

SPECIFICATION

of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

National War Memorial Park

Wellington

for
NZILA

Specification prepared by
WALA

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2110 SALVAGE

1. GENERAL

This section relates to the salvage of existing materials only,

1.1 RELATED WORK

Refer to 2110 for **DEMOLITION WORKS (ENGINEERS SPECIFICATION)**

Refer to **2241** for **EXCAVATION (ENGINEERS SPECIFICATION)**

1.2 DOCUMENTS

Documents referred to in this section are:

NZBC F5/AS1 Construction and demolition hazards

NZS 6803 Acoustics - Construction noise

NZDAA Best practice guidelines for demolition in New Zealand

NZDAA New Zealand guidelines for the management and removal of asbestos
Health and Safety in Employment Act 1992

1.3 QUALIFICATION

Carry out **SALVAGE** only under the supervision of a suitably experienced person and using only experienced operators and drivers. Use only experienced, certified, construction blasters for explosives demolition.

1.4 SURVEY

Before commencing work, carry out a thorough survey and examination of all structures to be **SALVAGED** in order to ensure the extent, sequence, technique and method of demolition proposed can be safely and efficiently carried out.

Take photographs of the works, adjacent buildings and sites, before commencing work.

Provide a set of these photographs as a record of existing condition.

1.5 ARCHAEOLOGICAL DISCOVERY

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

1.6 SALVAGE

Designated items remain the property of the owner.

2. PRODUCTS

2.1 ELEMENTS FOR SALVAGE OR RE-USE

Carefully dismantle, remove and store on site where directed. Protect from damage and weather until required.

3. EXECUTION

3.1 SALVAGE

Carefully dismantle and store safely all salvage items where directed; for removal, use on the site, or until completion of the works.

3.2 REINSTATE AND MAKE GOOD

Reinstate and make good demolition damage to adjoining properties, existing work, services, or property.

3.3 TAKE AWAY

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

4. SELECTIONS

4.1 ELEMENTS FOR SALVAGE AND DELIVERY TO OWNER
Salvage the following elements and deliver to the owner.
Refer to Engineers specification.

4.2 ELEMENTS FOR RE-USE

Element/ component	Location	Location for re-use
Glazed Brick kerbs	Entrance to Massey University	Tangata Whenua Gardens
S5 Concrete Seat	TBC by Principle	Deliver to site Install as per contract Drawings

END OF SECTION

3124 INSITU CONCRETE - FINISHES

1. GENERAL

This section relates to the standard of concrete finishes, exposed aggregate surfaces, floors and pavements, plain and textured.

This include:

- insitu concrete paving
- **Pi1** cast insitu flush concrete strip / historical interpretation

1.1 RELATED WORK

Refer to 2110 SALVAGE for concrete wall
Refer to 3120 PRECAST CONCRETE - FINISHES for precast concrete
Refer to 3361 STONEMWORK + BRICK INSERT for stone and brick cladding
Refer to 4924 LANDSCAPE METALWORK for metalwork
Refer to 6711R RESENE PAINTING EXTERIOR for painting finishes
Refer to 8231 CONCRETE UNIT PAVING for unit pavers and tactile pavers
Refer to 8461 STREET FURNITURE for furniture

Refer to [3101](#) for [CONCRETE WORK - BASIC](#)

Refer to Engineers technical specification for concrete paving, kerbs, edge and dished channels.

Documents

1.2 DOCUMENTS

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

[NZBC D1/AS1](#) Access routes
[NZBC D1/VM1](#) Access routes
[NZS 3114](#) Specification for concrete surface finishes
[NZS 3121](#) Specification for water and aggregate for concrete
[AS/NZS 3661.1](#) Slip resistance of pedestrian surfaces - Requirements

Requirements

1.3 QUALIFICATIONS

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

Carry out concrete works under the supervision of a suitably experienced person, using only operators and drivers trained for this work.

Experienced personnel: The Contractor shall be required to nominate the operational personnel for these works having appropriate proven experience in this type of precast construction.

Conformance to visual requirements: The Contractor shall conform to the requirements of the prototype, drawings and this Specification to achieve the quality and finish shown in the documentation.

Unless otherwise qualified or amended by this section of the Specification or shown on the structural drawings all work covered by this section of the Specification shall be carried out in strict accordance with NZS 3109. The Contractor shall be familiar with these standards and have (at his own expense) access to the standards for reference at all times.

Provide continuous supervision on site by a foreman experienced in this type of work.

1.4 SUBCONTRACTORS

Submit name and contact details of proposed manufacturer of precast concrete units.

1.5 RECORDS
Record on site and make available to the Engineer records of the quantities of concrete, cement and aggregate used on the various portions of the Contract. Supply the Engineer with docket of certified plant mix showing the time of loading the mixer drums, the time of completion of unloading, mix type and the job.

1.6 WARRANTIES
Obtain all warranties including (but not exclusive to)

- Concrete sealant
- Concrete anti graffiti coating

1.7 PROVIDE SAMPLE PANEL
Provide a sample panel of the following specified finishes before commencing work. Panels to be of similar thickness to the proposed construction.

Conformance: Supply sample panels to AS 3610 and in conformance with the **Sample panels schedule** (below) for the application specified.

Supply samples for concrete that include all saw cut or other jointing patterns and specified finishes as per design. Cast the sample panels using the formwork, concrete, compaction equipment, form release agents curing and removal methods which are to be used in the final work.

Samples shall be made and kept in an area remote from the designated locations for the constructed concrete elements that are to be installed.

Do not proceed with the related work until the acceptable range of surface treatments has been determined.

1.8 SAMPLE PANEL SCHEDULE
(For precast samples refer to section 3130)

code	Panel / sample	Incorporated features	Panel Sizes
	SURFACING		
CP1	In situ concrete paving (pedestrian loading)	<ul style="list-style-type: none"> • Saw cut joint • Concrete finish • Colour and aggregate sample • Radius edge 	2 metres
CP2	In situ concrete paving (vehicular loading)	<ul style="list-style-type: none"> • Saw cut joint • Concrete finish • Colour and aggregate sample • Radius edge 	2 metres
	HERTIGATE		
Pi1	In situ concrete flush strip	<ul style="list-style-type: none"> • Saw cut joint • Concrete finish • Colour and aggregate sample • Radius edge 	2 metres

1.9 CAST SAMPLE PANELS
For precast samples refer to section 3130

1.10 COLOUR VARIATION
Keep inherent shade variations within the range of the grey scale in [NZS 3114](#). Obtain written instructions regarding the colour established in the sample reference panel for matching.

- 1.11 **TECHNIQUE DISCUSSION**
Before casting the sample panel arrange a meeting to confirm the method of preparing the sample. After agreement that the sample panel is truly representative of the finish specified and can be produced on site, it then becomes the standard for that finish.
- 1.12 **SAMPLE SLIP RESISTANCE**
Test sample to [AS/NZS 3661.1](#) for slip resistance, to comply with [NZBC D1/VM1](#) and [NZBC D1/AS1](#), 2.0, Level access routes; 3.14 Slip resistance for ramps and 4.14 Stair treads.
- When in place on a level access route, to have a mean coefficient of friction (μ) not less than 0.4.
- When in place on a sloping access route, to have a coefficient of friction (μ) not less than $0.4 + 0.0125S$ (S = slope of surface expressed as a percentage).
- When in place on stair treads, to [NZBC D1/AS1](#), Table 2.
Provide certificates and any other evidence that the surface complies with the standard of performance specified.
- 1.13 **RUN OFF**
Ensure run off acids, other chemicals and cement products are contained within the site. They must not damage other surfaces, enter drains or pollute landscapes or water courses.
- 1.14 **Performance INSPECTIONS**
Give notice so that inspection may be made of the following:
Hold points
 - Concrete formwork and reinforcement in position
 - Precast Moulds complete
 - Trial set-outs before execution.
 - Samples as per sample schedule
Witness points
 - Set out of joints
 - Set out of service Pit lid covers
 - Control joints before sealing and grouting
 - Precast Moulds complete
- 2. PRODUCTS**
- 2.1 **MATERIALS**
All materials shall conform to NZS 3109 except that additives shall not be used without the written consent of the Engineer, and when used shall be at the Contractor's expense.
- 2.2 **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.
- 2.3 **CONCRETE COLOUR**
Proprietary natural oxides added to the concrete at mixing. Refer to SELECTIONS for brand and colour.
- 2.4 **AGGREGATES**

River stone. Aggregates and their gradings 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.

2.4 WATER

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

2.6 ADDITIVES

Additives shall not be used without the written consent of the Engineer, and when used shall be at the Contractor's expense. 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.

2.5 SEALERS

Proprietary penetrating or surface sealers. Refer to SELECTIONS for brand and type.

3. EXECUTION

Conditions

3.1 RESPONSIBILITY

Take responsibility for determining the method of producing the specified finished surface.

3.2 PROTECTION

Protect and maintain the specified finish where necessary during any handling, erection or subsequent construction operation to ensure a clean undamaged surface at completion of the contract works.

3.3 GENERAL

Except where noted otherwise on the drawings or in the specification, tolerances in regard to colour and surface to the requirements of [NZS 3114](#) for each finish specified.

3.4 SURFACE TOLERANCES

Variations from a plane surface are defined as follows:

Abrupt: 2mm

Steps or irregularities caused by displacement of form joints and measured between peak and hollow over a 200mm straight edge.

Gradual: 3mm

Undulations over the surface and measured between rise and hollow over a 1500mm straight edge.

Check all dimensions on the site and notify the Engineer of any inconsistencies of levels or dimensions with the plans prior to commencing work.

In addition the required standard of the tolerance shall be such that all fittings, equipment, etc. can be installed accurately and neatly as required by the drawings and specification.

It is particularly required that at construction joints that upward curl and or misalignment in level is prevented.

All surfaces shall be finished in conformity with the lines, grades, thickness and cross sections shown on the drawings or specified within the following limits:

Pavements shall be graded to achieve falls and levels indicated on the layout plans.

3.5 RISKS OF CRACKS FORMING

Ensure substrate is free of cracks. Follow correct procedures for curing to minimise cracks forming that may mar the finish quality.

Application

3.6 OFF THE FORM FINISHES

CLASS	REQUIREMENTS
F1 finish	To NZS 3114 :clause 105.1, F1 finish, with holes filled and defective concrete repaired to NZS 3109 as required. Dimensional tolerances to those set in NZS 3109 , table 5.2.
F2 finish	To NZS 3114 :clause 105.2, F2 finish, with abrupt and gradual surface tolerances not exceeding 6mm.
F3 finish	To NZS 3114 :clause 105.3, F3 finish, with abrupt changes not exceeding 6mm at construction joints nor 3mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 6mm.
F4 finish	To NZS 3114 :clause 105.4, F4 finish, with abrupt changes not exceeding 4mm at construction joints nor 2mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 6mm.
F5 finish	To NZS 3114 :clause 105.5, F5 finish, with abrupt changes not exceeding 2mm at construction joints nor 1mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 6mm.
F6 finish	To NZS 3114 :clause 105.6, F6 finish, with abrupt changes not exceeding 1mm at construction joints nor 0.5mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 4mm.

3.7 FLOOR AND EXTERIOR PAVEMENT, UNFORMED FINISHES

CLASS	REQUIREMENTS
U1 class	Screeded finish to NZS 3114 : clause 305.1, U1 finish, with abrupt changes not exceeding 5mm and gradual variations not exceeding 10mm.
U2 class	Floated finish to NZS 3114 : clause 305.2 U2 finish, with abrupt changes not exceeding 3mm and gradual variations not exceeding 5mm.
U3 class	Trowelled finish to NZS 3114 : clause 305.3, U3 and U4 finishes, with abrupt changes not exceeding 3mm and gradual variations not exceeding 5mm.
U5 class	Shallow textured to NZS 3114 : clause 305.2, U5 finish, with abrupt changes not exceeding 3mm and gradual variations not exceeding 5mm.
U5E class	Exposed aggregate shallow textured to NZS 3114 : clause 305.2, U5 finish, with abrupt changes not exceeding 3mm and gradual variations not exceeding 5mm.
U10	Special textured to NZS 3114 : clause 305.2, U 10 finish, architectural effects.
U11 class	Ground finish to NZS 3114 : clause 305.2, U11 finish, with no abrupt changes and gradual variations not exceeding 3mm.

3.8 JOINT – GENERAL

Provide movement joints

- as shown on finishes drawing and set out plans
- Over structural (isolation, contraction, expansion) joints.
- At junctions between different substrates.
- To divide large paved areas into bays, maximum 6 m wide, maximum area 16 m².

No joint shall be provided within 1m of the junction of any walls or edges unless directed otherwise within the drawing package.

3.9 EXPANSION JOINTS + CONSTRUCTION JOINTS

The concrete placing shall be carried out continuously between expansion joints and in such a manner that a plastic concrete face is maintained. Where the location of expansion joints are shown on the drawings, they shall neither be relocated nor eliminated without the approval of the Engineer.

Where no expansion joints are shown on the Contract Drawings and such are required, their location shall be to the approval of the Engineer.

Sealant

Colour to match that of the concrete and required sample approval from Landscape Architect. Apply in accordance with manufacturer's instructions.

3.10 SAW CUTS

Saw cuts:

- Dimensions as per drawing s
- saw cuts to be left without grout

Sawcuts shall be made in a manner to prevent chipping of edges during the operation - generally between 24 and 36 hours after casting. Saw cuts shall be to the depths shown on the drawings and shall be made using a self propelled diamond tipped circular saw machine.

Finishing

3.11 RADIUS / CHAMFER WORK

All edges will have no radius or chamfer to all visible sides unless stated otherwise in drawings

3.12 GENERAL

Achieve the standard of the specified finish required, direct from the formwork with a minimum of attention to the stripped surface.

3.13 TIE HOLES

Concealed tie holes unless agreed with Landscape Architect. If non concealed are accepted fill tie holes to finish F5 and to colour match the parent concrete.

3.14 MINOR SURFACE DEFECTS

Repair minor surface defects to match the shade and texture of the surrounding concrete.

3.15 PAINTED SURFACES

Fill minor surface defects with approved plaster stopping compound/cellulose filler and rub down to match the texture of the surrounding concrete.

3.16 SAND/ GRIT BLAST FINISH

Medium abrasive finish as described in CCANZ IB 18.

After surface has matured and preferably within 7 days of the element reaching 28 day age, the surface identified to be sand blasted shall receive a uniform sand blast treatment. Abrasive blast the cured surface to provide an even texture without exposing the coarse aggregate using hard, sharp, graded abrasive particles. All sand blasting shall be undertaken by the same skilled sand blasting operator using the same equipment.

The operator shall take care and provide such protection as is necessary to prevent sand blasting treatment of surfaces or planting adjacent.

The texture of the final sand blast surface treatment to be approved by the Landscape Architect/Architect.

Type of particle

- Sand or high pressure water
- Provide light acid wash to clean the surface after sand blasting

Colour concrete

3.17 COLOUR CONCRETE - WET MIX

Add coloured oxides to the concrete to the wet mix, to the manufacturer's recommendations.

3.18 COLOUR CONCRETE - AFTER PLACING

Apply (as a dry shake) pigments or liquids to the wet surface after placing.

Sealer

3.19 SEALER

Apply selected sealer to the manufacturer's recommendations.

Ensure slip resistance is achieved as per building code requirements for public accessible routes.

Obtain warranty from installer.

3.20 ANTI GRAFITTI COATING

Apply selected to the manufacturer's recommendations.

Obtain warranty from installer.

4. SELECTIONS

- 4.1 PROVIDE SAMPLE PANEL
Refer to clause 1.5 above for sample panel requirements.
- 4.2 EXTERIOR INSITU PAVEMENT
Paving (CP1 + CP2)

Properties

<i>Property</i>	
Surface finish to AS/NZS 3114	F5 X Class
Formwork	Fair face
Primary finish	Steel float
Supplementary Finish - vertical face	Light sand blast
Supplementary Finish - horizontal face	Light sand blast
Slip resistance classification to AS/NZS 4586.	V
Slip resistance treatment	Required
Slip resistance tests	Required
Surface modifier	None

Concrete colour & aggregate mixes

Aggregate to make up the % of concrete volume as required to make up the required MPA and comply with NZS 3121.

Type	Aggregate size	Aggregate Proportion	Concrete colour
River stone aggregate or similar approved to meet NZ 3121 (sample approval by LA required)	Refer Engineers Specification	100% of aggregate	<p>CP1 Natural concrete colour unless otherwise noted on drawings</p> <p>CP2 Concrete to be coloured with black oxide to match Peter Fell colour 698</p> <p>Sample required for approval</p>

4.3 EXTERIOR HISTORICAL REFERENCE / CONCRETE STRIP
Special feature (Pi1)

Properties

<i>Property</i>	
Surface finish to AS/NZS 3114	F5 X Class
Formwork	Fair face
Primary finish	Steel float
Supplementary Finish - vertical face	Light sand blast
Supplementary Finish - horizontal face	Light sand blast
Slip resistance classification to AS/NZS 4586.	V
Slip resistance treatment	Required
Slip resistance tests	Required
Surface modifier	None

Concrete colour & aggregate mixes

Aggregate to make up the % of concrete volume as required to make up the required MPA and comply with NZS 3121.

Type	Aggregate size	Aggregate Proportion	Concrete colour
River stone aggregate or similar approved to meet NZ 3121 (sample approval by LA required)	Refer Engineers Specification	100% of aggregate	No colour oxide to be added Sample required for approval

4.4 STAIR NOSING

Location: As shown on contract drawings
 Manufacturer/type: Latham Asbra Titaze S
 Colour: Exterior heavy duty slip resistant trowel able resign safety tread
 Black (standard) to concrete

4.5 CONCRETE SEALER

Location: CP1, CP2 in situ concrete paving
 Manufacturer/type: Penetrative matt finish sealer
 eg. 'Crystal Seal' by Nuplex or MIS Enviro Sealer or similar approved to protect the surface from future staining.
 Note: The sealer is to be clear in colour and be a matt finish

4.6 ANTI GRAFFITI COATING

Location: CW6 insitu concrete wall
 Manufacturer/type: 'PSS 20' anti-graffiti by Equus, or 'Guardian Graffiti Shield' by Graffiti solutions
 Note: Clear matt Graffiti Resistant Finish

END OF SECTION

3130 PRECAST CONCRETE - FINISHES

1. GENERAL

This section relates to the required performance and FINISHES of the precast panels for external works.

This includes:

- Precast walls
- Precast stairs
- Precast kerbs (including channels, crossings and permeable kerbs)

1.1 RELATED WORK

Refer to the appropriate concrete section for concrete requirements.

Refer to 2110 SALVAGE	for concrete wall
Refer to 3124 INSITU CONCRETE - FINISHES	for insitu concrete
Refer to 3361 STONWORK + BRICK INSERT	for stone and brick cladding
Refer to 4924 LANDSCAPE METALWORK	for metalwork
Refer to 6711R RESENE PAINTING EXTERIOR	for painting finishes
Refer to 8231 CONCRETE UNIT PAVING	for unit pavers and tactile pavers
Refer to Engineers technical specification	for concrete specification, concrete paving, kerbs and dished channels
Refer to Engineers technical specification	for UW underpass wall

1.2 DOCUMENTS

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

NZBC D1/VM1	Access routes
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3112.1	Methods of test for concrete - Tests relating to fresh concrete
NZS 3114	Specification for concrete surface finishes
NZS 3121	Water and aggregate for concrete
AS/NZS 3661.1	Slip resistance of pedestrian surfaces - Requirements
AS/NZS 4671	Steel reinforcing materials
AS/NZS ISO 9001	Quality management systems - Requirements
Precast CoP	Approved Code of Practice for Safe Handling, Transportation and Erection of Precast Concrete (OSH)

Requirements

1.3 PREPLANNING

Prior to shop drawing/manufacture of the precast panels the Contractor, Precaster and other relevant parties, must liaise, to ensure installation/on-site requirements are coordinated with the panel production.

1.4 SHOP DRAWINGS

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide shop drawings to show the general arrangement including, but not be limited to:

- size, spacing and cover of reinforcement
- details, position and layout of cast in items, including those for, lifting, handling, fastening and connecting
- details of panel edges
- surface finish requirements and locations
- location and size of rebates, recesses and penetrations
- grout ducts
- concrete mix requirements and strength
- concrete volume and weight of finished unit for lifting

- for insulated panels, details of insulation, low conduction connectors/ties, vapour barrier

Submit shop drawings for review to ~.

- 5working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Do not commence fabrication of any panel before shop drawing review of the panel is complete.
- Shop drawing review (and subsequent fabrication) can be carried out on an agreed sectional/staged basis.

Shop Drawing schedule

Code	Type	Comment
WALLS		
PCW#	precast concrete walls	Provide shop drawing
STAIRS		
PSS#	precast stair – stone clad	Provide shop drawing
PSC#	precast stair - concrete	Provide shop drawing
KERBS		
KCP	Permeable kerbs	Provide shop drawing
KCF	Flush kerbs	Provide shop drawing
KC	Upstand kerbs	Provide shop drawing
KCo	Upstand kerbs with channel	Provide shop drawing
KCdc	Dish Channel	Provide shop drawing
KXc	Kerb crossing (pedestrian)	Provide shop drawing
KXcv	Kerb crossing (vehicular)	Provide shop drawing
KCW	WCC kerb + channel	Provide shop drawing

1.5 MANUFACTURERS STATEMENT OF COMPLIANCE
Provide a Manufacturer's Statement of Compliance from the [Precast CoP](#).

1.6 PANEL SURFACE
Use appropriate mould materials, moulding systems and casting methods to achieve the specified surface finishes. Refer to SELECTIONS for surface finishes.

1.7 SAMPLE
Conformance: Supply sample panels to AS 3610 and in conformance with the **Sample panel's schedule** (below) for the application specified.

Supply samples for pre-cast concrete that include all saw cut or other jointing patterns and specified finishes as per design. Cast the sample panels using the formwork, concrete, compaction equipment, form release agents curing and formwork removal methods which are to be used in the final work.

Samples shall be made and kept in an area remote from the designated locations for the constructed concrete elements that are to be installed.

Do not proceed with the related work until the acceptable range of surface treatments has been determined.

Allow 2 weeks for review.

Sample schedule

Code	Type	Associated features	Sample required
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Code	Type	Associated features	Sample required
PRECAST CONCRETE WALLS			
PCW#	precast concrete walls	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • radius edge 	1 # wall
PRECAST CONCRETE STAIRS			
PSS#	precast stair – stone clad	CONCRETE SAMPLE NOT REQUIRED	
PSC#	precast stair - concrete	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • radius edge 	1# stair unit
precast concrete kerbs			
KCP	Permeable kerbs	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • radius edge 	1 unit
KCF	Flush kerbs	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • radius edge 	1 unit
KC	Upstand kerbs	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • radius edge 	1 unit
KCo	Upstand kerbs with channel	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • Radius edge 	1 unit
KCdc	Dish Channel	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • Radius edge 	1 unit
KXc	Kerb crossing (pedestrian)	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • Radius edge 	1 unit
KXcv	Kerb crossing (vehicular)	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • Radius edge 	1 unit
KCW	WCC kerb + channel	<ul style="list-style-type: none"> • concrete finish • colour and aggregate sample • Radius edge 	1 unit

1.8 QUALIFICATION, PRECAST MANUFACTURE

Precast concrete panels manufactured by either;

- a Precast NZ Certified Plant
- OR an off-site precast manufacturer with, an established record of panel production to a similar standard, suitable plant and an appropriate quality assurance system.

Use only precast concrete workers skilled and experienced in precast panel production.

1.9 QUALIFICATION, ON-SITE WORK

Use only concrete tilt up panel, crane and rigging, contractors skilled and experienced in the erection of tilt up panels.

Performance

1.10 TESTING - CONCRETE

Carry out sampling and concrete acceptance tests during construction to [NZS 3109](#): section 9, Concrete acceptance tests during construction.

Conduct 7 day strength tests. After a 7 day test result of less than 60% of the specified strength, concrete placement to stop until it is shown the suspect concrete complies with the specification.

Carry out slump tests, yield tests and air content tests to [NZS 3112.1](#), sections 4, 5 and 9, and evaluate to [NZS 3104.2.15](#). Control tests and their evaluation. Make available all test records to the contract administrator on request.

1.11 CONFIRM STEEL REINFORCING COMPLIANCE

Provide written confirmation that the steel reinforcing supplied complies with the grades specified on the drawings, by producing test results to [AS/NZS 4671](#)

1.12 QUALITY ASSURANCE

Carry out the whole of this work to the requirements of [NZS 3109](#) and under the regime of a quality system for quality assurance in production and erection.

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 concrete pour.

1.13 INSPECTION NOTIFICATION REQUIREMENTS

Give notice so that inspection may be made of the following:

Hold points

- Concrete formwork and reinforcement in position
- Precast Moulds complete
- Samples as per sample schedule

Witness points

- Precast Moulds complete

1.14 SAMPLE SLIP RESISTANCE FOR KERBS

Test sample to [AS/NZS 3661.1](#) for slip resistance, to comply with [NZBC D1/VM1](#).

- When in place on a level access route, to have a mean coefficient of friction (& micro) not less than 0.4.
- When in place on a sloping access route, to have a coefficient of friction (& micro) not less than $0.4 + 0.0125S$ (S = slope of surface expressed as a percentage).

Provide certificates and any other evidence that the surface complies with the standard of performance specified.

1.15 SITE LOADINGS, PERMANENT STRUCTURE

Prevent damage to supporting structure from stacking of precast items.

2. PRODUCTS

2.1 MATERIALS

All materials shall conform to NZS 3109 except that additives shall not be used without the written consent of the Engineer, and when used shall be at the Contractor's expense.

2.2 CONCRETE

To [NZS 3104](#).

Refer to CONCRETE section for concrete supply and to SELECTIONS for concrete strength.

2.3 CONCRETE COLOUR

Proprietary natural oxides added to the concrete at mixing. Refer to SELECTIONS for brand and colour.

2.4 AGGREGATES

Aggregates and their gradings 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.

- 2.4 **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.
- 2.5 **GRADE 500E STEEL**
To [AS/NZS 4671](#). Round bars shown by symbol "HR" and deformed bars by symbol "HD" followed by diameter in millimetres.
- 2.6 **WELDED WIRE FABRIC**
Hard drawn steel wire spot welded with correct gauge to [AS/NZS 4671](#), smooth or deformed and to the spacing and dimensions either specified or shown on the drawings.
- 2.7 **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.
- 2.8 **SEALERS + ANIT GRAFITTI COATINGS**
Proprietary penetrating or surface sealers. Refer to SELECTIONS for brand and type.

Components

- 2.9 **LIFTING INSERTS**
Proprietary lifting inserts to the [Precast CoP](#), minimum finish galvanised mild steel.
- 2.10 **CAST IN STEEL ITEMS**
Cast in items as detailed and required. Ensure items are prefinished where required.
- 2.11 **LEVELLING SHIMS**
Rigid plastic or other suitable levelling shims to [Precast CoP](#).
- 2.12 **SEALANTS**
Polysulphide, polyurethane or silicone gap filling proprietary sealants.

3. EXECUTION

Conditions

- 3.1 **HANDLE, TRANSPORT AND STACK**
Handle, transport and stack panels to ensure support that avoids distortion and stress and at the same time protects the finished surfaces from chipping, scoring, cracking or other disfigurement. Storage methods and packing between panels should minimise colour variations to exposed surfaces.
Arrange delivery and erection of precast panels to minimise handling, storage or restacking on site.

Manufacture

- 3.2 **TOLERANCES, OFF-SITE PRECAST, CRITICAL**
Manufacture panels to the following tolerances:

Item		Tolerance
-------------	--	------------------

Length and height:		< 3.0 metres	± 3mm
	Generally	> 3.0 metres	± 5mm
	Cladding	> 3.0 metres	± 3mm
Thickness overall:			± 3mm
Deviation from square:	Length	< 4.0 metres	0.0015 L
(difference in length between two diagonals)			
Twist:			± 3mm
(any one corner out of plane passing through other three corners)			
Position of panel openings and cast in items:			± 3mm

Other tolerances to [NZS 3109](#), Table 5.1 - Tolerances for Pre-cast components reduced by 40%.

Before casting, ensure moulds will result in the finished panels complying with tolerances.

3.3 SECURE REINFORCEMENT

Secure adequately with tying wire, spacers or other suitable means, and place accurately where detailed, supported and secured against displacement. Ensure minimum concrete cover is maintained.

3.4 CONCRETE PLACING

Carefully place concrete to ensure all parts of the mould are completely filled and full contact is made with the mould surface. Use appropriate compaction techniques to achieve the required finish.

3.5 CASTING IN ITEMS

Accurately cast in all embedded items and fixings as detailed, all securely located to avoid displacement during concrete placement and compaction. Where bolts are cast in, also provide the nut (free moving on the bolt).

3.6 CURING

Confirm in writing the system to be used for curing concrete. Cure panels, for a minimum of 7 days and until minimum strength is achieved for safe lifting, handling, transportation and erection.

3.7 TIE HOLES

Concealed tie holes unless agreed with Landscape Architect. If non concealed are accepted fill tie holes to finish F5 and to colour match the parent concrete.

Sealer

3.8 SEALER

Apply selected sealer to the manufacturer's recommendations.

Ensure slip resistance is achieved as per building code requirements for public accessible routes

Obtain warranty from installer.

3.9 ANTI GRAFITTI COATING

Apply selected to the manufacturer's recommendations.

Obtain warranty from installer.

Installation

3.10 INSTALLATION

Carry out work in accordance with the [Precast CoP](#).

Prior to lifting any panels from the truck, check and make a record of any damage to the panels, and obtain approval from the Contract Administrator before incorporating a damaged panel into the work.

- 3.11 **SETTING OUT**
Confirm panel dimensions, set out and site conditions. Also check starter bars, grout tube positions and fixing points. Check all temporary support work is ready, correct and capable of taking imposed loads.
- 3.12 **TOLERANCES, ON - SITE EXECUTION**
Locate precast items to the following tolerances:
Plan: $\pm 10\text{mm}$
Vertical: $\pm 1\text{mm/metre}$
Panel Joint width: $\pm 1\text{mm/metre}$; but no panel joint shall be less than 10mm, or more than 20mm (unless indicated otherwise on drawings)
- 3.13 **LIFTING**
Mobile crane positions to be arranged and prepared prior to panel delivery to provide safe lifting. Ensure that all cranes can provide safe and easy movement of panels, as well as careful positioning. Check that rigging, straps, etc, suit the panel design and lifting points. Panels are to remain attached to the crane until they are either fully fixed into their final position or adequately secured by temporary means.
- 3.14 **PROPPING AND BRACING**
Provide temporary adjustable props or braces to secure the panel in position until final support is provided. They must be able to withstand the expected wind loads on the panel for the site and position.
- 3.15 **PLACING**
On positioning of the panel, check that all reinforcing and fixings line up with the appropriate items on the preceding work. Also check fixings will function as intended, in particularly fixings required to accommodate seismic movement. Ensure that there is no damage caused to the panel, surrounding surfaces or fixings during placing.
- 3.16 **FINAL POSITION**
Adjust panels into final position, check alignment, verticality, joint widths etc., and fix into place.
- 3.17 **GROUT DUCTS**
Fill grout ducts with expansive grout, ensure ducts are completely filled.
- 3.18 **POST PLACING ADJUSTMENTS**
After permanent placing check and adjust as necessary;
- All fixings for correct alignment and operation, and check the torque on all nuts and bolts - not less than 1 day after final fixing.
- Recheck that all props, braces and fastenings are secure and capable of performing as required - not less than 1 day and not more than 7 days after a panel is fixed into position and held by temporary means.
- If panels are subject to, high wind loads, unintended or accidental loads during construction, recheck props braces and fastenings.
- 3.19 **SEALANTS**
Ensure at time of erection, that the limits of acceptable joint variation (from the manufacturer's requirements) for each product are maintained. Prepare joints, protect adjoining surfaces, seal joint surfaces, fit limiting rods and insert sealant to the manufacturer's requirements and temperature limits.
- 3.20 **CLEAN AND DRESS**
Clean and dress panels externally and internally to leave them to the standard of finish specified and without blemish, ensuring following work can be completed to the required standard.
- 3.21 **CLEAN UP**
Clean up surrounding areas of trade waste and remove temporary works required for the installation of the precast concrete items.

- 3.22 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 SAMPLE PANELS
Refer to **Requirements** above
- 4.2 EXTERIOR PRECAST WALLS
Walls (PCw)

Properties

<i>Property</i>	
Surface finish to AS/NZS 3114	F5 X Class
Formwork	Fairface
Primary finish	Steel float
Supplementary Finish - vertical face	Light sand blast
Supplementary Finish - horizontal face	Light sand blast
Slip resistance classification to AS/NZS 4586.	V
Slip resistance treatment	Required
Slip resistance tests	Required
Surface modifier	None
Bolt hole filling	Refer to clause above

Concrete colour & aggregate mixes

Aggregate to make up the % of concrete volume as required making up the required MPA and complying with NZS 3121.

Type	Aggregate size	Aggregate Proportion	Concrete colour
River stone aggregate or similar approved to meet NZ 3121 (sample approval by LA required)	Refer Engineers Specification	100% of aggregate	Concrete to be coloured with black oxide to match Peter Fell colour 698 Sample required for approval

4.3 EXTERIOR PRECAST CONCRETE STAIRS
Stairs (PSs#) – stone clad

Properties

<i>Property</i>	
Surface finish to AS/NZS 3114	F3 Class
Formwork	Fairface
Primary finish	Steel float
Supplementary Finish - vertical face	Light sand blast
Supplementary Finish - horizontal face	Light sand blast
Slip resistance classification to AS/NZS 4586.	V
Slip resistance treatment	Required
Slip resistance tests	None
Surface modifier	None
Bolt hole filling	Refer to clause above

Concrete colour & aggregate mixes

Aggregate to make up the % of concrete volume as required to make up the required MPA and comply with NZS 3121.

Type	Aggregate size	Aggregate Proportion	Concrete colour
River stone aggregate or similar approved to meet NZ 3121 (sample approval by LA required)	Refer Engineers Specification	100% of aggregate	Concrete to be coloured with black oxide to match PeterFell colour 698 . Sample required for approval

4.4 EXTERIOR PRECAST CONCRETE STAIRS
Stairs (PSc#) – Concrete

Properties

<i>Property</i>	
Surface finish to AS/NZS 3114	F5 X Class
Formwork	Fairface
Primary finish	Steel float
Supplementary Finish - vertical face	Light sand blast
Supplementary Finish - horizontal face	Light sand blast
Slip resistance classification to AS/NZS 4586.	V
Slip resistance treatment	Required
Slip resistance tests	Required
Surface modifier	None
Bolt hole filling	Refer to clause above

Concrete colour & aggregate mixes

Aggregate to make up the % of concrete volume as required to make up the required MPA and comply with NZS 3121

Type	Aggregate size	Aggregate Proportion	Concrete colour
River stone aggregate or similar approved to meet NZ 3121 (sample approval by LA required)	Refer Engineers Specification	90% of aggregate	Concrete to be coloured with black oxide to match Peter Fell colour 698 . Sample required for approval

4.5 EXTERIOR PRECAST CONCRETE KERBS
All Kerbs

Properties

<i>Property</i>	
Surface finish to AS/NZS 3114	F5 X Class
Formwork	Fairface
Primary finish	Steel float
Supplementary Finish - vertical face	Light sand blast
Supplementary Finish - horizontal face	Light sand blast
Slip resistance classification to AS/NZS 4586.	V
Slip resistance treatment	Required
Slip resistance tests	Required
Surface modifier	None
Bolt hole filling	Refer to clause above

Concrete colour & aggregate mixes

Aggregate to make up the % of concrete volume as required to make up the required MPA and comply with NZS 3121.

