

LEGEND:

- EXISTING STORMWATER
- PROPOSED STORMWATER PIPE (FLOW DIRECTION)
- PROPOSED JUNCTION PIT
- PROPOSED SIDE ENTRY PIT
- PROPOSED GRATED ENTRY PIT
- POTENTIAL WSUD TREATMENT ZONE
- CUT-OFF DRAIN/OVERLAND SWALE (FLOW DIRECTION)
- BUILDING HYDRAULICS ZONE (BY OTHERS)

STORMWATER DRAINAGE CALCULATIONS

- SITE AREA = 2.576ha
- NEW IMPERVIOUS AREA = 2.085ha
- RETENTION STORAGE REQUIREMENT = 515m³ (20.0mm/m STORAGE DEPTH)
- ROOF WATER HARVESTING TANK = 150m³ (ALLOWING 50% EFFICIENCY FOR RETENTION)
- CARPARK SWALES = 75m³ (NO ALLOWANCE FOR POTENTIAL BIORETENTION FEATURES)
- EXPANDED EXISTING DETENTION BASIN = 365m³

NOTE, THE SITE STORAGE REQUIREMENT HAS BEEN DETERMINED IN ACCORDANCE WITH 'NEWCASTLE CITY COUNCIL'S DCP 2005, ELEMENT 4.5'. A SITE AREA HAS BEEN ASSUMED, GIVEN THIS PROPOSAL IS FOR A NEW BUILDING IN A MUCH LARGER PROPERTY.

ROOF WATER HARVESTING
ALL ROOF DRAINAGE SHALL BE DIRECTED TO THE UNDERGROUND STORAGE TANK, LOCATED TO THE NORTH EAST OF THE EAST WING. FOR INFORMATION ON THE TANK, INCLUDING INTENDED USE REFER TO THE BUILDING HYDRAULICS DRAWINGS.

RETENTION METHODOLOGY
- 'DISPERSION' AND 'INFILTRATION' METHODOLOGIES ARE NOT CONSIDERED SUITABLE FOR THIS PROPOSAL. THE PRIMARY REASONS ARE:
1. EXTREMELY STEEP DOWNSLOPE BATTERS COULD BECOME DESTABILISED WHERE WATER IS INJECTED INTO THE SUBGRADE
2. UNSUITABLE SUBGRADE MATERIAL LOW IN PERMEABILITY

- IN ORDER TO LIMIT POST DEVELOPMENT FLOW FROM THE SITE, EXPANSION OF THE EXISTING DETENTION BASIN HAS BEEN PROPOSED. THE EXPANSION WILL REQUIRE THE BASIN TO HAVE AN ADDITIONAL STORAGE VOLUME OF AT LEAST 365m³. THIS CAN BE ACHIEVED BY LOCALLY RESHAPING AND RESIZING THE BASIN WITHIN THE EXISTING BASIN EXTENTS.
- GRASSED AND PLANTED SWALES AT THE BASE OF CARPARK BATTERS. FITTED WITH CHECK DAMS AT APPROPRIATE SPACING TO MAXIMISE RETENTION STORAGE. ADDITIONALLY THERE IS POTENTIAL TO FIT THE SWALES WITH BIORETENTION PRIOR TO THE OVERFLOW DISCHARGE POINT WHICH WILL INCREASE THE RETENTION STORAGE. FLOW CALCULATIONS DO NOT INCLUDE AN ALLOWANCE FOR BIORETENTION FEATURES WITHIN THE SWALES.

PEAK FLOW
THERE ARE TWO PRIMARY CATCHMENTS WHICH FLOW INTO THE EXISTING DETENTION BASIN: THE PROPOSED SITE AND THE EXISTING HOSPITAL COMPLEX TO THE WEST. THE RUNOFF FROM THE HOSPITAL SITE IS COLLECTED BY AN UNDERGROUND PIPED NETWORK WHICH SURCHARGES INTO THE EXISTING BASIN DURING MAJOR RAINFALL EVENTS OR OTHERWISE DISCHARGES VIA UNDERGROUND PIPE TO THE SOUTH EAST OF THE DETENTION BASIN INTO A RIPARIAN ZONE. THE PEAK FLOW LIKELY TO BE DERIVED DURING A 1 IN 100 YEAR EVENT IS AS FOLLOWS:
- EXISTING HOSPITAL CATCHMENT = 4.200ha - 1.700m³/s
- PROPOSED NEW BUILDING CATCHMENT = 2.085ha - 0.850m³/s

