

Christina Travers-Jones
Multiplex Constructions Pty Ltd
Level 22, 135 King Street
Sydney, NSW 2000

29 March 2022

RE: Mosman High School Project – Mosman Certificate of Design – Landscaping

I hereby certify that the above design is in accordance with normal design practice and meets the requirements of the Building Code of Australia and relevant Australian Standards. In particular the design is in accordance with the following:

- AS 4419 – 2003 Soils for Landscaping and Garden Use
- AS 4454 - 2012 Compost, Soil Conditioners and Mulches
- AS 1428 – Design for access and mobility
- AS2303-2018 - Tree stock for landscape use
- Education Standards Facilities Guidelines (EFSG)
- NSW Greener Places Design Guide
- Mosman LEP
- Conditions of Consent SSD-10465 (in particular Condition B27 & B28)

B27 Landscaping

Prior to the commencement of implementation of landscaping, the Applicant must prepare and submit to the Certifier, a revised Landscape Plan to deliver and manage the revegetation and landscaping works on-site. The plan must:

- (a) provide for the planting of 34 trees and in conjunction with remaining trees, demonstrate at least 24.6% tree canopy cover at the site;*
- (b) detail the location, species, maturity and height at maturity of plants to be planted on-site;*
- (c) include species (trees, shrubs and groundcovers) indigenous to the local area; and*
- (d) include the planting of trees with a pot container of 100 litres or greater.*

The design includes the provision of 34 trees, located on Planting Plans LA-88-G-L0-301-304 & 310, LA-88-G-L3-305-306 & LA-88-L4-308. Details of plant Species, heights and pot sizes are detailed on the plant schedule (dwg: LA-01-G-A-002). The plant selection also includes a species that are indigenous to the local area.

B28 Operational Waste Storage and Processing

Prior to the commencement of construction of waste storage and processing areas, the Applicant must obtain agreement from Council for the design of the operational waste storage area (where waste removal will be undertaken by Council). Where waste removal will be undertaken by a third party, evidence must be provided to the Certifier that the design of the operational waste storage area:

- (a) is constructed using solid non-combustible materials;*
- (b) is designed to ensure the door/gate to the waste storage area is vermin proof and can be openable from both inside and outside the storage area at all times;*
- (c) includes a hot and cold water supply with a hose through a centralised mixing valve;*
- (d) is naturally ventilated or an air handling exhaust system must be in place; and*
- (e) includes signage to clearly describe the types of materials that can be deposited into recycling bins and general garbage bins.*

The waste storage area is documented on the following drawings: LA-86-G-L0-106, LA-87-G-L0-206 & LA-89-G-A-410. The waste storage area has been designed to be constructed using non-combustible materials, with vermin proof doors that can be opened from both sides. The design also incorporates hot & cold water supply and is naturally ventilated.

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems comply with the above which are detailed on the following drawings:

Drawing Number	Revision	Date
LA-01-G-A-001 - Cover Sheet	A	25.03.22
LA-01-G-1-002 - General Notes and Plant Schedule	A	25.03.22
LA-29-G-A-TS1 – Technical Specification	03	25.03.22
LA-86-G-L0-101 - General Arrangement Plan - Level 0 – Sheet 01	A	25.03.22

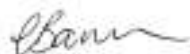
LA-86-G-L0-102 - General Arrangement Plan - Level 0 – Sheet 02	A	25.03.22
LA-86-G-L0-103 - General Arrangement Plan - Level 0 – Sheet 03	A	25.03.22
LA-86-G-L0-104 - General Arrangement Plan - Level 0 – Sheet 04	A	25.03.22
LA-86-G-L3-105 - General Arrangement Plan - Level 3 – Sheet 01 South	A	25.03.22
LA-86-G-L3-106 - General Arrangement Plan - Level 3 – Sheet 02 North	A	25.03.22
LA-86-G-L4-107 - General Arrangement Plan - Level 4 – Sheet 01 South	A	25.03.22
LA-86-G-L4-108 - General Arrangement Plan - Level 4 – Sheet 02 North	A	25.03.22
LA-86-G-L4-109 - General Arrangement Plan - Level 0 – Sheet 05	A	25.03.22
LA-86-G-L4-110 - General Arrangement Plan - Level 0 – Sheet 06	A	25.03.22
LA-87-G-L0-201 - Setout & Grading Plan - Level 0 – Sheet 01	A	25.03.22
LA-87-G-L0-202 - Setout & Grading Plan - Level 0 – Sheet 02	A	25.03.22
LA-87-G-L0-203 - Setout & Grading Plan - Level 0 – Sheet 03	A	25.03.22
LA-87-G-L0-204 - Setout & Grading Plan - Level 0 – Sheet 04	A	25.03.22
LA-87-G-L3-205 - Setout & Grading Plan - Level 3 – Sheet 01 South	A	25.03.22
LA-87-G-L3-206 - Setout & Grading Plan - Level 3 – Sheet 02 North	A	25.03.22
LA-87-G-L4-207 - Setout & Grading Plan - Level 4 – Sheet 01 South	A	25.03.22
LA-87-G-L4-208 - Setout & Grading Plan - Level 4 – Sheet 02 North	A	25.03.22
LA-87-G-L4-209 - Setout & Grading Plan - Level 0 – Sheet 05	A	25.03.22
LA-87-G-L4-210 - Setout & Grading Plan - Level 0 – Sheet 06	A	25.03.22
LA-88-G-L0-301 - Planting Plan - Level 0 – Sheet 01	A	25.03.22
LA-88-G-L0-302 - Planting Plan - Level 0 – Sheet 02	A	25.03.22
LA-88-G-L0-303 - Planting Plan - Level 0 – Sheet 03	A	25.03.22
LA-88-G-L0-304 - Planting Plan - Level 0 – Sheet 04	A	25.03.22
LA-88-G-L3-305 - Planting Plan - Level 3 – Sheet 01 South	A	25.03.22
LA-88-G-L3-306 - Planting Plan - Level 3 – Sheet 02 North	A	25.03.22
LA-88-G-L4-308 - Planting Plan - Level 4 – Sheet 02 North	A	25.03.22
LA-88-G-L4-310 - Planting Plan - Level 0 – Sheet 06	A	25.03.22
LA-89-G-A-401 - Sections and Details 01	A	25.03.22
LA-89-G-A-402 - Sections and Details 02	A	25.03.22
LA-89-G-A-403 - Sections and Details 03	A	25.03.22
LA-89-G-A-404 - Sections and Details 04	A	25.03.22
LA-89-G-A-405 - Sections and Details 05	A	25.03.22
LA-89-G-A-406 - Sections and Details 06	A	25.03.22
LA-89-G-A-407 - Sections and Details 07	A	25.03.22
LA-89-G-A-408 - Sections and Details 08	A	25.03.22
LA-89-G-A-409 - Sections and Details 09	A	25.03.22
LA-89-G-A-410 - Sections and Details 10	A	25.03.22

Should you require any further clarification or information, please contact me on 0418270382

I possess Indemnity Insurance to the satisfaction of the building owner or my principal.

Full Name of Designer: Giselle Barron
Qualifications: Registered Landscape Architect #1316
Address of Designer: Level 1, 1073 Pittwater Road, Collaroy NSW 2097
Business Telephone No: 0418 270 382
Name of Employer: Black Beetle pty ltd

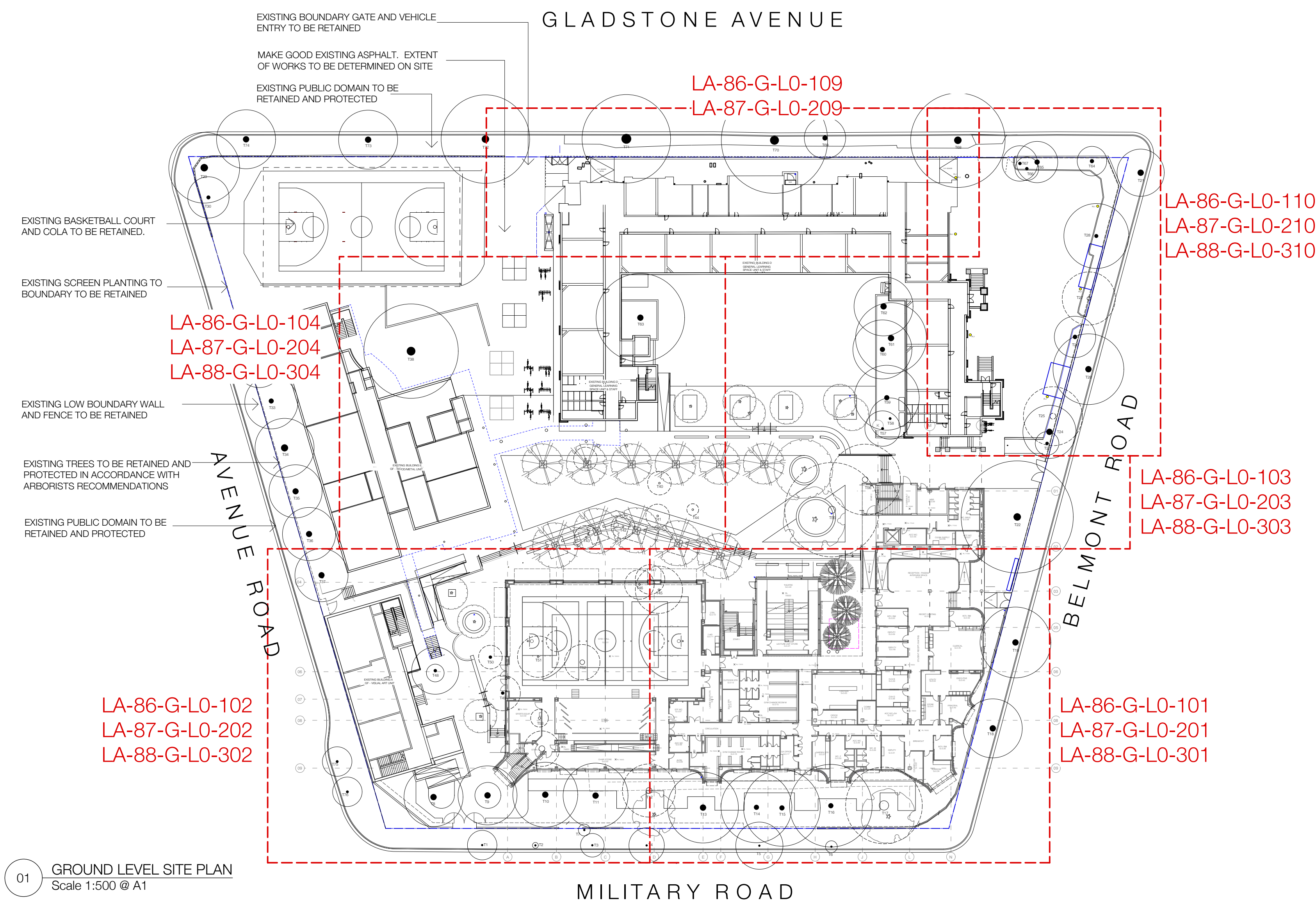
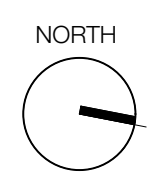
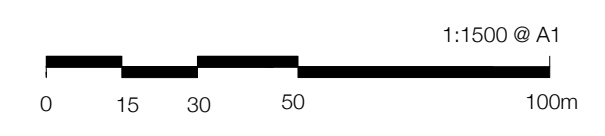
Kind regards,



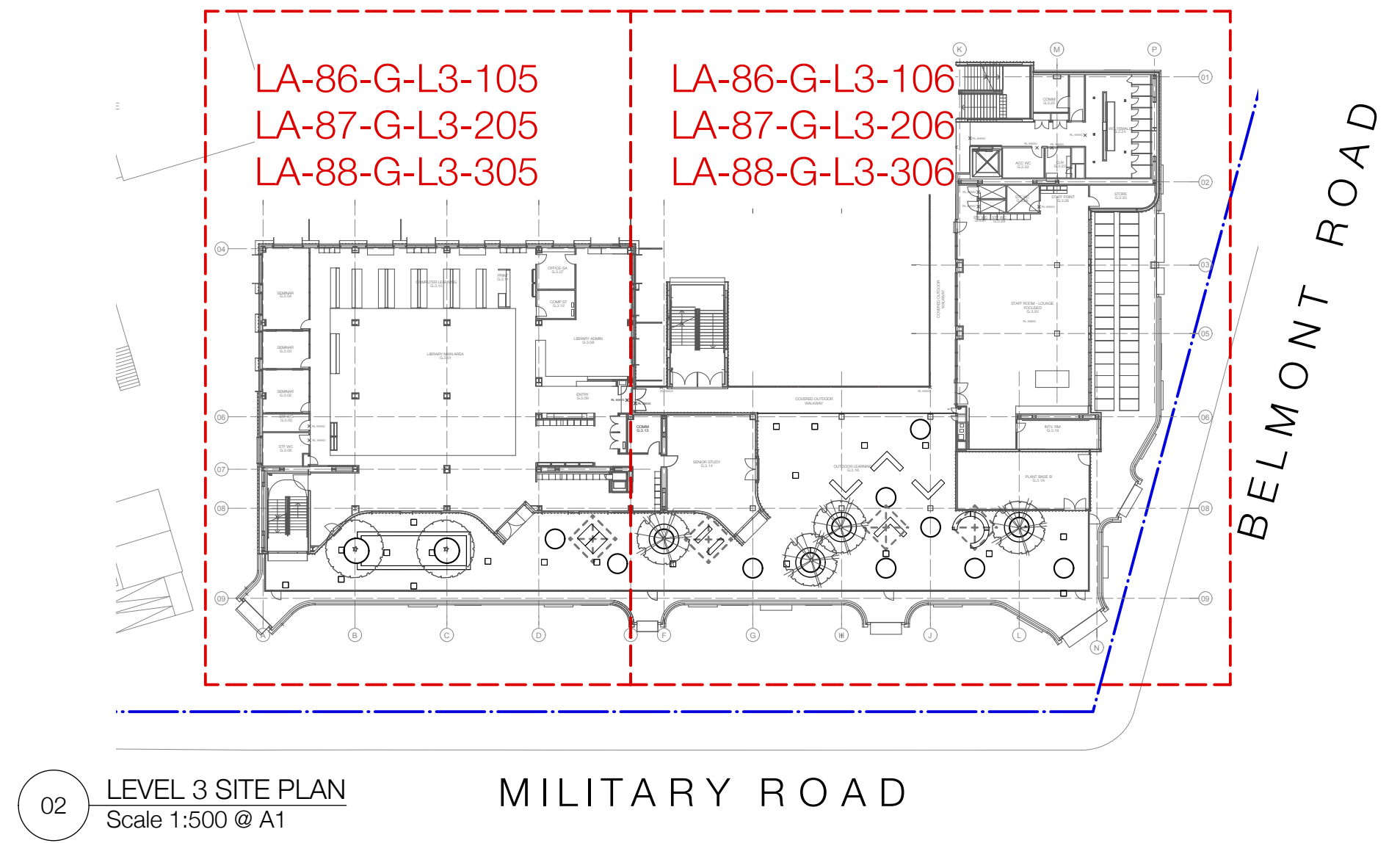
Giselle Barron
Director & Registered Landscape Architect
Black Beetle pty ltd
P: 0418 270 382
E: giselle@blackbeetle.com.au

Rev	Description	Date
01	Schematic Design Issue	25.05.21
02	Draft Tender Issue	06.08.21
03	Tender Issue	20.08.21
04	Detail Design	03.09.21
A	AFC Issue	25.03.22

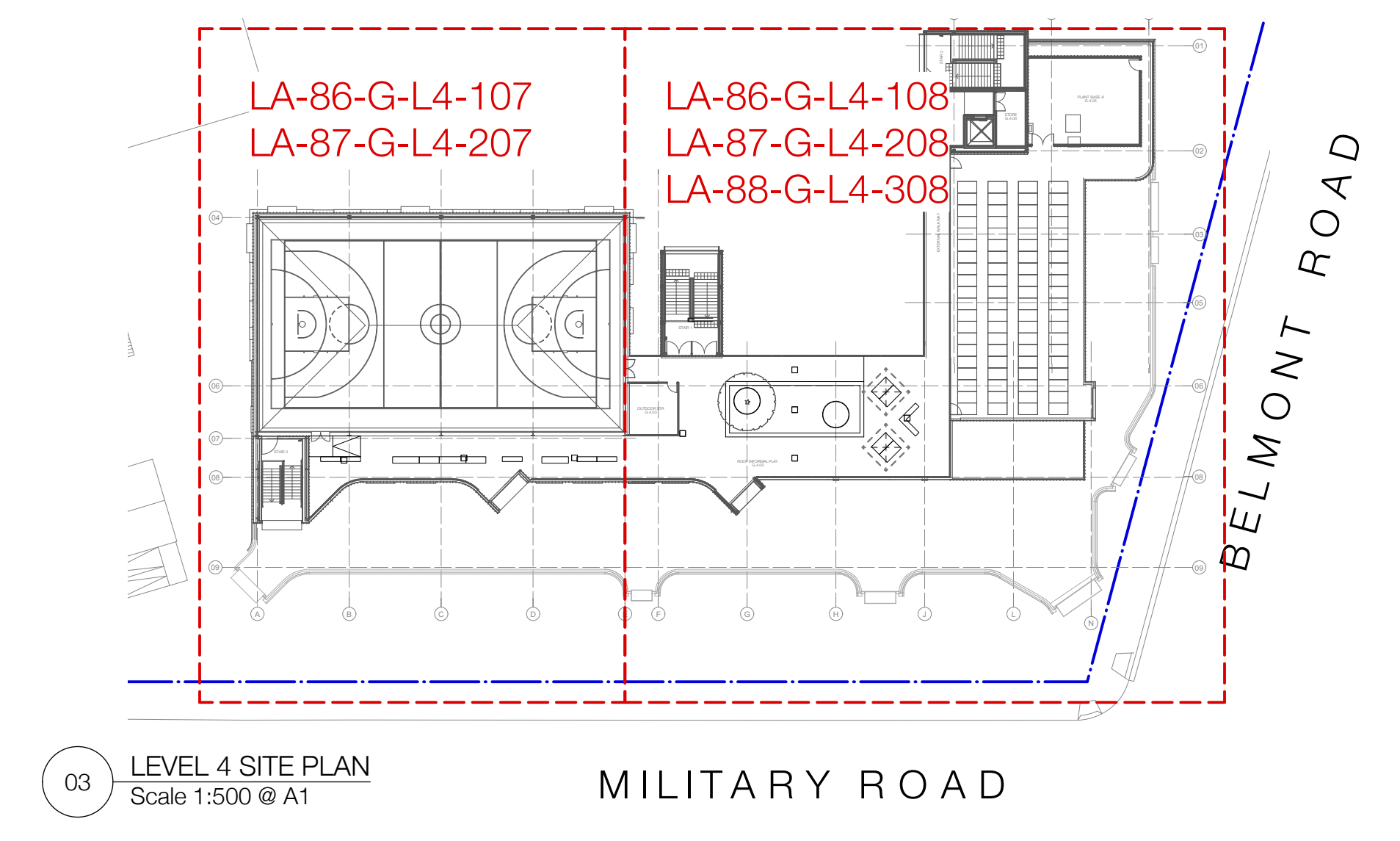
NOTES
Contractor must verify all dimensions on site before commencing work or preparing shop drawings. Do not scale drawings. Resolve discrepancies with Black Beetle before proceeding. Copyright of this drawing and the design executed remain vested in Black Beetle



01 GROUND LEVEL SITE PLAN
Scale 1:500 @ A1



02 LEVEL 3 SITE PLAN
Scale 1:500 @ A1



03 LEVEL 4 SITE PLAN
Scale 1:500 @ A1

LEGEND	
	BOUNDARY
	EXISTING TREE (& TREE ID) TO BE RETAINED AND PROTECTED
	EXISTING TREE (& TREE ID) TO BE REMOVED
	EXISTING LEVEL
	FINISHED LEVEL
	TOP OF WALL FINISHED LEVEL
	P1/P1A - PAVEMENT TYPE 1/1A - BRICK PAVEMENT REFER TO DETAIL NO. 01/LA-89-G-A-403
	P2 - PAVEMENT TYPE 2 - EXPOSED AGGREGATE CONCRETE. REFER TO DETAIL NO. 02/LA-89-G-A-403
	P3 - PAVEMENT TYPE 3 - CONCRETE SLEEPERS (RAISED WALKWAY). REFER TO DETAIL NO. 03/LA-89-G-A-403
	P4 - PAVEMENT TYPE 4 - PAINTED CONCRETE/ ASPHALT SURFACE. REFER TO SPECIFICATION.
	P5 - PAVEMENT TYPE 5 - TILE REFER TO DETAIL NO. 04/LA-89-G-A-403
	GARDEN PROFILE 01- GARDEN ON GRADE AND IRRIGATION EXTENT (DRIP IRRIGATION). REFER TO DETAIL NO. 01 / LA-89-G-A-401
	GARDEN PROFILE 02- GARDEN ON GRADE (TP2) AND IRRIGATION EXTENT (DRIP IRRIGATION). REFER TO DETAIL NO. 02 / LA-89-G-A-401
	GARDEN PROFILE 03- RAISED GARDEN ON GRADE AND IRRIGATION EXTENT (DRIP IRRIGATION). REFER TO DETAIL NO. 03 / LA-89-G-A-401
	T1 - TURF PROFILE 1 - SYNTHETIC TURF ON GRADE REFER TO DETAIL NO. 01/LA-89-G-A-405
	T2 - TURF PROFILE 2 - SYNTHETIC TURF ON STRUCTURE. REFER TO DETAIL NO. 02/LA-89-G-A-405
	REFER TO HYDRAULIC ENGINEERS DOCUMENTATION FOR PIT AND INFRASTRUCTURE TYPES
	STORM WATER INFRASTRUCTURE. REFER TO CIVIL ENGINEERS DOCUMENTATION.
	WATER TAP. REFER TO HYDRAULIC ENGINEERS DOCUMENTATION
	E1 - EDGE TYPE 1, METAL EDGE REFER TO DETAIL NO. 03/LA-89-G-A-402
	E2 - EDGE TYPE 2, METAL ANGLE REFER TO DETAIL NO. 01/LA-89-G-A-403
	B2 - BRICK SEATING WALL REFER TO DETAIL NO. 03/LA-89-G-A-405
	B3 - CONCRETE SEATING / PLANTER WALL REFER TO DETAIL NO. 01/LA-89-G-A-406
	W1 - WALL TYPE 1 - BRICK WALL REFER TO DETAIL NO. 02/LA-89-G-A-406
	W2 - WALL TYPE 2 - CONCRETE WALL REFER TO DETAIL NO. 03/LA-89-G-A-406
	PLANTER TYPE 1- 5 METAL PLANTER AND IRRIGATION EXTENT (DRIP IRRIGATION). REFER TO DETAIL NO. 04-06/LA-89-G-A-401
	HANDRAIL. REFER TO DETAIL NO.01/LA-89-G-A-403
	BALUSTRADE. REFER TO DETAIL NO.04/LA-89-G-A-405
	SIPHONIC OUTLET. REFER TO HYDRAULIC ENGINEERS DOCUMENTATION
	PLANTER DRAINAGE OUTLET. REFER TO HYDRAULIC ENGINEERS DOCUMENTATION
	RAIN WATER OUTLET. REFER TO HYDRAULIC ENGINEERS DOCUMENTATION
	B4 - B8 - BENCHES TYPE 04 - 08. REFER TO SPECIFICATION FOR FURNITURE DETAILS.
	T1 - T2 - TABLES TYPE 01-02. REFER TO SPECIFICATION FOR FURNITURE DETAILS.
	FIXED SHADE UMBRELLA. REFER TO SPECIFICATION.
	BILE RAILS. REFER TO SPECIFICATION.
	TP1 - TREE PIT TYPE 1 - TREE IN PAVEMENT REFER TO DETAIL NO. 01/LA-89-G-A-402
	TP2 - TREE PIT TYPE 2 - TREE IN SYNTHETIC TURF REFER TO DETAIL NO. 02/LA-89-G-A-402



PROJECT
MOSMAN HIGH SCHOOL
745 Military Road, Mosman

CLIENT
SCHOOLS INFRASTRUCTURE NSW

ISSUED BY
MULTIPLEX

black beetle
Landscape Architecture and Design
Black Beetle Pty Ltd
Level 01 | 1073 Pittwater Road, Collaroy NSW 2097
Tel: 0422 104 416
email: blackbeetle@blackbeetle.com.au

CHECKED	APPROVED	SCALE
IK	GB/IK	1:500 @ A1

SHEET TITLE
Cover Sheet & Key Plan

SHEET NO.	REVISION
LA-01-G-A-001	A
STATUS For Construction	

GENERAL NOTES

- DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTS / CIVIL / STRUCTURAL / HYDRAULIC ENGINEERS DOCUMENTATION
- DO NOT SCALE FROM THE DRAWING. REPORT ANY DISCREPANCIES TO THE SITE SUPERINTENDENT IMMEDIATELY AND SEEK ADVICE.
- PROTECT ALL ADJOINING PROPERTY BUILDINGS, WALLS, FENCES AND PAVING. DAMAGED ELEMENTS ARE TO BE REPLACED.
- OUTLINE OF ALL BUILDING STRUCTURES SHOULD BE CONFIRMED ONSITE AND SHOULD NOT BE USED AS A REFERENCE POINT FOR CONSTRUCTION
- PROTECT ALL ADJOINING PROPERTY BUILDINGS, WALLS, PAVING AND THIRD PARTY ASSETS AFFECTED OR POTENTIALLY AFFECTED BY WORKS UNDER CONTRACT (WUC). DAMAGED ELEMENTS ARE TO BE REPLACED.
- REFER TO ENGINEERS DRAWING FOR ALL DRAINAGE WORKS
- SERVICE LOCATIONS ON PLANS ARE INDICATIVE ONLY. BLACK BEETLE ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF SERVICE LOCATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE SERVICE LOCATION PRIOR TO COMMENCEMENT OF WORK. ANY DAMAGES REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
- THERE ARE TO BE NO SHARP PROTRUSIONS OR ABRASIVE EDGES, OBTRUSIVE FITTINGS OR FIXTURES.
- EACH AREA OF GARDEN PROFILE NOTED SHALL EXTEND TO ENTIRE AREAS BOUNDED BY ADJACENT WALLING PAVEMENT, EDGES AND KERB, OR DEMARCATION LINE SHOWN.
- ADJUST FINAL LOCATION OF GARDEN PROFILE LOCALLY AS REQUIRED TO ACCOMMODATE FINAL CONSTRUCTED LOCATION OF WALLS AND PAVEMENTS.
- ADJUST FINAL LOCATION OF GARDEN PROFILES LOCALLY TO SUIT SERVICE INFRASTRUCTURES, INCLUDING SERVICE LINE, PILLARS, VALVES AND THE LIKE.
- REFER TO HYDRAULIC/ CIVIL ENGINEERS FOR ALL SUBSOIL DRAINAGE AND STORMWATER PITS.
- PROVIDE CONDUITS THROUGH WALLS / PAVEMENTS AS REQUIRED FOR SERVICES.
- FOR ALL LIGHTING LOCATION REFER TO ELECTRICAL ENGINEERS DOCUMENTS.
- FOR ALL STRUCTURAL DETAILS OF WALLS, PAVEMENTS AND THE LIKE REFER TO ENGINEERS AND ARCHITECTS DOCUMENTATION AND SPECIFICATION.
- GREEN WASTE REMOVAL - ALL GREEN WASTE GENERATED BY THE MAINTENANCE WORK SHALL BE CONTAINED WITHIN THE IMMEDIATE WORK AREA, AND SHALL NOT LEAK INTO ADJACENT AREAS, OR OUTSIDE THE SITE. ALL DEBRIS SHALL BE CONTAINED AND REMOVED FROM SITE TO AN APPROVED CERTIFIED TIPPING AND LEGAL RECYCLING DEPOT LOCATION USING SUITABLE CLOSED WASTE CONTAINERS AND VEHICLES.

GRADING AND SETOUT NOTES

- SETOUT EXTENT OF EACH TYPE GARDEN PROFILE FOR APPROVAL PRIOR TO UNDERTAKING WORK.
- LEVELS SHOWN ARE FINISHED SURFACE LEVELS. REFER TO ENGINEERS DOCUMENTATION.
- GRADE AND TRIM LOCALLY TO ENSURE THE FINISHED SURFACE DRAINS.
- SOIL LEVELS IN GARDEN AREAS TO FINISH 50MM BELOW ADJACENT WALLS/ PAVEMENTS UNLESS NOTED OTHERWISE.
- FINAL MOUNDING / GRADING TO BE DIRECTED AND CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
- ALL PITS, PIT COVERS VALVES AND METERS FOR SERVICES ARE TO BE ADJUSTED TO SUIT NEW FINISHED LEVELS EXCEPT WHERE OTHERWISE NOTED.

PLANTING NOTES

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL PLANT MATERIAL IS AVAILABLE TO SIZES AND SPECIES TYPE NOMINATED IN THE PLANT SCHEDULE. THIS MAY REQUIRE THE PREORDERING AND GROWING ON OF SPECIES BY A SELECTED NURSERY FOR A EXTENSIVE PERIOD OF TIME PRIOR TO THEIR INSTALLATION. NO SUBSTITUTION OF SPECIES OR SIZES WILL ACCEPTED UNLESS EVIDENCE CAN BE FURNISHED TO THE LANDSCAPE ARCHITECT OF ALL REASONABLE ATTEMPTS BEING MADE TO ACQUIRE THE NOMINATED SPECIES BETWEEN THE TIME OF THE CONTRACT BEING AWARDED AND THE LANDSCAPE CONSTRUCTION DATE.
- ADJUST FINAL LOCATION OF PLANT MATERIAL TO SUIT SERVICE INSTALLATION, INCLUDING SERVICE LINES, PITS, PILLARS, VALVES AND THE LIKE.
- ADJUST FINAL LOCATION OF PLANT MATERIAL AS DIRECTED TO SUIT FINAL EXTENT OF EACH PLANTING AREA.
- FINAL SETOUT AND ARRANGEMENT OF EACH PLANTING TO BE CONFIRMED ON SITE WITH LANDSCAPE ARCHITECT PRIOR TO UNDERTAKING WORKS.
- DO NOT STAKE TREES OR SHRUBS. PLANTS ARE TO BE SELF SUPPORTING. REMOVE NURSERY STAKES AND LABELS.

IRRIGATION NOTES

- PREPARE DESIGN DRAWINGS AND SPECIFICATION FOR APPROVAL BY THE SUPERINTENDENT
- PROVIDE ACCESS POINTS IN WALLS AND UNDER PAVEMENTS
- COMMISSION THE SYSTEM
- PROVIDE HANDOVER PACKAGE INCLUDING MANUALS, WARRANTIES AND AS BUILT DRAWINGS

PLANT SCHEDULE

BOTANICAL NAME	COMMON NAME	HEIGHT	POT SIZE	LEVEL 0	LEVEL 3	LEVEL 4	QTY
TREES							
<i>Backhousia citriodora</i>	Lemon Myrtle	10M	200L	-	2	-	2
<i>Banksia integrifolia</i>	Coastal Banksia	15M	300L	-	2	1	3
<i>Eucalyptus punctata</i>	Grey Gum	20M	300L	1	-	-	1
<i>Elaeocarpus reticulatus 'Prima Donna'</i>	Prima Donna Blueberry Ash	8M	200L	3	2	-	5
<i>Glochidion ferdinandi</i>	Cheese Tree	15M	200L	6	-	-	6
<i>Livistona australis</i>	Cabbage Tree Palm	15M	2.5-4m CHT	3	-	-	3
<i>Lophostemon confertus</i>	Brush Box	15M	100L	1	-	-	1
<i>Magnolia grandiflora</i>	Magnolia	12M	700L	1	-	-	1
<i>Melaleuca quinquerivna</i>	Paperbark	15M	100L	1	-	-	1
<i>Pyrus ussuriensis</i>	Ornamental Pear	12M	400L	5	-	-	5
<i>Tristaniaopsis laurina 'Luscious'</i>	Luscious Water Gum	8M	200L	6	-	-	6
SHRUBS AND CLIMBERS							
<i>Adenanthos sericeus 'Silver Lining'</i>	Silver Lining Woolly Bush	0.4M	200MM	23	-	-	23
<i>Aspidistra elatior</i>	Cast Iron Plant	0.7M	200MM	72	-	-	72
<i>Asplenium australasicum</i>	Bird Nest Fern	1.3M	200MM	24	-	-	24
<i>Beschermeria yuccoides</i>	Lady Fern	0.8M	200MM	37	15	16	68
<i>Blechnum 'Silver Lady'</i>	Silver	1.2M	200MM	232	-	-	232
<i>Brachyscome multifida</i>	Cut Leaf Daisy	0.2M	150MM	22	-	-	22
<i>Callistemon 'Better John'</i>	Better John	0.8M	200MM	110	-	-	110
<i>Carpobrotus glaucescens</i>	Pigface	0.2M	150MM	59	-	-	59
<i>Crassula 'BlueBird'</i>	Blue Bird	0.6M	200MM	-	39	18	57
<i>Dianella caerulea</i>	Flax Lily	0.4M	150MM	600	-	-	600
<i>Dianella revoluta</i>	Flax Lily	0.4M	150MM	-	7	-	7
<i>Dichondra repens</i>	Kidney Weed	0.1M	150MM	95	-	-	95
<i>Disphyma crassifolium ssp. clavellatum</i>	Round Baby Pigface	0.3M	150MM	-	21	-	21
<i>Doranthus excelsa</i>	Gymea Lily	2M	200MM	51	-	-	51
<i>Hedera canariensis</i>	Canarian Ivy	0.3M	150MM	547	-	-	547
<i>Hibbertia scandens</i>	Snake Vine	0.2M	150MM	313	-	-	313
<i>Hymenosporum flavum 'Lushious'</i>	Lushious Native Frangipani	0.6M	200MM	90	-	-	90
<i>Isolepis nodosa</i>	Knobby Club Rush	0.8M	150MM	111	12	-	123
<i>Lomandra longifolia 'Nyalla'</i>	Nyalla Matt Rush	0.7M	150MM	304	-	-	304
<i>Lomandra 'Tanika'</i>	Tanika Matt Rush	0.7M	150MM	526	30	20	576
<i>Mentha satuireioides</i>	Bush Mint	0.2M	150MM	-	10	-	10
<i>Microseris lanceolata</i>	Mumong Yam Daisy	0.3M	150MM	-	9	-	9
<i>Murraya paniculata</i>	Orange Jessamine	3M	300MM	89	-	-	89
<i>Myoporum parvifolium 'Yareena'</i>	Yareena Creeping boobialla	0.2M	150MM	128	-	-	128
<i>Philodendron 'Xanadu'</i>	Xanadu	1M	200MM	294	-	-	294
<i>Pittosporum 'Miss Muffet'</i>	Miss Muffet	0.8M	200MM	16	24	12	52
<i>Prostanthera incisa</i>	Native Thyme	0.2M	150MM	-	9	-	9
<i>Ruselia equisetiformis</i>	Coral Plant	0.6M	150MM	-	19	9	28
<i>Senecio serpens</i>	Blue Chalk Sticks	0.3M	150MM	-	74	9	83
<i>Trachelospermum 'Tricolor'</i>	Tricolor Star Jasmine	0.3M	150MM	191	-	-	191
<i>Viola hederacea</i>	Native Violet	0.1M	150MM	267	-	-	267
<i>Westringia fruticosa 'Zena'</i>	Zena Coastal Rosemary	1.2M	200MM	8	-	-	8

Rev	Description	Date
01	Draft Tender Issue	06.08.21
02	Tender Issue	20.08.21
03	Detail Design	03.09.21
04	AFC Issue	25.03.22

NOTES

Contractor must verify all dimensions on site before commencing work or preparing shop drawings. Do not scale drawings. Resolve discrepancies with Black Beetle before proceeding. Copyright of this drawing and the design executed remain vested in Black Beetle

PROJECT

MOSMAN HIGH SCHOOL
745 Military Road, Mosman

CLIENT

SCHOOLS INFRASTRUCTURE NSW

ISSUER

MULTIPLEX

black beetle

Landscaping Architects and Design
Black Beetle Pty Ltd
Level 01 | 1073 Pittwater Road, Collaroy NSW 2097
Tel: 0422 104 416
email: blackbeetle@blackbeetle.com.au

CHECKED	APPROVED	SCALE
IK	GB/IK	as shown @ A1

SHEET TITLE

General Notes and Plant Schedule

SHEET NO.	REVISION
LA-01-A-002	A

STATUS

For Construction

Technical Specification

Mosman High School
745 Military Road
Mosman, NSW

Prepared for:
Schools Infrastructure NSW

LA-29-G-A-TS1 rev
03 March 25, 2022
AFC Issue

black beetle

Contents

- 01. General Requirements
- 02. Landscape Works
- 03. Plant Supply
- 04. Irrigation
- 05. Maintenance and Plant Establishment
- 06. Pavements
- 07. Concrete
- 08. External Walls
- 09. Metalwork
- 10. Handrails and Balustrades
- 11. Synthetic Surfaces
- 12. Furniture and Fixtures

SECTION 01 – GENERAL REQUIREMENTS

It is important that each tenderer makes a detailed site inspection to fully establish the scope of the work required. The successful tenderer will be required to undertake a services search and conduct a “Dial before you dig” survey of the site to ascertain the underground services that may affect the performance of the work under contract.