Type	Aggregate size	Aggregate Proportion	Concrete colour
River stone aggregate or similar approved to meet NZ 3121 (sample approval by LA required)	Refer Engineers Specification	100% of aggregate	Concrete to be coloured with black oxide to match Peter Fell colour 698 . Sample required for approval

4.6 STAIR NOSING

Location: As shown on contract drawings
Refer to MP-11-90442 "Stair Details 10"
Manufacturer/type: Latham Asbra Titaze S
Exterior heavy duty slip resistant trowel able resign safety tread
Colour: Black (standard) to concrete

4.7 SEALER

Location: PSc# precast concrete stairs
Manufacturer/type: Penetrative matt finish sealer
eg. 'Crystal Seal' by Nuplex or MIS Enviro Sealer or similar approved to protect the surface from future staining.
Note: The sealer is to be clear in colour and be a matt finish

4.8 ANTI GRAFFITI COATING

Location: All concrete walls
Manufacturer/type: 'PSS 20' anti-graffiti by Equus, or 'Guardian Graffiti Shield' by Graffiti solutions
Note: Clear matt Graffiti Resistant Finish

END OF SECTION

3361 STONEMWORK + BRICK FEATURES

1. GENERAL

This section relates to the supply, laying and fixing of non-load bearing stone, fixed to a rigid structural backing or erected as a freestanding low wall.

This includes:

- 500mm high stone kerb.
- Historic (Prisoner) bricks inserts to walls..

1.1 RELATED WORK

Refer to 2110 SALVAGE for Brick pavers
Refer to 3124 INSITU CONCRETE - FINISHES for insitu concrete
Refer to 3120 PRECAST CONCRETE - FINISHES for precast concrete
Refer to 3361 STONEMWORK + BRICK INSERT for stone and brick cladding
Refer to 4924 LANDSCAPE METALWORK for metalwork
Refer to 6711R RESENE PAINTING EXTERIOR for painting finishes
Refer to 8226 GRAVEL PAVING for limechip surfacing
Refer to 8231 CONCRETE UNIT PAVING pavers for unit pavers and tactile pavers

Refer to Engineers technical specification for **Stone paving and setts, bedding and stone laying**
for **salvaged glazed bricks**
for **stair stone cladding**

For stone finishes, refer to paving plans
MP-11-90310, 90311 + 90312 "Detailed paving plans 1-3"

Documents

1.2 DOCUMENTS

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

- [AS/NZS 2699.1](#) Built in components for masonry construction - Wall ties
- [NZS 3103](#) Sands for mortars and plasters
- [NZS 4210](#) Masonry construction: materials and workmanship

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 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- Contractor to source and refer to suppliers documentation

Requirements

1.4 QUALIFICATIONS

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

1.5 SHOP DRAWINGS

Provide shop drawings of set-out of blocks or panels complete with method of bedding and fixing.

Allow 2 weeks for review.

Shop drawing schedule

Item	Shop drawings
------	---------------

Item	Shop drawings
Historical (prisoner) brick insert to precast wall TW1 + TW2	Set out location of all bricks. Note: Set out to be agreed with Tenth's Trust And artist

1.6 REVISED SHOP DRAWINGS
Provide copies of shop drawings revised to include required modifications, before proceeding with any stonework.

2. PRODUCTS

Materials

2.1 STONE
Refer to SELECTIONS/drawings for type.

Components

2.2 ANCHORS, CRAMPS, DOWELS
Non-corrodible, non-ferrous metal, suitably stamped.

2.3 TIES
Non-corrodible, non-ferrous metal suitably stamped, to [AS/NZS 2699.1](#) for spacing, strength, stiffness and ductility.

Accessories

2.4 SEALANT
Elastomeric joint non-staining sealing compound of approved type and colour. Backing rods closed cell semi-rigid compressible plastic from the type sized to compress 33% in the joint and to the sealant manufacturer's requirements.

2.5 JOINTING MATERIAL
Suitable for the location and type of stone, non-staining, and to the manufacturer's requirements.

2.6 SAND FOR MORTAR
Sand to [NZS 3103](#). Chloride levels to not exceed 0.04% by dry weight of sand.

2.7 MORTAR
Provide details of the proposed mix for approval not less than 7 days before commencing work. Generally the mix to have a strength less than the stone it is bedding and a porosity equal to or greater than the stone.

3. EXECUTION

Conditions

3.1 TOLERANCES
To [NZS 4210](#), table 2.2 Maximum tolerances.

3.2 TOLERANCES AS SHOWN
Construct the stone work within the tolerances shown on the drawings.

3.3 BUILDING IN
Make provision for building into the structure those elements required for the erection and laying of stone.

- 3.4 **BUILT IN ITEMS**
Make provision as the work proceeds for elements that need to be built in or keyed to the stone work, including partitions, straps, handrails, beams, trusses and plates.
- 3.5 **SUBSTRATE WATERPROOFING**
Check substrate waterproofing is suitable, complete and undamaged before commencing stonework.
- 3.6 **TRANSPORT**
Transport, unload and handle all stone units to avoid any damage or disfigurement. Stack carefully in the vehicle with packing material to prevent damage.
- 3.7 **STORE**
Store stone clear of the ground on its natural bed, protected from the weather and atmospheric pollution on supports that avoid local overstressing and to promote good seasoning without staining, contamination, marking or damage.

Application

- 3.8 **CUTTING**
Cut and shape stone to profiles generally as detailed and including all weathering, jointing, chasing, forming mortises, grooves and drilling for handling and fixing. Work the bed, face and back joints of the stone square and true.

Application - facing work

- 3.9 **SOLID BEDDING**
Adequately support and restrain cladding with durable fixings and continually and solidly fill between backs and supporting structure with mortar.
- 3.10 **SPOT BEDDING**
Adequately support and restrain cladding with durable fixings and provide mortar bedding continuously around fixings and in the form of mortar dabs elsewhere.
- 3.11 **JOINTING**
Prime surfaces in contact, fit backing rods to ensure correct depths of jointing material and/or sealant, keeping panel surfaces completely clear and unmarked by masking, all to the jointing manufacturer's requirements.

Application - walling work

- 3.12 **BED AND JOINT**
Bed and joint stone where possible in one operation on a full bed of mortar. Solidly fill and grout vertical joints, joggles, cramps and the like as the work proceeds and point up joints around flashings.
- 3.13 **SET STONE**
Set stone on its natural bed.
- 3.14 **BEDDING SEDIMENTARY STONE**
Clean the bed area of dust and impurities and thoroughly damp it down before laying the mortar bed.
- 3.15 **RACKING**
Raise advanced work no more than 1m above the general level and rack back. Do not touch stonework unless shown on the drawings or when approved in writing.
- 3.16 **SUPPORT**
Provide support to the stone while mortar cures by bracing or joint spacers of non-staining softwood. When curing is complete remove spacers without damage to the stonework and point to match.

Finishing

- 3.17 **PROGRESSIVE CLEANING**
Keep the stone faces clean as the work proceeds. Prevent mortar or jointing material from coming into contact with the external face of the stone. Perform the cleaning procedure, including removal of stains as necessary, without damage to the work.
- 3.18 **COMPLETE DAMP-PROOFING**
Damp-proof the back and not less than 25mm on return of bedding faces with two coats of bitumen sealer. Avoid contact of bitumen with the face of the stone.
- Completion**
- 3.19 **PROTECT**
Protect newly erected stonework against inclement weather.
- 3.20 **KEEP FACEWORK CLEAN**
Keep facework clean during construction and until completion of the contract works. Clean off, rub down and leave stonework in the specified condition, immediately before handing over.
- 3.21 **REPLACE**
Replace damaged, cracked or marked elements.
- 3.22 **LEAVE**
Leave work to the standard required by following procedures.
- 3.23 **REMOVE**
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 **SHOP DRAWINGS, PROTOTYPES, SAMPLES AND SAMPLE PANELS**
Refer to **Requirements** above

HISTORICAL (PRISONER) CLAY BRICKS
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HISTORICAL (PRISONER) CLAY BRICKS

Materials	Existing, salvaged from site Currently in storage with the Alliance at Landfill site office
Installation	To be agreed with Tenth Trust Precast into wall TW1 As shown on drawing MP-11-90410 "Tangata whenua precast wall 1" Precast into wall TW2 As shown on drawing MP-11-90411 "Tangata whenua precast wall 2"

STONE KERB

KS 400b - STONE KERB

Height	500mm (confirm on contract drawings)
Stone finish	Refer to paving plans MP-11-90310, 90311 + 90312 "Detailed paving plans 1-3"
Stone	To match stone kerbs and paving
Colour:	To match stone kerbs and paving
Thickness:	As shown on drawing MP-11-9027 "Typical paving kerb interface details 8"
Finish:	To match stone kerbs and paving

END OF SECTION

4924 LANDSCAPE METALWORK

1. GENERAL

This section relates to the fabrication and installation of metal (steel, stainless steel and aluminium) items used in exterior applications.

This includes:

- Light poles
- Signs
- Handrails
- Balustrades
- Boundary wall fence (to Mount Cook school)
- QR code
- Pavilion structure

Also

- Metal frames for seats
- Metal support to timber decks

1.1 RELATED WORK

Refer 8331 PLANTING for **GBss** Stainless steel garden edge restraint and
for **TRss** Stainless steel tree pit edge restraint and
for **Kcss** Stainless steel edge restraint

Refer to Engineers technical specification for structural metalwork.
Refer to Engineers technical specification for SS grated drains

Also:

Refer to 3124 INSITU CONCRETE - FINISHES for insitu concrete
Refer to 3120 PRECAST CONCRETE - FINISHES for precast concrete
Refer to 6711R RESENE PAINTING EXTERIOR for painting finishes
Refer to 8422 CARPENTRY for timbers
Refer to 8461 STREET FURNITURE for furniture

Documents

1.2 DOCUMENTS

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

Metalwork generally

AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS 1594	Hot-rolled steel flat products
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Method selection guide - Abrasive blast cleaning
AS 1627.9	Metal finishing - Preparation and pretreatment of surfaces - Method selection guide - Pictorial surface preparation standards for painting steel surfaces
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS/NZS 4792	Hot-dip galvanized (zinc) coatings on ferrous hollow sections, applied by a continuous or special process
NZS/BS 1387	Screwed and socketed steel tubes and tubulars and for plain end steel tubes suitable for welding or for screwing to BS 21 pipe threads
NZS/BS 4848.2	Hot-rolled structural steel sections - Hollow sections
NZS/BS 4848.4	Hot-rolled structural steel sections - Equal and unequal angles
BS 4-1	Structural steel sections - Hot-rolled sections
BS 2630	Resistance projection welding of uncoated low carbon steel sheet and strip using embossed projections

BS 6265	Resistance seam welding of uncoated and coated low carbon steel
BS 6497	Powder organic coatings for application and stoving to hot-dip galvanized hot-rolled steel sections and pre-formed steel sheet
BRANZ BU 467	Principles of flashing design
Stainless steel specifically	
NZBC F4/AS1.	Safety from falling
AS/NZS 1554.6	Structural steel welding - Welding stainless steel for structural purposes
AS/NZS 4673	Cold-formed stainless steel structures
ASTM A240	Standard specification for chromium and chromium-nickel stainless steel plate, sheet and strip for pressure vessels and for general applications
ASTM A276	Standard specification for stainless steel bars and shapes
ASTM A480	Standard specification for general requirements for flat-rolled stainless steel and heat-resisting steel plate, sheet and strip
ASTM A1016	Standard specification for general requirements for ferritic alloy steel, austenitic alloy steel, and stainless steel tubes
BS EN 1011-3	Welding. Recommendations for welding of metallic materials. Arc welding of stainless steels
BRANZ BU 467	Principles of flashing design
Aluminium specifically	
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
BRANZ BU 467	Principles of flashing design
Cast bronze specifically	
AS 1566	Copper and copper alloys - Rolled flat products
AS/NZS 1567	Copper and copper alloys - Wrought rods, bars and sections
AS 1572	Copper and copper alloys - Seamless tubes for engineering purposes
BRANZ BU 467	Principles of flashing design

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- Contractor to source and refer to suppliers documentation

Requirements

1.4 QUALIFICATIONS

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

1.5 SUPPLIERS

Statements: Submit statements from suppliers of all metalwork, giving the following, where applicable;

- Particulars of the supplier's experience in the required type of work.
- Production capacity for material of the required type, sizes and quantity.
- Lead times for delivery of the material to the site.

1.6 SHOP DRAWINGS

Provide 1 set of shop drawings for review before manufacture showing:

- plans, elevations and sections
- methods of fixing
- methods of joint forming
- finishing techniques
- methods of fabrication and site assembly of large units.
- overall dimensions;
- materials, thicknesses and finishes of elements
- type of construction including mitre joints and junctions of members;

- hardware type and location;
- detail and dimensions of stainless steel fixing caps for threaded rod ends
- temporary bracing, if required;
- procedures for shop and site assembly and fixing; and

Allow 2 weeks for review.

Shop drawing schedule

Item	Comment
LICHT COLUMNS	
P1 9m pole with 900mm outreach	Provide shop drawing
P2 9m pole	Provide shop drawing
P3 12m pole	Provide shop drawing
HANDRAILS + BALUSTRADES	
HR1 Handrail type 1	Provide shop drawing
HR2 Handrail type 2	Provide shop drawing
Mt Cook School Southern Boundary Balustrade	Provide shop drawing
East tunnel lid balustrade	Provide shop drawing
Gap balustrade	Provide shop drawing
SIGNS + FENCES + GATES	
SITE SIGNAGE SG-A1, A2, SG-D1 SG - A3 (East tunnel lid signage) SG-C1, C2, C3 SG-E1 SG-F1 (refer to MP11-09750 "signage")	Provide shop drawing
Creche Gate (Timber on SS frame)	Provide shop drawing
OTHER	
QR code	Provide shop drawing / laser cut file
FURNITURE	
S1, S2, S3, S4 Timber bench with steel frame	Required as specified in section 8461 Furniture
B1,B3 Custom made bollards	Required as specified in section 8461 Furniture
OTHER	
QR code	Provide shop drawing / laser cut file

1.7 SHOP DRAWINGS REVIEW

Shop drawings review indicates the design concept has been reviewed without the need for further modification. This does not relieve the contractor of any responsibility for the correctness of the shop drawings, site dimensions, or for ensuring the work is performed in compliance with the drawings and specifications.

1.8 PROPTOTYPES

To be made in accordance with these specifications. Each shall be submitted for approval as the prototype for the various furniture items to be installed.

The prototype shall be correct in regard to all dimensions, materials, and finishes specified in the drawings and specification including any integrated lighting, to enable it to be accepted as the approved prototype for the seats to be installed.

Each element of the seat prototype design shall be submitted to the landscape architect for review before approval may be granted by the Engineer.

Only after full approval is given for the sample seat that is submitted, shall the contractor proceed to fabrication of the various seats to be installed. Failure to obtain such approval in advance may result in the seats that are installed or fabricated, to be rejected.

Note: Prototypes are required for other metal elements as composites of furniture items (i.e. steel frame for seat) are detail in 8461 Street furniture

Allow 2 weeks for review.

Prototype schedule

Item	Prototype required
OTHER	
QR code	Provide prototype
SG-A1	
	Provide prototype prior to <u>any</u> signage final production
FURNITURE	
S1, S2, S3, S4 Timber bench with steel frame	Required as specified in section 8461 Furniture
B1,B3 Custom made bollards	Required as specified in section 8461 Furniture

- 1.9 **SAMPLES**
Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Note: Samples are required for other metal elements as composites of furniture items (i.e. steel frame for seat) are detail in 8461 Street furniture

Allow 2 weeks for review.

Sample schedule

Item	Sample required
LICHT COLUMNS	
P1 9m pole with 900mm outreach	1# unit
P2 9m pole	1# unit
P3 12m pole	1# unit
HANDRAILS + BALUSTRADES	
HR1 Handrail type 1	2m section including all fixings and furniture (supports)
HR2 Handrail type 2	2m section including all fixings and furniture (supports)
Mt Cook School Southern Boundary Balustrade	2m section including all fixings and furniture (supports)
East tunnel lid balustrade	1# unit including all fixings and furniture (supports)
Gap balustrade	1# unit including all fixings and furniture (supports)
SIGNS	

Item	Sample required
SG-A1	Provide sample prior to <u>any</u> signage final production
SPECIAL FEATURES	
QR code	1# unit
Pi2	2m length – straight
Paving inlay (brass plate)	2m length – on curve
FURNITURE	
S1, S2, S3, S4 Timber bench with steel frame	Required as specified in section 8461 Furniture
B1,B3 Custom made bollards	Required as specified in section 8461 Furniture

- 1.10 **VERIFY DETAILS AND DIMENSIONS**
Refer to drawings to ensure all required details and fixings are provided for in the structural steelwork. Verify dimensions against site measurements prior to fabrication.

Tests + Engineers Certificates

- 1.11 **TEST WELDING**
Non-destructive weld examination with method, extent and standards of acceptance to [AS/NZS 1554.1](#), Section 7 and [NZS 3404.1](#), Appendix D.

- 1.12 **CERTIFICATION OF LIGHT POLES**
Lightpole manufacture is required to meet and provide verification in regards to building consent PS1 requirements for all light poles including wind calculations.

Warranties

- 1.13 **WARRANTY - MANUFACTURER/SUPPLIER**
Provide a material manufacturer/supplier warranty:
05 years: Metalwork
05 years: For powder coating finishes
- Provide this warranty on the manufacturer/supplier standard form.
Commence the warranty from the date of practical completion of the contract works.
- Refer to the general section 1237 WARRANTIES for additional requirements.

- 1.14 **WARRANTY - INSTALLER**
Provide an installer warranty:
05 years: Metalwork
- Provide this warranty on the installer/appliator standard form.
Commence the warranty from the date of practical completion of the contract works.
- Refer to the general section 1237 WARRANTIES for additional requirements.

2. PRODUCTS

Materials

- 2.1 **BRONZE SHEET**
Phosphor bronze sheet/coil.
- 2.2 **UNPAINTED HOT-DIP ZINC-COATED STEEL**
Hot-dip zinc-coated steel coil to AS 1397.
Zinc coating class: ZM 275

- 2.3 **PRE-FINISHED HOT-DIP ZINC-COATED STEEL**
Hot-dip ZM 275 zinc coated steel coil to AS 1397, pre-treated, primed, top-finished and back-coated.
Zinc coating class: ZM 275
- 2.4 **HOT-DIP ALUMINIUM AND ZINC ALLOY COATED STEEL, UNPAINTED**
Hot-dip aluminium and zinc alloy coated steel coil to AS 1397.
Coating class: AZ 150
- 2.5 **PRE-FINISHED HOT-DIP ALUMINIUM AND ZINC ALLOY COATED STEEL**
Hot-dip aluminium and zinc alloy coated steel coil to AS 1397, pre-treated, primed, top-finished and back-coated.
Coating class: AZ 150
- 2.6 **STRUCTURAL STEEL**
All steel Grade 300, except RHS sections Grade 350, unless noted otherwise on the drawings. Test and stress relieve for brittle fracture when required by [NZS 3404.1](#), section 17, Testing of structures or elements.
- 2.7 **STAINLESS STEEL COIL, SHEET, PLATE, BARS, ANGLES AND TUBES**
Coil and sheet manufactured to ASTM A240, plate, sheet and strip manufactured to ASTM A480. Bars and angles manufactured to ASTM A276. Design of stainless steel structural members to [AS/NZS 4673](#). Welding to [AS/NZS 1554.6](#).
Alloy containing iron, low carbon, and typically, 18% chromium and 8% nickel.
Refer to SELECTIONS for details.
- 2.8 **STAINLESS STEEL SHEET - DECORATIVE AND SPECIALISED FINISHES**
To ASTM A240.
Alloy containing iron, low carbon, and typically, 18% chromium and 8% nickel.
Refer to SELECTIONS for details.
- 2.9 **STAINLESS STEEL WIRE MESH AND EXPANDED METAL**
To ASTM A240.
Alloy containing iron, low carbon, and typically, 18% chromium and 8% nickel
Refer to SELECTIONS for details.
- 2.10 **STAINLESS STEEL HANDRAILS AND BALUSTRADES**
To ASTM A1016.
Alloy containing iron, low carbon, and typically, 18% chromium and 8% nickel, with 2% molybdenum added.
Refer to SELECTIONS for details.
- 2.11 **ALUMINIUM SHEET**
Pre-finished/anodised/plain finish sheet/strip to [AS/NZS 1734](#).

Components

- 2.12 **SCREWS**
Grade 316 stainless steel self-tapping with the type of head, length, gauge and thread to suit the work and its location.
- 2.13 **BOLTS**
Grade 316 stainless steel, type and size to suit the work and its location.
- 2.14 **RIVETS**
Domed with similar composition and mechanical properties to the parent metal.
- 2.15 **TUBULAR RIVETS**
Stainless steel or Monel metal with domed/countersunk head.

- 2.16 **THREADED STUDS**
Grade 316 stainless steel with stud and nut threads to suit the base material and the nut being used.
- 2.17 **CLIPS**
Form clips to detail of the same metal as the metal sheet being fixed/secured.
- 2.18 **NAILS**
Spiral rolled flat-head/clout type, with similar composition and mechanical properties to the parent metal. Select length and gauge to suit the work and its location.

Welding

- 2.19 **WELDING**
Electrodes to comply with and be selected for the grade of steel being welded as required by [AS/NZS 1554.1](#). Welding wire as required by the wire manufacturer for the materials to be joined and the welding position. Welding flux: dry and used from sealed containers. Material for arc stud welding to comply with [AS/NZS 1554.1](#).

3. EXECUTION

Conditions

- 3.1 **DELIVERY, STORAGE AND HANDLING**
Take delivery of materials and goods and store on site and protect from damage. Protect finished surfaces, edges and corners from damage. Move/handle goods in accordance with manufacturer's requirements. Reject and replace goods that are damaged or will not provide the required finish.
- 3.2 **PRE-INSTALLATION REQUIREMENTS**
Check work previously carried out and confirm it is of the required standard for this part of the work.
- 3.3 **FLASHINGS**
Form to BRANZ BU 467. Ensure the location and the substrate is ready to receive the fabrication and will allow work of the required standard.
- 3.4 **SURFACE TREATMENT OF STAINLESS STEEL**
Ensure stainless steel items commissioned for service are free from oil, scale, grinding dust or small particles of steel from tools, dies or rollers. On no account should welding slag or other contamination to be removed with a mild steel brush - a stainless steel brush should only be used.

Fabrication and Assembly for metalwork general

- 3.5 **PROTECTION**
During fabrication protect all surfaces which will be visible in completed work.
- 3.6 **COLD FORMED**
Ensure cold formed work is free from warping, buckling and fractures. Form bends with a brake press or by cold rolling.
- 3.7 **CORNERS**
Unless specified otherwise, mitre junctions of identical sections.
- 3.8 **HOLES**
Form without distortion of surrounding metal.

- 3.9 MOVING PARTS
When assembled, all moving parts must move freely and without binding.
- 3.10 CLEANING
Remove all burrs and sharp arrises which would be visible after fixing, or a hazard to the user.
- 3.11 AFTER CUTTING STAINLESS STEEL
Grind off materials liable to corrode after thermal cutting.
- 3.12 BONDING
Prepare surfaces of metals to receive adhesives by degreasing and abrading mechanically or chemically. Use adhesives in accordance with the manufacturer's requirements. Form bond under pressure.
- 3.13 RIVETED JOINTS
Draw riveted joints tightly together, with rivets closed to completely fill holes.
- 3.14 MECHANICAL JOINTS
Ensure mechanical joints are tight with no visible gaps.
- 3.15 MECHANICAL JOINTS - ELEMENTS
Bed in mastic all mechanical joints of elements which will be located externally, including all mating surfaces, cleats and other fixings.
- 3.16 MECHANICAL JOINTS - CLEATS
Unless specified otherwise connect cleats to frames with countersunk screws where they will be visible after the component has been fixed and where raised heads would interfere with any moving part.

Application - generally

- 3.17 INSTALLATION
Locate plugs accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the specified standards, the reviewed shop drawings and installation details, including brackets, bolts, fixings, grout, bedding compounds and sealants.
- 3.18 LOADING
Elements must not carry any structural load unless designed to do so. Do not use as strutting or support when in place.

Application - sheet steel

- 3.19 FABRICATE
Fabricate and assemble in a workshop wherever practicable.
- 3.20 MARK OUT
Mark out the work accurately, square and true to line allowing for correct radius folds and laps to give the dimensions required for neat, close fits when in place. Use marking methods that do not damage, deface or cause future corrosive attack to the sheet metal being worked. Do not use carbon-based pencils with aluminium/zinc alloy coated metals.
- 3.21 CUT SHEETS
Cut sheets by mechanical methods leaving edges true to line, square, smooth and free from all burrs. Do not use abrasive cutting blades with aluminium/zinc alloy coated metals.
- 3.22 FORMING
Use mechanical methods wherever possible and form and fold sheets square and true to line and face free of all deformation and defects. Minimise cold-working and stress build-up and their effects by limiting the amount of working and avoiding sharp radius bends (minimum 1 x sheet thickness).

- 3.23 **PRE-ASSEMBLE**
Pre-assemble in the workshop and match mark items for assembly or erection on site. Do not strain, twist, bend or open such items to force them into the correct position while assembling or erecting.
- 3.24 **SEPARATION**
Isolate dissimilar materials (metal and non-metal) in close proximity as necessary by painting the surfaces or fitting separator strips. Place isolators between metals and treated timber and cement-based materials. Do not use unpainted lead sheet in contact with or allow water run-off onto zinc-coated and aluminium/zinc alloy coated metals. Refer also to BRANZ BU 467.
- 3.25 **JOINING HOT-DIP ZINC-COATED STEEL**
Use self-secured seams, pop rivets, sealant strip, soldering and spot welding or a combination as best suits the form and location of the work.
- 3.26 **JOINING PRE-FINISHED HOT-DIP ZINC-COATED STEEL**
Neutral cure silicone and rivets as best suits the form and location of the work and the supplier's stated requirements.
- 3.27 **JOINING ALUMINIUM AND ZINC ALLOY COATED STEEL**
Use self-secured seams, pop rivets, sealant strip, or a combination as best suits the form and location of the work.
- 3.28 **JOINING PRE-FINISHED ALUMINIUM AND ZINC ALLOY COATED STEEL**
Neutral cure silicone and rivets as best suits the form and location of the work and the supplier's stated requirements.
- 3.29 **INSTALLATION**
Locate fixings accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Comply with the installation details and complete with bedding compounds and sealants.
- 3.30 **LOADING**
Ensure elements are fully supported unless designed to be self-supporting.
- Fabrication - welding**
- 3.31 **WELDING OF STAINLESS STEEL**
Weld stainless steel to [BS EN 1011-3](#) and for structural steel to [AS/NZS 1554.6](#).
- 3.32 **PREPARATION FOR WELDING**
Remove grease, dirt, moisture and oxide from edges to be welded. Remove scale and residue from arc and power cutting by machining or hand grinding.
- 3.33 **ACCURACY**
Ensure accurate fit using clamps and jigs where practical. Use tack welds for temporary attachment where jiggling is not practical.
- 3.34 **WELDS**
Make joints with parent and weld metal fully fused throughout with no inclusions, holes, porosity or cracks.
- 3.35 **WELDING STAINLESS STEEL**
Use double level butt welds, backing bars to remove heat, jiggling, tack welds and any other measures necessary to minimise distortion. Remove slight distortion by light hammering, taking care not to damage the surface finish.
- 3.36 **SPATTER**
Prevent weld spatter falling on surfaces of materials which will be self finished and visible in completed work.

3.37 RESIDUES
Ensure complete removal of flux residues and slag.

3.38 BUTT WELDS
Grind butt welds which will be visible in completed work smooth and flush with adjacent surfaces.

Fabrication - sheet products

3.39 FABRICATE SHEET PRODUCTS
Fabricate and assemble in a workshop wherever practicable.

3.40 MARK OUT
Mark out the work accurately, square and true to line allowing for correct radius folds and laps to give the dimensions required for neat, close fits when in place. Use marking methods that do not damage, deface or cause future corrosive attack to the sheet metal being worked.

3.41 CUT SHEETS
Cut sheets by mechanical methods leaving edges true to line, square, smooth and free from all burrs.

3.42 FORMING
Use mechanical methods wherever possible and form and fold sheets square and true to line and face free of all deformation and defects. Minimise cold-working and stress build-up and their effects by limiting the amount of working and avoiding sharp radius bends (minimum 1 x sheet thickness).

3.43 PRE-ASSEMBLE
Pre-assemble in the workshop and match mark elements being assembled or erected on site. Do not strain, twist, bend or open such elements to force them into the correct position while assembling or erecting.

3.44 SEPARATION
Isolate dissimilar materials (metal and non-metal) in close proximity by painting the surfaces or fitting separator strips. Refer also to BRANZ BU 467.

Isolate copper, brass and bronze from all other metals. Isolate dissimilar materials (metal and non-metal) in close proximity as necessary by painting the surfaces or fitting separator strips. Place isolators between metals and treated timber and cement-based materials.

3.45 JOINING STAINLESS STEEL SHEET PRODUCTS
Use self-secured seams, stainless steel rivets, Monel-metal rivets, bolts, self-tapping screws and welding as best suits the form and location of the work.

Assembly – Aluminium

3.46 WELDING OF ALUMINIUM
Grind flush visible welds.

Assembly - Welding

3.47 PREPARATION
Remove grease, dirt, moisture and oxide from edges being welded. Remove scale and residue from arc and power cutting by machining or hand grinding.

3.48 ACCURACY
Ensure accurate fit using clamps and jigs where practical. Use tack welds for temporary attachment where jiggling is not practical.

- 3.49 TACK WELDING
Use only for temporary attachment unless otherwise specified.
- 3.50 WELDS
Make joints with parent and weld metal fully fused throughout with no inclusions, holes, porosity or cracks.
- 3.51 SPATTER
Prevent weld spatter falling on surfaces of materials which will be self finished and/or visible in completed work.
- 3.52 RESIDUES
Ensure complete removal of flux residues and slag.
- 3.53 BUTT WELDS
Finish butt welds which will be visible in completed work smooth and flush with adjacent surfaces.
- 3.54 WELDING OF STEEL
Use one of the following methods for welding steel:
- gas welding
- metal-arc welding to [AS/NZS 1554.1](#) for mild steel
- projection welding to BS 2630
- seam welding to BS 6265

Fabrication - handrails and balustrades

- 3.55 FABRICATE HANDRAILS AND BALUSTRADES
Units to comply with the reviewed shop drawings and installation details, including brackets, bolts, fixings, complete with all associated stainless steel componentry and hardware.

Installation - fabricated items

- 3.56 INSTALL FABRICATED ITEMS
Install fabricated items in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Fix to comply with the reviewed shop drawings and installation details, including brackets, bolts, fixings, bedding compounds and sealants.

Installation - sheet products

- 3.57 INSTALL SHEET PRODUCTS
Locate fixings accurately and use in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Fix to comply with the installation details and complete with brackets, bolts, fixings, bedding compounds and sealants.

- 3.58 SUPPORT
Fully support elements unless designed to be self-supporting.

Installation - handrails and balustrades

- 3.59 INSTALL HANDRAILS AND BALUSTRADES
Install handrails and balustrades in accordance with the manufacturer's requirements. Fix plumb, level and true to line. Fix to comply with the reviewed shop drawings and installation details, including brackets, bolts, fixings, bedding compounds and sealants, complete with all associated stainless steel componentry and hardware. Unless otherwise detailed installation to comply with [NZBC F4/AS1](#).

Installation - signage

- 3.60 SIGN INSTALLATION
Erect signposts vertical and plumb to the standard heights and offsets from the kerbs as specified in [MOTSAM.1](#). The base of signposts shall be concreted in below the paving level, and the paving brought up flush with the signpost.

