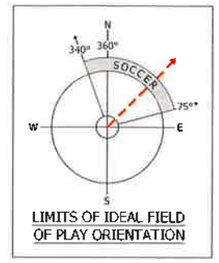
# APPENDIX A. DEVELOPMENT PLANS PREPARED BY SPORTENG

# MAJORS BAY RESERVE SYNTHETIC SOCCER PITCH - EARLY WORKS

## NORMAN STREET, CONCORD, NSW 2137



LIMITS OF IDEAL FIELD OF PLAY ORIENTATION

DRAWING SCHEDULE:

| | |
|---|---|
| F000 | COVER SHEET |
| F050 | EXISTING SITE LAYOUT PLAN |
| F100 | DEMOLITION PLAN |
| F150 | BULK EARTHWORKS LAYOUT PLAN |
| F200 | GENERAL ARRANGEMENT LAYOUT PLAN |
| F225 | SITE SETOUT |
| F600 | PAVEMENT PLAN |

LOCALITY PLAN - NORMAN STREET, CONCORD, NSW 2137

OVERALL SITE LAYOUT PLAN

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title
COVER SHEET

FIELD OF PLAY

PRELIMINARY

10332-00

Drawing No F000 - A

Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\ARM\SportEng\Smartsht\SportEng\ENG - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Majors Bay Reserve Synthetic Pitch\Drawings\SHEETS\F000 - A.dwg

## LEGEND:

EXISTING:

- LIGHT POLE WITH BASE
- FENCE
- TREE
- POWER POLE — PP
- UNDERGROUND STORM WATER DRAINAGE — SW
- SYDNEY WATER MAIN (SEWER) — S
- JEMENA GAS LINE / HIGH PRESSURE GAS — G — HPG
- COUNCIL ELECTRICITY CABLES — E

AFL OVAL

EMBANKMENT (TYP.)

LIGHTPOLE BASE. (TYP.)

LIGHTPOLE BASE. (TYP.)

BASEBALL DIAMOND

TREES / VEGETATION.

GOAL POSTS.

EXISTING NATURAL TURF FIELD

GOAL POSTS.

BURIED SEWER PIT.

TREE. (TYP.)

SEALED PIT.

TREES / VEGETATION.

NORMAN STREET

PLAY EQUIPMENT

3.00 3.22 3.49 3.30

PP HPG

## WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

N

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title
EXISTING SITE LAYOUT PLAN

0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F050 - A | Issue P1 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F050 - A.dwg

## LEGEND:

- TREE TO BE REMOVED AND DISPOSED OFFSITE INCLUDING ROOT SYSTEM.
- ABOVE GROUND ITEM TO BE REMOVED.
- UNDERGROUND ELEMENT TO BE REMOVED.
- AREA OF TURF TO BE SPRAYED DEAD.
- STAGE 1 WORKS
- STAGE 2 WORKS

## NOTES:

1. ALL ASSOCIATED FOOTINGS FOR REMOVED FURNITURE, SIGNAGE AND FENCING TO BE DEMOLISHED AND DISPOSED OF OFF-SITE. (U.N.O.)
2. CONTRACTOR TO PROTECT AND MAINTAIN ALL RETAINED IN-GROUND SERVICES (U.N.O).
3. ALL EXISTING SERVICES ARE INDICATIVE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THEIR LOCATION.
4. EXISTING SERVICE PIT COVERS THAT ARE TO REMAIN ARE TO BE RAISED/LOWERED AND REALIGNED TO SUIT THE PROPOSED FINISHED SURFACE LEVELS.
5. CONTRACTOR TO NOTIFY PROJECT MANAGER PRIOR TO CONSTRUCTION IF ANY DISCREPANCIES BETWEEN SURVEY AND ACTUAL CONDITIONS IS IDENTIFIED ON SITE.
6. PRIOR TO DEMOLITION OF IN-GROUND SERVICES, CONTRACTOR IS TO CONFIRM THAT THERE ARE NO DOWNSTREAM INFRASTRUCTURE AFFECTED THAT IS TO BE RETAINED.
7. CONTRACTOR TO REMOVE AND DISPOSE OFF-SITE ALL EXISTING IRRIGATION INFRASTRUCTURE BENEATH THE PLAYING SURFACE. THE FEED TO THE PLAYING FIELD IS TO BE CAPPED AT THE FENCE LINE.
8. ANY SUBSOIL DRAINAGE WITHIN THE PLAYING SURFACE IS TO BE REMOVED AND DISPOSED OFF-SITE.
9. ALL IRRIGATION PIPE WORK TO BE REMOVED AND DISPOSED OFF-SITE.
10. UNLESS NOTIFIED OTHERWISE BY THE PROJECT MANAGER, THE CONTRACTOR IS TO CAREFULLY REMOVE ALL EXISTING SPRINKLER HEADS AND PROVIDE BACK TO COUNCIL.

AFL OVAL

STAGE 2 WORKS

PROTECT AND RETAIN OVAL LIGHT POLE.

PROTECT AND RETAIN EXISTING PIT.

EXTENT OF STAGE 1 DEMOLITION WORKS.

PROTECT AND RETAIN EXISTING GAS MAIN.

REMOVE VEGETATION / TREES TO ENSURE 10m OFFSET FROM PROPOSED FIELD OF PLAY. INFILL AND COMPACT WITH ENGINEERED FILL. (O.A.E)

REMOVE AND STORE ONSITE EXISTING LIGHTPOLES AND ASSOCIATED SERVICES. FOOTINGS AND CONDUITS TO REMAIN (TYP.)

EXISTING CONDUITS TO BE LEFT IN THE GROUND AND MADE REDUNDANT.

STAGE 1 WORKS

STAGE 2 WORKS

PROTECT AND RETAIN BASEBALL LIGHTPOLE.

BASEBALL DIAMOND

PROTECT AND RETAIN EXISTING SEWER MAIN.

BREAK OUT & DISPOSE OFFSITE EXISTING GOAL POSTS & ASSOCIATED FOOTINGS (TYP.)

PROTECT AND RETAIN EXISTING PITS. (TYP.)

REMOVE AND STORE ONSITE EXISTING LIGHTPOLES AND ASSOCIATED SERVICES. FOOTINGS AND CONDUITS TO REMAIN. (TYP.)

PROTECT AND RETAIN EXISTING FENCE. (TYP.)

PROTECT AND RETAIN STORMWATER PIPEWORK. (TYP.)

REMOVE VEGETATION / TREES TO ENSURE 10m OFFSET FROM PROPOSED FIELD OF PLAY. INFILL AND COMPACT WITH ENGINEERED FILL. (O.A.E)

NORMAN STREET

EX ø900

EX ø375

EX ø900

EX ø375

PLAY EQUIPMENT

3.00 3.22 3.49 3.30

**WARNING**

**BEWARE OF UNDERGROUND SERVICES**

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

**NOT FOR CONSTRUCTION**

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/18 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/18 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title

DEMOLITION PLAN

0 5m 10m 15m 20m 25m

SCALE 1:400 @ A1

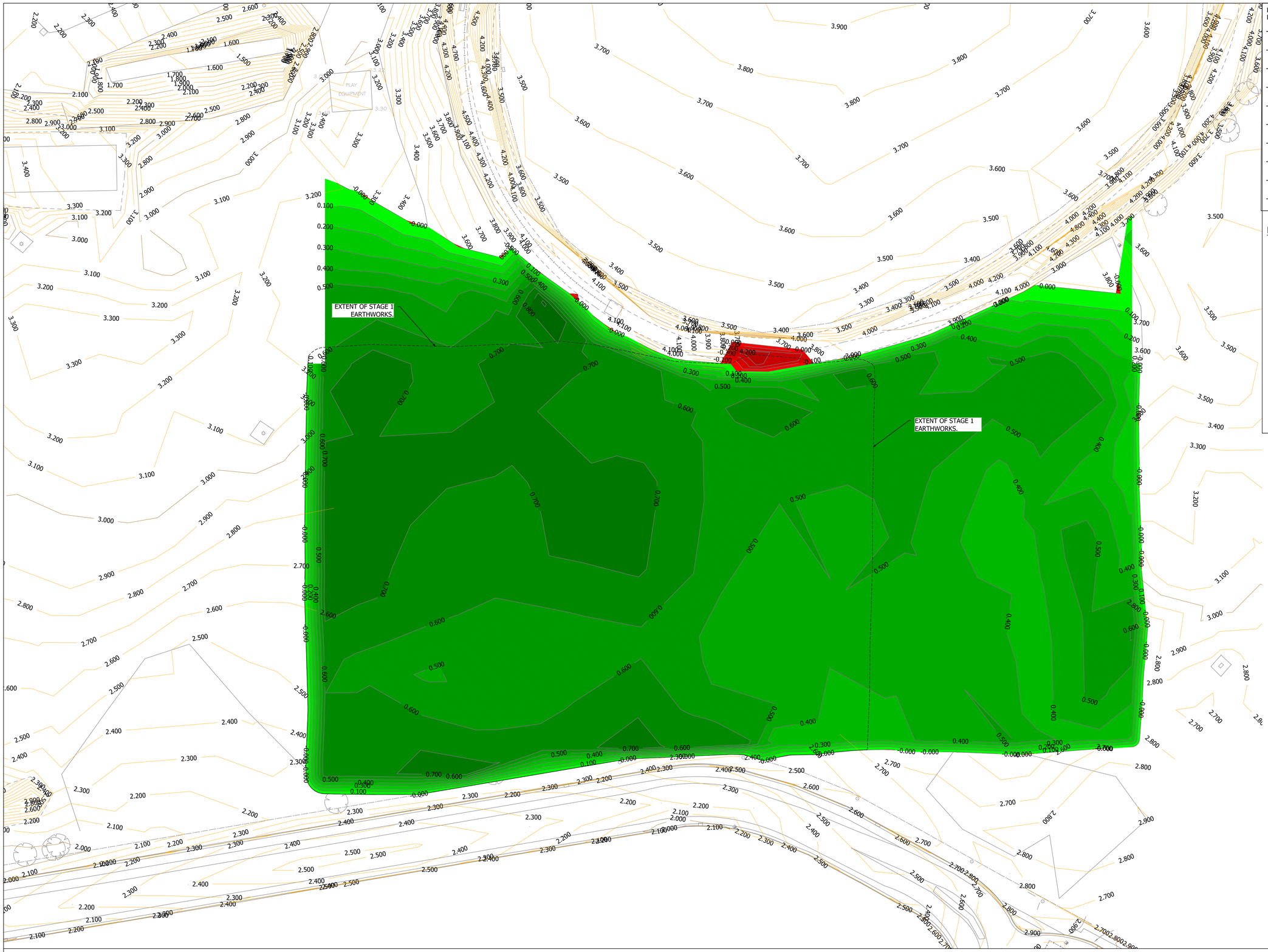
FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F100 - A | Issue P3 |
|---|---|---|



PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F100 - A.dwg




| DEPTH RANGE TABLE | | | | |
|---|---|---|---|---|
| Lower_value | | Upper_value | | Colour |
| -1.0 | to | -0.9 | m | |
| -0.9 | to | -0.8 | m | |
| -0.8 | to | -0.7 | m | |
| -0.7 | to | -0.6 | m | |
| -0.6 | to | -0.5 | m | |
| -0.5 | to | -0.4 | m | |
| -0.4 | to | -0.3 | m | |
| -0.3 | to | -0.2 | m | |
| -0.2 | to | -0.1 | m | |
| -0.1 | to | 0.0 | m | |

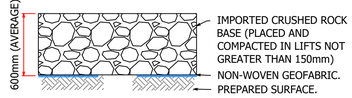
| DEPTH RANGE TABLE | | | | |
|---|---|---|---|---|
| Lower_value | | Upper_value | | Colour |
| 0.0 | to | 0.1 | m | |
| 0.1 | to | 0.2 | m | |
| 0.2 | to | 0.3 | m | |
| 0.3 | to | 0.4 | m | |
| 0.4 | to | 0.5 | m | |
| 0.5 | to | 0.6 | m | |
| 0.6 | to | 0.7 | m | |
| 0.7 | to | 0.8 | m | |
| 0.8 | to | 0.9 | m | |
| 0.9 | to | 1.0 | m | |

## NOTES:

1. PRIOR TO COMMENCING EARTHWORKS, CONTRACTOR IS TO PROVE AND VERIFY ALL EXISTING SERVICES.
2. PROTECT ALL EXISTING SERVICES DURING EXCAVATION WORKS.
3. CONTRACTOR TO REVIEW PROJECT GEOTECHNICAL REPORT PRIOR TO COMMENCEMENT OF WORKS.
4. EARTHWORKS VOLUMES ARE CALCULATED BETWEEN THE EXISTING LEVELS AND THE FINISHED SURFACE LEVELS.
5. IMPORTED MATERIAL TO BE PLACED COMPACTED IN LIFTS NOT GREATED THAT 150mm. HOLD POINT BY COUNCIL.
6. MONITORING OF DIFFERENTIAL SETTLEMENT IN 10m x 10m GRID POST COMPLETION OF SYNTHETIC WORKS.

EARTHWORKS VOLUMES - STAGE 1 AND 2

| | |
|---|---|
| CUT | 16 $m^3$ |
| IMPORTED CRUSHED ROCK | 9265 $m^3$ |
| BALANCE | 9249 $m^3$ |




IMPORTED CRUSHED ROCK PROFILE

## WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title

BULK EARTHWORKS LAYOUT PLAN

0 5m 10m 15m 20m 25m

SCALE 1:400 @ A1

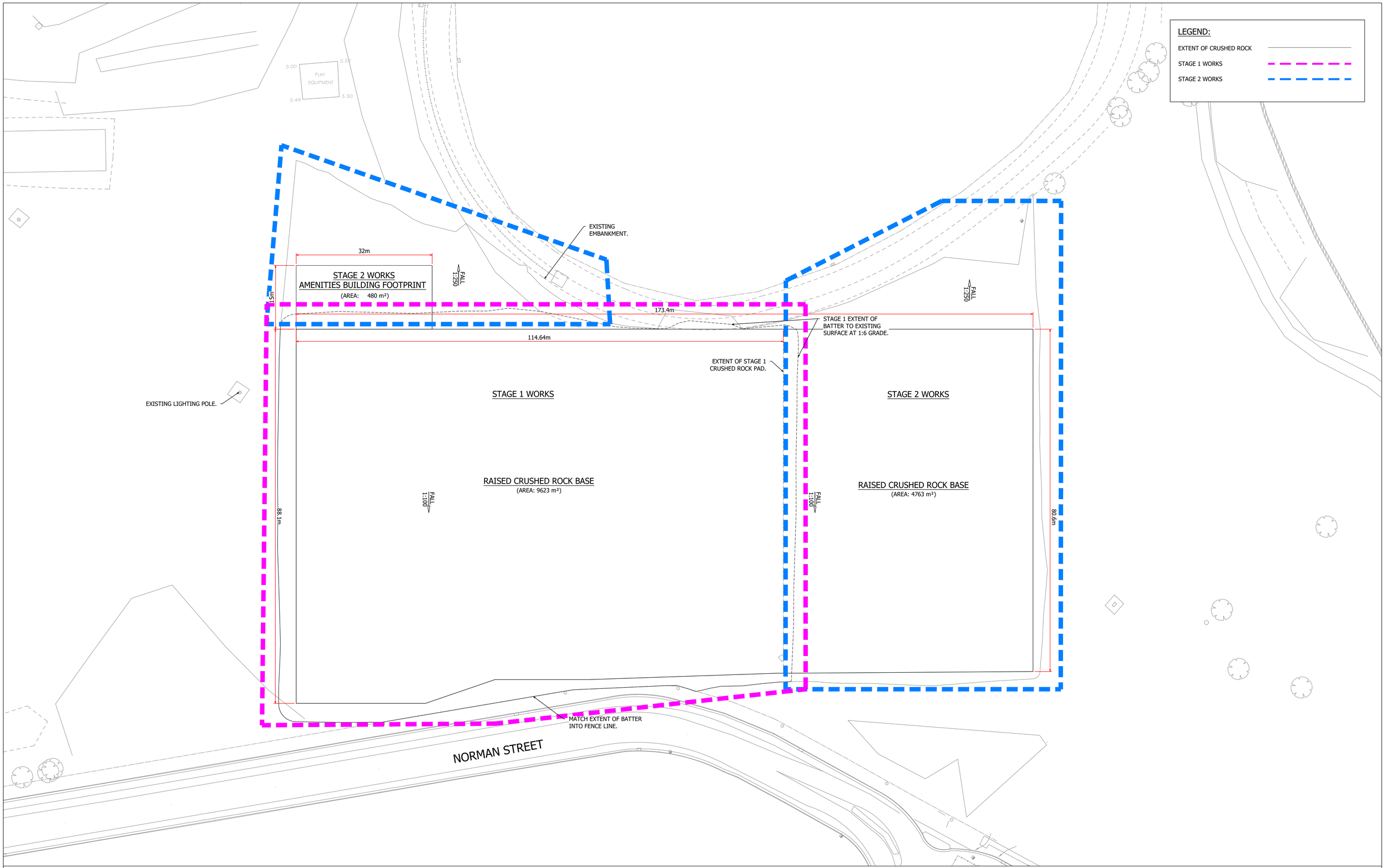
FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F150 - A | Issue P3 |
|---|---|---|



PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F150 - A.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title

GENERAL ARRANGEMENT LAYOUT PLAN

0 5m 10m 15m 20m 25m

SCALE 1:400 @ A1

FIELD OF PLAY

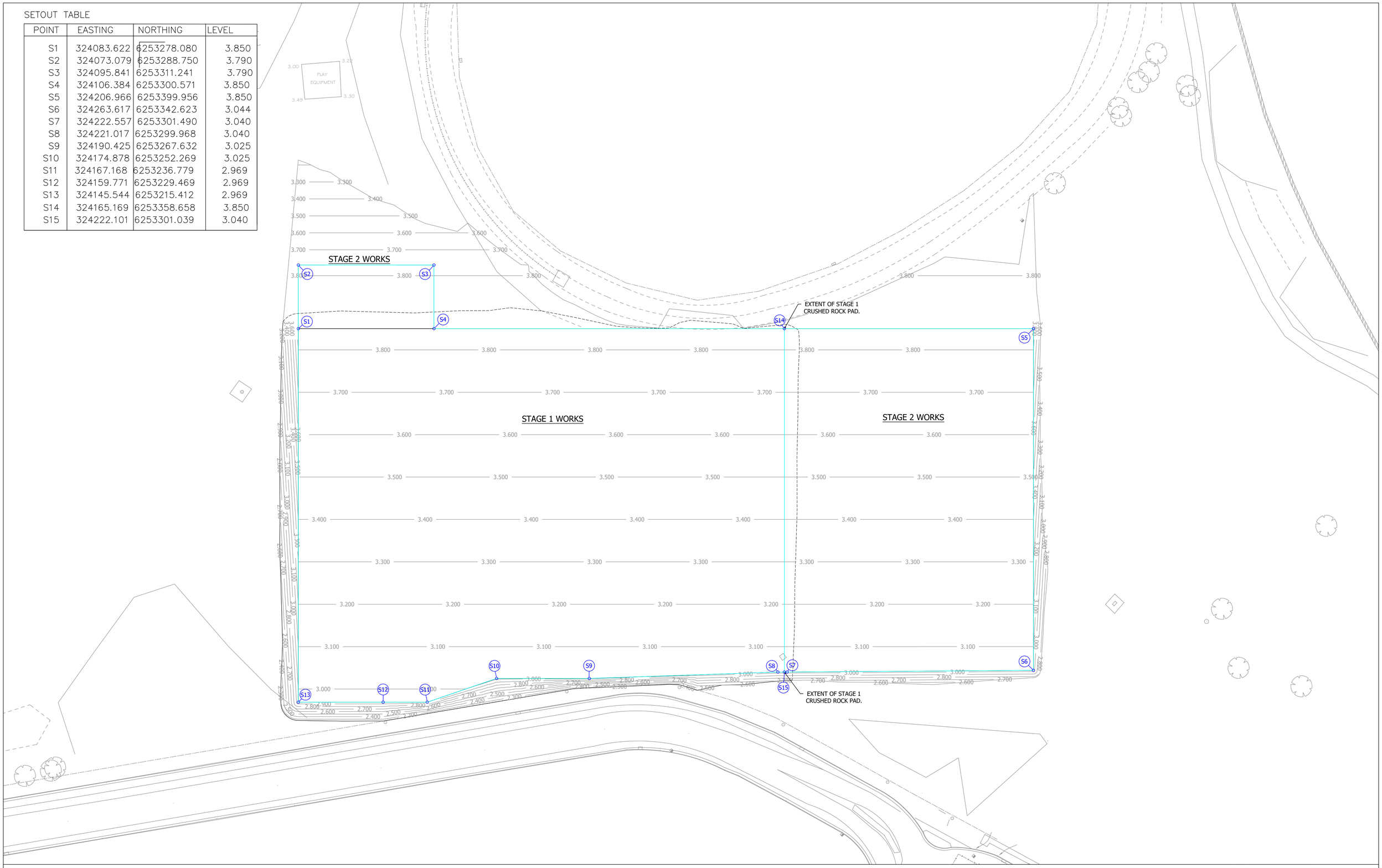
PRELIMINARY

| 10332-00 | Drawing No F200 - A | Issue P3 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F200 - A.dwg

SETOUT TABLE

| POINT | EASTING | NORTHING | LEVEL |
|---|---|---|---|
| S1 | 324083.622 | 6253278.080 | 3.850 |
| S2 | 324073.079 | 6253288.750 | 3.790 |
| S3 | 324095.841 | 6253311.241 | 3.790 |
| S4 | 324106.384 | 6253300.571 | 3.850 |
| S5 | 324206.966 | 6253399.956 | 3.850 |
| S6 | 324263.617 | 6253342.623 | 3.044 |
| S7 | 324222.557 | 6253301.490 | 3.040 |
| S8 | 324221.017 | 6253299.968 | 3.040 |
| S9 | 324190.425 | 6253267.632 | 3.025 |
| S10 | 324174.878 | 6253252.269 | 3.025 |
| S11 | 324167.168 | 6253236.779 | 2.969 |
| S12 | 324159.771 | 6253229.469 | 2.969 |
| S13 | 324145.544 | 6253215.412 | 2.969 |
| S14 | 324165.169 | 6253358.658 | 3.850 |
| S15 | 324222.101 | 6253301.039 | 3.040 |




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

N

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P2 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title

SITE SETOUT PLAN

0 10m 50m

SCALE 1:1000 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F225 - A | Issue P2 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F225 - A.dwg

LEGEND:

CRUSHED ROCK PAD

STAGE 1 WORKS

STAGE 2 WORKS

STAGE 2 WORKS

STAGE 1 EXTENT OF BATTER TO EXISTING SURFACE AT 1:6 GRADE.

EXTENT OF STAGE 1 CRUSHED ROCK PAD.

STAGE 1 WORKS

STAGE 2 WORKS

BATTER TO EXISTING. (TYP.)

FALL

NORMAN STREET

PLAY EQUIPMENT

**WARNING**

**BEWARE OF UNDERGROUND SERVICES**

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

**NOT FOR CONSTRUCTION**

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title

PAVEMENT PLAN

0 5m 10m 15m 20m 25m

SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

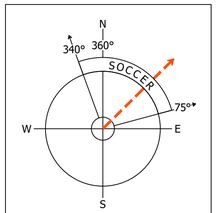
10332-00 | Drawing No F600 - A | Issue P3



PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F600 - A.dwg

# MAJORS BAY RESERVE SYNTHETIC SOCCER PITCH

## NORMAN STREET, CONCORD, NSW 2137



LIMITS OF IDEAL FIELD OF PLAY ORIENTATION

DRAWING SCHEDULE:

| | |
|---|---|
| F000 | COVER SHEET |
| F050 | EXISTING SITE LAYOUT PLAN |
| F200 | GENERAL ARRANGEMENT LAYOUT PLAN |
| F300 | STORMWATER DRAINAGE LAYOUT PLAN |
| F600 | PAVEMENT PLAN |


LOCALITY PLAN - NORMAN STREET, CONCORD, NSW 2137


OVERALL SITE LAYOUT PLAN

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
COVER SHEET

-

FIELD OF PLAY

PRELIMINARY

10332-00

Drawing No F000 - B

Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 5:09 PM FILE PATH: C:\Users\Aeila\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F000 - B.dwg

## LEGEND:
EXISTING:

- LIGHT POLE WITH BASE
- FENCE
- TREE
- POWER POLE — PP
- UNDERGROUND STORM WATER DRAINAGE
- SYDNEY WATER MAIN (SEWER)
- JEMENA GAS LINE / HIGH PRESSURE GAS — HPG
- COUNCIL ELECTRICITY CABLES

## LEGEND:
EARLY WORKS:

- STORMWATER JUNCTION PIT
- STORMWATER DRAIN PIPE, TYPE, SIZE AND FLOW DIRECTION — D
- ELECTRICAL PIT
- ELECTRICAL CONDUIT — E
- FUTURE SEWER MAIN — S
- FUTURE POTABLE WATER CONDUIT — W

3.00 3.22 PLAY EQUIPMENT 3.49 3.30

AFL OVAL

EMBANKMENT (TYP.)

LIGHTPOLE BASE. (TYP.)

BASEBALL DIAMOND

RAISED CRUSHED ROCK BASE

SEWER PIT.