1.1 Scope

The scope of works include:

Building works required to complete construction of elements as indicated in the current revision of drawings:

LA-01-G-A-001	Cover Sheet
LA-01-G-1-002	General Notes and Plant Schedule
LA-86-G-L0-101	General Arrangement Plan - Level 0 – Sheet 01
LA-86-G-L0-102	General Arrangement Plan - Level 0 – Sheet 02
LA-86-G-L0-103	General Arrangement Plan - Level 0 – Sheet 03
LA-86-G-L0-104	General Arrangement Plan - Level 0 – Sheet 04
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LA-86-G-L3-106	General Arrangement Plan - Level 3 – Sheet 02 North
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LA-86-G-L4-109	General Arrangement Plan - Level 0 – Sheet 05
LA-86-G-L4-110	General Arrangement Plan - Level 0 – Sheet 06
LA-87-G-L0-201	Setout & Grading Plan - Level 0 – Sheet 01
LA-87-G-L0-202	Setout & Grading Plan - Level 0 – Sheet 02
LA-87-G-L0-203	Setout & Grading Plan - Level 0 – Sheet 03
LA-87-G-L0-204	Setout & Grading Plan - Level 0 – Sheet 04
LA-87-G-L3-205	Setout & Grading Plan - Level 3 – Sheet 01 South
LA-87-G-L3-206	Setout & Grading Plan - Level 3 – Sheet 02 North
LA-87-G-L4-207	Setout & Grading Plan - Level 4 – Sheet 01 South
LA-87-G-L4-208	Setout & Grading Plan - Level 4 – Sheet 02 North
LA-87-G-L4-209	Setout & Grading Plan - Level 0 – Sheet 05
LA-87-G-L4-210	Setout & Grading Plan - Level 0 – Sheet 06
LA-88-G-L0-301	Planting Plan - Level 0 – Sheet 01
LA-88-G-L0-302	Planting Plan - Level 0 – Sheet 02
LA-88-G-L0-303	Planting Plan - Level 0 – Sheet 03
LA-88-G-L0-304	Planting Plan - Level 0 – Sheet 04
LA-88-G-L3-305	Planting Plan - Level 3 – Sheet 01 South
LA-88-G-L3-306	Planting Plan - Level 3 – Sheet 02 North
LA-88-G-L4-308	Planting Plan - Level 4 – Sheet 02 North
LA-88-G-L4-310	Planting Plan - Level 0 – Sheet 06
LA-89-G-A-401	Sections and Details 01
LA-89-G-A-402	Sections and Details 02
LA-89-G-A-403	Sections and Details 03
LA-89-G-A-404	Sections and Details 04
LA-89-G-A-405	Sections and Details 05
LA-89-G-A-406	Sections and Details 06
LA-89-G-A-407	Sections and Details 07
LA-89-G-A-408	Sections and Details 08
LA-89-G-A-409	Sections and Details 09
LA-89-G-A-410	Sections and Details 10

Diagrammatic layouts

Layouts of service lines, plant and equipment shown on the drawing are diagrammatic only, except where figured dimensions are provided or calculable. Before commencing work, obtain measurements and other necessary information

Works defined in this specification;

Site works, including preliminaries and site preparation; hardworks and works associated with planting, plant establishment, and maintenance.

1.2 Dilapidation Report

Provide a photographic and written record before demolition work of the condition of the existing building, adjacent buildings, and other relevant structures or facilities. Use the dilapidation record

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MILITARY ROAD
MOSMAN, NSW

Technical Specification
Rev 03 AFC Issue, 25/03/22

black beetle

amongst other things as a means of assessing responsibility for damage and/or making good arising out of the work under the contract. Keep a record at the site office. Provide one copy to the Principal.

1.3 Location of existing service

The contractor will be held responsible for bearing the cost of making good any damage to existing services and mains, whether or not these are shown on the drawings.

Services in close proximity to proposed works shall be exposed by hand before work is to commence. The contractor is responsible to cap and seal any abandoned services, which he/she may find on site to the satisfaction of the Superintendent.

It is the sole responsibility of the contractor to fully inform themselves of the location of services and to make the necessary provisions.

1.4 Setting out of works

The contractor shall allow for in their tender and be responsible for accurately setting out the works and for checking the works in progress.

The Contractor shall ensure the correct set out of all plant, equipment, pipes, ducts, brackets, bolts and like attachments to be provided and fixed under sub-contracts and of the terminating points for services provided by others in connection therewith.

It shall be the Contractor's responsibility to ensure that the required work is executed in accordance with the Drawings. Where no tolerances are given, it is expected that the Contractor will follow normal building accuracy and in any dispute arising from, the decision of the superintendent / client representative shall be final and binding.

Should the Contractor discover any error or discrepancy in the lines or levels, or the plans, or the site, he/she shall immediately notify the Project Manager before proceeding with the work.

The Contractor shall be responsible for checking all levels and dimensions before commencing work. Verify dimensions, bearings, levels, existing services, and lodge any objections to the information supplied before commencing work.

1.5 Standards

Australian Standards: Unless otherwise specified in the Contract, and where applicable, materials and workmanship shall be in accordance with the relevant standard of the Standards Association of Australia.

Current Edition: A standard applicable to the Works shall be the edition last published prior to the closing date for tenders unless otherwise specified.

Other Standards: Overseas standards and other standard documents named in the Specification shall be applicable in the same manner as Australian Standards to relevant materials and workmanship.

1.6 Samples

Approved Samples: Items in respect of which samples are specified shall be in accordance with an approved sample, or within a range defined by approved samples, as determined by the Superintendent, otherwise such items shall be liable to rejection. Keep approved samples in good condition on the site until Practical Completion.

Delay: Where the Specification requires samples to be submitted by the Contractor, the Contractor shall be solely responsible for the consequences of delay resulting from failure to allow adequate time for the assessment and approval of samples, or from the rejection of samples which do not comply with the Specification, or the like.

1.7 Inspection

Hold points: If notice of inspection is to be given in respect of parts of the works, do not conceal those parts without approval.

Minimum notice for inspections to be made: 1 day for on-site inspectors, otherwise 2 working days.

Witness points: If notice of inspection is required in respect of parts of the works, advise if and when those parts are to be concealed.

1.8 Testing

Testing authority: Unless otherwise specified, any testing required by the Contractor to be carried out by authorities accredited by NATA or approved by the Superintendent in the relevant field.

- Reports: Submit copies of test reports, including certificates for type tests, showing the observations and results of tests and conformance or non-conformance with requirement

If notice of testing is to be given in respect of parts of the works,

- do not test those parts without approval.
- Advise if and when those parts are to be tested

Minimum notice for inspections to be made: 1 working day for on-site inspections.

1.9 Submissions

Authorities

Authorities' approvals: If required, submit documents showing approval by the authorities whose requirements apply to the work.

Correspondence: Submit copies of correspondence and notes of meetings with authorities or project superintendent as appropriate.

Design

General: If part or all of an installation is to be designed by the contractor, submit documents showing the layout and details of the installation.

Variation documents: If it is proposed to change the installation from that shown on the contract documents, or if changes are required by statutory authorities, submit variation documents showing the proposed changes.

Errors

If a submission contains errors, make a new or amended submission as appropriate, indicating changes made since the previous submission.

Identification

Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include pertinent contract document references. Include service connection requirements and product certification. Identify proposals for non-compliance with project requirements, and characteristics which may be detrimental to successful performance of the completed work.

Notice

Minimum notice: 5 working days for offsite submissions, otherwise 10 working days.

Submission points: If a submission is required for a part of the works, do not commence work on the part until the submission is endorsed that the work may proceed. Coordinate related submissions and do not cause delays by making late or inadequate submissions.

1.10 Materials, Labour and Plant

Manufacturers' Recommendations: Unless otherwise specified, use manufactured items in the work under the Contract in accordance with current published recommendations of the manufacturer relevant to such use.

If products must conform to product certification schemes, submit evidence of conformance.

Product data: For proprietary equipment, submit the manufacturer's product data as follows:

- Technical specifications and drawings.
- Type-test reports.
- Performance and rating tables.
- Recommendations for installation and maintenance.

Proposed products schedules: If major products are not specified as proprietary items, submit a schedule of those proposed for use within 3 weeks of site possession.

1.11 Proprietary item

Implication: Identification of a proprietary item does not necessarily imply exclusive preference for the item so identified, but indicated the necessary properties of the item.

Alternatives: if alternatives are proposed, submit proposed alternatives and include samples, available technical information, reasons for proposed substitution and cost. State if provision of proposed alternatives will necessitate alteration to other parts of the works and advise consequent costs.

1.12 Guarantees / Warranties

Generally: The Contractor shall obtain, and shall ensure that the Principal will have the benefit of, warranties or guarantees as specified in the Contract, including warranties or guarantees that are obtained by the sub-contractors of the Contractor.

Name the Principal: Unless otherwise specified or agreed, warranties or guarantees specified in the Contract shall name the Principal as warrantee and shall be furnished by the warrantor direct to the Principal.

Warranty Schedule

Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Commencement: Commence warranty periods at practical completion or at acceptance of installation, if acceptance is not concurrent with practical completion.

Approval of installer: If installation is not by manufacturer, and product warranty is conditional on the manufacturer's approval of the installer, submit the manufacturers written approval of the installing firm.

1.13 Existing Services

Marking

Before commencing earthworks, locate and mark existing underground services in the areas which will be affected by the earthworks operations including clearing, excavating and trenching.

1.14 Environmental Protection

General

The Contractor shall plan and take all steps necessary to protect the environment and in particular shall provide erosion, sediment control measures of the site, surrounding areas and drainage systems and any other measures required by the Environmental Protection Agency (EPA) or the Council and other relevant Authorities

Erosion and sedimentation control measures shall include, but shall not be limited to the following;

- The installation of sediment control measures at existing drainage inlet pits before the removal of topsoil and commencement of earthworks for information within the catchment area of each inlet pt.
- The prompt completion of all permanent and temporary drainage works, once commenced, to minimize the period of exposure of disturbed areas.
- The limitation of areas or erodible material exposed at any time to those areas being actively worked.
- The protection of all areas with diversion drains or sediment control fence that prevent the deposit of sediment onto surrounding road or pedestrian pavement or stormwater drainage inlet pits.

Temporary erosion control measures

Staging: Stage operations (e.g. clearing, stripping).

Restoration

Progressively restore disturbed areas.

Drains

Provide temporary drains and catch drains.

Dispersal

Divert and disperse concentrated flows to points where the water can pass through the site without damage.

Spreader banks or other structures

Disperse concentrated run-off.

Silt traps

Construct and maintain silt traps to prevent discharge of scoured material to downstream areas.

Temporary fencing
Required.

Maintenance
After each rain inspect, clean, and repair if required, temporary erosion and sediment control works.

Removal
Remove temporary erosion control measures when they are no longer required.

Costs involved in carrying out this work are deemed to be included in the Contract Sum, regardless of weather conditions.

Sediment from control measures shall be removed and transported and dumped off site

Dewatering
General
Keep groundworks free of water. Provide and maintain slopes, crowns and drains on excavations and embankments to ensure free drainage. Place construction, including fill, masonry, concrete and services, on ground from which free water has been removed. Prevent water flow over freshly laid work.

Site Restoration
Where existing ground surfaces are not required to be varied as part of the works, restore them to the condition existing at the commencement of the contract.

Noise Control
The Contractor shall ensure that local regulations are complied with in regard to noise levels produced by equipment or methods of construction

Dust Control:
The Contractor shall take all necessary steps to limit the creation of any dust nuisance, which might arise during the execution of the Works; in this regard the Contractor shall regularly water construction areas. The Superintendent may direct that work cease until such time as any particular dust nuisance has been controlled satisfactorily, or to the satisfaction of any relevant Authorities.

1.15 Site Clearing

General: Clear only the following site areas:

- Areas to be occupied by works such as landscaping
- Other areas designated to be cleared.

Contractor's site areas: If not included within the areas specified above, clear generally only to the extent necessary for the performance of the works.

The Contractor shall assume full responsibility for the interpretation of any or all sub surface site information included in the contract documents and shall allow for the excavation of all material encountered irrespective of any description or classification contained therein. Geotechnical information is to be obtained and submitted to superintendent.

Clearing operations
Removal: Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble, drainage cell / filter fabric and protection board including irrigation lines.

Grubbing: Grub out stumps and roots over 75 mm diameter to a minimum depth of 500 mm below subgrade under buildings, embankments or paving, or 300 mm below finished surface in unpaved areas.

Old works: Remove old works, including slabs, foundations, paving, drains and manholes found on the surface.

Spoil
Off site disposal
General: Remove surplus excavated material and surplus site clearance material from the site.

On site burial

Do not bury boulders, concrete fragments and the like on site.

1.16 Demolition

Demolish existing site features as detailed on the plans, sufficient to carry out the works in a safe and responsible manner. Protect property, which is to remain on or adjacent to the site, from interference or damaged. Items to be demolished include but are not limited to:

- Hard landscape areas
- Soft landscape areas

Unless otherwise stated, remove demolished materials from the site

Hold Points

Do not commence work or proceed to the next stage of work before approval of the required Hold Points. Required Hold Point before commencing on-site include

- Method Statement
- Setout and extent demolition and refurbishment
- As built documentation for concealed building services
- Any unusual conditions

Health and Safety

Construction methods shall comply with legislative requirements and accepted industry practice with regards to the health and safety of construction personnel.

Authorities and permits

Where the Authorities require permits to be granted for particular type of work, procedures or equipment, pay for and obtain all required permits

Comply with all permit conditions, including required inspection

Submit copies of all permits, records of inspection and related documentation

Registration and insurance

Where the Authorities require registration or insurance, pay for and obtain all such registration and insurance, and keep current for the duration of the work and as required.

Building service

All work carried out on building service, including electrical, plumbing and communications services, shall be carried out by personnel properly licensed or otherwise approved by authorities. Engage and pay for all such licensed personnel and verify that licenses are current before commencing.

Support

Temporary support

Adjacent structures: Provide supports to adjacent structures where necessary, sufficient to prevent damage resulting from the works.

Permanent supports

If permanent supports for adjacent structures are necessary and are not described, give notice and obtain instructions.

Protection

Encroachment

Prevent the encroachment of demolished materials onto adjoining property, including public places.

Weather protection

If the surfaces of adjoining buildings are exposed, provide temporary covers to prevent water penetration. Provide covers to protect existing plant and equipment and material intended for re-use.

Dust protection

Provide dust-proof screens, bulkheads and covers to protect existing finishes and the immediate environment from dust and debris. Ensure that areas used by the general public adjacent to the works are protected from dust during demolition works. Where dust is considered excessive by the Superintendent, wet down areas to the satisfaction of the Superintendent.

Exposed surface

Where necessary protect and weatherproof the surface of adjacent structures exposed by demolition.

Demolition

Dilapidation record

Purpose: Use the dilapidation record to assess the responsibility for damage or making good, or both, arising out of demolition work.

Availability: Keep the records of the investigations on site and available for inspection until practical completion of the contract.

Encroachment

If encroachments from adjacent structures are encountered and are not described, give notice and obtain instructions.

Concrete Slabs / Asphaltic Concrete Pavement

Using a diamond saw, neatly cut back or trim to new alignment with a clean true face existing concrete slabs to be partially demolished or penetrated.

Explosives

Do not use explosives.

Hazardous materials

Give notice immediately if hazardous materials or conditions are found, including the following:

- Asbestos or material containing asbestos.
- Flammable or explosive liquids or gases.
- Toxic, infective or contaminated materials.
- Radiation or radioactive materials.
- Noxious or explosive chemicals.
- Tanks or other containers which have been used for storage of explosive, toxic, infective or contaminated substances.

1.17 Sealed Containers

Requirement: Materials and products supplied by the manufacturer in closed or sealed containers or packages shall be brought to the point of use in the Works in the original unbroken container or package, otherwise they shall be liable to rejection.

1.18 Sources policy

Generally: Preferentially source materials from Australian or New Zealand manufacturers.

1.19 Joining Up

Generally: Carry out the joining of new work to existing work, and any consequent cutting away, in a manner approved by the Superintendent / Landscape Architect, and make good to match existing adjacent work in all respects.

1.20 Restoration of Damaged Surfaces

All areas which may have been damaged by construction traffic or otherwise are to be restored by the Contractor to the approval of the superintendent.

1.21 Removal of rubbish and Final Cleaning Up

The Contractor shall remove from the site all rubbish, debris, surplus materials, containers and the like.

On completion, the Contractor shall ensure that the site is cleaned, and that the whole is left fit for immediate occupation or use.

1.22 Specification and Drawings

Where any item of work is not wholly indicated on the Drawings, carry out and complete the items so as to correspond entirely with work of a similar nature drawn in detail elsewhere on the Drawings, and in full accordance with the Specification.

Should there be any discrepancy between Drawings and/or Specifications, the Contract shall be deemed to cover the alternative which includes the greater cost.

The Contractor shall notify the superintendent promptly on discovery of any such discrepancy. Failure to

do so and/or unilateral decision from the Contractor to select one particular option may render the work unacceptable to the superintendent, in which case the Contractor shall rectify the work at its own expense upon superintendents notification.

1.23 Substitutions

Substitutions of any material or workmanship for that specified or shown on the drawings shall not be made without the written approval of the superintendent.

1.24 Material and Workmanship

Materials, unless otherwise specified, shall be new and of best quality of the respective kinds specified, and all subject to approval.

Remove condemned materials from site at once. Treat materials damaged on site as condemned. Use proprietary materials and products strictly in accordance with maker's instructions and deliver to the site in their original unbroken containers. Supply evidence if required of the quality of materials.

Workmanship shall be first quality standard and to the approval of superintendent who shall decide how far trade customs shall prevail.

1.25 Protection of Finishes / Surfaces and Materials

The Contractor shall provide and fix adequate timber sheathing, building paper and other protective material to protect the works, finishes, materials and fixtures from mechanical damage, staining, scuffing or any deterioration due to any cause.

1.26 Shop Drawings

Shop drawing shall be prepared and submitted for superintendents for all work involving fabrication, installation and / or assembly of work components.

Submit one (1) copy to the superintendent for examination, if so required correct and re-submit, at least three (3) weeks before the information on the Drawings is required for fabrication and / or installation to commence. When circulation of Shop Drawings is required to include Design Consultant(s) submit one (1) print copy to all relevant parties.

Shop Drawings shall be examined for compliance with Design Intent only. This examination shall not diminish the Contractors responsibility for co-coordinating and approving shop drawings and for ensuring that they are in Agreement with Contract Documents and correct as to all relevant information.

Shop Drawings, if appropriate, will be endorsed to indicate design intent approval; amendments, correction and the like, but no such endorsement shall constitute an instruction to carry out Variation work under the Contract unless expressly stated to the contrary.

The Contactor will convene co-ordination meetings and administer and be responsible for the co-ordination process.

1.27 Fastening Generally

All fixings, fastenings and the like shall be of approved type, and appropriate for their purpose. Explosive driven fastenings shall not be used. Masonry anchors shall be of the patent expansion type. Timber plugs in masonry shall be dry winding cedar.

1.28 Site Inspection

Contractors are expected to visit and familiarise themselves with the site and the nature and extent of the works required.

1.29 Underground Services

Layouts of service lines, plant and equipment shown on the drawings are diagrammatic only. The Contractor is responsible for investigating and locating underground services before any site works. Do not excavate by machine within 1m of existing underground services.

1.30 Storage of Materials

The Contractor is responsible for the safe and proper storage of all materials, equipment, plants and tools. Storage of materials beneath the canopy of any existing tree, either located on the site or on Council's nature-strip or adjacent lands is not permitted. The Contractor is to coordinate with the site manager prior to commencement to determine appropriate storage areas on-site.

1.31 Damage

Protect finished surfaces and the immediate environment from dust and debris for the duration of the works.

The Contractor is responsible for making good any damage to trees, piping, fencing, utility services, footpaths, kerbs, roads, paint, render, tiles and surfaces in general.

1.32 Variation

No variations shall be made without prior written approval from the superintendent.

1.33 Program

The Contractor's quote is to state the time for completion of the landscape construction work. Before starting, submit an itemised program of work to the superintendent including the time involved for the various sections of work.

1.34 Tree Protection

General

The tree protection measures and ground protection measures shall be carried out in accordance with and contained in the Arboricultural Impact Assessment prepared Bird Tree Consultancy.

Existing Trees

Protect trees/shrubs specified or shown to be retained from damage by machinery, groundwork's, trenching and all other operations. Take necessary precautions, including the following:

Protective Fencing

Erect a 1800mm high chain wire fence and enclosures at the locations as approved and directed on site by the Superintendent. The fence/enclosures are to be erected prior to the commencement of any works on the site, including the establishment of site facilities and the importation of any materials or constructional plant. Care must be taken during the erection of the fence to ensure that woody roots and branches are not damaged.

Fence and enclosures shall be immovable, and of rigid construction. All materials shall be new. All posts, rails, wires and chain mesh shall be galvanized. A minimum of three cable wires shall be used. All changes in direction shall be adequately braced.

Suitable approved waterproof signs shall be attached to the fence. The text of the signs shall be 'Tree Protection Zone - No Access!' Lettering size shall be minimum 50mm high.

Throughout the duration of the works no access is to be allowed to the tree protection zone. Maintain temporary fences and barriers for the duration of the services. Remove such fences and barriers when no longer required.

Excavation in the Vicinity of Existing Trees to be Retained

Where trenches for services pass within the root zone or between trees to be retained all excavation is to be by hand. No roots greater than 50mm diameter are to be cut. Conduits must be 'threaded' under any roots exposed.

Any initial excavation within the root zone of trees to be retained must NOT be carried out by a backhoe, excavator, dozer or similar.

Submit detailed proposal for excavation procedures in the vicinity of existing trees to be retained for consideration by the superintendent prior to undertaking works. Proposal must include written advice by a qualified arborist.

Harmful Material

Do not store, stockpile, dump, or otherwise place under or near trees or vegetation, bulk materials and harmful materials including oil, paint, waste concrete, clearings, boulders and the like. Do not place spoil within the dripline of trees, even for short periods. Prevent wind-blown materials from harming or coating trees and plants.

Damage

Prevent damage to tree bark and limbs. Do not attach stays, guys and the like to trees. Works must be carried out in such a way as to avoid any contact between machinery and tree limbs and trunks.

Work under trees

Do not remove topsoil within the drip line of trees unless otherwise specified. If it is necessary to excavate within the drip line of existing trees notify the Superintendent prior to commencing work and obtain approval to proceed. Use hand methods or approved alternatives such as 'air knife' equipment such that the roots systems are preserved intact and undamaged. Provide written advice from a qualified arborist as to the suitability of proposed procedure. Open up excavations under tree canopies for as short a period as possible.

Grass and vegetation to be removed under or in the vicinity of existing trees to be sprayed with Glyphosate based herbicide and removed by hand when dead.

Roots

Do not cut tree roots exceeding 50mm diameter unless permitted. Provide written advice from a qualified arborist as to the suitability of any procedures.

Compacted ground

Avoid compaction of the ground under trees, or in the vicinity of existing vegetation.

Work on Trees

If it is considered necessary to perform any work on trees, including trimming, lopping, root cutting, repair and removal, apply for permission and await instructions. All pruning work must be in accordance with AS4373 - 2007 *Pruning of Amenity Trees*

Qualified Personnel

Any work permitted to be done on trees to be retained shall be performed by qualified personnel under the direction of an approved qualified arborist

Existing trees to be Pruned:

All pruning work must be in accordance with AS4373-2007 *Pruning of Amenity Trees*

All work on existing trees must be undertaken by qualified personnel under the direction of a qualified arborist. Provide written advice from an approved qualified arborist describing the work and procedures to be implemented.

1.35 Foreman

While work is being conducted on-site, ensure that a competent Foreman is on-site. On commencement of works, provide the name, position and contact details for the designated Foreman to the superintendent /client's representative. Any instruction given to the Foreman by the superintendent will be deemed to have been given to the Contractor.

1.36 Defects Liability Period

The contractor shall be held responsible for replacement of any work and/or materials that fail during the first 52 weeks following the date of practical completion.

1.37 Practical Completion

The site will be jointly inspected by the client and the superintendent. If the completed works meet the approval of both parties, then the works shall be handed over to the client. Practical completion will be confirmed in writing to the Client.

On Practical Completion the Contractor shall have carried out the following work in relation to that stage but not limited to:

- Removed all rubbish, plant and surplus material, including from garden and path areas, lawns, storage areas and other obscure places.
- Replaced damaged, marked or otherwise disfigured parts, fittings and equipment.
- Checked and left the work and equipment of all trades, services and installations in proper condition

- Washed and thoroughly cleaned all works areas
- Checked all light power points for operation
- Provision is made to furnish the Owner with operating instructions, maintenance schedules and the like for equipment and services, and 'as-built' Drawings of installations.
- Lodged with the superintendent / clients representative certificates and / or letters of satisfactory completion of the various Authorities requirements.

1.38 Record Drawings & Records

General

The Contractor must progressively produce "as - built drawings" and secure accuracy of detail. When work for which a construction document is required has been completed, submit the original of each drawing showing the work as completed within 28 days of completion of that work. Drawings required may include updated construction documents.

Submit the drawings as described above.

Contractor is also required to keep the detailed digital photographic record of all works prior to covering up. Contractor should provide one hard copy of colour digital photographs and electronic copy in JPEG format within 28 days of covering up of that work. The hard copy and electronic record should clearly show & describes the date photo was taken and location plus nature of work.

"As - built drawings" are required by the Principal for its operations. The submission of satisfactory "as - built drawings" and photographs of covered up work is a condition precedent to the issue of a Certificate of Practical Completion and any Separable Portion.

Retain all product and service conformance records as objective evidence of conformance with the Contract requirements. Include all Subcontractors' and suppliers' records and certificates. Maintain a register of all quality records.

Retention Period: Retain all product and service conformance records for a period of not less than 7 years from Completion.

Submission: Submit a copy of the register of product and service conformance records prior to Practical Completion.

Submit copies of product conformance records as specified,

Accuracy

Documents: Incorporate all modifications made during the progress of the work and testing period. Show any provisions for the future.

Endorsement: Sign and date all record drawings. Keep one set of shop drawings on site at all times expressly for the purpose of marking changes made during the progress of the works.

1.39 Operation and Maintenance Manuals

General

General: Submit operation and maintenance manuals for irrigation system (refer to section 01. Irrigation)

Authors and compilers: Personnel experienced in the maintenance and operation of equipment and systems installed, and with editorial ability.

Referenced documents: If referenced documents or technical work sections require that manuals be submitted, include corresponding material in the operation and maintenance manuals.

Subdivision: By installation or system, depending on project size

Contents

Include the following but not limited to:

Certificates:

- Certificates from authorities.
- Copies of manufacturers' warranties.
- Product certification.
- Directory: Names, addresses, and telephone and facsimile numbers of principal consultant, subconsultants, contractor, subcontractors and names of responsible parties

Drawings:

- Record drawings, full size.
- Drawings and technical data: As necessary for the efficient operation and maintenance of the installation.
- Equipment descriptions:
- Name, address and telephone and facsimile numbers of the manufacturer and supplier of items of equipment installed, together with catalogue list numbers.
- Schedules (system by system) of equipment, stating locations, duties, performance figures and dates of manufacture. Provide a unique code number cross-referenced to the record and diagrammatic drawings and schedules, including spare parts schedule, for each item of equipment installed.

Maintenance procedures:

- Detailed recommendations for preventative maintenance frequency and procedures.
- Manufacturer's technical literature as appropriate. Register with manufacturer as necessary. Retain copies delivered with equipment.
- Safe trouble-shooting, disassembly, repair and reassembly, cleaning, alignment and adjustment, balancing and checking procedures. Provide logical step-by-step sequence of instructions for each procedure.
- Schedule of spares recommended to be held on site, being those items subject to wear or deterioration and which may involve the principal in extended deliveries when replacements are required. Include complete nomenclature and model numbers, and local sources of supply.

Operation procedures:

- Manufacturers' technical literature as appropriate.
- Table of contents: For each volume. Title to match cover

1.40 Weed Eradication

Eradicate weeds and unwanted exotic grass growth from all proposed planting areas by environmentally acceptable methods. Continue eradication throughout the course of the works and during the Plant establishment period.

Eradication methods are to ensure no regrowth of weeds and exotic grasses either from seed sources in the soil, cuttings, suckers or other remnant vegetative material.

Physically remove all parts of weeds where no damage will occur to existing vegetation to be retained.

Prevent damage to existing vegetation to be retained including from physical damage and herbicides.

Submit proposals for weed and exotic grass removal and control measures to be implemented. Provide written advice from a qualified horticulturalist/bush regenerator as to the effectiveness of proposed measures.

Continue eradication throughout the course of the Works and during the Establishment Period

Weed species on site include, but are not limited to; African Box-thorn; African Olive; Blackberry; Thistles; Flatweed; Saltbush; Rumex; Paspalum; Paddy's Lucerne; Hibernia; Fleabane; Chickweed; Clover; Kikuyu; Couch; Typha; Prairie Grass; Spiny Rush; African Love Grass; Fireweed; Prickly Pear; Purple Top; Lambs Tongue; Bridal Creeper; Privet; Narrow Leaf Carpet Grass.

Undertake weed eradication and control regularly so that unwanted growth has no impact upon new plantings.

Any use of chemicals should obtain approval prior to undertaking works. Permits should be sought for off-label uses. It is expected that contractors will be familiar with appropriate chemicals and their uses. Biological controls are beyond the scope of this contract.

Noxious Weeds

The NSW Noxious Weeds Act 1993 (NW Act) imposes obligations on occupiers of land to control noxious weeds declared for their area. Weeds that are declared noxious are those weeds that have potential to cause harm to the community and individuals, can be controlled by reasonable means and most importantly, have the potential to spread within an area and to other areas. A weed is declared noxious because its control will provide a benefit to the community over and above the cost of implementing control programs.

There are five classes of noxious weeds identified in the Act (Refer Schedule of Weed Species Classification Table 3). All Noxious Weeds in NSW are listed in the Noxious Weeds database, <http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/noxweed>.

1.41 Maintenance

The contractor shall continuously maintain all areas of the contract during the progress of the works specified. The contractor shall commence and fully implement the short-term maintenance and establishment after practical completion has been confirmed.

Maintenance Period: 52 weeks.

1.42 Protection of Archaeological Items

Works in the vicinity of areas identified as likely to contain archaeological artefacts to be undertaken under the direction of an approved qualified archaeologist appointed by School Infrastructure experienced with such archaeological artefacts. Such areas will be identified by School Infrastructure prior to the commencement of works.

Allow for works in these areas to be undertaken under the direct supervision of an approved archaeologist. Carry out procedures as directed by the archaeologist to allow recording and protection of artefacts if found. Allow for all requirements of any research design prepared for these elements including:

- Working under the direction of an archaeologist
- Searches by archaeologists during the works
- Any protective measures as directed to preserve artefacts if found
- Limitations on access as directed
- Limitations on work methods as directed.
- Down-time resulting from retrieval and/or recording of artefacts.

Refer to Preliminary Risk Analysis: Aboriginal and Historic Heritage report by Australian Museum Business Services (AMBS). Prior to the initiation of construction works allow for work crews to be briefed by a heritage consultant on the heritage best practice requirements associated with Aboriginal and historic archaeological sensitivities, relics and sites.

1.43 Progressive Stabilisation Works

All disturbed areas are to be progressively stabilised and/or revegetated so that no areas remain exposed to potential erosion damage for more than 14 days. Where permanent finishes works will take longer than the 14 day period to implement then temporary stabilisation measures are to be undertaken. Refer to the Soil and Water Management Works section of this specification.

1.44 Soil and Water Management Works

Introduction

Erosion and sediment control measures are to be implemented on the site as required. These works are to be maintained and/or varied during the contract period unless the area they protect is rehabilitated. Remove all measures when no longer required.

Prevent pollution of any waters. No solid, liquid or gaseous matter is to be placed in a position where it is likely to fall, descend, be washed, be blown or percolate into unconfined surface water, a natural or artificial watercourse, drain, channel or gutter used to convey rainwater, stormwater, floodwater, or unpolluted water.

Make all site workers and sub-contractors aware of their responsibilities to minimise the potential for soil erosion and pollution to downslope lands and waters.

Standard

All works to comply with the Landcom publication "Managing Urban Stormwater: Soils and Construction", (The Blue Book) 4th edition.

Soil and Water Management Plan

Prepare a site specific Soil and Water Management Plan (SWMP), suitable for submission to approval authorities if required, demonstrating measures to be implemented on the site to prevent soil erosion and contamination of downslope waters. The plan shall reflect any proposed staging of the works. The SWMP shall be prepared by an approved qualified party to the requirements of the 'Blue Book'.

Measures to be undertaken

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MILITARY ROAD
MOSMAN, NSW

Technical Specification
Rev 03 AFC Issue, 25/03/22

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Implement measures as required to suit the staging of works. Typical measures include the following, as required, as described in the 'Blue Book'.

- general erosion control guidelines
- topsoil handling procedures
- assessment of erosion hazard
- temporary waterway crossings
- temporary water diversion structures
- earth banks
- energy dissipaters
- sediment basins
- sediment filters, such as sediment fences, straw bales, filter rolls, and the like
- filter strips such as grass
- drain and inlet protection devices
- stabilised site access
- control of wind erosion

Site Stabilisation

Schedule land disturbance and stabilisation programs to achieve the C-factor parameters and rehabilitation times described in the 'Blue Book'.

All disturbed areas are to be progressively stabilised and/or revegetated so that no areas remain exposed to potential erosion damage for more than 14 days.

Stockpiles

Stockpiles are not to be located within 2 metres of hazard areas, including likely areas of concentrated or high velocity flows such as spoon drains, paved areas and driveways. Install diversion banks upslope from and "silt" fencing downslope from any stockpile.

Material Receptors

Provide acceptable receptors for concrete and mortar slurries, paints, acid washings, light-weight waste material and litter. Empty as necessary and dispose of in an acceptable manner.

Variations to Control Measures

Relocate control measures from time to time to suit the construction program and to permit construction works to proceed whilst still maintaining adequate protection to downslope lands and waters.

Maintenance

All sediment and erosion control measures shall be maintained in a satisfactory working order or up until such time as the area, which they protect, is permanently rehabilitated.

Maintain works as described in the 'Blue Book', including testing of waste water in basins.

Inspect the site weekly and after every rain event to ensure that:

- a. Control measures operate effectively and to initiate repairs or maintenance as required.
- b. Spilled material is removed from hazard areas including likely areas of concentrated or high velocity flows such as spoon drains, gutters, paved areas and driveways.
- c. Sediment is removed from basins, "silt" fencing or traps when 10% capacity is trapped in the settling zone. All collected sediment is to be removed to areas where further pollution to downslope lands and waters is unlikely.
- d. Gravel or other filter materials are clean and have been reinstated or replaced to maintain effective performance.

All devices are to be inspected after each storm for structural damage or clogging by silt or other debris and to make prompt repairs or replacement.

Final Site Landscaping

Final site landscaping is to be undertaken as soon as possible in any precinct after other construction

activities are completed.

Reinstatement

Remove all construction and materials used in these soil and water control measures from the site when they cease to perform effectively and are replaced, are damaged or are no longer required.

Reinstate the finished ground level around the works after it is determined that the areas they protect are satisfactorily rehabilitated.

Trimming and Grading

Undertake incidental trimming and grading as required across the site, to:

- repair localised erosion
- form smooth transitions with adjacent ground
- spread surface water flows

Final Site Landscaping

Final site landscaping is to be undertaken as soon as possible in any precinct after other construction activities are completed.

Reinstatement

Remove all construction and materials used in these soil and water control measures from the site when they cease to perform effectively and are replaced, are damaged or are no longer required.

Reinstate the finished ground level around the works after it is determined that the areas they protect are satisfactorily rehabilitated.

1. Scope

Supply, install and prepare for tree and groundcover planting, including subgrade establishment, supply and installation of soil mixes, sub soil drains, watering pipes, protection board, drainage cell, root barrier filter fabric. Coordination of installation of advanced trees, supply and installation of groundcovers, shrubs, aftercare and planting establishment.

2. Quality**Standards**

Composts, Soil Conditioners and Mulches – AS 4454- 2012

Soils for Landscaping and Garden Use – AS 4419-2018

Inspections*Witness Points:*

Give not less than (3) three days notice so that inspection may be made of the following.

- Drainage cell with geotextile fabric and membrane protection board installed prior to laying or topsoil
- Tree Pit excavated and prior to backfilling
- Garden beds excavated, subsoil drainage installed and prior to back filling with imported soilmix
- Setting out completed
- Sand blinding layer laid prior to topsoil placement.
- Soil mixes installed
- Completed soilmix profiles before planting
- At time of tree planting
- On completion of tree planting
- At time of planting
- On completion of planting
- During and on completion of landscape maintenance period
- Completion of planting establishment work.
- Topsoil spread before planting.

Hold Points:

Give not less than (3) three days' notice so that inspection may be made of the following.

- Completed soil mix profile, shaped to levels and falls, and consolidated with protection layers in place prior to placing concrete base slab for paving.
- Garden beds excavated, subsoil drainage installed and prior to backfilling with imported soil mix.
- Drainage cell with geotextile fabric, root barrier and membrane protection board installed prior to laying sand blinding layer or topsoil.
- Setout of Plant Material

Tests*Soil test:*

Provide a complete chemical test certifying that the topsoil mixes meet the required specification allow for any subsequent retesting.