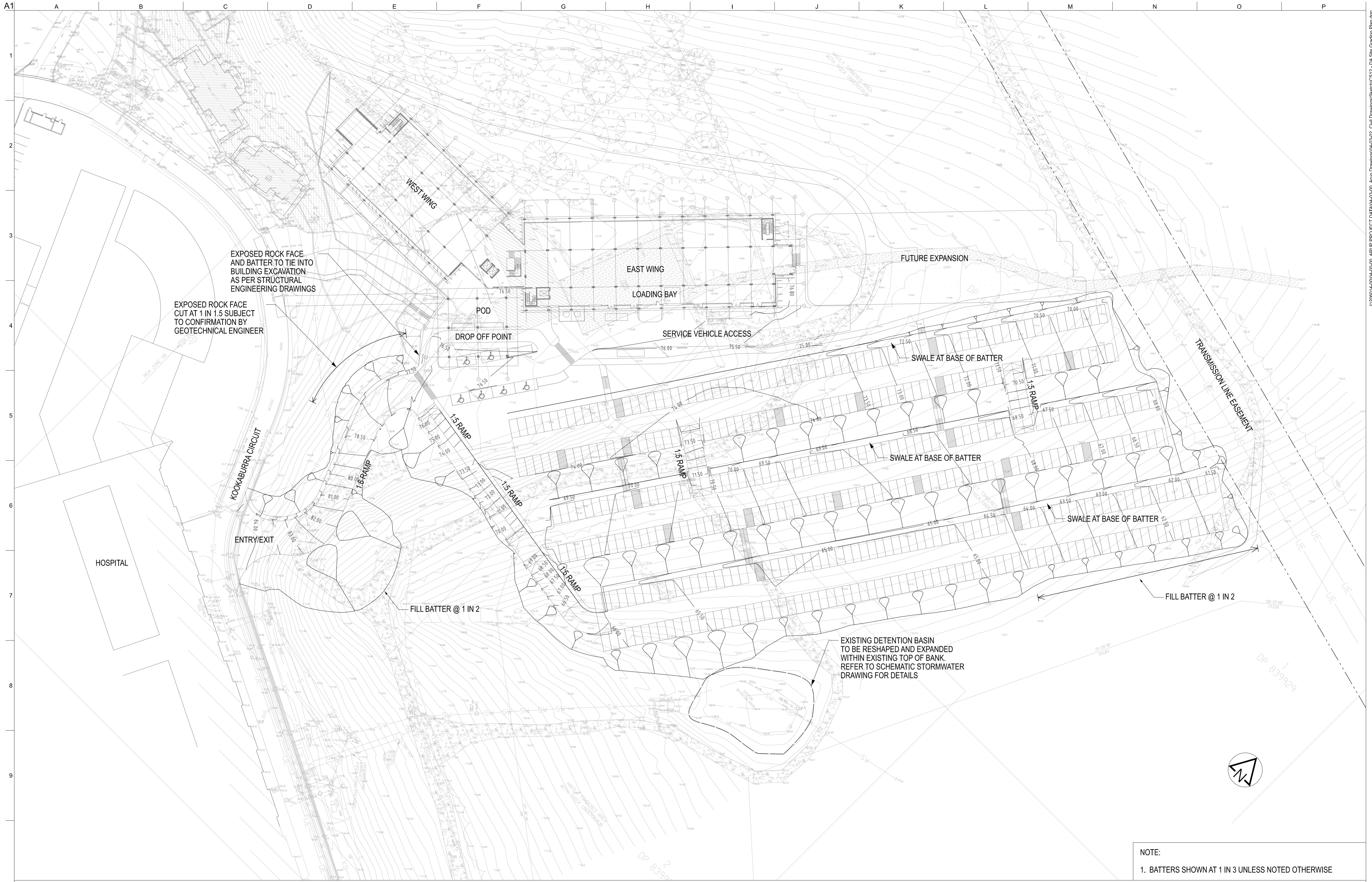
THEREFORE THE PEAK FLOW TO BE MANAGED BY THE DEVELOPMENT IS IN THE ORDER OF 2.856m³/s (INCLUDING AN ADDITIONAL 12% TO ACCOUNT FOR POTENTIAL CLIMATE CHANGE, REFER DECC PUBLICATION)

THE EXPANDED DETENTION BASIN (ADDITIONAL STORAGE VOLUME 365m³) IN COMBINATION WITH ONSITE DETENTION WITHIN THE SITE SWALES AND ROOF WATER STORAGE TANK HAVE SUFFICIENT CAPACITY TO DETAIN FLOWS AND LIMIT SITE DISCHARGE TO PREDEVELOPMENT LEVELS. THE CAPACITY OF THE 525mm DIAMETER OVERFLOW PIPE AND SPILLWAY IS IN EXCESS OF THE PEAK FLOW DERIVED FROM BOTH THE EXISTING HOSPITAL CATCHMENT AND THE PROPOSED NEW BUILDING.