CRUSHED ROCK BATTER.

STORMWATER PIT.

FENCE. (TYP.)

TREES / VEGETATION.

NORMAN STREET

### WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
EXISTING SITE LAYOUT PLAN

0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

10332-00 | Drawing No F050 - B | Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 5:09 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F050 - B.dwg

## LEGEND:

- 1.2m WIDE SINGLE ACCESS GATE
- 4.0m WIDE VEHICLE ACCESS GATE
- SHOE GRATE
- 1.2m HIGH CHAIN MESH FENCE — F1
- 6.0m HIGH CHAIN MESH FENCE — F2
- 2.4m HIGH RETRACTABLE DIVIDING NET — F3
- PLAYERS BENCHES/OFFICIALS BOX
- LIGHT POLE

LINE MARKING

- JUNIOR U 7s (30 x 20m)
- JUNIOR U 9s (44.12 x 31m)
- JUNIOR U 11s (68 x 44.12m)
- SENIOR (105 x 68m) (68 x 50m)
- STAGE 1 WORKS
- STAGE 2 WORKS

N
340° 360°
SOCCER
75°
W E
S

LIMITS OF IDEAL FIELD OF PLAY ORIENTATION

PLAY EQUIPMENT
3.00
3.22
3.49
3.30

AFL OVAL

EXISTING EMBANKMENT.

STAGE 2 WORKS
PROPOSED AMENITIES BUILDING FOOTPRINT

ALL SPORTS LIGHT POLES TO BE RELOCATED IN STAGE 1 OF WORKS.

4.0m WIDE FOOTPATH.

200mm WIDE CONCRETE EDGE STRIP.

1.2m WIDE OPENING.

EXTENT OF STAGE 1 PLAYING SURFACE.

EXISTING LIGHTING POLE.

BASEBALL DIAMOND

JUNIOR SYNTHETIC SOCCER PITCH (30 x 20m)

STAGE 1 WORKS
SYNTHETIC SOCCER PITCH (105 x 68m)

JUNIOR SYNTHETIC SOCCER PITCH (68 x 44.12m)

STAGE 2 WORKS
SYNTHETIC SOCCER PITCH (50 x 68m)

JUNIOR SYNTHETIC SOCCER PITCH (44.12 x 31m)

6.0m HIGH CHAIN MESH FENCE (TYP.)

1.2m HIGH CHAIN MESH FENCE (TYP.)

2.4m HIGH RETRACTABLE DIVIDING NET.

1.2m WIDE OPENING.

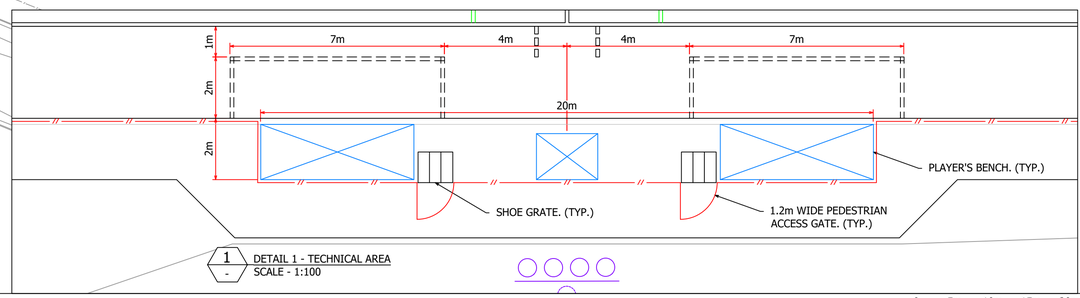
1.8m WIDE CONCRETE FOOTPATH.

TECHNICAL AREA.

RELOCATED LIGHTPOLES AS PER ELECTRICAL ENGINEER DESIGN. (TYP.)

GOAL STORAGE.

NORMAN STREET




1 - DETAIL 1 - TECHNICAL AREA
SCALE - 1:100

### WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
GENERAL ARRANGEMENT LAYOUT PLAN

0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F200 - B | Issue P3 |
|---|---|---|



PLOT DATE: 27/02/2019 PLOT TIME: 5:13 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F200 - B.dwg

## LEGEND:

- STORMWATER JUNCTION PIT
- STORMWATER DRAIN PIPE, TYPE, SIZE AND FLOW DIRECTION — ø225 PVC-U
- DRAINAGE CELL
- STAGE 1 WORKS
- STAGE 2 WORKS

AFL OVAL

BASEBALL DIAMOND

PLAY EQUIPMENT

3.00 3.22 3.49 3.30

STAGE 2 WORKS

STAGE 1 WORKS

SYNTHETIC SOCCER PITCH (105 x 68m)

FALL

FALL

STAGE 2 WORKS

SYNTHETIC SOCCER PITCH (50 x 68m)

FALL

EXTENT OF STAGE 1 FIELD OF PLAY DRAINAGE.

RAISE SEWER PIT TO FINISH SURFACE LEVEL.

RAISE STORMWATER PIT TO FINISH SURFACE LEVEL.

CONNECT PIPEWORK INTO EXISTING PIT.

EX ø375

ø375

EX ø900

EX ø375

EX ø900

NORMAN STREET

NOTE: SYNTHETIC TURF PITCH DRAINAGE IS A DESIGN AND CONSTRUCT ELEMENT. REFER TO SPECIFICATION FOR DESIGN PARAMETERS.

### WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
STORMWATER DRAINAGE LAYOUT PLAN

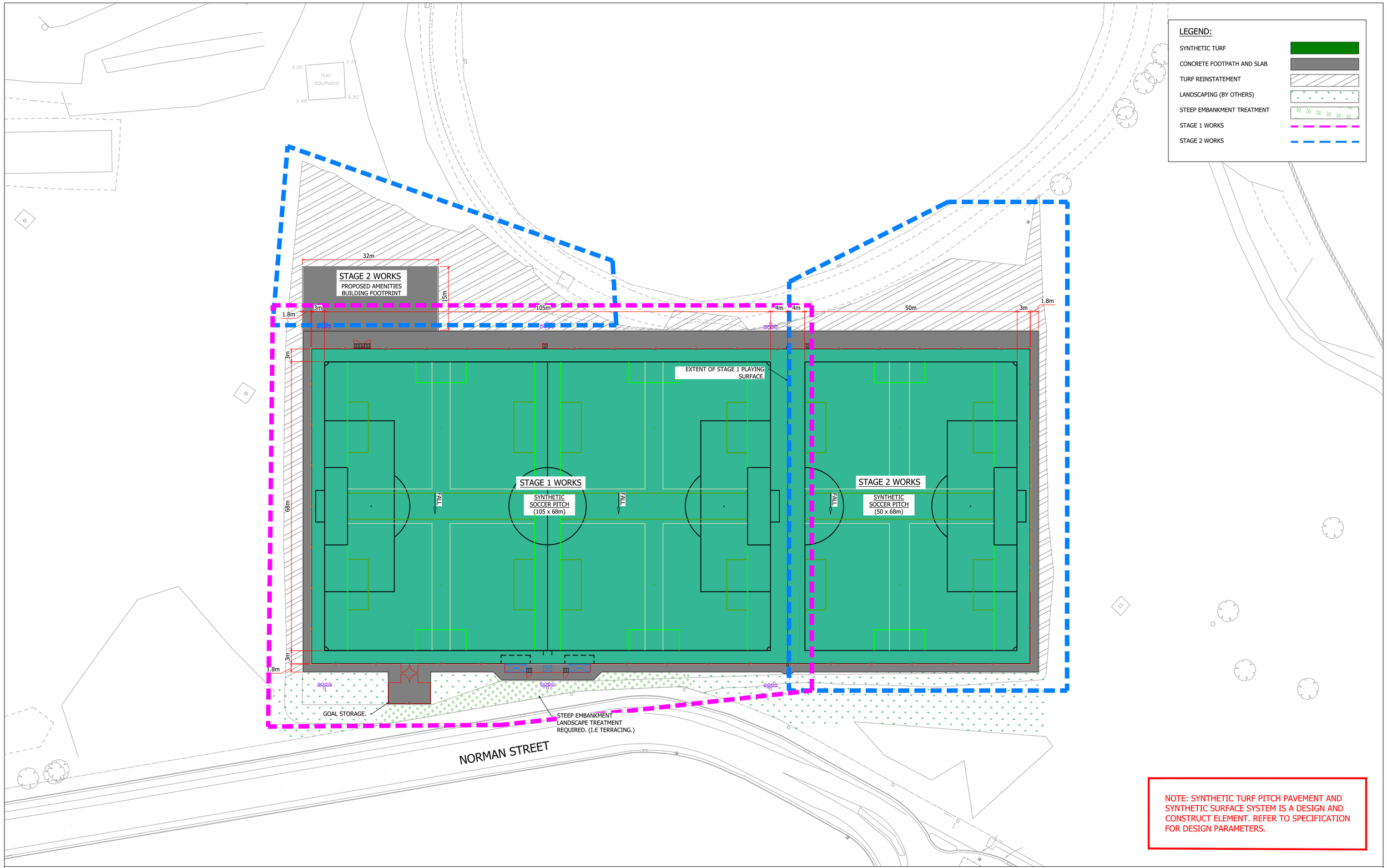
0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F300 - B | Issue P3 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 5:09 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F300 - B.dwg




NOTE: SYNTHETIC TURF PITCH PAVEMENT AND SYNTHETIC SURFACE SYSTEM IS A DESIGN AND CONSTRUCT ELEMENT. REFER TO SPECIFICATION FOR DESIGN PARAMETERS.

## WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
PAVEMENT PLAN

0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F600 - B | Issue P3 |
|---|---|---|



PLOT DATE: 27/02/2019 PLOT TIME: 5:10 PM FILE PATH: C:\Users\Aella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F600 - B.dwg

# APPENDIX B. RESOURCE RECOVERY ORDER (RECOVERED AGGREGATE ORDER 2014)

# Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

# The recovered aggregate order 2014

## Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of recovered aggregate to which 'the recovered aggregate exemption 2014' applies. The requirements in this order apply in relation to the supply of recovered aggregate for application to land as a road making material, or in building, landscaping or construction works.

## 1. Waste to which this order applies

1.1. This order applies to recovered aggregate. In this order, recovered aggregate means material comprising of concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory bricks or associated refractory materials, or asphalt that contains coal tar.

## 2. Persons to whom this order applies

2.1. The requirements in this order apply, as relevant, to any person who supplies recovered aggregate that has been generated, processed or recovered by the person.

2.2. This order does not apply to the supply of recovered aggregate to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

## 3. Duration

3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

## 4. Processor requirements

The EPA imposes the following requirements on any processor who supplies recovered aggregate.

### Sampling requirements

4.1. On or before supplying recovered aggregate, the processor must:

4.1.1. Prepare a written sampling plan which includes a description of sample

preparation and storage procedures for the recovered aggregate.

4.1.2. Undertake sampling and testing of the recovered aggregate as required under clauses 4.2 and 4.3 below. The sampling must be carried out in accordance with the written sampling plan and Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent).

4.2. Where the recovered aggregate is generated as part of a continuous process, the processor must undertake the following sampling:

4.2.1. Characterisation of the recovered aggregate by collecting 20 composite samples of the waste and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of characterisation. Characterisation must be conducted for recovered aggregate generated and processed every year following the commencement of the continuous process; and

4.2.2. Routine sampling of the recovered aggregate by collecting either 5 composite samples from every 4,000 tonnes (or part thereof) processed or 5 composite samples every 3 months (whichever is the lesser); and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1 other than those listed as 'not required' in Column 3. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of routine sampling. However, if characterisation sampling occurs at the same frequency as routine sampling, any sample collected and tested for the purposes of characterisation under clause 4.2.1 may be treated as a sample collected and tested for the purposes of routine sampling under clause 4.2.2.

4.3. Where the recovered aggregate is not generated as part of a continuous process, the processor must undertake one-off sampling of a batch, truckload or stockpile of the recovered aggregate, by collecting 10 composite samples from every 4,000 tonnes (or part thereof) processed and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. The test results for each composite sample must be validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 1 and the absolute maximum concentration or other value listed in Column 4 of Table 1 prior to the supply of the recovered aggregate.

## Chemical and other material requirements

4.4. The processor must not supply recovered aggregate to any person if, in relation to any of the chemical and other attributes of the recovered aggregate:

4.4.1. The concentration or other value of that attribute of any sample collected and tested as part of the characterisation, or the routine or one-off sampling, of the recovered aggregate exceeds the absolute maximum concentration or other value listed in Column 4 of Table 1, or

4.4.2. The average concentration or other value of that attribute from the characterisation or one-off sampling of the recovered aggregate (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 1, or

4.4.3. The average concentration or other value of that attribute from the routine sampling of the recovered aggregate (based on the arithmetic mean) exceeds the maximum average concentration or other value

listed in Column 3 of Table 1.

4.5. The absolute maximum concentration or other value of that attribute in any recovered aggregate supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4 of Table 1.

**Table 1**

| Column 1 | Column 2 | Column 3 | Column 4 |
|---|---|---|---|
| **Chemicals and other attributes** | **Maximum average concentration for characterisation** (mg/kg 'dry weight' unless otherwise specified) | **Maximum average concentration for routine testing** (mg/kg 'dry weight' unless otherwise specified) | **Absolute maximum concentration** (mg/kg 'dry weight' unless otherwise specified) |
| 1. Mercury | 0.5 | Not required | 1 |
| 2. Cadmium | 0.5 | 0.5 | 1.5 |
| 3. Lead | 75 | 75 | 150 |
| 4. Arsenic | 20 | Not required | 40 |
| 5. Chromium (total) | 60 | 60 | 120 |
| 6. Copper | 60 | 60 | 150 |
| 7. Nickel | 40 | Not required | 80 |
| 8. Zinc | 200 | 200 | 350 |
| 9. Electrical Conductivity | 1.5 dS/m | 1.5dS/m | 3 dS/m |
| 10. Metal | 1% | 1% | 2% |
| 11. Plaster | 0.25% | 0.25% | 0.5% |
| 12. Rubber, plastic, paper, cloth, paint, wood and other vegetable matter | 0.2% | 0.2% | 0.3% |

## Test methods

4.6. The processor must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.

4.7. The processor must ensure that the chemicals and other attributes (listed in Column 1 of Table 1) in the recovered aggregate it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.

4.7.1. Test method for measuring the mercury concentration:

4.7.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated maximum average concentration in Table 1, Column 2 (i.e. < 0.1 mg/kg dry weight).

4.7.1.2. Report as mg/kg dry weight.

4.7.2. Test methods for measuring chemicals 2 - 8:

4.7.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils.

4.7.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of stated maximum concentration in Table 1, Column 2 (i.e. 1 mg/kg dry weight for lead).

4.7.2.3. Report as mg/kg dry weight.

4.7.3. Test methods for measuring the electrical conductivity:

4.7.3.1. Sample preparation by mixing 1 part recovered aggregate with 5 parts distilled water.

4.7.3.2. Analysis using Method 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).

4.7.3.3. Report deciSiemens per metre (dS/m).

4.7.4. Test method for measuring the attributes 10 - 12:

4.7.4.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Aggregate (or an equivalent method), for the materials listed in 10 - 12 of Column 1, Table 1.

4.7.4.2. Report as %

## Notification

4.8. On or before each transaction, the processor must provide the following to each person to whom the processor supplies the recovered aggregate:

- a written statement of compliance certifying that all the requirements set out in this order have been met;
- a copy of the recovered aggregate exemption, or a link to the EPA website where the recovered aggregate exemption can be found; and
- a copy of the recovered aggregate order, or a link to the EPA website where the recovered aggregate order can be found.

## Record keeping and reporting

4.9. The processor must keep a written record of the following for a period of six years:

- the sampling plan required to be prepared under clause 4.1.1;
- all characterisation, routine and/or one-off sampling results in relation to the recovered aggregate supplied;
- the quantity of the recovered aggregate supplied; and
- the name and address of each person to whom the processor supplied the recovered aggregate.

4.10. The processor must provide, on request, the most recent characterisation and sampling (whether routine or one-off or both) results for recovered aggregate supplied to any consumer of the recovered aggregate.

4.11. The processor must notify the EPA within seven days of becoming aware that it has not complied with any requirement in clause 4.1 to 4.7.

## 5. Definitions

In this order:

**application or apply to land** means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

**composite sample** means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

**consumer** means a person who applies, or intends to apply, recovered aggregate to land.

**continuous process** means a process that produces recovered aggregate on an ongoing basis.

**processor** means a person who processes, mixes, blends, or otherwise incorporates recovered aggregate into a material in its final form for supply to a consumer.

**transaction** means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of recovered aggregate that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of recovered aggregate the first supply of recovered aggregate as required under the arrangement.

**Manager Waste Strategy and Innovation**

**Environment Protection Authority**

**(by delegation)**

## Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies recovered aggregate should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of recovered aggregate remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.

# APPENDIX C. RESOURCE RECOVERY EXEMPTION (RECOVERED AGGREGATE EXEMPTION 2014)

# Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014

# The recovered aggregate exemption 2014

## Introduction

This exemption:

- is issued by the Environment Protection Authority (EPA) under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation); and
- exempts a consumer of recovered aggregate from certain requirements under the *Protection of the Environment Operations Act 1997* (POEO Act) and the Waste Regulation in relation to the application of that waste to land, provided the consumer complies with the conditions of this exemption.

This exemption should be read in conjunction with 'the recovered aggregate order 2014'.

## 1. Waste to which this exemption applies

1.1. This exemption applies to recovered aggregate that is, or is intended to be, applied to land for road making activities, building, landscaping and construction works.

1.2. Recovered aggregate is a material comprising of concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory bricks or associated refractory materials, or asphalt that contains coal tar.

## 2. Persons to whom this exemption applies

2.1. This exemption applies to any person who applies, or intends to apply, recovered aggregate to land as set out in 1.1.

## 3. Duration

3.1. This exemption commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

## 4. Premises to which this exemption applies

4.1. This exemption applies to the premises at which the consumer's actual or intended application of recovered aggregate is carried out.

## 5. Revocation

5.1. 'The recovered aggregate exemption 2010' which commenced on 13 September 2010 is revoked from 24 November 2014.

## 6. Exemption

6.1. Subject to the conditions of this exemption, the EPA exempts each consumer from the following provisions of the POEO Act and the Waste Regulation in relation to the consumer's actual or intended application of recovered aggregate to land when used for road making activities, building, landscaping and construction works at the premises:

- section 48 of the POEO Act in respect of the scheduled activities described in clauses 39 and 42 of Schedule 1 of the POEO Act;
- Part 4 of the Waste Regulation;
- section 88 of the POEO Act; and
- clause 109 and 110 of the Waste Regulation.

6.2. The exemption does not apply in circumstances where recovered aggregate is received at the premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

## 7. Conditions of exemption

The exemption is subject to the following conditions:

7.1. At the time the recovered aggregate is received at the premises, the material must meet all chemical and other material requirements for recovered aggregate which are required on or before the supply of recovered aggregate under 'the recovered aggregate order 2014'.

7.2. The recovered aggregate can only be applied to land in road making activities, building, landscaping and construction works. This approval does not apply to any of the following applications:

7.2.1. Construction of dams or related water storage infrastructure,

7.2.2. Mine site rehabilitation,

7.2.3. Quarry rehabilitation,

7.2.4. Sand dredge pond rehabilitation,

7.2.5. Back filling of quarry voids,

7.2.6. Raising or reshaping of land used for agriculture, and

7.2.7. Construction of roads on private land unless:

(a) the recovered aggregate is applied only to the minimum extent necessary for the construction of the road, and
(b) a development consent has been granted under the relevant Environmental Planning Instrument (EPI), or

(c) it is to provide access (temporary or permanent) to a development approved by a Council, or
(d) the works are either exempt or complying development.

7.3. The consumer must keep a written record of the following for a period of six years:

- the quantity of any recovered aggregate received; and
- the name and address of the supplier of the recovered aggregate received.

7.4. The consumer must make any records required to be kept under this exemption available to authorised officers of the EPA on request.

7.5. The consumer must ensure that any application of recovered aggregate to land must occur within a reasonable period of time after its receipt.

## 8. Definitions

In this exemption:

**application or apply to land** means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

**consumer** means a person who applies, or intends to apply, recovered aggregate to land.

**processor** means a person who processes, mixes, blends, or otherwise incorporates recovered aggregate into a material in its final form for supply to a consumer.

**Manager Waste Strategy and Innovation**

**Environment Protection Authority**

**(by delegation)**

## Notes

The EPA may amend or revoke this exemption at any time. It is the responsibility of the consumer to ensure they comply with all relevant requirements of the most current exemption. The current version of this exemption will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this exemption, the EPA is not in any way endorsing the use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this exemption are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this exemption nor the accompanying order guarantee that the environment, human health or agriculture will not be harmed.

The consumer should assess whether or not the recovered aggregate is fit for the purpose the material is proposed to be used for, and whether this use will cause harm. The consumer may need to seek expert engineering or technical advice.

Regardless of any exemption provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The receipt of recovered aggregate remains subject to other relevant environmental regulations in the POEO Act and the Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of having an exemption, is guilty of an offence and subject to prosecution.

This exemption does not alter the requirements of any other relevant legislation that must be met in utilising this material, including for example, the need to prepare a Safety Data Sheet (SDS).

Failure to comply with the conditions of this exemption constitutes an offence under clause 91 of the Waste Regulation.

# APPENDIX D. GEOTECHNICAL INVESTIGATION, PREPARED BY GEOTECHNIQUE PTY LTD

GEOTECHNIQUE® PTY LTD

ABN 64 002 841 063

Job No: 13537/1
Our Ref: 13537/1-AA
21 August 2015

City of Canada Bay
c/- Complete Urban Pty Ltd
10 Regent Street
CHIPPENDALE NSW 2008
Email: edward_kong@completeurban.com.au

Attention: Mr E Kong

Dear Sir

re **Proposed Development**
**Majors Bay Reserve – Sir Richard Playing Fields**
**Norman Street, Concord**
**Geotechnical Investigation**

This report details the results of a geotechnical investigation for proposed light towers at Majors Bay Reserve (Sir Richard Playing Fields) at Norman Street, Concord, hereafter referred to as the site. The investigation was carried out in general accordance with the scope of work detailed in Geotechnique Pty Ltd proposal Q7254 dated 6 August 2015.

**Proposed Development**
We understand that City of Canada Bay Council is proposing to optimise the available land and build additional two new soccer fields with lighting infrastructure.

A geotechnical investigation was required by drilling nine (9) boreholes at the proposed light pole locations in order to determine subsurface conditions and develop geotechnical recommendations necessary for the design of footings. Also one test pit was required near the existing light pole location to determine the nature and capacity of founding material.

**Available Information**
Reference to the Geological Map of Sydney (scale 1:100,000) indicates that the subsurface profile across the site includes manmade fill comprising dredged estuarine sand and mud, demolition rubble, industrial and household waste.

Reference to the Soil Landscape Map of Sydney (scale 1:100,000) indicates that the landscape at the site has been extensively disturbed by human activities, including complete disturbance, removal or burial of natural soil with variable relief and slopes.

**Field Work**

Field work for the geotechnical investigation was carried out on 13 and 14 August 2015 and included the following:

- Reviewing available geological information relevant to the proposed development site.
- Carrying out a walk over survey to assess existing site conditions.
- Reviewing services plans obtained from "Dial Before You Dig" to determine locations of services across the site.
- Scanning proposed borehole locations for underground services to ensure that services are not damaged during field work. We engaged a specialist services locator for this purpose.
- Drilling nine boreholes (BH1 to BH9) using a track mounted drilling rig. Boreholes were drilled at the locations identified by the client and were terminated at depths ranging from 4.2m to 7.2m. The approximate borehole locations are indicated on the attached Drawing No 13537/1-AA1. Engineering borehole logs are also attached.
- Conducting Standard Penetration Test (SPT) in the boreholes to assess strength characteristics of sub-surface soils. It should be noted solid bit was used for conducting continuous SPT at deeper depths due to caving.
- Excavating one test pit adjacent to the existing pole to assess type of footing and bearing material. A backhoe was used for this purpose.
- Recovering representative soil samples for visual assessment and laboratory tests.
- Measuring depths to groundwater level or seepage in the boreholes, where encountered.

Field work was supervised by a Field Engineer from this company who was responsible for nominating the borehole locations, supervision of SPT tests, sampling and preparation of field logs.

**Site Description**

The site is almost levelled and is bound by Norman Street to the south, existing residential buildings and an open land to the east, Ron Routley Oval and Concord RSL to the north.

Sub-surface profiles encountered in the boreholes are detailed in the attached logs and summarised below in Table 1.