Samples

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

Provide samples as follows:

- Imported soil mixes – 3kg bag
- Mulch to garden beds – 3kg bag
- Plants – as specified below
- Drainage cell – 1 module

Submit one plant sample for each 100 of each species or variety, in the condition in which it is proposed to be supply that plant to the site.

Submission*Suppliers:*

Submit statement from suppliers of plants and other materials, giving the following, where applicable.

- Particulars of the suppliers 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:

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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Suppliers data: Supplier's data: Submit supplier's data including

- Certificate identifying seed species, purity, age and germination viability; and
- Material source of supply
- Evidence of hardening off programme for plant stock

Compost: Submit a certificate of proof of compost pH value.

Execution:

Program: Submit a work program for the landscape works.

Maintenance program: Submit a proposed planting maintenance program.

3. Materials & Components

GARDEN PROFILE 1 – GARDEN ON GRADE (G1)

GARDEN PROFILE 2 – GARDEN ON GRADE (G2) - TPZ

GARDEN PROFILE 3 – GARDEN ON GRADE (G3) – RAISED PLANTERS

PLANTER TYPES (PL1, PL2 , PL3, PL4 and PL5)

GARDEN PROFILE

Excavation for planter beds

Excavate site soil to allow for proposed finishes. Return or replace as clean fill where determined appropriate by structural and geo-technical engineers. Not to be reused as planting or turf soil.

Removal of planter bed debris

Remove all building rubble, waste oil, cement and other material harmful to plant growth from planting beds prior to placement of topsoil.

Garden beds (G1, G2 and G3) on grade

Spread the topsoil on prepared subsoil and grade evenly, making the necessary allowances to permit the following:

- Required finished levels may be achieved after light compaction

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 with site soil or imported topsoil to restore design levels.

Finishing: Feather edges into adjoining undisturbed ground.

Cultivation

As noted on details.

Garden beds (G3 and PL1-PL5) on grade

Imported Fill Soil No.2 – as supplied by Benedicts Sand and Gravel or approved equivalent.

Drainage cell: (G3 and PL1-PL5)

To the base of planters as detailed. Refer to drawings: 03-06 / LA-89-G-A-401 (30mm drainage cell and or Atlantis flo-tanks).

To the vertical faces and overhangs if applicable: 30mm drainage cell.

Lay according to manufacturer's instructions. Drainage cell to be fully wrapped in geotextile fabric as specified.

Geotextile Fabric: (G3 and PL1-PL5)

Geotextile as recommended appropriate by Atlantis Water Management or similar and approved. Wrapped and taped to manufacturer's instructions.

Sources/ contacts:

Atlantis Water Management

Phone: 9419 6000

Sand Blinding layer (PL1-PL5):

50 -100mm nominal coarse washed river sand.

Root Barrier (G3)

Root barrier shall be: HDPE (High Density Polyethylene) root barrier. Joints are to be taped. Generally lay and join material to manufacturers recommendation.

Membrane protection board (G3)

Provide 9mm CFC vertical or approved equivalent (screed to Architect's detail)

TREE PITS / TREE PLANTING

Excavation for tree pits

Excavation depths are as follows (900mm) unless detailed otherwise on the drawings. Remove all excavated material from site. Do not disturb services, excavate by hand around services.

Subgrade preparation

Excavate holes from subgrade to depths shown on the drawings and leave all finished surfaces clean and straight. Fall sub grade rock to facilitate positive drainage to air cell and sub soil drainage.

Test subgrade soils for suitability to support plant growth, incorporate any additives that may be required. Manually cultivate subgrade to base of tree pit and link channel excavations to a depth of 150mm. During cultivation, thoroughly mix in any materials to be incorporated in the subsoil.

Sub soil drainage

Ensure positive drainage to all tree pits prior to backfilling. If not install sub-soil drainage lines and connect to available stormwater system. Notify Superintendent with two days notice for inspection of drainage operation prior to backfilling.

SOIL MIX

GARDEN PROFILE 01 – GARDEN ON GRADE (G1)

GARDEN PROFILE 02 – GARDEN ON GRADE (G2) - TPZ

Source/ Type:

Garden Profile 01 and 02

Imported Topsoil Type A: The Hills Bark Blower Premium Garden Mix, As supplied by The Hills Bark Blower or approved equivalent.

Depth: Spread to a full depth as nominated on drawings.

Sources/ contacts

The Hills Bark Blower

Phone: 02 9654 2288

GARDEN PROFILE 03 – GARDEN ON GRADE (G3) - RAISED PLANTER

Garden Profile 03

Imported Topsoil Type A: The Hills Bark Blower Premium Garden Mix, As supplied by The Hills Bark Blower or approved equivalent.

Depth: Spread to a full depth as nominated on drawings.

Sources/ contacts

The Hills Bark Blower

Phone: 02 9654 2288

Clean Fill

Imported B Horizon (Inorganic matter) - Imported Fill Soil No.2 – as supplied by Benedicts Sand and Gravel or approved equivalent. Depth: Spread to a full depth as nominated on drawings.

Sources/ contacts

Benedicts Sand and Gravel

Phone: 02 9986 3500

PLANTER TYPES (PL1, PL2 , PL3, PL4 and PL5)

PL1, PL2, PL3, PL4 and PL5

Imported Topsoil Type A: The Hills Bark Blower Lightweight Planter Mix, As supplied by The Hills Bark Blower or approved equivalent.

Depth: Spread to a full depth as nominated on drawings.

Sources/ contacts

The Hills Bark Blower

Phone: 02 9654 2288

Imported Topsoil Type B: The Hills Bark Blower Lightweight Subsoil Mix, As supplied by The Hills Bark Blower or approved equivalent.
Depth: Spread to a full depth as nominated on drawings.

Sources/ contacts
The Hills Bark Blower
Phone: 02 9654 2288

TREE PIT TYPE 01

Imported Topsoil Type A: The Hills Bark Blower Premium Garden Mix, As supplied by The Hills Bark Blower or approved equivalent.
Depth: Spread to a full depth as nominated on drawings.

Sources/ contacts
The Hills Bark Blower
Phone: 02 9654 2288

Clean Fill

Imported B Horizon (Inorganic matter) - Imported Fill Soil No.2 – as supplied by Benedicts Sand and Gravel or approved equivalent. Depth: Spread to a full depth as nominated on drawings.

Sources/ contacts
Benedicts Sand and Gravel
Phone: 02 9986 3500

TREE PIT TYPE 02

Filter Media: Benedicts Bioretention Filter Media, As supplied by Benedict Sand and Gravel or approved equivalent.
Depth: Spread to a full depth as nominated on drawings.

Soil Structural System:

Stratavault soil structural system 'Strata vault 30' as supplied by City Green or an approved equivalent

Transition Layer:

Transition Layer: 100mm (nominal) depth washed glass sand - Benedict Washed GlassSand, As supplied by Benedicts Sand and Gravel or approved similar.

Drainage layer:

Drainage Layer: 200mm (nominal) depth fine grade (5mm) aggregate drainage layer - Benedict No Fines Drainage Gravel, As supplied by Benedicts Sand and Gravel or approved equivalent.

Sources/ contacts
Benedict Sand and Gravel
Phone: 9986 3500

STRUCTURAL SOIL

Use: backfill to Treepits

Description: Benedict SmartMix3 – 40mm Structural Soil Mix

Components: 80% Nominal 40mm (-63mm +25mm) Basalt Aggregate either recycled or ballast aggregate. Narrowly graded uniform sized angular clean hard and durable gravel sized approximately 25 to 75mm

20% Filler Soil consisting of one(1) part Menangle Sandy loam to one one(1) part Screed Dolerite. Remixed filler soil is a clay loam of uniform composition. It is free of stones greater than 15mm. The filler soil is free of toxic substances harmful to plants. The mix contains less than 1% by mass organic matter.

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

Submit filler soil for testing and approval prior to blending with aggregate to form soil mix. Filler soil shall

be tested for chemical and physical compliance with this specification. At the time of submitting samples for testing (5kg) the contractor supply a list of the component used in the mix and their proportion as well as rates of any chemical additives

All testing shall be undertaken by a competent laboratory for compliance to AS4419. The contractor shall pay the cost of all tests, including transport of samples to the laboratory. Laboratory reports shall be issued direct to the superintendent. The contractor shall incorporate all necessary amendments to tested samples in order to achieve compliance with the specification.

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

Each load of soil mix delivered to site must be accompanied by the supplier's delivery docket which identifies the load, batch, and confirms the volume and weight, and certifies that the soil mix complies with the Specification. All dockets must be presented to the Superintendent prior to unloading of the soil mix. All soil mixes delivered without the above documentation may not be accepted onto the Site, such decision being at the sole discretion of the Superintendent.

Tests Schedule

Test Type Required: Complete Soil Test and Agronomists report as available from Sydney Environmental & Soils Laboratory.

Materials To Be Tested	No. of Tests Required
Filler Soil	1 at approval stage
Structural soil	2 at random during construction
Soil mix	1 at approval stage

Watering Points / Water harvesting

Install tree and garden bed watering pipes to the extent shown on the details, PVC flexible coil pipe. Construct from 100-mm diameter with filter sock and set in a true horizontal position to enable an even distribution of water around the tree root zone. Fit upturn at nominated location and connect to pavement inspection/inlet grates. The grates shall be 150 mm X 150 mm hinged grate in nickel bronze finish equal to "SPS Squareflo series 150" with "no-hub" coupling for connection to slotted UPVC pipe. Finish grates flush with adjoining pavement levels.

Connect tree manifold with 100mm diameter galvanised steel pipe to drain system. Garden beds to consist of PVC flexible coil pipe, 50mm diameter with filter sock connected to tree manifold with PVC adaptor. Garden bed pipe to be set in a true horizontal position to ensure that water is distributed evenly. Garden bed manifold to be upturned at end and terminated with a threaded removable cap.

Notify Superintendent with two days notice for inspection of water harvesting system prior to covering and completing paving and garden bed construction.

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.

Fertiliser schedule

Location	N:P:K ratio	Application rate
All trees and shrubs in areas of organic mulch at time of planting	Pelletised poultry manure Equivalent to "Dynamic Lifter"	250g on top of root ball
All trees and shrubs three weeks after planting	10:6:4 equivalent to "multi grow"	60g per tree and shrub applied to top of soil around root ball

4. Execution

Planting beds on grade

Planting beds

Refer to drawing LA-86-G-L0-101 TO LA-86-G-L0-104 for location and extent. Refer to Detail 01-03 / LA-89-G-A-401. Excavated: Excavate to bring the subsoil to at least 300 mm below finished design levels. Shape the subsoil to fall to subsoil drains where applicable. Break up the subsoil to a further depth of 100 mm.

Cultivation

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Technical Specification
Rev 03 AFC Issue, 25/03/22

black beetle

Minimum depth: 100 mm.

The 100 mm minimum depth assumes that the subsoil is of sufficiently good quality and it therefore is not necessary to excavate and to import topsoil. This depth may not be achievable on rocky or steep areas. Vary if required. Where required imported fill as nominated is to be used to adjust levels accordingly.

Services and roots: Do not disturb services or tree roots and if necessary cultivate these areas by hand.

Cultivation: Thoroughly mix in materials required to be incorporated into the subsoil. Cultivate manually within 300 mm of paths or structures. 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 surface to design levels after cultivation.

(NO CULTIVATION TO GARDEN AREAS G2)

Additives

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

Gypsum: Incorporate at the rate of 0.25 kg/m².

Herbicide: Before spreading topsoil apply a herbicide treatment

Planting beds general

Topsoil Consolidation

Compact lightly and uniformly in 150mm layers. Compact topsoil mix with a single pass of a 50 kg hand drawn tennis court roller or similar means to a compacted depth of 150mm. Lightly water with a fine mist spray each layer, prior to installing the following layer. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to 30mm above design levels to allow for consolidation.
- 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 planting.

Settlement period

Allow the topsoil in planter boxes and garden beds to settle for one week prior to planting. Top up any settlement as required to meet design levels.

Topsoil depth

Typically spread topsoil to the depths as indicated on drawings.

Surplus topsoil

General: Spread surplus topsoil on designated areas on site, if any; otherwise, dispose off site.

Existing services

Do not disturb services during backfilling and compaction operations. Ensure that all protective measures have been installed prior to backfilling with soil mix.

5. Plants

Pre Ordering

The contractor shall be responsible for ensuring that all plant material is available to sizes and species type nominated in the plant schedule (refer to dwgs: LA-01-G-A-002, LA-88-G-L0-301- 304, LA-89-G-L3-305-306, LA-89-G-L4-307-308, LA-89-G-L0-310) for mature size specimens and plants required in large quantities this may require the preordering and growing on of species by a selected nursery for an extensive period of time prior to their installation. No substitution of species or sizes will be accepted unless evidence can be furnished to the Landscape Architect of all reasonable attempts being made to acquire the nominated species between the time of the contract being awarded and the landscape construction date.

Specimens nominated as so in the plant schedules have been selected by the Landscape Architect under agreement with the Client. The contractor shall satisfy themselves of the health and vigour of the selected specimens and provide written agreement as such.

It is the responsibility of the Contractor to supply the scheduled number of plants to the quality, size and health in accordance with this Specification and Plant Schedule. The Project Manager must be informed immediately if any difficulty is encountered in procuring the plants at the appropriate times. The secured plants shall be set aside from any other plants on the nursery site at which they are to be stored, and

clearly labeled as being for this project. The allocated plants must also be made available to the Project Manager to be inspected at all times.

Plants

General: 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.

Trees: Provide trees which, unless required to be multi-stemmed, have a single leading shoot.

Replacement: Replace damaged or failed plants with plants of the same type and size

Plant containers

General: Supply plants in weed-free containers of the required size.

Open rooted stock: If trees are to be supplied as open rooted stock, ensure this is appropriate to the species, variety, size, and time of year for planting.

Potting-on: Do not carry out potting-on.

Defective Samples

If samples so inspected are found to be defective, the entire line represented by the defective samples may be rejected. All plants rendered unsuitable as a result of this inspection will be considered as samples on which payment cannot be claimed.

Size and Form Requirements

At the time of delivery all plants shall conform with the specified minimum size and nominated container size, confirmed in the Plant Schedule.

Plants shall be grown, maintained, pruned and fertilised to produce a specimen at delivery conforming with the detail and description contained in the Plant Schedule. This shall include root pruning to advanced stock for a minimum 12 week period prior to delivery to site. Rootball dimensions should be appropriate to the planter into which they will be installed.

Production and Maintenance Generally

The plants shall be watered, fertilised, and treated for pests and diseases all as necessary to maintain continuing healthy growth. An approved pruning programme shall be carried out regularly during the Establishment Period to promote trunk and foliage canopy formation in trees all as directed by the Project Manager.

All plants must have been inspected by the Project Manager before delivery to site. Inspection by the Project Manager does not constitute approval and all plant material is to perform to the requirements of this specification or be replaced at the Sub-contractor's expense.

Installation

General

Acceptance of delivered stock, including installation to approved set out

The Sub-contractor shall allow for the delivery of the scheduled plants to the site. The Project Manager / Landscape Architect will inspect all plant stock on arrival at site prior to unloading. The Project Manager's inspection does not constitute approval and all plant material is to perform in accordance with this specification.

Labeling

Label at least one plant of each species or variety in a batch with a durable, readable tag.

Storage

Whenever possible plants shall be planted immediately after delivery to site. Maintain plants on site in perfect condition. Prevent theft, drying out or damage from any cause including frost, wind, sun, vermin, animals and the like. The Contractor shall be responsible for replacement at his own cost of any losses resulting.

Locations

Refer to hold points

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Technical Specification
Rev 03 AFC Issue, 25/03/22

black beetle

Do not vary the plant location from those required. If it appears necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, apply for directions.

Planting conditions

Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

Watering

Thoroughly water plants immediately after installation and continue adequate watering to keep them healthy and growing vigorously. Vary watering regime as necessary to account for climatic conditions e.g. increased frequency of watering during periods of dry or windy weather/ decreased frequency during periods of rain.

The contractor is to provide the water supply as required to maintain all newly vegetated areas in optimum condition for the duration of the construction period and maintenance period. Submit details of water supply proposals for approval at least six weeks prior to undertaking any revegetation operations.

The contractors watering program shall have regard to current and likely compulsory restrictions on the use of a mains water supply.

The contractor is to bear all costs associated with the provision of any water supply, and all materials and labour, including 'out of hours' work, associated with watering operations that may be required to maintain plant material and revegetated areas in healthy condition for the duration of the contract.

The contractor is to provide all suitable means for transporting the water across the site

Placing

Ascertain location of all underground services prior to commencing excavation and co-ordinate with other relevant works. Remove the plant from the container with minimum disturbance to the root ball, ensure that the root ball is moist and place it in its final position, in the centre of the hole and plumb, and with the top soil level of the plant root ball level with the finished surface of the surrounding soil.

Notify in writing of all soil or other drainage conditions which are considered detrimental to the growth of plant materials. State condition and submit proposal for correcting condition if feasible including change in cost, if any.

Plants are to be pre-watered prior to removal from containers. Ensure that all plant root systems are kept moist at the time of removal from container, and that minimal disturbance of the root system occurs during planting.

Excavate planting holes one and half times the container depth, and twice the container width. Cultivate subgrade within each hole and loosen compacted sections on the base and sides of the hole if they occur. Pre-water holes prior to planting.

Position plants so that the soil level of the plant rootball is level with the finished surface of the soil surrounding the hole.

Carry out all backfilling using backfill soil mixes, ensuring complete filling and consolidation of voids in and around the root system.

Spraying

Immediately report any evidence of insect attack or disease amongst plant material.

Where required, spray with insecticide, fungicide or both in accordance with the manufacturers' recommendations. Submit proposal and obtain approval before starting this work.

Maintenance

Continue maintenance of plants including watering, removal of weeds and grass growth within mulched areas, disease and pest control and adjustment of stakes ties and tree guards for the duration of the contract period and Plant Establishment Period.

Replacement

Replace plants, which wilt, fail to thrive, are broken or damaged, are incorrectly planted, are diseased or are defective in any manner.

Fertilising

Pellets: In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting.

Application rate (kg/ha): Refer to Fertiliser schedule

Backfilling

Backfill with topsoil mixture. Lightly tamp and water to eliminate air pockets. Ensure that topsoil is not placed over the top of the root ball, so that the plant stem remains the same height above ground as it was in the container.

Thoroughly incorporate fertilizer into the backfill soil mix at the following rates, unless otherwise recommended by manufacturer:

1. Tube 5 grams
2. 150mm dia. container 5 grams
3. 200 mm capacity container 15 grams
4. 35 litre capacity container 20 grams
5. 100 litre capacity container 50 grams
6. 200 litre capacity container 60 grams

7. Mulching

General: Provide mulch which is free of deleterious and extraneous matter such as soil, weeds and sticks.

Standard: To AS 4454- 2012 Composts, Soil Conditioners and Mulches

Organic mulches: Free of stones.

Organic mulch types

The Hills Forest Playmulch or approved equivalent

Supplier: The Hills Bark Blower

Phone: 02 9654 2288

Placing mulch

General: Place mulch to the required depth, clear of plant stems, and rake to an even surface flush with the surrounding finished levels. Spread and roll mulch so that after settling, or after rolling, it is smooth and evenly graded between design surface levels sloped towards the base of plant stems in plantation beds.

Application: Place mulch clear of plant stems, and rake to an even surface flush with the surrounding finished levels.

Depths: Spread organic mulch to a depth of 50-75 mm as nominated on planting details.

8. Edge Type 1 (E1) & Edge Type 2 (E2)**Scope***Edge Type 01*

Install metal edge strips to interface of planting areas and grass areas at locations indicated on the drawings as per detail

Edge Type 02

Install metal edge strips to interface of Pavement Type 05 and concrete Roof at locations indicated on the drawings as per detail

Standards

All workmanship and materials shall be in accordance with AS4100 and AS1554 except where varied by the contract documents.

Referenced Documents:

AS 4100	SAA Steel Structures Code
AS 1538	SAA Cold-formed Steel Structures Code
AS 1554	SAA Structural Steel Welding Code Part 1 - Welding of steel structures
AS 1650	Galvanized coatings
SAA MA1.8	Fabrication

SAA MA1.9 Erection

Recognised Australian codes of practice and standards where these exist but are not specifically referred to in this Specification

Quality Inspections

Witness points

Give not less than 3 days notice so that inspection may be made of the following.

- Location and setout of steel edging
- Completion of steel edging

Submission

Product Data

Submit product data for material and product, including manufacturers instructions, properties, test results, construction detail and any option as appropriate for:

- Metal components and finishes
- Applied coatings, including substrate preparation and pretreatment.

Include product data for adhesives, fasteners and joint sealants.

Execution:

Welding procedures: Submit details of proposed welding procedures before fabrication.

Welding dissimilar metals: Submit the following details:

- Type and thickness of materials to be welded.
- Proposed joint preparation and welding procedures.
- Proposed filler metal.
- Expected dilution (proportion of fused parent metal in the weld metal).

Control Samples

Submit representative control sample for

- Metal components and finishes
- Visible fasteners

Condition precedent to Practical Completion include

- Trade Warranty

Certification requirements include

- Structural certification

Testing Generally

Provide evidence/ testing data and reports to demonstrate that all materials/ products proposed have been tested to meet the standards specified herein.

Where testing has not previously been carried out on products/ materials proposed, arrange for tests to be carried out to comply with the Specification to the satisfaction of the Superintendent.

The provision of testing data or the carrying out of tests shall not relieve the Sub-Contractor of his responsibilities regarding the performance requirements, durability or service life requirements, etc.

Health and Safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel

The installed work shall comply with legislative requirements and accept industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of work.

Comply with relevant legislative requirements and the regulations of the relevant Authority.

Performance requirements

Fit for purpose

All materials and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Movements.

The installed work, including fasteners and framing, shall accommodate all short and long term movements and deflections in the base building, substrates to which the work is fixed, and within the work, including thermal movements, without failure or the transfer of loads from the base building to the work of this trade.

Loads

The installed work, including fasteners and framing, shall accommodate all permanent and temporary loads, individually and in combination, without failure, deflection, damage to adjacent or applied work, or risk to human safety in accordance with the relevant standards

Applicable loads may include dead loads, live loads, human impact loads, wind loads, earthquake loads, maintenance loads and service loads as applicable.

Connections

The installed work shall be connected to the base building or substrates in a neat, substantial manner by correctly sealed and located connections which transfer the loads from the work without displacement, distortion, or damage to the fasteners, substrates or the adjacent work. Connections shall accommodate movement requirements.

Visible fasteners.

Visible fasteners shall be evenly and neatly located and aligned. Use correctly sized tools to prevent damage to fasteners and adjacent surfaces. Rectify damage or marking to adjacent surfaces due to installation of visible fasteners. Where required to be finished flush with adjacent surfaces, visible fasteners shall be countersunk. Visible fasteners in accessible areas shall be vandal resistant.

Sharp edges.

There shall be no sharp edges or projections, which could cause human injury including injury to maintenance personnel.

Exposed fasteners shall be recessed, smooth and flush. Use flush countersunk heads where practicable.

Exposed thread ends of bolts shall be avoided, and where unavoidable, shall be cut back and ground smooth with no more than two threads exposed.

Metal edges and corners shall be rounded and smoothed to prevent human injury.

Corrosion

Materials and products, including fasteners and concealed components, shall be corrosion resistant or protective coated to prevent corrosion.

All materials and products, including fasteners and concealed components, required to be corrosion – resistant or protective coated shall be inspected after installation for any defects or damage incurred during installation and all defects and damage discovered shall be rectified.

Compatibility

Adjacent materials and products shall be chemically and electrolytically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spacers. Adjacent materials and products, including adhesives and joint – sealants, shall not stain or contaminate and shall not cause visual or structural defects in adjacent materials.

Tolerances

Fabrication tolerance of components and assemblies generally shall not exceed

- Length and width: +/- 1mm

- Diagonals: +/- 2mm
- Flatness: +/- 1mm /Lm (max. 2mm)
- Edge Straightness: +/-1mm / Lm (max. 2mm)

Installation tolerance for finished work shall not exceed

- Position on plan, or vertical surface: +/-3mm
- Deviation in level (horizontal): Not more than 1 in 1000 (max. 3mm)
- Deviation in plumb (vertical): Not more than 1 in 1000 (max. 3mm)
- Edge Straightness: +/-1mm /Lm length (max. 2mm)

Materials and Components

Metal Edging (E1)

Provide metal edge to locations indicated on drawings and to detail No 03/ LA-89-G-A-402.

Size: nominal 100mm deep and 6mm thick. Dimensions may vary, all edging requirements should be verified on site prior to fabrication/installation.

Installation: Set edgings flush with adjoining turf and gravel. Fix steel edging in place by spot welding mild steel pegs to steel at intervals no more than 1200mm apart and at alternating sides of edging. The pegs should finish 50mm below the top of the steel edge.

Joins: Butt weld and grind flush.

Metal Edging (E2)

Provide metal edge to locations indicated on drawings and to detail No 04/ LA-89-G-A-403.

Size: nominal 40mm x 40mm Metal angle. Dimensions may vary, all edging requirements should be verified on site prior to fabrication/installation.

Installation: Set edgings flush with adjoining Pavement Type 5. Chemically and /or mechanically fix steel edging in place.

Execution

General

Mark out alignment and levels on site for approval prior to installation

Fabricate metalwork to a high standard of fit and finish in accordance with approved control samples and shop drawings and the relevant standards

Establish finish quality standards before commencing fabrication. Finished work which does not comply to a high standard will be rejected and may require removal and complete replacement.

Visible surfaces, profiles and edges shall be fabricated with smooth, straight lines and angles, and uniform curves. Install work accurately and rigidly to required locations.

Surfaces and edges generally shall be clean, neat and free from burrs and indentations.

Butt welds shall be complete penetration butt welds to AS1554.1

All other welds shall be 6mm continuous fillet type GP using E41XX electrodes.

All steelwork shall be security temporarily braced as necessary to stabilise the structure during erection.

Prefabrication: Fabricate and pre-assemble items in the workshop wherever practicable.

Edges and surfaces: Keep clean, neat and free from burrs and indentations. Remove sharp edges without excessive radiusing.

Remove sharp edges without excessive or uneven radiusing

Joins: Fit accurately to a fine hairline.

Joints and assembly

Joints and assembly shall be robust and solid, and shall not become loose or break during normal in service use.

Visible joints shall be accurately scribed and fitted to fine, tight hairline fit without edge projection and misalignments

Ensure continuity of surface finish, colour and texture without variation

Edge Type 1 (E1)

Supply and install edges to the lines, levels and locations as shown on the Landscape Drawing Set

All junctions of edging boards shall be butt jointed, and shall occur where curvature is not excessive.

Pegs shall be firmly driven into the ground at maximum 1200 mm spacings or as required to hold the edging in position.

Edge Type 2 (E2)

Supply and install edges to the lines, levels and locations as shown on the Landscape Drawing Set

All junctions of angle shall be butt jointed, and shall occur where curvature is not excessive.

Chemically and /or mechanically fix steel edging in place.

Fabrication Tolerances

Ensure that in addition to the general requirements of the Specification:

- A high degree of accuracy shall be employed in the fabrication of work under the Contract and its support structure.
- Deviations in length, width and diagonal dimension shall not exceed $\pm 1\text{mm}$.
- The twist and warping shall not cause any point to be more than 0.5mm out of plane.
- The twist and warping shall not cause any point of the structural frame to be more than 2mm out of plane.

Thickness: Tolerances

Welding, Brazing, Soldering

Visible joints: Finish visible joints made by welding, brazing or soldering by grinding, buffing or the like methods appropriate to the class of work before painting, galvanizing, or the like further treatment.

Standards: To AS 4100 and AS 1554.

Correction of Faulty Welds: To AS 1554, Part 1, clause 5.8

Fastenings

Generally: Fastenings, including anchors, lugs, screws, rivets and the like, shall be of approved type, appropriate to the work, capable of transmitting the loads and stresses imposed, and sufficient to ensure the rigidity of the assembly.

Handling and Storage

Generally: To SAA MA1.9, section 9.1.4. Handle and store steelworks so as to protect it from damage, including overstress, distortion, damage to surfaces and applied finishes, contamination by foreign matter, and the like.

Correction of Faults: To AS 4100

Steel Type and Grade

Standards: Steel shall be of the types and grades shown on the Drawings or scheduled, to the appropriate material standard, and to AS 1250, Section 2, or AS 1538, clause 1.7 in the case of cold-formed sections.

1. Scope

Supply, install trees, shrubs and groundcover planting to a standard that allows them to establish rapidly and grow to maturity.

Maintenance: Encourage and maintain healthy growth for the duration of the contract.

Program: Provide a suitable irrigation, pruning, fertiliser and monitoring program for all plant materials held by the supplier. Take any other precautions required to safeguard the health and well being of all plant materials before and including their delivery to site.

Standards

Follow the guidance given in *NATSPEC Guide: Specifying Trees – a guide to assessment of tree quality*. AS2303-2018 : Tree stock for landscape use

Definitions

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

Size Index: Product of height (m) x calliper (mm).

Tubes or plant cells: Trees grown in small containers or cells in trays with a height: diameter ratio > 3:2, typically < 0.75 L.

Small trees: Trees grown in containers < 20 L (other than tubes or plant cells), and ex-ground trees of Size Index < 35.

Large trees: Trees grown in containers > 20 L, and ex-ground trees of Size Index > 35.

2. Quality

Inspections

Witness Points

Give sufficient notice so that trees may be inspected before shipment

Hold Points

- Trees/plants available for inspection at the nursery
- Trees/plants delivered to site prior to setout

Partial Sampling

Method: Expose a small section of the rootball by washing sufficient to permit inspection of root development from the stem to the outer extremity. After inspection carefully replace soil.

Rates: Inspect root systems using partial sampling at the following rates:

- < 20 trees: 1 tree sampled

Test

Rootball occupancy test

Shake or handle unsupported rootball

Acceptance criterion: > 90% of soil volume remains intact

Small trees rootball: shoot ratio test

Procedure: Hold stem at 80% of height above ground, deflect 30° from vertical, side to side.

Acceptance criterion: Container or rootball remains flat on the ground.

Contractors Submission

Plant provenance

Locality: Provide written certification that all plant material has been grown from locally provenanced stock. If this is not achievable give notice.

Species: Provide written certification that all plant material is true to the required species and type.

Reports

Forward order contracts: Submit regular reports in writing to the contract administrator. Include checks against specification requirements and current photographs.

- Inspection frequency: 3 months
- Report frequency: 3 months

Materials

Substitution: If non-complying trees are proposed, submit proposal. Submit a copy of the approval of substitution with the non-complying trees for approval by project Landscape Architect.

Execution

Holding methods: Submit proposed methods for holding trees beyond specified dates so that trees will continue to comply

Photographic examples

Requirement: Submit photographic examples as follows:

- 100, 200, 400L plant species.
- Specimen / exground plant species.

Program: Within fourteen (14) days of the date of contract.

Clarity: Sufficient to be able to ascertain the species, size and quality of a single specimen of the subject plant.

Identification: Provide photographs as follows:

- In colour.
- With a clearly identifiable scale reference located in the same plane as the plant stem or trunk.
- Labelled with plant species name.

Progress reports

Content: A detailed resume of the quantities, growth, general health and geographic location of the complete inventory of plant material for the works.

Purpose: To evaluate progress payments under the general conditions of contract.

Program: Monthly.

Accreditation

Submit evidence of accreditation as follows:

3. Trees/Plants

General

Labelling

General: Clearly label individual plants and batches.

Label type: To withstand transit without erasure or misplacement.

Health and vigour

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.

Damage: Supply plants free from damage and from restricted habit due to growth in nursery rows.

Stress: Supply plants free from stress resulting from inadequate watering, excessive shade or excessive sunlight experienced at any time during their development.

Site environment: Supply plants that have been grown and hardened off to suit the conditions that could reasonably be anticipated to exist on site at the time of delivery.

Root development

Containers: Grow plants in their final containers for the following periods:

Plants < 25 l size: > 6 weeks.

Plants > 25 l size: > 12 weeks.

Freedom from pests and disease

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

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

Below Ground - Plants

Requirement: Supply plant material with the root system:

- Well proportioned in relation to the size of the plant material.

- Conducive to successful transplantation.
 - Free of any indication of having been restricted or damaged.
- Root inspection: If inspection is by the removal of soil test as follows:
- For > 100 samples: Inspect 1%.
 - For < 100 samples: Inspect 1 sample.

Sample plants: Replace.

Alternatives:

Reject the entire line represented by the defective sample.

Treat to correct the defects before planting.

Rejection: Root bound stock.

Above Ground - Trees

Labelling

Clearly label individual trees and batches.

Label type: To withstand transit without erasure or misplacement

Health and vigour

Health: Supply trees 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 trees with extension growth consistent with that exhibited in vigorous specimens of the species nominated.

Freedom from pests and disease

Pests and disease: Supply trees 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.

Freedom from injury

Supply only trees free from injury.

Self-supporting

Supply only trees that are self-supporting.

Stem taper

Supply trees where the calliper at any given point on the stem is greater than the calliper at any higher point on the stem.

Pruning

General: Comply with the recommendations of AS 4373

Clean stem height: < 40% of total tree height.

Pruning wounds: Restrict fresh (i.e. recent, non-calloused) to < 20% of total tree height.

Type: Ensure a clean-cut at the branch collar.

Diameter of wound: < 50% of the calliper immediately above the point of pruning.

Apical dominance

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

Crown symmetry

Crown 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

Supply 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

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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

Indication of north

Trees in containers > 100 L or of Size Index > 140: Indicate the northerly aspect during growth in the nursery to withstand transit without erasure or misplacement.

Below Ground

Root division

Trees in containers < 45 L or ex-ground trees with a Size Index < 70: Primary division of roots at < 100 mm intervals.

Trees in containers > 45 L or ex-ground trees with a Size Index > 70: Primary division of roots within the outer 50% of the rootball at < 100 mm intervals.

Root direction

General: 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.

Rootball occupancy

Soil retention: On shaking or handling the unsupported rootball at least 90% of the soil volume to remain intact.

Rootball depth

Rootball depth assessment for containers/rootballs > 45 L or larger:

Depth: < maximum depth specified and no rootball (regardless of size) > 550 mm in depth.

- Diameter: > depth.

Height of root crown

Ensure that root crown is at the surface of the rootball.

Non-suckering rootstock

Grafted cultivars/varieties: Supply trees grafted onto non-suckering rootstock.

Balance

Rootball: shoot ratio (tubestock and small trees)

Tubestock height above soil level: 2 x height of tube \pm 25%.

Rootball:shoot ratio (other than tubestock or small trees)

Rootball:shoot ratio equations:

- Container grown trees: Size index = CF x Container volume (L) (\pm 10%).
- Balled and burlapped or RCB grown trees:

Rootball volume (L) (\pm 10%) = Size index/CF.

CF values table

Container grown trees		Balled and burlapped or RCB grown trees	
Container volume (L)	CF	Size index	CF
$\geq 20, < 60$	1.5	$\geq 35, < 90$	1.8
$\geq 60, < 100$	1.3	$\geq 90, < 130$	1.56
$\geq 100, < 150$	1.21	$\geq 130, < 180$	1.45
$\geq 150, < 200$	1.14	$\geq 180, < 230$	1.37
$\geq 200, < 300$	1.07	$\geq 230, < 320$	1.28
$\geq 300, < 600$	0.97	$\geq 320, < 580$	1.16

≥ 600, < 1000	0.93	≥ 580, < 930	1.12
≥ 1000	0.9	≥ 930	1.08

4. Execution

Acclimatisation

To cause physiological changes within the plant that will enable it to withstand the transition to the project site without loss of foliage or variance from a healthy and attractive state for five years or more.

Warranties

True-to-species

Parties: Supplier(s) to the principal.

Form: All the plants supplied under these works are true-to-species and type, and free of disease, fungal infection and/or any other impediment to their future growth and that they have been fully acclimatised for the conditions of the site.

Submission of warranty: At the time of each delivery.

1. Scope

Automatic Irrigation System

Design, Document, supply, install, adjust and commission a fully automatic irrigation system to all garden bed areas and planters. The work shall include the complete supply, construction and testing of new irrigation pipework, rain sensors, valves, drippers, manifolds, backflow prevention devices, wiring, programming and installation of new control system and cabinet. Work shall be in accordance with Australian Standard AS3500 and NSW Urban Irrigation Code of Practice. All fittings shall be vandal resistant and tamper proof. Work shall be undertaken by a qualified Irrigation Contractor who holds an Urban Irrigation License.

Water is to be delivered via sub surface drippers, drip line and/or pop up sprays from Rain Water Tanks to areas as indicated on drawing LA-86-G-L0-101-104, LA-86-G-L3-105-106, LA-86-G-L4-107-108 and LA-86-G-L0-109-110 General Arrangement Plans. The system is to be capable of supplying 32mm of water/week over all irrigated areas. All lines are to be buried below the finished garden bed level.

The Contractor shall allow for conduits to be provided under pavements, through walls and sealed surfaces if they are constructed prior to the installation of the irrigation system.

