer. Refer note below.

Construction joints are to be marked so as they can be accurately located and saw cut when the concrete has obtained its optimum strength. This is to be confirmed with the Engineer and Concrete Manufacturer.

Note: In general construction and control (sawn) joints shall be required in slabs of greater dimension than 6m x 6m size or at re-entrant angles of non rectangular slab pours. The location of all construction (or sawn) joints is to be confirmed with the Engineer prior to placement of reinforcement to the slab.

The contractor shall allow for all costs associated with the provision of construction joints in accordance with these requirements.

14.3 Control (Sawn) Joints

Control joints or "Sawn joints" are to be marked so as they can be accurately located and saw cut when the concrete has obtained sufficient strength for the saw cuts to be made without causing spalling to the concrete. This is to be confirmed with the Engineer and

Concrete Manufacturer but generally no later than 48 hours after the placement of the concrete.

Saw cuts shall be $^1/_3$ slab depth unless otherwise specified.

Where the Engineers preferred layout of control (sawn) joints are not shown on the drawings the layout of control (sawn) joints are to be nominated by the Contractor and confirmed with the Engineer. Refer note above for construction joints.

The contractor shall allow for all costs associated with the provision of control joints in accordance with these requirements.

14.4 Tolerances

Floor surfaces shall not vary by more than 3mm from a 3 metre straight edge placed anywhere on the surface and such variation shall extend over a minimum distance of 1000mm.

15. Schedule Of Concrete Mixes

Concrete mixes shall be as follows:

Location	Specified Strength (MPa)	Grade of concrete	Slump (mm)	Cement content (kg)	Max w/c	Max sand %	Max Aggr (mm)
Floor Slabs	30* Low Shrinkage	Special	T.B.C	300 min	0.50		19

w/c = water cement ratio
S/P = super plasticiser

* Mix design to be approved by Engineer

** Refer mix design notes for concrete containing super plasticiser.

16. Schedule Of Surface Finishes
Unformed Surfaces

Location	Surface Finish to NZS 3114
All floor slabs	U3 X

Special Requirements for U3 X Finish

Shall be compacted and floated with "Kelly" machines fitted with discs to provide a smooth level uniform and dense hard wearing surface.

At least two machines shall be available at the time of finishing.
Along walls and in other inaccessible positions, finish by hand steel trowelling.

Hand finish edges of slab to provide a dense hard wearing surface.

Do not commence finishing until the moisture film has disappeared from the screeded surface and the concrete surface has hardened sufficiently to prevent an excess of fine material from being worked to the surface.

Formed Surfaces

Location	**Formwork**	**Surface Finishes**	**Fillets**	**Stripping Agent**
Formed surfaces exposed foundations	Rough Sawn	F3	Yes	Mould Oil

Unless otherwise specified surface tolerances, colour variations and physical irregularities shall comply with the requirements of NZS 3114 1987, for the class of finish specified in the schedule of surface finishes.

SECTION IV
REINFORCING STEELWORK

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

This section includes the supply, cutting, bending, placing and fixing in position of all reinforcing bars shown on the drawings. The Contractor shall allow for all supports, spacers, ties as specified. The use of imported reinforcing, without the prior written approval of the Engineer will not be accepted on this project. Contractor to allow to supply and install reinforcing sourced from New Zealand Steel in their tender.

3. Standards

The following standards shall apply:

NZS 3109	Specification for concrete construction
NZS 3402	Hot rolled steel bars for concrete reinforcement
NZS 3421	Hard drawn mild steel wire for concrete reinforcement
NZS 3422	Welded fabric of drawn steel wire for concrete reinforcement
NZS 4461	Cold worked steel bars for the reinforcement of concrete
NZS 4702	Metal-arc Welding of Grade 275 Reinforcing Bar

4. Material

4.1 Reinforcing Steel

Reinforcing bars shall be either Grade 300 or Grade 500 complying with NZS 3402: 1989, as designated on the drawings. (Bars designated with an "X" or "H" prefix shall be Grade 500).

Grade 300 round mild steel rods complying with NZS 3402 shall be used for all stirrups, column ties and other reinforcement requiring tight hooks or tight bends, unless noted otherwise

Grade 300E and grade 500E MA deformed steel rods complying with AS/NZS 4671 shall be used for all other reinforcement as detailed.

All high strength reinforcing steel to be New Zealand manufactured micro alloy steel (denoted as MA). Reinforcing steel produced with the quenched and tempered process (denoted QTR) is NOT to be used on this project. Imported reinforcing steel will NOT be accepted without the specific written approval of the Engineer, and shall be demonstrated to be in accordance with AS/NZS 4671 and manufactured by the micro alloy process.

Reinforcement grades are to be as specified on the drawings. Grade 500E reinforcement is not an acceptable substitute where grade 300E mild steel has been specified.

Welded wire mesh reinforcement shall conform to the requirements of NZS 3422: 1975 and shall have a 0.2% proof stress of not less than 480 MPa.

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, unless shown otherwise on the drawings.

Unless detailed otherwise all bars shall be assumed to be continuous, with lap lengths of 40 and 60 bar diameters for Grades 300 and 500 respectively.

4.2 Mesh

Welded wire mesh reinforcement shall conform to the requirements of NZS 3422: 1975 and shall have a 0.2% proof stress of not less than 480 MPa.

Mesh Type: SE62 Grade 500E super ductile reinforcing mesh complying with AS/NZS 4671.

The use of "Economesh" shall not be permitted on this project.

4.3 Tying Wire

Tying wire shall be 1.2mm soft black iron wire.

5. Workmanship

5.1 Detailing

Where savings in steel may result, the Contractor may submit alternative lap positions to the Engineer for approval. However, no change from that shown on the drawings shall be made without the Engineer's written approval.

Where laps are not shown, they shall be staggered so that not more than one quarter of the rods are lapped within any 1000mm length.

All mesh shall be lapped 300mm and tied at every second intersection. No laps in the reinforcing mesh shall occur at the locations of sawn joints

The Contractor shall check the dimensions of all reinforcement before proceeding.

5.2 Fabrication

Reinforcement shall be cut and bent strictly in accordance with the drawings, the standard details and the requirements in NZS 3109 shall apply wherever the drawings are not fully explicit.

Reinforcement shall be bent cold unless otherwise approved by the Engineer.

When bends in reinforcement are not shown on the Contract Drawings and are required by the Contractor he shall submit details of the proposed bending to the Engineer for approval.

Bending shall not be carried out in a manner that may injure the material; in particular, bent bars shall not be re-bent within twenty bar diameters of any original bend.

Deformed bars shall not be bent around fixed pins. Rollers shall have the least possible resistance to movement to avoid undue stretching at the bends.

5.3 Placing Reinforcement

Reinforcement shall be accurately placed and securely fastened in accordance with the drawings. Adequately support reinforcement with chairs, spacers or hangers, etc., securing against lateral displacement during placing and vibration of concrete.

Support slab reinforcement at not more than 1 metre centres.

Approved plastic spacers shall be used on all fairface work.

The Contractor shall obtain the Engineer's approval of the method to be used to support the reinforcement prior to the placing of reinforcement.

All specified concrete cover shown on the drawings must be adhered to. Where not shown, the cover must comply with the requirements of NZS 3109.

Starters cast into concrete shall not be bent in any way except as instructed by the Engineer.

All reinforcing to be lapped 40 diameters and mesh 300mm.

5.4 Welding

Welding of reinforcement is not permitted.

5.5 Tolerances

Reinforcement shall be bent and placed in accordance with NZS 3109.

6. Penetrations, Embedded Services, Inserts

The Contractor shall be responsible for coordinating the penetrations and embedment requirements for all trades, and the provision of them in accordance with the requirements of the Contract Documents.

All weld plates shown on the drawings are to be securely tied in place to adjacent reinforcement so that they remain level and true during the concreting and finishing operations.

All concrete inserts shall be anchored back into the concrete by placing through the hole in the base of each insert a 500mm long tie-rod of as large a diameter as the hole permits.

7. Inspection

Concrete shall not be placed until formwork and reinforcement have been inspected and accepted by the Engineer. 24 hours notice of readiness for inspection shall be given, unless otherwise agreed by the Engineer.

8. Schedule Of Reinforcing

LOCATION	TYPE
All Stirrups and Ties	Grade 300 Round
Floor Slabs	SE 92 Mesh

SECTION V
STRUCTURAL STEELWORK

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

This section includes the supply, fabrication and erection, cleaning and painting of all new steelwork associated with the support structure for the Roller Shutter Door. Details for this will need to be provided once a visual site inspection has been carried out by the Engineer.

3. Standards

Materials and workmanship shall confirm to the current requirements of the following Codes and Standards except where modified by this Specification;

NZS 1365	Tolerances for Flat-Rolled Steel Products
NZS 1397	Steel Sheet and Strip - Hot Dipped, Zinc Coated or Aluminium/Zinc Coated
NZS 3401	Specification for Hot Rolled Sections
NZS 3403	Specification for Hot-Dipped Galvanised Corrugated Steel Sheet for Building Purposes
NZS 3404	Steel Structures Code
NZS 4711	Qualification Tests for Manual Metal-arc Welders
AS/NZS 1050	Methods for the Analysis of Iron and Steel
AS/NZS 1110	ISO Metric Precision Hexagon Bolts and Screws
AS/NZS 1111	ISO Metric Commercial Hexagon Bolts and Screws
AS/NZS 1112	ISO Metric Hexagon Nuts, Including Thin Nuts, Slotted Nuts and Castle Nuts
AS/NZS 1252	High Strength Steel Bolts with Associated Nuts and Washers for Structural Engineering
AS/NZS 1553	Covered Electrodes for Welding
AS/NZS 1554.1	Welding of Steel Structures
AS/NZS 1554.4	Welding of High Strength Quenched and Tempered Steels
AS/NZS 1554.5	Welding of Steel Structures Subject to High Levels of Fatigue Loading
AS/NZS 1650	Hot-Dipped Galvanised Coatings on Ferrous Articles
AS/NZS 2717.1	Ferritic Steel Electrodes
AS/NZS 3750	Paints for Steel Structures
AS/NZS 3678	Structural Steel - Hot Rolled Plates, Floorplates and Slabs
AS/NZS 3679.1	Hot Rolled Bars and Sections
AS/NZS 3679.2	Welded I Sections
AS/NZS 4291	Mechanical Properties of Fasteners
NZS/BS 1449	Steel Plate. Sheet and Strip

NZS/BS 4827	Specifications for ISO Miniature Screw Threads, Metric Series
NZS/BS 4848	Specifications for Hot Rolled Structural Steel Sections
AS 1101.3	Welding and Non-Destructive Testing
AS 1163	Structural Steel Hollow Sections.
AS 1275	Metric Screw Thread for Fasteners
AS 1443	Carbon Steels and Carbon-Manganese Steels - Cold-Finished Bars
AS 1554.2	Stud Welding
AS 1559	Fasteners-Bolts, Nuts and Washers for Tower Construction
AS 1594	Hot-Rolled Steel Flat Products
AS 1627	Metal Finishing - Preparation and Pretreatment of Surfaces
AS 1657	SAA Code fro Fixed Platforms, Walkways, Stairways and Ladders - Design, Construction and Installation
AS 1789	Electroplated Coatings - Zinc on Iron or Steel
AS 1858	Electrodes and Fluxes for Submerged-Arc Welding
AS 2074	Steel Casings
AS 2203	Cored Electrodes for Arc Welding
SAA/SNZ HB 62	Safe Erection of Structural Steelwork

Completed work shall be free of cracks, laminations, damage or other deformation likely to affect strength of appearance.

