Structural Concepts Ltd Specification

Freehold Properties (Investments) LLP

86 Wellington Street, Picton - Motel Units

Reference: 3587 9593

emajineer
the possibilities are endless

Structural Concepts

This document is prepared Freehold Properties (Investments) LLP by:

Structural Concepts Ltd
Level 3 Dunvegan House
215 Hastings Street
PO Box 3315, Napier, 4142
New Zealand
Phone: (06) 842 0111
E-mail: info@structuralconcepts.co.nz

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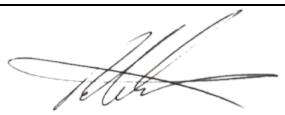
Written By:		**Phil Roberts** **Project Manager**

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1220 PROJECT

1. GENERAL

This general section describes the project including:
- A description of the work
- Design construction safety
- Principal's Health & Safety matters
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

1.1 READ ALL SECTIONS TOGETHER
Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK
SEISMIC STRENGTHENING TO 80% NBS

1.3 NO RESTRICTED BUILDING WORK
This project does not include Restricted Building Work, Due to it being a 2 level commercial motel building.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY
The project designers are unaware of unusual or atypical features, which a reasonably experienced contractor may not be aware of, that may present a hazard or risk during a typical construction process. The Contractor is still required to undertake its own assessment, to determine if they consider there are any further safety matters and provide for these in carrying out the construction of the work.

Principal's Health & Safety Matters

1.5 PRINCIPAL'S KNOWN SITE HAZARDS
Site hazards known to the principal are to be discussed with the property owners prior to all site work starting.

1.6 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN
Obtain a copy of the principal's site health and safety plan.

Site

1.7 SITE

The site consists of:	A number of motel related buildings.
As shown on drawing:	SCL Ltd sheets # 000 to 354

1.8 LEGAL DESCRIPTION

The site of the works, the street address and the legal description are shown on the drawings. 86 WELLINGTON STREET, PICTON. Lot 2 DP 4295

1.9 EXISTING BUILDINGS

Existing buildings consist of: A number of motel related buildings.
Refer drawing(s): SCL Ltd sheets # 000 to 354

1.10 EXISTING SERVICES

The following are the network utility services:

Electrical:	Yes
Communications:	Yes
Water:	Yes
Gas:	Yes
Stormwater:	Yes
Foul water:	Yes

Site environment - Durability

1.11 EXPOSURE ZONE

The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.
The site zone is: D

Site environment - Seismic

1.12 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.
The earthquake zone is:

1.13 EARTHQUAKE - SPECIFIC DESIGN

The earthquake design is to NZS 1170.5, in particular the intent of NZS 1170.5, 1.2 **Determination of earthquake actions**.

Zone 3	Building type, importance level (to AS/NZS 1170.0, table 3.2)

Archaeological discovery

1.14 REPORT FINDING ANY ANTIQUITIES AND ITEMS OF VALUE

Report the finding of any fossils, antiquities and other items of value, to the Contract Administrator. All to remain undisturbed until approval is given for removal.

Pre-1900, items or evidence of human activity on the site, come under the Heritage New Zealand Pouhere Taonga Act 2014. If such items or evidence is discovered work must stop immediately and the Contract Administrator must be notified immediately. The site may be classified as an Archaeological Site under

the Act, and the Contract Administrator or Owner must contact the Heritage New Zealand for authority to proceed.

Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.
Known archaeological information relating to this site includes the following: N/A

1233 REFERENCED DOCUMENTS

1. GENERAL

1.1 REFERENCED DOCUMENTS

Throughout this specification, reference is made to various New Zealand Building Code Compliance Documents, acceptable solutions (NZ/S 1170) and/or methods used to establish compliance with the New Zealand Building Code.

Reference is also made to various standards produced by Standards New Zealand (NZ/S, AS/NZ/S, NZ/S/AS), 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 expert 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.

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3109	Concrete construction
NZS 3602	Timber and wood-based products for use in building
AS/NZS 5131	Structural steel-work - Fabrication and erection
NZS 6803	Acoustics - Construction Noise

Building Act 2004
Building Regulations 1992
Health and Safety at Work Act 2015
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
Health and Safety at Work (Hazardous Substances) Regulations 2017
Health and Safety in Employment Regulations 1995
New Zealand Building Code
Heritage New Zealand Pouhere Taonga Act 2014

WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe NZ	Good Practice Guidelines - Excavation Safety
WorkSafe NZ	Scaffolding in New Zealand - Good Practice Guidelines

2112 PARTIAL DEMOLITION

1. GENERAL

This section relates to the partial demolition of existing buildings and structures, to the extent necessary to carry out the contract works.

1.1 RELATED WORK
Refer to the removal of some of the existing concrete footpath areas, etc to allow for the construction of some new foundations.

Documents

1.2 DOCUMENTS REFERRED TO
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:
NZBC F5/AS1 Construction and demolition hazards
NZDAA Best practice guidelines for demolition in New Zealand
Health and Safety at Work Act 2015

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.

Requirements

1.3 QUALIFICATIONS
Carry out demolition
- only under the supervision of a suitably experienced person, using only operators and drivers trained for this work
- using only experienced certified/licensed construction blasters for explosives demolition
- calling upon engineering expertise in those areas of demolition required by the NZDAA Best practice guidelines for demolition in New Zealand.

1.4 HEALTH AND SAFETY
Comply with the Health and Safety at Work Act 2015 in general, NZBC F5/AS1 and NZDAA Best practice guidelines for demolition in New Zealand, Section 5 Demolition safety

1.5 HOT WORK - FIRE SAFETY
Refer to section 1270 CONSTRUCTION

1.6 FIRE SAFETY SYSTEMS
Existing fire safety systems must be maintained and appropriate parts progressively deactivated and removed as demolition advances.

1.7 DEMOLITION TIME RESTRICTIONS
Times during which demolition work may be carried out is restricted. Refer to 4. SELECTIONS for times.

2. PRODUCTS

Materials

2.1 ELEMENTS FOR RE-USE
Carefully dismantle, remove and store on site where directed. Protect from damage and weather until required.

2.2 REMAINING ELEMENTS
Store all elements not scheduled for salvage or re-use on site until convenient for removal.

2.3 MATERIAL AND ELEMENTS FOR DISPOSAL
Remove demolished material and elements continually from the site through the period of the demolition.

3. EXECUTION

Conditions

3.1 EXISTING SERVICES
Disconnect and seal off services before work commences. Protect services adjacent to the area being demolished.
Maintain services to occupied areas of the building, particularly fire services.

3.2 SITE INSPECTION
Visit and check the site, the building or structural work being demolished and any contents for likely hazards.

3.3 PLANS AND DESCRIPTIONS
Carefully examine all available plans of the building, including those of the territorial authority and the network utility operators, all descriptions and past uses, and become totally familiar with the past and present condition and use of the building and its services.