2. Quality (Design of the System)

Standards

Comply with the following:

- The current statutory requirement in place;
- AS 1477 Unplasticised PVC (UPVC) pipes and fittings for pressure applications
- AS1074 Steel tubes and tubulars for ordinary service
- AS2544 Grey iron pressure pipes and fittings
- AS1724 Cast Grey iron pressure pipes and fittings with bolted gland joints
- AS1646 Rubber joint rings for water supply, sewerage and drainage purposes
- AS2129 Flanges for pipes, valves and fittings
- AS1718 Water supply- copper alloy screw down pattern taps
- AS1939 Degrees of protection provided by enclosures for electrical equipment
- AS2941 Low voltage switch gear and control gear
- AS2417 Pumps – the international acceptance test codes
- AS1432 Copper tubes for water, gas and sanitation
- AS3688 Capillary and brazing fittings of copper and copper alloy
- AS2032 Code of practice for installation of UPVC pipe
- AS3500.1 Water supply
- AS3000 SAA Wiring rules
- AS2845 Backflow prevention
- Recognised Australian codes of practice and standards where these exist but are not specifically referred to in this Specification

Inspections

Give not less than 3(three) days notice so that inspection may be made at the following stages:

- Issue of Shop drawings prior to Construction
- Excavated surfaces
- Concealed or underground Services prior to being enclosed.

Samples and Submissions

The Contractor shall allow for the preparation of design drawings for the system. Drawings shall be submitted to the Superintendent / Landscape Architect for approval prior to ordering of any materials. The drawings shall be prepared by a certified irrigation designer as defined by Irrigation Australia.

The drawings shall give complete information necessary for the installation of the irrigation systems indicating component parts, location, type, size and extent of reticulation.

Co-ordination: It is the responsibility of the Irrigation Contractor to co-ordinate all laying of conduits pipes

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Technical Specification
Rev 03 AFC Issue, 25/03/22

black beetle

and work with other services and works.

The power supply for the automatic controllers and the connections to the water supply is to be located as directed by Superintendent. Connection to the water supplies via backflow prevention devices is to be as detailed in the hydraulic documentation. Connection to power supplies is to be as detailed in the electrical documentation.

Test

On completion of installation and commissioning, balancing and adjusting the contractor shall test the system in the presence of the Superintendent. Any defects highlighted by this test shall be made good at the Contractor's cost.

3. Materials and Components

All irrigation equipment, including reticulation, automatic controller, backflow preventer, filters, drip irrigation, valves and the like shall be of a type approved by the Superintendent.

Location of Irrigation Control boxes, trenches, valve pits etc shall be verified with Superintendent prior to installation. All fittings shall be vandal resistant and tamper proof.

Mainline Pipework shall be in accordance with Local Water Authority requirements.

All fittings shall be of commercial quality approved by the manufacturer of the pipework as fully compatible and the best of their kind.

Controller- Automatic controllers shall be an approved type suitable for the purpose equal to Hunter or Toro providing manual cycle and individual station operation. Locate local controller in associated building plant room where practicable. Mount all controllers in lockable vandal proof galvanised box.

Rain Sensor – Supply and Install a Toro rain sensor to each system. Locate sensor so that it is not sheltered from wind-blown rainfall from any direction.

Solenoid Valves - 25mm to be Toro '250 Series' with union both sides of valve. 40mm – 50mm to be Toro 'P220 Series' plastic valves installed with a union either side of the valve.

80mm solenoid valves to be RAINBIRD 'BPES Series' (brass base with plastic bonnet) installed with a flange either side of valve. A 'slip-fix repair coupling' to be installed on the downstream side of the valve flange or union for all solenoid valves.

Isolation valves - Provide isolation ball valves on each branch at tee and upstream of each solenoid valve. Valves to be Philmac (Black base with blue handle)

Valve Boxes – Valve boxes to be buried with lid approx. 10-20mm above soil level (for garden areas). Use large boxes to house isolating ball and solenoid valve installations. Where necessary, use two boxes for ease of access.

Sprinklers - Sprinklers shall be of the Toro types spaced on a head to head basis wherever possible and of the models as follows:

1. Small lawns & gardens up to 4m radius: Toro Model 570 series sprinklers
2. Medium lawn & gardens up to 9m radius: Toro Model 300 series stream sprinklers
3. Large lawn & gardens up to 15m radius: Toro Model S700 commercial series sprinklers
4. Playing fields over 15m radius for cricket, soccer & rugby: Toro Model 640 series sprinklers
5. Synthetic hockey fields: Toro Model 690 series sprinklers

Automatic Control Valves - Automatic control valves to be an approved type equal to Hunter or Toro suited to the system housed in purpose made high impact plastic valve boxes. Minimum number of 10 stations with the ability to be upgraded.

Reticulation - Reticulation shall be a sub-surface drip irrigation line to an approved type suitable for the purpose equal to The KISS System. Drip lines to be at maximum 600mm centres. Reticulation system shall be polyethylene micro-irrigation pipe to AS 2698.1. Lay polyethylene pipe on finished ground surface under planting bed mulch and anchor at 1500mm maximum intervals with u-shaped stakes. All reticulation to be of appropriate grade and sizes to suit design flow rates or as required for efficient operation of the system.

Control Wires - Connect the automatic control valves to the controller with double insulated underground cables laid alongside piping. Lay intertwined for their full length without joints except at valves and branches off common wires. Provide waterproof connections. Provide expansion loops at changes of direction and all joints.

Balance, adjust and schedule the various components of the system so the overall operation of the system is the most efficient including but not limited to synchronization of the controllers, adjustment of the solenoid valves, sprinkler heads, and individual station adjustments on the controllers.

Make sure there is no overspray onto buildings walls, windows, paving or roads. Adjust pressure and flow of the zones to provide the performance of each nozzle or sprinkler described.

Programming shall be undertaken by the Contractor who shall indicate seasonal requirements and advise on the operation of the system. It shall be the Contractor's responsibility to ensure and guarantee satisfactory operation of the system. He/she shall advise on the coverage required to provide optimum watering regime.

Provide 'work-as-executed' drawings of the system, including any amendments to the approved design drawings. And an irrigation maintenance manual covering operation of systems, and maintenance information on all products used in the system.

Provide an operation manual including details of all components, plus all warranties and guarantees.

All material and equipment shall be installed in a neat and workman-like manner. Refer to Superintendent for water connection and power connection points

Valve pits are to be set on 200mm deep bed of gravel. Include plumbing connection to main, main valve and backflow prevention are to be located in garden bed, or within service room or as directed by Superintendent.

Provide controller / programmer – location to be confirmed on site. A dedicated GPO is to be provided for the controller to be plugged into.

On completion of the irrigation system, carry out the following:

- Flush system thoroughly. Check heads, sprays and drippers and clean if blocked.
- Clean strainers.
- Adjust for even distribution with no dry areas.

All work is to be approved by the local regulatory authority.

Irrigation system shall be maintained for a period of 52 weeks after Practical Completion. The system shall be intensively maintained, check monitored, including the rectification of all items of equipment.

1. Scope

General

The objective of this maintenance plan is to outline the maintenance requirements of the development and enable a defined scope of maintenance activities to be regularly undertaken.

The specification is a description of the major components and requirements of the maintenance contract. It is not intended to be a completely exhaustive list of all minor and incidental materials and tasks required to successfully complete the maintenance contract works.

Report to the Superintendent any discrepancies or shortfalls in information. Failure to report will imply unqualified acceptance and understanding of the documents issued as being adequate to accurately price and maintain the required trees and landscaping.

It is expected that the Contractor shall take a proactive and diligent approach to all maintenance activities and encourage all staff and sub-contractors to pickup any obvious litter found throughout the maintained areas as a matter-of-course, regardless of the activity or position within the site. Similarly be vigilant in looking for and reporting any noted incidence of vandalism, breakages, signage damage and graffiti etc. on their way to different duties and areas.

1.2 Period

Commencement: The planting establishment period commences at the date of practical completion.

Required period: 52 weeks

1.3 Recurrent works

Throughout the maintenance and planting establishment period, carry out maintenance work including, watering, weeding, rubbish removal, fertilising, pest and disease control, replanting, staking and tying, replanting, cultivating, pruning, hedge clipping, aerating, reinstatement of mulch, renovating and keeping the site neat and tidy.

1.4 Program

At least two weeks prior to Practical Completion submit a program outlining proposed maintenance regime during the Plant Establishment Period, including anticipated frequency and duration of individual tasks. Revise progressively to ensure the optimal maintenance regime is implemented and submit on a monthly basis.

1.5 Log book

Keep a logbook recording when and what maintenance work has been done and what materials, including toxic materials, have been used. Make the logbook available for inspection on request.

1.6 Variations

If the Contractor intends to claim additional time and/or cost arising out of latent conditions, requests to carry out additional works, instructions or any other circumstance then they must notify the Superintendent in writing. The Principal/Client is not obliged to make any additional payment unless agreed prior to the Contractor undertaking the work.

1.7 Services

Underground services locations have not been included in the maintenance documentation. Before commencing work, that may disturb services the Contract shall obtain measurements and other necessary information from relevant authorities and sources. The Contractor will take every precaution necessary to secure from damage all existing gas and water service pipes, stormwater drainage lines, sewers, electrical conduits, telephone/ communications installations, and other existing works or services in the area of maintenance work.

All damage caused to any services during the course of the work is to be repaired immediately, at the Contractor's expense and the Contractor, will notify the Superintendent and relevant Authority immediately upon detection of the breakage.

1.8 Site Conditions

The Contractor is deemed to have visited the site to determine the nature of the work and to have verified and made due allowance for the following conditions:

- Existing site and structural conditions;
- Site access and storage requirements.

SECTION 05 - MAINTENANCE & PLANT ESTABLISHMENT

1.9 Replacement Plant Supply and Ordering

The Contractor is to order and co-ordinate delivery of plants. All plants shall comply with specified requirements of NATSPEC Guide – Specifying Trees: a guide to assessment of tree quality – 2003 and AS 2303 -2018: tree stock for landscape use. The Contractor is to notify the Superintendent and Landscape Architect immediately of any problems with plant quality or supply.

Once the Contractor has received the plant stock it will be assumed that the quality of the stock was accepted by the Contractor as suitable for installation. The plants will then be the responsibility of the Contractor. Plant root-balls are to be kept moist at all times. Plants that are allowed to wilt or dry-out while in their pots or after planting will be rejected and replacements will be at the cost of the Contractor.

Replace any failed, damaged or stolen plants on a monthly basis.

1.10 Recording Incoming Plant Stock

The Contractor shall keep an organised register or other suitable on-site record of all incoming plant stock along with delivery dockets. These are to be presented to the Superintendent as requested from time to time throughout the period of the contract.

1.11 Work Site Safety

The Contractor is responsible for carrying out the Contract in a safe manner. Taking due care to prevent injuries to the public or to people involved in the work.

The Contractor is responsible for coordinating and facilitating pedestrian and vehicular traffic flow safely and unhindered around and through the works/site during all maintenance activities.

The Contractor will immediately notify and furnish a written report to the Superintendent if any of the following occurs in connection with the works:

- Accidents involving death or personal injury;
- Accidents involving loss of time;
- Incidents with injury potential such as equipment failure, collapses and the like.

1.12 Environmental & Existing Tree Protection

The Contractor will ensure that all materials and the execution of the work are ecologically sound, environmentally benign and consistent with the principles of sustainable development.

The Contractor is responsible to ensure that no damage occurs to any existing trees or other plants which:

- Are specified to be retained;
- Are beyond the extent of works;
- Need not be removed or damaged during the course of the works.

All work within the root zone of existing trees shall be undertaken with the utmost care. If roots are exposed they shall be backfilled as soon as possible by hand, watered and well consolidated. If by necessity a tree requires removal of branches, pruning shall be done in accordance with accepted arboriculture techniques and AS 4373-2007. No rubbish, spoil or new materials shall be placed on the root zone of any existing tree or against the trunk. If the extent of the root zone of existing trees is not clear, please refer to the Superintendent / Arborist Report or Landscape Architect for clarification.

The Contractor shall take all practical precautions to ensure that dust and noise caused by the works are kept to a minimum. The Contractor shall take all practical precautions to prevent the spread of dirt and mud along roads and paths. The Contractor shall be responsible for all localised sediment and erosion control of work and stockpiles under their control and use.

1.13 Access, Traffic & Resident Management

Pedestrian access must be provided to all the adjacent properties during the course of maintenance work. The Contractor shall liaise with owners and operators of properties that are adjacent to the works to minimise the effect of the works on the normal access to the properties and minimise the disruption to the normal residential or commercial activities of those properties. The Contractor must comply with all directions, in this regard, provided by the Superintendent.

Notwithstanding the above, the Contractor must provide and maintain signage, barricading and lighting as required to safely direct vehicles and pedestrians around the work site, where associated directly with their contracted work.

1.14 Regulations

Perform work in accordance with all applicable laws, rules and regulations required by authorities having jurisdiction over such work. Provide for all inspections, fees, escorts and permits required by Federal, State and local authorities in supply, transport and handling of the specified materials.

1.15 Documentation by the Contractor

Provide all required work method statements, programs and quality assurance manuals to the Superintendent for approval prior to works commencing.

Documents, which are to be prepared and updated as required by the Contractor, include but are not limited to the following:

- Maintenance Program
- Environmental Management Plan which will include, noise, dust, vibration, sedimentation and water management controls;
- Safety and Incident Management Plan which will include safe-work methodology, incident management protocols and risk management initiatives proposed by the Contractor;
- Safe Work Method Statements as noted in the specification

These and any other documents, which may be required, are to be submitted to the Superintendent for review prior to starting work.

1.16 Inspections

Give not less than 48 hours notice for the Superintendent to attend inspections at the points noted. Work is not to proceed beyond these points without written approval from the Superintendent or the Landscape Architect.

The Superintendent or Landscape Architect may inspect the site without notice at any time.

1.17 Testing

Any testing required must be carried out by an authority registered with the National Association of Testing Authorities (NATA) to perform the specified testing.

Undertake soil testing to ensure soil conditions are maintained in a state conducive to healthy plant, growth, identify and issues associated with over or under fertilization, nutrient imbalances, pH and water logging.

2. Quality and Execution

2.1 Quality

Any work or materials, which, in the opinion of the Superintendent or Landscape Architect, do not meet appropriate industry standards of workmanship or quality, shall be rejected. It shall be the Contractor's responsibility to remove rejected work and reinstall it to an acceptable standard at no additional cost to the Principal/Client.

Materials and workmanship are to conform to the current edition of applicable Australian Standard Specifications and Codes.

2.2 References & Standards

AS 4373-2007 – Pruning of Amenity Trees

NSW WorkCover – Code of Practice: Amenity Tree Industry 1998

AS 2303 -2018: Tree stock for landscape use

NATSPEC Guide – Specifying Trees: a guide to assessment of tree quality - 2003

AS 4454-2012: Composts, soil conditioners and mulches

AS 4419-2018: Soils for Landscaping and Garden Use

AS 3743-2003: Potting Mixes

2.3 Material Samples and Product Information

Materials and workmanship are to conform to the current edition of applicable requirements of Australian Standard Specifications and Codes.

Samples, product details and technical information for all materials and proprietary items are to be submitted to the Superintendent or Landscape Architect for written approval prior to inclusion into the works. Obtain and submit reports on relevant tests by an independent testing authority as requested by the Superintendent.

2.4 Require Product Sample / Product Information Hold Points

The Contractor shall provide samples, supplier and complete product information / details about the following materials:

1. Fertilisers / Soil Amelioration Chemicals,
2. Herbicides,
3. Pesticides,
4. Imported soil / soil conditioners,
5. Organic Mulch

And any other horticultural products or alternative products to those specified proposed to be used.

These are to be submitted to the Superintendent for approval no later than two (2) weeks before they are proposed to be used.

Use or installation of these items is not to proceed without written approval of the samples from the Superintendent or Landscape Architect.

2.5 Watering

All planted areas shall be adequately watered to keep them healthy and growing vigorously. The minimum acceptable watering requirement shall equal 25 mm of natural rainfall or its applied equivalent, or a combination of both, during each period of one week, except in periods of heavy rain. Vary the watering requirement to suit seasonal conditions and maintain healthy plant material and grass areas in optimum condition.

Timing: Water at times of day to minimise water evaporation loss. Do not water during the hottest period of Summer days.

Water restrictions: Coordinate the water supply and confirm the watering regime against Federal and State Government legislation and restrictions at the time.

2.6 Weeding and Rubbish Removal

During the contract period remove by hand or approved desiccant all rubbish and weed growth that may occur or re-occur throughout the works area. Remove all weed and grass growth from around the base of all planting. This work shall be executed regularly so that at weekly intervals at least the areas may be observed in a completely clean and tidy condition free from rubbish and weeds.

2.7 Planting

Establishment Works shall also include making good any settlement in planting. Lift plants and mulch and place additional topsoil as required. Replace all material to approval.

The Contractor shall at their own expense replace plants, which die or fail to thrive or are broken or stolen with plants of identical variety unless otherwise directed. Replacement shall be of similar size and quality to that specified. Replace any failed, damaged or stolen plants on a monthly basis.

Where existing planting is within the landscape contract area, maintain it as for the corresponding classifications of new planting.

General: Replace all evergreen plants that have died or lost 50% of their normal foliage cover.

Provide replacement plants as follows:

- Of the same species and variety and of the closest commercially available size.
- Of uniformly high quality stock equal to the best commercially available.
- Representative of optimum growth for the species as restricted by the container size.
- With a balanced root system in relation to the size of the plant and conducive to successful transpiration. Inspect the root conditions of plants by knocking plants from their containers.

SECTION 05 - MAINTENANCE & PLANT ESTABLISHMENT

- Without signs of having been stressed at any stage during their development due to inadequate watering, excessive shade/sunlight, suffered physical damage or have restricted habit due to growth in nursery rows.
- Healthy, well grown, hardened off specimens of good shape and free from pests and disease.
- Well rooted and without any indication of having been restricted (pot bound) or damaged at any time.
- Been grown in their final containers for not less than twelve (12) weeks

2.8 Mulched Surfaces

Maintain the surface in a clean and tidy condition and reinstate as necessary in accordance with original specification to all garden areas at the end of the maintenance period. The minimum depth of mulch at the completion of the plant Establishment Period is 50mm.

2.9 Disease and Pest Control

Herbicide, insecticide and/or fungicide spraying, if considered necessary, shall be carried out in accordance with manufacturer's directions, at the Contractor's expense ensuring that shrubs and groundcovers are maintained in a healthy and vigorous condition and growth rate is not compromised. The Contractor must advise what type of chemical is intended for use before such work is carried out.

The Contractor shall report any incidence of insect attack or evidence of disease amongst plant material.

All landscape areas including trees are to be visually inspected for the presence of persistent and damaging insect pests or diseases

2.10 Pruning

If pruning is desirable to promote or maintain shape or for reasons of health, the work shall be carried out by the Contractor at his expense.

Undertake required pruning of the shrubs and ground covers to create desirable forms, encourage compact bushy growth, improve visibility and safety and create clearance appropriate to street signage and planting in close proximity to overhead power lines or balconies and windows. Undertake pruning using procedures and practices that minimise the adverse effects of pruning on the tree, shrubs and groundcovers. All pruning shall be carried out by a Qualified Arborist or Horticulturalist

Any cutting instruments used are to be sharp and clean, and pruning procedures carried out using standard horticultural practices.

2.11 Soil Control

The Contractor shall make good and reinstate any erosion or subsidence of soil which may occur. Pavements, paths and roadways shall be kept clear of soil, mulch and any other debris or litter.

Imported Topsoil replacement

The Contractor shall undertake any topsoil replacement as indicated on the drawings and in landscape works section of this specification (Section 02). The Contractor is to undertake soil test result and provide evidence of proposed soil meeting the requirements for the Garden Profiles 01-03 Planter Type PL1-PL5 prior to undertaking any imported top soil replacement

2.12 Soil pH Correction

Maintain soil pH in a range that is conducive to healthy plant growth and prevent toxicity or nutrient deficiencies caused by extreme pH ranges.

2.13 Fertilising

Fertilizer shall be supplied and applied evenly to all landscape areas ensure optimum plant growth, health and disease resistance through the provision of all essential macro and micro nutrients commonly required by plants and thereby prevent any symptoms associated with nutrient deficiencies.

2.14 Hardscape / Furniture and Fixings

Ensure all external hardscape areas including pavements, walls, steps and ramps, furniture and fixings are maintained in a safe, clean, neat and tidy condition that promotes their use and enjoyment. Inspect all hardscape and furniture and fixtures items for damage or vandalism and report any faults or damage to the Superintendent. Make arrangement to fix any minor issues. Provide quote to Superintendent to repair or replace more major issues for instruction.

2.15 Subsoil Drainage (Garden Areas and Planters/Pots)

Inspect garden areas to ensure subsoil drainage system if functioning. Subsoil drainage pipes within the landscape areas shall be kept clean and clear of debris. Clear and remove debris by methods other than washing down. Flush out and check pipes after debris is removed.

Inspect planter boxes. Subsoil drainage pipes shall be kept clean and clear of debris. Clear and remove debris by methods other than washing down. Flush out and check pipes after debris is removed.

Drains

General: Inspect and clean all drainage structures and pit covers and ensure that they are in proper working order.

Frequency: As required so that all overflow drains are cleared when observed at fortnightly intervals.

2.16 Irrigation

Regularly inspect, monitor and adjust irrigation and watering system to ensure proper operation and coverage and rectify any leaks, blockages or breakages in a timely fashion. If required, undertake pressure testing or flushing to identify and/or address any system malfunction. The Contractor shall repair the system due to vandalism, unauthorized use and breakage. If vandalism or breakage is a persistent or a large-scale problem, the Contractor shall keep a record of components replaced or rectified and seek advice from Superintendent to render the system more vandal or damage proof. The Contractor shall be responsible for supplementary watering due to any inadequacies with the system, and address leaks immediately.

- Irrigation system program: To suit the following:
- The precipitation requirements of the individual zones/stations with regard to types of plants.
- The infiltration rate of the soil/medium and associated physical factors seasons, evaporation, exposure, topography, local authority restrictions.
- An allowance for adjustment or shut down during and after periods prolonged heavy rains.
- To co-ordinate water supply and to confirm watering regime against Federal and State Government legislation and restrictions at the time.

Equipment maintenance:

- Check all components for proper operation.
- Repair or replace damaged component with equivalent parts.
- Flush any dirt or foreign matter from the system and clear all blockages.

Operation: Ensure by adjustment or replacement of components, that the overall operation of the system is efficient and operational for the entire planting establishment period.

Supervision: Prevent excessive use of water.

Programming

Automated systems: Check that they are programmed to coincide with optimum periods of water pressure and water absorption.

Public access: Do not inconvenience persons occupying the site by water spray or block normal pedestrian or traffic flow.

2.17 Faults, Finishes and Defects

Faults or defects attributable to the workmanship of the Contractor shall be made good.

2.18 Green Waste Removal

All green waste generated by the maintenance work shall be contained within the immediate work area, and shall not leak into adjacent areas, or outside the site. All debris shall be contained and removed from site to a legal recycling depot location using suitable closed waste containers and vehicles.

2.19 Decommissioning

Decommissioning refers to the process undertaken the removal of the planters including (but not limited to): relocation, storage, or disposal/destruction.

A review of the condition of each planter should be undertaken on a annual or biennial basis (this can coincide with ongoing maintenance). This review will assess the value of the asset life.

Planters will be retained for as long as they;

- - continue to be relevant and useful to the purposes and activities of the individual sites;

SECTION 05 - MAINTENANCE & PLANT ESTABLISHMENT

- - do not create a public safety problem;
- - have no adverse environmental effects;
- - are authentic and original;
- - can withstand climatic conditions; and
- - can be cost effectively maintained.

3. COMPLETION

3.1 Product warranty

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.

3.2 Maintenance manual

Submit recommendations for maintenance of plan.

ESTABLISHMENT MAINTENACE SCHEDULE

TASK	MINIMUM FREQUENCY
<i>Specimen Tree and Planting</i>	
Health monitoring / litter control	Weekly during the first 13 week period / every 3 months following
Watering	Min twice weekly during first 4 week period/ min weekly during the next 48 week period
Fertilizing	1/3 months
Litter removal	weekly
Weeding	fortnightly or as required
Pest and Disease Control	as required
Pruning	as required
Mulching	as required
Soiling	as required
pH correction	as required
Staking / guying checking	weekly
Replacement planting	monthly
<i>Irrigation</i>	
Controller operation and resetting	as required
Station operation and resetting	as required
Coverage and infiltration checking	weekly during the first 13 weeks / quarterly

SECTION 05 - MAINTENANCE & PLANT ESTABLISHMENT

Maintenance report schedule

Minimum requirements: Check list.

Item	Action
Plant material	Replace failed plants
	Additional planting
	Treat for disease or insect attack
	Tree surgery
	Fertilising generally
	Fertilising for specific nutrient deficiencies
	Thin out planting
Turf	Pruning/trimming
	Returfing
	Seeding
	Treat for disease
	Topdressing
	Weeding
Soil	Mowing/trimming
	Erosion/bank stabilisation
	Additional soil
	Soil conditioner
Mulch	Weeding
	Top up mulch
Rubbish removal	Generally remove bottles, paper, cigarette butts etc.
	Remove leaf, litter from path and paved areas
Irrigation	Replace parts
	Repair
	Clean out
	Adjust
	Clean out subsurface drains
Paving and pathways	Repair dips, hollows, irregularities
	Remove stains and graffiti
	Replace sections of uplift
	Clear main pathway drains of debris
	Weeding
Fencing	Test against AS 4663
	Repair fencing
Furniture and hard fixtures	Benches/ Tables/Umbrellas
	Bollard
	Lighting
	Barriers / Fencing
	Bike Racks

SECTION 05 - MAINTENANCE & PLANT ESTABLISHMENT

Maintenance procedure schedule

Maintenance scope of works

Minimum attendance: Check list.

WEEK	SPRING (Sept, Oct, Nov)	SUMMER (Dec, Jan, Feb)	AUTUMN (Mar, Apr, May)	WINTER (Jun, Jul, Aug)
1	Trim Plants	Weed	Weed	Weed
2	Weed; trim and adjust trees and shrubs	Weed; trim and adjust trees and shrubs	Weed; trim and adjust trees and shrubs	Trim and adjust trees and shrubs
3	Treat plant material for insects and disease	Weed; treat plant material for insects and disease	Weed	Weed
4	Weed; issue maintenance report	Weed; issue maintenance report	Inspect condition of paving & furniture Issue maintenance report	Inspect condition of paving & furniture Issue maintenance report
5	Fertilise all trees and shrubs in garden beds; mow and trim lawns	Weed trim and adjust trees and shrubs	Weed	Weed
6	Weed; inspect mulch for deficiencies in cover; check and adjust irrigation	Check and adjust irrigation	Weed; inspect mulch for deficiencies in cover; check and adjust irrigation	Treat for insects and disease; check and adjust irrigation
7	Reinstate mulch as required; treat plant material for insects and disease; mow lawns	Weed trim and adjust trees and shrubs	Reinstate mulch as required; trim and fertilise	Weed
8	Weed; inspect condition of paving and furniture; issue maintenance report	Inspect condition of paving & furniture; issue maintenance report	Weed; inspect condition of paving and furniture; issue maintenance report	Inspect condition of paving and furniture; issue maintenance report
9	Weed, Trim Plants	treat plant material for insects and disease	Weed	Weed
10	Weed; Inspect condition of paving & furniture	Weed; Inspect condition of paving & furniture	Weed; treat plant material for insects and disease	Inspect condition of paving & furniture
11	Trim and adjust trees and shrubs	Weed	Trim and adjust trees and shrubs	Prune back trees and shrubs after flowering
12	Weed; treat plant material for insects and disease	Trim plants	Weed. Inspect condition of paving & furniture	Treat plant material for insects and disease
13	Check and adjust irrigation; issue maintenance report	Check and adjust irrigation; weed; issue maintenance report	Check and adjust irrigation; weed; issue maintenance report	Check and adjust irrigation; weed; issue maintenance report

SECTION 05 - MAINTENANCE & PLANT ESTABLISHMENT

Irrigation maintenance scope of works

Minimum attendance: Check list.

General:	
Filters – mainline	Monthly
Electrical source output (auto system)	Monthly
Controller (automatic systems)	Monthly
Operation – progression - Sta to Sta.	Weekly
Proper activation of valves	Monthly
Proper timing of stations	Bi-annually
Proper time and day readings	Weekly
Exterior appearance	Bi-annually
Valve operation	Bi-annually
Open, close completely (weeping)	Weekly
Sprinkler operation	Weekly
Rotaries – clogged nozzles	Bi-monthly
Plant obstructed pattern	Bi-monthly
Arc coverage	Bi-monthly
Radius adjustment	Bi-monthly
Pop-up action	Bi-monthly
Riser seal leaks	Bi-monthly
Set to grade	Bi-monthly
Coverage pressure	Bi-monthly
Rotational speed	Bi-monthly
Clogged screens	Bi-monthly
Head damage	Bi-monthly
Piping	Bi-monthly
Leaks – broken or cracked pipe	As Needed
Bad solvent welds, bad threaded	As Needed
Connection	As Needed
Clogged pipe	As Needed

1. Scope

Supply and install pavements to positions indicated on the drawings and as detailed. All pavements and stairs are to be constructed in accordance with the Engineers drawings and specification

Base course and subgrade preparation: refer Engineers Documentation

Reinforced concrete slab: Refer to Engineers' Documentation

Concrete Strength: Refer to Engineers' Documentation

2. Quality

Standards

Relevant Australian standard.

The slip resistance of all paver types must comply with AS4586:2013. It is the responsibility of the Contractor to supply the superintendent with test results from the manufacturer confirming the supplied material comply with standards.

General Pavement (Slip Resistance Rating - P4 Wet Pendulum Test, R11 Oil Wet Inclining Platform Test)

Ramps/ Steps (Slip resistance Rating – P5 Wet Pendulum Test, R12 Oil Wet Inclining Platform Test)

Inspections (GENERAL)

Give not less than 3 (three) day's notice so that inspection may be made of the following.

- Preparation of base levels
- Materials stored at yard or on site.
- Materials or areas of work ready for specified test
- Trial set out for typical paving before fixing, including control joints
- Trial set out for thresholds
- On site mixing of mortar bed material and mortar bed laid prior to paver installation
- Stabilising of joint filling material prior to applying pavement sealer
- Items to be built-in located in the correct positions including bolts, brackets etc.
- Commencement of all paving
- Completion of groundworks and finished subgrade levels established
- Conformance of subgrade (after testing) prior to placing bedding, subbase or base, as applicable
- At completion of set-out for **ALL** pavement types
- Setout of control joints prior to laying
- Expansion joints and dummy joints marked out ready for insertion of joint filler
- Completed installation of **ALL** pavement types.
- Survey check (level, alignment and crossfall of concrete base surface before paving placement
- Items to be built-in located in their correct positions including bolts, brackets, etc.

Samples and Submissions

Pavement P1– 5 pieces (minimum period for consideration – 10 working days)

Pavement P1 – 5 sq.m minimum sample panel including joint material and sealant, first work area as nominated by MPX (minimum period for consideration – 10 working days)

Provide a work method statement explaining formwork design, methods of tolerances, jointing (in accordance with engineer's documentation) and means of achieving final pavement aesthetics.

Pit cover with paving infill

Pavement P5– 5 pieces (minimum period for consideration – 10 working days)

Pavement P5 – 5 sq.m minimum sample panel, first work area as nominated by MPX (minimum period for consideration – 10 working days)

Provide a work method statement explaining formwork design, methods of tolerances, jointing (in accordance with engineer's documentation) and means of achieving final pavement aesthetics.

Pit cover with tile infill

Pavement P6 - 5 pieces (minimum period for consideration – 10 working days)

Pavement P6 – 5 sq.m minimum sample panel including joint material and sealant, first work area as nominated by MPX (minimum period for consideration – 10 working days)

Provide a work method statement explaining formwork design, methods of tolerances, jointing (in accordance with engineer's documentation) and means of achieving final pavement aesthetics.

Pit cover with paving infill

General

Submit samples of the paving finishes, showing the full range of texture and colour of each of the materials.

A minimum of 5 samples of the nominated size of paving shall be supplied by the Contractor to indicate the characteristics to be expected to be supplied. These samples will be approved or additional samples may need to be submitted should any samples be considered unacceptable. Once the approved samples have been agreed these will become the Control Samples for the supply. It is expected that any differences evident in type or frequency of characteristics in the final supply will be grounds for rejection.

These samples will show the surface finish required to be provided. Once this surface finish has been approved it is expected that any surface finish that is not in accordance with the approved control samples will be grounds for rejection.

It is important that the Control samples show the range to be expected both in Characteristics and Surface finish.

Sample panels

Prepare sample panels of designated paving finish, including sample of junction details and trim.

The contractor is to allow for multiple samples if required to meet the requirements of the specification and to the approval of the Landscape Architect/ Superintendent.

Paving Patterns. Prepare a trial set out for each area.

Location: To be approved by the Superintendent.

Incorporation into the works: An approved sample panel, if suitably located, may be permitted to be incorporated into the works otherwise remove all traces on completion of the works.

Approved subcontractors

Use an approved firm, specialising in the type of work required to carry out masonry paving.

Slip resistance and abrasion.

The slip resistance classification of pavers shall satisfy the following criteria, in accordance with AS/NZS 4586:2013 and HB197:1999

General Pavement (Slip Resistance Rating - P4 Wet Pendulum Test, R11 Oil Wet Inclining Platform Test)
Ramps (Slip resistance Rating – P5 Wet Pendulum Test, R12 Oil Wet Inclining Platform Test)

Manufacturer should supply test results from an approved agency to confirm this prior to confirmation of order.

Contractor's submissions – data submissions

In addition to requirements specified elsewhere in the specification and MAIN CONTRACT PRELIMINARIES, submit the following before the commencement of the respective work for approval by the Superintendent.

- Brick paving installation Work Method Statement and QA ITP

Certificates of Compliance

MOSMAN HIGH SCHOOL
MILITARY ROAD
MOSMAN, NSW

Technical Specification
Rev 03 AFC Issue, 25/03/22

black beetle

Submit relevant documentation from paving suppliers that nominated stone and unit paving complies with all relevant Australian Standards.

Execution

Paving pattern: If it appears that minor variations to joint widths will obviate cutting, submit proposals.

Programme

Provide a detailed programme for the supply of all paving materials in relation to the overall construction programme, including any staging of the works. Update the programme for the supply of paving on a monthly basis, and advise the Superintendent in writing of any change in the availability of paving.

Health and Safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel.

The installed work shall comply with legislative requirements and accepted industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of the work.

Comply with the relevant legislative requirements and regulation of the relevant Authority.

Have particular regard to regulations governing the safe handling and use of chemical products.

Falls and gradients

Surfaces shall comply with levels and gradients indicated on civil drawings or required for the control of surface water.

Surfaces are required to be self-draining shall shed water to appropriate drainage outlets or overflows without pond or pool of standing water.

Construct suitable substrate gradients to ensure correct gradients for finished works.

Verify that all levels and gradient are correct and drain properly before finishing and covering over.

Notify Project Management immediately where levels and gradients are incorrect and do not drain properly. Rectify work by approved methods before covering over.

Performance requirements

Fitness for purpose

All material and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Movements

The installed work shall accommodate movements and deflection in the base –building and substrates, without failure or loss of adhesion, performance or durability

Control Joints

Construct control joints where indicated or required to accommodate movements in the base building and substrates and the installed work, in accordance with product data and relevant standards

Controls joint should have sufficient movement capability to accommodate all movements.

Include required joint fillers and inserts.

Control joint in finished work shall extend full depth to the base building and substrates and shall coincide with joints in the base building and substrates.

Verify widths, spacing and location of control joints before commencing.

Compatibility

Adjacent materials and products shall be chemically and electronically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spaces. Adjacent materials and products, including adhesives and joint sealant, shall not stain or contaminate, and shall not cause visual or

structural defect in adjacent materials.

Blending of finishes

Blend and mix the finished work to achieve uniform overall distribution of visual characteristics and effect in the installed finishes within the approved range of the control samples when viewed as a whole, as far as practicable.

Ensure that local concentrations of particular visual characteristics do not occur.

Products of each type and installation area shall be from one manufacturing batch where practicable

3. Materials

Paving suppliers

Pavement Type 01 - Brick Paver

Brick Paving can be obtained from the following suppliers.

Brick Paver

- London Paver as supplied Austral Bricks
Ph:9830 7800

Other suppliers may be used subject to approval of the Superintendent.

Pavement Type 05 - Porcelain Tile

Tiles can be obtained from the following supplier.

- Classic Ceramics Ph: (02) 95606555

Other suppliers may be used subject to approval of the Superintendent.

Pavement Type 06 - Permeable Brick Paver

Permeable Brick Paving can be obtained from the following suppliers.

Ecopave 50

- Ecopave 50 as supplied MD Bricks
Ph:02 98324644

Other suppliers may be used subject to approval of the Superintendent.

Data Submission – contractor supplied items

Supplier's data

Written submissions from the stone and concrete unit paver supplier are to be provided at the appropriate stages, stating:

At tender stage

- The suppliers experience in the required type of work;
- Particulars of established quality control procedures (if any), and the category of the procedures to the relevant standard;
- The physical properties of the required material;
- Test data for the material including for slip resistance;
- Lead times for delivery of the material to a local storage site;

On delivery of material

- A warranty certifying that the material supplied complies with the specification and is suitable for the intended use;
- Recommendation for installation and maintenance of pavement.

