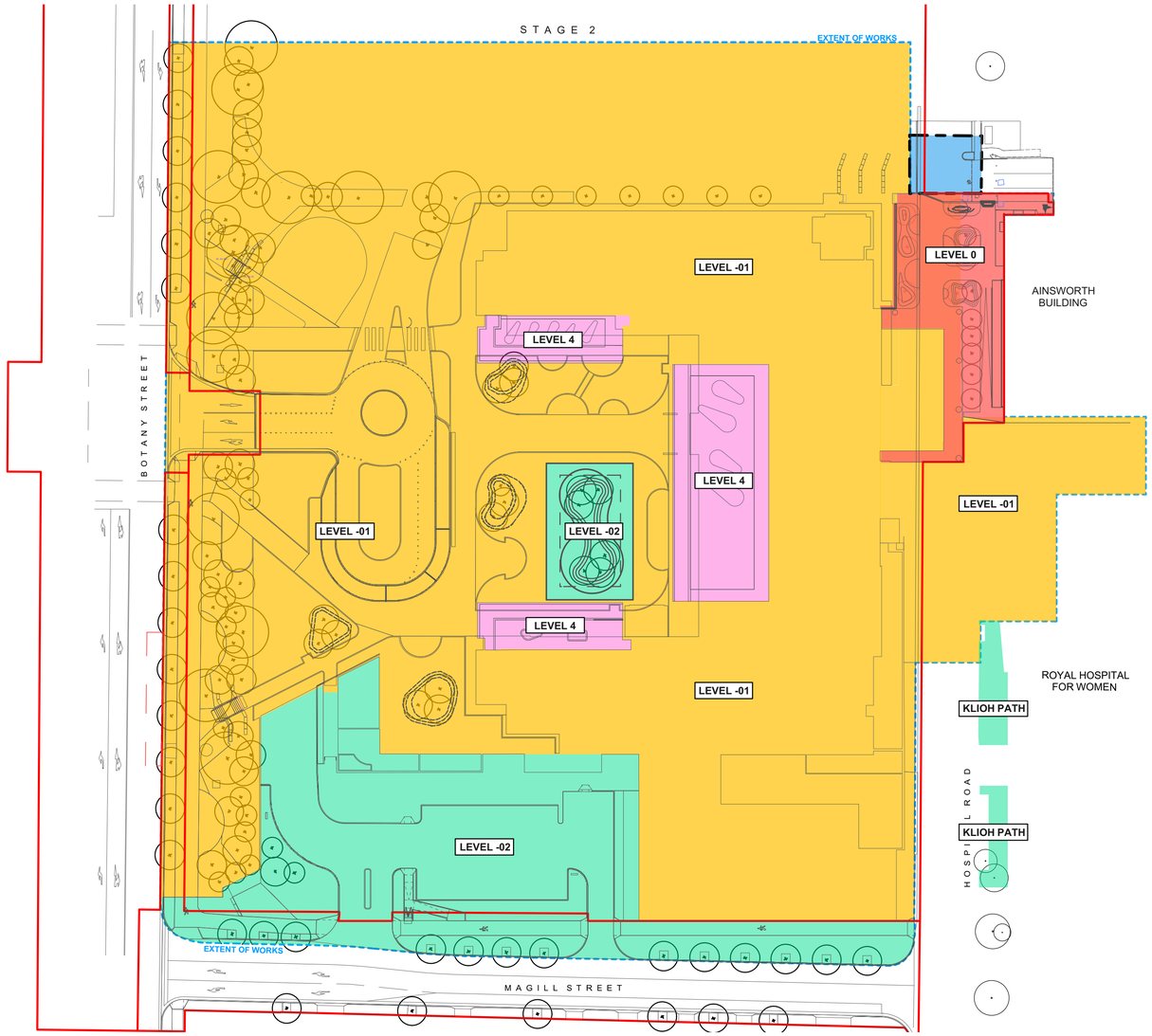
RANDWICK HOSPITAL CAMPUS REDEVELOPMENT

ACUTE SERVICES BUILDING
LANDSCAPE DOCUMENTATION
APPROVED FOR CONSTRUCTION



1 LANDSCAPE SCOPE
1:500

DRAWING	DRAWING TITLE	SCALE	STATUS
RCR-ASP-LA-30-DRW-0A-NL0-001	SCOPE DIAGRAM + DRAWING LIST	1:500	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-0A-NL0-002	LEGEND	NTS	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-0A-NL0-003	LEGEND	NTS	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-NL0-050	SITE TREE RETENTION + REMOVAL	1:600	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-B20-B20	GENERAL ARRANGEMENT - LEVEL B2	1:300	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-B20-B10	GENERAL ARRANGEMENT - LEVEL B1	1:300	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-B20-130	GENERAL ARRANGEMENT - LEVEL 03	1:300	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-B20-140	GENERAL ARRANGEMENT - LEVEL 04	1:300	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-B20-170	GENERAL ARRANGEMENT - LEVEL 07	1:300	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-B20-100	GENERAL ARRANGEMENT - LEVEL 00	1:300	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-10B-B20-B00	GENERAL ARRANGEMENT - KILOH PATHWAY	1:300	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B24-221	MATERIALS & FINISHES PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B28-222	MATERIALS & FINISHES PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-223	MATERIALS & FINISHES PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B28-224	MATERIALS & FINISHES PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-225	MATERIALS & FINISHES PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-226	MATERIALS & FINISHES PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-227	MATERIALS & FINISHES PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B11-211	MATERIALS & FINISHES PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B12-212	MATERIALS & FINISHES PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B13-213	MATERIALS & FINISHES PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B15-214	MATERIALS & FINISHES PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B18-215	MATERIALS & FINISHES PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B19-216	MATERIALS & FINISHES PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-006-217	MATERIALS & FINISHES PLAN - LEVEL 00	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B17-218	MATERIALS & FINISHES PLAN - LEVEL 00	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-031-231	MATERIALS & FINISHES PLAN - LEVEL 03	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-241	MATERIALS & FINISHES PLAN - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-242	MATERIALS & FINISHES PLAN - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-042-243	MATERIALS & FINISHES PLAN - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-261	MATERIALS & FINISHES PLAN - LEVEL 06	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-072-271	MATERIALS & FINISHES PLAN - LEVEL 07	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-05-DRW-26B-010-201	MATERIALS & FINISHES PLAN - KILOH PATHWAY	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B24-321	PLANTING PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B28-322	PLANTING PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-323	PLANTING PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B28-324	PLANTING PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-325	PLANTING PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-326	PLANTING PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-327	PLANTING PLAN - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B11-311	PLANTING PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B12-312	PLANTING PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B14-313	PLANTING PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B15-314	PLANTING PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B18-315	PLANTING PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B19-316	PLANTING PLAN - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-006-317	PLANTING PLAN - LEVEL 00		
RCR-ASP-LA-30-DRW-26B-B17-318	PLANTING PLAN - LEVEL 00	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-341	PLANTING PLAN - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-342	PLANTING PLAN - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-042-343	PLANTING PLAN - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-05-DRW-26B-B28-325	PLANTING PLAN - KILOH PATHWAY	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-50-SCH-26K-NL0-300	PLANTING SCHEDULE	NTS	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B24-421	LEVELS + GRADING - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B28-422	LEVELS + GRADING - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-423	LEVELS + GRADING - LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B12-412	LEVELS + GRADING - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B14-413	LEVELS + GRADING - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B15-414	LEVELS + GRADING - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B18-415	LEVELS + GRADING - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B19-416	LEVELS + GRADING - LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-006-417	LEVELS + GRADING - LEVEL 00	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B17-418	LEVELS + GRADING - LEVEL 00	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-031-431	LEVELS + GRADING - LEVEL 03	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-441	LEVELS + GRADING - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-442	LEVELS + GRADING - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-042-443	LEVELS + GRADING - LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-072-471	LEVELS + GRADING - LEVEL 07	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B24-521	SETOUT- LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B28-522	SETOUT- LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-523	SETOUT- LEVEL B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B11-511	SETOUT- LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B12-512	SETOUT- LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B14-513	SETOUT- LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B15-514	SETOUT- LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B18-515	SETOUT- LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B19-516	SETOUT- LEVEL B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-006-517	SETOUT- LEVEL 00	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B17-518	SETOUT- LEVEL 00	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-541	SETOUT- LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-041-542	SETOUT- LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-042-543	SETOUT- LEVEL 04	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-601	HARDWORK DETAILS - FINISHES	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-602	HARDWORK DETAILS - FINISHES	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-603	HARDWORK DETAILS - JUNCTIONS	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-604	HARDWORK DETAILS - WALLS + EDGES	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-605	HARDWORK DETAILS - RAMPS + ANCILLIARIES	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-606	HARDWORK DETAILS - FURNITURE + FIXTURES	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-608	HARDWORK DETAILS - STAIRS - LEVEL -02	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-609	HARDWORK DETAILS - STAIRS - LEVEL -01	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-610	HARDWORK DETAILS - STAIRS - LEVEL -01	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-611	HARDWORK DETAILS - WALLS + EDGES	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B28-722	FURNITURE SETOUT PLAN - B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B29-723	FURNITURE SETOUT PLAN - B2	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B11-711	FURNITURE SETOUT PLAN - B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B14-713	FURNITURE SETOUT PLAN - B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B15-714	FURNITURE SETOUT PLAN - B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-B18-715	FURNITURE SETOUT PLAN - B1	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26B-006-717	FURNITURE SETOUT PLAN - HOSPITAL RD	1:100	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-801	SOFTWORK DETAILS	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-802	SOFTWORK DETAILS	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-803	SOFTWORK DETAILS	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-804	SOFTWORK DETAILS	VARIES	APPROVED FOR CONSTRUCTION
RCR-ASP-LA-30-DRW-26G-NL0-805	SOFTWORK DETAILS	VARIES	APPROVED FOR CONSTRUCTION

STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

Check all dimensions and site conditions prior to commencement of any work, the purchasing or ordering of any materials, fitting, plant services or equipment and the fabrication of any components.

Do not scale drawings - refer to figured dimensions only. Any discrepancies shall immediately be referred to the landscape architect for clarification.

WARNING

DIAL BEFORE YOU DIG www.1100.com.au

Services shown on this drawing are approximate only. The exact location is to be confirmed on site by contractor prior to commencement of work.

REV	DATE	AMENDMENTS
1	26/05/21	APPROVED FOR CONSTRUCTION
2	16/06/21	APPROVED FOR CONSTRUCTION
3	21/06/21	APPROVED FOR CONSTRUCTION
4	05/07/21	APPROVED FOR CONSTRUCTION

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NOTE:
REFER TO THE SPECIFICATION SCHEDULE + DETAILS FOR DETAILED SELECTION INFORMATION.

REFER TO CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFER TO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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CLIENT

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PROJECT

Randwick Hospital Campus

DRAWING

Cover Sheet and Drawing List

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:500

DRAWING NO. RCR-ASP-LA-30-DRW-0A-NL0-001

REVISION 4

LEGEND

GENERAL

PROPERTY BOUNDARY
EXTENT OF WORKS
BUILDING LEVEL EXTENT
FUTURE ROAD EXTENSION

SITE TREE RETENTION & REMOVAL PLAN
REFER TO ARBORTIST REPORT AND TECHNICAL SPECIFICATION

RCR-ASP-LA-30-DRW-10B-NL0-050 — EXISTING TREE
TO BE PROTECTED & RETAINED

RCR-ASP-LA-30-DRW-10B-NL0-050 — EXISTING TREE REMOVED
COVERED TO BE REMOVED BY THE ORIGINAL ASB

RCR-ASP-LA-30-DRW-10B-NL0-050 — EXISTING TREE REMOVED
COVERED TO BE REMOVED BY THE ORIGINAL ASB
SUBJECT TO SEPERATE APPROVAL

RCR-ASP-LA-30-DRW-10B-NL0-050 — EXISTING TREE REMOVED
INCLUDED IN THE IASB

RCR-ASP-LA-30-DRW-10B-NL0-050 — PROPOSED TREE

RCR-ASP-LA-30-DRW-10B-NL0-050 — EXISITING TREE REMOVED
MAGILL STREET SOUTH

RCR-ASP-LA-30-DRW-10B-NL0-050 — PROPOSED TREE
MAGILL STREET SOUTH

MATERIALS & FINISHES PLAN | REFER TO CIVIL DOCUMENTATION
REFER TO CIVIL DOCUMENTATION FOR SERVICE PITS, KERBS AND CARRIAGEWAY TREATMENTS.
ITEMS SHOWN INDICATIVELY ONLY

RCR-ASP-LA-30-DRW-10B-B20-B20 — ELECTRICAL EASEMENT EXTENT

RCR-ASP-LA-30-DRW-10B-B20-B20 — KERB AND GUTTER TYPE
KE1
REFER TO CIVIL ENGINEERS DRAWINGS

RCR-ASP-LA-30-DRW-26G-NL0-605-1 — PIT LID TYPE 1 | INFILL PAVING
REFER TO CIVIL ENGINEERS DRAWINGS FOR DETAILS

RCR-ASP-LA-30-DRW-26G-NL0-605-1 — PIT LID TYPE 2 | UTILITY PIT
REFER TO CIVIL ENGINEERS DRAWINGS FOR DETAILS

N/A — EXISTING PIT LID
EXP
REFER TO CIVIL ENGINEERS DRAWINGS FOR DETAILS

MATERIALS & FINISHES PLAN | REFER TO HYDRAULIC ENGINEERS DOCUMENTATION
REFER TO CIVIL DOCUMENTATION FOR RAINWATER OUTLET TREATMENTS.
ITEMS SHOWN INDICATIVELY ONLY

RAINWATER OUTLET
REFER TO HYDRAULIC ENGINEERS DRAWINGS FOR DETAILS

MATERIALS & FINISHES PLAN | REFER TO LIGHTING ENGINEERS DOCUMENTATION
ITEMS SHOWN INDICATIVELY ONLY

N/A — LIGHTING
REFER TO LIGHTING ENGINEER'S DETAILS

N/A — LIGHTING
REFER TO LIGHTING ENGINEER'S DETAILS

N/A — LIGHTING
REFER TO LIGHTING ENGINEER'S DETAILS

N/A — LIGHTING
REFER TO LIGHTING ENGINEER'S DETAILS

N/A — LIGHTING
REFER TO LIGHTING ENGINEER'S DETAILS

MATERIALS & FINISHES PLAN | REFER TO WAYFINDING DOCUMENTATION
ITEMS SHOWN INDICATIVELY ONLY

N/A — WAYFINDING
REFER TO WAYFINDING DOCUMENTATION

MATERIALS & FINISHES PLAN | PAVING FINISHES
REFER TO LANDSCAPE SCHEDULE AND TECHNICAL SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-601-2 — PAVING TYPE B.1
PVB.1
CONCRETE UNIT PAVERS ON GRADE

RCR-ASP-LA-30-DRW-26G-NL0-601-3 — PAVING TYPE B.2
PVB.2
CONCRETE UNIT PAVERS ON SLAB

RCR-ASP-LA-30-DRW-26G-NL0-601-4 — PAVING TYPE C
PVC
CONCRETE UNIT PAVERS ON SLAB

RCR-ASP-LA-30-DRW-26G-NL0-601-6 — PAVING TYPE D
PVD
CRUSHED SANDSTONE GRAVEL - REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-601-7 — PAVING TYPE E
PVE
INSITU CONCRETE TO RANDWICK COUNCIL STANDARD

RCR-ASP-LA-30-DRW-26G-NL0-601-8 — PAVING TYPE F.1
PVF.1
INSITU CONCRETE WITH EXPOSED AGGREGATE

RCR-ASP-LA-30-DRW-26G-NL0-601-9 — PAVING TYPE F.2
PVF.2
INSITU CONCRETE WITH EXPOSED AGGREGATE ON CONCRETE SLAB

RCR-ASP-LA-30-DRW-26G-NL0-602-1 — PAVING TYPE G.1
PVG.1
INTERLOCKING VEHICULAR CONCRETE UNIT PAVERS

RCR-ASP-LA-30-DRW-26G-NL0-602-1 — PAVING TYPE G.2
PVG.2
INTERLOCKING VEHICULAR CONCRETE UNIT PAVERS PAVER - CONTRAST

RCR-ASP-LA-30-DRW-26G-NL0-602-4 — PAVING TYPE H
PVH
CONCRETE UNIT PAVERS BANDING

RCR-ASP-LA-30-DRW-26G-NL0-602-6 — PAVING TYPE I
PVI
PECC COURTYARD RUBBER SOFTFALL SURFACE

RCR-ASP-LA-30-DRW-26G-NL0-602-7 — PAVING TYPE J
PVJ
CONCRETE UNIT PAVERS ON PEDESTAL

LINEMARKING 1
LM1
SURFACE MOUNTED MARKER - REFER SPECFICATION + SELECTIONS SCHEDULE

MATERIALS & FINISHES PLAN | EDGES & WALLS
REFER TO LANDSCAPE SCHEDULE AND TECHNICAL SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-604-1 — EDGE TYPE 1 | STEEL EDGE ON GRADE
SE1
REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-604-2 — EDGE TYPE 2 | STEEL EDGE CONCRETE SLAB
SE2
REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-604-4 — WALL TYPE 1 | POWDERCOATED STEEL EDGE FIXED TO BLOCKWORK HOB
W1
REFER TO DETAIL

RCR-ASP-LA-30-DRW-26G-NL0-604-6 — WALL TYPE 2 | SANDSTONE BLOCKS
W2
REFER TO DETAIL

RCR-ASP-LA-30-DRW-26G-NL0-611-1 — WALL TYPE 4.1 | INSITU CONCRETE WALL
W4.1
REFER TO ENGINEERS DETAILS

RCR-ASP-LA-30-DRW-26G-NL0-611-1 — WALL TYPE 4.2 | INSITU CONCRETE WALL ON STRUCTURAL SLAB
W4.2
REFER TO ENGINEERS DETAILS

RCR-ASP-LA-30-DRW-26G-NL0-611-2 — WALL TYPE 4.3 | INSITU CONCRETE WALL KICK RAIL
W4.3
REFER TO ENGINEERS DETAILS

WALL TYPE 5 | BRICK WALL
W5
REFER TO ARCHITECTS DETAILS

MATERIALS & FINISHES PLAN | STAIRS & RAMPS
REFER TO LANDSCAPE SCHEDULE AND TECHNICAL SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-608-3 — STAIR TYPE 1
ST1
INSITU CONCRETE

RCR-ASP-LA-30-DRW-26G-NL0-605-1 — PRAM TYPE 1 | PEDESTRIAN
PR1
REFER TO LANDSCAPE DRAWINGS FOR FINISHES. REFER TO CIVIL ENGINEERS DRAWINGS FOR SETOUT LEVELS AND DETAILS

RCR-ASP-LA-30-DRW-26G-NL0-605-3 — PRAM TYPE 2 | PEDESTRIAN
PR2
PAVING TYPE B.2

MATERIALS & FINISHES PLAN | HANDRAILS & ANCILLIARIES
REFER TO LANDSCAPE SCHEDULE AND TECHNICAL SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-605-5 — HANDRAIL TYPE 1
HR1

RCR-ASP-LA-30-DRW-26G-NL0-605-5 — TACTILE INDICATOR TYPE 1 | STAINLESS STEEL BUTTONS
TI1
REFER TO SPECIFICATION + SELECTIONS SCHEDULE

MATERIALS & FINISHES PLAN | FURNITURE & FIXTURES
REFER TO LANDSCAPE SCHEDULE AND TECHNICAL SPECIFICATION

CUSTOM SHADE STRUCTURE
SS
TO ARCHITECTS DETAILS

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 1 | SEMI CIRCLE
BE1
RADIUS [INTERNAL] 1250MM | REFER SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 2 | SEMI CIRCLE
BE2
RADIUS [INTERNAL] 1500MM | REFER SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 3 | SEMI CIRCLE
BE3
RADIUS [INTERNAL] 2000MM | REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 4 | SEMI CIRCLE
BE4
RADIUS [INTERNAL] 3000MM | REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 5 | CUSTOM
BE5
LENGTH VARIED | REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 6 | ARC
BE6
RADIUS [INTERNAL] 7900MM | REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 7 | STANDARD
BE7
LENGTH 2020MM | REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BENCH TYPE 8 | STANDARD
BE8
RADIUS [INTERNAL] 825MM| REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-1 — TABLE TYPE 1 | STREET FURNITURE AUSTRALIA CAFE ROUND TABLE
TB1
830MM RADIUS | FIXED - REFER SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-1 — TABLE TYPE 2 | STREET FURNITURE AUSTRALIA CAFE MACCHIATO TABLE
TB2
600MM RADIUS | FIXED - REFER SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-606-4 — CHAIR | STREET FURNITURE AUSTRALIA CAFE STOOL
CH
360MM RADIUS | FIXED TO HOB OR FOOTING REFER TO SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-802-2 — POT TYPE 2 | MEDIUM SIZE
PP2
500MM QUATRO CYLINDER PLANTER

RCR-ASP-LA-30-DRW-26G-NL0-802-2 — POT TYPE 3 | SMALL SIZE
PP3
450MM QUATRO CYLINDER PLANTER

RCR-ASP-LA-30-DRW-26G-NL0-606-5 — BOLLARD TYPE 1 | FIXED
BO1
REFER SELECTIONS SCHEDULE + CIVIL ENGINEERS DETAILS

BIN ENCLOSURE TYPE 1
BIN
REFER SPECIFICATION + SELECTIONS SCHEDULE

WILDLIFE NEST BOX TYPE 1
WB1
REFER SPECIFICATION + SELECTIONS SCHEDULE

WILDLIFE NEST BOX TYPE 2
WB2
REFER SPECIFICATION + SELECTIONS SCHEDULE

WILDLIFE NEST BOX TYPE 3
WB3
REFER SPECIFICATION + SELECTIONS SCHEDULE

LEVELS & GRADING PLAN
REFER TO LANDSCAPE SCHEDULE AND TECHNICAL SPECIFICATION

+EX 0.00 — EXISTING | RELATIVE LEVEL
REFER TO SURVEY AND TO BE CONFIRMED ON SITE

+RL 2.57 — PROPOSED | RELATIVE LEVEL

+TOW 0.00 — PROPOSED | TOP OF WALL

+TOB 0.00 — PROPOSED | TOP OF BENCH

CROSSFALL | 1:40 EXCEPT WHERE NOTED

1:27 — LONGITUDINAL SLOPE | PROPOSED

OVERLAND FLOW PATH

+400 — HEIGHT OF MOUNDING ABOVE RELATIVE LEVEL
150MM CONTOURS

NOTE:
REFER TO THE SPECIFICATION SCHEDULE + DETAILS FOR DETAILED SELECTION INFORMATION.

REFER TO CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

STATUS

APPROVED FOR CONSTUCTION

NOTES

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WARNING

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REV	DATE	AMENDMENTS
1	16/06/21	APPROVED FOR CONSTRUCTION
2	05/07/21	APPROVED FOR CONSTRUCTION

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PROJECT

Randwick Hospital Campus

DRAWING

Legend
Acute Services Building

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

DRAWING NO. — REVISION

RCR-ASP-LA-30-DRW-0A-NL0-002 — 2

LEGEND

MATERIALS & FINISHES PLAN | SOFTWORKS
REFER TO LANDSCAPE SCHEDULE AND TECHNICAL SPECIFICATION

RCR-ASP-LA-30-DRW-26G-NL0-801-1	 SW1	SOFTWORKS TYPE 1 | TURF REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-801-1	 SW1.1	SOFTWORKS TYPE 1.1 | TURF ON SLAB REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-801-2	 SW2	SOFTWORKS TYPE 1 | HYDRO SEED REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-801-3	 SW3	SOFTWORKS TYPE 3 | MASS PLANTING ON GRADE REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-801-4	 SW4	SOFTWORKS TYPE 4 | MASS PLANTING ON EMBANKMENT REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-801-5	 SW5	SOFTWORKS TYPE 5 | MASS PLANTING ON CONCRETE SLAB REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-801-6	 SW6	SOFTWORKS TYPE 6 | MASS PLANTING PECC COURTYARD ON SLAB REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-802-1	 SW7	SOFTWORKS TYPE 7 | MASS PLANTING B2 COURTYARD ON CONCRETE SLAB. REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-802-2	 SW8	SOFTWORKS TYPE 8 | MOUNDED MASS PLANTING ON SLAB REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-802-3	 SW9	SOFTWORKS TYPE 9 | MASS PLANTING IN POTS REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-802-4	 SW10	SOFTWORKS TYPE 10 | HOSPITAL ROAD DECK REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-802-4	 SW11	SOFTWORKS TYPE 11 | MASS PLANTING KILOH PATH REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-803-1	 TP1	TREE TYPE 1 | ON GRADE REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-803-2	 TP2	TREE TYPE 2 | ON EMBANKMENT REFER TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-803-3	 TP3	TREE TYPE 3 | STREET TREE REFER TO TO SOFTWORKS DETAIL
RCR-ASP-LA-30-DRW-26G-NL0-803-4		TREE TYPE 4 | ON CONCRETE SLAB REFER TO SOFTWORKS DETAIL

STATUS

APPROVED FOR CONSTUCTION

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2	16/06/21	APPROVED FOR CONSTRUCTION
3	05/07 /21	APPROVED FOR CONSTRUCTION

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- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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PROJECT

Randwick Hospital Campus

DRAWING

Legend
Acute Services Building

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

DRAWING NO. RCR-ASP-LA-30-DRW-0A-NL0-003

REVISION 3

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-006-217
RCR-ASP-LA-50-DRW-26B-006-317
RCR-ASP-LA-50-DRW-26B-006-417
RCR-ASP-LA-50-DRW-26B-006-517
RCR-ASP-LA-50-DRW-26B-006-717

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-B17-218
RCR-ASP-LA-50-DRW-26B-B17-318
RCR-ASP-LA-50-DRW-26B-B17-418
RCR-ASP-LA-50-DRW-26B-B17-518

VEHICLE TURN AROUND
EXISTING DETENTION TANK
LOADING DOCK PARKING
VOID

STATUS

APPROVED FOR CONSTRUCTION

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PROJECT

Randwick Hospital Campus

DRAWING

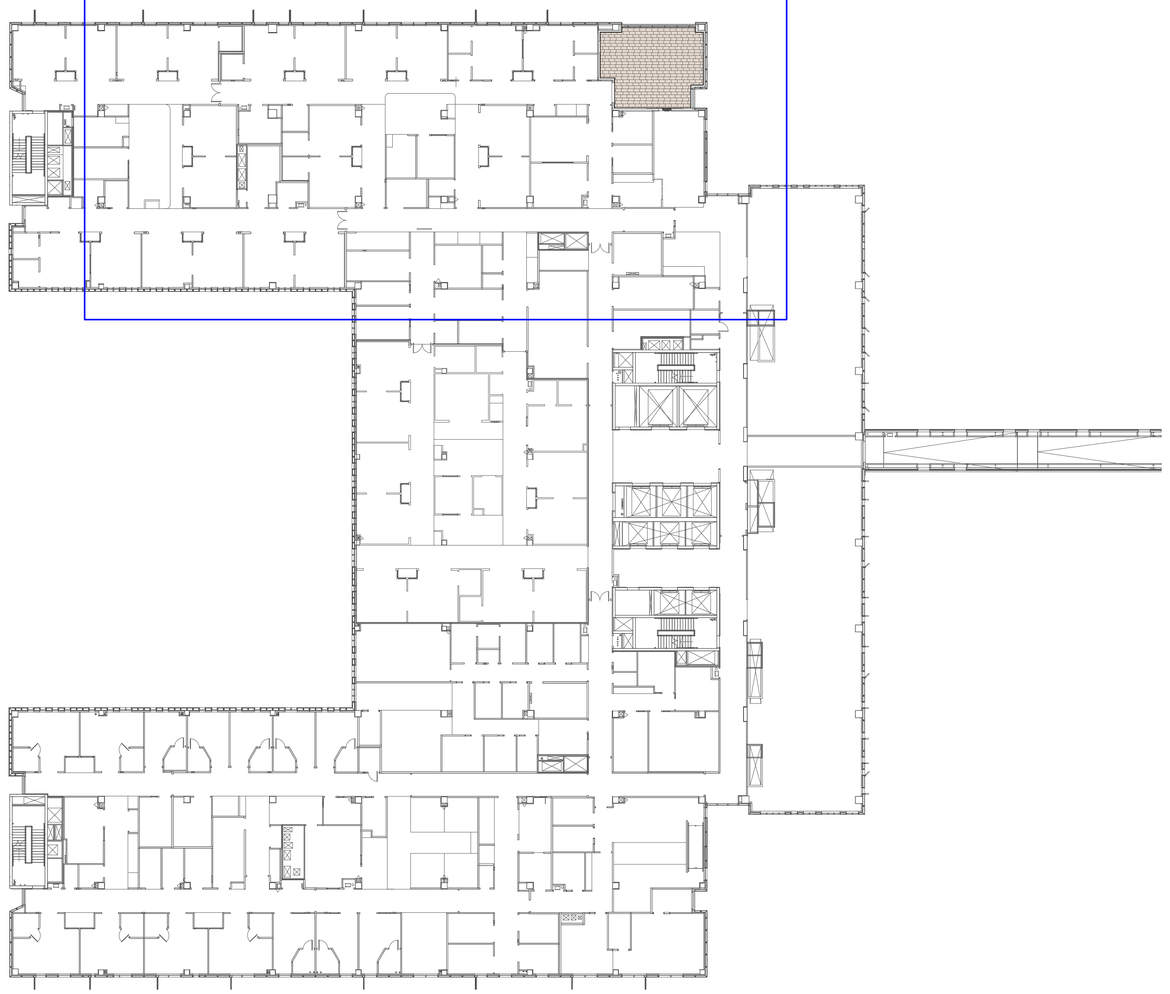
General Arrangement Plan
Level 00

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:300

DRAWING NO. RCR-ASP-LA-30-DRW-10B-B20-100

REVISION 1

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-031-231
RCR-ASP-LA-50-DRW-26B-031-331
RCR-ASP-LA-50-DRW-26B-031-431



STATUS

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PROJECT

Randwick Hospital Campus

DRAWING

General Arrangement Plan
Level 03

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:300

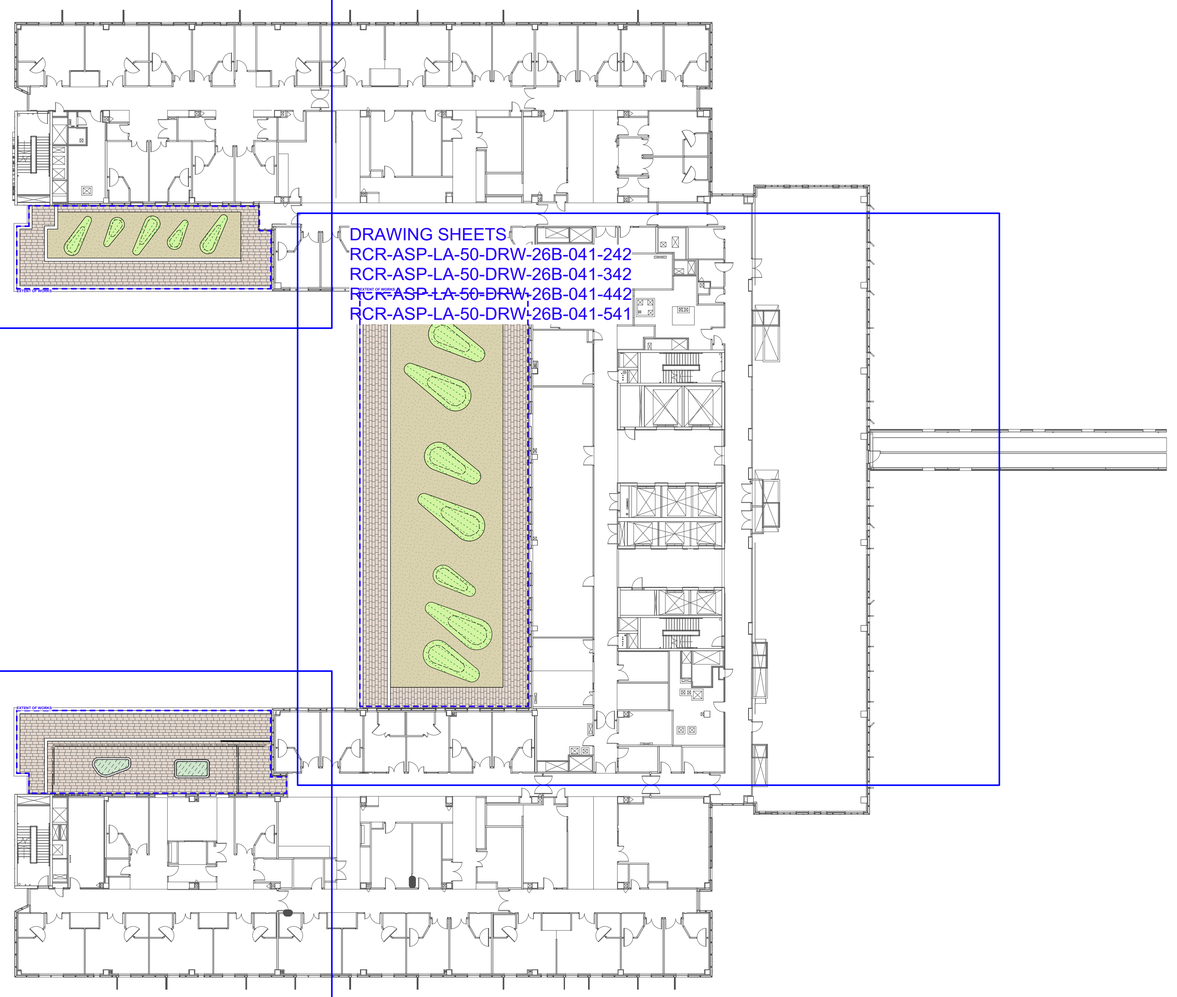
DRAWING NO. RCR-ASP-LA-30-DRW-10B-B20-130

REVISION 1

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-041-241
RCR-ASP-LA-50-DRW-26B-041-341
RCR-ASP-LA-50-DRW-26B-041-441
RCR-ASP-LA-50-DRW-26B-041-541

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-041-242
RCR-ASP-LA-50-DRW-26B-041-342
~~RCR-ASP-LA-50-DRW-26B-041-442~~
RCR-ASP-LA-50-DRW-26B-041-541

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-043-243
RCR-ASP-LA-50-DRW-26B-043-343
RCR-ASP-LA-50-DRW-26B-043-443
RCR-ASP-LA-50-DRW-26B-043-543



STATUS

APPROVED FOR CONSTRUCTION

NOTES

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- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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PROJECT

Randwick Hospital Campus

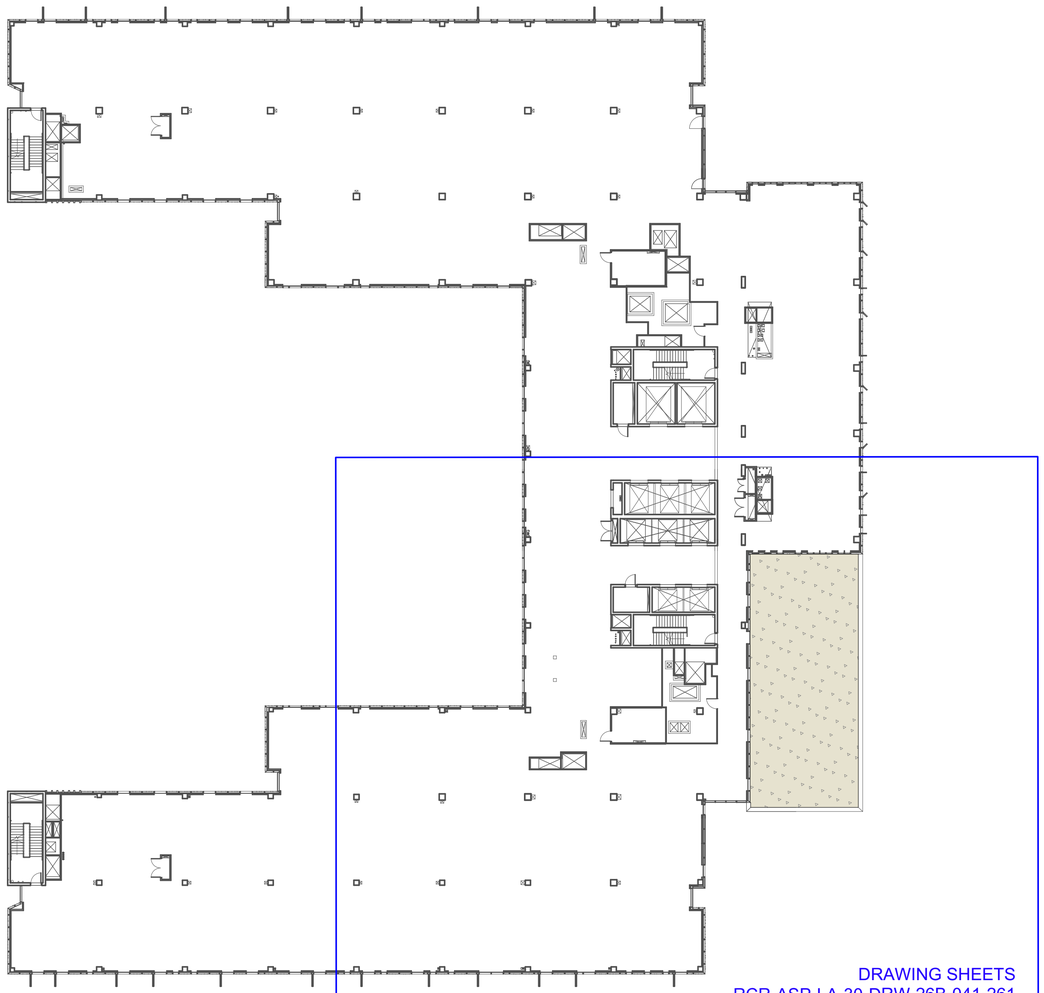
DRAWING

General Arrangement Plan
Level 04

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:300

DRAWING NO. RCR-ASP-LA-30-DRW-10B-B20-140

REVISION 1



DRAWING SHEETS
RCR-ASP-LA-30-DRW-26B-041-261

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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REV	DATE	AMENDMENTS
1	21/06/21	APPROVED FOR CONSTRUCTION

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- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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PROJECT

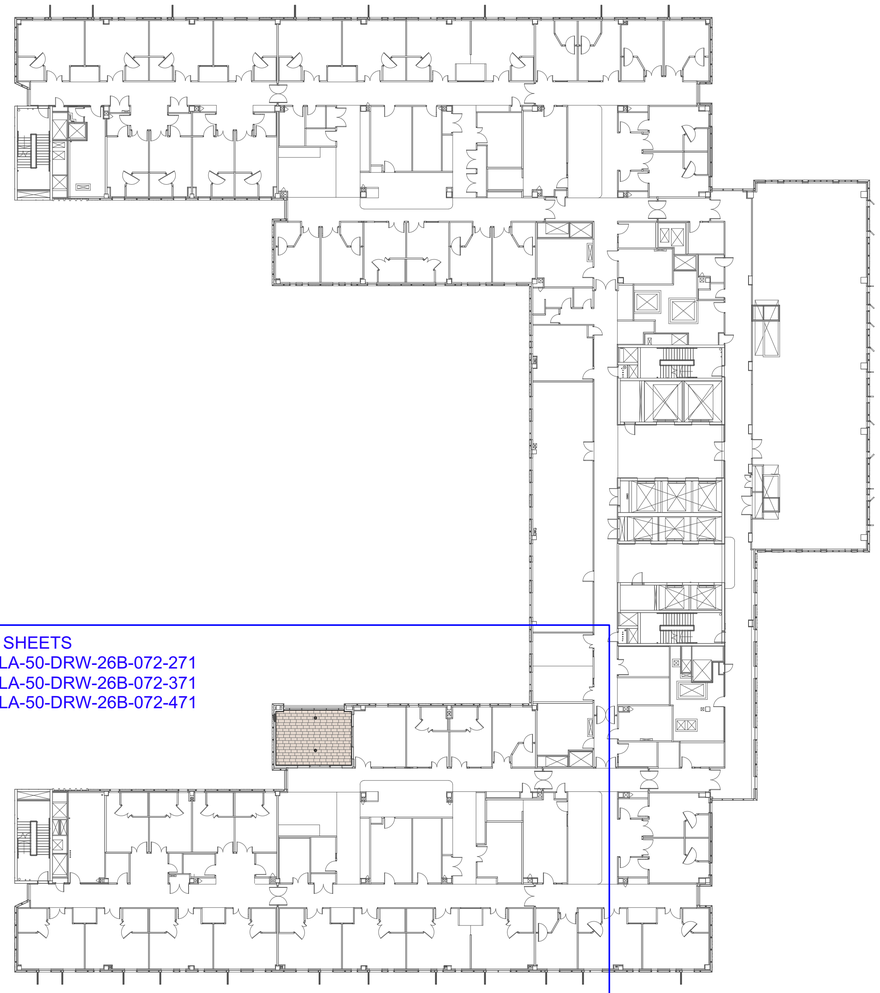
Randwick Hospital Campus

DRAWING

General Arrangement Plan
Level 06

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:300

DRAWING NO.	REVISION
RCR-ASP-LA-30-DRW-10B-B20-160	1



DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-072-271
RCR-ASP-LA-50-DRW-26B-072-371
RCR-ASP-LA-50-DRW-26B-072-471

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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PROJECT

Randwick Hospital Campus

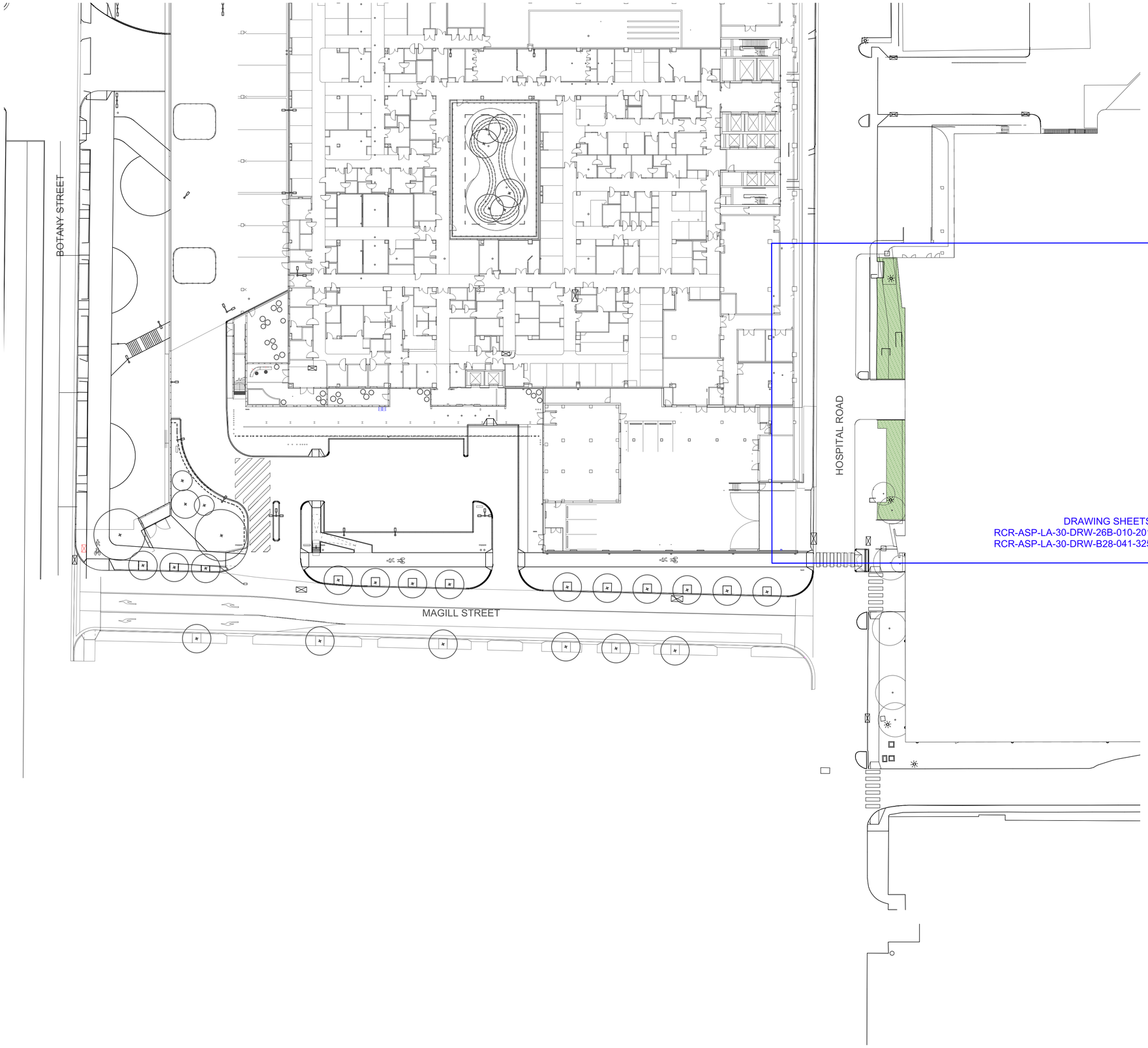
DRAWING

General Arrangement Plan
Level 07

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:300

DRAWING NO. RCR-ASP-LA-30-DRW-10B-B20-170

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

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Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

DRAWING

General Arrangement Plan
Level B2

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:350

DRAWING NO. RCR-ASP-LA-30-DRW-10B-B20-B00

REVISION 2

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-B11-211
RCR-ASP-LA-50-DRW-26B-B11-311
RCR-ASP-LA-50-DRW-26B-B11-411
RCR-ASP-LA-50-DRW-26B-B11-511
RCR-ASP-LA-50-DRW-26B-B11-711

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-B12-212
RCR-ASP-LA-50-DRW-26B-B12-312
RCR-ASP-LA-50-DRW-26B-B12-412
RCR-ASP-LA-50-DRW-26B-B12-512

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-B13-213
RCR-ASP-LA-50-DRW-26B-B13-313
RCR-ASP-LA-50-DRW-26B-B13-413
RCR-ASP-LA-50-DRW-26B-B13-513
RCR-ASP-LA-50-DRW-26B-B13-713

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-B15-214
RCR-ASP-LA-50-DRW-26B-B15-314
RCR-ASP-LA-50-DRW-26B-B15-414
RCR-ASP-LA-50-DRW-26B-B15-514
RCR-ASP-LA-50-DRW-26B-B15-714

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-B18-215
RCR-ASP-LA-50-DRW-26B-B18-315
RCR-ASP-LA-50-DRW-26B-B18-415
RCR-ASP-LA-50-DRW-26B-B18-515

DRAWING SHEETS
RCR-ASP-LA-50-DRW-26B-B19-216
RCR-ASP-LA-50-DRW-26B-B19-316
RCR-ASP-LA-50-DRW-26B-B19-416

HOSPITAL ROAD
AINSWORTH BUILDING
BOTANY STREET
MAGILL STREET
HOSPITAL ROAD

NOTE:
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REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

STATUS

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PROJECT

Randwick Hospital Campus

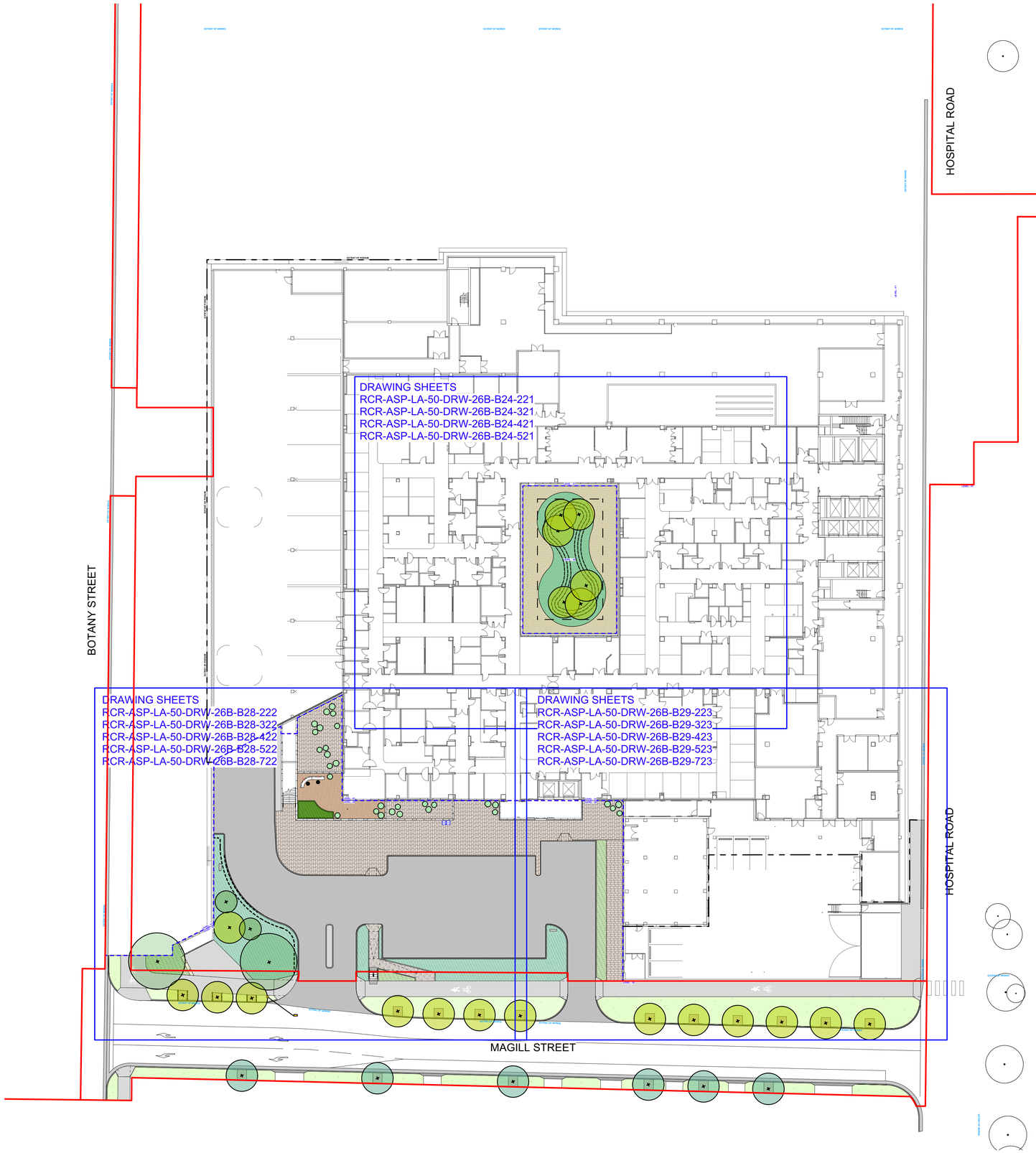
DRAWING

General Arrangement Plan
Level B1

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:300

DRAWING NO. RCR-ASP-LA-30-DRW-10B-B20-B10

REVISION 1



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REFER TO CIVIL ENGINEERS DRAWING FOR:
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- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

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International Towers Sydney
Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

DRAWING

General Arrangement Plan
Level B2

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:350

DRAWING NO. RCR-ASP-LA-30-DRW-10B-B20-B20

REVISION 1

QUANTITY OF TREES IN STAGE ONE WORKS

	QTY
PROPOSED TREE ASB STAGE 1 - CANOPY SIZE 9M	15
PROPOSED TREE ASB STAGE 1 - CANOPY SIZE 5M	85
PROPOSED TREE ASB STAGE 1 - CANOPY SIZE 3.5M	24
PROPOSED TREE HOSPITAL ROAD WORKS - CANOPY SIZE 3.5M	13
EXISTING TREE RETAINED	8
PROPOSED TREES TOTAL	**138**
EXISTING TREE OUT OF SCOPE	N/A
EXISTING TREE REMOVED COVERED [TO BE REMOVED] BY THE ORIGINAL ASB	17
EXISTING TREE REMOVED COVERED [TO BE REMOVED] BY THE ORIGINAL ASB SUBJECT TO SEPERATE APPROVAL	96
EXISTING TREE REMOVED INCLUDED IN THE IASB	10
MAGILL ST SOUTH TREES	**6** A
EXISTING TREE REMOVED MAGILL STREET SOUTH	5
PROPOSED TREE MAGILL STREET SOUTH	6 A

NOTE:
REFER TO TREE IQ REPORT FOR DETAILED ASSESSMENT OF SURVEYED TREES WITHIN THE STUDY AREA

REFER TO CIVIL ENGINEERS DRAWING FOR:
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STATUS

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PROJECT

Randwick Hospital Campus

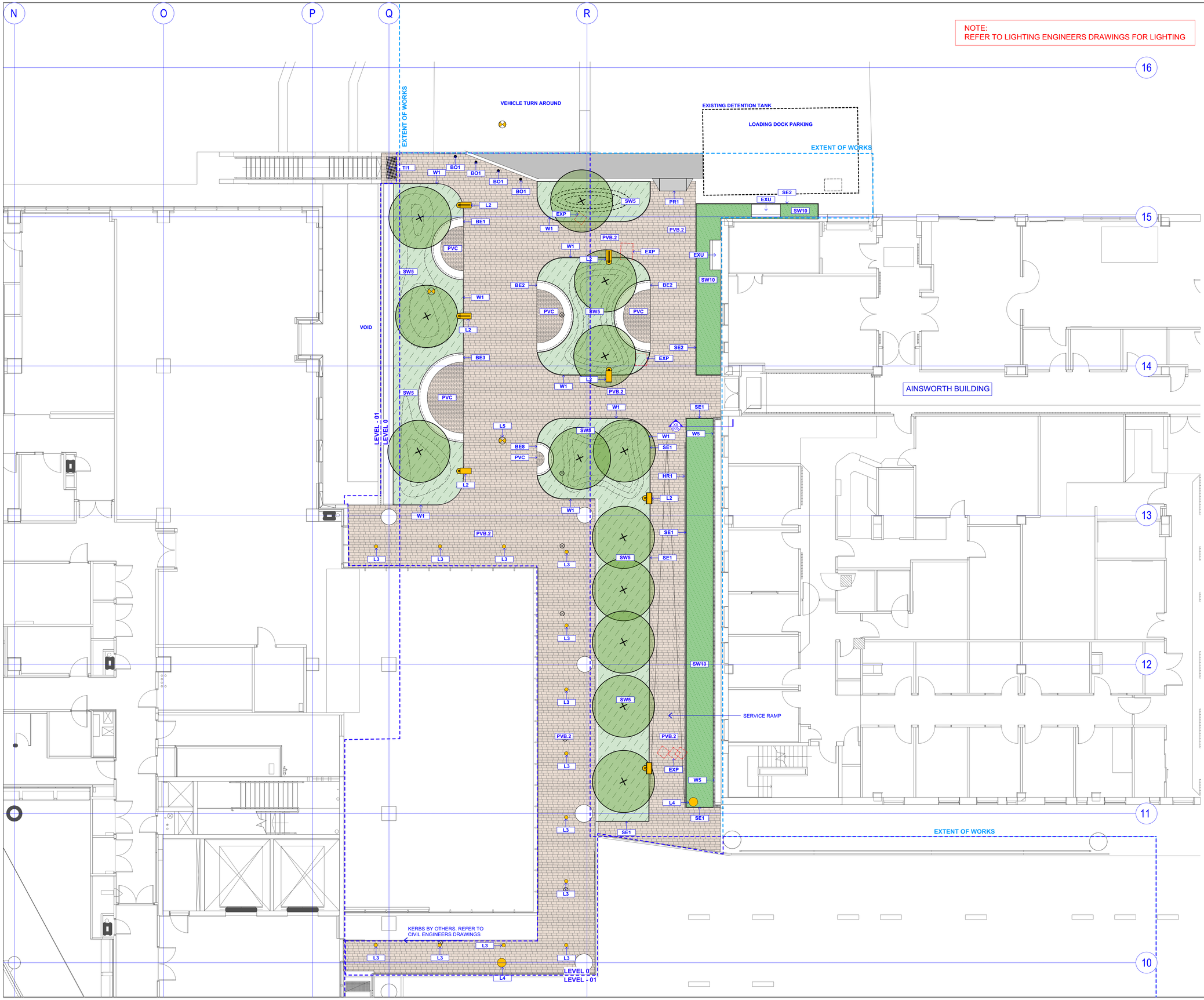
DRAWING

Site Tree Retention and Removal

DRAWN	CHECKED	SCALE @ A1
JT | CK	JH | KL	1:600

DRAWING NO. RCR-ASP-LA-30-DRW-10B-NL0-050

REVISION 1



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1	26/05/21	APPROVED FOR CONSTRUCTION
2	16/06/21	APPROVED FOR CONSTRUCTION

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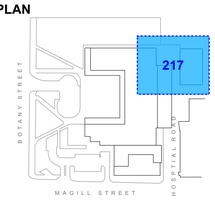
KEY PLAN



NOTE:
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PROJECT

Randwick Hospital Campus

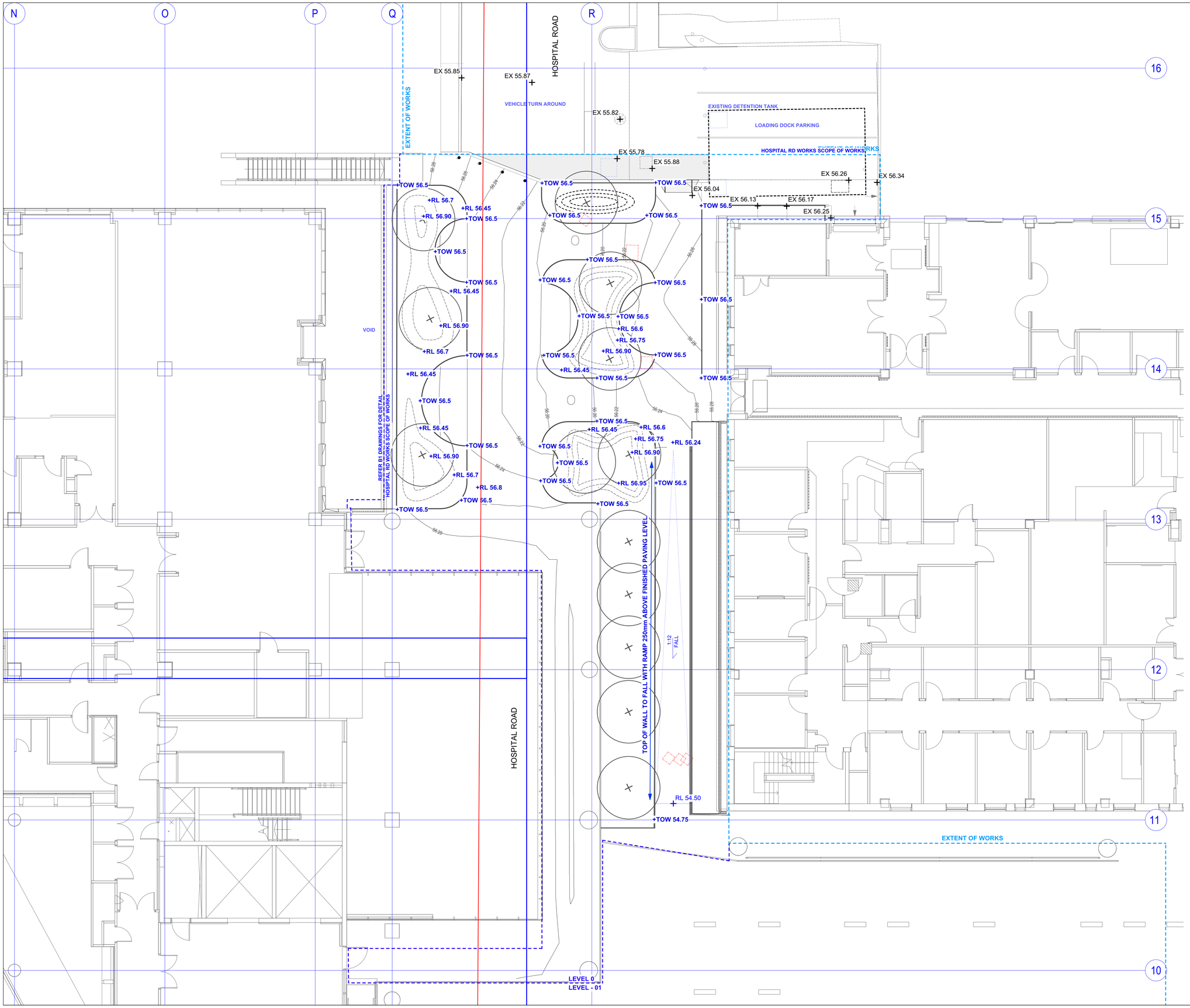
DRAWING

Materials & Finishes Plan
Level 00 Hospital Road
Sheet 10 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-006-217

REVISION 2



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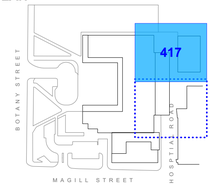

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PROJECT

Randwick Hospital Campus

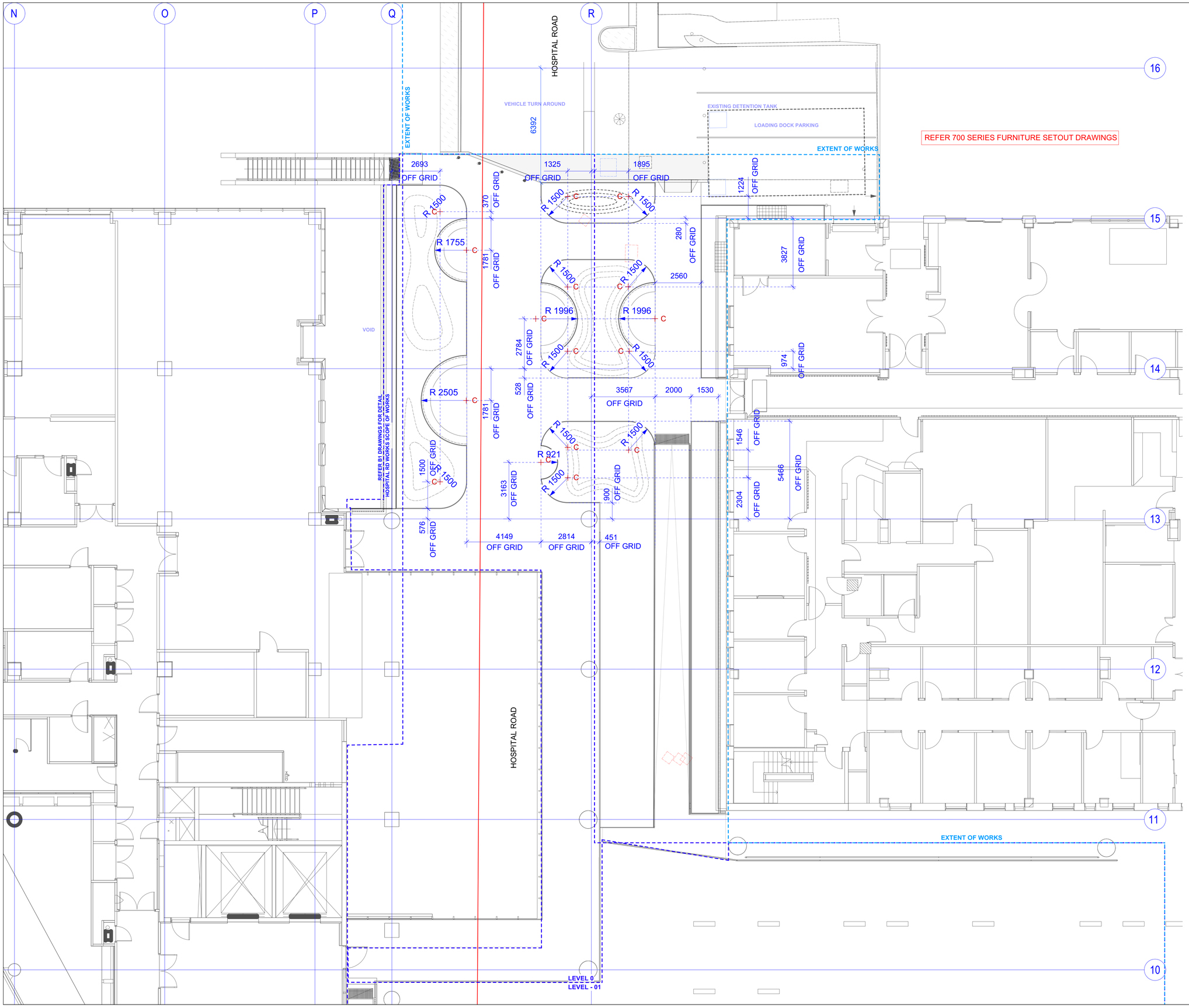
DRAWING

Levels & Grading Plan
L00 Hospital Road
Sheet 11 of 16

DRAWN	CHECKED	SCALE @ A1
LD | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-006-417 1



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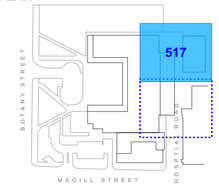

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PROJECT

Randwick Hospital Campus

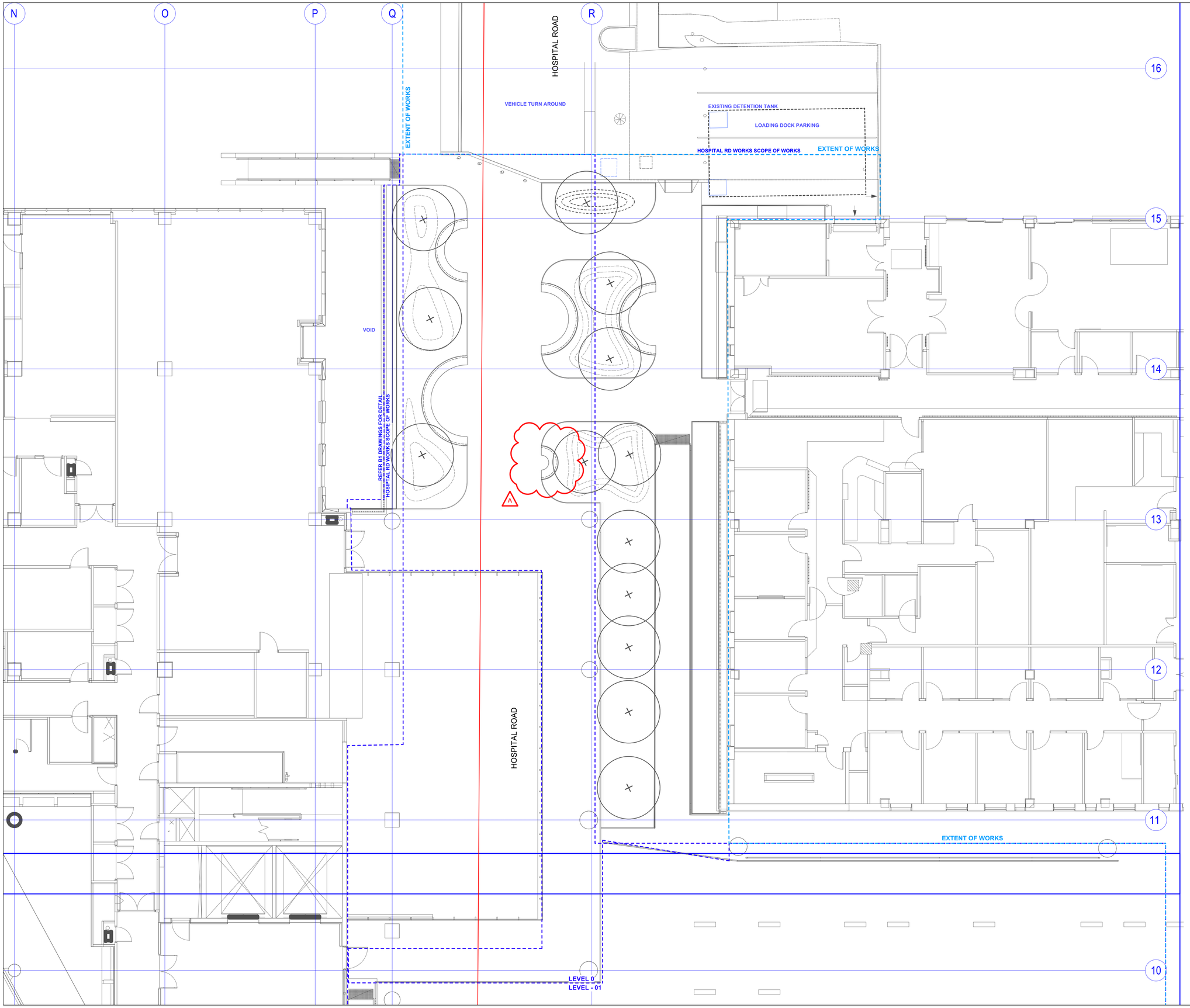
DRAWING

Setout Plan
L00 Hospital Road
Sheet 11 of 14

DRAWN	CHECKED	SCALE @ A1
LD | CK	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-006-517 1



STATUS

APPROVED FOR CONSTRUCTION

N

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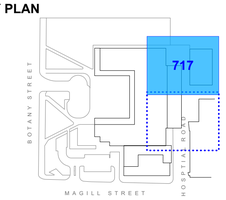

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PROJECT

Randwick Hospital Campus

DRAWING

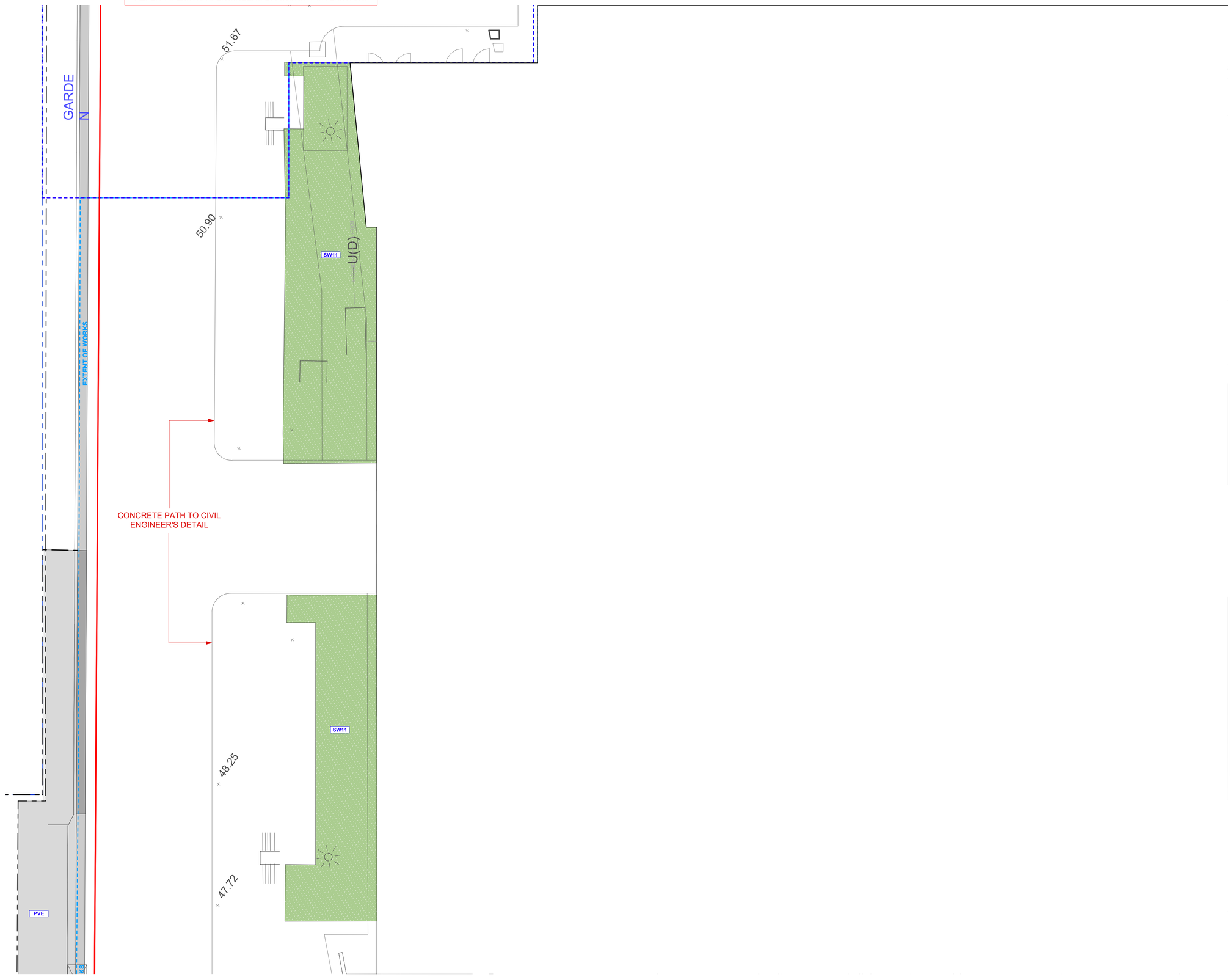
Furniture Setout Plan
L00 Hospital Road
Sheet 7 of 7

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-006-717 1

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING



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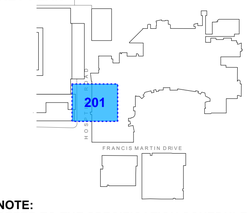

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PROJECT

Randwick Hospital Campus

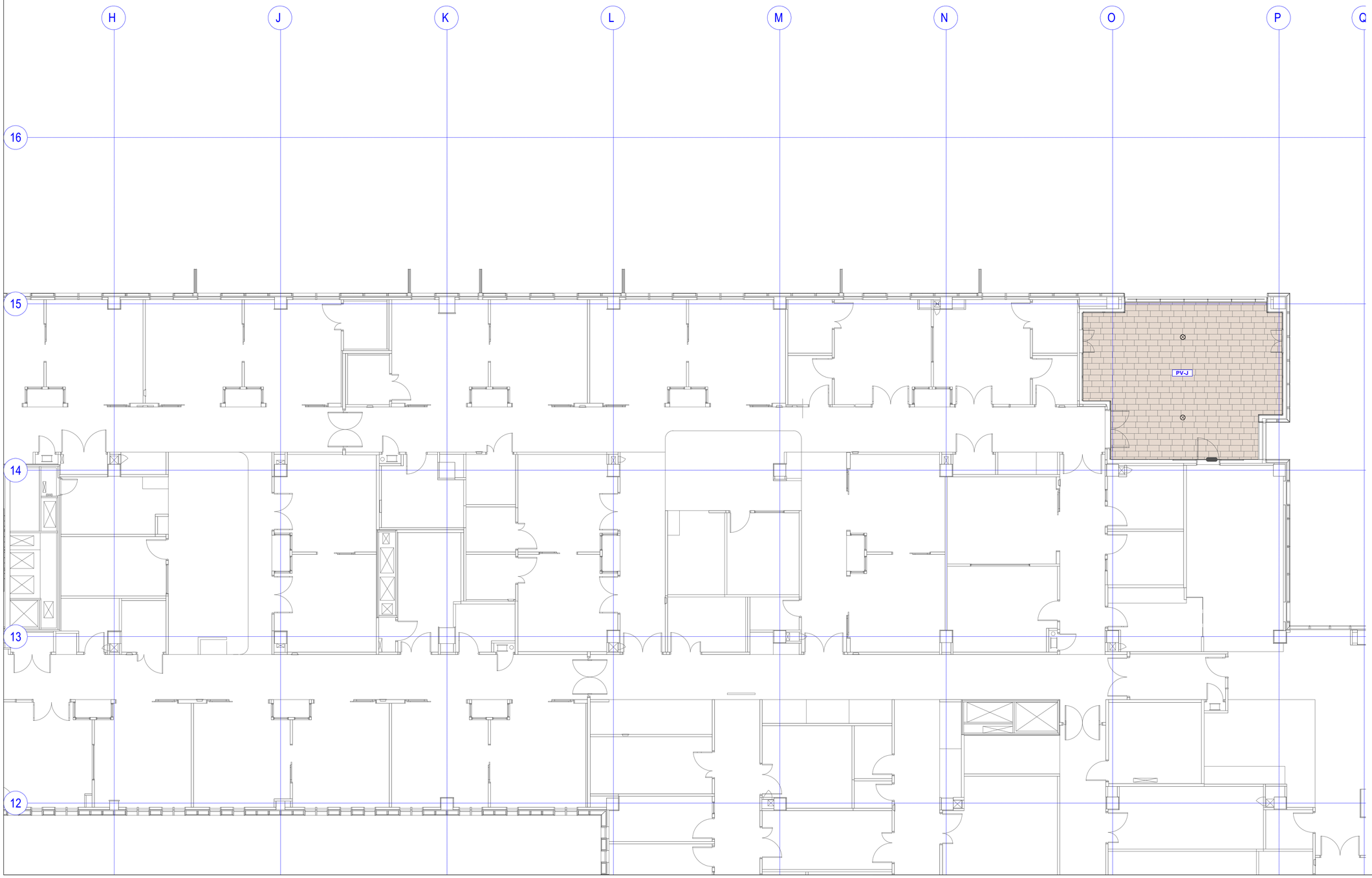
DRAWING

Materials & Finishes Plan Kiloh Pathway
Sheet 19 of 20

DRAWN	CHECKED	SCALE @ A1
JT	JT | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-010-201 1



STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

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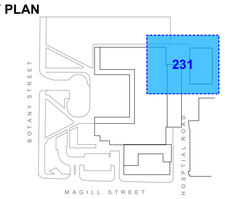

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PROJECT

Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level 3
Sheet 12 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-031-231 1

STATUS

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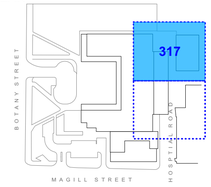

NOTE:
PLANTING TO BE SETOUT IN GROUPS OF 5-7 PER SPECIES UNDER SUPERVISION OF PROJECT LANDSCAPE ARCHITECT.

REFER TO THE TECHNICAL SPECIFICATION + DETAILS FOR DETAILED SELECTION INFORMATION.