4. Materials

Steel:

Unless otherwise specified all hot-rolled steel sections shall comply with AS 3679.1 for Grade 300PLUS or Grade 350.

Welded sections shall comply with AS/NZS 3679.2 for Grade 300PLUS.

Where specified, BHP NZ Steel (Steltech) welded sections shall comply to AS/NZS 1594 for Grade HA 300 (plate thicknesses less than 10mm), AS/NZS 3678 (modified) for Grade 300MOD (plate thicknesses of 10mm to 32mm) and Grade 250 (plate thicknesses greater than 32mm).

Flat bar shall be Grade 300PLUS in accordance with AS/NZS 3679.1.

Steel plate shall be in accordance with AS/NZS 3678 for Grade 250 and AS/NZS 1594 for Grade HA 250.

RHS and SHS sections shall be Grade C350 to AS 1163.

Circular hollow sections of up to 50mm OD shall be Grade C350 to AS 1163. For CHS above 50mm external diameter, the sections shall be to ASTM A106, Grade B or similar, with a yield stress of 241MPa, unless noted otherwise. CHS of diameters above 300mm shall be spiral welded steel pipe from Humes Steelpipe Ltd, Grade HA 250 or HA 350 steel plate to AS/NZS 1594. Other types and grades of steel shall not be used without the approval of the Engineer.

All materials shall be straight and clean. If straightening or flattening is required it shall be undertaken by a process and in a manner that will not injure the material. Material with kinks or bends shall be rejected. All steel shall be of Rust Grade A or B as defined in the Swedish Standard SIS 05 59 00: Rust Grades for Steel Surfaces and Preparation Grades Prior to Protective Coating.

Manufacturer's Certificates in accordance with AS/NZS 3678, AS/NZS 3679 and AS 1163 shall be available for inspection.

Where cold rolled steel purlins and / or girts are shown on the drawings they shall be to the sizes and sections detailed and shall be supplied by an approved manufacturer. Holes shall be provided for standard end connections using 16mm diameter bolts and for the number of standard tie rod/bracing struts detailed per span.

Unless noted otherwise on the drawings all purlins shall be galvanised.

The Contractor shall provide all tie rods and bracing channels, including washers and double nuts, fitted strictly in accordance with the manufacturer's recommendations. These items together with all fixing bolts shall be finished to the same standard as the purlins and/or girts.

The use of materials complying with Standards equivalent to those given above will only be permitted with the prior approval of the Engineer.

Nuts and Bolts:
All nuts and bolts shall be 150 metric coarse threads, hexagon Grade 4.6 (AS1111 and AS 1112 respectively) except where bolts Gr 8.8 (AS 1252) are specified.

All bolts, nuts and washers exposed to the weather (even if under canopies or cover ways) shall be hot dipped galvanised.

All bolts shall be supplied with at least one washer.

Use bevelled washers where necessary for true bearing.

Electrodes:
All electrodes shall comply with NZS 4701.

5. Erection

5.1 Handling, Delivery to Site and Storage

Steelwork shall be handled and stored in a manner that will not overstress or deform.

Members shall be stored above the ground so as to avoid contamination.

Members bent or buckled from handling or storing shall be liable to rejection.

Bolts, nuts and washers shall be supplied and stored in grit free watertight containers.

Burred, damaged or otherwise unserviceable bolts shall not be used. 8.8/TF and 8.8/TB bolts shall not be re-used after tensioning.

Handle and store electrodes, electrode wire and flux in accordance with the manufacturer's recommendations.

5.2 Erection Procedure

The Contractor shall give at least 48 hours notice to the Engineer of the time when he proposes to start erection.

Riggers must use and wear safety harnesses at all times.

The Contractor shall provide falsework and all the tools, machines and appliances including pilot and driving nuts, drift pins and fitting up bolts necessary for the expeditious handling of the work and shall remove them from the site after completion.

The Contractor shall provide, install and afterwards remove, sufficient temporary bracing to keep the structure plumb and in true alignment until other structural units provide the necessary permanent bracing. The steelwork shown on the drawings is that required in the design for the finished structure only and is not necessarily adequate for construction purposes. Any failure to make proper and adequate provision against damage during erection shall be the entire responsibility for the Contractor. The temporary guying and bracing should be capable of resisting all wind and earthquake forces on the structure during the erection period. Do not use bracing to force the structural frame into its correct position. Tighten bracing only after the frame has been squared, aligned and plumbed or, if inserted at an earlier time, loosen to permit these operations and tighten to a taut state on completion.

Where sections of existing structure are to be removed or strengthened the Contractor shall provide all the necessary support required to prevent distortion of the existing structure and excessive loads being placed on other parts of the structure.

All members shall be erected, fixed, adjusted and maintained in their intended vertical lateral alignment and level. Members which do not meet the tolerances specified in Clause 15.3 of NZS 3404 shall be liable to rejection.

The safety requirements, erection cranes, equipment, scaffolding and staging shall meet the requirements of the Department of Labour or other controlling authorities. The Contractor shall adopt an erection procedure such that all members can be placed and fixed in position without distortion.

During erection the steelwork shall be made safe against the wind and all erection stresses and loading conditions including those due to erection equipment.

Permanent bolting or welding shall not be carried out until correct alignment and preset or camber, if any, have been obtained in each member of the structure.

Additional members used to facilitate erection shall be affixed in a manner which does not weaken or deface permanent steelwork.

No holes shall be made in the flanges of any framing member for erection or for any other purpose unless specified.

Unless noted otherwise the fixing of purlins and girts shall be in accordance with the manufacturer's specifications.

The level and alignment of beams shall conform to the tolerances given in clause 15.3.5, NZS 3404.

The alignment and plumbing of struts shall conform to the tolerances given in clause 15.3.3, NZS 3404.

Remove all erection fittings and make good.

6. Workmanship

All work shall be carried out by skilled tradesmen.

Work on and off the site shall comply with NZS 3404:1989.

6.1 Cutting and Fitting

Before assembly is commenced, the fabricator shall verify important dimensions on site to ensure accurate fit on erection.

Tolerances for fabrication and erection shall comply with the requirements of NZS 3404. Steelwork shall be new, clean of rust or mill scale, free from twist steelwork, within a tolerance of 1mm in 1000mm from a flat plane in any direction and not more than 6mm overall.

Cutting may be by shearing, cropping, sawing or machine flame cutting. Hand flame cutting will be permitted by competent operators.

Re-entrant cuts shall be filleted to a radius of not less than 10mm.

Building up mis-cuts with weld metal will not be permitted.

All exposed sharp edges or corners shall be lightly ground to ensure that paint will adhere to these edges.

6.2 Bolting

Bolts

Bolt holes shall be drilled. Enlarging by flame cutting or drifts is prohibited.

No part of the threaded portion of a bearing bolt shall be within the thickness of the parts to be bolted together.

Threaded ends of bolts projecting beyond the end of the nut, if visible in the completed structure, shall be cut off flush with the end of the nut, except where otherwise specified.

Provided the projection is consistently not more than 10mm beyond the end of the nut, cutting off will not be required.

Provide Main Contractor with holding down bolts and templates for accurate positioning.

Only where specified on the drawing shall nuts be welded.

6.3 Welding

General
All welding shall conform to the requirements of AS/NZS 1554.1 : Structural Steel Welding. All welding shall be Class B (GP) unless noted otherwise.

Preparatory work, procedure and sequence of welding shall be such as to obviate distortion and minimise shrinkage stresses. Fully prepare and clean off all fusion faces and surrounding surfaces. Work is to be positioned for flat welding wherever possible.

Maintain a 5mm gap between all parts to be butt welded together by use of soft wire cushions. All butt welds shall be brought up proud of the parent metal.

The Contractor shall arrange for all welders employed on the work to be tested by welding inspectors nominated by the Engineer. The testing shall be in accordance with the requirements of NZS 4711: Qualification Tests for Manual Metal-arc Welders, and the Contractor shall be responsible for the payment of all costs in respect of the tests.

Welders shall only be employed on the types of weld for which they have satisfactorily completed tests.

Site welding shall not be undertaken without approval.

Qualification
All weld operators shall be skilled in welding in the positions in which they are to be engaged and for each welder employed on the contract, the Contractor shall submit evidence of satisfactory tests made by an approved authority in accordance with NZS 4711.

Qualification of procedures and personnel including all costs shall be allowed for and performed as specified in NZS 4701.

Preparation
Fully prepare and clean off all fusion faces and surrounding surfaces.

Main 1.5mm gap between all parts to be butt welded together by use of soft wire cushions.

Welding Operation
All welds shall be Class B unless otherwise stated.

The visible surface of all welds shall be clean, regular and of uniform contour.

The weld metal as deposited shall be free from cracks, slag inclusions, gross porosity, cavities and other deposition faults.

The weld metal shall be properly fused with the parent metal without serious undercutting or overlapping at the toes of the weld.

All butt welds shall be brought up proud of the parent metal.

NOTE: *Particular care must be taken when welding near inflammable material or vapour. All precautions must be taken to prevent sparks entering a potentially flammable area. An effective CO_2 fire extinguisher must be kept adjacent to the welder at all times. Check that area is gas-free prior to commencing work.*

7. Tolerances

Notwithstanding general tolerances, particular attention is required to the setting out for the supports such that exterior walls may run true to detail.

8. Testing

Specialist Welding Inspection
Before any welding is commenced, advise the Engineer so that an inspection of the prepared surfaces can be made.

Non-destructive testing, may be used to determine weld quality.

The cost of testing welds shown to be defective and the repair, or making good thereof, shall be met by the Contractor.

9. Holding Down Bolts

Where required, proprietary bolts will be used in diamond drilled holes. The type and size of these bolts is nominated on the drawings. Provide these bolts complete with round washers and allow to drill the holes and install the bolts in accordance with the manufacturer's recommendations.

Where required, provide cast-in bolts to the following tolerances:

Bolts - centrelines not more than 3 mm in any direction

Bolts in sleeves - sleeve centrelines not more than 5mm in any direction

Where practicable, bolt groups shall be prefabricated into cages to facilitate their placement. Bolts not confirming to the required tolerances shall be reported to the Engineer together with proposed remedial measures.

Alterations to steelwork to accommodate out-of-tolerance bolts without the approval of the Engineer may be cause for rejection.