Completion

- 3.61 ROUTINE CLEANING
Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.
- 3.62 DEFECTIVE OR DAMAGED WORK
Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.
- 3.63 PROTECTION
Provide the following temporary protection of all finished work:
- 3.64 ENSURE
Ensure all elements are free of marks or blemishes, with all moving parts working fully and freely.
- 3.65 REPLACE
Replace damaged, cracked or marked elements.
- 3.66 LEAVE
Leave work to the standard required by following procedures.
- 3.67 REMOVE
Remove all debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 LANDSCAPE EXTERNAL METALWORK
All metalwork as identified on the plans and details. Refer to detail for all member sizes

LIGHT COLUMNS

P1 Light pole:

Supplier	Sapa
Description	9m pole with 900mm outreach (confirm on contract drawings)
Material	Aluminium
Metal Grade	Marine grade aluminium
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	Refer to drawing MP-11-90701 "Light pole Details 1"

P2 Light pole:

Supplier	Sapa
Description	9m pole (confirm on contract drawings)
Material	Aluminium
Metal Grade	Marine grade aluminium
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	Refer to drawing MP-11-90701 "Light pole Details 1"

P3 Light pole:

Supplier	Sapa
Description	12m pole (confirm on contract drawings)
Material	Aluminium
Metal Grade	Marine grade aluminium
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	Refer to drawing MP-11-90701 "Light pole Details 1"

HANDRAILS + BALUSTRADES

H1 Handrail type 1

Supplier	Custom design
Description	Continuous post and rail handrail (roof fixed) With stanchion
Material	Stainless steel post + rail HDG steel stanchion post (allow for metal separation between SS rod and HDG stanchion post)
Metal Grade	Stainless steel – 306 HDG posts - HDG600
Finish	SS – No finish required HDG Stanchion - Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	Root fixed Refer to drawing MP-11-90722 “ Furniture Details 3”

H2 Handrail type 2

Supplier	Custom design
Description	Rail + posts (wall mounted bracket)
Material	Stainless steel rail HDG steel wall bracket (allow for metal separation SS and HDG)
Metal Grade	Stainless steel – 306 HDG posts - HDG600
Finish	Rail – No finish required Brackets - Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	Wall mounted bracket Refer to drawing MP-11-90722 “ Furniture Details 3”

Mt Cook school Southern boundary balustrade

Supplier	Custom design
Description	Fixing plate and pailings
Material	HDG steel fixing plate HDG steel pailings
Metal Grade	HDG600
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	HDG plate fixed to concrete brick wall Refer to drawing MP-11-90740 “ Balustrade detail 1”

East tunnel lid balustrade

Supplier	Custom design
Description	Frame and panel
Material	HDG steel flat frame HDG steel panels Integrated with tunnel name signage (HDG)
Metal Grade	HDG600
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	HDG steel flat frame bolted to concrete upstand Refer to drawing MP-11-90535 “ East tunnel lid balustrade”

Gap balustrade

Supplier	Custom design
Description	Base plate Railing
Material	HDG base plate
Metal Grade	HDG600
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	HDG steel base plate fixed to precast underpass panels Refer to drawing MP-11-90540 “ Typical gap balustrade”

FURNITURE

B1 bollard

Supplier	Custom design
Description	Timber bollard on metal frame.
Material	Aluminium
Metal Grade	Marine grade aluminium
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	Refer to drawing MP-11-90723 " Bollards"

S1, S2, S3 + S4 seat

Supplier	Custom design
Description	Timber seat on metal frame.
Material	Stainless steel
Metal Grade	306 stainless steel
Finish	No finish required
Fixing	Refer to drawing MP-11-90720 " Furniture details 1" MP-11-90721 " Furniture details 2"

SPECIAL FEATURES

QR Code tile

Supplier	Custom design
Description	Laser cut QR code tile. Allow for code embedment and WebLink and MCH review
Material	Cast bronze 150mmØ disc (confirm on contract drawings)
Metal Grade	Bronze
Finish	No finish required.
Fixing	Root fixed Refer to drawings

Pi2 Paving inlay / historical reference

Supplier	Custom design
Description	Brass flat as drawn
Material	Cast brass
Finish	No finish required.
Fixing	Refer to drawing MP-11-90327 "Typical paving/kerb interface Details 8"

FENCES, GATES

Sfn Steel fence (to Mount Cook School)

Supplier	Custom design
Description	Steel flats threaded by a steel round and fixed to boundary wall by flat
Material	HDG steel
Metal Grade	HDG600
Finish	Refer to 3711R RESENE PAINTING EXTERIOR
Fixing	Wall fixed as per drawing MP-11-90740 "Balustrade details 1"

SIGNAGE

SG-A1, SG-A2, SG-A3, SG-D1

Stainless steel letters

Supplier	Custom design
Description	lettering
Material	Stainless steel
Metal Grade	306 stainless steel
Finish	Varies. Refer to contract drawings MP-11-09750 "Signage details"
Fixing	Varies. Refer to contract drawings MP-11-09750 "Signage details"

SG-A3 (East tunnel lid signage)

Stainless steel cut from balustrade

Supplier	Custom design
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Description	Stainless steel cut from balustrade
Material	Stainless steel
Metal Grade	306 stainless steel
Finish	Varies. Refer to contract drawings MP-11-09750 "Signage details"
Fixing	Refer to drawing MP-11-90535 " East tunnel lid balustrade"

SG-C1, SG-C3, SG-C4

Stainless Steel signage signs

Supplier	Custom design
Description	Stainless steel signs (root fixed)
Material	Stainless steel
Metal Grade	306 stainless steel
Finish	Varies. Refer to contract drawings MP-11-09750 "Signage details"
Fixing	Varies. Refer to contract drawings MP-11-09750 "Signage details"

SG-E1

Glass fronted internally lit sign box

Supplier	Custom design
Description	Glass fronted internally lit sign box
Material	TBC
Metal Grade	TBC
Finish	Varies. Refer to contract drawings MP-11-09750 "Signage details"
Fixing	Varies. Refer to contract drawings MP-11-09750 "Signage details"

SG-F1

Massay University sign

Supplier	Custom design
Description	TBC
Material	TBC
Metal Grade	TBC
Finish	Varies. Refer to contract drawings MP-11-09750 "Signage details"
Fixing	Varies. Refer to contract drawings MP-11-09750 "Signage details"

END OF SECTION

6700R RESENE PAINTING GENERAL

1. GENERAL

This section relates to the general matters related to **Resene** painting work.

1.1 RELATED WORK

Refer to 6711R RESENE PAINTING EXTERIOR

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:

MPNZA Master Painters New Zealand Association Inc.

Documents

1.3 DOCUMENTS

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

[Health and Safety in Employment Act 1992](#)

MPNZA Specification manual

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Resene One-Line specifications and product data manual
(hard copy or at www.resene.co.nz)

Resene Putting your safety first

Copies of the above literature are available from **Resene**

Telephone: 0800 **RESENE** (0800 737 363)

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal conditions of use against failure referring to the **Resene** Promise of Quality in the **Resene** One-Line specifications and product data manual.

Requirements

This painting specification is written based on information available at the time of writing.

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Resene** coating system, or associated components and products. Do not combine paints from different manufacturers in a paint system.

If in the applicator's own expertise and judgement an amendment to this specification is required, or where a substrate preparation, or required painting system is not covered in this specification, this shall be brought to the attention of the contract administrator and any amendment agreed before work proceeds any further.

1.7 QUALIFICATIONS

Painters to be experienced competent workers, familiar with the materials and the techniques specified and with the **Resene** coating systems and be members of the Master Painters New Zealand Association Inc.

The applicator is to have the necessary skill, experience and equipment to undertake the work. The applicator remains responsible for ensuring proper completion of the work.

Painters to be selected from the **Resene** Eco.Decorator programme. The **Resene** Eco.Decorator programme is designed to recognise a nationwide network of environmentally responsible, quality focussed painting contractors. Refer to www.resene.co.nz/ecodecorator.htm for a list of Eco.Decorators in your area.

1.8 CONTROL SAMPLES

Prepare samples of the finished work, including the specified preparation. Refer to SELECTIONS for location and type. Obtain approval in writing of the appearance before proceeding. Use the **Resene** Architectural Sample Box as a basis of standard where appropriate.

Refer to 6711R RESENE PAINTING EXTERIOR

1.9 COLOUR SAMPLES

Control reference: Check colours to Resene colour samples prior to application and keep the Resene colour samples on site as a control reference. Colour matches are not permitted as they will differ in appearance, durability and performance to the original selected colour over the life of the coating. Samples of Resene colours may be ordered online from <https://secure.clearfield.com/resene/SelectChart.asp?productType=3> or by calling 0800 RESENE (737 363). Use the Resene Architectural Sample Box as a basis of standard where appropriate.

1.10 PRIOR TO WORK COMMENCING

Before any work commences painters should verify, with Architects or specifying authority, that their paint matches a previously supplied standard card or panel. Differently coloured paints will vary in price, opacity and durability. Resene normally only specify two coats of colour but with certain colours, such as yellows and oranges, three coats may be needed. Refer to SELECTIONS for location and type.

1.11 SUPERVISED CONTROL SAMPLES

Prepare samples of the finished work including the specified preparation. Refer to SELECTIONS for location and type. Make arrangements for the supervision of the relevant stages. Obtain written approval before proceeding.

Supervised control samples may, after written approval, be used for comparative testing of dry film thicknesses of the complete coating systems.

1.12 HEALTH AND SAFETY

Refer to and comply with the requirements of the [Health and Safety in Employment Act 1992](#) including the obligation to:

- Eliminate hazards and if hazards cannot be eliminated or isolated, then minimise the hazards in this work by using the proper equipment and techniques as required by the MPNZA Painters hazard handbook and **Resene** Putting your safety first handbook.
- Supply protective clothing and equipment.
- Inform the contractor as well as the employees and others on site of those hazards and put in place procedures for dealing with emergencies.

1.13 SAFETY DATA SHEETS

Obtain from **Resene** (phone 0800 **RESENE**, or www.resene.co.nz) the safety data sheet for each product used and comply with the required safety procedures. Keep sheets on site.

Performance

1.14 RESENE INSPECTION

Permit representatives of **Resene** to inspect the work in progress and to take samples of their products from site if requested. **Resene** will take care when inspecting the work, but does not accept any responsibility for the proper completion of the work before or after such inspection.

- 1.15 INSPECTION OF THE WORK
Inspection of the whole of the work at each of the stages set out in SELECTIONS may be made. Agree on a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

2. PRODUCTS

Materials

2.1 MATERIALS GENERALLY

Do not combine paints from different manufacturer's in a paint system.

Use only Resene products (which are guaranteed for consistency and performance under [AS/NZS ISO 9001](#) and APAS) prepared, mixed and applied as directed in the Resene One-Line Specifications and Product Data Manual. This specification has been written using where practical and available both low/no VOC and Environmental Choice approved products.

2.2 EXPOSED DARK COLOURS

Darker colours in areas of high sun exposure place significant stress on the coating and substrate. **Resene** 'CoolColour' technology reduces heat absorption of a wide range of colours. Contact your local Resene Representative or visit www.resene.co.nz for more information or visit www.resene.co.nz/coolcolour. View a list of Resene colours that can be made using Resene CoolColour technology at www.resene.co.nz/colourlibrary.

2.3 THINNERS/ADDITIVES

Use only if and when expressly directed by Resene for their particular product in a particular application. Always wear gloves when handling any solvents including turpentine as harmful chemicals may be absorbed into the body through the skin.

Accessories

2.4 ACCESSORIES

Contact your local **Resene ColorShop** for a full range of accessories and usage advice.

3. EXECUTION

Conditions

3.1 EXECUTION

To conform to required trade practice, which shall be deemed to include those methods, practices and techniques contained in the Master Painters New Zealand Association Inc. Specification manual.

3.2 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

3.3 ANCILLARY SURFACES

The descriptions of areas in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain written instructions before proceeding.

3.4 HARDWARE

Do not paint hinges or hardware that cannot be removed. Before commencing work carefully remove hardware, fixtures and fittings, set aside where they cannot be damaged or misplaced and replace on completion. Refer to SELECTIONS for hardware, fixtures and fittings for removal.

- 3.5 **PROTECTION**
Supply, lay and fix dropsheets, coverings and masking necessary to protect adjoining, fixtures, fittings and spaces from paint drops, spots, spray and damage.
- Application - preparatory work**
- 3.6 **SURFACE PREPARATION**
Refer to the **Resene** One-Line specifications and product data manual for surface preparation sheets (or obtain them by phoning 0800 **RESENE**, or at www.resene.co.nz) listed in the materials systems schedule clauses. Carry out the preparatory work required by them for each of the substrates.
- 3.7 **SHARP EDGES, CRACKS AND HOLES**
Remove and/or repair sharp edges, cracks and holes if present, as outlined in the preamble of the **Resene** One-Line specifications and product data manual.
- Elastomeric sealants, if used, should not be painted. The paint film will not match the flexibility of the sealant and may severely limit its effectiveness.
- 3.8 **REMEDIAL WORK**
If any substrate or surface, that even with the preparation work called for in this section, cannot be brought up to a standard that will allow painting or clear finishing of the required standard then do not proceed until remedial work is carried out.
- 3.9 **GAP FILLING**
Make good cracks, holes, indented and damaged surfaces. Use suitable gap fillers to match the surface being prepared. Any special priming requirements of the fillers must be satisfied. Allow to dry or set before sanding back level with the surface. Prime or seal timber before using putty.
- Exterior and wet areas: Use only Portland cement base or water-insoluble organic base gap fillers.
- 3.10 **OFF-SITE WORK**
Carry out this work under cover in a suitable environment with suitable lighting. Store items, both before and after coating, in a clean, dry area protected from the weather and mechanical damage, properly stacked and spaced to allow air circulation and to prevent sticking.
- 3.11 **PRIMING JOINERY**
Pre-treat any cut surfaces of preservative treated timber before priming. Ensure L.O.S.P. treated joinery has dried sufficiently to lose solvent odour. Pre-treat bare timber with **Resene** TimberLock (see Data Sheet D48) to improve the durability of subsequent coats.
- Liberal coat end grain, allow to soak in and then recoat.
- 3.12 **CONCEALED JOINERY SURFACES**
Where off-site coatings are specified they must be applied to surfaces including those concealed when incorporated into the building.
- 3.13 **CONCEALED METAL SURFACES**
Apply primer to suit the coating system to surfaces which will be concealed when incorporated into the building.
- 3.14 **EXTERNAL DOORS**
Prime or seal and paint bottom edges before hanging.
- 3.15 **BEAD GLAZING**
Stained, varnished, or painted joinery to have the first two coats, or the primer and one undercoat, applied to rebates and beads before glazing.

- 3.16 PUTTY FRONTING
According to the putty manufacturer's instructions allow putty to set, then prime with **Resene** Wood Primer (see Data Sheet D40). Fully protect the putty by completing the **Resene** coating system as soon as it is sufficiently firm.
- Application - generally**
- 3.17 PAINTING GENERALLY
Comply with the **Resene** One-Line specifications and product data manual data sheets and the additional requirements of this work section.
Ensure large wall areas that require more than one container of paint per coat, have enough paint boxed (mixed) together to complete the final coat. This will not apply if a single factory batch of paint, rather than shop tinted paint, is applied.
- 3.18 MIXING
Although generally supplied ready-mixed, thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.
- 3.19 ENVIRONMENT
Defer painting of exterior surfaces until weather conditions are favourable - warm dry days without frost or heavy dews. Avoid painting in direct sunlight any surfaces that absorb heat excessively. As far as possible apply paint in the temperature range 15°C to 25°C. If temperatures fall outside the range of 10°C and 35°C do not paint unless paints with the necessary temperature tolerance have been specified. Do not apply solvent borne paint if moisture is present on the surface.
- 3.20 SEQUENCE OF OPERATIONS
Painting work to generally follow the following sequences:
 - Complete surface preparation before commencing painting.
 - Apply primers, sealers, stains, undercoats, paints and clear coatings in the sequences laid down by **Resene**.
 - Allow the full drying time between coats laid down by **Resene**.
 - Do not expose primers, undercoats and intermediate coats beyond **Resene's** recommendations before applying the next coat.
 - Finish broad areas before painting trim.
 - Ensure batch numbers of tins are matched for whole areas.
 - Internally, paint ceilings before walls and walls before joinery, trim and other items.
- 3.21 APPLICATION
Select brush, roller, or pad and apply coatings to the requirements of **Resene** to obtain a smooth, even coating of the specified thickness, uniform gloss and colour.
- 3.22 LIGHTLY SAND
Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Complete by removing dust immediately before applying the next coat.
- 3.23 DEFECTIVE WORK
Correct defective work immediately and recoat as required, following precisely the **Resene** system being applied.
- 3.24 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 and the proper number of coats applied.
 - No blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare or starved patches, cracks, brush marks, ladder marks and blistering.
 - Proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application.

Completion

- 3.25 **CLEAN**
Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at the completion of the building works. Clean glass inside and out to a shining finish. Use the Resene Washwise on site 'paint equipment clean-up water' reclamation system to minimise the environmental impact of cleaning paint application tools.
- 3.26 **LEAVE**
Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.
- 3.27 **REMOVE**
Remove dropsheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.
- 3.28 **REPLACE**
Replace hardware without damage to it or the adjoining surface and leave hardware properly fitted and in working order.
- 3.29 **DISPOSAL OF PAINTS AND THINNERS**
Note: The use and disposal of paint and thinners represents a significant environmental hazard.
Ensure all paint and thinners are disposed of in the following manner:
 - When requested hand over part used paint containers to client for maintenance touch ups.
 - Recycle leftover paint at a Resene ColorShop as part of the Resene "Paintwise programme". Contact your local Resene ColorShop for details or view information online at www.resene.co.nz/paintwise.htm.
 - Donate left over paint to local community groups.
 - Solvent based paints, paint thinners, turpentine, mineral spirits and solvents require special disposal procedures. Do not pour down sewer or storm water drains, sinks or into the ground. If they cannot be recycled they must be disposed of in a refuse dump licensed to take toxic waste.
- 3.30 **MAINTENANCE**
Good maintenance of coating systems involves a routine of regular cleaning as well as regular inspections. Regular inspections of the coating systems are recommended to identify breakdown, accidental damage to or undesirable deterioration of the paint. Refer the Resene Caring for your paint finish brochure and the Resene website, www.resene.co.nz/comn/services/maintenance.htm.
- 4. SELECTIONS**
- 4.1 **SELECTIONS**
Refer to 6711R RESENE PAINTING EXTERIOR for selections.

Coatings Specification

Contract:	EXTERIOR PAINTING	
Building:	MEMORIAL PARK	
Location:	MOUNT COOK, WELLINGTON.	
Owner / Agent	WALA	
Specification:	M109-12-13	Date: 19/12/13
Writer:	Craig Ell	

SCOPE

The work involved and intended in this Contract to be carried out at the location detailed above comprises the following:

Prepare surfaces and apply Resene paint in accordance with this specification.

GUARANTEE

The Contractor guarantees this work under normal conditions of use against failure of:

Materials: According to 1(v) Durability of Paint Systems in the **Resene Paints One-Line Specifications and Product Data Manual.**

The Contractor is to guarantee their work against all defects that may occur within three months from the completion of the contract and will be required to make good such defects at their own cost. Such defects specifically exclude damage, or consequential damage, caused by third parties which are the responsibility of the main contractor.

INSURANCE

The Contractor shall provide adequate Public Liability insurance.

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1.0 NEW EXTERIOR MILL ALUMINIUM LIGHT POLES AND BOLLARDS ETC – IMPERITE IF-503 METALLIC

Condition: New Aluminium to be fabricated and painted off site in Resene ArmourCote 220 two pack inhibitive epoxy and Imperite IF503 metallic two pack acrylic epoxy, with a clear coat of Uracryl 404, allowing for possible on site touch ups due to damage.

Note 1: *Before fixing new Aluminium in place, any faces of the structure that cannot be painted later should be thoroughly degreased then primed with Resene Armourcote 220 Primer.*

Note 2: *Wind blown salt deposits should be thoroughly washed off with copious amounts of water and the surfaces allowed to dry before painting commences and at the beginning of each day's painting.*

Note 3: *This specification assumes that the metalwork has not been welded nor damaged in transit to the site. If this is not the case a new specification will be required.*

PREPARATION FOR PAINTING:

1.1 Mix one part of Resene Roof & Metal Wash with three parts of fresh water. Apply a liberal wash of this mixture to the surface with a nylon bristle brush or broom. Thoroughly scrub the surface to ensure complete removal of all grease and other contaminants. Rinse thoroughly with fresh water and allow to dry. **Data Sheet D88**

Note 4: *The contractor shall ensure that there is no deterioration in the condition of the surfaces to be painted between the actual preparation and the application of the priming paint. Any extraneous matter deposited before painting shall be completely removed and the surface restored to its prepared finish state*

PAINTING:

1.4 Apply Resene Armourcote 220 Primer to achieve a dry film thickness of 75 microns. **Data Sheet RA34**

Note 5: *For areas that will not be naturally washed by rain and where dirt & salts may accumulate (for example the underside of canopies) we recommend two full coats of primer.*

1.5 Apply Resene Imperite I.F. 503 Metallic by spray to achieve a dry film build of 75 microns. **Allow 48 hours to fully cure before overcoating with Uracryl. Data Sheet RA81a**

1.6 Apply Resene Uracryl 404 Clear to achieve a dry film build of 50 microns. **Data Sheet RA59**

Note 6: *Resene Paints Limited recommend that, prior to applying aluminium flake type finishing coats, that a standard panel is first prepared using the intended application equipment (airless spray is strongly recommended) and that this panel is approved for colour and pattern by the owners/architects. This panel should include the clear coating. Where a roller is used by a skilled applicator to apply the product the final finish on a smooth surface will be at best comparable to 80% of the effect achieved by spray. This is due to the impacts of rolling on flake alignment.*

ATTENTION - ISOCYANATES

The OSH 'Approved Code of Practice for the Safe Use of Isocyanates' should be read and followed if Uracryl is to be spray applied.

2.0 NEW EXTERIOR HDG STEEL BINS, BALUSTRADES, PLATES, BRACKETS ETC - IMPERITE IF-503 METALLIC

Condition: New steel to be fabricated Galvanised and painted off site in Resene ArmourCote 220 two pack inhibitive epoxy and Imperite IF503 metallic two pack acrylic epoxy, with a clear coat of Uracryl 404 allowing for possible on site touch ups due to damage.

Note 1: *Before fixing new galvanised steel in place, any faces of the structure that cannot be painted later should be thoroughly degreased then primed with Resene Armourcote 220 Primer.*

Note 2: *This specification assumes the Hot Dip Galvanised coating has been applied as per the current accepted AS/NZS Standard, is even in appearance and is in sound condition. "Bare spots" will not be accepted and if present, please contact the writer for rectification processes. The coating should be at least 75 microns thick in all areas provided that the steel is of the appropriate thickness.*

Note 3: *Wind blown salt deposits should be thoroughly washed off with copious amounts of water and the surfaces allowed to dry before painting commences and at the beginning of each day's painting.*

Note 4: *This specification assumes that the steelwork has not been welded nor damaged in transit to the site. If this is not the case a new specification will be required.*

PREPARATION FOR PAINTING:

2.1 Mix one part of Resene Roof & Metal Wash with three parts of fresh water. Apply a liberal wash of this mixture to the surface with a nylon bristle brush or broom. Thoroughly scrub the surface to ensure complete removal of all grease and other contaminants. Rinse thoroughly with fresh water and allow to dry. **Data Sheet D88**

2.2 **In marine areas (or if Galv. has been left unpainted for a long period) we strongly recommend water-blasting to remove any sea salts that may have accumulated over time. Wind blown salt deposits should be thoroughly washed off with copious amounts of water and the surfaces allowed to dry before painting commences and at the beginning of each day's painting.**

2.3 Carefully whip-blast (sweep blast) the surface to remove any chromate residue and to provide a slightly roughened surface profile using clean new non-metallic blasting media. Care must be taken to ensure a minimum amount of zinc is removed during this process (no more than 10um). Any areas of white corrosion must be totally removed during this process before painting.

Note 4: *The contractor shall ensure that there is no deterioration in the condition of the surfaces to be painted between the actual preparation and the application of the priming paint. Any extraneous matter deposited before painting shall be completely removed and the surface restored to its prepared finish state*

PAINTING:

2.4 Apply Resene Armourcote 220 Primer to achieve a dry film thickness of 75 microns. **Data Sheet RA34**

Note 5: *For areas that will not be naturally washed by rain and where dirt & salts may accumulate (for example the underside of canopies) we recommend two full coats of primer.*

2.5 Apply Resene Imperite I.F. 503 Metallic by spray to achieve a dry film build of 75 microns. **Allow 48 hours to fully cure before overcoating with Uracryl. Data Sheet RA81a**

2.6 Apply Resene Uracryl 404 LS Clear to achieve a dry film build of 50 microns. **Data Sheet RA59**

OFF SITE PAINTING TO DAMAGED OR WELDED AREAS

2.7a **To repaired areas of welds or damaged steel only** apply Resene Armourzinc 120 to achieve a dry film thickness of 75 microns. Ensure an overlap onto sound existing coatings of 10mm. Take care to achieve a uniform finish. **Data Sheet RA22**

2.8a Apply Resene Armourcote 221 to achieve a dry film thickness of 75 microns. Ensure an overlap onto sound existing coatings of 10mm. Take care to achieve a uniform finish. **Data Sheet RA36**

2.9a Apply Resene Imperite IF503 to achieve a dry film build of 50 microns. Ensure an overlap onto sound existing coatings of 10mm. Take care to achieve a uniform finish. **Data Sheet RA55**

2.10a Apply Resene Uracryl 404 LS Clear to achieve a dry film build of 50 microns. **Data Sheet RA59**

Note 6: *On completion of painting, all crevices shall have a suitable type silicon or mastic sealant applied into the as per manufacturer's instruction to aid in corrosion prevention.*

Note 7: *Resene Paints Limited recommend that, prior to applying aluminium flake type finishing coats, that a standard panel is first prepared using the intended application equipment (airless spray is strongly recommended) and that this panel is approved for colour and pattern by the owners/architects. This panel should include the clear coating. Where a roller is used by a skilled applicator to apply the product the final finish on a smooth surface will be at best comparable to 80% of the effect achieved by spray. This is due to the impacts of rolling on flake alignment.*

ATTENTION - ISOCYANATES

The OSH 'Approved Code of Practice for the Safe Use of Isocyanates' should be read and followed if Uracryl is to be spray applied.

3.0 NEW EXTERIOR HARDWOOD TIMBER BOLLARDS, BENCH SEATS, INCL BRIDGE AND STEPS – OILED FINISH

Condition: New timber to be oiled in Resene Furniture and Decking Oil with the first coat to be applied if possible prior to construction.

Note1 : Resene Furniture and Decking Oil is not intended for high traffic areas

Note2 : A trial area or panel is required prior to work being undertaken to ensure to desired finish can be achieved. All parties involved should agree that trial area is acceptable before proceeding.

Note3 : For best results Resene Paints Limited recommend that the backs of boards be sealed with a full coat of Resene Furniture and Decking Oil. End grains should ideally be sealed with two coats of Resene Furniture and Decking Oil. The performance of the stain will be improved if any sharp edges on the timber profile

PREPARATION FOR STAINING:

- 3.1 Ensure all surfaces are clean and free from contamination. Sand any sharp edges to a rounded profile. Any bare timber that has been left to weather longer than one month, should be thoroughly sanded back to a sound timber surface, inspected for mould & if necessary, treated with Resene Moss & Mould Killer and left for 48 hours. **Data Sheet D80**
- 3.2 Thoroughly scrub down using a 16% solution of Resene Timber and Deck Wash and fresh water. Rinse clean with fresh water. **Data Sheet D813**

Note: Avoid skin contact. Timber must be allowed to dry out thoroughly before painting.

STAINING:

- 3.3 Apply Resene Furniture and Decking Oil by brush, roller or spray saturating the surface at 10-12 square metres per litre (this may vary depending on porosity of the timber).
- 3.4 Wipe off excess Resene Furniture and Decking Oil with a dry, lint free, absorbent cloth along the grain.

OPTION A

4.0 NEW EXTERIOR HARDWOOD TIMBER BRIDGE AND STEPS ONLY – WOOD OIL STAIN

Condition: New timber to be stained in Resene Wood Oil Stain, with the first coat to be applied prior to all surfaces before construction commences.

Note 1: *For best results Resene Paints Limited recommend that the backs of boards be sealed with a full coat of Resene Solventborne Woodsman. End grains should ideally be sealed with two coats of Resene Solventborne Woodsman. The performance of the stain will be improved if any sharp edges on the timber profile are rounded off. Solventborne Woodsman is designed to slowly erode away in exposed places and may need regular maintenance.*

Note 2: *If timber is LOSP Preservative treated then it must not be painted if solvents from the LOSP treatment are still in the timber. Many problems may be encountered with the new paint system if timber is painted while these solvents are still in the timber.*

PREPARATION FOR STAINING:

4.1 Ensure all surfaces are clean and free from contamination. Sand any sharp edges to a rounded profile. Any bare timber that has been left to weather longer than one month, should be thoroughly sanded back to a sound timber surface, inspected for mould & if necessary, treated with Resene Moss & Mould Killer and left for 48 hours. **Data Sheet D80**

4.2 Thoroughly scrub down using a 16% solution of Resene Timber and Deck Wash and fresh water. Rinse clean with fresh water. **Data Sheet D813**

Note: *Avoid skin contact. Timber must be allowed to dry out thoroughly before painting.*

STAINING:

4.3 Apply a full coat of Resene Solventborne Woodsman at 3-14 square metres per litre depending on porosity of the surface. **Data Sheet D57**

4.4 Apply a finishing coat of Resene Solventborne Woodsman taking care to avoid an excessive build of stain on top of the timber. The application rate for the second coat will generally be much less than that for the first. Any material that is still tacky after overnight drying should be wiped off with a Turps wet cloth.

Note 3: *Spreading rates for Solventborne Woodsman depend on the roughness of the timber. Check the data sheet for details.*

Note 4: *Regular 18 monthly maintenance of exposed areas is recommended.*

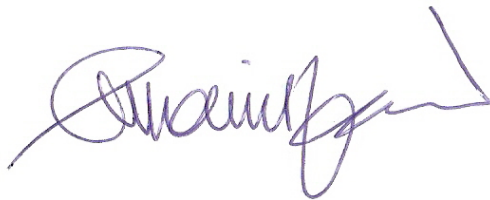
Note 5: *“The specified coating system for this substrate may, in wet conditions, become very slippery and dangerous.”*

Surface texture and abnormal surface porosity will effect either the spreading rate or the coverage achieved. Allowance for this should be made in the quotation.

This specification should be read in conjunction with the manufacturers recommendations contained in the relevant technical data sheets.

Site Assistance

Resene Representatives will visit specific job sites as required to assist with advice on adequacy of preparation; special mixing requirements; standard of application etc. However this should not be regarded as 'supervision', but simply 'site assistance'.

A handwritten signature in purple ink, appearing to read 'Rob Mountford', with a stylized flourish at the end.

Craig Ell
Thorndon Quay
Architectural Services Representative

Rob Mountford
Head Office, Lower Hutt
Technical Services Manager

6711R RESENE PAINTING EXTERIOR

1. GENERAL

This section relates to the surface preparation, painting and clear finishing of new and existing exterior substrates using **Resene** architectural and decorative coating systems.

- 1.1 RELATED WORK
Refer to 4924 Landscape Metalwork

2. PRODUCTS

Materials

- 2.1 PAINT TYPES GENERALLY/ THINNERS AND ADDITIVES
Refer to 6700R RESENE PAINTING GENERAL for product clauses.

3. EXECUTION

Conditions

- 3.1 EXECUTION
Refer to 6700R RESENE PAINTING GENERAL for execution clauses.

4. SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

- 4.1 LANDSCAPE EXTERNAL PAINTING
All painting as identified on the plans and details.

ELEMENT	SUBSTRATE	BRAND AND SYSTEM	COLOUR
CONCRETE WORK			
For Concrete finishes – refer to 3124 INSITU CONCRETE – FINISHES 3130 PRECAST CONCRETE - FINISHES			
METAL WORK			
P1 P2 + P3 Light Poles Pole and flange	Aluminium As per SAPA spec	RESENE 3-Coat system 1. Resene Armourcote 221 primer 2. Resene Imperite I.F. 503 Metallic 3. Resene Uracryl 403 clear Refer enclosed RESENE specification Applied as per manufacturer's specification – to be sprayed off site	Blast Grey 2 M44-006-075 Matt finish
H1 Handrail Stanchion	HDG Steel stanchion	To match light columns To be sprayed off site	Blast Grey 2 M44-006-075 Matt finish
H2 Handrail	HDG Steel bracket	To match light columns To be sprayed off site	Blast Grey 2 M44-006-075

bracket			Matt finish
Mt Cook school southern boundary balustrade	HDG plate	To match light columns To be sprayed off site	Blast Grey 2 M44-006-075 Matt finish
East tuneel lid balustrade	HDG base plate and railings	To match light columns To be sprayed off site	Blast Grey 2 M44-006-075 Matt finish
Gap balustrade	HDG frame and panels	To match light columns To be sprayed off site	Blast Grey 2 M44-006-075 Matt finish
B1 Bollards	Marine grade aluminium	To match light columns To be sprayed off site	MAIN BODY: Blast Grey 2 M44-006-075 Matt finish RECESSES (as per drawing) Reflective paint – SAFETY YELLOW Gloss finish
Signage	TBC	TBC	Black with white lettering
RB Rubbish Bin	Galvanised Mild steel	To match light columns To be sprayed off site	Blast Grey 2 M44-006-075 Matt finish

ELEMENT	SUBSTRATE	BRAND AND SYSTEM	COLOUR
TIMBERS			
B1 Bollards (cladding)	HWD Timber	Resene spec attached. Applied as per manufacturer's specification	Natural Furniture Oil – with antifungal
S1, S2, S3 + S4 Timber Seats	HWD Timber	Resene spec attached. Applied as per manufacturer's specification	Natural Furniture Oil – with antifungal
Timber deck/bridge and steps	HWD Timber	Resene spec attached. Applied as per manufacturer's specification	Natural Furniture Oil – with antifungal
Pavillion	TBC	TBC	TBC

Crèche timber fence/ screen and gate	Glulam Econo	<p>Top Coat : Resene Enamacryl Gloss Waterborne enamel.</p> <p>Priming, undercoat and top coat applications as per manufacturer's specification</p>	White
Timber deck slip resistance	HWD timber	<p>Allow for 50mm wide X1200mm long strips painted to each decking timber. Resene Anti Slip coating. Epoxy paint finish with slip resistance TO NZS</p> <p>To Landscape Architects approval</p>	Black

ELEMENT	SUBSTRATE	BRAND AND SYSTEM	COLOUR
OTHER SURFACES			
Road marking Paint	To Engineers specification		
Concrete	Sealer and anti-graffiti coating as specified in 3124 FINISHES TO WET CONCRETE		

- 4.1 CONTROL SAMPLES /
4.2 SUPERVISED CONTROL SAMPLES
Refer to section 1 above

END OF SECTION

8226 AGGREGATE PAVING + FEATURE ROCKS

1. GENERAL

This section relates to the installation of loose aggregate and stone paving for driveway, carpark and footpath areas.

This includes:

- Limechip surfacing
- Gravel surfacing

1.1 RELATED WORK

Refer to Engineers technical specification

for Stone paving and setts

Refer to 8332 PLANTING

for stone mulch

For edging

Documents

1.2 DOCUMENTS

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

NZS 4407 Methods of Sampling and Testing Roding Aggregates

TNZ B/02 Specification for Construction of Unbound Granular Pavement Layers

Requirements

1.3 QUALIFICATIONS

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

1.4 SUPPLIERS

Statements: Submit statements from suppliers of all metalwork, giving the following, where applicable;

- Particulars of the supplier's experience in the required type of work.
- Production capacity for material of the required type, sizes and quantity.
- Lead times for delivery of the material to the site.

1.5 SAMPLES

Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Allow 2 weeks for review.

Sample schedule

Item	Sample required
Limechip aggregate	0.5 kg bag

1.6 PROVIDE SAMPLE PANEL

Provide a sample panel of the following specified finishes before commencing work. Panels to be of similar thickness to the proposed construction.

Conformance: Supply sample panels to AS 3610 and in conformance with the **Sample panels schedule** (below) for the application specified.

Supply samples for concrete that include all saw cut or other jointing patterns and specified finishes as per design. Cast the sample panels using the formwork, concrete, compaction equipment, form release agents curing and removal methods which are to be used in the final work.

Samples shall be made and kept in an area remote from the designated locations for the constructed concrete elements that are to be installed.

Do not proceed with the related work until the acceptable range of surface treatments has been determined.

1.7 **SAMPLE PANEL SCHEDULE**
(For precast samples refer to section 3130)

code	Panel / sample	Incorporated features	Panel Sizes
	SURFACING		
LLCP	Limechip paving	• Colour and aggregate sample	2 mx 2m

- 1.8 **INSPECTIONS**
Give notice so inspection may be made of the following:
- Setting out completed.
 - Feature rock delivery
 - Feature rock placement

2. PRODUCTS

Materials

- 2.1 **LIMECHIP PAVING - AGGREGATE**
High quality calcium carbonate (CaCO₃) aggregate.

Aggregate size: 5mm to fines
Composition Crushed lime shall be 2 parts Lime Flour to 1 part Aggregate

The chip and flour shall be thoroughly mixed at the quarry before transportation.