Tolerances –Contractor Supplied items

Fabrication tolerances

Maximum deviation from required dimensions:

MOSMAN HIGH SCHOOL
MILITARY ROAD
MOSMAN, NSW

Technical Specification
Rev 03 AFC Issue, 25/03/22

black beetle

- Length and width: +/- 1mm.
- Diagonals: +/- 1mm.
- Flatness: +/- 1mm.
- Edge straightness: +/- 1mm.

Fine installation tolerances

Installation tolerances for finished work shall not exceed:

- Position on plan: +/- 3mm.
- Deviation in level (horizontal): Not more than 1 in 1000 (maximum 3mm)
- Edge straightness: +/- 1mm per metre length (maximum 2mm).
- Flatness: For any 1 metre length: +/- 2mm

Installation tolerances shall not be cumulative and shall not include base building, substrate or fabrication tolerances.

Joint and edge tolerances

Joint and edge tolerances for finished work shall not exceed:

- Misalignment of mating surfaces and hairline joints: +/- 0mm.
- Joint widths (other than hairline joints): +/- 10% of design width

Brick Pavers

Standards to: AS/NZS 4455/2010. Masonry Units and Segmental Pavers & AS 3661 Slip Resistance of Pedestrian Surfaces.

All supplied brick pavers are to be consistent in colour and finish quality so that they appear to be from the same batch. All dimensions required for the fabrication of unit pavers shall be verified from the site and contract documents provided prior to commencing production.

Dimensional Tolerance: +/- 2mm plan dimension and height
 Minimum compressive strength (concrete units): 45Mpa
 Minimum breaking load (pedestrian): 5kN
 Minimum breaking load (vehicular): 5kN
 Minimum abrasion index: 3.5
 Minimum slip resistance : 0.4

P1/P1A – Pavement Type 1/1A – Brick Paver

Refer to drawing General Arrangement Plans for location and extent.

MATERIAL: London Paver

COLOUR: (P1) 70% Brahman Granite, 30% Silver Sand
 (P1A) 30% Bowral Blue

MANUFACTURER: Austral Bricks

DIMENSIONS: 230 x 114 x 65mm

LAYING: Lay units on mortar bedding (refer to Engineers Documents)

PATTERN: refer to detail no. 01/LA-89-G-A-403

JOINTS: Nominal 10mm mortar joints (high strength grouting) Grout joints: Cement based proprietary grout. Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set.

Mortar materials

Sand: Use a fine aggregate with a low clay content selected for grading. – To engineers requirements

Cement: To AS 3972, type GP.

Mortar

Mix proportions: 1:1:63 (Portland cement : lime: sand). To engineers requirements

Jointing Material

Properties: Joint filling material shall conform to the requirements of the CMAA standard for Segmental Paving except that the material shall be dry and conform to the following grading requirements.

Sieve Size(mm)	Percentage Passing
2.360	100
1.180	70-100
0.600	40-75
0.300	10.35

0.150	2-15
0.075	0-.05

Tile

Requirements : All supplied tiles / pavers are to be consistent in colour and finish quality so that they appear to be from the same batch. All dimensions required for the fabrication of unit pavers shall be verified from the site and contract documents provided prior to commencing production. Subject to Client approval.

Use tiles / pavers which is of uniform quality in each grade, sound and free from defects (such as veins of dissimilar material, vents, cracks, fissures, seams, porous inclusions, foreign material, loose surface material striations, stains and discolouration) liable to affect its strength, appearance, durability or proper functioning under the intended conditions of use.

Matching: Select tiles / pavers for the optimum matching of visual properties such as colour and pattern.

P5 – Pavement Type 5 – TILE

Refer to drawing General Arrangement Plans for location and extent. Refer to Detail 04/ LA-89-G-A-403

MATERIAL: Porcelain Tiles

PRODUCT RANGE: Sorrento

COLOUR: Grigio

MANUFACTURER: Classic Ceramics

DIMENSIONS: 600 x 600 x 20mm

FINISH: P5 Structured

LAYING: Lay units on mortar bedding (refer to Engineers Documents)

PATTERN: refer to detail no. 04/LA-89-G-A-403

JOINTS: Nominal 3mm mortar joints (high strength grouting) Grout joints: Cement based proprietary grout. Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set.

PATTERN: Stackbond. Refer to Detail no. 03/LA-89-G-A-403

Tile / Paver Selection:

General: The shall be sound, strong and free from deleterious minerals and defects such as cracks, joints, veins of different colour or material, friable material or clay patches.

P6 – Pavement Type 6 – Permeable Brick Paver

Refer to drawing General Arrangement Plans for location and extent.

MATERIAL: Ecopave 50

COLOUR: Charcoal

MANUFACTURER: Adbri Masonry

DIMENSIONS: 226 x 111 x 50mm

LAYING: Lay units on sand bedding (refer to Engineers Documents)

PATTERN: refer to detail no. 02/LA-89-A-410

JOINTS: Butt Join

Geoweb:

To the base of pavement as detailed. Refer to drawings: 02 / LA-89-G-A-410 (100mm Geoweb)

Lay according to manufacturer's instructions. Fill with free draining 7-10mm gravel to engineers recommendation. Geoweb cell to be wrapped in geotextile fabric as specified.

Sources/ contacts:

Geofabrics

Phone:02 8785 8800

Geotextile Fabric:

Geotextile as recommended appropriate by Atlantis Water Management or similar and approved. Wrapped and taped to manufacturer's instructions.

Sources/ contacts:

Atlantis Water Management

Phone: 9419 6000

Joint Filling Sand

General: Well-graded sand and free of deleterious material such as soluble salts which may cause efflorescence.

Grading: To the **Joint filling sand grading table** when tested in accordance with AS 1141.11.1.

Sieve Size(mm)	Percentage Passing
2.360	100
1.180	70-100
0.600	40-75
0.300	10.35
0.150	2-15
0.075	0-05

4. Execution**General**

Supply and install pavers to the lines, levels and locations as indicated on the Drawings.

Finished surface crossfalls: To levels indicated on drawings and to Engineer's Drawings and Specifications.

Cut paver / tile: Neat and accurate

Fixing: Provide adhesion over entire background/ base and paver backs.

Final appearance: Make adjustments necessary to give true, regular appearance to tiles and joints when viewed under final lighting conditions.

Before fixing ensure that all materials, components, treatments and proprietary products are compatible when used in association with each other and the substrates. Comply with the manufacturer's published recommendations regarding all aspects.

Clean surplus material from joints and faces of pavers, without disturbing pavement. Keep the work clean as it proceeds and protect finished work from damage.

Cuts shall be around openings, obstacles, etc, and be trimmed in accordance with the Design Drawings. All cuts shall be made with a diamond tipped wet-saw and all exposed cut edges shall receive an arris to match uncut tiles. Proprietary tile cutting machines can be used if acceptance is received from the Superintendent.

All tiles /pavers shall be bedded fully in accordance with the manufacturer's instructions.

Clean pavers / tiles prior to completion. The initial clean shall be according to the manufacturer's instructions

Surface run-off: Direct to detention areas as shown on drawings. Refer to Hydraulic Engineer's Drawings and Specifications.

Surface tolerances

Surfacing layer thickness: + 3 mm, - 0 mm.

Surfacing layer level: ± 5 mm.

Surfacing profile: Over 3 m length of design profile, ± 10 mm.

Junctions: Maximum deviations:

- Across junctions between adjacent pavement surfaces: 2 mm.

- Across junctions between adjacent pavement unit surfaces: 2 mm.
- Flatness: Maximum deviation of the finished surface under a 3 m straight edge laid in any direction:
- 10 mm.

Subgrade Preparation

Refer to Engineer's Drawings and Specification

Cutting and Preparation

Cleaning Substrate

Remove oils, greases, retarders and loose material and leave the concrete base surface clean and dust free.

Storage

Store pavers so that they are protected from the weather, clear of the ground on its natural bed, on supports which do not locally overstress it and which allow for the future movement of the pavers. Store pavers in conditions where they will not be susceptible to staining, marking or other damage. Damaged pavers will be replaced at the expense of the Contractor.

Cutting units

Maintain sharp arises and accurate joints and margins.

Laying unit paving

Pavement Type 1

General: Over the base course, lay the units on a sand : cement bed, and to the required falls and levels. Lay units evenly spaced to achieve the specified nominal joint width throughout pattern.

Pavement Type 05

General: Over the base course, lay the units on a sand : cement bed, and to the required falls and levels. Lay units evenly spaced to achieve the specified nominal joint width throughout pattern.

Pavement Type 6

General: Over the base course, lay the units on a sand bed, and to the required falls and levels. Lay units evenly spaced to achieve the specified nominal joint width throughout pattern.

Edge restraint

Provide edge restraint where needed to support the bedding and maintain the paving shape. Bed edging units in mortar at least 40mm thick.

Protection

When laying the paving, protect from damage all fixtures including pit covers, lighting and traffic poles, signs and the like

Requirement

When cutting paving provide dust-proof screens and covers to protect existing finishes, adjacent buildings and the immediate environment from dust and debris.

Dry Cutting

The use of dry methods of cutting paving on site is not permitted

Wet Cutting

The use of wet methods of cutting paving on site is permitted subject to compliance with the requirements of the Australian Standard 2436-1981. Prevent slurry run-off from wet cutting operations from marking or tracking across adjacent paved areas. Collect residual water and slurry and divert them to an approved means of disposal. Do not allow slurry to enter grates, gutters or tree pits.

Mortar Bed Components and Preparation

All mortar is to comply with AS3700 Masonry Structures, in particular sections 4, 5 and 10.

The sand and cement shall comply with AS3700. All materials used in the mortar bed layer will be of a good quality, be free of deleterious soluble salts or other contaminants which may cause or contribute to efflorescence, and as detailed in the specification.

The slurry mix water and mortar mix water shall be clean and free from oil and from injurious amounts of acids, alkali, organic or other deleterious substances and shall be neither brackish nor salty.

The minimum compressive strength of the mortar bed mix to engineers specification shall be 4MPa at 7 days.

The mortar bed mix should consist of:

- a. Three parts blended washed sand by volume.
- b. 1 part Portland Type GP Cement by volume.
- c. 1 part water / elastisizer mix - (more than 1 part may be added during mixing to achieve the correct consistency).

Laying

Paving units shall be laid surface dry on the screeded mortar bedding course. Over concrete base slabs, lay units on a mortar bed course of approximately 30mm thick thickness (minimum 20mm / maximum 40mm) Tamp down paving units into position ensuring full contact with the bedding with minimum deviation between edges of adjacent pavers.

Check individual paver units for correct installation as work front proceeds. Where brick pavers do not align properly, are loose, drummy or rock, remove non compliant pavers, relay sand bedding and repeat paver installation procedure again.

Joint filling: Compact all paving units to design levels before the commencement of joint filling.

Level of Paving across Joints

The maximum deviation between paved surfaces either side of a joint, including movement joints, shall be:

- Joints less than 6mm wide: 1mm.
- Joints 6mm or greater in width: 2mm.

Inspection and Testing

Verification of the mix proportions and preparation methods shall be provided to the Superintendent on request, and as part of the QA ITPS, to ensure that a good quality mortar is prepared. The Superintendent will randomly check the mix proportions in the onsite batching, the consistency of the mortar mix as laid, the bond with the laid stone pavers and the storage conditions of the cement and sand.

If it is found that the sand bedding is not adequate and fails to meet the specification then the Contractor will notify the Superintendent and will be required to remove the sand bed and relay the pavers. All defective sand bedding, which causes paving to be loose, drummy, rock or break, will be removed and replaced at the Contractors expense. All pavers which are chipped, cracked, contain unnecessary saw cuts / grinding marks or do not otherwise comply with the Specification are to be removed, bedding to be rectified and replaced at the Contractor's expense.

Falls and Levels**Grading**

- Ponding: Grade paving to even falls to drain away from buildings to drainage outlets / kerb lines without ponding.
- Falls: Minimum fall for drainage 1:100. Refer to drawings for finished levels

Finished Level

- Maintain the same finished level across junctions between different finishes.

Tolerances

- Pavement thickness: +unspecified, -0.
- Surface level: 10mm from the specified level, 5mm from a 3m straight edge in areas of uniform grade.
- Maximum deviations. : Across junctions between adjacent paving surfaces: 2mm.
Across junctions between adjacent paving unit surfaces: 2mm.

Control Joints**General**

- Provide movement joints directly over movement joints in the concrete base including the depth of the mortar bedding (isolation, contraction and expansion).

Requirements

- Refer to the drawings for control joint locations and paving patterns.

Joint type

- Sealant filled, 10mm wide.

Protection

Protect all pavers / tiles from ongoing work, staining, damage of any kind, and inclement weather.

Protect adjoining surfaces and surfaces immediately below work being carried out to prevent damage during cleaning and pointing work.

Protect all adjoining brick surfaces during application. Clean off all mortar and mortar droppings on a daily basis.

Sealant/Joints

Provide joints in paving as indicated on drawings including depth of the mortar bedding at junctions with building margins, stairs, walls, and to other elements which penetrate the paving such as pit covers and the like.

Type: One part high performance polyurethane sealant, suitable for the location, future movement and type of stone used. Finish flush with the paved surface. Apply sealant over a backing rod.

Primer: Coat the surfaces in contact with the sealant with a primer compatible with the sealant and the substrate.

Backing Strip: Compressible closed cell expanded polyethylene strip.

Joint Depth: The depth of the sealant shall not exceed the joint width, nor be less than two thirds of the joint width.

Application: Apply the sealant strictly in accordance with the manufacturers written instructions. Immediately prior to jointing remove loose particles from the joint, using oil free compressed air.

Non – Staining: Use a non-staining sealant. Prior to the application of any sealant, provide documentary evidence from an independent testing authority to show that the sealant and primer will not stain the paving.

Protective sealant

A protective sealant is to be uniformly applied to the surface of pavers to protect the stonework from staining and to stabilize the joint filler material. The approved sealant is to have the following properties: solvent-based, non-flammable, non-toxic, single component, epoxy reinforced exterior polymer, penetrating sealer and joint filling material stabiliser. Sealant to be equal to Technical Protective Sealant for Paving Stones WLI.

The sealant is not to affect the colour of the pavers and not affect slip resistance.

The protective sealant must be applied to the surface of all pavers including over the joint filler material

as soon as possible after being laid, but before opening the area to pedestrian use.

Maintenance manual

On completion submit a manual of recommendations for the maintenance of the paving including frequency of inspection and recommended methods for cleaning, repair and replacement. Include recommendations for the maintenance of pit covers and the suggested methods of lifting and access to minimise damage.

Load Testing

No pavers are to move/rock under pedestrian, wheel chair, light vehicle and typical delivery trolley or test loading. Contractor is to test load each completed lot (section) of paving to determine the extent of any unbonded / loose or defective stone pavers.

Cleaning

Clean the pavement progressively as the work proceeds without the use of acid and without damage to the pavers, as necessary to remove mortar smears, stains, discolouration and the like and leave the paving clean on completion. Mortar stains to be washed off the paving at the end of each working day.

Precaution during cleaning

Prevent run-off from the cleaning operations from marking or tracking across adjacent paved areas. Collect residual water and cleaning wastes and divert them to an approved means of disposal.

Rejection

Lift and relay any pavers rejected by the Superintendent.

Service Infill Covers

The Contractor shall align new infill type service covers to reflect the paving pattern and finished pavement levels. Service cover lids shall be set square to the pavement pattern as indicate on the drawings or parallel to the kerb alignment where no pavement pattern exists. Service covers are to be positioned within a single pavement type finish. Refer to Civil detail and specification for finished levels and cover locations.

The Contractor shall allow for hand and mechanical saw cutting and bedding infill pavements to suit the respective infill lid types.

Certification

Submit certification by a registered surveyor that all pedestrian surfaces required to drain to drainage outlets have been constructed in accordance with drawings and civil engineers documentation and are;

- Constructed to correct gradients and profiles
- Will not cause ponding or standing of surface water.
- Will not cause flooding, spillage or migration of surface water to adjacent dry areas

1. Scope

Supply and install concrete pavements and stairs to positions indicated on the drawings and as detailed. All pavements / walls and stairs are to be constructed in accordance with the Engineers drawings and specification

- Base course and subgrade preparation: refer Engineers Documentation
- Reinforced concrete slab: Refer to Engineers' Documentation
- Concrete Strength: Refer to Engineers' Documentation

2. Quality Standard

All concrete work shall conform to the requirements for materials and construction of the relevant and current Australian Standards.

The slip resistance of all concrete types must comply with AS4586:2013. It is the responsibility of the Contractor to supply the superintendent with test results from the manufacturer confirming the supplied material comply with standards.

General Pavement (Slip Resistance Rating - P4 Wet Pendulum Test, R11 Oil Wet Inclining Platform Test)
Ramps and Steps (Slip resistance Rating – P5 Wet Pendulum Test, R12 Oil Wet Inclining Platform Test)

Inspection

Witness points

Give not less than 48 hours notice so that inspection may be made of the following.

- Samples completed, including finishes

Hold points

- Preparation and testing of base sub-base and sub-grade layers – all concrete elements.
- Approval of samples;
- Completed formwork, and reinforcement cores and embedments in place, all concrete elements.

Submission

Provide a work method statement for installation of all elements including quality controls and coordination points including the manufacturers drawings, details and installation guides showing methods of construction and installation, joining, edge treatments, fixing and finishing with dimensions and tolerances and manufacturer Warranties.

The contractor is to provide shop drawings of the Concrete pavements and Walls and all their components and hardware prior to fabrication for approval by landscape architects and engineers. The shop drawings should detail all fixing points and the hardware selection. State applicable Australian Standards, and composition of metals to be used.

Refer to Engineers drawings and specification for profile, reinforcement, concrete strength, sub grade and base course preparation and the like.

Additional shop drawings requirement for Pre cast elements

Submit shop drawings indicating setout material , construction details , connections and interfaces for

Fabrication and delivery

- Formwork types
- Curing methods
- Lifting methods
- Temporary support and protection during transportation
- Temporary support and protection during installation

Pre cast unit detail

- Individual panel dimensions
- Setout
- Joint system
- Anchorages, fasteners and brackets
- Numbering system
- Finishes and coatings
- Penetration and openings

- Embedment's and connections, including temporary connections

Formwork detail

- Formwork panels setout and joints between adjacent panel
- Tie bolt setout and appearance
- Construction joint details

Tolerances**General**

Conform to the **Tolerances table**.

Tolerances table

Position or dimension	Permissible deviation (mm)
Horizontal or vertical position of a surface relative to a plane surface (bow) when measured as described in AS 3700 Appendix G	3
Position of a bed joint relative to horizontal, or from the level required	10 mm in any 10 m length, 15 mm in total
Reinforcement and tendons:	
- Across thickness of walls	5
- Along the length of a wall or up the height of a wall	50
Thickness of bed joint	3
Thickness of perpend	5

Samples

P2 –Concrete Pavement - provide a 3m² sample panel (Refer to Materials & Components below) on site for as set out below –minimum period for consideration 10 working days)

P3 –Concrete Pavement - provide a 3m² sample panel (Refer to Materials & Components below) on site for as set out below –minimum period for consideration 10 working days)

Bench Type 3 - provide a 3LM sample panel (Refer to Materials & Components below) on site for as set out below –minimum period for consideration 10 working days)

W1 – Wall Type 1 - provide a 5LM sample panel (Refer to Materials & Components below) on site for as set out below –minimum period for consideration 10 working days)

Bleachers - provide a 5LM sample panel (Refer to Materials & Components below) on site for as set out below –minimum period for consideration 10 working days)

The contractor shall be solely responsible for the consequences of delay resulting from failure to allow adequate time for the assessment and approval of samples, or from the rejection of samples which do not comply with the Specification, or the like.

The sample panels are to be representative of all colours, aggregates, finishes and jointing required by the drawings and the specification. If approved the sample panels may be incorporated into the works. If not approved the panel shall be demolished. Do not proceed with installation until approval is received.

All concrete is to match the control samples in colour, aggregate, finish and jointing. Any concrete that does not conform to the control samples shall be replaced as directed by the Superintendent at the Contractors expense.

It is important that the Control samples show the range to be expected both in Characteristics and Surface finish.

Sample panels

Prepare sample panels of designated pavement finish, including sample of junction details and trim.

The contractor is to allow for multiple samples if required to meet the requirements of the specification and to the approval of the Landscape Architect/ Superintendent.

Paving Patterns. Prepare a trial set out for each area.

Location: To be approved by the Superintendent.

Incorporation into the works: An approved sample panel, if suitably located, may be permitted to be incorporated into the works otherwise remove all traces on completion of the works.

Approved subcontractors

Use an approved firm, specialising in the type of work required to carry out concrete works.

Slip resistance and abrasion.

The slip resistance classification of pavement shall satisfy the following criteria, in accordance with AS/NZS 4586:2013 and HB197:1999

General Pavement (Slip Resistance Rating - P4 Wet Pendulum Test, R11 Oil Wet Inclining Platform Test)

Ramps /Steps (Slip resistance Rating – P5 Wet Pendulum Test, R12 Oil Wet Inclining Platform Test)

Manufacturer should supply test results from an approved agency to confirm this prior to confirmation of order.

Testing

Testing Authority: NATA registered laboratory.

Sub-grade Test: 100% Standard Compaction to AS 1289.5.2.1

Concrete testing – carry out testing and submit results in accordance with structural / civil documentation

All works shall comply with the B.C.A., relevant Acts and Regulation, By-Laws and all relevant Australian standards.

Health and safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel.

The installed work shall comply with legislative requirements and accepted industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of the work.

Comply with the relevant legislative requirement and regulations of the relevant authority.

Falls and gradients

Surfaces shall comply with levels and gradients indicated on civil drawings or required for the control of surface water.

Surfaces are required to be self-draining shall shed water to appropriate drainage outlets or overflows without pond or pool of standing water.

Construct suitable substrate gradients to ensure correct gradients for finished works

Verify that all levels and gradient are correct and drain properly before finishing and covering over.

Notify Project Management immediately where levels and gradients are incorrect and do not drain properly. Rectify work by approved methods before covering over.

Performance requirements

Fitness for purpose

All material and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Movements

The installed work shall accommodate movements and deflection in the base –building and substrates, without failure or loss of adhesion, performance or durability

Control Joints

Construct control joints where indicated or required to accommodate movements in the base building and substrates and in the installed work, in accordance with product data and relevant standards

Controls joint shall have sufficient movement capability to accommodate all movements.

Include required joint fillers and inserts

Control joint in finished work shall extend full depth to the base building and substrates and shall coincide with joints in the base building and substrates

Verify widths, spacing and location of control joints before commencing

Compatibility

Adjacent materials and products shall be chemically and electronically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spaces. Adjacent materials and products, including adhesives and joint sealant, shall not stain or contaminate, and shall not cause visual or structural defect in adjacent materials.

Blending of finishes

Blend and mix the finished work to achieve uniform overall distribution of visual characteristics and effect in the installed finishes within the approved range of the control samples when viewed as a whole, as far as practicable

Ensure that local concentrations of particular visual characteristics do not occur.

Products of each type and installation area shall be from one manufacturing batch where practicable

Delivery Handling and Storage

Handle prefabricated units safely and carefully with suitable lifting equipment and supports

Properly restrain precast elements to prevent damage during transportation. Prevent contact or splashing with materials which may strain, mark or otherwise damage finished surfaces.

Support precast elements at proper bearing point with adequate contact area to prevent deflection over stressing or damage.

3 Materials & Components

All to meet Authority and Safe Access Standards slip resistance requirements
Reinforcement / Concrete to Structural Engineer's Details and Specification

Concrete

All concrete used shall generally be ready-mixed concrete unless approved otherwise and in accordance with Engineers Requirements.

Ready-mixed concrete shall be obtained from an approved ready-mix supplier and shall comply with AS 3600 Clause 19.1 and AS 1379.

Onsite-mixed concrete may be used where approved by the Superintendent and shall comply with the current edition of the relevant Australian Standard. The methods of batching, mixing and transportation shall be to the satisfaction of the Superintendent.

Concrete Properties

Concrete for the works shall have a characteristic strength in accordance with engineers requirements. The strength will be dependent on the type of works and will be stated in the relevant section or on the drawings.

The maximum size of aggregate to be used shall be 20mm. Concrete shall be of a consistency that it can be readily placed and compacted in the forms without segregation of the materials and without excess free water collecting on the surface. Concrete slump shall be 75mm maximum for manually placed concrete and shall be tested in accordance with AS 1012 Part 3.

Concrete Depth and Strength:

REFER TO ENGINEERS DOCUMENTATION

Admixtures:

The use of admixtures shall be subject to the approval of the superintendent.

The Service Provider shall submit to the superintendant details of the proposed source and nature of any admixtures and the proposed amount to be added.

Admixtures shall conform to the requirements of AS 1478 and shall not reduce the strength of the concrete. Admixtures shall not contain chlorides, chlorine, sulphur, sulphides or sulphites or any other substance detrimental to concrete or steel.

The use of chemical admixtures that result in Portland Cement reductions should be considered in relation to above sustainable materials in concrete aim, though the performance of the material must still meet or exceed all relevant design and construction requirements.

Formwork:

REFER TO ENGINEERS DOCUMENTATION.

All exposed edges shall be chamfered not less than 20 mm x 20 mm to prevent mortar runs and to preserve smooth, straight lines. Internal angles shall be filleted where shown on the drawings.

Timber formwork shall be in long lengths free from loose knots and surface defects and uniform in thickness. Before reuse, form materials shall have all protruding nails withdrawn and surfaces to be in contact with concrete shall be thoroughly cleaned. Forms shall not be reused if bulged or warped. All inside surfaces of formwork shall be coated with non-staining mineral oil, grease or other approved agent to ensure non-adhesion of the mortar.

Reinforcement:

REFER TO ENGINEERS DOCUMENTATION.

All reinforcing bars and mesh shall be supplied by an Australian Certification Authority for Reinforcing Steels (ACRS) accredited supplier and shall be appropriately marked with the supplier's unique identify mark. Any reinforcing steel or mesh not marked and/or supplied from an ACRS accredited supplier shall be immediately removed from the site.

Base courses:

REFER TO ENGINEERS DOCUMENTATION

Expansion Joints:

REFER TO ENGINEERS DOCUMENTATION

Jointing material – U/V stable, flexible, colour to match concrete, with backing rod and in accordance with engineers specification.

Filler – U/V stable, flexible, to match concrete colour.

Concrete Finish –

Class 2 generally

Produce a smooth, even finish with an impervious sheet material (e.g. high quality resin film faced plywood) arranged in an accepted regular pattern as a feature of the surface. This will coincide with the architectural features as indicated on the Design Drawings. Do not replace parts of the formwork panels where this may cause a change in colour in the concrete.

Abrupt irregularities and surface qualities shall be not greater than the stated criteria setout in AS 3610 table 3.4.2 and clause 5.6.

The surface shall be free from discoloration caused by contamination from a release agent, grout leakage or other source.

Cover spacers: No spacers shall be visible or rust marks evident.

Generally, surfaces shall be free from voids, honeycombing, segregation and other defects. Voids shall be kept to an absolute minimum while ensuring compliance with other requirements of the Specification. The following criteria shall be observed:

Blowhole evaluation shall be conducted in accordance with photo examples and evaluation criteria as defined in AS 3610 Appendix B.

- The concrete shall have a consistent, uniform, matt, light coloured face.
- The concrete shall be free from surface blemishes visible to the eye at 3000mm.
- No repairs are permitted to the formwork, unless acceptance has been given by the Principal's

Authorised Person. Damaged panels shall be replaced with material of the same performance and shall be grout washed to blend in with the existing panels.

- No water or grout loss shall be permitted. Marks no larger than 50mm in any dimension shall be acceptable.
- Making good: Apart from the making good allowed for in the Structural Engineer's Specification, making good shall be minimal and consistent to an accepted sample. As far as possible, the finished surface shall be achieved without making good. The improvement of the surface finish by the Contractor (e.g. filling noticeable surface blemishes) shall be agreed with the Principal's Authorised Person prior to any work being carried out. Continuity of personnel for making good, where required, shall be provided by the Contractor, to the satisfaction of the Principal's Authorised Person.

Formwork tie-rod holes shall be at uniform centres and in-line, horizontally and vertically, and in-filled with matching prepared cement/ fine aggregate paste, to an accepted sample as specified.

Where rebates or features are shown, these will also be the panel joints. No other joints are permitted. The design of panel joints, rebates, striking pieces and other elements are the responsibility of the Contractor but shall be subject to acceptance by the Principal's Authorised Person. Features shall be bedded on mastic, but no mastic shall be permitted on the finished facework.

All publicly exposed and front of house concrete that is visible in the finished work is to achieve this level of finish.

Machine Float Finish Generally

Power float the concrete to an even surface with no ridges or steps, then immediately commence curing as specified in the Structural Engineer's specification. When the concrete is suitably stiff, power trowel to give a uniform, smooth surface, free from trowel marks and other blemishes. Resume specified curing without delay.

Hand float in locations inaccessible to the machine float.

Steel Trowel Finish Generally

After machine floating finish, work the concrete surface as follows:

- Use power or hand steel trowels to produce a smooth surface relatively free from defects.
- When the surface has hardened sufficiently, re-trowel to produce the final consolidated finish free of trowel marks and uniform in texture and appearance.

Moulds for Precast Concrete

Moulds shall be constructed so that casting deviations can be readily controlled to give compliance with the Specification.

Moulds shall be maintained in clean, sound condition and inspected carefully for defects before each reuse. Damaged moulds shall not be repaired and reused if this would impair the surface appearance of the units.

Moulds shall be designed to permit demoulding without damage to the units.

Where applicable, moulds shall be coated evenly with a suitable release agent, which shall not be allowed to touch the reinforcement. Application shall be in such a way so that puddling and concentrations in corners, etc, are prevented.

Moulds shall be constructed of mould lining that is an impervious material suitable to provide the consistency of finish required and selected to provide crisp edge details as indicated on the Design Drawings. The mould linings shall not be of steel unless agreed with the Principal's Authorised Person. Materials for fillets, etc, required to achieve features shall be chosen to provide a finish identical to the finish of the body of the unit.

Any joints and fixings in mould linings shall be sealed to prevent grout loss defects and shall be such as to result in no visible change in plane of the concrete and no change in the finish whatsoever.

The mould linings shall have no variations in stiffness that may produce differences in vibration across the mould surface.

The mould linings shall be replaced after the agreed maximum number of casts, or when damage or

defects are discovered, whichever is the sooner.

Before casting, ensure that moulds have been checked to be free from dust, reinforcement clippings and other debris.

Inform the Principal's Authorised Person when each mould is complete and not less than 10 working days before commencing manufacture of units.

Moulds for features, etc, shall not have any splits, cracks or other defects.

Moulds that have been previously used shall be repaired and the edges resealed before they are assembled. Moulds, which have deteriorated to such an extent that they shall not produce the specified finish, shall not be used for that class or a higher class of finish.

Moulds shall be cut in such a manner that reinforcement and built-in components passing through the moulds are maintained in position; the joint shall be tight and shall not permit grout loss.

Formers for profiled work, chamfers, splays, rebates, curved troughs and other features shall be rigidly and evenly fixed to the formwork along the complete length and shall not permit grout loss.

Moulds shall be designed to be consistent with the geometry and as indicated on the Design Drawings, for acceptance by the Principal's Authorised Person. The lines of joints between units shall form smooth curved lines consistent with the geometry and as indicated on the Design Drawings, for acceptance by the Principal's Authorised Person. The number of make-up pieces shall be kept to a minimum.

Holes left by ties and components in concrete surfaces shall be in line horizontally and vertically and shall form a regular pattern for acceptance by the Principal's Authorised Person.

Unless otherwise indicated on the Design Drawings, chamfers shall be provided for all external angles of 90° or less in concrete surfaces with plain or fine finishes.

Moulds for curved concrete surfaces shall not be made up from a series of facets, unless indicated on the Design Drawings.

Materials for moulds shall be obtained from one source. Damaged moulds shall not be used unless permitted by the Principal's Authorised Person. Propose materials for use in moulds, for acceptance by the Principal's Authorised Person.

Moulds shall be protected from damage, including cracking, dents, spillages, rust marks, stains or any other debris or harm whatsoever.

Production Control Units

The first unit produced of each type shall be inspected by the Principal's Authorised Person. If its appearance is accepted it shall be clearly marked and kept safely at the factory as a control standard for appearance of subsequently produced units.

Allow for inspection of all units and provide adequate space and facilities for full inspection of all surfaces.

Records For Precast Concrete

Keep complete records for each unit including the following information:

- Unique identification number.
- Correlation with records of mixes, including batch numbers.
- Date of each stage of manufacture.
- Dates and results of all tests, checks and inspections.
- Dimensions related to specified levels of accuracy.
- Specific location in the finished work.
- Details of any damage.
- Any other pertinent data. For example, if the unit is an accepted production control unit.

Records shall be available for inspection on request.

Damaged Units

Making good shall be minimal and consistent to an accepted sample. As far as possible the finished surface shall be achieved without making good. The improvement of the surface finish by the Contractor

(e.g. filling noticeable surface blemishes) shall be agreed with the Principal's Authorised Person prior to any work being carried out. Blowholes shall be filled and all irregularities stoned off. Provide continuity of personnel for making good, where required, to the satisfaction of the Principal's Authorised Person.

Components having arrises or faces that are broken, chipped, cracked, crazed, honeycombed, irregular, inconsistent, stained or otherwise marred such that their appearance or performance is impaired are not acceptable.

Submit finished samples to the Principal's Authorised Person for acceptance prior to commencement. Finished samples of precast concrete units which have been submitted and accepted by the Principal's Authorised Person shall be used as reference samples for all precast units prior to being passed for inclusion. Precast units may be rejected for the following reasons:

- Exceeding specified construction tolerances for units.
- Chipped, spalled or cracked units or other damage incurred during transport or construction operations.
- Exposed-to-view surfaces that develop surface finish deficiencies.

Other defects as listed including:

- Ragged or irregular edges.
- Finish quality below standard set by samples.
- Excessive air voids/ blowholes on exposed surfaces.
- Casting lines evident from different placements.
- Visible form joints or irregular surfaces.
- Stains on unit surfaces.
- Non-uniformity of colour and texture.
- Effects of grout seepage.
- Areas of any back-up concrete bleeding through facing concrete.
- Foreign material embedded in face.
- Visible repairs.
- Reinforcement shadow lines.
- Visible cracks.
- Any damage due to erection methods, propping panels, etc.

Colour Consistency

The consistency of the concrete colour is of great importance. Select all suppliers, materials and all methods to ensure the specified finish and consistency, including but not limited to the following:

- The main plant shall have a consistent supply to achieve the specified finish.
- The back-up plant shall be selected to achieve an equivalent supply.

Cement, fines and other aggregates shall be from one region/ source in order to achieve consistent concrete colour.

Colour shall be within the relevant tonal scale range as defined in AS 3610 for the specific class of finish or as agreed with the Principal's Authorised Person based on the benchmarks or samples which shall then become the colour standard for the project.

Concrete colour and consistency must be uniform in colour and texture with no discolouration.

Coloured concrete must be cured in accordance with the Structural Engineer's details, including where curing compounds are used.

Colour consistency problems, for example inherent colour variation, aggregate transparency or loss or movement of water, shall be avoided and appropriate measures taken. These include but are not limited to:

- Ensuring the continuity of supply from one source for the duration of the work under the Contract. Any back-up plant shall have an equivalent supply.
- Batching the concrete precisely and mixing thoroughly.
- Bracing or stiffening the formwork to reduce flexibility.
- Ensuring that the formwork face material has a uniform absorbency.

Prevent surface blemishing and do not cure with plastic sheeting, intermittent wetting and drying membranes, paper, sodium or fluoro-silicate hardeners and other compounds which can cause discolouration.

P2 – Pavement Type P2 - Concrete Pavement and Stairs

Refer to General Arrangement Plans for location and extent. Refer to Detail 02/ LA-89-G-A-403 Reinforced concrete poured in-situ to engineers requirements.
 Aggregate – Engineers Requirements
 Concrete – Grey Concrete
 Concrete Depth and Strength – To engineers specification
 Finish – Helicopter Finish – NO TOOLED MARGINS

B3 – Bench Type 03

Refer to General Arrangement Plans for location and extent. Refer to Detail 01/ LA-89-G-A-406 Reinforced concrete poured in-situ to engineers requirements.
 Aggregate – 10mm Basalt TBC
 Concrete – Grey Concrete
 Concrete Depth and Strength – To engineers specification
 Finish – Off form - Class 2

W2 - Concrete Wall Type 2

Refer to General Arrangement Plans for location and extent. Refer to Detail 03/LA-89-G-A-406 Reinforced concrete poured in-situ to engineers requirements.
 Aggregate – 10mm Basalt TBC
 Concrete – Grey Concrete
 Concrete Depth and Strength – To engineers specification
 Finish – Off form - Class 2

P3 – Pavement Type 3

Refer to General Arrangement Plans for location and extent. Refer to Detail 03/LA-89-G-A-403 precast concrete to engineers requirements.
 Aggregate – 10mm Basalt TBC
 Concrete – Grey Concrete
 Concrete Depth and Strength – To engineers specification
 Finish – Off form - Class 2

Bleachers

Refer to General Arrangement Plans for location and extent. Refer to Detail 01/LA-89-G-A-407 precast concrete to engineers requirements.
 Aggregate – 10mm Basalt TBC
 Concrete – Grey Concrete
 Concrete Depth and Strength – To engineers specification
 Finish – Off form - Class 2

4. Execution*General*

Refer also to Concrete notes on Engineers Documentation.