10. Painting To Steelwork Not Exposed To The Weather On Completion

All steelwork not exposed to the weather shall have the surface cleaned to remove all rust, scale and bloom edges using blasting, electric wire brushes, scrapers or grinding machines. At the time of priming, the steel shall be dry and free from dirt, grease, rust or loose mill scale.

All steelwork excluding parts embedded in concrete and including all bolts, nuts, cleats, etc. shall be primed with 1 full coat of Inorganic Zinc Primer. (dry film thickness 40 microns).

11. Completion

On completion the paint system shall be complete, undamaged and in accordance with Resene recommendations.

SECTION VIII
DRAINLAYER

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

This section includes the following work:

Disconnect, seal and cap of all existing drains to be made redundant by new building works to the satisfaction of the Local Council and Engineer.

Supplying and laying pipes for new sewer drain and any other specials. Work to include the provision of all under slab services.

Locate existing sewer drain, confirm existing foundation depth (at grid 1/E and 2/E and external wall south side) and provide proposed shop drawing for Engineers approval prior to commencing work, install new inspection chamber, sewer drainage including gully trap, over flow relief gully and drain vents including all cleaning eyes, and floor wastes. Backfill as required. Sleeve all drains below footings as recommended by Engineer. New sewer drains shall be clear of the existing footings by 500mm as noted on the drawings.

Provide as built drainage plans on completion to Engineer and Council.

3. Permits and Fees

The Principal will pay for all fees relating to building consent application. The Contractor shall pay for any additional inspections made necessary due to errors made by the Contractors, etc.

4. Workmanship

All drainage work is to be carried out by a registered tradesman and shall comply with Building Industry Authority Documents E1 and G13.

Drainlayers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a craftsman plumber registered under the Plumbers, Gasfitters and Drainlayers Act 1976.

5. Materials

The Contractor shall supply all pipes, bends, junctions, rubber rings and specials required to complete the work. All materials shall be free from defects.

Materials and installation shall comply with NZBC B2 and G13/AS2 2.0 Materials and BS / AS / and NZ Manufacturing and Installation Standards and Specifications.

6. Excavation

Excavate trench true to line and grade and of sufficient width to allow for jointing operations. The depth of the excavation shall allow for the required granular bedding or concrete surround, as given in the table below.

Allow to remove all excavated material from the site.

Minimum cover shall be	With 100 min concrete slab over	With 100 min concrete surround	With no concrete surround
Subject to traffic loadings	300	500	900
Not subject to traffic loadings	200	300	500

7. Laying

Lay the pipes in the trench (on bedding if required) true to grade and line and correctly jointed. Advise the drainage inspector prior to back-filling so that inspection and testing can be carried out.

Pipe to be connected to downpipes shall finish 20mm above slab level in the exact position for the downpipe to discharge vertically into the collar. After the downpipe has been installed seal the downpipe in the collar with mortar, or as otherwise approved.

8. Connections to Existing Drains

Locate and excavate around the existing drains and make sewer connections as necessary.

9. Backfilling

Backfilling material shall be free of stones or other material liable to damage the pipes.

All backfilling shall be thoroughly compacted by ramming in layers not exceeding 200mm in thickness.

No mechanical compacting equipment shall be used until 300mm of backfill has been placed over the pipe.

No drains shall be covered until they have been inspected, tested and approved by the local authority.

10. Rodding Points

Rodding points shall comply with Building Industry Authority Documents E1 and G13 with concrete surround to support cast iron frame and lid. The top surface of the frame shall finish true to level at the finished ground level or concrete slab level.

11. Interceptors, Manholes and Sumps

All interceptors, manholes and sumps shall be in accordance with the drawings and the Building Industry Authority Document G13. These shall be correctly positioned as per the drawings. All sumps for the collection of stormwater from the site to be of a trapped type in accordance with Building Industry Authority Document E1 and G13.

12. Exterior works

Sealed paths affected by pipe runs shall be reinstated to the same condition or better than the existing pathways or to the satisfaction of the Engineer.

13. Clean-up

Upon completion, the drainlayer shall clean up all materials surplus to the drain laying operation, and remove from site.

SECTION IX
CARPENTRY AND JOINERY

1. Preliminary & General

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions which are equally binding to all trades. This section of the Specification shall be read in conjunction with all other Sections.

2. Scope of Work

The scope of works under this section (includes the supply and installation) comprises of the following building works;

- Generally includes all carpentry and joinery work within the new toilets , tenancy spaces numbered '101' and '102' including making good to areas damaged by new building work and all other work as shown on the drawings or nominated within this specification.
- All timber wall and ceiling framing to NZS3604 / NZS3602, including any bracing elements, damp proof course (dpc's),
- All plasterboard linings including stopping, plastering and finishing systems ready for Level 4 paint finish,
- All finishing trims, skirting's, architraves and moldings as detailed.
- Re-instate existing roller shutter door and making good to tenancy space '102'. 123 MART.
- Supply and installation of new automatic roller shutter doors RSD1 and RSD2. Note; supporting structure to be determined on site by Engineer, also refer to steel work section.
- All interior doors. Fitting of selected hardware, refer to Miscellaneous Hardware Section.
- All fixtures and fittings as per Materials schedule to toilets including signage to toilets and other areas,
- All Joinery cabinets to Kitchen, First aid and Parents room,
- All Toilet cubicle partitioning and associated hardware,
- New suspended ceiling system and plasterboard ceilings as shown on drawings framed and braced back to structure.
- All supporting structure to proposed new aluminium shop front glazing. Also refer to the Shop Front Glazing Section within this specification.
- All 'inter-tenancy' steel stud framing and track system.

Any other work which would customarily involve the carpenter whether or not referred to in this specification or shown on the drawings necessary for the proper completion of the works.

3. Timber

Timber and wood based products shall comply with NZS 3602. Timber shall be graded to comply with NZS 3631, "Classification and Grading of NZ Timbers".

Timber treatment levels shall comply with the requirements of the Structural Timberwork section of this specification.

The following NZ Standards, including all related amendments and other statutory references apply to this section of the work.

AS/NZS 1748 Product Requirements for Stress-Graded Timber
AS/NZS 2269 Plywood - Structural
NZS 3602 Timber and Wood-Based Products
NZS 3603 Timber Design
NZS 3604 Light Timber Frame Buildings (not requiring specific design)
NZS 3618 Mechanical Stress Grading of Timber
NZS 3621 Standard Names of Commercial Timbers in New Zealand
NZS 3631 New Zealand Timber Grading Rules
NZS 3640 Minimum Requirements of the NZ Timber Preservation Council Inc.

All wall framing, lintels, floor joists, beams and trusses to be MSG8 (Machine Stress Graded) or VSG8 (Visually Stress Graded) to the requirements of NZS 3622: 2004 "Verification of Timber Properties". Note that No. 1 Framing Grade is not acceptable.

Framing timbers shall not exceed 20% moisture content at the time of enclosure. Finishing timbers shall not exceed 14% moisture content.

All kiln-dried, dressed and finishing timbers shall be stacked under cover on delivery to site. Timber used for falsework or any other temporary purposes shall not be incorporated in the building.

4. Workmanship

All framing shall be in accordance with NZS 3604 "Light Timber Frame Buildings". The best workmanship shall be employed in thoroughly securing and framing together, spiking and bolting down as the various circumstances require. Only skew nailing will be permitted in the framing. Punch all nails in exposed joinery and work to be painted. All nails and spikes shall be of gauge and length suitable for the particular work. Nails shall enter the second timber at least one half their length before punching.

Remove all arises, rough patches, hammer-marks, and other surface defects before beginning painting.

5. Gauging & Thickness

All framing timbers shall be of the required thicknesses to produce regular plain surfaces. All exposed timbers are to be gauged.

6. Dressing

All external and internal finishing timbers shall be machine dressed. All internal finishing timbers are to be gauged.

7. Fixings & Fastenings

Nails, brads, screws, and bolts shall be steel of the best quality, except that non-corrodible metal or hot dipped galvanised steel shall be used externally, where inserted in redwood or totara, or where covered by plaster, paste and similar substances. Co-operate with Concrete Worker and other trades to install all bolts and fastenings.

Attachments to concrete shall be by bolts (built-in or engaging in approved expanding sockets), or by screws in Philiplugs (or equal).
Hardware shall be fixed with screws of similar material and finish to match.

8. Framing

Main Contractor is to ensure that the building is built accurately to the sizes shown on the drawings. Construct timber framing in accordance with NZS 3604 for a minimum standard, or to the details shown on the drawings.

9. Beads, etc

Provide and fix all necessary beads, stops, fillets, backing's, linings, furring's or bearers that may be required for the proper carrying out and completion of the work.

10. Damp-Proof Course

Under all timber plates fix malthoid fabric damp-course, neatly cut around all bolts, etc.

11. Interior Linings

Supply and fix internal linings in accordance with best trade practices, site guides and to manufacturer's recommendations. High impact trims and metal angles shall be used for all corners along with reinforced taping.

Contractor to achieve Level 4 finish as set out out in Winstone Wallboards GIB Site Guide Dec 2014.

- Ceilings: 13mm Winstones GIB Ultraline
- Walls: 13mm Winstones GIB Toughline / GIB Aqualine

Prefinished sheet linings shall be installed in accordance with best trade practice and the manufacturer's installation instruction manual 'James Hardies HardiGlaze Installation manual April 2014 New Zealand'. Sheets to be laid horizontally. All joints 9including corners shall be silicone jointed over a bond breaker tape as per the wet area details. Paint all edges prior to silicone jointing.

- James 6.0mm HardiGlaze lining.

14.0 Finishing Timbers

Allow to provide all finishing timbers as required in finger jointed pine.

15.0 Doors

15.1 Internal doors

Interior doors shall be solid core paint quality doors on "wide" paint quality finger jointed pine 45mm rebated jambs. Frames are to be finger jointed pine, rebated to accept the Gib board linings and comply with the construction requirements of NZS 1158.

All joinery shall be the best of its respective kind and thoroughly seasoned to a moisture content between 12% - 16% before machining. Check all dimensions before manufacture.

16.0 Timber Treatment and Grading

Timber shall be treated in accordance with the current requirements of the hazard specifications of NZS 3640. Where not specified they shall comply with NZS3602. Timber grading shall comply with NZS3622.

Timber supplied that is inappropriately treated and or incorrectly branded shall be removed and replaced with timbers that comply with the specification.

As a minimum standard the following species, treatment and grade levels will be required;

TIMBER SPECIFICATION	
	Species/ Treatment / grade
Exterior wall framing (Other Claddings)	Radiata Pine / H1.2 / MSG8 or VSG 8
Battens and packers (treated in final size)	Radiata Pine / H3.1/ MSG8 or VSG 8
Interior Framing	Radiata Pine / H3.1/ MSG8 or VSG 8
Internal Plywood lining	Radiata Pine / H1.2 / to AS/NZS2269 – BD Grade
Exterior Plywood (substrate)	Radiata Pine / H1.2 / to AS/NZS2269 – CD Grade

17.0 Joinery

The scope includes cabinets to Kitchen, First aid room and Parents room.
All joinery to be made by qualified and registered New Zealand Master Joiner (http://masterjoiners.nz/).