3.4 EXAMINE STRUCTURE
Examine roofs, walls, cantilevered structures and basements as required by the NZDAA Best practice guidelines for demolition in New Zealand and follow their requirements.

3.5 PROTECTION
Erect approved temporary screens and shelter to protect from weather and damage, and to prevent dust and dirt penetrating those parts of the existing

building, other buildings and the remainder of the site being retained in their present condition.

3.6 SAFETY DURING DEMOLITION

Refer to NZBC F5/AS1 and NZDAA Best practice guidelines for demolition in New Zealand. Carry out the requirements laid down in Section 5 Demolition safety in respect of:
- instability
- supervision
- plant, tools and equipment
- personal protective equipment
- protection of the public
- unauthorised access to site.

3.7 DEMOLITION PROCEDURES

Refer to the NZDAA Best practice guidelines for demolition in New Zealand. Carry out the requirements laid down in section 6 Methods of demolition including:
- scaffolding
- health
- disposal of debris and waste material
- fire protection.

Application

3.8 CARRY OUT DEMOLITION

Carry out all demolition to the requirements of NZDAA Best practice guidelines for demolition in New Zealand.

Completion

3.9 REINSTATE

Reinstate where any damage is caused by this demolition to those parts of the existing building, other buildings and the remainder of the site being retained.

3.10 LEAVE

Leave work to the standard required by following procedures.

3.11 TAKE AWAY

Take away from the site all plant, tools and equipment, temporary access works, and demolished materials and elements, to leave the site completely clean and tidy.

4. SELECTIONS

4.1 DEMOLITION TIME RESTRICTIONS

Demolition work is restricted to:

Weekdays:	8 am to 5 pm or by written agreement with the property owners n advance of all proposed work occurring.
Saturdays:	Not Allowed, without written permission for the property owners in advance of all proposed work occurring.
Sundays:	Not Allowed, without written permission for the property owners in advance of all proposed work occurring.
Public holidays:	Not Allowed, without written permission for the property owners in advance of all proposed work occurring.

4.2 PROTECTION SCREENS

Provide the following protection screens to NZBC F5/AS1 to separate off and protect unaffected parts of the building:
1800 mm high steel wire screen fence panels to prevent any public access to affected work site areas at all times.

4.3 ELEMENTS FOR SPECIAL PROTECTION

Element	Location/Special protection required
Any buried drainage systems under the affected concrete path removal.	Various

4.4 ELEMENTS FOR DEMOLITION AND DISPOSAL

Element/component	Location
Any affected concrete path areas to allow for new foundations	Various

4.5 DEMOLITION RUBBLE FOR RE-USE

Material	Location	Location for re-use
Concrete path areas	Various	If possible, take all broken up concrete to a re-cycle/crushing plant for re-use.

2223 REMOVING SUBSURFACE CONSTRUCTIONS

1. GENERAL

This section relates to the removal of disused subsurface building elements in whole or in part, including foundations and services, to the extent necessary to carry out the contract works.

Related work

1.1 RELATED SECTIONS
Refer to the affected concrete path areas that require removal of some or all areas to allow for any new concrete foundation installation.

1.2 DOCUMENTS REFERRED TO
Documents referred to in this section are:
Health and Safety at Work Act 2015

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.

1.3 ARCHAEOLOGICAL DISCOVERY
If fossils, antiquities and other items of value are found refer to the general section 1220 PROJECT for actions to be taken with archaeological discovery.

2. EXECUTION

Conditions

2.1 REPORT
Report any survey pegs, bench marks, and the like on any features, leaving them undisturbed until approval is given for removal.

2.2 MARK FEATURES
Refer to SELECTIONS/drawings for those features to be retained. Mark out those features with 1 metre high 50mm x 50mm timber stakes with yellow plastic tape between, to avoid accidental damage.

2.3 ITEMS FOR DISPOSAL
Carefully dismantle and/or remove and store on site where directed and protect from damage until taken away.

2.4 REMOVE DISUSED FOUNDATIONS
Break out and remove old foundations and concrete slabs as necessary for construction, or as detailed.

2.5 REMOVE DISUSED DRAINS
Break out and remove old drains and fittings as necessary for construction, or as detailed. Seal off ends of pipes to territorial authority requirements at the boundaries.

Completion

2.6 FIRES
Do not light rubbish fires on site.

2.7 SURPLUS MATERIAL
Remove spoil from the site continually as the work proceeds and clean up continually any materials, if dropped on footpaths or roads.

2.8 LEAVE
Leave work to the standard required by following procedures.

2.9 TAKE AWAY
Take away from the site all other material resulting from clearance of the site, leaving it clear and tidy.

3. SELECTIONS

3.1 FEATURES TO BE RETAINED
Low concrete retaining walls along rear face of building near where some areas of the existing concrete paths are required to be removed to make way for the new proposed concrete foundations.

3.2 ITEMS FOR DISPOSAL
Items for removal are any items related to the concrete footpath areas that require cutting and removal to make way for the new proposed concrete foundations.

2241 EXCAVATION

1. GENERAL

This section relates to the excavating required for the building works, removing surface soils and the disposal of excavated material.

Related work

1.1 RELATED SECTIONS
Refer to the affected concrete path areas that require removal of some or all areas to allow for any new concrete foundation installation.

Documents

1.2 DOCUMENTS REFERRED TO
Documents referred to in this section are:

NZS 4402	Methods of testing soils for civil engineering purposes
WorkSafe NZ	Good Practice Guidelines - Excavation Safety

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.

Requirements

1.3 ARCHAEOLOGICAL DISCOVERY
If fossils, antiquities and other items of value are found refer to the general section 1220 PROJECT for actions to be taken with archaeological discovery.

Performance

1.4 GROUND CONDITIONS
Foundation investigations and drilling have been carried out. Place your own interpretation on this information as no warranty is implied that the information is truly representative or complete. Make such extra investigations as considered necessary.

1.5 ACCESS FOR MACHINES
Determine working conditions and access for machines. Take into account the time of year, the nature of the ground and subsoil to be excavated, the ground water table and all matters influencing the carrying out of the work.

1.6 SAFE WORKING CONDITIONS
Provide safe working conditions and adequate support to excavations at all times to WorkSafe NZ, Good Practice Guidelines - Excavation Safety. Cover holes and fence off trenches and banks.

1.7 FOUNDATION BEARING

Request written instructions if a natural bearing is:
- reached at a lesser depth or
- not reached at the depth shown on the drawings.

In made-up ground excavate down to a natural bearing. Remove unsuitable material that is exposed and replace with compacted backfill.

1.8 INSPECTION

Arrange for inspections and before placing any new work. If bearing becomes inadequate due to any cause then stop work and request further instructions.

1.9 SITE MEASUREMENT, ROCK

Where rock is found to be part of the site condition, all rock removed to be solid measured and the quantity recorded and agreed to in writing as the excavation proceeds.