Setout markers indicating location of all expansion joints and obtain approval from Project Manager prior to construction of concrete pavements and walls.

Provide a light exposed – aggregate surface to match the approved sample panel. The exposed aggregate surface is to be achieved by applying a light abrasive blast

Samples/Formwork

The forms shall have depth at least equal to thickness of the pavement. They shall rest upon the sub-base and shall be rigidly fixed so as to maintain line and grade.

The forms shall be thoroughly prepared to ensure that stripping does not affect the surface of the concrete.

Forms shall be set well in advance of the area being poured so as to ensure true lines, grades and smooth transitions.

Placing

The placing of concrete shall be continuous between approved joints.

Sequence batching and delivery to ensure mix uniformity.

Compaction

Immediately after being placed, the concrete shall be struck off and screeded, leaving the concrete slightly above the required finished profile. The concrete shall then be compacted by vibrating units mounted directly on screeds, and, in addition, by internal vibrators as directed.

In corners and other places inaccessible to the approved vibratory equipment and at joints the concrete shall be compacted to approved density by such additional means as may be directed or approved.

Curing

The concrete shall be cured by covering with wet curing blankets. The blankets shall be two ply building paper with bituminous centre layer or other approved sheeting and shall be applied as soon as possible after finishing and kept in place for at least seven (7) days. The concrete shall be kept damp for at least seven (7) days.

Protection

The surface of the newly placed concrete shall be protected from damage.

Tolerances

Construct formwork so that the position of finished concrete to all visible surface is $\pm 3\text{mm}$ from the correct plane, and $\pm 3\text{mm}$ from a 2m straight edge.

Cleaning

Formwork Surfaces

All formwork shall be thoroughly cleaned before inspection and all debris, reinforcement wire, formwork nails, sawdust and the like removed after the completion of reinforcement installation and before placing concrete

Off-form concrete

Where off-form concrete is visible in the finished work, clean off all laitance, rough edges and protrusion to provide a surface consistent with the required Class of concrete.

Visible concrete repair

Visible in-situ concrete surfaces which are stained or damaged, or do not comply with the approved Control Panels, or not match accepted industry practice may be rejected, and if rejected, shall be rectified by approved procedures at the sole discretion of the Project Manager.

If rejected work cannot be rectified, the project manager may direct the affected work to be demolished and replaced.

Damage may include surface and edge damage caused by mechanical impact, including chips, scratches and cracks.

Rectification may also include the filling and patching of any lifting eye ferrules, formwork attachments or related items associated with manufacture or handling.

Discoloration may include staining and rust

Rectification shall match new work to the greatest extent practicable.

Documentation

Prepare and submit a detailed inspection report of all visible concrete surfaces listing all visible damage, discoloration and defects.

Submit a detailed method statement indicating all rectification and repair procedures, materials and equipment, including access and safety equipment

Submit control samples for each type of rectification and repair indicating the before and after conditions for comparison. Make comparisons after concrete has dried and cured.

Submit a structural engineers report to verify that the proposed rectification is structurally adequate.

Obtain approval in writing for all rectification work before commencing. Rectification, which has not been approved, or takes place before approval has been given may be rejected.

Carry out all rectification in accordance with the approved method statement and control samples. Do not commence rectification before approval of method statement and control samples.

The project management reserves the right to reject rectification, which does not match the approved control panels.

Procedures

Carry out rectification by suitable materials and procedures using only experienced and skilled personnel.

Repairs to corners and edges shall be reinforced by stainless steel pins and loops.

Patching and filling materials shall match the colour and texture of the adjacent existing work.

New materials shall be compatible with and not cause short or long-term damage to existing adjacent work.

Maintenance manual

On completion submit a manual of recommendations for the maintenance of the paving including frequency of inspection and recommended methods for cleaning, repair and replacement. Include recommendations for the maintenance of pit covers and the suggested methods of lifting and access to minimise damage.

Precaution during cleaning

Prevent run-off from the cleaning operations from marking or tracking across adjacent areas. Collect residual water and cleaning wastes and divert them to an approved means of disposal.

Service Infill Covers

The Contractor shall align new infill type service covers to reflect the finished pavement levels. Service cover lids shall be set square to the pavement pattern as indicate on the drawings or parallel to the kerb alignment where no pavement pattern exists. Service covers are to be positioned within a single pavement type finish. Refer to Civil detail and specification for finished levels and cover locations.

The Contractor shall allow for hand and mechanical saw cutting and bedding infill pavements to suit the respective infill lid types.

Certification

Submit certification by a registered surveyor that all pedestrian surfaces required to drain to drainage outlets have been constructed in accordance with drawings and civil engineers documentation and are;

- o Constructed to correct gradients and profiles
- o Will not cause ponding or standing of surface water.
- o Will not cause flooding, spillage or migration of surface water to adjacent dry areas

1. Scope

Construct a range of types of external walls / and bench seats to locations indicated on the drawings and as detailed.

The following is provided as a guide only and is not intended to be exhaustive. It is the Contractors responsibility to fully examine the extent of brickwork. No variation for failure to do so will be approved. Refer to drawings as an additional guide.

- Wall Type 02 – Brick Retaining Wall
- Bench Type 02 - Brick Bench Seat

For External Wall construction – Refer to Setout and Grading Plans for setout and levels of walls and engineers drawings and specification.

For drainage and waterproofing requirements of all external walls refer to architect and engineers requirements.

All walls and bench seats are to be constructed true to the documented line and levels and vertical. Select material and include admixtures to prevent the occurrence of efflorescence. Walls are to be less than 1% from vertical with zero subsidence. Horizontal wall members are not to sag.

Standards

Materials selections to the respective areas shall be in accordance with the Drawings and details.

All brick and blockwork shall conform to the requirements for materials and construction of the relevant current Australian Standards including AS 3600 AS/NZS 4455

All work shall be finished to achieve the required surface finish and provide a minimum amount of maintenance.

Comply with the following:

- The current statutory requirement in place;
- Recognised Australian codes of practice and standards where these exist but are not specifically referred to in this Specification
- AS 3700.
- AS 3972

2. Quality

Inspection

Witness points

Give not less than 48 hours notice so that inspection may be made of the following.

- Set out of walls / planters / seats prior to commencement
- Completion of surface preparation
- Bottoms of cavities, after cleaning out.
- Bottoms of core holes, before grouting.
- Control joints, ready for insertion of joint filler.

Hold points

- Approval of samples;

Approved subcontractor

The work under this section shall be carried out by experienced firms with the best quality reputation for workmanship and performance in masonry construction. All work is to be predominantly carried out by accredited trades persons or under their supervision.

Health and safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel. Have particular regard to regulations governing the safe handling and use of chemical products.

The installed work shall comply with legislative requirements and accepted industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of the work.

Comply with the relevant legislative requirement and regulations of the relevant authority.

Have particular regard to regulations governing the safe handling and use of chemical products.

Performance requirements

Fit for purpose

All materials and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Strength and stability of wall systems

Wall systems shall remain stable without deflection, damage or rattling under normal conditions of use, in accordance with relevant standards. The installed work, including fasteners and framing, shall accommodate all short and long term movements and deflections in the base building, substrates to which the work is fixed, and within the work, including thermal movements, without failure or the transfer of loads from the base building to the work of this trade.

Connections

The installed work shall be connected to the base building or substrates in a neat, substantial manner by correctly selected and located connections which transfer the loads from the work without displacement distortion, or damage to the fasteners, substrates or the adjacent work. Connections shall accommodate movement requirements

Control Joints

Construct control joints where applicable or required to accommodate movements in the base building and substrates and in the installed works, in accordance with the product data and the relevant standards.

Control joints shall have sufficient movement capability to accommodate all movements in the base building and substrates and within the installed work.

Include required joint fillers and inserts.

Control joints in finished work shall extend full depth to base building and substrates and shall coincide with joints in the base building and substrates

Corrosion

Materials and products, including fasteners and concealed components, shall be corrosion resistant or protective coated.

Junctions

Seal joints and junctions to adjacent work with suitable joint sealants to maintain integrity of fire, smoke, acoustic and moisture barriers.

Moisture resistant construction

Where the installed work is subject to moisture and water, or otherwise required, provide suitable moisture-resistant materials and construction details

Include flashings and barriers to prevent the passage of moisture

Include moisture resistant admixtures to mortars and cement mixes where required for moisture resistant construction.

Compatibility

Adjacent materials and products shall be chemically and electrolytically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spaces. Adjacent materials and products, including adhesives and joint sealants, shall not stain or contaminate, and shall not cause visual or structural defects in adjacent materials.

Do not use silicone products in contact with stone unless certified and warranted by the sealant manufacturer, and approved before installation.

Do not use products containing polymerized acrylics in contact with silicone and other joint sealants, which may cause yellowing, or other harmful effects to either products.

Tolerances

All wall / planter and seats shall be accurately set out to achieve correct alignment with controlling architectural features, all to the tolerances set out below. Where minor size adjustment is necessary to achieve this requirement, the size of all cladding, in any group between a pair of such controlling

features shall be adjusted so that all cladding, in that group are equally sized with constant width joints unless detailed otherwise.

Full allowance shall be made for taking all necessary site measurements to ensure that all work can be correctly set out in the manner described in this clause.

All brick is required to be cut and laid to close tolerances (maximum variation of 1mm) and variation must not be visible in any joints. Variation should only be due to unequal measurements of structural surfaces and variations must be approved by the client's representative prior to commencement of work in that area.

General

To AS 3700 Table 12.1

Conform to the **Tolerances table**.

Tolerances table

Position or dimension	Permissible deviation (mm)
Horizontal or vertical position of a surface relative to a plane surface (bow) when measured as described in AS 3700 Appendix G	3
Position of a bed joint relative to horizontal, or from the level required	10 mm in any 10 m length, 15 mm in total
Reinforcement and tendons:	
- Across thickness of walls	5
- Along the length of a wall or up the height of a wall	50
Thickness of bed joint	3
Thickness of perpend	5

Submission

Provide a work method statement explaining formwork designs and methods of guaranteeing achievement of tolerances specified.

Refer to Engineers drawings and specification for details of levels, profile, reinforcement, concrete strength, sub grade and base course preparation and the like.

Samples

Samples of each of the finishes and colours specified shall be prepared for approval by the Superintendent prior to commencement. The contractor is to allow for colours on walls to be selected, altered or modified at the direction of the Superintendent. Allow to prepare a sample of not less than two (2) m², if an alternative supplier is being requested to that specified. Exterior finishes must be approved regardless of supplier and be applied in the worst situation for final substrate and light considerations.

General: Prepare sample panel of designated finish

- Wall Type 01 – Brick Retaining Wall - 2 Lm sample panel
- Bench Type 02 - Brick Bench Seat - 2 Lm sample panel

The contractor shall be solely responsible for the consequences of delay resulting from failure to allow adequate time for the assessment and approval of samples, or from the rejection of samples which do not comply with the Specification, or the like.

The sample panels are to be representative of all colours, finishes and jointing required by the drawings and the specification and engineers requirement. If approved the sample panels may be incorporated into the works. If not approved the panel shall be demolished. Do not proceed with installation until approval is received.

All wall types are to match the control samples in colour, finish and jointing. Any wall that does not conform to the control samples shall be replaced as directed by the Superintendent at the Contractors expense

Installation tolerance

Installation tolerance generally shall not exceed

- Position on plan, or vertical surface: +/- 5mm
- Deviation in level (horizontal): Not more than 1 in 1000 (maximum 5mm)
- Deviation in plumb (vertical): Not more than 1 in 1000 (maximum 5mm)

- Edge straightness: +/- 2mm per meter length (maximum 5mm)

Installation tolerance shall not be cumulative and shall not include base-building, substrate or fabrication tolerances.

Flatness of finished surfaces

Tolerance for flatness of finished surface shall not exceed

- For any 3m length : +/- 3mm (not more than 3mm below a 3000mm straightedge)
- For any 1m length : +/- 2mm (not more than 2mm below a 1000mm straightedge)
- For any 300mm length : +/- 1mm (not more than 1mm below a 300mm straightedge)

Approved subcontractor

Use an approved firm, specialising in the type of work required to carry out masonry construction.

Test

Type tests: Submit results as follows:

- Characteristic unconfined compressive strength of masonry unit: To AS/NZS 4456.4. On-site testing of masonry is required only in rare cases when special mortar or special masonry is selected. See AS 3700 clause 11.4 and AS 3700 clause 12.7 for testing requirements. Delete this clause if on-site testing is not required.

2 Materials & Components

Generally:

Exposure locations: To AS 3700 clause 5.4.

Concrete masonry blockwall: REFER TO ENGINEERS DOCUMENTATION
Expansion and Control Joints: REFER TO ENGINEERS DOCUMENTATION
Footings: REFER TO ENGINEERS DOCUMENTATION
Reinforcement: REFER TO ENGINEERS DOCUMENTATION

Brick

Standard: To AS/NZS 4455.1 and AS/NZS 4455.3.

Salt attack resistance grade: To AS 3700 Table 5.1.

Minimum age of clay bricks: 7 days.

Brickwall / Bench Seats

Refer to drawing General Arrangement Plans for location and extent. Refer to detail no. 03/LA-89-G-A-405 & 02/LA-89-G-A-406

MATERIAL: Bowral 76

COLOUR: 70% Brahman Granite, 30% Bowral Blue

MANUFACTURER: Austral Bricks

PH: Ph:9830 7800

Connectors and accessories

Standard: To AS/NZS 2699.2.

Corrosion protection: To AS/NZS 2699.2

Slip joints

Standard: To AS 3700 clause 4.13.

Mortar mixing

Measure volumes using buckets or boxes. Machine mix for at least six minutes.

Mortar materials

Additives or admixtures:

- Air-entraining agents: To AS 1478.1.
- Methyl-cellulose water thickeners: To be designed for use in brickwork or blockwork.
- Plasticizers or workability agents: To be designed for use in brickwork or blockwork.
- Pigments: To BS EN 12878 or NZS 3117.

Lime: To AS 1672.1.

Masonry cement: To AS 1316.

Portland cement: To AS 3972.

- Type: GP.

Proportions: Conform to the **Mortar mix table**.

Sand: To be clean, fine and sharp aggregate with a low clay content and free from efflorescing salts, selected for colour and grading.

Water: To be clean and free from any deleterious matter.

White cement: To have iron salts content $\leq 1\%$.

Mortar mix table

Mortar to AS 3700	Bricks or blocks			Water thickener
	Clay	Concrete	Calcium silicate	
Masonry cement				
M3	1:0:4	1:0:4	n/a	No
M4	1:0:3	n/a	n/a	No
Portland cement				
M1	0:1:3	n/a	n/a	No
	1:3:12	n/a	n/a	No
M2	1:2:9	n/a	n/a	No
M3	1:1:6	1:1:6	n/a	Optional
	1:0:5	1:0:5	1:0:5	Yes
M4	1:0.5:4.5	1:0.5:4.5	n/a	Optional
	1:0:4	1:0:4	1:0:4	Yes
	1:0 to 0.5:3	1:0 to 0.5:3	1:0 to 0.5:3	Optional

Protection from contamination

Protect masonry materials and components from ground moisture and contamination.

Grout

Standard: To AS 3700 clause 11.7.

Minimum characteristic compressive strength: 12 MPa

Incidental Materials

Cement

Cement shall be type A Portland cement in accordance with AS 1315 of approved brand delivered fresh in batches and stored dry conditions. All light coloured stone panels to be in position with white or off white cements or adhesives.

Sand

Sand shall be clean river washed sieved, free from salt and foreign matter of course to fine sharp grading (.5-1.5mm). It is to be kept dry to allow for accurate measuring of liquids that are needed for mixing.

Hydrated

Hydrated to be of an approved brand delivered fresh and stored under dry conditions.

Lime is to be "slacked Lime down" prior to inclusion in any mixture.

Admixtures

Admixtures to be cementitious materials, to retard or accelerate setting, improve workability, reduce water content, may be used (to the manufacturer's specifications) subject to the Main Contractor approval. Admixtures which, in the opinion of the Main Contractor, may have an adverse effect on the mortar or associated materials, are not to be used.

Cementitious Material

Cementitious Material to be placed and all working of it completed within 16 hours of the first wetting of the cement in the material. Water content of the mortar to be kept to the minimum required to place and work the material and to minimise shrinkage and maintain strength of the mix.

The addition of water only, at any stage after the initial wetting of the cement in the plastic material, is prohibited.

The mortar to be applied and finished within the recommended period; any portion not used within this period to be removed from the site immediately.

Materials to be accurately gauged by volume in approved measuring devices.
The ingredients to be thoroughly mixed dry and again when wet with a carefully measured amount of water to produce a stiff mix. Mixing machines and platforms to be cleaned before each mortar batch is mixed.

4. Execution

Generally

Verify the scope and extent of work and resolve any unusual conditions, ambiguities and the like with the Project Manager before commencing. Do not commence installation unless conditions and substrates are suitable. Commencement of installation will indicate acceptance of conditions and substrates.

Verify that the masonry finishes provide suitable substrates for the required appearance and Verify masonry bonding patterns, mortar and joint profiles before commencing. In particular, check the type sand extent of following applied work by other trades and ensure that the masonry finishes provide suitable substrates for the required appearance and quality of the later applied work

Upon laying the first piece on these finishes the Subcontractor automatically accepts without reservation, the base upon which the finish is applied and the edge to which it finishes.

All backing surface materials such as concrete blockwork and reinforced concrete shall be thoroughly cleaned, prepared and checked to ensure a good key.

Allowances shall be made for wall surfaces, edges, vertical corners and the like which are not plumb during the setout of the brickwork. Changes to the designed/planned position of any brickwork must be approved by the Superintendent prior to commencement of work in that area.

The finished surface shall be true, plumb, or laid to the correct angle/line/fall (as specified in the drawings) with all edges intact and free from scratches, blemishes, defects, patches and the like.

Any part of the brickwork not of approved standard, or damaged or faulty bonded to the structure or if otherwise defective, is to be rectified by the Sub-contractor to the satisfaction of the Superintendent regardless of the cause and without extra cost to the Contract.

If any cracks, spalling or “drummy” sections appear in finishes before the completion of the job or the expiration of the Defects Liability Period, these shall be removed out and made good to the satisfaction of the Superintendent.

WALLS / BENCH SEATS

Bond

Stretcher bond and as detailed

Building in

Embedded items: Build in wall ties and accessories as the construction proceeds. If it is not practicable to obtain the required embedment wholly in the mortar joint in hollow unit brickwork or blockwork, fill appropriate cores with grout or mortar.

Construction at different rates or times

If two or more adjoining sections of masonry, including intersecting walls, are constructed at different rates or times, rake back or tie the intersections between those sections so that monolithic structural action is obtained in the completed work.

Holes and chases

If not required, do not cut holes and chases.

Joining to existing

Do not tooth new masonry into existing work.

Joints

Lay solid and cored units on a full bed of mortar. Face-shell bed hollow units. Fill perpends solid. Cut mortar flush.

- Externally: Tool to give a dense water-shedding finish.

- Thickness: 10 mm.

Joints and cutting

Set out bricks or blocks with joints of uniform width and minimise cutting of masonry units.

Monolithic structural action

General: Provide brick or block header units, except in stretcher bond facework.

Location:

- At engagement of engaged piers.
- At engagement of diaphragms with the leaves in diaphragm walls.
- At intersections of flanges with shear walls.
- At intersections with supporting walls and buttresses.
- Between leaves in solid masonry construction.

Rate of construction

Regulate the rate of construction to eliminate joint deformation, slumping or instability.

Rods

76 mm high units: 7 courses to 600 mm.

90 mm high units: 6 courses to 600 mm.

190 mm high units: 3 courses to 600 mm.

Weather protection

Keep the top surface of brickwork and blockwork covered to prevent the entry of rainwater and contaminants

Temporary support.

General: If the final stability of the masonry is dependent on construction of (structural) elements after the brickwork and blockwork is completed, provide proposals for temporary support or bracing

Adjacent Existing Work.

Interface with existing work.

Where new and adjacent existing work may come into contact, make neat junctions between new and existing works and ensure compatible and continuity of finishes

Notify any unusual or doubtful condition and interfaces to the Project Manager.

Where required and edges of existing work are damaged, cut back and remove existing work for sufficient distance and merge new work to ensure smooth transitions.

Ensure that the surfaces of new work are properly aligned and continuous with the surface of existing work, and construct suitable transitions as required.

Making good existing work

Make good existing adjacent work damaged during the construction of new work.

Submit the first completed example of making good work to establish the quality benchmark for matching construction and continuity of appearance between new work and making good work.

Set out Dimension

Joint dimensions

Bed joints and pretends shall be 10mm wide unless otherwise indicated

Control joint shall be 10mm wide unless otherwise indicated

Prepare accurate rods to ensure correct vertical set of masonry courses

If correct set out cannot be maintained due to variation in unit size, notify the project manager .

Junctions:

Use purpose made corner blocks at corner junctions

Except where control joints are indicate, bond intersecting wall at tee junctions by one of the following methods

- Tothing at every second course where masonry is not visible
- Wall ties at every course where masonry is visible

Masonry Laying

Generally

Lay masonry in accordance with product data, approved setout and the relevant standards. Constructs masonry plumb, level and properly bonded with perpendics aligned vertically. Masonry units shall be laid dry, unless required by extreme hot or dry conditions.

Setting out

Make a trial set-out of each area and obtain approval before commencing. Do not vary approved set out unless further approved. Verify position of control joints. Adjust set out with joints of uniform width, and with the minimum cutting of masonry units.

Laying Masonry

Remove dust and loose materials, and clean substrate surfaces before laying masonry. Use mortar within the working time. Discard un-used mortar after 20 minutes or earlier if setting or stiffening commences.

Place units with a single action and with minimum tapping. Remove mortar and relay in fresh mortar, if units are moved after initial placing.

Construct wall progressively and evenly and do not raise any part of the work more than 1200mm above adjacent work. Ensure that construction breaks are not visible in the completed work.

Provide temporary bracing to fresh masonry wall at the end of each day and if the work remains unattended to withstand wind loads.

Joints shall be not raked or tooled more than 3mm deep unless otherwise approved.

Facework

Construct visible masonry wall to facework quality unless otherwise approved.

Select masonry units for facework of uniform size and appearance. Do not use chipped or damaged masonry units in facework.

Where facework is required both sides of single leaf walls, select units of uniform width and quality both sides.

Corners

Verify cutting and jointing details for outside corners in face work before commencing. For walls meeting at non-perpendicular angles, saw cut corner units carefully to ensure sharp straight arrises.

Cutting

Carry out saw cutting with suitable well maintained equipment. Contain and immediately remove all debris and water from saw cutting operations.

Core Filling and Cavity Filling

Provide suitable grout of required strength grade and slump for core filling and cavity filling to engineers requirements. Place reinforcement progressively. Compact grout to eliminate voids. Notify Project Management before and give sufficient time for inspection before core filling.

Weather protection

Keep the top surface of brickwork and blockwork covered to prevent the entry of rainwater.

Completion

User manual:

Submit a User Manual for the work of this trade with records and details of materials used and sources of supply, cleaning and repair procedures.

Clean Up

At completion, all excess materials, debris and waste must be removed from the jobsite. Dispose of containers according to state and local government regulations.

Maintenance Schedule

Supply the major contractor details pertaining to the correct cleaning agents which can be utilized to assist in maintaining the architectural effect of the brickwork. List of chemical compounds to avoid in relation to cleaning eg. acid, oil based, etc shall be provided. Maintenance schedule shall also include details pertaining to the use and reapplication timelines according to manufacturers recommendation.

1. Scope

Supply and install the following as indicated on drawings and details. Provide –

- Planter Type 01, 02, 03, 04 and 05

Standards

All workmanship and materials shall be in accordance with recognised Australian codes of practice and Australian standards where these exist but are not specifically referred to in this Specification

Referenced Documents:

AS 4100	SAA Steel Structures Code
AS 1538	SAA Cold-formed Steel Structures Code
AS 1554	SAA Structural Steel Welding Code Part 1 - Welding of steel structures
AS 1650	Galvanized coatings
SAA MA1.8	Fabrication
SAA MA1.9	Erection

Recognised Australian codes of practice and standards where these exist but are not specifically referred to in this Specification

2. Quality**Inspections***Witness points*

Give not less than 3 days notice so that inspection may be made of the following.

- Prefabricated units prior to paint finish application
- Location and setout of steel edging
- Completion of steel edging

Submission*Shop Drawings*

The contractor is to provide shop drawings for the planters and trellis and all their components and hardware prior to fabrication.

The shop drawings should detail all fixing points and the hardware selection.

State applicable Australian Standards, and composition of metals to be used.

Details of fabrication involving other trades or components

Information necessary for site assembly

Proposals for the breakup of large items as required for delivery to the site

Proposed method of joining and fixing the module large items

Product Data

Submit product data for material and product, including manufacturers instructions, properties, test results, construction detail and any option as appropriate for:

- Metal components and finishes
- Applied coatings, including substrate preparation and pretreatment.

Include product data for adhesives, fasteners and joint sealants.

Execution:

Welding procedures: Submit details of proposed welding procedures before fabrication.

Welding dissimilar metals: Submit the following details:

- Type and thickness of materials to be welded.
- Proposed joint preparation and welding procedures.
- Proposed filler metal.
- Expected dilution (proportion of fused parent metal in the weld metal).

Control Samples

Submit representative control sample for

- Metal components and finishes
- Visible fasteners

Condition precedent to Practical Completion include

- Trade Warranty

Certification requirements include

- Structural certification

Testing Generally

Provide evidence/ testing data and reports to demonstrate that all materials/ products proposed have been tested to meet the standards specified herein.

Where testing has not previously been carried out on products/ materials proposed, arrange for tests to be carried out to comply with the Specification to the satisfaction of the Superintendent.

The provision of testing data or the carrying out of tests shall not relieve the Sub-Contractor of his responsibilities regarding the performance requirements, durability or service life requirements, etc.

Health and Safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel

The installed work shall comply with legislative requirements and accept industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of work.

Comply with relevant legislative requirements and the regulations of the relevant Authority.

Performance requirements

Fit for purpose

All materials and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Loads

The installed work, including fasteners and framing, shall accommodate all permanent and temporary loads, individually and in combination, without failure, deflection, damage to adjacent or applied work, or risk to human safety in accordance with the relevant standards

Applicable loads may include dead loads, live loads, human impact loads, wind loads, earthquake loads, maintenance loads and service loads as applicable.

Movements.

The installed work, including fasteners and framing, shall accommodate all short and long term movements and deflections in the base building, substrates to which the work is fixed, and within the work, including thermal movements, without failure or the transfer of loads from the base building to the work of this trade.

Connections

The installed work shall be connected to the base building or substrates in a neat, substantial manner by correctly sealed and located connections which transfer the loads from the work without displacement,

distortion, or damage to the fasteners, substrates or the adjacent work. Connections shall accommodate movement requirements.

Visible fasteners.

Visible fasteners shall be evenly and neatly located and aligned. Use correctly sized tools to prevent damage to fasteners and adjacent surfaces. Rectify damage or marking to adjacent surfaces due to installation of visible fasteners. Where required to be finished flush with adjacent surfaces, visible fasteners shall be countersunk. Visible fasteners in accessible areas shall be vandal resistant.

Sharp edges.

There shall be no sharp edges or projections, which could cause human injury including injury to maintenance personnel.

Exposed fasteners shall be recessed, smooth and flush. Use flush countersunk heads where practicable.

Exposed thread ends of bolts shall be avoided, and where unavoidable, shall be cut back and ground smooth with no more than two threads exposed.

Metal edges and corners shall be rounded and smoothed to prevent human injury.

Corrosion

Materials and products, including fasteners and concealed components, shall be corrosion resistant or protective coated to prevent corrosion.

All materials and products, including fasteners and concealed components, required to be corrosion – resistant or protective coated shall be inspected after installation for any defects or damage incurred during installation and all defects and damage discovered shall be rectified.

Protective coating system

Protective coatings and primers shall prevent corrosion to the substrate, or staining of finished surfaces due to corrosion. Provide additional coatings to concealed locations, contact surfaces, pockets, gaps and similar locations where the risk of corrosion may increase

Compatibility

Adjacent materials and products shall be chemically and electrolytically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spacers. Adjacent materials and products, including adhesives and joint – sealants, shall not stain or contaminate and shall not cause visual or structural defects in adjacent materials.

Tolerances

Fabrication tolerance of components and assemblies generally shall not exceed

- Length and width: +/- 1mm
- Diagonals: +/- 2mm
- Flatness: +/- 1mm /Lm (max. 2mm)
- Edge Straightness: +/-1mm / Lm (max. 2mm)

Installation tolerance for finished work shall not exceed

- Position on plan, or vertical surface: +/-3mm
- Deviation in level (horizontal): Not more than 1 in 1000 (max. 3mm)
- Deviation in plumb (vertical): Not more than 1 in 1000 (max. 3mm)
- Edge Straightness: +/-1mm /Lm length (max. 2mm)

3. Materials and Components

MILD STEEL

Generally

Mild Steel materials shall be the correct types and profiles indicated on the drawings and in accordance with the relevant Standards

AS 1163 Structural steel hollow sections

AS 1365 Tolerances for flat rolled steel products

AS 3678 Structural steel – Hot rolled plates, floor plates and slabs

AS/NZS 3679 Structural steel

AS/NZS 3679.1 Hot rolled bars and sections

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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AS/NZS 3679.2 Welded sections
AS 1397 Steel sheet and strip – Hot dipped zinc coated or aluminium /zinc coated
AS/NZS 1595 Cold rolled, unalloyed , steel sheet and strip
AS 1074 Steel tubes and tubulars for ordinary service
AS/NZS 2728 Prefinished/ prepainted sheet metal products for interior/exterior building application – performance requirements
AS 4100 Steel structures
AS/NZS 4600 Cold formed steel structures

Submit shop drawings and indicate steel sizes and finishes

Mild steel shall be new and free from defects, damage , corrosion and surface blemishes.

Mild steel shall be straight and free from buckle and twist. Rectify or replace members which exceed required tollerances

ALUMINIUM

Extrusions:

Aluminium extrusion shall be suitable alloys and grades in accordance with the product data and approved control sample and the relevant standards

AS/NZS 1866 Aluminium and aluminium alloys – Extruded rod, bar, solid and hollow shapes

Submit Product Data and Control Samples

Unless otherwise indicated or required, extrusion alloys shall be Grade 60663, Temper T5 or T6.

Temper T4 may be used where bending is required, subject to approval. Grade 6061, Temper T6 shall be used for structural applications.

Extrusion shapes and thicknesses shall accommodate required loads and connections, and shall be rigid and straight, with sharply defined profiles, and without draw marks.

Extrusion walls and screw flutes shall be of sufficient thickness for fasteners including flush countersinking where required.

Contact surface between aluminium sections, shall be smooth , tue and even , and fixed so joints are tight without filling materials.

Do not commence production of custom extrusion until profiles have been approved.

STAINLES STEEL

Generally:

Stainless steel shall be suitable grades, in accordance with the product data and approved control samples, and the relevant standards.

AS 1449 Wrought alloy steels – Stainless and heating resisting steel plate, sheet and strip
ASTM A480M Specification for general requirements for flat rolled stainless and heat resisting steel plate, sheet and strip
AS 2837 Wrought alloys steels – stainless steel bars and semi finished products

Submit Product Data and Control Samples

Stainless Steel Grade

Unless otherwise indicated or approved, stainless steel grades shall be

- Concealed: Grade 304 (UNS Grade S30403)
- Visible: Grade 316 (UNS Grade S31603)
- Structural fasteners and under tension : Grade 904L (UNS Grade N08904)

Corrosion and staining

Ensure that stainless steel is not contaminated by mild steel particles during fabrication

Ensure that cutting and welding does not discolour stainless steel

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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Stainless steel in visible location shall be selected for resistance to corrosion and staining. Stainless steel in external and humid locations shall be selected for resistance and corrosion.

Grain and roughness

Unless otherwise indicated, grain and visible stainless steel shall be vertical on vertical surfaces or parallel to the longer axis.

Roughness (Ra) of stainless steel surfaces shall not exceed 0.5microns.

FACTORY APPLIED COATINGS

Generally:

Factory applied coatings shall be finished to a consistent high quality by experienced applicators with documented quality control systems

All substrates shall be prepared and coatings applied in the factory unless otherwise approved in writing before commencing.

Submit Product Data for proposed coatings

Submit Method Statement for factory application and on-site repair of damage during installation including reference to substrate preparation, drying times, preparation between coats, health and safety requirements, and safe environmental disposal of waste products

Physical properties:

Coatings shall be free of defects and smooth over each components, with consistent appearance over the entire work.

Select suitable products and correct preparation and application procedures for the substrate type, required finish and prevailing conditions.

Verify that the substrate types are suitable for and compatible with the proposed coatings.

Each coating type shall be carried out by a single applicator using consistent materials and procedures and suitable quality assurance procedures.

Construction details:

Do not install components with damage to coatings, including damage during delivery. Return such damaged to the factory for repair or replacement.

Notify the superintended of damage to coatings during installation. Coatings damaged during installation may be repaired in place in accordance with the approved method statement or removed and replace at the sole discretion of the superintended.

POWDER COATING

Generally:

Powder coating to aluminium shall be an approved polyester resin system, in accordance with the product data and approved control sample and the relevant standards

AS 3715 Metal finishing – Thermoset powder coating for architectural applications of aluminium and aluminium alloys.

AS 4506 Metal finishing- Thermoset powder coatings

Submit Product Data and Control Samples

Thickness:

The dry film thickness (DFT) for powder coating shall not be less than 60 microns

Exterior Powder Coating:

Exterior powder coating shall be super durable grade in accordance with relevant standards

AAMA 2604 Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels

ANODIZED COATING

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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Generally:

Anodized coating shall be approved types, in accordance with the product data and approved control sample and the relevant standards

AS 1231 Aluminium and aluminium alloys- anodic oxidation coatings.

Submit Product Data and Control Samples

Thickness:

Thickness of inside surface of exterior elements shall be the same as external surfaces

Unless otherwise approved, thickness of anodizing shall be not less than

- External : Average 25 microns with local thickness not less than 20 microns
- Internal: Average 15 microns with local thickness not less than 12 microns

Unless otherwise approved, thickness of anodizing within 2 kilometres of the coats shall be not less than

- External : Average 40 microns with local thickness not less than 30 microns
- Internal: Average 25 microns with local thickness not less than 20 microns

PLANTERS TYPE 01, 02 , 03, 04 and 05

Provide planter types to locations indicated on drawings and to detail 04-06/LA-89-G-A-401

Planters Types shall be a complete fabricated system including fasteners, trims and finishes, in accordance with the Product data and approved control samples, and the relevant Standards including legislative requirements.

Fabricate Planter Types straight uniform and continuous, with smooth, even changes of direction, and free from defects affecting appearance and durability

Finish:

- All steel finish to be 2.5 blast + epoxy zinc prime + high build epoxy all over, top coat . Final colour to be a Dulux Epoxy Enamel, colour: '*Satin Black*' or an approved equivalent

The Contractor is to provide Shop drawings of the planter type , and all its components and hardware to indicate construction details, fasteners, transition and changes of direction prior to fabrication. These shop drawings should detail the fixing points and the hardware selection.

4. Execution

General

Metal work fabrication

Quality

Mark out alignment and levels on site for approval prior to installation

Fabricate metalwork to a high standard of fit and finish in accordance with approved control samples and shop drawings and the relevant standards

Establish finish quality standards before commencing fabrication. Finished work which does not comply to a high standard will be rejected and may require removal and complete replacement.

Visible surfaces, profiles and edges shall be fabricated with smooth, straight lines and angles, and uniform curves. Install work accurately and rigidly to required locations.

Butt welds shall be complete penetration butt welds to AS1554.1

All other welds shall be 6mm continuous fillet type GP using E41XX electrodes.

All steelwork shall be security temporarily braced as necessary to stabilise the structure during erection.

Prefabrication: Fabricate and pre-assemble items in the workshop wherever practicable.

Surfaces and edges generally shall be clean, neat and free from burrs and indentations.

Remove sharp edges without excessive or uneven radiusing

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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Joints and assembly

Joints and assembly shall be robust and solid, and shall not become loose or break during normal in service use.

Visible joints shall be accurately scribed and fitted to fine, tight hairline fit without edge projection and misalignments

Ensure continuity of surface finish, colour and texture without variation

Fabrication Tolerances

Ensure that in addition to the general requirements of the Specification:

- A high degree of accuracy shall be employed in the fabrication of work under the Contract and its support structure.
- Deviations in length, width and diagonal dimension shall not exceed $\pm 1\text{mm}$.
- The twist and warping shall not cause any point to be more than 0.5mm out of plane.
- The twist and warping shall not cause any point of the structural frame to be more than 2mm out of plane.
- Thickness: Tolerances for flat rolled steel sheet thicknesses shall be in accordance AS/NZS 1365.

Welding, Brazing, Soldering

Visible joints: Finish visible joints made by welding, brazing or soldering by grinding, buffing or the like methods appropriate to the class of work before painting, galvanizing, or the like further treatment.

Standards: To AS 4100 and AS 1554.

Correction of Faulty Welds: To AS 1554, Part 1, clause 5.8

Fasteners

Fasteners shall be the correct types, sizes and spacing to assemble and fix the works in place, and accommodate imposed loads, in accordance with the product data and the relevant standards.