All joinery cabinets and carcass to be 18mm MDF Melteca faced. Colours to be selected.
All edges to Melteca including shelving, cupboards doors, drawer facings, end panels and packers to be clashed with 3mm 't' section PVC. colour to match.

All bench tops to have coved upstands with Formica High Pressure Laminate over 2/18mm MDF. All front edges to be bull-nosed, edges to be flat.

All junctions in wet areas to be sealed with silaflex 'c' , including to the tops of bench top upstands.

17.1 Hardware

Drawer/cupboard pulls : generally Scotts furniture part stainless steel 7634017 (160 x 35) and for pot drawers 7634066 (384 x 35)

Provide Hettich 'Innotech' drawer slider system all drawers. 30 kg bearing capacity generally.

All cabinet hinges to be concealed 'grass' or similar approved self closing type.

Provide Ø8mm door buffers behind all drawers and cupboard doors to quieten impact from closing. Provide plastic screw caps (colour to match melteca surface) to all visible screw heads.

Provide cutlery insert in top drawer of first aid and parents room, joinery

Parent's room stainless steel sink bench insert c/w strainer, waste and overflow for sink.

18.0 Roller Shutter Doors

The Automatic roller shutter door/s shall be installed in accordance with the manufacturer's installation details.

Motorising; Allow to co-ordinate power supply with Electrician. Install 3 phase power only if required. Provide external key switch and remote control.

Provide and install curtains, bottom rails, barrels and guides. Include mullion between door pairs.

Co-ordinate all building work and electrical work with other trade subcontractors.

Selection: Scotty Doors – 6 Atlas Place
Atlas 12 – Aluminuim Roller Grille
Finish Satin Silver Anodised Aluminium.

Scotty Doors
6 Atlas Place, Mairangi Bay
Auckland 0632
Phone 0800 760 687
www.scottydoors.com

Provide manufacturers guarantee and product warranty for 2 yrs.

19.0 Toilet Partition System

The Toilet Partition System shall be installed in accordance with the manufacturer's installation details and specifications.

Partitions shall be set out in accordance with the drawings.

Selection:	Hale manufacturing – Stratos HPL Partition System – 1955mm high partitions set-out as shown on the floor plans.
Panel finish:	18mm Marine-Ply core faced with high pressure laminate in wet areas. Silver anodised aluminium edge trim to perimeter of all panels.
Panel finish:	Colour to be selected.
Channels:	30mm x 25mm x 3mm silver anodised aluminium channel forming head rail and wall brackets.
Indicators:	Satin chrome plated indicator lock with large turn button and red/green indication.
Coat hook:	Design patented concealed Avanti coat hook and bumper.
Hinges:	Stainless Steel 75mm x 50mm hold closed (not self-closing) butt hinges.

Provide a two year guarantee for boards, hardware and installation.

20.0 Suspended Ceiling

Armstrong RH 99 Ultima ceiling tiles in a 24mm Peakform exposed two way grid system

20.1 General

This section relates to the supply and installation of Forman Building Systems suspended ceiling systems, including Acoustic ceiling panels and all elements offered to complete the system.

20.2 Manufacturer's Documents

Manufacturer's and supplier's documents relating to work in this section are:

Armstrong 30 year limited ceiling and suspension ceiling system warranty
Peakform 24 mm Exposed Tee System
Armstrong Ultima

20.3 Installation

To AS/NZS 2785. Installation by a manufacturer's accredited installer, using the manufacturer's technical services. Provide evidence of experience, listing completed projects of similar size and complexity

Installation to comply with the loadings code AS/NZS1170. Installation to comply with the requirements of NZS 4219; with related building services installations complying specifically with clauses 2.22, 2.25 and 2.29.

20.4 Cleaning Instructions

Supply information on the materials and method of cleaning the ceiling system over its expected life.

20.5 Spares

Provide spare matching ceiling elements to be equal to 3% of the total tiles used on the project. Deliver into a dry store at the site or elsewhere as directed and at agreed times.

20.6 Loading Code Requirement

Comply with the requirements of NZS 1170.

20.7 Certification

Provide:

- certification of compliance NZS 1170, section 8 for evaluation
- certificates and other evidence that the system offered complies with the standards of performance specified
- a Producer Statement on completion.

20.8 Armstrong Peakform Suspension System

Grid finish/colour: Armstrong global white

20.9 Perimeter Trim - Steel

Brand/form: Armstrong PeakForm perimeter trim by Forman Building Systems
Material: Hot dipped galvanized steel
Finish/colour: Armstrong global white

20.10 Ceiling Tiles

Armstrong Ultima supplied by Forman Building Systems.

20.11 Co-Ordinate Services

Co-ordinate and co-operate with electrical and mechanical work to avoid conflict between suspension members and luminaires, diffusers, pipework and ducting. Confirm the provision of extra hangers and fixings.

Ensure co-operation with work in and above the ceiling, including the marking of specific ceiling tiles below major access points to above-ceiling services. Colour coded markings to follow the standards laid down by mechanical and electrical services.

20.12 Penetrations

Accommodate recessed light fittings, air conditioning outlets and other electrical and/or mechanical services that are fixed to or pass through the ceiling system. Provide independent support for these as necessary.

20.13 Protect Existing Work

Protect adjacent existing work from damage during the installation.

20.14 Replace

Replace damaged or marked elements.

20.15 Leave

Leave work to the standard required by following procedures.

20.16 Remove
Remove debris, unused elements and elements from the site.

20.17 Clean
Clean soiled or marked units.

21.0 Steel Stud Wall Partitioning System

21.1 General Requirements
Workers to be experienced, competent and familiar with the materials and techniques specified.

21.2 Warranties
Warranties this work under normal environmental and use conditions against failure of materials and execution Warranty period: 2 years Refer to PRELIMINARIES and GENERAL section for the required form of warranty agreement and details of when completed warranty must be submitted.

21.3 Steel Stud and Suspended metal ceiling Systems
Rondo Steel Stud partitioning system shall be installed in accordance with the NZBC, manufacturer's installation manual and to relevant standards and regulations.

21.4 Standards and Code requirements
Extruded aluminium alloy 6063 with silver anodised finish.

21.5 Replace
Replace damaged or marked elements

21.6 Leave
Leave work with parts fully and freely working and to the standard required by following procedures.

21.7 Remove
Remove debris, unused materials and elements from the site.

SECTION X
PLUMBER

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

This section of the Specification covers the supply and fitting of;

- reticulation of hot and cold water services to the various areas of the modified / fitted out building as indicated on the drawings and schematics,
- Supply and install to NZBC new 135litre hot water cylinder including trays , bracing of cylinder, vents and connections.
- Supply and installation of all plumbing fixtures and fittings within the Men's Toilet, Women's Toilet, Accessible Toilet, Cleaner sink, First Aid Room and the Parents Room, refer to the Schedule of Materials,
- include roof flashings associated with plumbing work,
- include supply and install of all associated hot and cold water supply,
- all valves and taps associated with the above,
- all work associated with the provision of the above.

All pipe work is to be brazed copper.

3. Guarantee

Prompt attention shall be given to replace defective materials and cure any leaks within a period of two years commencing from the end of the maintenance period.

4. Regulations and Standards

All plumbing work shall comply with Building Industry Authority Documents E1 and G13 and NZS 671. Give all necessary notices, obtain all relevant consents, and pay all fees due.

All pipework and fittings for the reticulation of water shall:

(a) comply with G12/AS1 or AS/NZS 3500.5 section 2 and

(b) be installed by a person authorised under the Plumbers, Gasfitters and Drainlayers Act and Regulations.

The Principal has paid for all fees relating to the building permit application.

Allow to pay for all other additional tests and permits, including those made necessary due to the Contractor's error.

5. Workmanship

All work shall be carried out in accordance with best trade practices by skilled craftsmen.

The plumber shall ensure that the builder provides and fixes all necessary supports, grounds, etc. and makes all other provisions so that plumbing work may be finished in a thorough, neat and tradesman like manner.

Check all dimensions on site. Zinc or galvanised iron shall not be in contact with copper. Lead or copper shall not be in contact with aluminium.

Dissimilar metals shall be separated by Malthoid washers or bitumastic paint. Similarly, separate aluminium from concrete.

All cutting, drilling and fixing shall be included, but no work of other trades shall be so cut that damage is done to structural or finished work. No structural steel shall be cut without the permission of the Engineer.

Co-operate with other trades as required.

6. Materials

All materials shall be as specified and only of the best quality of their respective kinds and comply with NZBC / B2 / AS1.

Galvanised Pipework and Fittings
Shall be medium weight to BS 1387.

Copper Pipe Work
Shall be of the weights and gauges specified in the plumbing regulations. All internal building pipework to be copper (except Rotorua).

P.V.C. Pipes
Shall be to NZS 7641 and NZS 7642.

7. Water Supply

Any underground water pipes are to be MDPE (blue polythene).

Allow to locate and re-route the existing water main connection to the existing toilets.

Water supply to comply with G12/AS1.

8. Hot Water Cylinder

Provide and install a 135 litre Mains Pressure Electric Hot Water Cylinder as shown on the drawings and schematics in accordance with NZBC G12/AS1 or AS/NZS3500.5

All valves, pressure reducing and relief valves, expansion control valves, isolating valves, tempering valves, tundishes shall be installed in accordance with the relevant provisions of NZBC G12/AS1 or AS/NZS3500.5

Install Seismic Restraint to the Hot Water Cylinder (storage heater) in accordance with NZBC G12/AS1 – figure 14.

9. Waste and Vent Pipe System

All waste pipes to sink shall be concealed in the wall framing with no penetrations through the finished floor, unless authorised in writing by the Engineer prior.

Provide and install complete all waste pipes, traps and vent pipes for all sinks as required by AS3500.2 and as per drawings.

Waste systems shall be polypropylene or uPVC and discharge in to gully traps.

Traps shall be polypropylene S or P.

Vents shall be PVC pipes and fittings to underside of roofing and 0.55 gms above. Provide flanges to roof and seal connections to vents.

All wastes run under floor slabs shall be in P.V.C.

Pipe work shall be concealed in timber walls.

10. Sinks and Tapware

Refer to Carpentry and Joinery Section, Parents room and First Aid sinks to be supplied by Joiner built in within the joinery units. Plumber to provide all tapware as per Schedule of Materials.

Supply and install hot and cold water supply as shown on the drawings and schematics.

11. Test

Subject all water installations to a full water pressure test. All fittings shall be tested and left in working order to the satisfaction of the Engineer. All pipe work shall be tested before wall linings are fixed. Allow for all tests as required by the Territorial Authority.

SECTION XI
PAINTER

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

Works shall include all preparatory work, supply of materials and painting of the interior surfaces as scheduled in the table at the end of this section.