1.10 SITE MEASUREMENT, OTHER FORMATIONS

If for any reason the excavations have to vary from the drawings, those affected to be solid measured and the quantity recorded and agreed to in writing as the excavation proceeds.

2. PRODUCTS

Materials

2.1 TOPSOIL

Weathered soil, with organic inclusions capable of supporting the growth of vegetation.

2.2 CUT MATERIAL

Consisting of sands, gravels, sedimentary materials, clays, scoria and similar deposits.

2.3 ROCK

Defined as material encountered in excavations which because of its size or position can be removed only by breaking up by explosives or mechanical plant such as jack hammers or percussion drills.

2.4 UNCONTROLLED FILL

Variable fill material placed with little or no compaction control.

2.5 EXCAVATED FILL

Material from other formations in the excavation which may be selected and approved as suitable for filling and complying with NZS 4402 by having grading and moisture content properties that will allow compaction to 95% of maximum density.

3. EXECUTION

Conditions

3.1 REPORT
Report any survey pegs, bench marks, and the like on any features, leaving them undisturbed until approval is given for removal.

3.2 RETAINED FEATURES
Refer to SELECTIONS/drawings for those features to be retained. Mark out those features to be retained with 1 metre high 50 mm x 50 mm timber stakes with yellow plastic tape between, to eliminate accidental damage.

3.3 COMPLY
Comply with the requirements of WorkSafe NZ, Good Practice Guidelines - Excavation Safety.

3.4 WORK BY OTHERS
Before taking over work done on the site by others check all levels and conditions and report any discrepancies affecting further work.

3.5 EXISTING SERVICES AND FOUNDATIONS
Locate underground services and foundations before work is started. Any information provided regarding the location of these services and foundations is given from available records but with no guarantee of accuracy as regards alignment or depth. Furthermore no guarantee is given or implied that the information provided covers all existing services and foundations. Make good at no extra cost damage to existing services to the satisfaction of the appropriate network utility operator. Protect existing roads, footpaths, gutters, crossings etc from damage during work.

3.6 EXCAVATION NEAR TREES
Do not excavate or remove topsoil within the drip line of retained trees unless specifically directed. If excavation is directed, use hand methods, taking care to avoid damage to roots. Do not cut roots greater than 50 mm diameter. Do not stockpile spoil against tree trunks or beneath the drip line of retained trees. Report any damage to tree boles or branches, with necessary remedial work by an approved tree surgeon.

3.7 KEEP FREE OF WATER
Keep excavations free from water and keep water from excavations clear of other construction work.

3.8 TERRITORIAL AUTHORITY REQUIREMENTS
Obtain from the territorial authority requirements for the method of discharging water from the site.

3.9 FORM SUMPS

Form sumps outside the line of foundations and deep enough to drain excavations. Pump from sumps without disturbing excavations or any material in place.

3.10 SILT CONTROL

Undertake silt control measures required by territorial authorities and network utility operators in relation to design, location and discharge into the drainage system.

Application

3.11 STRIP TOPSOIL

Strip topsoil carefully over the whole site and stockpile where directed on the site, on the prepared subgrade, for re-spreading at the completion of the contract.

3.12 STRIP TO SUBGRADE

Strip the soil over the whole site to form a subgrade generally, but at a minimum of 200mm below the original ground level. Leave the subgrade level, clear of all loose material and with no impediment for the excavation work.

3.13 DIVERT WATERWAYS

Temporarily divert as necessary all ditches, field drains and other waterways encountered during the excavations and reinstate to approval on completion.

3.14 DIVERT DRAINS AND SERVICE LINES

Divert services, drains and field drains encountered in the excavations to new routes clear of the building and reconnect to the requirements of the network utility operator.

3.15 BREAK OUT

Break out and remove old foundations, floor slabs, drains, manholes and septic tanks, seal up connections and remove contaminated soil. Grub out roots in excess of 75mm diameter to a minimum of 500mm below the bottom level of footings or paving. Backfill with selected excavated material, well rammed in layers.

Take special care when working close to retained trees and shrubs.

3.16 EXCAVATION GENERALLY

Excavate for pads, strip foundations and tie beams to the profiles and levels shown on the drawings. Allow clearance for working space and form-work as necessary. Trim to required profiles, falls and levels. If pouring against natural ground excavate an extra 25 mm that side to provide 75 mm minimum cover to reinforcement horizontally. Bench surface of sloping ground to receive filling. Use plant and equipment suitable for the purpose.

3.17 OVER EXCAVATION
Make good with well compacted backfill.

3.18 EXCAVATED BACKFILL
Stockpile selected excavated backfill on site where directed so that it does not impede continuing works until it is required.

Completion

3.19 LEAVE
Leave work to the standard required by following procedures.

3.20 SURPLUS TOPSOIL
Remove unwanted stripped soil from the site continually as the work proceeds and clean up continually any soil if dropped on footpaths or roads.

3.21 SURPLUS MATERIAL
Remove surplus excavated material from the site continually as the excavation proceeds and clean up continually any excavated material dropped on footpaths or roads.

4. SELECTIONS

4.1 RETAINED FEATURES
Please refer to section 3.2 for these details.

3101 CONCRETE WORK - BASIC

1. GENERAL

This section relates to formwork, reinforcement, concrete mixes and the placing of concrete.

1.1 RELATED WORK

Refer to the affected concrete path areas that require removal of some or all areas to allow for any new concrete foundation installation.

1.2 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

ACRS	Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards.

ACRS web site - www.steelcertification.com

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/AS1	Structure
NZBC B1/VM1	Structure
NZS 3101.1	Concrete structures standard
AS/NZS 4671	Steel reinforcing materials

Requirements

1.4 QUALIFICATIONS

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

1.5 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to AS/NZ/S 4671. Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel. Confirm compliance and provide evidence if requested.

2. PRODUCTS

2.1 MASS CONCRETE

Concrete having a minimum strength of 30 MPA at 28 days for all or any new proposed concrete foundations.

2.2 REINFORCEMENT

Bars to AS/NZS 4671. Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to AS/NZS 4671, and 500E mesh to AS/NZS 4671 as modified by NZS B1/VM1.

2.3 MESH FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground mesh to be welded reinforcing mesh to AS/NZS 4671 as modified by NZS B1/VM1, Class E, minimum to B1/AS1 - Grade 500E, 2.27kg/m2 (1.14kg/m2 in each direction).

2.4 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.5 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

3. EXECUTION

3.1 HANDLE AND STORE

Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.2 OVER EXCAVATION

Contact the contract administrator for direction if more than minor over excavation below designed for founding levels is required.