- NOTES**
1. BUILDING DRAINAGE BY SPP CONSULTANTS. CIVIL DRAINAGE TO CONNECT UPON CONFIRMATION OF HYDRAULIC DRAINAGE
 2. ALLOWANCE FOR THE FUTURE EXPANSION STORMWATER DRAINAGE HAS BEEN MADE. THE FUTURE EXPANSION WILL REQUIRE ADDITIONAL ONSITE DETENTION AS PER NEWCASTLE DCP REQUIREMENTS.
 3. WSUD TREATMENT ZONES ARE INDICATIVE ONLY AND WILL BE SIZED TO ACHIEVE REQUIRED WATER TREATMENT OBJECTIVES
 4. SWALES WITHIN THE CARPARK ARE TO BE PLANTED WITH EPHEMERAL SPECIES AS PER THE LANDSCAPE PLAN

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| <p>Client HUNTER MEDICAL RESEARCH INSTITUTE</p> <p>Job Title HMRI - JOHN HUNTER HOSPITAL</p> <p>RANKIN PARK CAMPUS NEWCASTLE</p> <p>Scale at A1 1:500</p> <p>Plot ID</p> | <p>Client HUNTER MEDICAL RESEARCH INSTITUTE</p> <p>Job Title HMRI - JOHN HUNTER HOSPITAL</p> <p>RANKIN PARK CAMPUS NEWCASTLE</p> <p>Scale at A1 1:500</p> <p>Plot ID</p> | <p>Client HUNTER MEDICAL RESEARCH INSTITUTE</p> <p>Job Title HMRI - JOHN HUNTER HOSPITAL</p> <p>RANKIN PARK CAMPUS NEWCASTLE</p> <p>Scale at A1 1:500</p> <p>Plot ID</p> | <p>Drawing Title STORMWATER MANAGEMENT LAYOUT PLAN</p> <p>Drawing Status Preliminary - For Development Application</p> <p>Job No 206014</p> <p>Drawing No CS11</p> <p>Issue P1</p> | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>P1</td> <td>18/08/09</td> <td>PJG</td> <td>PJG</td> <td>PAJ</td> </tr> <tr> <td colspan="5" style="text-align: center;">Schematic Design for DA</td> </tr> <tr> <td>Issue</td> <td>Date</td> <td>By</td> <td>Chkd</td> <td>Appd</td> </tr> </table> | | P1 | 18/08/09 | PJG | PJG | PAJ | Schematic Design for DA | | | | | Issue | Date | By | Chkd | Appd | <p>ARUP</p> <p>Level 17, 1 Nicholson Street Melbourne, Victoria 3000 Tel +61 (03) 9688 5500 Fax +61 (03) 9663 1546 www.arup.com</p> <p>Arup Pty Ltd ABN 19 000 996 165</p> | |
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| Schematic Design for DA | | | | | | | | | | | | | | | | | | |
| Issue | Date | By | Chkd | Appd | | | | | | | | | | | | | | |

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EXPOSED ROCK FACE AND BATTER TO TIE INTO BUILDING EXCAVATION AS PER STRUCTURAL ENGINEERING DRAWINGS

EXPOSED ROCK FACE CUT AT 1 IN 1.5 SUBJECT TO CONFIRMATION BY GEOTECHNICAL ENGINEER

EXISTING DETENTION BASIN TO BE RESHAPED AND EXPANDED WITHIN EXISTING TOP OF BANK. REFER TO SCHEMATIC STORMWATER DRAWING FOR DETAILS

NOTE:
1. BATTERS SHOWN AT 1 IN 3 UNLESS NOTED OTHERWISE

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Hunter Medical Research Institute