Paint new plasterboard linings, mdf trims, skirtings and bulkheads. timber trims, existing concrete columns and walls.

Painting work shall include making good to all existing areas where damage has been caused by new work.

Painting contractor shall allow for painting to;

- Main entry ceiling area,
- Existing walls and ceilings within the toilet and other areas, including tenancies 101 and 102.
- Existing columns within toilet and other areas, including spaces 101 and 102.
- All existing areas which have been affected / damaged by new building work.

3. Preparation of Surfaces

No painting, enamelling or similar finishing work shall be performed until all surfaces are in a suitable condition to receive and finish. The Engineer is to be notified of surfaces prepared by others that are unsuitable to receive finishing works.

4. Materials

All materials shall be first quality paint, delivered on site in unbroken packages. No materials shall be mixed on any unprotected floor surfaces. Paint finishes to shop interior to comply with spread of flame index not greater than 2 and smoke development index not greater than 5.

5. Workmanship

All work shall be of the highest standard performed by skilled tradesmen and shall conform with the recommended practice set out in NZS 7703 "Recommendations for the Painting of Buildings".

Paint shall not be applied to damp surfaces. External painting shall not be undertaken in unsuitable weather conditions.

All care shall be taken not to stain any existing finished surface.

The painter must take care to protect all freshly painted surfaces from dust, dirt etc during and after painting operations.

6. Colours and Paint Types

All colours and paint types shall be as specified in the painting schedule at the end of this section. The painter shall allow for preparing samples of all paint for approval of the Engineer before any of the work is put in hand.

7. Priming

Attend to all priming as required during progress of the work.

Brush primer thoroughly into the woodwork to completely cover the whole surface.

Priming shall be of the type recommended by the paint manufacturer and compatible with the paint system scheduled.

MATERIAL	PAINT TREATMENT
Gibraltar Board, Plywood and Fyreline	Prime with Resene Sureseal @ 12.5m^2/litre

8. Stopping and Rubbing Down

After paint priming has been applied and fully set, all nail holes, cracks, shrinkages etc shall be neatly filled and stopped with linseed oil putty or other approved stopping. Between each coat lightly rub down with a fine grade glasspaper to cut off all imperfections, and provide a suitable surface for subsequent coats. Final coats shall not be applied until the Engineer has approved the preparatory work.

9. Undercoats

All undercoats shall be compatible with the finishing coat. No consecutive coats of paint are to be of the same shade, except in the case of white.

10. Finishing Coats

All finishing coats shall be used at the received paint consistency except that, with the permission of the Engineer, thinning may be allowed to within the limits specified by the paint manufacturer. On gloss and semi-gloss paint finishes a 'flat porcelain' type of finish is required. An 'orange peel' type of finish will not be accepted. Apply two finishing coats at an application rate of 16m^2/litre or as recommended by the manufacturer.

11. Ceilings and Pelmets

Plasterboard ceilings shall receive one sealer coat, an intermediate and two finishing coats, as shown in schedule.

12. Cleaning Up

The interior and exterior of the building including all glass, floor fittings and all other sub-trades work shall be left clean and free from all paint and other marks and imperfections caused by this trade.

13. Painting Schedule

Paint system to plasterboard, mdf trims, skirtings and bulkheads. timber trims, fibre cement claddings, metal balustrades, exposed steel work (wall bracing elements)

PAINTED AREAS	WALLS	CEILINGS (NOT TILES) AND BULKHEAD AND PERIMETERS	DOORS AND TRIM
Open Plan Tenancies and Toilet Areas	Sealer - Broad Wall Sealer 1st – Acrylic Undercoat 2nd – Lumbersider 3rd – Lumbersider	Sealer - Broad Wall Sealer 1st – Resene Ceiling Paint 2nd – Resene Ceiling Paint 3rd – Resene Ceiling Paint	Sealer - Quick Dry Acrylic Primer Undercoat 1st – Quick Dry Acrylic Primer Undercoat 2nd – Lusta Glo Semi Gloss 3rd – Lusta Glo Semi Gloss

SECTION XII
ALUMINUIM SHOP FRONT & GLAZING

1. Preliminary and General

The subcontractors shall pay attention to that section of the preliminary and general clauses that relate to their trade.

2. Scope

This section includes the supply and installation of the Aluminium Shopfront sections and glazing complete with aluminium reveals. Include door D8 and associated hardware to D8.

3. Materials

3.1 Glass

Grade A safety glass shall be used and sized in accordance with NZS4223 and Section 309 Shopfront Glazing and sized to suit the proposed Aluminium shopfront profiles. Maximum glass thickness shall be 12.38mm laminated glass or to suit selected shopfront sections. Glass to shop frontage shall be of uniform thickness.

Provide temporary safety markings on all full height panes until permanent signage applied.

3.2 Aluminium Shopfront

105mm Potters A Series (Or Similar Approved).
Finish to be silver anodised.

3.3 Sealants

Sealants for glazing shall be the best of their respective kinds for the purpose and area in which they are being used. At butt joints between panes and other visible sealant positions, use a clear silicon sealer with anti-fungicidal properties.

3.4 Gaskets

Gaskets for glazing shall be extruded neoprene.

3.5 Screws

All screws for fastenings shall be non magnetic stainless steel.

4. Guarantee

Provide a 2 year guarantee from the end of the maintenance period for failure of the anodic finish. Prompt attention shall be given to replace defective materials.

5. Proposals by Shopfront Window Contractor

The window contractor shall submit with their tender sufficient information for the quality of the product offered to be assessed. In particular the following will be required;

- Methods of mounting and securing glazing at the floor slab,
- Methods of shopfront sections into openings,
- Glass Type and thickness of glazing,
- Confirmation that glazing has been sized in accordance with the requirements of the NZBC and NZS4223.

6. Installation

Inspect location of installation prior and slab prior to installation to confirm acceptance. Advise the Engineer if the rebate is unsatisfactory.

Glass shall be dry glazed to frames and rendered thoroughly watertight with Neoprene seals.

7. Completion

Leave installation clean. Protect frames from mortar, scratching and paint splashes.

SECTION XIII
ELECTRICAL WORK

1. Preliminary and General

The Preliminary and General clauses of this specification apply to this trade. The Electrical Contractor shall allow for co-operation with all other trades, specialist suppliers and installers.

2. Scope of Work

The electrical work covered by this contract includes supply, installation, testing, commissioning, and maintenance of the electrical services as shown on the drawings and schedules and described in this specification.

Performance requirements: Provide lighting to a minimum of 800Lux (at floor level) throughout the Lincraft tenancy area. On completion provide a certificate to verify lighting levels of 800Lux (measured at 8pm) have been achieved.

These services include, but not necessarily limited to:

1. Electrical - power supply to new switchboard / lighting including strip lighting to pelmet / emergency exit signs & lighting / power to automatic roller shutter door. Add thermostat controls to extended mechanical air conditioning within kitchen and office areas.
2. Isolate existing power to tenancy area and remove all redundant electrical cabling as directed on site.
3. Install new sub main electrical distribution board switchboard to the Tenancy providing new circuits for power and lighting.
4. Supply and install power supply to **new Lift** along with additional power to allow for submersible pump connection within lift pit.
5. Supply lighting to Engage lighting specialist to propose
6. Supply and install new lighting to the suspended ceiling area, new lighting to office and kitchen, new pelmet track lighting,
7. Supply and install new EXIT signage to tenancy above doors leading to the egress route,
8. Ensure existing power points within tenancy are working.
9. Other Electrical, Data and Communication outlets to exterior walls of the tenancy are to be confirmed by Lincraft, allow a nominated PC sum for this work (amount to be confirmed by Engineer). **Note: If Electrical, Lighting, Power or other work is shown on the plans or noted within this specification it should be included within tender.**
10. Emergency Lighting is covered in section 16, allow to supply power as required to these items.
11. Allow to supply power and lighting to the 'Lincraft' storage area facility.

All minor items necessary for the full completion of the installation shall be provided.

3. Standards, Permits and Inspections

The Electrical Contractor shall comply with the latest versions of following standards and regulations:

- AS/NZS 3000 and associated standards.
- The New Zealand Building Code Handbook and Approved Documents.

Where a particular standard is quoted the work and material shall comply with that standard.

Where no standard is quoted, or where there is conflict between this Specification and drawings and the above standards, refer to the Engineer and obtain instructions before proceeding.

All work shall be carried out in accordance with the requirements of the Engineer and any statutory authority that has jurisdiction over the installation.

The Electrical Contractor shall obtain the necessary permits before commencing work and shall pay all fees and charges relating to them.

4. Materials

All materials and equipment shall be new, of the highest quality, and comply with the current appropriate New Zealand Standards. The Electrical Contractor shall obtain and comply with all instructions for handling, preparation and installation of materials and equipment, issued by the manufacturers or suppliers.

5. Positioning of Equipment

The electrical layout drawings show the general arrangement of the work. These shall be followed unless otherwise instructed by the Engineer. If any equipment is installed in the wrong position, or contrary to instructions, the Electrical Contractor shall make good at their own expense.

The Electrical Contractor shall familiarise himself with the structural details of the building and before installing any outlet, and ensure that there is no conflict with any structural feature or fittings. Any discrepancies found shall be brought to the notice of the Engineer and instructions obtained before proceeding. The Electrical Contractor shall mark up any changes to the layout on their as-built drawing set.

6. Workmanship

Workmanship throughout shall be in accordance with the requirements of the current Electricity Regulations and amendments thereto. Experienced tradesmen shall carry out all works. Apprentices shall not exceed the ratio of one apprentice to two tradesmen. All electrical accessories are to be properly wired and the whole electrical installation is to be installed and finished to a high standard, with surfaces made good where required. The Engineer's decision shall be binding on decisions over acceptable standards of workmanship and finish.

7. Co-operation with Other Trades

The Electrical Contractor shall co-operate with all trades in the set out of services, equipment and cable routes etc. He shall ensure any holes, buried conduits, or ducts provided by others are correctly located.

The Electrical Contractor shall liaise with suppliers and installers of specialist plant and equipment, such as shop fittings, HVAC plant, LPG system, feature lighting etc; and shall coordinate the placement of sub-circuit wiring and terminations to suit the specific details of equipment.

8. Completion

All equipment shall be left in proper working order with ducts, cabinets, boxes, fittings, glands, terminations etc. left securely tightened and/or correctly sealed as required.

The site shall be left free of all debris resulting directly or indirectly from the electrical trade works, so that the whole installation is left as a complete working unit in a clean and tidy condition. Allow to clean residual adhesives, paint, dirt etc. from the interior and exterior of all appliances, switches, outlets and switchboards.

9. As-Built Drawings

On completion, the Electrical Contractor shall obtain a complete clean set of full size electrical contract drawings from the Engineer. The drawings shall be marked up in red ink with as-built changes and handed to main contractor.

Drawings to be provided are detailed elsewhere in this specification.