3.3 FALSEWORK AND FORMWORK

Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss. Do not use tie wires or rods unless approved in writing by the Contract Administrator. Unless detailed otherwise, provide a 19mm chamfer or fillet strip at all interior and exterior angles of beam and column forms. Mitre at intersections.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

Unless detailed otherwise, set up soffit boxing for beams and slabs to provide a camber when forms are stripped, of 3mm rise for every 3 metres of total clear span.

3.4 CUT AND BEND REINFORCEMENT

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3109, table 3.1, Minimum radii of reinforcement bends. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.

3.5 ADJUSTMENTS

Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.6 TOLERANCES, BENDING

To NZS 3109, 3.9, Tolerances for reinforcement.

3.7 SECURE REINFORCEMENT

Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums in NZS 3109, 3.6, Spacing of reinforcement.

3.8 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.
Wire mesh laps to NZS 3101.1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.9 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:
- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

3.10 REINFORCEMENT COVER TO NZS 3101.1

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101.1, table 3.6, **Minimum required cover for a specified intended life of 50 years**. Sub-soil cover to NZS 3101.1, to suit soil and groundwater conditions. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109, 3.9, Tolerances for reinforcement.

3.11 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

For in-situ concrete, foundations and interior slabs on ground, to NZS 3604 or NZS 4229, the reinforcement and welded mesh cover to be:

Location, cover to	NZS 3604	NZS 4229
Footing, to earth	75mm	75mm
Footing, to DPM	75mm	50mm
Foundation, to edge	75mm	75mm
Slab, to slab top	30mm	30mm
Slab, to slab edge	50mm to 75mm	50mm to 75mm

3.12 EQUIPOTENTIAL BONDING REINFORCING

If it is a project requirement, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before the concrete is poured. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

3.13 CASTING IN

Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.

Do not use grounds exceeding 100mm in length. Location and form of conduits to be approved in writing by the Contract Administrator. Minimum cover 40mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to accommodate expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

3.14 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with NZS 3109, 5.6, Type B.

3.15 PRE-PLACEMENT INSPECTION

Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority and CPeng engineer so that a P/S-4 can be issued later ready for the council CCC issuing process.

3.16 CONCRETE SURFACE TOLERANCES

To NZS 3114, 104, Surface tolerances and NZS 3114, 105, Specification of finishes, with the suggested tolerances becoming the required tolerances or to match the existing footpath or the property owners expected finish requirements - check with the owner prior to pouring finished path concrete.

3.17 PUMPING CONCRETE

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109, 7.4, Handling and placing and NZS 3109, 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

3.18 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with 1:2 mortar or plaster, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

3.19 CURING OF CONCRETE

Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

3.20 STRIKE FORMWORK

Strike form-work without damaging or overloading structure. Do not remove form-work before the following minimum periods:

12 hours:	Sides of beams, walls and columns
4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.21 REMOVE

Remove all unused materials and all concrete and reinforcing debris from the site.

4. SELECTIONS

4.1 REINFORCEMENT LAPS

Where reinforcement laps are not shown on the drawings, lap as follows:

Bar diameter	Grade 300E deformed
10mm	400mm
12mm	500mm
16mm	650mm

4.2 MASS CONCRETE

Mass concrete:

30 MPa minimum to the affected concrete path areas that require removal of some or all areas to allow for any new concrete foundation installation.

4.3 SURFACE FINISHES PAVEMENTS AND DRIVEWAYS

Surface finish class to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
U2 wood float finish or to owners requirements, check with the owner prior to pouring any finished concrete.	Various pathways

3105 CONCRETE - COMMON REQUIREMENTS

1. GENERAL

This section deals with general matters relating to all aspects of concrete work.

1.1 RELATED WORK

Refer to 3111 FORM-WORK FOR CONCRETE for form-work
Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcement
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing

1.2 ABBREVIATIONS AND DEFINITIONS

The following abbreviation and definition apply specifically to this section:

ACRS: Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards. Web site: www.steelcertification.com

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/VM1	Structure
AS/NZS 1554.3	Structural steel welding - Welding of reinforcing steel
NZS 3101.1	Concrete Structures Standard
AS/NZS 4671	Steel reinforcing materials

Requirements

1.4 QUALIFICATIONS

Workers to be experienced, competent and familiar in the fabrication and erection of formwork and with the materials and the techniques specified.

1.5 INSPECTIONS

Refer to SELECTIONS for type of inspection.

1.6 RECORDS

Make and keep record of mix, time, date and location of each pour and make available on request together with delivery dockets. Cross reference delivery dockets in pour records.

1.7 PRODUCER STATEMENTS

Provide Producer Statements where required by the Building Consent Authority and where required by this specification.

Performance

1.8 CONFIRM STEEL REINFORCING COMPLIANCE

Certification from the supplier confirming that the steel reinforcing supplied complies with the grades specified on the drawings by producing test results to AS/NZS 4671 or AS/NZS 4672.1 and AS/NZS 4672.2. Any 500E steel reinforcing mesh to AS/NZS 4671 as modified by NZS B1/VM1. For overseas manufactured steel provide NZ S Mark or ACRS certificate details or approved equivalent.

1.9 EQUIPOTENTIAL BONDING REINFORCING

If it is a project requirement, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before the concrete is poured. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

1.10 QUALITY ASSURANCE

Carry out the whole of this work to the requirements of NZS 3109 and under the regime of a quality systems model for quality assurance in production and erection to AS/NZS ISO 9001.

Quality assurance procedures to include all aspects of concrete construction including:
- Formwork quality
- Reinforcing steel placing
- Cast in items
- Concrete quality
- Concrete placing and compaction
- Concrete finishes
- Construction tolerances

Advise name of the suitably experienced and qualified representative who is responsible for quality control of the concrete work. The representative is to sign a written quality control checklist for each on site concrete pour. Provide a copy to the construction reviewer in sufficient time for a pre pour inspection.

2. SELECTIONS

2.1 INSPECTIONS BY CONSTRUCTION REVIEWER

As per the attached Structural Concepts Limited P/S-1 and inspections required list.

2.2 INSPECTIONS BY BUILDING CONSENT AUTHORITY

As per the local BCA approved and issued documentation.

3112 REINFORCEMENT FOR CONCRETE

1. GENERAL

This section relates to the supply, cutting, bending and fixing of steel bar and steel welded reinforcement for concrete.

1.1 RELATED WORK
Refer to 3105 CONCRETE COMMON REQUIREMENTS for general matters
Refer to 3121 CONCRETE PLACEMENT for concrete placing

Documents

1.2 DOCUMENTS REFERRED TO
Documents referred to in this section are listed in 3105 CONCRETE COMMON REQUIREMENTS.

Requirements

1.3 SELECTIONS AND DIAGRAMS
Provide schedules and diagrams of bars and bar bending, these are as per the Structural Concepts Limited attached plan set.

2. PRODUCTS

Materials

2.1 GRADE 300E STEEL
To AS/NZS 4671. Round bars are shown by symbol "R" and deformed bars by symbol "D", followed by the diameter in millimetres.