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PROJECT

Randwick Hospital Campus

DRAWING

PLANTING PLAN - L2
Sheet 10 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-031-317

REVISION 1

RCR-ASP-LA-50-DRW-26B-031-217

MIX 7
27-Cm
27-Px
27-Dc
27-Lm
27-Lpc

10
09
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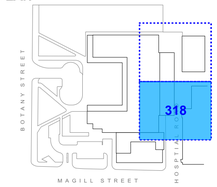

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PROJECT

Randwick Hospital Campus

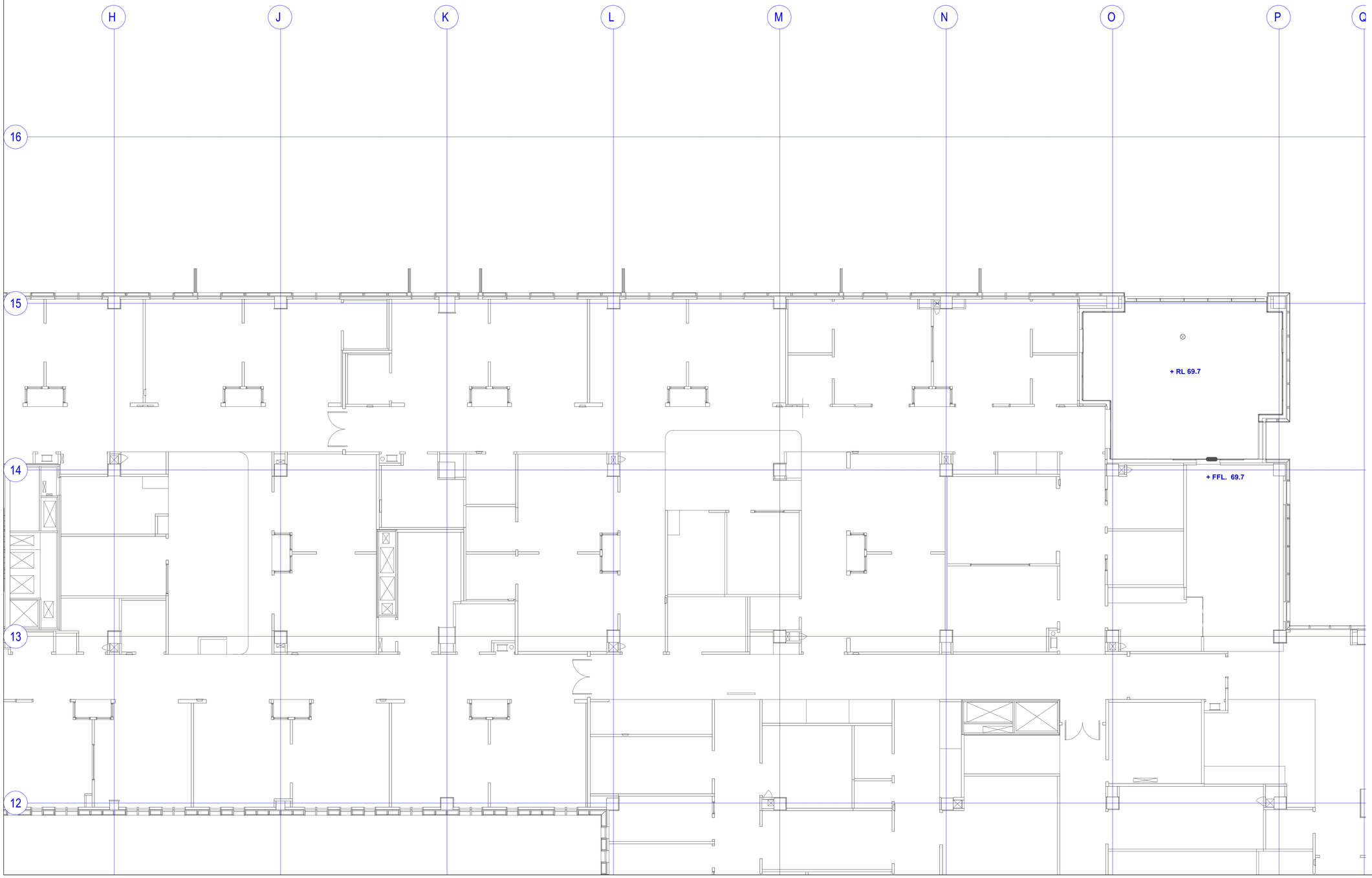
DRAWING

PLANTING PLAN - L2
Sheet 11 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-031-318

REVISION 1



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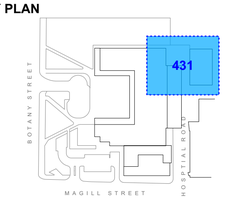

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PROJECT

Randwick Hospital Campus

DRAWING

Levels & Grading Plan - L3
Sheet 12 of 16

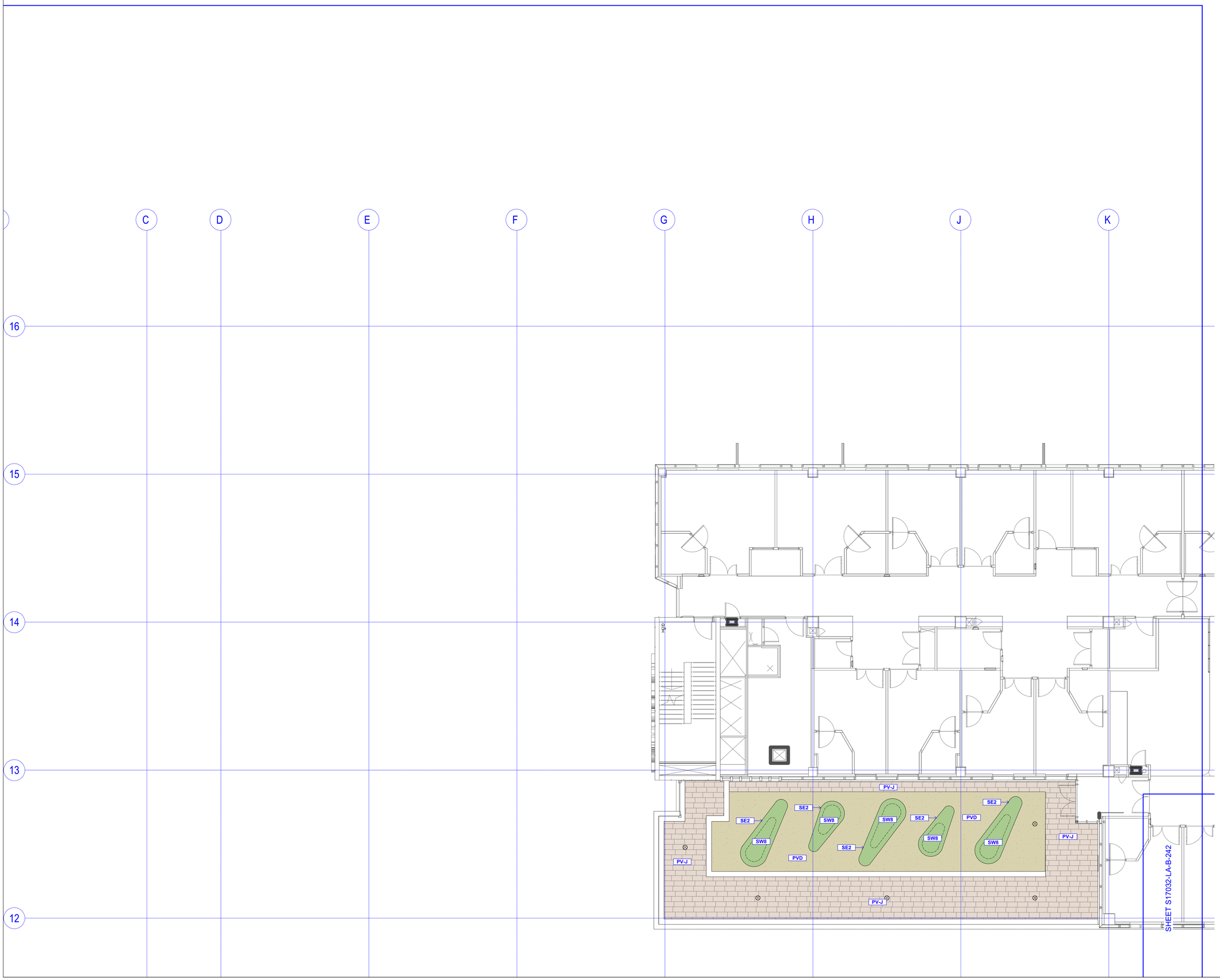
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO.

RCR-ASP-LA-30-DRW-26B-031-431

REVISION

1



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ACOR
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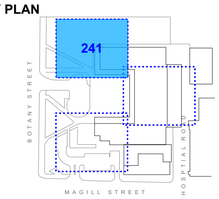
St Leonards NSW 2065
T +612 9438 5098

KEY PLAN



NOTE:
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REFER TO HYDAULIC + CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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CLIENT

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Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level 4
Sheet 13 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-041-241 1

RCR-ASP-LA-50-DRW-26B-041-241

RCR-ASP-LA-50-DRW-26B-042-243

L M N O P Q R

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STATUS

APPROVED FOR CONSTRUCTION

NOTES

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1	26/05/21	APPROVED FOR CONSTRUCTION

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CIVIL ENGINEER
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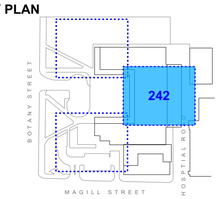
KEY PLAN



NOTE:
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PROJECT

Randwick Hospital Campus

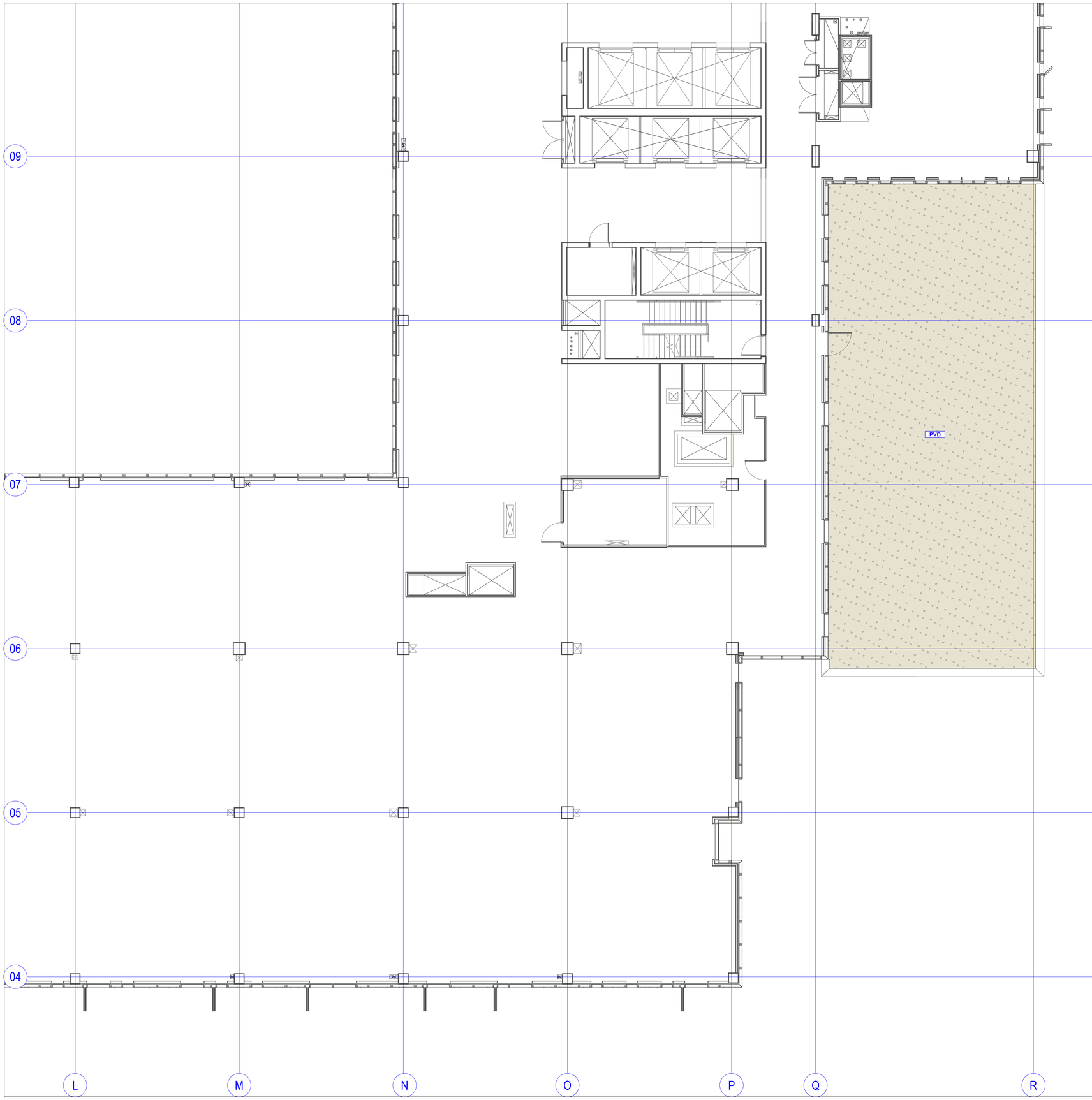
DRAWING

Materials & Finishes Plan Level 4
Sheet 14 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-041-242 1



STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

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Sydney NSW 2000
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CIVIL ENGINEER
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1/33 Herbert St
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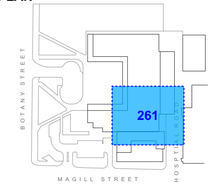

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PROJECT

Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level 6
Sheet 16 of 17

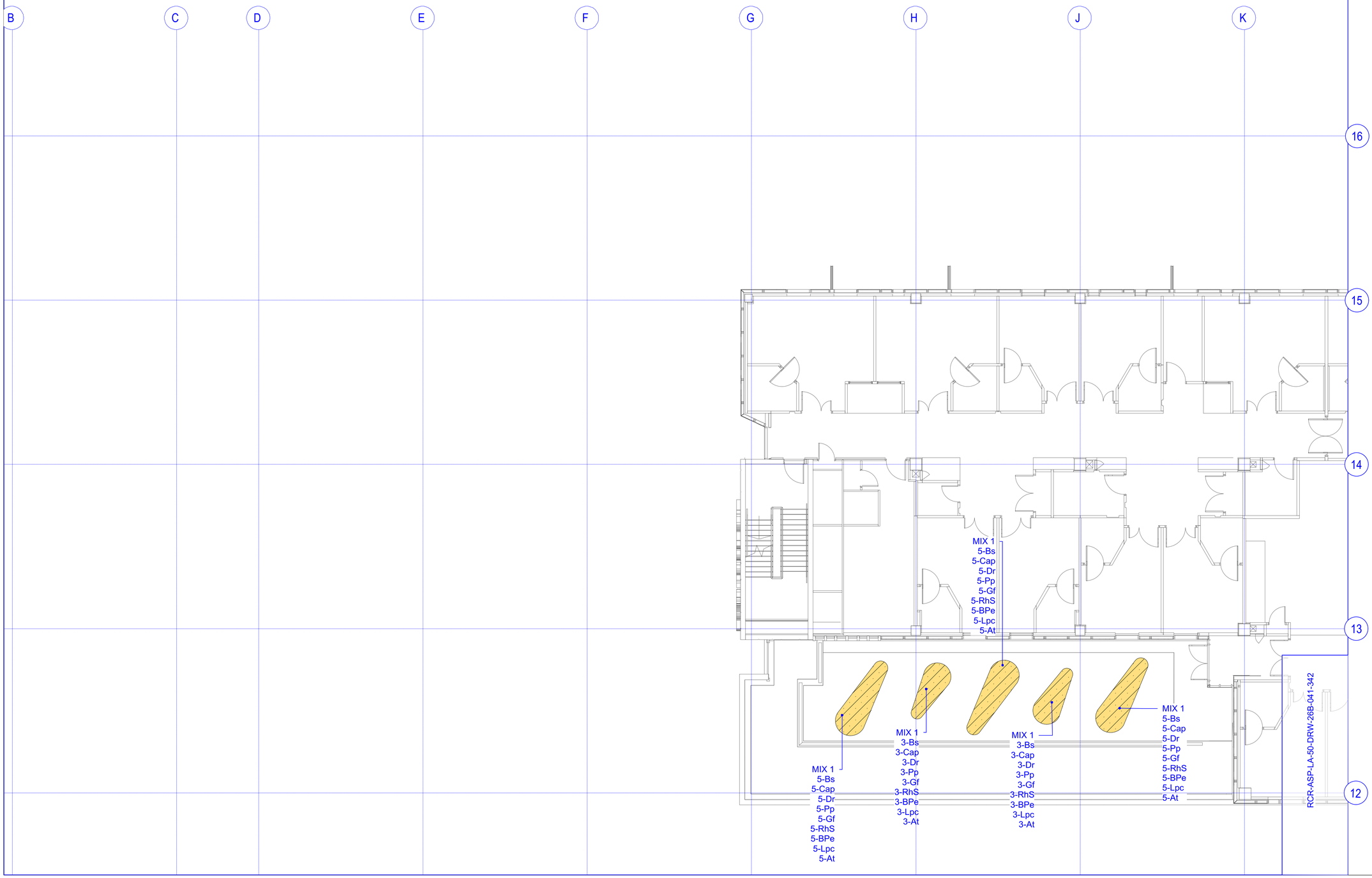
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO.

RCR-ASP-LA-30-DRW-26B-041-261

REVISION

1



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1	26/05/21	APPROVED FOR CONSTRUCTION

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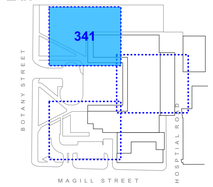

NOTE:
PLANTING TO BE SETOUT IN GROUPS OF 5-7 PER SPECIES UNDER SUPERVISION OF PROJECT LANDSCAPE ARCHITECT.

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PROJECT

Randwick Hospital Campus

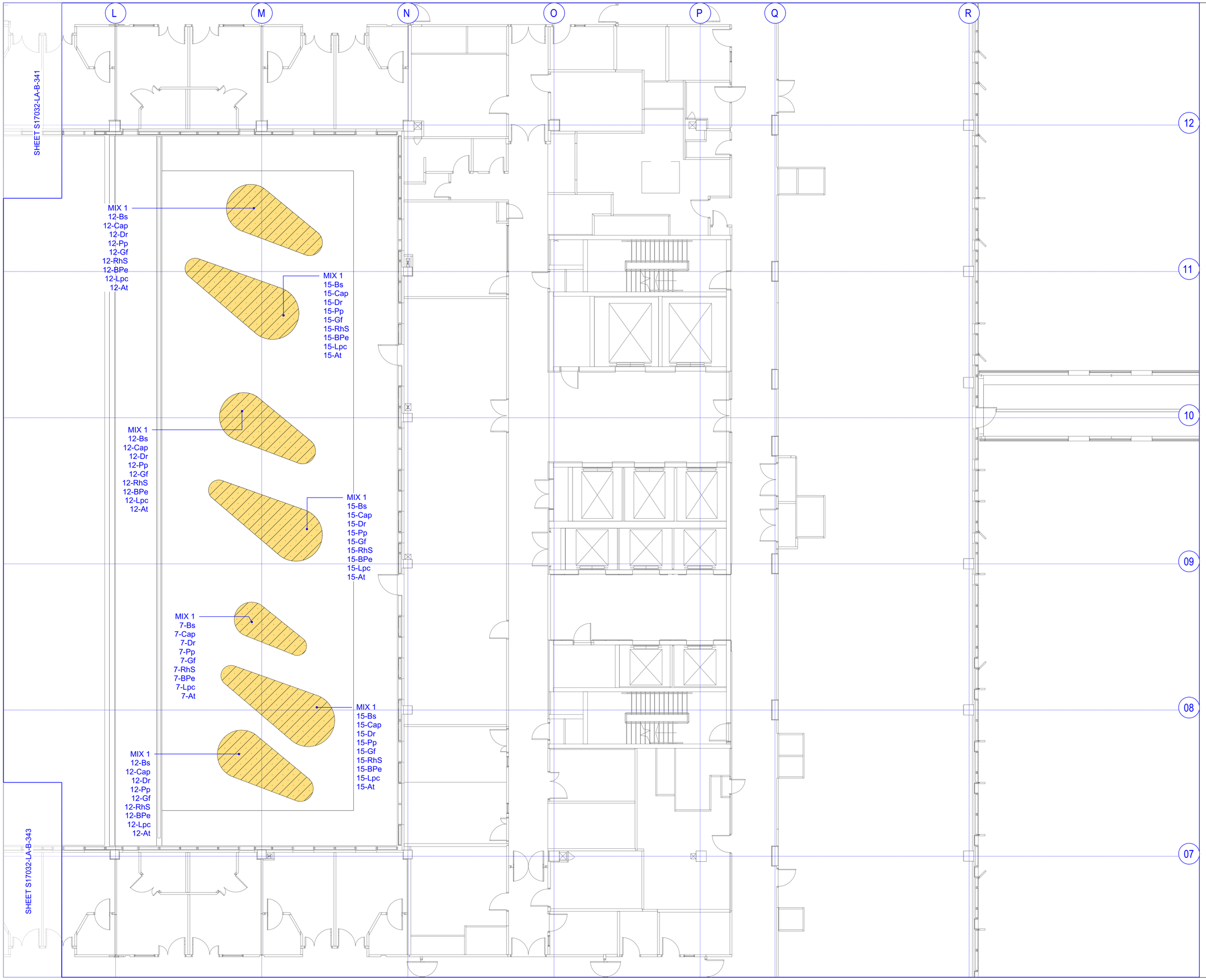
DRAWING

PLANTING PLAN - L4
Sheet 12 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-041-341

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

N

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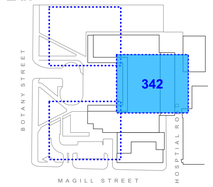

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PROJECT

Randwick Hospital Campus

DRAWING

PLANTING PLAN - L4
Sheet 13 of 14

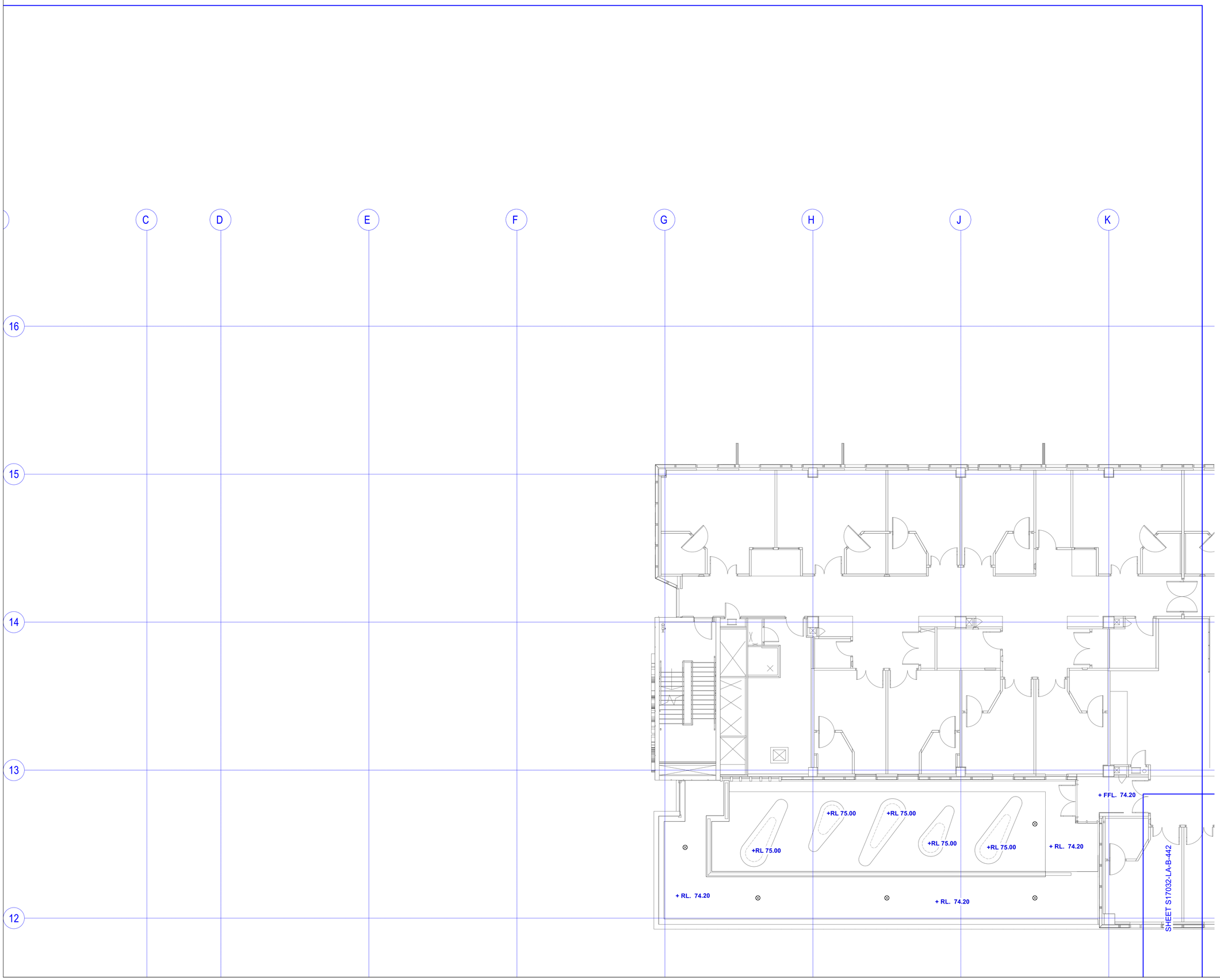
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO.

RCR-ASP-LA-30-DRW-26B-041-342

REVISION

1



STATUS

APPROVED FOR CONSTRUCTION

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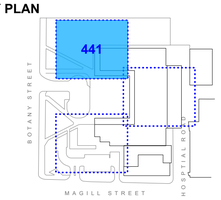
KEY PLAN



NOTE:
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PROJECT

Randwick Hospital Campus

DRAWING

Levels & Grading Plan - L4
Sheet 13 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-041-441

REVISION 1

L M N O P Q R

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SHEET S17032-LA-B-443

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STATUS

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ACOR
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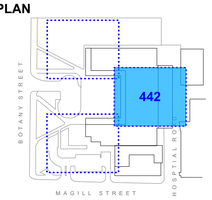
KEY PLAN



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PROJECT

Randwick Hospital Campus

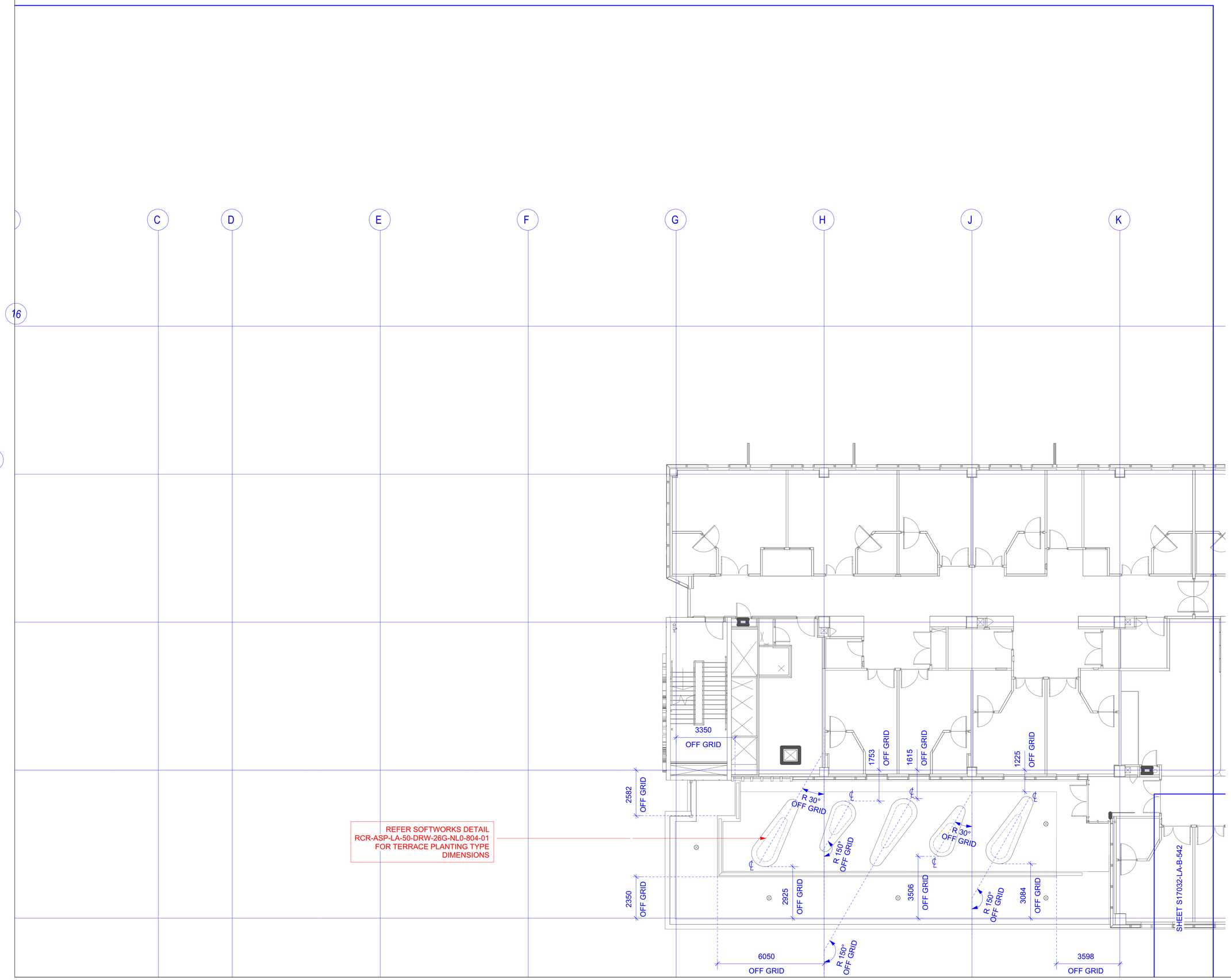
DRAWING

Levels & Grading Plan - L4
Sheet 14 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-041-442 1



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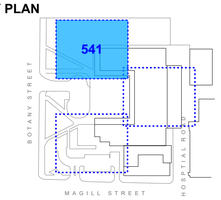

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PROJECT

Randwick Hospital Campus

DRAWING

Setout Plan - L4
Sheet 13 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-041-541 1

L M N O P Q R

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SHEET S17032-LA-B-543

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5443
OFF GRID

REFER SOFTWORKS DETAIL
RCR-ASP-LA-50-DRW-26G-NL0-804-01
FOR TERRACE PLANTING TYPE
DIMENSIONS

STATUS

APPROVED FOR CONSTRUCTION

N

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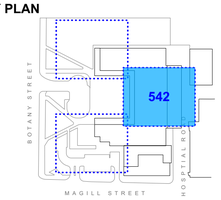
KEY PLAN



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PROJECT

Randwick Hospital Campus

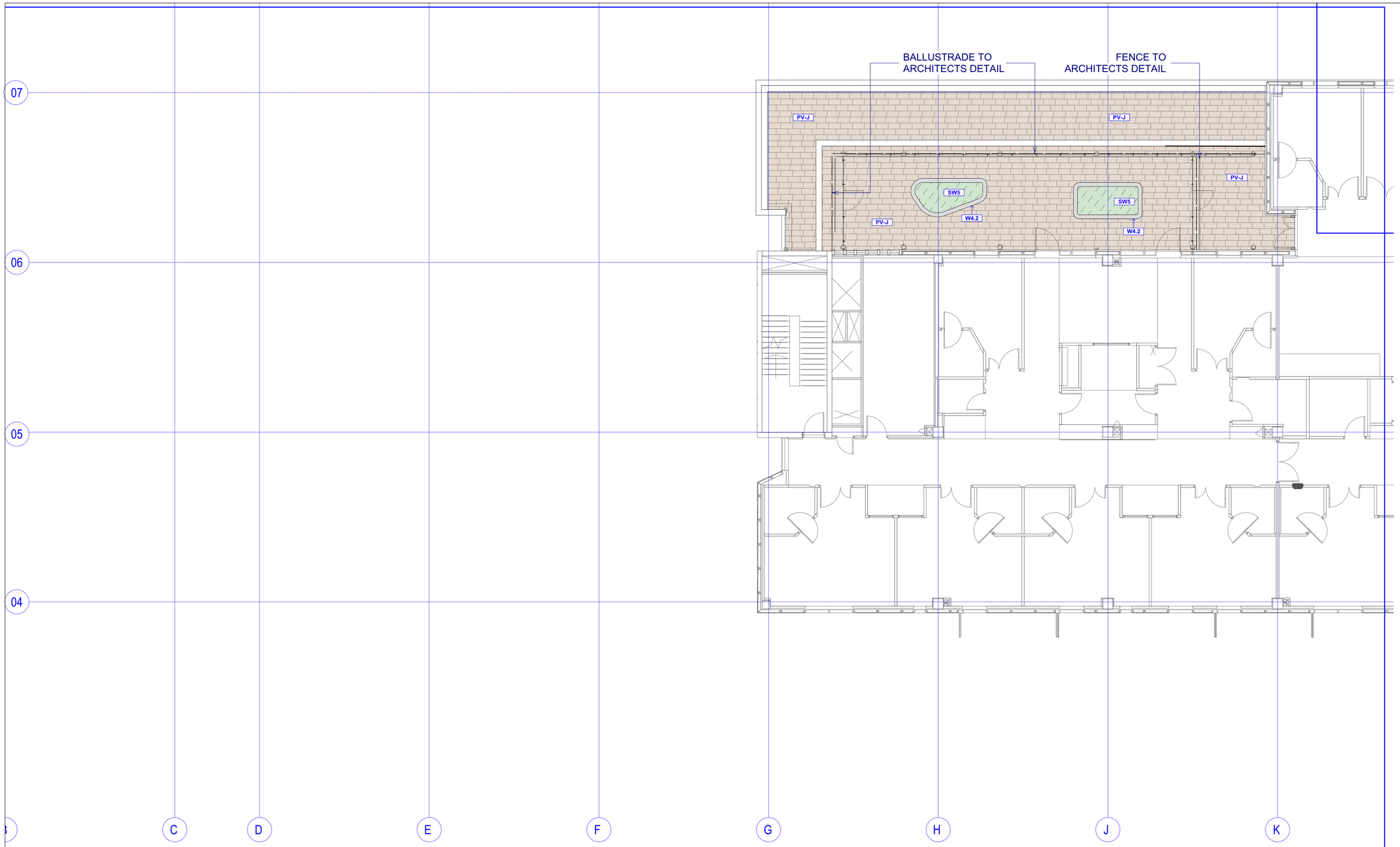
DRAWING

Setout Plan - L4
Sheet 14 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-041-542 1



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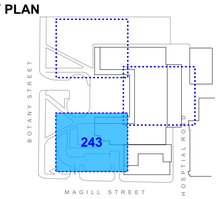

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PROJECT

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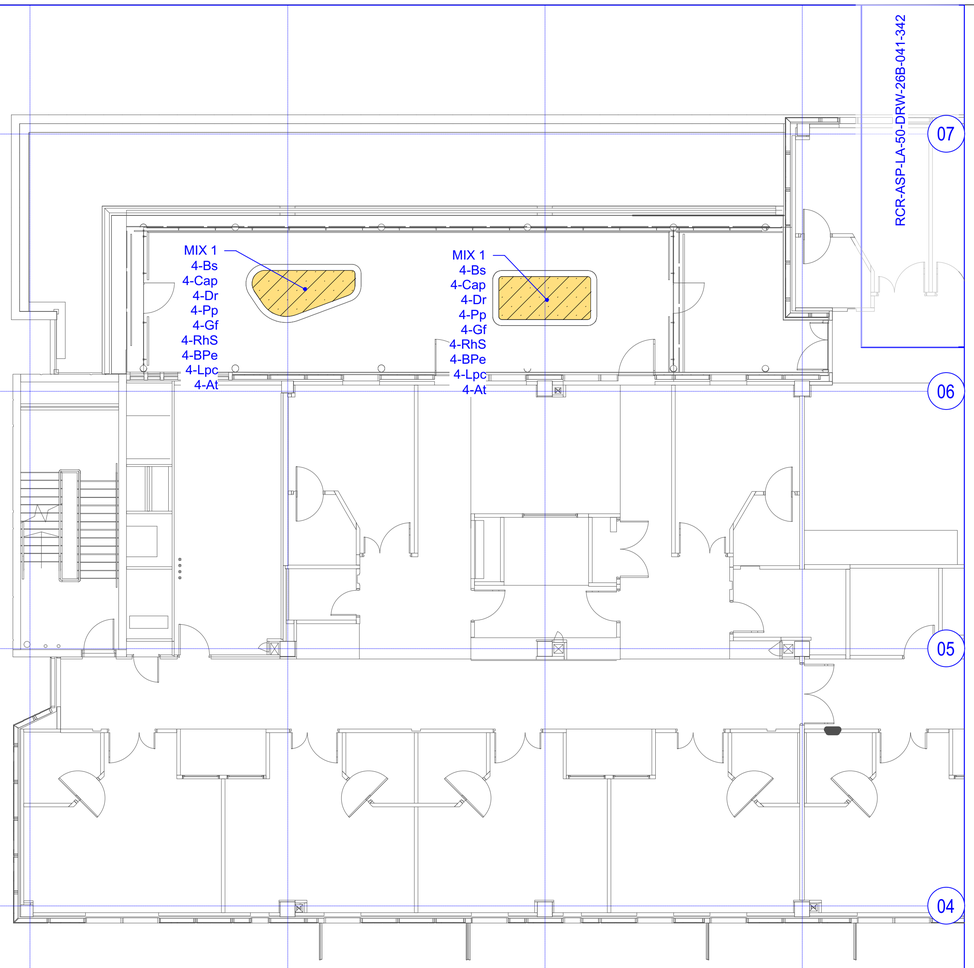
DRAWING

Materials & Finishes Plan Level 4
Sheet 15 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-042-243

REVISION 1



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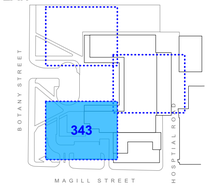
KEY PLAN



NOTE:
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PROJECT

Randwick Hospital Campus

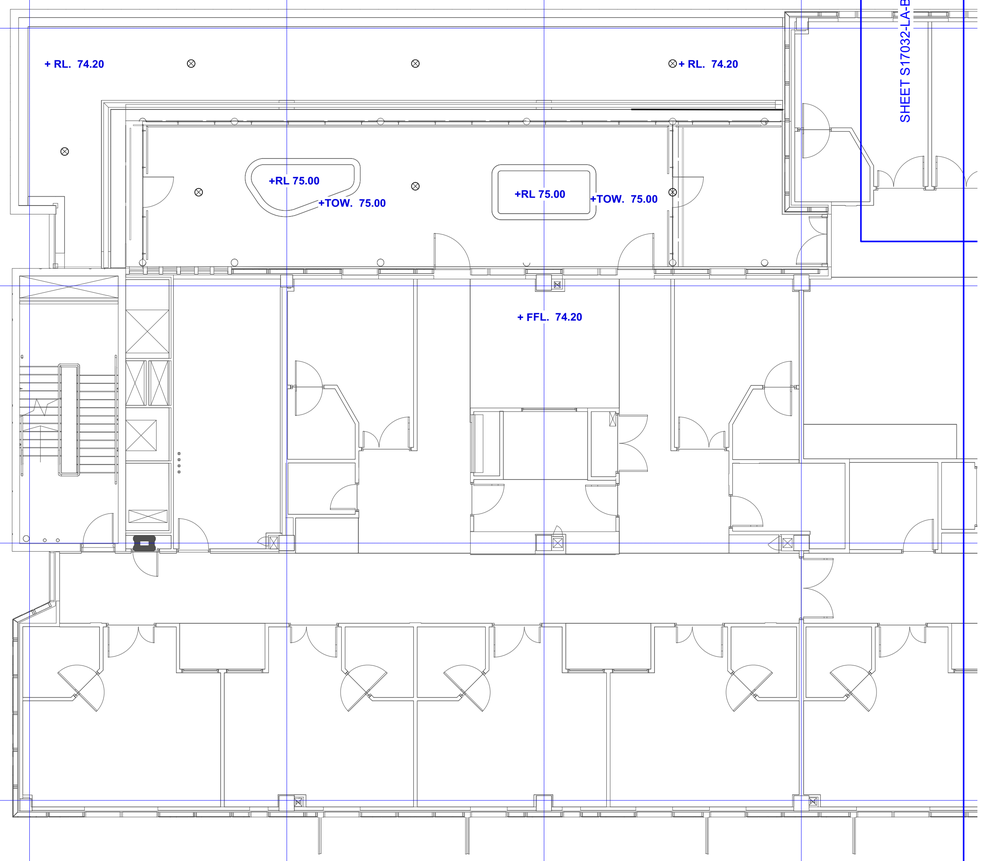
DRAWING

PLANTING PLAN - L4
Sheet 14 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-042-343

REVISION 1



07
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STATUS

APPROVED FOR CONSTRUCTION

NOTES

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1	26/05/21	APPROVED FOR CONSTRUCTION

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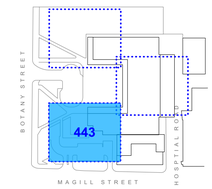

NOTE:
REFER TO THE SPECIFICATION SCHEDULE + DETAILS FOR DETAILED SELECTION INFORMATION.

REFER TO CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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CLIENT

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PROJECT

Randwick Hospital Campus

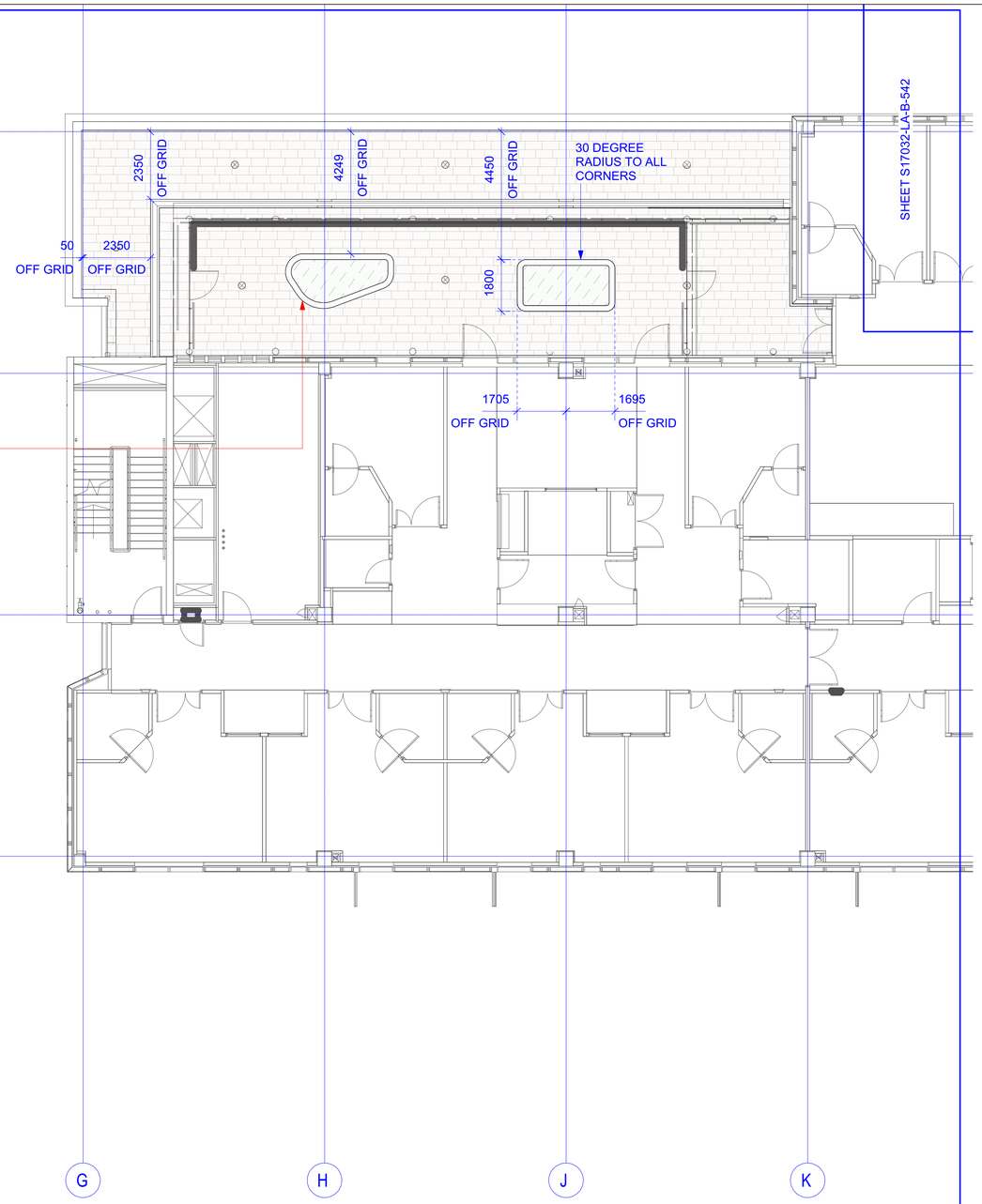
DRAWING

Levels & Grading Plan - L4
Sheet 15 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-042-443

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

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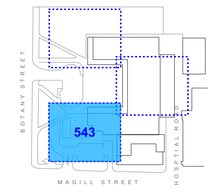

NOTE:
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REFER TO CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
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PROJECT

Randwick Hospital Campus

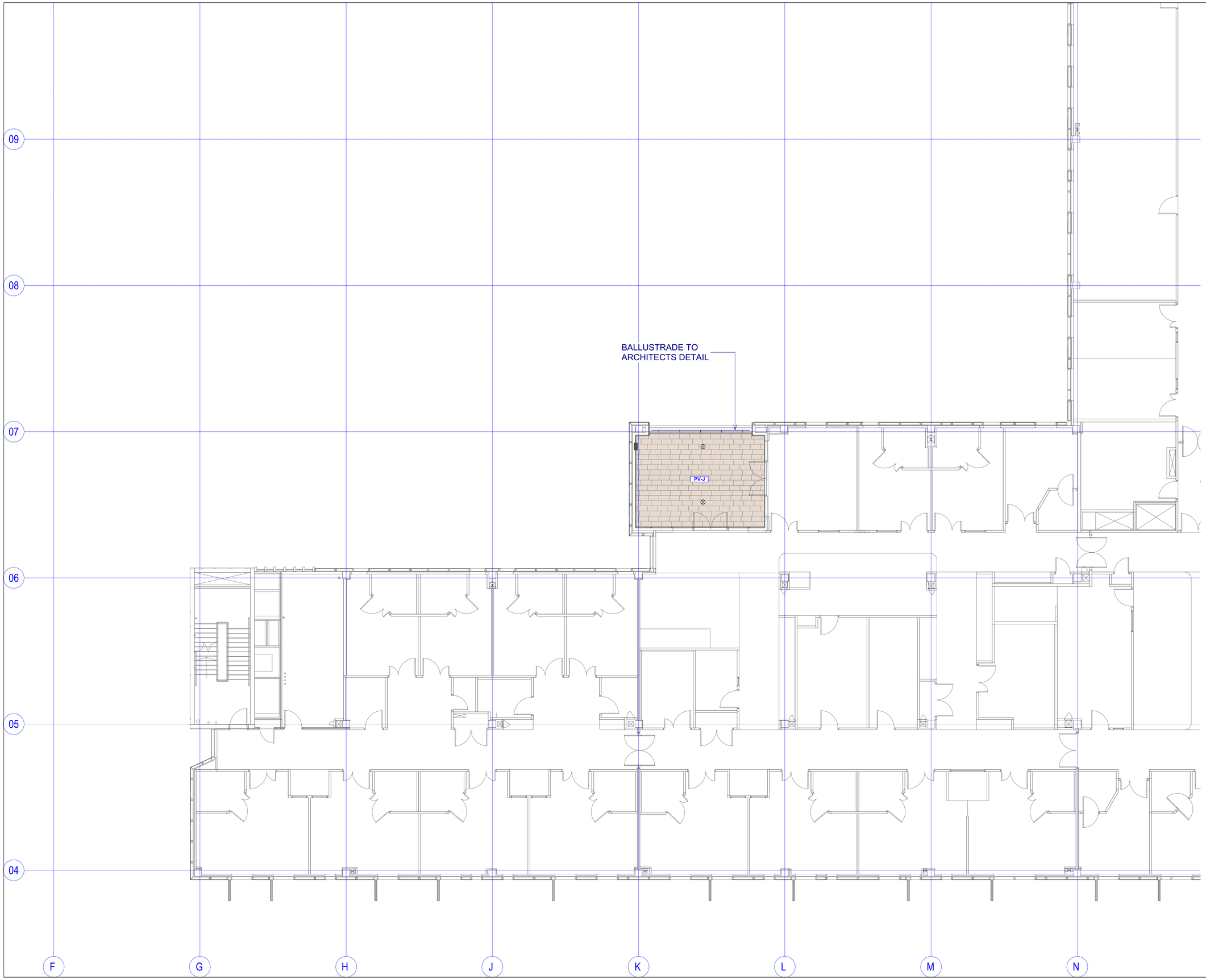
DRAWING

Setout Plan - L4
Sheet 15 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-042-543 1



STATUS

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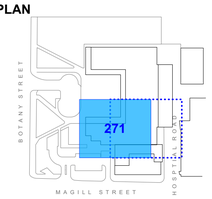
KEY PLAN



NOTE:
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PROJECT

Randwick Hospital Campus

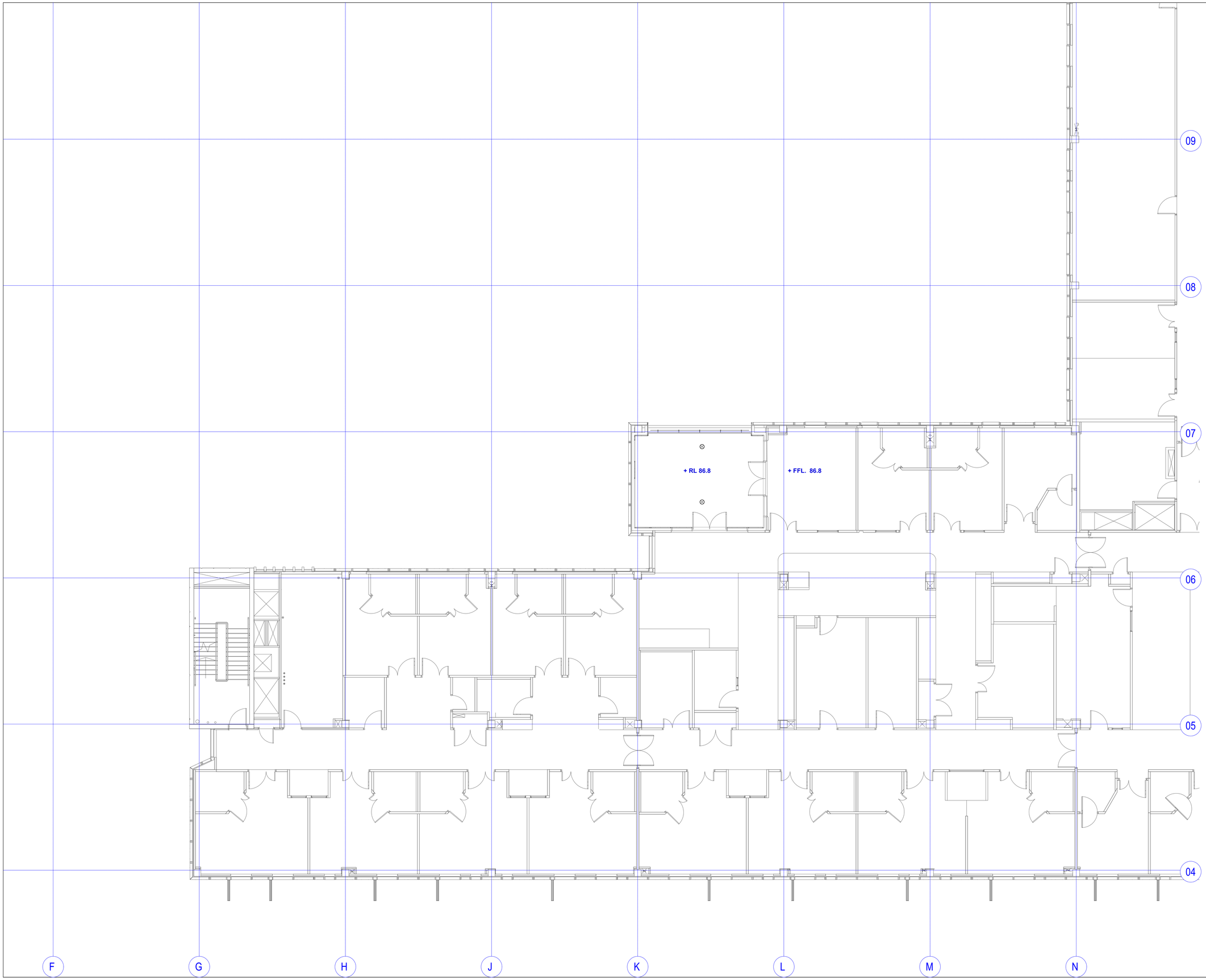
DRAWING

Materials & Finishes Plan Level 7
Sheet 16 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-072-271

REVISION 1



STATUS

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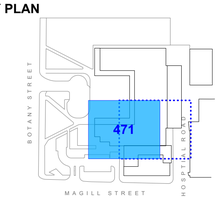
KEY PLAN



NOTE:
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- DRAINAGE POINTS AND FALLS

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PROJECT

Randwick Hospital Campus

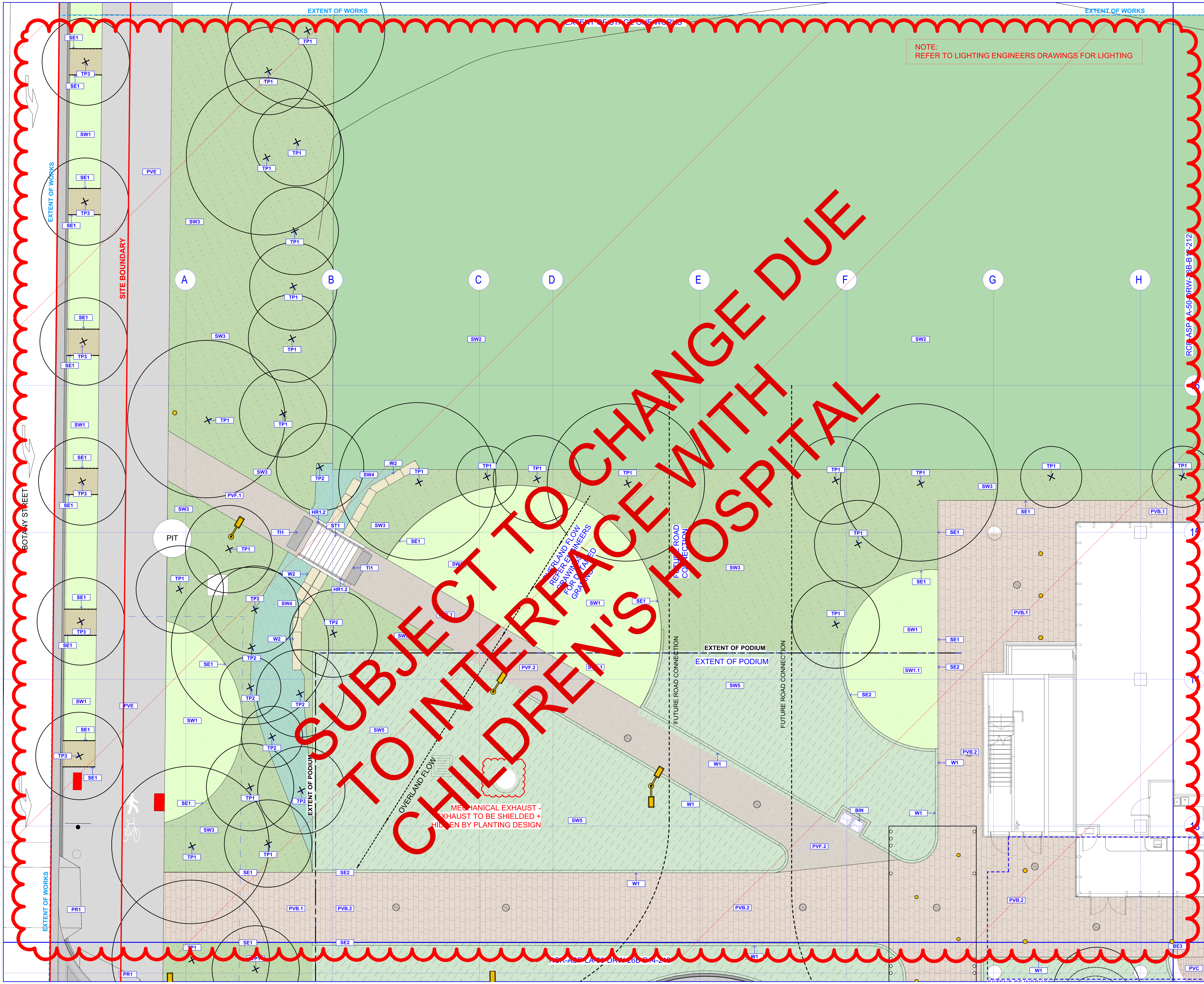
DRAWING

Levels & Grading Plan - L7
Sheet 16 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-072-471

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

N

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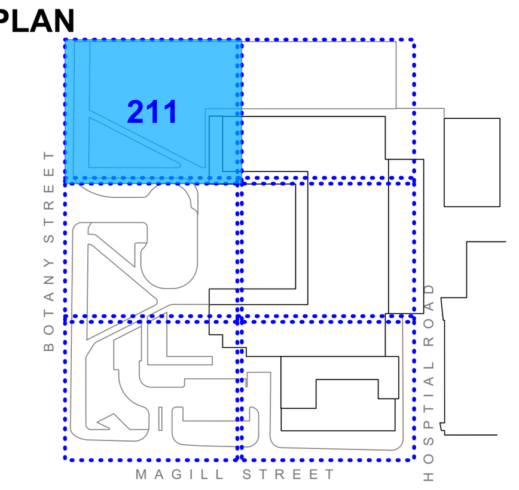
KEY PLAN



NOTE:
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REFER TO HYDAULIC + CIVIL ENGINEERS DRAWING FOR:
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- DRAINAGE POINTS AND FALLS

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PROJECT
Randwick Hospital Campus

DRAWING
Materials & Finishes Plan Level B1
Sheet 4 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO.	REVISION
RCR-ASP-LA-30-DRW-26B-B11-211	1

EXTENT OF WORKS

EXTENT OF WORKS

SITE BOUNDARY

EXTENT OF WORKS

BOTANY ST

HYDROSEED LAWN

SW1
REFER TO SOFTWORKS DETAIL 801-1

SW1
REFER TO SOFTWORKS DETAIL 801-1

SW1
REFER TO SOFTWORKS DETAIL 801-1

SW1
REFER TO SOFTWORKS DETAIL 801-1

MIX 1
205-Bs
205-Cap
205-Dr
205-Pp
205-Gf
205-RhS
205-BPe
205-Lpc
205-At

MIX 1
409-Bs
409-Cap
409-Dr
409-Pp
409-Gf
409-RhS
409-BPe
409-Lpc
409-At

MIX 1
141-Bs
141-Cap
141-Dr
141-Pp
141-Gf
141-RhS
141-BPe
141-Lpc
141-At

MIX 5
187-Fn
187-Lt

A B C D E F G H

15 14 13 12

RCR-ASP-A-50-DRW-26B-B11-312

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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CIVIL ENGINEER
ACOR
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St Leonards NSW 2065
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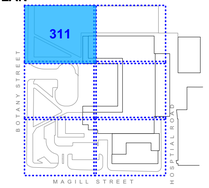
KEY PLAN



NOTE:
PLANTING TO BE SETOUT IN GROUPS OF 5-7 PER SPECIES UNDER SUPERVISION OF PROJECT LANDSCAPE ARCHITECT.

REFER TO THE TECHNICAL SPECIFICATION + DETAILS FOR DETAILED SELECTION INFORMATION.

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Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

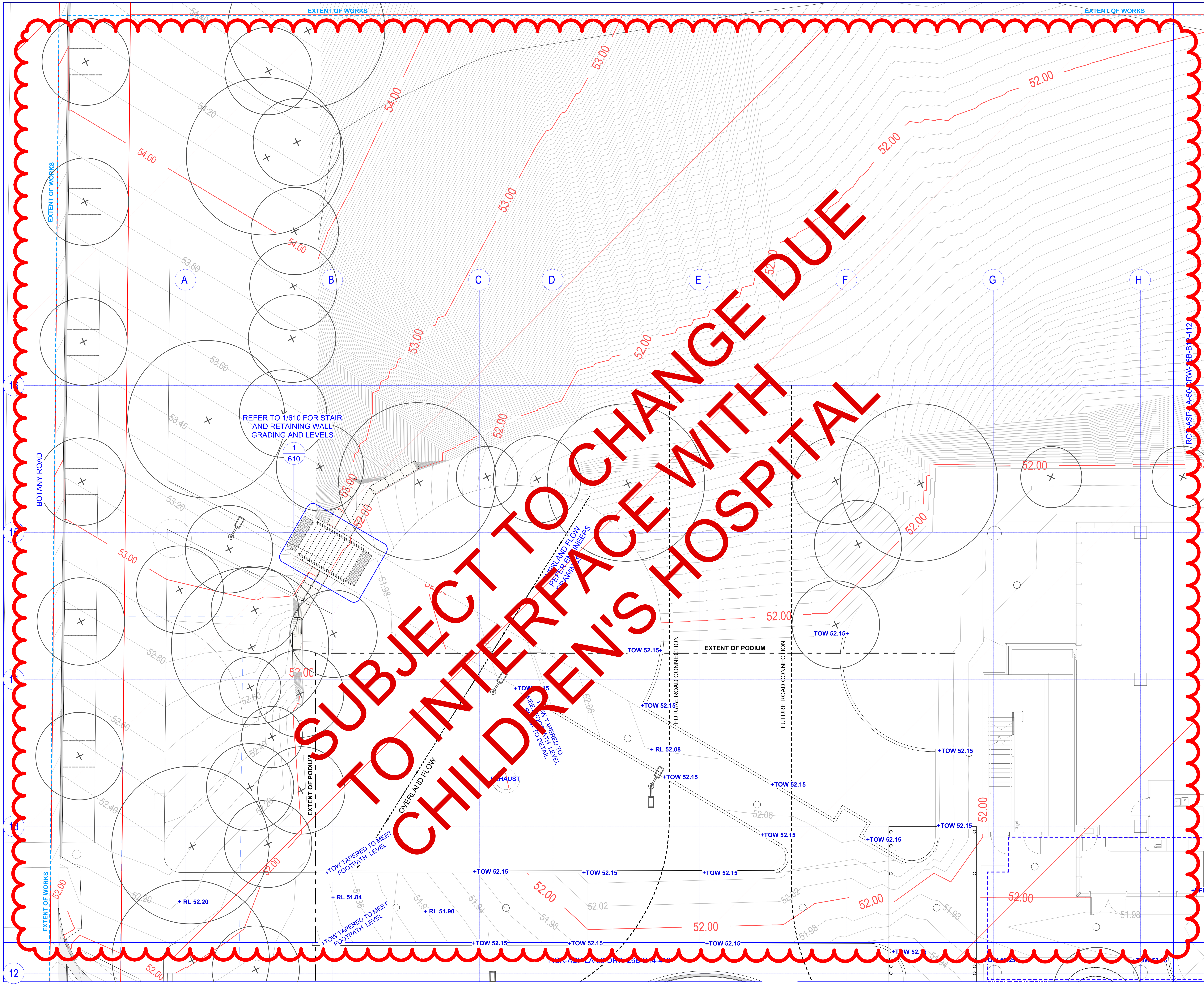
DRAWING

PLANTING PLAN - B1
Sheet 4 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B11-311

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

N

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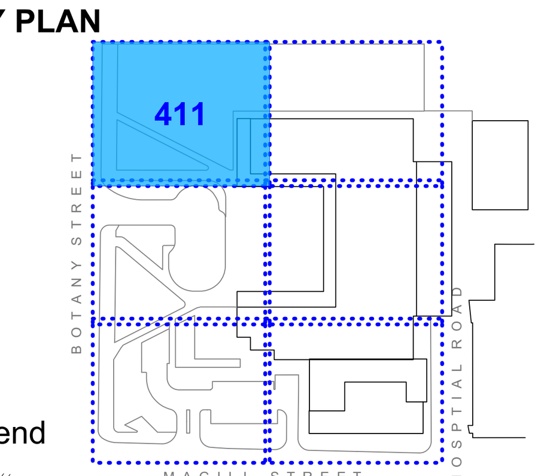
KEY PLAN



Legend

less than 400mm soil depth

NOTE:
REFER TO THE SPECIFICATION SCHEDULE + DETAILS FOR DETAILED SELECTION INFORMATION.

REFER TO CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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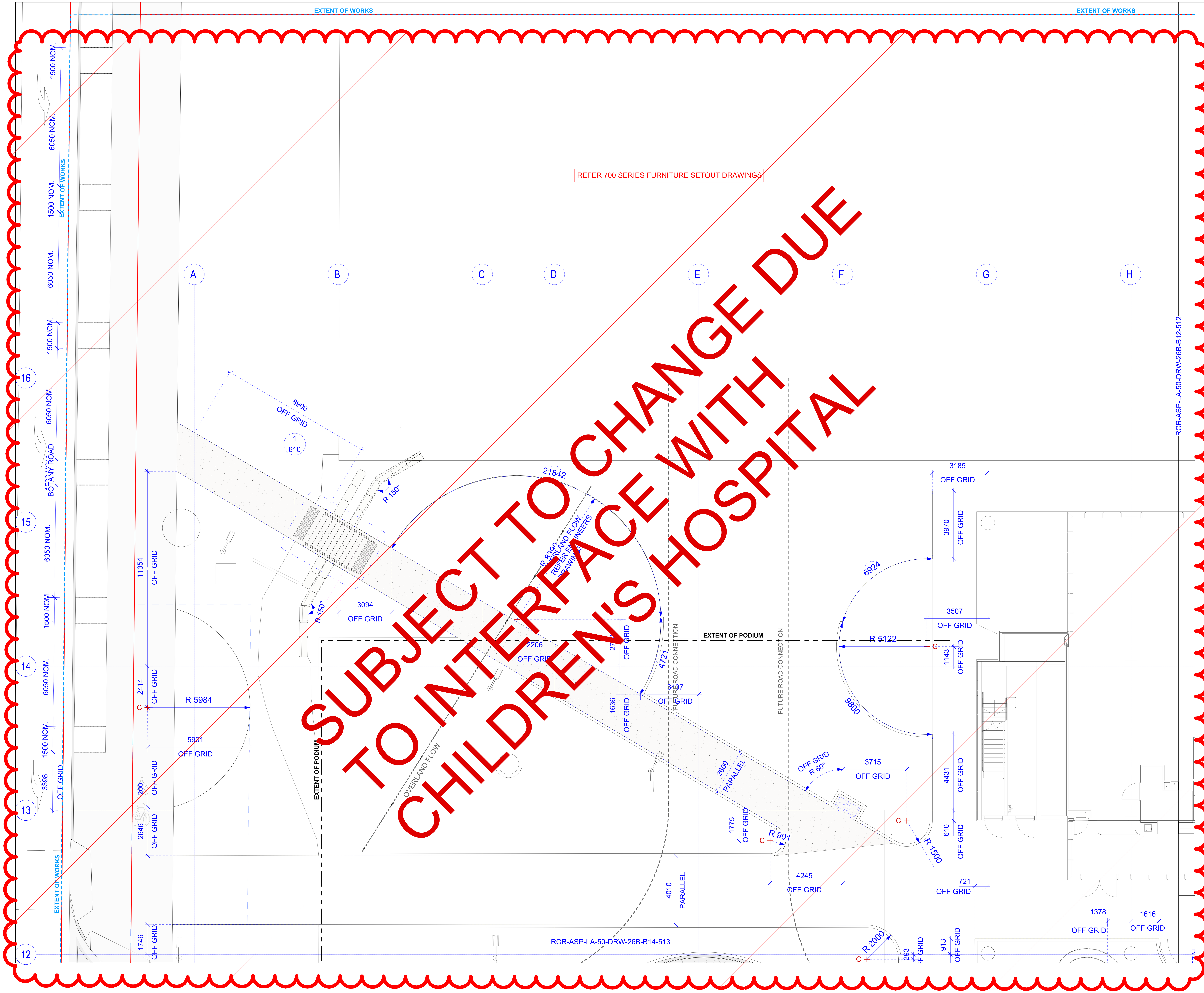
PROJECT
Randwick Hospital Campus

DRAWING
Levels & Grading Plan B1
Sheet 4 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B11-411

REVISION 1



STATUS

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N

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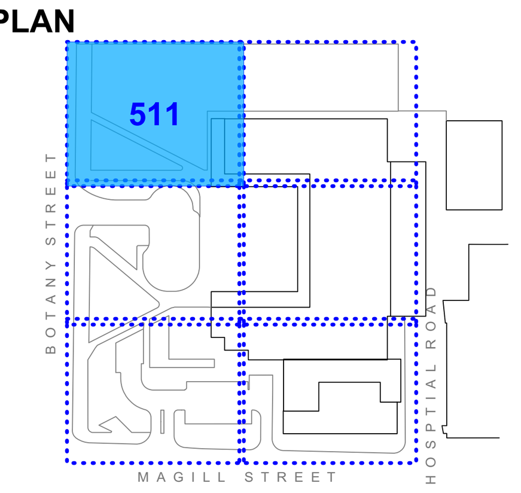
KEY PLAN



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Barangaroo NSW 2000

PROJECT
Randwick Hospital Campus

DRAWING
Setout Plan B1
Sheet 4 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO.	REVISION
RCR-ASP-LA-30-DRW-26B-B11-511	1

EXTENT OF WORKS

EXTENT OF WORKS

EXTENT OF WORKS

BOTANY ROAD

A B C D E F G H

16 15 14 13 12

EXTENT OF PODIUM

EXTENT OF PODIUM

FUTURE ROAD CONNECTION

FUTURE ROAD CONNECTION

OVERLAND FLOW

151

133

133

400

RCR-ASP-LA-50-DRW-26B-B14-712

RCR-ASP-LA-50-DRW-26B-B14-712

SUBJECT TO CHANGE DUE TO INTERFACE WITH CHILDREN'S HOSPITAL

STATUS

APPROVED FOR CONSTRUCTION

N

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ACOR
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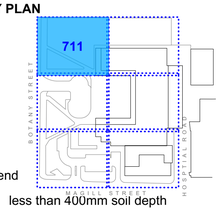
KEY PLAN



Legend

less than 400mm soil depth

NOTE:
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PROJECT

Randwick Hospital Campus

DRAWING

Furniture Setout Plan B1
Sheet 3 of 7

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B11-711 1

EXTENT OF WORKS

EXTENT OF WORKS

SITE BOUNDARY

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING

SUBJECT TO CHANGE DUE TO INTERFACE WITH CHILDREN'S HOSPITAL

J K L M N O P Q

16 15 14 13 12

RCR-ASP-LA-50-DRW-26B-B11-211

SW2 SW3 SW4 W2 TP1 SE1 PVB.1 TH1 PVB.2 SW5 BE3 W1 BE4 PVC TB2 CH BIN

EXTENT OF B1 WORKS

EXTENT OF WORKS

REFER L00 DRAWINGS FOR DETAIL

HOSPITAL ROAD

LEVEL - 01
LEVEL 0EXTENT OF B1 WORKS

REFER L00 DRAWINGS FOR DETAIL

RCR-ASP-LA-50-DRW-26B-B15-214

EXTENT OF WORKS

STATUS

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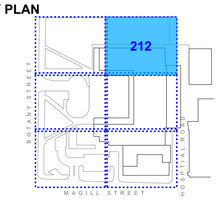
KEY PLAN



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PROJECT

Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level B1
Sheet 5 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B12-212 1

STATUS

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1	26/05/21	APPROVED FOR CONSTRUCTION

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ACOR
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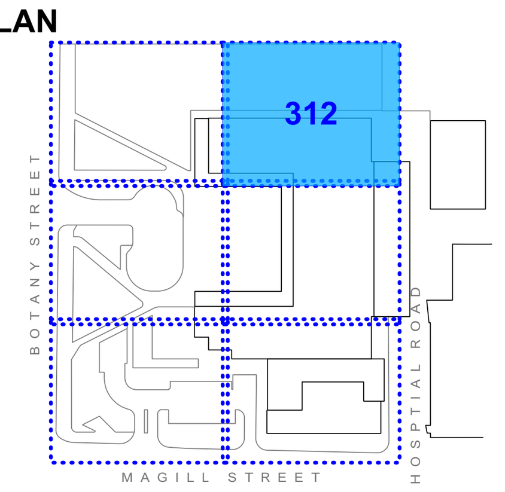
KEY PLAN



NOTE:
PLANTING TO BE SETOUT IN GROUPS OF 5-7 PER SPECIES UNDER SUPERVISION OF PROJECT LANDSCAPE ARCHITECT.