Limechip material shall be clear and free of any extraneous matter.

- 2.2 **FEATURE ROCKS**
Feature rocks.
Refer to SELECTIONS.

3. EXECUTION

Conditions

- 3.1 **SETTING OUT**
Set out to the dimensions shown on the drawings.
Construct footpaths in to levels, grades and cross falls matching the surrounding ground levels. Ensure that the finished level of the path matches the surrounding ground level without ponding on the path or on adjoining ground.
- 3.2 **FORMATION TO SUBGRADE LEVEL**
Complete the formation to subgrade level to leave it well compacted, firm, and free from any weak spots or loose material.
Remove all topsoil from the construction width of the footpath, and remove to stockpile onsite.
Where the excavation to subgrade has not removed all the topsoil or contains weak material, undercut works material to a firm base and supply and install GAP 40 aggregate to make up levels to the subgrade level.
- 3.3 **FORMATION ON SIDLING SLOPE**
Cut so that the subgrade on the low side of the path is on natural ground. Cross fall of path to fall towards the low side at a maximum of 4% grade.
Cut the upslope side so that the maximum grade of the cut batter is 1vertical: 3horizontal.

- 3.4 **EDGING**
Install on completion of the preparation of the subgrade, true to line and grade to match the design levels or surrounding ground levels.
- 3.5 **SURFACE MATERIAL**
To [TNZ B/02](#). Lay weed mat over the completed basecourse surface prior to placement of the surfacing material.
Place and compact surface material to design levels with slight camber to fall to adjacent grass and kerbs. Compact with no less than 4 passes of a vibrating pedestrian roller or plate compactor. Leave the surface fully compacted with a tight surface with no loose aggregate stones.
Compact lime aggregate and hoggin with water added during the final compaction to bring finer aggregates to the surface.
Gravel, broken shell or river stone to be levelled to grade, but not compacted.
The final surface shall be firm, even and flush with edgings where provided, and within surface tolerances.
- 3.6 **FEATURE ROCKS**
Excavate a hole for the rocks accommodating one third of rock below the ground surface. If rocks are potentially unstable, place site concrete to the base to stabilise them. Concrete shall not be visible on the finished surface. The placed rocks shall not have water ponding around them.
- 3.7 **BACKFILL**
Where paths are constructed in grassed areas, respread and compact topsoil adjacent to the paving edging to fill all depressions and voids and provide a compact and free draining surface, and re-grass. Re-use topsoil from stripping operations.
- 3.8 **CLEAN UP**
Clean up as the work proceeds.
- 3.9 **LEAVE**
Leave the whole of this work in a sound, coherent, voidless and level to grade condition, free of any defects.
- 3.10 **REMOVE**
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 **LIME AGGREGATE**
Refer to **Contract drawings for materials size/ dimensions**
Refer to **PRODUCTS** section above
- 4.2 **FEATURE ROCKS**
Refer to **Contract drawings for materials size/ dimensions**
Supplier: Tenth's Trust supplied
Note: Contractor will be responsible for inspection from source, craning / lifting at source, delivery and installation

END OF SECTION

8231 CONCRETE UNIT PAVING

1. GENERAL

This section relates to the bedding and laying of:
- interlocking concrete pavers
to form paving for pedestrians and light vehicular traffic.

This includes

- Concrete unit pavers (CUP)
- Tactile pavers

1.1 RELATED WORK

Refer to 8212 SUB BASES TO SEALING AND PAVING for sub base preparation.

Refer to 3124 INSITU CONCRETE - FINISHES for insitu concrete

Refer to 3120 PRECAST CONCRETE - FINISHES for precast concrete

Refer to 3361 STONWORK + BRICK INSERT for stone and brick cladding

Refer to Engineers technical specification for concrete paving and paving bedding

Documents

1.2 DOCUMENTS

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

- [AS/NZS 1428.4.1](#) Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators
- [NZS 3104](#) Specification for concrete production
- [NZS 3116](#) Concrete segmental and flagstone paving
- [AS/NZS 4455.2](#) Masonry units, pavers, flags, and segmental retaining wall units - Pavers and flags
- [AS/NZS 4456](#) Masonry units, segmental pavers and flags - Methods of test

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 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- Contractor to source and refer to suppliers documentation

Requirements

1.4 QUALIFICATIONS

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

1.5 CONFIRM APPEARANCE

Before commencing work confirm the layout and any elements affecting the visual appearance of the work. Pavers should be mixed on site from several pallets to ensure blending and avoid colour contrasts. Ensure extra paving is required to be from the same batch number to avoid colour variation.

1.6 SAMPLES

Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Allow 2 weeks for review.

Sample schedule

Item	Sample required
------	-----------------

Item	Sample required
CUP Concrete unit paving	2# unit
CTP1 Tactile pavers	2# unit
CTP2 Tactile pavers	2# unit

1.7 SAMPLE PANEL
Submit representative sample panel of each material.

Allow 2 weeks for review.

Sample panel schedule

Item	Sample panel required
CUP Concrete unit paving	2m x 2m area

2. PRODUCTS

Materials

2.1 ICONCRETE PAVING BLOCKS
To [AS/NZS 4455.2](#).

2.2 TACTILE GROUND SURFACE INDICATORS
To [AS/NZS 1428.4.1](#).

Type: Concrete for concrete and asphalt paved areas
Stone for stone paved areas to match stone paving
Paint Concrete only to have safety yellow painting to [AS/NZS 1428.4.1](#).
No colour / paint to stone tactile pavers

Components

2.3 RATTLE SPACE PLATE
Refer to drawing MP-11-90360

3. EXECUTION

Conditions

3.1 STORAGE
Take delivery of blocks and pavers in protected pallets, undamaged and dry. Store on level hard standings, protect from damage and keep dry until laid.

3.2 INSPECTION
Before starting paving work inspect the area to ensure that kerbing, edge restraints, drainage, cesspits, channels, basecourse and other services are in place to correct falls and to allow work of the required standard.

3.3 SURFACE TOLERANCES

Final surface of paving:	±10mm of design level
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Surface level above drainage:	5mm minimum above drainage channels or gully entries and continuously graded towards them
Maximum deviation:	8mm in 3 metres without ponding
Between adjacent blocks:	< 2mm

Application

- 3.4 **CUTTING PAVING**
Cut paving, neat and tidy with a diamond-tipped saw blade. Do not use cut units less than half a paver. Adjust pattern to suit as necessary.
- 3.5 **JOINTS**
Butt joint.
Brush bedding sand to Engineer specification on pavers.
- 3.6 **LAY PAVING ON FLEXIBLE BASE**
To Engineers specification
- 3.7 **LAY PAVING ON RATTLE SPACE PLATE**
Refer to detail 01 on sheet **MP-11-90360 "creche interface details 1"**
To Engineers specification.
Mortar to steel tray to Engineers specification
Cut pavers to suit steel tray angle and dimensions
- 3.8 **INSTALL TACTILE GROUND SURFACE INDICATORS**
Installing tactile Ground Surface Indicators to required layout, installed to the manufacturer's requirements, and to AS/NZS1428.4..1

Finishing

- 3.9 **PROTECTION**
Protect the completed work from damage and from dropping other materials during the remainder of the construction period. Do not use the completed work as a building platform or for material storage.

Special Features

- 3.10 **SPECIAL FEATURES**
Allow for cutting around all features - bollards, light columns, handrails, posts, water fountains etc.
- 3.11 **RECESSED MANHOLE COVERS**
In fill manhole covers with the paving type and pattern of the adjoining pavement.

Completion

- 3.12 **REPLACE**
Replace damaged, cracked or marked elements.
- 3.13 **LEAVE**
Leave work to the standard required by following procedures.
- 3.14 **REMOVE**
Remove debris, unused materials and elements from the site.

4. SELECTIONS

4.1 SAMPLES AND SAMPLE PANELS

Refer to **Requirements** above

4.2 CONCRETE PAVING BLOCK

On Flexible base:

Source	Manufacturer supply: Horizon paving – ph 0800 682 745 or similar approved.
Description	Pastelli Shotblasted Natura Veneto Paving blocks
Size	600x400x60 thick
Materials	Fibre reinforced concrete
Finish	Shot blasted Grigio
Fixing	Refer paving details MP - 11-90327 & MP - 11-90360 s.

On rattle space plate (tray):

Source	Horizon paving – ph 0800 682 745 or similar approved
Description	Pastelli Shotblasted Natura Veneto Paving blocks
Size	600 x 400 x thickness as determined by rattle space plate depth.
Materials	Fibre reinforced concrete, cast to suit rattle space plate geometry and lip.
Finish	Shot blasted Grigio
Fixing	Refer paving details MP - 11-90360 s.

4.3 TACTILE PAVERS

Refer to **Contract drawings for materials size/ dimensions**

Refer to **PRODCUTS** section above

END OF SECTION

8310 LANDSCAPE SITE PREPARATION

Including tree and vegetation protection

1. GENERAL

This section relates to:

- clearing and disposal of existing vegetation
- removal and disposal of existing inorganic debris
- weed spraying
- pruning existing trees and shrubs
- minor landscape earthworks
- removal of existing hardstand surfaces
- tree and vegetation protection

1.1 RELATED WORK

Refer to 8321 SOIL AND SOIL PREPARATION FOR PLANTING

for soil, mulch, fertiliser +
compost

Refer to 8332 PLANTING

for planting, SS edge + staking

Refer to 8333 TURF LAYNG

for turf laying

Refer to 8380 LANDSCAPE MAINTENANCE

for landscape maintenance

Documents

1.2 DOCUMENTS

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

[TNZ F/01](#) Specification for Earthworks construction

Requirements

1.3 ARCHAEOLOGICAL DISCOVERY

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

1.4 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified. Construction plant and equipment shall only be operated by licensed or experienced operators as appropriate.

Only certified applicators shall be responsible for the application of herbicides.

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 RESPONSIBILITY

The main Contractor shall be responsible for:

- The protection of the existing vegetation that is not determined for removal.
- Removal of temporary enclosures or barriers at completion.
- Removal of temporary marks and tags at completion.

NOTE: A tree within the CBC is a protected heritage tree. The contractor is responsible for being familiar with and complying with all statutory documentation.

Quality control and assurance

1.7 INSPECTIONS

Notify the Contract Administrator for inspection of the works following:

- Identification of unsuitable materials requiring removal
- Prior to the placement of any fill material

- At the completion of the Site preparation
- EXISTING TREES**
- Tree tagging complete;
 - Tree protection measures completed;
 - Tree removal completed.
 - Trees lifted for relocation

2. PRODUCTS

Materials

2.1 IMPORTED FILL

Cohesive clay, clean and free of stones, rubble, organic material, contaminants, stumps, branches and construction debris. Obtain the approval of the Contract Administrator prior to importing the material to site for placement. Imported aggregate fill shall be proprietary GAP40 or GAP65.

3. EXECUTION

Conditions

3.1 DELIVERY

Only deliver material to the site that can be immediately placed in its final location from the delivery vehicle.

3.2 REPORT

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

3.3 RETAINED FEATURES

Refer to SELECTIONS/drawings for those features to be retained. Mark out those features to be retained with 1.0m high 50mm x 50mm timber stakes with yellow plastic tape between, to eliminate accidental damage.

3.4 SETTING OUT

As described on the drawings, confirm with the Contract Administrator prior to commencing works.

3.5 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

Provide appropriate measures to prevent or minimise sediment generation and silt run off. Comply with territorial and other authority requirements relating to carrying out earthworks. Refer to the general section 1250 TEMPORARY WORKS & SERVICES for more details.

Undertake regular inspections and maintain the erosion and sediment control measures in operational order.

On stabilisation of disturbed soil or upon sufficient ground cover, remove control measures including the disposal of silt off site.

Installation/application

3.6 TOLERANCES

All cut and fill work shall be free draining and be constructed to the design levels and shapes to ± 100 mm. Ensure NZ Building Code ground clearances are maintained against buildings. Ensure all surfaces are graded to shed water and maintain overland flow paths.

3.7 MARKING

General: Mark trees to be retained using suitable non-injurious, easily visible and removable means of identification.

Secure tags to trees using loose galvanised steel wire band and/or yellow/red striped hazard warning tape wrapped around the trunk or plant and securely tied for the duration of the works.

3.8 TREE PROTECTION

Protect from damage the trees to be retained, both above and below ground.

Repair trees damaged during the work. Submit proposals prior to commencing repair work. All tree work must be carried out by a qualified arborist acceptable to the Principal's Representative.

Plastic mesh barrier, supported on star pickets spaced at not more than 4 m around the drip line of the tree as identified on site by the Landscape Architect.

3.9 WORKS CLOSE TO PROTECTED TREES

Keep the area within the dripline free of construction material and debris. Do not place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants. Do not remove topsoil from, or add topsoil to, the area within the dripline of the trees.

If it is proposed to perform work on trees, give notice and obtain instructions. All tree work must be carried out by a qualified arborist acceptable to the Principal's Representative. Where underpruning is required, prune lateral branches from ground level to a height of 1m above the ground. Do not cut main trunks. Pruning to be undertaken in accordance with AS 4373. If excavation is required near trees to be retained, give notice and obtain instructions. Open up excavations under tree canopies for as short a period as possible.

Prevent damage to tree bark. Do not attach stays, guys and the like to trees.

Use hand methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged.

Do not cut tree roots exceeding 50 mm diameter. Where it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Immediately after cutting, apply a bituminous fungicidal sealant to the cut surface to prevent the incursion of rot or disease.

3.10 DAMAGE TO PROTECTED TREES

The Contractor shall be liable for payment of costs associated with any damage caused to the trees as follows:

- a) Minor damage caused to limbs which then require pruning. An approved arboriculturalist shall rectify the damage and all his costs shall be met by the Contractor.
- b) Damage to trees with a girth size as 1m above ground level of less than 500mm circumference.
- c) Where visible scaring and disfigurement occurs the Contractor shall be required to meet the costs in full associated with the tree's removal and replacement. The replacement tree shall be an Advanced Nursery Stock tree with a girth size in the region of 150-200mm circumference.
- d) Typical costs for damage to existing mature trees with a girth size at 1m above ground level greater than 500mm circumference shall be assessed at follows:

<i>Item</i>	<i>Typical Cost</i>
Scuffs, scaring of bark tissue	\$100.00 per 300mm ²
Broken branches up to 100mm Ø at trunk	\$250.00 each

Broken branches over 100mm Ø at trunk and major root damage	\$500.00 each
Major disfiguring of the tree as determined by the Landscape Architect	\$1,500.00
Removal of a tree or major damage likely to result in its death or decay as determined by the Landscape Architect including all costs involved with the tree's removal, stump clearance, tree replacement (a semi-mature specimen of a similar species)	\$2,500.00 - \$10,00.00

3.11 CLEARING - GENERAL

To [TNZ F/01](#) Earthworks construction. Clear the working area of all vegetation and structures except those specifically required to remain.

Include all areas affected by cutting and filling together with sufficient additional areas on which to stockpile stripped topsoil.

Include the complete removal of all trees and other vegetation, stumps, inorganic debris, pipes, fences, stonewalls, retaining walls, hardstand surfaces, boulders, and other materials as specified.

Where machine clearing is not possible, remove vegetation by hand methods. Remove roots from cleared vegetation during cultivation work. Take particular care around the root zone of trees to be retained.

The clearing of hardstand surfaces shall include saw cutting where necessary, breaking and excavation of bedding materials and disposal off site. Store on site cleared materials for re-use.

3.12 TREE CLEARING

Trees and shrubs to be cleared includes the removal of stumps off site. Stumps in excess of 300mm in diameter may be ground in lieu of removal.

3.13 PRUNING EXISTING TREES

Refer to 8382T TREE PRUNING.

3.14 TOPSOIL STRIPPING

Do not start topsoil stripping until silt control measures are installed.

Strip all topsoil including turfs, humus and organic materials. Stockpile stripped topsoil separately and neatly outside of the stripped areas for later re-spreading or disposal.

Trim the stockpiles to a free draining slope to reduce ingress of rainwater.

Unless otherwise specified, do not remove topsoil from the site, and surplus topsoil shall remain on site.

3.15 MINOR EARTHWORKS

Earth-worked surfaces to have sufficient fall to shed water in a controlled manner and prevent ponding.

Obtain suitable fill material for the earthworks from the cut areas if available, or import where there is a shortfall. Ensure fill material is free of organic material, contaminants, stumps, branches and construction debris.

Place and compact the material to be used for general landscape shaping in layers not exceeding 150mm, and compact by track rolling in 4 passes with equipment in excess of 10 tonnes weight or other approved methods to prevent undue settlement.

Fill material placed adjacent to pipes, walls and other structures shall be compacted by hand held vibrating plate compaction equipment. Heavy equipment shall not be operated within one metre of any pipes or structures.

Ensure that all batters are maintained in a stable condition at all times.

- 3.16 UNSUITABLE MATERIALS
Advise the Contract Administrator if unsuitable materials are encountered. Remove and dispose of these materials and backfill with compacted clay or hardfill as directed by the Contract Administrator.
- 3.17 TOPSOIL RESREADING
Refer to 8321 SOIL AND SOIL PREPARATION.
- 3.18 SURPLUS MATERIAL
Remove surplus excavated material from the site continually as the excavation proceeds. Clean up continually any excavated material dropped on footpaths or roads.

Completion

- 3.19 ROUTINE CLEANING
Reinstate all areas affected by the works to pre-construction condition or better. Remove all rubbish and spoil from the site on completion of the works, leaving the site in a clean and tidy condition.
- 3.20 PROTECTION
Provide the following temporary protection of the finished work:
~

4. SELECTIONS

- 4.1 RETAINED FEATURES
Refer to planting plans and demolition plans

END OF SECTION

8321 SOIL AND SOIL PREPARATION FOR PLANTING

1. GENERAL

This section relates to the supply, preparation and placement of soil and plant mix for the planting of:

- trees
- shrubs (garden beds)
- lawns
- raingardens
- Underpass planting

1.1 RELATED WORK

Refer to 8310 LANDSCAPE SITE PREPARATION.

Refer to 7441 GROUNDWATER DRAINAGE for Groundwater Drainage

Refer to 7451 SURFACE WATER DRAINAGE for Surface Water Drainage

Refer to 8241 EDGING, KERBS AND GUTTERS for Edgings, Kerbs and Gutters

Refer to 8310 LANDSCAPE SITE PREPARATION for vegetation protection and removal

Refer to 8332 PLANTING for planting, SS edge + staking

Refer to 8333 TURF LAYNG for turf laying

Refer to 8380 LANDSCAPE MAINTENANCE for landscape maintenance

Documents

1.2 DOCUMENTS

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

[NZS 4402](#) Methods of testing soils for civil engineering purposes

[NZS 4454](#) Composts, soil conditioners and mulches

[TNZ F/01](#) Specification for Earthworks construction

Definitions

1.3 DEFINITIONS

For the purposes of this works section the definitions given below apply.

Bad ground:

Ground unsuitable for the purposes of the works, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which is or becomes soft, wet or unstable.

Site rock:

Rocks selected for salvage.

Site topsoil:

Soil excavated from the site which has the following characteristics:

Contains organic matter.

Supports plant life.

Free from unwanted matter.

Unwanted matter (in topsoil):

Stones over 25 mm diameter.

Clay lumps.

Weeds and tree roots.

Sticks and rubbish.

Material toxic to plants.

Imported topsoil / growing medium:

Fine: Clay loam, fine sandy loam, sandy clay loam, silty loam, loam.

Medium: Sandy loam, fine sandy loam.

Coarse: Sand, loamy sand.

Topsoil mixture:

Topsoil and compost or other additives, thoroughly mixed before placing.

Top dressing:

A soil which is suitable for surface application to lawn.

Rain Garden

Rain Gardens (or Bio Retention Systems) are landscaped areas that collect and treat stormwater runoff. The stormwater is filtered as it passes through the layers of mulch, and then infiltrated into the ground as groundwater. If full infiltration is not possible, an underdrain system is required to carry treated water to a traditional storm water drainage system.

Requirements

1.4 QUALIFICATIONS

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

1.5 SAMPLES

Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content. Submit bulk material samples, with required test results, at least 5 working days before bulk deliveries. Bulk materials include topsoil, topsoil additives, structural soil and compost.

Compost + Soil:

Submit a certificate of proof of compost + soil pH value

Samples Table:

<i>Item</i>	<i>Quantity</i>
Topsoil / growing medium Planting medium / topsoil for: - trees, - garden beds, - lawn and - underpass planting	Provide 1kg sample for approval
Planting medium for: - raingardens.	Provide 1kg sample for approval
Compost	Provide 0.5kg sample for approval

1.6 TESTS

Soil tests

Contractor shall test for compliance with requirements of type and ph.

Test a 1kg sample for every 100m³ or part thereof prior to importation to site where the soil is imported from one site. Provide 2 tests for every 100m³ or part thereof where topsoil is imported from different sites. Test again randomly during construction. Supply copies of all results.

All soil mixes installed on site shall be in accordance with the approved sample. Random sampling and testing of soil mixes will be undertaken by the Engineer during the progress of the Works. All soil mixes which do not comply with the specification will be rejected, and must be removed from the site. On site remediation is not acceptable.

Tests schedule

Test type required - Complete Soil Test and Agronomists report including chemical and particle analysis testing, as available from Gribbles Analytical, Ruakura Research. East Street, Hamilton.

Material to be tested

- Topsoil / growing medium for trees, plants and lawn
- Topsoil / growing medium for raingardens

Performance

1.7 INSPECTIONS

Give notice so inspection may be made of the following;

- Setting out completed;
- Tree pits, excavated
- Subgrades cultivated or prepared for placing topsoil / growing mediums
- Subsoil drainage installed;
- Soil mixes spread, levelled and consolidated before planting

Additional Notice:

If the following are encountered, give notice immediately and obtain instructions before carrying out any further work in the affected area;

- Bad ground
- Discrepancies

1.8 SUPPLIERS

Submit statements from suppliers of soils and other materials, giving the following, where applicable:

- Particulars of the supplier's experience in the required type of work.
- Production capacity for material of the required type, sizes and quantity.
- Lead times for delivery of the material to the site.

Materials

Supplier's data: Submit supplier's data including the following:

- Sandy loam topsoil source of supply + PH value.
- Compost - Submit a certificate of proof of compost pH value
- Fertilisers source of supply + content
- Structural soil source of supply + content

1.9 WORK PROGRAM

Submit a work program in the form of a bar chart, for the soil and soil preparation works.

2. PRODUCTS

Materials

2.1 PLANTING MEDIUM GENERALLY

Use of Additives

Following testing, apply additives as required to achieve the specified properties.

Additives are to be mixed through the full soil depths. Re-test and repeat amelioration procedures as necessary to achieve the specified properties.

If using additives to raise topsoil to the required standard, ensure compliance with the relevant test criteria.

Contamination:

Where diesel oil, cement or other phytotoxic material has been spilt on the subsoil or topsoil, excavate the contaminated soil, dispose of it off the site, and replace it with site soil or topsoil mixture to restore design levels.

Transporting:

Soil mixes must be delivered to site pre-blended. The soil mix must be transported in a moist condition to prevent segregation of components.

On site storage:

Preferably place soil directly in its final location. However on site storage of modest quantities is permitted only if it is done so on a raised site, free from water run off, and covered to prevent ingress of rain water.

2.2 PLANTING MEDIUM

<i>Item</i>	<i>Mixture</i>	<i>Percentage</i>	<i>Refer to clause</i>
Planting medium / topsoil for: - trees, - garden beds, - lawn and - underpass planting Refer to drawing MP-11-90840 "Typical planting details 1"	Sandy Loam - 35-50% sand - Clay less than 25%	90%	2.3
	Compost	10%	2.6
	Fertiliser – controlled release type	1 kg/m ³	2.8
Planting medium for: - raingardens. In layers. Refer to drawing MP-11-90840 "Typical planting details 1"	FILTER MEDIUM / TOPSOIL		
	Medium to Coarse Sand (0.25-1.0 mm)	40-60%	2.4 + 2.5
	Fine Sand(0.15-0.25 mm)	10-30%	
	Very Fine Sand (0.05-0.15 mm)	5 – 30%	
	Coarse Sand (1.0-2.0 mm)	7-10%	
	Clay & Silt (<0.05 mm) to improve water holding capacity	< 10 %	
	Organic Content to ensure good water holding capacity	+3% <10%	
	Fine Gravel (2.0-3.4 mm)	<3%	
	TRANSITION LAYER (SAND)		
	Refer to Engineers specification		
	DRAINAGE LAYER/ LINERS		
Refer to Engineers specification			

Sandy Loam Requirements

2.3 SANDY LOAM REQUIRED PROPERTIES

Import topsoil in accordance with the Soil schedule and the topsoil properties schedule below.

Sandy Loam Mix Properties Schedule:

Property	Type	Soil Mix Amount
Nutrient levels	Phosphorus (P) (mg/L)	10 – 50
	Potassium (K) (mg/L)	5 – 15% of CEC
	Sulphur (S) (mg/L)	> 40 <100
	Calcium (Ca) (mg/L) ²	60 – 75% of CEC
	Sodium (Na) (mg/L) ²	< 5% of CEC
	Nitrogen (N) (mg/L)	≤ 100
	Manganese (Mn) (mg/L)	1 – 15
	Carbon:nitrogen ratio	< 80:1
Other properties	Organic matter (% by mass)	3 – 15%
	Soil reaction (pH)	5.5 – 7.5
	Moisture content	where clods are easily fractured and soil remains workable

Calcium level to be expressed as a percentage of the cation exchange capacity, where calcium should represent 60-75% of the cation exchange capacity and sodium <5%.

Raingarden Requirements

2.4 HYRAULIC CONDUCTIVITY

Required 100-300mm/hr

Note: The hydraulic conductivity of potential filter media should be measured using the ASTM F1815-06 method.

2.5 RAINGARDEN ADDITIONAL REQUIRED PROPERTIES

Import topsoil in accordance with the Soil schedule and the topsoil properties schedule below.

- i. Total Nitrogen (TN) Content – <1000 mg/kg.
- ii. Orthophosphate (PO₄₃₋) Content – <80 mg/kg.
Note: Soils with total phosphorus concentrations >100 mg/kg should be tested for potential leaching. Where plants with moderate phosphorus sensitivity are to be used, total phosphorus concentrations should be <20 mg/kg.
- iii. Organic Matter Content at least 3% (w/w).
Note: An organic content lower than 3% is likely to have too low a water holding capacity to support healthy plant growth. In order to comply with both this and the TN and PO₄₃₋ content requirements, a low nutrient organic matter will be required.
- iv. pH as specified for 'natural soils and soil blends' 5.5 – 7.5 (pH 1:5 in water).
- v. Electrical Conductivity (EC) as specified for 'natural soils and soil blends' <1.2 dS/m.

- 2.6 **COMPOST PROPERTIES**
Provide well-rotted vegetative material or animal manure, free from harmful chemicals, grass and weed growth.

Standard: To AS 4454.
- 2.7 **HERBICIDES**
Post-emergence selective chemical to control broadleaf weeds and/or a non-selective chemical. Submit for review the proposed chemical and area of use.
- 2.8 **FERTILISER**
Provide proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or vendor, weight, fertiliser type, N:P:K ratio, recommended uses and application rates.
- 2.9 **ADDITIVES**
Where required in section 3 below apply additives to subsoil after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil.
Description: Gypsum
Volume: Incorporate at the rate of 0.25 kg/m².
- 2.10 **DRAINAGE PIPE**
Refer to 7451 SURFACE WATER DRAINAGE for pipe work related to overflow drains and underdrains.
- 2.11 **OVERFLOW**
Overflow appropriately sized to the rain garden, and connected to drainage system.
- 3.9 **FILTER FABRIC**
Proprietary heavy duty geotextile filter fabric made from non-woven polypropylene fibre (PP).

3. EXECUTION

Conditions

- 3.1 **WORK SEQUENCE**
Planting shall not begin in any given area until all construction work which would cause damage to new planting has been completed, total weed control is achieved and the Engineer has approved of the final ground shape in accordance with the contract drawings.

If planting is not possible due to unfavourable seasonal requirements, the Contractor shall be responsible for maintaining erosion and weed control at his own expense in all planted areas until planting, mulching and weed matting is able to take place.
- 3.2 **DELIVERY**
Only deliver material to the site that can be immediately placed in its final location from the delivery vehicle.
- 3.3 **SERVICES**
Check for services in the area of this work. Avoid interference or damage to them. Ensure that all new services are in place before commencing work.
- 3.4 **ENSURE**
Ensure that all areas are clean, ready to be worked and clear of any continuing work by others.

Application

- 3.5 **PREPARATION OF PLANTING AREAS**
Place in 100mm layers, lightly compacted by heeling or rolling and slightly mounded in the centre of the bed.

Thoroughly spray planting areas which contain weed growth with a non-selective herbicide. Apply using protective clothing, in dry, still-air conditions to the spray manufacturer's requirements.

Excavation, shape the subgrade to fall as shown on the Drawings.

Cultivate manually within 300 mm of paths, kerbs, footings or other structures to a depth of 150mm. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the compacted surface to design levels after cultivation.

Apply additives to subsoil after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil.

Do not destabilise kerbs, gutters and adjacent pavements, edge restraints and structures.

3.6 PREPARATION FOR TREE PLANTING

Excavate tree pits as per drawings

Tree pits in hard paved areas shall be drilled using an auger to minimise disturbance to surrounding subgrade. Tree pits in aggregate paving, lawn or garden beds shall be excavated manually or with a backhoe. Excavate tree pits to dimensions as shown on drawings. The pit bases and sides to be broken up by hand to a depth of 150mm to facilitate root penetration, air movement and drainage.

Cultivate as required on the drawings manually cultivate subgrade to base and sides of tree pit to a depth of 150mm. Do not disturb services. Do not destabilise kerbs, gutters and adjacent pavements, edge restraints and structures. During cultivation, remove stones exceeding 25mm, clods of earth exceeding 50mm, and any rubbish or other deleterious material brought to the surface during cultivation.

Trim the base of tree holes to the required design levels and shapes, after cultivation. Ensure tree pit bases are graded to fall to the subsoil drainage where nominated on the Drawings.

Apply additives to subsoil after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil.

Do not destabilise kerbs, gutters and adjacent pavements, edge restraints and structures.

3.7 PREPARATION OF GRASS AREAS

Place in 100mm layers, lightly compacted by heeling or rolling and slightly mounded in the centre of the bed.

Thoroughly spray planting areas which contain weed growth with a non-selective herbicide. Apply using protective clothing, in dry, still-air conditions to the spray manufacturer's requirements.

Thoroughly spray grass areas which contain weed growth with a non-selective herbicide. Apply using protective clothing, in dry, still-air conditions to the spray manufacturer's requirements.

Excavation, shape the subgrade to fall as shown on the Drawings.

Cultivate manually within 300 mm of paths, kerbs, footings or other structures to a depth of 150mm. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the compacted surface to design levels after cultivation.

Apply additives to subsoil after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil.

Do not destabilise kerbs, gutters and adjacent pavements, edge restraints and structures

3.8 CONSOLIDATION

Compact lightly and uniformly topsoils in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to design levels.
- Smooth and free from stones or lumps of soil.
- Graded to drain freely, without ponding, to catchment points.
- Graded evenly into adjoining ground surfaces.
- Ready for mulch and planting.

3.9 TOPSOIL SPREADING

Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances to required finished levels and contours may be achieved after light compaction.

Spreading:

On steep batters, if using a chain drag, ensure there is no danger of batter disturbance.

Finishing:

Feather edges into adjoining undisturbed ground.

Spread topsoil to the compacted depth as on the drawings

Do not place and spread topsoil when the ground or topsoil are excessively wet or in a condition which would be detrimental to the work.

Carry out final grading of the top 100 - 150mm to ensure a true specified level and slope and to avoid hollows or other depressions where water may collect. Loosen unduly compacted areas (such as in traffic routes) by ripping or discing prior to final levelling. The final grade shall allow for subsidence so that after settlement the levels shall be the final specified levels. Avoid unnecessary handling of soil. Only handle soil during fine weather. Never handle soil when soil is saturated.

3.10 RAINGARDEN TOPSOIL (FILTER MEDIA) INSTALLATION

It is recommended that filter media be lightly compacted during installation to prevent migration of fine particles. In small areas, a single pass with a vibrating plate should be used to compact the filter media, while in large areas, a single pass with roller machinery (e.g. a drum lawn roller) should be performed. Under no circumstance should heavy compaction or multiple-passes be made. Filter media should be installed in 150mm layers.

Do not install filter media in wet conditions or when the media itself is wet.

Protect all areas of installed soil to prevent any additional compaction during construction.

3.11 FINAL GRADING

When topsoil is reasonably dry and workable, grade it to smooth, flowing contours, with falls, for adequate drainage, removing all minor hollows and ridges. Crown all planter beds to provide a gently rounded profile.

3.12 OVERFLOW DRAIN

Install overflow stand pipe with top above garden level, connect to surface water system. Refer 7451 SURFACE WATER DRAINAGE

3.13 UNDERDRAIN PIPE INSTALLATION

Install underdrain pipe with the aggregate at the lower level, wrap end in filter fabric and lay to fall and connect to surface water system. Refer 7451 SURFACE WATER DRAINAGE.

- 3.14 LAY DRAINAGE AGGREGATE
Place aggregate from a low level and spread manually, do not compact.
- 3.15 LAY FILTER FABRIC
Lay fabric over the drainage gravel and along any walls of the garden. Overlap edges minimum 150mm along all edges.
- 3.16 PROTECTION
Protect freshly laid soil from any adjacent site works.

Exclude any activity which may result in soil compaction and/or contamination. This includes walking or standing on freshly laid soil. No vehicles are to cross newly placed soil and/or completed garden areas.

Should pedestrian access across a completed garden bed or rain garden be necessary suitable measures must be taken to **ensure no compaction occurs.**

Completion

- 3.17 CLEAN UP
Clean up and remove surplus soil from the site.
- 3.18 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 SOIL SCHEDULE
Refer to **Requirements** above

END OF SECTION

8332 PLANTING

1. GENERAL

This section relates to Planting
It includes;

- Preparing ground conditions
- Planting trees, shrubs and groundcovers
- Applying soil, fertiliser and mulch
- Installation of strata cell system
- Installing stainless steel edges
- Staking and generally securing trees

1.1 RELATED WORK

Refer to 8310 LANDSCAPE SITE PREPARATION for excavation.

Refer to 8321 SOIL AND SOIL PREPARATION for topsoil.

Refer to Engineers technical specification for Stone and concrete edges.

Refer to 8310 LANDSCAPE SITE PREPARATION for vegetation protection and removal

Refer to 8321 SOIL AND SOIL PREPARATION FOR PLANTING for soil, mulch, fertiliser

+ compost

Refer to 8333 TURF LAYNG

for turf laying

Refer to 8380 LANDSCAPE MAINTENANCE

for landscape maintenance

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:

PB Planter Bag

Calliper: The stem or trunk diameter at a nominated point. Generally measured at 300 mm above ground.