2.2 GRADE 500E STEEL
To AS/NZS 4671. Round bars shown by symbol "HR" and deformed bars by symbol "HD" followed by diameter in millimetres.

2.3 TYING WIRE
Mild drawn steel wire not less than 1.2mm diameter.

Components

2.4 SPACERS AND CHAIRS
Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

3. EXECUTION

Conditions

3.1 HANDLE AND STORE
Handle and store all reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation and lay steel bars flat.

3.2 DELIVER ALL BUNDLES
Deliver all bundles of steel to the site clearly marked or tagged with numbers relating them to the bending schedule and drawings.

3.3 CLEANLINESS
Keep reinforcement clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.4 PROJECTING REINFORCEMENT
Protect projecting reinforcement from the weather where rust staining of exposed concrete surfaces may occur.
Protect and/or mark any projecting reinforcement where it provides a potential hazard to site personnel.

Assembly

3.5 CUT AND BEND
Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3101.1, 8 and NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3101.1, 8 and NZS 3109: table 3.1, Minimum radii of reinforcement bends. Do not rebend grade 500E bars. Where rebending is necessary for grade 300E bars, use a purpose built tool, proper preparation and preheating.

3.6 ADJUSTMENTS
Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.7 TOLERANCES, BENDING
To NZS 3109: clause, 3.9 Tolerances for reinforcement.

Application

3.8 SECURE REINFORCEMENT
Secure reinforcement adequately with tying wire and place accurately, supported adequately and secured against displacement when concreting. Bend tying wire back well clear of the formwork.

3.9 SPACING
Spacing as dimensioned on the drawings but if not shown then the clear distance between parallel bars in a layer, or the distance between layers, or the spacing of

other steel to the minimums laid down in NZS 3109: clause 3.6, Spacing of reinforcement.

3.10 TOLERANCES, SPACING
To NZS 3109: clause 3.9, Tolerances for reinforcement.

3.11 LAPPED SPLICES
Length of laps where not dimensioned on the drawings in accordance with NZS 3101.1, 8.7 **Splices in reinforcement**, refer SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.

3.12 MECHANICAL SPLICES
Use only if shown on the attached SCLtd drawings. Use the appropriate sleeve size and length, swaged onto the bars using correct die and hydraulic press all to the manufacturer's requirements. Notify when ready for inspection and carry out tests if required.

3.13 REINFORCEMENT COVER TO NZS 3101.1
Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101.1, table 3.6, **Minimum required cover for a specified intended life of 50 years**. Sub-soil cover to NZS 3101.1, to suit soil and groundwater conditions. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109, 3.9, Tolerances for reinforcement.

3.14 TOLERANCES, COVER
Tolerances on cover relative to the values in NZS 3109: clause 3.9 Tolerances for reinforcement. Tolerances shall be +5mm all positions, but in no case shall cover be less than that shown on the drawings.

3.15 FIX CHAIRS
Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support.

Completion

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

4. SELECTIONS

4.1 REINFORCEMENT LAPS
Where reinforcement laps are not shown on the drawings, lap as follows:

Bar Diameter	Grade 300E deformed	Grade 500E deformed
12mm	500mm	750mm
25mm	1000mm	1600mm
32mm	1200mm	2000mm

3411 STRUCTURAL STEELWORK

1. GENERAL

This section relates to the fabrication and erection of structural steel framing and steel framed buildings of a general nature.

Refer to SELECTIONS for project Construction Category.

1.1 RELATED WORK
Refer to the affected areas that require the installation of any and all new structural steel bracing to the exterior of the 2 level motel complex building/s.

1.2 ABBREVIATIONS AND DEFINITIONS
Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

CC:	Construction Category

Documents

1.3 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC F5/AS1	Construction and demolition hazards
AS 1111.1	ISO metric hexagon bolts and screws - Product grade C - Bolts
AS 1111.2	ISO metric hexagon bolts and screws - Product grade C - Screws
AS 1112.1	ISO metric hexagon nuts - Style 1 - Product grades A and B
AS/NZS 1163	Cold-formed structural steel hollow sections
AS/NZS 1252.1	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Technical requirements
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS/NZS 1554.4	Structural steel welding - Welding of high strength quenched and tempered steels
AS/NZS 1554.5	Structural steel welding - Welding of steel structures subject to high levels of fatigue loading
AS/NZS 1594	Hot-rolled steel flat products
AS 1627.9	Metal finishing - Preparation and pre-treatment of surfaces - Pictorial surface preparation standards for painting steel surfaces
AS/NZS 2980:2018	Qualification of welders for fusion welding of steels - Additional requirements for Australia and New Zealand
NZS 3404.1	Steel Structures Standard
AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1	Structural steel - Hot-rolled bars and sections
AS/NZS 3679.2	Structural steel - Welded I sections
AS/NZS 5131	Structural steelwork - Fabrication and erection

AS/NZS ISO 9001 Quality systems - Requirements
WorkSafe NZ Guidelines for the provision of facilities and general safety in the construction industry

1.4 RESPONSIBILITIES
Provide structural steelwork, as documented.

1.5 CO-ORDINATION
Refer to architectural, electrical and services drawings to ensure details and fixings required are provided for in the structural steel work.

1.6 VERIFY DIMENSIONS
Verify dimensions against site measurements prior to fabrication. For existing structures, verify grade of steel and dimensions against site measurement.

Requirements

1.7 QUALIFICATIONS
Welding operators (and supervisors) to be experienced, competent workers, qualified to AS/NZS 5131, Table 7.4, to suit relevant Construction Category and weld category. Compliance with AS/NZS ISO 9606.1 is also acceptable used in conjunction with AS/NZS 2980:2018. Provide evidence of qualifications on request.

Riggers to be experienced and competent workers, familiar with the materials and techniques required.

1.8 HOT WORK - FIRE SAFETY
Refer to section 1270 CONSTRUCTION

Performance

1.9 QUALITY ASSURANCE & SYSTEMS
Maintain quality assurance programmes to AS/NZS ISO 9001 for both fabrication and erection as necessary to assure that work is performed in accordance with this specification and the qualifying requirements of the contract documents.

Provide quality documentation to Clause 4.5.1 of AS/NZS 5131.
Maintain quality systems to AS/NZS 5131, Appendix D, relevant to the project Construction Categories (CC2 to 4) and corrosion requirements.

Provide a Quality Plan to Clause 4.5.2 of AS/NZS 5131, relevant to the project Construction Categories (CC2 to CC4).

1.10 TOLERANCES
To AS/NZS 5131 Section 12 and Appendix F, Tolerance Class 1.

Submissions

1.11 KEY PERSONNEL
Submit names and contact details of proposed fabricator, detailer and installer.

1.12 MATERIAL CERTIFICATES
Supply mill test certificates relating to mill sections, bolts and nuts or welding consumables. High strength steel to be marked accordingly by the supplier before delivery.