Job Title
HMRI - JOHN HUNTER HOSPITAL

RANKIN PARK CAMPUS NEWCASTLE

Scale at A1 1:500

Plot ID

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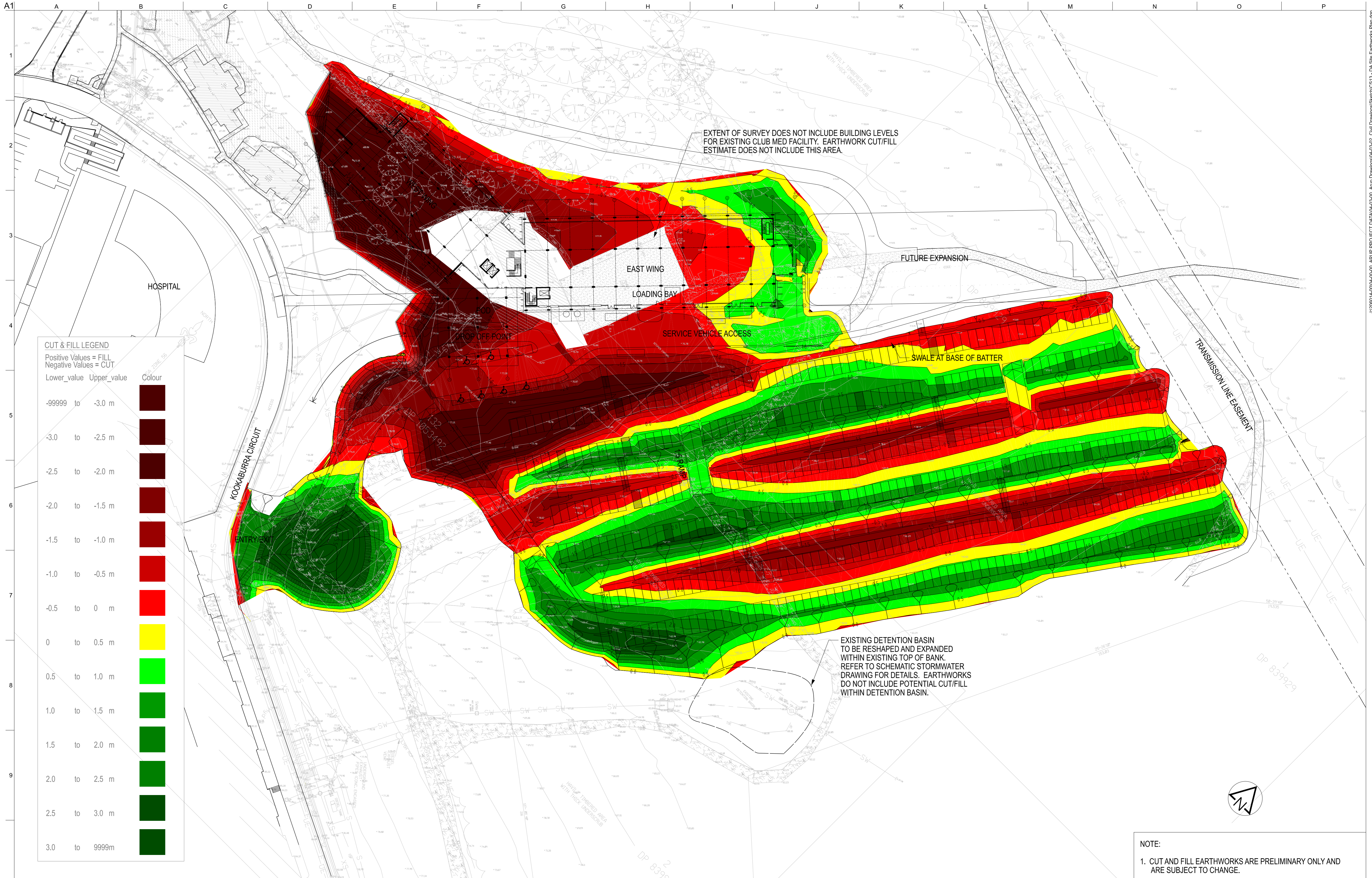
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Drawing Title
SITE GRADING LAYOUT PLAN