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Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

DRAWING

PLANTING PLAN - B1
Sheet 5 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B12-312

REVISION 1

EXTENT OF WORKS

EXTENT OF WORKS

SUBJECT TO CHANGE DUE TO INTERFACE WITH CHILDREN'S HOSPITAL

52.00

53.00

52.00

52.00

52.00

52.00

J K L M N O P Q

16 15 14 13 12

RCR-ASP-LA-50-DRW-26B-B11-411

TOW 52.50 TOW 54.16 TOW 55.80

1:3 1:3 1:3

EXTENT OF WORKS

FFL 52.00 RL 52.00

LEVEL - 01
LEVEL 0 EXTENT OF B1 WORKS

REFER L00 DRAWINGS FOR DETAIL

HOSPITAL ROAD

+FFL 52.00 +FFL 52.00

51.98 51.98

+TOW 52.25 +TOW 52.25 +TOW 52.25 +TOW 52.25

EXTENT OF WORKS

RCR-ASP-LA-50-DRW-26B-B15-414

STATUS

APPROVED FOR CONSTRUCTION

N

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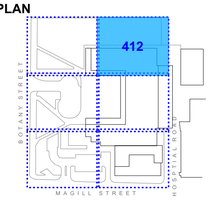

NOTE:
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REFER TO CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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PROJECT

Randwick Hospital Campus

DRAWING

Levels & Grading Plan - B1
Sheet 5 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B12-412 1

SUBJECT TO CHANGE DUE TO INTERFACE WITH CHILDREN'S HOSPITAL

REFER 700 SERIES FURNITURE SETOUT DRAWINGS

RCR-ASP-LA-50-DRW-26B-B11-511

J K L M N O P Q

16 15 14 13 12

2805 OFF GRID 20°
1918 OFF GRID 20°
2016 OFF GRID 20°

4290 OFF GRID
4338 OFF GRID
1783 OFF GRID
833 OFF GRID
558 OFF GRID
1105 OFF GRID
1064 OFF GRID

HOSPITAL ROAD

EXTENT OF B1 WORKS

REFER L00 DRAWINGS FOR DETAIL

RCR-ASP-LA-50-DRW-26B-B15-514

STATUS

APPROVED FOR CONSTRUCTION

N

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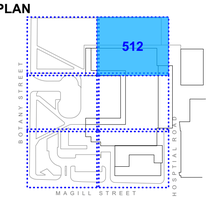

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PROJECT

Randwick Hospital Campus

DRAWING

Setout Plan - B1
Sheet 5 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B12-512

REVISION 1

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING

SITE BOUNDARY

SITE BOUNDARY

EXTENT OF WORKS

EXTENT OF PODIUM

EXTENT OF PODIUM

EXTENT OF WORKS

EXTENT OF WORKS

EXTENT OF WORKS

TAPER TO MEET KERB LEVEL

VOID

VOID

3000
KERB TRANSITION ZONE

BOTANY STREET

TAXI ZONE

RCR-ASP-LA-50-DRW-26B-B11-211

RCR-ASP-LA-50-DRW-26B-B15-214

RCR-ASP-LA-50-DRW-26B-B18-215

12 11 10 09 08 07 06

A B C D E F G H

STATUS

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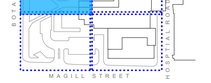

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PROJECT

Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level B1
Sheet 6 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B13-213 1

STATUS

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N

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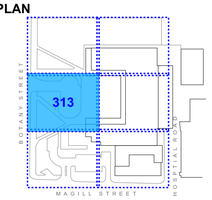
KEY PLAN



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PROJECT

Randwick Hospital Campus

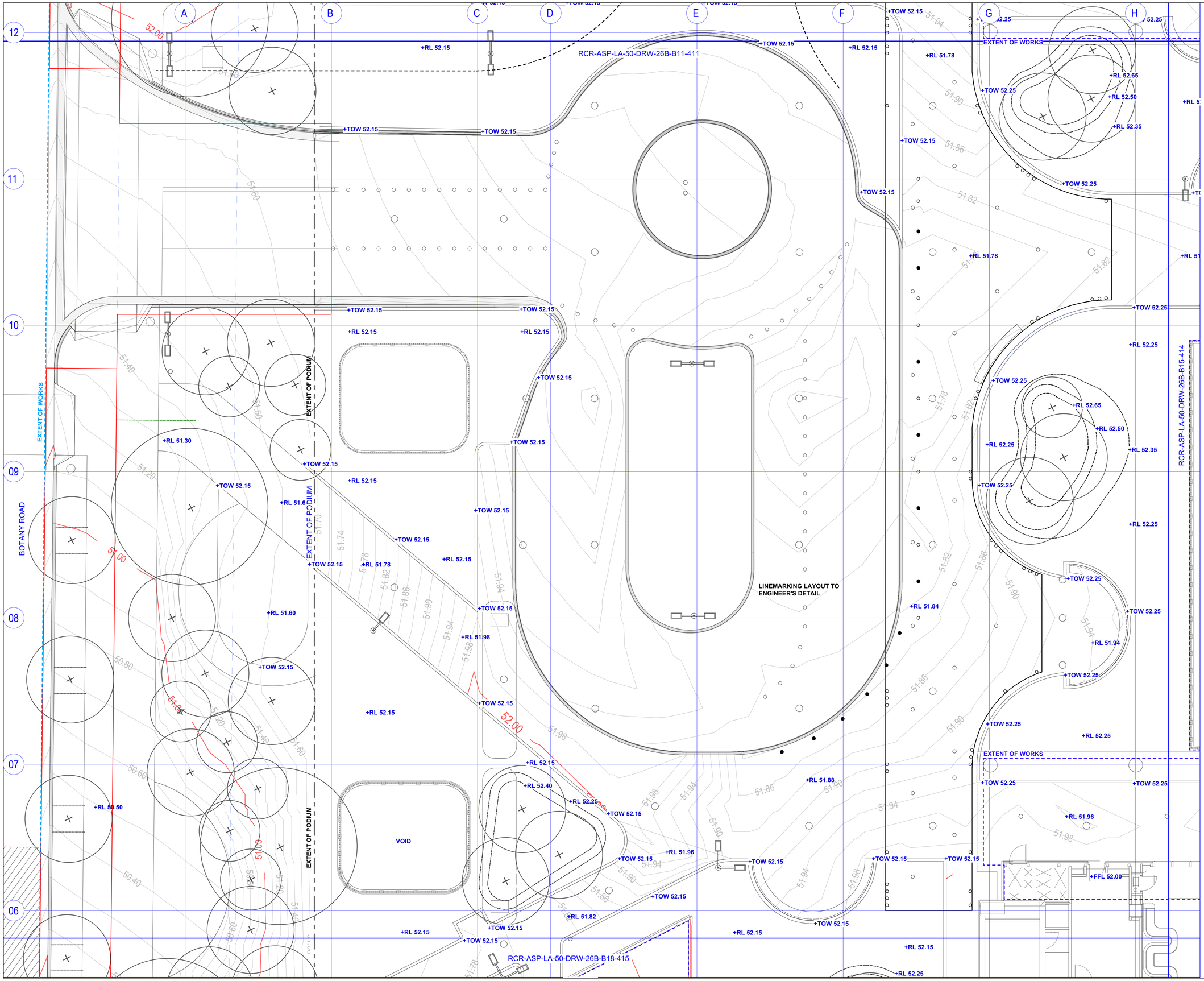
DRAWING

PLANTING PLAN - B1
Sheet 6 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B14-313

REVISION 1



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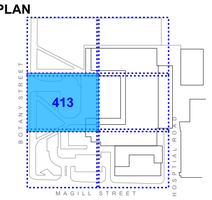

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PROJECT

Randwick Hospital Campus

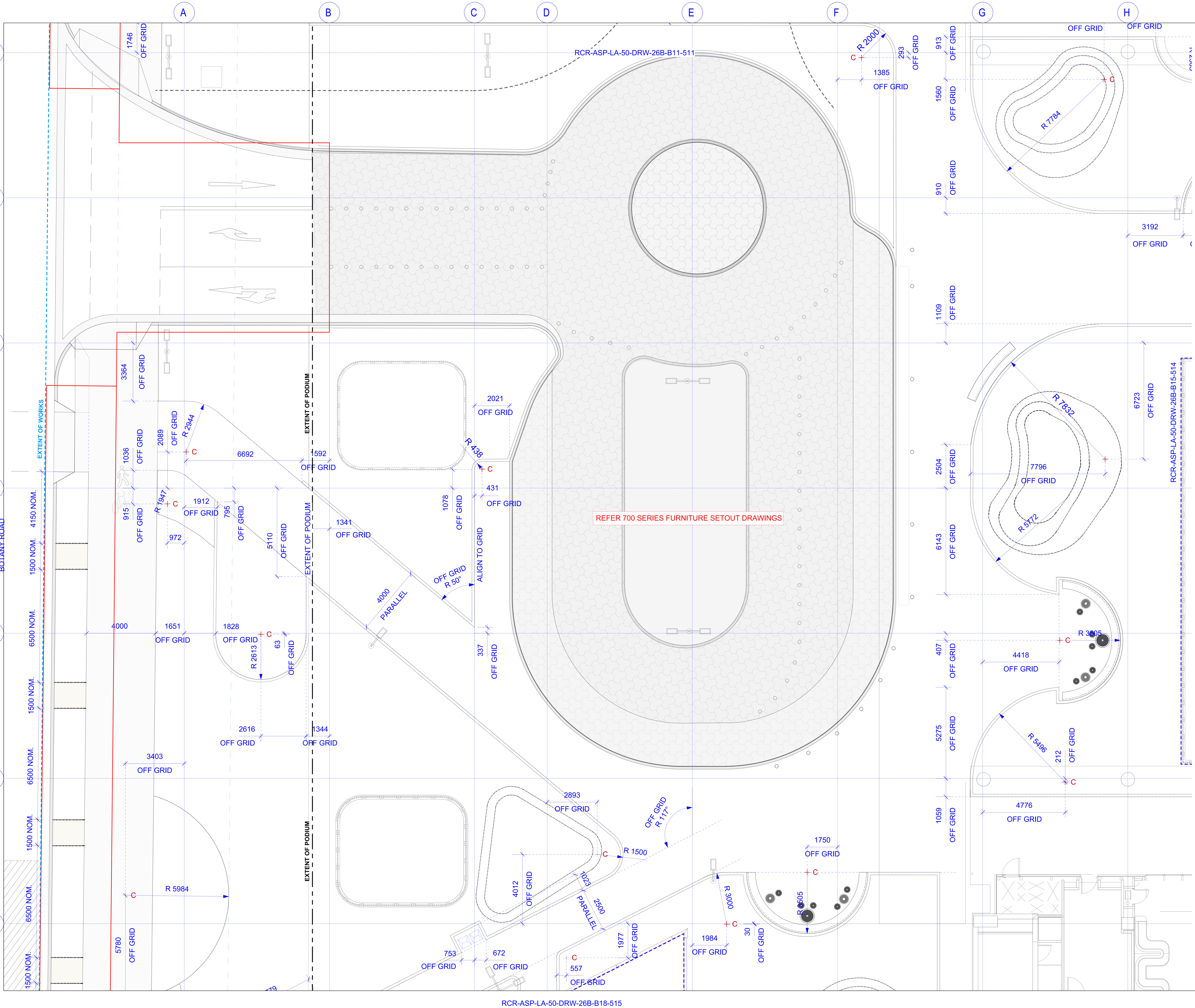
DRAWING

Levels & Grading Plan - B1
Sheet 6 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B14-413 1



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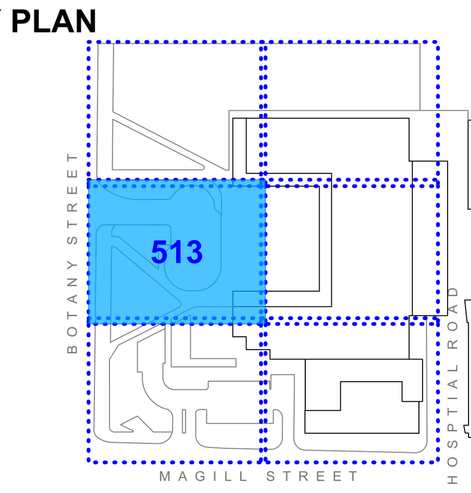
KEY PLAN



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PROJECT

Randwick Hospital Campus

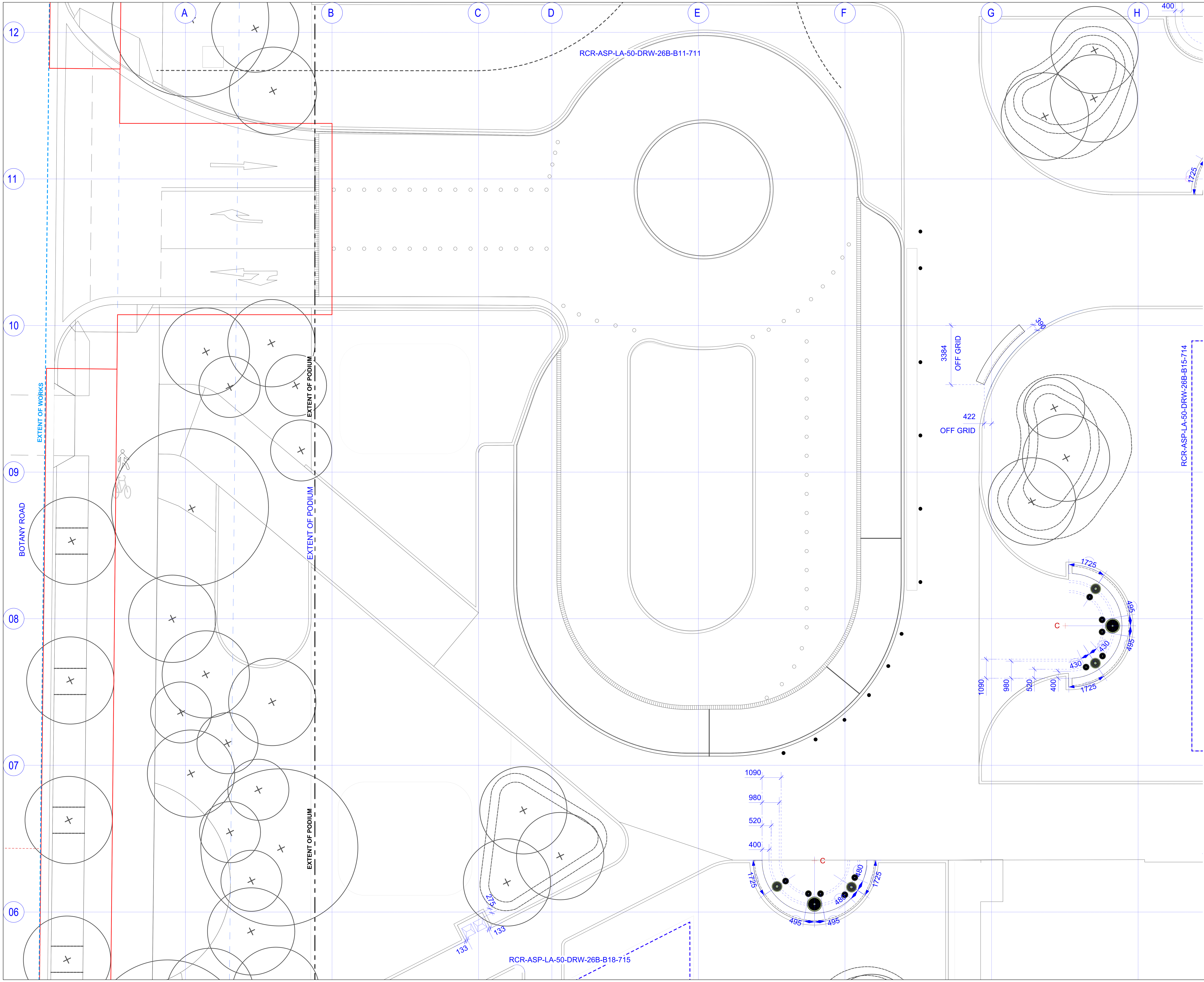
DRAWING

Setout Plan - B1
Sheet 6 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B14-513

REVISION 1



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KEY PLAN

713

Legend

less than 400mm soil depth

NOTE:
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PROJECT
Randwick Hospital Campus

DRAWING
Furniture Setout Plan - B1
Sheet 4 of 7

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO.	REVISION
RCR-ASP-LA-30-DRW-26B-B14-713	1

RCR-ASP-LA-50-DRW-26B-B12-212

EXTENT OF WORKS

LEVEL - 01

LEVEL - 02

HOSPITAL ROAD

EXTENT OF B1 WORKS

REFER L00 DRAWINGS FOR DETAIL

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING

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STATUS

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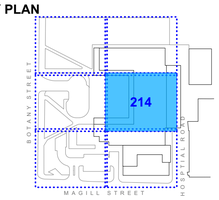

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PROJECT

Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level B1
Sheet 7 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B15-214

REVISION 1

RCR-ASP-LA-50-DRW-26B-B12-312

RCR-ASP-LA-50-DRW-26B-B14-313

RCR-ASP-LA-50-DRW-26B-B19-316

12
11
10
09
08
07
06

J K L M N O P Q

337036415mm X
6245516744mmY
7-DE

337025563mm
X 6245517766mm

337025358mm X
6245516236mmY
1-DE

X 337021457mm
Y 6245515373mm
1-TSp

337018610mm
6245514385mm

7132mm
12288mm

X 337037971mm
Y 6245515136mm
1-TSp

3-Dp

MIX 2
72-Bs
72-Dr
72-Dre
72-Vh
72-BPe
72-Pl
72-BRo
72-Ttw
72-Vp
72-Mic
72-Lpc
72-At

X 337033116mm
Y 6245514370mm

337035317mm X
6245512291mmY

X 337037506mm
Y 6245510982mm

337031751mm X
6245511377mmY

337036655mm X
6245509901mmY

X 337037915mm
Y 6245509601mm

3-Dp

X 337036495mm
Y 6245497716mm

337035645mm X
6245496636mmY

X 337036904mm
Y 6245496335mm

3-Dp

X 337033393mm
Y 6245478416mm

337032542mm X
6245477336mmY

X 337033802mm
Y 6245477035mm

STATUS

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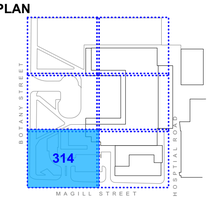

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PROJECT

Randwick Hospital Campus

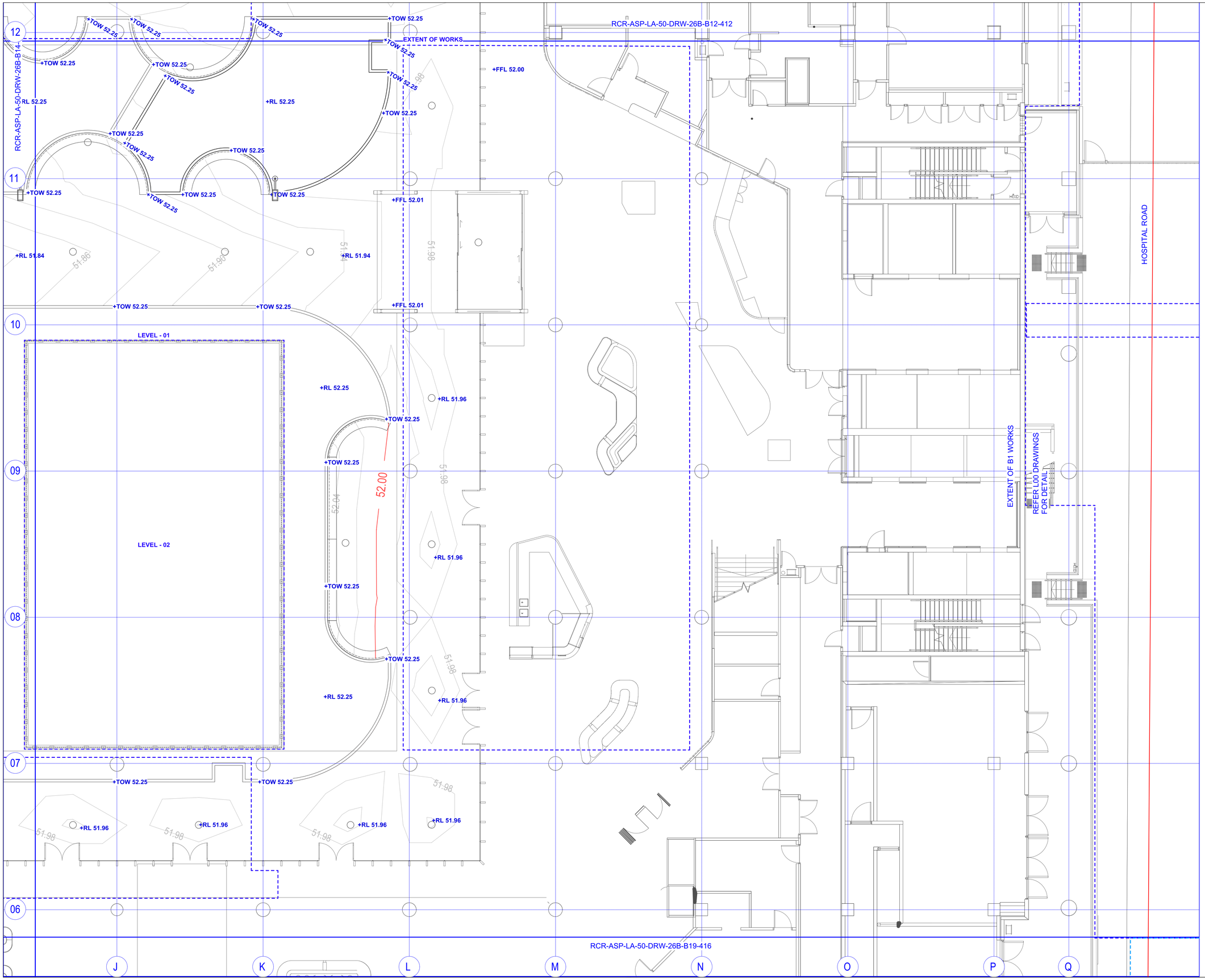
DRAWING

PLANTING PLAN - B1
Sheet 7 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B15-314 1



STATUS

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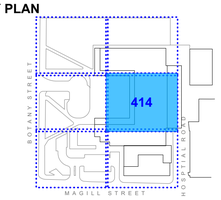
KEY PLAN



NOTE:
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PROJECT

Randwick Hospital Campus

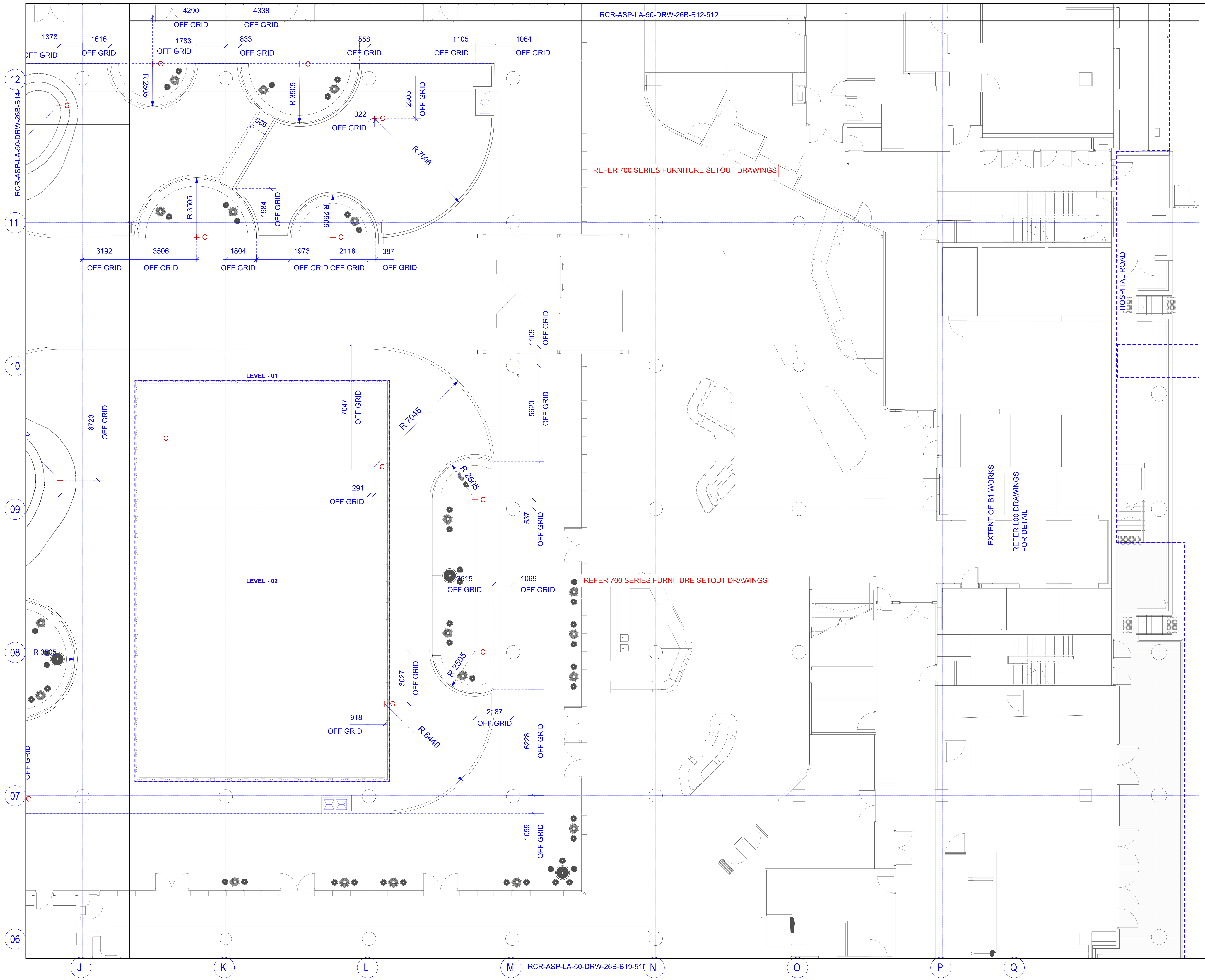
DRAWING

Levels & Grading Plan - B1
Sheet 7 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B15-414 1



STATUS

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NOTES

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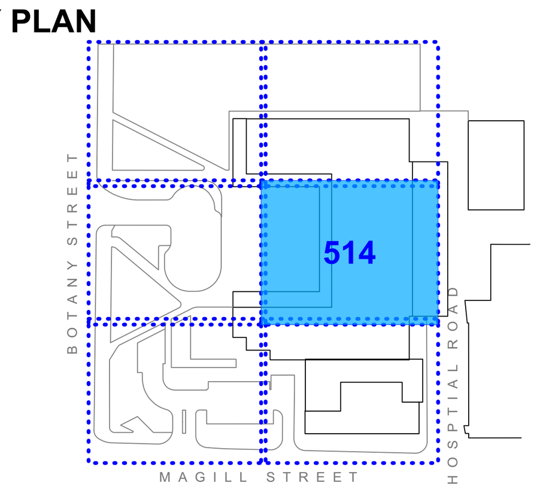

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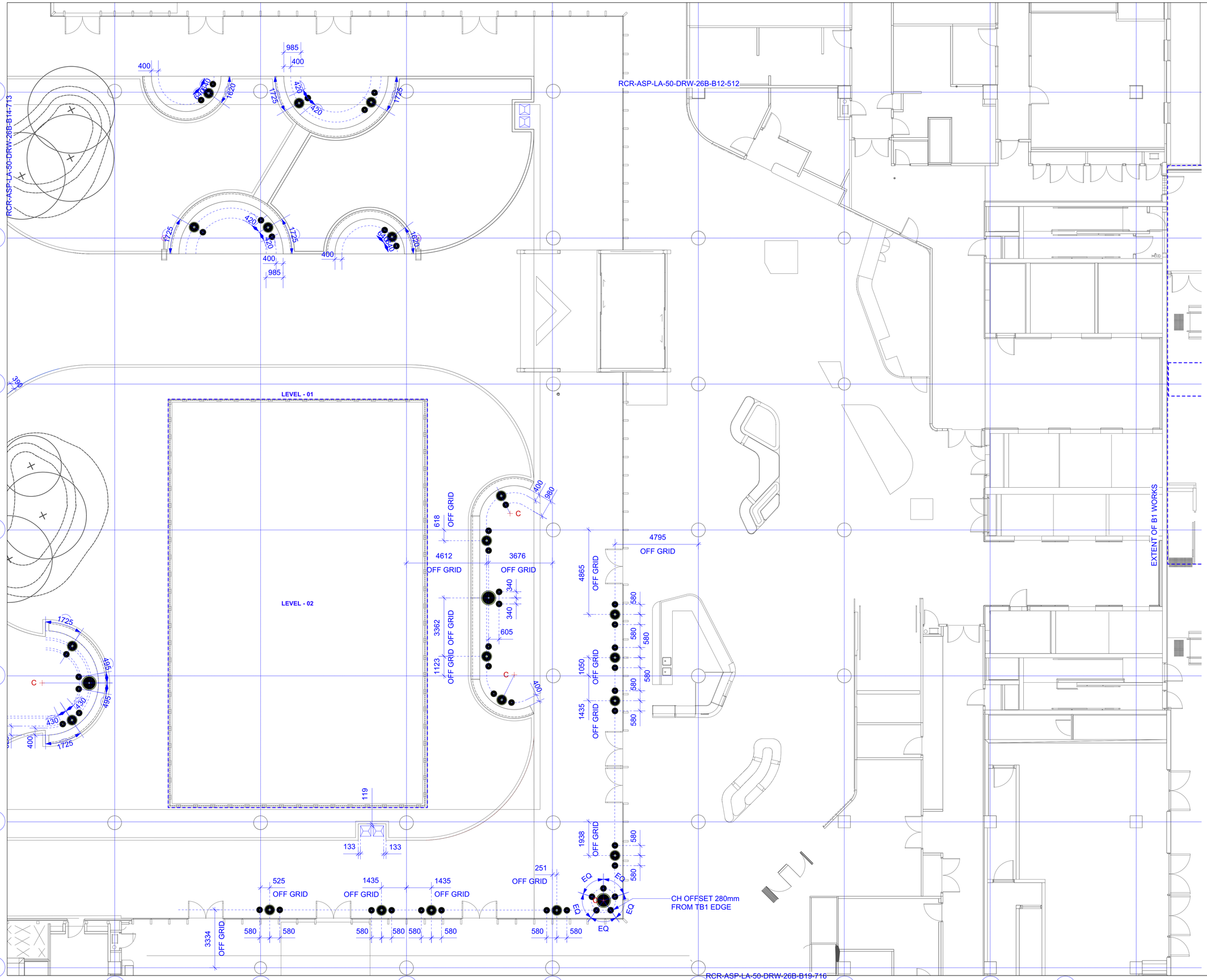
PROJECT
Randwick Hospital Campus

DRAWING
Setout Plan - B1
Sheet 7 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B15-514

REVISION 1



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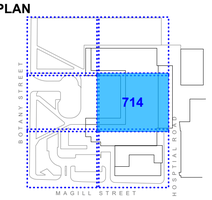

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PROJECT

Randwick Hospital Campus

DRAWING

Furniture Setout Plan - B1
Sheet 5 of 7

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B15-714

REVISION 1

LEVEL 0
LEVEL - 01

PVE

KERBS BY OTHERS. REFER TO CIVIL ENGINEERS DRAWINGS

SW3

EXTENT OF WORKS

10
09
08
07
06
05
04

N
O
P
Q
R

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING

STATUS

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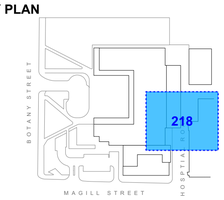

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PROJECT

Randwick Hospital Campus

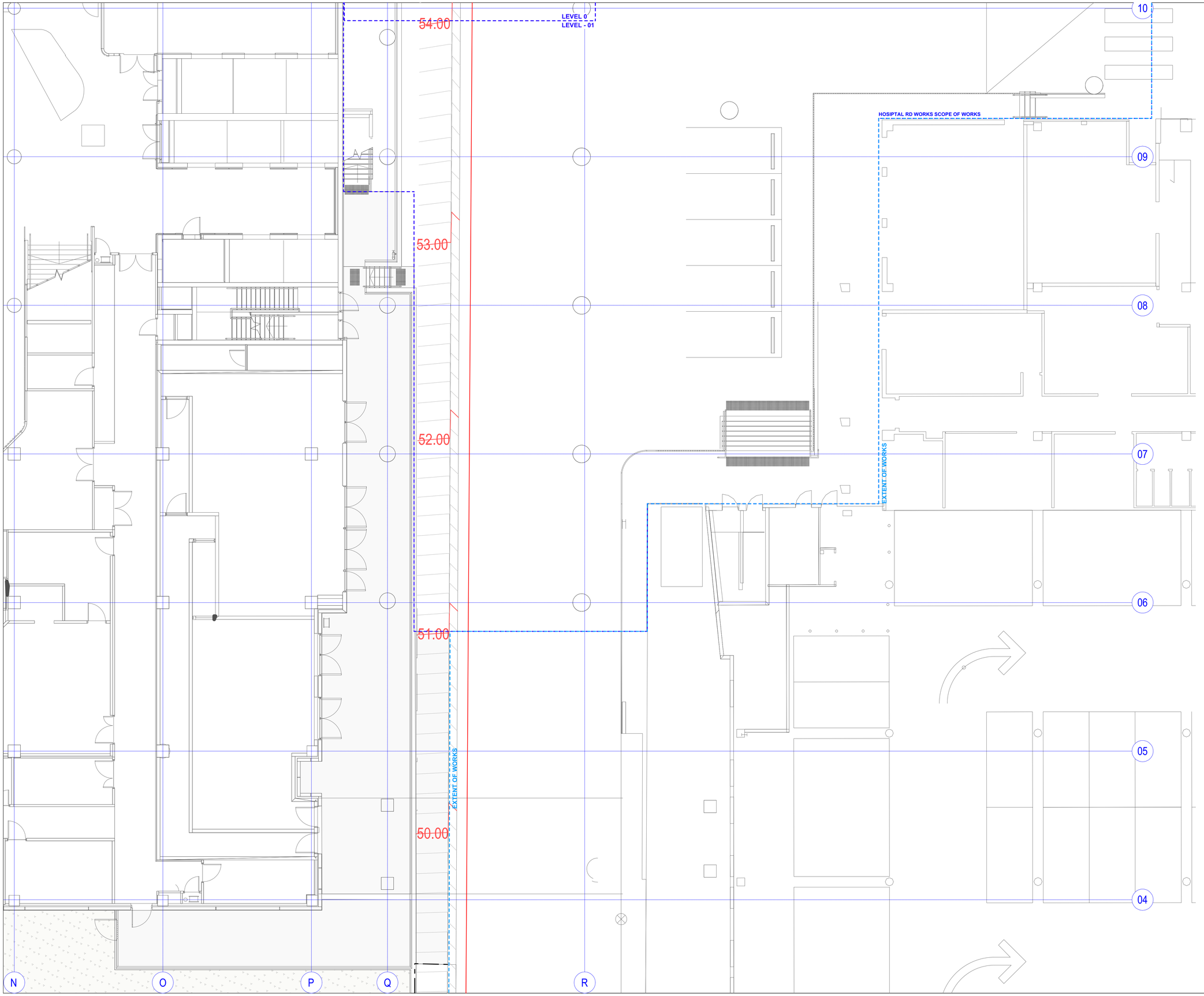
DRAWING

Materials & Finishes Plan
Level B1 Hospital Road
Sheet 11 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B17-218

REVISION 1



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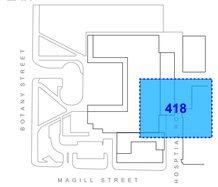

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PROJECT

Randwick Hospital Campus

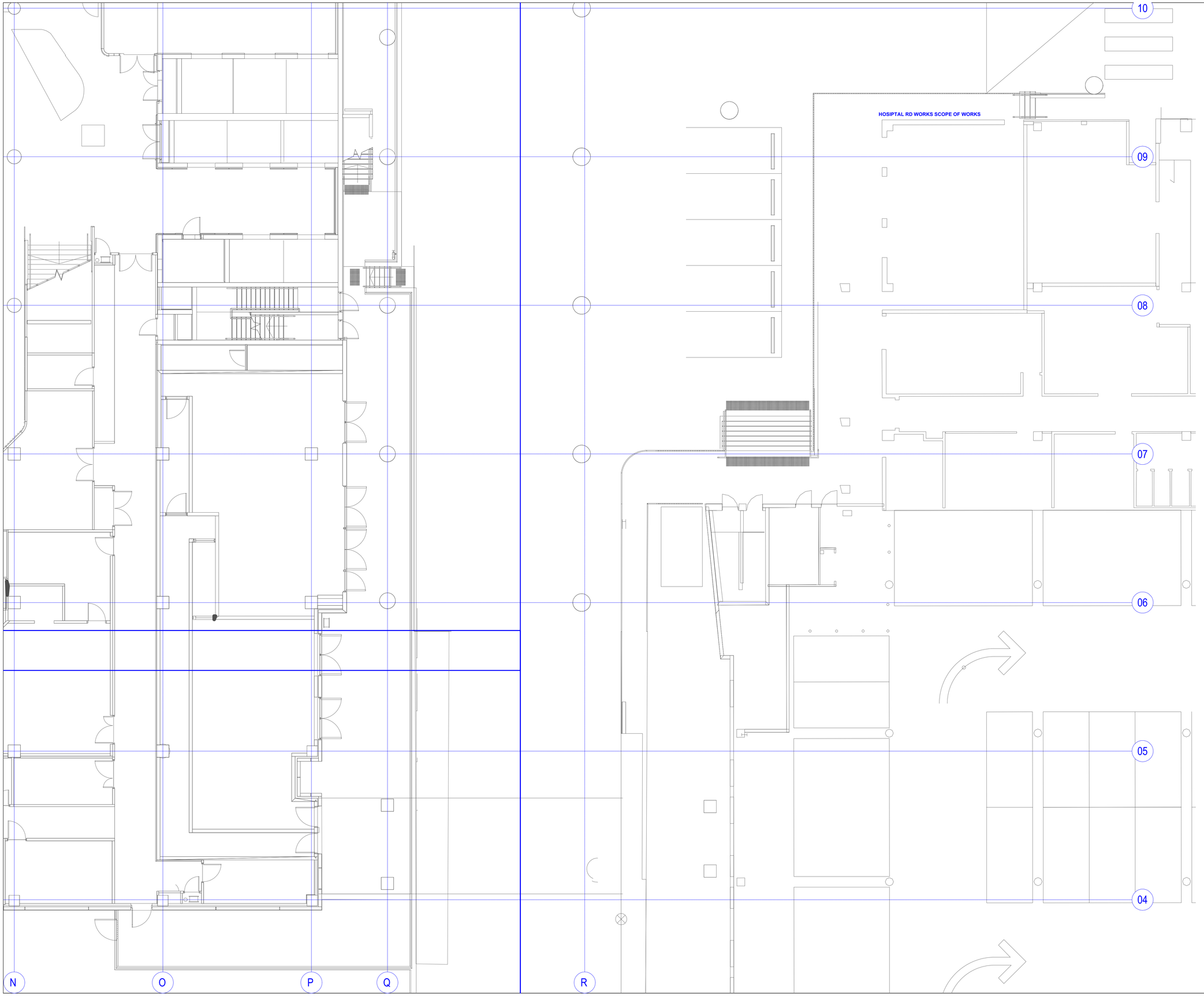
DRAWING

Levels & Grading Plan
B1 Hospital Road
Sheet 10 of 16

DRAWN	CHECKED	SCALE @ A1
LD | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B17-418 1



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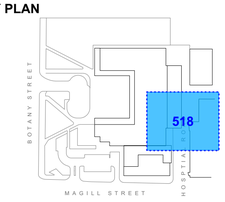

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PROJECT

Randwick Hospital Campus

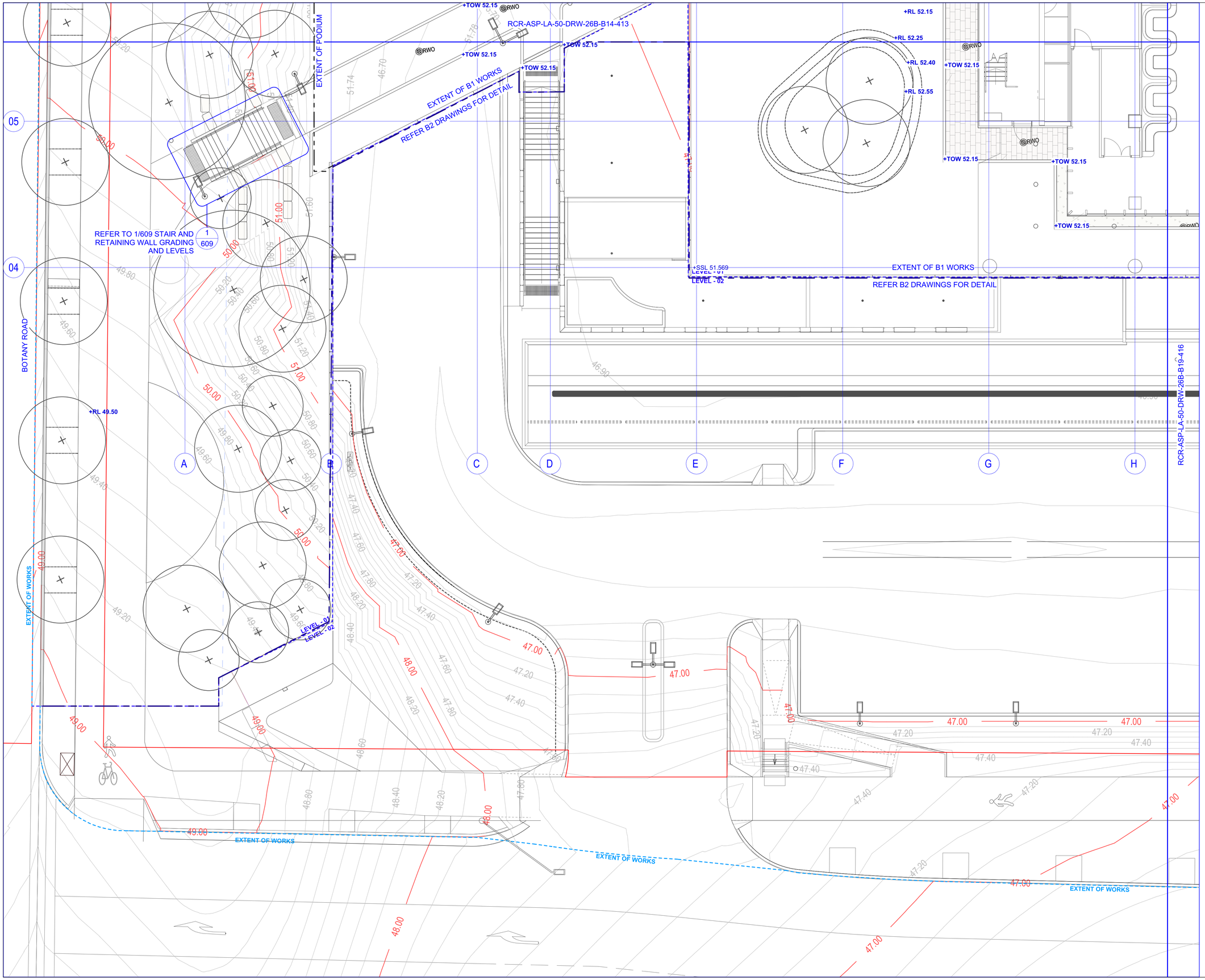
DRAWING

Setout Plan
B1 Hospital Road
Sheet 10 of 14

DRAWN	CHECKED	SCALE @ A1
LD | CK	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B17-518

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

N

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PROJECT

Randwick Hospital Campus

DRAWING

Levels & Grading Plan - B1
Sheet 8 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	SB | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B18-415 1

RCR-ASP-LA-50-DRW-26B-B14-513

EXTENT OF WORKS

EXTENT OF PODIUM

EXTENT OF B1 WORKS

REFER B2 DRAWINGS FOR DETAIL

LEVEL - 01
LEVEL - 02

EXTENT OF WORKS

BOTANY ROAD

RCR-ASP-LA-50-DRW-26B-B19-516

3403 OFF GRID
2893 OFF GRID
OFF GRID R 177°
R 1500
R 5984
4012 OFF GRID
1023 PARALLEL 2500
1750 OFF GRID
R 3000
R 2505
1059 OFF GRID
4776 OFF GRID
212 OFF
5780 OFF GRID
4246 OFF GRID
1140 OFF GRID
753 OFF GRID
672 OFF GRID
1977 OFF GRID
1984 OFF GRID
30 OFF GRID
557 OFF GRID
550 OFF GRID
1550 OFF GRID
4779 OFF GRID
1221 OFF GRID
596
R 153°
45°
1 609
2217 OFF GRID
2481 OFF GRID
3897 OFF GRID
4680 OFF GRID

6500 NOM.
1500 NOM.
6510 NOM.

A B C D E F G H

05 04

STATUS

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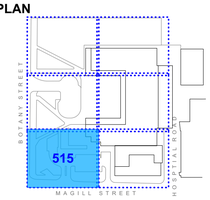

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PROJECT

Randwick Hospital Campus

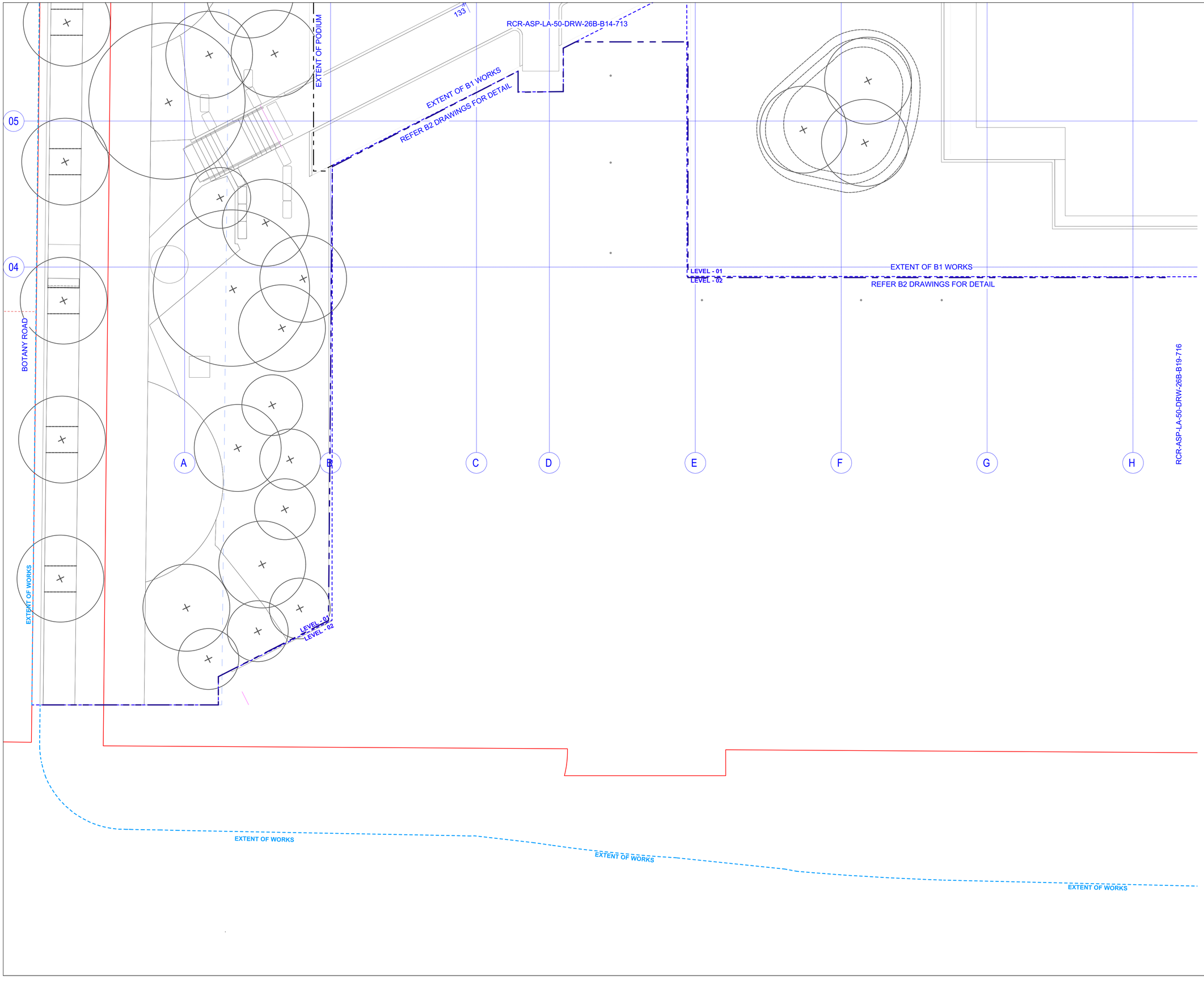
DRAWING

Setout Plan - B1
Sheet 8 of 14

DRAWN	CHECKED	SCALE @ A1
JT	SB | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B18-515

REVISION 1



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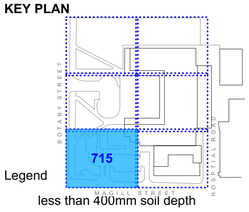

Legend

less than 400mm soil depth

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PROJECT

Randwick Hospital Campus

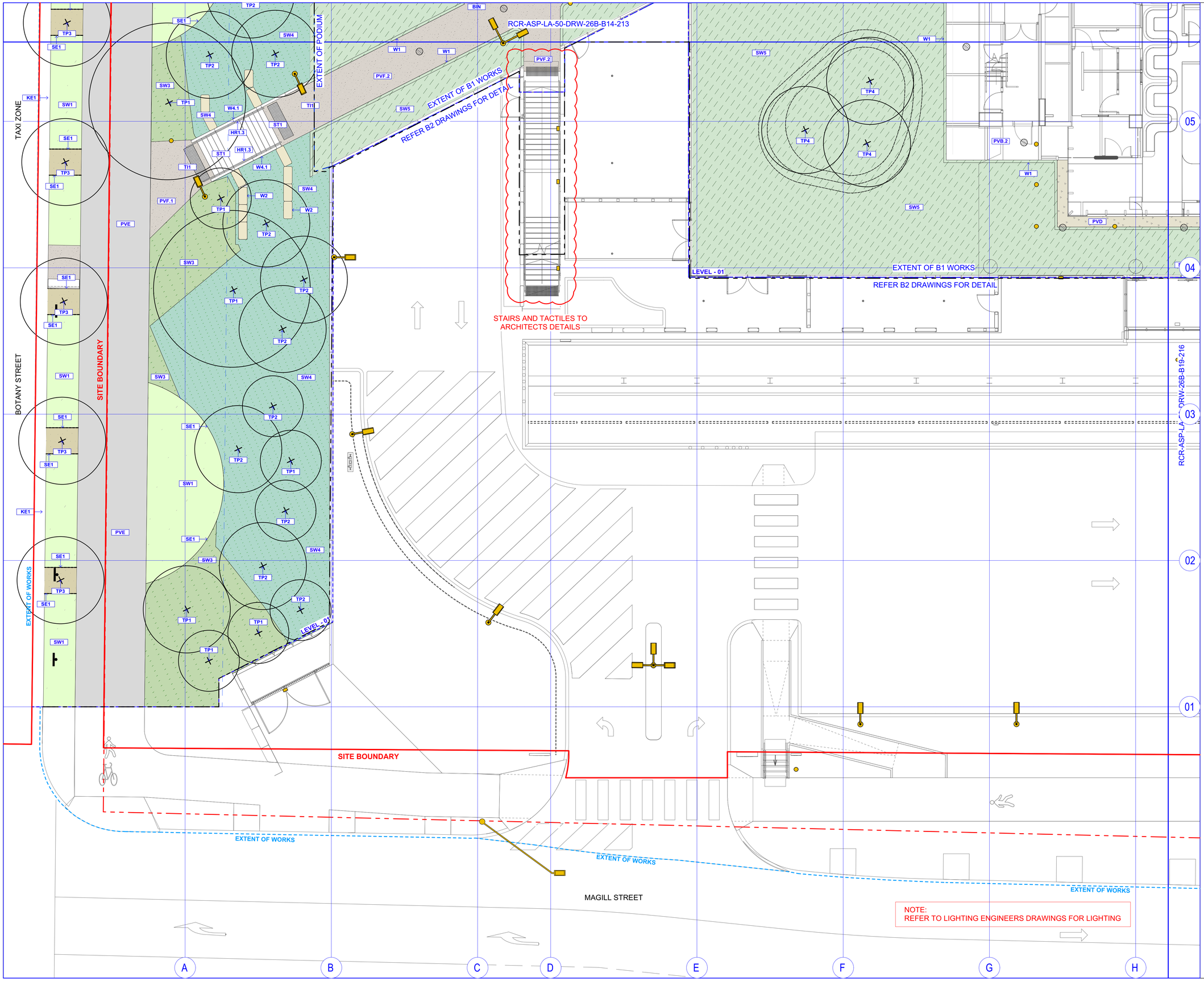
DRAWING

Furniture Setout Plan - B1
Sheet 6 of 7

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B18-715 1



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Randwick Hospital Campus

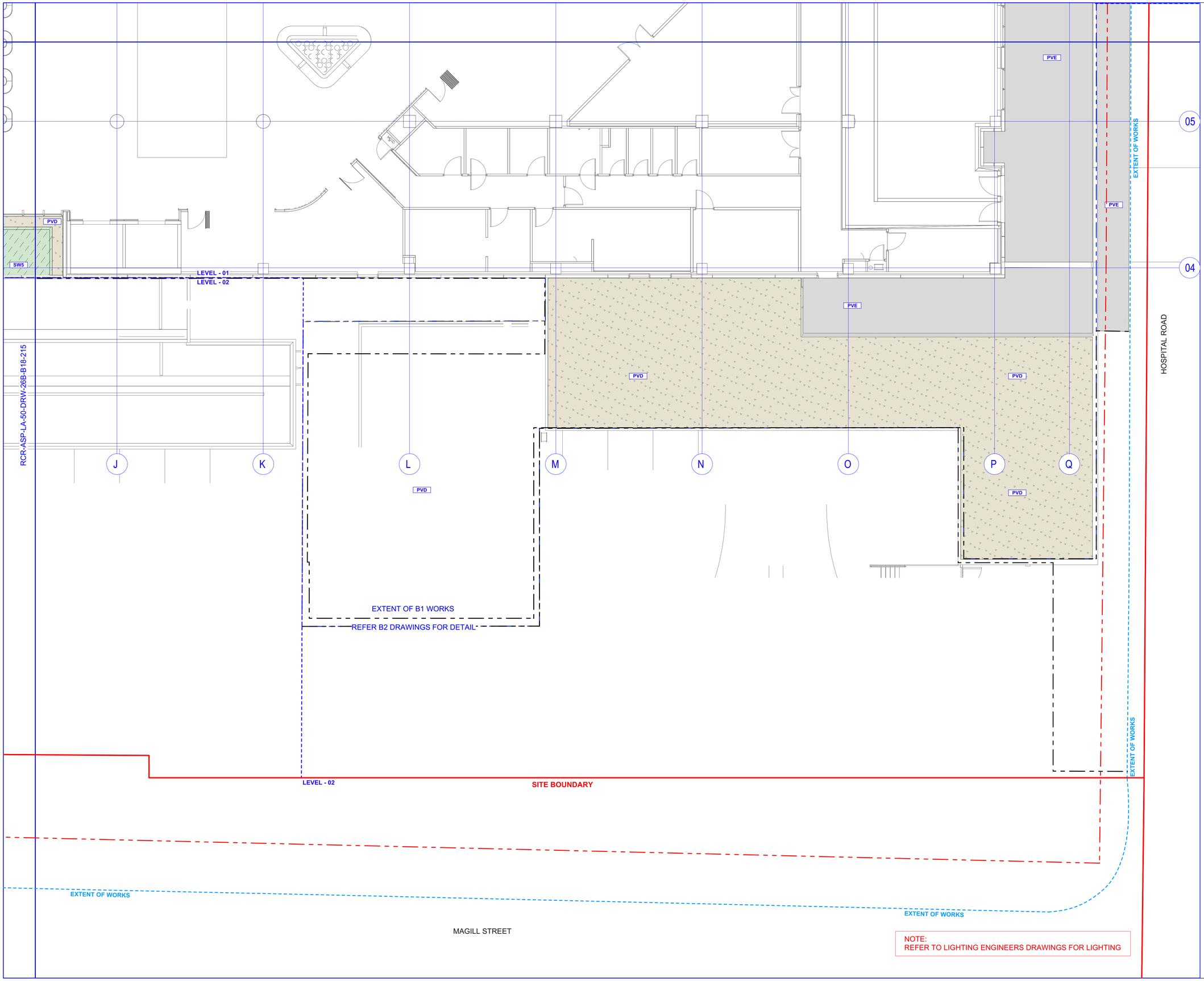
DRAWING

Materials & Finishes Plan Level B1
Sheet 8 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B19-215

REVISION 1



NOTE:
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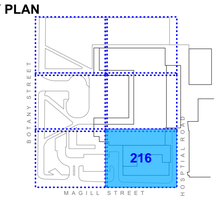
KEY PLAN



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- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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PROJECT

Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level B1
Sheet 9 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B19-216 1

RCR-ASP-LA-50-DRW-26B-B15-314

SEE RCR-ASP-LA-50-DRW-26B-B18-315 FOR ADJACENT PLANTING

RCR-ASP-LA-50-DRW-26B-B18-315

LEVEL - 01
LEVEL - 02

EXTENT OF B1 WORKS

REFER B2 DRAWINGS FOR DETAIL

LEVEL - 02

EXTENT OF WORKS

EXTENT OF WORKS

EXTENT OF WORKS

EXTENT OF WORKS

05
04
03
02
01

J K L M N O P Q

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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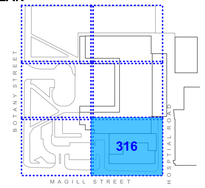
KEY PLAN



NOTE:
PLANTING TO BE SETOUT IN GROUPS OF 5-7 PER SPECIES UNDER SUPERVISION OF PROJECT LANDSCAPE ARCHITECT.

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PROJECT

Randwick Hospital Campus

DRAWING

PLANTING PLAN - B1
Sheet 9 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B19-316

REVISION 1

RCR-ASP-LA-50-DRW-26B-B15-414

05

04

+TOW 52.15

+TOW 52.15

LEVEL - 01

LEVEL - 02

RCR-ASP-LA-50-DRW-26B-B18-415

J

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47.30

46.90

46.80

46.80

46.60

47.60

EXTENT OF WORKS

EXTENT OF WORKS

EXTENT OF WORKS

EXTENT OF WORKS

EXTENT OF B1 WORKS

REFER B2 DRAWINGS FOR DETAIL

LEVEL - 02

MAGILL STREET

HOSPITAL ROAD

STATUS

APPROVED FOR CONSTRUCTION

N

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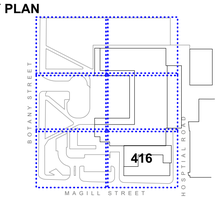

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PROJECT

Randwick Hospital Campus

DRAWING

Levels & Grading Plan - B1
Sheet 9 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B19-416 1

RCR-ASP-LA-50-DRW-26B-B15-514

05

4680

F GRID

04

LEVEL - 01

LEVEL - 02

RCR-ASP-LA-50-DRW-26B-B18-515

J K L M N O P Q

EXTENT OF WORKS

EXTENT OF B1 WORKS

REFER B2 DRAWINGS FOR DETAIL

LEVEL - 02

EXTENT OF WORKS

EXTENT OF WORKS

MAGILL STREET

HOSPITAL ROAD

STATUS

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N

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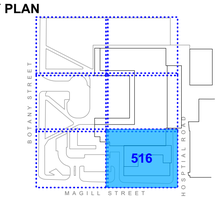

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DRAWING

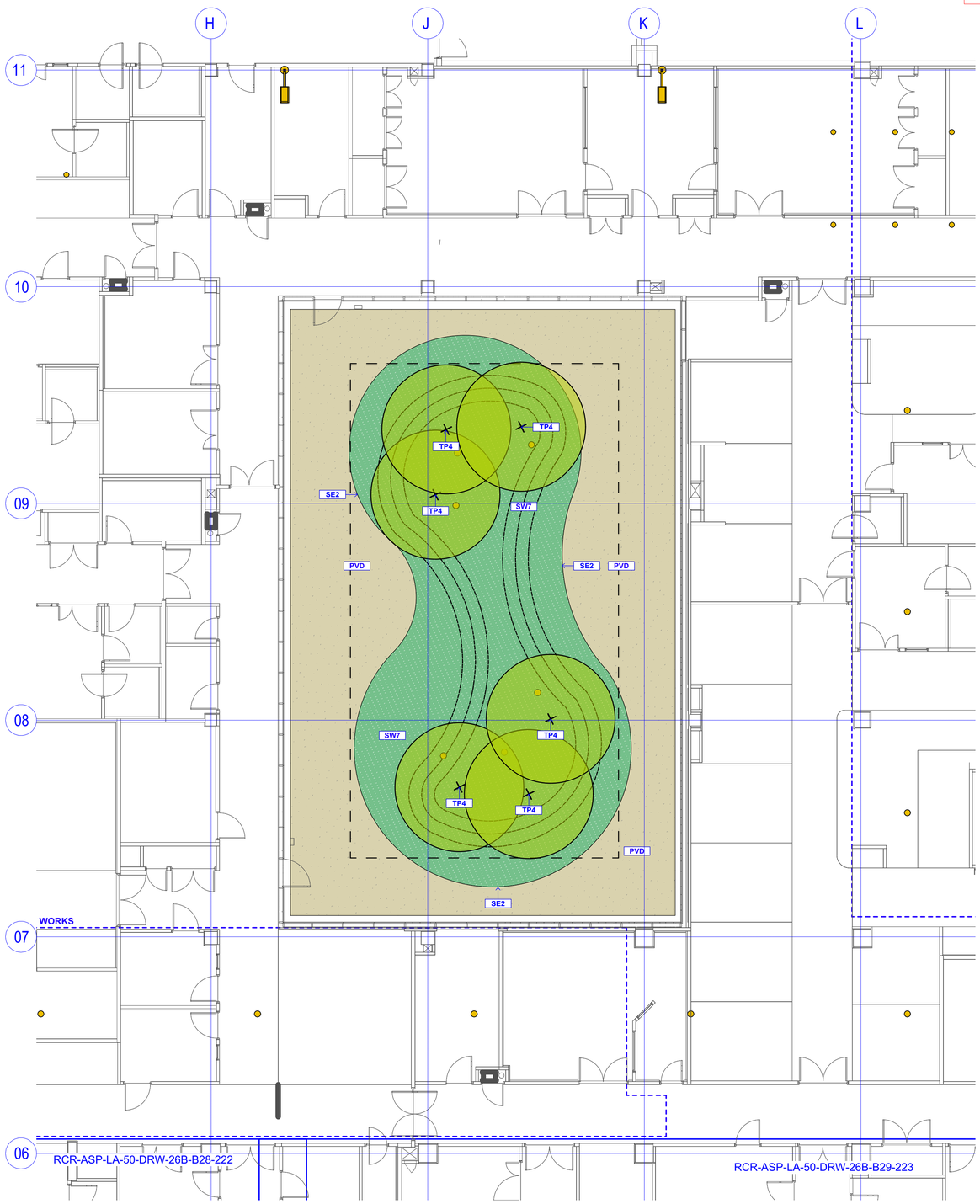
Setout Plan - B1
Sheet 9 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B19-516

REVISION 1

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING



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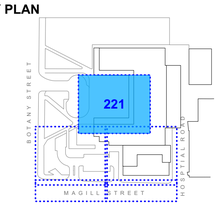

NOTE:
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- DRAINAGE POINTS AND FALLS

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PROJECT

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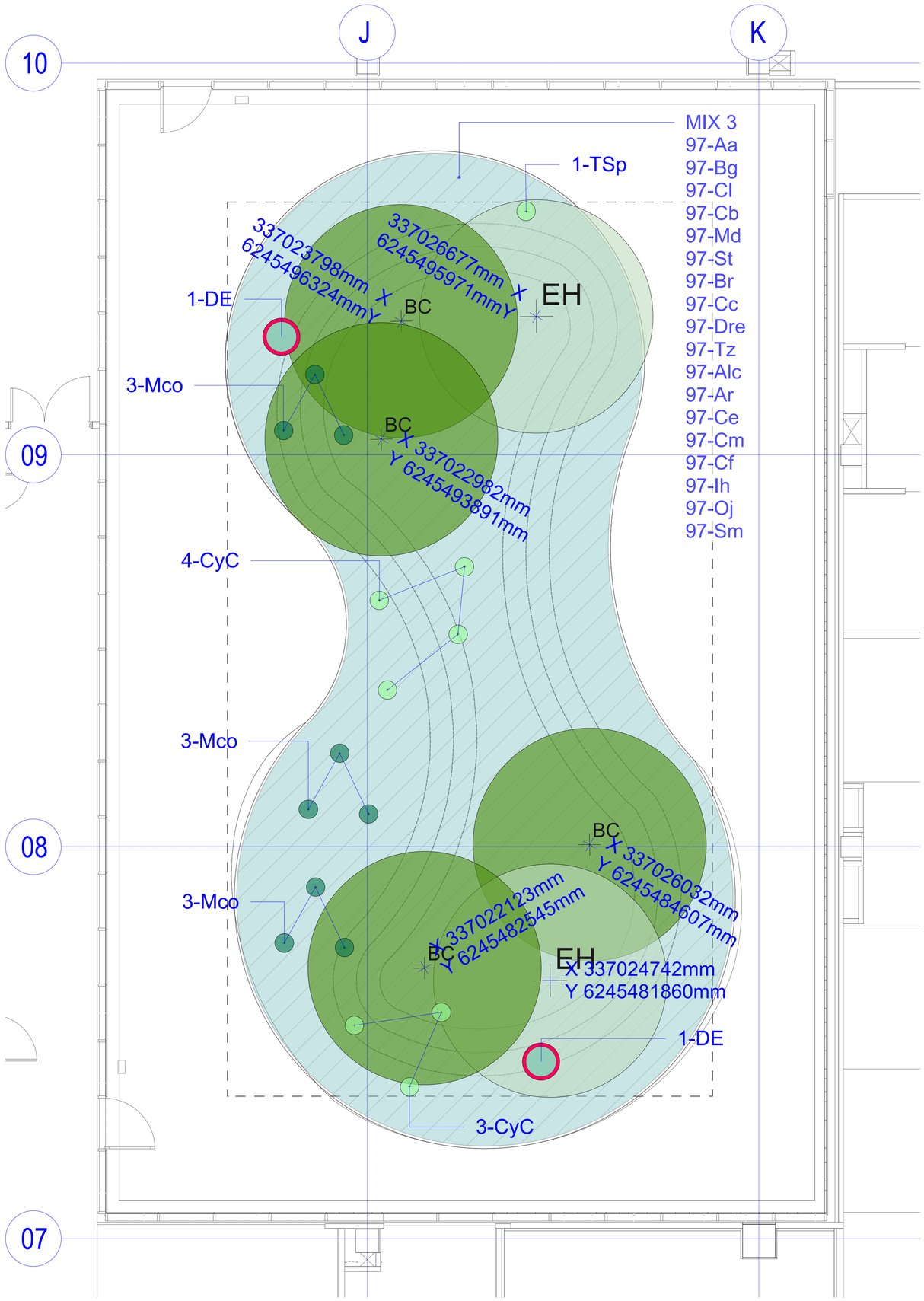
DRAWING

Materials & Finishes Plan Level B2
Sheet 1 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B24-221

REVISION 1



STATUS

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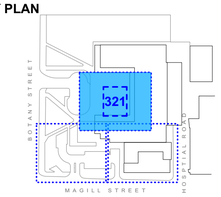

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DRAWING

PLANTING PLAN - B2
Sheet 1 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:50

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B24-321 1

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+ FFL 47.00
+ RL 46.95
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+ RL 47.30
+ RL 47.15
+ RL 47.00
+ RL 46.90
+ RL 46.95
+ FFL 47.00
+ RL 46.95
+ RL 46.95
+ FFL 47.00
1:100
1:100
450mm SET DOWN IN SLAB
REFER ARCHITECT'S DRAWINGS
1000mm SET DOWN IN SLAB
REFER ARCHITECT'S DRAWINGS
MGVB
MGVB
MGVB
MGVB
MGVB
RCR-ASP-LA-50-DRW-26B-B28-422
RCR-ASP-LA-50-DRW-26B-B29-423

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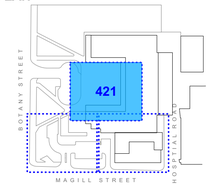

NOTE:
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- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

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PROJECT

Randwick Hospital Campus

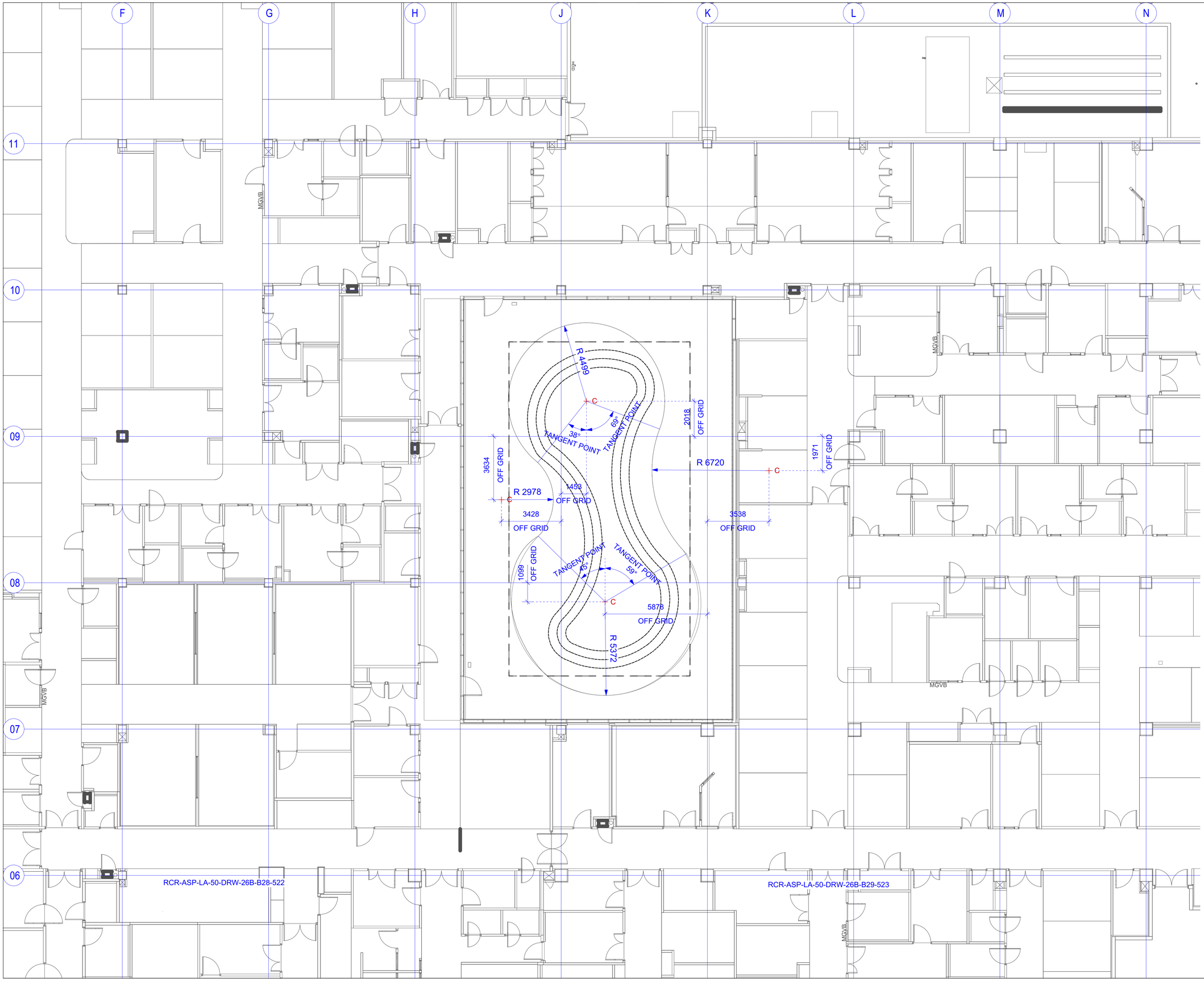
DRAWING

Levels & Grading Plan - B2
Sheet 1 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B24-421 1



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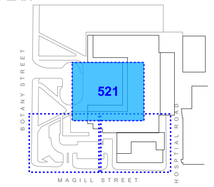

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PROJECT

Randwick Hospital Campus

DRAWING

Setout Plan - B2
Sheet 1 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B24-521 1

RCR-ASP-LA-50-DRW-26B-B28-222

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING

REFER B1 DRAWINGS FOR DETAIL
EXTENT OF B2 WORKS

EXTENT OF B2 WORKS
REFER B1 DRAWINGS FOR DETAIL

LEVEL - 01
LEVEL - 02

DRAINAGE OVERFLOW FROM
COURTYARD TO BE RESOLVED.
REFER ENGINEERS DRAWINGS.

RCR-ASP-LA-50-DRW-26B-B29-223

BOTANY STREET

EXTENT OF WORKS

LEVEL - 01
LEVEL - 02

SITE BOUNDARY

EXTENT OF WORKS

MAGILL STREET

EXTENT OF WORKS

SITE BOUNDARY

EXTENT OF WORKS

06
05
04
03
02
01

A B C D E F G H

STATUS

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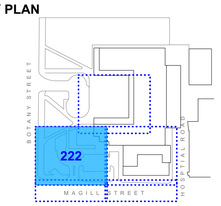
KEY PLAN



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Randwick Hospital Campus

DRAWING

Materials & Finishes Plan Level B2
Sheet 2 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B28-222

REVISION 1

RCR-ASP-LA-50-DRW-26B-B14-313

EXTENT OF B1 WORKS
REFER B2 DRAWINGS FOR DETAIL

LEVEL - 01
LEVEL - 02

SITE BOUNDARY

BOTANY ST

EXTENT OF WORKS

SW1
REFER TO SOFTWORKS DETAIL 801-1

MIX 1
282-Bs
282-Cap
282-Dr
282-Pp
282-Gf
282-RhS
282-BPe
282-Lpc
282-At

MIX 2
249-Bs
249-Dr
249-Dre
249-Vh
249-BPe
249-Pl
249-BRo
249-Ttw
249-Vp
249-Mic
249-Lpc
249-At

RCR-ASP-LA-50-DRW-26B-B19-316

05
04
03
02
01

A B C D E F G H

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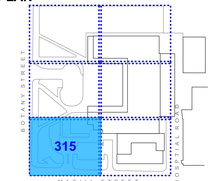

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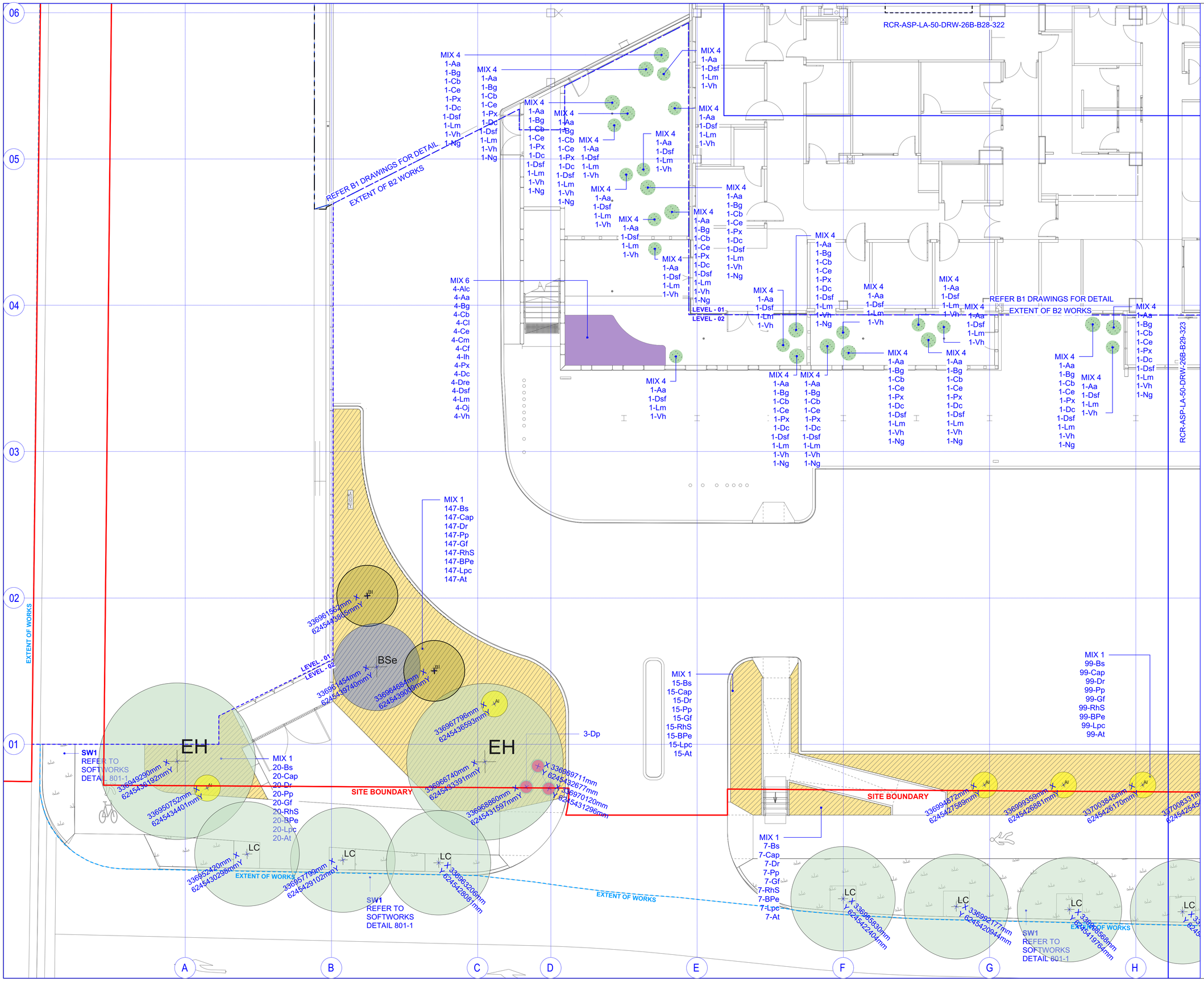
DRAWING

PLANTING PLAN - B1
Sheet 8 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B28-315

REVISION 1



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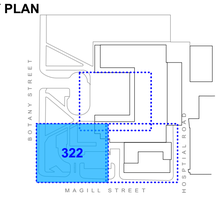

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CLIENT

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PROJECT

Randwick Hospital Campus

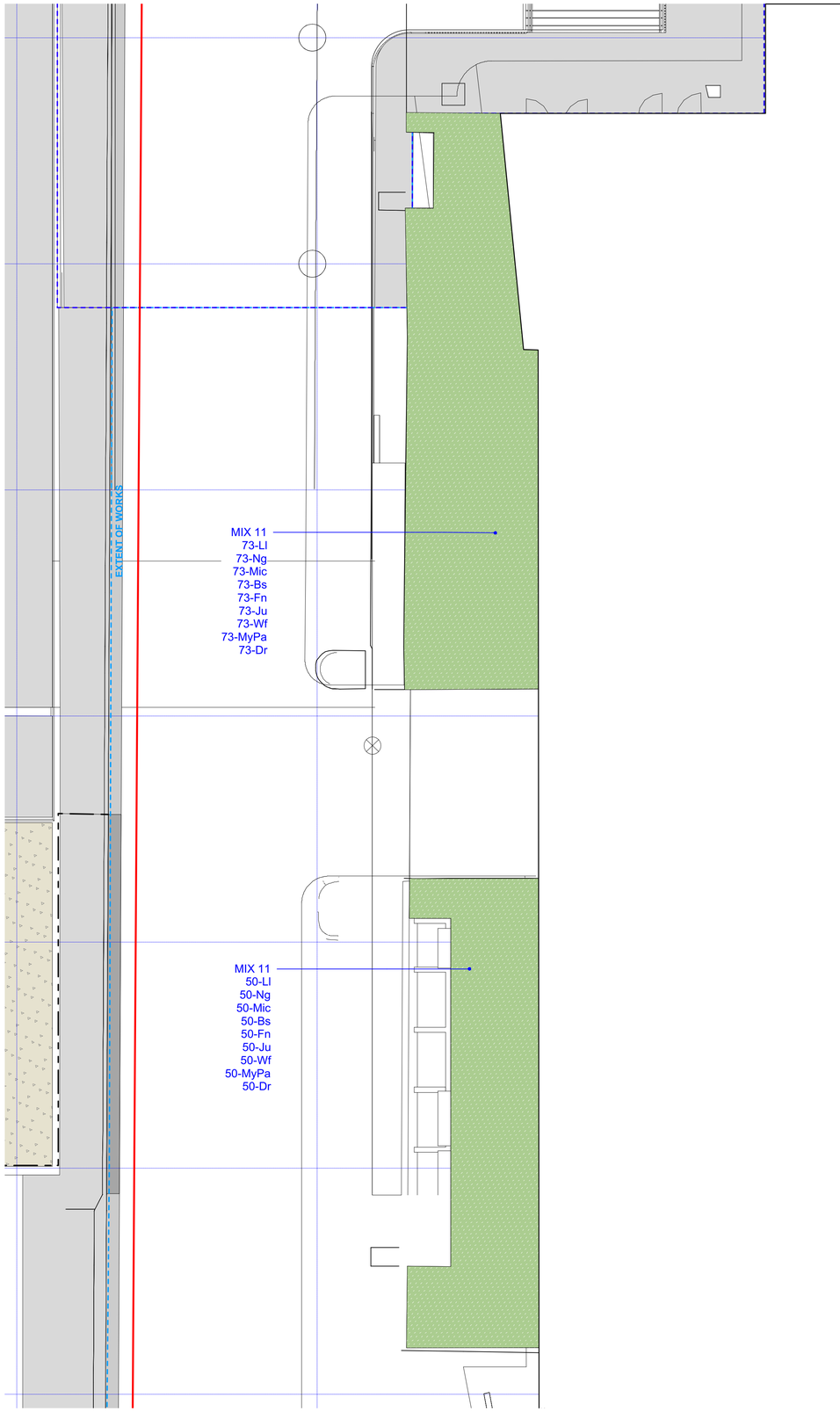
DRAWING

PLANTING PLAN - B2
Sheet 2 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B28-322

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

NOTES

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1	16/06/21	APPROVED FOR CONSTRUCTION

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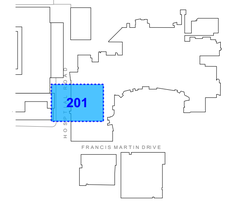
KEY PLAN



NOTE:
PLANTING TO BE SETOUT IN GROUPS OF 5-7 PER SPECIES UNDER SUPERVISION OF PROJECT LANDSCAPE ARCHITECT.

REFER TO THE TECHNICAL SPECIFICATION + DETAILS FOR DETAILED SELECTION INFORMATION.

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PROJECT

Randwick Hospital Campus

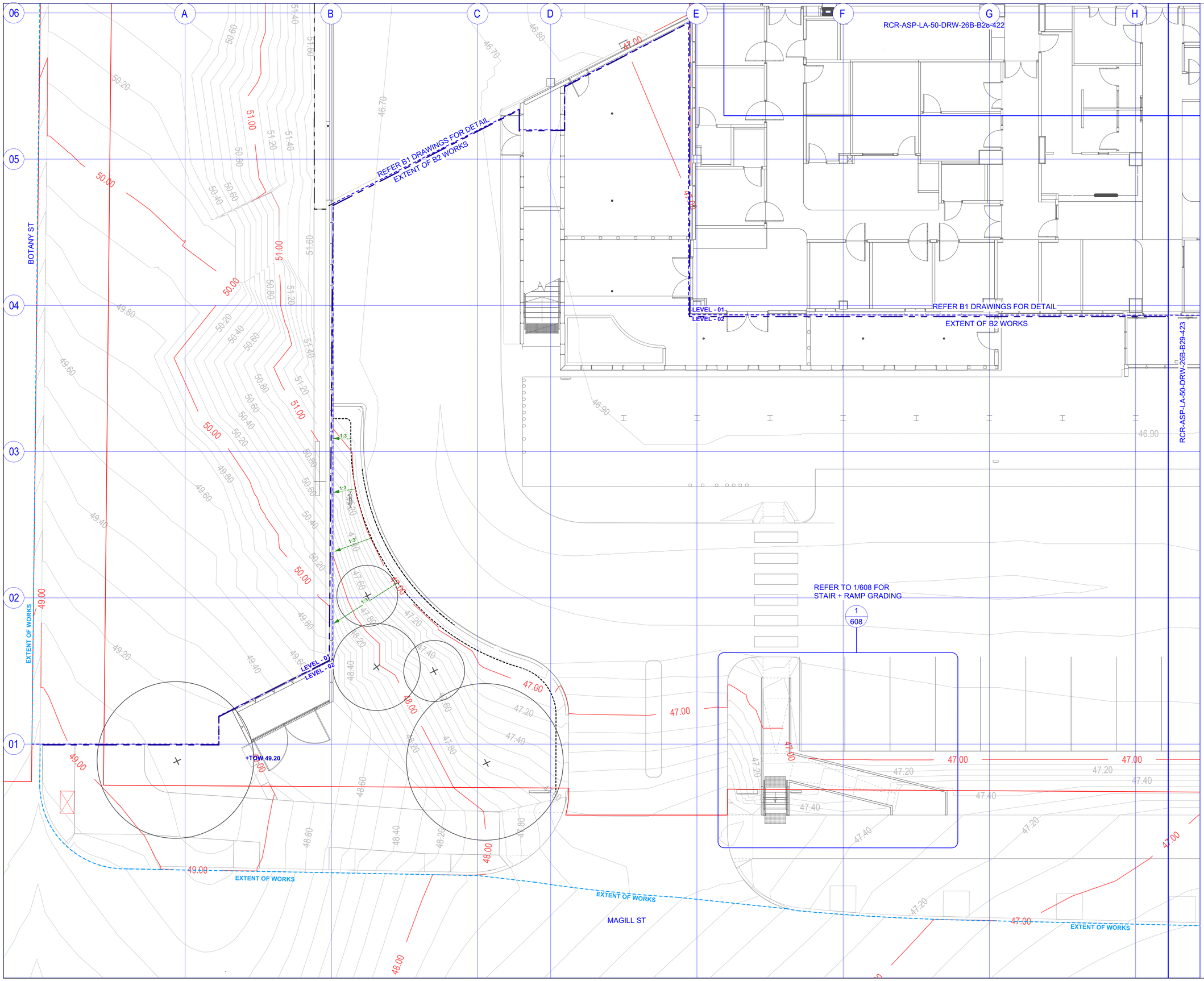
DRAWING

PLANTING PLAN - B2
Sheet 2 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B28-325

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

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1	26/05/21	APPROVED FOR CONSTRUCTION

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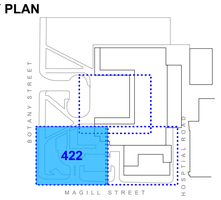
KEY PLAN



NOTE:
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- PIT AND PIPE LOCATIONS
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PROJECT

Randwick Hospital Campus

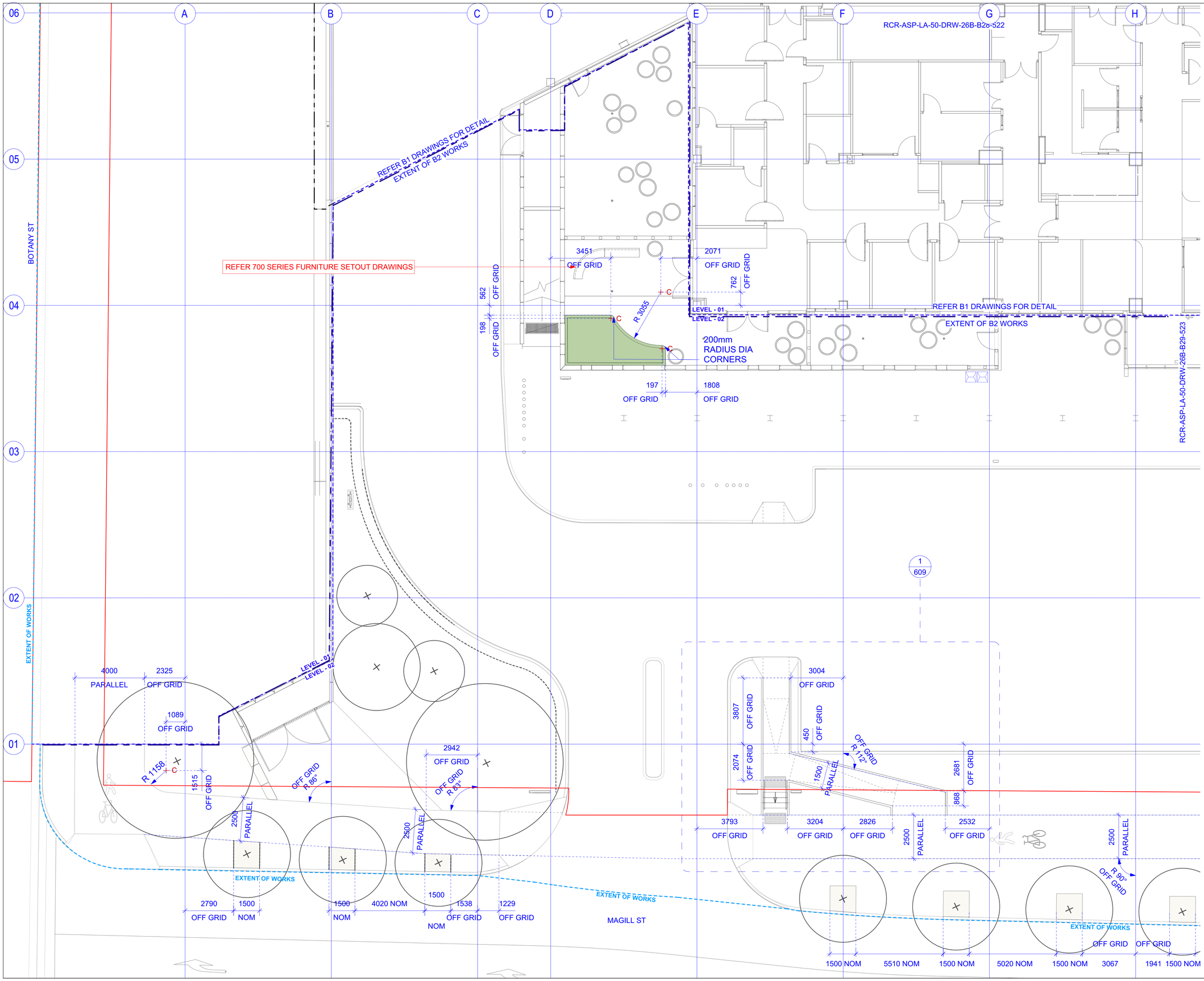
DRAWING

Levels & Grading Plan - B2
Sheet 2 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B28-422 1



STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

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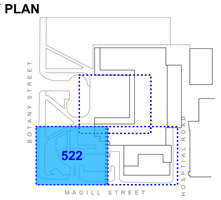

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PROJECT

Randwick Hospital Campus

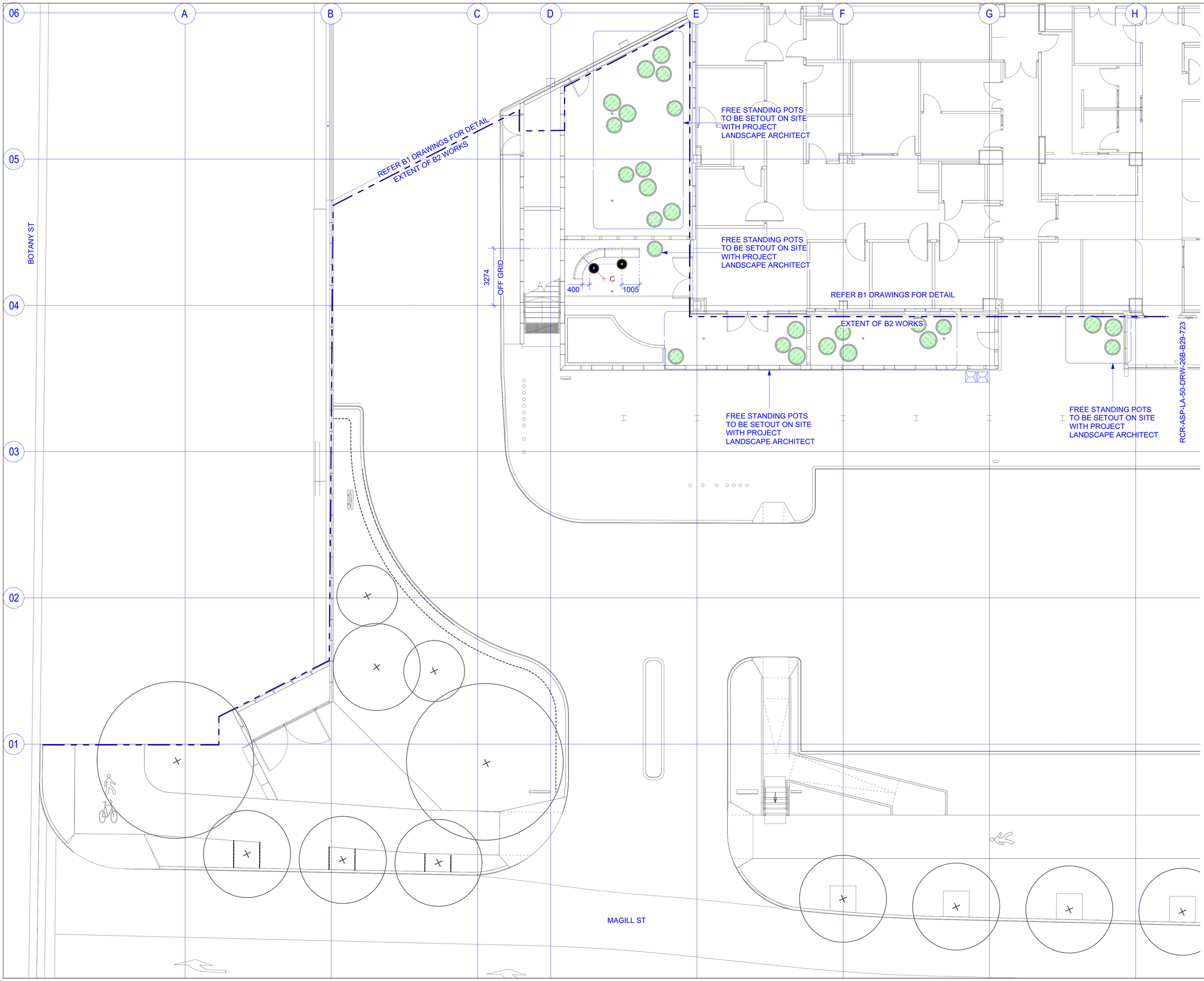
DRAWING

Setout Plan - B2
Sheet 2 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B28-522

REVISION 1



STATUS

APPROVED FOR CONSTRUCTION

NOTES

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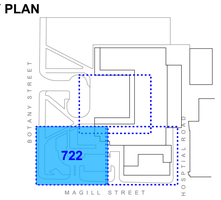
KEY PLAN



NOTE:
REFER TO THE SPECIFICATION SCHEDULE + DETAILS FOR DETAILED SELECTION INFORMATION.