1.13 INSPECTION
To AS/NZS 5131, Section 13, Inspection, Testing And Correction and AS/NZS 5131 Appendix I, Inspection of Welding and Bolting (New Zealand Only)

1.14 TESTS
To AS/NZS 5131, Section 13, Inspection, Testing And Correction and AS/NZS 5131 Appendix I, Inspection of Welding and Bolting (New Zealand Only)
Submit site test results, as follows:
- Bars and sections: Non-destructive tests
- Plates: Ultrasonic tests (UT)
- Welds: Non-destructive examinations (NDE)

2. PRODUCTS

2.1 PURCHASE & TRACEABILITY
Purchasing documentation and procedure To AS/NZS 5131, clause 4.6.

Level of traceability to AS/NZS 5131, clause 4.7 and the following:
- CC1: No specific requirement.
- CC2: Basic traceability.
- CC3: Partial traceability.
- CC4: Partial traceability.

Steel members

2.2 STRUCTURAL STEEL
Comply with New Zealand, Australian, British or Japanese Standards for steel as required by NZS 3404.1, section 2, including, type, category, and suppression of brittle fracture. Also to AS/NZS 5131, Section 5.

Steel members and sections steel grade table

Component	Conforming to	Grade
Hot rolled steel sections	AS/NZS 3679.1	300; 350; 300L0; 300S0; 350L0, 300L15; 350L15
Plates and flats	AS/NZS 3678; AS/NZS 1594;	250; 300; 350; 400; 450; WR350; 250L0, 300L0; 350L0; 300L15; 350L15
Plates and flats	AS/NZS 1594; TS 102	HA250; HA300; HA350; HA400; HW350

Square Hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Rectangular Hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Welded beams and columns	AS/NZS 3679.2; TS 102	300; 400
Quench & tempered plate	AS 3597	500; 600; 700; 900; 1000

Mechanical fasteners

2.3 BOLTS, NUTS AND WASHERS

Grade 4.6, screws AS 1111.2 and bolts to AS 1111.1. Grade 4.6 nuts to comply with AS 1112.1. Property Class 8.8 bolts and equivalent nuts and washers (high strength structural quality only) to comply with AS/NZS 1252.1. Hot-dip galvanize to AS/NZS 4680 (and AS/NZS 1214), bolts, nuts and washers forming a permanent part of a structure subject to a protective coating. Alternatively electrogalvanize to AS 1897.

Bolt Categories and tensioning

Bolting category	Bolt standard	Property Class	Tension method	Tensioned joint type
4.6/S	AS 1111.1	4.6	Snug tight	
8.8/S	AS/NZS 1252.1	8.8	Snug tight	
8.8/TB	AS/NZS 1252.1	8.8	Full tension	Bearing
8.8/TF	AS/NZS 1252.1	8.8	Full tension	Friction

In bearing type connections where the thread position relative to the shear plane is to be controlled.
N - threads included in shear plane
X - threads excluded from shear plane
F - friction type joints - prepare faying surfaces

2.4 STEEL STUDS AND SHEAR CONNECTORS

To NZS NZS 3404.1 and AS/NZS 5131
Material for arc stud welding to comply with AS/NZS 1554.1 and AS/NZS 1554.2.

Accessories

2.5 WELDING CONSUMABLES

To comply with and be selected for grade of steel being welded as required by AS/NZS 1554 series of standards.

2.6 FLUX

Welding flux to be dry and from sealed containers.

2.7 GROUT
To AS/NZS 5131, 5.8.

3. EXECUTION

Standard preparation, assembly and fabrication

3.1 GENERALLY
To AS/NZS 5131, Section 6.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.3 ROUTINE MATTERS
Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning. Discard any material or fabricated items showing defects affecting its structural integrity.

3.4 CUTTING
To AS/NZS 5131, Section 6 particularly AS/NZS 5131, 6.13
Do not shear edges in areas designated as yielding regions for seismic design.

3.5 SHAPING
Where forming, shaping or correcting distorted members, avoid damage and conform to AS/NZS 5131, clause 6.6.

3.6 HOLING
To AS/NZS 5131, Section 6 particularly AS/NZS 5131, 6.7 and 6.13
Do not use slotted holes for connections, other than those documented.
Punched holes in yielding regions (1, 2 or 3) to be 3mm undersized and reamed to final size.

3.7 SURFACE FINISH
Grind off burrs and sharp arrises.

Welding

3.8 WELDING GENERALLY
To AS/NZS 5131, Section 7 and AS/NZS 1554.1. Equipment to comply with AS/NZS 1554.1, clause 1.8.2.
Site weld only when correct alignment and preset or camber have been achieved.
Weld categories not documented elsewhere or on drawings to be Category GP.

3.9 WELDING TYPE
Submit proposals for weld type and welding consumables, for weld types not documented.

3.10 NON-DESTRUCTIVE WELD EXAMINATION
Non-destructive weld examination (NDE) to AS/NZS 5131, clause 13.6.2. and AS/NZS 5131 Appendix I, Inspection of Welding and Bolting (New Zealand Only)
Repair any welds revealed as faulty by NDE and repeat the examination.

Mechanical fastening

3.11 MECHANICAL FASTENING GENERALLY
To AS/NZS 5131.
Connection contact surfaces to AS/NZS 5131, 8.4.1.
Category 8.8/TF bolting to be clean, as rolled and free from applied finishes.
For washers, place one washer under the part rotated during tightening process (nut or bolt head).
Permanent bolt only when correct alignment and preset or camber have been achieved.

3.12 TENSIONING BOLTS
For tensioning of bolting categories 8.8/TB and 8.8/TF, use part-turn method or a direct tension indicator device. Ensure clear thread run out beneath the nut after tensioning is to New Zealand requirement of AS/NZS 5131, 8.2.2.

3.13 THREADS EXCLUDED FROM SHEAR PLANE
Select length of bolts such that the threaded portion does not occur within the shear plane between joined parts.

Erection of structural steel

3.14 ERECTION GENERALLY
To AS/NZS 5131, Section 11.
Make sure every part of the structure has sufficient design capacity and is stable under construction loads produced by the construction procedure.
Comply with NZBC F5/AS1: Construction and demolition hazards, and the WorkSafe NZ publication: Guidelines for the provision of facilities and general safety in the construction industry.

3.15 BOLTS AND ANCHORAGES
For each group of anchor bolts, provide a template with set-out lines clearly marked for positioning the bolts when casting in.
Start erection only when the holding down bolts and anchorages have been cast-in-place long enough to achieve sufficient strength.

3.16 TEMPORARY WORK
Provide temporary bracing, propping and restraint as required to make structure safe. Fix any temporary members so as not to weaken or deface permanent steelwork. Leave temporary bracing and restraint in place until the erection is sufficiently advanced to allow safe removal of temporary bracing.