Corrosion

Fasteners shall be corrosion-resistant for the location and equivalent to or exceeding the members to be fixed or assembled in accordance with the relevant standards.

Fasteners shall not cause damage, deterioration, and staining or electrolytic corrosion to adjacent work.

Lock Nuts

Provide lock nuts or suitable nut locking compounds for bolts, holding work to base-building, moving parts, where subject to vibration, vertical bolts in tension and where there is any risk of loosening.

Joint Sealants

Joint sealant shall be approved elastomeric products, in accordance with product data and the relevant standards. Submit product data including generic type, cure type, movement capability, properties and test results, including VOC content and emission data.

Unless otherwise indicated, sealant colour shall match adjacent finish colours. Joint sealants shall be compatible with and no staining to substrates and adjacent work, and shall be capable of cleaning.

All joint shall be low VOC (volatile organic compound) types.

External joint sealants shall be resistant to ultra-violet light and the effects of exposure.

Handling and Storage

Generally: To SAA MA1.9, section 9.1.4. Handle and store steelworks so as to protect it from damage, including overstress, distortion, damage to surfaces and applied finishes, contamination by foreign matter, and the like.

Correction of Faults: To AS 4100

Steel Type and Grade

Standards: Steel shall be of the types and grades shown on the Drawings or scheduled, to the appropriate material standard, and to AS 1250, Section 2, or AS 1538, clause 1.7 in the case of cold-formed sections.

Certification of Metalwork

Submit certification by an independent certifying engineer that all metalwork comply with the Building Code and Australian Standards.

PAINTING**1. Scope**

The work in this Section of the Specification includes the supply, application and paint finish to Planter Types 01, 02, 03, 04 and 05. Works to the extent shown on the Drawings and Details

The following is provided as a guide only and is not intended to be exhaustive. It is the Contractors responsibility to fully examine the extent of the planters. No variation for failure to do so will be approved. Refer to drawings as an additional guide.

Standard

Materials selections to the respective areas shall be in accordance with the Drawings and details.

All work shall be finished to achieve the required surface finish and provide a minimum amount of maintenance.

Comply with the following:

- The current statutory requirement in place;
- Recognised Australian codes of practice and standards where these exist but are not specifically referred to in this Specification
- Materials and workmanship except where superseded by this Specification shall be in accordance with relevant SAA Codes and AS Specifications particularly AS.2311-2004 The Painting Of Buildings.
- AS3750 Paints for Steel Structures

2. Quality**Inspection**Witness points

Give not less than 48 hours notice so that inspection may be made of the following.

- Completion of surface preparation.
- Completion of Painted planters

Hold points

- Approval of samples;
- Completed render and paintwork

Approved subcontractor

The work under this section shall be carried out by experienced firms with the best quality reputation for workmanship and performance, in the render and Painting fields. All work is to be predominantly carried out by accredited tradespersons or under their supervision.

Health and safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel. Have particular regard to regulations governing the safe handling and use of chemical products.

General

All work shall comply with the BCA, relevant acts and regulations by-laws and all relevant Australian Standards. The Painting Sub-contractor shall examine all surfaces, and if not in proper condition for painting he shall notify the Superintendent before proceeding with the work. Should painting work commence without inspection, this will be construed to be acceptance of the surfaces as satisfactory and any defects in work resulting from accepting poor surfaces shall be made good and rectified at no cost to the Principal.

Paint shall not be applied to any surface which is not thoroughly dry except when recommended by Manufacturer. All surfaces to be inspected and where defective made good before Work proceeds. No variation to the quality of paint finish specified will be accepted and the painter shall confer with the firm who supplies the paint materials and comply strictly with their recommendation. The representatives of the suppliers shall have access to the job and to materials being used. All materials are to be delivered to the job in unbroken containers bearing the brand name of the Manufacturer's and shall be subject to

inspection and approval by the Superintendent. Deliveries to be made well in advance of applications. Materials to be stored in sheds on timber platforms.

Submission

Paint

General: Submit the selected manufacturer's details at least 3 weeks before the paint is required, as follows:

- Paint brand name and paint line quality statement.
- Material safety data sheets (MSDS) showing the health and safety precautions to be taken during application.
- The published recommendations for maintenance.
- Shop Drawings -Indicate the type and extent of hot dip galvanizing and/or protective coatings on the shop drawings , including concealed surfaces and fasteners.

Samples

Samples of each of the finishes and colours specified shall be prepared by the Painter for approval by the Superintendent prior to commencement. The contractor is to allow for colours on planters to be selected, altered or modified at the direction of the Superintendent. Allow to prepare a sample of not less than two (2) m² for each colour, if an alternative supplier is being requested to that specified. Exterior finishes must be approved regardless of supplier and be applied in the worst situation for final substrate and light considerations.

Warranty

Material Warranty: Submit the manufacturer's material warranty as follows:

- Extent: Paintwork generally.
- Terms: Paint systems are suitable for their intended use.
- Warranty period: As defined by the manufacturer.

3 Materials & Components PERFORMANCE REQUIREMENTS

All materials and products, and the installed works, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Cleanability

Applied coatings and finished surfaces shall be hard-wearing and shall enable the removal of dust, dirt, fingermarks and the like, using normal household cleaning compounds without damage or change of colour to the coatings and finished surfaces.

Corrosion

Materials and products, including fasteners and concealed components, shall be corrosion resistant or protective coated to prevent corrosion

Corrosion protection

All materials and products, including fastener and concealed components, required to be corrosion – resistant or protective coated shall be carefully inspected after installation for any defects or damage incurred during installation and all defect and damages discovered shall be rectified. Rectification may include complete replacement of the item or part of the work at the sole discretion of the project manager.

Cut ends and edges

The cut ends and edges of factory-coated products shall be protective coated after fabrication or on-site cutting to ensure corrosion protection

Protective coatings

Protective coatings and primers shall prevent corrosion to the substrate, or staining of finished surfaces due to corrosion.

Provide additional coatings to concealed locations, contact surface, pockets, gaps and similar locations where the risk of corrosion may increase.

Manufacturer and batches

All products in each coating system shall be from one manufacturer. Do not combine products from different manufacturers.

Products used in each installation area and finish type shall be from the same production batch.

Combinations

General: Do not combine paints from different manufacturers in a paint system.
Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the top coats.

Delivery

Deliver materials to the job site in original sealed containers, clearly marked with the manufacturer's name, brand name and type of material and colour of colour formula. Verify the product matches that of the original sample applied on the control panel.

Store materials inside if possible, away from sparks or open flame. Store in a secure area to avoid tampering and contamination. Water based materials must be kept from freezing. Store and handle according to manufacturer's written instructions.

Putty and fillers

Material: To the recommendation of the paint system manufacturer, as suitable for the substrate and compatible with the primer.

Tinting

General: Provide only products, which are colour tinted by the manufacturer or supplier.

Toxic ingredients

General: Comply with the requirements of Appendix I Uniform Paint Standard to the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

Ultra –violet exposure

Paint and coating products subject to direct and reflected sunlight shall be ultra-violet resistant types.

Extent of Coatings

Steel members shall be protective coated or hot dip galvanized on all sides and surfaces. Decorative top coats over protective coatings may be limited to visible surface only. Indicate extent of top coating on Shop Drawings

PRODUCTS

Factory Applied Coatings

Factory applied coatings shall be finished to a consistent high quality by experienced applicators with documented quality control systems

All substrates shall be prepared and coatings applied in the factory unless otherwise approved in writing before commencing.

Submit method statement for factory application and on site repair of damage during installation including reference to substrate preparation, drying times, preparation between coat, health and safety requirements and safe environmental disposal of waste products.

Physical properties

Coatings shall be free of defects and smooth over each component, with consistent appearance over the entire work

Select suitable products, and correct preparation and application procedures for the substrate type, required finish and prevailing conditions

Verify that the substrate types are suitable for and compatible with the proposed coatings.

Each coating type shall be carried out by a single applicator using consistent materials and procedures and suitable quality assurance procedures

Construction details

Do not install components with damage to coatings, including damage during delivery. Return such damaged to the factory for repair or replacement.

Notify the superintendent of damage o coatings during installation. Coatings damaged during installation may be repaired in place in accordance with the approved method statement or removed and replaced at

the sole discretion of the Project Manager.

Protective Coatings to Steel

Protective coatings (primers) to steel work shall be approved proprietary system, in accordance with approved control sample and the relevant standards

Select appropriate systems for the substrates, required finish and prevailing conditions.

Submit details before commencing, including substrate preparation, application, on-site repair and health and safety.

Visible protective coatings shall match control samples.

Where indicated as two pack, the coating system shall be a complete protective coating system with a two pack decorative top coat.

All coatings and products shall be compatible with previous protective coatings. Steel surface for protective coatings shall be blast cleaned in accordance with relevant standards.

One pack zinc phosphate primer shall not be used unless approved in writing. Solvent-based inorganic zinc silicate protective coatings shall not be used for factory applied work. Solvent based coatings may be used for site applied work subject to written approval before commencing work.

Steel preparation

Prepare steel substrates by consistent procedures to ensure finished work matches control sample and in accordance with relevant standards

Establish optimum procedure by practical trials before commencing and record details. Submit control samples; following approval do not vary procedure for remainder of the work

Complete welding, cutting, drilling and other fabrication procedures before commencing,

Grind welds smooth and remove weld spatter. Round edge to 2mm radius

Cleaning

Degrease with suitable degreasing solutions, de-scale and remove rust and other harmful matter or contamination likely to adversely affect applied coatings

Wire brush, power tool or abrasive blast clean as appropriate

Carry out additional fine sanding, buffing, scouring or the like where required to match smoothness of control sample. Remove dust

Application

Apply protective coatings as soon as practicable after surface preparation. If surface become tarnished before coating, repeat the surface preparation.

Where there has been a delay after the application of primer, carry out decontamination of primer surface before application of top – coat

Where metal surfaces will be in contact or near contact after installation, apply protective coating and properly dry before assembly

After installation, apply protective coatings to visible un primed surfaces, site welds and bolt heads and repair any damage to protective coatings before any rusting occurs

Decorative Coatings to Steel

Decorative coatings for steel shall durable approved proprietary system, in accordance with product data and the relevant standards

Submit product data and control sample

Decorative coating shall be as noted on drawings unless otherwise indicated or approved.

Decorative coatings shall be non yellowing moisture resistant and shall be re-coatable on site for maintenance and repair

Select appropriate coating system for the substrates, exposure, required finish and prevailing conditions

Finished surface quality

Finished surface quality shall be free of defects and smooth over each element, with consistent appearance over the entire work

Where there has been a delay after the application of primer, carry out decontamination of primer surface before application of subsequent coats or repeat application primer

Carry out application of decorative coatings in a dust free factory spray booths where practicable. Rectify any damages on site after installation

The minimum and maximum dry film thickness of each coat shall comply with the product data apply additional coats if required for high build thickness.

Paint

Paint finishes as noted on drawings and in accordance with manufactures recommendation

Colour : Satin Black (*Dulux*)

4. Execution

Verify the scope and extent of work and resolve any unusual conditions, ambiguities and the like with the Project Manager before commencing. Do not commence installation unless conditions and substrates are suitable. Commencement of installation will indicate acceptance of conditions and substrates.

Verify that the finishes provide suitable substrates for the required appearance and quality of the later applied work.

Adjacent Existing Work.

Interface with existing work.

Where new and adjacent existing work may come into contact, make neat junctions between new and existing works and ensure compatible and continuity of finishes

Notify any unusual or doubtful condition and interfaces to the Project Manager.

Where required and edges of existing work are damaged, cut back and remove existing work for sufficient distance and merge new work to ensure smooth transitions.

Ensure that the surfaces of new work are properly aligned and continuous with the surface of existing work, and construct suitable transitions as required.

Making good existing work

Make good existing adjacent work damaged during the construction of new work.

Submit the first completed example of making good work to establish the quality benchmark for matching construction and continuity of appearance between new work and making good work.

Paint (Touch Up)

Samples of each colour and finish to be prepared on selected surfaces before painting commences. Samples to be not less than two (2) square metres. Where certain colours may require tinting and intermixing, it is only to be done with paints of the same manufacture.

Work to be performed by skilled Tradesmen. Materials and intermixing paints on floors of the building will not be permitted. Parts to be painted to be thoroughly cleaned and inspected to ensure surfaces are suitable. Colour schemes to be strictly adhered to. Notwithstanding this, sample colours will be required to be prepared on work for Superintendent approval.

Substrate preparation

General: Prepare substrates to receive the painting systems.

Cleaning: Clean down the substrate surface. Do not cause undue damage to the substrate or damage to, or contamination of, the surroundings.

Filling: Fill cracks and holes with fillers, sealants, putties or grouting cements as appropriate for the finishing system and substrate, and sand smooth, dust off and apply specified coatings

No painting to be commenced until such time as the work of other Trades has been completed within area.

Supply and lay suitable drop sheets in all areas where painting is being done, to protect finished floor, wall and joinery surfaces.

Allow to mask and protect all adjacent surfaces including stonework and metal window frames and glass when external painting is being carried out.

Wall and floor finishes to be adequately protected; remove paint splashes without injury to affected area. Any adjacent surface that is damaged by paint splashes shall be made good to the satisfaction of the Superintendent and all costs involved shall be borne by the Builder.

Any pavings (inclusive of stone etc.) splashed with paint where paint cannot be removed to the Superintendent's approval, to be taken up and re-laid and no additional cost to the Contract. If walls are damaged in effecting any relaying, they shall be repainted at the Sub-contractor's expense.

Containers shall not be opened until required for use. Thoroughly stir paint and keep at uniform consistency during application.

All work to be executed in accordance with approved trade practice. Materials shall be applied evenly and primers well brushed into the pores and into crevices and quirks. Undercoat when dry shall be thoroughly rubbed down with sandpaper and dusted clean before applying the next coat. Finished surfaces shall be uniform in degree of gloss and colour and free from brush marks.

Prime coats and undercoats shall be unscarred and completely integral before the application of each succeeding coat. Slightly vary colour of each paint coat to distinguish it from the proceeding coat. Allow time between coats as listed in the manufacturer's specification to coats ensure complete drying. No painting shall be executed during unsuitable weather and all areas shall be cleaned out completely before commencing work.

Remove or protect adjacent item prior to commencing painting. Unpainted areas adjoining painted areas shall be adequately protected with drop sheet or other approved means.

Final coat shall be free of brush marks, dust or other blemishes.

Repair

General: Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition. Touch up new damaged decorative paintwork or misses only with the paint batch used in the original application.

Cracks appearing in paintwork before completion or before expiration of maintenance period to be cut out, stopped, pointed up and made good to the satisfaction of the Superintendent. Walls in which they occur to be repainted in required number of coats to the satisfaction of the Superintendent

'Wet paint' warning

General: Place notices conspicuously and do not remove them until the paint is dry grain.

Paint application

General: Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Apply subsequent coats after the manufacturer's recommended drying period has elapsed.

Protection

Protect shrubs, metal, wood trim, glass, asphalt and other building hardware during application from overspray if applicable. Do not permit mist (if spraying) or liquid to drift onto surrounding properties, parking lots or completed works on site.

Painting conditions

General: Do not paint in dusty conditions, or otherwise unsuitable weather as follows unless the paint is suitable and recommended for such conditions:

- Surface temperature $\leq 5^{\circ}\text{C}$ or $\geq 35^{\circ}\text{C}$.

- unless otherwise specified by the manufacturer.
- application cannot proceed if the substrate is wet, contains frozen water, or if rain is likely within 4 hours.

Clean Up

At completion, all excess materials, debris and waste must be removed from the jobsite. Dispose of containers according to state and local government regulations.

Completion

User manual:

Submit a User Manual for the work of this trade with records and details of materials used and sources of supply, cleaning and repair procedures.

1. Scope

Provide –

- Balustrade and Handrails

Standards

All workmanship and materials shall be in accordance with recognised Australian codes of practice and Australian standards where these exist but are not specifically referred to in this Specification

- AS1428 - Design for access mobility
- AS1657 - Fixed platforms, walkways, stairways, and ladders – Design, construction and installation.

2. Quality

Inspections

Witness points

Give not less than 3 days notice so that inspection may be made of the following.

- Location and setout of balustrades / handrails
- Completion of balustrades /handrails

Submission

Shop Drawings

The contractor is to provide shop drawings of the balustrades including all its components and hardware prior to fabrication.

- The shop drawings should detail all fixing points and the hardware selection.
- State applicable Australian Standards, and composition of metals to be used.
- Information necessary for site assembly
- Proposals for the breakup of large items as required for delivery to the site
- Proposed method of joining and fixing the module large items

Product Data

Submit product data for material and product, including manufacturers instructions, properties, test results, construction detail and any option as appropriate for:

- Metal components and finishes
- Applied coatings, including substrate preparation and pretreatment.

Include product data for adhesives, fasteners and joint sealants.

Execution:

Welding procedures: Submit details of proposed welding procedures before fabrication.

Welding dissimilar metals: Submit the following details:

- Type and thickness of materials to be welded.
- Proposed joint preparation and welding procedures.
- Proposed filler metal.
- Expected dilution (proportion of fused parent metal in the weld metal).

Control Samples

Submit representative control sample for

- Balustrades / handrails
- Metal components and finishes
- Visible fasteners

Condition precedent to Practical Completion include

- Trade Warranty

Certification requirements include

- Structural certification

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MOSMAN, NSW

Technical Specification
Rev 03 AFC Issue, 25/03/22

black beetle

- Building Code Certification of handrails and balustrades

Industry associations

The stainless steel fabricator shall be accredited under the scheme managed by the Australian Stainless Steel Development Association.

Testing Generally

Provide evidence/ testing data and reports to demonstrate that all materials/ products proposed have been tested to meet the standards specified herein.

Where testing has not previously been carried out on products/ materials proposed, arrange for tests to be carried out to comply with the Specification to the satisfaction of the Superintendent.

The provision of testing data or the carrying out of tests shall not relieve the Sub-Contractor of his responsibilities regarding the performance requirements, durability or service life requirements, etc.

Health and Safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel

The installed work shall comply with legislative requirements and accept industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of work.

Comply with relevant legislative requirements and the regulations of the relevant Authority.

Performance requirements

Fit for purpose

All materials and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Loads

The installed work, including fasteners and framing, shall accommodate all permanent and temporary loads, individually and in combination, without failure, deflection, damage to adjacent or applied work, or risk to human safety in accordance with the relevant standards

Applicable loads may include dead loads, live loads, human impact loads, wind loads, earthquake loads, maintenance loads and service loads as applicable.

Crowd loads

Balustrade and handrails in public areas shall accommodate loads in accordance with relevant standards.

Movements.

The installed work, including fasteners and framing, shall accommodate all short and long term movements and deflections in the base building, substrates to which the work is fixed, and within the work, including thermal movements, without failure or the transfer of loads from the base building to the work of this trade.

Connections

The installed work shall be connected to the base building or substrates in a neat, substantial manner by correctly sealed and located connections which transfer the loads from the work without displacement, distortion, or damage to the fasteners, substrates or the adjacent work. Connections shall accommodate movement requirements.

Visible fasteners.

Visible fasteners shall be evenly and neatly located and aligned. Use correctly sized tools to prevent damage to fasteners and adjacent surfaces. Rectify damage or marking to adjacent surfaces due to installation of visible fasteners. Where required to be finished flush with adjacent surfaces, visible fasteners shall be countersunk. Visible fasteners in accessible areas shall be vandal resistant.

Sharp edges.

There shall be no sharp edges or projections, which could cause human injury including injury to maintenance personnel.

Exposed fasteners shall be recessed, smooth and flush. Use flush countersunk heads where practicable.

Exposed threads ends of bolts shall be avoided, and where unavoidable, shall be cut back and ground smooth with no more than two threads exposed.

Metal edges and corners shall be rounded and smoothed to prevent human injury.

Corrosion

Materials and products, including fasteners and concealed components, shall be corrosion resistant or protective coated to prevent corrosion.

All materials and products, including fasteners and concealed components, required to be corrosion – resistant or protective coated shall be inspected after installation for any defects or damage incurred during installation and all defects and damage discovered shall be rectified.

Compatibility

Adjacent materials and products shall be chemically and electrolytically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spacers. Adjacent materials and products, including adhesives and joint – sealants, shall not stain or contaminate and shall not cause visual or structural defects in adjacent materials.

Visual contrast

Handrails shall have a minimum visual contrast (luminance contrast) of 30% to the adjacent surfaces in accordance with the relevant standards

Tolerances

Fabrication tolerance of components and assemblies generally shall not exceed

- Length and width: +/- 1mm
- Diagonals: +/- 2mm
- Flatness: +/- 1mm /Lm (max. 2mm)
- Edge Straightness: +/-1mm / Lm (max. 2mm)

Installation tolerance for finished work shall not exceed

- Position on plan, or vertical surface: +/-3mm
- Deviation in level (horizontal): Not more than 1 in 1000 (max. 3mm)
- Deviation in plumb (vertical): Not more than 1 in 1000 (max. 3mm)
- Edge Straightness: +/-1mm /Lm length (max. 2mm)

3. Materials and Components

BALUSTRADES

Generally

Balustrades shall be a complete fabricated system including stanchions, fasteners, trims and finishes, in accordance with the Product data and approved control samples, and the relevant Standards including legislative requirements.

Submit shop drawings to indicate construction details, fasteners, transition and changes of direction, and to verify human safety.

Handrail Dimensions and Heights

Balustrade heights, and clearance between balustrade and adjacent wall and obstructions shall comply with the Building Code.

Submit written certification that all installed balustrades comply with the Building Code.

Balustrade/ Handrail Construction

Fabricate handrail straight uniform and continuous, with smooth, even curves and changes of direction, and free from defects affecting appearance and durability.

Curves and bends shall be smooth, without deforming the cross section or reducing diameter

SECTION 09 – HANDRAILS AND BALUSTRADE

Joins shall be tight hairline fit and sleeved to ensure continuity and smoothness.

Free ends shall be closed with flush caps or other suitable means.

Fix balustrade securely to base-building with corrosion resistant, tamper proof fasteners. Fasteners shall be concealed where practicable. Fasteners shall be countersunk smooth and flush. Visible fasteners will not be approved.

Ensure there are no sharp edges or obstructions adjacent to balustrades, which may cause human injury

Welding to steel handrails shall be carried out without pitting or discoloration, and ground smooth to ensure uniform finish.

Carry out welding at the factory in preference to site. Site welding shall be of equivalent quality. Protect adjacent surfaces when site welding and repair any damages.

Metal work fabrication

Quality

Fabricate metalwork to a high standard of fit and finish in accordance with approved control samples and shop drawings and the relevant standards

Establish finish quality standards before commencing fabrication. Finished work which does not comply to a high standard will be rejected and may require removal and complete replacement.

Visible surfaces, profiles and edges shall be fabricated with smooth, straight lines and angles, and uniform curves. Install work accurately and rigidly to required locations.

Surfaces and edges generally shall be clean, neat and free from burrs and indentations.

Remove sharp edges without excessive or uneven radiusing

Joints and assembly

Joints and assembly shall be robust and solid, and shall not become loose or break during normal in service use.

Visible joints shall be accurately scribed and fitted to fine, tight hairline fit without edge projection and misalignments

Ensure continuity of surface finish, colour and texture without variation

Mild steel

Mild Steel materials shall be the correct types and profiles indicated on the drawings, in accordance with the relevant standards

- AS1163 – Structural steel hollow sections
- AS1365 – tolerance for flat rolled steel products
- AS3678 – Structural steel – Hot rolled plates, floor plates and slabs
- AS/NZS 3679 – Structural Steel
- AS/NZS 3679.1- Hot rolled bars and sections
- AS/NZS 3679.2- welded sections
- AS1397- Steel Sheet and strip – hot dipped zinc-coated or aluminum /zinc coated
- AS/NZS 1595 - Cold rolled, unalloyed, steel sheet and strip
- AS1074 - Steel tubes and tubulars for ordinary service
- AS1397 – Steel sheet and strip- hot dipped zinc coated or aluminum /zinc coated
- AS/NZS2728- prefinished / pre-painted sheet metal product for interior/exterior building applications – performance requirements
- AS4100 – Steel Structures
- AS/NZS 4600- cold formed steel structures

Mild steel shall be new and free from defects, damage, corrosion and surface blemishes

Mild steel shall be straight and free from buckle or twist. Rectify or replace members which exceed

required tolerances

Fasteners

Fasteners shall be the correct types, sizes and spacing to assemble and fix the works in place, and accommodate imposed loads, in accordance with the product data and the relevant standards.

Corrosion

Fasteners shall be corrosion-resistant for the location and equivalent to or exceeding the members to be fixed or assembled in accordance with the relevant standards.

Fasteners shall not cause damage, deterioration, and staining or electrolytic corrosion to adjacent work.

Stainless steel fasteners shall not be less than grade 904L suitable for tension loads.

Lock Nuts

Provide lock nuts or suitable nut locking compounds for bolts, holding work to base-building, moving parts, where subject to vibration, vertical bolts in tension and where there is any risk of loosening.

Joint Sealants

Joint sealant shall be approved elastomeric products, in accordance with product data and the relevant standards. Submit product data including generic type, cure type, movement capability, properties and test results, including VOC content and emission data.

Unless otherwise indicated, sealant colour shall match adjacent finish colours. Joint sealants shall be compatible with and no staining to substrates and adjacent work, and shall be capable of cleaning.

All joint shall be low VOC (volatile organic compound) types.

External joint sealants shall be resistant to ultra-violet light and the effects of exposure.

FACTORY APPLIED COATINGS

Generally:

Factory applied coatings shall be finished to a consistent high quality by experienced applicators with documented quality control systems

All substrates shall be prepared and coatings applied in the factory unless otherwise approved in writing before commencing.

Submit Product Data for proposed coatings

Submit Method Statement for factory application and on-site repair of damage during installation including reference to substrate preparation, drying times, preparation between coats, health and safety requirements, and safe environmental disposal of waste products

Physical properties:

Coatings shall be free of defects and smooth over each components, with consistent appearance over the entire work.

Select suitable products and correct preparation and application procedures for the substrate type, required finish and prevailing conditions.

Verify that the substrate types are suitable for and compatible with the proposed coatings.

Each coating type shall be carried out by a single applicator using consistent materials and procedures and suitable quality assurance procedures.

Construction details:

Do not install components with damage to coatings, including damage during delivery. Return such damaged to the factory for repair or replacement.

Notify the superintendent of damage to coatings during installation. Coatings damaged during installation may be repaired in place in accordance with the approved method statement or removed and replace at the sole discretion of the superintendent.

4. Execution

General

Install metalwork plumb, level and straight within required tolerances, and suitably anchored to the base –building in accordance with shop drawings.

Install proprietary metalwork in accordance with product data. If directed make a trial set out and obtain approval before commencing installation. Do not make on-site modification unless approved.

Visible surfaces, profiles and edges shall be fabricated with smooth, straight lines and angles and uniform curves. Install work accurately and rigidly to required locations.

Surface and edges generally shall be clean, neat and free from burrs and indentations.

Remove sharp edges without excessive or uneven radiusing

Fabrication Tolerances

Ensure that in addition to the general requirements of the Specification:

- A high degree of accuracy shall be employed in the fabrication of work under the Contract and its support structure.
- Deviations in length, width and diagonal dimension shall not exceed ± 1 mm.
- The twist and warping shall not cause any point to be more than 0.5mm out of plane.
- The twist and warping shall not cause any point of the structural frame to be more than 2mm out of plane.
- Thickness: Tolerances for flat rolled steel sheet thicknesses shall be in accordance AS/NZS 1365.

Balustrade/Handrails

The balustrade/ handrails are to be installed to the highest quality standard.

There are to be no blemishes on the balustrade following completion. Prior to handover the Contractor is to ensure that balustrade / handrail has been fully cleaned.

Install metalwork plumb, level and straight within required tolerance, and suitable anchored in accordance with the approved shop drawings.

Mark out alignment and levels on site for approval prior to installation

Certification of Balustrade/ handrail

Submit certification by an independent certifying engineer that all balustrades comply with the Building Code

Structural certificate

Submit certification of all structural work designed by the contractor. Structural work designed by the contractor shall include as applicable

- Member sizes and thickness
- Secondary steel framing, fasteners and anchorages,

1. Scope

Install Synthetic Surfaces as set out on the drawings and in accordance with manufacturers' recommendations

Provide Synthetic turf to areas indicated on drawings and to detail.
Base course and subgrade preparation: refer Engineers Documentation

2. Quality

Standards

All synthetic Surfaces shall conform to the requirements for materials and construction of the relevant current Australian Standards.

AS/ NZ 4422:2016 : Playground Surfacing

Inspections (GENERAL)

Give not less than 3 (three) days notice so that inspection may be made of the following.

- Preparation of base levels
- Materials stored at yard or on site.
- Materials or areas of work ready for specified test
- Commencement of all surfacing
- Completion of finished subgrade levels established
- Conformance of subgrade (after testing) prior to placing bedding, subbase or base, as applicable
- At completion of set-out for **ALL** pavement types
- Completed installation of **ALL** pavement types.
- Survey check (level, alignment and crossfall of base surface before final surface finish placement

Samples and Submissions

Turf Profile 01 and 02 Synthetic Surfaces-
Synthetic Turf Type 01 and 02 (T1 and T2) - 'Summer Cool' 30mm' 2sq.m - minimum period for consideration 10 working days.

Provide a work method statement for installation of all elements including quality controls and coordination points including the manufacturers standard drawings, details and installation guides showing methods of construction and installation, joining, edge treatments, fixing and finishing with dimensions and tolerances and means of achieving final pavement aesthetics.

Supplier's Data

Provide the name of the proposed product, manufacturer and supplier for approval. Provide Product characteristics' for approval.

General

Submit samples of the synthetic surface finishes, showing the full range of texture and colour of each of the materials.

These samples will be approved or additional samples may need to be submitted should any samples be considered unacceptable. Once the approved samples have been agreed these will become the Control Samples for the supply. It is expected that any differences evident in type or frequency of characteristics in the final supply will be grounds for rejection.

These samples will show the surface finish required to be provided. Once this surface finish has been approved it is expected that any surface finish that is not in accordance with the approved control samples will be grounds for rejection.

It is important that the Control samples show the range to be expected both in Characteristics and Surface finish.

Sample panels

Prepare sample panels of designated pavement finishes, including sample of junction details and trim.

SECTION 11 – SYNTHETIC SURFACE / SAFTEY SURFACING

The contractor is to allow for multiple samples if required to meet the requirements of the specification and to the approval of the Landscape Architect/ Superintendent.

Prepare a trial set out for each area.

Location: To be approved by the Superintendent.

Incorporation into the works: An approved sample panel, if suitably located, may be permitted to be incorporated into the works otherwise remove all traces on completion of the works.

Sample panels are to be representative of colour, finish and jointing required by the specification. If approved the sample panels may be incorporated into the works. If not approved the panel shall be demolished. Do not proceed with installation until approval is received.

The contractor shall be solely responsible for the consequences of delay resulting from failure to allow adequate time for the assessment and approval of samples, or from the rejection of samples which do not comply with the Specification, or the like.

Approved subcontractors

Use an approved firm, specialising in the type of work required to carry out synthetic surfacing.

Contractor's submissions – data submissions

In addition to requirements specified elsewhere in the specification and MAIN CONTRACT PRELIMINARIES, submit the following before the commencement of the respective work for approval by the Superintendent.

- Installation Work Method Statement and QA ITP

Programme

Provide a detailed programme for the supply of all materials in relation to the overall construction programme, including any staging of the works. Update the programme for the supply of paving on a monthly basis, and advise the Superintendent in writing of any change in the availability of paving.

Health and Safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel

The installed work shall comply with legislative requirements and accepted industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of the work

Comply with the relevant legislative requirements and regulation of the relevant Authority.

Have particular regard to regulations governing the safe handling and use of chemical products.

Falls and gradients

Surfaces shall comply with levels and gradients indicated on civil drawings or required for the control of surface water.

Surfaces are required to be self-draining shall shed water to appropriate drainage outlets or overflows without pond or pool of standing water.

Construct suitable substrate gradients to ensure correct gradients for finished works.

Verify that all levels and gradient are correct and drain properly before finishing and covering over.

Notify Project Management immediately where levels and gradients are incorrect and do not drain properly. Rectify work by approved methods before covering over.

Performance requirements

Fitness for purpose

All material and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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SECTION 11 – SYNTHETIC SURFACE / SAFETY SURFACING

Movements

The installed work shall accommodate movements and deflection in the base –building and substrates, without failure or loss of adhesion, performance or durability

Compatibility

Adjacent materials and products shall be chemically and electronically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spaces. Adjacent materials and products, including adhesives and joint sealant, shall not stain or contaminate, and shall not cause visual or structural defect in adjacent materials.

Blending of finishes

Blend and mix the finished work to achieve uniform overall distribution of visual characteristics and effect in the installed finishes within the approved range of the control samples when viewed as a whole, as far as practicable

Ensure that local concentrations of particular visual characteristics do not occur.

Products of each type and installation area shall be from one manufacturing batch where practicable

3. Materials

Turf Profile 01 and 02 – Synthetic surfaces

Synthetic Turf Type 01 and 02 –'Long Pile Synthetic Turf

Product: Summer Cool 30mm' or an approved equivalent

As supplied by All Seasons Synthetic Turf. Ph: 1300 931 443

Infill Synthetic turf with 'Hydrochill' coated sand as available from All Seasons Synthetic Turf and installed to manufacturers recommendation

Subsurface layers

75MM depth compacted crusher dust - in accordance with Engineers requirements

75MM depth compacted (DG) Road Base – in accordance with Engineers requirements

Structural Void Fill

Provide layers of drainage cell – Atlantis Flo Cell or an approved equivalent

Sources/ contacts:

Atlantis Water Management

Phone: 9419 6000

4. Execution

General

Supply and install synthetic surfaces to the lines, levels and locations as indicated on the Drawings. Finished surface crossfalls: To levels indicated on drawings and to Engineer's Drawings and Specifications.

Synthetic Turf, subsurface materials to be installed by specialist playground installers and to comply with Australian Playground Standards. Supply and install edges to the lines, levels and locations as shown on the Landscape Drawings. Synthetic turf to be properly secured.

Cut synthetic surfaces neat and accurate.

Fixing: Provide adhesion over entire background/ base.

Before fixing ensure that all materials, components, treatments and proprietary products are compatible when used in association with each other and the substrates. Comply with the manufacturer's published recommendations regarding all aspects.

Allow no unintended colour/ shade variations within the synthetic surface for use in each area.

Keep the work clean as it proceeds and protect finished work from damage.

Cuts shall be around openings, obstacles, etc, and be trimmed in accordance with the Design Drawings

SECTION 11 – SYNTHETIC SURFACE / SAFTEY SURFACING

and manufacturers recommendation

Clean synthetic surfaces prior to completion. The initial clean shall be according to the manufacturer's instructions.

Synthetic Turf

Supply and install selected turf to lines, levels and locations as documented and to manufacturers recommendations. Refer to Detail No 01-02/LA-89-G-A-405

Edges and joins in synthetic turf are to be properly secured. Fixing method shall be by all weather adhesives, with sufficient adhesive to ensure that the surface is permanently fixed in position. Joins shall be butt joined with continuous adhesive on both sides of the join. An appropriate adhesive shall be determined through the advice or recommendation of the specified manufacturer/supplier and approved by the Project Manager prior to installation.

Installation method shall also follow the specified manufacturer/supplier's installation guidelines.

Subgrade Preparation

Refer to Engineer's Drawings and Specification

Adhesive

As recommended in writing by the manufacturer and applied strictly in accordance with printed recommendations.

All synthetic surface shall be bedded in accordance with the manufacturer's instructions.

Inspection and Testing

If it is found that bedding is not adequate and fails to meet the specification then the Contractor will be required to remove the bedding material bed and relay. All defective bedding, which causes synthetic surface to be loose, drummy, rock or break, will be removed and replaced at the Contractors expense. All synthetic surfaces which contain unnecessary marks or do not otherwise comply with the Specification are to be removed, and replaced at the Contractor's expense.

Falls and Levels

Grading

- Ponding: Grade synthetic surface to even falls to drain away from buildings to drainage outlets / kerb lines without ponding.
- Falls: Refer to civil engineers documentation

Finished Level

- Maintain the same finished level across junctions between different finishes.

Maintenance manual

On completion submit a manual of recommendations for the maintenance of the synthetic surfaces including frequency of inspection and recommended methods for cleaning, repair and replacement. Include recommendations for the maintenance of pit covers and the suggested methods of lifting and access to minimise damage.

General: Submit the manufacturers' data as follows:

- Recommendations for service use, care and maintenance.
- List of manufacturers and suppliers of replacement parts.

Load Testing

No synthetic surfaces are to move under pedestrian, wheel chair, light vehicle and typical delivery trolley or test loading. Contractor is to test load each completed lot (section) of synthetic surface to determine the extent of any unbonded / loose or defective surfaces.

SECTION 11 – SYNTHETIC SURFACE / SAFTEY SURFACING

Cleaning

Clean the synthetic surface progressively as the work proceeds without the use of acid and without damage to the synthetic surface, as necessary to remove mortar smears, stains, discolouration and the like and leave the synthetic surface clean on completion.

Precaution during cleaning

Prevent run-off from the cleaning operations from marking or tracking across adjacent tiled/paved areas. Collect residual water and cleaning wastes and divert them to an approved means of disposal.