REFER TO CIVIL ENGINEERS DRAWING FOR:
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- DRAINAGE POINTS AND FALLS

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PROJECT

Randwick Hospital Campus

DRAWING

Furniture Setout Plan - B2
Sheet 1 of 7

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B28-722

REVISION 1

NOTE:
REFER TO LIGHTING ENGINEERS DRAWINGS FOR LIGHTING

RCR-ASP-LA-50-DRW-26B-B24-221

RCR-ASP-LA-50-DRW-26B-B28-222

MGVB

LEVEL - 01
LEVEL - 02

PP2 PP3 PVB.1 PR2 SE1 KE1 SW3 FL PVE PR1 SW1 TP3

SITE BOUNDARY

EXTENT OF WORKS

MAGILL STREET

HOSPITAL ROAD

06 05 04 03 02 01

J K L M N O P Q

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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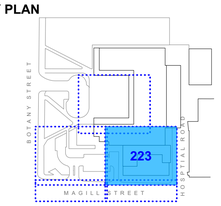

NOTE:
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REFER TO HYDAULIC + CIVIL ENGINEERS DRAWING FOR:
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PROJECT

Randwick Hospital Campus

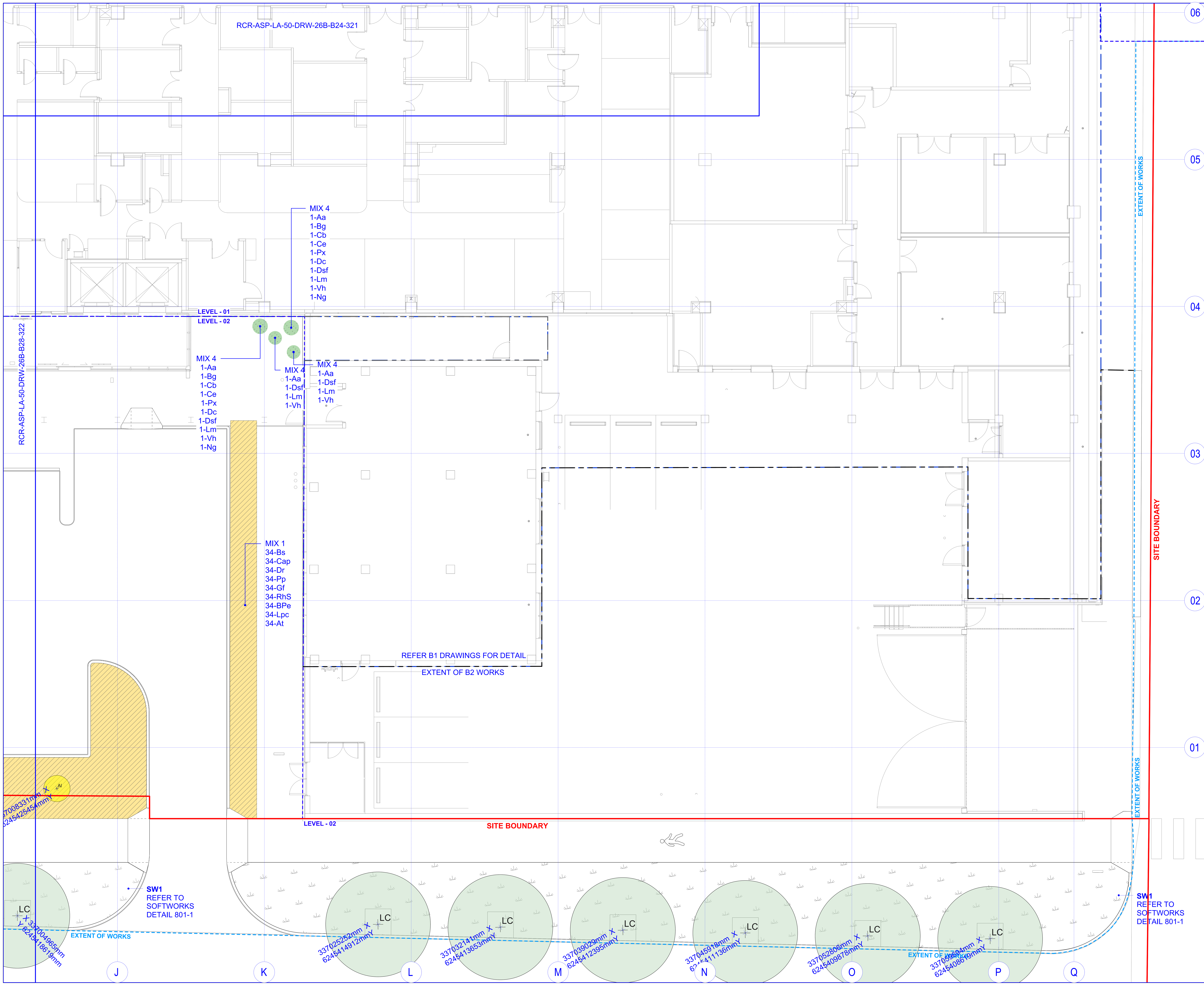
DRAWING

Materials & Finishes Plan Level B2
Sheet 3 of 17

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B29-223

REVISION 1



STATUS

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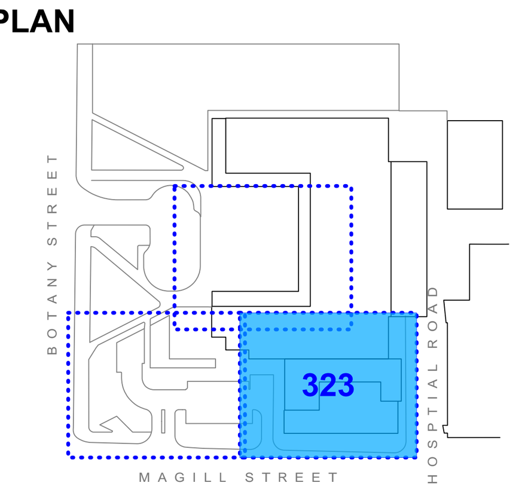
KEY PLAN



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PROJECT
Randwick Hospital Campus

DRAWING
PLANTING PLAN - B2
Sheet 3 of 14

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO.	REVISION
RCR-ASP-LA-30-DRW-26B-B29-323	1

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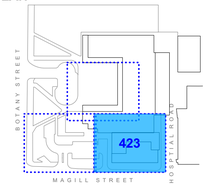
KEY PLAN



NOTE:
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Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

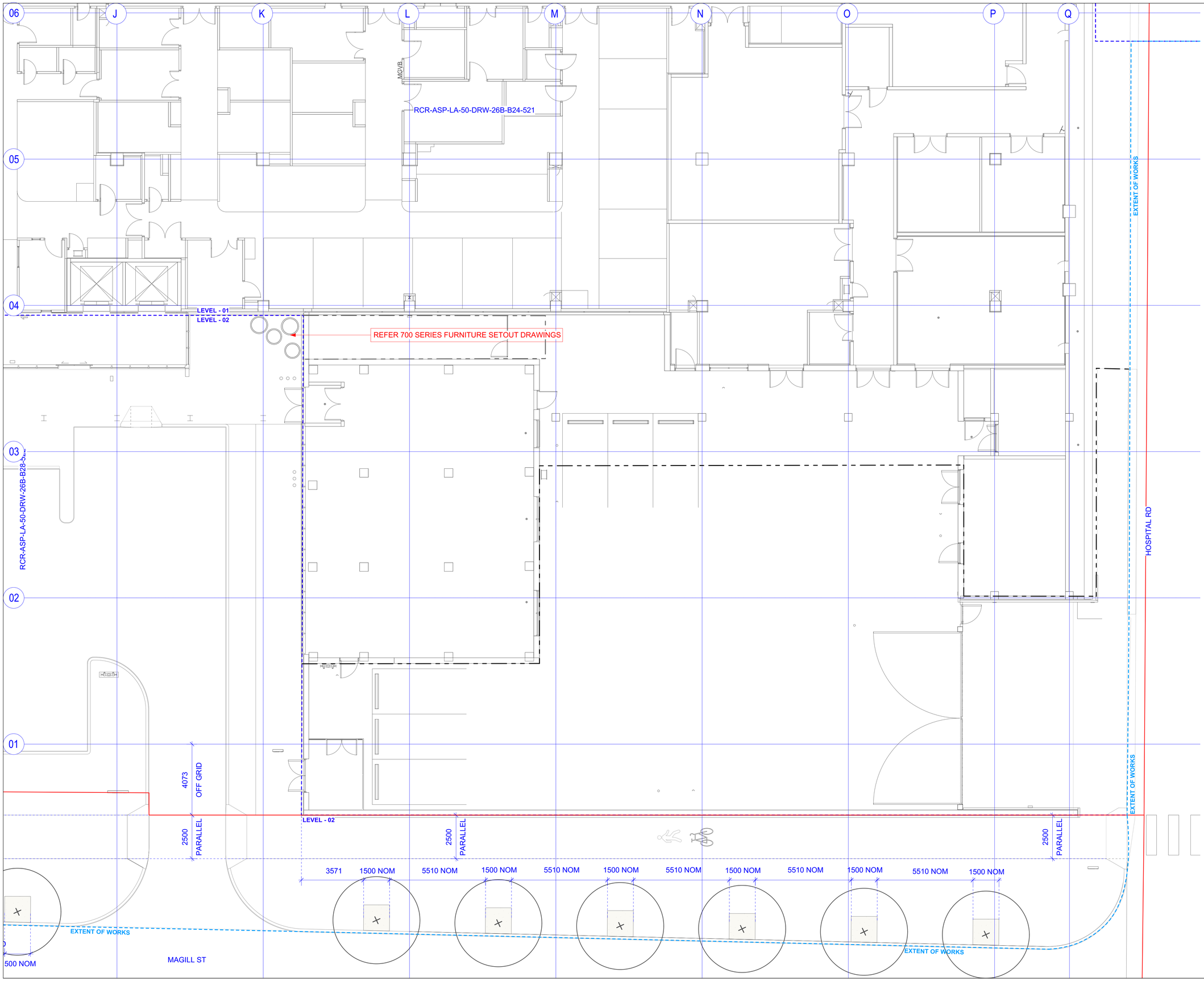
DRAWING

Levels & Grading Plan - B2
Sheet 3 of 16

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B29-423 1



STATUS

APPROVED FOR CONSTRUCTION

N

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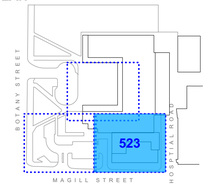

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PROJECT

Randwick Hospital Campus

DRAWING

Setout Plan - B2
Sheet 3 of 14

DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. RCR-ASP-LA-30-DRW-26B-B29-523

REVISION 1

06
05
04
03
02
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J
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L
M
N
O
P
Q
MGVB
FREE STANDING POTS
TO BE SETOUT ON SITE
WITH PROJECT
LANDSCAPE ARCHITECT
RCR-ASP-LA-50-DRW-26B-B28-722
HOSPITAL RD
MAGILL ST

STATUS

APPROVED FOR CONSTRUCTION

N

NOTES

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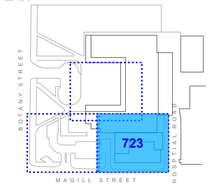
KEY PLAN



NOTE:
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PROJECT

Randwick Hospital Campus

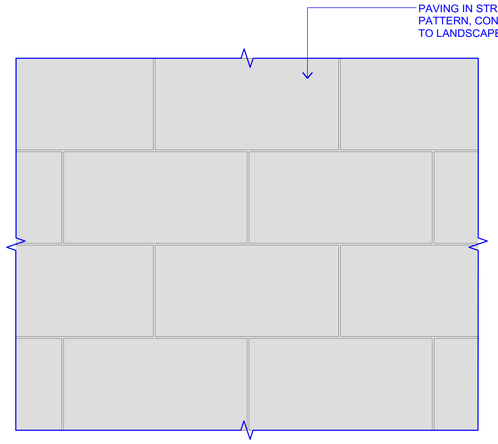
DRAWING

Furniture Setout Plan - B2
Sheet 2 of 7

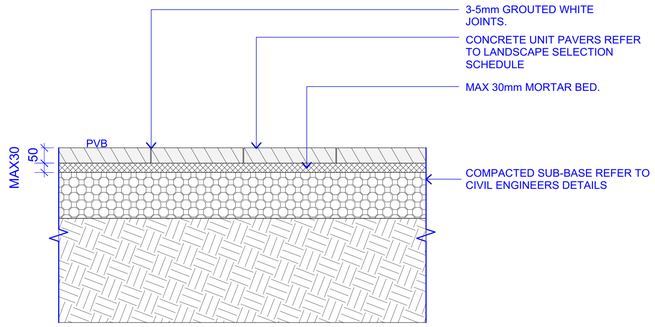
DRAWN	CHECKED	SCALE @ A1
JT	GW | KL	1:100

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26B-B29-723 1



1 PAVING TYPE B.1 + B.2 ARRANGEMENT | CONCRETE UNIT PAVERS
1:10 PLAN PVB.1 PVB.2



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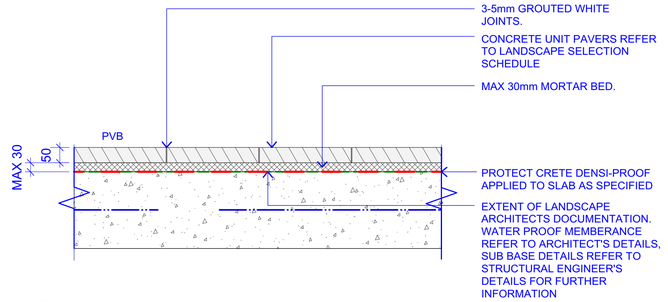
1:10 SECTION PVB.1



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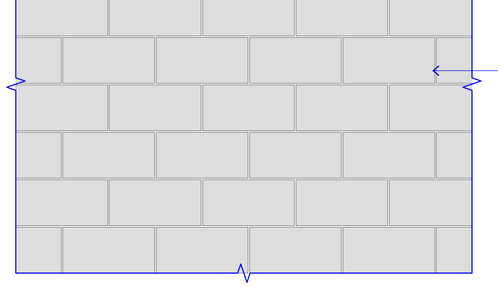
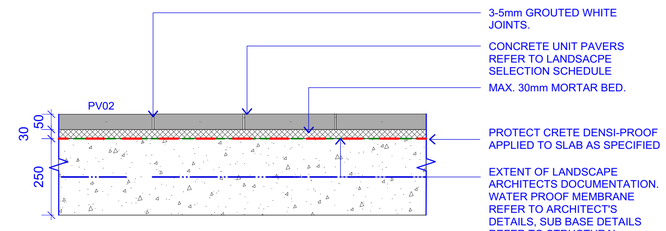
1:10 SECTION PVB.2



4 PAVING TYPE C ARRANGEMENT | CONCRETE UNIT PAVERS
1:10 PLAN PVC



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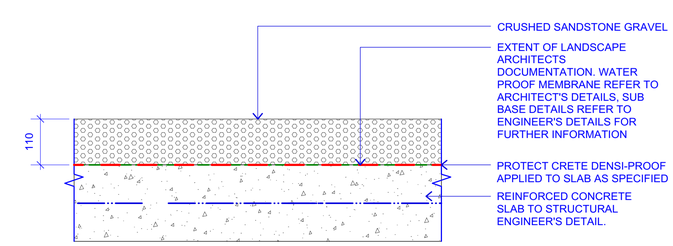
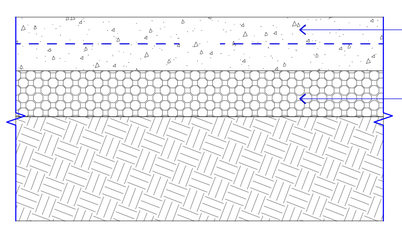
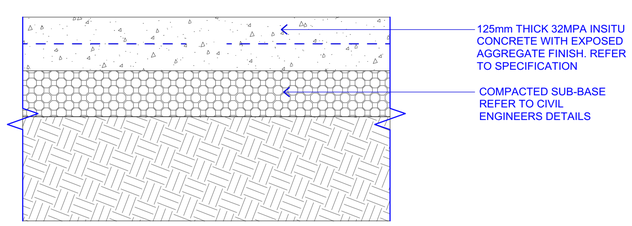
1:10 SECTION PVC



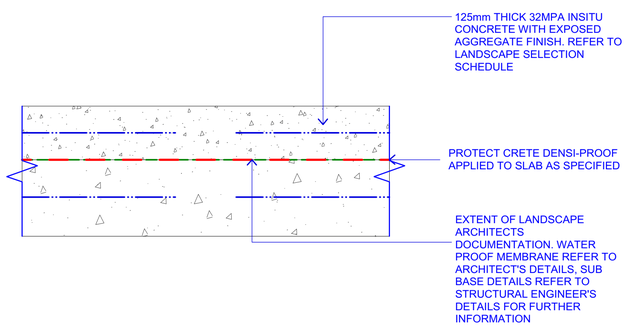
6 PAVING TYPE D | CRUSHED SANDSTONE ON CONCRETE
1:10 SECTION PVD



7 PAVING TYPE E | INSITU CONCRETE
1:10 SECTION PVE



8 PAVING TYPE F.1 | INSITU CONCRETE + EXPOSED AGGREGATE
1:10 SECTION PVF.1



9 PAVING TYPE F.2 | INSITU CONCRETE + EXPOSED AGGREGATE ON SLAB
1:10 SECTION PVF.2

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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WARNING

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REV	DATE	AMENDMENTS
1	26/05/21	APPROVED FOR CONSTRUCTION

NOTE:
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NOTE:
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International Towers Sydney
Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

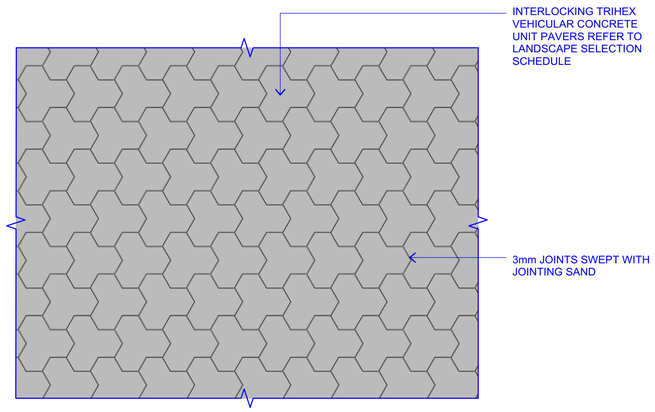
DRAWING

Hardworks Details - Finishes

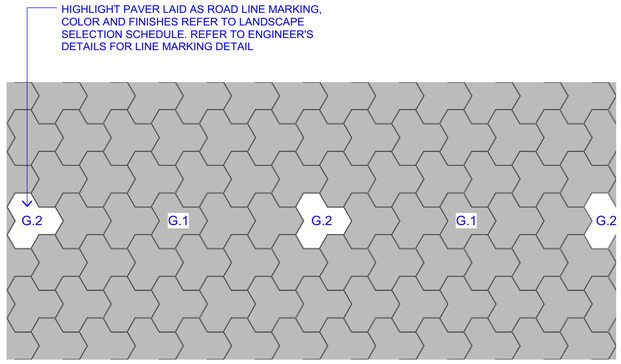
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

DRAWING NO. REVISION

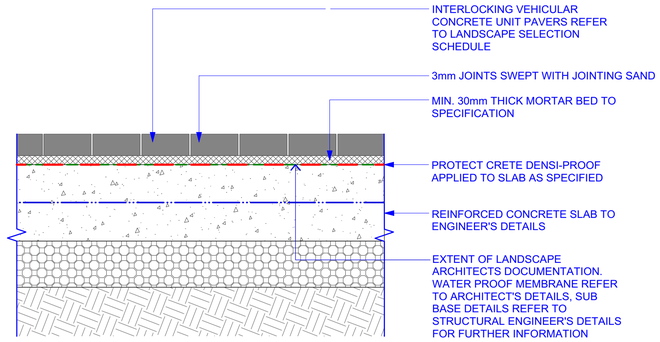
RCR-ASP-LA-30-DRW-26G-NL0-601 1



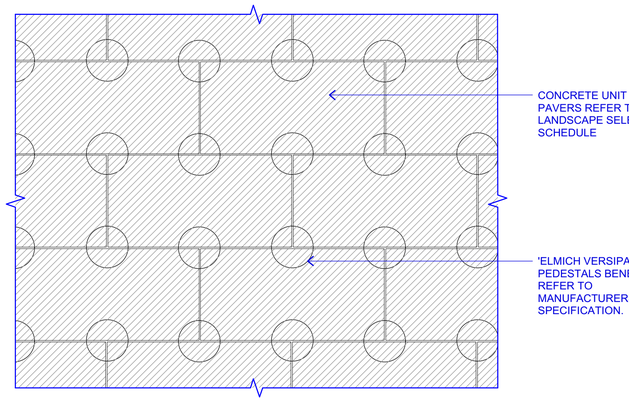
1 PAVING TYPE G.1 ARRANGEMENT
1:10 PLAN PVG.1 PVG.2



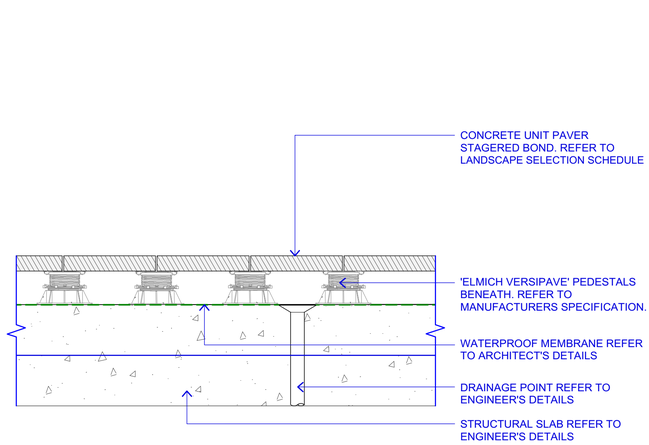
2 PAVING TYPE G.2 | ROAD LINE MARKING + PARKING BAYS
1:10 PLAN PVG.2



3 PAVING TYPE G.1 | INTERLOCKING VEHICULAR CONCRETE UNIT PAVERS
1:10 SECTION PVG.1 PVG.2



4 PAVING TYPE H | ROADBANDING PAVING
1:10 PLAN PVH



5 PAVING TYPE H | ROADBANDING PAVING WITH PVG
1:10 SECTION PVH

6 PAVING TYPE I | RUBBER SOFTFALL
1:10 SECTION PVI

7 PAVING TYPE J | PAVING ON PEDESTAL
1:10 PLAN PVJ

8 PAVING TYPE J | PAVING ON PEDESTAL
1:10 SECTION PVJ

STATUS

APPROVED FOR CONSTRUCTION

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PROJECT

Randwick Hospital Campus

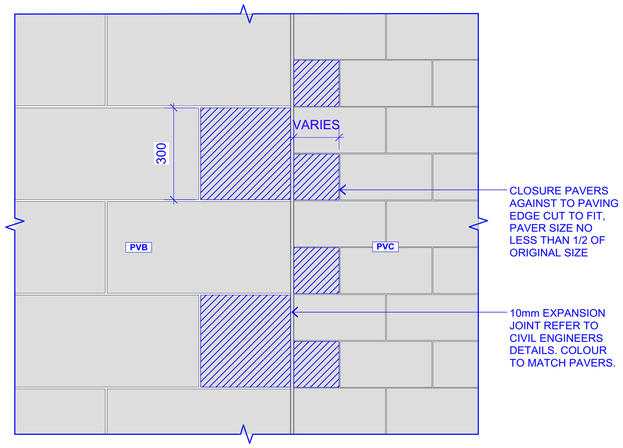
DRAWING

Hardworks Details - Finishes

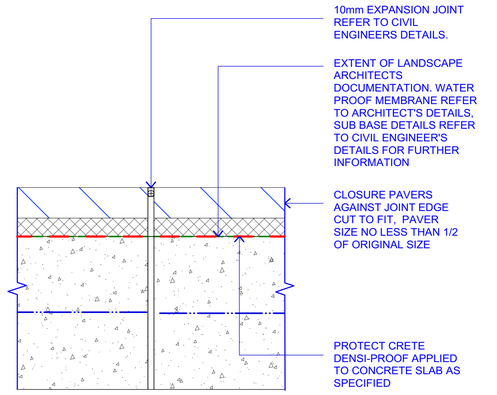
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

DRAWING NO. REVISION

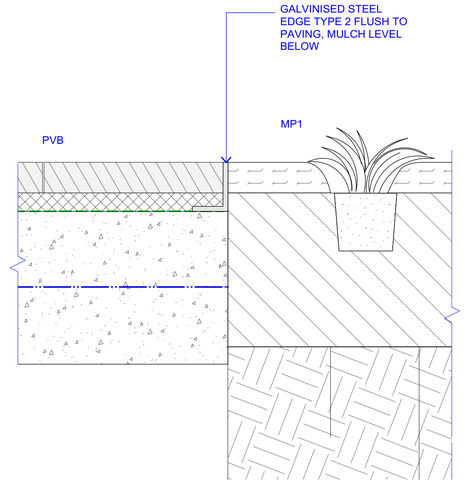
RCR-ASP-LA-30-DRW-26G-NL0-602 1



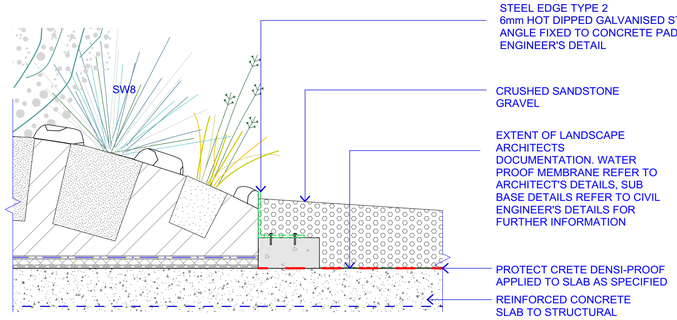
1 PAVING TYPE B AND C JUNCTION | CONCRETE UNIT PAVERS
1:10 PLAN PVB PVC



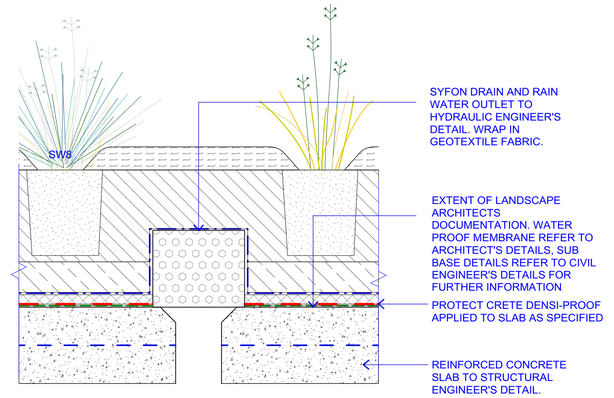
2 PAVING TYPE B AND C JUNCTION | CONCRETE UNIT PAVERS
1:5 SECTION PVB PVC



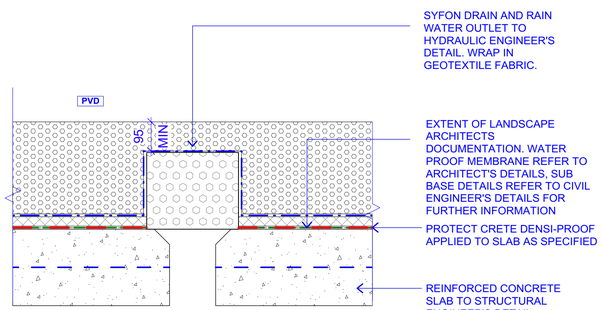
3 PAVING TYPE B AND SOFTWORKS JUNCTION
1:5 SECTION PVB MP1



4 PAVING TYPE D AND SW8 JUNCTION
1:10 SECTION SW8 PVD



5 SYPHON DRAIN IN PODIUM PLANTING
1:10 SECTION



6 SYPHON DRAIN IN PODIUM GRAVEL
1:10 SECTION

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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Level 14, Tower Three
International Towers Sydney
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PROJECT

Randwick Hospital Campus

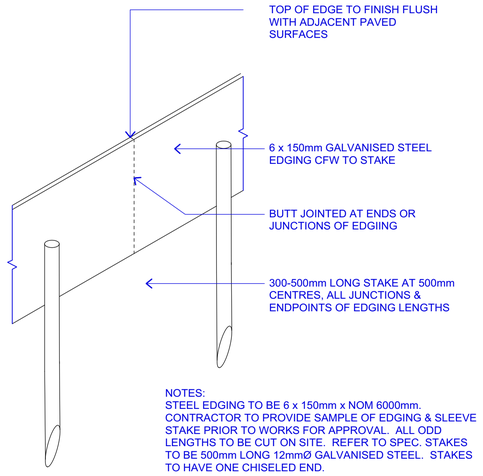
DRAWING

Hardworks Details - Junctions

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-603

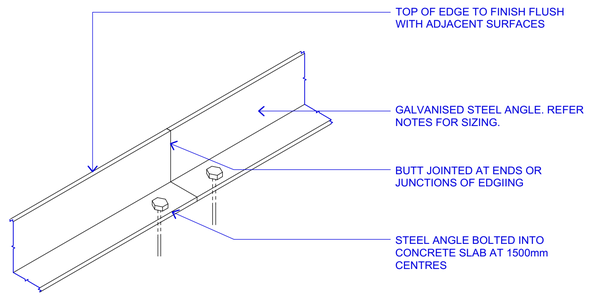
REVISION 1



NOTES:
STEEL EDGING TO BE 6 x 150mm x NOM 6000mm.
CONTRACTOR TO PROVIDE SAMPLE OF EDGING & SLEEVE STAKE PRIOR TO WORKS FOR APPROVAL. ALL ODD LENGTHS TO BE CUT ON SITE. REFER TO SPEC. STAKES TO BE 500mm LONG 12mmØ GALVANISED STEEL. STAKES TO HAVE ONE CHISELED END.

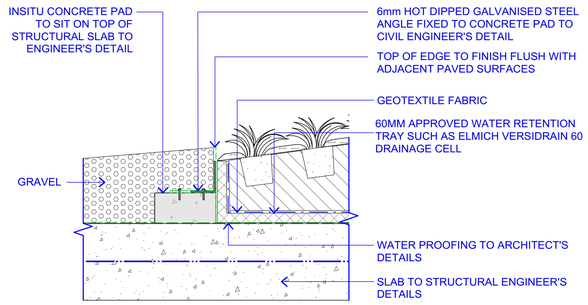
1 STEEL EDGE TYPE 1 | ON GRADE
1:5 AXONOMETRIC SE1

STEEL EDGING NOTES
1. STEEL EDGING TO BE: 150mmx150mmx6mm
2. CONTRACTOR TO PROVIDE SAMPLE OF ANGLE PRIOR TO WORKS FOR APPROVAL.
3. ALL ODD LENGTHS TO BE CUT ON SITE.
4. REFER TO SPECIFICATION.

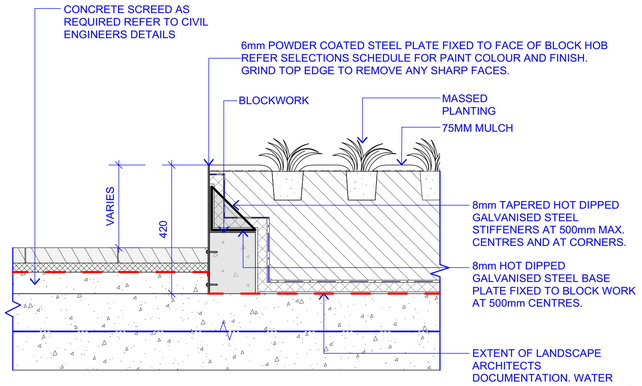


2 STEEL EDGE TYPE 2 | ON SLAB
1:5 AXONOMETRIC SE2

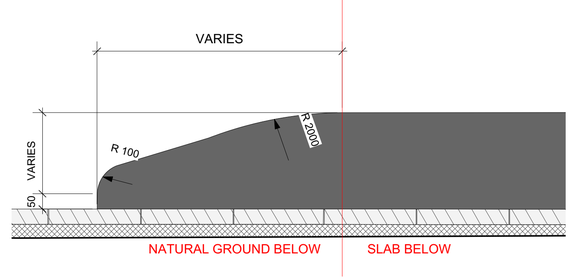
STEEL EDGING NOTES
1. CONTRACTOR TO PROVIDE SAMPLE OF ANGLE PRIOR TO WORKS FOR APPROVAL.
2. ALL ODD LENGTHS TO BE CUT ON SITE.
3. REFER TO SPECIFICATION.



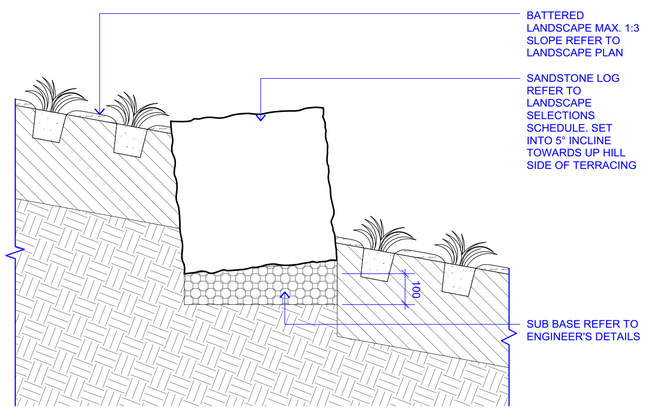
3 STEEL EDGE TYPE 2 | ON SLAB
1:10 TYPICAL SECTION SE2



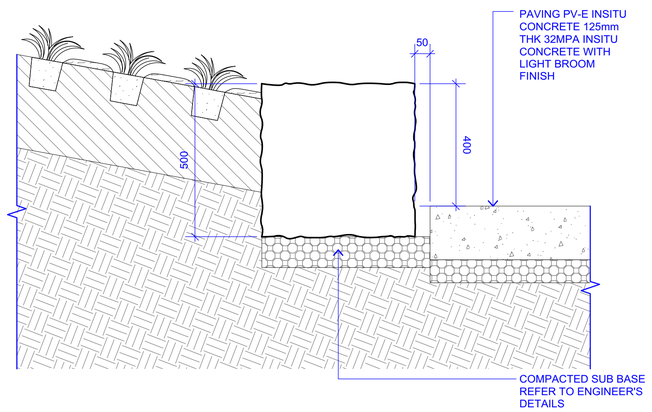
4 WALL TYPE 1 | TYPICAL DETAIL
1:10 SECTION W1



5 WALL TYPE 1 | TYPICAL EDGE TRANSITION DETAIL
1:10 ELEVATION W1

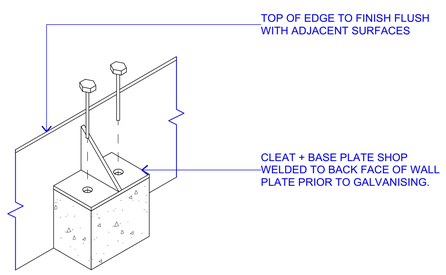


7 WALL TYPE 2 | SANDSTONE LOG WALL IN PLANTING
1:10 SECTION W2



9 WALL TYPE 2 | SANDSTONE LOG WALL
1:10 SECTION W2

STEEL EDGING NOTES
1. STEEL EDGING TO BE: 150mmx150mmx6mm
2. CONTRACTOR TO PROVIDE SAMPLE OF ANGLE PRIOR TO WORKS FOR APPROVAL.
3. ALL ODD LENGTHS TO BE CUT ON SITE.
4. REFER TO SPECIFICATION.



10 STEEL EDGE TYPE 3 | ON HOB
Scale: 1:5 AXONOMETRIC

STATUS

APPROVED FOR CONSTRUCTION

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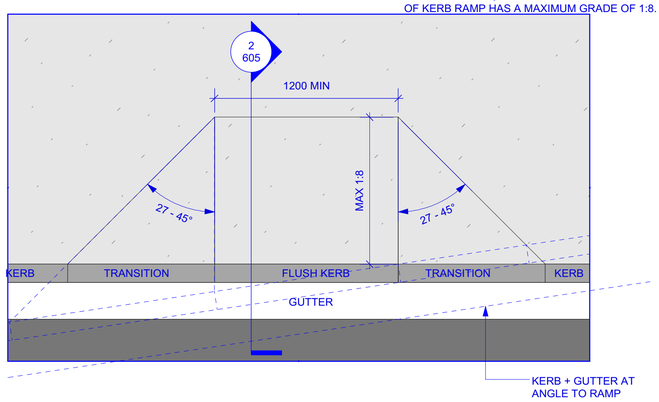
Barangaroo NSW 2000

PROJECT
Randwick Hospital Campus

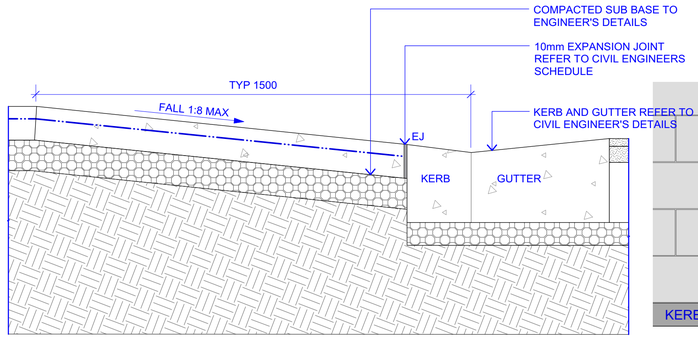
DRAWING
Hardworks Details -
Walls and Edges

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

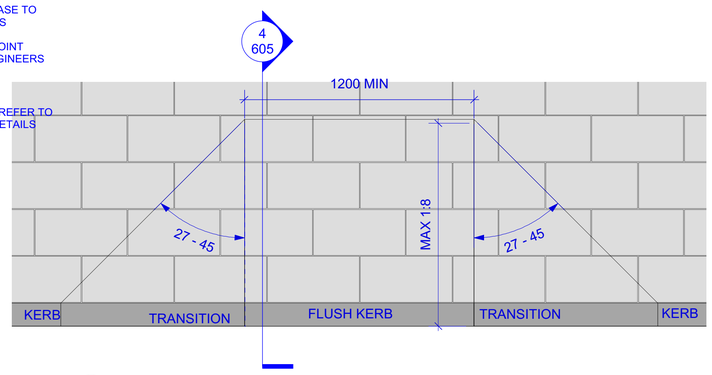
DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-604
REVISION 1



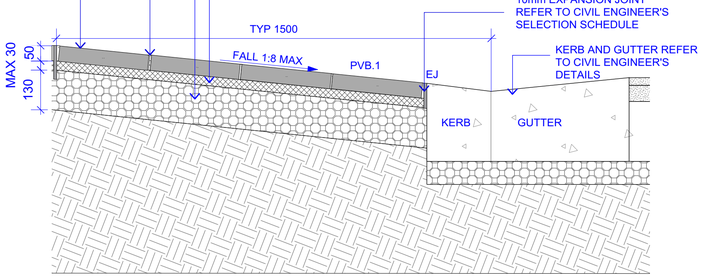
1 PEDESTRIAN PRAM RAMP1 | INSITU CONCRETE
1:25 PLAN PRAM RAMP TO CIVIL ENG. DETAILS



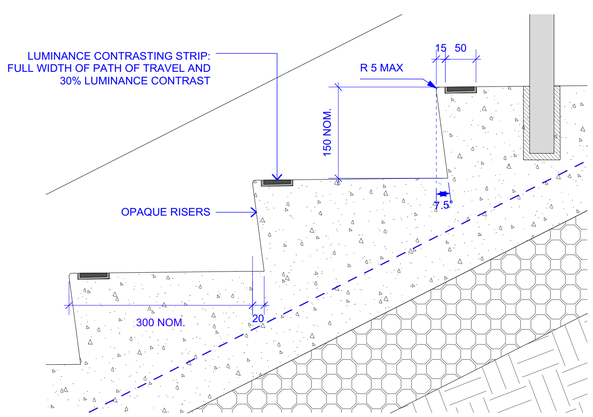
2 PEDESTRIAN PRAM RAMP 1 | INSITU CONCRETE
1:10 SECTION PRAM RAMP TO CIVIL ENG. DETAILS



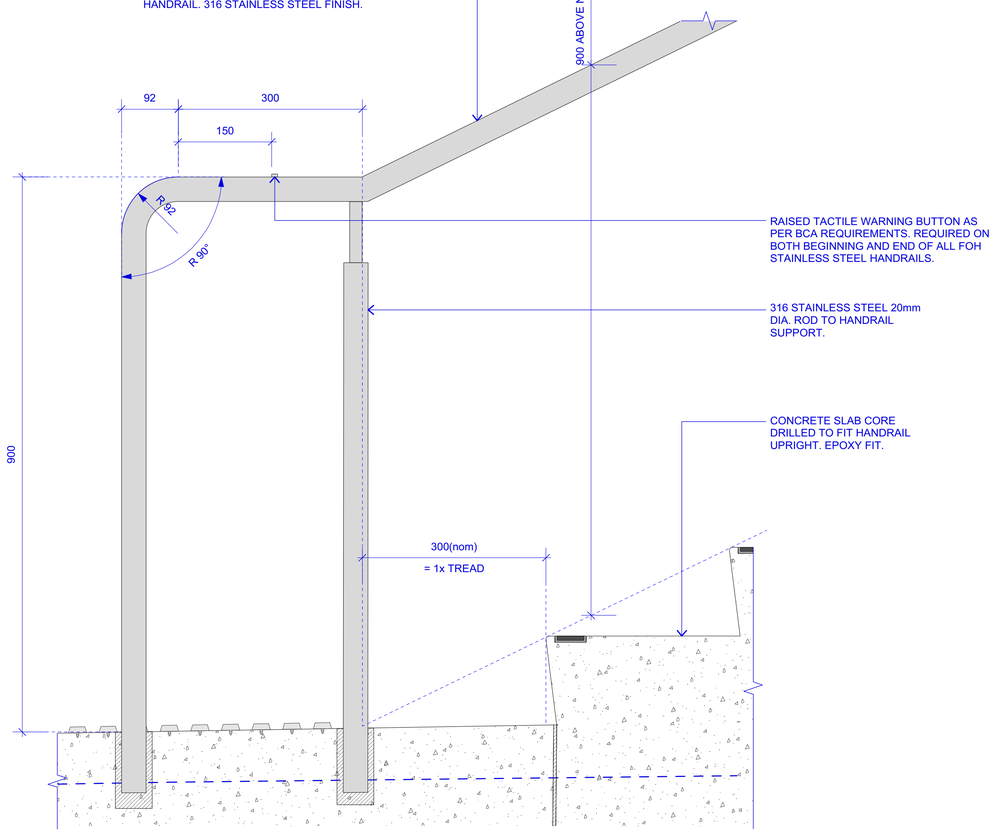
3 PEDESTRIAN PRAM RAMP 2 | CONCRETE UNIT PAVER
1:20 PLAN PR2



4 PEDESTRIAN PRAM RAMP 2 | CONCRETE UNIT PAVER
1:10 SECTION PR2



7 STAIR NOSING TYPICAL I INSITU CONCRETE
1:5 SECTION



6 HANDRAIL TYPICAL
1:5 TYPICAL SECTION HR1

STATUS

APPROVED FOR CONSTRUCTION

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NOTE:
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ALL HANDRAILS REQUIRE SHOP DRAWINGS FOR APPROVAL

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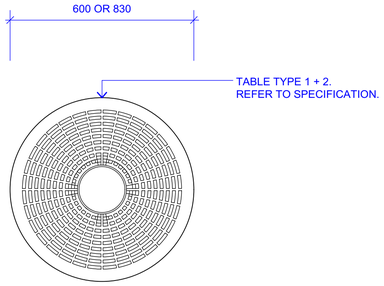
Barangaroo NSW 2000

PROJECT
Randwick Hospital Campus

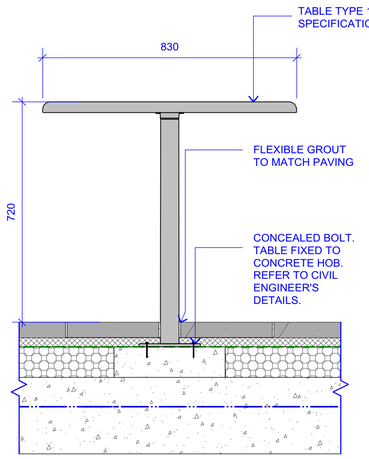
DRAWING
Hardworks Details
Walls, Ramp and Ancillaries

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

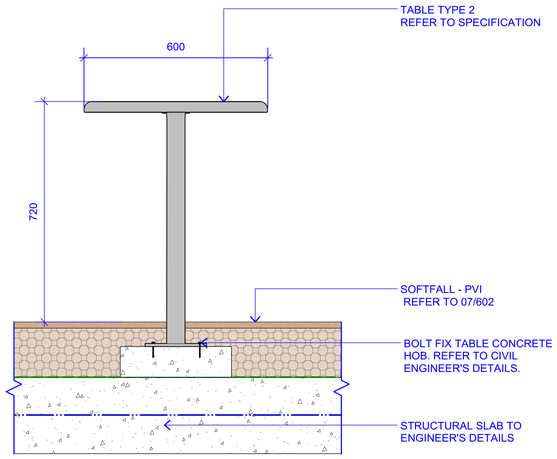
DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-605
REVISION 1



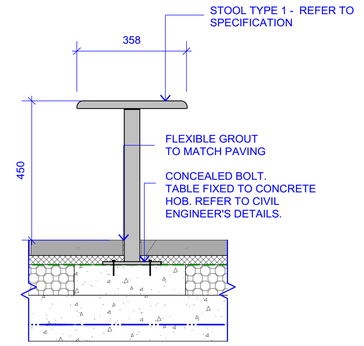
1 TABLE TYPE 1 + 2 | FIXED CAFE TABLE
1:10 PLAN TB1 TB2



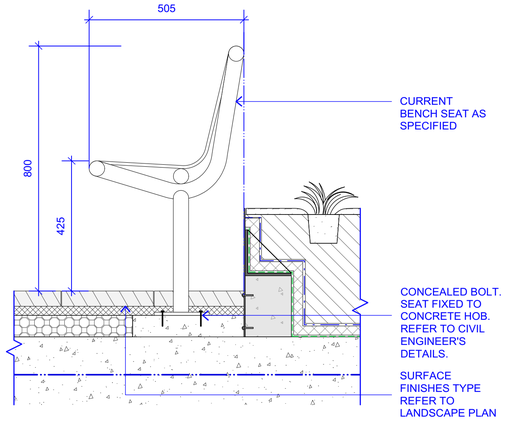
2 TABLE TYPE 1 | FIXED CAFE TABLE
1:10 SECTION TB1



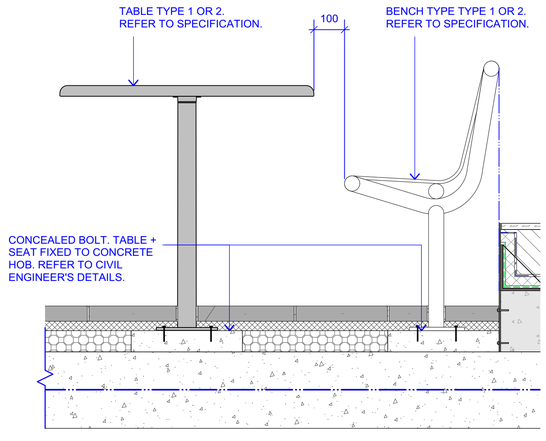
3 TABLE TYPE 2 | FIXED CAFE TABLE ON SOFTFALL (PECC)
1:10 SECTION TB2



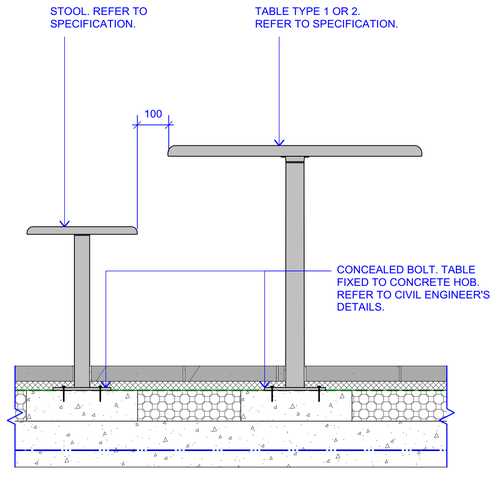
4 STOOL| FIXED CAFE STOOL
1:10 SECTION CH



5 TYPICAL BENCH SEAT
1:10 SECTION BE1 BE2 BE3 BE4 BE5 BE6 BE7



6 TYPICAL FURNITURE ARRANGEMENT 1
1:10 SECTION TB1 TB2 BE1 BE2 BE3 BE4 BE5 BE6 BE7



7 TYPICAL FURNITURE ARRANGEMENT
1:10 SECTION TB1 TB2

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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WARNING

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REV	DATE	AMENDMENTS
1	26/05/21	APPROVED FOR CONSTRUCTION

NOTE:
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- DRAINAGE POINTS AND FALLS

REFER TO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

NOTE:
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Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

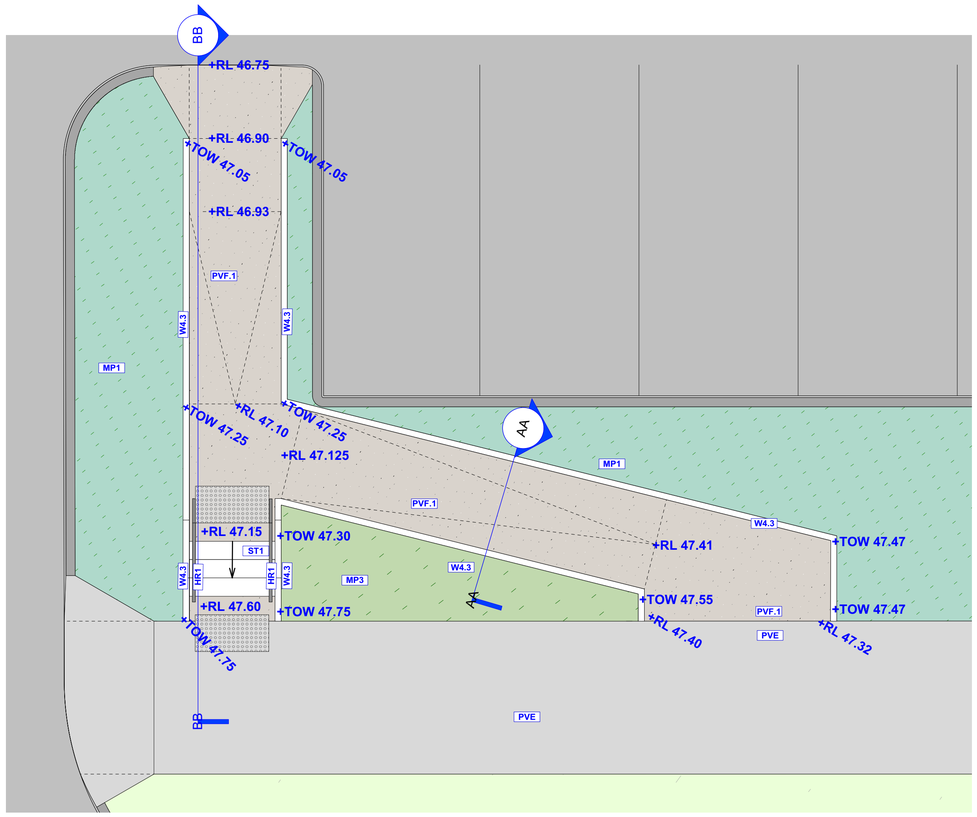
DRAWING

Details - Furniture and Fixtures

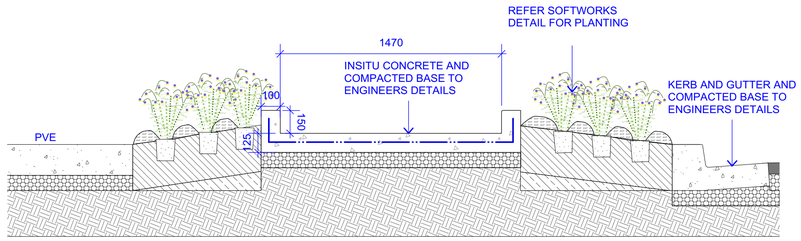
DRAWN	CHECKED	SCALE @ A1
JT | CK	CK | KL	N/A

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-606

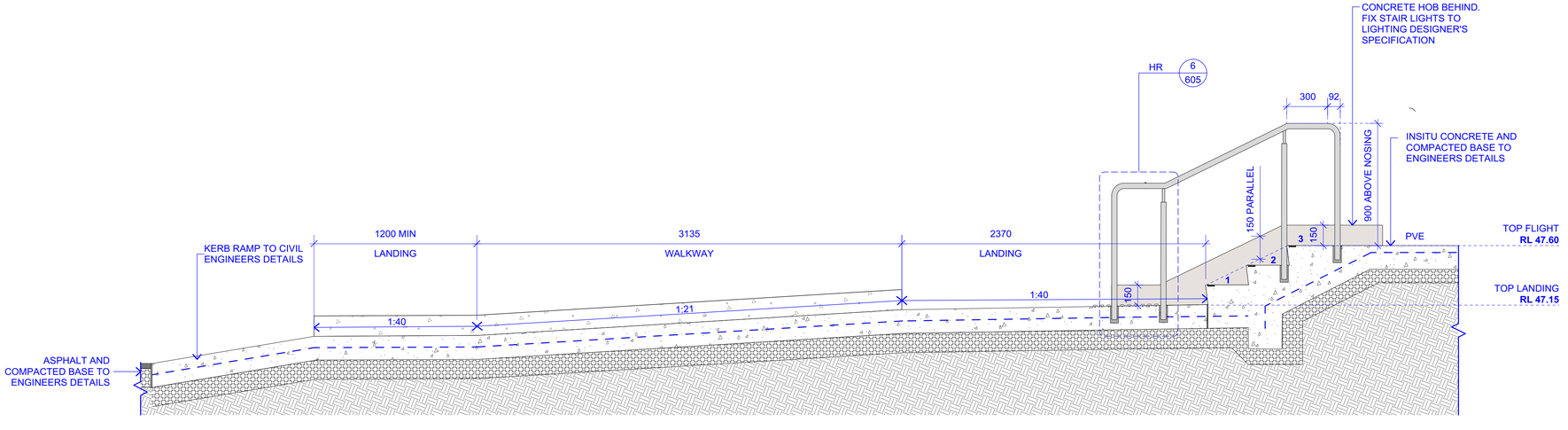
REVISION 1



1 STAIR 1 DETAIL PLAN
1:50



2 STAIR 1 INSITU CONCRETE WALKWAY
1:20 SECTION AA



3 STAIR 1 INSITU CONCRETE
1:20 SECTION BB ST1 HR

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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NOTE:
REFER TO THE SPECIFICATION + SELECTIONS SCHEDULE FOR TACTILE INDICATORS

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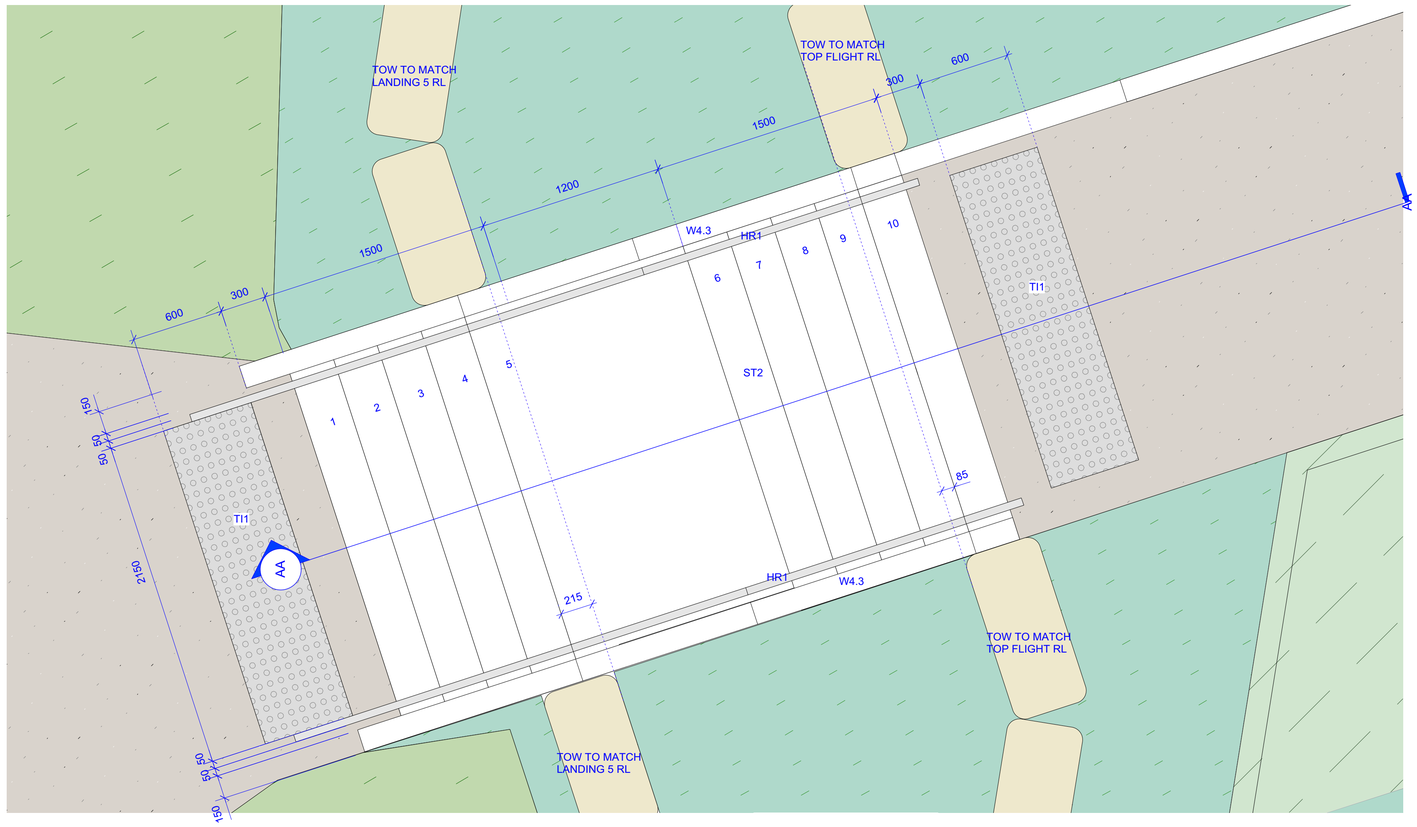
PROJECT
Randwick Hospital Campus

DRAWING
Hardworks Details - Stair

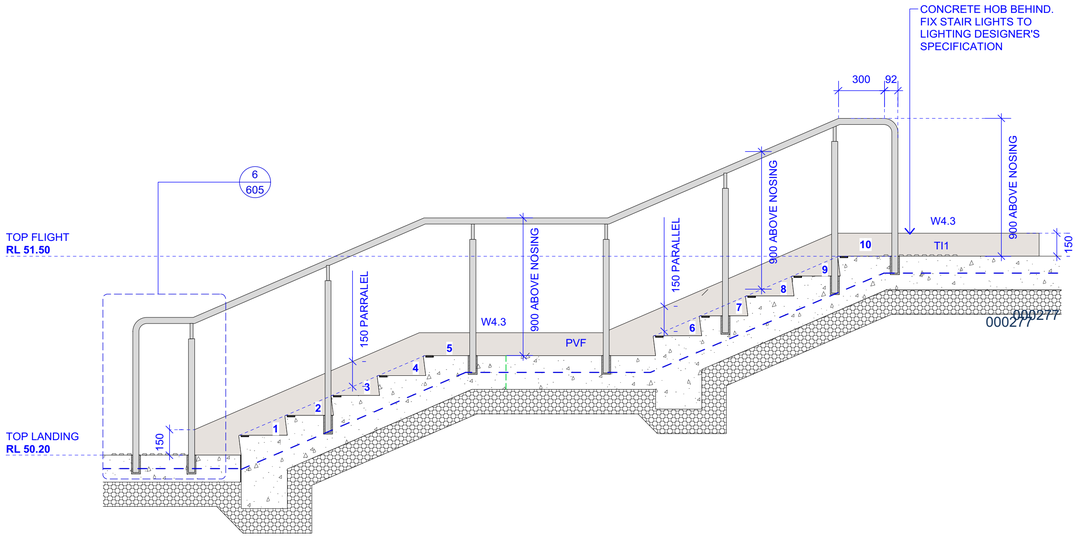
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-608
REVISION 1



1 STAIR 2 DETAIL PLAN
1:20

ST1 TI HRI W4.3



2 STAIR 2
1:20
SECTION AA

ST1 TI HRI W4.3

STATUS

APPROVED FOR CONSTRUCTION

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PROJECT

Randwick Hospital Campus

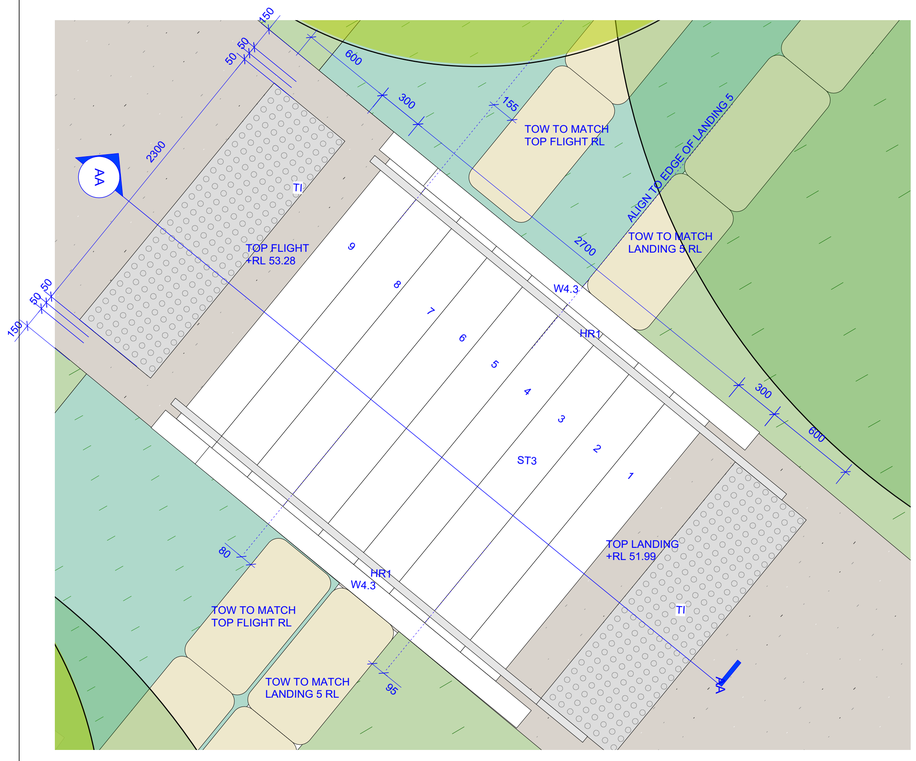
DRAWING

Level B1 - Stair 02

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

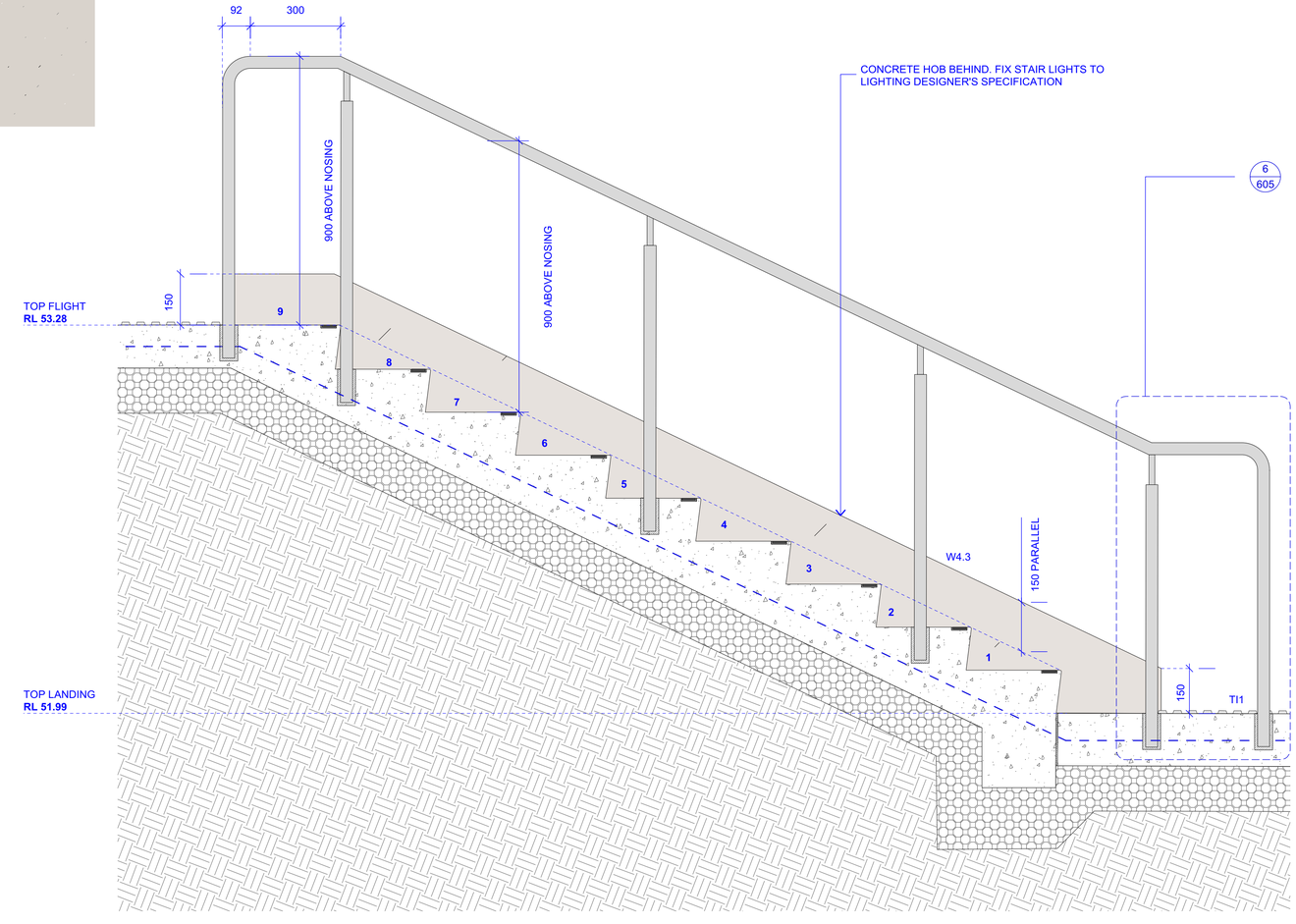
DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-609

REVISION 1



1 STAIR 3 DETAIL PLAN
1:20

ST1 TI HRI W4.3



2 STAIR 3
1:10

SECTION AA

ST3 TI HRI W4.3

STATUS

APPROVED FOR CONSTRUCTION

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- DRAINAGE POINTS AND FALLS

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PROJECT

Randwick Hospital Campus

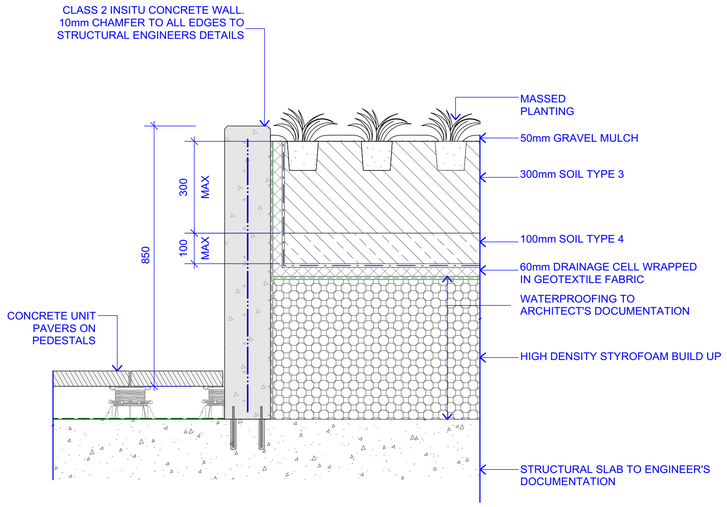
DRAWING

Level B1 - Stair 03

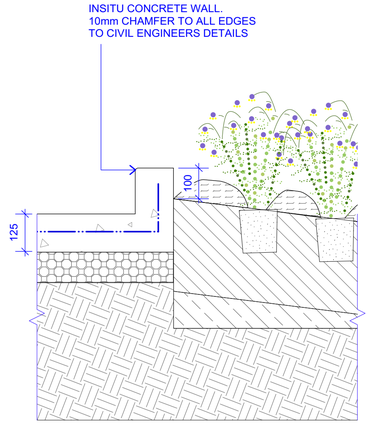
DRAWN	CHECKED	SCALE @ A1
JT | CK	CK | KL	N/A

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-610

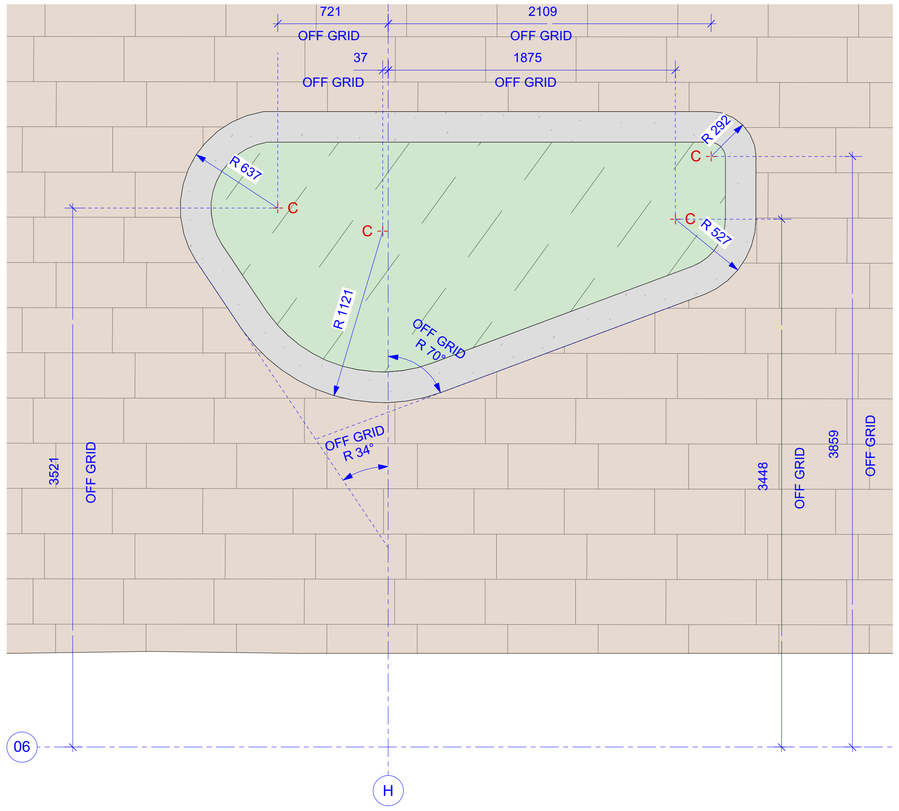
REVISION 1



1 WALL TYPE 4.2 | INSITU CONCRETE WALL ON SLAB
1:10 TYPICAL SECTION W4.2



2 WALL TYPE 4.3 | INSITU KERB TO WALKWAY EDGE
1:10 TYPICAL SECTION W4.3



3 TERRACE PLANTING | TYPE 6
1:20 PLAN DETAIL W4.2

STATUS

APPROVED FOR CONSTRUCTION

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Barangaroo NSW 2000

PROJECT

Randwick Hospital Campus

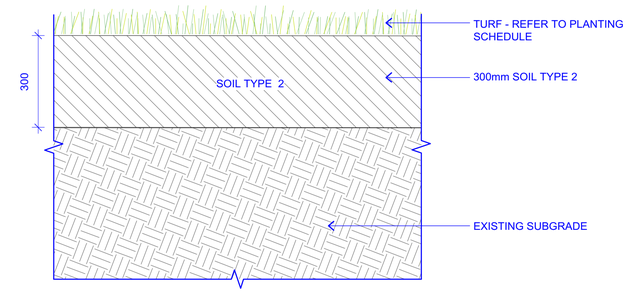
DRAWING

Hardworks Details -
Walls and Edges

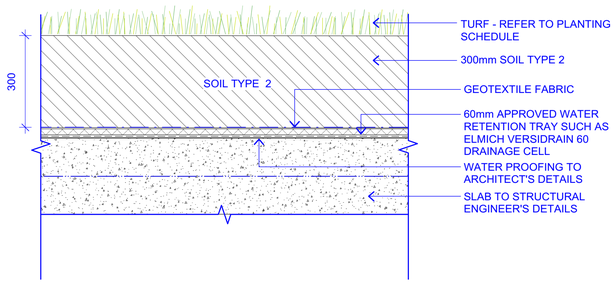
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	N/A

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-611

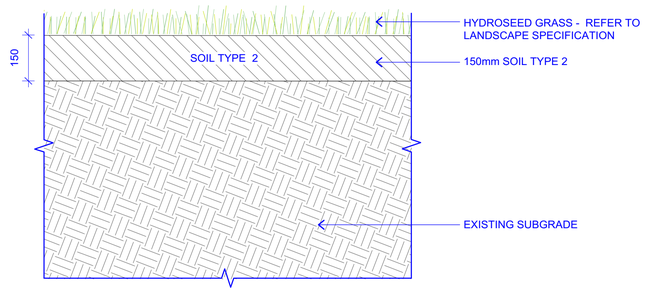
REVISION 1



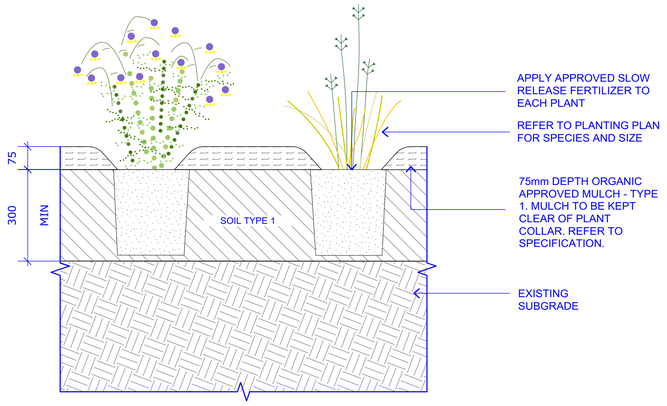
1 SOFTWORKS TYPE 1 | TURF SW1
1:10 SECTION



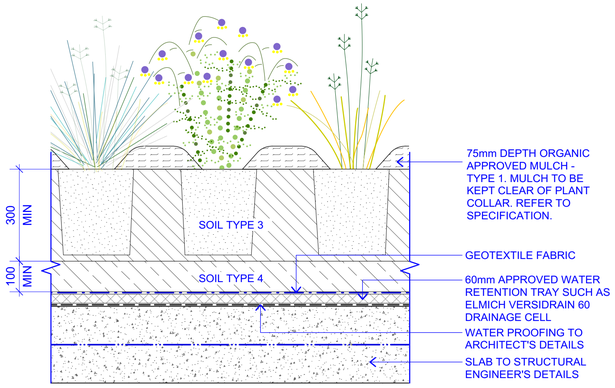
2 SOFTWORKS TYPE 1.1 | TURF ON SLAB SW1.1
1:10 SECTION