TABLE 1A

| BH | Termination Depth (m) | Topsoil (m) | Fill (m) | Natural (m) | Bedrock (m) | Groundwater |
|---|---|---|---|---|---|---|
| 1 | 6.25 | 0.0 – 0.15 | 0.15 – 5.0 | 5.0 –> 6.25* | NE | NE |
| 2 | 6.7 | 0.0 – 0.15 | 0.15 – 5.0 | 5.0 –> 6.7* | NE | 2.0 |
| 3 | 5.8 | 0.0 – 0.15 | 0.15 – 3.9 | 3.9 –> 5.8 | NE | 1.5 |
| 4 | 4.0 | 0.0 – 0.1 | 0.1 – 2.3 | 2.3 –> 4.0 | =>4.0 | 2.5 |
| 5 | 4.04 | 0.0 – 0.1 | 0.1 – 2.3 | 2.3 –> 4.04 | =>4.04 | 2.1 |
| 6 | 6.25 | 0.0 – 0.1 | 0.1 – 3.2 | 3.2 –> 6.25 | NE | 3.0 |
| 7 | 7.1 | 0.0 – 0.1 | 0.1 – 4.3 | 4.3 –> 7.1 | NE | 3.9 |
| 8 | 6.6 | 0.0 – 0.1 | 0.1 – 3.4 | 3.4 –> 7.2 | NE | 2.5 |
| 9 | 5.0 | 0.0 – 0.1 | 0.1 – 2.5 | 2.5 – 5.15 | =>5.15 | 2.0 |

*NE : Not encountered;*

** Depths to natural soils assessed from the material coated on solid SPT sampler*

TABLE 1B

| TP | Termination Depth (m) | Concrete (mm) | Fill (m) | Groundwater |
|---|---|---|---|---|
| 1 | 0.7 | 130 | 0.13 –> 0.7 | NE |

| | |
|---|---|
| Topsoil | Clayey Silt, low plasticity, trace roots |
| Fill | Silty Clay, medium plasticity, brown, black, with fine to coarse grained sandstone gravel, cobbles, boulders, pieces of timber, plastic etc<br>Sandy Silt, low plasticity, black, with fine to coarse grained gravel |
| Natural | Clayey Sand, medium grained, grey-brown<br>Sandy Clay, medium plasticity, brown, mottled yellow, with fine grained, sandstone gravel |
| Bedrock | Sandstone, medium grained, off-white, low strength, extremely weathered |

Groundwater level was encountered in all boreholes at depths of 1.5m to 3.9m from existing ground surface. It should however be noted that fluctuations in the level of groundwater might occur due to variations in rainfall and/or other factors not evident during drilling.

**DISCUSSION AND RECOMMENDATIONS**

**Existing Fill**

Table 1 indicates fill materials are likely to be encountered across the site. Fill thickness is likely to vary from about 2.9m to 5m. Fill was consisted for silty clay and sandy silt with sandstone gravel, cobbles, pieces of timber and plastic etc.

We do not have information on how the existing fill across the site was placed and compacted. However, based on results of SPT in fill materials, it is our assessment that fill was assessed to be variably compacted. Furthermore, the fill was to found to contain pieces of timber, plastic etc. Therefore it is our assessment that the existing fill is not suitable for supporting load bearing structures.

**Light Pole Footings**

As discussed earlier, footings founded in fill are not recommended for the proposed light poles. Also natural soils encountered immediately below the fill were generally found to be soft or loose. We do not recommend use of footings founded in the fill and natural soft or loose layers. Therefore, we recommend that the footings for the light poles are founded in stiff or medium dense natural soils likely to be encountered at the following depths:

TABLE 2

| BH | Depth to Suitable Founding Material (m) |
|---|---|
| 1 | 5.0 |
| 2 | 6.0 |
| 3 | 5.0 |
| 4 | 2.5 |
| 5 | 3.5 |
| 6 | 5.5 |
| 7 | 6.5 |
| 8 | 6.0 |
| 9 | 4.0 |

Loading conditions from the proposed light poles are not known at this stage. However, we understand that screw piles are being considered as the footings for the proposed light poles. We consider screw piles founded in natural soils (see Table 2) or bedrock will be appropriate footings for the proposed light poles. The recommended allowable bearing pressures for design of screw piles are presented in the following Table 3.

TABLE 3

| Founding Material | Founding Depth from Ground Surface *(m) | Allowable Bearing Pressure (kPa) | Allowable Shaft Adhesion (kPa) |
|---|---|---|---|
| Stiff clays or medium dense sands | 2.5-6.5 | 400 | 20 |
| Sandstone, low strength | >4.0 | 1000 | 100 |

* Approximate only

Please note that sandstone bedrock was encountered at BH4, 5 and 9 at depths of 4m to 5m.

The recommended allowable shaft adhesions against uplift pressures are halves the shaft adhesions for compressive loads presented in Table 3.

As depths to natural soils and bedrock with the recommended allowable bearing pressures could vary across the site, the founding depths of footings to be constructed will also vary. The depth ranges presented in Table 3 are measured from existing ground surface at borehole locations and are indicative only. Therefore, an experienced Geotechnical Engineer on the basis of assessment made during pile installation should confirm founding levels during construction. The engineer should ensure that the design strength of bedrock is achieved.

Screw piles founded in firm or stiff or medium dense natural soils, the total settlements under the recommended allowable bearing pressures are estimated to be about 8mm to 10mm. For footings founded in bedrock, total settlements under the recommended allowable bearing pressures are estimated to be about 1% of pier diameter or minimum footing dimension. Differential settlements are estimated to be about half the estimated total settlements.

**Existing Light Pole Footing**

One test pit (TP) excavated near the existing light pole footing indicated 130mm slab. The slab measured about 3.8mx3.8m. It is possible that there is pier underneath the pole. However, this could not be confirmed due to the large size of the slab.

**General**

Assessments and recommendations presented in this report are based on site observation and information from only nine boreholes. Although we believe that the sub-surface profile presented in this report is indicative of the general profile across the site, it is possible that the sub-surface profile across the site could differ from that encountered in the boreholes. Likewise, comments on depth to groundwater level are based on observation during field work. We recommend that this company is contacted for further advice if soils and bedrock encountered during construction stage differ from those presented in this report.

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully
GEOTECHNIQUE PTY LTD

ZIAUDDIN AHMED
Associate Geotechnical Engineer

Attached Drawing No 13537/1-AA1 Borehole Location Plan
Engineering Borehole Logs

Copy Mr B Woodcock Email: bill_woodcock@completeurban.com.au


N

Imagery ©2015 NearMap.com

LEGEND

- Borehole
- Test Pit

0 2 4 6 8 10m

Scale 1:200

PREPARED BY:

GEOTECHNIQUE® PTY LTD

PO Box 880
Penrith NSW 2750
Tel: 02 4722 2700
Fax: 02 4722 2777
e-mail:info@geotech.com.au
www.geotech.com.au

Complete Urban Pty Ltd
Proposed Development
Majors Bay Reserve - Sir Richard Playing Field
Norman Street, Concord

Borehole and Test Pit Locations

Drawing No: 13537/1-AA1
Job No: 13537/1
Drawn By: MH
Date: 20 July 2015
Checked By: ZA

File No: 13537-1
Layers: 0, AA1

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 1
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | | DS | 1.8 | | | 0 | | | TOPSOIL: Clayey Silt, low plasticity, brace roots | | | | |
| | | | | | | | | | FILL: Silty Clay, medium plasticity, brown, with fine to coarse grained sandstone gravel | M<PL | | | Variably compacted |
| | | DS | 2.8 | DS | N=9<br>9,5,4 | 0.5 | | | | | | | |
| | | DS | 1.5 | | | 1 | | | | | | | |
| | | DS | 2.2 | DS | N=7<br>3,3,4 | 1.5 | | | | | | | |
| | | DS | 5.0 | | | 2 | | | | | | | |
| | | DS | 1.5 | DS | N=26<br>3,10,16 | 2.5 | | | | | | | |
| | | DS | 3.0 | | | 3 | | | | | | | |
| | | DS | 6.0 | | | 3.5 | | | | | | | |
| | | DS | 1.6 | DS | N=7<br>2,3,4 | 4 | | | | | | | |
| | | | | | N=19<br>4,11,8 | 4.5 | | | | | | | Sample unable to be recovered due to moisture content in soil. Solid SPT initiated at 4.45m |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 1
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dry | | | | N=11<br>3,4,7 | 5 | | | | | | | Natural material (sandy clay or clayey sand expected with possible sandstone gravel) at around 5m |
| | | | | | N=11<br>5,3,8 | 5.5 | | | | | | | |
| | | | | | N=22<br>5,7,15 | 6 | | | | | | | |
| | | | | | | | | | Borehole No. 1 terminated at 6.25m | | | | |
| | | | | | | 6.5 | | | | | | | |
| | | | | | | 7 | | | | | | | |
| | | | | | | 7.5 | | | | | | | |
| | | | | | | 8 | | | | | | | |
| | | | | | | 8.5 | | | | | | | |
| | | | | | | 9 | | | | | | | |
| | | | | | | 9.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 2
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 2.0 | | | 0 | | | TOPSOIL: Silty Clay, low plasticity, brown, trace roots | | | | |
| | | | | | | | | | FILL: Silty Clay, medium plasticity, brown, with fine grained sand | M<PL | | | Possible concrete boulder or hard material encountered |
| | | DS | 3.5 | | | 0.5 | | | | | | | |
| | | | | DS | N=8<br>3,4,4 | 1 | | | | | | | Timber pieces can be observed |
| | | DS | 2.0 | | | | | | | | | | |
| | | DS | 7.0 | DS | N=16<br>4,9,7 | 1.5 | | | | | | | |
| | | DS | 15.0 | | | 2 | | | FILL: Silty Clay, medium plasticity, black, with timber pieces and fine to coarse grained gravel | M>PL | | | Odour in the soil |
| | | DS | 6.0 | DS | N=3<br>1,1,2 | 2.5 | | | | | | | |
| | | DS | 13.0 | | | 3 | | | | | | | |
| | | DS | 14.0 | | | 3.5 | | | | | | | |
| | | DS | 14.0 | DS | N=2<br>1,1,1 | 4 | | | | | | | |
| | | | | DS | N=8<br>5,4,4 | 4.5 | | | | | | | Sample unable to be recovered due to moisture content in soil. |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 2
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | N=7<br>4,4,3 | 5 | | | | | | | Solid SPT initiated at 4.95m<br>Possible natural alluvial material overlaying sandy clay/clayey sand at 5m |
| | | | | | N=7<br>4,4,3 | 5.5 | | | | | | | |
| | | | | | N=13<br>5,6,7 | 6 | | | | | | | |
| | | | | | N=20<br>10,10,10 | 6.5 | | | | | | | |
| | | | | | | | | | Borehole No. 2 terminated at 6.7m | | | | |
| | | | | | | 7 | | | | | | | |
| | | | | | | 7.5 | | | | | | | |
| | | | | | | 8 | | | | | | | |
| | | | | | | 8.5 | | | | | | | |
| | | | | | | 9 | | | | | | | |
| | | | | | | 9.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 3
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 3.5 | | | 0 | | | TOPSOIL: Silty Clay, medium plasticity, brown, trace roots, with fine grained gravel | | | | |
| | | | | | | | | | Fill: Silty Clay, medium plasticity, brown, with fine grained gravel, cobbles and boulders | M<PL | | | Variably compacted |
| | | DS | 2.5 | DS | N=15,4, 8,7 | 0.5 | | | | | | | Pieces of glass and plastics can be observed in fill |
| | | DS | 2.0 | | | 1 | | | | | | | |
| | | DS | 3.0 | DS | N=0 0,0,0 | 1.5 | | | | M>PL | | | |
| | | DS | 4.0 | | | 2 | | | | | | | |
| | | DS | 5.0 | | | 2.5 | | | | | | | |
| | | DS | 3.0 | DS | N=0 0,0,0 | 3 | | | | | | | |
| | | DS | 1.5 | | | 3.5 | | SC | Clayey SAND, medium grained, grey-brown | | | | Natural material |
| | | | | | | 4 | | | | | | | Shell pieces observed SPT values at 4.0m not taken due to wall caving in. |
| | | | | | N=3 1,1,2 | 4.5 | | | | | | | Sample unable to be recovered due to moisture content in soil. Possible clay/sandy clay overlying sandstone |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 3
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | N=10<br>3,4,6 | 5 | | | | | | | Solid SPT initiated at 4.95m |
| | | | | | N=18<br>8,8,10 | 5.5 | | | | | | | |
| | | | | | | | | | Borehole No. 3 terminated at 5.8m | | | | |
| | | | | | | 6 | | | | | | | |
| | | | | | | 6.5 | | | | | | | |
| | | | | | | 7 | | | | | | | |
| | | | | | | 7.5 | | | | | | | |
| | | | | | | 8 | | | | | | | |
| | | | | | | 8.5 | | | | | | | |
| | | | | | | 9 | | | | | | | |
| | | | | | | 9.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 4
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 1.5 | | | 0 | | | TOPSOIL: Silty Clay, medium plasticity, brown, with gravel and trace roots | | | | |
| | | | | | | | | | FILL: Silty Clay, medium plasticity, brown-black, with fine grained gravel | M<PL | | | Variably compacted |
| | | DS | 2.0 | DS | N=8<br>1,2,6 | 0.5 | | | | | | | |
| | | | 1.5 | DS | | 1 | | | | | | | |
| | | | 1.5 | DS | | 1.5 | | | | | | | |
| | | | | DS | N=12<br>7,8,4 | | | | | | | | |
| | | | 1.1 | DS | | 2 | | | | | | | |
| | | | 1.3 | DS | | | | SC | Clayey SAND, medium grained, grey-brown | M | VL-L | | Natural |
| | | | | DS | N=16<br>5,8,8 | 2.5 | | | | | | | |
| | | | | | | 3 | | CI | Sandy CLAY, medium plasticity, brown mottled yellow, with fine grained sandstone gravel | M<PL | St-VSt | | |
| | | | | | | 3.5 | | | SANDSTONE, medium grained, white, low strength, extremely weathered | | | | Bedrock |
| | | | | | | 4 | | | Borehole No. 4 terminated at 4.0m due to refusal on sandstone | | | | |
| | | | | | | 4.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 5
**Date :** 13/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 1.5 | | | 0 | | | TOPSOIL: Sandy Silt, low plasticity, brown, with trace roots | | | | |
| | | | | | | | | | FILL: Silty Sand, fine grained, with fine to coarse grained gravel | | | | |
| | | DS | 2.0 | DS | N=14<br>6,7,7 | 0.5 | | | | | | | |
| | | DS | 3.0 | | | 1 | | | FILL: Silty Clay, medium plasticity, brown-black, with fine to coarse grained gravel | | | | |
| | | DS | 2.5 | DS | N=3<br>4,2,1 | 1.5 | | | | | | | |
| | | DS | 1.5 | | | 2 | | | | | | | |
| | | DS | | | | | | SC | Clayey SAND, medium grained, grey-brown | M-W | VL-L | | Natural |
| | | | | DS | N=3<br>1,2,1 | 2.5 | | | | | | | |
| | | | | | | 3 | | SC | Clayey SAND, fine to medium grained, brown, with fine to coarse grained sandstone gravel | M-W | L-M | | |
| | | | | DS | N=Ref<br>20/40 | 3.5 | | | | | | | |
| | | | | | | 4 | | | Borehole No. 5 terminated at 4.04m due to refusal on sandstone | | | | |
| | | | | | | 4.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 6
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 5.0 | | | 0 | | | TOPSOIL: Silty Sand, fine grained, brown, trace roots | | | | |
| | | | | | | | | | FILL: Sandy Silt, low plasticity, black, with fine to coarse grained gravel | | | | Variably compacted |
| | | DS | 6.2 | DS | N=11<br>6,7,4 | 0.5 | | | | | | | |
| | | DS | 8.0 | | | 1 | | | FILL: Silty Clay, medium plasticity, black, with fine to coarse grained gravel | | | | General rubbish observed in fill |
| | | DS | 12.4 | DS | N=10<br>3,4,6 | 1.5 | | | | | | | |
| | | DS | 9.0 | | | 2 | | | FILL: Silty Clay, medium plasticity, black, with fine to coarse grained gravel and bark pieces | | | | |
| | | DS | 17.0 | DS | N=19<br>8,5,14 | 2.5 | | | | | | | |
| | | DS | 15.0 | | | 3 | | | Clayey SAND, fine to medium grained, grey-brown | M-W | L-MD | | Natural |
| | | | | | N=4<br>2,2,2 | 3.5 | | | | | | | Sample unable to be recovered due to moisture content in soil. Solid SPT initiated. |
| | | | | | N=5<br>3,2,3 | 4<br>4.5 | | | | | | | Solid SPT initiated at 4.45m<br>Possible clay/sandy clay overlaying sandstone |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 6
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | N=8<br>3,4,4 | 5 | | | | | | | |
| | | | | | N=17<br>7,9,8 | 5.5 | | | | | | | |
| | | | | | N=22<br>11,10,12 | 6 | | | | | | | |
| | | | | | | | | | Borehole No. 6 terminated at 6.25m | | | | |
| | | | | | | 6.5 | | | | | | | |
| | | | | | | 7 | | | | | | | |
| | | | | | | 7.5 | | | | | | | |
| | | | | | | 8 | | | | | | | |
| | | | | | | 8.5 | | | | | | | |
| | | | | | | 9 | | | | | | | |
| | | | | | | 9.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 7
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 3.0 | | | 0 | | | TOPSOIL: Silty Clay, low plasticity, brown, trace roots | | | | |
| | | | | | | | | | FILL: Silty Clay, medium plasticity, brown-black, with fine to coarse grained gravel | | | | |
| | | DS | 5.0 | DS | N=14<br>3,7,7 | 0.5 | | | | | | | |
| | | DS | 4.0 | | | 1 | | | | | | | |
| | | DS | 1.6 | DS | N=28<br>8,14,14 | 1.5 | | | | | | | |
| | | | | | | 2 | | | | | | | Glass pieces observed |
| | | DS | 4.0 | DS | N=6<br>3,3,3 | 2.5 | | | | | | | |
| | | DS | 3.5 | | | 3 | | | | | | | Wood pieces observed |
| | | DS | 2.7 | | | 3.5 | | | | | | | |
| | | DS | 3.0 | DS | N=0<br>0,0,0 | 4 | | | | | | | |
| | | | | | | | | SC | Clayey SAND, fine grained, grey-brown | | | | Natural |
| | | | | | | 4.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 7
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | N=3<br>3,1,2 | 5 | | | | | | | Solid SPT initiated at 4.9m |
| | | | | | N=2<br>2,1,1 | 5.5 | | | | | | | Solid SPT sinking under own weight up to 6.2m |
| | | | | | | 6 | | | | | | | |
| | | | | | N=9<br>3,4,5 | 6.5 | | | | | | | Possible natural clay/ sandy clay |
| | | | | | N=18<br>8,9,9 | 7 | | | | | | | |
| | | | | | | 7.5 | | | Borehole No. 7 terminated at 7.1m | | | | |
| | | | | | | 8 | | | | | | | |
| | | | | | | 8.5 | | | | | | | |
| | | | | | | 9 | | | | | | | |
| | | | | | | 9.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 8
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 1.0 | | | 0 | | | TOPSOIL: Silty Sand, fine grained, with trace roots | | | | |
| | | | | | | | | | FILL: Silty Clay, medium plasticity, brown-black, with fine to coarse grained gravel | | | | |
| | | DS | 1.0 | DS | N=4<br>4,2,2 | 0.5 | | | | | | | |
| | | DS | 1.2 | | | 1 | | | | | | | |
| | | DS | 1.2 | DS | N=7<br>4,3,4 | 1.5 | | | | | | | Plastics and glass pieces observed |
| | | D | 2.2 | | | 2 | | | | | | | |
| | | DS | 1.6 | DS | N=0<br>0,0,0 | 2.5 | | | | | | | |
| | | DS | 1.5 | | | 3 | | | | | | | |
| | | DS | 1.3 | | | 3.5 | | CL | Sandy CLAY, low plasticity, black | M>PL | | | Natural |
| | | | | DS | N=0<br>0,0,0 | 4 | | | | | | | |
| | | | | | | 4.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 8
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 5 | | | | | | | Solid SPT initiated at 4.95m.<br>Solid SPT sinking under own weight from 4.95m to 5.4m |
| | | | | | N=5<br>3,3,2 | 5.5 | | | | | | | |
| | | | | | N=10<br>4,5,5 | 6 | | | | | | | Possible natural clay/ sandy clay overlying sandstone/shale |
| | | | | | N=19<br>5,9,10 | 6.5 | | | | | | | |
| | | | | | N=27<br>13,14,13 | 7 | | | | | | | |
| | | | | | | | | | Borehole No. 8 terminated at 7.2m | | | | |
| | | | | | | 7.5 | | | | | | | |
| | | | | | | 8 | | | | | | | |
| | | | | | | 8.5 | | | | | | | |
| | | | | | | 9 | | | | | | | |
| | | | | | | 9.5 | | | | | | | |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 9
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TC-Bit | ▼ | DS | 1.0 | | | 0 | | | TOPSOIL: Silty Clay, medium plasticity, brown, trace roots | | | | |
| | | | | | | | | | FILL: Silty Clay, medium plasticity, black, with fine to coarse grained gravel | | | | |
| | | DS | | DS | N=10<br>0,4,6 | 0.5 | | | | | | | |
| | | DS | 1.0 | | | 1 | | | | | | | |
| | | DS | 0.8 | DS | N=0<br>0,0,0 | 1.5 | | | | | | | |
| | ▼ | DS | 1.3 | | | 2 | | | | | | | Wood pieces observed |
| | | DS | 1.0 | DS | N=0<br>0,0,0 | 2.5 | | CI | Silty CLAY, medium plasticity, brown-black | M>PL | | | Natural |
| | | | | | | 3 | | CH | Silty CLAY, high plasticity, red mottled grey | M<PL | St-VSt | | |
| | | | | DS | N=12<br>3,5,7 | 4 | | CH | Silty CLAY, high plasticity, grey | M<PL | VSt-H | | |
| | | | | | N=16<br>4,7,9 | 4.5 | | | | | | | Possible bedrock |

# engineering log - borehole

**Client :** Complete Urban Pty Ltd
**Project :** Proposed Development
**Location :** Majors Bay Reserve - Sir Richard Playing Field, Norman Street, Concord

**Job No. :** 13537/1
**Borehole No. :** 9
**Date :** 14/08/2015
**Logged/Checked by:** SS

**drill model and mounting :** Hanjin D8, Track Mounted **slope :** **deg.** **R.L. surface :**

**hole diameter :** 125 **mm** **bearing :** **deg.** **datum :**

| method | groundwater | env samples | PID reading (ppm) | geo samples | field test | depth or R.L. in meters | graphic log | classification symbol | MATERIAL DESCRIPTION<br>soil type, plasticity or particle characteristic, colour, secondary and minor components. | moisture condition | consistency density index | hand penetrometer kPa | Remarks and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | N=Ref 18, 16/100 | 5 | | | | | | | |
| | | | | | | 5.5 | | | Borehole No. 9 terminated at 5.15m due to refusal on sandstone | | | | |
| | | | | | | 6 | | | | | | | |
| | | | | | | 6.5 | | | | | | | |
| | | | | | | 7 | | | | | | | |
| | | | | | | 7.5 | | | | | | | |
| | | | | | | 8 | | | | | | | |
| | | | | | | 8.5 | | | | | | | |
| | | | | | | 9 | | | | | | | |
| | | | | | | 9.5 | | | | | | | |

# KEY TO SYMBOLS

**Symbol Description**

**Strata symbols**

**Topsoil**

**Fill**

**Sandy Clay**
**low plasticity**

**Clayey Sand**

**Sandstone**

**Silty Clay**
**medium plasticity**

**Silty Clay**
**high plasticity**

**Misc. Symbols**

**Groundwater**

**Descriptions of various line types (solid, dotted, etc.)**

**Profile change**

**Gradual profile change**

**Notes:**

1. **Exploratory borings were drilled between 14/08/2015 and 14/08/2015 using a 50, 100 and 125mm diameter continuous flight power auger.**

2. **These logs are subject to the limitations, conclusions and recommendations in this report.**

3. **Results of tests conducted on samples recovered are reported on the logs.**

# KEY TO SYMBOLS

**Symbol Description**

**Strata symbols**

**Topsoil**

**Fill**

**Sandy Clay**
**low plasticity**

**Clayey Sand**

**Sandstone**

**Silty Clay**
**medium plasticity**

**Silty Clay**
**high plasticity**

**Misc. Symbols**

**Groundwater**

**Descriptions of various line types (solid, dotted, etc.)**

**Profile change**

**Gradual profile change**

**Notes:**

1. **Exploratory borings were drilled between 14/08/2015 and 14/08/2015 using a 50, 100 and 125mm diameter continuous flight power auger.**

2. **These logs are subject to the limitations, conclusions and recommendations in this report.**

3. **Results of tests conducted on samples recovered are reported on the logs.**

# APPENDIX E. CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN PREPARED BY ZOIC ENVIRONMENTAL PTY LTD

# Construction Environmental Management Plan

Sid Richards Playing Field 3, Majors Bay Reserve,
Concord NSW 2137

City of Canada Bay
28 February 2019

19005

# Quality Management

## Document Distribution

| Issue/Revision | Issue 1 |
|---|---|
| Remarks | Final |
| Date | 28 February 2019 |
| Prepared by | Graeme Malpass<br>CEnvP-SC |
| Signature |  |
| Reviewed by | Peter Moore<br>CEnvP-SC |
| Signature |  |
| File reference | 19005 CEMP (Final)<br>28Feb19.docx |
| Distribution | • City of Canada Bay<br>• Zoic Electronic File |

This report was prepared in accordance with the scope of services set out in the contract between Zoic Environmental Pty Ltd, ABN 23 154 745 525, and the client.