Drawing Status
Preliminary - For Development Application

Job No **206014** Drawing No **CS12** Issue **P1**



CUT & FILL LEGEND
 Positive Values = FILL
 Negative Values = CUT

| Lower_value | Upper_value | Colour |
|-------------|-------------|-------------|
| -99999 | -3.0 m | Dark Brown |
| -3.0 | -2.5 m | Dark Red |
| -2.5 | -2.0 m | Red |
| -2.0 | -1.5 m | Dark Red |
| -1.5 | -1.0 m | Red |
| -1.0 | -0.5 m | Red |
| -0.5 | 0 m | Red |
| 0 | 0.5 m | Yellow |
| 0.5 | 1.0 m | Light Green |
| 1.0 | 1.5 m | Green |
| 1.5 | 2.0 m | Green |
| 2.0 | 2.5 m | Green |
| 2.5 | 3.0 m | Green |
| 3.0 | 9999m | Green |

NOTE:
 1. CUT AND FILL EARTHWORKS ARE PRELIMINARY ONLY AND ARE SUBJECT TO CHANGE.

| | | | | |
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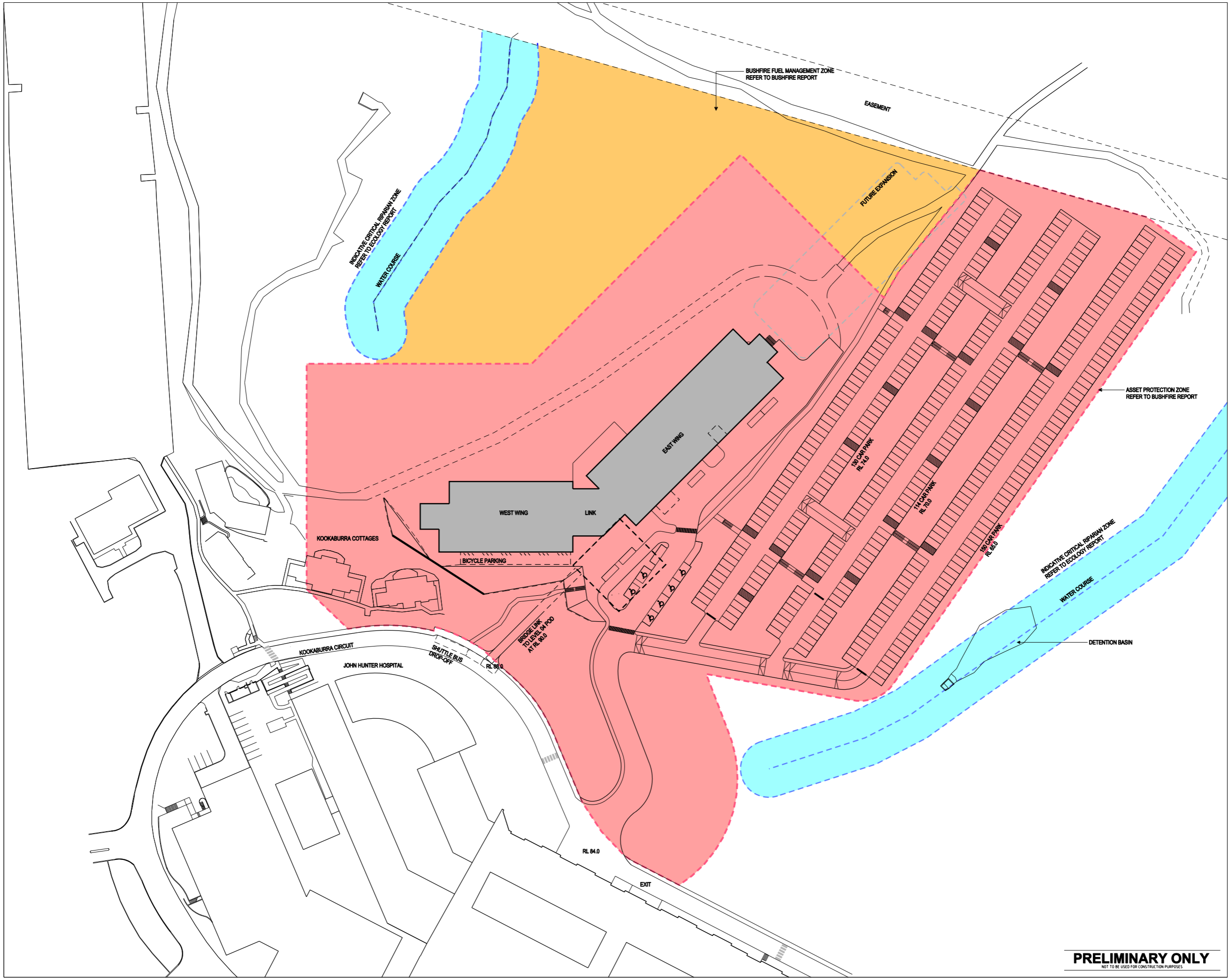
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Drawing Title
SITE EARTHWORKS LAYOUT PLAN