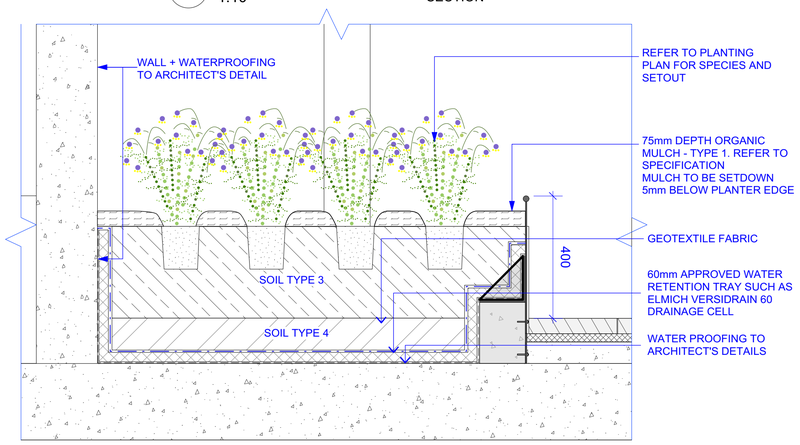
3 SOFTWORKS TYPE 2 | HYDROSEED SW2
1:10 SECTION



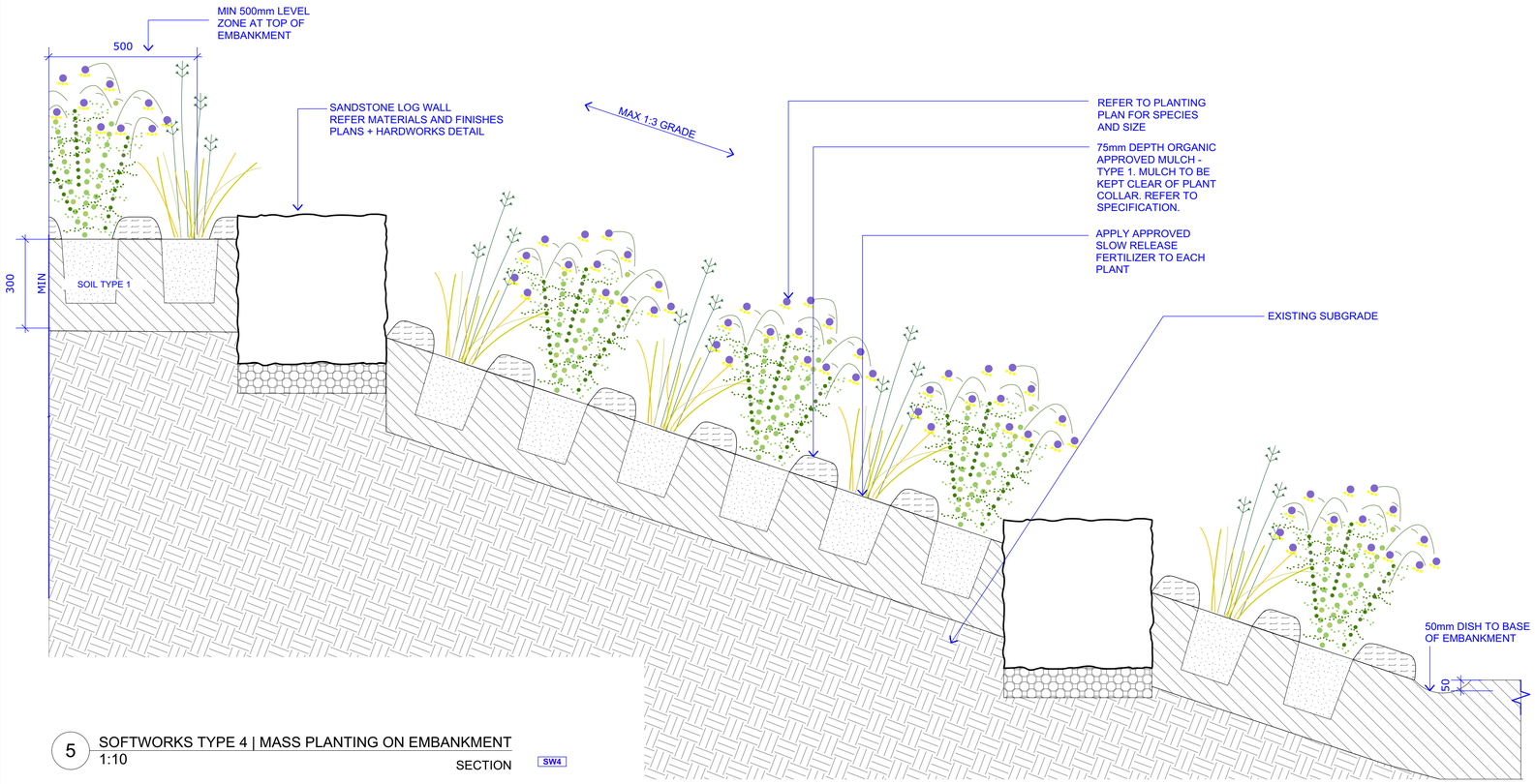
4 SOFTWORKS TYPE 3 | MASS PLANTING ON GRADE SW3
1:10 SECTION



6 SOFTWORKS TYPE 5 | MASS PLANTING ON CONCRETE SLAB SW5
1:10 SECTION



7 PECC COURTYARD PLANTER SW6
1:10 SECTION



5 SOFTWORKS TYPE 4 | MASS PLANTING ON EMBANKMENT
1:10 SECTION SW4

STATUS

APPROVED FOR CONSTRUCTION

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PROJECT

Randwick Hospital Campus

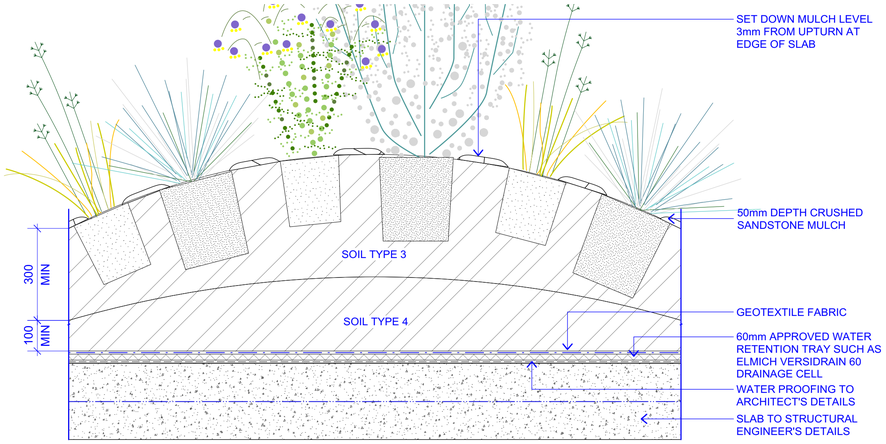
DRAWING

Softworks Details
ASB

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	AS SHOWN

DRAWING NO. REVISION

RCR-ASP-LA-30-DRW-26G-NL0-801 1



1 SOFTWORKS TYPE 8 | MOUNDED MASS PLANTING ON CONCRETE SLAB SW8
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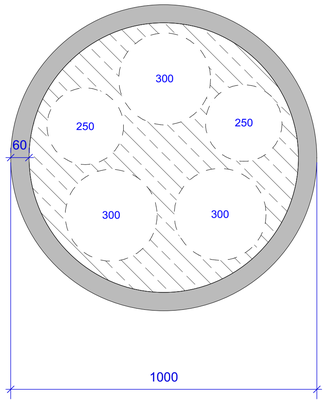

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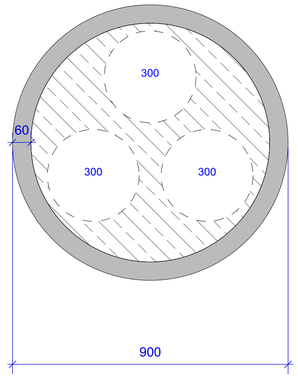
Scale: 1:10



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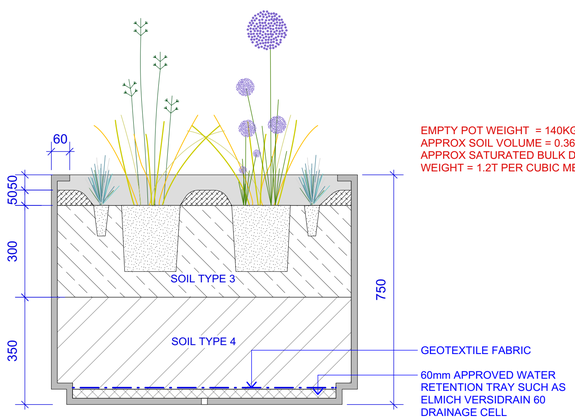
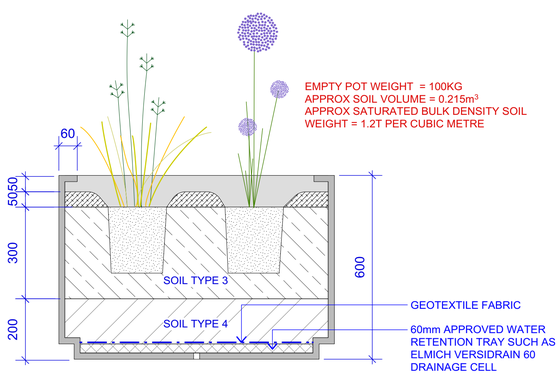
Scale: 1:10



6 SOFTWORKS TYPE 9.2 I POT 2 SW9
Scale: 1:10 SECTION



7 SOFTWORKS TYPE 9.3 I POT 3 SW9
Scale: 1:10 SECTION

STATUS

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Barangaroo NSW 2

PROJECT

Randwick Hospital Campus

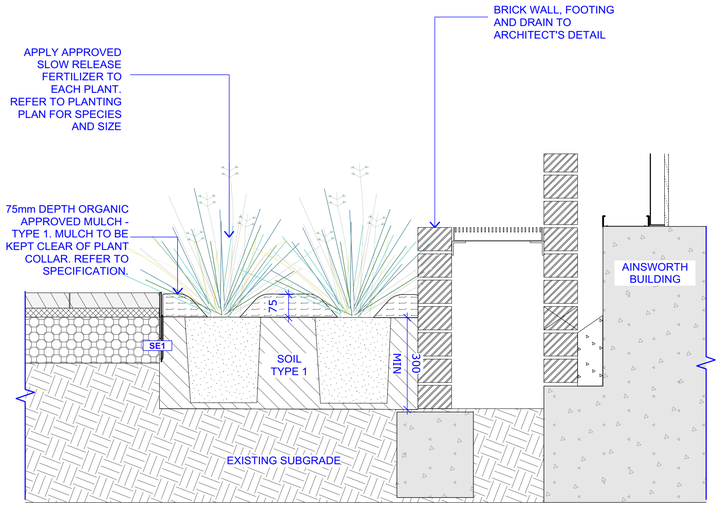
DRAWING

Softworks Details
ASB

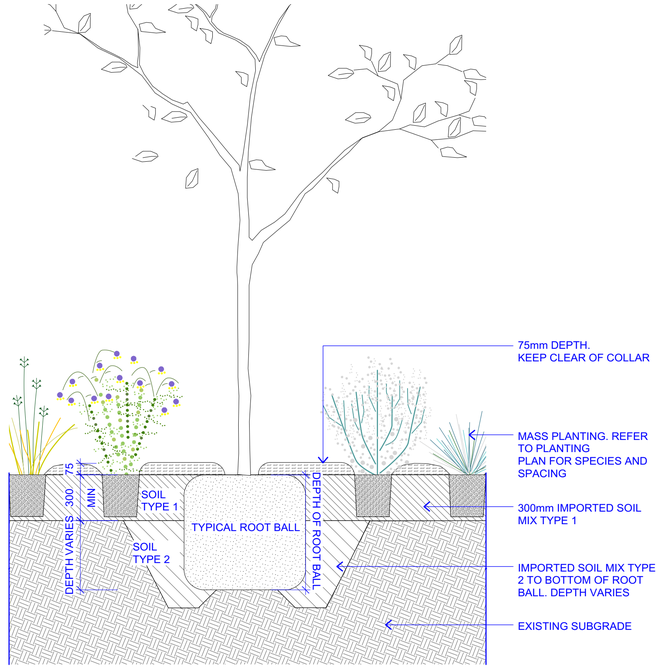
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	AS SHOWN

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-802

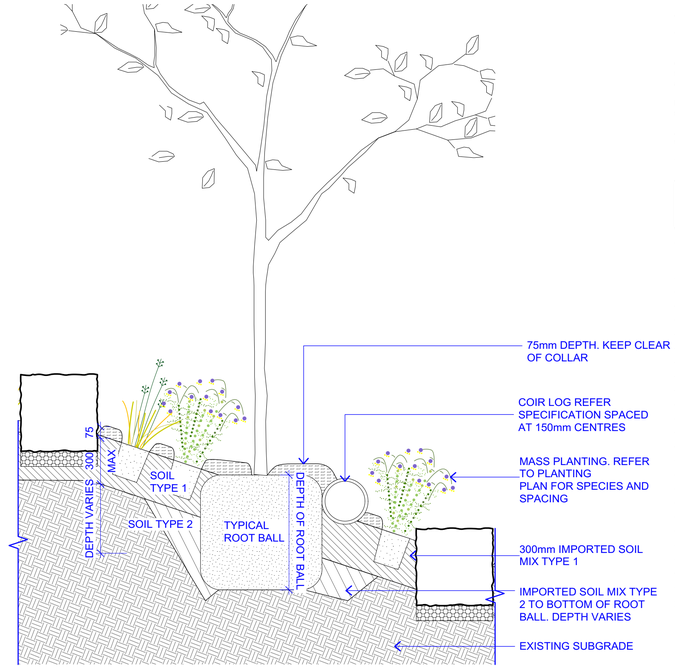
REVISION 1



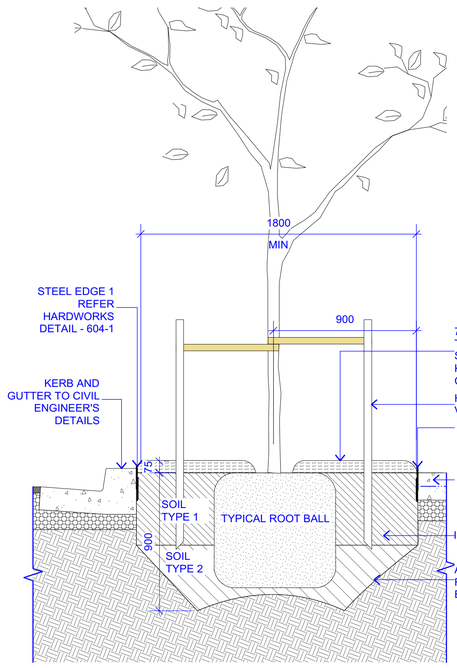
1 SOFTWORKS 10 | HOSPITAL RD PLANTING | ADJACENT BRICK WALL SW10
1:10 SECTION



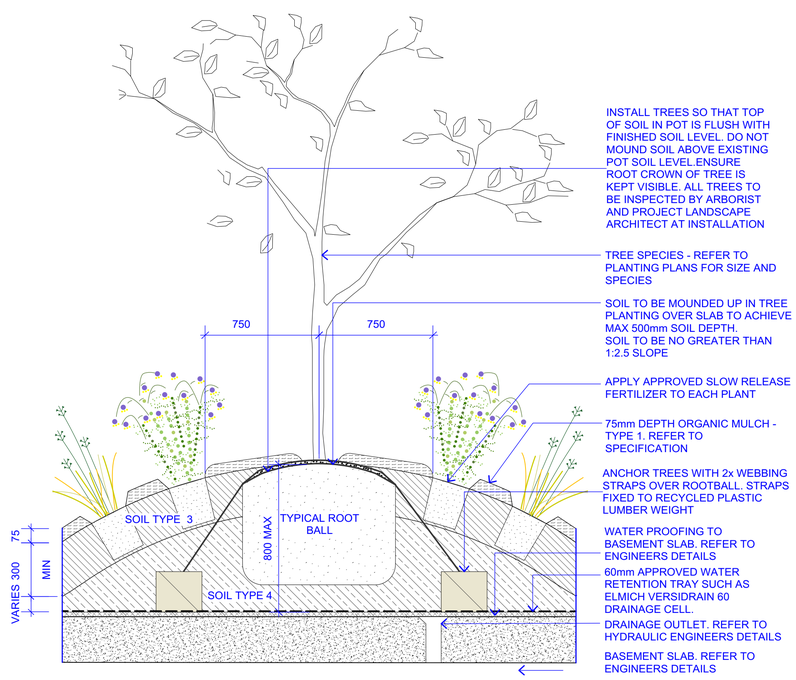
2 TREE TYPE 1 | ON GRADE TP1
1:20 SECTION



3 TREE TYPE 2 | ON EMBANKMENT TP2
1:20 SECTION



4 TREE TYPE 3 | ON GRADE - STREET TREES (RANDWICK COUNCIL STANDARD) TP3
1:20 SECTION



5 TREE TYPE 4 | ON CONCRETE SLAB TP4
1:20 SECTION

STATUS

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CLIENT

LENDLEASE
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Barangaroo NSW 2

PROJECT

Randwick Hospital Campus

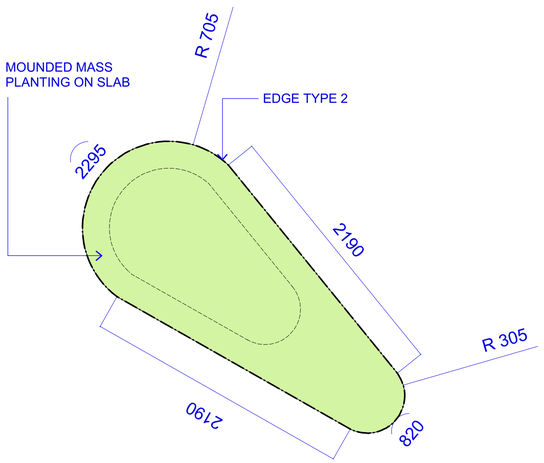
DRAWING

Softworks Details
ASB

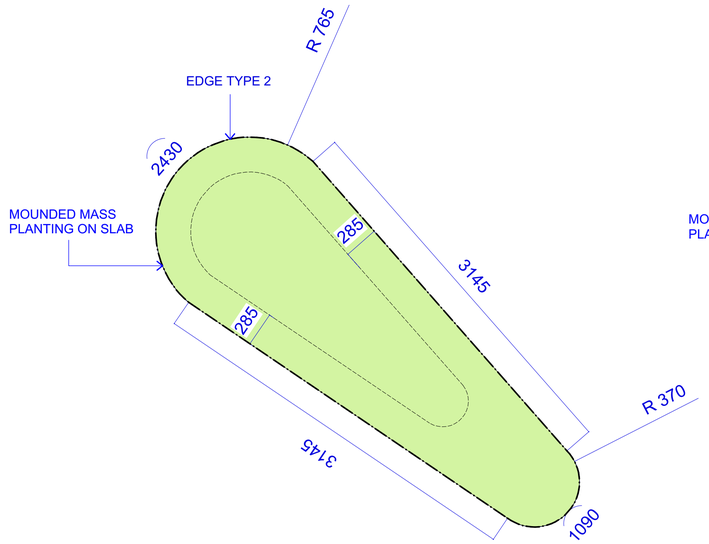
DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	AS SHOWN

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-803

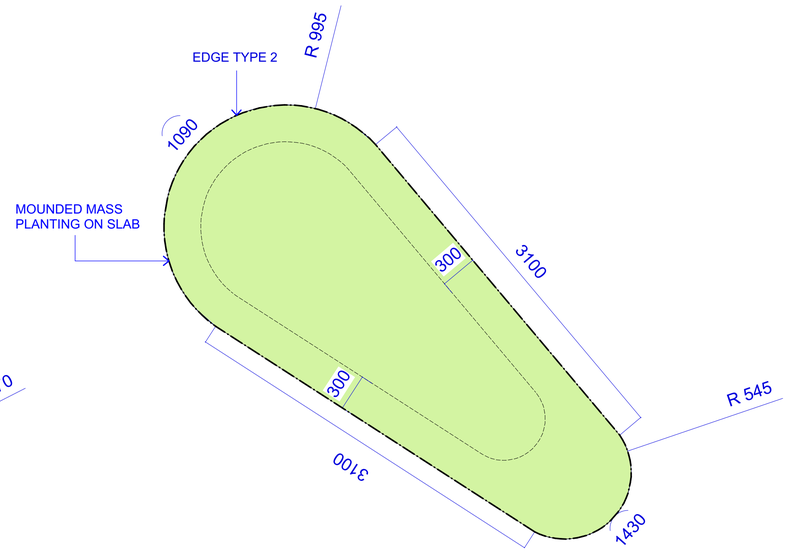
REVISION 1



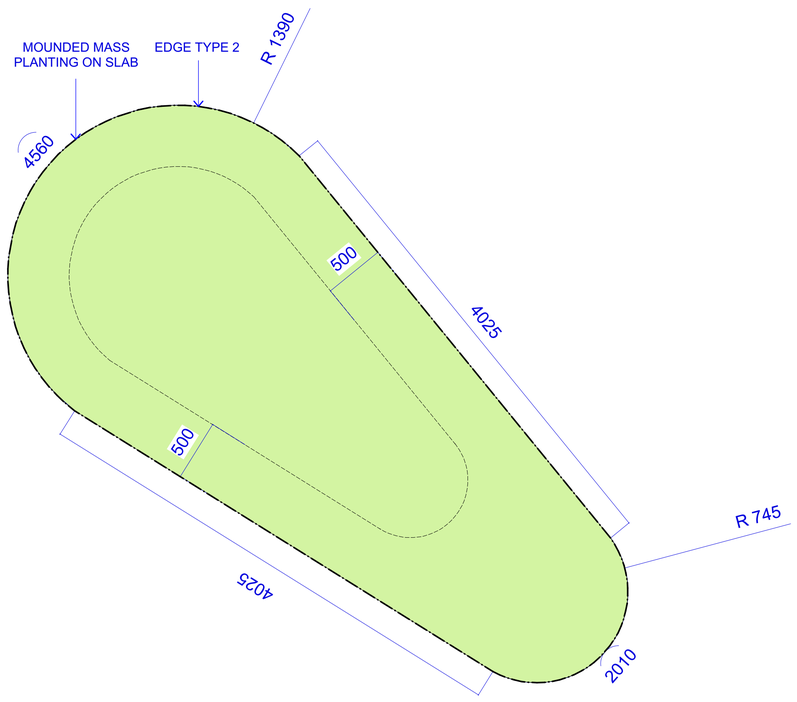
1 TERRACE PLANTING | TYPE 1 SW8
1:25 PLAN DETAIL



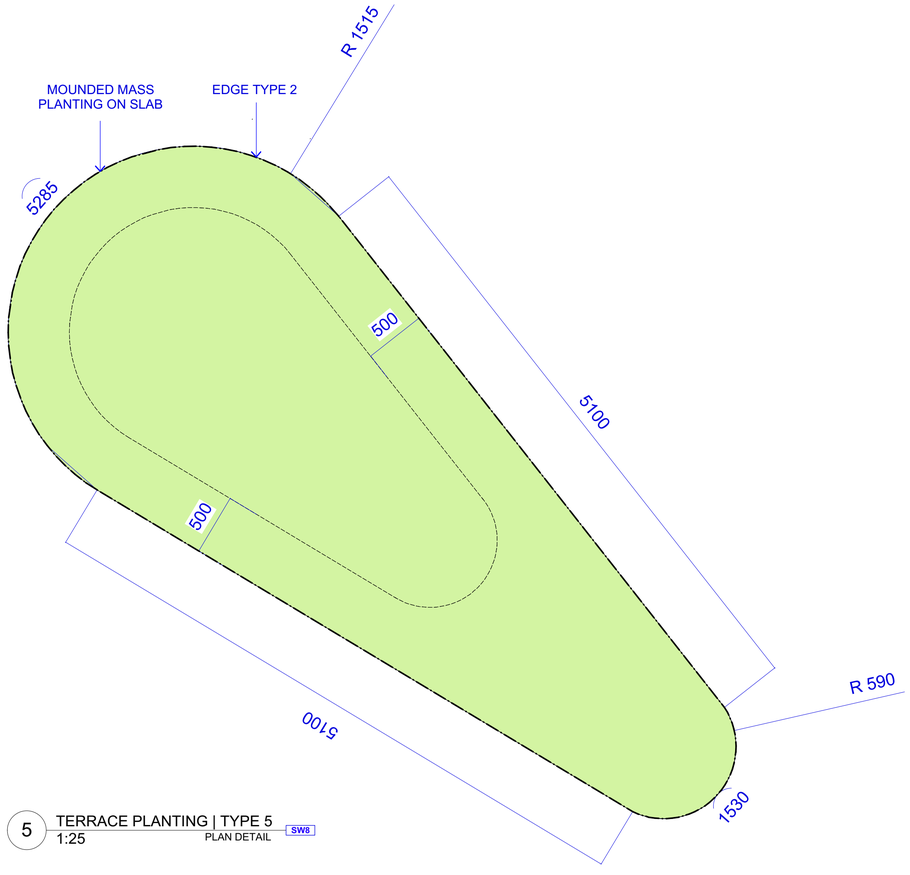
2 TERRACE PLANTING | TYPE 2 SW8
1:25 PLAN DETAIL



3 TERRACE PLANTING | TYPE 3 SW8
1:25 PLAN DETAIL



4 TERRACE PLANTING | TYPE 4 SW8
1:25 PLAN DETAIL



5 TERRACE PLANTING | TYPE 5 SW8
1:25 PLAN DETAIL

STATUS

APPROVED FOR CONSTRUCTION

NOTES

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WARNING

DIAL BEFORE YOU DIG www.1100.com.au

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REV	DATE	AMENDMENTS
1	26/05/21	APPROVED FOR CONSTRUCTION

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CLIENT

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Level 14, Tower Three
International Towers Sydney
Barangaroo NSW 2

PROJECT

Randwick Hospital Campus

DRAWING

Softworks Details
Terrace Planting

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	AS SHOWN

DRAWING NO. RCR-ASP-LA-30-DRW-26G-NL0-804

REVISION 1

PLANT SCHEDULE: TREES

ID	Botanical Name	Common Name	Scheduled Size	Qty	Spacing (mm)	Mature Height	Mature Spread	Endemic or Native
Trees								
AC	*Angophora costata*	Sydney Red Gum	100L	9	AS SHOWN	15 - 20m	6 - 10m	Endemic
BI	*Banksia integrifolia*	Coastal Banksia	100L	32	AS SHOWN	5 - 10m	3.5 - 6m	Endemic
BSe	*Banksia serrata*	Old Man Banksia	100L	15	AS SHOWN	5 - 10m	3.5 - 6m	Endemic
BC	*Buckinghamia celsissima*	Ivory Curl Tree	100L	4	AS SHOWN	5 - 10m	3.5 - 6m	Native
CaC	*Callistemon citrinus*	Lemon-scented Bottlebrush	100L	9	AS SHOWN	1.5 - 3m	1.2 - 2.0m	Endemic
CoG	*Corymbia gummifera*	Red Bloodwood	100L	7	AS SHOWN	15 - 20m	3.5 - 6m	Endemic
EH	*Eucalyptus haemastoma*	Scribbly Gum	100L	15	AS SHOWN	10 - 15m	6 - 10m	Native
ER	*Eucalyptus robusta*	Swamp Mahogany, Bengaly	100L	7	AS SHOWN	25 - 30m	3.5 - 6m	Endemic
GB	*Grevillea baileyana*	Brown Silky Oak/ White Oak	100L	13	AS SHOWN	6 - 8m	2 - 4m	Native
LC	*Lophostemon confertus*	Brush Box	100L	33	AS SHOWN	20 - 25m	6 - 10m	Native
TOTAL				144				

PLANT SCHEDULE: FEATURE SHRUBS

ID	Botanical Name	Common Name	Scheduled Size	Qty	Spacing (mm)	Mature Height	Mature Spread	Endemic / Native / Exotic
Feature Shrubs								
Al	*Acacia longifolia*	Sydney Golden Wattle	200mm	6	AS SHOWN	0.9 - 1.5m	0.9 - 1.2m	Native
CyC	*Cyathea cooperi*	Lacy Tree Fern	5L	7	AS SHOWN	10 - 15m	0.6 - 0.9m	Native
DE	*Doryanthes excelsa*	Gymea Lily, Giant Lily	25 L	53	AS SHOWN	1.5m	1m	Native
Dp	*Doryanthes palmeri*	Giant Spear Lily	5L	24	AS SHOWN	1.5 - 3m	1.2 - 2.0m	Native
Mco	*Macrozamia communis*	Burrawang	300mm	9	AS SHOWN	1.5 - 3m	2.0 - 3.5m	Native
TSp	*Telopea speciosissima*	Waratah	5L	29	AS SHOWN	1.5 - 3m	0.9 - 1.2m	Native
TOTAL				128				

PLANT SCHEDULE: MIX 1 - 2520m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate	Endemic / Native / Exotic
Shrubs								
At	Acacia terminalis	Sunshine Wattle	200mm	2511	0.9 - 1.5m	1.2 - 2.0m	11/m2	Endemic
Bs	Banksia spinulosa	Banksia ' Birthday Candles'	Tube	2511	0.45 - 0.60m	1.2 - 2.0m	11/m2	Native
Gf	Grevillea flexuosa	Grevillea	200mm	2511	0.75 - 0.9m	2.0 - 3.5m	11/m2	Native
Lpc	Leptospermum hybrid	Pink Cascade	200mm	2511	.8m	1.2 - 1.5m	11/m2	Native
RhS	Rhagodia spinescens	Saltbush, Fragrant Saltbush	200mm	2511	1.50 - 3m	0.6 - 0.9m	11/m2	Native
Total:				**12555**				
Grasses / Groundcovers								
BPe	Banksia petiolaris	Prostrate Banksia	Tube	2511	0.3 - 0.45m	0.9 - 1.2m	11/m2	Native
Cap	Chrysocephalum apiculatum	Yellow Buttons	Tube	2511	0.0 - 0.3m	0.3 - 0.6m	11/m2	Native
Dr	Dianella revoluta	Spreading Flax Lily/Blue Flax Lily	Tube	2511	0.75 - 0.9m	0.3 - 0.6m	11/m2	Native
Pp	Poa poiformis	Coast Tussock-grass	Tube	2511	0.75 - 0.9m	0.3 - 0.6m	11/m2	Native
Total:				**10044**				

PLANT SCHEDULE: MIX 2 + 2.1 - 1330m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate / m	Endemic / Native / Exotic
Shrubs								
At	Acacia terminalis	Sunshine Wattle	200mm	928	0.9 - 1.5m	1.2 - 2.0m	11/m2	Endemic
Ah	Actinotus helianthi	Flannel Flower	200mm	117	1.5 - 3m	1.2 - 2.0m	11/m2	Exotic
BRo	Banksia robur	Swamp Banksia, Large-leaf Banl	200mm	929	0.9 - 1.5m	1.2 - 2.0m	11/m2	Native
Bs	Banksia spinulosa	Banksia ' Birthday Candles'	Tube	929	0.45 - 0.60m	1.2 - 2.0m	11/m2	Native
Cd	Correa Dusky Bells	Correa	200mm	118	1m	1m	11/m2	Native
Lpc	Leptospermum hybrid	Pink Cascade	200mm	928	.8m	1.2 - 1.5m	11/m2	Native
Mic	Micromyrtus ciliata	Fringed heath myrtle	200mm	928	0.6 - 0.75m	0.6 - 0.9m	11/m2	Native
Pl	Pimelea linifolia	Slender Rice-flower	200mm	929	0.45 - 0.6m	0.0 - 0.3m	11/m2	Endemic
Vp	Verticordia plumosa	Plumed Feather Flower	200mm	929	0.90 - 1.50m	0.6 - 0.9m	11/m2	Native
Total:				**6735**				
Grasses / Groundcovers								
BPe	Banksia petiolaris	Prostrate Banksia	Tube	929	0.3 - 0.45m	0.9 - 1.2m	11/m2	Native
Dr	Dianella revoluta	Spreading Flax Lily/Blue Flax Lily	Tube	929	0.75 - 0.9m	0.3 - 0.6m	11/m2	Native
Dre	Dichondra repens	Kidney Weed	Tube	929	0.0 - 0.3m	0.9 - 1.2m	11/m2	Native
Hv	Hardenbergia violacea	Purple Coral Pea	200mm	120	0.3 - 0.45m	0.3 - 0.6m	11/m2	Exotic
Ttw	Tetratheca thymifolia white	Black eyed Susan	200mm	929	0.45 - 0.60m	0.3 - 0.6m	11/m2	Native
Vh	Viola hederacea	Native Violet	Tube	929	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
Total:				**4765**				

PLANT SCHEDULE: MIX 3 - 166m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate / m	Endemic / Native / Exotic
Shrubs								
Aa	Asplenium australasicum	Bird's nest fern	200mm	97	0.9 - 1.5m	2.0 - 3.5m	11/m2	Native
Bg	Blechnum gibbum	Silver Lady	200mm	97	0.75 - 0.9m	0.9 - 1.2m	11/m2	Native
Cl	Calathea lancifolia	Rattlesnake plant	200mm	97	1.5 - 3m	2.0 - 3.5m	11/m2	Exotic
Ce	Calocasia esculenta 'Black Magic'	Taro	200mm	97	0.75 - 0.9m	0.9 - 1.2m	11/m2	Exotic
Cm	Clivia miniata	Bush Lily	200mm	97	0.45 - 0.6m	0.3 - 0.6m	11/m2	Exotic
Cf	Cordyline fruticosa Negra	Cordyline	200mm	97	1.5 - 3m	0.9 - 1.2m	11/m2	Native
Cb	Ctenanthe burle marxii	Fishbone prayer plant	200mm	97	0.30 - 0.45m	0.3 - 0.6m	11/m2	Exotic
Ih	Iresine herbstii	Blood leaf	200mm	97	0.75 - 0.9m	0.3 - 0.6m	11/m2	Exotic
Md	Monstera delicosa	Fruit salad plant	200mm	97	1.5 - 3m	1.2 - 2.0m	11/m2	Exotic
Sm	Sansevieria moonshire	Mother-in-law tongue	200mm	97	0.3 - 1m	1.2 - 2.0m	11/m2	Exotic
St	Sansevieria trifasciata	Snake plant	200mm	97	0.3 - 1m	1.2 - 2.0m	11/m2	Exotic
Total:				**1067**				
Grasses / Groundcovers								
Ar	Ajuga reptans	Bugle, Wild Mint	Tube	97	0.0 - 0.3m	0.6 - 0.9m	11/m2	Exotic
Alc	Alpinia caerulea	Native Ginger	Tube	97	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
Br	Bauera rubioides	River Rose, Dog Rose	Tube	97	0.75 - 0.9m	1.2 - 2.0m	11/m2	Native
Cc	Chlorophytum comosum	Spider plant	Tube	97	0.45 - 0.60m	0.3 - 0.6m	11/m2	Exotic
Dre	Dichondra repens	Kidney Weed	Tube	97	0.0 - 0.3m	0.9 - 1.2m	11/m2	Native
Oj	Ophiopogon japonicus	Mondo Grass	Tube	97	0.0 - 0.3m	0.0 - 0.3m	11/m2	Exotic
Tz	Tradescantia zebrina	Spiderwort	Tube	97	0.45 - 0.6m	0.0 - 0.3m	11/m2	Exotic
Total:				**679**				

PLANT SCHEDULE: MIX 4 - Pots - 17m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate / m	Endemic / Native / Exotic
Shrubs								
Aa	Asplenium australasicum	Bird's nest fern	200mm	30	0.9 - 1.5m	2.0 - 3.5m	11/m2	Native
Bg	Blechnum gibbum	Silver Lady	200mm	15	0.75 - 0.9m	0.9 - 1.2m	11/m2	Native
Ce	Calocasia esculenta 'Black Magic'	Taro	200mm	15	0.75 - 0.9m	0.9 - 1.2m	11/m2	Exotic
Cb	Ctenanthe burle marxii	Fishbone prayer plant	200mm	15	0.30 - 0.45m	0.3 - 0.6m	11/m2	Exotic
Px	Philodendron 'Xanadu'	Xanadu	200mm	15	0.3 - 1m	0.5 - 1m	11/m2	Exotic
Total:				**90**				
Grasses / Groundcovers								
Dc	Dianella caerulea 'Little Jess'	Little Jess	Tube	15	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
Dsf	Dichondra 'Silver Falls'	Silver Falls	Tube	30	0.0 - 0.3m	0.9 - 1.2m	11/m2	Native
Lm	Liriope muscari 'Just Right'	Liriope	Tube	30	0.0 - 0.3m	0.0 - 0.3m	11/m2	Exotic
Ng	Neomarica gracilis	Walking Iris	Tube	15	0.75 - 0.9m	0.0 - 0.3m	11/m2	Exotic
Vh	Viola hederacea	Native Violet	Tube	30	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
Total:				**120**				

PLANT SCHEDULE: MIX 5 - 34m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate / m	Endemic / Native / Exotic
Grasses								
Fn	Ficinia nodosa	knobby club-rush	Tube	187	0.75 - 0.9m	0.0 - 0.3m	11/m2	Native
Ll-t	Lomandra longifolia 'Tanika'	Spiny-headed mat rush	Tube	187	0.45 - 0.6m	0.6 - 0.9m	11/m2	Native
				0			11/m2	
Total:				**374**				

PLANT SCHEDULE: TURF/HYDROSEED

Category / ID	Botanical Name	Common Name	Sq/m	Endemic / Native / Exotic
Turf				
	Elymus repens	Couch grass	872m2	Exotic
Hydroseed				
			2857m2	

PLANT SCHEDULE: MIX 6 - PECC - 12.75m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate / m	Endemic / Native / Exotic
Plants								
16	16	16	16	64	16	16	11/m2	16
Alc	Alpinia caerulea	Native Ginger	Tube	4	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
Aa	Asplenium australasicum	Bird's nest fern	200mm	4	0.9 - 1.5m	2.0 - 3.5m	11/m2	Native
Bg	Blechnum gibbum	Silver Lady	200mm	4	0.75 - 0.9m	0.9 - 1.2m	11/m2	Native
Cl	Calathea lancifolia	Rattlesnake plant	200mm	4	1.5 - 3m	2.0 - 3.5m	11/m2	Exotic
Ce	Calocasia esculenta 'Black Magic'	Taro	200mm	4	0.75 - 0.9m	0.9 - 1.2m	11/m2	Exotic
Cm	Clivia miniata	Bush Lily	200mm	4	0.45 - 0.6m	0.3 - 0.6m	11/m2	Exotic
Cf	Cordyline fruticosa Negra	Cordyline	200mm	4	1.5 - 3m	0.9 - 1.2m	11/m2	Native
Cb	Ctenanthe burle marxii	Fishbone prayer plant	200mm	4	0.30 - 0.45m	0.3 - 0.6m	11/m2	Exotic
Dc	Dianella caerulea 'Little Jess'	Little Jess	Tube	4	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
Dre	Dichondra repens	Kidney Weed	Tube	4	0.0 - 0.3m	0.9 - 1.2m	11/m2	Native
Dsf	Dichondra 'Silver Falls'	Silver Falls	Tube	4	0.0 - 0.3m	0.9 - 1.2m	11/m2	Native
Ih	Iresine herbstii	Blood leaf	200mm	4	0.75 - 0.9m	0.3 - 0.6m	11/m2	Exotic
Lm	Liriope muscari 'Just Right'	Liriope	Tube	4	0.0 - 0.3m	0.0 - 0.3m	11/m2	Exotic
Oj	Ophiopogon japonicus	Mondo Grass	Tube	4	0.0 - 0.3m	0.0 - 0.3m	11/m2	Exotic
Px	Philodendron 'Xanadu'	Xanadu	200mm	4	0.3 - 1m	0.5 - 1m	11/m2	Exotic
Vh	Viola hederacea	Native Violet	Tube	4	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
				0			11/m2	
Total:				**64**				

PLANT SCHEDULE: MIX 7 + 7.1 + 7.2 - Hospital Rd Walls + Street - 71.5m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate / m	Endemic / Native / Exotic
Plants								
Cm	Clivia miniata	Bush Lily	200mm	27	0.45 - 0.6m	0.3 - 0.6m	11/m2	Exotic
Dc	Dianella caerulea 'Little Jess'	Little Jess	Tube	27	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
Dr	Dianella revoluta	Spreading Flax Lily/Blue Flax	Tube	105	0.75 - 0.9m	0.3 - 0.6m	11/m2	Native
Dre	Dichondra repens	Kidney Weed	Tube	124	0.0 - 0.3m	0.9 - 1.2m	11/m2	Native
Lpc	Leptospermum hybrid	Pink Cascade	200mm	27	.8m	1.2 - 1.5m	11/m2	Native
Lm	Liriope muscari 'Just Right'	Liriope	Tube	27	0.0 - 0.3m	0.0 - 0.3m	11/m2	Exotic
Px	Philodendron 'Xanadu'	Xanadu	200mm	27	0.3 - 1m	0.5 - 1m	11/m2	Exotic
Tj	Trachelospermum jasminoides	Star Jasmine	200mm	97	0.45 - 0.6m	0.3 - 0.6m	11/m2	Exotic
Vh	Viola hederacea	Native Violet	Tube	124	0.45 - 0.6m	0.3 - 0.6m	11/m2	Native
				0			11/m2	
Total:				**585**				

PLANT SCHEDULE: MIX 11 - Hospital Rd & Kiloh Path - 158m2

Category / ID	Botanical Name	Common Name	Pot Size	Qty	Mature Height	Mature Spread	Rate / m	Endemic / Native / Exotic
Plants								
Bs	Banksia spinulosa	Banksia ' Birthday Candles'	Tube	123	0.45 - 0.60m	1.2 - 2.0m	11/m2	Native
Dr	Dianella revoluta	Spreading Flax Lily/Blue Flax	Tube	123	0.75 - 0.9m	0.3 - 0.6m	11/m2	Native
Fn	Ficinia nodosa	knobby club-rush	Tube	123	0.75 - 0.9m	0.0 - 0.3m	11/m2	Native
Ju	Juncus usitatus	Common Rush	Tube	123	0.8m	0.3m	11/m2	Native
Ll	Lomandra longifolia	Basket Grass	140mm	123	0.6m	0.6m	11/m2	Native
Mic	Micromyrtus ciliata	Fringed heath myrtle	200mm	123	0.6 - 0.75m	0.6 - 0.9m	11/m2	Native
MyPa	Myoporum parvifolium	Carpet Spreading Myoporum	Tube	123	0.3m	3m	11/m2	Native
Ng	Neomarica gracilis	Walking Iris	Tube	123	0.75 - 0.9m	0.0 - 0.3m	11/m2	Exotic
Wf-1	Westringia fruticosa 'Mundi'	Mundi	200	123	0.5m	1.5m	11/m2	Endemic
				0			11/m2	
Total:				**1107**				

NOTE: LOCAL PROVENANCE PREFFERED

STATUS

APPROVED FOR CONSTRUCTION

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DIAL BEFORE YOU DIG www.1100.com.au®

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REV	DATE	AMENDMENTS
1	26/05/21	APPROVED FOR CONSTRUCTION
2	16/06/21	APPROVED FOR CONSTRUCTION
3	05/07/21	APPROVED FOR CONSTRUCTION

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NOTE:
REFER TO THE SPECIFICATION SCHEDULE + DETAILS FOR DETAILED SELECTION INFORMATION.

REFER TO CIVIL ENGINEERS DRAWING FOR:
- LEVELS AND GRADING INFORMATION
- PIT AND PIPE LOCATIONS
- DRAINAGE POINTS AND FALLS

REFERTO ELECTRICAL ENGINEERS DRAWINGS FOR LIGHTING DETAIL.

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PROJECT

Randwick Hospital Campus

DRAWING

Planting Schedule

DRAWN	CHECKED	SCALE @ A1
JT | CK	JK | KL	NTS

DRAWING NO.

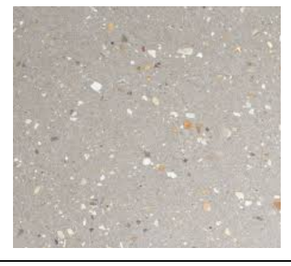
RCR-ASP-LA-30-SCH-26K-NL0-300

REVISION

3

RANDWICK HOSPITAL CAMPUS
LANDSCAPE SELECTIONS SCHEDULE

Document No: RCR-ASP-LA-30-SCH-26Y-NL0-100-01
Date: 5/07/2021
Revision: 2
Issue: Approved For Construction

CATEGORY	CODE	DESCRIPTION	SELECTION + SPECIFICATION	RECOMMENDED SUPPLIER	SAMPLE, SHOP DRAWING & ADDITIONAL REQUIREMENTS (to be submitted 5 days prior to required sign-off)	REFERENCE PHOTO
PAVEMENTS AND SURFACES						
	PV-B.1 PV-B.2	Concrete Unit Pavers	**Colour: 'Marino'** , **Finish: shot blasted finish** Plan dimension: 300 x 600mm Thickness: 50mm Slip Resistance Classification (AS4586): P4 Pattern: Refer to details. Joint: 5mm wide, 3mm raked mortar joint Grout Colour: Laticrete 'Smoke Grey' Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing Sealer: DuPont StoneTech Professional Heavy Duty Exterior Sealer- To manufacturers recommendation		General: Submit labelled samples of pavers illustrating the range of variation in colour and finish Samples: Submit colour samples of visible joint sealants.	
	PV-C	Concrete Unit Pavers	**Colour: Marino'** , **Finish: shot blasted finish** Plan dimension: 300 x 150mm Thickness: 50mm Slip Resistance Classification (AS4586): P4 Pattern: Refer to details. Joint: 5mm wide, 3mm raked mortar joint Grout Colour: Laticrete 'Smoke Grey' Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing Sealer: DuPont StoneTech Professional Heavy Duty Exterior Sealer- To manufacturers recommendation	Supplier: Stone Contact: enquiries@stoneoutdoors.com.au 03 8770 6000	General: Submit labelled samples of pavers illustrating the range of variation in colour and finish.	
	PV-D	Crushed Stabilised Sandstone	Type: Crushed material produced from Hawkesbury sandstone Particle Size: 75mm Surface Finish: Levelled	Supplier: ANL Landscapes Contact: 317 Mona Vale Road, Terrey Hills, NSW 2084 T: (02) 9450 1444	Samples: Stockpile of sandstone to be approved prior to batching. To be signed by landscape architect and client. Must be approved prior to installation. Prototype: 1m x 1m with substrate & edging installed. Prototype may form part of final landscape if approved.	
	PV-E	Concrete Path	Colour: Portland Grey Primary finish: Medium broom finish generally perpendicular to the direction of travel. Supplementary finish: N/A Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing Slip Resistance Classification (AS4586):): P4 where grade is less than 1:33 (3%), P5 where grade is steeper than 1:33 (3%) Joints: To engineers details. Sealant: N/A		Samples: None Prototype: 4 each at 1m x 1m with substrate & finish as documented. Prototype will not form part of final landscape	
	PV-F.1	Exposed Aggregate concrete Path	Colour: Portland Grey Primary finish: Medium broom finish generally perpendicular to the direction of travel. Supplementary finish: N/A Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing Slip Resistance Classification (AS4586):): P4 where grade is less than 1:33 (3%), P5 where grade is steeper than 1:33 (3%) Joints: To engineers details. Sealant: N/A		Samples: None Prototype: 4 each at 1m x 1m with substrate & finish as documented. Prototype will not form part of final landscape	

CATEGORY	CODE	DESCRIPTION	SELECTION + SPECIFICATION	RECOMMENDED SUPPLIER	SAMPLE, SHOP DRAWING & ADDITIONAL REQUIREMENTS (to be submitted 5 days prior to required sign-off)	REFERENCE PHOTO
	PV-F.2	Exposed Aggregate concrete Path	Colour: Portland Grey Primary finish: Medium broom finish generally perpendicular to the direction of travel. Supplementary finish: N/A Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing Slip Resistance Classification (AS4586):): P4 where grade is less than 1:33 (3%), P5 where grade is steeper than 1:33 (3%) Joints: To engineers details. Sealant: N/A		Samples: None Prototype: 4 each at 1m x 1m with substrate & finish as documented. Prototype will not form part of final landscape	
	PV-G.1	Interlocking, Tri-hex, Vehicular Unit Pavers	**Colour: Adbri colour to match - Euro Classic 'Prague' colour or Standard Charcoal** **Finish: shot blasted finish** Plan dimension: 181 x 88 x 80mm Thickness: 80mm Slip Resistance Classification (AS4586): P5 Pattern: Tri-hex - Refer to details. Joint: 5mm wide, 3mm sand swept joint Basecourse: Mortar Bed, Refer to Civil Engineers Drawing Subgrade: Structural Slab Refer to Civil Engineers Drawing Sealer: DuPont StoneTech Professional Heavy Duty Exterior Sealer- To manufacturers recommendation	Supplier: Adbri Contact: 20 Kelso Crescent, Moorebank, NSW 2170 Australia. Phone: (02) 9822 6822 Fax: (02) 9822 6822	General: Submit labelled samples of pavers illustrating the range of variation in colour and finish.	
	PV-G.2	Interlocking, Tri-hex, Vehicular Unit Pavers - Line Marking	**Colour: Adbri colour to match - Euro Classic 'Cypress' colour or Standard Oatmeal** **Finish: Shot blasted** Plan dimension: 181 x 88 x 80mm Thickness: 80mm Slip Resistance Classification (AS4586): P5 Pattern: Tri-hex - Refer to details. Joint: 5mm wide, 3mm sand swept joint Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing Sealer: DuPont StoneTech Professional Heavy Duty Exterior Sealer- To manufacturers recommendation	Supplier: Adbri Contact: 20 Kelso Crescent, Moorebank, NSW 2170 Australia. Phone: (02) 9822 6822 Fax: (02) 9822 6822	General: Submit labelled samples of pavers illustrating the range of variation in colour and finish.	
	PV-H	Concrete Unit Paver Banding	**Colour: 'Marino' ,** **Finish: shot blasted finish** Plan dimension: 200x100mm Thickness: 80mm Slip Resistance Classification (AS4586): P4 Pattern: Refer to details. Joint: 5mm wide, 3mm sand swept joint Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing Sealer: DuPont StoneTech Professional Heavy Duty Exterior Sealer- To manufacturers recommendation	Supplier: Stone Contact: enquiries@stoneoutdoors.com.au 03 8770 6000	General: Submit labelled samples of pavers illustrating the range of variation in colour and finish.	

CATEGORY	CODE	DESCRIPTION	SELECTION + SPECIFICATION	RECOMMENDED SUPPLIER	SAMPLE, SHOP DRAWING & ADDITIONAL REQUIREMENTS (to be submitted 5 days prior to required sign-off)	REFERENCE PHOTO
	PV-I	Rubber Softfall	Surfacing: 20mm Depth EPDM (Ethelyne Propylene Diene Monomer) rubber wearing layer. Thicken to adjoining finish at junctions with adjacent paving. Sub surface: Rubber base layer to meet fall attenuation requirements to be determined by manufacturer's specifications. Rubber Wear Layer: German Melos EPDM wetpour playground surfacing. Granule size 1-3 mm. Wear layer shall be UV stable, with no granulated dust under 1mm in size. **Colours: 30% Brown (RH32), 40% Beige (RH30) 30% Light Grey (RH61)** Base Layer: Where required, shall be recycled SBR tyre rubber granule to graded size 8-15 mm, free from all deleterious material such as nylon or loose wire fibres. The Contractor shall confirm binder source with the landscape architect. Binder: Shall be a proprietary single pack polyurethane rubber crumb binder, similar or equal to "Procure" as produced by B.A.S.F. Polyurethane Resins. A "soft" binder is recommended. It is unacceptable to mix two products from different sources. The Contractor shall confirm binder source with the landscape architect. Basecourse: DGB 20 Road base To Civil Engineer's Drawings Note: Application as per manufacturer's specification	Softfall Supplier: Rosehill TPV Tel: 02 9986 2445 Fax: 02 9944 6479 Address: Unit 12, 1-3 Jubilee Ave, Warriewood, NSW 2102	General: Samples and colour mixes to be supplied prior to installation	
	PV-J	Concrete Unit Pavers on pedestals	**Colour: 'Marino' ,** **Finish: shot blasted finish** Plan dimension: 300 x 600mm Thickness: 50mm Slip Resistance Classification (AS4586): P4 Pattern: Refer to details. Joint: 5mm wide, Footing: Elmich VersiJack (ref VJ Specification)	Supplier: Stone Contact: enquiries@stoneoutdoors.com.au 03 8770 6000		
	VJ	Elmich VersiPave	Product: Elmich VersiPave Material: Polypropylene Colour: Black Weight VersiPave GP 130 g 10 mm Extender 80 gm 30 mm Extender 140 gm Height Range: 24 mm to 34mm - 1mm increments Up to 150 mm (with Extenders) Dimensions Head diameter: 162 mm Base Spacers Width: 4 mm Slope Compensation 0 to 5% @ 1% increments Installation: per manufacturers recommendation	Supplier: Elmich 18/8 Avenue of Americas Newington NSW 2127 Australia Phone: 61 2 9648 2073 Fax: 61 2 9648 4731 Email: australia@elmich.com.au	General: Submit samples of paving jacks and extenders	
	LM1	Linemarking Dot	Product: Seton Road marking Dot Material: Injection moulded plastic **Colour: White** Installation: fix to concrete pavers using a suitable 2-part epoxy adhesive system as per manufacturers recommendation	Supplier: Seton Australia 2 Bellevue Circuit Greystanes, NSW 2145 Phone:1800 531 493 Fax: 1800 678 796 Email: seton_aust@seton.com	General: Submit samples prior to installation	

CATEGORY	CODE	DESCRIPTION	SELECTION + SPECIFICATION	RECOMMENDED SUPPLIER	SAMPLE, SHOP DRAWING & ADDITIONAL REQUIREMENTS (to be submitted 5 days prior to required sign-off)	REFERENCE PHOTO
STAIRS WALLS AND EDGES						
	W01	Powder Coated Steel Edge fixed to Blockwork Hob	Selection: Powdercoated Mild Steel Plate fixed to Concrete blockwork hob (Boral) Steel Thickness: 6mm Steel Height: 300mm (or to height to ensure face of block behind is concealed Fixings: Fixing to blockwork to structural concrete slab. Fixing and waterproofing to engineers / architects specification. Steel Fixings: Gal. Steel brackets and fins at min 500mm centres (and at corners) refer to detail Chemset bracket to blockwork face with 10mm dowel and to top with M10 bolt (to engineer's detail) **Powdercoating Colour - Dulux ELECTRO® MEDIUM BRONZE FLAT - 9068183K** Refer to Specification	Supplier - Blockwork: Boral Contact: 02 9033 4000 Supplier - Steel: Australian Steel Contact: 64 Mills Rd Braeside VIC 3195 Email: steel@australiansteel.com.au Phone: 03 9580 2200 (Sales Hotline 24/7) Fax: 03 9580 8400	samples: Steel edging (300mm length) Powdercoating colour and finish General: Submit a sample of the finished product for each different coating system. Size of each sample: 400 x 400 mm. Retention: Retain half of each sample for comparison during coating application	
	W02	Sandstone Log Wall	Selection: Sandstone Log, Source Option A: Site recycled sandstone. Source Option B: New stone from Gosford Quarry 1m Grade B Sandstone Logs Dimensions: 900/1100 (L) X 350/550 (W) X 450/550 (H) Quarry Sawn and Split, Quarry Run, No Colour Selection Basecourse: Refer to Civil Engineers Drawing Subgrade: Refer to Civil Engineers Drawing	Supplier: Gosford Quarry Contact: TERREY HILLS SHOWROOM 301 Mona Vale Rd, Terrey Hills 2084 Sydney Australia Email: sales@gosfordquarries.com.au Phone: (02) 8585 8282		
	W04	Insitu Concrete Wall or reinforced, rendered and painted concrete wall - Height Varies	**Colour: Portland Grey** **Finish: Class 2**			
	Protective Coating	Anti Grafitti coating to exposed insitu concrete landscape walls		Nanokote Pty Ltd or similar approved 6-8 England St Dandenong VIC 3175 T: (03) 9768 3277 W: www.nanokote.com.au	To be reapplied as per manufacturer's instructions	

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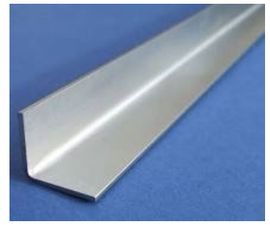
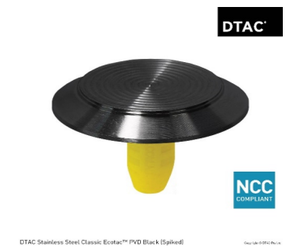
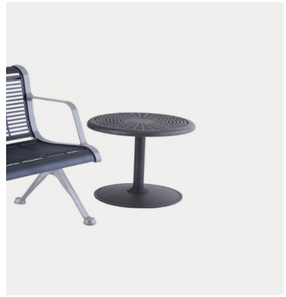
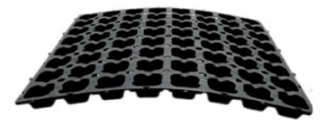
	SE1	Steel Edge	Dimension: 150x6mm Finish: hot-dipped galvanised steel to AS4680:2006 Fixing: N16 300-500mm hot dipped galvanised dowels at min 500mm centres and at corners		Samples: Hot dipped gal, steel edging (300mm length)	
	SE2	Steel Edge	Dimension: EA1506 (150x150x6mm) Finish: hot-dipped galvanised steel angle to AS4680:2006 Fixing: Chemset to structural slab to engineer's detail. Waterproofing to Architects detail		Samples: Hot dipped gal, steel edging (300mm length)	
	ST1	Insitu Concrete Stair	Selection: Insitu concrete Size: Refer to details Colour: Portland Grey cement). Aggregate size: 6-14mm (subject to review and approval of prototype) Surface finish: Milled with light shot blast to top surface only as required to meet slip resistance requirements. Slip Resistance Classification (AS4586): P4 Joints: Refer to engineers details Reinforcing: To Structural Engineer's details Nosings: DTAC Flat Recessed - DE0690B • 58mm x 5mm - up to 2.5m lengths • Anodised aluminium with solid black protruding anti-slip carborundum strips, R13 Slip rating and luminance contrast requirements.		Samples: 1 x length Prototype: Shop drawings to be provided by supplier, fabricator or manufacturer for approval to fabrication Luminance contrast testing required prior to installation to achieve a luminance contrast to the background surface meeting clause 2.2 of AS1428.4.1 in both wet and dry conditions.	 
	PR	Pram Ramp	TO MATCH PV-E TO CIVIL ENGINEER'S DETAILS		Samples: 3 x samples required for product approval to be signed by landscape architect and client. Must be approved prior to installation. Prototype: 1m x 1m with substrate & finish as documented. Prototype may form part of final landscape if approved.	
	TI	Tactile Ground Surface indicators	Selection: DTAC - Warning Tactile in Stainless steel finish Finish: CNC turning method completed to a mill finish. NOTES: Item has been selected based on contrast to selected adjacent paving materials, however this must be tested in-situ after paving is installed and finished. Using sample, confirm on site that tactile indicator complies with AS1428.4 (2009) requirement for 45% luminance contrast with surrounding pavement. Contractor to engage a qualified consultant such as Safe Environments to perform insitu testing prior to completing order of tactile. If samples do not comply, notify landscape architect prior to making alternative selection.	Supplier: DTAC or approved equivalent. Contact: 1300 793 478 Testing consultant: Safe Environments Contact: 02 9621 3706	Samples: 3 x tactile indicators. Must be approved prior to installation. Prototype: 1 x 600mm width x min 1000mm length to be installed. Approved prototype may form part of final landscape	

CATEGORY	CODE	DESCRIPTION	SELECTION + SPECIFICATION	RECOMMENDED SUPPLIER	SAMPLE, SHOP DRAWING & ADDITIONAL REQUIREMENTS (to be submitted 5 days prior to required sign-off)	REFERENCE PHOTO
FURNITURE AND FIXTURES						
	BE1	Bench Type 1	Customised radius version of proprietary curved bench from Commercial Systems Australia Product: HM3050 - With Arm rests Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Internal Radius: 1250mm Length: 3980mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		
	BE2	Bench Type 2	Customised radius version of proprietary curved bench from Commercial Systems Australia Product: HM3050 - With Arm rests Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Internal Radius: 1500mm Length: 4760mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		
	BE3	Bench Type 3	Customised radius version of proprietary curved bench from Commercial Systems Australia Product: HM3050 - With Arm rests Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Internal Radius: 2000mm Length: 6345mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		
	BE4	Bench Type 4	Customised radius version of proprietary curved bench from Commercial Systems Australia Product: HM3050 - With Arm rests Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Internal Radius: 3000mm Length: 9500mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		
	BE5	Bench Type 5	Straight version of proprietary bench from Commercial Systems Australia Product: HM3050 - With Arm rests Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Internal Radius: 00mm Length: 9500mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		
	BE6	Bench Type 6	Customised radius version of proprietary curved bench from Commercial Systems Australia Product: HM3050 - With Arm rests Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Internal Radius: 7900mm Length: 3860mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		
	BE7	Bench Type 7	Straight bench from Commercial Systems Australia with arm rests Product: HM3020 Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Length - 2020mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		

	BE8	Bench Type 8	Customised radius version of proprietary curved bench from Commercial Systems Australia Product: HM3050 - With Arm rests Finish: Powder coated metal Dulux colour - **White (Duralloy 271-1139S Satin)** Internal Radius: 825mm Length: 1290mm	Supplier: Commercial Systems Australia Contact: (03) 9723 4111		

CATEGORY	CODE	DESCRIPTION	SELECTION + SPECIFICATION	RECOMMENDED SUPPLIER	SAMPLE, SHOP DRAWING & ADDITIONAL REQUIREMENTS (to be submitted 5 days prior to required sign-off)	REFERENCE PHOTO
	TB1	Table Type 1	Selection: Cafe Round Table Quanity x 4 830mm (W) x 720mm (H) Dulux colour Pale Eucalyptus to frame Finishes: Cast aluminium powder coat to table top. Aluminium powder coat to frame. Dulux colour Pale Eucalypt (R:119, G:125, B:103) to table top and frame. Materials: Aluminium Fixing: Sub surfaced based plate	Supplier: Street Furniture Australia Contact: N6 Regents Park Estate, 391 Park Road, Regents Park, NSW, 2143 +61 2 8774 8888 nsw@streetfurniture.com		
	TB2	Table Type 2	Selection: Cafe Macchiato Table Quanity x 24 600mm (W) x 720mm (H) Dulux colour Pale Eucalyptus to frame Finishes: Cast aluminium powder coat to table top. Aluminium powder coat to frame. Dulux colour Pale Eucalypt (R:119, G:125, B:103) to table top and frame. Materials: Aluminium Fixing: Sub surfaced based plate	Supplier: Street Furniture Australia Contact: N6 Regents Park Estate, 391 Park Road, Regents Park, NSW, 2143 +61 2 8774 8888 nsw@streetfurniture.com		
	CH	Chair	Selection: Cafe Macchiato Table Quanity x 46 360mm (W) x 450mm (H) Dulux colour Pale Eucalyptus to frame Finishes: Cast iron powder coat to table top. Aluminium powder coat to frame. Dulux colour Pale Eucalypt (R:119, G:125, B:103) to top and frame.Materials: Aluminium Fixing: Sub surfaced based plate	Supplier: Street Furniture Australia Contact: N6 Regents Park Estate, 391 Park Road, Regents Park, NSW, 2143 +61 2 8774 8888 nsw@streetfurniture.com		
	BIN	Bin enclosure	Selection: Escola bin enclosure 120L DIMENSIONS: 570L x 590W x 1180H (mm) Single Module Angled Roof Stainless steel 316 No perforations Brushed finish Surface mounted	Supplier: Street Furniture Australia Contact: N6 Regents Park Estate, 391 Park Road, Regents Park, NSW, 2143 +61 2 8774 8888 nsw@streetfurniture.com		

	BO1	Security Bollard	Selection: LEDA Stainless Steel Bollards Code: SSP125B A Fixing: Fixed Insitu Finish: Stainless steel 316 (316 Finish required due to proximity to coast) *Non security rated bollard, Installed to civil engineers detail to manufacters reccomendation	Supplier: LEDA Security Contact: 8 Ferris Street, North Parramatta, NSW 2151 61 2 8413 3410 https://www.ledasecurity.com.au/contact-us/		
	PP2	Pot	Selection: 1000 Medium Cylinder planter Colour: Charcoal Dimension: 1000 dia x 750 mm H Product Code: CYL101075 Empty weight - 140kg	Supplier: Quatro Design 6 Kay Street, Murwillumbah Phone: 02 6672 1190 Fax: 02 6672 4411 Email: sales@quatrodesign.com.au Postal Address: PO Box 1243 Murwillumbah NSW 2484		
	PP3	Pot	Selection: 900 Cylinder planter Colour: Charcoal Dimension: 900 dia x 600 mm H Product Code: CYL909060 Empty weight - 100kg	Supplier: Quatro Design 6 Kay Street, Murwillumbah Phone: 02 6672 1190 Fax: 02 6672 4411 Email: sales@quatrodesign.com.au Postal Address: PO Box 1243 Murwillumbah NSW 2484		
	WB1	Wild Life Box - Bats	Selection: Cyplas rececyled plastic Double Chambered Micro Bat Box. Box fixed to 70mm diameter steel post as per suppliers specification. Post painted to match colour of lighting. Post installation a per engineers details.	Supplier: Hollow Log 149 Chinaman Creek Road, Cambroon, QLD 4552 Phone: 02 6672 1190 Email: hello@hollowloghomes.com		
	WB2	Wild Life Box - Galah	Selection: Cyplas rececyled plastic Galah Nesting Box. Box fixed to 70mm diameter steel post as per suppliers specification. Post painted to match colour of lighting. Post installation a per engineers details.	Supplier: Hollow Log 149 Chinaman Creek Road, Cambroon, QLD 4552 Phone: 02 6672 1190 Email: hello@hollowloghomes.com		
	WB3	Wild Life Box - Parrot	Selection: Cyplas rececyled plastic Parrot Nesting Box. Box fixed to 70mm diameter steel post as per suppliers specification. Post painted to match colour of lighting. Post installation a per engineers details.	Supplier: Hollow Log 149 Chinaman Creek Road, Cambroon, QLD 4552 Phone: 02 6672 1190 Email: hello@hollowloghomes.com		

CATEGORY	CODE	DESCRIPTION	SELECTION + SPECIFICATION	RECOMMENDED SUPPLIER	SAMPLE, SHOP DRAWING & ADDITIONAL REQUIREMENTS (to be submitted 5 days prior to required sign-off)	REFERENCE PHOTO
SOFTWORKS						
Tree Pits	TP1/TP2/TP3/TP4	Tree planting on grade, slab, Street and in mounded planting	Refer to planting plans and Softworks Details		Samples: To the External tree inspection sampling table for each tree species. Select a sample tree that is representative of the species and the batch of trees (4 trees to sample)	
Soil Types	SOIL TYPE 1,2,3,4	All planting and softworks	Refer to Technical Specification, planting plans and Softworks Details			
Organic Mulch		Description: Organic Mulch to areas of Mass Planting	Type: Forest Fines 75mm Depth Horticultural Grade Mulch	ANL Landscapes 317 Mona Vale Road,Terrey Hills, NSW 2084T: (02) 9450 1444	To be provided by supplier prior to installation	
Gravel Mulch	PV-D	Description: Rock Mulch to Non-trafficable and planted terraces	Type: Crushed Sandstone	ANL Landscapes 317 Mona Vale Road,Terrey Hills, NSW 2084T: (02) 9450 1444	To be provided by supplier prior to installation	
Planting Drainage Cell		Standard drainage cell for all softworks on slab and planting in pots All applications to be wrapped in geotextile fabric	VersiDrain 60 Material Recycled Polyethylene Colour Black Weight 0.9 kg/m² Sheet thickness 1.0 mm Overall height 60 mm Compressive strength min 50 kN/m² (5 t/m²) Water storage 18 l/ m² Sheet Size 500 x 500 x60mm Biological/chemical resistance Resistant to ground chemicals, rot, moulds, algae, bacteria and root penetration. Does not affect potable water Fire resistance B2 (DIN 4102)	Supplier: Elmich 18/8 Avenue of Americas Newington NSW 2127 Australia Phone: 61 2 9648 2073 Fax: 61 2 9648 4731 Email: australia@elmich.com.au	To be provided by supplier prior to installation	
Coir logs		Coir logs for TP2 and graded mass planting	Name: Coir Log Material: High Density Coconut Coir Fibres Life Span: Biodegrades after 2-3 years Dimensions - 3m x 300mm Installation - fixed with hardwood timber pegs	Supplier: Ecoscape Solutions 174 Clergate Road Orange NSW 2800 Tel: 1800 326 722 info@ecoscapesolutions.com.au		 

Randwick Hospital Campus

Landscape Technical Specification

Issued For: IFC

Client: **Lendlease**

Document Number: **S17032-TS-001**

Document Control:

Revision	Date	Approved by
A	9.04.2020	NB
B	19.01.2021	KL

Prepared by:

ASPECT Studios™

CONTENTS

1 WORKSECTIONS

2 WORKSECTION NOTES

- Substituted or additional texts to NATSPEC standards are shown in **blue**.
- Adjustments of format, spelling, or punctuation are not identified, unless likely to affect the sense.
- Deletions to NATSPEC standards and superseded text is deleted by removal entirely.
- Refer **Landscape Selections Schedule** (**S17032-LA-200**) for materials and finishes selections and specifications.
- The full scope and extent of revisions should be comprehended by comparison with previous editions.

0171 GENERAL REQUIREMENTS

1 GENERAL

1.1 DESIGN

Design development

General: The works include development of the design beyond that documented, as required.

Design by contractor: If the contractor provides design, use only appropriately qualified persons and conform to all statutory requirements.

Conflict with the documents: If it is believed that a conflict exists between statutory requirements and the documents, notify the contract administrator immediately and provide a recommendation to resolve the conflict.

1.2 PRECEDENCE

General

Order of precedence:

- The requirements of the Landscape Selections Schedule override conflicting requirements of this worksection.
- The requirements of other worksections of the specification override conflicting requirements of this worksection.
- The requirements of the worksections override conflicting requirements of their referenced documents, excluding the Landscape Selections Schedule. The requirements of the referenced documents are minimum requirements.

1.3 REFERENCED DOCUMENTS

Contractual relationships

General: Responsibilities and duties of the principal, contractor and contract administrator are not altered by requirements in the documents referenced in this specification.

Current editions

General: Use referenced documents which are the editions, with amendments, current 3 months before the closing date for tenders, except where other editions or amendments are required by statutory authorities.

1.4 INTERPRETATION

Documentation conventions

Imperative mood and streamlined language: The words shall or shall be are implied where a colon is used following a keyword or within a sentence or sentence fragment.

Subject of sentences and phrases: Specification requirements are to be performed by the contractor, unless stated otherwise.

Abbreviations

General: For the purposes of this specification the following abbreviations apply:

- AS: Australian Standard.
- BCA: National Construction Code Series Volume One: Building Code of Australia Class 2 to 9 Buildings and Volume Two: Building Code of Australia Class 1 and Class 10 Buildings.
- GRP: Glass Reinforced Plastic.
- IP: Ingress protection.
- NATA: National Association of Testing Authorities.
- NCC: National Construction Code.
- NZS: New Zealand Standard.
- PCA: National Construction Code Series Volume 3: Plumbing Code of Australia.
- PVC: Polyvinyl Chloride.
- PVC-U: Unplasticised Polyvinyl Chloride. Also known as UPVC.
- SDS: Safety data sheets.

- VOC: Volatile Organic Compound.
- WHS: Work Health and Safety.

Definitions

General: For the purposes of this specification, the following definitions apply:

- Access for maintenance: Includes access for maintenance, inspection, measurement, operation, adjustment, repair, replacement and other maintenance related tasks.
- Accessible, readily: Readily accessible, easily accessible, easy access and similar terms mean capable of being reached quickly and without climbing over or removing obstructions, mounting upon a chair, or using a movable ladder, and in any case not more than 2.0 m above the ground, floor or platform.
- Attendance: Attendance, provide attendance and similar expressions mean give assistance for examination and testing.
- Contract administrator: Has the same meaning as architect or superintendent and is the person appointed by the owner or principal under the contract.
- Contractor: Has the same meaning as builder and is the person or organisation bound to carry out and complete the work under the contract.
- Default: Specified value, product or installation method which is to be provided unless otherwise documented.
- Design life: The period of time for which it is assumed, in the design, that an asset will be able to perform its intended purpose with only anticipated maintenance but no major repair or replacement being necessary.
- Documented: Documented, as documented and similar terms mean contained in the contract documents.
- Economic life: The period of time from the acquisition of an asset to the time when the asset, while still physically capable of fulfilling its function and with only anticipated maintenance, ceases to be the lowest cost alternative for satisfying that function.
- Electricity distributor: Any person or organisation that provides electricity from an electricity distribution system to one or more electrical installations. Includes distributor, supply authority, network operator, local network service provider, electricity retailer or electricity entity, as may be appropriate in the relevant jurisdiction.
- Fire hazard properties: To BCA A2.4.
- Geotechnical site investigation: The process of evaluating the geotechnical characteristics of the site in the context of existing or proposed construction.
- Give notice: Give notice, submit, advise, inform and similar expressions mean give notice (submit, advise, inform) in writing to the contract administrator.
- High level interface: Systems transfer information in a digital format using an open system interface.
- Hot-dip galvanized: Zinc coated to AS/NZS 4680 after fabrication with coating thickness and mass to AS/NZS 4680 Table 1.
- Ingress protection: IP, IP code, IP rating and similar expression have the same meaning as IP Code in AS 60529.
- Joints:
  - Construction joint: A joint with continuous reinforcement provided to suit construction sequence.
  - Contraction joint: An opening control joint with a bond breaking coating separating the joint surfaces to allow independent and controlled contraction of different parts or components, induced by shrinkage, temperature changes or other causes. It may include unbound dowels to assist vertical deflection control.
  - Control joint: An unreinforced joint between or within discrete elements of construction which allows for relative movement of the elements.
  - Expansion joint: A closing control joint with the joint surfaces separated by a compressible filler to allow axial movement due to thermal expansion or contraction with changes in temperature or creep. It may include unbound dowels to assist vertical deflection control.
  - Sealant joint: A joint filled with a flexible synthetic compound which adheres to surfaces within the joint to prevent the passage of dust, moisture and gases.

  - Structural control joint: A control joint (contraction, expansion and isolation) in structural elements when used with applied material and finishes.
  - Substrate joint: A joint in the substrate which includes construction joints and joints between different materials.
  - Weakened plane joint: A contraction joint created by forming a groove, extending at least one quarter the depth of the section, either by using a grooving tool, by sawing, or by inserting a premoulded strip.
- Local (government) authority: A body established for the purposes of local government by or under a law applying in a state or territory.
- Low level interface: Systems transfer information via terminals and voltage free contacts.
- Manufacturer's recommendations: Recommendations, instructions, requirements, specifications (and similar expressions) provided in written or other form by the manufacturer and/or supplier relating to the suitability, use, installation, storage and/or handling of a product.
- Metallic-coated: Steel coated with zinc or aluminium-zinc alloy as follows:
  - Metallic-coated steel sheet: To AS 1397. Metal thicknesses specified are based metal thicknesses.
  - Ferrous open sections zinc coated an in-line process: To AS/NZS 4791.
  - Ferrous hollow sections zinc coated by a continuous or specialised process: To AS/NZS 4792.
- Network utility operator: The entity undertaking the piped distribution of drinking water or natural gas for supply or is the operator of a sewerage system or external stormwater drainage system.
- Obtain: Obtain, seek and similar expressions mean obtain (seek) in writing from the contract administrator.
- Pipe: Includes pipe and tube.
- Practical completion or defects free completion: The requirements for these stages of completion are defined in the relevant building contract for the project.
- Principal: Principal has the same meaning as owner, client and proprietor and is the party to whom the contractor is legally bound to construct the works.
- Professional engineer: As defined by the BCA.
- Proprietary: Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Prototype: A full size mock-up of components, systems or elements to demonstrate or test construction methods, junctions and finishes, and to define the level of quality.
- Provide: Provide and similar expressions mean supply and install and include development of the design beyond that documented.
- Record drawings: Record drawings has the same meaning as as-installed drawings, as-built drawings and work-as-executed drawings.
- Referenced documents: Standards and other documents whose requirements are included in this specification by reference.
- Registered Testing Authority:
  - An organisation registered by the National Association of Testing Authorities (NATA) to test in the relevant field; or
  - An organisation outside of Australia registered by an authority recognised by NATA through a mutual recognition agreement; or
  - An organisation recognised as being a Registered Testing Authority under legislation at the time the test was undertaken.
- Required: Required by the contract documents, the local council or statutory authorities.
- If required: A conditional specification term for work which may be shown in the documents or is a legislative requirement.
- Sample: A physical example that illustrates workmanship, materials or equipment, and establishes standards by which the work will be judged. It includes samples, prototypes and sample panels.
- Statutory authority: A public sector entity created by legislation, that is, a specific law of the Commonwealth, State or Territory.
- Supply: Supply, furnish and similar expressions mean supply only.

- Tests – completion: Tests carried out on completed installations or systems and fully resolved before the date for practical completion, to demonstrate that the installation or system, including components, controls and equipment, operates correctly, safely and efficiently, and meets performance and other requirements. The superintendent may direct that completion tests be carried out after the date for practical completion.
- Tests – pre-completion: Tests carried out before completion tests, including:
  - Production: Tests carried out on a purchased item, before delivery to the site.
  - Progressive: Tests carried out during installation to demonstrate performance in conformance with this specification.
  - Site: Tests carried out on site.
  - Type: Tests carried out on an item identical with a production item, before delivery to the site.
- Tolerance: The permitted difference between the upper limit and the lower limit of dimension, value or quantity.
- Verification: Provision of evidence or proof that a performance requirement has been met or a default exists.

1.5 CONTRACT DOCUMENTS

Services diagrammatic layouts

General: Layouts of service lines, plant and equipment shown on the drawings are diagrammatic only, except where figured dimensions are provided or calculable.

Before commencing work:

- Obtain measurements and other necessary information.
- Coordinate the design and installation in conjunction with all trades.

Levels

General: Spot levels take precedence over contour lines and ground profile lines.

1.6 SUBMISSIONS

Requirement

General: Submit the following, as documented:

- Authority approvals: Notes of meetings with authorities whose requirements apply to the work and evidence that notices, fees and permits have been sought and paid, that authority connections are complete and that statutory approvals by the authorities whose requirements apply to the work have been received.
- Building penetrations: Details of the methods to maintain the required structural, fire and other properties to **EXECUTION**, **BUILDING PENETRATIONS**.
- Certification: Certification of conformance to documented requirements, including certification that the plant and equipment submitted meets all requirements of the contract documents and that each installation is operating correctly.
- Design documentation: Design data and certification of proposed work, if required and as documented.
- Electronic facility and asset management information: For the whole of the work to **EXECUTION**, **ELECTRONIC FACILITY AND ASSET MANAGEMENT INFORMATION**.
- Execution details: Execution programs, schedules and details of proposed methods and equipment. For building services include the following:
  - Embedded services: Proposed method for embedding services in concrete walls or floors or chasing into concrete or masonry walls.
  - Fixing of services: Typical details of locations, types and methods of fixing services to the building structure.
  - Inaccessible services: If services will be enclosed and not accessible after completion, submit proposals for location of service runs and fittings.
- Marking and labelling: Samples and schedules of proposed marking and labels to **EXECUTION**, **MARKING AND LABELLING.**
- Operation and maintenance manuals: For the whole of the work to **EXECUTION**, **OPERATION AND MAINTENANCE MANUALS**.

- Products: Products and materials data, including manufacturer's technical specifications and drawing, evidence of conformance to product certification schemes, performance and rating tables and installation and maintenance recommendations.
- Prototypes: Prototypes of components, systems or elements.
- Records: As-built documents, photographs, system diagrams, schedules and logbooks to **EXECUTION**, **RECORD DRAWINGS**.
- Shop drawings: Refer Landscape Selections Schedule.
- Substitutions: To PRODUCTS**, GENERAL, Substitutions**.
- Tests:
  - Inspection and testing plan consistent with the construction program including details of test stages and procedures.
  - Certificates for type tests.
  - Fire hazard properties: Evidence of conformance of proposed proprietary products to documented requirements for fire hazard properties.
  - Test reports for testing performed under the contract to **EXECUTION**, **TESTS**.
- Warranties: To **EXECUTION**, **WARRANTIES**.