Zoic Environmental Pty Ltd
ABN 23 154 745 525
Suite 1, Level 9
189 Kent Street, Sydney 2000
Phone: +61 2 9251 8070
www.zoic.com.au

# Table of Contents



## Appendices

# 1. Introduction

## 1.1 Background and Scope

Zoic Environmental Pty Ltd (Zoic) was commissioned by City of Canada Bay (CCB) to prepare a Construction Environmental Management Plan (CEMP) for the proposed Synthetic Sports Pitch and Amenities Block (the 'Project') located at Sid Richards Playing Field 3, Majors Bay Reserve, NSW 2137 (the 'site').

From an environmental planning perspective, the Synthetic Sports Pitch (SSP), comprising both a full sized pitch and half sized training field, will be constructed under SEPP (Infrastructure) 2007 and does not require development approval (DA). Due to the proposed change of use, the Amenities Block (AB) will require further approval.

It is understood that the above elements will be constructed in the stages outlined below, however, for completeness both are addressed within this CEMP (Refer to drawings in Appendix A). Therefore, depending on the Project works being undertaken at a particular time only the relevant components of the CEMP need to be implemented:

- Stage 1: Construction of the full sized SSP; and
- Stage 2: Construction of the half sized training field and AB (and associated service trench).

CCB must ensure that the requirements of this Plan are communicated and implemented by the Principal Contractor. This CEMP may be updated, as required, throughout the Project.

This CEMP provides overarching guidance to manage environmental risks associated with the Project. It is understood that the Project will be managed by the Principal Contractor who will be required to communicate necessary requirements to all Employees and Subcontractors, prepare and implement a number of additional Sub Plans to ensure compliance with the CEMP.

## 1.2 Site Location

The site is located to the west of the intersection between Majors Bay Road and Norman Street in Majors Bay Reserve, Concord.

According to the Canada Bay LEP (2013) Majors Bay Reserve is zoned as RE1 Public Recreation. Land to the north east of the site is designated as a road reserve and is zoned as R2 Low Density Residential. Land to the east is zoned as R2 and R3 Medium Density Residential. Land to the south is zoned as RE2 Private Recreation.

The Project footprint comprises the following:

- Synthetic Sports Pitch (SSP) and half sized training field (HSTF)– approximately 15,640m2 for both full and half sized pitches;
- Amenities Building (AB) – approximately 450m2; and
- Services Trench for Amenities Building – approximately 500m2 (100m long x 5m wide).

The Project site is legally described as Part Lots 6 in DP217073, 1 in DP327309 and 1 in DP909052.

The location and layout of the site is available in Appendix A, Figures 1 and 2 respectively.

## 1.3 Proposed Construction Activities

It is understood that the existing grass will be treated with an appropriate herbicide before construction takes place.

The foundation for the SSP (Stage 1), HSTF and AB (Stage 2) will comprise approximately 600mm of compacted planings from Council road renewal works.

The reuse of road planings must be managed in accordance with the requirements outlined in:

- The Recovered Aggregate Order 2014 (Resource Recovery Order (RRO) - to be complied with by the supplier of the material);
- The Recovered Aggregate Exemption 2014 (Resource Recovery Exemption (RRE) 2014 - to be complied with by the user of the material); and
- At the request of EPA, it must also be demonstrated that the asphalt material does not contain coal tar or asbestos.

With the exception of a service trench (ST) (Stage 2) running from the south eastern corner of the AB to an existing Baseball Amenity Building, no excavation of existing site levels is proposed. The depth of the ST has yet to be confirmed but is expected to be 600mm below existing site levels.

It is noted that four existing light poles will be relocated but this will involve the use of displacement piling techniques. Consequently, no cuttings will be generated.

## 1.4 Operating Hours

Works will be carried out during standard construction hours or as stipulated within any subsequent approvals issued for the Project:

- Monday to Friday 7.00am to 6.00pm; and
- Saturdays 8.00am to 1.00pm.
- No work may be carried out on Sundays or public holidays except in the following cases:
  - By the Police or a public authority for the delivery of vehicles, plant or material; or
  - In an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
  - Where the works are inaudible at the nearest sensitive receivers; or
  - Where a variation is approved in advance in writing by CCB.

Notification of high impact activities or works out of standard construction hours must be notified to key stakeholders and neighbours in advance.

## 1.5 Environmental Objectives and Targets

The environmental objectives and targets for the Project are in Table 1.1 below.

**Table 1.1 Environmental Objectives and Targets**

| Objective | Target |
|---|---|
| Effective site environmental controls | Achieve alignment with CCBC expectations in relation to best practice control measures<br>-Fulfil environmental obligations |
| Environmental Performance | • Zero environmental incidents and no breaches<br>• Zero infringement notices<br>• All environmental spills to be reported to CCB within 2 hrs of occurrence<br>• Environmental inspection completed each week and documented using an Inspection Checklist (an example is presented in Appendix C). Frequency of documented inspections can increase, if required. |
| Reduce the amount of environmental impact our operations have on the environment | Environmental issues identified and controlled prior to causing negative impacts on the project or on the environment |
| Effective implementation of the environmental system | • 80% or better internal audit results<br>• Full compliance with DA requirements |
| Community issues carefully handled | Zero valid complaints and all complaints reported to CCB |

## 1.6 Consultation

It is understood that no consultation is required to facilitate the Stage 1: Construction Works.

It is understood that community consultation will be conducted by CCB or their nominated representative prior to commencement of Stage 2: Construction Works.

# 2. Construction Management

## 2.1 Environmental Management Structure and Responsibilities

The Project roles and responsibilities are summarised in the following table:

**Table 2.1 Project Roles and Responsible Persons**

| Role | Responsible Person |
|---|---|
| CCB Project Manager | Andrew Dimitriadis |
| Construction Manager | Principal Contractor TBA |
| Project Manager | Principal Contractor TBA |
| Site Manager | Principal Contractor TBA |
| Corporate HSE Manager | Principal Contractor TBA |
| Site HSE Officer | Principal Contractor TBA |
| Project/Site Engineers | Principal Contractor TBA |
| Contracts Administrator | Principal Contractor TBA |

Specific responsibilities expected under the CEMP are as follows:

**CCB Project Manager**

- Shall appoint the Principal Contractor to implement the CEMP on behalf of City of Canada Bay.
- Shall ensure that the Principal Contractor has demonstrated appropriate training, experience and competencies to be able to successfully deliver the Project in accordance with this CEMP.
- Shall provide the Principal Contractor with available information and existing documents relevant to the implementation of the CEMP.
- Shall conduct appropriate checks to ensure that the Principal Contractor implements all relevant requirements of the CEMP.

**Construction Manager**

- Facilitate a systematic approach to managing health, safety and environment (HSE) including the identification, assessment, control and monitoring of related risks that may arise through both normal and adverse operating conditions.
- Check that personnel are adequately skilled and trained for the tasks they are required to undertake.
- Encourage and promote safety by participating and openly consulting with employees in respect to their health and safety.

- Support the HSE Manager in ensuring Project / Site Managers have developed and implement systems, which will ensure Subcontractors and/or Suppliers engaged by the Principal Contractor comply with the health and safety management systems and the relevant work health and safety (WHS) legislation.
- Respond to non-conformance by any Subcontractor, Supplier or Employee who fails to discharge their duties as set by the responsibility statement and actively participate in dispute resolution where required.

**Project Manager**

- Monitor construction activities against the conditions of approval to evaluate compliance.
- Conducting an Environmental Risk Assessment, reviewing and incorporating legal matters, and any requirements of other documents such as Environmental Impact Assessments (EIA) / Review of Environmental Factors (REF) prepared for the development.
- Identifying, planning and ensuring all environmental training required for personnel is undertaken. This task may be done in liaison with the Corporate HSE Manager.
- Support the Site Manager in the management of employees, sub-contractors, and suppliers' performance in complying with the requirements of this CEMP.
- Selecting appropriate Subcontractors, giving due regard to their ability to comply with legislative and environmental requirements of the Principal Contractor.
- Ensure environmental emergencies are incorporated in the site Emergency Response Procedures.
- Ensuring incidents are investigated and appropriate action taken as required by the Principal Contractors environmental plan requirements in consultation with the Corporate HSE Manager.
- Ensuring compliance with environmental legislation and the Principal Contractors environmental procedures.
- Operate as one of the 24-hour contact person for environmental matters.
- The Project Manager must carry out at least one formal site inspection per month at the site.
- Ensuring compliance with environmental legislation, regulations and licensing conditions, and authorities' requirements relevant to all construction work.
- Reporting to the CCB Project Manager on environmental performance of the Project.

**Site Manager**

- Unless otherwise nominated, undertaking the role of Site HSE Officer for environmental issues and control of the site. This role is supported by the Project Manager and the Corporate HSE Manager.
- Ensuring site security and site specific signage is fixed to key access, internal and perimeter areas including 24 hour project contact details, attendance details for visitors, personal protective equipment (PPE) requirements and construction zone signage.
- Monitor environmental controls for effectiveness and suitability.
- Implementing through consultation with the Project Manager, the CEMP in accordance with Legislation and Regulations, Codes of Practice, Australian Standards and/or other statutory requirements.

- Implementing and undertaking formal and proactive consultation measures between the Project Team, Subcontractors and Industrial Representatives such as Subcontractor meetings, toolbox talks, site HSE committee meetings and inspections.
- Monitoring Subcontractors compliance with the CEMP in particular to the environmental components of their safe work method statements.
- Identifying any hazards and assessing risks onsite, and implementing risk control measures.
- Liaising with civil or statutory authorities should an onsite emergency situation occur.
- Investigating, recording and reporting incidents and initiating corrective and action plans by relevant personnel. Reporting any serious incident immediately to the CCB Project Manager, Project Manager and Corporate HSE Manager.
- Ensuring that all plant and equipment used on the site is safe, correctly maintained and that the operator is correctly licensed or qualified for that equipment.
- Ensure that all environmental incidents (including spills, failure of sediment controls, water pollution etc.) are reported in accordance with the Incident Reporting and Investigation Procedure.
- Assessing Subcontractors Safe Work Method Statements prior to any work commencing, to ensure environmental requirements are met.

**Corporate HSE Manager**

- Overseeing the implementation of the integrated HSE management system and the Environmental Management Plans throughout the Principal Contractors activities.
- Ensuring a CEMP is prepared for the project.
- Advise Management and Site teams to any new or revised Act's, Standards, codes of practice (COP) or legal requirements associated or required in conducting the works.
- Setting and reviewing overall environmental targets and allocating priorities within the framework of the HSE management system.
- Planning and facilitating training in environmental management, including arranging for the appropriate internal or external trainers/facilitators to conduct the training.
- Manage collection and reporting of environmental performance data from monthly site reporting.
- Conducting or delegating internal HSE management system and site audits.
- Reviewing internal and external (independent) audit reports, and in consultation with the Directors and the Project Manager - develop appropriate action plans if necessary.
- Assist Project Managers in preparation of Environmental Risk Assessment and determining appropriate controls.
- Communicating relevant environmental information to management, staff and contractors.

**Site HSE Officer**

- Carry out erosion and sediment control inspections.
- Ensure that a Materials Management Plan (MMP) and Erosion & Sediment Control Plan (ESCP) are prepared and implemented.
- Maintenance of the CEMP including any minor revisions, as required.

- Ensure training/induction of personnel is carried out and that staff operate in an environmentally responsible manner.
- Ensure compliance with Environmental Approvals.
- Operate as one of the 24-hour contact person for environmental matters.
- Report on environmental incidents, liaise with the CCB Project Manager on corrective actions and verify environmental measures.
- Manage the register of environmental complaints and the subsequent corrective measures.
- Undertake and report on all monitoring and inspections completed.
- Monitor construction activities against the conditions of approval to evaluate compliance with the Environmental Management Systems (EMS), including at a minimum weekly site inspections.
- Maintain a register of all environmental management documents for the Project.
- Ensure that the CEMP is established, implemented and maintained in compliance with all Sub Plans, supplementary method statements and DA conditions.
- Overall responsibility for on-site establishment, management, monitoring and maintenance of erosion and sediment controls.
- Carry out regular inspections and auditing of the works to ensure that environmental safeguards are being followed.
- Identifying where environmental measures are not meeting the targets set and where improvement can be achieved.
- Facilitating environmental induction and toolbox talks for all site personnel.
- Specific authority to stop work on any activity where it is considered necessary to prevent environmental non-conformances.

**Project/Site Engineers**

- Liaise closely with the CCB to ensure environmental considerations contained within this CEMP are incorporated into construction activities.
- Produce SWMS which address environmental requirements.
- Conduct regular checks of the site to ensure environmental controls such as sediment controls and dust suppression are functioning effectively.
- Where engineers are responsible for managing Subcontractors and/or utilities authorities, ensure that any work performed by these external parties meets with the requirements of this CEMP and Sub Plans, including identifying and documenting the environmental risks of the proposed works.
- Report any non-compliance with Erosion and Sediment Control Plans (ESCP) and/or the CEMP to CCB.

**Contracts Administrator**

- Support the Project and Site Manager in the management of Employee, Subcontractor and Suppliers' performance in complying with the Principal Contractors WHS and the site specific rules for the Project.

- Assist the Project / Site Manager to ensure the CEMP and all Sub Plans associated documentation, including standard forms, procedures and templates; remain current and up to date.
- Include in subcontract agreement the requirement for Subcontractors to carry out their works in accordance with the Companies or Subcontractors approved Environmental Plans.
- At the tender interview stage discuss with the Subcontractors their obligation for managing environmental requirements by issuing to them relevant sections of the tender interview form and ensuring this is completed by Subcontractor prior to commencing on site.
- Request and obtain from the Subcontractor copies of their Environmental Plans.
- Where required, assist the Project / Site Manager in collecting required environmental documentation from engaged Subcontractors, and for conducting initial review ensuring all required documents have been submitted prior to forwarding documentation provided by Subcontractors to the Project / Site Manager for review.
- Ensure that the latest copies of Project Plans and HSE Risk Assessments are uploaded onto an appropriate data control system to which engaged Subcontractors have access.
- Assist the Project / Site Manager in conducting project audits, to report on safety compliance and in the maintenance of environmental records.
- Ensure all external complaint/incidents are recorded on 'Incident Report Form', filed in the 'Complaints Register' and communicated to CCB Project Manager.
- Assist Project / Site Manager in the general administration of HSE where requested.

**Employees / Subcontractors**

- Must comply with all site HSE rules, procedures and work practices identified in the CEMP, and / or as directed or informed by the Site Manager.
- Attending environmental training / inductions as directed by the Site Manager.
- Complying with all relevant environmental legislation.
- Reporting promptly to a Site Manager of any spills, leaks, potential pollution and / or poor environmental practices.

## 2.2 Approval and Licencing Requirements

In general, all activities carried out onsite must comply with the provisions of all legislation relating to the construction and operation of the Project.

Key planning legislation requirements are listed in Table 2.2 below.

**Table 2.2 List of Legal and Legislative Requirements**

| Legislation / Policy (Administering Authority) | Summary of Legislation Requirements | Approvals/Permits or Licences Required |
|---|---|---|
| Contaminated Land Management Act 1997<br>(NSW Office of Environment & Heritage (OEH) / CCB Council) | Establishes a process for investigating and, where appropriate, remediating land where contamination presents a risk of harm to human health and/or the environment. | The proposed amenities building (and associated services trench) footprints, must be investigated to demonstrate suitability for a proposed change of use.<br>Waste classification is required to be conducted for material disposed offsite.<br>Where excavated materials are reused as part of the construction of the amenities building (and associated service trench) they must also be demonstrated as being suitable for use and unlikely to pose a significant risk to the environment.<br>No further approvals needed. However, works are to be conducted in accordance with this CEMP to satisfy EPA requirements. |
| Environmental Planning and Assessment Act 1979 | Works must proceed in accordance with the consent provided, including any conditions. | Construction of the SSP will be conducted under SEPP (Infrastructure) 2007 and may proceed without Development Consent.<br>Construction of the AB and associated ST will require Planning Approval.<br>Comply with the requirements of the SEPP (Infrastructure) 2007 and / or Development Consent conditions.<br>Planning approval is required for any changes which are not in accordance with the Development Consent conditions. |
| Environmental Protection and Biodiversity Conservation Act (1999)<br>(Commonwealth Department of Environment and Water Resources) | The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places – defined in the EPBC Act as Matters of National Environmental Significance (MNES). In addition, the EPBC Act confers jurisdiction over actions that have significant impact on the environment where the actions affect, or are taken on, Commonwealth land, or are carried out by a Commonwealth agency (even if that significant impact is not on one of the nine matters of 'national environmental significance'). | There are no known MNES on the site.<br>No requirement for permit or approval identified. |
| Environmentally Hazardous Chemicals Act 1985 (OEH) | Regulates the disposal of wastes issued with a "chemical control order" and designated chemical and chemical wastes (including asbestos).<br>Disposal requirements for asbestos are identified under the Protection of the Environment Operations Act 1997 (POEO)<br>Other chemical wastes designated under this act are: | Clearance, transport and disposal of designated chemical wastes must be completed under appropriate licences.<br>Chemical wastes designated under this Act to be removed from this site must be transported and disposed of by appropriately licensed waste transport contractors to a facility lawfully able to accept that type of waste. |

| Legislation / Policy (Administering Authority) | Summary of Legislation Requirements | Approvals/Permits or Licences Required |
|---|---|---|
| | • Aluminium smelter wastes containing fluoride or cyanide<br>• Dioxin contaminated waste materials<br>• Organotin waste materials<br>• Polychlorinated Biphenyl Compounds (PCB)<br>• Scheduled chemical wastes | |
| Heritage Act 1977 (OEH) | Protects all items of environmental heritage (natural and cultural) in NSW. The Act does not apply to Aboriginal "relics". | The site is not listed as a heritage item. |
| Local Government Act 1993 | Controls environmental impacts including noise, pollution and nuisance not controlled under the POEO Act.<br>Provides for licensing of trade waste discharges, in conjunction with the *Liquid Trade Waste Guidelines*. | Approval required, as appropriate. |
| National Parks and Wildlife Act 1974 | Provides protection for most fauna species and protected flora. Provides protection for indigenous heritage in NSW.<br>It is an offence: to harm animal which is part of a threatened species, population or ecological community; to pick any plant which is part of a threatened species, population or ecological community.<br>It is also an offence if a person knows that an area of land is the habitat of a threatened species, population or ecological community, to do something or fail to do something that causes damage to that habitat. | There are no threatened species which have been identified.<br>The potential for indigenous artefacts, based on the former site use as landfill, considered low. |
| Noxious Weeds Act 1993 (NSW Department of Primary Industries) | Provides for the identification, classification and control of noxious weeds in NSW.<br>Applies to the management and disposal of noxious weeds if found and removed during works. | No approvals required. |
| Protection of the Environment Operations Act 1997 (OEH) | Environment protection licences are required for scheduled activities.<br>Provides for the control of polluting activities in NSW to prevent pollution to the environment.<br>Provides a duty to notify OEH of any environmental harm from site activities.<br>Waste Classification is required prior to the removal of waste (including fill/soil) form a site to establish the appropriate means of disposal. | No requirement for an Environment Protection Licence identified for scheduled activities. However, control measures must be established on site to ensure that there are no uncontrolled discharges to water, sediments or air during the construction works.<br>Waste classification assessment and waste classification certificates (produced by a qualified environmental assessor) are required prior to disposal and are required to accompany all waste soils materials being transported to waste facilities that are licenced by the EPA to accept the respective class of waste. |

| Legislation / Policy (Administering Authority) | Summary of Legislation Requirements | Approvals/Permits or Licences Required |
|---|---|---|
| | | Transport contractors must be appropriately licensed to transport the class of waste they are carrying.<br><br>EPA is the appropriate regulatory authority for the works. |
| Soil Conservation Act 1938 (OEH) | Controls activities causing or likely to cause soil erosion or land degradation.<br>Project activities must prevent soil erosion or land degradation. | No requirements for permit or approval or licence identified. |
| Threatened Species Conservation Act 1995 (OEH) | This Act protects vulnerable and threated species, populations and ecological communities. | No requirements for permit or licence identified. |
| CCB Local Environmental Plan 2013 | Provides detailed implementation of development requirements, including where particular typed of development are permitted with or without consent.<br>Identifies items of local heritage value and trees which require preservation. | Consideration must be given to the potential to disturb acid sulfate soils when conducting excavations for foundations and services associated with the AB and ST.<br>Whilst the proposal does include the removal of trees, they are not subject to preservation orders and will be replaced with native species as part of proposed landscaping works. |
| Waste Avoidance and Resource Recovery Act 2001 (OEH) | Promotes the waste management hierarchy (avoidance, resource recovery, and disposal). | No requirement for permit or approval or licence identified.<br>Where possible, excavated material is to be reused onsite. |
| Waste Management Act 2000 (NSW Office of Water) | Controls water use for excavation activities and in areas of groundwater management. | It is considered unlikely that groundwater will intrude into excavations; however, a temporary licence may be required if excavations require dewatering during works. |

Notwithstanding the above, all environmental investigation or waste classification works must be conducted in accordance with guidelines made or endorsed by Environmental Protection Authority (EPA) under Section 105 of the CLM Act 1997.

It is also understood that any works will be managed in accordance with CCB's policies and procedures.

Work which involves removal of asbestos containing material may require the presence of a licenced asbestos removalist in accordance with the Safe Work Australia (2011) How to Safely Remove Asbestos Code of Practice and Safe Work Australia (2011) How to Manage and Control Asbestos in the Workplace. A licenced asbestos removalist must notify SafeWork NSW in writing at least five days before licenced asbestos removal work commences.

This CEMP has been prepared in accordance with the relevant legislation and industry standards, with particular reference to the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) Guideline for the Preparation of Environmental Management Plans (2004).

# 3. Site Condition and Environmental Setting

## 3.1 Site Identification

The site location is shown on Figure 1, Appendix A. The project site identification and land use details are provided in Table 3.1.

**Table 3.1 Site Identification**

| Title | Details |
|---|---|
| Street Address | Majors Bay Reserve, Norman Street, Concord NSW 2137 |
| Current Description | Part of Lot 1 DP909052, Lot 1 DP327309 and Lot 6 DP217073 |
| Proposed Development | Construction of a full sized synthetic soccer pitch (Stage 1) and half sized training field with associated amenities building and service trench (Stage 2).<br>Refer to Figures in Appendix A |
| Site Ownership | Crown / City of Canada Bay |
| Property Size | The Project footprint comprises the following:<br>• Synthetic Sports Pitch (SSP) and half sized training field (HSTF) – approximately 15,640m2<br>• Amenities Building (AB) – approximately 450m2<br>• Services Trench (ST) for Amenities Building – approximately 500m2 (100m long x 5m wide) |
| Local Government Area | City of Canada Bay |
| Zoning | RE1 Public Recreation LEP 2013 |

## 3.2 Surrounding Land Use and Sensitive Environments

The site is located at the eastern edge of Majors Bay Reserve. Immediately adjoining land uses are described as follows:

**Table 3.2 Site Surrounds**

| Direction | Details |
|---|---|
| North: | Majors Bay Reserve beyond which lies Majors Bay |
| East: | Norman Street beyond which lies residential properties |
| South: | Norman Street beyond which lies Concord Golf Club |
| West: | Majors Bay Reserve beyond which lies Concord RSL |

## 3.3 Previous Investigation Works

The following previous environmental investigations were conducted at the site:

- Geotechnique Pty Limited (Geotechnique) (8 October 2015) Geotechnical Investigation (GI), Majors Bay Reserve, Sid Richards Playing Fields, Norman Street, Concord (Ref: 13537/1-AA-R1);

- Milestone (Aust) Pty Limited (Milestone) (4 April 2016) Statement of Environmental Effects (SEE) Provision for a Single Additional Outdoor Playing Field and Upgrade of Outdoor Light Poles and Floodlighting at Sid Richards Playing Fields, Majors Bay Reserve, Concord; and
- Zoic (August 2016) Targeted Stage 2 Soil Investigation (TSI) for Lighting Upgrade Project, Majors Bay Reserve, Nullawarra Avenue, Concord NSW (Ref: Z16023).