Description	Size Mm	Vol. Ltr
PB 3/4	64 x 64 x 150	0.45
PB 1 1/2	90 x 90 x 150	0.90
PB 2	90 x 90 x 200	1.20
PB 3	100 x 100 x 200	1.70
PB 5	120 x 120 x 230	2.80
PB 6 1/2	130 x 130 x 280	3.60
PB 8	140 x 140 x 280	4.50
PB 10	120 x 120 x 460	5.60
PB 12	160 x 160 x 320	6.75
PB 18	180 x 180 x 360	10.0
PB 28	200 x 200 x 420	12.0
PB 40	230 x 230 x 460	18.0
PB 60	260 x 260 x 500	36.0
PB 95	300 x 300 x 600	50.0
PB 150	500 x 500 x 850	170

Planter bags (PB): Planter bags of following sizes:

External tree inspection:

Tree inspection without washing away of soil from the rootball which assesses the following:

- The tree's ability to be self-supporting.
- Its balance.
- Its root development.

Investigative inspection:

Any method of root inspection that involves the washing away of all or portions of the soil from the rootball to expose a section or all the roots.

Destructive inspection:

The washing away of all soil from a rootball to allow inspection of rootball development. Where inspection is destructive, trees will be sacrificed. The trees sacrificed should be in addition to the number of trees ordered.

Partial inspection:

A method of exposing a section of a root system to enable inspection of root development by washing the soil away in a wedge-shaped section from the stem to the extremity of the rootball. This soil can be gently replaced so the tree is not damaged.

Health:

Supply plants with foliage size, texture and colour at time of delivery consistent with the size, texture and colour shown in healthy specimens of the nominated species.

Vigour:

Supply plants with extension growth consistent with that exhibited in vigorous specimens of the species nominated.

Documents

- 1.3 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:
NZS 4454 Composts, Soil Conditioners and Mulches

- 1.4 SUPPLIER DOCUMENTS
Supplier's documents relating to this part of the work:
- Completed tree form and certification of source

Supplier contact details

Tree have been Client procured at selected nurseries for specific tree species. The Contractor is to contact the Engineer for confirmation of Nursery + trees.

Warranties

- 1.5 WARRANTY
Provide warranty for:
05 years: For all trees
05 years Structural cell system

Provide the warranty in the standard form in the general section 1237WA WARRANT AGREEMENT.

Commence the warranty from the date of practical completion of the contract works.

Requirements

- 1.6 QUALIFICATIONS
Landscape contractors to be experienced, competent landscapers familiar with the materials and techniques specified.
- 1.7 ACCEPTABLE PRODUCT SUPPLIERS
Where a product supplier is named in SELECTIONS, the product must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.
- 1.8 NO SUBSTITUTIONS
Substitutions are not permitted to any of the products listed in this section.

1.9

SAMPLES

Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

<i>Item</i>	<i>Quantity + Comment</i>
All trees	All trees to be available at nursery for inspection by LA and tagging for use on site. Contractor to coordinate the availability of tree species for inspection to a standard as per the specification to ensure that all trees can be tagged within a singular 1 day nursery visit by Landscape Architect. Any additional visit to the nursery by Landscape Architect to this will be at the cost of the Contractor.
All plants	1 plant sample for each 100 (or part thereof) of each species or variety, in the condition in which it is proposed to supply that plant to the site.
MULCH	
Organic Twig Mulch	0.5 kg bag for each type Free of fines
Limestone Aggregate Mulch	0.5 kg bag for each type Free of fines
River stone Aggregate	0.5 kg bag for each type Free of fines
EDGE RESTRAINTS	
KCss Stainless steel edge restraint	1m length
GBss Garden bed stainless steel edge restraint	1m length
TRss Tree pit stainless steel edge restraint	1m length
OTHER	
Trees stakes	1 # stake
Root barrier	1# sample (min 200mm x 200mm)

Quality control and assurance

1.10

INSPECTIONS

Give notice so inspection may be made of the following:

- Setting out completed.
- Plant holes excavated and prepared for planting.
- Tree pits excavated and prepared for cell placement.
- Tree pits cell placement with soil placement + prior to basecourse placement.
- Placement of SS edges prior to final fix
- Plant material set out before planting.
- Final tree position prior to planting
- Planting, staking and tying completed.
- Completion of planting establishment work.
- Selected trees at nursery

- 1.11 IDENTITY
Plants to be good and true representatives of their species, cultivar or variety and each batch shall be labelled.
- 1.12 LABELLING
Attach legible labels to each plant delivered to site as a separate unit, or to each box, bundle or bale containing plants. The labels shall give the approved botanical name, size, age and quantity and other information required to identify the plant or plants.
- 1.13 PLANTER BAGS
UV stabilised black plastic planter bags (PB). Standard bag sizes range from PB3 to PB150. Plant sizes are specified by PB bag size (pint bag) up to PB150. Thereafter specimen trees may be specified by bag size, girth or height or a combination of these.
- 1.14 HEALTH
Ensure plants are free of pests, diseases, disorders, disfiguring knots damage or pruning injury.
- 1.15 RESPONSIBILITY FOR CONTINUED SURVIVAL, HEALTH AND GROWTH
The Contractor is responsible for the survival, good health and adequate growth of plants connected with this contract during transportation, storage or when planted on the site during the contract and maintenance period.

Replace any plants which die, are significantly damaged, or which show signs of significant stress or declining health during the contract and maintenance period. Plants destroyed by vandalism by others or theft once planted are excluded from this condition.

Weed Control

- 1.16 WEED CONTROL
Use Chemical Herbicides with caution. They shall conform in every respect to the mixture required and be applied strictly in accordance with the manufacturer's instructions. Do not spray herbicide in windy conditions. Make good any damage caused by excess spray drift.

All chemical herbicides used are to be non-toxic to human beings, birds and animals under normal use and only those chemical herbicides registered under the Pesticides Act may be used.

Where a translocated herbicide such as glyphosate is used around plants in leaf, an adequate guard must be used for all spraying.

Carefully calibrate all spraying equipment to prevent under or over dosing. Replace any plants damaged by misplaced herbicide. No herbicide containers, empty or full, are to be left on site at any time.

Cultivation

- 1.17 CULTIVATION OF PLANTING AREAS
Cultivate planting areas to a depth as shown on the drawings to form a firm and friable tilth suitable for pit planting by hand.
During cultivations remove all weed including weed root off site.
Grade to smoothly flowing or even contours to the finished levels by hand or machine as necessary.
- 1.18 STONE/DEBRIS PICKING
After cultivating remove all stones, grass sods and other debris larger than 75mm in any dimension and all roots in excess of 15mm diameter or 200mm length.

2. PRODUCTS

Materials

2.1 CONTAINER GROWN SHRUBS AND GRASSES

Container grown shrubs to be strong well-rooted sturdy plants, without stakes or canes, with two or three main stems and a good bushy form. They must have been grown in the containers for at least 6 months over a summer period prior to planting out. The container shall be full of root but not root bound. Recently 'Containerised' or 'bagged up' plants will not be accepted.

Plants shall not have been grown in the container for longer than 12 months without having been potted on.

Characteristics:

Provide plants with the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage.
- Vigorous, well established, free from disease and pests, of good form consistent with the species or variety.
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Other Characteristics as described in this section.

Supply only plants that:

- Are free from injury.
- Are self-supporting.
- Have the calliper at any given point on the stem greater than the calliper at any higher point on the stem.

2.2 TREES

Tree species to have a single well defined leader and a reasonably straight main stem which is sturdy enough to easily support the crown of the tree under the environmental and climatic conditions of the planting site.

Characteristics:

Provide trees with the following characteristics:

- Provide trees which, unless required to be multi-stemmed, have a single leading shoot.
- Large healthy root systems, with no evidence of root curl, restriction or damage.
- Vigorous, well established, free from disease and pests, of good form consistent with the species or variety.
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Other Characteristics as described in this section.

Supply only plants that:

- Are free from injury.
- Are self-supporting.
- Have the calliper at any given point on the stem greater than the calliper at any higher point on the stem.

Species with an excurrent form: Supply trees with a defined central leader and the apical bud intact.

Crown symmetry and distribution:

Difference on opposite sides of the stem axis < 20%.

Stem structure:

Species with excurrent form:

Supply trees with a single stem roughly in the centre of the tree with any deviation from vertical < 15°.

Species with decurrent form:

Supply trees where the central stem is not divided at any point lower than the clean stem height nominated, and that the stem junction at the point of division is sound.

All species:

Ensure that branch diameter is less than or equal to one-half of the calliper immediately above the branch junction.

Included bark:

trees where the branch/stem bark ridges at junctions between stems and branches and between co-dominant stems are convex, except for species prone to include bark that are known to remain strong.

Trunk position:

Supply trees with the distance from the centre of the trunk to the extremity of the rootball not varying by > 10%.

Compatibility of graft unions:

Supply trees where the union between the scion and rootstock is sound for the entire perimeter of the graft, and the diameter of the scion immediately above the graft is equal to the diameter of the rootstock immediately below the graft ($\pm 20\%$).

2.3

ROOT SYSTEMS

All plants to have good, vigorous, fibrous root systems in keeping with the normal rooting habit of the species. Root balls and container growing medium shall be free from perennial weed and soil borne plant diseases.

Root direction: Ensure that roots, from the point of initiation, generally grow in an outwards (radial) or downwards direction, and that any deviation from the established direction < 45°.

- Trees with a calliper at ground level < 40 mm: Ensure that the diameter of any nonconforming roots at the extremity of the rootball < 25% of the calliper.
- Trees with a calliper at ground level ≥ 40 mm: Ensure that the diameter of any nonconforming roots at the extremity of the rootball < 10 mm.
- Soil retention: On shaking or handling the unsupported rootball at least 90% of the soil volume to remain intact.
- Height of root crown: ensure that root crown is at the surface of the rootball.

2.4

BRANCH SYSTEMS

Plants to have well developed vigorous branch systems of normal habit, dimensions and density for a well grown nursery plant of their species. Plants which have 'leggy', narrow or thin branch systems will not be accepted.

2.5

PEST AND DISEASE

Supply plants with foliage free from attack by pests or disease.

Native species with a history of attack by native pests: Restrict evidence of previous attack to < 15% of the foliage and ensure absence of actively feeding insects.

2.6

HARDINESS

Plants to be fully hardy having been acclimatized in the nursery to sun, exposure and cold. Plants which have not been hardened off, drawn plants with soft growth or plants requiring additional support to that specified will not be accepted.

2.7

DRYING OUT

Plants which have dried out or show signs of desiccation or wilting will not be accepted.

2.8

SIZES

For acceptable sizes of plants refer to SELECTIONS. Plants which are larger than the maximum size may be accepted at the discretion of the Contract Administrator who may require oversize plants to be pruned. Where plants have been recently "bagged on" from a smaller nursery grade they will be deemed to only fulfil the size requirements of the smaller grade.

All plants of the same species to be of similar height and stature ($\pm 10\%$). Plants supplied later in the contract to replace defective plants are to match the current size of those previously planted.

Components – For tree pits with structural cells

2.9

INTERCONNECTED STRUCTURAL CELLS

Location Refer to drawings
 Supplier City green (<http://www.citygreen.com>)
 Type: SC250 strata cell – (series type (30- 300kpa or 60 – 600Kpa) to be specified by Engineer.
 Description: Engineered plastic modules 100% recycled Polypropylene (PP)
 Note: Also required :
 1) ReRoute ribbed linear barrier to tree pit opening
 2) Root barrier to tree pit (RS600 RootStop barrier)
 3) Irrigation / aeration to rootball (RRCIV1 RootRain Civic single inlet)
 4) Deep Irrigation / aeration to cells (RRARB2 RootRain arborvent dual inlet)
 5) Filter fabric to top of cell stack (FilterGrid)

2.10

ROOT BARRIER (TO TREE PIT OPENING)

Location Tree pit opening, refer to drawings
 Supplier City green (<http://www.citygreen.com>)
 Type: RER260 ReRoute ribbed linear barrier
 Description: Ribbed liner, 100um thickness, 100% High density Polyethylene. Vertical, integral ribs guide tree roots down into matrix beneath pavement.

2.11

ROOT BARRIER (TO TREE PITS SIDES AND BASE)

Location Sides and base, refer to drawings
 Supplier City green (<http://www.citygreen.com>)
 Type: RS600 RootStop barrier
 Description: 100% High density Polyethylene.

2.12

IRRIGATION SYSTEM (TO ROOTBALL WATERING)

Location Refer to drawings
 Supplier City green (<http://www.citygreen.com>)
 Type: RRCIV1 RootRain Civic single inlet
 Description: Flexible, perforated pipe system. Lateral pipe system is connected to the surface by means of T-pieces and riser pipes. 100% High density Polyethylene pipe. Moulded T-Pieces and junctions
 Note Also required:
 Cast aluminium ventilation grilles with tamper-resistant grating.

2.13

IRRIGATION SYSTEM (DEEP IRRIGATION / CELL WATERING AND AERATION)

Location Refer to drawings
 Supplier City green (<http://www.citygreen.com>)
 Type: RRARB2 RootRain arborvent dual inlet
 Description: Flexible, perforated pipe system. Lateral pipe system is connected to the surface by means of T-pieces and riser pipes. 100% High density Polyethylene pipe. Moulded T-Pieces and junctions

2.14

FILTER FABRIC (TO TOP OF CELL STACK)

Location Refer to drawings
 Supplier City green (<http://www.citygreen.com>)

Type: FilterGrid
Description: heavy grade non-woven filter fabric with reinforced grid

- 2.15 FILTER FABRIC (Creche Planters)
Location Refer to drawings
Supplier Maccaferri or similar approved
Type: Bidim – A14
Description: non-woven filter fabric

Components - other

- 2.16 TIMBER FOR STAKES
Stake Material: Manuka stakes, straight, free from knots or twists, pointed at one end.
Stake sizes: Three 50mmØ x 2400mm stakes per tree.
Ties Material: 50 mm hessian webbing stapled to the stake.

- 2.17 ORGANIC MULCH
Location All tree pits in paving, tree-pits in grass, all garden beds and rain gardens.
Type: Twig mulch
Materials Not Permitted:
Leaf matter and tree loppings from noxious weed, deleterious and extraneous matter such as soil, weeds, and stones

- 2.18 WASHED GRAVEL MULCH
Location GRC Planters at the Creche
Type: Washed river gravel
Description: Uniform size or graded material
Size: 03-7mm Pea gravel
Materials Not Permitted:
Leaf matter and tree loppings from noxious weed, deleterious and extraneous matter such as soil, weeds, and stones

- 2.19 LIMECHIP MULCH
Location Trees in lime-chip paving
Type: Limechip to match aggregate section specification
Size: No fines, 05 -40mm
Materials Not Permitted:
Leaf matter and tree loppings from noxious weed, deleterious and extraneous matter such as soil, weeds, and stones

- 2.20 STAINLESS STEEL EDGE RESTRAINTS
Location GBss - Refer to contract drawings
KCss – Refer to contract drawings
Type: Stainless steel (refer to 3410 LANDSCAPE METALWORK
Size: As drawn. Refer to contract drawings

Maximum deviation from alignment.
Vertical: 5mm in 2.0m
Horizontal: 5mm in 2.0m

- 2.21 COMPOST
As specified in 8321 Soil and soil preparation for planting.

- 2.22 TOPSOIL FROM STOCKPILE
Top quality screened topsoil minimum depth 300mm excluding soil conditioner to all planters or planted areas. Free of weeds and stones. Screened site topsoil may be used.

2.23 FERTILISER FOR PLANTING

Well-balanced 6 month slow release fertiliser including available nitrogen, phosphorus and potassium plus magnesium and trace elements. Fertiliser in granular form to allow distribution through the backfill mix.

Apply slow release fertiliser at a rate of 100g per specimen tree and mixed evenly with the backfill mix.

2.24 WATERING TUBES

Watering tubes shall be 65mm diameter perforated HDPE pipe installed across the base of the tree pit and up the side to extend 100mm above the finished ground level.

3. EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

The Contractor shall be responsible for arranging time of plant delivery to the site at which time the plants become the full responsibility of the Contractor. Acceptance of plants on site shall mean that the Contractor is satisfied that the quality of the plants meets the following specifications for quality. The landscape architect shall be informed immediately of any plants that do not meet this standard. The nominated plant supplier will be responsible for the supply, unloading, placement of plants to the site, at suitable times as arranged by the Contractor. The Contractor will be responsible for the care of the plants as soon as they are accepted on arrival at the site. Larger material, such as trees, shall have individual root balls wrapped in polythene to retain humidity. Container grown plants shall not be bundled.

The Contractor shall confirm that the proposed method for preparation, lifting on to pallets, loading, transport and delivery to site of advanced plants is compatible with the Contractor's method for storage. In the event that the plants are not acceptable to the Contractor and the Landscape Architect they will be rejected in writing, to be replaced.

Take delivery of materials and goods and store on site and protect from damage. Cover plants during transportation. Plant roots shall be protected at all times from sun or drying winds. Plants that cannot be planted immediately on delivery shall be kept in the shade, well protected, with soil well watered.

Any damage to roots and limbs and damage to the main super structure may result in the rejection of the plant. Plants with damaged growing points, lop sided growth or other deformities may also be rejected at the discretion of the Landscape Architect. If major damage occurs the plants shall be replaced at the Contractor's expense.

Pots and other protective materials shall not be removed until immediately prior to planting, and shall be disposed of off the site after planting. Roots shall not be left uncovered at any time. Any plants that, in the opinion of the Landscape Architect and Contractor, are found to be root bound or defective in any way when they are removed from their containers, shall be set aside and brought to the attention of the Engineer for action.

3.2 APPROVAL

Do not start preparation or planting until the setting out has been inspected and approved by the Contract Administrator.

3.3 PRE-INSTALLATION REQUIREMENTS

Prepare all planting areas indicated on the drawings including clearing out, controlling weeds, forming new planters, cultivating, and adding soil conditioner, fertiliser and bark mulch.

3.4 TIMING OF OPERATIONS

Work shall only be undertaken when the weather is suitable, i.e. mild, still, overcast and moist, and when the ground is moist and workable. All planting operations shall be suspended during periods of severe frosts, drought, waterlogging or persistent drying winds. Grass seeding shall take place following final sealing of surrounding areas unless otherwise directed by the Engineer. Trees shall be planted prior to the commencement of grass seeding. The Principal shall accept liability for plant deaths greater than 5% where the Contractor has been instructed to proceed with planting outside the normally recognised horticultural season.

3.5 CLEAN OUT PLANTER AREAS

Remove weeds, unwanted plants, stumps, rubbish, and excess earth.

- 3.6 **PROTECT EXISTING PLANTING TO BE RETAINED**
Protect plants that are indicated on the plans to be retained. Make good any damage, including replacement where necessary.
- 3.7 **TEND EXISTING PLANTING TO BE RETAINED**
Tend any plants that are indicated on the plans to be retained. This includes removing dead branches and pruning or cutting back so that plants are compact, tidy in appearance, healthy, and of the required size and shape.
- 3.8 **TOPSOIL**
Supply and install topsoil to planting areas to achieve finished surface levels, and to ensure specified topsoil depths are achieved. Remove existing earth where necessary to accommodate topsoil and soil conditioner in planters to achieve finished surface levels.
- 3.9 **SOIL CULTIVATION AND CONDITIONER**
Supply and incorporate soil conditioner to all planting areas where indicated on the plans at the rate of 0.075m³ per m² (75mm depth) worked into the top 150mm of existing soil.
- 3.10 **FINISHED SURFACE LEVELS**
The finished surface soil level including soil conditioner (but excluding mulch) shall be 50mm higher than adjacent kerb or lawn areas in the middle of the planter, but shall be graded so that the finished level at the outside of the planting areas is 50mm lower than the adjoining kerb or lawn.
- 3.11 **MARKING & DIMENSIONS**
Set out the outlines of seeding, turfing and planting areas. Use sand, paint or short canes close enough together to accurately define the shapes on the ground.

Installation/application – structural cells

- 3.12 **EXCAVATION FOR STRUCTURAL CELLS**
Installer to excavate the tree pit accurately to the dimensions of the detailed plans, allowing 200mm (8") additional clearance in length and width. Side walls of excavated pit to be clean, straight, and within 15° of vertical. Tree pit length, width and diagonals at base of pit to be measured to ensure that correct dimensions are being obtained (measurements shown on tree pit detail plus 200mm). Installer to confirm that correct depth has been provided, measuring from finished pavement level, including any drainage layers. Base of tree pit should be flat unless there is a drainage layer to be provided, in which case the subgrade surface must have a grade of 5%.
- 3.13 **REINFORCING COLLAR FOR STRUCTURAL CELLS**
The top perimeter of the tree pit must be further excavated to a depth of 300mm (12") and to a width of 200mm (10"), or a width sufficient to permit a narrow foot compacting plate (reinforcing collar) to be installed. Sides and base of this excavation must be clean and straight.
- 3.14 **DRAINAGE**
Refer to drawings.

Cover top and sides of gravel drainage with a proprietary non-woven filter fabric to engineer specifications and ensure the sides of the drainage layer are compacted against the sides of the excavation to the density specified.
- 3.15 **SUB-BASE PREPARATION**
Installer to check CBR of the subgrade below the proposed granular pavement layers to ensure it meets the applicable pavement design criteria. If the subgrade is fill confirm that it is compacted to a minimum of 95% of maximum dry density at optimum moisture content in accordance with ASTM D 698 Standard Proctor Method.
- 3.16 **INTERCONNECTED STRUCTURAL SOIL CELL ASSEMBLY**
Refer to supplier installation specification.

3.17 ROOTTRAIN IRRIGATION / AERATION PIPE

Refer to supplier installation specification.

Open ends of pipes to be sealed with Cast aluminium ventilation grilles with tamper-resistant grating.

3.18 ROOT BARRIERS (ROOT STOP)

Refer to supplier installation specification.

3.19 LOADING MATRIX WITH FILLER SOIL

Ensure that all required filler soil testing and certification is complete to the satisfaction of the Landscape Architect prior to loading into the tree pit.

When matrix is fully assembled, with all specified piping and barriers in place, the filler soil can be loaded into the matrix. Soil should be placed in the matrix using an excavator bucket and spread with rakes or shovels until the void spaces are filled. Ensure the outer trench for the reinforcing collar is kept clean and free of filler soil. Matrix is to be vibrated using plate vibration or needle vibration equipment in order to shake soil into all voids. Continue loading dry soil, raking out and vibrating, until matrix is filled.

Should the filler soil constituents and moisture content not permit the voids to be fully filled, assemble the structural soil cell modules in layers and progressively fill, layer by layer.

Note:

In some instances an air layer is detailed in the top of the matrix. In this case soil is loaded, spread and vibrated in smaller amounts, to ensure an even distribution of soil beneath the air layer.

3.20 FILTER FABRIC

Refer to supplier installation specification.

3.21 COMPACTION AND PAVEMENT LAYERS

Reinforcing collar

Load the granular base course material into the base of the collar trench ensuring the geocomposite layer is not displaced from the base of the trench. Compact the granular material in 150mm (6") lifts until the collar is level with the top of the matrix.

Tree pit opening

Confirm the exact required position of the tree pit opening from project details and with reference to survey markers. Cut geocomposite layer and fold back to expose the tree pit opening. Position form-work to provide for poured concrete system, or other method as specified in project details. Place linear ribbed root barrier within the tree pit opening with vertical ribs facing inwards. Ensure bottom edge of barrier is placed on the structural soil cell matrix and upper edge is at finished pavement level. Trim to suit with sharp knife. Ensure any joints are overlapped a minimum of 150mm (6"), are clean and dry and taped both sides with external grade, moisture resistant, adhesive tape.

Granular base course

Load and spread granular base course material onto the geocomposite layer in an even depth of 100mm (4"). Compact this layer with a vibrating plate compactor with a mass of 1200kg – 1400kg/m² of base plate, to specified compaction levels. Continue building compacted granular layers to required levels including the reinforcing collar.

Installation/application – all planting (refer above to structural cells)

3.22 SETTING OUT

Planting positions shall be pegged/laid out, in accordance with the planting plan and plant schedule. Where locations of individual plants are not shown, space at an even spacing in staggered rows across the plant bed indicated.

The Landscape Architect may require minor refinement to the design with adjustments to lines, levels and grouping of trees/shrubs/reeds locally as the planting proceeds requiring the Contractor's co-operation and agreement.

In areas of block planting, plants shall be spaced evenly so that when established they will completely fill the areas indicated as precisely as possible. The extent of the area to be filled by each species shall first be defined by plants spaced around the perimeter. The remaining plants shall then be used to fill the centre of the area in an informal manner avoiding straight lines and regular geometric patterns.

The Contractor shall not commence planting until the setting out has been inspected and approved. If work is carried out without the prior approval, realignment and resetting may be necessary at the Contractor's expense.

3.23 PLANT LAYOUT

Place and plant at the same density throughout that species area, group or drift. Do not plant in regular rows unless this is shown on the drawings. Pay particular attention to the distribution of plants around the perimeter of areas to ensure they are evenly spaced and that the front row of plants follows the shape of the area.

3.24 CURVED EDGES

Achieve a smooth and even curve when setting out curved edges and outlines of planting next to grass or hard surfaces. The first row of plants in the planting area is to exactly follow this curve at a constant distance behind it.

3.25 MAINTAINING MARKINGS

Keep all setting out visible until planting has been finished.

3.26 PIT SIZE

Dig the planting pit large enough to allow the root-ball of plants to be accommodated without distortion or, in the case of bare root/open ground plants, for their roots to be fully spread. Do not distort or bend roots to fit into the planting pit.

3.27 PRUNING

Prune any damaged or diseased roots and branches.

3.28 PLANT POSITIONING

Place plants in the centre of the planting pit with their main stem vertical and at such a depth that the firmed down soil after planting is at the same height as the nursery ground level or the container soil level.

Pierce the bottom of each hole to a depth of 200mm with the tines of a fork or similar implement to ensure root penetration and free drainage. Roughen the sides of pits dug by rotary augers.

The base of each hole shall be provided with a 25mm layer of proprietary compost. Apply fertiliser to the base of the dug hole.

Remove container from container grown plants immediately prior to planting. Take care to ensure that the root ball is not disturbed during container removal or planting.

Set plants in their final positions with main stem vertical and at such a depth that the soil, when firmed down is at the same height as the nursery earth marks on the stem or the container soil level. Spread out loose roots in a natural fashion, carefully place the soil under and amongst them to fill all voids and firmed in.

3.29 BACKFILL

Back fill with finely broken down topsoil free from clay lumps and large clods and thoroughly mixed with slow release planting fertiliser. Spreading of planting fertiliser on the soil surface after planting will not be accepted.

3.30 TWIG PULL TEST

It should not be possible to lift or disturb the roots of a properly firmed plant by pulling on leaves or un-lignified shoots.

3.31 HEELING IN
Heel the soil firmly after planting and thoroughly water.

3.32 BACKFILL FERTILISER
Incorporate backfill fertiliser into the backfill of each planting hole at the following rates:

nursery grade	per plant
Pb5	12g
Pb8	20g
Pb18	40g
Pb40	60g
Pb95	150g
Pb150	400g

3.33 WATER GENERALLY
Provide water supply for watering (or water carts if necessary) and water the installed plants to the level required for the season the planting is programmed to be installed. Additional watering will be required during the drier seasons. Attention must be paid to watering during and after planting to ensure successful establishment. All plants shall be thoroughly watered a few hours prior to planting, and again immediately after planting.

3.34 STAKING FRAME + WIND / OTHER PROTECTION
Drive stakes into the ground at least one third of their length, avoiding damage to the root system. All trees marked on the schedule shall have their trunks tied with Hessian Webbing ties to the tree guards as necessary, to promote healthy establishment and avoid damage in high winds. The trees shall be held firmly, although not rigidly, by tying to prevent a pocket forming around the stem and newly formed fibrous roots being broken by mechanical pulling as the tree rocks.

Trees shall be securely fastened using hessian ties wrapped in a figure eight between the stake and the tree trunk to prevent rubbing of the tree. The top shall be fastened approximately 50mm below the bottom branch. Ties shall be securely fastened in a manner that allows adjustment over the establishment period. Care shall be taken to avoid damage to surrounding edges, paving and irrigation pipes.

Newly planted areas shall be protected from any possible construction or other damage. To ensure protection for the duration of the site works, the Contractor shall if necessary, provide and maintain a 1m minimum height barrier around the plants.

Earth anchors:
To be used for the stabilisation of transplanted trees and those in exposed positions. Provide temporary support where necessary to trees, root balls or stakes using galvanized steel cables attached to proprietary aluminium anchors or drive rods, which have been hand or power driven at an angle into the ground.

3.35 MULCHING
Dress all planter areas with a minimum 75mm depth of mulch. Apply mulch following planting. Level the soil surface prior to mulch being applied. Ensure that soil is not mixed with the mulch. Spread mulch to a generally even level but in particular grade away from plant stems to avoid the possibility of collar rot. Ensure mulch is graded away from the paths and kerbs in a way that avoids mulch spilling from planters.

3.36 PRUNING
All pruning shall be performed by skilled operatives. Before planting, all trees and shrubs shall be pruned as necessary to conform with the best horticultural practice appropriate to the type of plant. Pruning shall remove all injured twigs and branches and shall be such as to compensate for any loss of roots during planting operations and shall be carried out without any bruising or tearing of the bark.

After planting, all plants with damaged branches unless rejected, shall be carefully pruned back to healthy wood. Operations are to be carried out using sharp clean implements to

give a clean sloping cut with one flat face. Ragged edges of bark or wood are to be trimmed with a sharp knife. All pruning's shall be removed from site.

3.37

WATERING

Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress. Adjust irrigation system as required to provide required amounts and frequency of watering.

An trickle irrigation system is to be installed on this site for new tree planting. The Contractor shall ensure that the system is fully operational at all times. Should the system fail to operate for whatever reason the Contractor shall be required to provide manual watering until the irrigation system is fully operational.

Attention must be paid to watering during and after planting to ensure successful establishment. Notwithstanding any prevailing restrictions by the local authority on the use of water for watering any plants, the Contractor shall be deemed totally responsible for making any special arrangements which may be necessary to ensure regular and adequate watering of trees and shrubs to ensure successful establishment.

In the interests of good horticultural practice watering shall be sufficient to give 300mm minimum depth penetration and not just surface dampening. The Contractor shall bring to the site sufficient water carts, hoses and sprinklers to provide an adequate water supply to the plant material.

Prior to Planting: - All plants, shall be thoroughly watered a few hours prior to planting.

After Planting: - At the time of planting all trees and shrubs are to be copiously watered in such a way that the entire tree pit or shrub station is moistened to field capacity to encourage settlement. The Contractor shall be responsible for watering all plants as required to ensure their survival.

Drought Conditions: - Lack of availability of water shall not release the Contractor from his obligation to replace all dead or dying plants at the end of the first season of growth after planting. The price submitted shall allow for adequate watering and, when not directed, the Engineer shall not need to remind the Contractor of his obligation during periods of drought. If water supply is likely to be restricted, inform the Engineer without delay and ascertain availability and cost of water from another approved source.

Completion

3.38

ROUTINE CLEANING

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

3.39

DEFECTIVE OR DAMAGED WORK

All plants shall be maintained for two full growing seasons after planting. Replace damaged or marked plants during this period.

3.40

PROTECTION

Provide the following temporary protection of the finished work:

- As required to allow plant establishment and at the direction of the Landscape Architect

4.

SELECTIONS

Materials

4.1

PLANTING SCHEDULE

Refer to the planting schedules in the SCHEDULES section of this specification

4.2

STRUCTURAL CELL SYSTEM

Refer to PRODUCTS of this section and the contract drawings.

- 4.3 PLANTING HARDWARE (INCLUDING STEEL EDGES)
Refer to **Contract drawings for materials size/ dimensions**
Refer to **PRODUCTS** section above

Spares and maintenance materials

- 4.4 SPARES AND MAINTENANCE MATERIALS
Provide the following spares and maintenance materials:
Item/quantity: Maintenance manual
Deliver to: Engineer prior to practicable completion.

END OF SECTION

8333 TURF LAYING

1. GENERAL

This section relates to the laying of turf and seeding of lawns.
It includes, fertilizer and initial mowing

1.1 RELATED WORK

Refer to 8310 LANDSCAPE SITE PREPARATION for vegetation protection and removal
Refer to 8321 SOIL AND SOIL PREPARATION FOR PLANTING for soil, mulch, fertiliser + compost
Refer to 8332 PLANTING for planting, SS edge + staking
Refer to 8380 LANDSCAPE MAINTENANCE for landscape maintenance

1.2 DOCUMENTS

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- Turf certification

Warranties

1.4 WARRANTY

Provide warranty for:

01years: For turf

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.5 QUALIFICATIONS

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

1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.8 SAMPLES

Supply a sample of the turf for the approval of the Contract Administrator. Ensure that all the turfs are similar to the approved sample.

Quality control and assurance

1.9 INSPECTIONS

Contract Administrator to inspect the works following:

- cultivation and preparatory work prior to turfing
- cultivation and preparatory work prior to seeding
- completion of respreading topsoil prior to final levelling and seeding
- completion of turf establishment

2. PRODUCTS

Materials - Turf

2.1 SIZES

Turf of an even thickness of approximately 20mm x 450mm wide and of a consistent length. Sufficiently fibrous for turfs to hold together when handled, but without excessive fibre or thatch.

2.2 WEED AND PEST FREE

Ensure the turf is free of weeds and pests.

2.3 GRASSES

The constituent grasses of the turf should provide a close texture of even density and green in colour. The turf should be sufficiently fibrous for turf to hold together when handled but excess fibre or thatch is undesirable.

3. EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING - TURF

Pack turf to avoid drying out in transit. In hot weather spray it with water and cover with hessian as required.

Deliver turf to the site the day of lifting and off load by hand unless arranged on pallets for mechanical handling.

Turf permitted to dry out shall be rejected when its survival after placement is doubtful.

3.2 PRE-INSTALLATION REQUIREMENTS - TURFING

Thoroughly cultivate the area of topsoil to a depth of 100 - 150mm, and free of clods.

Clear weeds, stones and rubbish. Evenly consolidate the topsoil sufficiently to avoid settlement, but friable enough to allow free root penetration. Carry out minor grading to ensure an even surface, particularly at junctions with edgings, kerbs, manholes and paths etc.

The top 25mm shall have a loose tilth. No soil shall be cultivated or handled when the moisture content is at a level where soil structure damage will result.

Installation/application

3.3 SOIL PH LEVEL

Target a soil pH level of between 5.5 and 6.0. Dress clay based soils with agricultural lime, applied at the rate of 150gms/m², and thoroughly 'work in' during cultivation (unless soil tests prove otherwise).

3.4 STANDARDS AND TOLERANCES - SEEDING & TURFING

Completed topsoil shall be 15mm above paths, paving and tops of kerbs, manhole covers and catchpit aprons, and free draining. It shall not have depressions capable of ponding.