Contractor review: Before submissions, review each submission item and check for coordination with other work of the contract and conformance to contract documents.

Submission times

Default timing: Make submissions at least 5 working days before ordering products or starting installation of the respective portion of the works.

Submission response times: Allow in the construction program for at least the following times:

- Shop drawings: **4 days**
- Samples and prototypes: **4 days**
- Manufacturers' or suppliers' recommendations**: 4 days**
- Product data: **4 days**
- Product/design substitution or modification: **4 days**

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.

Identification

Requirement: Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include relevant contract document references. Include service connection requirements and product certification.

Non-conformance: Identify proposals that do not conform with project requirements, and characteristics which may be detrimental to successful performance of the completed work.

Errors

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

1.7 INSPECTION

Notice

Concealment: If notice of inspection is required for parts of the works that are to be concealed, advise when the inspection can be made before concealment.

Tests: Give notice of the time and place of documented tests.

Minimum notice: As documented in the **INSPECTION, Site Inspections**.

Light levels

Requirements: To AS/NZS 1680.2.4.

Attendance

General: Provide attendance for documented inspections and tests.

Site Inspections

The Sub Contractor is to notify the head contractor where applicable in order to arrange inspection of the works at the stages described below. Sub-Contractor will ensure that site visits by Landscape Architect are coordinated such that multiple items can be inspected concurrently, where possible.

A minimum of 3 days' notice is to be provided. Items for Landscape Architect inspection are noted below.

The Sub Contractor is not to proceed to the next stage of construction until obtaining approval for the works. Program inspection's activities accordingly to ensure approval times do not affect the works programme. Where completion schedules vary or overlap, inspections may be negotiated. Approval of samples to be carried out on site, with all samples to be retained on site.

Inspection	Release Authority
Inspection: Sample and Prototypes Inspections	
Inspection of all materials and surfaces samples units samples	Superintendent and Project Landscape Architect
Prototype of all bespoke furniture and fixture sample units bespoke	Superintendent and Project Landscape Architect
Completion of excavations, set out to tree planting areas at ground level	Superintendent and Project Landscape Architect
Substrate installation complete (prior to planting media infill)	Superintendent and Project Landscape Architect
Completion of layout and set out of landscape edges and walls.	Superintendent and Project Landscape Architect
Inspection of all softscape samples	Superintendent and Project Landscape Architect
Completion of topsoil installation. Topsoil and testing results	Superintendent and Project Landscape Architect
Inspection of all plant stock from supplier for quality assurance	Superintendent and Project Landscape Architect
Substrate installation complete	Superintendent and Project Landscape Architect
Soil installation complete	Superintendent and Project Landscape Architect
Setout of planting prior to installation	Superintendent and Project Landscape Architect
Mulch installation complete	Superintendent and Project Landscape Architect
Practical Completion	Superintendent and Project Landscape Architect
Final Completion	Superintendent and Project Landscape Architect

2 PRODUCTS

2.1 GENERAL

Manufacturers' or suppliers' recommendations

General: Provide and select, if no selection is given, transport, deliver, store, handle, protect, finish, adjust and prepare for use the manufactured items in conformance with the recommendations of the manufacturer or supplier.

Proprietary items/systems/assemblies: Assemble, install or fix to substrate in conformance with the recommendations of the manufacturer or supplier.

Project modifications: Advise of activities that supplement, or are contrary to the recommendations of the manufacturers or supplier.

Sealed containers

General: If materials or products are supplied by the manufacturer in closed or sealed containers or packages, bring the materials or products to point of use in the original containers or packages.

Prohibited materials

General: Do not provide the following:

- Materials, exceeding the limits of those listed, in the Safe Work Australia Hazardous Substances Information System (HSIS).
- Materials that use chlorofluorocarbon (CFC) or hydro chlorofluorocarbon (HCFC) in the manufacturing process.

Substitutions

Identified proprietary items: Identification of a proprietary item does not necessarily imply exclusive preference for the identified item, but indicates the necessary properties of the item.

Alternatives: If alternatives to the documented products, methods or systems are proposed, submit sufficient information to permit evaluation of the proposed alternatives, including the following:

- Evidence that the performance is equal to or greater than that specified.
- Evidence of conformity to a cited standard.
- Samples.
- Essential technical information, in English.
- Reasons for the proposed substitutions.

Availability: If the documented products or systems are unavailable within the time constraints of the construction program, submit evidence.

Criteria: If the substitution is for any reason other than unavailability, submit evidence that the substitution:

- Is of net enhanced value to the principal.
- Is consistent with the contract documents and is as effective as the identified item, detail or method.

2.2 MATERIALS AND COMPONENTS

Consistency

General: For each material or product use the same manufacturer or source and provide consistent type, size, quality and appearance.

Corrosion resistance

General: Conform to the following atmospheric corrosivity category as defined in AS 4312 and the AS/NZS 2312 series.

Galvanizing

Severe conditions: Galvanize mild steel components (including fasteners) to AS/NZS 1214 or AS/NZS 4680 as appropriate, if:

- Exposed to weather.
- Embedded in masonry.
- Exposed to or in air spaces behind the external leaf of masonry walls.
- In contact with chemically treated timber, other than copper chrome arsenate (CCA).

3 EXECUTION

3.1 SAMPLES

General

Incorporation of samples: Only incorporate samples in the works which have been endorsed for inclusion. Do not incorporate other samples. Refer Landscape Selections Schedule.

Retention of samples: Keep endorsed samples in good condition on site, until the date of practical completion.

Unincorporated samples: Remove on completion.

Samples

Submit representative samples of each material as set out in Landscape Selections Schedule for approval by the Superintendent, Landscape Architect and where necessary the Architect:

Proposed products schedules: If major products are not specified as proprietary items, submit a schedule of those proposed for use with the tender submission.

Authorities

Authorities' approvals: Submit documents showing approval by the authorities whose requirements apply to the work.

Correspondence: Submit copies of correspondence and notes of meetings with authorities whose requirements apply to the work.

Identification

General: 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.

Materials and components

Product certification: 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.
- Additional product data for services equipment:
  - Model name, designation and number.
  - Country of origin and manufacture.
  - Capacity of all system elements.
  - Size, including required clearances for installation.
  - Materials used in the construction.

3.2 DESIGN

General

Design by contractor: If the contractor provides design, use only appropriately qualified persons and comply with all statutory requirements.

Conflict with the documents: If it is believed that a conflict exists between statutory requirements and the documents notify the Superintendent immediately and provide a recommendation to resolve the conflict.

3.3 SHOP DRAWINGS

General

Documentation: Include dimensioned drawings showing details of the fabrication and installation of structural elements, building components, services and equipment, including relationship to building structure and other services, cable type and size, and marking details.

Diagrammatic layouts: Coordinate work shown diagrammatically in the contract documents, and prepare dimensioned set-out drawings.

Record drawings: Amend all documented shop drawings to include changes made during the progress of the work and up to the end of the defects liability period.

Services coordination: Coordinate with other building and service elements. Show adjusted positions on the shop drawings.

Space requirements: Check space and access for maintenance requirements of equipment and services indicated diagrammatically in the contract documents.

Submission medium: .pdf (.dwg upon request)

Building work drawings for building services: On dimensioned drawings show all:

- Access doors and panels.
- Conduits to be cast in slabs.

- Holding down bolts and other anchorage and/or fixings required complete with loads to be imposed on the structure during installation and operation.
- Openings, penetrations and block-outs.
- Sleeves.
- Plinths, kerbs and bases.
- Required external openings.

Submissions

Submit the Shop Drawings as per Landscape Selections Schedule.

Submit to: Superintendent.

Default timing: Make submissions at least 5 working days before ordering products for, or starting installation of, the respective portion of the works.

3.4 OFF-SITE DISPOSAL

Removal of material

General: Dispose of building waste material off site to the requirements of the relevant authorities.

3.5 FIXING

General

Suitability: If equipment is not suitable for fixing to non-structural building elements, fix directly to structure and trim around penetrations in non-structural elements.

Fasteners

General: Use proprietary fasteners capable of transmitting the loads imposed, and sufficient for the rigidity of the assembly.

3.6 SERVICES CONNECTIONS

Connections

General: Connect to network distributor services or service points. Excavate to locate and expose connection points. Reinstate the surfaces and facilities that have been disturbed.

Network distributors' requirements

General: If the network distributor elects to perform or supply part of the works, make the necessary arrangements. Install equipment supplied, but not installed, by the authorities.

3.7 SERVICES INSTALLATION

General

Fixing: If non-structural building elements are not suitable for fixing services to, fix directly to structure and trim around holes or penetrations in non-structural elements.

Installation: Install equipment and services plumb, fix securely and organise reticulated services neatly. Allow for movement in both structure and services.

Concealment: Unless otherwise documented, conceal all cables, ducts, trays and pipes except where installed in plant spaces, ceiling spaces and riser cupboards. If possible, do not locate on external walls.

Lifting: Provide heavy items of equipment with permanent fixtures for lifting as recommended by the manufacturer.

Suspended ground floors: Keep all parts of services under suspended ground floors at least 150 mm clear of the ground surface. Make sure services do not impede access.

Arrangement: Arrange services so that services running together are parallel with each other and with adjacent building elements.

Dissimilar metals

General: Join dissimilar metals with fittings of electrolytically compatible material.

Temporary capping

Pipe ends: During construction protect open ends of pipe with metal or plastic covers or caps.

Piping

General: Install piping in straight lines at uniform grades without sags. Arrange to prevent air locks. Provide sufficient unions, flanges and isolating valves to allow removal of piping and fittings for maintenance or replacement of plant.

Spacing: Provide at least 25 mm clear between pipes and between pipes and building elements, additional to insulation.

Changes of direction: Provide long radius elbows or bends and sets where practicable, and swept branch connections. Provide elbows or short radius bends where pipes are led up or along walls and then through to fixtures. Do not provide mitred fittings.

Vibration: Arrange and support piping so that it remains free from vibration whilst permitting necessary movements. Minimise the number of joints.

Embedded pipes: Do not embed pipes that operate under pressure in concrete or surfacing material.

Valve groupings: If possible, locate valves in groups.

Pressure testing precautions: Isolate items not rated for the test pressure. Restrain pipes and equipment to prevent movement during pressure testing.

Differential movement

General: If the geotechnical site investigation report predicts differential movements between buildings and the ground in which pipes or conduits are buried, provide control joints in the pipes or conduits, as follows:

- Arrangement: Arrange pipes and conduits to minimise the number of control joints.
- Magnitude: Accommodate the predicted movements.

3.8 BUILDING PENETRATIONS

Penetrations

Requirement: Maintain the required structural, fire and other properties when penetrating or fixing to the following:

- Structural building elements including external walls, fire walls, fire doors and access panels, other tested and rated assemblies or elements, floor slabs and beams.
- Membrane elements including damp-proof courses, waterproofing membranes and roof coverings. If penetrating membranes, provide a waterproof seal between the membrane and the penetrating component.

Sealing

Fire-resisting building elements: Seal penetrations with a system conforming to AS 4072.1.

Non fire-resisting building elements: Seal penetrations around conduits and sleeves. Seal around cables within sleeves. If the building element is acoustically rated, maintain the rating.

Sleeves

General: If piping or conduit penetrates building elements, provide metal or PVC-U sleeves formed from pipe sections as follows:

- Movement: Arrange to permit normal pipe or conduit movement.
- Diameter (for non fire-resisting building elements): Sufficient to provide an annular space around the pipe or pipe insulation of at least 12 mm.
- Prime paint ferrous surfaces.
- Terminations:
  - If cover plates are fitted: Flush with the finished building surface.
  - In fire-resisting and acoustic rated building elements: 50 mm beyond finished building surface.
  - In floors draining to floor wastes: 50 mm above finished floor.
  - Elsewhere: 5 mm beyond finished building surface.
  - Termite management: To AS 3660.1.
- Thickness:
  - Metal: 1 mm or greater.
  - PVC-U: 3 mm or greater.

Sleeves for cables: For penetrations of cables not enclosed in conduit through ground floor slabs, beams and external walls provide sleeves formed from PVC-U pipe sections.

3.9 CONCRETE PLINTHS

Construction

General: Provide concrete plinths as documented and under all equipment located on concrete floor slabs as follows:

- Height: 75 mm or greater, as documented.
- Concrete: Grade N20.
- Finish: Steel float flush with the surround.
- Reinforcement: Single layer of F62 fabric.
- Surround: Provide galvanized steel surround at least 75 mm high and 1.6 mm thick. Fix to the floor with masonry anchors. Fill with concrete.

3.10 WARRANTIES

General

Requirement: If a warranty is documented, name the principal as warrantee. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Warranty period: Start warranty periods at acceptance of installation.

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

3.11 RECORD DRAWINGS

General

Requirement: Show the following:

- Installed locations of building elements, services, plant and equipment.
- Off-the-grid dimensions and depth if applicable.
- Any provisions for the future.

Recording, format and submission

Progress recording: Keep one set of drawings on site at all times, expressly for the purpose of marking changes made during the progress of the works.

Drawing layout: Use the same borders and title block as the contract drawings.

Quantity and format: Conform to **SUBMISSIONS.**

Endorsement: Sign and date all record drawings.

Accuracy: If errors in, or omissions from, the record drawings are found, amend the drawings and re-issue in the quantity and format documented for **SUBMISSIONS.**

Date for submission: Not later than 2 weeks after the date for practical completion.

Services record drawings

General: To **General** and **Recording, format and submission** and the following:

- Contents: As for the respective shop drawings.
- Extensions and/or changes to existing: If a drawing shows extensions and/or alterations to existing installations, include sufficient of the existing installation to make the drawing comprehensible without reference to drawings of the original installation.
- Detention: If on-site detention tanks or pondage are provided, include the volume required on the drawing and the permitted flow rate to the connected system.
- Domestic cold water or fire mains: Show the pressure available at the initial connection point and the pressure available at the most disadvantaged location on each major section of the works.
- Stormwater: If storm water pipes are shown, include the pipe size and pipe grade together with the maximum acceptable flow and the actual design flow.

Diagrams: Provide diagrammatic drawings of each system including the following:

- Controls.
- Piping including all valves and valve identification tags.
- Principal items of equipment.
- Single line wiring diagrams.
- Acoustic and thermal insulation.
- Access provisions and space allowances.
- Fixings.
- Fixtures.

- Switchgear and control gear assembly circuit schedules including electrical service characteristics, controls and communications.
- Charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

Subsurface services: Record information on underground or submerged services to the documented quality level, conforming to AS 5488.

3.12 OPERATION AND MAINTENANCE MANUALS

General

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 worksections require that manuals be submitted, include corresponding material in the operation and maintenance manuals.

Subdivision: By installation or system, depending on project size.

Contents

Requirement: Include the following:

- Table of contents: For each volume. Title to match cover.
- Directory: Names, addresses, email addresses and telephone and facsimile numbers of principal consultant, subconsultants, contractor, subcontractors and names of responsible parties.
- Record drawings: Complete set of record drawings, full size.
- Drawings and technical data: As necessary for the efficient operation and maintenance of the installation. Include:
  - Switchgear and control gear assembly circuit schedules including electrical service characteristics, controls and communications.
  - Charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- Installation description: General description of the installation.
- Systems descriptions and performance: Technical description of the systems installed and mode of operation, presented in a clear and concise format readily understandable by the principal's staff. Identify function, normal operating characteristics, and limiting conditions.
- Systems performance: Technical description of the mode of operation of the systems installed.
- Baseline data: To AS 1851 and AS/NZS 1668.1.
- Documentation to AS 1851 including the schedule of essential functionality and performance requirements.
- Digital photographic records to **Underground services**.
- Equipment descriptions:
  - Name, address, email 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. Equipment schedules in tabular form including the equipment designation used on the drawings, manufacturer's name and contact details, equipment name plate data, function of item, associated system and capacity data.
  - Manufacturers' technical literature for equipment installed, assembled specifically for the project, excluding irrelevant matter. Mark each product data sheet to clearly identify specific products and component parts used in the installation, and data applicable to the installation.
  - Supplements to product data to illustrate relations of component parts. Include typed text as necessary.
- Certificates:
  - Certificates from authorities.
  - Copies of manufacturers' warranties.
  - Product certification.
  - Test certificates for each service installation and all equipment.

  - Test reports
  - Test, balancing and commissioning reports.
  - Control system testing and commissioning results.
- 7 day record of all trends at commissioning.
- Operation procedures:
  - Manufacturers' technical literature as appropriate.
  - Safe starting up, running-in, operating and shutting down procedures for systems installed. Include logical step-by-step sequence of instructions for each procedure.
  - Control sequences and flow diagrams for systems installed.
  - Legend for colour-codes services.
  - Schedules of fixed and variable equipment settings established during commissioning and maintenance.
  - Procedures for seasonal changeovers.
  - If the installation includes cooling towers, a water efficiency management plan.
- Maintenance procedures:
  - Detailed recommendations for periodic maintenance and procedures, including schedule of maintenance work including frequency and manufacturers' recommended tests.
  - 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.
  - Schedule of normal consumable items, local sources of supply ,and expected replacement intervals up to a running time of 40 000 hours. Include lubrication schedules for equipment.
  - Schedules for recording recommissioning data so that changes in the system over time can be identified.
  - Instructions for use of tools and testing equipment.
  - Emergency procedures, including telephone numbers for emergency services, and procedures for fault finding.
  - Safety data sheets (SDS).
  - Instructions and schedules conforming to AS 1851, AS/NZS 3666.2, AS/NZS 3666.3 and AS/NZS 3666.4.
- Maintenance records:
  - Prototype service records conforming to AS 1851 prepared to include project specific details.
  - Prototype periodic maintenance records and report to AS/NZS 3666.2, AS/NZS 3666.3 and AS/NZS 3666.4 as appropriate, prepared to include project specific details.
  - For hard copies: In binders which match the manuals, loose leaf log book pages designed for recording completion activities including operational and maintenance procedures, materials used, test results, comments for future maintenance actions and notes covering the condition of the installation. Include completed log book pages recording the operational and maintenance activities performed up to the time of practical completion.
  - Number of pages: The greater of 100 pages or enough pages for the maintenance period and a further 12 months.
- Emergency information: For each type of emergency, including fire, flood, gas leak, water leak, power failure, water failure, system or sub system failure, chemical release or spill, include the following:
  - Emergency instructions.
  - Emergency procedures including:
    * Instructions for stopping or isolating.
    * Shutdown procedures and sequences.

* Instructions for actions outside the property.
* Special operating instructions relevant to the emergency.
* Contact details relevant to the emergency.

Emergency information manual

Form of emergency information: Provide one of the following:

- An index and coloured tabs identifying emergency information for each type of emergency within the Operation and maintenance manual.
- A separate Emergency manual containing copies of emergency information from the main Operation and maintenance manual.

Format – electronic copies

Scope: Provide the same material as documented for hardcopy in electronic format.

Quantity and format: Conform to **SUBMISSIONS , Electronic submissions**.

Printing: Except for drawings required in the **RECORD DRAWINGS** clause provide material that can be legibly printed on A4 size paper.

Format – hard copy

General: A4 size loose leaf, in commercial quality, 4 ring binders with hard covers, each indexed, divided and titled. Include the following features:

- Cover: Identify each binder with typed or printed title *OPERATION AND MAINTENANCE MANUAL*, to spine. Identify title of project, volume number, volume subject matter, and date of issue.
- Dividers: Durable divider for each separate element, with typed description of system and major equipment components. Clearly print short titles under laminated plastic tabs.
- Drawings: Fold drawings to A4 size with title visible, insert in plastic sleeves (one per drawing) and accommodate them in the binders.
- Pagination: Number pages.
- Ring size: 50 mm maximum, with compressor bars.
- Text: Manufacturers' printed data, including associated diagrams, or typewritten, single-sided on bond paper, in clear concise English.

Number of copies: 3.

Date for submission

Draft submission: The earlier of the following:

- 4 weeks before the date for practical completion.
- Commencement of training on services equipment.

Final submission: Within 2 weeks after practical completion.

3.13 TOOLS AND SPARE PARTS

Spare parts

General: Provide spare parts listed in the appropriate worksections.

Replacement: Replace spare parts used during the maintenance period.

Tools and spare parts schedule

Submission timing: At least 8 weeks before the date for practical completion.

Requirement: Prepare a schedule of tools, portable instruments and spare parts necessary for maintenance of the installation. For each item state the recommended quantity and the manufacturer's current price. Include the following in the prices:

- Checking receipt, marking and numbering in conformance with the spare parts schedule.
- Packaging and delivery to site.
- Painting, greasing and packing to prevent deterioration during storage.
- Referencing equipment schedules in the operation and maintenance manuals.
- Suitable means of identifying, storing and securing the tools and instruments. Include instructions for use.

Replacement: Replace spare parts used during the maintenance period.

3.14 TESTING

Attendance
General: Provide attendance on tests.

Testing authorities
General: Except for site tests, have tests carried out by a Registered testing authority.

Test instruments: Use instruments calibrated by a Registered testing authority.

Test reports
General: Indicate observations and results of tests and conformance or non-conformance with requirements.

Notice
Inspection: Give sufficient notice for inspection to be made of the commissioning and completion testing of the installation.

Controls
General: Calibrate, set and adjust control instruments, control systems and safety controls.

Circuit protection
General: Confirm that circuit protective devices are sized and adjusted to protect installed circuits.

Completion tests
General: Test the works under the contract to demonstrate conformance with the documented performance requirements of the installation.

Functional checks: Carry out functional and operational checks on energised equipment and circuits and make final adjustments for the correct operation of safety devices and control functions.

Type test reports: Required, as evidence of conformance of proprietary equipment.

Sound pressure level measurements: Conform to the following:

- Correction for background noise: To AS/NZS 2107 Table B1.
- External: To AS 1055.1.
- Internal: To AS/NZS 2107.
- Measurement positions: If a test position is designated only by reference to a room or space, do not take measurements less than 1 m from the floor, ground or walls.
- Sound pressure level analysis: Measure the sound pressure level and the background sound pressure level over the full range of octave band centre frequencies from 31.5 Hz to 8 kHz at the designated positions.
- Sound pressure levels: Measure the A-weighted sound pressure levels and the A-weighted background sound pressure levels at the designated positions.

Certification
General: On satisfactory completion of the installation and before the date of practical completion, certify that each installation is operating correctly.

3.15 TRAINING

General
Duration: Instruction to be available for the whole of the commissioning and running-in periods.

Format: Conduct training at agreed times, at system or equipment location. Also provide seminar instruction to cover all major components.

Operation and maintenance manuals: Use items and procedures listed in the final draft operation and maintenance manuals as the basis for instruction. Review contents in detail with the principal's staff.

Certification: Provide written certification of attendance and participation in training for each attendee. Provide register of certificates issued.

Demonstrators
General: Use only qualified manufacturer's representatives who are knowledgeable about the installations.

Maintenance
General: Explain and demonstrate to the principal's staff the purpose, function and maintenance of the installations.

Operation
General: Explain and demonstrate to the principal's staff the purpose, function and operation of the installations.

Seasonal operation
General: For equipment requiring seasonal operation, demonstrate during the appropriate season and within 6 months.

3.16 CLEANING

Final cleaning
General: Before the date for practical completion, clean throughout, including all exterior and interior surfaces except those totally and permanently concealed from view.

Labels: Remove all labels not required for maintenance.

3.17 PERIODIC MAINTENANCE OF SERVICES

General
Requirement: During the maintenance period, carry out periodic inspections and maintenance work as recommended by manufacturers of supplied equipment, and promptly rectify faults.

Emergencies: Attend emergency calls promptly.

Annual maintenance: Carry out recommended annual maintenance procedures before the end of the maintenance period.

Maintenance period: The greater of the defects liability period and the period documented in the **Maintenance requirements schedule**.

Maintenance program
General: Submit details of maintenance procedures and program, relating to installed plant and equipment, 6 weeks before the date for practical completion. Indicate dates of service visits. State contact telephone numbers of service operators and describe arrangements for emergency calls.

Maintenance records
General: Record in binders provided with the Operation and maintenance manuals.

Referenced documents: If referenced documents or technical worksections require that log books or records be submitted, include this material in the maintenance records.

Certificates: Include test and approval certificates.

Service visits: Record comments on the functioning of the systems, work carried out, items requiring corrective action, adjustments made and name of service operator. On completion of the visit, obtain the signature of the principal's designated representative on the record of the work undertaken.

Site control
General: Report to the principal's designated representative on arriving at and before leaving the site.

3.18 POST-CONSTRUCTION MANDATORY INSPECTIONS AND MAINTENANCE

General
Requirement: For the duration of the defects liability period, provide inspections and maintenance of safety measures required by the following:

- AS 1851.
- Other statutory requirements applicable to the work.

Records: Provide mandatory records.

Certification: Certify that mandatory inspections and maintenance have been carried out and that the respective items conform to statutory requirements.

Annual inspection: Perform an annual inspection and maintenance immediately before the end of the defects liability period.

0172 ENVIRONMENTAL MANAGEMENT

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide environmental management, as documented.

Management and control plans for contractor submission
Implementation: To approved management plans documented in **SUBMISSIONS**, **Control plans**.

Management and control measures
Implementation: To the management and control measures documented in **EXECUTION**.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.3 INTERPRETATION

Abbreviations
General: For the purposes of this worksection the following abbreviations apply:
- EIA: Environmental impact assessment.
- EMP: Environmental management plan.

Definitions
General: For the purposes of this worksection the following definitions apply:
- Authorities: Any authority or agency covering statutory requirements relating to the project, including clearances for work in that particular area.
- Clearances: A formal certificate, approval or condition issued by an authority to allow work to be carried out in a particular area.
- Contamination of land: The presence of a substance in, on or under the land which is designated hazardous material and/or is at a concentration above that which is normally found in that locality, such that there presents a risk of harm to human health or to the environment.
- Environment: The physical factors of the surroundings of human beings including the land, waters, atmosphere, climate, sound, odours, tastes, the biological factors of animals and plants and the social factor of aesthetics.
- Environmental audits: A review of environment management practices, in particular the evaluation of a site for environmental liability.
- Environmental impact assessment: A method for predicting environmental impacts of a proposed development including minimizing identified impacts.
- Environmental management plan (EMP): A project or site specific plan describing the management of the environmental issues and considerations for the activity being undertaken. This applies to the design, construction and operation of the buildings, external works and infrastructure.
- Organic waste: Includes all food wastes, vegetative wastes from land clearing and pruning operations, biosolids produced from the treatment of liquid wastes, garden wastes and forestry waste (bark and saw dust) and paper and cardboard products.
- Pollution incident: An incident or set of circumstances during or as a consequence of which there is, or is likely to be, a leak, spill or other escape of a substance as a result of which pollution has occurred, is occurring or is likely to occur.
- Weed: An invasive plant that degrades natural areas, reduces the sustainability or affects the health of people and animals.

1.4 SUBMISSIONS

Submissions program
Time for submissions: In accordance with The Principal's requirements.

Control plans

Requirement: Submit the following:

- Environmental management plan.
- Soil erosion and sediment control plan.
- Waste management plan.
- Ground contamination control plan.
- Weed management plan.

1.5 INSPECTION

Notice

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

- Discovery of non-conforming items, e.g. contamination.
- Completed removal or rectification of non-conforming items.
- Discovery of unexpected finds.

2 EXECUTION

2.1 ENVIRONMENTAL MANAGEMENT PLAN

Control plan

EMP: Submit a plan with the following details:

- Project description, including site location, construction activities, and project schedule.
- EMP context, describing how the EMP fits into the overall project planning process.
- EMP objective and environmental policy.
- Assignment of responsibility for environmental controls, including hierarchy of management.
- Conditions of approvals, licences and permits to meet statutory requirements.
- Reporting requirements.
- Environmental training plan and procedures. Include in the plan, a program to familiarise staff with the EMP and/or management controls, environmentally sensitive areas and responsibilities.
- Environmental auditing program and corrective action procedures.
- Emergency response procedures including response time.
- Risk assessment.
- Control plans: Conform to **SUBMISSIONS**, **Control plans**.
- Details of potential environmental impacts and operational control measures for implementation including:
  - Heritage.
  - Preservation of visual values.
  - Protection of endangered species.
  - Preservation of habitat.
- Details of environmental protection for each activity.
- Locations of environmental controls and environmentally sensitive areas.
- Communication procedures.
- Other items necessary to protect the surrounding environment.

Activities staging: Address the phases of activity, as appropriate:

- Before construction and site establishment.
- During construction.
- After construction, including rehabilitation activities and site and landscaping maintenance such as erosion and sedimentation controls.

Preliminary EMP: Submit with the tender documentation.

Completed EMP: Submit before work commences on site.

Control measures

- In accordance with The Principal’s requirements

2.2 PROCEDURAL AND PERSONNEL

Legislative environmental control requirements

- In accordance with The Principal's requirements

Community liaison

General: Notify residents of construction activities which will affect access to, or disrupt the use of, their properties.

Notice: Minimum 5 working days, unless the work is of an urgent nature with safety implications.

Notification content:

- The nature of the work.
- The reason for it being undertaken.
- The expected duration.
- Changes to traffic arrangements and property access.
- The 24-hour contact number of the representative responsible.

Internal monitoring

Approval authority: The Principal

Documentation: Provide descriptions of the following:

- Environmental monitoring: Procedures for implementation and recording.
- For all control measures to be implemented: Non-conformance control and corrective action procedures.

Records: Maintain records of results of environmental monitoring, including the effectiveness of any remedial action taken.

Internal monitoring personnel: Provide staff names and contact details.

Machinery and equipment: Provide details of proposed plant.

Review timing: Undertake reviews of the EMP or control measures at the following stages:

- When there is a change in the project, e.g. scope.
- Following significant environmental accidents.
- When improved performance is required to reduce specific environmental impact.
- At completion of environmental audits.
- At the end of the project.

Emergency response

Emergency response personnel: Provide staff names and contact details.

Response procedure: to The Principal's requirements

Response time: to The Principal's requirements

Penalty for failure to respond: to The Principal's requirements

Complaints

Reporting: Within 1 working day of receiving a complaint about any environmental issue, including pollution, submit a written report detailing the complaint and remedial action taken.

Register: Keep a register of all environmental complaints and action taken.

Reporting

Requirement: Compile the environmental management reports to record the progress of the following:

- Performance against statutory requirements.
- Performance against the EMP, environmental objective and policy, ecologically sustainable development outcomes and targets.
- Summary of monitoring, inspection and audits.
- Summary of reports required to meet the statutory requirements.
- Summary of environmental emergencies, incidents, non-conformance and complaints.
- Summary of corrective actions where required.

Reporting frequency: to The Principal's requirements

Unexpected finds

Requirement: If encountered, give notice and close off affected site area with barrier tapes and warning signs to prevent access. Unexpected finds include asbestos and other hazardous or volatile contaminants, archaeological finds and items of heritage value.

Further action: to The Principal's requirements

2.3 SOIL EROSION AND SEDIMENT CONTROL

Control plan

Plan: Submit a soil erosion and sediment control plan with the following details:

- Staging of operations and sequence of works.
- Diversion of upstream water around the site.
- Provision of temporary drains and catch drains.
- Application of diversion, dispersal and/or retention measures to concentrate flows to control and dissipate stormwater through the site without damage.
- Spreader banks or other structures to disperse concentrated runoff.
- Temporary grassing or other treatments such as contour ploughing or bunding to disturbed areas and long-term stockpiles.
- Restoration of disturbed areas in progress with the works.
- Use of mulch materials to protect disturbed or exposed areas where suitable.

Areas: Include all site areas and access and haulage tracks, borrow pits, stockpile and storage areas and compound areas.

Control measures

Staging of operations and sequence of works: to The Principal's requirements

Diversion of upstream water around the site: to The Principal's requirements

Provision of temporary drains and catch drains: to The Principal's requirements

Erosion control measures: to The Principal's requirements

- Stockpile protection: Provide the following at the end of each working day:
  - Sandbags: Placed on downslope of stockpile to prevent movement.
  - Waterproof cover: Placed over stockpile material.
  - Sandbags, filter bags or fibre sausages: Locate to divert upslope flow of stormwater into grassed areas of the site and away from the stockpiled material.

Sediment control measures: to The Principal's requirements

Stormwater control:

- Diversion: to The Principal's requirements
- Dispersal: to The Principal's requirements
- Retention: to The Principal's requirements

Maintenance of controls: Check control measures, minimum daily and following storms, and make sure they are in good working order. Replace barriers if they are torn, damaged or no longer anchored.

Areas: Include all site areas and access and haulage tracks, borrow pits, stockpile and storage areas and compound areas.

Sediment filters – general

Inspection: Inspect for displacement, undercutting, over-topping and soil build-up, after each rain event. Effect repairs immediately.

Removal: When the upslope areas have been permanently stabilised.

Filters at toe of a slope: Place filter 1500 to 2000 mm away from slope, to provide access for maintenance and to allow coarse sediment to drop out of suspension before reaching sediment filter.

Sediment filters - straw bales

Straw bale filters: Provide temporary structures made of straw bales (cereal straw) laid end to end across direction of stormwater flow in order to filter sediment.

Binding: Wire-bound or with string-tied bindings wrapped around the bale sides.

Installation:

- Trench: 100 mm deep trench, the width of a bale and the length of the proposed sediment filter.
- Placement: Lengthwise in the trench with ends tightly abutting and corners lapped.
- Fixing: Drive two 50 x 50 mm wooden stakes or metal star pickets through each bale. Make sure bales are packed closely and staked securely. Tightly wedge gaps with loose straw.

Backfilling: Compacted excavated soil to ground level on downhill side of barrier, and 100 mm above ground level on the uphill side of the bales.

Sediment filters – silt fence

Silt fence: Provide geotextile temporary barrier, supported on wire or mesh fencing for filtering sediment from stormwater flow conforming to the following:

- That will retain soil on site.
- Have openings large enough to permit drainage and prevent clogging.

Contours: Locate fence line and posts along contours curving upstream at the sides to direct flow toward middle of the fence.

Installation:

- Trench: 100 mm wide x 200 mm deep along line of posts and upslope from barrier.
- Posts: 1200 mm long pre-drilled steel star picket posts at 3000 mm centres, driven 600 mm and fitted with plastic safety caps.
- Wire mesh: ≥ 14 gauge x ≤ 150 mm mesh spacing. Fasten wire mesh to upslope side of posts with 25 mm long heavy-duty wire staples and tie wire. Extend wire mesh 150 mm into trench.
- Filter: Geotextile to suit local soil conditions, cut from a continuous roll to minimise joints.
- Fixing: Wire ties to the uphill side of fence posts, extended 200 mm into the trench. Do not staple onto trees.
- Joints: 150 mm overlap at a support post, with both ends fastened to the post.

Fence height: 600 mm average.

Backfilling: Backfill trench over toe of geotextile and compact soil.

Sediment filters – straw bale and geotextile filters

Filters: Provide sediment filter comprising straw bales and geotextile conforming to the following:

- That will retain soil on site.
- Have openings large enough to permit drainage and prevent clogging.

Binding: Wire-bound or with string-tied bindings wrapped around the bale sides.

Bale installation:

- Trench: 100 mm deep trench the width of a bale and the length of the proposed sediment filter.
- Placing: Lengthwise in the trench with ends tightly abutting and corners lapped.
- Fixing: Drive two 50 x 50 mm wooden stakes or metal star pickets through each bale. Make sure bales are packed closely and staked securely. Tightly wedge gaps with loose straw.

Geotextile installation:

- Geotextile selection: To suit local soil conditions cut from a continuous roll to minimise joints.
- Fixing: Staple geotextile to top of straw bale and extend down the uphill face of the bale into the trench. Stretch the geotextile and peg securely into the subgrade.
- Joints: 150 mm overlap at a support post, with both ends fastened to the post.

Backfilling: Compacted excavated soil to ground level on downhill side of barrier, and 100 mm above ground level on the uphill side of the bales against and over toe of the fabric.

2.4 WASTE MANAGEMENT

Control plan

Plan: Submit a waste management plan and identify major waste streams that will be generated during the contract including:

- Organic waste.
- Construction waste, including:
  - Spoil.
  - Demolition waste.
  - Asphalt or bitumen.

  - Concrete
  - Metal.
  - Paint materials and empty containers.
  - Office waste.
  - Kitchen waste.
  - Sewage effluent.
- For each waste stream indicate:
  - How and where the waste will be re-used, recycled, stockpiled or disposed of.
- How the waste will be transported between the site and point of re-use, recycling, stockpiling, treating or disposal and who will be responsible.

Waste stream: Submit details of location, labelling and protection of separate skips for the identified waste stream.

Control measures

Requirement: Establish major waste streams that will be generated during the contract including:

- Organic waste.
- Construction waste, including:
  - Spoil.
  - Demolition waste.
  - Asphalt or bitumen.
  - Concrete
  - Metal.
  - Paint materials and empty containers.
  - Office waste.
  - Kitchen waste.
  - Sewage effluent.
  - Hazardous materials.

Location of each waste stream: to The Principal's requirements

Disposal of organic waste: to The Principal's requirements

Disposal of construction waste: to The Principal's requirements

Method of transport between the site and point of re-use, recycling, stockpiling, treating or disposal: to The Principal's requirements

Identification: Submit details of location, labelling and protection of separate skips for the identified waste stream.

Disposal of materials

Spoil: Remove cleared and grubbed material from the site and dispose of legally.

Waste storage: to The Principal's requirements

Surplus material: to The Principal's requirements

Burial: Bury concrete and other inorganic fragments as follows:

- Location: Beyond built or paved areas.
- Depth: More than 600 mm from finished ground level to the top of the object.
- Compaction: Eliminate voids.

2.5 GROUND CONTAMINATION

Control plan

Requirement: Submit a ground contamination control plan if land is suspected of being contaminated or the presence of acid sulphate soil is found.

Plan: Prepared in conformance with the Environmental Protection Authority (EPA) and planning guidelines for each state with the following details:

- Preliminary investigation.
- Detailed investigation.
- Site Remedial Action Plan (RAP).

- Site auditing and reporting procedures.
- Record maintenance procedures, e.g. record of remediation work, certificates issued and restrictions placed on the site.

Control measures

Preliminary investigation: to The Principal's requirements

Detailed investigation: to The Principal's requirements

Site Remedial Action Plan (RAP): to The Principal's requirements

Stockpile sites: Locate on previously cleared areas.

Site auditing and reporting procedures: to The Principal's requirements

Record maintenance procedures: to The Principal's requirements

2.6 WEED MANAGEMENT

Control plan

Plan: Submit a weed management plan with the following details:

- Identify weeds and infestation zones within the work site and the investigation period.
- Method and date of cleaning vehicles and machinery.
- Cleaning bay location and treatment date.
- Contaminated fill stockpile, treatment type and treatment date.

Control measures

Weed species: to The Principal's requirements

Weed infestation zones: to The Principal's requirements

Treatment of infestation: to The Principal's requirements

Weed management personnel

Requirement: Submit details of the following:

- Subcontractors who will treat weed infestations.
- Chemical handlers, qualifications, date, and spray type.

2.7 SITE CONTROL AND PROTECTION MEASURES

Air quality control

Requirement: Protect adjoining owners, residents and the public against dust, dirt, water nuisance and injury. Use dust screens and watering to reduce dust nuisance.

Dewatering

Requirement: Keep earthworks free of water. Provide and maintain slopes, crowns and drains for excavations and embankments, to make sure there is free drainage. Construct, including placing of fill, masonry, concrete and services, on ground where free water has been removed. Prevent water flow over freshly laid work.

Dewatering system: to The Principal's requirements

Water disposal: Dispose off-site.

Dust control

Dust control measures: to The Principal's requirements

Lighting of fires

Prohibition: Do not light fires.

Noise control and vibration

Standard: To the recommendations of AS 2436.

Maximum noise level at the site boundary: to The Principal's requirements

Noise levels: Avoid excessive noise and long periods of elevated noise that is reasonably anticipated to annoy or adversely effect the adjacent community.

Noise control measures: to The Principal's requirements

Noise suppression: Minimise noise nuisance with measures including the following:

- Enclose noisy equipment.
- Provide noise attenuation screens.
- Maintain plant in good working order.

- Fit effective residential class silencers to all engine exhausts.
- Fit engine covers to all plant.

Vibration assessment report: to The Principal's requirements

Vibration control measures: to The Principal's requirements

Limits on ground vibration: Make sure ground vibration levels transmitted from operating items of plant in the vicinity of buildings do not exceed levels that are close to the lower level of human perception inside the premises or cause structural damage to the buildings and other structures.

Monitoring: Provide the following:

- Baseline condition measurements before commencement of the works.
- Progressive monitoring during the works to confirm conformance with approval conditions.

Vegetation and fauna

Wildlife to be protected: All native species.

Trees to be removed: Inspect to establish if nesting native fauna are present. If present, give notice.

Pruning: To AS 4373.

Water quality

Wash out: Prevent wash out from entering waterways or stormwater drains.

Cross connection: Make sure there are no cross connections between stormwater and the public sewerage system.

Vehicular and equipment contamination precautions

Covers: Use tarpaulins to prevent the dropping of materials on public roads.

Washing: Wash the underside of all vehicles leaving the site as follows:

- Mud: Do not carry onto other areas, including adjacent paved streets.
- Noxious plants: If those designated by the local authority are present on the site, make sure seeds are not carried onto other areas, including adjacent paved streets.

Wheel wash/shaker bay

Shaker area size: to The Principal's requirements

Surface: Crushed concrete or rock of between 100 mm and 200 mm approximate diameter.

Services: High pressure hose water supply.

Location: Locate the shaker bay and provide berms to drain to grassed areas of the site and allow infiltration to the subsurface.

2.8 OTHER ENVIRONMENTAL CONTROLS

Cultural heritage

Training: Make sure all personnel working on the site have received training on their responsibilities regarding cultural heritage and are made aware of any sites/areas, which must be avoided. Mark-up such sites/areas on a site map and make available to all relevant personnel during the works.

Notice: Give notice if any item encountered is suspected to be an artefact of heritage value, relic or material which is Aboriginal or belonging to early settlement.

Action: Stop construction work that might affect the item and protect the item from damage or disturbance.

0195P DTAC TACTILE INDICATORS AND STAIR EDGINGS

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide DTAC tactile indicators and stair nosing as documented.

1.2 COMPANY CONTACTS

DTAC technical contacts
Website: www.dtac.com.au/contact

1.3 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.4 STANDARDS

General
Tactile indicators: To AS/NZS 1428.4.1.
Stair edging: To AS 1428.1.

Slip resistance
Classification: To AS 4586.

1.5 MANUFACTURER'S DOCUMENTS

Technical manuals
Technical data sheets and laying guides: www.dtac.com.au/resources
DTAC Stair & Tread Edging: www.dtac.com.au/product/edging
DTAC Warning Tactile: www.dtac.com.au/product/warning-tactile
DTAC Directional Tactile: www.dtac.com.au/product/directional
DTAC Integrated Tactile: www.dtac.com.au/product/integrated
DTAC Edge Protector: www.dtac.com.au/product/edge-protector

1.6 SUBMISSIONS

Products and materials
Type tests: Submit results, as follows:
- Slip resistance of tactile indicators and edgings.
- Luminance contrast testing: Submit evidence of conformance to AS/NZS 1428.4.1 Appendix E and AS 1428.1 Appendix B.

Prototypes
Refer Selections Schedules

Warranties
Tactile indicators, edge protectors and stair edging: Submit DTAC product and installation warranties.

1.7 INSPECTION

Notice
Inspection: Give notice so that inspection may be made of the completed substrate ready for tactile indicators and edging installation.

2 PRODUCTS

2.1 GENERAL

Product substitution
Other products: Conform to PRODUCTS, **GENERAL**, **Substitutions** in *0171 General requirements*.

2.2 DTAC TACTILE INDICATORS, EDGE PROTECTORS AND STAIR EDGING

Warning tactile products
Handrail button: Machined domed type 316 stainless steel button.

Ecotac™ Classic PVD Black: Tactile indicators with a cupped underside, a concentric circle design machined on the type 316 stainless steel horizontal face and a smooth outer edge.

Stair edging products
Urban edging: Continuous band of silicon carbide inserted into anodised aluminium extrusions.

3 EXECUTION

3.1 GENERAL

Substrate preparation and installation of DTAC products
Requirement: To DTAC's recommendations and fitting instructions.

Location: As documented.

Tactile buttons: Drill and pressure fit.

Handrail button: Drill and glue to substrate.

Stair edging: Screw-fix with additional adhesive.

3.2 TESTING

Completion tests
Slip resistance of completed installation: To AS 4663.

Luminance contrast testing of completed installation: Submit evidence of conformance to AS/NZS 1428.4.1 Appendix E and AS 1428.1 Appendix B.

3.3 COMPLETION

Warranties
Conditions: Installation by DTAC or DTAC approved by installer.

Warranty period: 2 years.

4 SELECTIONS

4.1 DTAC PRODUCTS

Refer Selections Schedule

0221 SITE PREPARATION

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide site preparation, as documented.

Designated areas for protection: All existing treed areas to be retained within and adjoining the site boundary

Incidental works

Generally: Undertake the following:

- Reinstatement: Reinstate undeveloped ground surfaces to the condition existing at the commencement of the contract.
- Minor trimming: As required to complete the works, as documented.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements*.

1.3 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions apply:

- Authorities: Any authority or agency covering statutory requirements relating to the project, including clearances for work in that particular area.
- Clearances: A formal certificate, approval or condition issued by an authority to allow work to be carried out in a particular area.
- Network Utility Operator: The entity undertaking the piped distribution of drinking water or natural gas for supply or is the operator of a sewerage system or external stormwater drainage system.

1.4 SUBMISSIONS

Execution details

Requirement: Submit details of methods and equipment proposed for the following:

- Clearing and grubbing.
- Tree removal and transplanting.

1.5 INSPECTION

Notice

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

- Enclosures around trees to be retained.
- Trees to be removed.

2 EXECUTION

2.1 COMMUNITY LIAISON

Notification

General: Notify residents about construction activities which will affect access to, or disrupt the use of, their properties.

Notice: Minimum 5 working days, unless the work is of an urgent nature with safety implications.

Notification content:

- The nature of the work.

- The reason for it being undertaken.
- The expected duration.
- Changes to traffic arrangements and property access.
- The 24-hour contact number of the representative responsible.

2.2 EXISTING SERVICES

General

Requirement: 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.

Utility services: Contact DIAL BEFORE YOU DIG to identify location of underground utility services pipes and cables.

Excavation: Do not machine excavate within 1 m of existing underground services.

Existing service lines: If required, divert services detected during excavation to new routes, clear of the building, and reconnect to the Network Utility Operator's requirements.

2.3 SITE CLEARING

Extent

Requirement: Clear only areas to be occupied by works such as structures, paving, excavation, regrading and landscaping or other areas designated to be cleared.

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

Clearing and grubbing

Clearing: Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble.

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. Backfill holes remaining after grubbing with sand material to prevent ponding of water. Compact the material to the relative density of the existing adjacent ground material.

Redundant/decommissioned works: Remove works, including slabs, foundations, pavings, drains and access chambers covers found on the surface.

Batters

Temporary protection: Where change in level between crest and toe is more than 1.5 m, protect from erosion with geofabric, a hessian and tar or heavy duty black polythene sheet waterproof cover. Seal joints and securely fix down at crest and toe.

Surplus material

Topsoil and excavated material: Continually remove unwanted stripped soil and other material from the site as the work proceeds, including any material dropped on footpaths or roadways.

2.4 STORMWATER AND SEDIMENT CONTROL

General

Erosion and sediment control measures: To *0172 Environmental management*.

Waterways and drains

Waterways: Temporarily divert, as necessary, ditches, field drains and other waterways affected by excavation and reinstate on completion.

Stormwater drains: Divert drains detected during excavation to new routes, clear of the building, and reconnect to the Network Utility Operator's requirements.

2.5 EXISTING WORKS TO BE RETAINED

Marking

Requirement: Mark out works with 1 m high 50 x 50 mm timber stakes with yellow plastic tapes attached to prevent accidental damage.

2.6 TREES TO BE REMOVED

Designation

Marking: Mark trees and shrubs to be removed 1000 mm above ground level.

Extent: In accordance with Arborist Report and Tree protection/ Removal Plans

Tags: to The Principal's requirements

2.7 TREE PROTECTION

General

Warning signs: Display in a prominent position at each entrance to the site, warning that trees and plantings are to be protected during the contract. Remove on completion.

Lettering: Road sign type sans serif letters, 100 mm high to AS 4970 Appendix C.

Protection measures: Provide before commencement of earthworks.

Trees to be retained

Extent: All trees NOT marked for removal.

Tree protection

Tree protection zone (TPZ): To AS 4970 Section 3.

Tree protective measures: To AS 4970 Section 4.

Monitoring and certification: To AS 4970 Section 5.

Work near trees

Harmful materials: Conform to the following:

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

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

Work under trees: Do not remove topsoil from, or add topsoil to, the area within the dripline of the trees.

Excavation: If excavation is required near trees to be retained, give notice. Minimise period of excavation under tree canopies.

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

Roots: Do not cut tree roots exceeding 50 mm diameter. Where it is necessary to cut tree roots, use cutting methods that do not excessively disturb the remaining root system. Immediately after cutting, water the tree and apply a liquid rooting hormone to stimulate the growth of new roots.

Backfilling: Backfill excavations around tree roots. Place the backfill in layers of 300 mm maximum depth and compacted to a dry density similar to that of the original or surrounding soil. Do not backfill around tree trunks to a height greater than 200 mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.

Backfill material:

- Mix proportions (topsoil:well-rotted composts) by volume: 3:1.
- Neutral pH value.
- Free from weed growth and harmful materials.

Compacted ground: Do not compact the ground or use skid-steel vehicles under the tree dripline. If compaction occurs, give notice.

Compaction protection: Protect areas adjacent the tree dripline. Submit proposals for an elevated platform to suit the proposed earthworks machinery.

Watering: Water trees as necessary, including where roots are exposed at ambient temperature more than 35°C.

Mulching: Spread 100 mm thick organic mulch to the whole of the area covered by the drip line of all protected trees.

2.8 TEMPORARY LANDSCAPE FENCING

Fence dimensions

Height: 1200 mm.

Maximum post spacing: 5000 mm.

Components sizes

Corner and gate posts: Hardwood or preservative-treated softwood, 250 mm diameter.

Intermediate posts: Star picket.

Gate: Provide a suitable hinged gate with a gate latch.

Wire: Top, intermediate and bottom rows of 3.2 mm plain galvanized steel wire. Thread the top wire through pieces of plastic tube and through corner posts.

Removal

Completion: Remove the fence at the end of the planting establishment period.

2.9 TREE MAINTENANCE

General

Notice: Give notice before commencing tree maintenance.

Pruning: To AS 4373 using a fully qualified and experienced arborist. Carry out all required works in a safe manner.

Execution

Repair: Undertake tree surgery and rectify any damage to existing trees to be retained.

Operations: Remove dead and decayed wood or limbs that have been broken. Make all cuts at branch collars. If trees show signs of deterioration after the work is completed, carry out a program of soil amelioration such as soil aeration, irrigation or incorporation of organic material. Continue this program until the end of the plant establishment period.

Root pruning: Do not excessively disturb the remaining root system. Cut off damaged roots cleanly inside the exposed or damaged area. Cover exposed root area with soil immediately after pruning, do not leave roots exposed.

Wetting and new root stimulation: Form a water collecting basin and apply a rooting hormone and wetting agent to the rootball.

Precautions: Avoid damage to trees being treated and to nearby trees and surroundings. Do not use trees as anchors for winching operations or bracing. Provide bracing as necessary before cutting to prevent uncontrolled breakages and damage to surroundings.

Failure: If repair work is impracticable, or is attempted and is rejected, remove the tree and root system and make good.

NOTE: Replacement of trees damaged as a result of construction works to The Principal's requirements – liaise with The Principal to arrange replacement sizes and species selection prior to procurement.

2.10 COMPLETION

Clean up

Progressive cleaning: Keep the work included in the contract clean and tidy as it proceeds and regularly remove from the site waste and surplus material arising from execution of the work, including any work performed during the defects liability period or the plant establishment period.

Removal of plant: Within 10 working days of the date of practical completion, remove temporary works, construction plant, buildings, workshops and equipment which does not form part of the works, except what is required for work during the defects liability period or the plant establishment period. Remove these on completion.

Waste disposal: To *0172 Environmental management*.

Vermin management

Requirement: Employ an approved firm of pest exterminators and provide a certificate from the firm stating that the completed works is free of vermin.

0241 LANDSCAPE – WALLING AND EDGING

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide landscape walling and edging, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.3 SUBMISSIONS

Samples
Refer Selections Schedule

1.4 INSPECTION

Notice
Inspection: Give notice so inspection may be made of the following:
- Set out before starting construction.
- Geotextiles and subsurface drainage in place before backfilling.

2 PRODUCTS

2.1 CONCRETE

General
Standard: To AS 1379.
Exposure classification: To AS 3600 Table 4.3.
Grade, if there are cast-in metal items: To AS 3600 Table 4.4.

2.2 DRY STONE WALLS

Walling stone
Natural stone: Stone of uniform quality, sound and free from defects liable to affect its strength, appearance or durability.
Quarried stone: Cut or uncut random or regular size stone.

2.3 EDGING

Concrete
Standard: To AS 1379 – Grade N20.
Steel
Product: Refer selection schedule
Size and profile: Refer selection schedule
Finish: Hot-dip galvanized or powdercoated. Refer plans and details.

3 EXECUTION

3.1 GENERAL

Set-out
General: Set out the position of walls and edging and mark the position of furniture.

Clearing

Extent: Except for trees or shrubs to be retained, clear vegetation within 1 m of the landscape walls. Grub out stumps and roots of removed trees or shrubs and trim the grass to ground level, but do not remove the topsoil.

Excavation

Extent: Excavate for foundations and footings.

Geotextiles

Storage and handling: Store clear of the ground and out of direct sunlight. During installation do not expose the filter fabric to sunlight for more than 14 days.

3.2 DRY STONE WALLS

Construction

Generally: Select the stones for their locations and lay in the wall with minimum stonecutting as follows:

- Each stone is stable, non-rocking, and firmly interlocked with adjacent stones without mortar.
- The wall face shows reasonably regular, flat and vertical stone faces.
- Vertical joints or perpends between stones are spanned by the next stone above.
- Stones are laid generally as through stones whenever possible.
- At least 50% of footings, 30% of wall stones, and all coping stones are laid as through stones.

Footings: Select the largest, flattest and most regular stones for footings, and set them one third of their depth into the ground.

Copings: Select stones of reasonably uniform size and finish the top of the wall to a level line.

Retaining walls

Construction: If dry stone walls act as retaining walls, construct the stonework to be free draining through the wall. Secure the top course of the wall with cement mortar bedding. Backfill progressively, with a layer at least 300 mm thick of porous material, such as coarse aggregate or crushed rock in the size range 20 to 40 mm.

Minimum thickness: 300 mm.

Wall face batter: Batter back the wall face 50 mm to 70 mm for every 300 mm in height.

3.3 EDGING

Concrete

Edging strip: Place in a shallow trench between timber forms. Wood float finish flush with the adjacent finished level. Provide control joints, filled with resilient bituminous material, at 3 m maximum centres.

Concrete kerb: Fixed form, extrusion or slip forms to AS 2876.

Steel

Fixing:

- Angle section: Fixed in place by the mass of surrounding soil works.
- Flats: Fix in place with 250 mm long x 10 mm galvanized steel spikes driven through 50 x 50 mm fixing plates. Weld holed plates at right angles to the face of the flat at 1000 mm centres on alternate sides set parallel and 25 mm below the top of the edging.

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0251 LANDSCAPE – SOILS

1 GENERAL

1.1 RESPONSIBILITIES

General

Soil Types: Provide landscape soils that are 'fit for purpose' and meet the performance requirements specified herein.

Performance

Identification of fit for purpose: Testing certificates.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARDS

Soils

Site and imported topsoil: To AS 4419.

Potting mixes: To AS 3743.

Composts, soil conditioners and mulches: To AS 4454.

1.4 INTERPRETATION

Definitions

General: For the purposes of this worksection the following definitions apply:

- Bad ground: Ground unsuitable for the work, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which is, or becomes, soft, wet or unstable.
- Imported topsoil: Similar to naturally occurring local topsoil, suitable for the establishment and ongoing viability of the selected vegetation, free of weed propagules and of contaminants, and classified by texture to AS 4419 Appendix 1, as follows:
  - Fine: Clay loam, fine sandy loam, sandy clay loam, silty loam, loam.
  - Medium: Sandy loam, fine sandy loam.
  - Coarse: Sand, loamy sand.
- Low density soil: Soil for use on an artificial base material, e.g. roof top garden or large landscape containers. Such soils will usually be blends of mineral and organic compounds, and will typically have:
  - Bulk density: 0.3 to 0.6 Kg/L.
  - Organic matter: 10% to 40% by mass.
- Natural soil: A soil that has been dug from the landscape and is presented for use with no more than minor amendment. This soil could be topsoil, subsoil or a mixture of them and have a bulk density greater than 0.6 Kg/L.
- Organic soil: A general purpose soil (normally an amended natural soil or soil blend) that has:
  - Bulk density: > 0.6 Kg/L.
  - Organic matter: 15% to 25% by mass. Naturally occurring organic soil can be 95% organic by mass.
- Site rock: Rocks selected for salvage.
- Site topsoil: Soil excavated from the site which contains organic matter, supports plant life, conforms to the technical specification and is free from:
  - Stones more than 25 mm diameter.
  - Clay lumps more than 75 mm diameter.
  - Weeds and tree roots.

. Sticks and rubbish.
. Material toxic to plants.

- Soil blend: A general purpose soil derived from the blending of two or more of sand, natural soil material or organic materials, and with a bulk density and organic matter content to meet site specific requirements.
- Top dressing: A sandy soil which is suitable for surface application to lawn.

1.5 SITE INVESTIGATION

Notice

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

- Bad ground.
- Discrepancies.
- Rock.
- Springs, seepages.
- Topsoil > 100 mm deep.

1.6 SUBMISSIONS

Execution

Program: Submit a work program in the form of a bar chart, for the landscape works.

Materials

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

- Material source of supply for topsoil, filling, stone and filter fabrics.

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

Suppliers

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

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

1.7 INSPECTION

Notice

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

- Setting out completed.
- Subgrades cultivated or prepared for placing topsoil.
- Topsoil spread before planting.
- Grassing bed prepared before turfing, seeding, or temporary grassing.

1.8 QUALITY ASSURANCE AND CONTROL

General

The contractor must use analytical testing to verify compliance with the product specification. Testing shall be carried out by a NATA-accredited laboratory such as SESL Australia. Testing shall be done in two parts: Initial compliance certification and Quality control, as described below.

Initial compliance certification

Before any soil installation, the contractor or soil manufacturer will submit samples of trial blends likely to meet the performance specifications to SESL Australia or equivalent NATA-accredited laboratory. See Example components for the soil supplier below for suggested formulations to start this process. The trial blend must be based on available test information on components and, if necessary, employ a Soil Scientist for advice.

Submit trial samples to the testing laboratory, allowing sufficient time for testing and re-formulation in the case of failure to satisfy the performance criteria. Once compliant, a test certificate signed by a Certified Professional Soil Scientist (CPSS) clearly stating compliance with the applicable criteria must be presented to the site supervisor or quality officer.

Note that alternative test methodologies may be accepted and certified as compliant by an independent Soil Scientist.

HOLD POINT 1

Non-compliance will automatically generate HOLD POINT 1. No soil will be installed until initial compliance certification has been demonstrated.

Manufacturer's product representation: For imported soils from manufactures, a 'product representation' document produced by the supplier may be accepted as a compliance certificate if:

- It is an off-the-shelf product line, not a custom mix
- A representative test certificate is available and is acceptably recent (within 3 months)
- The testing covers all those criteria in the performance specification
- The manufacturer's quality assurance system is externally certified

Record keeping

Growing media initial compliance certification records must be kept in an easily retrievable manner that provides for traceability of purchase and location on site. Each compliance certification for all the product specifications used on site must be identified by date, quantity to be supplied and a copy of the formulation used to reach compliance.

Quality control: compliance during construction

The contractor must submit samples of blended spoils or imported soil mixes at regular intervals during construction for the purposes of demonstrating continued compliance as part of quality control.

Soil tests

General: To AS 4419, Table 1.

Sampling: As recommended in AS 4419 Appendix A.

Laboratory: SESL Australia or other NATA registered laboratory.

Imported topsoil tests: Type tests to AS 4419 Appendix B to I (topsoil), or AS 3743 Appendix D to G (potting mixes), as applicable.

Site topsoil tests: To AS 4419 Appendix C to I.

Test submissions

Submit representative samples of ~ 5 kg of each product specification, packed and labelled to indicate the source and the specification to be met. Ten litres of material is required for compost testing. The samples must be taken in a representative manner.

The contractor must undertake testing frequencies at 1 per 500m^3. Variations to this testing frequency are permitted on the submission to the superintendent of an alternative testing program that clearly achieves the desired outcome of quality control. Materials supplied from operations that have a third-party-endorsed quality assurance program may be acceptable pending submission of the relevant documentation.

Testing

All testing as required by the product specifications must be arranged by the contractor, and carried out by the Principal's nominated soil testing laboratory. All test results records will be made available to the superintendent, for review and approval by the project Landscape Architect.

Non-compliance

In the case of substantive non-compliance, Hold Points 2 and 3 will be invoked – HP2 to correct soil already installed and HP3 to ensure new deliveries are compliant. In the case of a minor non-compliance or substantial compliance, a clear statement must be obtained from a qualified independent Soil Scientist waiving the compliance and certifying the sample is fit for purpose.

Non-compliance with the target range criteria does not necessarily render a soil not fit for purpose but making this judgement requires an expert person to take responsibility for such deviation. Also, a conditional compliance certificate may be issued by a CPSS requiring that a certain fertiliser or further organic matter or some other amendment be added, with the aim of achieving compliance.

Where a drainage layer is coarser than around 5mm, a transition layer may be needed between it and the filtration soil media to prevent soil migrating into the drainage gravel layer. Generally this will be an intermediate very coarse sand or fine gravel. Do not use geotextile fabrics over the drainage layer to prevent soil migration.

HOLD POINT 2

The contractor will need to make corrective procedures to bring any soil that has been placed within substantial compliance in accordance with any Soil Scientist's advice.

HOLD POINT 3

In the event that quality control samples show substantial non-compliance from the approval performance requirements, the supplier must demonstrate compliance of any future loads. This may require re-formulation or alteration to existing formulations and may require the advice of a CPSS to meet correct analysis, and make adjustments to mixing ratios, additives and procedures to achieve compliance.

Record keeping

Growing media construction and QC compliance records must be kept in an easily retrievable manner that provides for traceability of purchase and location on site. Each batch of soil must be identified by date of manufacture, quantity and a corresponding test result, and must link into when the material was delivered and where the material was placed.

2 PRODUCTS

2.1 TOPSOIL

Source

General: All soils to be imported shall be manufactured specialist planting media.

General

Deliveries: Documentation to AS 4419, clause 8.

Additives: If using additives to raise topsoil to the required standard, ensure compliance with the relevant test criteria of AS 4419.

Nitrogen drawdown: If the NDI_{150} value is less than 0.5 to AS 4419 Appendix E, a source of soluble nitrogen should be added to or specified for those soils.

Nutrient levels: Provide soil nutrients as outlined in the **Physical and Chemical Properties** tables for each specified soil type.

Bushland restoration nutrient levels: Provide topsoil with nutrient levels related to the soils of the local natural bushland.

Utilise crushed sandstone as specified by Macquarie University and as appropriate and in accordance with the soil performance specification

3 EXECUTION

3.1 PREPARATION

Vegetative spoil

Spoil suitable for mulch or spreading for bushland restoration: Spread freshly harvested native plant biomass, free of weed propagules.

Unsuitable material: Remove vegetative spoil from site. Do not burn.

Embankment stabilisation

General: Where necessary to prevent erosion or soil movement, stabilise embankments.

Method: Either matting overlay or hydromulching.

Matting generally: Biodegradable fibre reinforced with lightweight polymer mesh. Provide lightweight material for seeding, medium or heavy weight material for planting.

Matting in high erosion zones: Flexible carbon black UV stabilised interwoven nylon mesh.

Matting installation: Sow before matting is installed, where sowing is required. Plant after matting is installed, where planting is required. Peg the matting into 300 x 300 mm anchor trenches at top and bottom, backfill the trenches with soil and compact.

Matting pegs: U-shape galvanized steel, at 1000 x 1000 mm intervals generally, 250 mm at overlaps.

3.2 ROCK WORK

Existing rock

General: Protect existing rock, rock shelves and rock outcrops from mechanical damage, surface defacement and other works.

Rock surfaces: Report damage or defacement occurring to any rock faces during the course of the Works.

Replacement: If restoration is not feasible repair the rock face with replaced rocks imported or taken from site.

Planted treatment to rock faces

Treatment: Bonded fibre matrix product including the following:

- Fertiliser starter hydraulically applied as one blended slurry.
- Seed mix.
- Insecticide.

Application: Spray, by a certified soil guard applicator, on to the rockface to encourage vegetation growth in crevices and hollows.

New rock work

Erosion control: Bury rock two thirds by volume or as appropriate for effective erosion control, with weathered faces exposed. Protect the weathered faces from damage.

Site rock: Stockpile for future placement and accessibility for lifting. Dispose of other rock off site.

Imported rock: Provide rock which has been selected before delivery.

Placing rocks: Place while ground formation work is being carried out, as shown in the Landscape Drawings.

3.3 EARTH MOUNDS

Construction

Placing: Place clean fill in layers approximately 150 mm thick compacted to 85% of the dry density ratio of the surrounding soil as determined by AS 1289.5.4.1. Minimise slumping and further compacting.

Edges: Construct changes in grade over a minimum width of 500 mm to smooth, gradual and rounded profiles with no distinct joint.

Existing trees: Maintain the natural ground level under the canopy.

Pipes, culverts and associated structures: Construct mounding to avoid unbalanced loading.

3.4 SUBSTRATE

Podium levels

Screed

General: Provide a high strength mortar screed to podium levels where garden beds and tree planting is to be installed.

Screed depths:

- Maximum unreinforced : 50 mm
- Minimum thickness 25mm

Drainage layer

Excavated: Install drainage cell to top of screed such that drain points freely discharge to the storm water recovery system (into rainwater tank).

Install drainage cell to all sides of void formers as detailed.

Where void former is used, drainage cell must be applied above and below the void former, as well as vertically beside the void former to ensure unimpeded storm water movement. Void former and drainage cell, should be cut to fit the space, so the gap from the planter box wall is no greater than 15mm.

Geofabric

Lay geofabric loosely over drainage cell and ensure that a minimum 100mm of overlay exists

Planter media installation

Planter media should be delivered in bulka bags or small 20kg bags dependant on site access restrictions.

Consolidation

General: Compact lightly and uniformly in 50 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to design levels.

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

Rain Garden

Filter media shall be lightly compacted during installation to prevent migration of fine particles. In small systems, a single pass with a vibrating plate should be used to compact the filter media, while in large systems, a single pass with roller machinery (e.g. a drum lawn roller) should be performed.

Under no circumstance should heavy compaction or multiple-passes be made. Filter media should be installed in two lifts unless the depth is less than 500 mm.

Field testing of hydraulic conductivity shall be carried out at least twice:

1. one month following commencement of operation, and
2. in the second year of operation to assess the impact of vegetation on hydraulic conductivity.

The hydraulic conductivity of the filter media should be checked at a minimum of three points within the system. The single ring, constant head infiltration test method (shallow test), as described by Le Coustumer et al. (2007), should be used. Given the inherent variability in hydraulic conductivity testing and the heterogeneity of the filter media, the laboratory and field results are considered comparable if they are within 50% of each other. However, even if they differ by more than 50%, the system will still function if both the field and laboratory results are within the relevant recommended range of hydraulic conductivities.

3.5 SUBSOIL

General

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.

Unexcavated: Remove weeds, roots, builder's rubbish and other debris. Bring the planting bed to 75 mm below finished design levels.

Cultivation

Cultivation depths (mm):

- Grassed areas (instant turf): 100mm
- Planting areas: 300mm

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.

Additives

Subsoils shall be tested prior to any cultivation to determine subsoil conditions and formulate appropriate recommendations for their amelioration.

3.6 TOPSOIL

General

Following installation of all garden bed and turf areas, soil compaction to be tested and in the event it is excessively high, to be remediated to the satisfaction of the Landscape Architect prior to planting or grassing. Testing to be done with a penetrometer to test soil compaction to a depth of 500mm. If resistance as measured by the penetrometer is greater than 300psi or 2,000kPa, decompaction of material must be undertaken.

Site topsoil preparation

Screeding: By a power hydraulic screen capable of handling 100 tonne per hour, with sieves grading from 20 mm to 15 mm.

Contamination: If diesel oil, cement or other phytotoxic material has been spilt on the site topsoil, excavate the contaminated soil and dispose of it off the site.

Additives program: 8 weeks before stolonizing or turfing.

Placing topsoil

Site topsoil: Do not incorporate site topsoil into the works until soil testing certification has been approved. Remove unauthorised material from the site.

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

- Required finished levels and contours may be achieved after light compaction.
- Grassed areas may be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

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

Finishing: Feather edges into adjoining undisturbed ground.

Consolidation

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

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

3.7 STRUCTURAL SOIL

Transport and handling: Structural support soil is a uniformly blended mixture of aggregate and filler soil that is prone to segregation during handling at the source and during transport. Particular care must be taken to ensure that all structural support soil is thoroughly homogenised before placement and compaction. To assist this, and to prevent segregation, ensure that the soil mixture remains moist and covered at all times during mixing, transport, storage, and placement.

Placement: Structural soil is to be placed in 150mm layers and compacted to a minimum of 95% of maximum dry density at optimum moisture content, in accordance with ASTM D 698 Standard Proctor Method. Compact the subgrade with a minimum of three passes of a suitable vibrating machine or apply other compaction forces as needed to achieve the required subgrade compaction rate.

Watering and aeriation pipes: Water and aeriation pipes are to be installed with structural soil to provide air and water to soil below pavements – refer to tree planting details for location and fixing of pipes.

Installation: Ensure structural soil is covered to retain moisture level and protect filler soil from damage immediately after installation. Do not install structural soil if it is raining as the filler soil can be washed away, or washed to the bottom of the tree pit. If structural soil has become segregated during transport, or filler soil is washed away during installation, seek advice from Landscape Architect and soil scientist to rectify the damaged soils.

4 SELECTIONS

4.1 SOIL TYPE 1 | IMPORTED TOP SOIL – MASS PLANTING ON GRADE 'A' HORIZON

Reference: 'Specification D1 Mass Planting Soil' in Soils for Landscape Development (Leake S & Haege E, 2014)

Part A. 'Fit-for-purpose' performance description

A sandy loam to clay loam topsoil mix designed for mass planting of grasses, woody and herbaceous perennials that do not have very high nutrient requirements and is not subject to compaction by pedestrian or other traffic. The heavier textured soils in this specification may require the use of engineered solutions (drainage techniques) where excessive wetness is anticipated. Planting methods may vary and include direct seeding, tube and potted specimens up to 45L.

This planting specification can use site-won topsoil characterised according to *Part D. Site soil investigation and characterisation* described below.

Appropriate recycled soils may also be incorporated.

Phosphorous-sensitive plants: Phosphorus-tolerant plants have been chosen for this soil type. Yellow highlighted text denotes critical chemical property ranges – i.e. there is no tolerance

outside these ranges for this soil type and batch testing results of procured soils must be supplied. Phosphorus levels must be within the standard range of the chemical properties.

Part B. Product specification (technical parameters)

Generally, the soil must be free of 'unwanted material' and must meet all the requirements of the physical and chemical specifications below. If any discrepancy exists, Australian Standards AS 3743 for Potting mixes and the specified requirements of AS 4419.

Soil Type 1 – Physical Properties

Property	Unit	Sufficiency range
Texture, preferred range	n/a	Sandy loam to clay loam
Organic matter	% dry weight basis	2-5%
Hydraulic conductivity / Permeability (@ 16 drops by McIntyre Jakobsen)	mm/h	> 20
Wettability	mm/min	> 5
Dispersibility in water	Category	1 or 2 (AS 4419) category
Large particles (naturally occurring)		
2-20 mm	% w/w	< 20
> 20 mm	% w/w	< 10
Visible contaminants > 2mm (glass, plastic and metal)	% w/w	< 0.5

Soil Type 1 – Chemical Properties

Property	Unit	Sufficiency range
pH in water (1:5) Standard range	pH units	5.4-6.8
pH in $CaCl_2$ (1:5) Standard range	pH units	5.2-6.5
pH in water (1:5) Alkaline range	pH units	6.8-8.0
pH in $CaCl_2$ (1:5) Alkaline range	pH units	6.5-7.5
Electricity conductivity	dS/m	< 0.5
Phosphorus – P tolerant / standard plants. Acid soils method 18F1	mg/kg	30-100
Phosphorus – P tolerant / standard plants. Alkaline soils method 9B1 or 9C1	mg/kg	10-30
Phosphorus – P sensitive plants. Acid soils method 18F1	mg/kg	< 30
Phosphorus – P sensitive plants. Alkaline soils method 9B1 or 9C1	mg/kg	< 20
Exchangeable sodium (Na)	% of ECEC	< 7%
Exchangeable potassium (K)	% of ECEC	3-10%
Exchangeable calcium (Ca) method 18F1 or 15A1 in alkaline soils	% of ECEC	60-80
Exchangeable magnesium (Mg)	% of CEC	15-25
Exchangeable aluminium (Al)	% of CEC	< 5
Exchangeable Ca:Mg ratio	Ratio	3-9
Available iron (Fe)	mg/kg	100-400
Available manganese (Mn)	mg/kg	25-100
Available zinc (Zn)	mg/kg	5-30
Available copper (Cu)	mg/kg	1-15
Available boron (B)	mg/kg	0.5-5
Available N (N as nitrate)	mg/kg	> 20

Part C. Example components for the soil supplier

The following table outlines suggested components that may likely meet the physical requirements of this specification. This is **not** part of the product specification. It is an example for the edification of the soil supplier of what might meet the product specification.

Example components (likely to meet the physical requirements of this specification)

Sandy loam soil or site won topsoil	70-100% by volume	e.g. 8 parts washed sand / 2 parts sandy loam / 1 part AS 4454 compost
Composted soil conditioner conforming with AS 4454	0-30% by volume	

Base level requirements for fertilisers (to be verified by laboratory testing and per agronomist's report)

Lime and / or dolomite	2 kg/m3 at mixing
Balanced compound NPK turf starter fertiliser	0.5 kg/100m^2 after placement
Minor and trace elements	300 g/m^3 at mixing

For the purposes of tendering the contractor must allow for the inclusion of the above soil amendments but the specific amendments required must be verified by laboratory testing and agronomist's recommendations.

Part D. Site soil investigation and characterisation

This section describes requirements of the analysis of existing site soil for substantially intact sites (the topsoil and the subsoil are present).

Site soil survey

A survey of the sites soil resource must be conducted, with the following as a minimum:

1. The uniformity or otherwise of the residual surface materials must be determined to 500mm minimum depth.
2. The morphology (texture, structure and colour) of the main types of surface materials present and their horizon designation should be determined.
3. The depths of each soil horizon to rock or parent material shall be measured if possible.
4. Any physical limitation imposed by the materials (stoniness, clay, poor drainage) should be assessed.
5. Samples representative of the main types of surface horizon (topsoil) material present must be analysed for the following properties as minimum:
    a. pH
    b. salinity
    c. cation exchange properties
    d. plant available nutrient contents P, N, S Fe, Mn, Zn, Cu, B
    e. dispersability and aggregate stability
    f. organic matter
    g. texture or particle size analysis
    h. stone content
6. Samples representative of the main types of subsurface horizons (subsoil) material present must be analysed for the following properties as a minimum:
    a. pH
    b. salinity
    c. cation exchange properties
    d. dispersability and aggregate stability
    e. texture or particle size analysis
    f. stone content
7. Where there is any suspicion of salinity, a deep soil sample (to around 800mm depth) must be taken and also analysed for subsoil properties as above.
8. The consultant must provide a report identifying as a minimum:
    a. A description of the field condition of the surface material soil (results of the field survey)

b. Interpretation of test results
c. A statement of 'fit-for-purpose' as topsoil, subsoil, or subgrade
d. Recommendation for reuse, amelioration or improvement of both topsoil and subsoil.

9. The report must include comments and recommendations on the following details:
   a. The depth of each soil horizon
   b. The morphology (texture, structure and colour) of the at least the A and B horizons
   c. The presence of any inclusions (ironstone, manganese pellets, lime concretions)
   d. The soil types or classification of the soil(s) present
   e. Any areas of disturbed, filled or altered conditions that render the soil unusable or raises special requirements
   f. The depth of the topsoil and any variation in depth for stripping purposes
   g. Recommended topsoil stripping depths and stockpiling methods
   h. Any limitations imposed by the chemical and physical properties of the soils
   i. The means by which the soils may be ameliorated or imp[roved various landscape purposes

4.2 SOIL TYPE 2 | IMPORTED TOP SOIL – MASS PLANTING ON GRADE 'B' HORIZON

Reference: 'Specification B3 Imported Subsoil' in Soils for Landscape Development (Leake S & Haege E, 2014)

Part A. 'Fit-for-purpose' performance description

Generally a low organic matter material that is well balanced chemically, is not saline or sodic or excessively acidic or calcium deficient and not dispersive. It is designed to provide improved rooting depth for larger plantings and reduce the likelihood of waterlogging. It may be made up using site subsoil or fill materials or a blend of both. It is not generally considered to require the application of fertiliser to subsoil but must be low in P if used for P-sensitive plantings.

Phosphorous-sensitive plants: Phosphorus-tolerant plants have been chosen for this soil type. Yellow highlighted text denotes critical chemical property ranges – i.e. there is no tolerance outside these ranges for this soil type and batch testing results of procured soils must be supplied. Phosphorus levels must be within the standard range of the chemical properties.

Part B. Product specification (technical parameters)

Generally the soil must be free of 'unwanted material' and must meet all the requirements of Tables 6.1 and 6.2. If any discrepancy exists, Australian Standards AS 3743 for Potting mixes and the specified requirements of AS 4419.

Soil Type 2 – Physical properties

Property	Unit	Sufficiency range
Texture, preferred range	n/a	Sandy loam to sandy clay loam
Emerson aggregate class		> 4
Large particles (method ref. AS7755 5.4) in the largest dimension		
2–10 mm	% w/w	< 20
10–20 mm	% w/w	< 10
> 20	% w/w	< 10
> 50 mm	% w/w	< 2
Visible contaminants > 2 mm*	% w/w	0–0.5

*Of which plastics: 0–0.25 of which man-made sharps: 0 in 1.0 kg of air-dried soil.

Soil Type 2 – Chemical properties

Property	Unit	Sufficiency range
Wettability	min	≥ 2
pH in water (1:5) Standard range	pH units	5.4–6.8
pH in $CaCl_2$ (1:5) Standard range	pH units	5.2–6.5

Property	Unit	Sufficiency range
pH in water (1:5) Alkaline range	pH units	6.8–8.0
pH in $CaCl_2$ (1:5) Alkaline range	pH units	6.5–7.5
Electrical conductivity (1:5)	dS/m	< 0.5
Chloride	mg/kg	< 200
Phosphorus – P-tolerant or standard plants acid soils method 18F1	mg/kg	< 50
Phosphorus – P-sensitive plants alkaline soils method 9B1 or 9C1	mg/kg	< 20
Exchangeable Sodium (Na)	% of ECEC	< 7%
Exchangeable Potassium (K)	% of ECEC	3–10%
Exchangeable Calcium (Ca) method 18F1 or 15A1 in alkaline soils	% of ECEC	60–80
Exchangeable Magnesium (Mg)	% of ECEC	15–25%
Ca:Mg ratio	Ratio	1.5–8

Part C. Example components for the soil supplier

The following table outlines suggested components that may meet the physical requirements of this specification. This is **not** part of the product specification. It is an example for the edification of the soil supplier of what might meet the product specification.