The following table provides a summary of the previous investigation reports:

**Table 3.3 Summary of Previous Investigation Reports**

| Report | Summary (Objectives, Scope of Work, Key Findings) |
|---|---|
| Geotechnique (2015) GI | The GI was conducted across a wider area that included the Project site.<br>The objective of the GI was to determine subsurface conditions and geotechnical recommendations to facilitate design of footings for the proposed lighting upgrade.<br>The scope of works comprised:<br>• Reviewing available geological information relevant to the proposed development site.<br>• Carrying out a walk over survey to assess existing site conditions.<br>• Services search and scanning for buried services by a specialist subcontractor<br>• Drilling nine boreholes (BH1 to BH9) using a track mounted drilling rig. Boreholes were drilled to depths ranging from 4.2m to 7.2m.<br>• Preparation of engineering borehole logs.<br>• Conducting Standard Penetration Test (SPT) in the boreholes to assess strength characteristics of sub-surface soils.<br>• Excavating one test pit adjacent to the existing pole to assess type of footing and bearing material.<br>• Recovering representative soil samples for visual assessment and laboratory geotechnical tests.<br>• Measuring depths to groundwater level or seepage in the boreholes, where encountered.<br><br>The key findings of the GI in relation to this Project can be summarised as follows:<br>• Fill thickness varied between 2.3 and 5m, and comprised silty clay, medium plasticity, brown, black, with fine to coarse grained sandstone gravel, cobbles, boulders, pieces of timber, plastic etc sandy silt, low plasticity, black, with fine to coarse grained gravel. 'Rubbish' was noted in the logs.<br>• Natural ground comprised Clayey Sand, medium grained, grey-brown Sandy Clay, medium plasticity, brown, mottled yellow, with fine grained, sandstone gravel.<br>• Weathered medium grained sandstone bedrock was encountered in three boreholes between 4 and 5mbgl.<br>• The deepest fill was encountered in the northern part of the site, closest to Majors Bay (i.e. off site), with fill thickness reducing to 2.3mbgl towards the south close to Norman Street (i.e. on site).<br>• Geotechnique concluded that the fill was likely to extend across Majors Bay Reserve and compaction was variable.<br>• Groundwater was encountered in most boreholes between 1.5m bgl (in the north) and 3.9m bgl (at the southern edge of the Oval). Groundwater was encountered mostly in the fill profile or at the fill and natural interface.<br>• A review of borehole logs indicates that a PID was used to screen samples for volatiles with most readings <5ppm, and all readings <20ppm. |
| Milestone (2016) SEE | The SEE was prepared to support a DA for provision of a single additional outdoor playing field and an upgrade of light poles and floodlighting at Sid Richards playing fields (a larger area which included the Project site).<br>The SEE provided:<br>• An overview of the site and its context;<br>• A detailed description of the proposed development; |

| Report | Summary (Objectives, Scope of Work, Key Findings) |
|---|---|
| | • The planning framework; and<br>• An environmental assessment of the development.<br><br>The key findings of the SEE in relation to this Project can be summarised as follows:<br>• Threatened Species Conservation Act 1995: No requirements identified;<br>• CLM Act 1997: Section 35 Unhealthy Building Land "Contaminated by the prescribed activity of the disposal of chemical wastes, namely wastes, suspected of being dioxin contaminated, from the manufacture of pesticides";<br>• POEO Act 1997: No significant disturbance of the aforementioned wastes was proposed;<br>• Waste Avoidance and Resource Recovery Act 2001: Waste Management Plan (to be included in the Materials Management Plan) to be prepared and implemented for the works;<br>• SEPP (Infrastructure) 2007: Although not technically required, development consent was sought being the subject of the SEE;<br>• SEPP55 Remediation of Land: Proposals were not considered to alter previous conclusions regarding contamination at the site. A report prepared by Geotechnique (2015) concluded that the site is suitable for the proposed Lighting Upgrade Works subject to geotechnical recommendations made;<br>• SEPP (Sydney Harbour Catchment) 2005: Triggered the need for consideration under Part 4 of the EP&A Act 1979;<br>• Canada Bay Local Environmental Plan 2013: The Proposed Lighting Upgrade met the requirements for zoning and permissibility. No significant impacts in relation to height, heritage, terrestrial biodiversity or acid sulfate soils were identified;<br>• Canada Bay Development Control Plan 2013: No significant impacts were identified;<br>• EP&A Act 1979: Recommendations provided to manage Visual / Acoustic Amenity and requirement for Construction Management Plan (traffic, transport). No significant impacts identified with respect to heritage and socio economics; and<br>• EP&A Act 1979: The proposed land use was considered to be suitable for the site. |
| Zoic (2016) TSI | The TSI was conducted across a wider area which included the Project site.<br>The TSI had the following objectives:<br>• Satisfy Development Consent Condition DACCA03 regarding Investigation for Potential Contamination;<br>• Assess fill / soil conditions likely to be encountered during the future lighting upgrade works; and<br>• If contamination is identified, outline control and management measures to be implemented during the completion of the works such that disturbance and migration of soils is limited and to ensure the safety of workers and future users of the site.<br>The scope of work comprised:<br>• Drilling at 18 boreholes with a solid flight auger, targeting soils likely to be disturbed during upgrade works. Samples were collected from fill material;<br>• Laboratory Analysis of selected samples for contaminants of concern including total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), organochlorine pesticides (OCP), heavy metals, asbestos and dioxins;<br>• Selected testing of two samples for suspension peroxide oxidation combined acidity and sulfate (SPOCAS) to evaluate the potential for Acid Sulfate Soils;<br>• Assessment of results against NSW EPA endorsed human health criteria for open space/parkland (NEPM HIL Residential C, NEPM HSL Recreational/Open Space C (2013)), ecological protection guidelines for urban parks (NEPM ESL/EIL Urban Residential and Public Open Space (2013)); and<br>• Reporting of findings with recommendations in accordance with the NSW OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites.<br><br>The key findings of the TSI in relation to the Project can be summarised as follows: |

| Report | Summary (Objectives, Scope of Work, Key Findings) |
|---|---|
| | • Majors Bay Reserve has been extensively filled with material of unknown origin. Historical information indicated that dioxin-contaminated materials could have been used as filling at the site;<br>• BH3, 4, 5, 6, 14, 15 and 16 were formed in the vicinity of the proposed Synthetic Sports Pitch;<br>• Ground conditions comprised sandy clay or clayey sand with rubbish throughout to a maximum proven depth of 2m bgl;<br>• Elevated concentrations of total petroleum hydrocarbons, polycyclic aromatic hydrocarbons and some heavy metals were recorded in the fill materials<br>• Asbestos was observed locally within the fill materials, testing confirmed the presence of both non friable and friable forms of asbestos<br>• Concentrations of dioxins (composite samples BH1 / BH2 and BH9/BH10 which lie outside the Project site) were identified above background concentrations, confirming that dioxin-contaminated wastes were likely to have been used as fill at the site. However, concentrations are significantly lower than those that would be expected to pose a risk to human health;<br>• Acid sulfate soils may be present in deeper natural soils underlying the fill materials; and<br>• Volatile contaminants were not identified at elevated concentrations in soil. |

## 3.4 Site History and Environmental Setting

This information has been sourced from the reports listed in Section 3.3 above and supplemented by publically available information.

**Table 3.4 Summary of Site History and Environmental Setting**

| Item | Details |
|---|---|
| Summary of Aerial Photographs (both on and offsite): | Based on the review of historical photos, Majors Bay Reserve has been highly modified by historical filling of low lying swampland to allow urban and recreational uses.<br>Historical aerial photos for Majors Bay Reserve, which includes the site, indicated the following:<br>• 1933 – Majors Bay Reserve was densely vegetated land, which appeared to comprise mangroves. The Concord Golf Course and Dame Edith Walker Hospital were present. Surrounding properties appeared to predominantly comprise low density residential, or vacant land, with the Mortlake Gasworks present 500m to the east at Breakfast Point.<br>• 1943 – Less vegetated than the 1933 photo, possibly indicating minor filling activities. Dirt tracks across Majors Bay Reserve. Norman Street appears as a dirt road, with Nullawarra Avenue an established road. Residential dwellings starting to occupy land to the east and north.<br>• 1951 – The southern portion of Majors Bay Reserve appeared heavily vegetated, with the northern portion appearing as bare ground. Norman Street is an established road. A track is present west of the land now occupied by Concord RSL and Community Centre, running off Nullawarra Avenue.<br>• 1961 – Quality of image poor, but indicates disturbance along the foreshore of Majors Bay and redevelopment of former low lying land for commercial/industrial purposes.<br>• 1981 – Defined foreshore with the Bay, established grassed, levelled land with very little established/mature trees. Concord RSL and community centre present west of Majors Bay Reserve. |

| Item | Details |
|---|---|
| | • 1985 and 1986 – Established recreational facility with defined oval and sporting fields. Scattered vegetation.<br>• 1994 –No change since 1985 image, established recreational facility and vegetated foreshore.<br>• 2009 to current – No change since 1994, established recreational facility with vegetated areas and foreshore. |
| NSW EPA Records | A search of the POEO public register did not indicate any environment protection licences, licence applications or notices issued under the POEO Act or pollution studies or reduction programs for the site.<br>A search of NSW EPA contaminated land public register indicated the following:<br>• Two notices issued under Section 35 of the Environmentally Hazardous Chemicals (EHC) Act 1985 issued by the State Pollution Control Commission (SPCC) (now EPA).<br>• Former Notice 107 (dated 20 August 1987) indicates that for any works that would disturb land below 0.5m depth approval from SPCC is required. The notice states that the land has become contaminated by the disposal of dioxin-contaminated waste materials during the period of 1949 to 1971. This notice operated for 12 months.<br>• Current Notice 121 (dated 10 February 1989) indicates that the 'premises' is 'contaminated by the prescribed activity of the disposal of chemical wastes, namely wastes, suspected of being dioxin contaminated from the manufacture of pesticides; and deemed to be contaminated by reason of their being environmentally degraded.' The Notice requires that any work (be it reducing contamination, restoration or rehabilitation or removing/disposing of soil, rock, sand, water etc) disturbing land below a depth of 0.5m requires approval from the SPCC.<br>Correspondence from EPA dated 11 January 2019 states that the Notice issued under Section 35 of the EHC Act 1995 is continued in force under Schedule 2 of the CLM Act 1997.<br>The EPA stated that excavation below 0.5m depth can occur providing the following requirements are met:<br>• Works are conducted in accordance with a CEMP to be prepared, or reviewed and approved, by a certified consultant.<br>• Include the classification of excavated material (identified for offsite disposal) in accordance with current EPA guidance, included analysis of dioxins.<br>• Ensure any proposed reuse of excavated material onsite is appropriate in terms of potential risk to human health and the environment posed by residual contamination.<br>• Ensure appropriate public and work health and safety practices are implemented.<br>The EPA intends to review the regulation of the site under the EHC Act 1995 / CLM Act 1997. Options include reassessing contamination at the site under s12 of the CLM Act and/or issuing a notice under s28 of the CLM Act for ongoing maintenance of the land (s28 notices can be issued to the owner or occupier of the land). |
| Additional Information | Milestone (2015) SEE stated that, based on their searches, there are no Indigenous or European heritage items located onsite. The site is not located on or within proximity to any Conservation Area. |
| Geology and Soil Map Conditions: | Geological Map of Sydney (scale 1:100,000) indicates that the subsurface profile across the site includes manmade fill comprising dredged estuarine sand and mud, demolition rubble, industrial and household waste. |

| Item | Details |
|---|---|
| | Reference to the Soil Landscape Map of Sydney (scale 1:100,000) indicates that the landscape at the site has been extensively disturbed by human activities, including complete disturbance, removal or burial of natural soil with variable relief and slopes (Geotechnique 2015). |
| Acid Sulfate Soils: | The NSW Natural Resources Atlas for Prospect/Parramatta River, Acid Sulfate Soil Risk Map 1:25,000 (1992) indicates that the site is located on 'Disturbed terrain'. Disturbed terrain includes filled land as part of reclamation of low lying swampland for urban development. Investigations are required to determine potential for ASS.<br>Land further south west (occupied by Nirranda, Mepunga and Yaralla streets), is identified as having a low probability of ASS at depths >3m below surface.<br>Review of Council's LEP 2013, indicates that the site is Class 2 ASS. This requires development consent where works will occur below the natural ground surface, and where works result in the lowering of the water table. |
| Location of Fill Materials: | Investigation works conducted by Geotechnique (2015) and Zoic (2016), as summarised in Section 3.3, stated that fill of variable thickness occurs across the site as a whole.<br>This includes material described as 'rubbish' and silty clay, medium plasticity, brown, black, with fine to coarse grained sandstone gravel, cobbles, boulders. |
| Summary of Registered Bores: | In 2016, Zoic carried out a search of Department of Primary Industries Office of Water for registered wells in the vicinity of the site.<br>The search indicated that there was one registered well within a 500m radius of the site. This well is installed to a depth of 90m bgl, and is located on the golf course, across Norman Street. The water bearing zone targeted is within sandstone. The bore is most likely for irrigation purposes. It is noted on the drillers log that 'clay rubbish' was identified in the upper profile.<br>Based on Zoic's experience with the general area, there are other sites along the Mortlake peninsula that have monitoring wells installed, however, the purpose is for monitoring rather than for any beneficial use. Shallow groundwater is saline in the region. |
| Depth to Groundwater: | Based on the geotechnical investigation (Geotechnique, 2015), perched groundwater was encountered in fill material between 1.5m bgl in the north, and 3.9m bgl in the central part of Majors Bay Reserve. |
| Direction and Rate of Groundwater Flow: | Groundwater is expected to flow in a north easterly direction towards Majors Bay, which lies approximately 100m beyond the site boundary. Groundwater may be tidally influenced. |
| Direction of Surface Run Off: | Surface water is expected to follow the topography and internal drainage lines for Majors Bay Reserve. It is likely that the site drains towards Nullawarra Avenue, Norman Street (south west and south east respectively) and also towards Majors Bay (in the north). |

## 3.5 Potential Extent of Contamination

Reference should be made to the information presented in the existing reports for further detail, however, contamination at the site can be summarised in sections 3.5.1 to 3.5.3 inclusive.

During construction activities that involve excavation below the existing grassed site surface it is possible that workers may come into contact with the potentially contaminated media detailed below.

Management of future below ground works (and the associated environmental and health & safety risks) should take into consideration the information presented in this CEMP.

### 3.5.1 Potential Sources and Types of Contamination

Based on the review of site history, environmental setting and considering the proposed works, the potential source of contamination and associated contaminants of concern is as follows:

- Uncontrolled and historically placed fill present across the site ranging in thickness between 2.3m and 5m;
- Fill material is variable and contains waste material (referred to as rubbish). EPA records indicates that suspected dioxin impacted fill placed in the area;
- Contaminants of potential concern (COPC) include:
  - Heavy metals;
  - Total petroleum hydrocarbons (TPH);
  - Volatile organic hydrocarbons (VOC including BTEX)
  - Asbestos;
  - Dioxin;
  - Polycyclic aromatic hydrocarbons (PAH);
  - Polychlorinated biphenyls (PCB);
  - Organochlorine pesticides (OCP). (Organophosphate pesticides (OPP) are unlikely due to historical fill activities (>30 years) and OPP typically degrade within 24 months);
- Given the uncontrolled nature of filling, a potential exists for hazardous ground gases (including methane, carbon dioxide, carbon monoxide and hydrogen sulphide) to be present;
- Potential for acid sulfate soils at depth if natural ground under the water table, is disturbed, and brought to surface allowing for oxidation. A review of the Geotechnique (2015) logs indicate that ASS, if present, would occur >2mbgl.

### 3.5.2 Potential Migration Pathways

The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (i.e. solid / liquid and mobility characteristics);
- The extent of the contaminants (i.e. isolated or widespread);
- The location of the contaminants (i.e. on the site surface or at depth); and
- The topography, geology, hydrology and hydrogeology at the site.

Based on the information available to date, the following migration pathways may be associated with the site:

- If shallow fill is disturbed during the Project, workers and general public could be exposed to COPC identified above.
- If spoil generated is not removed from the site, or sufficiently remediated, capped or managed, there could be ongoing migration resulting in surface impact and runoff potentially causing a risk to human health and the environment.
- If volatile vapours or hazardous ground gases are identified, these may pose a potential risk to workers and the general public during construction and / or in the future.

However, in the context of the proposed works, the location and extent of potential disturbance of fill is likely to be minimal (as described in Sections 1.2 and 1.3), with works requiring reinstatement of any disturbed ground rendering it safe for continued public recreational use.

### 3.5.3 Potential Receptors

Potential receptors to COPC that may be present include the following:

- Construction workers on the site during the Project works;
- Recreational users of Majors Bay Reserve during the Project works;
- Future users of the site; and
- Future maintenance workers that may need to access service trenches;

Majors Bay lies approximately 100m beyond the northern site boundary at its closest point, however, if excavated soils are managed in accordance with this CEMP they are considered unlikely to adversely affect the surface water quality.

The closest residential receptor lies approximately 30m beyond the north eastern site boundary at its closest point. However, excavation works for the AB and ST lies at least 150m distance from this receptor and are considered unlikely to pose a significant risk if managed in accordance with this CEMP.

# 4. Environmental Management Activities and Controls

## 4.1 Impact Identification

A list of Environmental Aspect and Impacts has been prepared for the Project works and is available in Appendix B. The list outlines the anticipated major environmental aspects associated with the proposed works which have the potential to impact the surrounding environment. The list contains a risk assessment based approach to the risks identified, describes mitigation and management measures, and provides a residual risk rating based on implementation of the management measures. Upon identification of additional potential impacts, these documents will need to be updated accordingly.

## 4.2 Control Measures

Control measures to be implemented to address identified potential effects are included in the Project's Environmental Aspects and Impacts and Environmental Weekly Checklist (Appendix C). Relevant procedures will be followed by implementing the required control measures.

Specific requirements and all reasonable practical steps to reduce impacts regarding erosion and sediment, stockpiles, groundwater, contamination, waste, traffic, noise and vibration, flora and fauna, air quality, acid sulfate soils, asbestos, Aboriginal and non-Aboriginal heritage items, and external lighting are addressed in the following sections and the Environmental Aspects and Impacts list (Appendix B).

### 4.2.1 Erosion and Sediment Control

The Principal Contractor and Subcontractors must plan and carry out works to avoid erosion and prevent sediment leaving the site to the surrounding land, watercourses, water bodies, wetlands, and stormwater drainage systems. This includes the installation of erosion and sedimentation controls prior to commencing works. Where possible, works shall be staged to reduce the areas cleared at the time to minimise soil disturbance.

The construction zone of the site comprises of predominately grassed areas. As work progresses the ground surface and excavated material will be exposed to rainfall and flows. It is important to manage flows on site so that sediment laden water is not mobilised into existing or temporary stormwater drains or channels.

An Erosion and Sediment Control Plan (ESCP) must be prepared by the Principal Contractor prior to commencement of works. It is to be available at the site, and shall be communicated to all Project staff during induction processes.

The ESCP must identify specific site measures that control water quantity and reduce the potential for soil erosion, land degradation and impacts on water quality within the construction zone, including typical measures as follows:

- Silt fences to prevent sediment from entering adjoining land.
- Stormwater inlet filters comprising of gravel filled wire mesh or geotextile 'sausage'
- Geotextile pit filters and / or geotextile filter pit surrounds will maintain stormwater quality by preventing sediment from entering stormwater pits.

- Temporary construction vehicle exit providing a stabilised site access point comprising of a berm and timber or metal sleepers underlain by a gravel bed followed by geotextile fabric.
- The removal of mud from the wheels and bodies of plant and vehicles before it enters public roads or other sealed pavements. This could be rumble grids, dry brushing, wheel wash etc. depending on the nature and conditions of the site.
- The removal of mud or dirt spilt by construction equipment on to public roads or other sealed pavements.

The controls shall be inspected and approved by the Site HSE Officer prior to the commencement of works. The controls shall be maintained in good working order and inspected daily to ensure they are effective in controlling erosion and sedimentation. Accumulated sediment shall be removed and disposed of regularly, i.e. weekly and after rain events.

Works shall be undertaken in accordance with this Plan and be subject to review / update by the Project Manager as works progress (the ESCP is to be considered a working document). Specific details such as the sizing of diversion channels must be confirmed by the Principal Contractor prior to commencing works.

To further protect water quality, additional actions have been outlined in Appendix B.

A weekly checklist to be completed by the Site Manager is provided in Appendix C.

### 4.2.2 Soil and Stockpile Management

Where storage of material is required, stockpiles should be kept to a maximum of 2m in height and be situated in area of the site of relatively level ground with no intercepting surface water flow paths. Stockpiles are to be 2m clear of drainage lines, natural water courses and established trees. Stockpiles are to have temporary silt fences in place around the stockpiles to create an enclosure and if necessary they will be covered with a shade cloth or tarpaulin to retain the materials on the stockpile.

A Materials Management Plan (MMP) must be prepared by the Principal Contractor prior to commencement of works to document the handling, temporary storage, environmental controls and final emplacement requirements of excavated and imported materials. It is to be available at the site and will be communicated to all Project staff during induction processes.

The MMP must identify appropriate controls and requirements to ensure that road aggregate importation and reuse are compliant with The Recovered Aggregate Order (RAO) and Recovered Aggregate Exemptions (RAE) 2014. Some key considerations include:

<u>RRO (Responsibility of the Generator)</u>

- Section 1.1 states that the RRO does not apply if the asphalt is found to contain Coal Tar
- Section 4.1 requires preparation of a Sampling Analysis and Quality Plan (SAQP) to facilitate sampling and testing in accordance with the frequencies specified in Section 4.2 (generated by continuous process) and 4.3 (generated as one off batches), as appropriate. Requirements around data quality and interpretation of the results are also present. A procedure for describing the material must also be included to demonstrate compliance with Section 1.2 of the RRE (see below).

- Each sample must be analysed for 8 heavy metals, electrical conductivity, NSW Roads & Traffic Authority Test T276 Foreign Materials (includes metal, plaster, rubber, plastic, paper, cloth, paint, wood and other vegetable matter) as outlined in Table 1. Test methods must be in accordance with Sections 4.6 and 4.7.
- To meet EPA requirements, in addition to the above parameters, asbestos and coal tar must also be analysed.
- In relation to the above point, written confirmation should be sought from the EPA regarding what test methods and detection limits they would accept for asbestos and coal tar analysis as these are not specified in the RRO. This is particularly important for coal tar as any detection above this approved level will negate the reuse of the asphalt for CCB purposes.
- Sample results must meet the requirements outlined in Section 4.4 and 4.5
- Section 4.8 requires that a written statement of compliance must be supplied for each sampling event.
- Sections 4.9-4.11 require that the specified documentation / information must be kept for 6 years. EPA must be notified within 7 days after becoming aware of any contravention with Sections 4.1-4.7 of the RRO.

RRE (Responsibility of the Consumer)

- Section 1.1 states that the exemption applies to recovered aggregate that is intended to be applied to land for road making activities, building, landscaping and construction works.
- Section 1.2 states that recovered aggregate is material comprising concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory bricks associated materials or asphalt that contains coal tar.
- Section 7.1 states that the exemption only applies if, at the time the materials are delivered to the receiving site, all requirements of the RRO have been met.
- Section 7.2 outlines under what uses the exemption applies and also lists specific applications which are not permissible.
- Sections 7.3-7.5 requires that appropriate records are collected, supplied to EPA on request and that the material is used within a reasonable period after its receipt.
- Written confirmation should be sought from the EPA regarding what they consider to be a reasonable period of use after receipt of the material on site as this will be important when planning quantities to import to site and how long they can be stockpiled before application to land.

### 4.2.3 Groundwater

Proposed excavations only extend to 600mm below the existing site surface and are considered unlikely to encounter groundwater.

### 4.2.4 Contamination Management

No below ground excavation of the current playing field surface shall take place within the proposed footprint of the SSP. Consequently, no excavation into the underlying contamination (refer to Section 3 above) is anticipated.

With respect to SEPP 55 (1998) Remediation of Land, the use of the land as a playing field is currently suitable for the site and the proposed development of the SSP does not involve a change of use therefore contamination investigation is not considered to be required.

Below ground excavation is only required for proposed services associated with the AB and ST to a maximum depth of 600mm below existing levels. A change of use is proposed and DA will also be required. In accordance with SEPP 55 (1998) Remediation of Land, a contamination investigation shall be required in these areas of the Project site.

In support of the DA, the Principal Contractor must appoint a suitably qualified and experienced environmental consultant (i.e. Certified Environmental Practitioner – Soil Contamination or similar) to conduct testing for the proposed Amenity Building and associated Service Trench to confirm site suitability and waste management requirements. Key considerations for the investigation shall include:

- Combined PSI and DSI prepared in accordance with guidelines made or approved by NSW EPA
- Amenities Building: NSW EPA Sampling Design Guidelines requires a minimum of 5 investigation locations for an area of approximately 450m2
- Service Trench: NSW EPA Sampling Design Guidelines requires a minimum of 5 investigation locations for an area of approximately 500m2
- Where possible, test pits should be used as they will allow a better description of fill to be completed, particularly for asbestos
- 3no. of the locations should comprise landfill gas / groundwater wells and be installed within the proposed building development footprint (service trench / amenities building) to the base of filling / 2m below groundwater levels to allow sampling to be conducted.
- Contaminants of Potential Concern (COPC) shall include: heavy metals, TPH, VOC, SVOC, dioxins and asbestos
- Gas monitoring is required for methane, carbon dioxide, oxygen, carbon monoxide, hydrogen sulphide together with flow rate in accordance with NSW EPA (2012) Gas Guidelines
- Where volatile COPCs are detected in soils / groundwater then assessment of volatile vapour risks to the proposed building shall be required
- Waste Classification will be required for soils surplus to development requirements (include consideration of TCLP for metals and PAH). Consideration of chemical control orders, particularly with respect to dioxin shall also be required.
- The testing and management of acid sulfate soils shall be considered where excavations extend beneath the water table. Follow ASSMAC (1998) requirements.

On completion of the construction works, the Principal Contractor must appoint a suitably qualified and experienced environmental consultant (i.e. Certified Environmental Practitioner – Soil Contamination or similar) to prepare a Long Term Environmental Management Plan (LTEMP) to manage the residual contamination present across the Project site as a whole.