Grassed surfaces shall be deemed to be in an acceptable condition when;

- fully established with vigorous growth
- no ponding of surface water occurs
- grass covers 95% of the grassed areas
- single areas of exposed soil are less than 100mm diameter in any one location
- broad leaved weeds visible by eye through 360 degrees from any location, are limited to 4 plants/m².
- Kikuyu grass is not present

Turf

- 3.5 **INSTALLATION**
Lay turf immediately after delivery to site. Where this is not possible unload the turfs and stack on clear ground to a maximum height of 1.0m, and ensure they are suitably protected and watered.
- 3.6 **TURF LAYING**
Do not lay in exceptionally hot, dry weather, or in exceptionally wet or frosty soil or weather conditions.
Handle turf carefully to ensure minimum breakage and to prevent soil dropping from the roots.
- Lay turfs on the prepared soil bed and firm into position in consecutive rows with broken joints (as in stretcher bond brick work) closely butted together and to correct levels.
Lay turfs from planks working over the turfs previously laid.
- Thoroughly water until the turf mat and top 50mm of soil is wet. Allow a "soaking in" period, and then firmly and evenly compress with a wooden tamper, so that the under side of the turf mat and the wet soil surface are thoroughly bonded.
- Any inequalities in finished levels owing to variation in turf thickness or uneven consolidation of soil shall be adjusted by raking and/or packing fine soil under the turf, not by top dressing the lawn surface.
- The finished level of the turf is to conform to the final levels taking into account settlement.
- Do not allow turfs to dry out for at least three weeks after laying - after that water normally. Do not overwater.
- 3.7 **MOWING TURF**
Mow the grass when it has reached a height of 30mm to 40mm. Cut to 20mm to 25mm high depending on variety and end use. Mow only one third grass length at one mowing. Mow in dry conditions with sharp mower blades and remove clippings. Use only reel mowers on fine turf, rotary mowers can be used on coarser sports/amenities turf like Ryegrass.
For subsequent mowings, the mowing frequency shall be governed by growth rate. Grass height at the completion of the contract to be, 15mm to 20mm for fine turf like Fescue/Browntop etc, 20mm to 25mm for coarser turf like Ryegrass etc.
- Generally**
- 3.8 **ROUTINE CLEANING**
Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused materials and elements from the site.
- 3.9 **DEFECTIVE OR DAMAGED ELEMENTS**
Replace damaged elements.
- 3.10 **PROTECTION**
Provide the following temporary protection of the finished work:
~
- 3.11 **MAINTENANCE**
The contractor shall be required to maintain the surface of all grassed areas, and to cut the grass at intervals throughout the period of the contract works, including the defects notification/liability period. A final cut shall be made just prior to the expiration of the defects notification/liability period, and ground surfaces shall present a uniform, dense continuous surface free from bare patches.

4. SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Materials

- 4.1 TURF
Location: As shown on drawings
Mix/Brand: Instant lawn or similar approved.

END OF SECTION

8380 LANDSCAPE MAINTENANCE

1. GENERAL

This section relates to Landscape Maintenance.

It includes:

- Plants
- Grass
- Mulch
- Planting ancillaries

1.1 RELATED WORK

Refer to 8310 LANDSCAPE SITE PREPARATION for vegetation protection and removal

Refer to 8321 SOIL AND SOIL PREPARATION FOR PLANTING for soil, mulch, fertiliser + compost

Refer to 8332 PLANTING for planting, SS edge + staking

Refer to 8333 TURF LAYNG for turf laying

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:

NPK The labelling of fertiliser based on the relative content of Nitrogen (N), Phosphorus (P), and Potassium (K).

ESD Environmentally Sustainable Design.

Requirements

1.3 QUALIFICATIONS

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

1.4 PERIOD

Undertake maintenance of the landscaping works regularly for:
24 months From Practical completion of the Landscape Work.

Item	Duration
Hard landscape items	06 month defect + maintenance period (start date from the issue of practical completion)
Soft landscape items	24 month defect + maintenance period (start date from the issue of practical completion)
Limechip Paving	24 month defect + maintenance period (start date from the issue of practical completion)
Irrigation	12 month defect + maintenance period (start date from the issue of practical completion)
Lighting & services	To electrical specification (start date from the issue of practical completion)

The degree required and frequency is detailed in these specifications.

Maintenance shall be continuous and shall maintain a standard of landscaping and Engineering at least equal to that achieved for Practical Completion and to the satisfaction of the Landscape Architect.

The Sub-Contractor shall provide a weekly checklist of jobs completed and a monthly report outlining the progress of the project and any defects. Practical Completion shall be as each area of soft landscape is completed and certified.

1.5 RECURRENT WORKS

Throughout the Planting Establishment Period, continue to carry out recurrent works of a maintenance nature including, but not limited to, watering, weeding, fertilising, pest and disease control, replanting, cultivating, pruning, removal of clippings.

1.6 NOTICE & HOLD POINTS

Notice:

Give 2 days' notice to the Principal's representative so that inspection may be made at the following stages:

- Beds excavated and cultivated in preparation for backfilling with soil mixes, including location and connection of subsoil, drainage and irrigation where applicable.
- Tree pits - excavated and prepared for planting, including location and connection of subsoil, drainage and irrigation where applicable.
- Soil mixes spread, leveled and consolidated before planting.
- Plant material set out before planting.
- Planting completed and irrigation operational.

Give notice so monthly inspection by LA at appropriate timing.

At the request of any works requested by the Landscape Architect.

Hold Points:

Delivery of plant material as supplied by the Principal's nominated supplier.

- Placement of trees in tree pits.

1.7 SITE STORAGE

Material storage on site during maintenance period: Submit proposal.

1.8 PROGRAMME

Submit a work program in the form of a bar chart, for the maintenance period. Comply with the program once confirmed by the Engineer.

1.9 CHECKLISTS / REPORTS

Weekly checklist + monthly report as listed in above.

1.10 LOG BOOK

Submit copies at 6 month intervals starting from date of Practical completion.

Keep a log book recording when and what maintenance work has been done and what materials, including toxic materials, have been used. Make the log book available for inspection to the Superintendent on request. Allow for weekly inspection of all trees and monitoring of irrigation system. Provide detailed logs of conditions on a monthly basis

1.11 GUIDANCE MANUAL

At the end of the Establishment Period, submit to Engineer a Guideline Maintenance Manual outlining recommended operations and treatments for the maintenance of the works.

Quality control and assurance

- 1.12 NOTIFICATION OF MAINTENANCE VISITS
Supply to the Contract Administrator a maintenance schedule detailing the dates of proposed visits and work to be undertaken. In addition, notify the Contract Administrator immediately prior to those visits being made.

2. MAINTENANCE

- 2.1 GENERAL
Maintenance shall include watering, weed removal, plant trimming, cultivation, insect and disease control, checking stakes and ties, pruning and other accepted horticultural operations to ensure normal and healthy plant establishment and growth. Ensure that the plants installed will survive and grow. Water the plants installed as frequently as necessary.
Inspect the landscaping works no less than monthly to confirm the health of the plants, existence of pests, diseases, or vandalism.

3. EXECUTION

Application – Hard Landscape

- 3.1 GENERAL
Care shall be taken to avoid damage to any works or adjacent works.
- 3.2 PAVED AREAS
The Contractor shall check for loose pavers, slumping or other blemishes and rectify in accordance with the specification.

The contractor shall report malicious damage or spillages to the Engineer who will issue the appropriate instructions.

Spray to remove weeds from all paved areas.

Brush paved areas to remove debris, leaves and litter. Provide clean edges to stone interfaces.
- 3.3 AGGREGATE PAVING (RIVER STONE)
Aggregate paving surfaces are to be raked lightly to maintain an even clean surface, at two weekly intervals during the maintenance period. Aggregate paving which is trampled, kicked or moved over adjacent surfaces shall be swept back and removed from adjacent surfaces at the same intervals.
- 3.4 LIGHTING
During the Defects Liability Period the Contractor shall, in addition to attending to any operational defects, fully maintain the plant either supplied and installed by him or supplied by others and installed by him and carry out twelve (12) preventative maintenance services on the installed equipment fully complying with Manufacturers' recommendation and requirements and all relevant regulations. The maintenance service work may be carried out by an agent appointed by the Contractor subject to approval by the engineer.

Provide maintenance log including pro-forma sheets detailing all activities and frequency.

All maintenance work carried out during the construction and/or defects liability period shall be done in strict accordance with the recommendations of the equipment manufacturers and as detailed in the approved operating and maintenance manuals and as specified herein.
- 3.5 DRAINAGE
Maintain all sumps and covers. Check and empty regularly and prior to Final Completion.

Regularly check drains and remove obstructions.

- 3.6 CARPENTRY
Maintain all timber surfaces, remove splinters, and drive home nails which sit proud. Furniture is to be kept clean of dirt or algae etcetera.

Repair as required which may include re-sanding, rust treatment, painting and/or replacement of damaged parts.

- 3.7 OTHER HARD LANDSCAPE ITEMS
Check that all items are free of defects and repair as specified.

Application – Irrigation

- 3.8 GENERAL
Maintain the Irrigation System in sound working order at all times to ensure water supply is kept up to all trees. Replace all parts including drippers found to be defective as specified.

The Contractor shall regularly check timing switches and shut down the system over winter. All costs associated with frost damage resulting from failure to keep the system drained over the appropriate time period shall be met by the Contractor.

It is important to ensure that the irrigation system is monitored, fully operational and set to achieve optimum plant growth especially in adversely dry conditions. Keep drains and kerb inlets clear and functional with respect to treepits and rain gardens.

Application – Soft landscape

- 3.9 GENERAL
Care shall be taken to avoid damage to any works or adjacent works. For planting the relevant planting rates shall be deemed to include all such costs and no additional payment shall be made for defects work under any circumstances.

- 3.10 GENERAL
Maintenance shall include watering, weeding, trimming, cultivation, insect and disease control, checking of stakes and ties, pruning and other accepted horticultural operations to ensure normal and healthy plant establishment and growth. Also removal of litter and generally keeping the area neat and tidy.

The relevant planting rates shall be deemed to include all such costs and no additional payment shall be made for defects work under any circumstances.

- 3.11 VANDALISED PLANTS
Any plants vandalised after Practical Completion shall be notified in writing to the Engineer and shall be removed and replaced upon instruction.

Those plants not notified to the Engineer shall be assumed to have died as a result of planting operations and shall be replaced at the Contractor's expense.

The cost of plants or other landscape works deemed to have failed due to theft, willful damage or vandalism shall be the principal's responsibility.

- 3.12 REPLACEMENTS PLANTS
Replacements to make good defects must be planted during the planting season immediately following their loss. These shall be similar to those specified, previously supplied and approved unless otherwise agreed between the Engineer and the Contractor.

All such replacement planting shall be at the Contractor's expense and the Contractor shall be responsible for any preparatory and other work necessary to enable planting to be properly carried out including the removal and disposal of dead materials.

Replacement of plants which die through no fault of the Contractor may be required to be planted at the same time if so instructed by the Engineer.

Any stakes, ties, etc shall be replaced as soon as possible after being found defective.

3.13 LITTER (INCLUDING LEAF FALL)

The Contractor shall removal all litter material within the planted areas. Litter shall refer to all extraneous rubble which is detrimental to the appearance of the site.

This rubbish is to include stones, bricks, debris, paper, confectionery and other wrappings, bottles, cans and plastic containers. It also includes organic material including dead animals. Litter is to be disposed of in an environmentally responsible manner.

Allow for leaf fall removal at leaf fall season (generally 1 April – 1 July)

3.14 WATERING

Where planter beds and trees are watered by an automatic irrigation system, operate and manage the system to ensure that all beds receive adequate water at all times. Adjust the watering periods as necessary to accommodate seasonal fluctuations.

Monitor Trees planted into paved areas for symptoms of water stress and provide additional watering as necessary.

Carefully monitor transplanted trees for symptoms of water stress and provide additional watering as necessary.

Additional to automatic irrigation, carry out watering by hand held hoses at regular intervals as necessary during dry conditions to ensure successful plant establishment and growth.

Water shall be applied until the top 200mm of topsoil around each plant is saturated.

Do not water during the hot part of the day. Watering nozzles shall be fine rose or sprinkler heads to prevent damage to growth areas of the plants.

3.15 WEED CONTROL

Remove and control weeds regularly throughout the period of maintenance.

Keep weed free all cultivated planted areas to the extent that perennial weed species are eradicated and annual weed species are well controlled. Take care not to disturb the shrub roots and excessive compaction of the bed surface. Additional weed control may be required in spring when the ground warms and seeds in the soil germinate.

Remove weeds by hand wherever possible. Spaying of weeds with an approved organic herbicide with all necessary safety precautions may be required for persistent weeds; however the visible portion of the weed shall be removed as soon as the weed has died. Apply herbicide by spot spraying using a protective spray nozzle/cone. Selective weed sprays may be used in appropriate circumstances.

Inadequate mulch depth may allow excessive weed growth; therefore keep mulch topped up to the original specified depth

3.16 NOXIOUS PESTS AND DISEASES

Monitor the works for insect and plant disease problems. If present, identify the problem and apply appropriate remedy by accepted horticultural practices including chemical or biological methods.

Take all suitable precautions for the safe handling and application of herbicides, fungicides and insecticides and use these strictly in accordance with the manufacturer's specifications. In all cases, apply sprays on windless days. If the site is in a public area, the public shall be advised by signage that spraying is occurring and shall be directed away from the spray area.

Avoid damage to neighbouring properties caused by spraying.

Should animal pests be encountered, refer to guidance in

Source Department of Conservation

Document Standard operating procedures for managing animal pests

Link <http://www.doc.govt.nz/publications/science-and-technical/doc-procedures-and-sops/managing-animal-pests/standard-operating-procedures/>
Note that permission for pest control may be required.

- 3.17 **FERTILISER**
Apply slow release fertiliser to the bedding soil of plants at the time of plant installation. Apply further applications of approved, NPK balanced, slow-release fertiliser in accordance with the maintenance programme. Refer to SELECTIONS. Application rates shall be as recommended by the fertiliser manufacturer with regard to the size of plant. 'Water-in' fertiliser after application.
Apply fertiliser to grassed areas in accordance with the maintenance programme. Refer to SELECTIONS. Fertiliser shall be slow release type, applied at a rate recommended by the manufacturer.
- 3.18 **MULCH**
Supply and install additional mulch and/or bark (the same material as existing) to ensure all mulch areas have a minimum depth of 75mm.

For stone mulch, replace dislodged or chipped stones as required throughout the maintenance period and remove weeds or moss.
- 3.19 **PERENNIALS AND BULBS**
Trim and remove dead or decaying foliage back to ground level at the end of the growing season.
- 3.20 **WETLAND PLANTING**
Remove weeds and replace dead or damaged plants.
Do not apply fertiliser to wetland plants.
- 3.21 **PROTECTION OF TREES AND STRUCTURES**
Avoid damage to existing and newly planted trees during cutting or trimming operations. Trim or cut using small appliances (weedeater or hand mower) for a minimum diameter of 1.0m from the trunk, to avoid ring barking by larger appliances.
Take due care to locate and protect all structures from damage by mowers. Boundary pegs are included in structures to be protected.
- Specimen Trees**
- 3.22 **OPERATIONS - TREES**
Planted trees are to be encouraged to grow to maturity as naturally as possible to achieve their natural characteristic form. Employ sound management practices including weeding, trimming, checking of stakes and ties, pruning and other accepted horticultural operations. Pruning may also be required as a safety measure to remove overhanging branches causing obstruction to footpaths, driveways and car parking.
- 3.23 **STAKING**
Repair or replace staking as required.
Check ties every two months, to ensure that they have not broken or become too tight around the trunk. Ties should be maintained firm but not so tight as to cause damage to the bark. They should be adjusted accordingly over the initial three growing seasons for planted trees, after which time the majority of stakes can be removed.
- 3.11 **STAINLESS STEEL GARDEN EDGE RESTRAINT**
Inspection
Before starting work inspect the area to ensure that the preliminary works are in place to correct falls, and all services completed, to allow work of the required standard.

Alignment
Lay edging true and straight to grade, alignment and level. Curves to sweep evenly around bends without kinks, flats or angles. Form bends with purpose-made corner blocks.

Tolerances

Maximum deviation from alignment.

Vertical: 5mm in 2.0m

Horizontal: 5mm in 2.0m

Installation

Excavate for and set edging in place to line and levels shown. The operation shall be carefully controlled to ensure that the precast edging is not displaced or damaged.

3.24 PRUNING

Pruning during maintenance period.

At the end of the first growing season, all of the trees and shrubs shall be checked for any dead wood, broken or damaged branches which shall be cut out.

Prune as required to ensure there is no obstruction of lighting, signage or walkways.

3.25 CROWN LIFTING

Allow to crown lift all trees to 1500mm clear height or as directed by the Engineer.

3.26 WATERING / IRRIGATION

Ensure the automatic system is operational at all times, check for leaks and blockages and take corrective action as required.

THE AUTOMATIC IRRIGATION IS FOR THE TREE PLANTING, BANKS WITH SOIL RETAINMENT AND LAWNS ONLY. MANUAL WATERING OF ALL OTHER PLANTING IS REQUIRED.

Generally, ensure all planting is watered at night between 9pm to 6am a minimum of once every 7 days with each plant receiving a minimum of 25 litres.

During periods of extended rainfall suspend the watering programme. During periods of extended heat increase the frequency of watering.

Completion

3.27 REPLACE

Replace damaged, cracked or marked elements.

3.28 LEAVE

Leave work to the standard required by following procedures.

3.29 REMOVE

Remove debris, unused materials and components from the site.

3.30 PRUNING

Undertake regular light pruning of specimen trees over a period of time to avoid one severe pruning. Excessive foliage removal should be avoided which may result in wind damage or sun scalding and loss of the tree's aesthetic appearance. Remove broken or dangerously overhanging branches.

Prune back overhanging branches to a minimum clearance of 2.3m above the ground.

Remove dead and broken branches. Care must be taken when removing branches to prevent further damage to the tree.

Prune back to a sound healthy branch with a clean cut, in accordance with good arboricultural practice. Final cuts shall be made as close as possible to the branch collar without damaging the collar, and apply wound treatment where necessary.

Dispose of all pruning waste off site.

3.31 FORKING

Regularly fork tree pits within paved areas to loosen the ground in order to avoid compaction, which can reduce the infiltration of water into the ground.

Shrubs and Ground Cover

- 3.32 **OPERATIONS - SHRUBS AND GROUND COVER**
 Maintain planting beds to establish good plantings, and achieve a high level of lush vegetation with visual impact. Maintenance shall include weed control, trimming, watering and fertilising. Ground cover plants should grow to fully cover the ground and thus reduce weed growth and maintenance.
 Maintain planting beds to a neat and tidy appearance to at least the same condition as at Practical Completion.
- 3.33 **TRIMMING**
 Undertake regular trimming of shrubs to maintain the following aspects:
- Removal of dead heads after flowering
 - Removal of dead or old weak growth
 - Cutting back to encourage growth vigour
 - Thinning out mass planted areas to allow stronger plants to dominate
- 3.34 **CLIMBERS**
 Train climbing shrubs to grow over the climbing frame and wires. Adjust vegetation and tie to wires to encourage even spread over the structure where necessary.
- 3.35 **HEDGES**
 Trim hedge shrubs to form low hedges to the height, shape and form shown on the drawings.
- Grass**
- 3.36 **GRASSED AREAS**
 Protect and maintain grassed areas to produce an even sward of grass at a uniform height and healthy colour by watering, mowing and spraying. Maintain turf to a good quality with a neat appearance.
 Protect newly sown and grassed areas against traffic until the grass is well established.
- If necessary top dress the turf with clean screened soil to eliminate minor hollows. Applications shall be less than 15mm at any one time, preferably applied in spring or autumn.
 Protect and maintain all grassed areas by watering, mowing and spraying to maintain a good quality turf with a neat appearance.
- 3.37 **TEMPORARY PROTECTION**
 Newly sown areas and turfed areas are to be protected against traffic until the grass is well established.
- Remove temporary protective fences at the end of the planting establishment period.
- 3.38 **WEAR AND TEAR**
 The Contractor shall notify the Engineer of areas which in his opinion have become worn due to wear and tear. Appropriate action shall then be advised.
- 3.39 **TOPDRESSING**
 If necessary the lawn shall be topdressed with clean screened soil to eliminate minor hollows. Do not apply more than 15mm at any one time, preferably in spring or autumn.
- 3.40 **MOWING ./ GRASS CUTTING**
 Undertake grass cutting in dry conditions using a suitable mower with sharp blades. The first cut shall be after the grass has reached a height of 100mm. Cut off one third of the height of the grass.
- Cutting thereafter shall be undertaken in accordance with the maintenance schedule. Refer to SELECTIONS.
 Before each cut, remove all litter, stones and other debris so that a tidy appearance is maintained at all times.
 Neatly trim edges to paths and around trees or structures each time the grass is mowed.

Prior to the commencement of mowing operations, the Contractor shall inspect for hazardous litter material which may cause damage to his equipment or if caught by machinery may be injurious to others.

Litter shall refer to all extraneous rubble which is detrimental to the appearance of the site. This rubbish is to include stones, bricks, debris, paper, confectionery and other wrappings, bottles, cans and plastic containers.

All grassed areas shall be protected and maintained by watering, and mowing and spraying to maintain a good quality turf with a neat appearance to the Engineer's satisfaction until the end of the maintenance period.

Do not make the first cut until grass has reached 50-70mm. Do not remove more than one third of the height of grass. Mow in dry conditions using a suitable mower with sharp blades.

Mowing frequency shall be governed by growth rate. Do not remove more than one third height of grass at each mowing. Minimum grass height to be 50mm. Edges to the lawn shall be kept trimmed and tidy.

Lawn cuttings shall be collected and removed from the site.

Edges around planted beds adjacent to or in grassed areas shall be trimmed at each visit and prior to hand over with appropriate equipment.

Following cutting in all areas any exposed litter shall be collected and removed.

3.41 WATERING / IRRIGATION

Ensure the automatic system is operational at all times, check for leaks and blockages and take corrective action as required.

During periods of extended rainfall suspend the watering programme. During periods of extended heat increase the frequency of watering.

Completion

3.42 ROUTINE CLEANING

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

3.43 PROTECTION

Provide the following temporary protection of the finished work:

3.44 RUBBISH

The Contractor shall remove all rubbish, excess stakes, planter bags and undesirable debris, resulting from planting operations from the site, and make good any compaction marks or other damage resulting from the works.

3.45 FINAL LAWN ESTABLISHMENT APPROVALS

Final establishment shall only be agreed at the satisfaction of the Engineer. If establishment is unsatisfactory the Contractor shall return the area to seedbed condition and replant with the appropriate turf sod or seed mixture until satisfactory turfgrass is established, or take remedial action as agreed by the Engineer.

3.46 PRODUCT WARRANTY

Certification: Submit the supplier's written statement certifying that plants are true to the required species and type, and are free from diseases, pests and weeds.

3.47 MAINTENANCE MANUAL

Submit recommendations for future maintenance of plants along with completed copy of the log books for the previous 24 months.

3.48 **COMPLETION**
 Product warranty At Practical Completion, submit supplier's written statements certifying that plants are true to the required species and type, and are free from diseases, pests and weeds.

At the end of the Establishment Period, submit a Guide Maintenance manual outlining recommended operations and treatments for the maintenance of the landscape works.

4. SELECTIONS

4.1 **MAINTENANCE SCHEDULE - TREES, SHRUBS, GROUND COVER**
 To be completed by Contract for Landscape Architects approval.

	Staking	Trimming	Hedge trimming	Fertilizer	Weed control	Watering	Replacement	Mulch top up
Jan								
Feb								
Mar								
Apr								
May								
Jun								
Jul								
Aug								
Sep								
Oct								
Nov								
Dec								

4.2 MAINTENANCE SCHEDULE – GRASS

To be completed by Contract for Landscape Architects approval.

	Mowing (medium)	Mowing (rough)	Edge trimming	Fertilizer	Weed control	Watering	Over-sowing
Jan							
Feb							
Mar							
Apr							
May							
Jun							
Jul							
Aug							
Sep							
Oct							
Nov							
Dec							

4.3 MAINTENANCE SCHEDULE - RAINGARDEN

To be completed by Contract for Landscape Architects approval.

	Staking	Anchorage	Fertilizer	Weed control	Replacement
Jan					
Feb					
Mar					
Apr					
May					
Jun					
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					

4.4 MAINTENANCE SCHEDULE – TYPICAL

The schedule below details typical maintenance activities, the frequency with which the maintenance activity shall occur and the specific timing of some maintenance procedures.

It is envisaged this schedule will form the basis of ongoing maintenance performed after the contractual period.

Recurrent maintenance works include, but are not limited to,

- watering,
- weeding,
- fertilising,
- pest and disease control,
- replanting,
- cultivating,
- pruning and removal of,
- removals of prunings clippings and litter.

Maintenance Item	Frequency				Action required
	Daily	Weekly	monthly	yearly	
EROSION + SOIL SURFACE					Check for evidence of erosion on planted beds – smooth and replant as required to maintain smooth batters
					Monitor to check the soil is freely draining drainage. Check for evidence of boggy conditions or extended (> 12hours) of ponding. Remove any fine sediment accumulation on soil surfaces. Report all sediment removal processes
LITTER					Allow for litter removal. Refer to clause 3.12 and 3.31.
					Allow for leaf fall removal at leaf fall season (generally 1 April – 1 July)
ANIMAL PESTS		/			Inspect for damage from animal pests. Refer to clause 3.16 + 3.26
PLANT REPLACEMENT		/			Monitor for failed, damaged, vandalised or stolen plants and trees. Replacements should be planted as soon as possible or if inappropriate, during the planting season immediately following their loss. These plants/trees shall be the same species and grade as those specified and previously supplied to match existing planting. Refer to clause 3.15
TREES - GENERAL			/		Remove any dead leaves and monitor plant health.
					Trees to be checked for any dead wood, broken or damaged branches, unwanted lower growth, and remove.
					Prune trees in Autumn if required to develop and maintain even upright form and for personal safety. No topping of trees is permitted.
				/	Allow crown lift for all trees to 1500mm clear height.
			/		Check tree ties and stakes and replace as necessary. Each year assess if tree stake (and associated ties) can be removed. Remove as soon as viable to allow even upright form

				Check for insect attack or disease and provide proposal for eradication for approval.
PLANTS - GENERAL		/		Remove any dead leaves and monitor plant health.
				Shrubs to be checked for any dead wood, broken or damaged branches, unwanted lower growth, and remove.
				Replant dead plants or bare patches larger than 10% of garden bed surface
				Check for insect attack or disease and provide proposal for eradication for approval.

Maintenance Item	Frequency				Action required
	Daily	weekly	Monthly	Yearly	
LAWN AREAS					Allow to mow lawn to specification (clause 3.31)
					Check for lawn wear and tear. Refer to clause 3.29
					Allow for topdressing if required (bi yearly)
					Check for insect attack or disease and provide proposal for eradication for approval.
WEEDING, CULTIVATION		/			Ongoing hand weeding is required to maintain weed free tree pits, garden beds and terraces.
MULCHING		/			Top up mulch as necessary to maintain original specified depth and lines and keep weed-free throughout. Rake to ensure an even loose surface around plants and across the area generally ensuring no mixing of soil/weeds at all times. Pull mulch away from stems of plants and trees if piled up around stems.
FERTILISING			/		Fertilise in late spring or as per manufacturers recommendation of fertiliser as per Specification clause 3.20 and 3.28 above (this section)
WATERING – IRRIGATION SYSTEM (NOTE: the automatic irrigation is for the tree planting, banks with soil reinforcement + lawns only. Manual watering of other is required.					Maintain the Irrigation System in sound working order at all times to ensure water supply is kept up to all trees. Replace all parts including drippers found to be defective as specified. (refer to clause 3.08)
					Check timing switches
					Shut down the system over winter.
WATERING – MANUAL					Water during maintenance period to allow for plant establishment. Generally ensure planting is watered a minimum of once a week and more during times of drought and less during excessive rainfall. Refer to clause 3.23 + 3.32 above.
					SUMMER Monitor all planting to ensure there is not drought stress and immediately resolve with manually irrigate those plants that require additional watering. In times of drought, manually irrigation all planting every 2 days. Regular deep watering is recommended.

Maintenance Item	Frequency				Action required
	Daily	weekly	Monthly	Yearly	
HYDRAULIC STRUCTURES			/		Check that all structures (: inlet pipes, weirs, culverts and particularly outlet pipes; overflow pits) are free of debris and are not blocked. Remove debris if more than 20% blocked

END OF SECTION

8422 CARPENTRY

1. GENERAL

This section relates to the supply and erection of exterior

- light timber framing
- timber decking.
- Timber screen (to creche) and gate (with SS frame)
- Timber to seats
- Timber to bollard **B1**

1.1 RELATED WORK

Refer to 4924 LANDSCAPE METALWORK for metalwork
Refer to 6711R RESENE PAINTING EXTERIOR for painting finishes
Refer to 8461 STREET FURNITURE for furniture

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC D1/AS1	Access routes
NZBC E2/AS1	External Moisture
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1748.1	Timber - Solid - Stress graded for structural purposes - General requirements
AS/NZS 2269.0	Plywood - Structural - Specification
AS/NZS 2904	Damp-proof courses and flashings
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS/NZS 4347.0	Damp-proof courses and flashings - Methods of test - General introduction, list of methods and test specimen requirements

1.3 MANUFACTURER'S DOCUMENTS

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

- Suppliers specifications
- FSC certification (or similar approved)

1.4 DEFINITIONS

For the purposes of this section the definitions given below apply,

Moisture content:

The percentage by mass of water present in the timber.

Equilibrium moisture content (EMC):

For given conditions of humidity and temperature, the moisture content which timber approaches at which it neither gains nor loses moisture while the conditions of its environment are maintained.

Feature:

Any figure, grain, natural variation or similar which affects timber appearance.

Butt joints:

Boards cross cut square with plain ends for joining over supports.

Performance

- 1.5 SLIP RESISTANCE FOR ACCESS ROUTES
Slip resistance for decking to comply with NZBC D1/AS1: 2.0 Level access routes and 3.0 Ramps; NZS 3604, 7.4.4 Surface.
- when in place on a level access route, to have a mean coefficient of friction (μ) not less than 0.4 when tested in accordance with AS/NZS 3661.1.
- when in place on a sloping access route, to have a coefficient of friction (μ) not less than $0.4 + 0.0125S$ (S = slope of surface expressed as a percentage).
- 1.6 PROVIDE EVIDENCE OF SLIP RESISTANCE
Provide evidence that the decking complies with the standard of performance specified.
- 1.7 CERTIFY SLIP RESISTANCE
Provide certificates and any other evidence at the time of selection/supply that the decking complies with NZBC D1/VM1, NZBC D1/AS1: Access route and NZS 3604, 7.4.4 Surface.
- 1.8 SHOP DRAWINGS
Refer to requirements as part of other sections, including:
- All seats 8461 Street furniture
- 1.9 SAMPLES
Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Allow 2 weeks for review.

Sample schedule

Item	Sample required
TIMBER DECKS	
Timber deck. bridge and stairs by Crèche	1 timber unit
SEATS	
S1 Timber bench with steel frame No back	1 timber unit
S2 Timber bench with steel frame With back	1 timber unit
S3 Timber stool with steel frame No back	1 timber unit
S4 Modified S1 attached to wall	1 timber unit
SCREENS	
Timber screen by crèche	2m section
PERGOLA	
Various timbers – refer to #####3	1 timber unit
BOLLARD	
Timber to B1 bollard	1 timber unit

- 1.10 VERIFICATION
Certification: Submit a supplier's certificate (which may be included on an invoice or delivery docket) verifying conformance to grading and noting moisture content.
- Sourcing:
Where hardwood is required use only certified plantation grown timbers and provide verification of this source

1.11 DIMENSIONS
All timber sizes are actual minimum dried sizes.
Maximum deviation of the finished floor surface under a 3 m straight edge laid in any direction: 1 mm.

1.12 ACCESSIBLE ROUTES
Where required by NZBC D1/AS1 and NZS 4121, Appendix A, accessible routes for people with disabilities to comply with NZS 4121, section 6, **Footpaths, Ramps and Landings**.

PERFORMANCE

1.13 INSPECTIONS
Give notice so that inspection may be made of the following:
Hold points for timber decking

- Installation of joist and bearers and all works required by Structural engineer.
- Completion of works
- Timber edge
- Completion of works

1.14 TESTS
For Product moisture content
Confirm that the moisture content of the timber conforms with the requirements of BRANZ Bulletin 343 and matches the moisture content of the substrate as measured on site. If there is a mismatch allow for acclimatisation.
Test method for timber products: To AS/NZS 1080.1.

2. PRODUCTS

2.1 PILES AND FOUNDATIONS
Refer to 2323 TIMBER PILE FOUNDATIONS for piles and foundations.

2.2 HARDWOOD TIMBERS
Species, grade and moisture content in service as set out in NZS 3602. Either mechanically stress graded to AS/NZS 1748, or visual grading to NZS 3631.

Plantation-grown selected hardwood. Satisfactory documentation is required for approval to ensure the timber sourced from a sustainably managed plantation.

The timber is to be heart timber.

For B1 bollard, pavillion + timber decking

Timbers:	Totara
Supplier	To the approval of the LA
Durability grade	Class I
Moisture content	18% maximum.

For all other timbers

Timbers:	Purpleheart
Supplier	To the approval of the LA
Durability grade	Class I
Moisture content	18% maximum.
Note:	On site weather (minimum of 3 weeks) required prior to final fixing. No leaching on finishes or furniture will be acceptable.

The timber is to be well seasoned prior to final dressing.

Finish Decks:
Dressed sawn for all decks to meet slip resistance.

Finish Balustrades and Furniture:
Dressed all 6 sides and with arises removed

Provide required weathering of timbers to ensure colour leaching on final finishes does not occur.

2.3 GLULAM-ECONO TIMBERS

Species, grade and moisture content in service as set out in NZS 3602. Either mechanically stress graded to AS/NZS 1748, or visual grading to NZS 3631.

Plantation-grown selected timbers.

The timber is to be heart timber.

For crèche fence + gate

Timbers:	H3 glulam econo
Supplier	To the approval of the LA
Durability grade	H3
Note:	Paint finish

2.4 SOLID TIMBER COMPONENTS

Selection to NZS 3602.

2.5 CORROSION RISKS

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and components, if the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89). Also isolate any steel fences and gates etc. from timber with these treatments.

Timber gate and fences

2.6 TIMBER GATES

Timber clad gate (hit and miss type to match adjacent screen fence) on stainless steel frame, same height to the adjacent fence or wall. Leave 50mm to 100mm clearance under gates, depending on surface finish of adjacent ground. Check operation of gates to ensure that they swing clear of the ground and other features. Hang gates from stainless steel hinges on the up-slope post (if any).

Place latches up to 200mm from the top of the gate to a maximum of 1500mm off the ground, able to be locked with a padlock and accessible from both sides of the gate, through an 'access' hole for tall gates.