Rejection

Lift and relay any synthetic surface rejected by the Superintendent.

Certification

Submit certification by a registered surveyor that all pedestrian surfaces required to drain to drainage outlets have been constructed in accordance with drawings and civil engineers documentation and are;

- Constructed to correct gradients and profiles
- Will not cause ponding or standing of surface water.
- Will not cause flooding, spillage or migration of surface water to adjacent dry areas

SECTION 12 – FURNITURE AND FIXTURES

1. Scope

Install all furniture items, complete with all required fasteners, trims and accessories, coordination with building services and interface with adjacent work as set out on the drawings and in accordance with manufacturer's directions.

Furniture and fixing may include proprietary and custom fabricated items

2. Quality

Standards

Comply with the following:

- The current statutory requirement in place;
- Recognised Australian codes of practice and standards where these exist but are not specifically referred to in this Specification

Inspections

Witness Points

Give not less than (3) three days notice so that inspection may be made of the following.

- Setout and Placement Bike Racks prior to fixing
- Completion of installation of Bike Racks
- Setout and Placement of Fence Type 01
- Completion of installation of Fence Type 01
- Setout and Placement of Tree Grates
- Completion of installation of Tree Grates
- Setout of Painted Playing Court (Pavement Type 4)
- Completion of Painted Playing Court (Pavement Type 4)
- Setout and Placement of Furniture (Benches, Tables and Umbrella's) prior to fixing
- Completion of installation of Furniture (Benches, Tables and Umbrella's)
- Setout and Placement of TGSI's and Stair Nosings prior to fixing
- Completion of installation of TGSI's and Stair Nosings

Condition precedent to practical completions

- Trade warranties
- User manuals

Health and safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel.

The installed work shall comply with legislative requirements and accepted industry practice with regard to the health and safety of the in-service users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of work.

Comply with relevant legislative requirements and the regulations of the relevant Authority.

Standards

All workmanship and materials shall be in accordance with recognised Australian codes of practice and Australian standards where these exist but are not specifically referred to in this Specification.

Samples and Submissions

Submissions

- Product Data
- Manufacturer's Warranties
- Provide sample (1) (minimum period for consideration – 10 working days)
- Provide a work method statement for installation of all elements including quality controls and coordination points including the manufacturers drawings, details and installation guides showing methods of construction and installation, joining, edge treatments, fixing and finishing with dimensions and tolerances and manufacturer Warranties.

Shop Drawings

SECTION 12 – FURNITURE AND FIXTURES

The contractor is to provide shop drawings of the handrail and balustrades including all its components and hardware prior to fabrication.

- The shop drawings should detail all fixing points and the hardware selection.
- State applicable Australian Standards, and composition of metals to be used.
- Information necessary for site assembly
- Proposals for the breakup of large items as required for delivery to the site
- Proposed method of joining and fixing the module large items

Product Data

Submit product data for material and product, including manufacturers instructions, properties, test results, construction detail and any option as appropriate for:

- Metal components and finishes
- Applied coatings, including substrate preparation and pretreatment.

Include product data for adhesives, fasteners and joint sealants.

Control Samples

Submit representative control sample for

- Components and finishes
- Visible fasteners

Condition precedent to Practical Completion include

- Trade Warranty

Certification requirements include

- Structural certification

Testing Generally

Provide evidence/ testing data and reports to demonstrate that all materials/ products proposed have been tested to meet the standards specified herein.

Where testing has not previously been carried out on products/ materials proposed, arrange for tests to be carried out to comply with the Specification to the satisfaction of the Superintendent.

The provision of testing data or the carrying out of tests shall not relieve the Sub-Contractor of his responsibilities regarding the performance requirements, durability or service life requirements, etc.

Health and Safety

Construction methods shall comply with legislative requirements and accepted industry practice with regard to the health and safety of construction personnel

The installed work shall comply with legislative requirements and accept industry practice with regard to the health and safety of users and maintenance personnel responsible for the in-service operation, cleaning and maintenance of work.

Comply with relevant legislative requirements and the regulations of the relevant Authority.

Performance requirements

Fit for purpose

All materials and products, and the installed work, shall be durable and suitable for the location and the intended purpose, frequency of use, and usual cleaning and maintenance procedures.

Loads

The installed work, including fasteners and framing, shall accommodate all permanent and temporary loads, individually and in combination, without failure, deflection, damage to adjacent or applied work, or risk to human safety in accordance with the relevant standards

SECTION 12 – FURNITURE AND FIXTURES

Applicable loads may include dead loads, live loads, human impact loads, wind loads, earthquake loads, maintenance loads and service loads as applicable.

Crowd loads

Fences in public areas shall accommodate loads in accordance with relevant standards.

Movements.

The installed work, including fasteners and framing, shall accommodate all short and long term movements and deflections in the base building, substrates to which the work is fixed, and within the work, including thermal movements, without failure or the transfer of loads from the base building to the work of this trade.

Connections

The installed work shall be connected to the base building or substrates in a neat, substantial manner by correctly sealed and located connections which transfer the loads from the work without displacement, distortion, or damage to the fasteners, substrates or the adjacent work. Connections shall accommodate movement requirements.

Visible fasteners.

Visible fasteners shall be evenly and neatly located and aligned. Use correctly sized tools to prevent damage to fasteners and adjacent surfaces. Rectify damage or marking to adjacent surfaces due to installation of visible fasteners. Where required to be finished flush with adjacent surfaces, visible fasteners shall be countersunk. Visible fasteners in accessible areas shall be vandal resistant.

Sharp edges.

There shall be no sharp edges or projections, which could cause human injury including injury to maintenance personnel.

Exposed fasteners shall be recessed, smooth and flush. Use flush countersunk heads where practicable.

Exposed threads ends of bolts shall be avoided, and where unavoidable, shall be cut back and ground smooth with no more than two threads exposed.

Metal edges and corners shall be rounded and smoothed to prevent human injury.

Corrosion

Materials and products, including fasteners and concealed components, shall be corrosion resistant or protective coated to prevent corrosion.

All materials and products, including fasteners and concealed components, required to be corrosion – resistant or protective coated shall be inspected after installation for any defects or damage incurred during installation and all defects and damage discovered shall be rectified.

Compatibility

Adjacent materials and products shall be chemically and electrolytically compatible with each other, substrates, and adjacent work, or shall be separated by suitable spacers. Adjacent materials and products, including adhesives and joint – sealants, shall not stain or contaminate and shall not cause visual or structural defects in adjacent materials.

3. Materials and Components

BIKE RACK

Supply and Installation Bike Rack as documented in General Arrangement Plan

Product Name: Cora Bike Rack (TBC)

Product Code: EXPO 2000

Size: 2000 x 850 x 850MM - Mainframe 60.3 OD x 3.2 MD. Hangers 20mm round bar

Finish: Galvanised Steel

Quantity: 6

Fixing:

In accordance with AS2890.3. Fixing to Manufacturers recommendations

Supplier: Cora Bike

Ph: 1800 249 878

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MILITARY ROAD
MOSMAN, NSW

Technical Specification
Rev 03 AFC Issue, 25/03/22

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SECTION 12 – FURNITURE AND FIXTURES

Product Name: Cora Bike Rack (TBC)

Product Code: EXPO 1500

Size: 1500 x 850 x 850MM - Mainframe 60.3 OD x 3.2 MD. Hangers 20mm round bar

Finish: Galvanised Steel

Quantity: 3

Fixing:

In accordance with AS2890.3. Fixing to Manufacturers recommendations

Supplier: Cora Bike

Ph: 1800 249 878

FENCE TYPE 01

Supply and Installation Fence Type 01 including pedestrian gates as documented in General Arrangement Plan and in accordance with manufactures recommendations

Product Name: Premier Fencing

Product Code: FP27TC

Size: Straight Pale – Anti climb profile 1800mm H – Post Spacing 2725MM (Typical)

Finish: Hot Dip Galvanised plus powder coat Colour - Black (TBC)

Fixing: Fixed to Manufacturers recommendations

Supplier: Securagate

Ph: 1300 063 220

Fence shall be a complete fabricated system including fasteners, trims and finishes, in accordance with the Product data and approved control samples, and the relevant Standards including legislative requirements.

Fabricate Fence Type 01 straight, uniform and continuous, with smooth, even changes of direction, and free from defects affecting appearance and durability

Provide a work method statement and shop drawings for installation of all components and hardware including quality controls and coordination points including the manufacturers drawings, details and installation guides showing methods of construction details and installation, joining, edge treatments, fixing /fasteners and finishing, transitions and changes in directions with dimensions and tolerances and manufacturer Warranties. The shop drawing should also state applicable Australian Standards, composition of metals to be used.

Supply and install fences to the lines, levels and locations as shown on the Landscape Drawing Set. Confirm location for pedestrian and vehicle gates, end posts for each run, and spacing of intermediate posts for each run prior to fixing.

Structural certificate

Submit certification of all structural work designed by the contractor. Structural work designed by the contractor shall include as applicable

- Member sizes and thickness
- Secondary steel framing, fasteners and anchorages,

PAVEMENT TYPE 4 (PAINTED MULTICOURT SURFACES)

Supply and Installation painted multicourt surface including linemarking as documented in General Arrangement Plan / Details and in accordance with manufactures recommendations

Product Name: NuCourt Pro Coat /Roll Coat and NuCourt Line Marking or an approved equivalent

Substrate surface and preparation : In accordance with manufacturers recommendation

Application : Use an approved firm, specialising in the type of work required to carry out multicourt painted surface and in accordance with manufacturers recommendations

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Technical Specification
Rev 03 AFC Issue, 25/03/22

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SECTION 12 – FURNITURE AND FIXTURES

Inspection :

- Preparation of subgrade / substrate surface and levels
- Materials or areas of work ready for specified test
- Trial set out for multicourt painted surface
- Commencement of paint application
- Completion of finished subgrade / substrate surface
- Conformance of subgrade/substrate prior to application
- Completed installation of **ALL** pavement types.
- Survey check (level, alignment and crossfall of surface)

Samples and Submission:

- Product Data for approval prior to commencement
- 5 sq.m minimum sample panel including linemarking, (minimum period for consideration – 10 working days)

Slip resistance and abrasion.

- The slip resistance classification of pavers shall satisfy the following criteria, in accordance with AS/NZS 4586:2013 and HB197:1999
- General paving (class W; Low Risk) – wet pendulum test
- General paving – ramps (Class V; Very Low risk) – wet pendulum test
- Manufacturer should supply test results from an approved agency to confirm this prior to confirmation of order.

Supplier: Nutech Paint

Ph: 03 9770 3000

The Multicourt painted surface to be a complete finish, in accordance with the Product data and approved control samples, and the relevant Standards (ie. slip resistance requirements) including legislative requirements.

Provide a work method statement drawings for installation of all components and including quality controls and coordination points including the manufacturers requirement and installation guides showing methods of installation, joining, edge treatments, finishing and tolerances and manufacturer Warranties. The shop drawing should also state applicable Australian Standards, composition of metals to be used.

TGSI's

Supply and Installation of Tactile Ground Surface Indicators (TGSI's) subject to client approval as shown on the drawings and in accordance with relevant Australian standards

Range: tactile Classic Black Urethane

Type: TGSI

Material: UV stabilised thermo plastic urethane

Finish: Black Injection Moulded

Fixing: Drill and press fit

Code: DT0600B

Supplier: DTAC

Ph: 1300 793 478

Or approved similar

STAIR NOSINGS

Supply and Installation of Stair Nosings subject to client approval, In accordance with relevant Australian standards

Range: Corduroy

Type: Edging

Material: 6063T5 extruded aluminium alloy.

Finish: Hard Black Anodised

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MOSMAN, NSW

Technical Specification
Rev 03 AFC Issue, 25/03/22

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SECTION 12 – FURNITURE AND FIXTURES

Code: DE0110B
Supplier: DTAC
Ph: 1300 793 478
Or approved similar

TREE GRATE (TP1)

Supply and Installation of Tree Grates as documented in General Arrangement Plans
Code: DPFPPR120SS
Product: Praxis Tree Grate.
Size: 1200 X 1200 X 87MM
Quantity: 14
Supplier: Citygreen
Ph: 1300 066 949

BENCH TYPE 04a

Supply and Installation Timber Benches as documented in General Arrangement Plans
Product Name: AVENUE
Product Code: AVEN.S.18.DS
Size: 1800mmL x 580mmW x 820mm H
Quantity: 13
Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)
Battens : DURASLAT 'SilverGum'
Fixing: to Manufacturers recommendations
Supplier: Botton + Gardiner
Ph: 1300 762 701

BENCH TYPE 04b

Supply and Installation Timber Benches as documented in General Arrangement Plans
Product Name: AVENUE
Product Code: AVEN.HB.24.DS
Size: 2400mmL x 580mmW x 820mm H
Quantity: 9
Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)
Battens : DURASLAT 'SilverGum'
Fixing: to Manufacturers recommendations
Supplier: Botton + Gardiner
Ph: 1300 762 701

BENCH TYPE 04c

Supply and Installation Timber Benches as documented in General Arrangement Plans
Product Name: AVENUE
Product Code: AVEN. B.18.DS
Size: 1800mmL x 430mmW x 450mm H
Quantity: 18
Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)
Battens : DURASLAT 'SilverGum'
Fixing: to Manufacturers recommendations
Supplier: Botton + Gardiner
Ph: 1300 762 701

SECTION 12 – FURNITURE AND FIXTURES

BENCH TYPE 05

Supply and Installation Timber Benches as documented in General Arrangement Plans

Product Name: AVENUE (Custom Circular Bench)

Product Code: AVEN. B.CR.23.DS

Size: 1650mm (Outer Radius), 2790(Arc Length), 2330(Chord Length), 430 (Depth)

Quantity: 6

Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)

Battens : DURASLAT 'SilverGum'

Fixing: to Manufacturers recommendations

Supplier: Botton + Gardiner

Ph: 1300 762 701

BENCH TYPE 06

Supply and Installation Timber Benches as documented in General Arrangement Plans

Product Name: AVENUE Custom Bench

Product Code: - CUSTOM 90° BENCH

Size: 1800mm (Depth 430mm) x 1800mm(Width 430mm) x 450mmH

Quantity: 5

Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)

Battens : DURASLAT 'SilverGum'

Fixing: to Manufacturers recommendations

Supplier: Botton + Gardiner

Ph: 1300 762 701

BENCH TYPE 07

Supply and Installation Timber Benches as documented in General Arrangement Plans

Product Name: AVENUE

Product Code: AVEN. PB.18.DS

Size: 1800mmL x 1010mmW x 450mm H

Quantity: 6

Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)

Battens : DURASLAT 'SilverGum'

Fixing: to Manufacturers recommendations

Supplier: Botton + Gardiner

Ph: 1300 762 701

BENCH TYPE 08

Supply and Installation Timber Benches as documented in General Arrangement Plans

Product Name: AVENUE (Custom Circular Bench)

Product Code: AVEN. B.CR.23.DS

Size: 950mm (Inner Radius), 2000(Arc Length), 1880(Chord Length), 430 (Depth)

Quantity: 12

Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)

Battens : DURASLAT 'SilverGum'

Fixing: to Manufacturers recommendations

Supplier: Botton + Gardiner

Ph: 1300 762 701

SECTION 12 – FURNITURE AND FIXTURES

TABLE TYPE 01

Supply and Installation Timber Benches as documented in General Arrangement Plans

Product Name: AVENUE

Product Code: AVEN. T.18.DS

Size: 1800mm x 720mm x 720mmH

Quantity: 7

Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)

Battens : DURASLAT 'SilverGum'

Fixing: to Manufacturers recommendations

Supplier: Botton + Gardiner

Ph: 1300 762 701

TABLE TYPE 02

Supply and Installation Timber Benches as documented in General Arrangement Plans

Product Name: AVENUE (Custom Table)

Product Code: CUSTOM TABLE

Size: 2100mm x 720mm x 850mmH

Quantity: 5

Frame Finish: Hop dip Galvanised mild steel , powdercoated (Colour – TBC)

Battens : DURASLAT 'SilverGum'

Fixing: to Manufacturers recommendations

Supplier: Botton + Gardiner

Ph: 1300 762 701

FIXED UMBRELLA

Code: Ocean Master M1/ Centre Post Canopy

Product / Size: SQUARE 2600 x 2600M (Auto lift assist system)

Quantity: 6

Finish: Frame Jet Black / Fabric Marine Grade – Jockey Red (TBC) prior to procurement

Fixing – Subsurface Fixed in accordance with manufactures recommendation and engineers requirements

Supplier: Tuuci as available from KEZU or Parterre Gardens

Ph: 9669 1788 or 93635874

4. Execution

General

Supply and install furniture and fixings to the lines, levels and locations as shown on the details and drawings. Comply with manufacturer's recommendations where applicable.

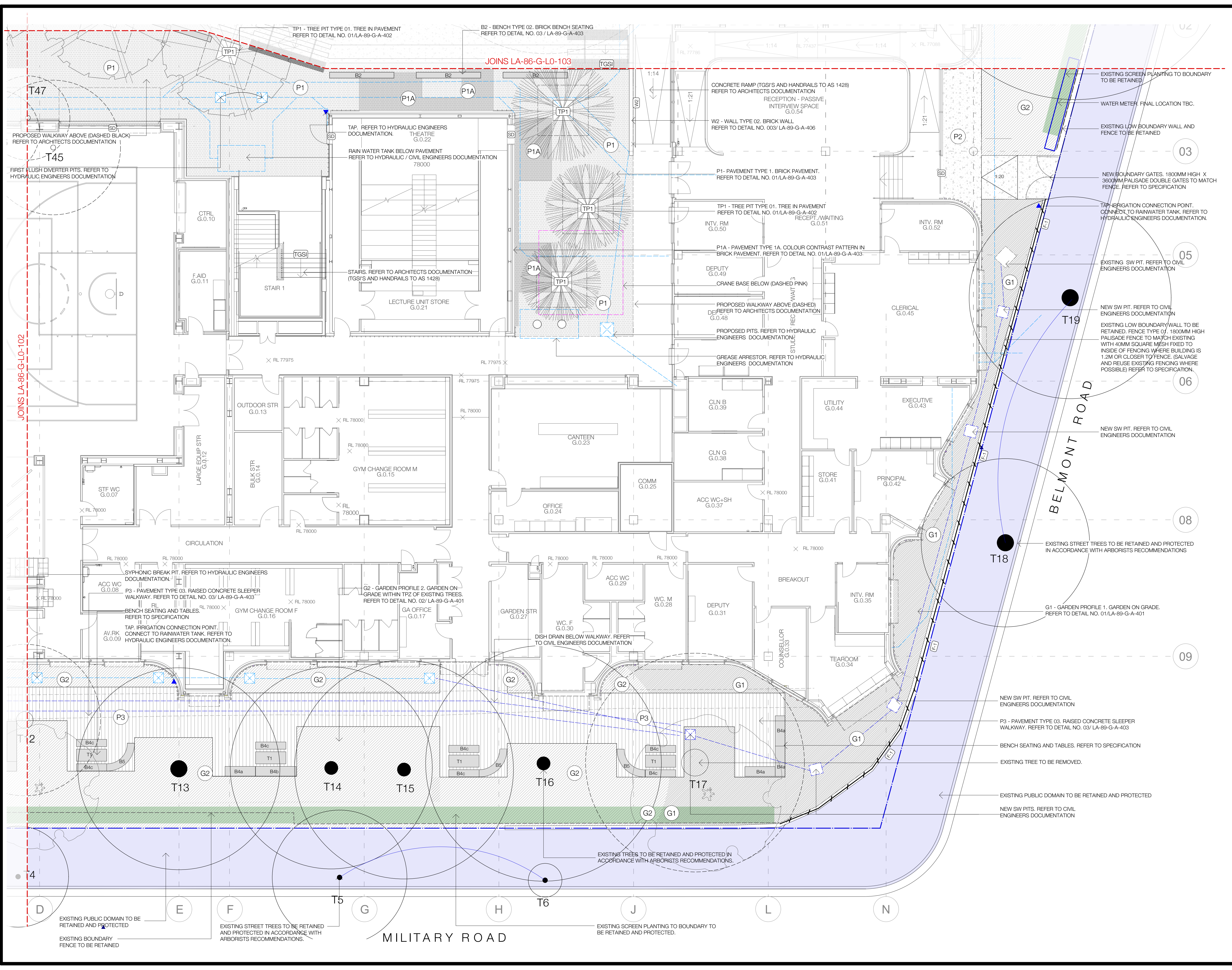
Install all furniture and fixings plumb.

Submit the manufacturer's standard drawings and details or provide shop drawings showing methods of construction, assembly and installation; with dimensions and tolerances.

Maintenance manual

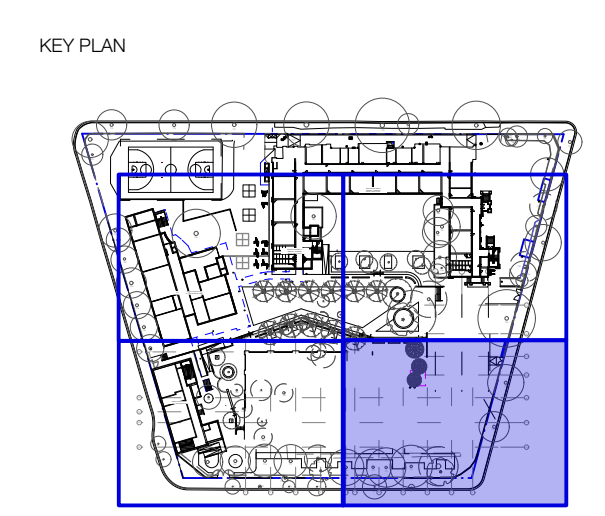
General: Submit the manufacturers' data as follows:

- Recommendations for service use, care and maintenance.
- List of manufacturers and suppliers of replacement parts.



Rev	Description	Date
01	Preliminary SSDA	16.02.21
02	Preliminary SSDA	22.02.21
03	SSDA Issue	15.03.21
04	SSDA Issue	16.03.21
05	Schematic Design Issue	19.05.21
06	Draft Tender Issue	06.08.21
07	Tender Issue	20.08.21
08	Detail Design	03.09.21
09	Detail Design	11.11.21
A	APC Issue	25.03.22

NOTES
 Contractor must verify all dimensions on site before commencing work or preparing shop drawings. Do not scale drawings. Resolve discrepancies with Black Beetle before proceeding. Copyright of this drawing and the design executed remain vested in Black Beetle.



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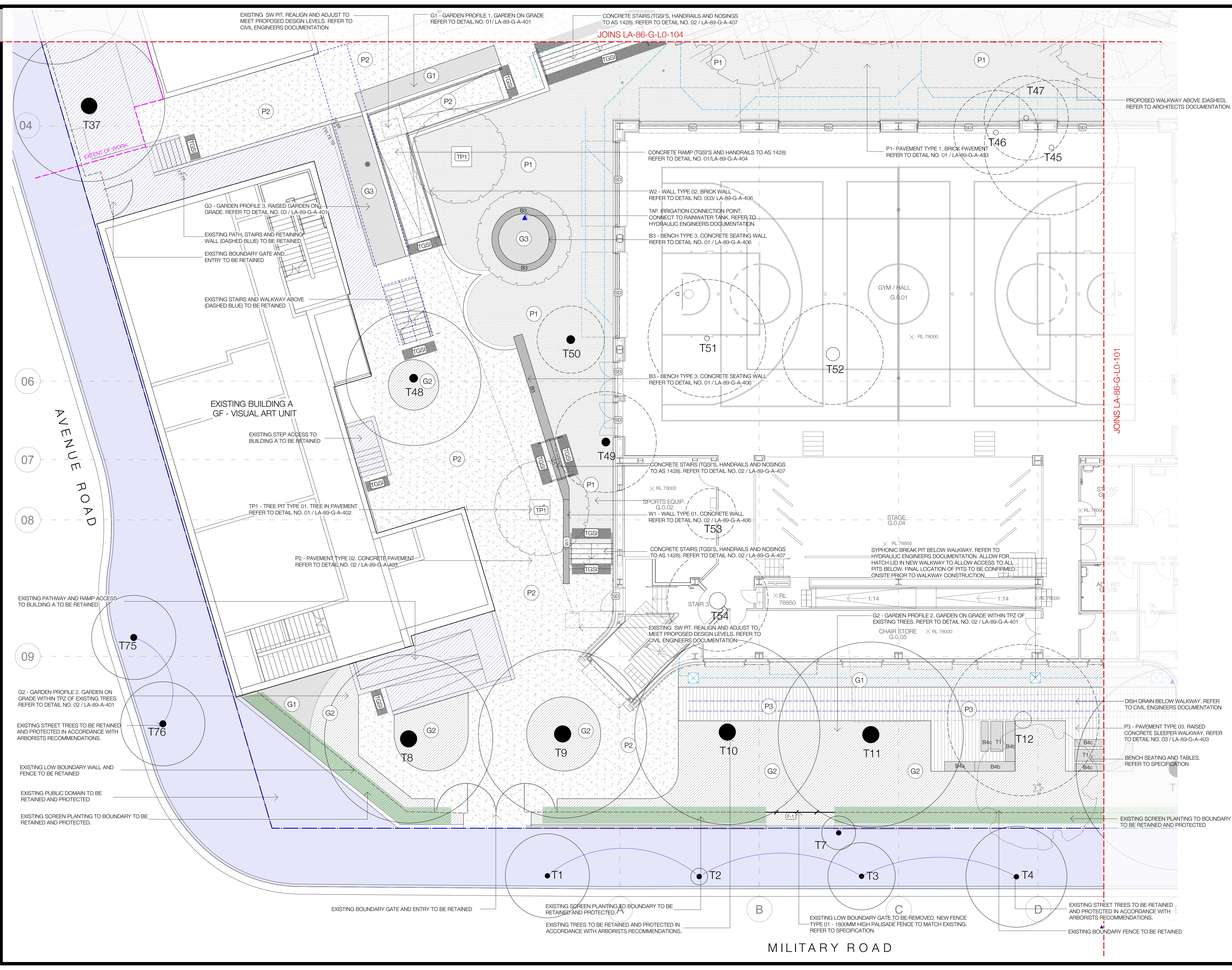
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 Sheet 01

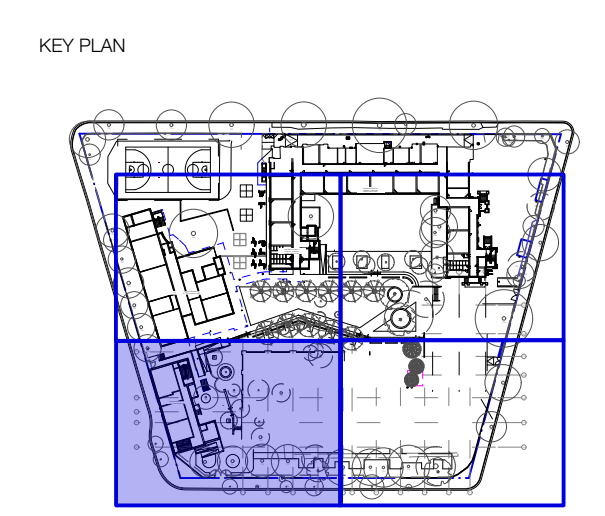
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LA-86-G-L0-101	A

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01	Preliminary SSDA	16.02.21
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A	AFC Issue	25.03.22

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SHEET TITLE
 General Arrangement Plan - Level 0
 Sheet 02

SHEET NO.	REVISION
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EXISTING BUILDING D
GENERAL LEARNING
SPACE UNIT & STAFF

EXISTING PAVEMENT TO BE RESURFACED.
NEW PAINT SURFACE AND LINEMARKINGS.
REFER TO SPECIFICATION.

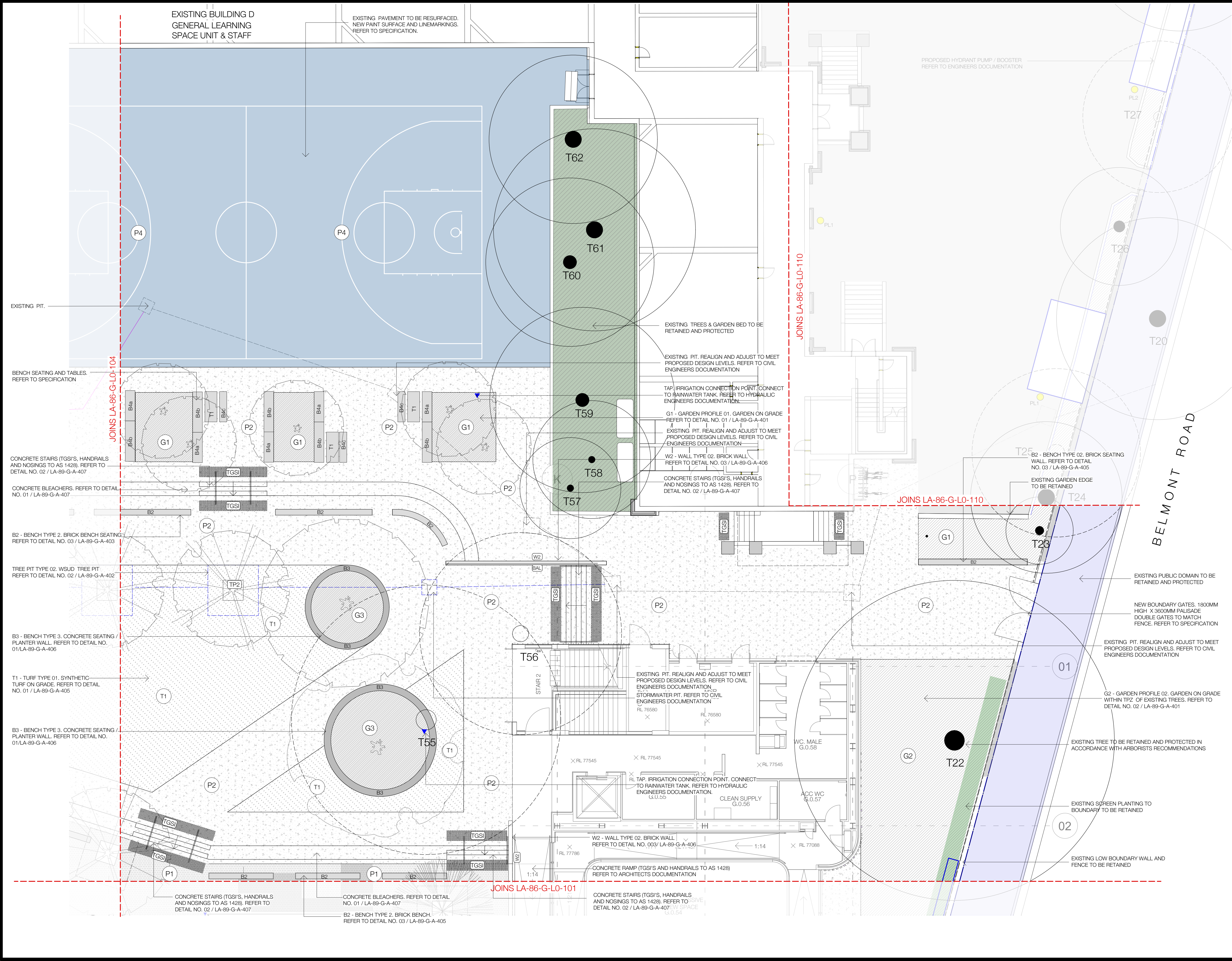
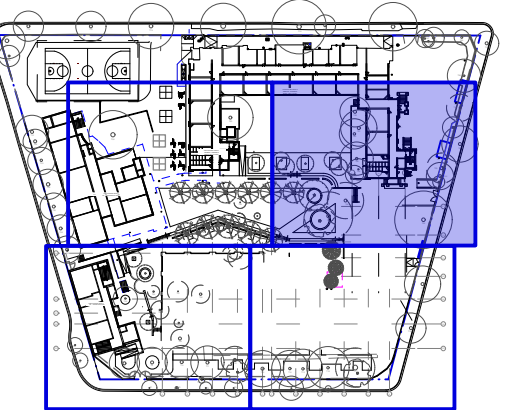
PROPOSED HYDRANT PUMP / BOOSTER
REFER TO ENGINEERS DOCUMENTATION

Rev	Description	Date
01	Preliminary SSDA	16.02.21
02	Preliminary SSDA	22.02.21
03	SSDA Issue	15.03.21
04	SSDA Issue	16.03.21
05	Schematic Design Issue	19.05.21
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08	Detail Design	03.09.21
A	AFC Issue	25.03.22

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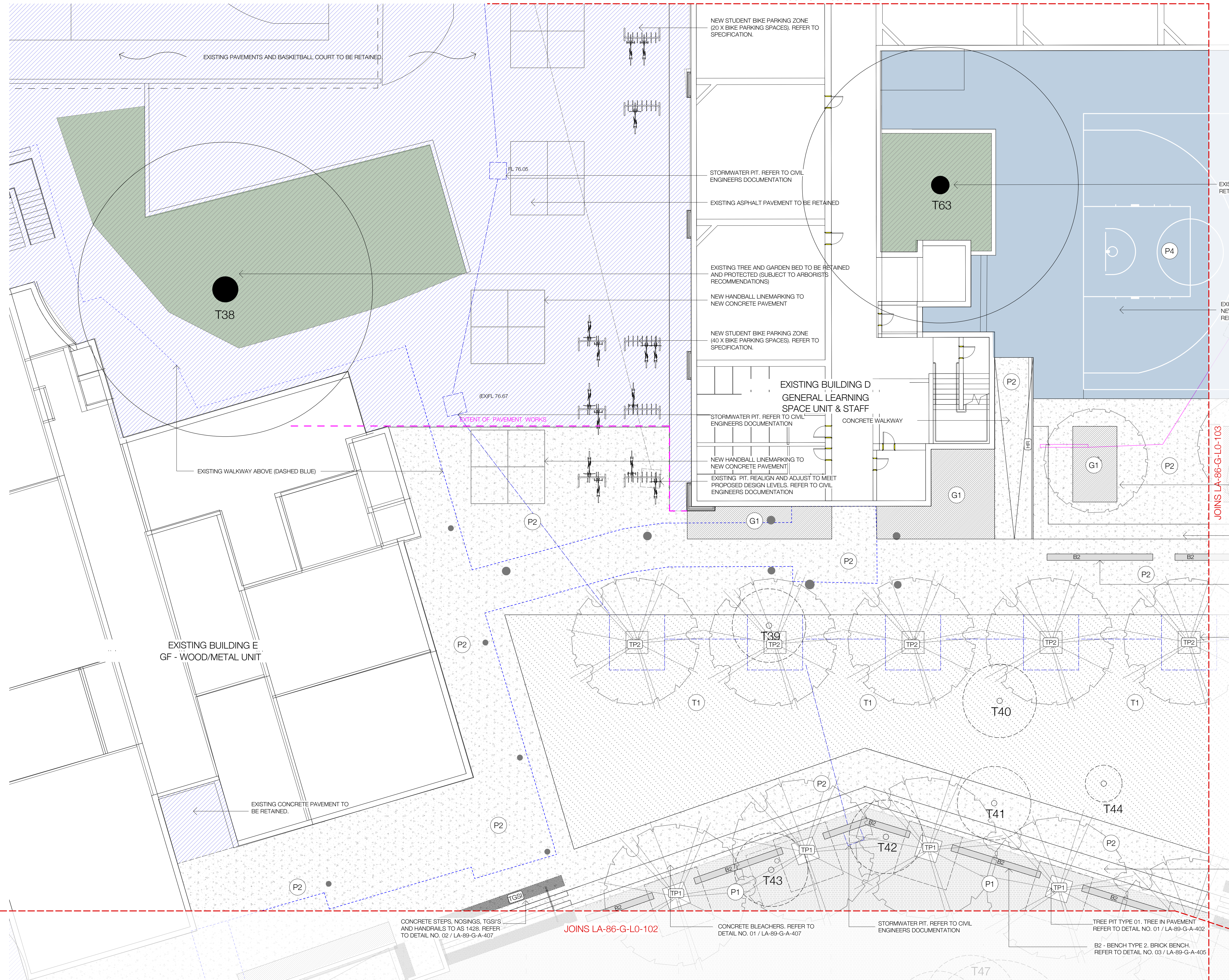
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Sheet 03

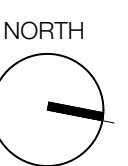
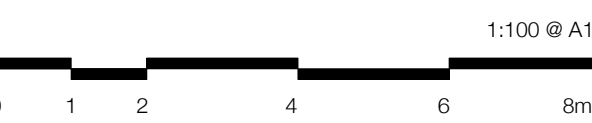
SHEET NO.	REVISION
LA-86-L0-103	A

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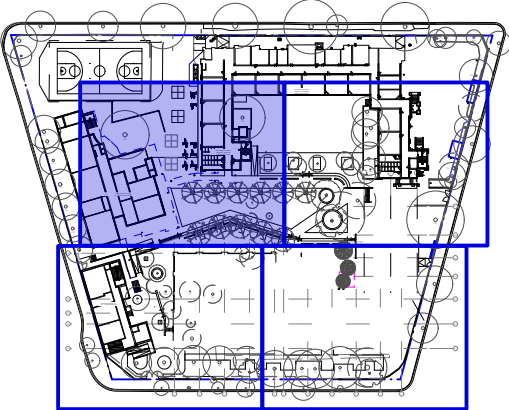


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03	SSDA	15.03.21
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A	AFC Issue	25.03.22

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 Sheet 04

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