### 4.2.5 Spill Management

To prevent the possible contamination of the site with hydrocarbons during construction, several measures are to be implemented to reduce the risk of an oil / fuel spill:

- Dangerous goods (such as petrol, diesel, oxy-acetylene, oils, etc) shall be stored in a lockable compound with sufficient ventilation in accordance with the relevant codes of practice and standards.
- Safety Data Sheets on all flammable and potentially harmful liquids shall be provided by the contractor undertaking the works.

- A register shall be kept of all chemicals stored onsite.
- A Spill Response Procedure Flow Chart must be prepared by the Principal Contractor prior to storage of any dangerous goods or chemicals on site.

### 4.2.6 Water Quality and Storm Water Control

The Principal Contractor and Subcontractors shall comply with the requirements of Section 120 of the Protection of the Environment Operations Act 1997 – Prohibition of pollution of waters. The Act prohibits all forms of pollution unless specifically authorised through an Environmental Protection Licence (EPL). To address this, the following control measures shall be in place.

Potentially hazardous activities, including washing out of concrete delivery vehicles, washing down of construction plant are not permitted on site except in specially constructed bays that retain high pH water. Washing out of concrete delivery vehicles offsite is only permitted at locations approved for that purpose by the appropriate authority. Drains are to be labelled to reduce likelihood of misuse.

Washing of paint brushes must be managed via collection of the wash-water and removed from the site and appropriately treated and / or disposed. The chemicals, acids or residues from any "wet trades" such as brick cleaning must be prevented from entering drains and waterways.

All liquids and materials that could cause water pollution must be stored in areas with secondary containment.

In general, stormwater shall be managed onsite via ESCP (refer to Section 4.2.1). In the event of stormwater collecting in erosion and sediment controls and is required to be pumped out, the pump intake is to be located no more than one metre below the surface of the collected water to reduce the amount of settled silt being pumped out for further treatment. Discharge of stormwater to the stormwater system requires prior written consent from Council.

Stormwater treatment options shall be outlined in the ESCP.

If stormwater cannot be treated suitable to regulations, an appropriately licenced liquid waste contractor must be engaged and the stormwater collected and disposed of at a location lawfully able to receive that type of waste and receipt documentation must be recorded.

### 4.2.7 Waste Management Plan

As discussed in Section 4.2.2, a Materials Management Plan (MMP) must be prepared to manage importation of materials to site including road planning to be used as a foundation material for the SSP and AB. In addition, the MMP must also address management of excavated soils and general construction wastes. The investigation outlined in Section 4.2.4 will assist in this process for excavated soils.

The Principal Contractor and Subcontractors shall adopt the hierarchy of waste – avoid, reduce, recycle/reprocess and dispose, to maximise resource recovery and minimise disposal wherever possible and practical. The Project's target is to recycle as much waste as possible. The importance of appropriate waste management practices is to be included in the site induction.

For general waste and general recycling, bins shall to be provided onsite.

Any soils designated for offsite disposal must be classified in accordance with NSW EPA (2014) Waste Classification Guidelines, Part 1: Classifying Waste. Once classified, waste designated for offsite disposal must be taken to a facility lawfully allowed to receive that type of waste. Consideration of chemical control orders, particularly with respect to dioxin shall also be required.

The MMP must include an Unexpected Finds Protocols for contamination, details on air monitoring requirements and the approach for the removal of hazardous materials including asbestos. An example is provided in Appendix D, but this shall be modified to suit the findings of the proposed investigations and MMP requirements.

### 4.2.8 Construction Traffic Management

A Construction Traffic Management Plant (CTMP) shall be prepared for the site outlining how the Principal Contractor proposes to manage safety in regards to traffic during the external works and construction components of the Project. The CTMP should include provisions for:

- The safe movement of vehicular and pedestrian traffic;
- The protection of workers on the site and from passing traffic;
- Access to the property for delivery of material and movement of work vehicles located within the limits of the project;
- Design, construction, maintenance and removal of any necessary temporary roadways and detours;
- Traffic controllers;
- The installation of temporary signs, road markings, lighting and safety barriers;
- The proposed protection of pedestrians adjacent to the site; and
- The best route / road corridor for all work activities including the existing road and road shoulder that may be used for the temporary diversion of traffic.
- Defined traffic route through the local area to minimise the impact to surrounding residents.

### 4.2.9 Noise and Vibration Management

From an environmental viewpoint, noise can create a nuisance to neighbours, members of the public, fauna and is subject to legal requirements. The Principal Contractor and its Subcontractors shall make all practical efforts to comply with statutory requirements for noise management and minimise nuisance to neighbours.

A Construction Noise Management Plan (CNMP) shall be prepared for the site by the Principal Contractor. The CNMP must provide site specific recommendations for management of noise and vibration together with complaints management procedures.

### 4.2.10 Flora and Fauna Management

No sensitive flora and fauna have been identified at the site and no special precautions are required.

### 4.2.11 Bushfire and Flood Emergency Plan

The site is not susceptible to bush fire. Whilst flooding may occur at the southern end of the site, modelling has confirmed that the proposed development will have no adverse affect on the current site condition  and no special precautions are required

### 4.2.12 Air Quality

The Site Manager shall ensure that all construction facilities erected on the site and equipment associated with the works are designed and operated to minimise the emission of dust, plant and vehicle exhausts and other substances into the atmosphere.

The Principal Contractor and its Subcontractors shall employ construction methods that keep the air pollution to a minimum and apply measures as those listed below to ensure that airborne pollutants do not cause air pollution and nuisance in the vicinity of the works:

- The spraying of disturbed soil and roads with water while under construction, as required.
- Minimising exposed and disturbed soil areas.
- The provision of coverings or stabilisation of soil stockpiles.
- Covering all loads leaving the site.
- Stabilisation of ground likely to be exposed for significant periods (e.g. – using sterile seed).
- Fitting power tools with dust collection devices where practical.
- Keeping all plant and equipment well maintained and not leaving them idling while not being used.
- Reporting excess air emissions from plant and arranging for a service to fix the problem.

### 4.2.13 Acid Sulfate Soils

The works are only proposed to extend to 600mm below the current site surface and no special precautions regarding acid sulfate soils are required.

Field indicators of actual or potential ASS include the following:

- Dominance of mangroves / swamp / marine / estuarine environment
- Scalded or bare low lying areas
- Sulfurous smell
- Presence of shells in soil
- Yellowish / rust coloured staining in soil or water
- Unusually clear or milky blue-green drain water
- Erosion of concrete or steel
- Waterlogged soils, muds estuarine sands or sediments

Where the presence of ASS is suspected, **STOP WORKS** and arrange for appropriate investigation / management to be conducted by a Competent Person in accordance with ASSMAC (1998) to prevent environmental harm from occurring.

### 4.2.14 Asbestos

The presence of asbestos has been identified previously in fill materials underlying the site. An Asbestos Management Protocol (AMP) must be included in the MMP to be prepared by the Principal Contractor.

### 4.2.15 Aboriginal and Non-Aboriginal Heritage

The presence of aboriginal or non aboriginal heritage is considered unlikely due to the extensive filling that has occurred at the site. However, the following unexpected finds protocols are provided as a contingency measure.

Indigenous Heritage

Should any relic, artefact or material (including skeletal remains) suspected of being of Aboriginal origin be encountered, the Principal Contractor and Subcontractors must cease all construction work that might affect the relic, artefact or material and protect the relic, artefact or material from damage or disturbance. The Project Manager will notify CCB immediately, who will then provide further direction, as required.

Non-Indigenous Heritage

Should any item be encountered which is suspected to be a relic of heritage value, the Principal Contractor and Subcontractors must cease all construction work that might affect the item and protect the item from damage or disturbance. The Project Manager will notify CCB immediately, who will then provide further direction, as required.

A 'relic' means any deposit, object or material evidence:

- Which relates to the settlement of the area, not being aboriginal settlement; and
- Which are 50 or more years old.

### 4.2.16 External Lighting

External lighting will comply with AS 4282-1997 Control of the obtrusive effects of outdoor lighting.

## 4.3 Unexpected Finds

Residual hazards that may exist at the site would generally be expected to be detectable through visual or olfactory means. At this site, these types of hazards may include friable types of asbestos in soil and odorous or stained hydrocarbon impacted soils. The Project Manager is to maintain communication with the engaged specialist consultants to ensure the appropriate procedures are implemented.

An example is provided in Appendix D, but this shall be modified to suit the findings of the proposed investigations and MMP requirements.

# 5. Monitoring and Review

## 5.1 Environmental Monitoring Program

Requirements for environmental monitoring for the project are included in the Environmental Aspects and Impacts list (Appendix B). The monitoring program consists of: daily site inspections; weekly inspections, which are formally documented each week by using the Weekly Checklist (Appendix C); and specific monitoring carried out at agreed intervals or following major events, e.g. rainfall and vegetation clearing. The environmental monitoring program shall be the responsibility of the Site HSE Officer (or Project Manager Nominee), and include:

- Sufficient training of personnel.
- Arranging specialist consultants when required.
- Coordination of monitoring equipment and materials.
- Coordination of sample collection, documentation and delivery.
- Ensuring frequency and methodology is in accordance with all licences, permits, approvals, Australian Standards and any other industry standards.
- Data management and representation of results.
- Reporting non-conformances and implementing corrective actions.

Field data such as weather, air quality, and noise and water quality shall be recorded electronically where possible and transferred into monitoring results spreadsheets. Field data sheets shall be completed where required, and data input directly into monitoring results spreadsheets. In addition to measured parameter readings, the following information shall be recorded on Field Data sheets:

- Date
- Time
- Sampling point/location
- Name of sampler
- Laboratory analysis results will be filed electronically onsite.

### 5.1.1 Site Inspections

Environmental site inspections shall be undertaken by various project personnel to assess the adequacy and effectiveness of environmental controls. These inspections shall address the following as a minimum:

- High risk activities and processes.
- Work in environmentally sensitive areas.
- Site preparation for adverse weather conditions.

Responsibilities for environmental inspections on the Project are summarised below:

- Site staff shall conduct daily inspections of areas under their supervision, including assessment of environmental controls and issues. Daily inspections will be documented in Daily Diaries.

- Site supervisory staff / Site HSE Officer (or nominated person) shall conduct weekly inspections completing the Weekly Environmental Checklist. Environmental issues arising shall be immediately reported to the Site HSE Officer and Site Manager for rectification. Where required, issues may be entered into the Corrective Action Database.
- Any employee of the Principal Contractor or Subcontractor may raise an environmental issue through tool box talks or to any managing personnel.
- Safety, Environment and Quality Audits shall be performed by the Principal Contractors nominated HSE representative on a regular basis.

### 5.1.2 Auditing of CEMP

Audits of the CEMP shall be conducted regularly to ensure the Plan is appropriately in place and implemented. Audits must be undertaken by suitably experienced auditors.

Projects that have duration of more than six months shall have at least one audit of the CEMP, and after 6 months, shall be audited at least once per year. Projects with high risk activities or that performed poorly at the initial audit may be audited at a higher frequency. The Corporate HSE Manager is responsible for coordinating project audits.

A concluding environmental compliance audit must be undertaken at completion of the work under this Project. It shall include the following:

- Site surveillance/inspection.
- Full review of environmental records.
- Identification of any environmental protection measures and operational controls that have not yet been implemented to the levels identified in the associated plans.
- Recording of the condition of existing environmental protection controls.
- Identification of any environmental protection measures which require rectification and ongoing management.

## 5.2 Site Environmental Inspections

Site Environmental Inspections are to be undertaken weekly using the Weekly Environmental Checklist provided in Appendix C to ensure that environmental hazards are recognised and can be promptly rectified.

Additional environmental issues may be added to the Site HSE Inspection form, as required.

## 5.3 Monitoring of Project Environmental Activities

Objectives and Targets for the project are specified in Section 1.5. Data relating to these targets are to be documented daily using site diaries which are to be reviewed by Project / Site Managers on a monthly basis and forwarded to the Corporate HSE Manager for reporting to CCB Project Manager.

The KPI Monthly Report shall capture information on lag and lead indicators. The current indicators are:

Lag indicators:

- Number of environmental incidents.
- Number of Penalty Infringement Notices (PINs) or clean-up notices.
- Number of community complaints.

Lead Indicators:

- Number of toolbox talks (combined with WHS & include environmental issues)
- Number of environmental inspections undertaken.
- Waste and recycling volumes (initially to set benchmark then track improvement).

## 5.4 Review of CEMP

This CEMP must be reviewed by the Project Manager in consultation with the Site HSE Officer and the Corporate HSE Manager whenever any major changes occur on the site that may have an impact on the environment, or at least once during construction. Changes made to the plan are to be documented.

# 6. Environmental Incidents, Non-Conformance and Complaints

## 6.1 Environmental Incidents

An environmental incident may, amongst other things, include a fuel or hazardous material spillage / release; a major leak; failure of a pollution control device such as sediment controls; major noise and/or vibration affecting neighbours.

Any Environmental Incidents shall be immediately reported to the Site HSE Officer or Project Manager who will report the incident to the CCB Project Manager as per project requirements.

In the event of serious or material environmental harm, the Principal Contractor shall notify the CCB Project Manager and the relevant regulatory authorities in accordance with State / Commonwealth requirements. Where necessary, an agreed representative shall also notify the respective property owners or occupiers within 24 hours of the incident occurring.

An incident shall be reported if any of the following scenarios occur or have the potential to occur:

- Serious environmental harm.
- Material environmental harm.
- Prosecution by a regulatory authority.
- Environmental approval condition breach.
- Environmental monitoring parameter breach.

Incidents shall be reported both verbally and in writing. Additionally this information shall be forwarded to the CCB Project Manager. Verbal notification shall be provided immediately, and written notification will be forwarded to the CCB within 24 hrs of incident occurring. All incidents and accidents shall be recorded in an appropriate Incident and Accident Database.

All environmental incidents that cause, or could potentially cause environmental harm are to be investigated, and corrective actions implemented following the investigation. Depending on the seriousness of the incident, key site personnel, the Principal Contractors HSE Officer / Project Manager, witnesses etc. shall be consulted on the investigation and in determining appropriate corrective or preventive actions.

## 6.2 Preparedness

The key to effective prevention of incidents is risk assessment, procedure development, monitoring and training. During construction activities, the Principal Contractors inspections and preventive actions will include:

- Activity specific and daily risk assessments.
- Development of work procedures and construction method statements in consultation with relevant staff such as work teams, environment team members and senior management.
- Daily inspections of active work sites.
- Completion of routine environmental checklists.
- Issue and quick close-out of non-compliance notices.

- On-going environmental training.
- Environmental audits of work sites, Subcontractors and compliance issues.

Environmental and safety information on hazardous substances (e.g. MSDS) shall be available at the main site office and where such substances are stored. Environmental response procedures may be tested in areas where a pollution risk is present, such as those adjacent to waterways.

Personnel involved in emergency response activities shall be provided with specific training.

An up-to-date list of emergency response personnel and organisations shall be maintained at the site office and compounds.

## 6.3 Reporting

Site environmental incidents must be reported to the Project / Site Manager as soon as practically possible; in addition, any major environmental incidents must also be reported to the Principal Contractors HSE Manager. The first priority is to ensure that the situation is controlled as soon as possible, and to avoid further pollution or other adverse environmental consequences. Reporting of the incident shall not delay any immediate responses to the incident.

Environmental incidents that cause or threaten to cause material environmental harm must be reported to the Appropriate Regulatory Authority (ARA – which may include Council, EPA, Fire & Rescue, Minister for Health and SafeWork NSW) as soon as practicable following the incident. This would include any spillage or leak of substances that cause water or land pollution. Material environmental harm generally means harm that is not trivial and / or costs more than $10,000 to clean up.

If the Site Manager believes the incident may be reportable to the ARA, contact the HSE Manager for further advice prior to making an Investigation Report.

Incident reports must be completed and forwarded to the Corporate HSE Manager within 24 hours and must be kept for a minimum of 5 years.

In the event of an environmental emergency, the Principal Contractor must nominate a person that can be contacted 24 hours per day, seven days per week (e.g. Project Manager).

Emergency services contact details are as follows:

- Emergency Hotline: 000
- Ambulance: 000
- NSW Fire Service: 000
- NSW Police (Strathfield): (02) 9746 7084
- State Emergency Service (SES): 132 500
- WIRES (injured wildlife): 1300 094 737
- OEH Environmental Hotline: (02) 9995 5911

All onsite information relating to hazardous materials, including Safety Data Sheets and spill containment materials shall be kept at the site office.

## 6.4 Non-Conformance Reports (NCRs)

The Principal Contractor shall have a non-conformance and Corrective Action process in place to address all non- conformities across the business regardless of the source.

Typically, environmental non- conformances would result from audits and inspections, from observations by the Site Manager of poor environmental practices including incorrect waste disposal/recycling including liquid waste, poor storage of hazardous substances, oils, chemicals and damage to existing environmental controls such as sediments fencing. Non-conformances may be issued for serious breaches, or repeated minor breaches.

# 7. Environmental Control Documentation

## 7.1 Records

Where applicable, the Principal Contractor shall maintain the following records for the project, in legible format, in order to demonstrate compliance with the CEMP:

- The CEMP (all versions), supplementary plans and procedures.
- Internal and external Construction Environmental Management Systems and CEMP audit reports approvals, regulatory licences and permits.
- Regulatory authority inspection reports.
- Correspondence with regulatory authorities and other key stakeholders.
- Employee induction and training records.
- Environmental monitoring records.
- Monthly KPI reports
- Sediment control works checklist and release records.
- Environmental accidents/incidents/emergency reports.
- Non-conformance reports.
- Reports to regulatory bodies.
- Complaint records.
- Community involvement information.
- Waste records.
- Checklists and field sheets.
- Any relevant reports submitted to regulatory bodies.
- Management review minutes and action taken.

Records will be held for at least five years after the date of final completion and will be available to upon request by regulatory authorities.

## 7.2 Inspections and Checklists

Inspections and checklists to be completed are to be documented within each Sub Plan. The primary Environmental Weekly Checklist is available in Appendix C.

## 7.3 Availability

Environmental control documentation, monitoring results and other environmental records shall be made available to CCB Project Manager or any regulatory authority immediately upon request.

# 8. Communication

## 8.1 Complaints Management

CCB Project Manager will engage suitably trained and experienced Council personnel to be responsible for fielding stakeholder feedback and coordinating appropriate responses from the Project team.

The CCB Project Manager or other nominated Council personnel must prepare a Complaints Management Protocol commensurate for the scale of the Project.

Those responsible for undertaking complaints and feedback handling shall be equipped to respond promptly to concerns about construction impacts, including but not limited to noise, dust, and vehicle movements – notwithstanding proper conduct on the part of the Contractor to mitigate foreseeable impacts. Where required, enquiries and / or disputes about compensation and rectification will be escalated.

A complaints register shall be maintained by the Site HSE Officer with the following records for all complaints and enquiries:

- Date and time of complaint.
- The method by which the complaint was made (telephone, letter, meeting, etc.).
- Name, address, and contact telephone number of complainant (if no such details were provided, a note to that effect).
- Nature of complaint.
- Action taken in response including follow up of contact with the complainant.
- Any monitoring to confirm that the complaint has been satisfactorily resolved.
- If no action was taken, the reasons why no action was taken.

This process enables the management of receipt and response to issues and reports.

All project staff shall be advised of the procedures to be followed on receipt of a complaint during the project induction.

The Principal Contractor shall notify relevant authorities (e.g. CCB) upon the receipt of a complaint, and provide a final report within 5 working days detailing the action taken to remedy the situation and any proposed measures to prevent recurrence.

## 8.2 Internal Communication

- Essential information relating to project environmental management will be communicated through tool-box talks and inductions.
- Environmental alerts shall be periodically prepared and sent to sites for posting on notice boards.
- Key changes to environmental legislation shall be sent by email to all Project Managers and Site Managers.

## 8.3 External Communication

### 8.3.1 Regulatory Authorities

Communication with a range of Regulatory Authorities shall be undertaken throughout the Project. This communication shall be through the Project Manager. Any communication from a regulator must be notified to the Corporate HSE Manager, and records of all communications retained and appropriately filed.

The name and contact numbers for two site personnel who are available on a 24 hour basis and who have authority to take immediate action to shut down any activity or to effect any pollution control measure must be notified to CCB prior to commencement of the works

### 8.3.2 Media

All contact with the media must be through CCB Project Manager. Under no circumstances are Project staff to engage with the media.

# 9. Emergency Plan and Response

Prior to commencement of the Project, the Principal Contractor must prepare an Emergency Plan and Response.

Some examples of incidents / emergencies, impacts and contingency response measures are provided in the following table:

| Incident / Emergency | Potential Impact | Contingency Response Measures |
|---|---|---|
| Major Oil or Fuel or Chemical Spill<br>Major spills defined as a spill that is likely to have direct environmental consequences. | • Contamination of land or stormwater system.<br>• Contamination of soil.<br>• Prosecution. | • Immediately call the fire brigade and notify Site Manager<br>• All work to stop immediately in vicinity.<br>• Identify the source of the spill.<br>• Refer to the Material / Safety Data Sheet, MSDS / SDS and evaluate the hazards of the material.<br>• Spill response kits and equipment deployed if it is safe to do so.<br>• Use all available resources to contain and clean up spill.<br>• Contact additional consultants or Subcontractors if required.<br>• Notify relevant authorities and persons (Corporate HSE Manager, Site Manager & Project Manager, EPA).<br>• Implement incident reporting procedures. |
| Minor Site Spills<br>Minor spills defined as spills which can be contained and rectified correctly without the need of external services. | • Contamination of land or stormwater system.<br>• Contamination of soil.<br>• Prosecution. | • Stop work in the vicinity.<br>• If the material is dangerous, evacuate the site immediately and notify neighbours.<br>• If it is safe, halt the source of the spill immediately.<br>• Contain the spill with spill kits and control the flow.<br>• Block stormwater drains downstream of the spill.<br>• EPA and local Council must be notified about any spills that are likely to threaten the environment.<br>• Minor spills shall be contained and rectified with the site spill kit and disposed of correctly. Project Manager to be notified via incident report.<br>• Reported to the Site Manager. |

| Incident / Emergency | Potential Impact | Contingency Response Measures |
|---|---|---|
| Major Sediment Discharge<br>This could result from heavy rainstorm and flooding beyond the capacity of the sediment and erosion controls or a failure in the sedimentation control measures. | • Contamination of stormwater system.<br>• Risk to aquatic flora/fauna.<br>• Prosecution. | • All work to stop immediately in the vicinity.<br>• Reinstate controls if required.<br>• Install new controls if required.<br>• Apply flocculants if required.<br>• Commence clean-up activities.<br>• Contact additional consultants or Subcontractors if required.<br>• Notify relevant authorities (i.e. Council)<br>• Implement incident reporting procedures. |

At practical completion, the Principal Contractor shall ensure the site and surround, or any area which may have been used or impacted upon as a result of project-related works, is rehabilitated to a state equivalent or better in comparison to the pre-construction state.