10. Defects Liability

The Electrical Contractor shall from the date of Practical Completion;

- Maintain the installation in full working order for the period specified in the Conditions of Contract
  A 24 hour, seven day emergency call-back service shall be provided
- Replace any failed or defective lamps or tubes for three months
- For all other materials, make good any fault arising from defective material, equipment or workmanship or from any act or omission by the Electrical Contractor and his sub-contractors, which may develop in the work within a period of twelve months

The contract shall include the maintenance of all electrical equipment wired by the Electrical Contractor in the building or exterior, for a period of three months.

In the event of any fault developing in any electrical equipment supplied by others but wired by the Electrical Contractor, the Electrical Contractor shall carry out maintenance work on this equipment at regular rates.

11. Lighting - General

The Electrical Contractor shall supply and install the light fittings for the shop, canopy, car wash and any site lighting detailed.

The make and model number of the light fittings shall be as specified on the drawings and schedules.

All fittings shall comply with NZS 6705, NZS 6741, NZS 1123, and NZS 1536 as appropriate and with this specification.

The Electrical Contractor shall not substitute alternative fittings, lamps or controls without prior approval from the Engineer.

All fittings shall be installed in the positions shown on the drawings, neatly and in line, complete with all necessary mounting plates and fixings etc.

12. Power Outlets & Accessories

The Electrical Contractor shall supply and install all power outlets for the shop, as detailed.

All switches, sockets, flush plates etc are to be of the same manufacture and in matching patterns except were detailed or directed otherwise, and shall be in accordance with New Zealand Standards. They shall be of the type detailed on the drawings.

Provide pole mounted outlets in the shop as detailed on the drawings.

Check specific ratings of equipment prior to installation of cabling and outlets.

The exact location and mounting heights etc of all outlets, fittings, equipment etc shall be checked against the architectural drawings and confirmed on site before construction commences and installed in the position in the manner directed. Any discrepancies shall be advised to the Engineer.

13. Wiring And Cabling

All cables shall be new, PVC/PVC or PVC/SWA/PVC and rated for 0.6/1 kV insulation level. They shall have stranded copper conductors, and manufactured to comply with AS3147 "PVC Insulated Electric Cables and Flexible Cables" or NZS 6401: 1973.

Power cables shall 2.5 mm^2.minimum, lighting cables 1.5mm^2 minimum.

Cables shall be mechanically protected at least AS/NZS 3000.

Where cables are to be buried under concrete slabs or concealed in permanent structures, conduits are to be installed with the ends stopped where in exposed positions to exclude the ingress of water and/or other fluids. All underground conduits shall be installed with draw wires to facilitate cables being pulled later.

Ground markers are to be fixed at exits from buildings denoting the direction of laid cables. Cables of TPS construction may be used only where they are fully enclosed within timber framing or high impact PVC conduit. Note: where white TPS cables are used they shall be concealed throughout the entire run.

Wiring shall be run concealed in wall partitions wherever linings occur on one or both sides.

Catenary wires shall be used for circuits in the ceiling space. No more than four cables shall be tied together in a bunch on catenary wires or grouped on trays or supports.

The Electrical Contractor shall carry out all trenching for electrical unless shared trenches are to be used.

Underground cables shall be buried at a minimum depth of 500mm (or at least 300mm below the underside surface of a concrete slab), in a bed of clean compacted sand. Sand bedding around cables shall have a minimum cover of 75mm all round.
Conduits and ducts routed through or below hazardous areas shall be sealed at both ends with a gas tight proprietary expanding foam or equal system. The duct entries to the shop building shall be similarly sealed with expanding foam.

Low voltage, communications and data cabling shall be segregated from power cabling and electrical equipment particularly light fittings by at least 300mm.

No cable shall contain 230V power and low voltage cores. Control cables shall be dedicated to each unit of plant and a single control cable shall not be used for more than one unit of plant (i.e. motor) and shall contain only one voltage group.

Only one core shall be terminated in each rail-mounted tunnel terminal.

All wiring shall terminate only in terminals of outlet fittings with looping to further outlets as required. No through joints shall be permitted other than in outlet fittings.

All cables to equipment outside of the shop shall be uniquely identified using the cable and core numbers shown on the drawing.

Cable outer sheaths shall be fitted with Critchley Type K (with cable-tied carrier strip) or approved equivalent numbering system, stating the number shown on the drawings. If there is no number allocated the circuit number, dispenser number etc shall be used.

Each core shall be uniquely numbered using Critchley Type-Z or approved equivalent ferrule system. All cable and core identifications shall be included in the as-built drawings submitted by the Electrical Contractor.

Power cables of greater than 6mm^2 core area shall be terminated using crimp lugs and be crimped to the manufacturer's specification.

The electrical manhole and the associated ductwork to the main switchboard shall be provided by others.

The ducts to the main switchboard shall be used for specific cabling to the required switchboard tier as designated on the drawings. Spare ducts for future use shall be left empty except for a draw wire.

14. Testing & Commissioning

The Electrical Contractor shall:

- Complete all tests required by the Electricity Regulations and AS/NS 3000
- Carry out a load balance at each switch board
- Obtain the services of an independent Registered Electrical Inspector to carry out the inspections required by the Electrical Safety Regulations
- Complete an Electrical Certificate of Compliance for the installation and hand to the Engineer
- Pay for all costs associated with the testing and inspection including the Registered Electrical Inspector's charges and the cost of the Electrical Certificate of Compliance

For the load balance, the Electrical Contractor shall establish the full load current in each phase when the installation is fully loaded.

The Electrical Contractor shall allow for the reconnection of any circuits necessary to obtain optimum balance of the system over the three phases at each distribution board in the manner that may be directed by, or approved by the Engineer.

15. As-Built Documentation

The Electrical Contractor shall provide the following in accordance with the Preliminary and General Section:

- Marked up set of contract electrical drawings
- Photocopy of DB schedules

16. Data Cabling

The Electrical Contractor shall, supply, install, test, commission and maintain the communications cabling system as follows:

- Incoming telecommunications cabling
- Voice service cabling connecting the external voice lines
- Commissioning

SECTION XIV
FLOOR COVERINGS

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

This section includes supply, installation and laying of tiles to the toilets and corridor areas as well as making good any areas damaged due to the associated works.

Allow to prepare the existing concrete floor, the existing and new walls to receive new ceramic tiles (Tiles 1). Allow to supply and install new floor tiles (Tiles 2) to match existing tiling within the corridor and main atrium areas as shown on the drawings.

The Tiling contractor should allow to supply and install all tiling adhesives, floor levelling compound, grouting, and silicone sealant as required in order leaving a complete a flooring surface ready for

Refer also to the Schedule of Materials within the appendix.

3. Documents

Documents referred to in this section are:

NZBC D1/VM1 Access routes
NZBC D1/AS1 Access routes
AS 2358 - Adhesives - For fixing ceramic tiles
AS/NZS 3661.1 - Slip resistance of pedestrian surfaces - Requirements
AS 3740 - Waterproofing of wet areas to residential buildings
AS 3958.1 - Ceramic tiles - Guide to the installation of ceramic tiles
AS/NZS 4671 - Steel reinforcing material
BRANZ Good practice guide: Tiling.

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

4. Qualification

All work in this section to be by competent, experienced tilers familiar with the materials and techniques specified.

5. Guarantee

Guarantee this work under normal environment and use conditions against failure of workmanship for: 5 years and execution for 1 year from the date of practical completion.

6. Slip Resistance

All sheet and tiles when in place on a level access route to have a mean coefficient of friction (u) not less than 0.4 when tested in accordance with AS/NZS 3661.1, appendix A and B.

7. Materials

Tiles to be supplied by the Tiling Contractor.

New floor Tiles to match the existing tiles and be laid to the same pattern.

Pattern layout to be proposed by the Tiling Contractor prior to laying and approved by Engineer.

8. Accessories

Flooring tiling adhesive: to be nominated by flooring contractor and approved by Engineer before commencing work.

Primer and Sealer
To the adhesive manufacturers requirements for the particular substrate

9. Execution

Storage
Ensure packages of tiles and accessories remain undamaged and dry. Store on level surfaces in non-traffic, non-work areas that are enclosed, clean and dry.

Handling
Do not use damaged material.

Preparation: ensure surface are clean dry and ready for tiling in accordance with adhesive manufacturers specifications

Inspect
Inspect the substrate to ensure it is a suitable finish. Do not start work if it will not allow work of the required standard.

Commencement
Commencement of this work means that the substrate is accepted as satisfactory for work of the required standard.

Protection
Protect adjoining work surfaces and finishes during the vinyl installation.

Laying Generally

Carry out the whole of this work to NZS/AS 1884, BRANZ Bulletin 330 and the flooring manufacturers requirements.

Technique
Before beginning the installation confirm the proposed layout of material, location of seams and other visual considerations of the finished work.

10. Substrate Preparation

Preparing New Concrete
Clear substrate of all debris, clean off all surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at all perimeter of repaired areas. Grind level, then vacuum to remove all dust. The floor should be level to 3mm over 3 metres. Check for moisture content by hygrometer to BRANZ Bulletin 330 and do not commence laying vinyl until readings for the whole area show 75% relative humidity or less.

Temporary Floor Slab Sealing
The flooring contractor shall allow to seal the floor slab with Greenslab Sealer prior to laying of the vinyl floor tiles should this be required to satisfy the program requirements for the project.

Applying Primer Or Sealer For Vinyl Sheet
Primer and/or seal porous plaster, concrete and timber substrates to the adhesive manufacturers requirements.

11. Installation

Application Of Adhesive
Apply approved adhesive either by trowel as required by the vinyl manufacturer and without trowel marks after setting. Follow requirements for open time, taking note of the substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using required techniques.

12. Completion

Replace all damaged or marked elements.

Remove
Remove all debris, unused materials and elements from the site.

Protect
Protect all completed work from damage for the period between completion of laying and completion of the contract works.

DO NOT USE WAX OR POLISH

SECTION XV
SPRINKLER SYSTEM

1. Preliminary & General

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions which are equally binding to all trades. This section of the Specification shall be read in conjunction with all other Sections.

2. General

This section of work is to be performed as a Design and Build Contract where the Fire Protection Sub-Contractor shall be responsible for the detailed design and commissioning of the extended sprinkler system, associated with the proposed changes to "Goldfields Mall" building.

The work shall be complete allowing for all minor and incidental items, and even though not specifically detailed or mentioned.

Where a discrepancy exists which prevents successful co-ordination the Engineer shall be notified and a written instruction will be issued.

3. Scope

The existing sprinkler system shall be modified to suit the alteration works proposed within "Goldfields Shopping Centre" in accordance with the version of standard NZS4541 to which the base system was installed to. The sprinkler system after completion of works shall be independently inspected and certified as being compliant by an ISO17020 accredited body.

4. Pipework and Fittings

All pipe work and fittings shall comply with New Zealand Standards 4541 together with the additional requirements of the Insurance Council of New Zealand.

Grooved couplings will be acceptable.