3.17 SITE WORK

Other than work shown on the shop detail documentation as site work, do not fabricate, modify or weld structural steel on-site.

3.18 MOVEMENT

Allow for thermal movements during erection.

3.19 GROUTING SUPPORTS

Before grouting steelwork supported by concrete or masonry, set steelwork on packing or wedges as follows:

- Permanent packing or wedges - Form with solid steel or grout of similar strength to the permanent grout.
- Temporary packing or wedges - Remove before completion of grouting.

Grout at supports before constructing supported floors, walls and roofing.
Do not grout if the base plate or the footing surface temperature are outside the range 3ºC to 35ºC or to manufacturer's requirements.
Fill the space beneath the base plate with grout, if necessary hammered in tight to ensure complete filling of space.

3.20 DRIFTING

Use drifting only to bring members into position, without enlarging holes or distorting components.

3.21 EARTHING STRUCTURAL STEEL

If it is a project electrical requirement, ensure that any electrically at-risk, steel frames or isolated members, are earthed (or at least conductor cable attached) before the steel has any in-situ finishes applied or is enclosed.

Finishing

3.22 POWER TOOL CLEANING

To AS/NZS 5131, Section 9.
Remove oil and grease by the use of solvents. Scrape, wire brush and power tool clean to a minimum Class 2 finish to AS 1627.9. Clean to bright metal, but avoid producing a polished surface. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.23 ABRASIVE BLASTING

To AS/NZS 5131, Section 9.
Remove oil and grease by the use of aqueous alkaline detergent cleaners with high pressure water cleaners, water jetting or scrubbing equipment, liquid solvent cleaning may be used on small areas. Abrasive blast clean to a Class 2.5 finish to AS 1627.4. Clean to bright metal, but avoid producing a polished surface. Select grit type and equipment such that the cleaned surface profile between peaks and valleys does not exceed one third of the dry film thickness. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.24 UNPAINTED SURFACES

Do not paint:
- Faying face of high strength friction grip (HSFG) bolted joints
- Areas for site welding keeping 75mm clear all round
- Surfaces for embedding in concrete.

Where steel is only partly encased, then extend priming 50mm minimum into the concrete encasement area.

3.25 PROTECTIVE COATINGS

Refer to sections for the PUR5 system requirements for the steel preparation and protective coatings.

3.26 PAINTING

Refer to the appropriate separate painting section(s) for priming and painting requirements.

3.27 TEMPORARY CONNECTIONS

Remove temporary elements on completion and restore the surface.

Completion & Commissioning

3.28 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

4. SELECTIONS

4.1 CONSTRUCTION CATEGORY

Construction category (to AS/NZ/S 5131)	Location
CC 4	Various

4.2 TESTING OF BARS AND SECTIONS

Non-destructive testing of bars and sections schedule

Item to be tested	**Test method**	**Other requirements**
All steel reinforcing bars, stirrups, etc.	As per the standard requirements.	

4.3 BOLTING CATEGORIES

Bolting category schedule

Joint location	**Bolt type/size**	**Bolting category**
All steel work plates, etc.	Various	8.8

4.4 GROUT SCHEDULE

	Location A	Location B	Location C

Grouting method:	Dry Packing	Under all steel base plates	Various
Grout Type:	Cement based dry packing	As above	As Above
Minimum Compressive Strength:	30 MPa	30 MPa	30 MPa
Min Thickness:	10 mm	10 mm	10 mm
Max Thickness	25 mm	25 mm	25 mm

6745 PROTECTIVE COATINGS - STEELWORK

1. GENERAL

This section relates to the preparation and specialised coating/painting of structural and miscellaneous steelwork items.

1.1 RELATED SECTIONS

Refer to Structural Steel-work section for fabrication of structural steel-work.

1.2 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:

DFT	Dry Film Thickness
MPNZA	Master Painters New Zealand Association Inc
PRN	Paint reference number

Documents

1.3 DOCUMENTS

Documents referred to in this section are:

NZBC C/AS2	Protection from fire
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Method selection guide - Abrasive blast cleaning
AS 3894.6	Site testing of protective coatings Determination of residual contaminants
AS/NZS 2312.1	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings – Part 1: Paint coatings
AS/NZS 2312.2	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings – Part 2: Hot dip galvanizing
SNZ TS 3404	Durability requirements for steel structures and components
AS/NZS 3750.5	Paints for steel structures - Acrylic full gloss (two-pack)
AS/NZS 3750.6	Paints for steel structures - Full gloss polyurethane (two-pack)
AS/NZS 3750.9	Paints for steel structures - Organic zinc-rich primer
AS/NZS 3750.13	Paints for steel structures - Epoxy primer (two pack)
AS/NZS 3750.14	Paints for steel structures - High-build epoxy (two pack)
AS/NZS 3750.15	Paints for steel structures - Inorganic zinc silicate paint
AS/NZS ISO 9001	Quality management systems - requirements
WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
MPNZA	Health and Safety Programme
	Health and Safety at Work Act 2015

Australian Paint Approval Scheme (APAS): Specifications

APAS 2908	Inorganic zinc coating for protection of steel
APAS 2911	Polyurethane coating for protection of steel (parts 1 & 2)
APAS 2916	Organic zinc rich coating for protection of steel (parts 1 & 2)

APAS 2920	Siloxane & polysiloxane coating for protection of steel and masonry (parts 1, 2 & 3)
APAS 2971	Epoxy two-pack durable primer for protection of steel in atmosphere
APAS 2973	Medium build two-pack epoxy coating for the long term protection of steel in atmosphere

Warranties

1.4 WARRANTY

Warrant this work under normal environmental and use conditions against failure of materials and execution.

Years: As per the PUR5 requirements For As per the PUR5 requirements

Requirements

1.5 MEETING

Contractor to convene a meeting prior to the commencement of works, between a representative of the contractor, painter, coating manufacturer, contract administrator and inspectors.

The following topics to be reviewed and clarified:
- Review of specification and referenced standards.
- Standards of workmanship for each step in the system.
- Methods of inspection.
- Materials to be used.
- Equipment to be used.
- Surface preparation required
- Method and technique of application
- Drying / curing time intervals
- Method of measurement of coating thickness
- Preparation of inspection reports

Meeting minutes recorded by contract administrator

1.6 QUALIFICATIONS

Painters to be experienced competent workers, familiar with the materials and the techniques specified.

1.7 CERTIFICATION

Provide evidence that the paints used meet or exceed the minimum performance levels stated in SELECTIONS.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

Manufacturer's cleaning and maintenance requirements for each coating system. Identify Manufacturer, paint system, paint type, brand and colour.

1.9 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as set out in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

1.10 MATERIAL SAFETY DATA SHEETS

Obtain from each manufacturer the material safety sheet for each paint product used and comply with the required safety procedures. Keep sheets on site.