# 10. Contacts

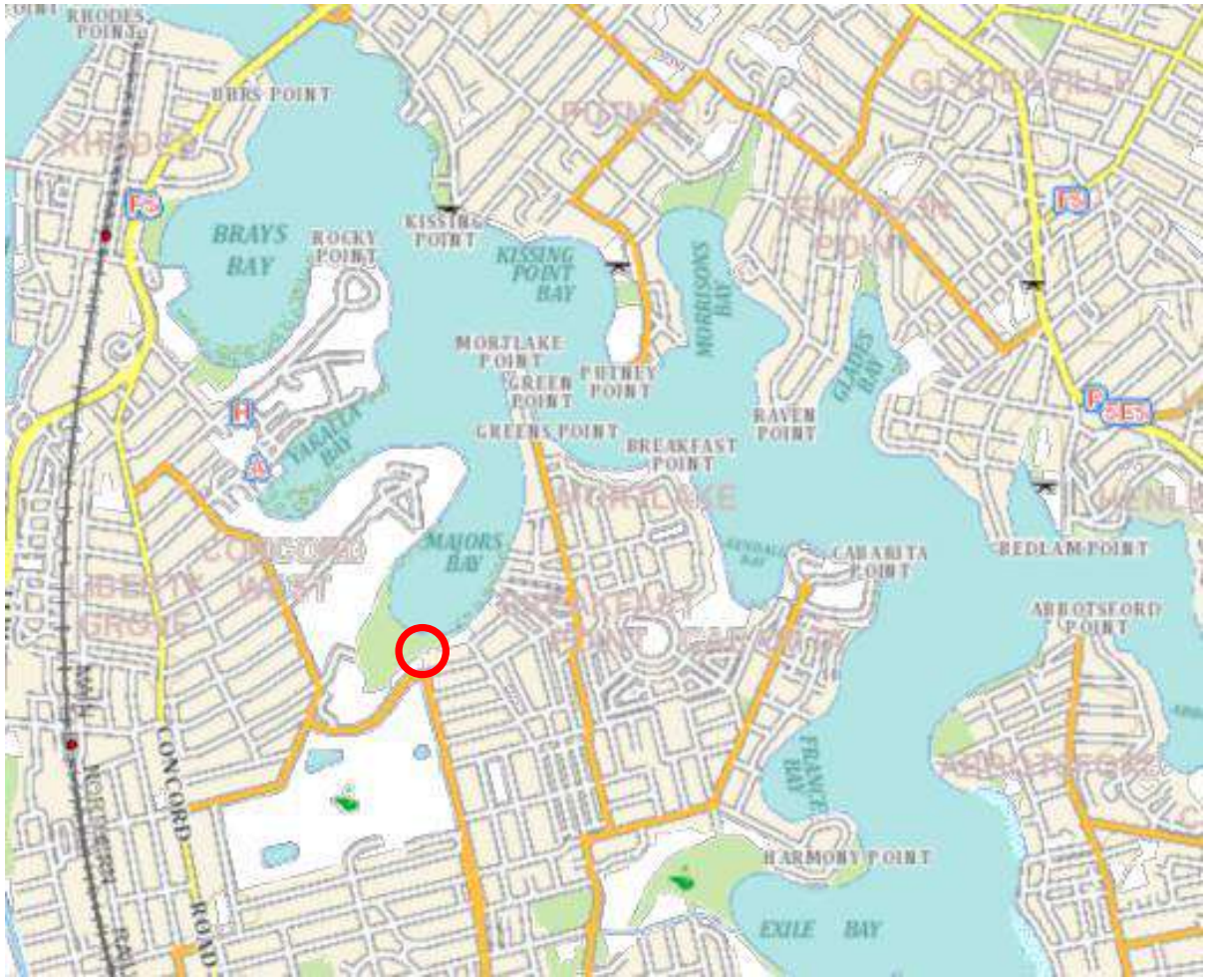
| Internal Contacts Position | Name | Contact Number |
|---|---|---|
| CCB Project Manager | Andrew Dimitriadis | 02 9911 6319 |
| Construction Manager | TBA | TBA |
| Project Manager | TBA | TBA |
| Site Manager | TBA | TBA |
| Corporate HSE Manager | TBA | TBA |
| Site HSE Officer | TBA | TBA |
| Project/Site Engineers | TBA | TBA |
| Contracts Administrator | TBA | TBA |

| External Contacts Position | Name | Contact Number |
|---|---|---|
| Emergency Services | Police/Fire/Ambulance | 000 |
| Poisons Info Line | TBA | 13 11 26 |
| EPA Hotline | TBA | 131 555 |

# 11. References


- AS/NZS ISO 14001: Environmental Management Systems – Specifications with Guidance for Use
- AS 3480.4: Methods for Sampling and Analysis of Ambient Air
- AS 1940-2017 The Storage and Handling of Flammable and Combustible Liquids
- Canada Bay Local Environmental Plan 2013
- Contaminated Land Management Act 1997
- Environmental Planning and Assessment Act 1979
- Environmental Protection and Biodiversity Conservation Act 1999
- Environmentally Hazardous Chemicals Act 1985 (OEH)
- Heritage Act 1977 (OEH)
- IECA Best Practice Erosion and Sediment Control Guidelines 2008.
- Landcom, 2008, The Blue Book – Managing Urban Stormwater: Soils and Construction.
- Local Government Act 1993
- NEPC Assessment of Contaminated Sites Measure 2013.
- NSW EPA (2014) Waste Classification Guidelines, Part 1: Classifying Waste
- Protection of the Environment Operations Act 1997 (OEH)
- SEPP 55 (1998) Remediation of Land (OEH)
- Soil Conservation Act 1938 (OEH)
- Waste Avoidance and Resource Recovery Act 2001 (OEH)
- Waste Management Act 2000 (NSW Office of Water)

# Appendix A Figures




N

**LEGEND**

Site Location

This product has been created to support the main report and is not suitable for other purposes. Image courtesy of Google Maps.

Not to Scale

Figure 1: Site Location Plan

Site Address: Syd Richards Playing Field 3, Majors Bay Reserve, Concord NSW 2137

Client: City of Canada Bay

Job Number: 19005

Date: January 2019

ZOIC


N

**LEGEND**

Site Location

This product has been created to support the main report and is not suitable for other purposes. Image courtesy of Google Maps.

0m 45m

Scale indicative only

## Figure 2: Site Layout

Site Address: Syd Richards Playing Field 3, Majors Bay Reserve, Concord NSW 2137

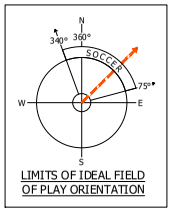
Client: City of Canada Bay

Job Number: 19005 | Date: January 2019

ZOIC

# MAJORS BAY RESERVE SYNTHETIC SOCCER PITCH - EARLY WORKS

## NORMAN STREET, CONCORD, NSW 2137



LIMITS OF IDEAL FIELD OF PLAY ORIENTATION

DRAWING SCHEDULE:

| | |
|---|---|
| F000 | COVER SHEET |
| F050 | EXISTING SITE LAYOUT PLAN |
| F100 | DEMOLITION PLAN |
| F150 | BULK EARTHWORKS LAYOUT PLAN |
| F200 | GENERAL ARRANGEMENT LAYOUT PLAN |
| F225 | SITE SETOUT |
| F300 | UNDERGROUND SERVICES LAYOUT PLAN |
| F600 | PAVEMENT PLAN |

LOCALITY PLAN - NORMAN STREET, CONCORD, NSW 2137

OVERALL SITE LAYOUT PLAN

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title: COVER SHEET

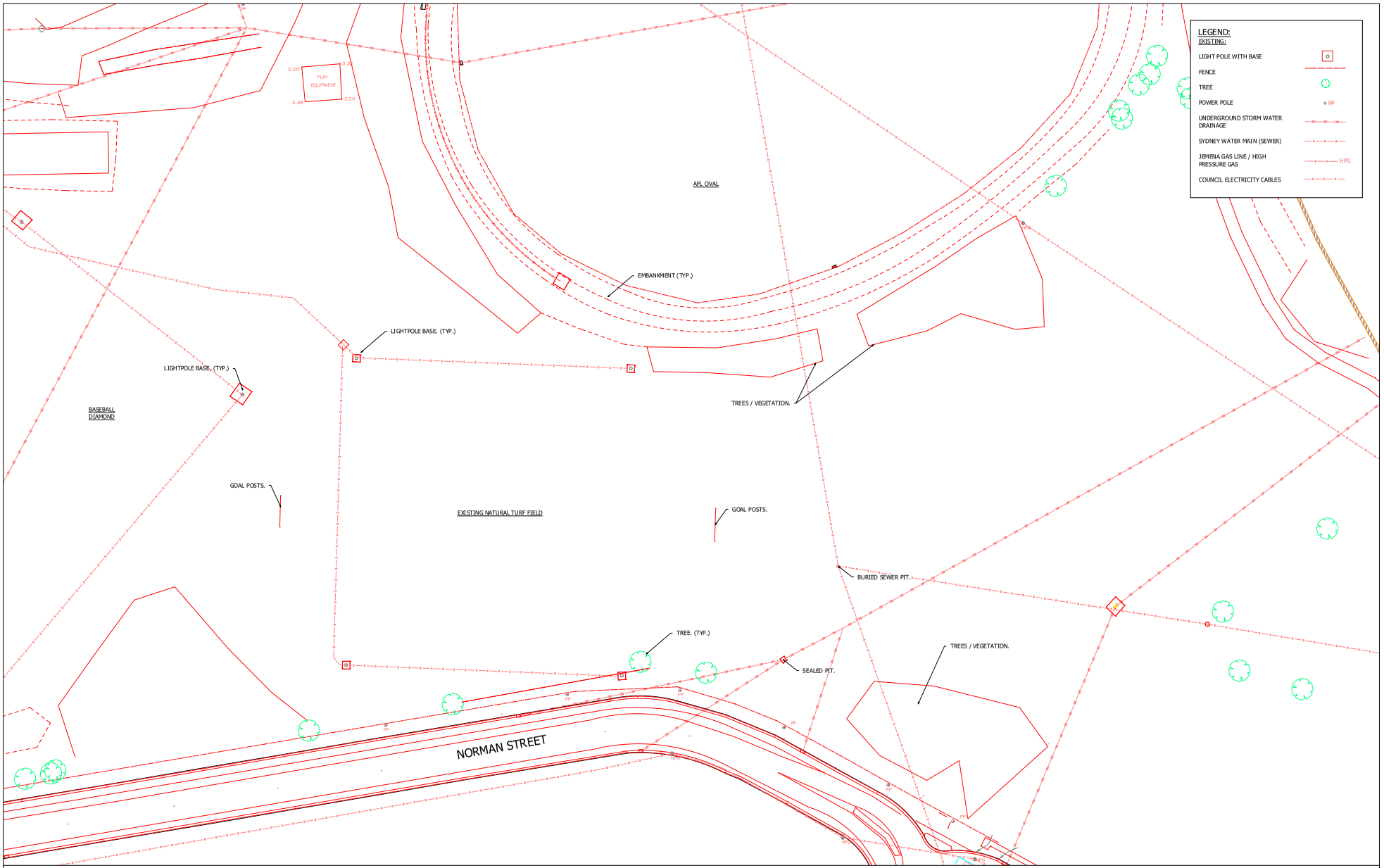
-

FIELD OF PLAY

PRELIMINARY

10332-00 | Drawing No: F000 - A | Issue: P3

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aelin\Sporting One drive\Sporting BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F000 - A.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title
EXISTING SITE LAYOUT PLAN

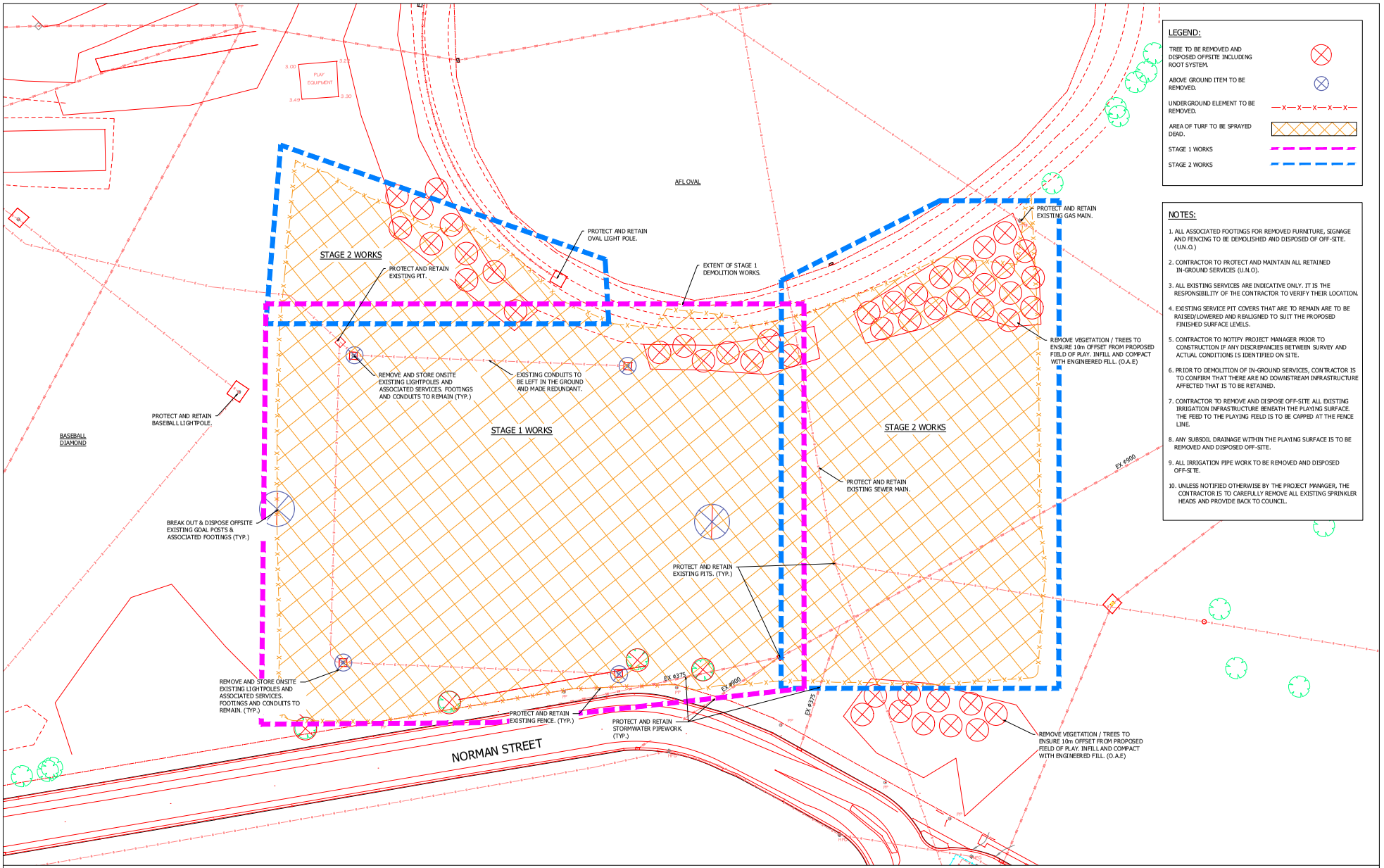
0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F050 - A | Issue P1 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\AdelaSportEng\OneDrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F050 - A.dwg




WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/18 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/18 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title

DEMOLITION PLAN

0 5m 10m 15m 20m 25m

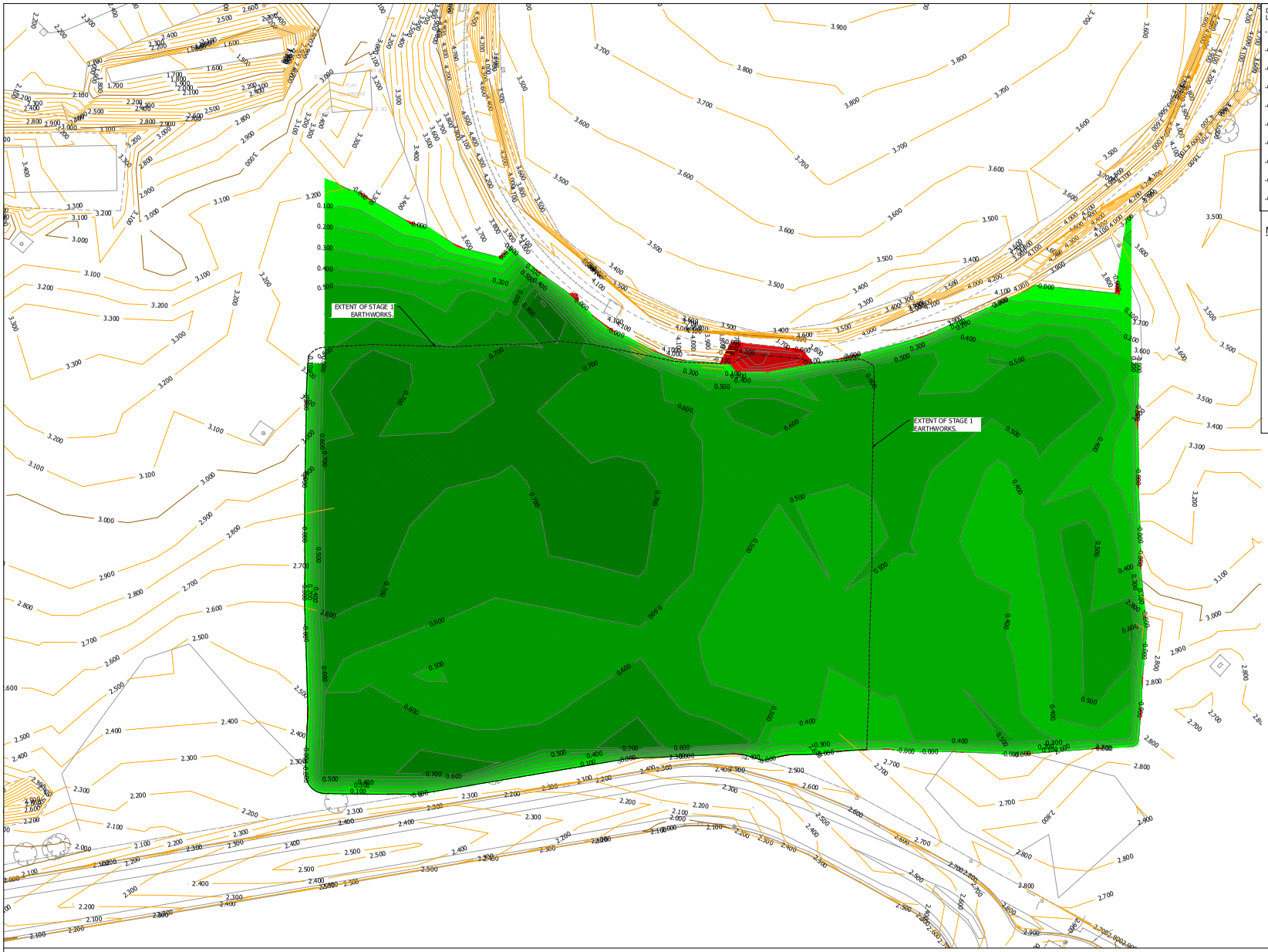
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

10332-00 | Drawing No F100 - A | Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aella\Sporteng\Onedrive\Sporteng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\L\0332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F100 - A.dwg




| DEPTH RANGE TABLE | | | | | Colour |
|---|---|---|---|---|---|
| Lower_value | | Upper_value | | | |
| -1.0 | to | -0.9 | m | | |
| -0.9 | to | -0.8 | m | | |
| -0.8 | to | -0.7 | m | | |
| -0.7 | to | -0.6 | m | | |
| -0.6 | to | -0.5 | m | | |
| -0.5 | to | -0.4 | m | | |
| -0.4 | to | -0.3 | m | | |
| -0.3 | to | -0.2 | m | | |
| -0.2 | to | -0.1 | m | | |
| -0.1 | to | 0.0 | m | | |

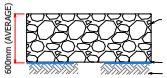
| DEPTH RANGE TABLE | | | | | Colour |
|---|---|---|---|---|---|
| Lower_value | | Upper_value | | | |
| 0.0 | to | 0.1 | m | | |
| 0.1 | to | 0.2 | m | | |
| 0.2 | to | 0.3 | m | | |
| 0.3 | to | 0.4 | m | | |
| 0.4 | to | 0.5 | m | | |
| 0.5 | to | 0.6 | m | | |
| 0.6 | to | 0.7 | m | | |
| 0.7 | to | 0.8 | m | | |
| 0.8 | to | 0.9 | m | | |
| 0.9 | to | 1.0 | m | | |

NOTES:

1. PRIOR TO COMMENCING EARTHWORKS, CONTRACTOR IS TO PROVE AND VERIFY ALL EXISTING SERVICES.
2. PROTECT ALL EXISTING SERVICES DURING EXCAVATION WORKS.
3. CONTRACTOR TO REVIEW PROJECT GEOTECHNICAL REPORT PRIOR TO COMMENCEMENT OF WORKS.
4. EARTHWORKS VOLUMES ARE CALCULATED BETWEEN THE EXISTING LEVELS AND THE FINISHED SURFACE LEVELS.
5. IMPORTED MATERIAL TO BE PLACED COMPACTED IN LIFTS NOT GREATED THAT 150mm. HOLD POINT BY COUNCIL.
6. MONITORING OF DIFFERENTIAL SETTLEMENT IN 10m x 10m GRID POST COMPLETION OF SYNTHETIC WORKS.

EARTHWORKS VOLUMES - STAGE 1 AND 2

| | |
|---|---|
| CUT | 16 $m^3$ |
| IMPORTED CRUSHED ROCK | 9265 $m^3$ |
| BALANCE | 9249 $m^3$ |




IMPORTED CRUSHED ROCK BASE (PLACED AND COMPACTED IN LIFTS NOT GREATER THAN 150mm)
NON-WOVEN GEOFABRIC.
PREPARED SURFACE.

IMPORTED CRUSHED ROCK PROFILE

**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title
BULK EARTHWORKS LAYOUT PLAN

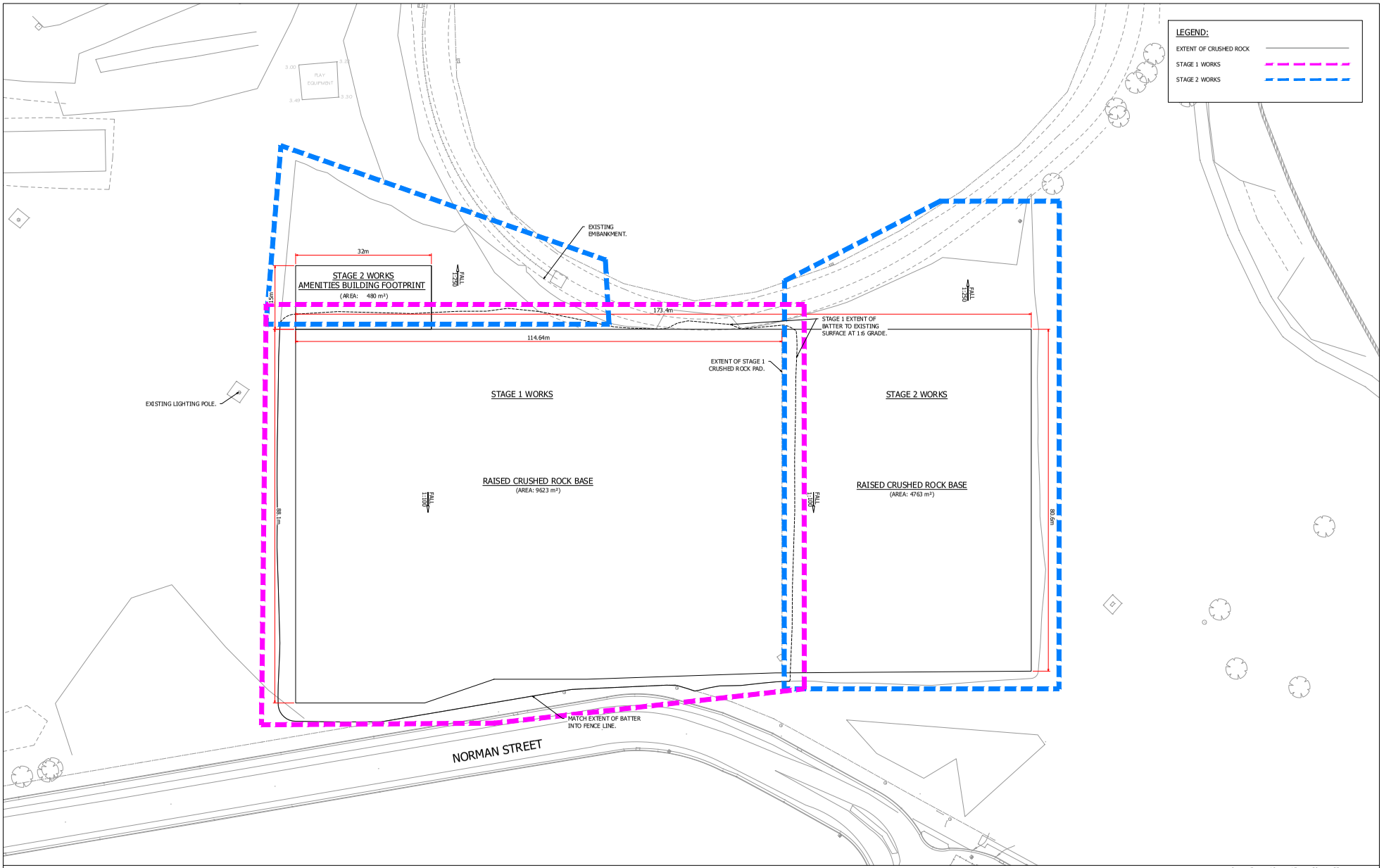
0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F150 - A | Issue P3 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Axella\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F150 - A.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title
GENERAL ARRANGEMENT LAYOUT PLAN