Screwed fittings must comply to BS143 or JIS B2301 suitable for working pressures of 1400 kPa.

The use of cPVC will not be permitted on this project.

6. Builders Work

The Fire Protection Contractor shall allow for all the builders work required to enable the installation of the completed sprinkler system, or clearly define those works required to be attended to by others. No claims for additional work with respect to builders work will be accepted on the contract. This shall include, but not be limited to;

6.1 Builders work that will be necessary to enable the Fire Protection equipment to be installed including the provision and making good of sleeves and penetrations,

6.2 Cutting of holes in the ceiling finishes to accommodate droppers to the sprinkler heads,

6.3 The contractor shall mark all builders work to be cut through the structure and advise the Engineer for approval before cutting. All cutting of structural components will be undertaken under the guidance of a structural engineer,

6.4 All builders work holes are to be located and cut so that pipes occur central to the hole, and approved fire resisting collars and sleeves fully close the resultant services penetration,

6.5 Installation of fire resisting collars and sleeves is to be fully in accordance with the requirements of the manufacturer, and where located through "Gib" board lining be in accordance with the requirements of Winstone Wall Boards publication "Penetrations and Closures in Gib Fire Rated Systems.

7. Fabrication of Steel Pipes

Shall be to level 1 of the Fire Protection Industry Standard, with welder qualifications to NZS 4711 : 1984.

8. Painting

The fire protection contractor shall allow for the following;

8.1 Steel pipe work located within ceiling or floor space or any concealed spaces, shall have one coat of "Red Z" primer applied at the works. No further coats need be applied,

8.2 Exposed steel pipe work shall be primed at the works with "Red Z" primer and then given two finish coats of enamel (gloss level to be confirmed by the Architect), the colour to the clients requirements. These coat may be applied at the works, however, it may require to be touched up after installation on site so as to level to completed job with a monolithic paint finish,

8.3 Exposed external steel pipe work must be galvanised, etch primed, and then painted in accordance with item (b).

9. Pipe Hangers and Supports

The piping system and all associated equipment shall be properly supported by suitable clips, brackets and hangers in such a manner as to provide all necessary restraint to ensure its capability of accepting all normal loads and movements which can occur in the

building areas service by the system without excessive noise transmission, vibration or displacement at connections and joints.

Sagging pipes or untidy runs will not be accepted.

Provide all necessary supplementary support work to secure pipe supports.

Pipe supports shall be constructed of mild steel.

Pipe supports shall be capable of withstanding the seismic loadings normally expected on these installations.

Pipe supports exposed to the weather shall be hot dip galvanised after fabrication and shall be provided with galvanised hardware.

The maximum spacing of hangers and supports shall be in accordance with NZS 4541.

Pipe supports shall be of an approved pattern obtained through normal trade sources, or, alternatively, detailed designs of the supports proposed shall be submitted and approval obtained prior to commencing work.

Painting of the pipe supports is to be carried out in accordance with the painting requirements for the pipe work covered in Section 12, Painting.

10. Fixings

All fixings shall;

- comprise metal thread screws or bolts into expanding type masonry anchors for fixings to concrete or masonry,
- comprise tapered woodscrews for fixings to timber framing,
- be electro galvanised finish for all bolts, nuts, washers and screw,
- be brass where installed externally to the building or in damp situations.

Nuts and bolts shall;

- have heads which are hexagonal in shape,
- have metric threads in accordance with AS1275.

The following fixings are NOT acceptable;

- fixings made by the use of explosive powered tools,
- fixings made in the mortar joint in block or brickwork,
- fixings into plasterboard, asbestos cement, ceiling tiles or similar friable materials,
- self tapping screws into sheet metal,
- nails.

11. Testing of Piping

The engineer shall witness all hydrostatic tests. Test certifications shall be signed off and a copy provided in the maintenance manual.

Sprinkler piping systems shall be hydrostatically pressure tested in sections or in their entirety at an early stage to avoid delaying the work of other trades.

Testing shall be carried out before piping is boxed or otherwise covered by false ceilings, walls, ducts, etc.

Testing pressures for sprinkler pipe work shall be 1400 kPa and held for a period of 2 hours without any pressure drop, or 400 kPa in excess of maximum static working pressure whichever is the greater.

All defects disclosed during testing shall be immediately rectified and new tests carried out after rectification work.

Items of plant and equipment liable to damage at the test pressure to be applied shall not be connected while pressure tests are being carried out.

The sub-contractor shall supply a sufficient number of plugs to blank off all outlets of the section of pipe work to be hydrostatically tested. The plugs shall be removed on satisfactory completion of hydrostatic testing of each progressive section of work.

Whether it is necessary to isolate sections of pipe work prior to hydrostatic testing, each section shall be isolated by means of a blank metal flange, or " spade".

On completion of the sub-contract the sub-contractor shall ensure that all special isolating flanges have been removed from the piping reticulation to the satisfaction of the Engineer.

SECTION XVI
EMERGENCY LIGHTING

1. Preliminary & General

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions which are equally binding to all trades. This section of the Specification shall be read in conjunction with all other Sections.

This specification is to be read in conjunction with the Section 112 Assessment prepared by Spencer Holmes Limited for this building reference doc. 140869C01, dated 15th June 2015.

2. Type of Contract - Regulations

The sub-contract for this section shall be a "Design and Build" performance type Contract whereby the Main Contractor shall be responsible for the detailed design, performance, selection of materials, installation techniques and verification of compliance, all as required to achieve the concepts and objectives covered by this specification.

All detailed design and installation work shall be carried out to best trade practice fully in accordance with the NZ Building Code, and all related Regulations and Standards and the Thames Coromandel District Council and other related Authorities requirements all as referred to in this specification.

The Contractor shall provide as built drawings and a specification of proposed fixtures and fittings for approval prior to commencing work. The Contractor shall provide to the Principal all necessary certification for the illuminated exit signage to enable a warrant of fitness to be issued.

3. Scope

The detailed scope of work for the Emergency Lighting contractor shall include;

- Supply and install self-contained emergency luminaries and egress signage as shown on the drawings. Emergency lighting is to be totally independent from the systems within the buildings,
- The entire emergency lighting installation to the building is to comply with AS/NZS 2293: 1995,

Fittings shall be;

- Rexel Ceiling Button with opal diffuser and 2 x 18W Osram lamps complete with emergency pack maintained,
- KTL Technologies X2 – E fully self-contained low voltage emergency downlight complete with 1 x 10W6V halogen lamp and Nicad battery for 2 hrs operation,

- KTL Technologies X2 – T Lifelights mounted maintained emergency light,
- Provide a 12 month written guarantee covering the completed emergency lighting system including a Certificate of Compliance.

4. Coordination

Tenderers for this section shall review all tender issue drawings and related documents and fully allow for coordination with the works included in other sections.

When preparing his detailed design for the installation, the contractor shall ensure that all details are fully coordinated with the building structure, and work by other trades, where required. The sub-contractor shall prepare drawings detailing his work and coordination with other sections.

5. Fire Sealing

Provide fire/smoke sealing of all new penetrations made through fired rated walls or floors for the passage electrical cables etc. Firepro Nullifire System B Barrier lightweight flexible mineral fibre boards with a fire resistant coating shall be used to seal wall penetrations. Apply intumescent fire resistant compound around gaps and edges.

Firepro M702 Nullifire intumescent fire resistant mastic or equivalent shall be used to seal around electrical cable penetrations. All fire/smoke sealing to be undertaken to manufacturer's recommendations.

6. Design Criteria / Regulations / Standards

The Emergency Lighting system shall be designed and installed in accordance with the following design criteria, regulations and standards. The regulations and standards shall include all the relevant local Territorial Authority regulations and legal requirements for the work and the standards stated therein.

Electrical Services	NZ Building Code F6/AS1 for the Emergency Lighting Installation, and F8/AS1 for the Emergency Egress Signage. G9/AS1 and VM1 for the general electrical installation. General Electrical Services NZS 8100. New Zealand Electrical Codes of Practice, and the Electrical Regulations, 1997
Fire Sealing	Fire sealing FRR is to match that of the partition or floor being penetrated.
Circuit Wiring	NZS 6401: 1973 Specification for PVC-insulated cables for electric power and lighting
Lighting	NZS/AS 3137: 1992 Approval and test specification - Luminaires NZS6705: 1986 Part 1 Luminaires General requirements and tests
Emergency Lighting	AS / NZS2293: 1995 Emergency luminaries and exit signs

SECTION XVII
FIRE ALARM SYSTEM

1. Preliminary & General

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions which are equally binding to all trades. This section of the Specification shall be read in conjunction with all other Sections.

2. Contract

To carry out the design, installation and obtain certification of amendments to the Fire Alarm system. All design and building work to be carried out carried out by suitably qualified persons and contractors.

The Contractor to ensure modifications Building Warrant of Fitness is issued on completion of all work and pay for all associated fees.

3. Regulations

All detailed design and installation work shall be carried out to best trade practice fully in accordance with the NZ Building Code, and all related Regulations and Standards and the Thames Coromandel District Council, FPIS, (or other alternate independent inspector) and other related Authorities requirements all as referred to in this specification.

4. Scope

The existing fire alarm system shall be modified to suit the alteration works proposed within "Goldfields Shopping Centre" in accordance with the version of standard NZS4512 to which the base system was installed to. The fire alarm system after completion of works shall be independently inspected and certified as being compliant by an ISO17020 accredited body.

The fire alarm works shall include the following but not limited to:

- Removal or relocation of redundant fixtures from the areas to be demolished,
- All work as recommended by the Fire Report,
- Extend and modify the current manual fire alarm system to suit the alterations,
- The extension and modification of the existing Emergency Warning and Lighting systems,
- The installation of signs relating to specified systems,
- Upgrade of the existing Fire Alarm Panel Indicator Panel located on the exterior of the building altered to reflect the final layout of the building and to comply with the requirements of the NZ Fire Service,
- Arrange for and pay for an FPIS Inspection, (or alternate independent inspector) of the modified fire alarm system,

- Modifications to the system shall include all required hardware, interconnecting wiring and software to accomplish the requirements of this specification whether itemised or not,
- Test and commission the items required to complete the required alarm system as specified herein.

All equipment shall be new and shall be the products of a single company engaged in the manufacture and sale of fire detection systems.

5. Coordination

Tenderers for this section shall review all tender issue drawings and related documents and fully allow for coordination with the works included in other sections.

When preparing his detailed design for the installation, the sub-contractor shall ensure that all details are fully coordinated with the building structure and work by other trades, where required.

6. Materials and Services

The system shall include, but not be limited to, the following elements;

- Conventional non-addressable devices as required for compliance with this specification,
- Wiring,
- Installation, testing, commissioning and completion of installer's statement as in accordance with NZS 4512: Fire Alarm Systems in Buildings.

7. FPIS Inspection and Approval

The modified fire alarm system to is to be subject to an FPIS inspection (or alternate independent inspector) and the Fire Systems Contractor shall arrange and pay for this inspection.