Performance - Quality assurance

1.11 QUALITY ASSURANCE

The paint manufacturer is to maintain quality assurance programmes to AS/NZS ISO 9001. The painter is required to follow the paint manufacturer's requirements for preparation, coating/painting and monitoring/inspections.

Inspections

1.12 INSPECTIONS - PAINTER

Inspect for fabrication defects and report any defects for rectification. Monitor, inspect and document all phases of surface preparation and coating application to the requirements of the manufacturer and as stated in the INSPECTIONS clause.

1.13 INSPECTIONS - MANUFACTURER

Permit the paint manufacturer to inspect the work in progress and to take samples of their products from site as requested.

1.14 INSPECTIONS - INDEPENDENT INSPECTOR

Permit an independent inspector (engaged by the Principal) to inspect the work in progress and to take samples of products.

1.15 INSPECTIONS

Inspections include the following;
- Initial inspection prior to surface preparation.
- Inspection of surface preparation.
- Paint containers and paint prior to application
- Mixing of multi-pack paints (if used).
- Paint application (each coat)
- Each coat of paint after application

For those items that are Hold Points or Notification Points and that involve notifying the Contract administrator, refer to clauses below.

1.16 HOLD POINTS

Notify of Hold Point work/item, do not to proceed further with work/item until advised to continue.

Notify: Contract administrator

Notification: 2 working days prior to work/item being carried out.

Hold Point Schedule

Location	**Hold Point**	**Requirement**

1.17 NOTIFICATION POINTS

Notify of Notification Point work/item, continue with the work/item and subsequent work unless advised otherwise.

Notify: Contract administrator

Notification: 2 working days prior to work/item being carried out.

Notification Point Schedule

Location	Notification Point	Requirement

2. PRODUCTS

Materials

2.1 COATING SYSTEMS

Refer to SELECTIONS for coating systems.

3. EXECUTION

Conditions

3.1 PAINT STORAGE

Store paint in a secure area under conditions which will prevent degradation of the paint.

3.2 CONDITIONS FOR PAINTING

Coat steelwork in conditions required for the application of the specified coatings. Ensure prepared and painted surfaces are clean and dry.

Carry out painting with the air temperature between 15°C and 30°C.

Do not carry out painting when:
- The relative humidity exceeds 85%.
- The surface temperature is less than 3°C above the dew point.
- The surface temperature is less than 10°C or greater than 35°C
- The surface is in direct strong sunlight.

- The weather is deteriorating or is unfavourable for application or curing.

3.3 COATING APPLICATION

Mix and apply coatings strictly in accordance with the manufacturer's stated requirements. Ensure that the manufacturer's latest product data sheets are available for reference during preparation and painting.

3.4 COMPATIBILITY

Ensure that materials are as required by their manufacturer for the particular surface and conditions of exposure, and that materials used within each painting system are compatible with each other and are from the same manufacturer.

3.5 SEQUENCE OF OPERATIONS

Complete surface preparation before commencing painting. Apply paint in the specified sequence using the specified paint.

3.6 DRYING TIME

Before handling or applying the next coat of paint, give each coat the required drying time required by the manufacturer. Ensure that surfaces being painted are dry and that ambient conditions are such that condensation does not occur before the paint reaches surface-dry condition.

Application - surface preparation

3.7 CONDITIONS FOR PREPARING STEELWORK BEING PAINTED

Prepare steelwork in conditions approved for the application of coatings. Carry out off-site preparation and coating applications under cover, in a suitable controlled environment and with adequate lighting.

3.8 BLAST CLEANING

Remove oil and grease by the use of aqueous alkaline detergent cleaners with high pressure water cleaners, water jetting or scrubbing equipment. Use test methods in AS 3894.6 to determine that surfaces are free of oil and grease prior to abrasive blast cleaning.

Abrasive blast clean to a Sa2 1/2 finish to AS 1627.4. Clean to bright metal, but avoid producing a polished surface. Select grit type and equipment such that the cleaned surface profile between peaks and valleys does not exceed one third of the dry film thickness. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained. Proceed with the next operation immediately.

Application - general

3.9 UNPAINTED SURFACES

Do not paint:

- Faying face of high strength friction grip (HSFG) bolted joints
- Areas for site welding keeping 150mm clear all round

- Surfaces for embedding in concrete.

Where steel is only partly encased, then extend coating 100mm minimum into the concrete encasement area.

3.10 EACH COAT

Each coat of paint and the completed paint system to have the following qualities and properties:

- Uniform finish, colour, texture, sheen and hiding power
- The proper number of coats applied
- Free of defects such as pinholing, alligatoring, blistering, staining, overspray, peeling, runs, sags and wrinkling.

Surfaces that are in contact or near contact to receive specified coating before assembly.

3.11 PERIOD BETWEEN COATS

Comply with the manufacturer's requirements for recoating intervals and time between application of intermediate and final coats.

3.12 PRIMING GENERALLY

Coat steelwork, unless specifically noted otherwise, with the specified priming paint, including patch priming on site after erection.

3.13 SHOP PRIMING

Carefully prepare the surface and apply a coat of primer. Refer to SELECTIONS for dry film build.

3.14 PATCH PRIMING

Clean areas of damaged priming and areas left clear for site jointing to a standard comparable with the surface preparation specified. Wash off chemical deposits from welding fumes. Apply priming coats to same standard as shop primers, ensuring thorough coating of bolts, nuts and connection areas. Reprime if the primer fails.

3.15 FINISHING

Prepare primer for intermediate coats and apply intermediate coats to coating manufacturer's requirements. Apply final coat to manufacturer's requirements.

Completion

3.16 LEAVE

Leave the whole of this work uniform in gloss, texture and colour, free from painting defects, clean and unmarked, and to the standard required by following procedures.

4. SELECTIONS

Performance

Polyurethane coating systems for steel

4.1 POLYURETHANE - TWO PACK, SOLVENT-BORNE (PUR5 SYSTEM) FOR STEEL

Location:	External walls
Atmospheric corrosivity category:	C4
System Designation:	PUR5 to AS/NZS 2312.1 and SNZ TS 3404
Manufacturer:	To be advised
Surface prep:	Sa 2½ (blast cleaning)

1st Coat

Brand:	TBA
PRN, Type, minimum DFT:	75
Minimum performance level to:	As per the PUR5 requirements
Application:	Spray
Colour:	TBA

2nd Coat

Brand:	
PRN, Type, minimum DFT:	C13, High build epoxy, 200 µm
Minimum performance level to:	AS/NZS 3750.14 or APAS 2973
Application:	Spray
Colour:	TBA

3rd Coat

Brand:	TBA
PRN, Type, minimum DFT:	C26, Polyurethane gloss, 50 µm
Minimum performance level to:	AS/NZS 3750.6 or APAS 2911
Application:	TBA
Colour:	TBA