Hardware

2.7 NAILS

Type to [NZS 3604](#), section 4: Durability, and of the size and number for each particular types of joint as laid down in the nailing schedules of [NZS 3604](#), sections 6-10.

2.8 BOLTS AND SCREWS

Bolts and screws of engineering and/or coach type complete with washers, to the requirements of [NZS 3604](#), section 4: Durability, and of the number and form required for each particular junction to [NZS 3604](#), sections 6-10.

2.9 NAIL PLATES

Comply with the requirements of [NZS 3604](#), section 4: Durability, and of the number and form required for each particular junction to [NZS 3604](#), sections 6-10. Plates to the plate manufacturer's design for the particular locations as shown on the drawings.

- 2.10 **CONNECTORS**
Comply with the requirements of [NZS 3604](#), section 4: Durability, and of the number and form required for each particular junction to [NZS 3604](#), sections 6-10. Connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.
- 2.11 **CORROSION RISKS**
For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).
- 2.12 **POLYETHYLENE DPC**
Polyethylene film to [AS/NZS 2904](#) and to the appropriate test methods set out in [AS/NZS 4347.0](#). Thickness 500 microns minimum, manufactured for use as a damp-proof course.
- 2.13 **BITUMINOUS IMPREGNATED DPC**
Heavy Kraft impregnated with high grade bitumen and coated with higher heat resistant bitumen to [AS/NZS 2904](#) and to the appropriate test methods set out in [AS/NZS 4347.0](#). Do not use with LOSP treated timber.
- 2.14 **CONCRETE**
For piles and footings, 17.5 MPa prescribed mix concrete to [NZS 3104](#), section 3, Provisions for prescribed mix concrete, and [NZS 3604](#), section 6.4.5, Pile footings.

3. EXECUTION

Conditions

- 3.1 **DELIVERY, STORAGE AND HANDLING**
Take delivery of materials and goods and store on site and protect from damage. Protect finished surfaces, edges and corners from damage. Move/handle goods in accordance with manufacturer's requirements. Reject and replace goods that are damaged or will not provide the required finish
- 3.2 **TIMBER DECKING GENERALLY**
Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

Check site dimensions. Carry out machining within the practices recommended for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's recommendations. Work to be accurate, square and true to line and face.
- Application – timber decking**
- 3.3 **FABRICATE AND INSTALL TIMBER STEPS**
Fabricate and install steps and landings to comply with [NZBC D1/AS1:4.0](#) Stairways, and unless detailed otherwise to BRANZ BU 497.
- 3.4 **LAYING TIMBER SPACED BOARDING - EXTERIOR DECKS**
Confirm whether the grooved side of the boards is face up or face down. Avoid excessively short or long lengths. Drill for all fixings. Stagger end joints. Space narrow boards (<100mm) a minimum of 2mm apart in general conditions, or minimum 3mm to 4mm apart if wide boards (>100mm) or narrow boards that are likely to swell after fixing, or 5mm apart for wide boards that are likely to swell. Leave a 12mm minimum gap between the exterior wall and the adjacent decking board.
- 3.5 **SCREW FIXING**
Pre-drill for all fixings, where the screws allow, use a proprietary deck pre-drilling and countersinking tool.

Use decking screws and power drive into the deck surface to just slightly below the board surface (approx. 0.5mm). Take care to not overdrive the screw as this may result in the screw heads or the boards being damaged. Refer to SELECTIONS.

3.6 CORROSION RISKS

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel or silicon bronze, fixings and connectors, if decking or framing timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

Installation – timber decking

3.7 EXECUTION GENERALLY

To [NZS 3603](#) and [NZS 3604](#) except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (exterior joinery, and stairs etc).

3.8 SEPARATION

Separate all timber framing timbers, except H4 and H5, from concrete, masonry and brick by;

- a full length DPC overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space

Separate H3.2 structural timber, with a DPC, from H4 or H5 ground contact timber, if the junction is within 300mm of the ground.

3.9 SET-OUT

Set out framing in accordance with the requirements of [NZS 3604](#).

3.10 FRAMING DECKS OR FLOORS

Framed and fastened to [NZS 3604](#), section 7, Floors.

3.11 FRAMING

Frame to required loading and bracing complete with trimmers and nogs, all fabricated and fastened to [NZS 3604](#).

3.12 FRAMING ABUTTING BUILDINGS

Where decks, pergolas or other framing abuts or is fixed to buildings, comply with [NZBC E2/AS1](#). Section 7 **Decks and Pergolas**.

3.13 LAYING TIMBER SPACED BOARDING FOR EXTERIOR DECKS

Refer to 4383 TIMBER DECKING for exterior timber board decks.

Installation/application – timber fence and gate

3.14 STANDARDS AND TOLERANCES

Refer to the general section CONSTRUCTION for general requirements.

3.15 SETTING OUT

Boundaries to be defined by legal survey pegs. Do not install fences where pegs have not been located. In this event, instruction from the Contract Administrator on fence location is required.

Where fences are installed on property boundaries, fence lines shall be installed parallel to and 25mm within the subject property boundary.

If using palings or similar, fix palings on the road face of fences and inside faces of internal boundaries.

3.16 EXCAVATIONS

Excavate to the dimensions detailed on the drawings.

- 3.17 **POST EMBEDMENT**
Embed posts with a minimum of 100mm clearance between the base of the excavation and bottom of the post.
Place concrete under and around the post and compact by tamping or vibrating. Ensure the posts are set vertical and temporarily prop for at least two days after placement of concrete.
- 3.18 **CLOSE BOARDED TIMBER FENCING**
Construct parallel to the ground surface. Post spacing 2.4 metres max. centres.
Set the greater dimension of rails vertically, and outside face flush with the outside face of posts. Fix rails to posts with 2 x 100mm nails at each post connection, and parallel to ground.
Fix palings 50mm above the ground surface with 10mm gaps between palings.
Trim tops of palings parallel to the ground surface.
- 3.19 **TIMBER GATES**
Timber clad gate (hit and miss type to match adjacent screen fence) on stainless steel frame, same height to the adjacent fence or wall. Leave 50mm to 100mm clearance under gates, depending on surface finish of adjacent ground. Check operation of gates to ensure that they swing clear of the ground and other features. Hang gates from stainless steel hinges on the up-slope post (if any).
Place latches up to 200mm from the top of the gate to a maximum of 1500mm off the ground, able to be locked with a padlock and accessible from both sides of the gate, through an 'access' hole for tall gates.
- 3.20 **TOLERANCES**
Posts shall not deviate by more than 30mm from the vertical over the height of the post.
- 3.21 **REINSTATE**
Ensure all surfaces affected by the works are reinstated to pre-construction condition (e.g. topsoiled and grassed).

Completion

- 3.22 **ROUTINE CLEANING**
Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.
- 3.23 **DEFECTIVE OR DAMAGED WORK**
Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

4. SELECTIONS

- 4.1 **PILES AND FOUNDATIONS**
Refer to 2323 TIMBER PILE FOUNDATIONS for timber piles and poles.

4.2 SUB-FLOOR FRAMING

Member	Species	Grade	Treatment
Bearers	Radiata pine	SG6	H3.2 CCA
Deck joists:	Radiata pine	SG6	H3.2 CCA

Note: All CCA preservative code 01 or 02

4.3 EXTERIOR EXPOSED TIMBERS

Member	Species	Grade	Treatment
Framing:	Radiata pine	SG6	H3.2 CCA
Posts (ground contact):	Radiata pine	SG6	H5 CCA
Posts (non-ground contact):	Radiata pine	SG6	H3.2 CCA
Joists:	Radiata pine	SG6	H3.2 CCA
Exterior stairs and steps:	Radiata pine	~	H3.2 CCA

Balustrades and handrails	Radiata pine	~	H3.2 CCA
Pergola:	Radiata pine	~	H3.2 CCA

Note: All CCA preservative code 01 or 02

4.4 EXTERNAL CARPENTRY

FURNITURE

B1 – BOLLARD

Element	4# lengths per bollard
Timber	HWD timber, Class 1 Refer to PRODUCTS, clause 2.2 or similar approved.
Finish	Timber oil. Refer to 3711R RESENE PAINTING EXTERIOR
Size	To drawing MPM-11-90723 "Bollards"

S1,S2, S3 + S4 – SEAT

Element	timber seat and seat back members fixe to a SS frame
Timber	HWD timber, Class 1 Refer to PRODUCTS, clause 2.2 or similar approved.
Finish	Timber oil. Refer to 3711R RESENE PAINTING EXTERIOR
Size	To drawing MPM-11-90720 "Seat details 1" MPM-11-90721 "Seat details 2"

PAVILION

FENCE/ SCREEN + GATE

Crèche timber fence/ screen and gate

Element	Posts, railing and pailings
Timber	Glulam Econo Refer to PRODUCTS, clause 2.2 or similar approved.
Finish	Painted. Refer to 3711R RESENE PAINTING EXTERIOR
Size	To drawing MPM-11-90740 "Balustrade details 1"

DECKING TO CRECHE

Timber decking/bridge and stairs to creche

Element	Timber decking on HDG joists and post system.
Timber	HWD timber, Class 1 Refer to PRODUCTS, clause 2.2 or similar approved.
Finish	Timber oil. Refer to 3711R RESENE PAINTING EXTERIOR
Size	To drawing MPM-11-90114 "Creche finishes plan"

END OF SECTION

8461 STREET FURNITURE

1. GENERAL

This section relates to the supply and installation of exterior fixtures including;

- Benches
- Seats
- Litter bins
- Drinking fountains
- Bollards

This section relates to both manufacturer supplied and Custom made furniture.

Note:

For wheel stops refer to 3130 Precast concrete

Related work

1.1 RELATED SECTIONS

Refer to the appropriate concrete section(s) for concrete to furniture bases.

- | | |
|---|----------------------------------|
| Refer to 2110 SALVAGE | for Brick pavers + concrete wall |
| Refer to 3124 INSITU CONCRETE - FINISHES | for insitu concrete |
| Refer to 3120 PRECAST CONCRETE - FINISHES | for precast concrete |
| Refer to 4924 LANDSCAPE METALWORK | for metalwork |
| Refer to 6711R RESENE PAINTING EXTERIOR | for painting finishes |
| Refer to 8422 CARPENTRY | for timbers |

Documents

1.2 DOCUMENTS

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

- | | |
|--------------------------|---|
| NZS 3104 | Specification for concrete production |
| NZS 3124 | Specification for concrete construction for minor works |

1.3 MANUFACTURER'S DOCUMENTS

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

- Manufacturers installation specification

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

1.5 QUALIFICATIONS

Work to be carried out by tradesmen experienced, competent and familiar with the materials and installation requirements specified.

1.6 SUPPLIERS

Statements: Submit statements from suppliers of all furniture, giving the following, where applicable;

- Particulars of the supplier's experience in the required type of work.
- Production capacity for material of the required type, sizes and quantity.
- Lead times for delivery of the material to the site.

1.7 SHOP DRAWINGS

Provide 1 set of shop drawings for review before manufacture showing:

- plans, elevations and sections
- methods of fixing
- methods of joint forming
- methods of fabrication and site assembly.

- overall dimensions;
- materials, thicknesses and finishes of elements including benches;
- type of construction including mitre joints and junctions of members;
- hardware type and location;
- detail and dimensions of stainless steel fixing caps for threaded rod ends
- temporary bracing, if required;
- procedures for shop and site assembly and fixing; and

Allow 2 weeks for review.

Shop drawing schedule

Item	Comment
BOLLARDS	
B1 Bollard – type 1	Provide shop drawing
B3 Bollard – type 2	Provide shop drawing
SEATS	
S1 Timber bench with steel frame No back	Provide shop drawing
S2 Timber bench with steel frame With back	Provide shop drawing
S3 Timber stool with steel frame No back	Provide shop drawing
S4 Modified S1 attached to wall	Provide shop drawing

1.8 PROTOTYPES
To be made in accordance with these specifications. Each shall be submitted for approval as the prototype for the various furniture items to be installed.

The prototype shall be correct in regard to all dimensions, materials, and finishes specified in the drawings and specification including any integrated lighting, to enable it to be accepted as the approved prototype for the seats to be installed.

Each element of the seat prototype design shall be submitted to the landscape architect for review before approval may be granted by the Engineer.

Only after full approval is given for the sample seat that is submitted, shall the contractor proceed to fabrication of the various seats to be installed. Failure to obtain such approval in advance may result in the seats that are installed or fabricated, to be rejected.

Allow 2 weeks for review.

Prototype schedule

Item	Comment
BOLLARDS	
B1 Bollard – type 1	Provide 1# prototype for approval
B3 Bollard – type 2	Provide 1# prototype for approval
SEATS	
S1 Timber bench with steel frame No back	Provide 1# prototype for approval

Item	Comment
S2 Timber bench with steel frame With back	Provide 1# prototype for approval
S3 Timber stool with steel frame No back	Provide 1# prototype for approval
S4 Modified S1 attached to wall	Provide 1# prototype for approval

1.9 **SAMPLES**
 Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Allow 2 weeks for review.

Sample schedule

Item	Sample required
BOLLARDS	
B1 Bollard – type 1	1 unit
B1 Bollard – type 2	1 unit (and timber samples – refer to 8422 carpentry)
B3 Bollard – type 2	1 unit
SEATS	
S1 Timber bench with steel frame No back	1 unit (and timber samples – refer to 8422 carpentry)
S2 Timber bench with steel frame With back	1 unit (and timber samples – refer to 8422 carpentry)
S3 Timber stool with steel frame No back	1 unit (and timber samples – refer to 8422 carpentry)
S4 Modified S1 attached to wall	1 unit (and timber samples – refer to 8422 carpentry)
OTHER	
CR Cycle rack	1 unit
DF Drinking Fountain	1 unit
RB Rubbish Bin	1 unit

Warranties

1.10 **WARRANTY - MANUFACTURER/SUPPLIER**
 Provide a material manufacturer/supplier warranty:
 05 years: For street furniture
 05 years: For powder coating finishes

Provide this warranty on the manufacturer/supplier standard form.
 Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

- 1.11 WARRANTY - INSTALLER
Provide an installer warranty:
05 years: For all furniture

Provide this warranty on the installer/applicator standard form.
Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Performance

- 1.12 INSPECTIONS
Carry out inspections of the following:

Proprietary furniture

- Give notice so inspection may be made of the following:
- Requested Shop drawings submitted for approval
- Substrate preparation before furniture is installed.
- Locations or footings prepared to receive furniture or fixtures before installation.
- Services - prior to installation of Street Furniture.
- Setting out on site completed for inspection and approval

Custom made furniture

- Give notice so inspection may be made of the following:
- Shop drawings submitted for approval
- Timber samples submitted for approval
- Stainless steel samples submitted for approval
- Timber seat sample submitted for approval as prototype
- Manufacturer furniture prior to site delivery.
- Locations or footings prepared to receive furniture or fixtures before installation.
- Services - prior to installation of Street Furniture.
- Substrate preparation before furniture is installed.
- Setting out on site completed for inspection and approval

Give 7 days notice so that inspection may be made of items fabricated off site before delivery. Timber for seat slats approved prior to cutting to size

2. PRODUCTS

- 2.1 PRODUCTS
Refer to SELECTIONS

- 2.2 FIXINGS
To suit application including corrosion resistance.

- 2.3 MISCELLANEOUS CONNECTIONS AND ATTACHMENTS
Where end cleats, brackets and other connections are not specifically detailed on the Architect's drawings, they shall be of a type and proportion to suit the location and reaction shown thereon.

The Contractor shall allow for any drilling and cleats indicated on the Architect's drawings, and those necessary to support and connect finishes and fixings of other trades.

3. EXECUTION

Conditions

- 3.1 DELIVERY, STORAGE AND HANDLING
Take delivery of materials and goods and store on site and protect from damage.

Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish.

Implication

Identification of a proprietary item or supplier for it does not necessarily imply exclusive preference for the item or supplier so identified but indicates the necessary properties of the item and a known source.

Manufacturers or suppliers recommendations

Transport, deliver, store, handle, protect, finish, adjust, prepare for use and install furniture items in accordance with the current written recommendations and instructions of the manufacturer or supplier. In the event of perceived conflicts with other requirements, submit the recommendations and instructions and advise of conflicts.

3.2 CUSTON FUNRITURE

Build the various furniture to match the approved Prototypes held by the Engineer and otherwise in accordance with the specification and shop drawings as approved.

Accuracy:

Build components square and install plumb.

Joints:

Provide materials in single lengths whenever possible. If joints are necessary make them over supports.

Fixings

To be as shown on drawings.

All timbers fixings shall be countersunk as shown on the drawings.

Allow to pre-drill hardwood timbers prior to driving fixings. All fixings shall be carefully aligned and driven just flush with surface of timber.

Framing

As indicated on the drawings, or as necessary to ensure that the construction is structurally sound.

Finish of timbers All timber to of sound condition. All timber to be free of defects and splits for period up to end of defects liability period.

Arises:

Non required apart from all exposed edges to have 5mm radius

Installation

3.3 STREET FURNITURE

Mount street furniture onto footings in accordance with manufacturer's recommendations.

Erect all posts or poles vertically. Assemble items to manufacturer's requirements.

Erect/locate furniture items level.

3.4 SERVICES

Allow for installation and connection of services.

Completion

3.5 IN SITU TOUCH-UP

In situ touch-up only after receiving written authority from the contract administrator.

3.6 ROUTINE CLEANING

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

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

3.8 PROTECTION
 Provide the following temporary protection of the finished work:
 ~

4. SELECTIONS

BOLLARDS

B1 BOLLARD

Source	Custom Made
Description	Timber bollard with steel frame, manually retractable
Size	Refer to detail drawings
Materials	HWD timber Totara from sustainable source to match Pavilion Columns With Marine Grade Aluminium extruded section
Finish	Refer to section 6711R Resene painting exterior
Fixing	Root fixed. Refer to detail drawing MP-11-90760 "Bollards"

SEATING

S1 SEAT

Source	Custom Made
Description	HWD timber bench with metal frame
Size	Refer to detail drawings
Materials	HWD timber seat Stainless steel frame
Finish	Refer to section 6711R Resene painting exterior
Fixing	Root fixed. Refer to detail drawings

S2 SEAT

Source	Custom Made
Description	HWD timber bench with metal frame + back
Size	Refer to detail drawings
Materials	HWD timber seat + back Stainless steel frame to seat + back
Finish	Refer to section 6711R Resene painting exterior
Fixing	Root fixed. Refer to detail drawings

S3 SEAT

Source	Custom Made
Description	HWD timber stool with metal frame
Size	Refer to detail drawings
Materials	HWD timber stool Stainless steel frame
Finish	Refer to section 6711R Resene painting exterior
Fixing	Root fixed. Refer to detail drawings

S4 SEAT

Source	Custom Made
Description	As per S1 Seat
Fixing	Fixed to wall. Refer to detail drawings

S5 SEAT

Source	Salvaged from site
Description	Precast concrete seat

Fixing Root fixed. Refer to detail drawings
Note: Refer to section 2110 Salvage

OTHER FURNITURE

CR CYCLE RACK

Source Manufacturer supplied
Description Metal cycle rack – Scope
Size 1000mm tall
475mm wide
Materials Stainless steel
Manufacturer Streetscape
09 273 9523
Finish **Satin finish**
Fixing Plate fixed to finished surfaces.
Install to 200mm depth concrete footing but ensure footing is not visible at surface

DR DRINKING FOUNTAIN

Source Manufacturer supplied
Description Metal drinking fountain - Apollo 900
Size 775mm tall
184mm wide
552mm long
Materials Stainless steel
Manufacturer Urban fountains + furniture
07 3382 7372
Finish **Satin finish**
Fixing Refer drawing MP-11-90761 and manufacturer's specification
Plumbing To manufacturer's specification
Extra Dog bowl
Additional tap for dog bowl

RB RUBBISH BIN

Source Manufacturer supplied
Description Metal rubbish bin - Civi Bin
Size 740mm tall (bin only)
385mm diameter wide
Materials Galvanised mild steel
Manufacturer Metal Art Limited
04 939 6666
Finish Refer to section 6711R Resene painting exterior
Fixing Plant mounted footing to manufacturers specification, footing to be concealed below paving finishes.

And

Some bracket fixed to tapered light columns. Allow for required post mounting hardware and metal separation liner.

WS WHEEL STOPS

Source Manufacturer supplied
Description Black plastic 'Replas' wheel stop with 3# white 85mm round reflectors on front face – Mod 1
Size 1650mm long
Materials Recycled plastic wheel stop, 3# galvanised, 1# concealed reinforced concrete footing 1650L x 200W x 300D
Manufacturer Metal Art Limited
04 939 6666
Fixing 3# galv DYNABOLT fixings, nominal 300mm length to accommodate 150mm depth embedment into footing below asphalt paving.

CRECHE GRC PLANTERS

Source	Manufacturer supplied :
Description	GRC Lightweight planter trough and custom triangular planter
Size	5No. 480d x 480w x 900length and 2No. 480d x 900w x 900length (triangle)
Materials	GRC - natural concrete colour
Manufacturer	Sanstone NZ 41 Jellicoe Rd, Panmure 1072 09-570 2112

SCULPTURE

SF4 SCULPTURE

Source	Tenth Trust supplied
Description	Cloak sculpture
Size	To be confirmed by Tenth Trust
Materials	To be confirmed by Tenth Trust
Finish	To be confirmed by Tenth Trust
Fixing	To be confirmed by Tenth Trust
Note:	Contractor is responsible for inspection at source, lifting/ craning at source, delivery and installation.

TUNNEL POPPIES

Source	Custom Made
Description	Large circular stylised Poppies to be mechanically fixed to tunnel walls
Size	Refer drawing details
Materials	Marine grade aluminium
Finish	Powder coat red and black
Fixing	Refer drawings

END OF SECTION

0000A SCHEDULES - DRAWING REGISTER

Document Transmittal Record for Issues from WALA
1314 NWM PARK

	90% issue	100% issue	100% WCC issue
Day of Issue	09	20	10
Month	12	12	01
Year	13	13	14
MPA	1	1	1
MCH			
WCC			1

100% Detailed Design

Dwg No.	Scale @A1	Drawing Title	File Type	A1 PDF	A1 PDF	A1 PDF
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ISSUE: FOR SIGN OFF

Dwg No.	Scale	Drawing Title	WA	AAL	MPA	F	G	H	I	J
		Drawings	WALA Lr: Review: Input/ Review By:							
		INTRODUCTION								
		100s - PLANS (Site Wide)								
MP-11-90100	1:500	Site Reference plan	WA	AAL	MPA					A
MP-11-90101	NTS	Contents and Drawing Legends	WA	AAL	MPA					
MP-11-90110	1:200	Site Finshes - West 1	WA	AAL	MPA	F	G	H		
MP-11-90111	1:200	Site Finshes - Central 2	WA	AAL	MPA	F	G	H		
MP-11-90112	1:200	Site Finshes - East 3	WA	AAL	MPA	D	E	F		
MP-11-90113	1:200	Temp Site Finishes - West	WA	AAL	MPA	C	D	E		
MP-11-90114	1:200	Creche Finishes	WA	AAL	MPA	D	E	F		
MP-11-90120	1:200	Site Levels - West 1	WA	AAL	MPA	F	G	H		
MP-11-90121	1:200	Site Levels - Central 2	WA	AAL	MPA	F	G	H		
MP-11-90122	1:200	Site Levels - East 3	WA	AAL	MPA	D	E	F		
MP-11-90123	1:200	Temp Site Levels - West	WA	AAL	MPA	C	D	E		
MP-11-90124	1:200	Creche Levels	WA	AAL	MPA	D	E	F		
MP-11-90140	As Shown	Furniture, Lighting & Signage - West 1	WA	AAL	MPA	B	C	D		
MP-11-90141	As Shown	Furniture, Lighting & Signage - Central 2	WA	AAL	MPA	B	C	D		
MP-11-90142	As Shown	Furniture, Lighting & Signage - East 3	WA	AAL	MPA	B	C	D		
MP-11-90150	As Shown	Planting - West 1	WA	AAL	MPA	B	C	D		
MP-11-90151	As Shown	Planting - Central 2	WA	AAL	MPA	B	C	D		
MP-11-90152	As Shown	Planting - East 3	WA	AAL	MPA	B	C	D		
		300s - PAVING & KERBING								
MP-11-90300	1:200	Paving + Kerbing Reference Plan - West	WA	AAL	MPA	E	F	G		
MP-11-90301	1:200	Paving + Kerbing Reference Plan - Central	WA	AAL	MPA	E	F	G		
MP-11-90302	1:200	Paving + Kerbing Reference Plan - East 3	WA	AAL	MPA	D	E	F		
MP-11-90310	As shown	Detailed paving plan 1	WA	AAL	MPA			A	B	
MP-11-90311	As shown	Detailed paving plan 2	WA	AAL	MPA			A	B	
MP-11-90312	As shown	Detailed paving plan 3	WA	AAL	MPA			A	B	
MP-11-90313	As shown	Detailed paving plan 4	WA	AAL	MPA			A	B	
MP-11-90314	As shown	Detailed paving plan 5	WA	AAL	MPA			A	B	
MP-11-90315	As shown	Detailed paving plan 6	WA	AAL	MPA			A	B	
MP-11-90320	1:200	Paving + Kerbing Interface Details 1	WA	AAL	MPA	H	I	J		
MP-11-90321	1:200	Paving + Kerbing Interface Details 2	WA	AAL	MPA	G	H	I		
MP-11-90322	1:200	Paving + Kerbing Interface Details 3	WA	AAL	MPA	F	G	H		
MP-11-90323	1:200	Paving + Kerbing Interface Details 4	WA	AAL	MPA	E	F	G		
MP-11-90324	1:200	Paving + Kerbing Interface Details 5	WA	AAL	MPA	D	E	F		
MP-11-90325	1:200	Paving + Kerbing Interface Details 6	WA	AAL	MPA	C	D	E		
MP-11-90326	1:200	Paving + Kerbing Interface Details 7	WA	AAL	MPA	D	E	F		
MP-11-90327	1:200	Paving + Kerbing Interface Details 8	WA	AAL	MPA	B	C	D		
MP-11-90328	1:200	Paving + Kerbing Interface Details 9	WA	AAL	MPA		B	C		
MP-11-90340	As shown	Typical Kerbing Details 1	WA	AAL	MPA	H	I	J		
MP-11-90341	As shown	Typical Kerbing Details 2	WA	AAL	MPA	G	H	I		
MP-11-90342	As shown	Typical Drainage Details 1	WA	AAL	MPA	E	F	G		
MP-11-90350	As shown	Pedestrian Crossing 1	WA	AAL	MPA		H	I		
MP-11-90360	As shown	Creche Interface Details	WA	AAL	MPA	A	B	C		
MP-11-90361	As shown	Creche Interface Details	WA	AAL	MPA	A	B	C		
MP-11-90362	As shown	Creche Interface Details	WA	AAL	MPA			A		

400s - WALLS, STAIRS AND RAMPS						
MP-11-90400	1:200	Western Terraces Wall Reference Plan	AAL	WA	MPA	B C C
MP-11-90401	1:200	Central Area Wall Reference Plan	AAL	WA	MPA	B C C
MP-11-90402	1:200	Eastern Terraces Wall Reference Plan	AAL	WA	MPA	B C C
MP-11-90403	1:50	Western Terrace - Precast Walls 1-3	AAL	WA	MPA	C D D
MP-11-90404	1:50	Western Terrace - Precast Walls 4-5	AAL	WA	MPA	C D D
MP-11-90405	1:50	Western Terrace - Precast Walls 6-11	AAL	WA	MPA	C D D
MP-11-90406	1:50	Central Area - Precast Walls 1-2	AAL	WA	MPA	C D D
MP-11-90407	1:50	Central Area - Precast Walls 3-4	AAL	WA	MPA	C D D
MP-11-90408	1:50	Central Area - Precast Wall 5	AAL	WA	MPA	C D D
MP-11-90409	1:50	Central Area - Precast Walls 6-8	AAL	WA	MPA	C D D
MP-11-90410	1:50	Tangata Whenua - Precast Wall 1	AAL	WA	MPA	B C C
MP-11-90411	1:50	Tangata Whenua - Precast Walls 2-4	AAL	WA	MPA	B C C
MP-11-90412	1:50	Eastern Terraces - Precast Walls 1-3	AAL	WA	MPA	B C C
MP-11-90413	1:50	Eastern Terraces - Precast Walls 4-7	AAL	WA	MPA	A B B
MP-11-90414	1:50	Eastern Terraces - Precast Walls 8-10	AAL	WA	MPA	A B B
MP-11-90415	1:50	Eastern Terraces - Precast Wall 11	AAL	WA	MPA	A B B
MP-11-90416	1:50	CrecheTerraces - Precast Walls 1-3	AAL	WA	MPA	A B C
MP-11-90417	1:50	CrecheTerraces - Precast Walls 4	AAL	WA	MPA	A B C
MP-11-90420	1:50	Precast Walls - Typical Details	AAL	WA	MPA	A B C
MP-11-90430	1:200	Stair Reference Plan - West 1	AAL/WA		MPA	E F G
MP-11-90431	1:200	Stair Reference Plan - Central 2	AAL/WA		MPA	C E F
MP-11-90432	1:200	Stair Reference Plan - East 3	AAL/WA		MPA	C D E
MP-11-90433	As Shown	Stair Details 1	AAL/WA		MPA	C D E
MP-11-90434	As Shown	Stair Details 2	AAL/WA		MPA	C D E
MP-11-90435	As Shown	Stair Details 3	AAL/WA		MPA	C D E
MP-11-90436	As Shown	Stair Details 4	AAL/WA		MPA	C D E
MP-11-90437	As Shown	Stair Details 5	AAL/WA		MPA	C D E
MP-11-90438	As Shown	Stair Details 6	AAL/WA		MPA	C D E
MP-11-90439	As Shown	Stair Details 7	AAL/WA		MPA	C D E
MP-11-90440	As Shown	Stair Details 8	AAL/WA		MPA	C D E
MP-11-90441	As Shown	Stair Details 9	AAL/WA		MPA	B C D
MP-11-90442	As Shown	Stair Details 10	AAL/WA		MPA	C D E
500s - TUNNEL AND CUTTING						
MP-11-90500	1:500	Underpass Long Sections North & South	AAL	WA	MPA	B B
MP-11-90501	As Shown	Underpass Northwest Walls Pre Cast seto	AAL	WA	MPA	B B
MP-11-90502	As Shown	Underpass Northeast Walls Pre Cast seto	AAL	WA	MPA	B B
MP-11-90503	As Shown	Underpass Southwest walls Pre Cast seto	AAL	WA	MPA	B B
MP-11-90504	As Shown	Underpass Southeast walls Pre Cast seto	AAL	WA	MPA	B B
MP-11-90510	As Shown	Underpass Wall Details 1	AAL	WA	MPA	B B
MP-11-90511	As Shown	Underpass Wall Details 2	AAL	WA	MPA	B B
MP-11-90520	As Shown	Tunnel Graphic Elevations	AAL/WA		MPA	B B
MP-11-90521	As Shown	Tunnel Graphic Details	AAL/WA		MPA	B B
MP-11-90530	As Shown	Tunnel Lid West Balustrade Plan	AAL	WA	MPA	A A
MP-11-90533	As Shown	Tunnel Lid West Balustrade Details	AAL	WA	MPA	A A
MP-11-90535	As Shown	Tunnel Lid East Balustrade	AAL	WA	MPA	B B
MP-11-90536	As Shown	Tunnel Lid East Balustrade	AAL	WA	MPA	B B
MP-11-90537	As Shown	Tunnel Lid East BalustradeDetails	AAL	WA	MPA	B B
MP-11-90538	As Shown	Tunnel Lid East Balustrade Details	AAL	WA	MPA	B B
MP-11-90540	As Shown	Typical Gap Balustrade	AAL	WA	MPA	B B

		600s - SHELTERS						
MP-11-90601	1:25	Pavilion 1 Taranaki St Plans	AAL	WA	MPA			C C
MP-11-90611	1:25	Pavilion 2 Buckle St Plans	AAL	WA	MPA			C C
		Sections						
MP-11-90620	1:50	Pavilion 1 Taranaki St - Sections	AAL	WA	MPA			A A
MP-11-90625	1:50	Pavilion 2 Buckle St - Sections	AAL	WA	MPA			A A
		Details						
MP-11-90650	As Shown	Pavilion - Typical Details	AAL	WA	MPA			C C
		700s - LIGHTING & FURNITURE						
MP-11-90720	As Shown	Seat details 1	WA	AAL	MPA	B	D	E
MP-11-90721	As Shown	Seat details 2	WA	AAL	MPA	A	C	D
MP-11-90722	As Shown	Seat details 3	WA	AAL	MPA		A	B
MP-11-90730	As Shown	Handrail details 1	WA	AAL	MPA	A	A	B
MP-11-90740	As Shown	Balustrade/fence details 1	WA	AAL	MPA		A	A
MP-11-90750	As Shown	Signage details 1	WA	AAL	MPA	A	B	B
MP-11-90751	As Shown	Signage details 2	WA	AAL	MPA	A	B	B
MP-11-90760	As Shown	Bollards details 1	WA	AAL	MPA		A	B
MP-11-90761	As Shown	Misc details 1	WA	AAL	MPA		A	B
		800s - PLANTING						
MP-11-90800	1:200	Planting Reference Plan - West 1	WA	AAL	MPA	E	F	G
MP-11-90801	1:200	Planting Reference Plan - Central 2	WA	AAL	MPA	D	E	F
MP-11-90802	1:200	Planting Reference Plan - East 3	WA	AAL	MPA	D	E	F
MP-11-90810	As Shown	SH1 Pit Details 1	WA	AAL	MPA		C	D
MP-11-90811	As Shown	SH1 Pit Details 2	WA	AAL	MPA	D	E	F
MP-11-90812	As Shown	SH1 Pit Details 3	WA	AAL	MPA	C	D	E
MP-11-90813	As Shown	SH1 Pit Details 4	WA	AAL	MPA		C	D
MP-11-90814	As Shown	SH1 Pit Details 5	WA	AAL	MPA	D	E	F
MP-11-90815	As Shown	SH1 Pit Details 6	WA	AAL	MPA	C	D	E
MP-11-90816	As Shown	SH1 Pit Details 7	WA	AAL	MPA		A	B
MP-11-90817	As Shown	SH1 Pit Details 8	WA	AAL	MPA		A	B
MP-11-90818	As Shown	SH1 Pit Details 9	WA	AAL	MPA		A	B
MP-11-90819	As Shown	SH1 Pit Details 10	WA	AAL	MPA		A	B
MP-11-90820	As Shown	SH1 Pit Details 11	WA	AAL	MPA		A	B
MP-11-90821	As Shown	SH1 Pit Details 12	WA	AAL	MPA		A	B
MP-11-90822	As Shown	SH1 Pit Details 13	WA	AAL	MPA		A	B
MP-11-90823	As Shown	SH1 Pit Details 14	WA	AAL	MPA		A	B
MP-11-90830	As Shown	Typical Tree details 1	WA	AAL	MPA	G	H	I
MP-11-90831	As Shown	Typical Tree details 2	WA	AAL	MPA		A	B
MP-11-90832	As Shown	Typical Tree details 3	WA	AAL	MPA		A	B
MP-11-90833	As Shown	Typical Tree details 4	WA	AAL	MPA		A	B
MP-11-90840	As Shown	Typical planting details 1	WA	AAL	MPA	G	H	I

0000B SCHEDULES – PLANT SCHEDULE

NWM Park Planting Schedule

Date: 15.11.13
Project: 1314 Memorial Park

Wright Athfield Landscape & Architecture

Issue: A| 30% complete detailed design 15.11.13
B| 90% complete detailed design 09.12.13
C| 100% detailed design 20.12.13
D| 100% detailed design WCC 10.01.14

%			Common Name	Spacing (m)	Size	Qty	Qty + conting	area	Comments
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BUCKLE ST - WEST**GB_01**

SHRUB + GROUNDCOVER

TOTAL AREA 31.9 m2

0%	Ch.r	<i>Chionochloa rubra</i>	Red Tussock	0.6	PB3				
0%	He.o	<i>Hebe odora</i>	Hebe	0.6	PB3				
0%	Kn.PP	<i>Kniphofia 'Percys pride'</i>	Torch lily	0.6	PB3				
0%					TOTAL	0	0		

RG_01

TOTAL AREA 340.9 m2

10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	95	105		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	95	105		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	213	234		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	426	469		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	95	105		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	426	469		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	284	312		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	213	234		
30%	Mu.a	<i>Muehlenbeckia axialaris</i>		0.6	PB3	284	312		
150%					TOTAL	2131	2345	no.	