Example components (likely to meet the physical requirements of this specification)

Sandy or sandy loam soil	20–40% v/v
On-site clay loam or clay subsoil	30–60% v/v

Base level requirements for fertilisers (to be verified by laboratory testing and per agronomist's report)

Lime and/or dolomite	2 kg/m^3
or	
Gypsum	2 kg/m^3

4.3 SOIL TYPE 3 | IMPORTED TOP SOIL – TURF ON GRADE

Reference: 'Specification C1 Passive Amenity Turf' in Soils for Landscape Development (Leake S & Haege E, 2014)

Part A. 'Fit-for-purpose' performance description

Generally, this requires a sandy loam 'turf underlay' topsoil mix designed to provide moderate resistance to compaction in public and other amenity turf areas subject moderate levels of pedestrian traffic. The specification is not suitable for active recreational areas and is not generally considered suitable for construction of playing fields, even with specific turf management practices to prevent compaction. The blend provides superior water-holding capacity to Specification C2 soils.

Part B. Product specification (technical parameters)

Generally the soil must be free of 'unwanted material' and must meet all the requirements of Tables 6.3 and 6.4. If any discrepancy exists, Australian Standards AS 3743 for Potting mixes and the specified requirements of AS 4419.

Soil Type 3 – Physical Properties

Property	Unit	Sufficiency range
2.0 mm (fine gravel)	% retained by mass	< 10
1.0 mm (very coarse sand)	% retained by mass	< 10

Property	Unit	Sufficiency range
0.5 mm (coarse sand)	% retained by mass	10–30
0.25 mm (medium sand)	% retained by mass	20–40
0.1 mm (fine sand)	% retained by mass	10–30
0.05 (very fine sand)	% retained by mass	5–15 (max 25% combined vfs, Si +Cl)
0.002 mm (silt)	% retained by mass	< 12 (Si + Clay combined) 5–10
< 0.002 mm (clay)	% retained by mass	3–8
Large particles	% by mass	2–20 mm = < 10% > 20 mm = 0%
Organic matter content	% w/w	2 to 8
Permeability	mm/h	> 30 (@ 16 drops by McIntyre Jakobsen)
Wettability (AS 4419)	mm/h	> 5
Dispersibility in water	Category	1 or 2 (AS 4419) category

Soil Type 3 – Chemical properties

Property	Unit	Sufficiency range
pH in water (1:5)	pH units	5.4-8.0
pH in $CaCl_2$ (1:5)	pH units	5.2-7.5
Electricity conductivity	dS/m	< 0.5
Exchangeable sodium (Na)	% of ECEC	< 7
Exchangeable Ca:Mg ratio	Ratio	3-9
Available phosphorus	mg/kg	
Acid soils method 18F1		50-150
Alkaline soils method 9B1 or 9C1)		20-50
Available nitrogen (N as nitrate)	mg/kg	20-60

Part C. Example components for the soil supplier

The following table outlines suggested components that may likely meet the physical requirements of this specification. This is not part of the product specification. It is an example for the edification of the soil supplier of what might meet the product specification.

Example components (likely to meet the physical requirements of this specification)

Medium–coarse grade washed sand	30–50% by volume	e.g. 5 parts washed sand/4 parts site soil loam/1 part AS 4454 compost
Sandy loam soil or site soil	40–60% by volume	
Composted soil conditioner conforming with AS 4454	10% by volume	

Base level requirements for fertilisers (to be verified by laboratory testing and per agronomist's report)

Lime and / or dolomite	2 kg/m3 at mixing
Balanced compound NPK turf starter fertiliser	0.5 kg/m^3 or 50 g/m^2 after placement
Minor and trace elements	300 g/m^3 at mixing

For the purposes of tendering the contractor must allow for the inclusion of the above soil amendments but the specific amendments required must be verified by laboratory testing and agronomist's recommendations.

4.4 SOIL TYPE 4 | IMPORTED TOP SOIL – MASS PLANTING ON SLAB 'A' HORIZON

Reference: 'Specification E1 On-Slab Soil Media 'A' Horizon' in Soils for Landscape Development (Leake S & Haege E, 2014)

Part A. 'Fit-for-purpose' performance description

This specification describes the formulation of an open granular well-drained growing media with a saturated density of less than 2400 kg/m3 (2.4 kg/L) for use in on-slab applications, including green roofs with an expectation of longevity. It is a topsoil formulation to be used in the surface 300 mm of all on-slab installations including planter boxes, containers and garden beds.

In order to maintain structure and porosity over extended periods, and to avoid slumping and volume loss over time, the formulation must employ low density mineral components such as ash, perlite, scoria, pumice and diatomaceous earth, or artificial components such as urea formaldehyde and styrofoam. Physically, the media has the properties of a potting media and is assessed using the methodology of AS 3743.

Phosphorous-sensitive plants: Phosphorus-tolerant plants have been chosen for this soil type. Yellow highlighted text denotes critical chemical property ranges – i.e. there is no tolerance outside these ranges for this soil type and batch testing results of procured soils must be supplied. Phosphorus levels must be within the standard range of the chemical properties.

Part B. Product specification (technical parameters)

Generally, the soil must be free of 'unwanted material' and must meet all the requirements of AS 3743 Potting mixes and the specified requirements of AS 4419. However, compliance with AS 3743 does not demonstrate compliance with this specification. Where the requirements of this specification and AS 3743 conflict, properties specified here must take precedence.

Use AS 3743 unless otherwise stated.

Soil Type 4 – Physical Properties

Property	Unit	Sufficiency range
Texture, preferred range	n/a	Gravelly loamy sand to organic sandy loam
Air-filled porosity	%	≥ 10
Water-holding capacity	%	≥ 40
Permeability (@ 16 drops by McIntyre Jakobsen)	mm/h	> 100
Organic matter	% w/w	< 15
Wettability	min	≤ 5
Dispersibility in water	Category	1 or 2 (AS 4419) category
Large particles in the largest dimension		
< 2 mm	% w/w	30–70
2–10 mm	% w/w	10–20
10–20 mm	% w/w	5–10
20–50 mm	% w/w	< 5
> 50 mm	% w/w	0

Soil Type 4 – Chemical properties

Property	Unit	Sufficiency range
pH in water (1:5) standard range	pH units	5.4–6.8
Electrical conductivity (1:1.5)	dS/m	< 2.2
Chloride	mg/L	≤ 200
Ammonium-N (NH_4)	mg/L	≤ 100
Ammonium-N + nitrate-N (NH_4 + NO_3)	mg/L	≥ 50
Nitrogen draw-down index	-	≥ 0.7

Property	Unit	Sufficiency range
Toxicity index	mm	≥ 70
Phosphorus – P-tolerant plants (P)	mg/L	8–40
Low phosphorus – P-sensitive plants (P)	mg/L	< 3
Potassium (K)	mg/L	50–250
Sulphate (SO_4)	mg/L	≥ 40
Calcium (Ca)	mg/L	≥ 80
Magnesium (Mg)	mg/L	≥ 15
Ca:Mg ratio	Ratio	1.5–10
K:Mg ratio	Ratio	1–7
Sodium (Na)	mg/L	≥ 130
Iron (Fe)	mg/L	≥ 35
Copper (Cu)	mg/L	0.4–15
Zinc (Zn)	mg/L	0.3–10
Manganese (Mn)	mg/L	1–15
Boron (B)	mg/L	0.02–0.65

Part C. Example components for the soil supplier

The following table outlines suggested components that may likely meet the physical requirements of this specification. This is not part of the product specification. It is an example for the edification of the soil supplier of what might meet the product specification.

Example components (likely to meet the physical requirements of this specification)

Sandy loam soil or site won topsoil	20–40% by volume
Horticultural ash, perlite, or similar lightweight low-density mineral matter or mixtures of these	30–60% by volume
Composted soil conditioner conforming with AS 4454	20–30% by volume

Base level requirements for fertilisers (to be verified by laboratory testing and per agronomist's report)

Lime and / or dolomite	2 kg/m3 at mixing
Balanced compound NPK turf starter fertiliser	3.0 kg/100 m^2 after placement
Minor and trace elements	300 g/m^3 at mixing

For the purposes of tendering, the contractor must allow for the inclusion of the above soil amendments, but the specific amendments required must be verified by laboratory testing and agronomist's recommendations.

The suggested fertilisers are expected to last 3–6 months of sustained growth. A suitable fertiliser (e.g. controlled slow release) and organic matter maintenance program may be required after this period, depending on the design intent.

4.5 SOIL TYPE 5 | IMPORTED TOP SOIL – MASS PLANTING ON SLAB 'B' HORIZON

Reference: 'Specification E2 On-Slab Soil Media 'B' Horizon' in Soils for Landscape Development (Leake S & Haege E, 2014)

Part A. 'Fit-for-purpose' performance description

The specification describes the formulation of an open granular well-drained growing media with an all-up saturated density of less than 2400 kg/m3 (2.4 kg/L) for use in on-slab applications with an expectation of longevity to be used as a subsoil below 300 mm of all on-slab installations, including planter boxes, containers and garden beds.

In order to maintain structure and porosity over extended periods, and to avoid slumping and volume loss over time, the formulation must employ low-density mineral components such as ash, perlite,

scoria, pumice and diatomaceous earth, or artificial components such as urea formaldehyde and Styrofoam.

Physically the media has the properties of a potting media and is assessed using the methodology of AS 3743.

Phosphorous-sensitive plants: Phosphorus-tolerant plants have been chosen for this soil type. Yellow highlighted text denotes critical chemical property ranges – i.e. there is no tolerance outside these ranges for this soil type and batch testing results of procured soils must be supplied. Phosphorus levels must be within the standard range of the chemical properties.

Part B. Product specification (technical parameters)

Generally, the soil must be free of 'unwanted material' and must meet all the requirements of AS 3743 and the specified requirements of AS 4419. However, compliance with AS 3743 does not demonstrate compliance with this specification. Where the requirements of this specification and AS 3743 conflict, properties specified here must take precedence.

Soil Type 5 – Physical Properties

Property	Unit	Sufficiency range
Texture, preferred range	n/a	Gravelly loamy sand to organic sandy loam
Air-filled porosity	%	≥ 10
Water-holding capacity	%	≥ 40
Permeability (@ 16 drops by McIntyre Jakobsen)	mm/h	> 100
Organic matter	% w/w	< 5
Wettability	min	≤ 5
Dispersibility in water	Category	1 or 2 (AS 4419) category
Large particles in the largest dimension		
< 2 mm	% w/w	30–70
2–10 mm	% w/w	10–20
10–20 mm	% w/w	5–10
20–50 mm	% w/w	< 5
> 50 mm	% w/w	0

Soil Type 5 – Chemical properties

Property	Unit	Sufficiency range
pH in water (1:5) standard range	pH units	5.4–6.8
Electrical conductivity (1:1.5)	dS/m	< 2.2
Chloride	mg/L	≤ 200
Ammonium-N (NH_4)	mg/L	≤ 100
Ammonium-N + nitrate-N (NH_4 + NO_3)	mg/L	≥ 50
Nitrogen draw-down index	-	≥ 0.7
Toxicity index	mm	≥ 70
Phosphorus – P-tolerant plants (P)	mg/L	8–40
Low phosphorus – P-sensitive plants (P)	mg/L	< 3
Potassium (K)	mg/L	50–250
Sulphate (SO_4)	mg/L	≥ 40
Calcium (Ca)	mg/L	≥ 80
Magnesium (Mg)	mg/L	≥ 15
Ca:Mg ratio	Ratio	1.5–10
K:Mg ratio	Ratio	1–7

Property	Unit	Sufficiency range
Sodium (Na)	mg/L	≥ 130
Iron (Fe)	mg/L	≥ 35
Copper (Cu)	mg/L	0.4–15
Zinc (Zn)	mg/L	0.3–10
Manganese (Mn)	mg/L	1–15
Boron (B)	mg/L	0.02–0.65

Part C. Example components for the soil supplier

The following table outlines suggested components that may likely meet the physical requirements of this specification. This is not part of the product specification. It is an example for the edification of the soil supplier of what might meet the product specification.

Example components (likely to meet the physical requirements of this specification)

Sandy loam soil or site won topsoil	10–30% by volume
Horticultural ash, perlite, or similar lightweight low-density mineral matter or mixtures of these	30–50% by volume
Composted 10mm pine bark	20–40% by volume
Composted soil conditioner conforming with AS 4454	<20% by volume

Base level requirements for fertilisers (to be verified by laboratory testing and per agronomist's report)

Lime and / or dolomite	2 kg/m3 at mixing
Balanced compound NPK turf starter fertiliser	3.0 kg/100m^2 after placement
Minor and trace elements	300 g/m^3 at mixing

For the purposes of tendering, the contractor must allow for the inclusion of the above soil amendments, but the specific amendments required must be verified by laboratory testing and agronomist's recommendations.

The suggested fertilisers are expected to last 3–6 months of sustained growth. A suitable fertiliser (e.g. controlled slow release) and organic matter maintenance program may be required after this period, depending on the design intent.

~~4.6 SOIL TYPE 6 | IMPORTED TOP SOIL – STRUCTURAL SUPPORT SOIL~~

~~*Reference: 'Specification F1 Structural Support Soils' in Soils for Landscape Development (Leake S & Haege E, 2014)*~~

~~Part A. 'Fit-for-purpose' performance description~~

~~The specification describes the formulation of a structural support soil (SSS) for tree planting in urbanised environments. SSS are designed to form a basement for engineered structures such as roads, pavements and kerbing, while also providing rooting volume for tree roots. Due to the high void space, they will permit root growth through the medium and also help distribute root pressures over a wider section of pavement, reducing or delaying pavement heaving by roots. The size of the aggregates or stone fraction determines how large the roots can grow before heaving occurs.~~

~~SSS is a two-part system comprised of a stone lattice for strength and structural support (load bearing) and filler soil to service the horticultural needs. The stone lattice provides structural stability through stone-to-stone contact, while also providing interconnected voids for root penetration, air and water movement. The system is engineered to maintain a high degree of porosity after installation and compaction. The intention is to 'suspend' the horticultural soil component of the blend between stones, which come together during compaction, producing a load-bearing, compacted stone lattice with uncompacted soil in the voids.~~

~~The ratio of filler soil to aggregate is the major consideration for achieving the engineering and horticultural objective. Thus the 'aggregate', 'filler soil' and blending ratio of the two need to be specified and carefully validated. Generally, it will be an amount of filler soil equal to half the void space of the compacted aggregate. Assuming the aggregate has a void space of 40%, it will be 10 parts aggregate by volume to 2 parts filler soil.~~

Important note:

The total volume of SSS is determined by the volume of aggregate as adding filler soil does not increase the overall volume. Tree soil volume estimations must factor this into calculations for recommending soil volume.

Transport and placement of SSS

SSS must be a uniformly blended mixture of aggregate and filler soil and are prone to segregation during handling at the source and during transport. Particular care must be taken to ensure that all structural soil is thoroughly homogenised before placement and compaction. To assist this, and to prevent segregation, ensure that the mixture remains moist at all times during mixing, transport, storage and placement.

Part B. Product specification (technical parameters): filler soil

The criteria provided in Tables 6.23 and 6.24 must be applied to the filler soil component of the SSS blend. In addition to the performance specification listed below, the filler soil component must be a clay loam or similar texture and be of uniform composition without admixture of subsoil must be free of 'unwanted material'. It must be free of stone and gravel greater than 8 mm and be free from toxic substances harmful to plant growth.

Soil Type 6 – Physical Properties

Property	**Unit**	**Sufficiency range**
Texture, preferred range	n/a	Loam to clay loam
Organic matter	% dwb	3–8
Wettability	mm/h	> 5
Gravel > 4 mm	% w/w	< 2
Dispersibility in water	Category	1 or 2 (AS 4419) category

The following assessment criteria apply to the nominal 63 mm aggregate to be used in the SSS blend. The aggregate must be a free-draining granular material capable of sustaining the anticipated load bearing requirements of the pavement and must be free of 'unwanted material'. As a guide, an aggregate that conforms to the requirements of AS 2758.7 (1996) for Class L 60 mm railway ballast is likely to possess the desired properties.

Part C. Example components for the soil supplier

The following table outlines suggested components that may likely meet the physical requirements of this specification. This is **not** part of the product specification. It is an example for the edification of the soil supplier of what might meet the product specification.

Example components (likely to meet the physical requirements of this specification)

Nominal 63 mm hard rock aggregate (usually basalt, diorite or granite)	1 m^3
Filler soil (preferably loam to clay loam)	200 L

Soil Type 6 – Chemical properties

Property	**Unit**	**Sufficiency range**
pH in water (1:5) standard range	pH units	5.4–6.8
pH in CaCl2 (1:5) standard range	pH units	5.2–6.5
Electrical conductivity (1:5)	dS/m	< 0.5
Phosphorus (P)	mg/kg	30–100
Exchangeable sodium (Na)	% of ECEC	< 7
Exchangeable potassium (K)	% of ECEC	3–10
Exchangeable calcium (Ca)	% of ECEC	60–80
Exchangeable magnesium (Mg)	% of CEC	15–25
Exchangeable aluminium (Al)	% of CEC	< 5

Property	Unit	Sufficiency range
Exchangeable Ca:Mg ratio	Ratio	3–9
Available iron (Fe)	mg/kg	100–400
Available manganese (Mn)	mg/kg	25–100
Available zinc (Zn)	mg/kg	5–30
Available copper (Cu)	mg/kg	1–15
Available boron (B)	mg/kg	0.5–5
Available N (N as nitrate)	mg/kg	> 20

4.7 SOIL TYPE 7 | IMPORTED TOP SOIL – RAINGARDENS & STORMWATER FILTRATION SOILS

Reference: 'Specification F2 Raingardens and Stormwater Filtration Soils' in Soils for Landscape Development (Leake S & Haege E, 2014)

Part A. 'Fit-for-purpose' performance description

This Specification describes a high permeability loamy sand medium for use as the growing and filtration layer in biofiltration bed installations. The specification is based on a modified version of 'Guidelines for filtration media in biofiltration systems' (FAWB 2009). The permeability requirements are quite strict and usually mean that naturally occurring materials will not meet the specifications and mixtures of sand with some soil are required. The FAWB recommendation is that only the surface 100mm of filtration media must be fertilised to aid plant establishment.

The required properties of the drainage layer and transition layer (if needed) are also specified.

When considering variation, more emphasis must be placed on compacted permeability than on strict adherence to particle distribution. In practice, hydrologists may define the permeability rate more closely than is specified here following hydraulic loading calculations.

Part B. Product specification (technical parameters)

Generally, the soil must be free of 'unwanted material' and must meet all the requirements of the specifications below. Where engineers have otherwise specified permeability, that specification will over-ride permeability within the specifications below.

Note: If the drainage gravel is significantly coarser than the biofiltration soil medium it may be necessary to install a 50 mm transition layer of coarse sand between the two to prevent migration of fines into the gravel. Do not use geotextile fabrics between the gravel and the biofiltration soil or the transition layer.

Soil Type 7 – Physical Properties

Property	Unit	Sufficiency range
Texture, preferred range	n/a	Loamy sand
Permeability	mm/h	100–300
Particle size distribution		
2.0–3.35 mm fine gravel	% w/w	< 3
1.0–2.0 mm coarse sand	% w/w	4–10
0.25–1.0 mm medium and coarse sand	% w/w	40–60
0.15–0.25 mm fine sand	% w/w	10–30
0.05–0.15 mm very fine sand	% w/w	5–30
< 0.05 mm silt plus clay	% w/w	< 3

Soil Type 7 – Chemical properties

Property	Unit	Sufficiency range
pH (1:5 in water)	pH units	5.5–7.5
Electrical conductivity (1:5)	dS/m	< 1.2
Phosphorus (Olsen)	mg/kg	< 80
Total nitrogen	mg/kg	< 1000

Property	**Unit**	**Sufficiency range**
Organic matter	% w/w	2–5

Part C. Example components for the soil supplier

The following table outlines suggested components that may likely meet the physical requirements of this specification. This is **not** part of the product specification. It is an example for the edification of the soil supplier of what might meet the product specification.

Example suggested components for the surface layer

Loamy sand or sandy loam soil	< 20% v/v
Medium sand	70–80% v/v
Composted soil conditioner conforming with AS 4454	10–20% v/v

Example base level requirements for fertilisers for the surface layer (to be verified by laboratory testing and per agronomist's report)

Organic fertiliser (e.g. poultry manure)	5 kg/m^3 or 500 g/m^2
Compound fertiliser (NPK 16:4:14)	0.4 kg/m^3 or 40 g/m^2
Trace element mix	0.1 g/m^3 or 10 g/m^2
Superphosphate	0.2 g/m^3 or 20 g/m^2
Magnesium sulphate	0.3 g/m^3 or 30 g/m^2
Potassium sulphate	0.2 g/m^3 or 20 g/m^2

Example suggested components for the filtration layer

Loamy sand or sandy loam soil	< 20% v/v
Medium sand	70–80% v/v
Composted soil conditioner conforming with AS 4454	10–20% v/v

Example suggested components for the transition layer

Medium sand	100% v/v

Example suggested components for the drainage layer

2–5 mm drainage gravel	100% v/v

For the purposes of tendering, the contractor must allow for the inclusion of the above soil amendments, but the specific amendments required must be verified by laboratory testing and agronomist's recommendations.

0253 LANDSCAPE – PLANTING

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide planting, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.3 SUBMISSIONS

Certification
Species: Submit evidence of conformance to EXECUTION, **COMPLETION**, **Product Certification**.

Execution details
Program: Submit a work program in the form of a bar chart, for the landscape works.

Maintenance program: Submit a proposed planting maintenance program.

Planting machine: If a planting machine is to be used as an alternative to hand planting, submit proposal.

Spraying: Submit proposal.

Material site storage: Submit proposal.

Maintenance manuals
General: Submit recommendations for maintenance of plants.

Products and materials
Supplier's data: Submit supplier's data including the following:
- Material source of supply.

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

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

Bulk materials: Submit a 5 kg sample of each type specified. Submit bulk material samples, with required test results, at least 5 working days before bulk deliveries.

1.4 INSPECTION

Notice
Inspection: Give notice so that inspection may be made of the following:
- Setting out completed.
- Plant holes excavated and prepared for planting.
- Plant material set out before planting.
- Planting, staking and tying completed.
- Completion of planting establishment work.

2 PRODUCTS

2.1 SOIL CONDITIONING COMPOST

Compost
General: Provide mature soil conditioning compost free from harmful chemicals, grass and weed growth. Apply at an application rate that accounts for the immediate fertilizer equivalence of the compost as part of the overall fertilizer management schedule.

Particle size as a soil conditioner, pH, physical and chemical contaminants: To AS 4454 Table 3.1(A).

Mature compost: To AS 4454 Appendix N Table N3.2.

Soil conditioning properties

Wettability: ≤ 2 to AS 3743 Table 2.1 as tested to Appendix C.

Total water holding capacity: ≥ 40 to AS 3743 Table 2.1 tested to Appendix B.

Nitrogen draw down index: ≥ 0.7 to AS 3743 Table 2.1 tested to Appendix E.

Chlorine content: < 1000 mg/kg to Rayment and Lyons 2011, *Soil chemical methods - Australasia* test method.

Compost fertiliser equivalence properties values

Standard: To the test methods in Rayment and Lyons 2011, *Soil chemical methods - Australasia* for nitrate N, total N or total Kjeldahl N, total P and Cowell P, and extractable K.

Requirement: Establish the following values for each type of soil conditioning compost:

- Nitrogen content (kg/ton):
  - Total N.
  - Nitrate.
- Phosphorus content (kg/ton):
  - Total P.
  - Colwell P.
- Plant available Potassium (kg/ton).

2.2 FERTILISER

General

Delivery: 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.

Application rate: Vary the application rate to allow for the plant available immediate fertilizer equivalence value of the soil conditioning compost.

Fertiliser schedule

Provide fertilised as suitable to plant species, location and soil type, subject to coordination with The Principal regarding maintenance strategy.

2.3 MULCH

Requirement: Provide mulch which is free of deleterious and extraneous matter such as soil, weeds and sticks. Do not include fine mulch.

Standard:

- Particle size, physical and chemical contaminants: To AS 4454 Table 3.1(A).
- pH, electrical conductivity, ammonium, chlorine and other nutrients: To AS 3743 Table 2.1 for regular mix.

Organic mulches: Free of stones.

Mulch material: Brush chippings and leaf litter recovered from site clearing, if available; otherwise, pine bark.

Organic mulch types

Refer Landscape Selection Schedule

Inorganic mulch types

Refer Landscape Selection Schedule

Decomposed granite gravel:

Uniform size or graded material in the size range 5 – 20 mm, of uniform colour and low plasticity. Keep clear of plant stems.

Refer Landscape Selection Schedule

3 EXECUTION

3.1 PREPARATION

Weed eradication

Herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Removal: Regularly remove, by hand, rubbish and weed growth throughout grassed, planted and mulched areas. Remove weed growth from an area 750 mm diameter around the base of the trees in grassed areas. Continue eradication throughout the course of the works and during the planting establishment period.

Weed eradication schedule

Contractor to liaise with The Principal regarding target and critical weed species for removal throughout scope areas.

Vegetative spoil

Disposal: Remove vegetative spoil from site. Do not burn.

3.2 PLANTING

Individual plantings in grassed areas

Method: Excavate a hole twice the diameter of the root ball and at least 100 mm deeper than the root ball. Break up the base of the hole to a further depth of 100 mm, and loosen compacted sides of the hole to prevent confinement of root growth.

Ripline planting

Method: Rip the row and excavate a plant hole for each plant large enough to accept the root ball plus 0.1 m³ of backfilling with topsoil. Clear weeds and other vegetative material within 300 mm radius of the plants. If planting holes are excavated by mechanical means increase the hole size by 100 mm and loosen compacted sides to prevent confinement of root growth.

Locations

General: If it appears necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, give notice.

Planting conditions

Weather: 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

Timing: Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

Placing

Method: Remove the plant from the container with minimum disturbance to the root ball. Root prune to ensure all circling roots have been either severed or aligned radially into the surrounding soil. Make sure that the root ball is moist, place it in its final position, in the centre of the hole and plumb, and with the top soil level of the plant, level with the finished surface of the surrounding soil. Compact lightly so as to minimise subsidence without compacting the backfill. Avoid mixing mulch with topsoil.

Fertilising

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

Backfilling

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

3.3 MULCHING

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, and not closer to the stem than 50 mm in the case of gravel mulches.

In mass planted areas: Place after the preparation of the planting bed but before planting and other work.

In smaller areas (e.g. planter boxes): Place after the preparation of the planting bed, planting and other work.

Extent: Provide mulch to 750 mm diameter, to surrounds of plants planted in riplines and grass areas.

Depths: Spread organic mulch to a depth of 75 mm, and gravel mulch to a depth of 50 mm.

3.4 SPRAYING

Notice

General: Immediately give notice of evidence of insect attack or disease amongst plant material.

Spraying

Product: Spray with insecticide, fungicide or both, as required.

3.5 STAKES AND TIES

Generally: If plants are unable to be self-supported or if stakes are damaged, stake or re-stake the plants as follows:

- Drive three hardwood stakes placed obliquely with the first stake on the opposite side to the prevailing winds.
- Do not single stake large plants.

Removal: If plants are robust with well developed systems and are strong enough to no longer require support, remove stakes and ties.

3.6 COMPLETION

Product certification

Certification: Submit the supplier's written statement certifying that plants are true to the required species and type and free from diseases, pests and weeds.

Cleaning

Stakes and ties: Remove those no longer required at the end of the planting establishment period.

Temporary fences: Remove temporary protective fences at the end of the planting establishment period.

0254 IRRIGATION

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide automatically controlled, fixed irrigation systems, as documented.

Performance
Requirements:

- Achieve the documented flow rates over the irrigated area.
- Meet statutory requirements for backflow prevention.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARDS

Water supply
General: To AS/NZS 3500.1.

1.4 INTERPRETATION

Abbreviations
General: For the purposes of this worksection the following abbreviations apply:

- LDPE: Low-density polyethylene.

Definitions
General: For the purposes of this worksection the following definitions apply:

- Backflow prevention device: A device, required by law, on an irrigation system that prevents water from re-entering the potable water lines once it flows into the irrigation pipes.
- Emitter: A device used to control the rate at which water is applied to a specific area.

1.5 SUBMISSIONS

Shop drawings
General: Submit drawings and schedules showing the layout and details of the system, including the following:

- Micro-irrigation stake layout.
- Irrigation controller cabinets.

1.6 INSPECTION

Notice
Inspection: Give notice so that inspection may be made in accordance with 0171 GENERAL REQUIREMENTS, INSPECTIONS, Site Inspections.

2 PERFORMANCE SPECIFICATION

2.1 AIMS

Pump, filtration and all infrastructure requiring servicing and maintenance is easily accessible.

Tank lids and pit lids ideally located in hard stand (paths/pavement).

Rain switch device or mains top up/balance tank are ok – as long as water tracking can be achieved and operational pressure is maintained.

Need to be able to track both potable and non potable water usage – best method is to install pulse type flow meter on the irrigation output line (which is a general requirement for cloudmaster) and in alternate supply sites also use a pulse type flow meter on the town water top up. These meters are to

be wired into the cloudmaster. Meters should be easily accessible to allow for manual meter reading in the event of controller failure.

Systems should include rain sensor and/or soil moisture sensors to optimise system efficiency.

2.2 TREATMENT

UV filter should be installed per manufactures spec – braced and secured in a water proof enclosure (most water harvesting sites require a pump station so put all infrastructure together).

All primary and secondary filtration to be serviceable and sufficient to ensure water quality is suitable for use and ensure public health is maintained. Note that UV filtration may not be effective if water is cloudy or turbid when entering UV chamber.

2.3 CABLING, WIRING, AND PIPE WORK

The system design will be dependent upon the requirements of the site, manufacturer and designer recommendations, and available technology and resources. The following is the hierarchy of system types.

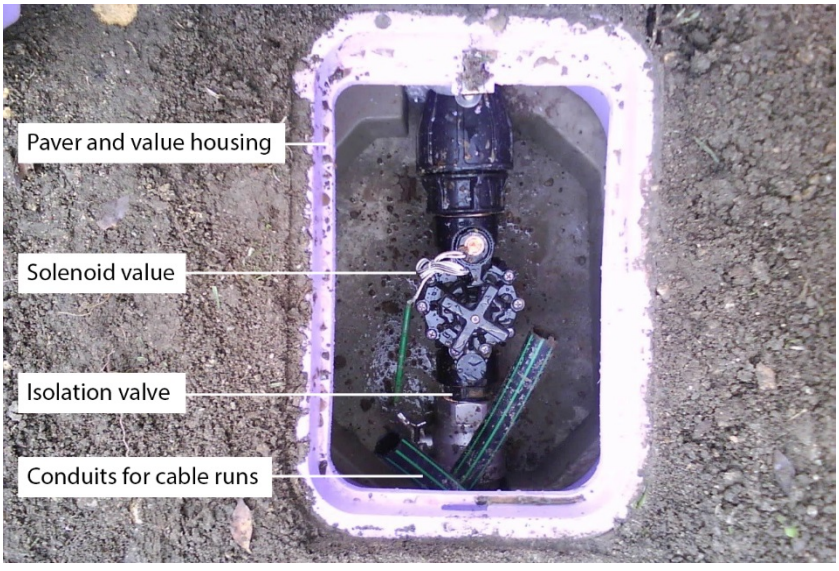
- Decoder system (Large sites only)
- multi strand cabling
- Hydraulic system

All can be operated by Cloudmaster controllers. Decoder systems allow for ease of future system expansion and repairs so are preferred in large systems. Multi strand systems are sufficient in small scale systems. Hydraulic systems have been problematic in the past and are not desirable.

Other key items for consideration are:

- All cabling should be installed in conduits with connections at valve boxes only.
- All connections must be water tight.
- If Decoder system is used please ensure the designer calculates the cable runs and voltage draw down. This is particularly important when using cloudmaster decoders.
- If cable runs are long or the system is constructed in large parklands, cable isolation points are desirable.
- Mainlines should have warning tape installed with it. Tape should be at 200mm above the pipe and contain a tracer line for locating purposes.

Image 1 – Preferred valve box layout



2.4 DEPTH OF PIPE WORK

Some issues have been encountered previously with pipe work not being installed at sufficient depth. The pipes are hard to detect and if not at a sufficient depth can be damaged during maintenance works (image below). Mainlines should be installed at a minimum depth of 450mm. Lateral lines

should be at a minimum of 300mm – with articulated riser assemblies used to attach and raise sprinklers.

Image 2 – Mainline installed too shallow and damaged by mower

Image 3 – Mainlines to be installed at minimum 450mm below surface

2.5 MAINS CONNECTIONS

All water meters and back flow prevention devised must the registered with Sydney water on installation. The installer will require the lot number of the parkland to complete this. Key requirements for mains connections are:

- Ensure appropriate backflow/duel use controls are installed. Mains top up should be placed to achieve relevant air gap as specified by Sydney water.
- Backflow prevention or RPZ units must be installed to Sydney water requirements. These units are tested annually as part of ongoing maintenance so it is critical that units comply with regulations at construction or development.

- QCV (Quick Coupler Valves) should be incorporated in the initial design and installation works. This allows for water supply in event of failure.
- If alternate water supply is utilised, signage should be installed to notify the public.

Image 4 – Sample signage – Hornsby Council

Cloudmaster controller and system initiation

- GSM modem and SIM card (Paul Rowley) and set up operations for back to base
- Initialise controller and PC communication
- Upload aerial image of site (bitmap)
- Cloudmaster detail

2.6 TESTING AND COMMISSIONING

To include but not limited to:

- System flushing to remove all residue
- Test pump units and operate at duty flow rates. Shut off heads to confirm their integrity. Reset after testing
- Test mainlines at 1.5 times pressure rating of the pipe for 30 min. Take readings at 0min, 10min, 20min, 30min. Test will be successful if the 3rd and 4th reading are less than 2% difference, and the 4th is not lower than 7% lower than the original test pressure.
- After testing adjust solenoid control valves, heads, and controllers for operation.
- Test all electrics and rectify any issues.
- All water harvesting components are to be fully operational at hand over to parks services. Trunk valves, feeder lines, storage tanks etc will have been tested and be fully operational.
- Commissioning must incorporate initiation of any storm water harvesting agreements, water disposal/trade waste agreements or initial system testing requirements to ensure that the system is successfully validated as legally required and to minimise public risk.
- As the end user of the system and being responsible for future testing we need to ensure that the system at hand over has been fully operated and thoroughly tested (trunk lines open, storm water supply and treatment units etc fully tested and operated on recycled supply). The Contractor shall be responsible for full commissioning of the system to prove the scheme is operating as designed. Commissioning will involve the testing of all pumps, pressure pipe, storages, alarms, treatment systems and any other aspect of the scheme as designed including the testing of RPZ valves and solenoid valves on the potable water back up. The objective is to define the routine conditions of the scheme for the long term and to confirm that the equipment and systems operate as intended.
- The Contractor shall leave each system in full operation condition. Its proper function shall then be demonstrated to Council maintenance staff to the satisfaction of the Superintendent who will then accept handover.
- Water quality testing of the recycled stormwater shall be undertaken over a minimum period of 4 weeks where the recycled water quality shall meet the compliance values set. All testing shall be at the cost of the Contractor until 4 successive weeks of compliance has been met. The testing parameters and frequency is will be at weekly intervals (minimum) and by a NATA accredited

laboratory. A validation report outlining the results from the water quality testing and the compliance shall be submitted to the Superintendent for approval.

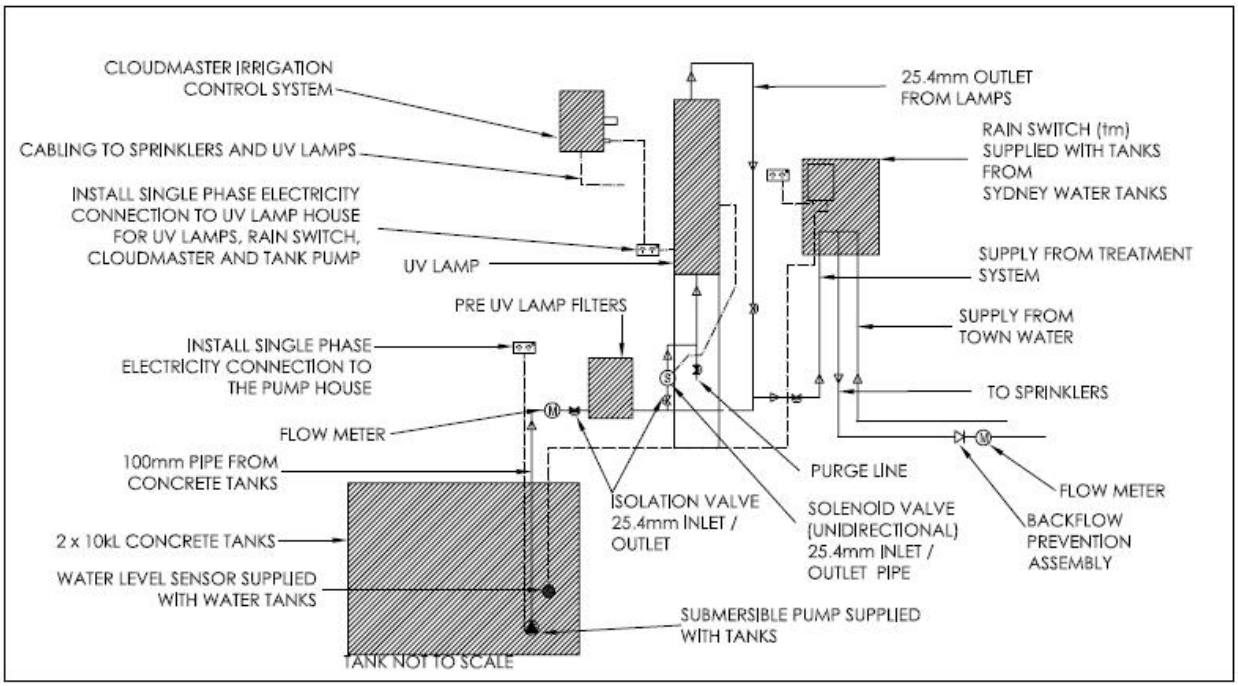
- Defect period should include follow up servicing of irrigation components as required.

2.7 HAND OVER

Site hand over will occur at successful completion of testing and commissioning period. This will include the following:

- Site meeting and induction/training of parks maintenance staff
- Spare parts – 2 x full circle sprinklers, 1 x solenoid valve
- Provision of servicing manuals and maintenance manuals for the system and all components.
- As constructed drawings
- electronic copies – 1 x DWG (CAD) file and 1 x PDF
- 2 x hard copies in A3 or bigger
- Diagram of pump station and system component (see example diagram below)

Image 5 – Example Diagram of pump station and system component



0255 LANDSCAPE – PLANT PROCUREMENT

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide plants as documented.

Where possible, procure plants from local, Sydney area nurseries.

Performance
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.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARD

General
Tree stock supply: Conform to the recommendations of AS 2303.

1.4 INTERPRETATION

Definitions
General: For the purposes of this worksection the definitions given in AS 2303 and the following below apply:

- Destructive inspection (of trees): The washing away of all soil from a rootball to allow inspection of rootball development.
- Investigative inspection: Any method of root inspection that involves the washing away of all or portions of the soil from the rootball to expose a section or all the roots.
- Known history: Supplier documentation, demonstrating and enabling verification that the product was grown by essentially the same processes and under essentially the same system of control.
- Large tree: A tree grown in a container not less than 20 L or ex-ground with a minimum rootball diameter of 400 mm.
- Partial inspection (of trees): A method of exposing a section of a root system to enable inspection of root development by washing the soil away in a wedge-shaped section from the stem to the extremity of the rootball. This soil can be gently replaced so the tree is not damaged.
- Shrub: A woody perennial plant smaller than a tree, usually having permanent stems branching from or near the ground.
- Small trees: Tree or shrub grown in a container less than 20 L (other than tubes or plant cells) or ex-ground trees of size index less than 35.

1.5 SUBMISSIONS

Accreditation of plant supplier
Submit evidence of accreditation as follows:

- Accreditation body: Nursery and Garden Industry Australia

Forward order contracts
Reports: Complete regular reports using the pro forma **TREE INSPECTION FORM** provided in **SELECTIONS**. Include checks against specification requirements.

- Photographs: Provide current colour copies with date verification.

- Inspection: Complete and return the attached pro-forma **TREE INSPECTION FORM** before despatch of every batch, and at the following frequencies:
  - Inspections: At 3 monthly intervals.
- Reports: At time of inspections.

Photographic examples

Requirement: Submit photographic examples as follows:

- All palm species.
- 100, 200, 400 L plant species.
- Specimen 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.

Plant provenance

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

Where possible, procure plants from local, Sydney area nurseries.

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

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: At 3 monthly intervals.

Test results

General: Complete and return the **TREE INSPECTION FORM** for each batch inspected.

Rejection: Non-conformity may lead to rejection of the entire batch.

Corrective action: Conform to corrective action procedures for each order as instructed.

Substitution: If non-conforming trees are proposed, submit a proposal in writing.

Authentication: Submit a copy of the written approval of substitution with any non-conforming trees.

1.6 INSPECTION

Notice – off-site

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

- Immediately prior to the acceptance of tender to establish conformance of the representative samples of all stock scheduled. Conform to **PRODUCTS**, **BALANCE**.
- After eight weeks of the growing on period.
- At 80% completion of stocking of plant material.
- At completion of stocking of plant material, deemed to be as close as practical to 100% in terms of species and numbers.
- At the date of commencement of delivery.
- At a time to be determined to assess potting on procedures, if necessary.

2 PRODUCTS

2.1 PLANTS – GENERAL ASSESSMENT CRITERIA

General

Requirement: Supply trees to AS 2303 and with the following properties:

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

- Site environment: Grown and hardened off to suit anticipated site conditions at the time of delivery.
- Native species with a history of attack by native pests: Restrict plant supply to those with evidence of previous attack to less than 15% of the foliage and make sure of the absence of actively feeding insects.

Labelling

General: To AS 2303 clause 2.2.1.

Label type: To withstand transit without erasure or misplacement.

2.2 ABOVE-GROUND ASSESSMENT CRITERIA - TREES

General

Requirement: Supply trees to AS 2303 clause 2.2 and with the following properties:

- Pruning:
  - Specific form: for trees overhanging accessible areas or paths, ensure minimum branch clear height from ground is minimum 2m.
- Clean stem height: < 40% of total tree height.
- Trunk position: Variation in distance from the centre of the trunk to the extremity of the rootball:
  - < 10%.
- Tree stock in containers less than 45 L: Self-supporting at dispatch.
- Pest and diseases: No evidence of active pests and diseases.
- Indication of north: Trees in containers greater than 100 L or of Size Index greater than 140:
  - Label the northerly aspect during growth in the nursery and maintain during transit.

2.3 BELOW-GROUND ASSESSMENT CRITERIA - TREES

General

Requirement: Supply trees to AS 2303 clause 2.3 and with the following properties:

- Rootball occupancy: Soil retention:
  - On shaking or handling the unsupported rootball, at least 90% of the soil volume is to remain intact.
- Rootball diameter:
  - Containers less than or equal to 45 L and ex-ground stock: ≥ to rootball depth.
  - Bare-rooted tree stock with size index less than or equal to 57: ≥ 10 x calliper
- Pest, diseases and weeds: No evidence of active pests, diseases and weeds.

2.4 BELOW-GROUND QUALITIES – SHRUBS

Root system

Requirement: Supply plant material with a root system as follows:

- 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 such as destructive inspection, sample as follows:

- For > 100 samples: Inspect 1%.
- For < 100 samples: Inspect 1 sample.

Sample plants: Replace plants used in inspection.

Defective samples: To be returned to supplier.

Rejection: Do not provide root bound stock.

2.5 BALANCE - ASSESSMENT CRITERIA

Small trees and shrubs

Containers (except tubes or plant cells) or rootballs: To remain flat on the ground when the stern, held at 80% of height above ground, is deflected 30°C from the vertical, side to side.

Exempt: Species that naturally produce hard inflexible wood in the early stages of their development.

Small container-grown trees and shrubs table

Container size or minimum rootball diameter	**Height range above soil (m)**	
	Thin-stemmed species	**Thick-stemmed species**
Tubes or plant cells	1.5 to 2.5 x the height of the container	
150 mm (1.8 L)	0.4 – 0.6	0.3 – 0.5
170 mm (2.6 L)	0.5 – 0.7	0.4 – 0.6
200 mm pot (4 L)	0.7 – 0.9	0.6 – 0.8
200 mm bag (5 L)	0.8 – 1.0	0.7 – 0.9
250 mm (8 L)	1.0 – 1.2	0.8 – 1.0
300 mm (15 L)	1.2 – 1.5	1.0 – 1.2

Large trees

Size Index range for trees grown in containers ≥ 20 L: To AS 2303 Appendix E Table E1.

Minimum rootball diameter for ex-ground trees: To AS 2303 Appendix E Table E2.

2.6 SPECIMEN PLANTS

Properties

Source: From locations where these plant materials are growing in natural ground conditions.

Non-containerised nursery stock: Required.

Presentation: Provide maximum initial impact at the time of project opening.

Properties: As documented in the **Specimen plants schedule**.

Preparation: Undertake the preliminary preparation of all specimen plants and the programming of all necessary preparation works to assure readiness of specimen plants for transplanting to site when required.

Indication of north

Trees in containers greater than 100 L or of Size Index greater than 140: Label the northerly aspect during growth in the nursery and maintain during transit.

2.7 INTERNAL PLANTS

Properties

Presentation: Provide maximum initial impact at the time of project opening. Consideration providing alternative species that may mimic or offer similar foliage display to those nominated.

Properties: As documented in the **Internal plants schedule**.

Growing medium: Anticipate and match the soil type and drainage conditions of the works.

3 EXECUTION

3.1 SUPPLY PROGRAM

Delivery

Guideline dates for delivery: As documented in the **Supply program schedule**.

Plant material per stage: As documented in the SELECTIONS, **SUPPLY schedule(s)**.

Supply program schedule

Stage	**Date**
Staging of supply to requirements of The Principal	TBA

3.2 ACCLIMATISATION

Internal plants

Requirement: 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.

Method: Provide internal plants nursery grown in their final nursery containers for six months or longer, under a lighting regime of shading from natural light appropriate to the plant variety. During the final four months simulate conditions in the shadehouse to match the climate anticipated on the project site.

3.3 TRANSPLANTING

General

Requirement: As documented in the **Transplanting schedule**.

Notice: Give notice before:

- Watering: 2 weeks
- Fertilising: 2 week
- Root cutting: 2 weeks

Conditions: Select a time for transplanting having regard to the appropriate season, time of actual operation, rootball diameter and depth, lifting methods and weather conditions.

Preparation

Watering: Establish a temporary trickle irrigation system, or manually water the intended trees for a period of two weeks before ball excavation work.

Fertilising: Apply one application of liquid fertiliser mix to the foliage and root as appropriate to the species. Apply sufficient liquid fertiliser mix to allow the spray to drip from foliage and soak into the rootball. Do not spray the fertiliser mix on excessively hot, dry or windy days.

Rootball

General: Minimise the cutting of roots. Use only sharp tools, water blasting or water cutting.

Initial cut:

- Manually or by chain trenching machine. Trees whose rootballs have been excavated by backhoe or excavator will be rejected.
- Located 250 mm beyond the required finished rootball dimensions of each side to allow any damaged roots to be trimmed back to final dimensions and sealed.

Hand trimming:

- To 100 mm less than the required finished rootball dimension. Cut back and seal with an approved horticultural sealer on and all roots greater than 25 mm diameter.

Outcome: Cut rootball to be:

- Symmetrical about the trunk and in proportion to the overall size of the tree except where the limitations of individual tree planter openings requires specific tailoring of the rootball dimension.
- Cut to a size designed to maximise the rootball in the best interests of each specimen. Rootball size not less than 10 x calliper.

Trench: Backfill and lightly compact with clean sand, free of any foreign matter, pathogens or any substances likely to be deleterious to future root growth. Apply sufficient root inducing formulation, at the manufacturer's recommended concentration, to effectively saturate the backfill in the trench.

Maintenance of on-site plant material

Watering: Maintain a trickle irrigation system around each tree, located within the trenched rootball perimeter. Program the system to supply water at an optimum rate to encourage healthy growth and avoid desecration through excessive transpiration following the pruning of the roots. Monitor the system continuously until the tree is lifted and removed to its final destination.

Fertilising: Submit a program for regular fertiliser applications continued over this period.

Responsibility: Take any other precautions required to safeguard the health and well being of all on-site plant material before the lifting and transplanting of all such stock into their finished location.

Above ground

Pruning: If selected pruning of branches appears necessary to balance root loss obtain prior approval.

Pruning requirements: In conformance with AS 4373. Works to be carried out by a fully qualified and experienced arborist. Carry out all required works in a safe and progressive manner.

Lifting: Thoroughly irrigate to the full depth of the rootball two days before transplanting of each specimen. Do not fracture the ball of soil around the root system. Maintain ball in firm condition during transplanting by wrapping in hessian or other appropriate open weave material, securely tied.

Storage: Transport transplanted trees to a designated nursery site. Store and maintain until ready for planting.

Planting: Avoid disturbance to the rootball during moving and planting. After placement, remove the rootball wrapping and ties by cutting.

Watering: At the completion of transplanting, water the rootball thoroughly and continue to water until established. Use 10% rootball volume, per application, as a guide to watering volume.

3.4 PRE-COMPLETION TESTS

Production tests

Sampling: Select sample trees, of known history, at evenly distributed intervals within each batch.

Above ground tree inspection:

- Frequency: Inspect trees at dispatch.
- Sampling strategy: To AS 2303 Appendix A Table A1.
- Inspector: Supplier.

Investigative tree inspection:

- Frequency: Inspect trees before dispatch.
- Inspector: Qualified person authorised by the contract administrator.
- Destructive inspection: Use for trees with rootballs/containers not more than 200 mm.
- Allowance: Allow for sample trees in addition to quantity ordered.
- Partial inspection: Use for trees with rootballs/containers more than 200 mm.

Investigative tree inspection sampling table

Number of trees per batch	Number of trees to sample
0 – 20	1
21 – 50	2
51 – 100	4
101 – 500	4 for the first 100 + 2% of balance of order
501 – 2000	12 for first 500 + 1% of balance of order
2001+	27 for the first 2000 + 0.5% of balance of order

3.5 CONTINGENCY PLANT MATERIAL

Replacement

Provision: Anticipate replacement of failures on site.

Amount: 15% above any normal allowances made in the nursery trade for anticipated losses in the course of propagation and the growing on of plant materials.

Delivery: Supply to the site upon 7 days' notice to the supplier.

Holding: Until the contingency plant material is delivered to site or until the expiry of twelve months from the date of completion of the works, whichever is the earlier. The supplier is not entitled to holding costs for contingency plant material.

Surplus plant material: To remain the property of the supplier.

3.6 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.

Maintenance

Parties: Supplier(s) to the principal.

Form: Maintain all plant materials sourced and secured by the supplier throughout the procurement and pre-transplanting maintenance period. Cover the cost of purchase, labour, equipment, transport and materials to replace any losses, with plant materials of equivalent sizes and quality during the warranty period. Ensure that it is physically possible for any or all of the on-site plant material to be successfully prepared and transplanted.

Warranty period:

- Commencement: The date of contract.
- Completion: To cease in respect of any particular plant material upon issue of a delivery notice issued by the contractor upon delivery to site.
- Earliest delivery date: One week after the date of contract.

4 SELECTIONS

4.1 TREE INSPECTION FORM

General details schedule

Date		**Reference**	
Customer contact details:			
Supplier contact details:		Inspected by (supplier/purchaser/agent)	
Species		Batch identification	
Botanical name		Number of tree stock sampled	
Included bark (circle): Yes/no		Self-supporting (circle): Yes/no	
Number of trees in batch		Container/rootball size	
Height range/Average		Calliper range/Average	
Tree stock balance/Calculated using average figures		Tree stock balance conforms to AS 2303 clause 3.2: Yes/no	
Special requirements			

Above-ground attributes schedule

Attributes	**Conforming (yes/no/not applicable)**	**Comments**
Label present		
Sufficient crown density		
Typical crown cover		
Typical crown form		
Typical leaf colour and size		
Absence of epicormic shoots		
Absence of dieback		
Symmetrical crown		
Freedom from injury		
Adequate stem taper		
Adequate branch diameter		
Apical bed and adequate stem deviation		

Attributes	**Conforming (yes/no/not applicable)**	**Comments**
Sound divisions		
Divisions above clean stem requirement		
Pruning cuts and branch collar or node points		
Minimal pruning cut diameter		
Clean stem height		
Convex unions at stem and branch bark ridges		
Central trunk position		
Compatibility of graft unions		
Diameter of scion		
Freedom from pests and diseases		
Indication of north		

Below-ground attributes schedule

Attributes to AS 2303 Appendix B	**Conforming (yes/no/not applicable)**	**Comments**
Inspection method used		
Number of trees in sample		
Adequate rootball diameter		
Adequate rootball depth		
Height of root crown		
Non-suckering rootstock		
Absence of active pests, diseases and weeds		
Adequate rootball occupancy		
Absence of circling roots		
Absence of woody circling roots		
Adequate root direction		
Absence of girdled, kinked or j-roots		
Root division		
Date of rootball assessment		
Rootball assessment valid until		

Conformance with the specification schedule

Conforming Yes/no	
Comments	
Name of inspector	
Signatures of inspector	

Date of inspection	
Inspection valid until	

4.2 SUPPLY

Refer to the planting schedules.

Transplanting schedule

Refer to the 0253- LANDSCAPE- PLANTING SECTION- 3.2.

0256 LANDSCAPE – ESTABLISHMENT

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide plant establishment, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.3 INTERPRETATION

Definitions
General: For the purpose of this worksection the following definitions apply:
- Plant establishment period: The period between the date of practical completion and the end of the defects liability period.

1.4 SUBMISSIONS

Execution details
Notice: Provide two days notice of the following operations:
- Application of herbicide.
- Application of fertiliser.
- Watering.
- Each site maintenance visit.

Log book
Records: Log the following on a weekly basis:
- Description, time and method of application of toxic material.
- Maintenance work details.
- Inclement weather to verify inability to carry out work within the specified time frame.

Availability: Upon request.

Monitoring program
General: Provide a monitoring program developed by a specialist monitoring consultant and incorporating the following:
- Photographic record including:
  - Colour photographs.
  - Documented monitoring locations and photograph angles.
- Reporting periods including photographic records at the following:
  - Before commencement of the works.
  - Date of practical completion.
  - Three monthly intervals during the plant establishment period.
  - Date of final completion.
  - Benchmark definition based on remnant communities.
  - Replicated measurements over time and comparative analysis with regard to the benchmark.

Specialist consultant: Submit the name, qualifications including research papers and scientific publication details, and contact details of the specialist monitoring consultant.

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

1.5 INSPECTION

Notice

Inspection: Give notice so that inspection of the contract area may be made at the following:

- Date of practical completion.
- Three monthly intervals during the plant establishment period.
- Date of final completion.

2 EXECUTION

2.1 GENERAL

Special instructions

Priority: If instructed by the contract administrator, attend to certain areas and procedures as a priority. Obtain approval for additional costs before commencement of works.

Reporting

Monthly report: Submit regular reports by the last Friday of each month:

- Of the general status of works.
- Include soil test results as required for the fertilising programs.
- Plant replacement requirements.

Incident reports: Report immediately verbally and confirm in writing any disturbance or incidence affecting or likely to affect the day to day scheduling of works.

Disruption of works by others

Other contractors: Make arrangements to work around the disturbance.

2.2 PLANTING WORKS

Planting

Planting: Ensure the general appearance and presentation of the landscape and the quality of plant material at date of practical completion is maintained for the full planting establishment period.

Existing plant material: Maintain existing planting and grass within the landscape contract area as specified for the corresponding classifications of new grassland or planting.

Replacements: Replace failed, dead and/or damaged plants at maximum 3 week intervals as necessary throughout the full plant establishment period.

Pruning

Prune: To AS 4373 and as documented in the **Pruning schedule**.

Fertilising

Soil tests: Take samples from both planting beds and lawn areas and conduct tests.

Fertilising: Base the fertilisation program on the soil testing results. Fertilise trees once every two years. Generally apply an all purpose fertiliser of N:P:K (Nitrogen:Phosphorus:Potassium) 10:4:6 at recommended rates. Alternatively apply 12 month slow release fertiliser at the manufacturer's recommended rate. Apply all purpose fertiliser to shrubs annually in two bands and cultivated into the soil 100 mm deep.

Season: Fertilise shrubs and trees in September and March according to their seasonal growth requirement.

Insect and disease control

Responsibility for insect and disease control: contractor

Period for treatment: Until the problem has been eliminated.

Chemical spray: Apply outside of normal working hours.

Stakes and ties

Generally: If plants are unable to be self-supported or if stakes are damaged, stake or restake the plants as follows:

- Drive three hardwood stakes placed obliquely with the first stake on the opposite side to the prevailing winds.
- Do not single stake large plants.

Removal: If plants are robust with well developed systems and are strong enough to no longer require support, remove stakes and ties.

2.3 GRASS

Mowing and trimming

Litter: Remove litter and fallen branches before mowing.

Height: Consistent with the growth habit of the grass variety and maintained at 25 mm to 40 mm throughout the year.

Program: Weekly during the mowing season, November to March, and at bi-weekly intervals during April to October. Do not mow under wet conditions.

Raking: Once every month before mowing, during the mowing season, with a flexible rake. On alternate mowings, adopt a north-south and east-west pattern.

Edges: At the same time as mowing, trim lawn edges to plant beds, pathways, base of trees and other obstacles. Ensure trees and shrubs are not damaged.

Clippings distribution: Remove from site

Topdressing

Topdressing material for established lawns: Weed free imported sandy topsoil to a depth of 5 mm.

Program: The spring following establishment.

Topdressing material for remediation of depressions or irregularities: Apply coarse or medium soil to AS 4419 suitable for application to turf or grass seeded areas.

Fertilising

Fertilising: Apply lawn fertiliser at the completion of the first and last mowings of the plant establishment period, and at other times as required to maintain healthy grass cover.

2.4 GARDEN BEDS

Weeding

Weeds: Unwanted plants and grasses considered invasive to the locality.

Program:

- Lawns: Quarterly, and as determined by the relationship of the general lawn condition and weed growth.
- Trees and shrubs: As required for planted, paved and mulched areas to be weed free when observed at bi-weekly intervals.

Method: Clear and keep clear vigorous ground covers 200 mm from the base of any shrub or tree:

- Small areas: By hand.
- Large areas: Proprietary herbicides.

Herbicide application: Avoid windy days or if rain is likely to follow within 12 hours. Apply:

- To the manufacturer’s instructions and Safety Data Sheets.
- When the weather is humid with moderate temperatures and maximum sunlight.
- When the ground has recommended soil moisture.

Rubbish removal

Rubbish: Remove loose rubbish such as bottles, papers, and cigarette butts from the site. Execute this work regularly so that all areas are free from rubbish when observed at bi-weekly intervals.

Leaf litter: Remove from all path and lawn areas.

Leaf litter distribution: Remove from site

Mulched surfaces

Inspection: Bi-weekly to determine mulch requirements.

Depth: Maintain a minimum depth of:

- 75 mm for organic mulch.
- 50 mm for gravel mulch.

Remulching: Maintain the original ground levels around the base of plants.

2.5 WATERING

Establishment

Extent: 52 weeks, to be confirmed by The Principal

Water quality:

- pH between 5.5 and 7.5.
- Total soluble salts less than 1000 mg/litre.
- No substances that would be toxic to plant growth.

Watering program: Minimum three complete waterings, soaking to a depth of 150 mm at fortnightly intervals for the first 6 weeks of plant establishment irrespective of natural rainfall. Confirm soaked depth and record in the log book.

Water restrictions: Coordinate the water supply and confirm the watering regime against state and territory government legislation and restrictions at the time.

Irrigation

Hand watering: Manually water all lawn and planting areas until the proposed irrigation system is fully operational, soaking to a depth of 150 mm for lawn and 300 mm for planting. Avoid frequent dampening of the surface. Allow the surface of the soil to partially dry out between waterings.

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.

Equipment maintenance:

- Check all components for proper operation.
- Repair or replace damaged components 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.

Hand watering

General: Manually water all lawn and planting areas, soaking to a depth of 150 mm for lawn and 300 mm for planting. Avoid frequent dampening of the surface. Allow the surface of the soil to partially dry out between waterings.

2.6 PAVING AND STRUCTURES

Paving

Weed and grass control: manually remove weeds and grass from paving joints and cracks without using chemical weed removal products.

Furniture, signage and barriers

Maintenance guidelines:

- Furniture and pots: Keep in a good condition and move as required to carry out maintenance works.

Directional and building signs: Keep in a good condition and maintain visibility.

Boundary and car park barriers: Keep in a good condition as originally specified.

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.

2.7 COMPLIANCE

Criteria

Generally: Plant establishment shall be deemed complete, subject to the following:

- Repairs to planting media completed.
- Ground surfaces are covered with the specified treatment to the specified depths.
- Pests, disease, or nutrient deficiencies or toxicities are not evident.

- Organic and rock mulched surfaces have been maintained in a weed free and tidy condition and to the specified depth.
- Vegetation is established and well formed.
- Vegetation cover to cell, seeded and/or hydromulched areas.
- Plants have healthy root systems that have penetrated into the surrounding, undisturbed ground and not able to be lifted out of its planting hole.
- Vegetation is not restricting essential sight lines and signage.
- Only frangible species are growing within road side clear zones.
- Specified vegetation setbacks from services and road furniture are evident.
- All hard landscape works have been installed and are operating as specified.
- Collection and removal of litter.
- Removal of mulch from drainage and access areas.
- All non-conformance reports and defects notifications have been closed out.

Plant establishment compliance table

Plant material	**Acceptable failure per area**	**Acceptable concentration of failure**
Tube stock	< 10%	< 15% in any given location
140 mm	< 5%	< 15% in any given location
300 mm or larger	< Nil%	Nil %
Turf	< 5%	Nil %
Cells	< 5%	< 15% in any given location
Direct seeded native species and cover crop – including hydromulch, drilled and broadcasted areas	Not less than 3 [Nominate as appropriate] specified species per 1 m^2 grid (determined on a testing frequency of 20 grid areas per 500 m^2)	Nil grids with < three (3) [Nominate as appropriate] specified plant species
Direct seeded grass species and cover crop	< 15% (determined by a 1 m^2 grid on a testing frequency of 1 grid area per 500 m^2)	< 10%
Cover crop	< 5%	Nil %

0259 LANDSCAPE MAINTENANCE

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide landscape maintenance of the contract area during the maintenance period.

Performance

Extent of maintenance:

- Weeding of lawn, garden bed areas, and pavement.
- Supply and spreading of fertiliser to lawn, garden bed areas and pots.
- Supply and installation of mulch to existing garden bed areas and pots.
- Pruning, trimming and tree surgery.
- Pest and disease control of lawn, shrubs and trees.
- Mowing and edge trimming to all lawn areas including collection and removal of clippings.
- Replacement of dead or failed plants.
- Maintenance of irrigation systems.
- Removal of rubbish and debris in garden areas.
- Keeping of a log book.
- Monthly reports.

Maintenance period: 52 weeks, to be confirmed by The Principal

Maintenance procedures: To the SELECTIONS **Maintenance schedule**.

1.2 THE SITE

Record drawings

Refer to landscape architect's drawings

Site restrictions

Site limitations: Comply with the following restrictions on the use of the site as determined by The Principal

Entry permits: Make available, to persons entering designated secure areas, valid entry permits. Make sure these persons comply with conditions of entry.

Designated secure areas: To the requirements of The Principal

Conditions of entry: To the requirements of The Principal

List: At least 10 working days before entry is required, submit the full name, address, and date and place of birth of persons required to enter designated secure areas.

- Purpose of submission: Review.

Protection of persons and property

Temporary works: Provide and maintain required guards, fencing, footpaths, signs and lighting.

Accessways, services: Do not obstruct or damage footpaths, drains and watercourses or other existing services in use on or adjacent to the site.

Property: Do not interfere with or damage property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

Rectification

Accessways, services: Rectify immediately any obstruction or damage to footpaths, drains and watercourses or other existing services in use on or adjacent to the site. Provide temporary services whilst repairs are carried out.

Property: Rectify immediately any interference or damage to property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

1.3 GENERAL CONDITIONS

Contract
Form of contract: To the requirements of The Principal

Payment
Payment period: To the requirements of The Principal

Bond: Equal to one month's maintenance.

Expenditure of the bond: By the principal upon unsatisfactory maintenance, to employ others to carry out such work.

Contractor and staff
Representative: Nominate a senior partner/personal experienced in maintenance nursery practices and horticulture, to be responsible for taking and carrying out instruction, and reporting to the principal.

Special instructions
Priority: If instructed by the principal attend to certain areas and procedures as a priority. Obtain approval for additional costs prior to commencement of works.

Reporting
Monthly report: Submit regular reports by the last Friday of each month, to the SELECTIONS **Monthly reports schedule** and as follows:

- General status of the works.
- Soil test results included as required for the fertilising programs.
- Any plant replacement requirements.

Incident reports: Report immediately verbally and confirmed in writing any disturbance or incidence affecting or likely to affect the scheduling of the works.

Notice
Inspection: Provide two days' notice of the following operations:

- Application of herbicide.
- Application of fertiliser.
- Each site maintenance visit.
- Work affecting public access or amenity on the Thursday of the week before the work is planned.

Log book
Records: Log the following on a weekly basis:

- Description, time and method of application of toxic material.
- Maintenance work details.
- Inclement weather to verify inability to carry out work within the specified time frame.

Availability: Upon request.

Replacement plants
Species: Provide written certification that all plant material is true-to-species and type, and free of disease and fungal infection.

Disruption of works by others
Other contractors: Make arrangements to work around the disturbance.

2 EXECUTION

2.1 GENERAL

Weeding
Requirement: Remove unwanted broadleaf plants and grasses considered invasive to the locality.

Program:

- Lawns: Quarterly.
- Trees and shrubs: As required for planted, paved and mulched areas to be weed free when observed at fortnightly intervals.

Method: Clear and keep clear vigorous ground covers 200 mm from the base of any shrub or tree:

- Small areas: By hand.
- Large areas: Proprietary herbicides.

Herbicide application: Apply as follows:

- To the manufacturer's recommendations and the material data and safety data sheets.
- When the weather is humid with moderate temperatures and maximum sunlight.
- When the ground has adequate soil moisture.
- Avoid windy days or if rain is likely to follow within 12 hours.

Pest and disease control

Requirement: Control any pests or diseases affecting the lawn and garden bed areas as follows:

- Identify the problem.
- Execute the correct treatment until the problem has been eliminated.
- Apply hazardous material out of normal working hours.
- Protect staff and public.

2.2 LAWN

Mowing and trimming

Litter: Remove litter and fallen branches prior to mowing.

Height: Consistent with the growth habit of the grass variety and maintained at 25 mm to 40 mm throughout the year.

Program: Weekly during the mowing season, November to March, and at fortnightly intervals during April to October. Do not mow under wet conditions.

Raking: Once every month before mowing during the mowing season with a flexible rake. On alternate mowings, adopt a north-south and east-west pattern.

Edges: At the same time as mowing, trim lawn edges to plant beds, pathways, base of trees and other obstacles. Do not damage trees or shrubs.

Clippings distribution: Remove from site in accordance with the requirements of The Principal

Non-selective herbicide: Make sure application does not exceed the area limits of normal manual trimming. Repair any damage from overuse or over spray.

Fertilising

N:P:K (Nitrogen:Phosphorus:Potassium) ratio: Balanced 10:4:6.

Rate: To the manufacturer's recommendation.

Program:

- Regular application: Each September and April.
- Additional application: Each November and February at reduced rates.

Soil pH adjustment: Apply additional fertilisers and soil conditioners as indicated from soil testing or from the physical soil structure. Maintain a pH range of 5.5 to 6.5.

pH testing program: Two year schedule commencing in the first year of the contract.

Application: Spread as follows:

- Dry: Crush lumps and broadcast dry material by hand or mechanically when the lawn is dry.
- Spray: Acceptable.
- Prevent fertiliser from leaching to adjoining planted beds, particularly those with sensitive native trees and shrubs.

Topdressing

Topdressing material for established lawns: Weed free imported sandy topsoil to a depth of 5 mm.

Program: The spring following establishment

Topdressing material for remediation of depressions or irregularities: Apply coarse or medium soil, to AS 4419, suitable for application to turf or grass seeded areas.

Renovation

Established lawns of sandy soil profile: Renovate by dethatching or verticutting.

2.3 TREES AND SHRUBS

Pruning and trimming

General: Prune to reflect the natural growth, flowering and regrowth habit of the individual species.

Program generally: Spring and Summer and on a spot basis as required.

Shrubs: Prune after flowering.

Hedge trimming: Schedule trimming at times which will maintain the character and design of hedges. Allow up to three times per season.

Tip pruning:

- Purpose: To encourage development of new shoots during the active growing season.
- Method: Removal of the top 25 mm or growing tip of each branch.
- Restriction: Do not remove buds before the flowering season in those plants that have terminal flowers.

Radical pruning:

- Purpose: To maintain a hedge or formal shape or when a particular problem, growth habit, damage, or disease requires branch removal.

Tree pruning:

- Eliminate diseased or damaged growth, avoid inter-branch contact and thin out crowns in a natural manner.
- Maintain sight lines to signs and lights.
- Maintain visibility for personal security.

Tree branch removal:

- To AS 4373.
- Give notice and engage a suitably qualified arborist.

Fertilising

Fertilising program: Base the program on soil testing results.

Soil testing: Undertake soil tests as follows:

- At the commencement of the contract.
- Take samples from a cross section of planting beds.

Soil pH adjustment: Apply additional fertilisers and soil conditioners as indicated from soil testing or from the physical soil structure. Maintain a pH range of 5.5 to 6.5.

Shrubs:

- N:P:K ratio: Balanced 10:4:6.
- Rate: To the manufacturer's recommendation and cultivate two rows into the soil 100 mm deep.
- Regular application: Each September and March.
- Sensitive native species: Apply appropriate dosage.

Trees:

- Application: Apply pill to the root zone at a distance from the trunk equal to the spread of the foliage. Make holes 400 mm deep to take the pill, equally spaced around the plant and backfill with sand.

Micro nutrients: Apply 1 kg of urea in 20 litres of water per 100 m^2, through a hose proportioner every four weeks during Summer.

Stakes and ties

Generally: If plants are unable to be self-supported or if stakes are damaged, stake or re-stake the plants as follows:

- Drive three hardwood stakes placed obliquely with the first stake on the opposite side to the prevailing winds.
- Do not single stake large plants.

Removal: If plants are robust with well developed systems and are strong enough to no longer require support, remove stakes and ties.

Plant replacements

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.
- 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.

- 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.
- Grown in final containers for not less than twelve (12) weeks.

2.4 WATERING

Lawn and planted areas

Generally: Maintain a vigorous healthy appearance.

Application rates: Soak to a depth of 150 mm for lawn and 300 mm for planting. Avoid frequent dampening of the surface. Allow the surface of the soil to partially dry out between waterings. Confirm soaked depth and record in the log book.

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 legislation and restrictions applying at the time.

Hand watering

General: Manually water all lawn and planting areas in the absence of an irrigation system or until the proposed irrigation system is fully operational.

Irrigation

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, of seasons, evaporation, exposure, topography, local authority restrictions.
- Adjustment or shut down during and after periods prolonged heavy rains.
- Water supply and watering regime of legislation and restrictions applying at the time.

Equipment maintenance: Confirm the following:

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

Operation: Make sure by adjustment or replacement of components, that the overall operation of the system is efficient and operational during the maintenance contract.

System maintenance: Conform to the **Irrigation system maintenance schedule**.

Programming

Automated systems: Program 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.

2.5 MULCHING

General

Clean up: Remove all mulching materials off lawn or paved areas and maintain a clean and tidy appearance when viewed on a weekly basis.

Depth: Maintain a minimum depth of:

- 75 mm for organic mulch.
- 50 mm for gravel mulch.

Top up: Areas of excessive wear.

Appearance: Maintain to keep clean and tidy with no soil disturbance evident on the surface of the mulch.

2.6 INCIDENTAL WORKS

Supplementary works

General: Execute the following:

- Removal of waste from maintenance work.
- Removal of leaf litter fortnightly during leaf fall.

- Wash paving on completion of herbicide application.

Furniture, signage and barriers

Scope: All fixed and movable features noted in the record drawings.

Furniture and pots:

- Move and relocate as required for maintenance of the area.
- Repair or replace items damaged by the maintenance contract staff.

Signage: Maintain sight line visibility.

Drains

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

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

3 SELECTIONS

3.1 SCHEDULE OF RATES

Schedule of rates schedule

Item	Unit	Quantity	Rate	Total
Preliminaries/establishment (one off cost)	item			
Mowing and edge trimming	item			
Watering	item			
Irrigation repair	item			
Manual watering	item			
Fertiliser: Lawn	m^2			
Fertiliser: Garden/pot	m^2			
Fertiliser: Trees	no			
Weeding	item			
Pest and disease control	item			
Pruning and trimming	item			
Plant replacement: In lawn areas: 150 mm	no			
Plant replacement: In lawn areas: 5 litre	no			
Plant replacement: In lawn areas: 15 litre	no			
Plant replacement: In lawn areas: 25 litre	no			
Plant replacement: In lawn areas: 35 litre	no			
Plant replacement: In lawn areas: 75 litre	no			
Plant replacement: In lawn areas: 100 litre	no			
Plant replacement: In lawn areas: 200 litre	no			
Plant replacement: In garden areas: 150 mm	no			
Plant replacement: In garden areas: 5 litre	no			

Item	Unit	Quantity	Rate	Total
Plant replacement: In garden areas: 15 litre	no			
Plant replacement: In garden areas: 25 litre	no			
Plant replacement: In garden areas: 35 litre	no			
Plant replacement: In garden areas: 75 litre	no			
Plant replacement: In garden areas: 100 litre	no			
Plant replacement: In garden areas: 200 litre	no			
Staking and tying	item			
Mulching: Pine bark graded	m^3			
Mulching: Pine flake	m^3			
Mulching: Crushed gravel	m^3			
Lawn renovation	item			
Topdressing	m^3			
Incidentals (including protective clothing)	item			

Labour rates schedule

Item	Ordinary time $ per hour	Overtime $ per hour
Additional labour charge: Labourer	$	$
Additional labour charge: Tradesman	$	$

3.2 MAINTENANCE REPORT

Monthly reports schedule

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
	Pruning/trimming
Turf	Returfing
	Seeding
	Treat for disease
	Topdressing
	Weeding

Item	Action
	Mowing/trimming
Soil	Erosion/bank stabilisation
	Additional soil
	Soil conditioner
	Weeding
Mulch	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
Water Feature	Clear channel and drains of leaf litter and rubbish
Fencing	Repair fencing
Furniture and hard fixtures	Repair/ replace damaged items
	Clean all items

3.3 MAINTENANCE PROCEDURE

Maintenance schedule

WEEK	SPRING (Sept, Oct, Nov)	SUMMER (Dec, Jan, Feb)	AUTUMN (Mar, Apr, May)	WINTER (Jun, Jul, Aug)
1	Mow and trim lawns	Mow lawns; weed	Mow lawns	Weed
2	Weed; trim and adjust trees and shrubs	Weed; mow lawns, trim and adjust trees and shrubs	Weed; mow lawns, trim and adjust trees and shrubs	Mow and trim lawns Trim and adjust trees and shrubs
3	Mow and fertilise lawns; treat plant material for insects and disease	Mow lawns; weed; treat plant material for insects and disease	Mow and trim lawn	Weed
4	Weed; topdress, condition lawns and oversow bare patches; issue maintenance report	Weed; mow and trim lawns; issue maintenance report	Weed; mow lawns; issue maintenance report	Mow lawns; issue maintenance report
5	Fertilise all trees and shrubs in garden beds; mow and trim lawns	Mow lawns; weed	Mow lawns	Mow lawns

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

3.4 IRRIGATION

Irrigation system maintenance schedule

Item	Frequency
Filters – mainline	Monthly
Electrical source output (auto system)	Monthly
Controller (automatic systems)	Monthly
Operation – progression - Station to Station.	Weekly
Proper activation of valves	Monthly
Proper timing of stations	6 monthly
Proper time and day readings	Weekly
Exterior appearance	6 monthly
Valve operation	6 monthly
Open, close completely (weeping)	Weekly
Sprinkler operation	Weekly
Rotaries – clogged nozzles	2 monthly
Plant obstructed pattern	2 monthly

Arc coverage	2 monthly
Radius adjustment	2 monthly
Pop-up action	2 monthly
Riser seal leaks	2 monthly
Set to grade	2 monthly
Coverage pressure	2 monthly
Rotational speed	2 monthly
Clogged screens	2 monthly
Head damage	2 monthly
Piping	2 monthly
Leaks – broken or cracked pipe	As Needed
Bad solvent welds, bad threaded	As Needed
Connection	As Needed
Clogged pipe	As Needed

0261 LANDSCAPE – FURNITURE AND FIXTURES

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide landscape furniture and fixtures, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.
- *0262 External sports and playground surfacing*.

1.3 SUBMISSIONS

Operation and maintenance manual
Requirement: Submit the manufacturer's published use, care and maintenance requirements for each item.

Products and materials
Requirement: Submit the manufacturer’s standard drawings and details showing methods of construction, assembly and installation; with dimensions and tolerances.

Type test: Submit results as follows:

Playground equipment: To AS 4685 series.

Shop drawings
Custom-built furniture and fixtures: Submit shop drawings to a scale that best describes the details, showing methods of construction, assembly and installation, with dimensions and tolerances.

Subcontractors
General: Submit names and contact details of proposed suppliers and installers.

Warranties
Requirement: Submit the manufacturer's published product warranties.

1.4 INSPECTION

Notice
Inspection: Give notice so that inspection may be made of the following:
- Custom-built furniture and fixtures fabricated and ready to be delivered to the site.
- Furniture items delivered to site before installation.
- Site locations or substrates prepared to receive furniture or fixtures before installation.
- Completed installation.

2 PRODUCTS

2.1 GENERAL

Storage and handling
General: Deliver, unload and store products and accessories in sealed manufacturer's packaging.

Preservative treatment
CCA treated timber: If proposed, provide details.

3 EXECUTION

3.1 INSTALLATION

Erection
Line and level: Erect posts or poles vertically. Erect furniture items level. Where installed on slopes, provide a level area around benches and seats.

3.2 COMPLETION

Cleaning
General: On completion, remove protective coatings, clean all surfaces and remove all labels not required for maintenance, or by AS 4685 series.

4 SELECTIONS

Refer selections Schedule

0262 EXTERNAL SPORTS AND PLAYGROUND SURFACING

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide external softfall surfacing, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.3 STANDARDS

General
Playground surfacing: To AS 4685.0 and AS 4685.1.

1.4 INTERPRETATION

Abbreviations
General: For the purposes of this worksection the following abbreviations apply:
- EDPM: Ethylene propylene diene monomer (M-class) rubber.
- SBR: Styrene-butadiene rubber.

Definitions
General: For the purposes of this worksection the following definitions apply:
- Critical fall height: The maximum free height of fall for which a surface provides an acceptable level of impact attenuation.
- Rubber: Polymeric material, either natural or synthetic that is elastomeric.
- Substrate: The surface to which a material or product is applied.
- Surfacing: An impact-attenuating surface consisting of one or more material components cast in situ, formed into a sheet, tile or other continuous surface where the underlying protective properties of the impact surfacing remain constant with consecutive and/or repeated use.

1.5 TOLERANCES

Softfall surfacing
General: No ridges, bumps or hollows to cause a hazard or to deflect a ball from its true path.

Gradients: Not greater than 1:100 in any direction.

Deviation from the finished plane: When checked on a 10 m grid the difference in level between adjacent grid points, after taking design gradients into account, must not exceed 25 mm.

General: No ridges, bumps or hollows to cause a hazard, with a 2.5 m gradual transition from playground surfacing to adjacent surfaces.

1.6 SUBMISSIONS

Operation and maintenance manuals
General: Submit manufacturer's published use, care and maintenance requirements for each type of surfacing.

Products and materials
Manufacturer's data: Submit the manufacturer's product data for each type of surfacing, and the manufacturer's recommendations for its application in the project including the following, as appropriate:
- Product technical data sheets.
- Safety data sheets (SDS).
- Maintenance recommendations.

Type tests: Submit results, as follows:

- Impact-attenuation performance of surfaces: To AS 4422.
- Slip resistance: To AS 4586.

Samples

Polymeric cast in situ surfacing and polymeric liquid coatings: For each type, submit a sample of the following:

- Coating system including impact-attenuation layer on a suitable base.
- Minimum size per sample: 450 mm x 450 mm.
- Game line sample: 450 mm long by line width.

Polymeric cast prefabricated surfacing: For each type, submit a sample of the following:

- Minimum size per sample: 450 mm x 450 mm.
- Game line sample: 450 mm long by line width.

Polymeric granular material: For each type, submit a 100 g sample of the material.

Identification: Label each sample, with brand, product name, and manufacturer's code reference (including the code for each coat of multi-coat work).