Drawing Status
Preliminary - For Development Application

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|-------------------------|---------------------------|--------------------|
| Job No 206014 | Drawing No CS13 | Issue P1 |
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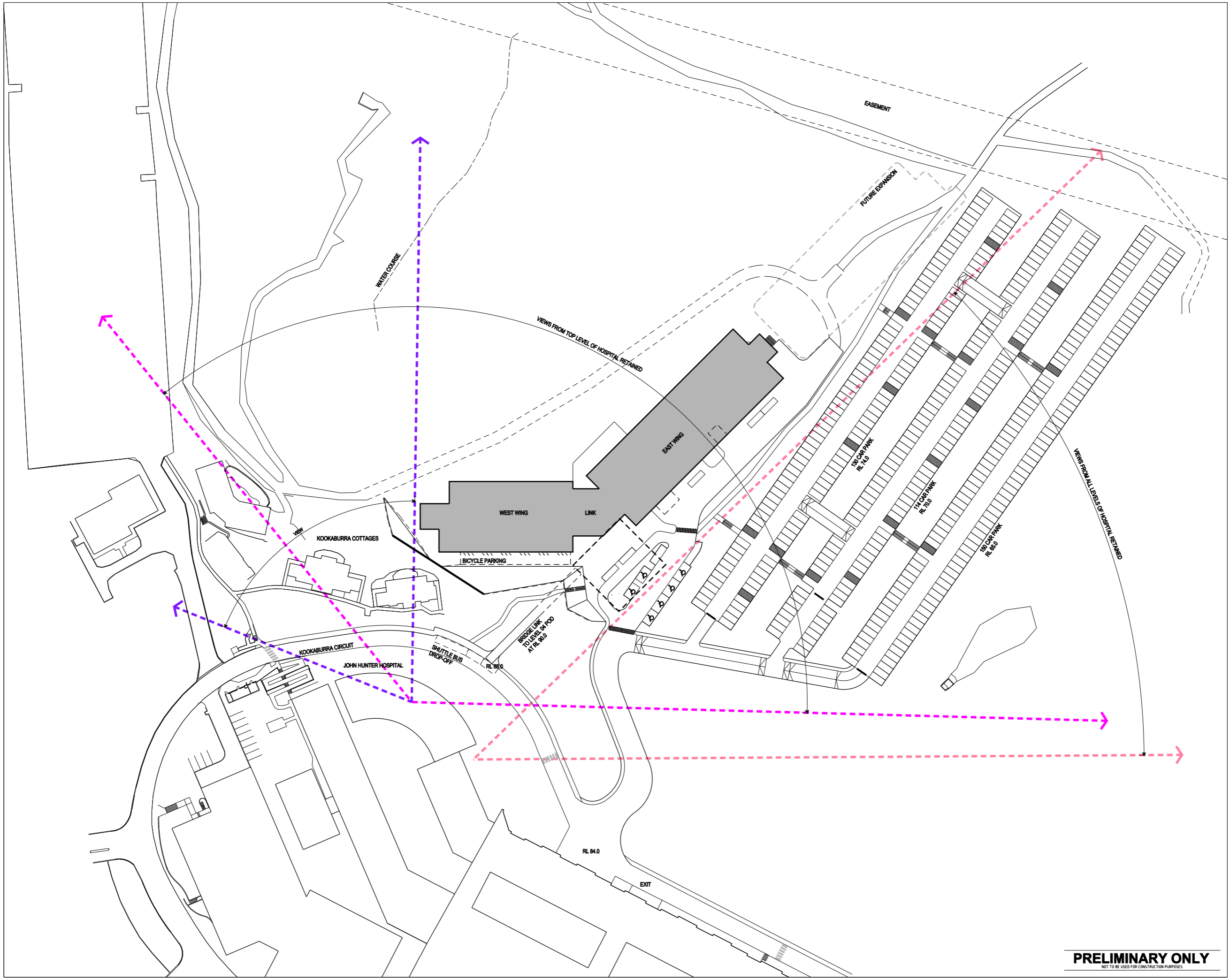
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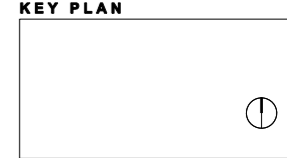
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