8. FAIP Fire Alarm Indicator Panel

The Fire Alarm Panel Indicator Panel located on the exterior of the building shall be altered as required to reflect the final "as built walls and structure" and to meet the requirements of the New Zealand Building Act and New Zealand Fire Service as approved by the Engineer and Fire Service. The contractor shall allow sufficient costs and time to ensure the indicator panel floor plans are correctly drawn for the whole building.

9. Ancillary Devices

The general location of the various devices is shown on Fire Services drawings. The contractor at time of tender shall confirm these locations comply with the requirements of the relevant standards.

10. Alarm Sounders

The existing fire alarm sounders if identified as a part of works shall be re-installed in suitable locations in accordance with the version of standard NZS4512 to which the system was installed to.

11. Call Points

Call points shall be flush mounted wherever possible.

All Manual Call points to match the existing.

Signage to as required to comply with F8 NZBC shall be provided adjacent to each of the new manual call points.

11. Builders Work

The Fire Systems Contractor shall allow for all the builders work required to enable the installation of the completed fire safety system, or clearly define those works required to be attended to by others. No claims for additional work with respect to builders work will be accepted on the contract;

This shall include, but not be limited to;

Builder's work that will be necessary to enable the fire safety equipment to be installed including the provision and making good of sleeves and penetrations,

The contractor shall mark all builders work to be cut through the structure and advise the Engineer for approval before cutting. All cutting of structural components will be undertaken under the guidance of a structural engineer,

All builders work holes are to be located and cut so that cables occur central to the hole.

Work which relates to the upgrade of the Fire Alarm Panel to the exterior of the building.

12. Design Criteria / Regulations / Standards

All new work to the current fire safety system within the building shall comply with all relevant New Zealand and Australian standards including, but not limited to,

Building Code New Zealand Building Code Handbook and Approved Documents,

Fire Alarm System NZS 4512: Fire Alarm Systems in Buildings,

Conduits AS/NZS 2053: 1989 Conduits and fittings for electrical installations.

SECTION XVIII
MISCELLANEOUS HARDWARE

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade.

2. Scope

This section of the Specification covers the supply and fixing of all items of miscellaneous hardware as detailed in the sections below.

3. Door Hardware

Contractor is to allow a sum of $5000.00 to supply door hardware for doors D1-D9 inclusive.

Refer also to fire assessment report.

Contractor shall allow in the tender to install all hardware to interior and exterior doors, including installing grilles to existing doors (D7) to Bin room.

Double doors to have keyed locks, handles, kick plates to interior and exterior and flush bolts to opposite door.

Allow to fit door closers to D2, D3 and D9.

D8 supplied with Aluminium Shop front section.

Provide door stops to interior doors as noted on drawings.

The contractor shall supply a hardware schedule for approval by Engineer before commencing work.

- Doors: D1-D9 inclusive
- Hardware: Ingersoll Rand / Legge / Lockwood or similar approved.
- Finish: Satin Stainless
- Suppliers: Sopers Macindoe / Allegion or similar approved Hardware supplier.

4. Kitchen

Joinery contractor is to supply and install all hardware to cabinets and draws including runners, "grass hinging hardware", cutlery tray.

SECTION XIX
MECHANICAL SERVICES

1. Preliminary and General

The subcontractor shall pay attention to that part of the preliminary and general clauses that relate to their trade and to the following clauses of this section. The main contractor shall allow for co-operation between this trade, all other trades, specialist suppliers and installers.

2. Scope

This is a design-build contract. The sub-contractor shall allow to design, supply, install and commission the following systems;

- Mechanical filtered fresh air supply fan and ducting to service the Parents Room, First Aid Room, Security and Cleaners Rooms complete with filter chamber, fresh air supply fan, thermostat control, electric heater battery, flexible ducting and supply diffusers.
- Mechanical extract fan and ducting to service the Men's and Women's toilets, Bins, Cleaners, First Aid, and Parents Rooms and the Accessible Toilet.
- All transfer grilles.
- All controls and wiring required.

Provide shop drawings to Engineer for approval prior to manufacturing.

The finished system is to be complete with all ancillary equipment to provide a total working air conditioning and ventilation system.

Provide a separate price for provision of a 12 month Preventative Maintenance contract.

On completion provide to the Engineer all As-Built information and Operating and Maintenance Manuals.

3. General

3.1 Regulations, Codes and Standards

Comply with all relevant codes and regulations, including:

- N.Z. Building Code
- NZS4303:1990 – Ventilation for Acceptable Indoor Air Quality
- Electricity Regulations 1997 and N.Z. Electrical Codes of Practice (NZECP).

3.2 Materials and Workmanship

All materials shall be new and of the highest quality of their respective kinds, free from defects and shall be maintained in as new condition until the end of the contract.

All work shall be carried out in accordance with sound trade practice by competent, and where necessary, registered tradesmen, experienced in the types of work concerned.

3.3 Protection of Works, Cleaning & Rubbish

Take all reasonable precautions to protect finished work and work of other trades from damage caused while carrying out installation.

Work areas that the subcontractor is responsible for shall be kept clean and tidy and all rubbish, dust and debris created cleaned up and removed each day.

3.4 Structure and Penetrations

No structural member shall be cut or penetrated without the approval of the Engineer. All penetrations shall be properly formed and neatly flashed. External penetrations such as for ducts, vents, louvres and pipes shall be flashed to provide a waterproof seal.

3.5 Corrosion Protection

All proprietary equipment shall be manufactured from galvanized sheet metal and finished in corrosion protective coatings appropriate for the sea spray zone and its exposure. All brackets and other miscellaneous steelwork used for fixings, whether inside or outside shall be made from galvanized steel and finished with corrosion protective coatings suitable for the sea spray zone and to achieve a 15year durability.

3.6 Builders Work

Allow for all builders work required, such as timber platforms on the roof for outdoor units, framed out roof openings and weather flashed upstands for roof fans as required. Provide ceiling access panels where shown on the drawings.

3.7 Seismic Restraint

All equipment and pipework shall be restrained against seismic forces to the requirements of NZS42l9.

3.8 Practical Completion

When the works are finished, tested and commissioned ready for operation, to the satisfaction of the Engineer, and the site manager has received instructions on the operation and maintenance of the systems, Practical Completion will be certified.

3.9 As-Built information and Operating and Maintenance Manual

Provide as-built drawings and commissioning data, as well as technical data and maintenance and operating instructions for all equipment installed. Bind information together in a suitable folder. Provide 3 copies to the Engineer before or at the time of Practical Completion.

4. Equipment

4.1 Fans

Roof mounted extract and supply fans shall be Fantech, Woods, Ziel, or similar centrifugal, axial or mixed flow type suitable for the design duty and noise criteria.

5. Ductwork

5.1 Rigid Sheet metal Ductwork

(a) Shall be constructed of galvanised sheet metal in accordance with the latest edition of the SMACNA Duct Standards, Low Velocity Systems.

(b) Use single thickness turning vanes to SMACNA details on all square bends.
(c) Paint all cut edges on longitudinal seams with galvanised steel primer.
(d) Seal all bayonet joints and branches with "Duct Seal" adhesive sealant.
(e) Provide butterfly dampers with manual adjustment quadrant at every grille and diffuser branch take-off.
(f) Provide internal insulation to the ducted indoor unit discharge plenums and to the ceiling diffuser grille box adaptors.
(g) Insulation shall be 25mm thick fibreglass sheet with factory applied perforated sisalation covering on the exposed surface
(h) Ductwork shall be sized and installed within the ceiling voids to leave a minimum clear space of 100mm above the ceiling soffit.

5.2 Flexible Ductwork

(a) Use Holyoake Spiroflex or similar equivalent insulated aluminium foil/polyethylene fabric ducting with polypropylene continuous rib, on all air-conditioned supply and returns.
(b) Install fully extended but not taut.
(c) Support with straps at least 25mm wide at spacing's of not more than 1.5m.
(d) Clamp to sheet metal spigots with stainless steel "band-it" strapping

6. Grilles & Diffusers

Locate return air grilles and extract system grilles carefully in relation to heat generating chiller and freezer cabinets etc. so as to avoid recirculating warm air through the air conditioning units.

Co-ordinate the layout of grilles and diffusers in the ceiling with the layout of light fittings and other components fixed to the ceiling.

(a) All grilles and diffusers shall be powder coated to a standard colour, to be advised.
(b) Fix to ductwork, or grille box adaptors using springs or pop-rivets through the neck if accessible. Face fixing is not acceptable.
(c) Use removable core egg crate type return air and extract air grilles.

7. Pipework and Fittings

7.1 Materials

All pipework materials and fittings shall be new and free from defects of any kind.

(a) Refrigeration: Refrigeration grade Copper – insulated as required, with Armaflex (or equivalent), painted where external
(b) Condensate drains: PVC or copper.

7.2 Installation

(a) Pipework shall be installed in accordance with appropriate standards and with good trade practice, fixed neatly and parallel to walls or adjacent pipes where possible.
(b) All pipework if run exposed shall be painted to match walls and ceilings.

8. Electrical

Allow for all controls and electrical work required to provide a fully operational system. The electrical subcontractor will allow space in the main switchboard for 10 miniature circuit breakers, including 3 off 3 phase ways.

The subcontractor shall supply and install circuit breakers to suit his Equipment and shall liaise and co-ordinate with the electrical subcontractor to access the switchboard and terminate his cables.

All equipment shall be provided with a local isolator.

Supply and fit time clock, control thermostats, remote sensors and all field wiring as required.

The air conditioning plant shall have a single on/off control switch for the whole system. The electrical subcontractor shall provide a three pole switch shall be provided on the main switchboard for this purpose. The mechanical services contractor subcontractor shall terminate his control cable at the terminals provided.

All electrical work is to comply with N.Z. Electrical Wiring Regulations, and Local Authority requirements, and shall be carried out by competent electricians experienced in this type of work.

Confirm at the time of tendering, all electrical loadings of equipment, and the size of the sub main circuit required.

9. Grille Removal

All extract grilles to be installed to the shop and ancillary areas are to be removable so as to facilitate cleaning.

10. Testing and Commissioning

All pipework shall be purged, pressure and leak tested to the requirements of the appropriate standards and trade practice. Ensure all condensate drains are tested and leak free before wall and ceiling linings are fitted.

All air systems and air conditioning units shall be commissioned and airflows balanced, and commissioning data provided in the Operating and Maintenance Manual.

APPENDICES

All product information supplied is to be read in conjunction with these specifications, drawings and other contract documents. All products shall be installed in accordance with the latest manufacturer's product manuals, specifications and documents.

1. SCHEDULE OF MATERIALS
2. JAMES HARDIES HARDIGLAZE_spec feb13
3. ROLLER SHUTTER DOOR_Atlas 12 Aluminium Roller Grille
4. SHOP FRONT PARTITION - POTTER-A-Series-1053
5. STRATOS Toilet partitioning
6. ARMSTRONG CEILING TILES - Ultima