Sample panels: refer to landscape selections schedule

Shop drawings

Polymeric surfacing: Submit shop drawings to a scale that best describes the detail, showing the following:

- Installation details.
- Layout of game lines, numbers, and letters. Indicate application method of each line and marking.
- Location of equipment inserts.
- Method of joining different colours and separate pours.

Subcontractors

General: Submit names and contact details of proposed suppliers and applicators.

Substrate acceptance: Submit evidence of applicator's acceptance of the surfacing substrate before commencing installation.

Tests

Site tests: Submit results, as follows:

- Impact-attenuation performance of completed surfaces.
- Slip resistance test of completed installations.

Warranties

Requirement: Submit warranties, as documented.

1.7 INSPECTION

Notice

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

- Base preparation completed.
- Substrate preparation completed.
- Setting out completed.
- Installation completed.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Deliver, unload and store surfacing materials in unbroken manufacturer's packaging. Inspect for damage upon delivery.

Storage: Store in a dry environment and in a location to allow installation of the surfacing without excess disturbance of the substrate.

2.2 SUBSTRATES

Base and subbase
Requirement: To *0271 Pavement base and subbase.*

Asphaltic concrete
Requirement: To *0272 Asphaltic concrete.*

Concrete
Requirement: To *0310 Concrete – combined.*

2.3 GEOTEXTILE MATERIALS

General
Material: UV stabilised polymeric fabric formed from a plastic yarn composed of at least 85% by weight.

Identification and marking: To AS 3705.

Quality: Free of flaws, stabilised against UV radiation, rot proof, chemically stable and with low water absorbency. Filaments resistant to delamination and dimensionally stable.

2.4 IMPACT-ATTENUATION LAYER

General
Description: Proprietary resilient layer between the base and surface with the following properties:

- Reduce injury risk from falls.
- Reduce lower leg stress.
- Control ball bounce.

2.5 POLYMERIC CAST IN SITU

General
Description: Proprietary polymeric system comprising polyurethane binder and granular rubber mixed and cast in situ and finished with a coloured spray coating.

Game lines and markings: Inlaid or painted.

2.6 POLYMERIC PREFABRICATED SHEETS AND TILES

General
Description: Proprietary system of prefabricated sheets or tiles comprising polyurethane binder and granular rubber.

Game lines and markings: Inlaid or painted.

2.7 POLYMERIC GRANULAR MATERIAL

General
Definition: Proprietary system comprising loose laid granular rubber.

Granular rubber: Shredded particles free of metal, non-metallic fibres, rubber dust and contaminants.

Edging: Water-resistant interconnected modular units.

2.8 POLYMERIC LIQUID COATINGS

General
Description: Proprietary system comprising acrylic or polyurethane coatings with or without an impact-attenuation layer.

Game lines and markings: Painted.

3 EXECUTION

3.1 GENERAL

Subcontractors
Requirement: Use specialist applicators recommended by the material manufacturer.

Combinations
General: Do not combine products from different manufacturers in a surfacing system.

3.2 SUBSTRATES

Drying and shrinkage

General: Before laying surfaces, allow at least the following times to elapse for these substrates:

- Concrete slabs: 28 days.
- Asphaltic concrete: 14 to 21 days.

3.3 PREPARATION

Substrate condition

Requirement: Sound, clean and free of any deposit or finish, including laitance, efflorescence, curing compounds, dirt and grease, which may impair bonding or is incompatible with the surfacing.

Substrate alkalinity and adhesion: Verify the concrete pH is within the range recommended by the manufacturer. Perform adhesion tests to the manufacturer's recommendations, do not proceed with application unless the substrate passes the test.

Substrate correction

Substrate rectification: Conform to the following:

- Surface treatments: Mechanically remove the following surface treatments:
  - Sealers and hardeners.
  - Curing compounds.
  - Waterproofing additives.
  - Surface coatings and contamination.
- Planeness, smoothness, projections: Remove projections and fill voids and hollows with a smoothing and self-levelling compound compatible with the adhesive. Allow filling or levelling compound to dry to manufacturer's recommendations.

Ambient conditions

Ambient air temperature: If less than 5°C or more than 35°C, do not lay surfacing.

Ambient surface temperature: If less than 10°C or more than 60°C, do not lay surfacing.

Rainfall and humidity: If rainfall is imminent or high humidity may prevent drying, do not lay surfacing.

Falls

Requirement: Make sure the fall in the substrate conforms to the fall documented for the surface finish.

Geotextile

Preparation: Trim the ground to a smooth surface free from cavities and projecting rocks.

Placing: Lay the fabric flat, but not stretched tight, and secure it with anchor pins. Overlap joints 300 mm minimum.

Priming

General: If required by the surfacing manufacturer, prime the substrates with a primer compatible with the surfacing system.

3.4 POLYMERIC CAST IN SITU

Installation

General: Mix and apply components of seamless surfacing to manufacturer's recommendations to produce uniform, monolithic, and impact-attenuating surfacing of required overall thickness.

Substrate primer: Apply over prepared substrate.

Impact-attenuating layer: Spread evenly over primed substrate to form a uniform layer with a minimum of cold joints.

Intercoat primer: Apply primer over cured cushioning layer.

Wearing layer: Spread over primed substrate or impact-attenuation layer to form a uniform layer and, except where colour changes, with a minimum of cold joints. Finish surface to standard wearing surface texture.

Topcoat: Spray or roller apply in one continuous operation.

Joints: To the manufacturer's detail.

Edge treatment: Fully adhere edges to substrate with full coverage of substrate. Maintain the cushioned thickness required to conform with performance requirements.

Game lines: Mask surfacing and apply to the manufacturer's recommendations.

3.5 POLYMERIC PREFABRICATED SHEETS AND TILES

Installation

General: Apply components of prefabricated surfacing to manufacturer's recommendations to produce a uniform wearing surface without unaligned units, raised edges (lipping), or other surface imperfections.

Prefabricated sheet: Lay from centreline established between principal perimeter edges.

Prefabricated tiles: Lay out from centreline established between principal perimeter edges, with tiles at opposite sides of installation of equal width. Adjust as required to avoid cut tiles less than one-half of a tile width and as follows:

- Alignment axis and pattern: Lay units along axis and in grid pattern, as documented.

Obstructions: Scribe, cut, and fit prefabricated units to vertical surfaces, equipment anchors and other interruptions of floor surface.

Fixing sheets and tiles:

- Adhesive: Adhere to substrates using a full spread of adhesive applied to substrate or to sheet/tile.
- Mechanical: Anchor to substrates.

Joints: To the manufacturer's details.

Edging: Maintain cushioned thickness required to conform with performance requirements.

Game lines: Mask surfacing and apply to the manufacturer's recommendations.

3.6 POLYMERIC GRANULAR MATERIAL

Installation

General: Apply components of loose-fill surfacing to manufacturer's recommendations to produce a uniform surface.

Edging: Install and permanently secure edging in place, and attach units to each other.

Loose fill: Place loose-fill materials to required depth after installation of playground equipment support posts and foundations, including the recommended amount of additional material to offset compaction over time.

Grading: Uniformly grade loose fill to an even surface free from irregularities.

3.7 POLYMERIC LIQUID COATINGS

Installation

General: Mix and apply flooring components according to manufacturer's recommendations to produce a uniform surface.

Substrate primer: Apply over prepared substrate.

Impact-attenuation layer: Roll out and fix with adhesive. Stagger head seams between adjacent rows. Apply sealer over impact-attenuation layer.

Wearing layer: Apply by spray or roller over primed substrate or impact-attenuation layer to form a uniform layer.

Topcoat: Apply by spray or roller in one continuous operation.

Game lines: Mask surfacing and apply to the manufacturer's recommendations.

3.8 TESTING

Completion tests

Slip resistance of testing of completed installation: To AS 4663.

Impact-attenuation performance of completed surfaces: To AS 4422.

3.9 COMPLETION

Protection

General: Keep traffic off finished work for 48 hours after installation.

Reinstatement

Extent: Repair or replace faulty or damaged work. If the work cannot be repaired satisfactorily, replace the whole area affected.

Spare materials

General: Supply spare matching surfacing and accessories of each type for future replacement purposes. Store the spare materials on site where directed.

Quantity: At least 1% of the quantity installed.

Warranties

Surfacing: Cover materials and workmanship in the terms of the warranty in the form of interlocking warranties from the supplier and the applicator.

- Form: Against failure of materials and execution under normal environment and use conditions.

4 SELECTIONS

4.1 PERFORMANCE

Refer landscape Selections Schedule

0275 PAVING – MORTAR AND ADHESIVE BED

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide paving, as documented.

Performance
Requirements:

- Consistent in colour and finish.
- Firmly bonded to substrates for the expected life of the installation.
- Resistant to expected impacts in use.
- Set out with joints accurately aligned in both directions.
- To direct all water flowing from supply points to drainage outlets without leakage to the substrate or adjacent areas.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARDS

Slip resistance
Classification: To AS 4586.

1.4 INTERPRETATION

Definitions
General: For the purposes of this worksection the following definitions apply.

- Absolute level tolerance: Maximum deviation from design levels.
- Adhesives - cementitious (C): Adhesive in which the binders are hydraulic, e.g. General purpose cement, with aggregates and organic additives.
- Bedding: Mixtures of materials which are applied to substrates in a plastic state and which dry, cure and adhere tiles to substrates:
  - Adhesive bedding: Paving/tiling adhered by adhesives.
  - Mortar bedding: Paving/tiling adhered in a cementitious mortar bed.
- Lippage: Height deviation between adjacent units.
- Pavers: Units made from clay, stone, precast concrete, ceramic, terrazzo and/or other inorganic raw materials, generally over 20 mm thick, used as coverings for horizontal surfaces. Larger pavers are often referred to as flags.
- Relative level tolerance: Maximum deviation from a 3 m straightedge laid on the surface.
- Substrate: The surface to which a material or product is applied.

1.5 TOLERANCES

Completed paving
Lippage:

- Unpolished pavers: Less than 2 mm.
- Polished pavers 300 x 300 mm or less: 1 mm, with 5% not exceeding 1.5 mm.
- Polished pavers over 300 x 300 mm: 1.5 mm, with 5% not exceeding 2 mm.

Paving surface level tolerances table

Item	Level tolerance	
	Absolute	Relative
Vehicular pavements	± 5 mm	5 mm

Item	Level tolerance	
	Absolute	**Relative**
Pedestrian pavements	± 10 mm	10 mm

1.6 SUBMISSIONS

Execution details

Grouting: Submit proposals for grouting methods and materials.

Margins: If it appears that minor variations in joint widths or overall dimensions will avoid cut pavers, submit a proposal.

Operation and maintenance manuals

General: Submit a manual describing care and maintenance of the paving, including procedures for maintaining the slip-resistance grading stating the expected life of the slip-resistance grade.

Products and materials

Product conformity: Submit current assessments of conformity as follows:

- Marking and classification of adhesive to AS ISO 13007.1.

Type tests: Submit results, as follows:

- Slip resistance of pavers.
- Accelerated wear test of pavers.
- Stone paver properties.

Samples

General: Submit labelled samples of pavers, grout and sealants, illustrating the range of variation in colour and finish.

Sample panel: Prepare a sample panel of each type of finish as follows:

- Size: ≥ 2 m^2.
- Include samples of junction details and trim.
- Preserve each panel until related work is complete.

Tests

Site tests: Submit results, as follows:

- Slip resistance of completed installation.
- Stone paver properties tests.
- Salt efflorescence of paver prototype testing.

1.7 INSPECTION

Notice

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

- Substrate immediately before paving.
- Trial set-outs before execution.
- Control joints before sealing and grouting.

2 PRODUCTS

2.1 ADHESIVES

General

Standard: To AS ISO 13007.1.

Type

General: Provide adhesives compatible with the materials and surfaces to be adhered.

Prohibited uses: Do not provide the following combinations:

- Organic PVC-based adhesives and organic natural rubber latex adhesives in damp or wet conditions.
- PVA (polyvinyl acetate) based adhesives in wet areas or externally.

2.2 MORTAR

Materials
To Civil Engineers details and specification

Mixing: To AS 3958.1 clause 2.15.

Gauging: Site gauged by volume.

2.3 GROUT

Type
Portland cement based grout: Mix with fine sand. Provide minimum water to achieve workability.

- Mix proportion (cement:sand): 1:3.

Pigments
Pigments for coloured grout: Provide colourfast pigments compatible with the grout material. For cement-based grouts, provide inorganic mineral pigments or lime-proof synthetic metallic oxides compatible with cement.

Water
General: Clean and free from any deleterious matter.

2.4 PAVERS

Concrete and clay pavers
Standard: To AS/NZS 4455.2.

Properties: To AS/NZS 4455.2 Table 2.8.

Tests
Accelerated wear test: To the requirements of the landscape selections schedule

2.5 OTHER MATERIALS

Tactile ground surface indicators
Standard: To AS/NZS 1428.4.1.

Control joint types
General: As documented in the **Control joints schedule**.

Divider strip: A proprietary expansion joint consisting of a neoprene filler sandwiched between plates with lugs or ribs for mechanical keying. Set flush with the finished surface.

Proprietary slide plate divider strip: An arrangement of interlocking metal plates grouted into pockets formed in the concrete joint edges.

Sealant: Two-pack self-levelling flexible mould resistant, one-part silicone or polyurethane sealant applied over a backing rod. Finish flush with the paver surface.

- Floors: Trafficable, shore hardness more than 35.

Backing rod: Compressible closed cell polyethylene foam with a bond-breaking surface.

3 EXECUTION

3.1 PREPARATION

Trial set-out
General: Prepare a trial paving set-out to each area as follows to:

- Maximise the size of equal margins of cut pavers.
- Locate control joints.
- Note minor variations in joint widths to eliminate cut pavers at margins.

Ambient temperature
General: If the ambient temperature is less than 5°C or more than 35°C, do not lay pavers.

Substrates
General: Make sure substrates are as follows:

- Clean and free of any deposit or finish which may impair adhesion or location of pavers.
- Projections are hacked off and voids and hollows are filled with a cement:sand mix not stronger than the substrate nor weaker than the bedding.

Drying and shrinkage: Before paving, allow at least the following times to elapse (for curing and initial shrinkage) for these substrates:

- Concrete slabs: 28 days.
- Toppings on slabs: A further 21 days.

Absorbent substrates: If suction is excessive, control it by dampening but avoid over-wetting and do not apply mortar bedding to substrates showing surface moisture.

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 3 mm of the surface and expose the aggregate then apply a bonding treatment.

Fixtures

General: Before paving make sure that fixtures interrupting the surface are accurately positioned in their designed or optimum locations relative to the paving layout.

3.2 PAVING GENERALLY

Variations

General: If necessary, distribute variations in hue, colour, or pattern uniformly, by mixing pavers or paving batches before laying.

Paving joints

Joint widths: Set out pavers to give uniform joint widths of 6 to 12 mm.

Margins

General: Provide whole or purpose-made pavers at margins where practicable, otherwise set out to give equal margins of cut pavers. If margins less than half paver width are unavoidable, locate the cut pavers where they are least conspicuous.

Protection

Traffic: Keep pedestrian and vehicular traffic off paving until the bedding has set and attained its working strength.

Cleaning: Keep the work clean as it proceeds and protect finished work from damage.

3.3 MORTAR BEDDING

Preparation of pavers

Suction: Soak porous pavers in water for half an hour and then drain until the surface water has disappeared.

Bedding

To be confirmed with Civil Engineer

General: Use bedding methods and materials which are appropriate to the paver, the substrate, the conditions of service, and which leave the paver firmly and solidly bedded in the bedding material and adhered to the substrate. Form falls integral with the substrate.

Mortar beds

To be confirmed with Civil Engineer

Substrate preparation: Either lightly dust the screeded bed surface with dry cement and trowel level until the cement is damp, or spread a thin slurry of neat cement, on to the paver back. Do not provide mortar after initial set has occurred.

Nominal thickness: 30-60mm

Nominal thickness: 6 mm.

3.4 MOVEMENT JOINTS

General

Requirement: Provide control joints as follows:

- Location:
  - Over structural control joints.
  - At internal corners.
  - Close to external corners in large paved areas.
  - Around the perimeter at abutments.
  - At junctions between different substrates.
  - To divide large paved areas into bays, maximum 5 m wide, maximum area 16 m^2.

. At abutments with the building structural frame and over supporting walls or beams where flexing of the substrate is anticipated.

- Depth of joint: Right through to the substrate.
- Sealant width: 6 to 25 mm.
- Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

3.5 GROUTED JOINTS

Grouting
General: Commence grouting as soon as practicable after bedding has set and hardened sufficiently. Clean out joints as necessary before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout and wash down as the grouting proceeds.

3.6 TESTING

Completion tests
Slip resistance of completed installation: To AS 4663.

3.7 COMPLETION

Spares
General: Supply spare matching pavers of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

Storage location: To the requirements of The Principal

Cleaning
Completion: Clean progressively and leave pavements clean on completion.

4 SELECTIONS

Refer to Selections Schedule

0277 PAVEMENT ANCILLARIES

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide channels, kerbs, linemarking, and vehicle barriers, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.
- *0271 Pavement base and subbase*.

1.3 INTERPRETATION

Definitions
General: For the purposes of this worksection the following definitions apply:
- Absolute level tolerance: Maximum deviation from design levels.
- Relative level tolerance: Maximum deviation from a 3 m straightedge laid on the surface.

1.4 TOLERANCES

Channels and kerbs
Absolute level tolerance: ± 10 mm at any point on the finished concrete surface.

Relative level tolerance: 5 mm to the top or face of kerbs, and to the surface of channels.

Plan position deviation: 25 mm.

Exception: Kerb laybacks, grade changes or curves, or at gully pits requiring channel depression.

Linemarking
Longitudinal line lengths: ± 20 mm from the lengths documented in AS 1742.2.

Longitudinal line widths: ± 10 mm from the widths documented in AS 1742.2

Transverse line lengths and widths: ± 10 mm from the lengths and widths documented in AS 1742.2.

Other markings: ± 50 mm from the dimensions shown on the drawings or in AS 1742.2 for arrows, chevrons, painted medians, painted left turn islands and speed markings. Place arrows and speed markings square with the centreline of the traffic lane.

Raised pavement markers
Plan position deviation: 20 mm.

Directional displacement: ± 4˚.

Vehicle barriers
Plan position deviation: 50 mm.

Length: ± 20 mm.

Bollard plumb: H/100.

1.5 SUBMISSIONS

Linemarking materials
General: Submit NATA Registered Laboratory Test Reports, at least seven days before work is scheduled to commence, on the properties of the materials, including paint and glass beads.

2 PRODUCTS

2.1 CHANNELS AND KERBS

Concrete
Standard: To AS 1379.

Grade: N20.

2.2 LINEMARKING

Pavement marking paint
Standard: Conform to the following:
- Solvent-borne paint: To AS 4049.1.
- Waterborne paint: To AS 4049.3.
- High performance: To AS 4049.4.

Glass beads
Standard: To AS/NZS 2009.

Bead type: B.

2.3 VEHICLE BARRIERS

Steel tube bollards
Type: Bollards fabricated from heavy steel tube, to AS 1074.

Minimum nominal size: DN 100.

Finish: Galvanize after fabrication.

2.4 TACTILE GROUND SURFACE INDICATORS

Refer to 0195P DTAC Tactile Indicators and Stair Edgings

2.5 STEP NOSING

Refer to 0195P DTAC Tactile Indicators and Stair Edgings

3 EXECUTION

3.1 CHANNELS AND KERBS

General
Standard: Construct kerb and/or gutters in fixed forms, by extrusion or by slip forming.

Foundation preparation
Foundation material: Shape and compact to form a firm base before placing any kerb and/or channel.

Construction on a pavement course: To *0271 Pavement base and subbase*.

Joints
Concrete pavement: Where kerbs and/or channels are cast adjacent to a concrete pavement, continue the same joint type, as documented for the concrete pavement, across the kerb and/or channel.

Backfill
Timing: Not earlier than three days after placing kerb and/or channel concrete, backfill and reinstate the spaces on both sides of the kerb and/or channel.

Material: Granular, free of organic material, clay and rock in excess of 50 mm diameter.

Compaction: Compact backfill in maximum 150 mm thick layers, to a relative compaction of 95%, when tested in conformance with AS 1289.5.4.1, for standard compactive effort.

Pavement: Backfill pavement material adjacent to new kerbs and/or channels to the drawings and *0271 Pavement base and subbase*.

3.2 LINEMARKING

Setting out
General: Set out the work so that all markings are placed, as documented.

Surface preparation
Surface: Clean, dry and free of any deposit which may impair adhesion of the paint finish.

Wet weather: Do not apply pavement marking during wet weather or if rain is likely to fall during the process or paint drying time.

Provision for traffic: Allow for traffic during application and protect pavement markings until the material has dried sufficiently to carry traffic without being damaged.

Mixing of paint: Before use, mix all paint in its original container to produce a smooth uniform product consistent with the freshly manufactured product.

Application of paint

Longitudinal lines: Spray all longitudinal lines with a self-propelled machine. For a one-way or two-way barrier line pattern, concurrently spray the two sets of lines.

Hand spraying: Hand spray transverse lines, symbols, letters, arrows and chevrons using templates.

Paint thickness: Uniform wet film thickness: 0.35 mm to 0.40 mm.

Markings alignment: Straight or with smooth, even curves where intended.

Edges: Form clean, sharp edges. Remove any paint applied beyond the defined edge of the marking and leave a neat and smooth marking on the wearing surface of the pavement.

Glass bead application

Glass beads: Apply glass beads immediately after the application of the paint, at the following minimum rates:

- Longitudinal lines: 0.5 kg/m^2.
- Other markings: 0.3 kg/m^2.

Removal of pavement markings

General: Remove pavement markings, as documented or no longer required, from the wearing surface of pavements without causing significant damage to the surface.

3.3 TACTILE GROUND SURFACE INDICATORS

Install in accordance with manufacturer's requirements

Refer to 0195P DTAC Tactile Indicators and Stair Edgings

3.4 VEHICLE BARRIERS

Steel tube bollards

Footing: Encase buried end of bollard in concrete, minimum 600 mm deep x 250 mm diameter.

On slabs: Weld on a 10 mm thick baseplate drilled for 4 bolts, and bolt to slab using masonry anchors installed to manufacturer's recommendations.

Filling: Fill the tube with 15 MPa concrete.

Open ends: Seal with fabricated end caps, spot welded and ground smooth.

Footing size: To manufacturer's specifications

0278 GRANULAR SURFACES

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide geotextile, base, granular surfacing and edging, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.
- *0241 Landscape – walling and edging*.

1.3 INTERPRETATION

Definitions
General: For the purposes of this worksection the following definitions apply:
- Absolute level tolerance: Maximum deviation from design levels.
- Base: One or more layers of material, forming the uppermost structural element of a pavement and on which the surfacing may be placed.

1.4 TOLERANCES

Base
Absolute level tolerance: + 10 mm, - 5 mm.

Finished granular surface
Absolute level tolerance: ± 10 mm.

1.5 SUBMISSIONS

Samples
Granular surfacing: Submit a sample of the granular material.

Refer to selections schedule

Tests
Site tests: Submit results, as follows:
- Compaction tests.

1.6 INSPECTION

Notice
Inspection: Give notice so that inspection may be made of the following:
- Completed base preparation.
- Completed granular surfacing.

2 PRODUCTS

2.1 GENERAL

Storage and handling
Geotextile: Store clear of the ground and out of direct sunlight. During installation, do not expose to sunlight for more than 14 days.

2.2 BASE MATERIALS

General
Description: Fine crushed rock, free of sand and coatings of clay or organic material, and containing not more than 1% disintegrated, weathered, soft fractured, friable or poorly indurated fragments.

2.3 GEOTEXTILE

General
Standard: To AS 3705.

Quality: Free of flaws, stabilised against UV radiation, rot proof, chemically stable and with low water absorbency. Filaments resistant to delamination and dimensionally stable.

2.4 EDGE RESTRAINTS

General
Requirement: To *0241 Landscape – walling and edging*.

2.5 GRANULAR SURFACE MATERIAL

Decomposed granite
Source: Crushed stabilised sandstone

Particle size: 5 mm to 20 mm with 40% of 5 mm to 10 mm.

Stabilising: Screen out the fines and replace with the following:

- Mix proportions for slopes < 1:30 (off-white cement:decomposed granite) by volume: 1:35.
- Mix proportions for slopes > 1:30 (off-white cement:decomposed granite) by volume: 1:20.

3 EXECUTION

3.1 SUBGRADE

Preparation
Excavation: Cut and trim the subgrade to the required profile and extend to the rear face of the proposed edge restraints or to the face of existing abutting structures.

Weed eradication: Manual removal of weeds where possible, chemical application in accordance with the requirements of The Principal

3.2 BASE

Placement
Method: Mechanically spread material to the loose thickness required to achieve the finished compacted thickness. Do not transport new material over uncompacted material.

Moisture: Bring base material to the optimum moisture content before and during placing. Do not add water during compaction except as required to replace evaporation.

Repair: If the subgrade is disturbed during placing or becomes mixed with new material, remove all contaminated material and replace, regrade and compact.

3.3 COMPACTION

Subgrade and base
Hand compaction: Condition the material by moisture adjustment before compaction.

Compaction: 95% of the maximum dry density.

3.4 GEOTEXTILE

Installation
General: To the manufacturer’s requirements.

Joint lapping: Lap minimum 150 mm at joints.

3.5 EDGE RESTRAINTS

General
Requirement: If edging is not provided by other structures, install edge restraints to *0241 Landscape – walling and edging* before placing the granular surfacing.

3.6 SURFACING

General
Falls: Slightly camber surface to fall to adjacent surfaces and edge restraints.

Finished surface: Firm, even and flush with adjacent surfaces and edge restraints.

Decomposed granite- crushed stabilised sandstone
Requirement: Spread blended dry mix over compacted subgrade.

Thickness: Screed to minimum 100 mm thick.

Compaction: 90% of the maximum dry density.

Moisture: Do not add water to surface material. Allow the natural ground water to rise and stabilise the mixture.

3.7 TESTING

Site tests
Compaction:

- Subgrade, base and decomposed granite surface:
  - Sampling: To AS 1289.1.2.1.
  - Testing: To AS 1289.5.1.1, AS 1289.5.3.1, AS 1289.5.4.1 or AS 1289.5.8.1.

3.8 COMPLETION

General
Adjacent surfaces: Rake and finish granular surface flush against adjacent existing surfaces.

0279 PAVING – ON PEDESTALS

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide paving on pedestals, as documented.

Performance
Requirements:

- Consistent in colour and finish.
- Resistant to expected impacts in use.
- Pavers capable of spanning between pedestal supports when subjected to imposed loads.
- Resistant to any wind uplift forces.
- Set out with joints accurately aligned in both directions.
- Within documented level tolerances.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARDS

Slip resistance
Classification: To AS 4586.

1.4 INTERPRETATION

Definitions
General: For the purposes of this worksection the following definitions apply:

- Absolute level tolerance: Maximum deviation from design levels.
- Lippage: Height deviation between adjacent units.
- Pavers: Units made from clay, stone, precast concrete, ceramic, terrazzo and/or other inorganic raw materials, generally over 20 mm thick, used as coverings for horizontal surfaces. Larger pavers are often referred to as flags.
- Pedestal: The structure directly supporting the pavers, including head, base, column, any adjustment and any locking devices.
- Relative level tolerance: Maximum deviation from a 3 m straightedge laid on the surface.

1.5 TOLERANCES

Completed paving
Lippage:

- Unpolished pavers: Less than 2 mm.
- Polished pavers 300 x 300 mm or less: 1 mm, with 5% not exceeding 1.5 mm.
- Polished pavers over 300 x 300 mm: 1.5 mm, with 5% not exceeding 2 mm.

Level tolerance:

- Absolute: ± 8 mm.
- Relative: 8 mm.

1.6 SUBMISSIONS

Execution details
Set out: If it appears that an alternative set out, spacing width between pavers or minor variations in overall dimensions will avoid cut pavers, submit a proposal.

Operation and maintenance manuals
General: Submit a manual describing care and maintenance of the paving and pedestals, including procedures for future height adjustment to maintain installation tolerances and for maintaining the slip-resistance grading stating the expected life of the slip-resistance grade.

Products and materials
Pavers: Submit evidence from paving manufacturer of paver suitability for installation on pedestals, being supported only on the corners of the paver.

Type tests: Submit results, as follows:

- Slip resistance of pavers.
- Accelerated wear test of pavers.
- Stone paver properties tests.

Waterproof membrane: Submit evidence of the waterproofing membrane's suitability for pedestals and pavers to be installed over and that it is also UV resistant/stable.

Samples
Pavers: Submit labelled samples of pavers, illustrating the range of variation in colour and finish.

Pedestals: Submit a sample of each component of the pedestal support system.

Shop drawings
General: Submit shop drawings to a scale that best describes the detail, showing the following:

- Paver size.
- Any required paver reinforcement.
- Pattern.
- Grid layout.
- Pedestal locations.
- Pedestal heights.
- Starting point.
- Finished levels.

Subcontractors
Substrate acceptance: Submit evidence of the installer's acceptance of the substrate before commencing installation.

Tests
Site tests: Submit results, as follows:

- Site slip resistance test of completed installations.

Warranties
Requirement: Submit the following:

- Pedestal warranty.
- Paver warranty.
- Installation warranty.

1.7 INSPECTION

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

- Substrate immediately before installing pedestals.
- Set-out of grids for placement of pedestals.
- Installation of any bracing to pedestals.
- Completed paving.

2 PRODUCTS

2.1 GENERAL

Storage and handling
Pedestals and pavers: Deliver and store in the manufacturer's original sealed packaging in a dry environment. Inspect for damage upon delivery.

2.2 PEDESTAL SYSTEM

Description
Pedestal types: Proprietary system of fixed height or adjustable height pedestals.

Selection
Refer selections schedule

2.3 PAVERS

General
Selection: To the **Paver schedule**.

Concrete and fired clay pavers
Standard: To AS/NZS 4455.2.

Properties: To AS/NZS 4455.2 Table 2.8.

Stone pavers
Description: Provide sound stone pavers of uniform quality. Reject stone pavers with any of the following defects liable to affect strength and durability:

- Vents.
- Cracks.
- Fissures.
- Seams.
- Porous inclusions.
- Foreign material.
- Loose surface material.
- Discolouration.

Matching: Select for optimum matching of colour and pattern.

Other pavers
Requirement: Provide sound pavers of uniform quality, as documented.

Tests
Stone paver properties tests: To the requirements of the landscape selections schedule

Accelerated wear test of pavers: To the requirements of the landscape selections schedule

2.4 OTHER MATERIALS

Tactile ground surface indicators
Standard: To AS/NZS 1428.4.1.

3 EXECUTION

3.1 PREPARATION

Substrates
Drying and shrinkage: Before installing any waterproof membrane or locating pedestals, allow at least the following times to elapse (for curing and initial shrinkage) for these substrates:

- Concrete slabs: 28 days.
- Toppings on slabs: A further 21 days.

Preparation: Before starting the installation of pedestals, make sure substrates are as follows:

- Broom clean and free from any oil, deposit, finish or projection which may impair the performance of the pedestal system or any waterproofing membrane that has been installed.
- Complete, including the installation of any documented waterproofing membrane, drainage mat, insulation or protection board.
- Sloped to provide positive and adequate drainage.

Extent of protection: If protection to any documented waterproof membrane is only required under each pedestal, extend protection a minimum of 25 mm beyond the edge of each pedestal base.

Compressive strength of insulation placed beneath a pedestal: Sufficient to support the loads transmitted through the pedestal upon completion.

Perimeter

Containment: Provide adequate restraint to all assemblies of insulation, protection board, drainage mat, pedestals and pavers to the perimeter of the paving area.

Fixtures

General: Before installing pedestals make sure that fixtures interrupting the surface of the paving are accurately positioned in their designed or optimum locations relative to the paving layout. Allow for movement between paving and fixtures.

3.2 INSTALLATION

Set-out

Level: Establish and mark the support system level (finished paving elevation less the paver thickness) around the perimeter of the paving area.

Grid: Establish a grid on the substrate from the set-out point. The grid will reflect the joint lines in the completed paving. Use grid lines to check paver layout during installation.

Expansion joints: Do not locate pedestals directly over expansion joints in the substrate. Locate pedestals on one side or the other of any expansion joint in the substrate.

Margins: Provide whole or purpose-made pavers at margins where practicable, otherwise set out to give equal margins of cut pavers. If margins less than half paver width are unavoidable, locate the cut pavers where they are least conspicuous.

Pedestal installation

General: Install pedestals to the manufacturer's recommendations in complete rows, starting at one side of the perimeter, installing pavers and adjusting to the correct level as each subsequent row of pedestals are installed.

Location: Locate a pedestal at each intersection of grid lines.

Perimeter edge: Locate pedestal on grid line that meets perimeter, as close to the perimeter edge as possible.

Irregular cut pavers: Locate pedestals so any irregular shaped cut pavers are supported on, or as close as possible to, each corner of the paver.

Pedestal height adjustment

General: For adjustable height pedestals, set the pedestal to the required height before placing pavers onto pedestal. After placing pavers make fine vertical adjustments, as required.

Compensation for substrate slope

General: If required to install paving at a different slope to that of the substrate, compensate for the substrate slope to the manufacturer's recommendations.

Variations

General: If necessary, distribute variations in hue, colour, or pattern uniformly, by mixing pavers or paving batches before laying.

Thickness: Accommodate variations in paver thickness by placing shims under a paver corner on top of the pedestal head, to the manufacturer's recommendations.

3.3 TESTING

Completion tests

Slip resistance of completed installation: To AS 4663.

3.4 COMPLETION

Cleaning

Requirement: Clean progressively and leave pavements clean on completion.

Spares

General: Supply spare matching pavers of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

Storage location: To the requirements of The Principal

4 SELECTIONS

4.1 PRODUCT

Refer Selections schedule

0315 CONCRETE FINISHES

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide finishes to formed and unformed concrete surfaces, as documented.

Performance
Requirement: Compatible with documented finishes.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARDS

General
Formed surfaces: To AS 3610.1.

Slip resistance
Classification: To AS 4586.

1.4 INTERPRETATION

Definitions
General: For the purposes of this worksection the following definition applies:

- Green concrete: Concrete which has set but not appreciably hardened.

1.5 TOLERANCES

Formed surfaces
Quality of the surface finish: To AS 3610.1 Table 3.3.2.

Unformed surfaces
Unformed surfaces flatness: To the **Flatness tolerance class table,** using a straightedge placed anywhere on the surface in any direction, for the documented class of finish.

Flatness tolerance class table

Class	Measurement	Maximum deviation (mm)
A	2 m straightedge	4
B	3 m straightedge	6
C	600 mm straightedge	6

1.6 SUBMISSIONS

Prototypes
Test panels: Provide test panels to AS 3610.1 and as documented in the **Test panels schedule**.

Manufacture: Cast the panels using the formwork, concrete, compaction equipment, form release agents, curing and formwork removal methods which are to be used in the final work.

Storage: Once accepted, maintain the panels on site undamaged and protected from the weather, as reference prototypes for evaluation of completed work.

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

Tests
Site tests: Submit test results, as follows:

- Slip resistance test of completed installations.

1.7 INSPECTION

Notice

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

- Evaluation of the off-form finishes.
- Evaluation of surface finish.

2 PRODUCTS

2.1 MATERIALS

Surface modifiers

Hardeners, sealants and protectors: If documented, proprietary products conforming to the manufacturer's recommendations.

Slip resistance treatment: If documented, proprietary products conforming to the manufacturer's recommendations.

3 EXECUTION

3.1 SURFACE MODIFIERS

General

Application: Apply to clean surfaces to the manufacturer's recommendations.

3.2 FORMED SURFACES

General

Surface finish: Provide formed concrete finishes as documented in the **Formed surface finishes schedule.**

Damage: Do not damage concrete works through premature removal of formwork.

Curing

General: If formwork is stripped before the minimum curing period for the concrete has elapsed, continue curing the exposed faces as soon as the stripping is completed.

Evaluation of formed surfaces

General: If evaluation of formed surface tolerance or colour is required, complete the evaluation before surface treatment.

Surface repairs

Method: If surface repairs are required, submit proposals.

Finishing methods

Details: If soffits of concrete elements or faces of concrete columns are to have a finish other than an off-form finish, provide finishes as documented.

Blasted finishes:

- Abrasive: Blast the cured surface using hard, sharp graded abrasive particles until the coarse aggregate is in uniform relief.
- Light abrasive: Blast the cured surface using hard, sharp graded abrasive particles to provide a uniform matt finish without exposing the coarse aggregate.

Bush hammered finish: Remove the minimum matrix using bush hammering to expose the coarse aggregate, recessing the matrix no deeper than half the aggregate size, to give a uniform texture.

Exposed aggregate finish: Remove the vertical face formwork while the concrete is green. Wet the surface and scrub with stiff fibre or wire brushes, flushing continuously with clean water, until the aggregate is uniformly exposed. Do not use acid etching. Rinse the surface with water.

Floated finishes:

- Sand floated finish: Remove the vertical face formwork while the concrete is green. Wet the surface and rub using a wood float. Rub fine sand into the surface until a uniform colour and texture are produced.

- Grout floated finish: Remove the vertical face formwork while the concrete is green. Dampen the surface and spread a slurry, using hessian pads or sponge rubber floats. Remove surplus slurry and work until a uniform colour and texture are produced.

Smooth rubbed finish: Remove the vertical face formwork while the concrete is green. Wet the surface and rub using a carborundum or similar abrasive brick until a uniform colour and texture are produced.

3.3 UNFORMED SURFACES

General

Surface finish: As documented in the **Unformed surface finishes schedule**.

Finished levels: Strike off, screed and level slab surfaces to finished levels and to the flatness tolerance class documented.

Surface repairs

Method: If surface repairs are required, submit proposals.

Finishing methods – primary finish

Machine float finish:

- After levelling, consolidate the surface using a machine float.
- Cut and fill and refloat immediately to a uniform, smooth, granular texture.
- Hand float in locations inaccessible to the machine float.

Steel trowel finish: After machine floating finish, 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.

Burnished finish: Continue steel trowelling until the concrete surface attains a polished or glossy finish, uniform in texture and appearance, and free of trowel marks and defects.

Wood float finish: After machine floating, use wood or plastic hand floats to produce the final consolidated finish free of float marks and uniform in texture and appearance.

Broom finish: After machine floating and steel trowelling use a broom or hessian belt drawn across the surface to produce a coarse even-textured transverse-scored surface.

Scored or scratch finish: After screeding, use a stiff brush or rake drawn across the surface before final set, to produce a coarse scored texture.

Sponge finish: After machine floating and steel trowelling, use a damp sponge to wipe the surface to produce an even textured sand finish.

Exposed aggregate finish: After floating and when concrete has stiffened, wet the surface and scrub with stiff fibre or wire brushes, flushing continuously with clean water, until the aggregate is uniformly exposed. Rinse the surface with water.

Finishing methods – supplementary finish

Abrasive blast: After steel trowelling, abrasive blast the cured surface to provide texture or to form patterns without exposing the coarse aggregate, using hard, sharp graded abrasive particles.

Coloured applied finish: After machine floating, apply a proprietary liquid or dry shake material to the manufacturer’s recommendations and trowel to achieve the required appearance.

Stamped and coloured faux paved or cobblestone finish: Provide a proprietary finishing system.

Polished finish: After steel trowelling, grind the cured surface of the concrete.

3.4 TESTING

Completion tests

Slip resistance of completed installation: To AS 4663.

4 SELECTIONS

Refer to Landscape Selections Schedule

0344 STEEL – HOT-DIP GALVANIZED COATINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide hot-dip galvanized coatings, as documented.

Performance

Requirement: Control atmospheric corrosion to structural steelwork or steel products until the first scheduled maintenance.

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARDS

General

Coating: To AS/NZS 4680.

Coating on fasteners: To AS/NZS 1214.

Durability: To AS/NZS 2312.2.

Metal finishing

Coating mass/thickness minimum: To AS/NZS 4680.

Threaded fasteners coating mass/thickness minimum: To AS/NZS 1214.

1.4 SUBMISSIONS

Execution details

Holes and lifting lugs: If holes and lifting lugs are required to facilitate handling, filling, venting and draining during galvanizing, submit details on size and location.

Detailing features: If design and fabrication features of the items to be galvanized may lead to dimensional change, distortion or difficulties during galvanizing, identify these and submit details for improvement.

Tests

Galvanizing tests: Submit results to AS/NZS 4680 Appendix G6

1.5 INSPECTION

Notice

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

- Coating appearance and thickness, at the galvanizing plant.

2 EXECUTION

2.1 GENERAL

Care

Embrittlement: Take due care to avoid embrittlement of susceptible steels.

Mechanical properties: Avoid mechanical damage. Make sure that mechanical properties of the base metal do not change.

Surface preparation

Surface contaminants and coatings generally: Chemical clean, then acid pickle.

Chemical cleaning: To AS 1627.1.

Acid pickling: To AS 1627.5.

- Inhibitor: Required.

Abrasive blast cleaning: To AS 1627.4

Coating process
General: To AS/NZS 4680 Section 6.

Double dipping to AS/NZS 5131 clause 9.10.5

Threaded fasteners: To AS/NZS 1214 Section 5.

Post treatment
General: Passivate.

Drilling after completion of hot-dip galvanizing
Repair: Prime drill hole surfaces to AS/NZS 4680 clause 8 before the surfaces begin to corrode.

Surface finish
Standard: To AS/NZS 4680 clause 7.

Coating quality: Continuous and as smooth and evenly distributed as possible. Free of blisters, roughness, sharp points, flux residues and any defects that may affect the end use of the article.

Silicon killed steels: Dull grey is acceptable.

Surplus zinc on fastener threads: Remove.

Friction-type bolted connections: Treat coated contact surfaces to achieve the required design slip factor, without removing excessive coating thickness as follows:

- Contact surface preparation: To *GAA After fabrication hot dip galvanizing* Chapter 4.
- Slip factor test: To AS/NZS 5131 Appendix G.

Coating repair
Rejection: If uncoated surfaces or areas damaged by handling at the galvanizing plant exceed the limits specified for repair in AS/NZS 4680 clause 8, reject the galvanizing.

Extent and methods: To AS/NZS 4680 clause 8.

Preparation of galvanized surfaces for paint finishes
Coarse preparation: Remove spikes, and make sure edges are free from lumps and runs.

Light sweep blasting before painting: Required.

- Maximum zinc removal: 10 microns.
- Abrasive grade (range): 150 to 180 microns.
- Abrasive type: Clean ilmenite or garnet.
- Blasting angle to surface: 45° maximum.
- Blast pressure (maximum): 275 kPa.
- Distance of nozzle from surface (range): 350 to 400 mm.
- Nozzle type: 10 to 13 mm minimum diameter venturi type.

2.2 TESTING

Galvanizing tests

2.3 SITE WORK

Site welding
Grinding of edges: Permitted.

Weld areas: Reinstate coating to AS/NZS 4680 clause 8.

Site coating reinstatement
Rejection: If any item has damaged areas exceeding the limits specified for repair in AS/NZS 4680 clause 8.1, reject the item.

Extent: Areas damaged by transport, site welding, site flame cutting, site handling, or erection.

Method: To AS/NZS 4680 clause 8.

3 SELECTIONS

3.1 STRUCTURAL STEEL

Refer to landscape selections schedule

0345 STEEL – PROTECTIVE PAINT COATINGS

1 GENERAL

1.1 RESPONSIBILITIES

General

Requirement: Provide protective paint coatings for the protection of steel products and structural steelwork against interior and exterior atmospheric corrosion, as documented.

Performance

Requirement: Control atmospheric corrosion to structural steelwork and steel products until the first scheduled maintenance.

Period from application to first scheduled maintenance: to Maintenance Schedule

1.2 CROSS REFERENCES

General

Requirement: Conform to the following:

- *0171 General requirements*.

1.3 STANDARDS

General

Surface preparation and coating: To AS/NZS 5131 Section 9 and the recommendations of AS 2312.1.

1.4 INTERPRETATION

Abbreviations

General: For the purposes of this worksection the following abbreviations apply:

- DFT: Dry Film Thickness.
- ITP: Inspection and Test Plan.
- MIO: Micaceous Iron Oxide.
- PDS: Product Data Sheet.
- SDS: Safety Data Sheet.
- µm: Micron (10^{-6}m).

Definitions

General: For the purposes of this worksection the definitions given in AS/NZS 2310 and the following apply:

- Coating contractor: The protective coatings application contractor conducting the on- or off-site coating application works.
- Coating manufacturer: The supplier and/or manufacturer of the protective coating materials used.
- Inspection and test plans (ITP): A series of formal inspection and test plans, prepared by the coating contractor to reflect the specific inspection and testing that will be carried out on the surface preparation, coating application and the record keeping tasks to be undertaken.

1.5 SUBMISSIONS

Execution details

Detailing features: If design and fabrication features of the items to be coated may lead to difficulties, identify these and submit details for improvement.

Repair of damaged coating: If the protective coating is damaged, submit a coating repair proposal, based on the coating manufacturer's recommendations for reinstating the corrosion protection function of the system.

Reinstatement: If final coat varies from the submitted sample, submit proposals for reinstatement of the visible final coating system.

Maintenance painting

Existing steelwork: Identify, itemise and submit details of areas of corrosion, damage and other degradation.

Recoating systems: Submit details of coating systems for maintenance painting of previously coated items and structural elements, including surface preparation.

Products and materials

Multi-component coatings: If partial mixing of packs is proposed, submit details.

Quality

ITPs: Submit for each proposed coating system.

Quality supervisor: Submit the name and record of experience of the person responsible for the implementation of the ITPs.

Records

General: Prepare and maintain records of all surface preparation and coating application works, as follows:

- Standards: To AS 3894.10, AS 3894.11, AS 3894.12, AS 3894.13 and AS 3894.14.
- Reference the relevant parts of the ITP and record conformance.

Samples

Painting and coating colour: Submit a 400 x 400 mm sample of the finished product for each coating system.

Retention: Retain samples for comparison during application.

Subcontractors

General: Submit names and contact details of proposed suppliers and applicators.

Requirement: Submit proof of currency of the applicator's environmental operating licence.

Substrate acceptance: Submit evidence of applicator's acceptance of the coating substrate before starting installation.

Warranties

General: Submit details of the proposed warranty terms, form and period.

1.6 INSPECTION

Notice

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

- Items after fabrication, before commencing surface cleaning and preparation.
- Surfaces after preparation, before application of first coating.
- Coating stages:
  - After application of primer or seal coats.
  - After application of each subsequent coat.
- Repair of coating damage: Exposure of corrosion pitting or significant metal loss by blasting process.

2 PRODUCTS

2.1 GENERAL

Storage and handling

Requirement: Handle, store, mix and apply all protective coatings in conformance with the manufacturer's recommendations.

Original containers: Deliver coating products to site in manufacturer's labelled and sealed containers.

Ambient temperature range for storage: 3°C to 30°C, or to manufacturer's recommendations.

Sunlight: Protect coating materials from direct sunlight before mixing or adding the converter (catalyst).

Use-by-date: Use products with limited shelf life before their use-by-date, unless written authorisation from the coating manufacturer's technical services section is provided.

Paint material

Requirement: To AS/NZS 5131 clause 9.9.3.

Proprietary products

Requirement: Provide all products from the one manufacturer's supply.

Product data sheets (PDS): Keep on site copies of all relevant manufacturer's PDS.

Safety data sheets (SDS): Keep on site copies of all relevant manufacturer's SDS.

Recording: To AS/NZS 5131 clause 9.9.5.

3 EXECUTION

3.1 GENERAL

Product warnings
Requirement: Conform to the SDS.

Surroundings
Protection: Prevent the release of abrasives, overspray or paint waste debris into the air, ground or to any watercourse. Prevent damage to other assets, services or equipment.

Reinstatement: Repair and/or clean affected surrounding areas.

Working area
General: Perform all painting under cover and/or protected from rain, condensation, dew, excessive wind, overspray or wind-blown dust.

Period: Continue protection where any of these conditions exist until the coating is no longer affected.

3.2 SURFACE PREPARATION

General
Requirement: Conform to AS/NZS 5131 clauses 9.3, 9.4 and 9.5.

Galvanized, aluminium and zinc primed surfaces
Requirement: Remove grease, oil and other solvent-soluble contaminants to AS 1627.1. Allow to dry and immediately proceed with the next operation.

Galvanized and aluminium surfaces: Abrade surfaces to a medium coarse type finish to provide an adhesion key.

Zinc primed surfaces: If present, remove zinc salts from zinc primers.

Treatment of welds
Requirement: Clean welds to remove roughness, using power tools to AS 1627.2. Remove filings by vacuuming or compressed air.

Temporary welds: Grind flush any temporary welds.

Porous, skip or stitch welds: Not permitted.

Site welding: If possible, avoid site welding. If on site welding is required, prepare and treat the weld to AS/NZS 5131 clause 9.12.2.

Shop priming
Requirement: Dust off and apply a coat of primer in conformance with the manufacturer's recommendations.

Site coating
General: High pressure wash down all surfaces with clean water. Lightly sand down primer/intermediate coats, which have been shop applied, before site application of next coat.

3.3 PREPARATION ASSESSMENT

General
Conformance: Assess all surfaces of each steel member for conformance with the documented preparation requirements.

Abrasive blast cleaning
Assessment: To AS 1627.4 and AS 1627.9.

Mechanical cleaning
Assessment: To AS 1627.9.

Surface profile
General: To AS 3894.5 Method A.

Surface dust from abrasion
General: To AS 3894.6 Method C.

Chloride level testing
Test: To AS 3894.6 Method A.

Maximum allowable chloride levels: 50 mg/m^2 for critical applications (heavy condensation, fresh water ponding or immersion) or to manufacturer's recommendations.

Conformance: If the maximum allowable chloride is exceeded, rewash the affected surface area until the chloride level is within the acceptable limits using clean water or chloride neutralising solutions. Jet-washing or steam cleaning is also acceptable before re-testing and re-abrasive blasting.

Timing of testing: Early in the blasting work so that removal procedures can be started before the blasting is completed.

3.4 MIXING

General

Requirement: To AS/NZS 5131 clause 9.9.6.

Powered agitators: Mix package sizes larger than 4 litres using powered agitators driven by air motors.

Multi-component coatings: Combine as whole pack units before application.

Thinners: If addition of thinners is proposed, conform to the coating manufacturer's recommendations for the documented product.

Colour consistency: If colour consistency is required, pre-mix tinted products, before the addition of the curing agent or converter and before coating application.

3.5 COATING APPLICATION

General

Requirement: Conform to AS/NZS 5131 clause 9.9 and the PDS.

Painting and coating colour: Verify all project finish colours with the retained samples.

Final surface preparation or coating application

Limits: If the environmental/climatic/substrate conditions listed in AS/NZS 5131 clause 9.9.10 and the following are present do not apply coating:

- Ambient air temperature below 5°C or above 40°C.
- Substrate temperature below 5°C or above 35°C.
- Full prime coat application cannot be carried out before the specified cleanliness of the surface deteriorates.
- Surface preparation standard has not been achieved.
- Time between final surface preparation and the commencement of coating has exceeded 4 hours.
- Visual tarnishing or black spots develop on the surface of the steel.

Exception: Preliminary blast or other surface preparations may be performed in conditions that are outside the limits, providing the final surface preparation and all coating applications are undertaken under the limit conditions.

Pre-coating: Before the spray application of each coating, stripe coat by brush method all edges, welds, seams, rivets, bolts, boltholes (including slots) and difficult to spray areas. Prime the underlying surfaces of replacement bolting, washers and nuts before installation.

Procedure: Conform to the coating order shown in **SELECTIONS, PROTECTIVE PAINT COATING SYSTEMS**.

Subsequent coats: Before applying any subsequent coating layer, make sure the surface condition of the preceding coat conforms to **SELECTIONS, PROTECTIVE PAINT COATING SYSTEMS** and is clean and free from defects.

Wet film thickness (WFT)

Method of measurement: To AS 3894.3 Appendix C using an approved wet film gauge continuously during application.

Dry film thickness (DFT)

Method of measurement: To AS 3894.3 clause 10.

Extent: Measure all surfaces at the completion of each prime, intermediate and finish coats, including areas of the element difficult to paint, masked by structure, or where double or light coating is likely.

Number of measurements: To AS 3894.3 clause 7.

Coatings with DFT 150 µm or less: If testing, deduct the effect of the measured surface profile from all DFT readings.

Single readings: Conform to the following:

- The average of 5 point readings for each 10 m^2 area of coating surface to be within the documented coating thickness range.
- No single point reading in any 10 m^2 to be less than 80% of the specified minimum coating thickness. If the average of three readings is used to produce a point reading, an individual reading may be less than 80% of the minimum coating thickness.
- Check any single reading that is greater than 150% of the documented maximum DFT with three additional readings within 50 mm of the original reading. If the average of these three readings is not greater than 150% of the specified DFT, take the average reading as the point reading. If greater than 150%, reject the DFT for that area. If no maximum limit for DFT is documented, consult manufacturer.

Rectification and defects

Rectification: Re-work areas rejected, using the same surface preparation, coatings and sequence as for the original work.

Defects (including under-thickness and over-thickness): Mark with dustless chalk, adhesive inspection labels or masking tape. Do not use crayon, paint or spirit based ink pens.

3.6 PROTECTION

Contamination

Surfaces: Prevent contamination of coated surface, which are not yet dry, from blasting dust, abrasive or surface preparation debris and any other foreign matter.

Post application care

General: Protect the coating against physical, chemical, or atmospheric damage until all components are fully cured.

Care: Stack and handle all coated items using fabric slings or padded chains. Use soft packaging, carpet strips or other deformable materials between all coated items.

Water ponding: Stack coated items to prevent water ponding.

3.7 COATING REPAIR

Repair of coating damage

Preparation: Feather back by hand or machine sanding all leading edges of intact coating adjacent to the repair, to remove any sharp edge.

Surface contamination: Remove by dusting or blowing down before applying the first coat of paint.

Sequence: Apply the repair coating in the same sequence and manner as the original coating.

Areas damaged without exposing the primer: Wash with a proprietary detergent solution, rinse with clean water and abrade so that edges of sound paint are feathered. Coat the area with the appropriate intermediate and finishing coat materials.

Areas damaged exposing the primer or steel surface: Blast clean to the original standard. Prepare at least 50 mm into the sound coating and to a further feathering zone of approximately 50 mm. Recoat with the documented system to restore the film thickness and integrity over the whole prepared surface including the feathered zone.

Aesthetic reinstatement: If required, repaint to a physical or discernible boundary line.

Defects: If corrosion pitting or areas of significant metal loss and defects are exposed by the blasting process, advise for inspection and have areas passed as being fit for service before proceeding with the coating system.

Timing: Apply the protective coating system within 4 hours of blast cleaning or in any case before visual tarnishing of the steel occurs.

3.8 COMPLETION

General

Joints: On completion, seal all joints and mating surfaces with a compatible polyurethane sealant.

Warranties

Requirement: Cover materials and workmanship in the terms of the warranty in the form of interlocking warranties from the supplier and the applicator.

- Form: Against failure of materials and execution under normal environment and use conditions.
- Period: As offered by the supplier.

4 SELECTIONS

4.1 PROTECTIVE PAINT COATING SYSTEMS

Polyurethane – AS 2312.1Categories C1 and C2 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	75 µm Epoxy zinc phosphate conforming to AS/NZS 3750.13	Nil	Nil
Internal decorative conforming to AS 2312.1 PUR2	75 µm Epoxy zinc phosphate conforming to AS/NZS 3750.13	50 µm High Solids Polyurethane conforming to AS/NZS 3750.6	Nil
External non-decorative conforming to AS 2312.1 PUR2	75 µm Epoxy Zinc phosphate conforming to AS/NZS 3750.13	50 µm High Solids Polyurethane conforming to AS/NZS 3750.6	Nil
External decorative conforming to AS 2312.1 PUR2	75 µm Epoxy zinc phosphate conforming to AS/NZS 3750.13	50 µm High Solids Polyurethane conforming to AS/NZS 3750.6	Nil

Polyurethane – AS 2312.1 Categories C3, C4 and C5 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	Nil	Nil
Internal decorative conforming to AS 2312.1 PUR2a	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	75 µm High Solids Polyurethane conforming to AS/NZS 3750.6	Nil
External non-decorative conforming to AS 2312.1 EHB4	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	200 µm High-Build Epoxy MIO conforming to AS/NZS 3750.14	Nil
External decorative conforming to AS 2312.1 PUR5	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	200 µm High-Build Epoxy MIO conforming to AS/NZS 3750.14	50 µm Polyurethane conforming to AS/NZS 3750.6 (Alternative: 75 µm High Solids Polyurethane)

Micaceous Iron Oxide – AS 2312.1 Categories C1 and C2 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	75 µm Alkyd zinc phosphate containing MIO and Aluminium pigment conforming to AS/NZS 3750.19 Type 2	Nil	Nil
Internal decorative	75 µm Alkyd zinc phosphate containing MIO and Aluminium pigment conforming to AS/NZS 3750.19 Type 2	50 µm Alkyd MIO finish conforming to AS/NZS 3750.12	Nil
External non-decorative	75 µm Alkyd zinc phosphate containing MIO and Aluminium pigment conforming to AS/NZS 3750.19 Type 2	Nil	Nil

Location	Primer	Second Coat	Third Coat
External decorative	75 µm Alkyd zinc phosphate containing MIO and Aluminium pigment conforming to AS/NZS 3750.19 type 2	40 µm Alkyd MIO finish conforming to AS/NZS 3750.12	40 µm Alkyd MIO finish conforming to AS/NZS 3750.12

Micaceous Iron Oxide – AS 2312.1 Categories C3, C4 and C5 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	Nil	Nil
Internal decorative	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	75 µm Epoxy MIO conforming to AS/NZS 3750.14	Nil
External non-decorative conforming to AS 2312.1 EHB4	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	200 µm High-Build Epoxy MIO conforming to AS/NZS 3750.14	Nil
External decorative conforming to AS 2312.1 EHB6	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	125 µm Epoxy MIO conforming to AS/NZS 3750.14	125 µm Epoxy MIO conforming to AS/NZS 3750.14

Epoxy Acrylic – AS 2312.1 Categories C1 and C2 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	75 µm Epoxy zinc phosphate conforming to AS/NZS 3750.13	Nil	Nil
Internal decorative conforming to AS 2312.1 ACC2	75 µm Epoxy zinc phosphate conforming to AS/NZS 3750.13	50 µm Epoxy Acrylic conforming to AS/NZS 3750.5	Nil
External non-decorative conforming to AS 2312.1ACC2	75 µm Epoxy zinc phosphate conforming to AS/NZS 3750.13	50 µm Epoxy Acrylic conforming to AS/NZS 3750.5	Nil
External decorative conforming to AS 2312.1ACC2	75 µm Epoxy zinc phosphate conforming to AS/NZS 3750.13	50 µm Epoxy Acrylic conforming to AS/NZS 3750.5	Nil

Epoxy Acrylic – AS 2312.1Categories C3, C4 and C5 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	Nil	Nil
Internal decorative	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	50 µm Epoxy Acrylic conforming to AS/NZS 3750.5	Nil
External non-decorative conforming to AS 2312.1 EHB4	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	200 µm High-Build Epoxy MIO conforming to AS/NZS 3750.14	Nil
External decorative conforming to AS 2312.1 ACC6	75 µm Zinc rich epoxy conforming to AS/NZS 3750.9 Type 2	200 µm High-Build Epoxy MIO conforming to AS/NZS 3750.14	50 µm Epoxy Acrylic conforming to AS/NZS 3750.5

Low VOC steel protection and decoration – AS 2312.1 Categories C1 and C2 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	50 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	Nil	Nil
Internal decorative	50 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	40 µm waterborne acrylic conforming to AS/NZS 3750.16 VOC < 75 g/L	Nil
External non-decorative conforming to AS 2312.1 IZS2	75 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	Nil	Nil
External decorative	75 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	40 µm waterborne Acrylic conforming to AS/NZS 3750.16 VOC < 75 g/L	Nil

Low VOC steel protection and decoration – AS 2312.1 Categories C3, C4 and C5 table

Location	Primer	Second Coat	Third Coat
Interior non-decorative	50 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	Nil	Nil
Internal decorative	50 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	40 µm waterborne Acrylic conforming to AS/NZS 3750.16 VOC < 75 g/L	Nil
External non-decorative conforming to AS 2312.1 IZS2	75 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	Nil	Nil
External decorative	75 µm waterborne inorganic zinc conforming to AS/NZS 3750.15 Type 3 VOC < 15 g/L	50 µm waterborne epoxy conforming to AS/NZS 3750.13 VOC < 20 g/L	40 µm waterborne Acrylic conforming to AS/NZS 3750.16 VOC < 75 g/L

4.2 SCHEDULES

Refer to Selections Schedule

0673 POWDER COATINGS

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide powder coating systems to substrates, as documented.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.3 STANDARDS

General
Application to metal substrates other than aluminium for architectural applications: To AS 4506.

1.4 INTERPRETATION

Definitions
General: For the purposes of this worksection the following definitions apply:
- Powder coating: The process of preparing, applying, fusing and curing a thermoset powder coating material to a substrate:
  - Thermoset powder coating: A mixture of finely ground particles of pigment and resin sprayed on to a prepared substrate. Charged powder particles adhere to electrically grounded surfaces until heated and fused into a smooth coating in a curing oven.
  - Polyester powder coating: Uses an enhanced polyester resin.
  - Fluoropolymer powder coating: Uses PTFE (poly tetra fluoro ethylene) for aluminium substrates.
- Substrate: The surface to which a material or product is applied.

1.5 SUBMISSIONS

Products and materials
Coating manufacturer: Submit the following details at least 3 weeks before fabrication:
- Recommended coating system for the nominated service condition.
- Brand name.
- Storage and handling recommendations.
- Product data sheets.
- Maintenance recommendations.

Samples
Powder coating samples: Submit samples of each coating system on representative substrates, showing surface preparation, colour, gloss level, texture, and physical properties.

Subcontractors
Specialist applicators: Submit name and contact details of proposed specialist applicators as registered by the coating manufacturer.

Warranties
General: Submit the coating manufacturer's warranties, as documented.

2 EXECUTION

2.1 PREPARATION

Substrate pre-treatment
Powder coating to metals, other than aluminium: To AS 4506 Appendix I.

2.2 COMPLETION

Cleaning
Metal, other than aluminium, architectural applications: Clean completed assembly to AS 4506 Appendix D.

3 SELECTIONS

Refer selection schedule

0611 RENDERING AND PLASTERING

1 GENERAL

1.1 RESPONSIBILITIES

General
Requirement: Provide plaster finishes as documented.

Performance
Requirements:
- Resistant to impacts expected in use.
- Free of irregularities.
- Consistent in texture and finish.
- Firmly bonded to substrates for the expected life of the application.
- Without obvious shrinkage cracks.
- As a suitable substrate for the nominated final finish.

1.2 CROSS REFERENCES

General
Requirement: Conform to the following:
- *0171 General requirements*.

1.3 INTERPRETATION

Abbreviations
General: For the purposes of this worksection the following abbreviations apply:
- CRF: Cement render – finish.
- CRM: Cement render – medium.
- CRS: Cement render – stronger.
- CRW: Cement render – weaker.
- GPF: Gypsum plaster – finish.

Definitions
General: For the purposes of this worksection the following definitions apply:
- Base coat: A plaster coat applied before the application of the finish coat.
- Bonding treatment: A treatment of a substrate which improves adhesion of a plaster system.
- Finish coat (rendering and plastering): The final coat of a coating system.
- Finishing treatment (plastering): The treatment applied to a finish coat which may include processes and results.
- Plaster: A mixture of binders, aggregate and water which is applied to substrates in a plastic state and dries and cures to a hard surface which may subsequently be decorated:
  - Cement plaster: Contains Portland cement as the principal binder.
  - Gypsum plaster: Contains hydrated or anhydrous calcium sulfate as the principal binder.
- Plastering: The process of coating the framing or solid surfaces of a building with a plastic material which hardens and then may be decorated or remain self-finished.
- Plastering system: One or more coats of plaster and associated treatments comprising some or all of the following in sequence:
  - Base coat 1 or 2.
  - Bonding treatment.
  - Finish coat.
  - Finishing treatment.
- Render, rendering: Plaster, plastering, usually single coat and usually cement:lime:sand.

- Substrate: The surface to which a material or product is applied.

1.4 TOLERANCES

Tolerances table

Description	Alignment	Tolerance
Walls and other vertical structures	Vertical	6 mm in 2400 mm
Reveals sides	Vertical	3 mm in 1800 mm
Reveals head up to 1800 mm	Horizontal	3 mm in 1800 mm
Reveals head over 1800 mm	Horizontal	5 mm max
Reveals, piers, beams, wall stop ends up to 300 mm	Square	3 mm max
Reveals, piers, beams, wall stop ends over 300 mm	Square	5 mm max
Radius of corners	Round	Should not vary by more than ± 10% over the length of the arris.

1.5 SUBMISSIONS

Prototype

Plaster systems: Prepare prototypes of each plaster system complete with beads and other embedded items:

- Size: 1200 x 2400 mm.

1.6 INSPECTION

Notice

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

- Prototypes ready for inspection.
- Substrates immediately before applying base coats.
- Finish treatments before decoration.

2 PRODUCTS

2.1 GENERAL

Storage and handling

General: Store materials in a dry, well-ventilated and secure storage area, unaffected by weather.

2.2 MATERIALS AND COMPONENTS

Accessories

Beads: Provide metal proprietary sections manufactured for fixing to substrates and/or embedding in the plaster to form and protect plaster edges and junctions.

Metal lath: Provide a proprietary product manufactured from raised expanded metal for use with plaster:

- Mass/unit area: 1.84 kg/m^2 or greater.
- Material thickness: 0.70 mm or greater.
- Mesh size: 9.5 x 28.6 mm.

Metallic-coatings to AS 1397: For beads or lath in cement plaster: To the **Corrosion resistance and durability table**.

Admixtures

Plasticisers or workability agents: Do not use in cement plasters.

Aggregates

Sand: Fine, sharp, well-graded sand with a clay content between 1% and 5% tested to AS 1141.12, and free from efflorescing salts.

Sand grading for base coat plaster table

Sieve size	Percent passing	
	Minimum	**Maximum**
4.75 mm	100	100
2.36 mm	90	100
1.18 mm	60	90
600 µm	35	70
300 µm	10	30
150 µm	0	5
75 µm	0	3

Plaster for autoclaved aerated concrete
General: Proprietary product manufactured for use with the wall system.

Bonding products
General: Proprietary products manufactured for bonding cement-based plaster to solid substrates.

Cement
Standard: To AS 3972.

Type: GP.

Colouring products
General: Provide proprietary products manufactured for colouring cement plaster.

Integral pigment proportion: 5% maximum weight of cement.

Corrosion resistance and durability
Compliance: To the **Corrosion resistance and durability table** or provide proprietary products with metallic and/or organic coatings of equivalent corrosion resistance and as follows:

- Galvanize: To AS/NZS 4680.

Corrosion resistance and durability table

Atmospheric corrosivity category to AS 4312	Metal lath, beads and embedded items	Minimum cement content (mix type) above damp-proof course
C1 and C2	Galvanize after fabrication 300 g/m^2 Stainless 316	CRW
	Powder coated aluminium	CRM
C3	Stainless 316 Powder coated aluminium	CRM
C4 and T[1]	Stainless 316 Powder coated aluminium	CRS
[1] Avoid organic coating in Category T zones.		

Curing products
General: Provide proprietary products manufactured for use with the plaster system.

Gypsum plaster
General: Provide a proprietary product containing calcium sulfate hemihydrate with additives to modify setting.

Lime
Limes for building: To AS 1672.1.

Lime putty
General: Prepare lime putty as follows:

- Stand dry hydrate of lime to AS 1672.1 and water for 24 hours or more without drying out.
- Stand quicklime and water for 14 days or more without drying out.

Mixes
General: Select a mix proportion to suit the conditions of application.

Measurement: Measure binders and sand by volume using buckets or boxes. Do not allow sand to bulk by absorption of water.

Plaster mixing: Machine mix for 3 to 6 minutes.

Strength of successive coats: Make sure successive coats are no richer in binder than the coat to which they are applied.

Mix proportion table – Cement render, by volume

Mix type		**Substrate**	**Upper and lower limits of proportions by volume**		
			Cement	**Lime**	**Sand**
Single or multi-coat systems with integral finishing treatments Base coats in multi-coat systems with cement or gypsum finishes	CRS	Dense and smooth concrete and masonry	1 1	0 0.5	3 4.5
	CRM	Regular clay or concrete masonry	1 1	0.5 1	4.5 6
	CRW	Lightweight concrete masonry and other weak substrates	1 1	1 2	6 9
Second coat - Internal	CRF	Cement render base coats	1 1	1 2	6 9
Second coat - External	CRF	Cement render base coats	1 1	1 2	5 6

Mix proportion table – Gypsum finish coat, by volume

Mix type		**Substrate**	**Upper and lower limits of proportions by volume**			
			Gypsum	**Cement**	**Lime putty**	**Sand**
Gypsum finish coats	GPF	Cement render base coats	1 1	- -	1.5 2	- -

Mix proportion table – Gypsum finish coat, by weight

Gypsum plaster (kg)	**Lime putty (kg)**
17	25
34	50
51	75

Control joint products

General: Provide proprietary products manufactured for use with the plastering system and to accommodate the anticipated movement of the substrates and/or the plaster.

Water

General: Clean and free from any deleterious matter.

3 EXECUTION

3.1 PREPARATION

Substrates

General: Provide substrates as follows:

- Clean and free from any deposit or finish which may impair adhesion of plaster.
- If framed or discontinuous, support members in full lengths without splicing.
- If solid or continuous, remove excessive projections and fill voids and hollows with plaster stronger than the first coat and not weaker than the substrate.

Absorbent substrates: If suction is excessive, control it by dampening without over-wetting, and do not plaster substrates showing surface moisture.

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 2 mm of the laitance and expose the aggregate before applying a bonding treatment.

Painted surfaces: Remove paint and hack the surface at close intervals.

Untrue substrates: If the substrate is not sufficiently true for conformity with the thickness limits for the plaster system, or has excessively uneven suction resulting from variations in the composition of the substrate, apply additional coats without exceeding the thickness limits for the substrate or system.

Beads

Location: Fix beads as follows:

- Angle beads: At all external corners.
- Drip beads: At all lower terminations of external plaster.
- Beads for control of movement: At all control joints.
- Stop beads: At all terminations of plaster and junctions with other materials or plaster systems.

Joints in beads: Provide dowels to maintain alignment.

Mechanical fixing to substrate: ≤ 300 mm centres.

Bonding treatment

General: If bonding treatment is required, throw a wet mix onto the background. Mix proportions to the following:

- Cement plaster (cement:sand): 1:2.
- Gypsum plaster (gypsum:sand): 1:2.

Curing: Keep continuously moist for 5 days or more and allow to dry before applying plaster coats.

Thickness: ≥ 3 < 6 mm.

Embedded items

General: To the **Corrosion resistance and durability table**. If there are water pipes and other embedded items, sheath them to permit thermal movement.

Lath

Location: Provide lath as follows:

- Chases: If chases or recesses are 50 mm wide or greater, fix metal lath extending 75 mm or more beyond each side of the chase or recess.
- Metal and other non-porous substrates: Fix metal lath to provide a key.

Installation: Fix lath as follows:

- General: Run the long way of the mesh across supports with strands sloping downwards and inwards from the intended face of the plaster.
- Fixing: Mechanically fix at centres of 150 mm or less.
- Laps: Tie with 1.25 mm galvanized wire at centres of 150 mm or less. Do not stop edges of sheets at corners but bend around.
- On solid substrates: Space the lath 5 mm or more clear of the substrate.
- Support spacing: ≤ 400 mm.

3.2 APPLICATION

Plastering

Base coats: Scratch-comb each base coat in two directions when it has stiffened.

Metal lath: Press the plaster through the apertures of expanded metal lath and wings of beads.

Incidental work

General: Return plaster into reveals, beads, sills, recesses and niches. Plaster faces, ends, and soffits of projections in the substrate, such as string courses, sills, pilasters and corbels. Run neatly finished throating on soffits of external projections. Trim around openings. Plaster exposed internal surfaces of built-in cupboards.

Joining up

General: If joining up is required, make sure joints are imperceptible in the finished work after decoration.

Control joints

General: Provide joints in the finish to coincide with control joints in the substrate. Make sure the joint in the substrate is not bridged during plastering.

Size:

- Depth: Extend the joint right through the plaster and reinforcement to the substrate.

- Width: 3 mm, or the same width as the substrate joint, whichever is greater.

Damp-proof courses: Do not continue plaster across damp-proof courses.

Plastering on metal lath: Provide control joints to divide the plastering area into rectangular panels of 10 m^2 or less.

V-joints: Provide V-joints, cut right through the plaster to the substrate, at the following locations:

- Abutments with metal door frames.
- Abutments with other finishes.
- Junctions between different substrates.

Cornices

General: Accurately cut and mitre corners. Match and align ornament. Do not make butt joints in the length of a cornice unless required, or if full lengths are not available.

Installation: Butter edges, mitres and joins for the full length of the cornice with adhesive.

Mechanical fixing: If cornice projects across a ceiling 400 mm or more, provide additional mechanical fixing as follows:

- Fixing centres: ≤ 600 mm.

Decorative joints

Plaster thickness table

Substrate	Cement render, total thickness of single or multi-coat work (mm)	Gypsum/lime plaster (mm)
Dense concrete walls	15 max	3 max
Dense concrete ceilings	9 max	3 max
Brickwork and blockwork	12 min	3 max
Lightweight concrete and blocks	12 min	3 max
Metal lath measured from the face of the lath.	18 min	3 max

Temperature

General: If the ambient temperature is less than 10°C or more than 30°C, make sure the temperature of mixes, substrates and reinforcement at the time of application are between 5°C and 35°C.

3.3 FINISHES

Finishing treatments

Plain even surfaces: Work the hardening plaster as follows:

- Bag: Rub the finish coat when set firm with a hessian bag or similar.
- Carborundum stone: Rub the finish coat when set hard with a carborundum stone to achieve a finish free from sand.
- Foam float: Float finish coat on application with a wood or plastic float to an even surface and finish with a foam float to achieve a fine sand textured finish.
- Steel trowel: Steel trowel finish coat to a smooth dense surface which is not glass-like and is free from shrinkage cracks and crazing.
- Wood or plastic float: Float the finish coat on application to an even surface with a wood or plastic float.

Ornamental patterned surfaces: Work the hardening plaster with a trowel or other tool.

Sprayed textured surfaces: Spray plaster onto a substrate using a purpose-designed machine.

Specialist plaster finishes

Polymer modified render:

- Basecoat render: Proprietary polymer modified cementitious render supplied as a complete plastering system.
- Finish coats: Proprietary trowelled on coloured and textured polymer modified finish coats.

Polished plaster: In situ applied plaster system incorporating selected stone dust in a proprietary matrix producing a smooth polished surface with visual patterning.

3.4 COMPLETION

Curing

General: Prevent premature or uneven drying out and protect from the sun and wind.

Keeping moist: If a proprietary curing agent is not used, keep the plaster moist as follows:

- Base coats and single coat systems: Keep continuously moist for 2 days and allow to dry for 5 days before applying further plaster coats.
- Finish coats: Keep continuously moist for 2 days.

4 SELECTIONS

4.1 SCHEDULES

Refer selection schedule

0000 LANDSCAPE – GRASSING

4 GENERAL

4.1 RESPONSIBILITIES

General

The grassing works shall be undertaken, where possible within the window of opportunity of the optimum season between September to November, or April to June to enable optimum establishment of grass in order that erosion be controlled.

If in the event that grassing is undertaken outside of these optimum windows of opportunity, then the contractor shall make adequate provision to ensure establishment. This will take the form of watering in the summer months (when plants will require supplementary water for establishment), and measures to prevent erosion in the winter months (where the grass seed will be dormant and not germinate).

Failure to make adequate provision to ensure establishment to control will result in additional soil works and re-grassing of effected areas.

Design Requirements include:

Erosion Management and Slope Stability on Batters and Swales. (High Priority due to cost, environmental, & public liability implications if areas fail)

Low Fuel Load Requirement (High Priority, however can be controlled by fuel reduction based on seasonal variation)

Low Maintenance Requirement (Medium priority, the selected seeding mix may consider less maintenance slashing, however natural regeneration will still mean that seasonal slashing will always be required).

Natural Regeneration (Medium Priority because as the site matures Native Seed stock and some local pasture grasses will ensure a sustainable site with diverse qualities to cope with extreme horticultural stresses).

2.5% Native Grass Coverage meeting the Native Vegetation Sustainability Target (Low Priority because native grass seeds will exist in the stripped topsoil and will naturally regenerate at a rate greater than what is being proposed for seeding).

Competition against prohibited weeds (High Priority because of the statutory requirements to control prohibited weeds)

Seed Mix for Hydroseeding / Hydromulching and Tractor Seeding

The following proposed Native mix for the entire site at a rate 250kg per hectare is as follows:

- **Themeda triandra** (local provenance) - 50%
- **Austrodanthonia setacea** or other (local provenance) - 50%

4.2 INSPECTION

Notice

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

- Clearing completed.
- Setting out completed.
- Grassing bed prepared before turfing, seeding, or temporary grassing.
- Grassing or turfing completed.

4.3 SUBMISSIONS

Suppliers

Statements: Submit statements from suppliers, giving the following, where applicable:

- Particulars of the supplier's experience in the required type of work.

- Production capacity for material of the required type and quantity.
- Lead times for delivery of the material to the site.

Materials

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

- Material source of supply.

Execution

Program: Submit a work program in the form of a bar chart, for the landscape works.

Maintenance program: Submit a proposed planting maintenance program.

Material storage on site: Submit proposal.

5 PRODUCTS

5.1 GRASS

Seed

Supplier: Obtain seed from a specialist supplier.

5.2 FERTILISER

Fertiliser

General: 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.

6 EXECUTION

6.1 SEEDING METHODOLOGY

Seeding will occur with the following techniques:

1. Hydroseeding for flat to moderately sloping ground
2. Hydromulching for >2:1 batters and drainage lines
3. Tractor Seeding as an alternative to Hydroseeding

Hydro Seeding Products to be used for seeding:

1. **Terra control SC823**: a membrane that breaths in order to protect soil and seeds effectively.
   - It performs as a 'liquid crust' to stabilize the soil surface
   - It prevents soil erosion caused by wind and water
   - It creates a three-dimensional grid on the most superficial centimeters of the soil surface stabilizing it
   - It prevents the clogging of the superficial pores
   - It is ideal for suppressing dust in debris deposits and landfills
   - It fastens precious seeds on the soil crum, improving also the effectiveness of the grassing
   - It fosters the germination and the growth of the plants
   - It does not hinder rain or oxygen to penetrate the soil
   - It retains moisture in the soil and protects the soil and the plants from drying up
   - It allows to save water during dry periods
2. **Liquid Fertiliser Agriapp-** Industry Standard Fertilizer for Hydroseeding
3. **Green Malachyte Crystal Dye:** A concentrated dye which gives hydroseeding mulch a natural green color for easier, more consistent application.
4. **Cellulose Fibre Mulch(option 1):** Mulch product added to hydroseeding mix. It has a unique blending of fibre size allowing moisture to penetrate into the soil, yet forming a protective coverage for seeds and fertilizer insuring maximum in germination.
5. **Straw Fibre Mulch(option 2):** Enviro-Straw HGM: Is a Straw based hydromulch that is the ideal blend of Cereal straw, organic fertiliser's, soil conditioners and a legume. Enviro-Straw is a true Hydraulic growth medium that is sprayed on using the hydroseed unit. This option will be considered for railway alignment batters depending on topsoil quality between different areas.

6.2 PREPARATION

Weed eradication

Herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Manual weeding: Regularly remove, by hand, rubbish and weed growth throughout grassed, planted and mulched areas. Remove weed growth from an area 750 mm diameter around the base of the trees in grassed areas. Continue eradication throughout the course of the works and during the planting establishment period.

Fertilising

General: Mix the fertiliser thoroughly into the topsoil before placing the turf. Apply lawn fertiliser at the completion of the first and last mowing's, and at other times as required to maintain healthy grass cover.

Watering

General: Water immediately after laying until the topsoil is moistened to its full depth. Continue watering to maintain moisture to this depth.

Mowing

Height: Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing within 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.

Maintenance

General: Maintain grassed areas until the attainment of a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height.

Failed turf: re seed as required to achieve full cover by end of Establishment period.

Top dressing

General: When the turf is established mow, remove cuttings and lightly top dress to a depth of 10 mm. Rub the dressing well into the joints and correct any unevenness in the turf surface.