TP_01-05

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	5	6		
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WESTERN TERRACES**GB_02**

SHRUB + GROUNDCOVER

TOTAL AREA 44.2 m2

10%	Bl.nz	<i>Blechnum novae zealandia</i>		0.6	PB3	12	13		
30%	Ch.r	<i>Chionochloa rubra</i>	Red Tussock	0.6	PB3	37	41		
20%	He.o	<i>Hebe odora</i>	Hebe	0.6	PB3	25	28		
32%	Li.i	<i>Libertia ixioides</i>	NZ Iris	0.4	PB3	88	97		
10%	Kn.PP	<i>Kniphofia 'Percys pride'</i>	Torch lily	0.6	PB3	12	13		
60%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.6	PB3	74	81		
20%	Ro.RFC	<i>Rosa 'Red FlowerCarpet'</i>	Red Rose	0.6	PB3	25	28		
182%					TOTAL	273	301	no.	

TP_11-14

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	4	4		
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GB_03

SHRUB + GROUNDCOVER

TOTAL AREA 47.0 m2

10%	Bl.nz	<i>Blechnum novae zealandia</i>		0.6	PB3	13	14		
30%	Ch.r	<i>Chionochloa rubra</i>	Red Tussock	0.6	PB3	39	43		
20%	He.o	<i>Hebe odora</i>	Hebe	0.6	PB3	26	29		
33%	Li.i	<i>Libertia ixioides</i>	NZ Iris	0.4	PB3	97	107		
10%	Kn.PP	<i>Kniphofia 'Percys pride'</i>	Torch lily	0.6	PB3	13	14		
60%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.6	PB3	78	86		
20%	Ro.RFC	<i>Rosa 'Red FlowerCarpet'</i>	Red Rose	0.6	PB3	26	29		
183%					TOTAL	292	322	no.	

TP_18-21

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	4	4		
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GB_04

SHRUB + GROUNDCOVER

TOTAL AREA 46.1 m2

10%	Bl.nz	<i>Blechnum novae zealandia</i>		0.6	PB3	13	14		
30%	Ch.r	<i>Chionochloa rubra</i>	Red Tussock	0.6	PB3	38	42		
20%	He.o	<i>Hebe odora</i>	Hebe	0.6	PB3	26	29		
32%	Li.i	<i>Libertia ixioides</i>	NZ Iris	0.4	PB3	92	101		
10%	Kn.PP	<i>Kniphofia 'Percys pride'</i>	Torch lily	0.6	PB3	13	14		
60%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.6	PB3	77	85		
20%	Ro.RFC	<i>Rosa 'Red FlowerCarpet'</i>	Red Rose	0.6	PB3	26	29		
182%					TOTAL	285	314	no.	

NWM Park Planting Schedule

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D| 100% detailed design WCC 10.01.14

%			Common Name	Spacing (m)	Size	Qty	Qty + conting	area	Comments
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TP_24-27

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	4	4		
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GB_05

SHRUB + GROUNDCOVER

TOTAL AREA 52.3 m2

%	Bl.nz	<i>Blechnum novae zealandia</i>		0.6	PB3	15	17		
30%	Ch.r	<i>Chionochloa rubra</i>	Red Tussock	0.6	PB3	44	48		
20%	He.o	<i>Hebe odora</i>	Hebe	0.6	PB3	29	32		
32%	Li.i	<i>Libertia ixioides</i>	NZ Iris	0.4	PB3	105	116		
10%	Kn.PP	<i>Kniphofia 'Percys pride'</i>	Torch lily	0.6	PB3	15	17		
60%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.6	PB3	87	96		
20%	Ro.RFC	<i>Rosa 'Red FlowerCarpet'</i>	Red Rose	0.6	PB3	29	32		
182%			TOTAL			324	358	no.	

TP_30-33

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	4	4		
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GB_06

SHRUB + GROUNDCOVER

TOTAL AREA 22.2 m2

%	Bl.nz	<i>Blechnum novae zealandia</i>		0.6	PB3	6	7		
10%	Ch.r	<i>Chionochloa rubra</i>	Red Tussock	0.6	PB3	19	21		
20%	He.o	<i>Hebe odora</i>	Hebe	0.6	PB3	12	13		
32%	Li.i	<i>Libertia ixioides</i>	NZ Iris	0.4	PB3	44	48		
10%	Kn.PP	<i>Kniphofia 'Percys pride'</i>	Torch lily	0.6	PB3	6	7		
60%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.6	PB3	37	41		
20%	Ro.RFC	<i>Rosa 'Red FlowerCarpet'</i>	Red Rose	0.6	PB3	12	13		
182%			TOTAL			136	150	no.	

TP_37-39

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	3	3		
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RG_02

TOTAL AREA 16.2 m2

%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	5	6		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	5	6		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	10	11		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	20	22		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	5	6		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	20	22		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	14	15		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	10	11		
30%	Mu,a	<i>Muehlenbeckia axialaris</i>		0.6	PB3	14	15		
150%			TOTAL			103	114	no.	

TP_06

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1		
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RG_03

TOTAL AREA 28.0 m2

%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	8	9		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	8	9		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	18	20		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	35	39		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	8	9		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	35	39		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	23	25		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	18	20		
30%	Mu,a	<i>Muehlenbeckia axialaris</i>		0.6	PB3	23	25		
150%			TOTAL			176	195	no.	

TP_07

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1		
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NWM Park Planting Schedule

Date: 15.11.13
Project: 1314 Memorial Park

Wright Athfield Landscape & Architecture

Issue: A| 30% complete detailed design 15.11.13
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C| 100% detailed design 20.12.13
D| 100% detailed design WCC 10.01.14

%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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RG_04

								TOTAL AREA	25.3 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	7	8		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	7	8		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	16	18		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	32	35		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	7	8		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	32	35		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	21	23		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	16	18		
30%	Mu.a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	21	23		
150%						TOTAL	159	176	no.

TP_08

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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RG_05

								TOTAL AREA	22.1 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	6	7		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	6	7		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	14	15		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	28	31		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	6	7		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	28	31		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	18	20		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	14	15		
30%	Mu.a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	18	20		
150%						TOTAL	138	153	no.

TP_09

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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RG_06

								TOTAL AREA	28.3 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	8	9		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	8	9		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	18	20		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	35	39		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	8	9		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	35	39		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	24	26		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	18	20		
30%	Mu.a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	24	26		
150%						TOTAL	178	197	no.

TP_10

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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TREES IN PAVING: TP_16-17, 22, 29, 36, 40

								TOTAL AREA	8.5 m2
50%	Li.i	<i>Libertia ixioides</i>	New Zealand Iris	0.4	PB3	27	30		
50%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.4	PB3	27	30		
50%						TOTAL	54	60	no.

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	6	7	
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TREES IN LAWN: TP_15, 23, 28, 34-35

TREES								
	OE	<i>Olea sp</i>	Olive	as shown	120-160L	2	2	
	UP	<i>Ulnus parvifolia</i>	Chinese Elm	as shown	120-160L	3	3	

NWM Park Planting Schedule

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D| 100% detailed design WCC 10.01.14

%			Common Name	Spacing (m)	Size	Qty	Qty + conting	area	Comments
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CENTRAL AREA**GB_07**

SHRUB + GROUNDCOVER								TOTAL AREA	106.5 m2
25%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	166	183		
20%	Ch.r	<i>Chionochloa rubra</i>	red tussock	0.6	PB3	59	65		
20%	He.'s'	<i>Hebe 'Snowcaps'</i>	Hebe	0.6	PB3	59	65		
20%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	0.6	PB3	59	65		
20%	Pa.r	<i>Papaver rhoeas</i>	Poppy	0.4	PB3	133	146		
35%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	104	114		
30%	Ro.rfc	<i>Rosa 'Red flower carpet'</i>	Rose	0.6	PB3	89	98		
170%						TOTAL	669	736	no.

Note: Discuss growing Papaver rhoeas with David Sole. Potential to plant in pots close to Anzac day.

summer or/and

TP_75-80

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	5	6	
	PB	<i>Pinus brutia</i>	Gallipoli pine	as shown	TBC	1	1	

GB_08

SHRUB + GROUNDCOVER								TOTAL AREA	230.8 m2
45%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	649	714		
20%	As.f	<i>Astelia fragrans</i>	kakaha	0.6	PB3	128	141		
0%	Co.a	<i>Cordyline australis</i>	Cabbage tree	0.6	PB3	12	13		
15%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	0.6	PB3	96	106		
20%	My.h	<i>Myosotidium hortensia</i>	Chatham Island forget-me-not	0.6	PB3	128	141		
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	321	353		
20%	Ro.rfc	<i>Rosa 'Red flower carpet'</i>	Rose	0.6	PB3	128	141		
170%						TOTAL	1462	1609	no.

TP_90

TREES

	MR	<i>Metrosideros robusta</i>	Northern rata	as shown	45L	1	1	

RG_07

								TOTAL AREA	20.0 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	6	7		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	6	7		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	13	14		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	25	28		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	6	7		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	25	28		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	17	19		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	13	14		
30%	Mu.a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	17	19		
150%						TOTAL	128	143	no.

TP_107

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	

RG_08

								TOTAL AREA	18.3 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	5	6		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	5	6		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	11	12		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	23	25		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	5	6		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	23	25		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	15	17		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	11	12		
30%	Mu.a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	15	17		
150%						TOTAL	113	126	no.

TP_108

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	

NWM Park Planting Schedule

Date: 15.11.13
Project: 1314 Memorial Park

Wright Athfield Landscape & Architecture

Issue: A| 30% complete detailed design 15.11.13
B| 90% complete detailed design 09.12.13
C| 100% detailed design 20.12.13

D| 100% detailed design WCC 10.01.14

%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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RG_09

								TOTAL AREA	12.0 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	3	3		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	3	3		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	8	9		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	15	17		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	3	3		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	15	17		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	10	11		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	8	9		
30%	Mu.a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	10	11		
150%					TOTAL	75	83	no.	

TP_109

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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TREES IN PAVING: TP_72-74, 81-82, 87-89, 100-101

								TOTAL AREA	14.2 m2
50%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.4	PB3	44	48		
50%	Li.i	<i>Libertia ixioides</i>	New Zealand Iris	0.4	PB3	44	48		
50%					TOTAL	88	96	no.	

TREES

	AE	<i>Alectryon excelsus</i>	Titoki	as shown	120-160L	2	2	
	OE	<i>Olea sp</i>	Olive	as shown	120-160L	8	9	

TREES IN LAWN & LIMECHIP: TP_83-86, 91-99

TREES

	AE	<i>Alectryon excelsus</i>	Titoki	as shown	120-160L	7	8	
	Euc	<i>Eucalyptus Sp</i>	Eucalyptus	as shown	by others	4	4	
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	2	2	

Supplied by others

NORTH LANE - WEST

GB_09

								TOTAL AREA	155.6 m2
	Mu.c	<i>Muehlenbeckia complexa</i>	Pohuehue	0.8	PB3	10	11		
	Cl.p	<i>Clematis paniculata</i>	Puawhananga	0.8	PB3	10	11		

SHRUB + GROUNDCOVER

0%	Co.a	<i>Coryline australis</i>	Cabbage tree	0	PB3	21	23	
40%	Bl.nz	<i>Blechnum Novae Zealandia</i>		0.6	PB3	173	190	
60%	Co.c	<i>Corokia cheesemanii</i>	Korokio	0.75	PB3	166	183	
40%	Fu.p	<i>Fuchsia procumbens</i>		0.6	PB3	173	190	
60%	Mu.a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	259	285	
20%	Po.a	<i>Poa anceps</i>	Broad-leaved poa	0.4	PB3	195	215	
220%					TOTAL	1007	1108	no.

TP_45-49

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	5	6	
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GB_10

								TOTAL AREA	55.2 m2
100%	Ph.EG	<i>Phormium cookianum 'Emerald Gem'</i>	Phormium cookianum Dwarf	0.75	PB3	98	108		
100%	Mu.ax	<i>Muehlenbeckia axiolaris</i>	Creeping pohuehue	0.6	PB3	153	168		
200%					TOTAL	251	276	no.	

SCHOOL PLANTING

CLIMBER

		<i>Metrosideros carminea</i>	climbing rata (seed grown only)	0.8	PB3	20	22	
		<i>Ficus pumila</i>	creeping fig	0.8	PB3	20	22	
					TOTAL	40	44	no.

TP_66-70

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	5	6	
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NWM Park Planting Schedule

Date: 15.11.13
Project: 1314 Memorial Park

Wright Athfield Landscape & Architecture

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C| 100% detailed design 20.12.13
D| 100% detailed design WCC 10.01.14

%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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RG_10 DELETED

TOTAL AREA									m2
0%	Ca.so	<i>Carex solandri</i>		0.4	PB3	0	0		
0%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	0	0		
0%	Bl.m	<i>Blechnum minus</i>	swamp kiokio	0.4	PB3	0	0		
0%	Le.WK	<i>Leptospermum 'Wiri Kerry'</i>		0.4	PB3	0	0		
0%	Le.SF	<i>Leptospermum 'Snow flurry'</i>		0.4	PB3	0	0		
0%					TOTAL	0	0		no.

RG_11

TOTAL AREA									104.3 m2
30%	Ca.so	<i>Carex solandri</i>		0.4	PB3	196	216		
30%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	196	216		
20%	Bl.m	<i>Blechnum minus</i>	swamp kiokio	0.6	PB3	58	64		
25%	Le.WK	<i>Leptospermum 'Wiri Kerry'</i>		0.75	PB3	46	51		
25%	Le.SF	<i>Leptospermum 'Snow flurry'</i>		0.75	PB3	46	51		
40%	Ma.r	<i>Mazus radicans</i>	swamp musk	0.6	PB3	116	128		
170%					TOTAL	658	726		no.

TP_50-65

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	16	18	

RG_12

TOTAL AREA									9.8 m2
0%	Ca.so	<i>Carex solandri</i>		0	PB3				
0%	Ca.v	<i>Carex virgata</i>	Purei	0	PB3				
0%	Bl.m	<i>Blechnum minus</i>	swamp kiokio	0	PB3				
0%	Le.WK	<i>Leptospermum 'Wiri Kerry'</i>		0	PB3				
0%	Le.SF	<i>Leptospermum 'Snow flurry'</i>		0	PB3				
0%					TOTAL	0	0		no.

TP_71

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	1	1	

RG_13

TOTAL AREA									15.6 m2
0%	Ca.so	<i>Carex solandri</i>		0	PB3				
0%	Ca.v	<i>Carex virgata</i>	Purei	0	PB3				
0%	Bl.m	<i>Blechnum minus</i>	swamp kiokio	0	PB3				
0%	Le.WK	<i>Leptospermum 'Wiri Kerry'</i>		0	PB3				
0%	Le.SF	<i>Leptospermum 'Snow flurry'</i>		0	PB3				
0%					TOTAL	0	0		no.

TREES IN PAVING: TP_41-44

SHRUB + GROUND COVER

TOTAL AREA									11.0 m2
50%	Li.i	<i>Libertia ixioides</i>	New Zealand Iris	0.4	PB3	34	37		
50%	Lo.a	<i>Lobelia angulata</i>	Panakenake	0.4	PB3	34	37		
50%					TOTAL	68	74		no.

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	4	4	

TANGATA WHENUA GARDENS / MASSEY ENTRANCE**GB_11**

SHRUB + GROUND COVER

TOTAL AREA									11.7 m2
50%	Me.c	<i>Metrosideros carminea 'Red carpet'</i>		0.6	PB3	16	18		
60%	Po.c	<i>Poa colensoi</i>	Blue tussock	0.4	PB3	44	48		
50%	Li.m	<i>Linum monogynum</i>	Native Linen	0.6	PB3	16	18		
160%					TOTAL	76	84		no.

TP_102

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	

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%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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GB_12

SHRUB + GROUNDCOVER									TOTAL AREA	2.8 m2
60%	Po.c	<i>Poa colensoi</i>		0.4	PB3	11	12			
40%	Ph.GD	<i>Phormium cookianum 'Green Dwarf'</i>		0.6	PB3	3	3			
60%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	5	6			
160%						TOTAL	19	21	no.	

GB_13

SHRUB + GROUNDCOVER									TOTAL AREA	5.8 m2
50%	Li.g	<i>Libertia grandiflora</i>	mikoikoi	0.4	PB3	18	20			
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.4	PB3	18	20			
100%						TOTAL	36	40	no.	

TP_103

TREES									
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1		

GB_14

SHRUB + GROUNDCOVER									TOTAL AREA	290.5 m2
20%	As.f	<i>Astelia fragrans</i>	kakaha	0.6	PB3	161	177			
40%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	726	799			
40%	Bl.pm	<i>Blechnum penna marina</i>	Alpine hard fern	0.4	PB3	726	799			
20%	Bl.nz	<i>Blechnum novae-zelandiae</i>	kiokio	0.6	PB3	161	177			
20%	Ma.m	<i>Macropiper melchior</i>	Three Kings Island kawakawa	1.5	PB3	26	29			
20%	Ph.c	<i>Phormium cookianum</i>	Wharariki	1.5	PB3	26	29			
10%	Ps.c	<i>Pseudowintera colorata</i>	mountain horopito	1.5	PB3	13	14			
170%						TOTAL	1839	2024	no.	

GB_15

SHRUB + GROUNDCOVER									TOTAL AREA	334.0 m2
20%	As.f	<i>Astelia fragrans</i>	kakaha	0.6	PB3	186	205			
40%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	835	919			
38%	Bl.pm	<i>Blechnum penna marina</i>	Alpine hard fern	0.4	PB3	793	872			
20%	Bl.nz	<i>Blechnum novae-zelandiae</i>	kiokio	0.6	PB3	186	205			
20%	Ma.m	<i>Macropiper melchior</i>	Three Kings Island kawakawa	1.5	PB3	30	33			
20%	Ph.c	<i>Phormium cookianum</i>	Wharariki	1.5	PB3	30	33			
10%	Ps.c	<i>Pseudowintera colorata</i>	mountain horopito	1.5	PB3	15	17			
168%						TOTAL	2075	2284	no.	

TP_106

TREES									
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1		

GB_16

SHRUB + GROUNDCOVER									TOTAL AREA	2.1 m2
50%	Li.g	<i>Libertia grandiflora</i>	mikoikoi	0.4	PB3	7	8			
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.4	PB3	7	8			
100%						TOTAL	14	16	no.	

TP_104

TREES									
	MR	<i>Metrosideros robusta</i>	Northern rata	as shown	400L	1	1		

GB_17

SHRUB + GROUNDCOVER									TOTAL AREA	2.8 m2
50%	Li.g	<i>Libertia grandiflora</i>	mikoikoi	0.4	PB3	9	10			
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.4	PB3	9	10			
100%						TOTAL	18	20	no.	

GB_18

SHRUB + GROUNDCOVER									TOTAL AREA	5.5 m2
50%	Me.c	<i>Metrosideros carminea 'Red carpet'</i>		0.6	PB3	8	9			
60%	Po.c	<i>Poa colensoi</i>	Blue tussock	0.4	PB3	21	23			
50%	Li.m	<i>Linum monogynum</i>	Native Linen	0.6	PB3	8	9			
160%						TOTAL	37	41	no.	

NWM Park Planting Schedule

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%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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GB_19

SHRUB + GROUNDCOVER									TOTAL AREA	8.0 m2
60%	Po.c	<i>Poa colensoi</i>		0.4	PB3	30	33			
40%	Ph.GD	<i>Phormium cookianum 'Green Dwarf'</i>		0.6	PB3	9	10			
60%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	13	14			
160%						TOTAL	52	57	no.	

TP_105

TREES									
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1		

GB_20

SHRUB + GROUNDCOVER									TOTAL AREA	2.0 m2
60%	Po.c	<i>Poa colensoi</i>		0.4	PB3	8	9			
40%	Ph.GD	<i>Phormium cookianum 'Green Dwarf'</i>		0.6	PB3	2	2			
60%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	3	3			
160%						TOTAL	13	14	no.	

BUCKLE ST - EAST

GB_21

SHRUB + GROUNDCOVER									TOTAL AREA	112.7 m2
60%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	423	465			
40%	Ph.c	<i>Phormium cookianum</i>	Wharariki	1.5	PB3	20	22			
60%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	0.6	PB3	188	207			
20%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	63	69			
180%						TOTAL	694	763	no.	

TP_114

TREES									
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	200L	1	1		

GB_22

SHRUB + GROUNDCOVER									TOTAL AREA	65.5 m2
60%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	246	271			
40%	Ph.c	<i>Phormium cookianum</i>	Wharariki	1.5	PB3	12	13			
60%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	0.6	PB3	109	120			
20%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	36	40			
180%						TOTAL	403	444	no.	

RG_14

SHRUB + GROUNDCOVER									TOTAL AREA	190.0 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	53	58			
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	53	58			
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	119	131			
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	238	262			
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	53	58			
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	238	262			
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	158	174			
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	119	131			
30%	Mu.a	<i>Muehlenbeckia axialaris</i>		0.6	PB3	158	174			
150%						TOTAL	1189	1308	no.	

TP_110-113

TREES									
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	4	4		

TP_115

SHRUB + GROUNDCOVER									TOTAL AREA	3.3 m2
60%	Po.c	<i>Poa colensoi</i>		0.4	PB3	12	13			
40%	Ph.GD	<i>Phormium cookianum 'Green Dwarf'</i>		0.6	PB3	4	4			
60%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	6	7			
160%						TOTAL	22	24	no.	

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	200L	1	1		
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NWM Park Planting Schedule

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%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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NORTH LANE - EAST**GB_23**

SHRUB + GROUNDCOVER				TOTAL AREA		228.1 m2	
35%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	499	549
0%	Co.a	<i>Cordyline australis</i>	Cabbage tree	0	PB3	7	8
38%	Di.n	<i>Dianella nigra</i>	turutu	0.4	PB3	542	596
20%	Fu.p	<i>Fuchsia procumbens</i>	Creeping fuchsia	0.6	PB3	127	140
0%	Ma.m	<i>Macropiper melchior</i>	Three Kings Island kawakawa	0	PB3	30	33
40%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	1	PB3	91	100
20%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	127	140
153%						TOTAL	1423 1566 no.

TP_124-136

TREES

OE	<i>Olea sp</i>	Olive	as shown	120-160L	13	14
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EASTERN TERRACES**GB_24**

SHRUB + GROUNDCOVER				TOTAL AREA		36.8 m2	
50%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	115	127
30%	As.f	<i>Astelia fragrans</i>	kakaha	1	PB3	11	12
20%	Di.n	<i>Dianella nigra</i>	turutu	0.4	PB3	46	51
20%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	1	PB3	7	8
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	51	56
170%						TOTAL	230 254 no.

TP_142-144

TREES

OE	<i>Olea sp</i>	Olive	as shown	120-160L	3	3
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GB_25

SHRUB + GROUNDCOVER				TOTAL AREA		17.6 m2	
70%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	77	85
50%	As.f	<i>Astelia fragrans</i>	kakaha	0.6	PB3	24	26
50%	Le.WL	<i>Leptospermum 'Wiri Linda'</i>		1	PB3	9	10
170%						TOTAL	110 121 no.

GB_26

SHRUB + GROUNDCOVER				TOTAL AREA		41.8 m2	
50%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	131	144
30%	As.f	<i>Astelia fragrans</i>	kakaha	1	PB3	13	14
20%	Di.n	<i>Dianella nigra</i>	turutu	0.4	PB3	52	57
20%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	1	PB3	8	9
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	58	64
170%						TOTAL	262 288 no.

TP_148-149

TREES

OE	<i>Olea sp</i>	Olive	as shown	120-160L	2	2
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GB_27

SHRUB + GROUNDCOVER				TOTAL AREA		9.5 m2	
70%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	42	46
50%	As.f	<i>Astelia fragrans</i>	kakaha	0.6	PB3	13	14
50%	Le.WL	<i>Leptospermum 'Wiri Linda'</i>		1	PB3	5	6
170%						TOTAL	60 66 no.

GB_28

SHRUB + GROUNDCOVER				TOTAL AREA		44.5 m2	
50%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	139	153
30%	As.f	<i>Astelia fragrans</i>	kakaha	1	PB3	13	14
20%	Di.n	<i>Dianella nigra</i>	turutu	0.4	PB3	56	62
20%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	1	PB3	9	10
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	62	68
170%						TOTAL	279 307 no.

TP_155-156

TREES

OE	<i>Olea sp</i>	Olive	as shown	120-160L	2	2
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%			Common Name	Spacing (m)	Size	Qty	Qty + conting	area	Comments
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GB_29

SHRUB + GROUNDCOVER								TOTAL AREA	15.9 m2
70%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	70	77		
50%	As.f	<i>Astelia fragrans</i>	kakaha	0.6	PB3	22	24		
50%	Le.WL	<i>Leptospermum 'Wiri Linda'</i>		1	PB3	8	9		
170%					TOTAL	100	110	no.	

GB_30

SHRUB + GROUNDCOVER								TOTAL AREA	36.9 m2
50%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	115	127		
30%	As.f	<i>Astelia fragrans</i>	kakaha	1	PB3	11	12		
20%	Di.n	<i>Dianella nigra</i>	turutu	0.4	PB3	46	51		
20%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	1	PB3	7	8		
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	51	56		
170%					TOTAL	230	254	no.	

TP_164-165

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	2	2	
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GB_31

SHRUB + GROUNDCOVER								TOTAL AREA	22.7 m2
70%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	99	109		
50%	As.f	<i>Astelia fragrans</i>	kakaha	0.6	PB3	32	35		
50%	Le.WL	<i>Leptospermum 'Wiri Linda'</i>		1	PB3	11	12		
170%					TOTAL	142	156	no.	

TP_163

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	1	1	
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GB_32

SHRUB + GROUNDCOVER								TOTAL AREA	64.2 m2
50%	Ar.c	<i>Arthropodium cirratum</i>	rengarenga	0.4	PB3	201	221		
20%	As.f	<i>Astelia fragrans</i>	kakaha	1	PB3	13	14		
20%	Di.n	<i>Dianella nigra</i>	turutu	0.4	PB3	80	88		
20%	Le.WL	<i>Leptospermum 'Wiri Linda'</i>		1	PB3	13	14		
10%	Mu.a	<i>Muehlenbeckia astonii</i>	Shrubby tororaro	1	PB3	6	7		
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.6	PB3	89	98		
170%					TOTAL	402	442	no.	

TP_172-174

TREES

	OE	<i>Olea sp</i>	Olive	as shown	120-160L	3	3	
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RG_15

								TOTAL AREA	27.1 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	8	9		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	8	9		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	17	19		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	34	37		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	8	9		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	34	37		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	23	25		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	17	19		
30%	Mu.a	<i>Muehlenbeckia axialis</i>		0.6	PB3	23	25		
150%					TOTAL	172	189	no.	

TP_117

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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RG_16

								TOTAL AREA	26.1 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	7	8		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	7	8		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	16	18		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	33	36		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	7	8		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	33	36		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	22	24		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	16	18		
30%	Mu,a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	22	24		
150%						TOTAL	163	180	no.

TP_118

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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RG_17

								TOTAL AREA	33.3 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	9	10		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	9	10		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	21	23		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	42	46		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	9	10		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	42	46		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	28	31		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	21	23		
30%	Mu,a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	28	31		
150%						TOTAL	209	230	no.

TP_119

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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RG_18

								TOTAL AREA	39.6 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	11	12		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	11	12		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	25	28		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	50	55		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	11	12		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	50	55		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	33	36		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	25	28		
30%	Mu,a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	33	36		
150%						TOTAL	249	274	no.

TP_120

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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RG_19

								TOTAL AREA	34.8 m2
10%	As.g	<i>Astelia grandis</i>	Swamp Astelia	0.6	PB3	10	11		
10%	Bl.m	<i>Blechnum minus</i>	Swamp kio kio	0.6	PB3	10	11		
10%	Ca.d	<i>Carex dissita</i>	Purei	0.4	PB3	22	24		
20%	Ca.t	<i>Carex trifida</i>	Muttonbird sedge	0.4	PB3	44	48		
10%	Ca.s	<i>Carex secta</i>	Purei	0.6	PB3	10	11		
20%	Ca.v	<i>Carex virgata</i>	Purei	0.4	PB3	44	48		
30%	Fu.p	<i>Fuchsia procumbens</i>	Creeping Fuchsia	0.6	PB3	29	32		
10%	Li.i	<i>Libertia ixioides</i>	Nz Iris	0.4	PB3	22	24		
30%	Mu,a	<i>Muehlenbeckia axiolaris</i>		0.6	PB3	29	32		
150%						TOTAL	220	241	no.

TP_121

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
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%			Common Name	Spacing (m)	Size	Qty	Qty + contig	area	Comments
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TREES IN PAVING: TP_116, 122-123, 157

SHRUB + GROUNDCOVER						TOTAL AREA		5.6 m2
50%	Li.g	<i>Libertia grandiflora</i>	mikoikoi	0.4	PB3	18	20	
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.4	PB3	18	20	
50%			TOTAL			36	40	no.

TREES

	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	1	1	
	SM	<i>Sophora microphylla</i>	Kowhai	as shown	120-160L	3	3	

TREES IN LAWN: TP_137-141, 145-147, 150-154, 158-162, 166-171

TREES

	MR	<i>Metrosideros robusta</i>	Northern rata	as shown	45L	3	3	
	OE	<i>Olea sp</i>	Olive	as shown	120-160L	1	1	
	SM	<i>Sophora microphylla</i>	Kowhai	as shown	120-160L	20	22	

CRECHE

GB_33

SHRUB + GROUNDCOVER						TOTAL AREA		5.5 m2
50%	La.a.G	<i>Lavandula augustifolia Grosso</i>	Lavender	0.5	PB3	11	12	
50%	Ro.o	<i>Rosmarinus officinalis sp</i>	Rosemary	0.5	PB3	11	12	
100%	Th.v	<i>Thymus vulgaris</i>	Thyme	0.6	PB3	15	17	
200%			TOTAL			37	41	no.

TBC

GB_34

SHRUB + GROUNDCOVER						TOTAL AREA		12.0 m2
50%	La.a.G	<i>Lavandula augustifolia Grosso</i>	Lavender	0.5	PB3	24	26	
50%	Ro.o	<i>Rosmarinus officinalis sp</i>	Rosemary	0.5	PB3	24	26	
100%	Th.v	<i>Thymus vulgaris</i>	Thyme	0.6	PB3	33	36	
200%			TOTAL			81	88	no.

TBC

GB_35 (a,b,c,d,e,f,g)

SHRUB + GROUNDCOVER						TOTAL AREA		2.5 m2
50%	La.a.G	<i>Lavandula augustifolia Grosso</i>	Lavender	0.4	PB3	8	9	
50%	Ro.o	<i>Rosmarinus officinalis sp</i>	Rosemary	0.4	PB3	8	9	
100%	Th.s	<i>Thymus serpyllum</i>	Thyme	0.6	PB3	7	8	
200%			TOTAL			23	26	no.

TBC

TREES IN PAVING: TP_183-184

SHRUB + GROUNDCOVER						TOTAL AREA		2.8 m2
50%	Li.g	<i>Libertia grandiflora</i>	mikoikoi	0.4	PB3	9	10	
50%	Pr.a	<i>Pratia angulata</i>	Panakenake	0.4	PB3	9	10	
50%			TOTAL			18	20	no.

TREES

	Py.c	<i>Pyrus conference</i>	pear	as shown	120L	2	2	
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TREES IN LAWN & LIMECHIP: TP_175-182, 185

TREES

	M.co	<i>Malus Cox's pippin</i>	apple	as shown	120L	4	4	
	Pr.h	<i>Prunus hawera</i>	plum	as shown	120L	2	2	
	Pr.s	<i>Prunus santa rosa</i>	plum	as shown	120L	2	2	
	SM	<i>Sophora microphylla</i>	Kowhai	as shown	120-160L	1	1	

UNDERPASS PLANTING

UP_1-13

CLIMBER						TOTAL AREA		TBC m2
100%		<i>Metrosideros carminea</i>	climbing rata (seed grown only)		PB3	30	33	
100%			TOTAL			30	33	no.

2no. per planter

+ 2 each side west portal steps

TREE TOTALS

	AE	<i>Alectryon excelsus</i>	Titoki	as shown	120-160L	9	10	
	Euc	<i>Eucalyptus sp</i>	Eucalyptus	as shown	by others	4	4	Supplied by others
	M.co	<i>Malus Cox's pippin</i>	apple	as shown	120L	4	4	
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	1500L	29	32	
	ME	<i>Metrosideros excelsa</i>	Pohutukawa	as shown	200L	2	2	
	MR	<i>Metrosideros robusta</i>	Northern rata	as shown	400L	1	1	Supplied by others (WCC)
	MR	<i>Metrosideros robusta</i>	Northern rata	as shown	45L	4	4	
	PB	<i>Pinus brutia</i>	Gallipoli pine	as shown	TBC	1	1	
	Pr.h	<i>Prunus hawera</i>	plum	as shown	120L	2	2	
	Pr.s	<i>Prunus santa rosa</i>	plum	as shown	120L	2	2	
	Py.c	<i>Pyrus conference</i>	pear	as shown	120L	2	2	

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%			Common Name	Spacing (m)	Size	Qty	Qty + conting	area	Comments
	OE	<i>Olea sp</i>	Olive	as shown	120-160L	98	108		
	SM	<i>Sophora microphylla</i>	Kowhai	as shown	120-160L	24	26		
	UP	<i>Ulmus parvifolia</i>	Chinese Elm	as shown	120-160L	3	3		
TOTAL						185	201	no.	