0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

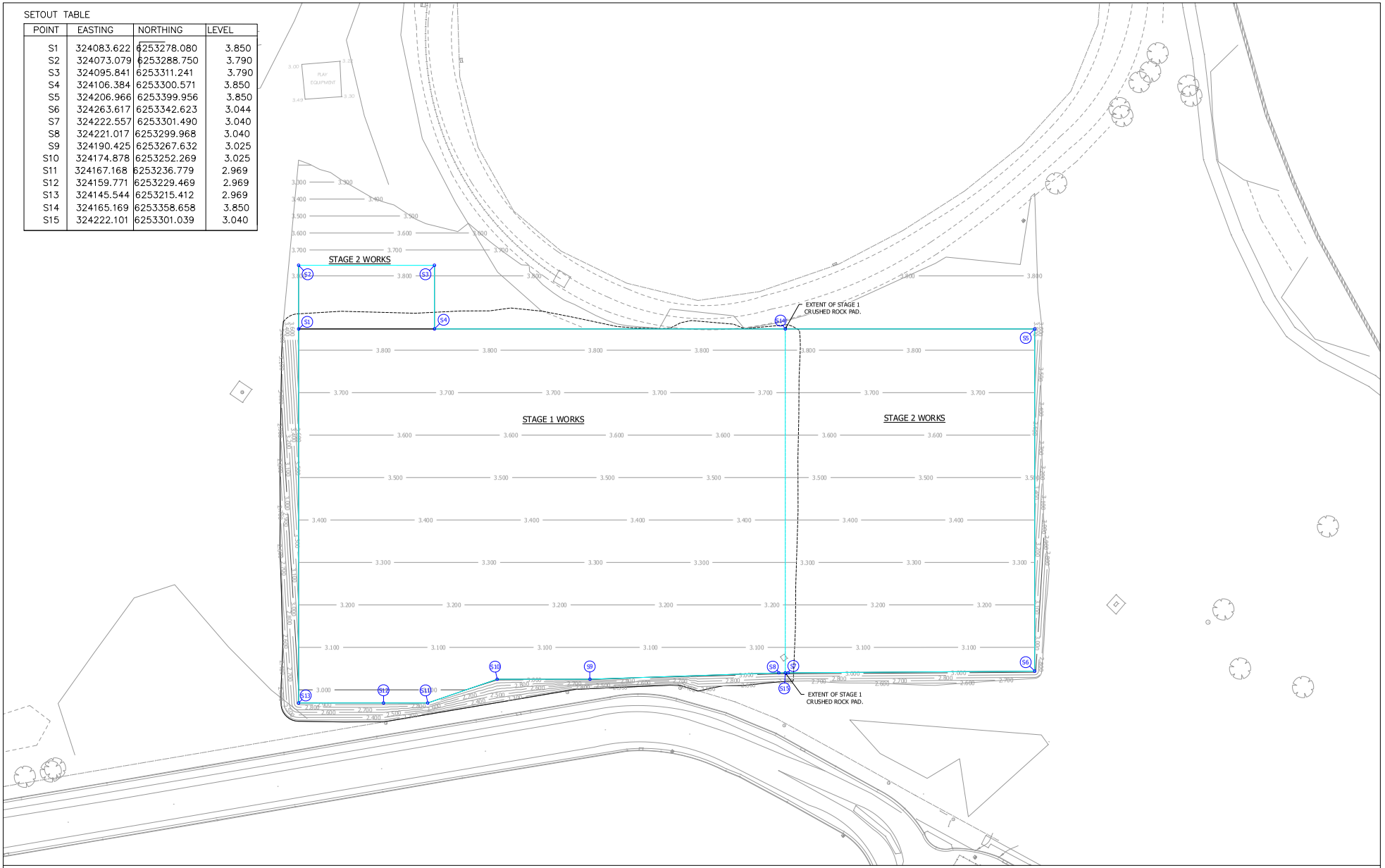
PRELIMINARY

| 10332-00 | Drawing No F200 - A | Issue P3 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\AellaSportEng\OneDrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F200 - A.dwg

SETOUT TABLE

| POINT | EASTING | NORTHING | LEVEL |
|---|---|---|---|
| S1 | 324083.622 | 6253278.080 | 3.850 |
| S2 | 324073.079 | 6253288.750 | 3.790 |
| S3 | 324095.841 | 6253311.241 | 3.790 |
| S4 | 324106.384 | 6253300.571 | 3.850 |
| S5 | 324206.966 | 6253399.956 | 3.850 |
| S6 | 324263.617 | 6253342.623 | 3.044 |
| S7 | 324222.557 | 6253301.490 | 3.040 |
| S8 | 324221.017 | 6253299.968 | 3.040 |
| S9 | 324190.425 | 6253267.632 | 3.025 |
| S10 | 324174.878 | 6253252.269 | 3.025 |
| S11 | 324167.168 | 6253236.779 | 2.969 |
| S12 | 324159.771 | 6253229.469 | 2.969 |
| S13 | 324145.544 | 6253215.412 | 2.969 |
| S14 | 324165.169 | 6253358.658 | 3.850 |
| S15 | 324222.101 | 6253301.039 | 3.040 |




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

N

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P2 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title
SITE SETOUT PLAN

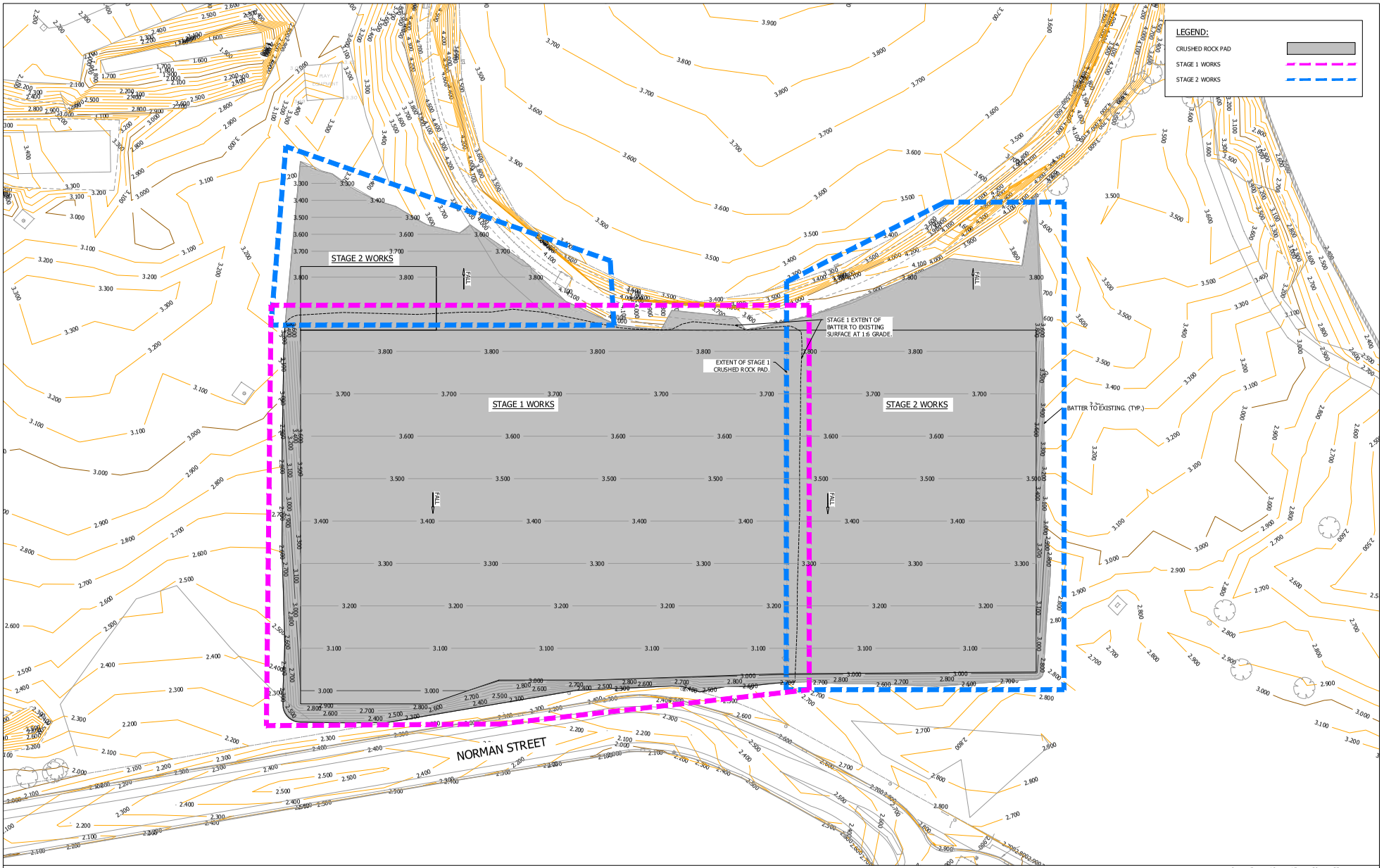
0 10m 50m
SCALE 1:1000 @ A1

FIELD OF PLAY

PRELIMINARY

10332-00 | Drawing No F225 - A | Issue P2

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aellul\SportEng\OneDrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFER\10.0332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F225 - A.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

**NOT FOR CONSTRUCTION**

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 22/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH - EARLY WORKS

Drawing Title
PAVEMENT PLAN

0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

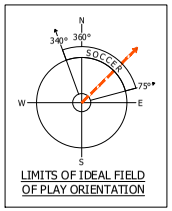
PRELIMINARY

10332-00 | Drawing No F600 - A | Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 4:59 PM FILE PATH: C:\Users\Aelia\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F600 - A.dwg

# MAJORS BAY RESERVE SYNTHETIC SOCCER PITCH

## NORMAN STREET, CONCORD, NSW 2137



LIMITS OF IDEAL FIELD OF PLAY ORIENTATION

DRAWING SCHEDULE:

| | |
|---|---|
| F000 | COVER SHEET |
| F050 | EXISTING SITE LAYOUT PLAN |
| F200 | GENERAL ARRANGEMENT LAYOUT PLAN |
| F300 | STORMWATER DRAINAGE LAYOUT PLAN |
| F600 | PAVEMENT PLAN |

LOCALITY PLAN - NORMAN STREET, CONCORD, NSW 2137

OVERALL SITE LAYOUT PLAN

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE SYNTHETIC TURF PITCH

Drawing Title
COVER SHEET

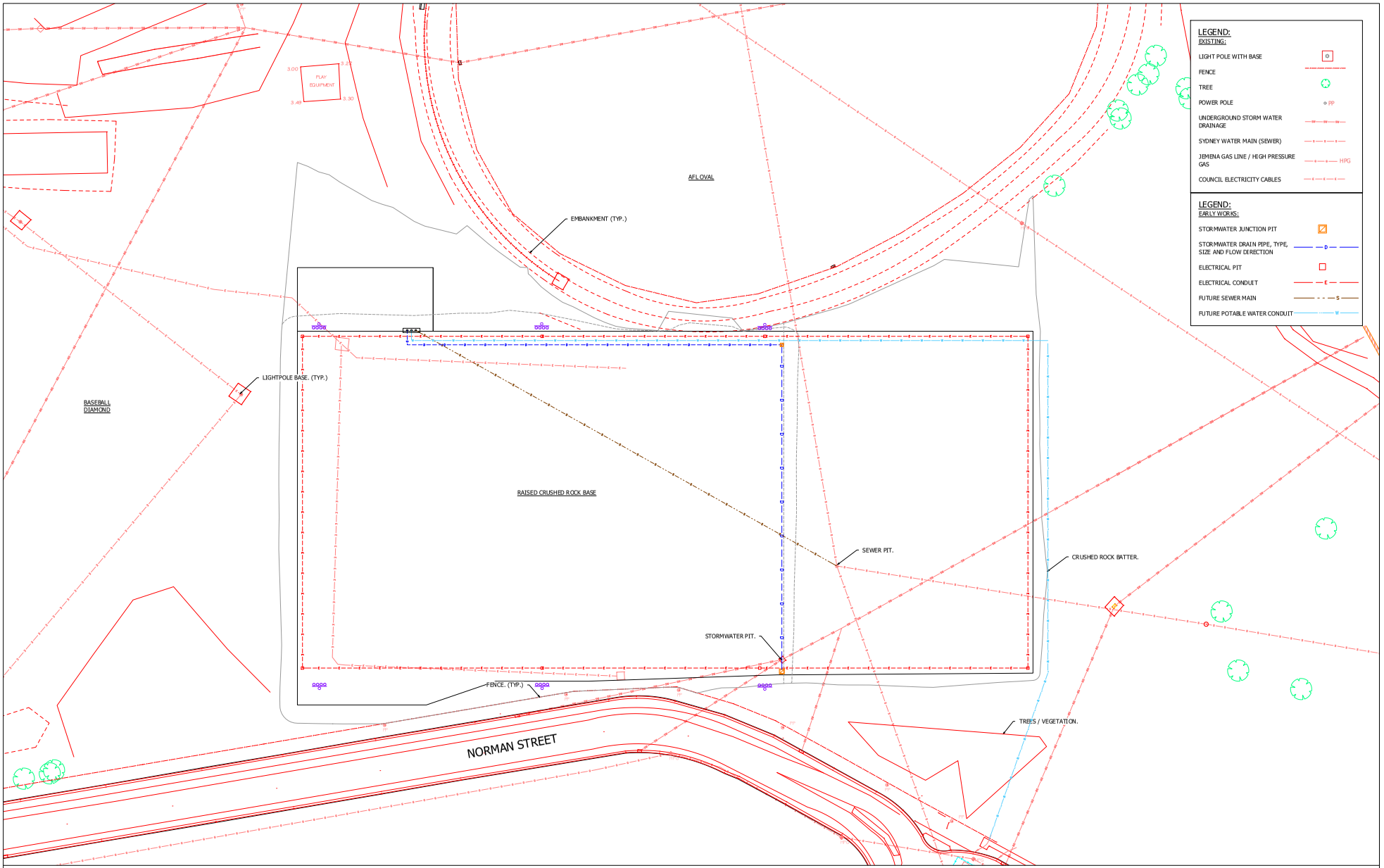
-

FIELD OF PLAY

PRELIMINARY

10332-00 | Drawing No F000 - B | Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 5:09 PM FILE PATH: C:\Users\Aelin\Sporteng\Onedrive\Sporteng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F000 - B.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
EXISTING SITE LAYOUT PLAN

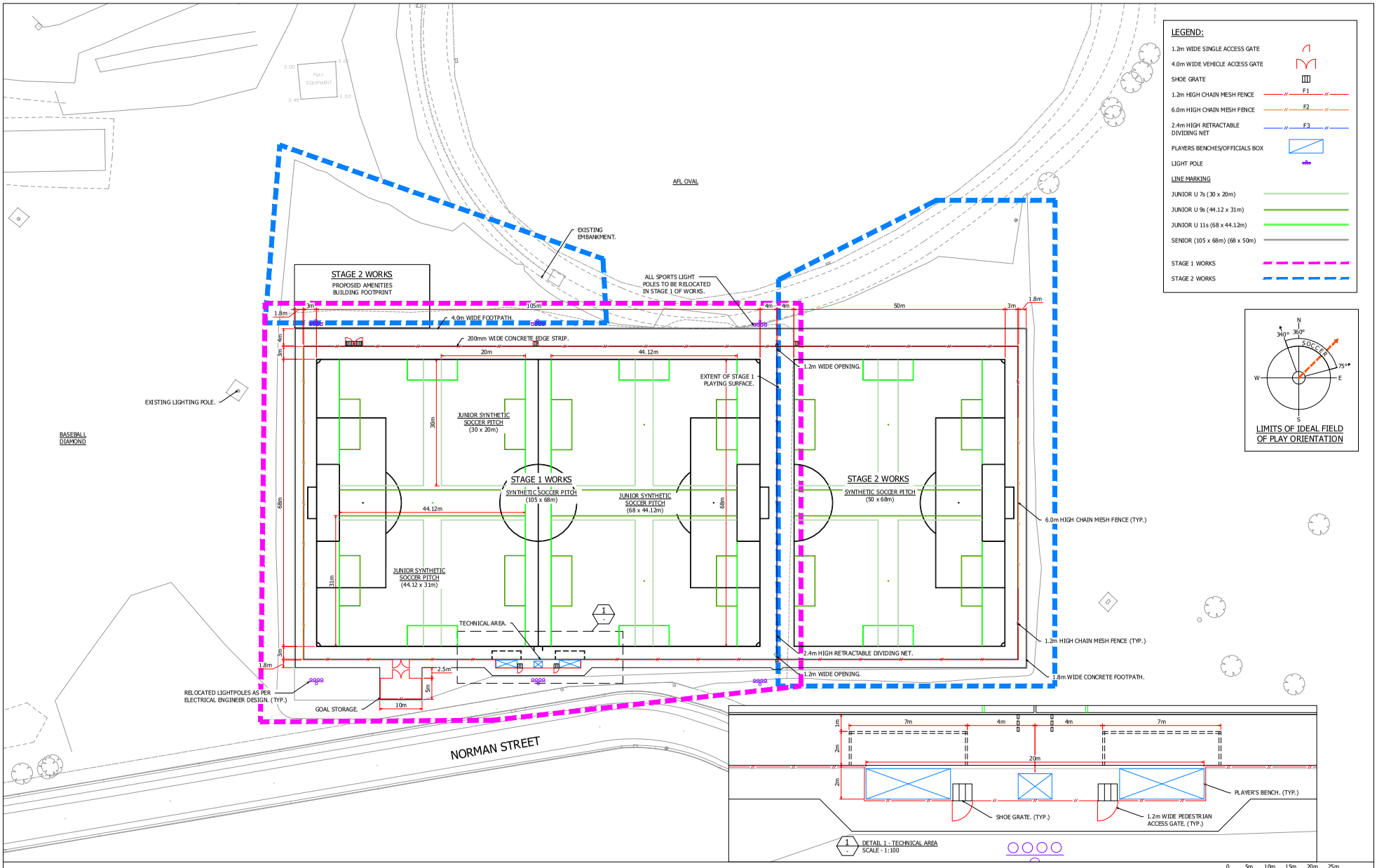
0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

10332-00 | Drawing No F050 - B | Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 5:09 PM FILE PATH: C:\Users\Aelia\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F050 - B.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
GENERAL ARRANGEMENT LAYOUT PLAN

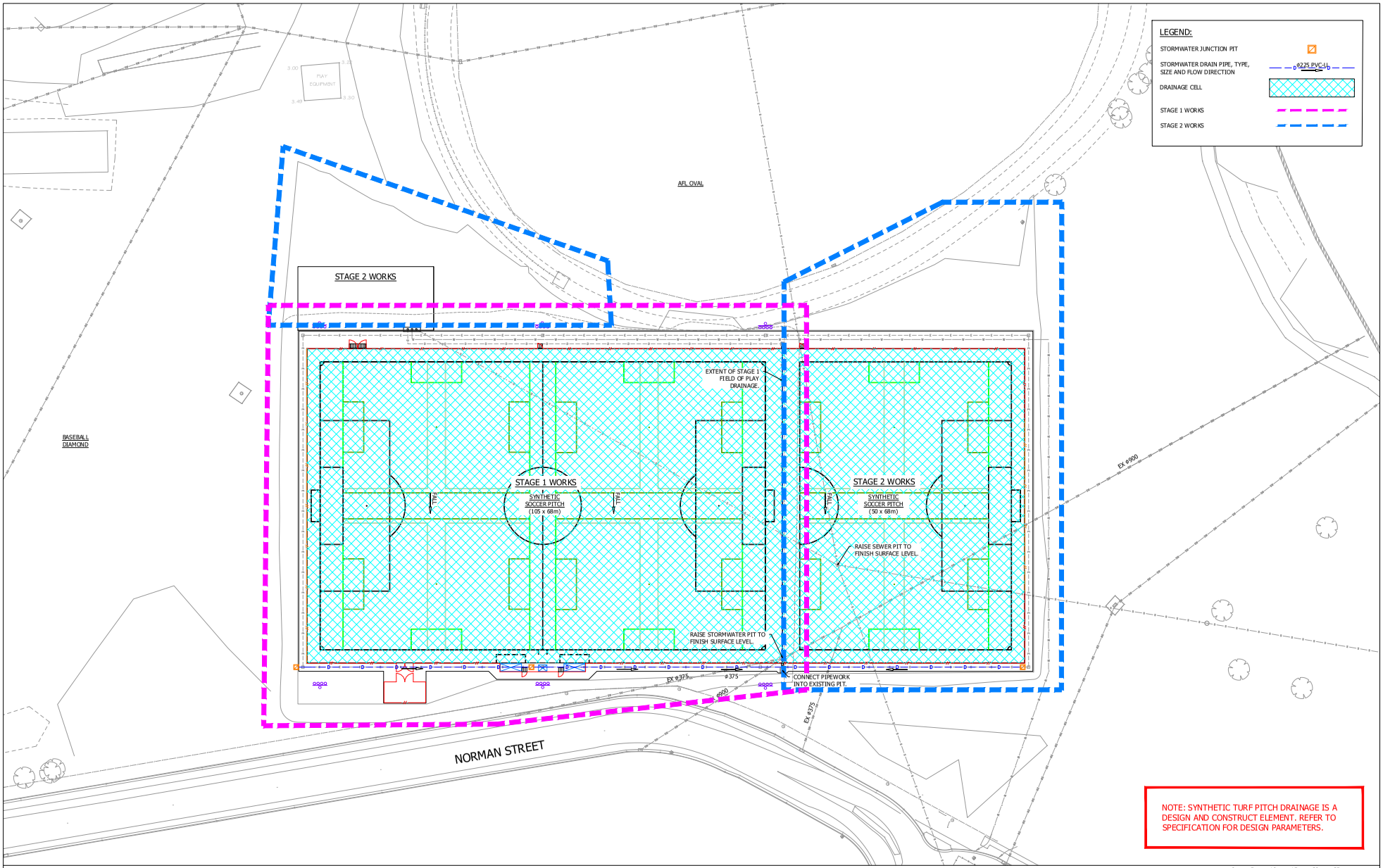
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F200 - B | Issue P3 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 5:13 PM FILE PATH: C:\Users\Aellar\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F200 - B.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
STORMWATER DRAINAGE LAYOUT PLAN

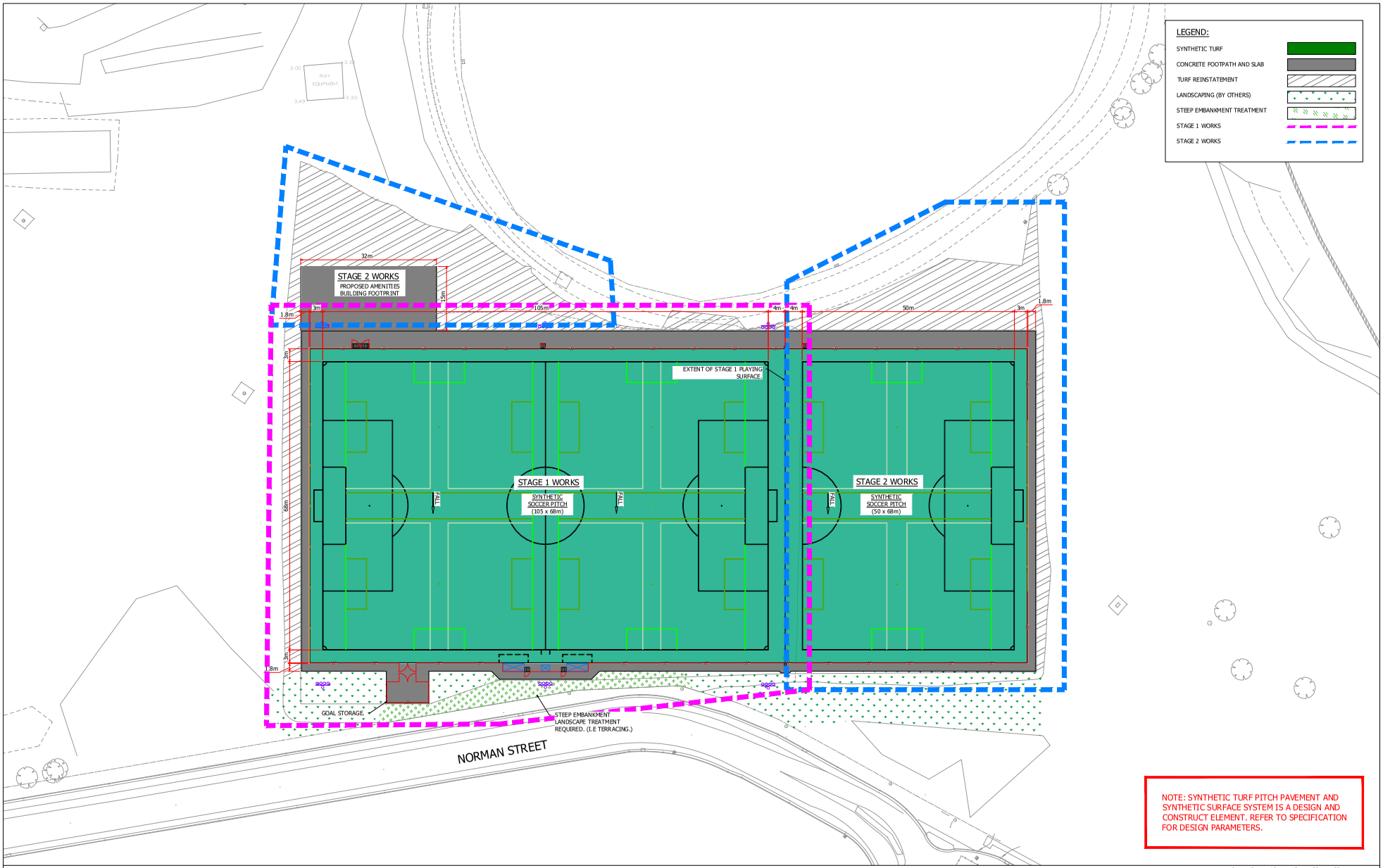
0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

| 10332-00 | Drawing No F300 - B | Issue P3 |
|---|---|---|

PLOT DATE: 27/02/2019 PLOT TIME: 5:09 PM FILE PATH: C:\Users\Aelia\SportEng\Onedrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F300 - B.dwg




**WARNING**

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATELY SHOWN ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

NOT FOR CONSTRUCTION

| Issue | Date | By | Chkd | Appd |
|---|---|---|---|---|
| P3 | 27/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P2 | 08/02/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE REVISED | | | | |
| P1 | 17/01/19 | ARM | JDH | JDH |
| PRELIMINARY ISSUE | | | | |

smart connection consultancy

SPORTENG™

City of Canada Bay

MAJORS BAY RESERVE
SYNTHETIC TURF PITCH

Drawing Title
PAVEMENT PLAN

0 5m 10m 15m 20m 25m
SCALE 1:400 @ A1

FIELD OF PLAY

PRELIMINARY

10332-00 | Drawing No F600 - B | Issue P3

PLOT DATE: 27/02/2019 PLOT TIME: 5:10 PM FILE PATH: C:\Users\AellaySportEng\OneDrive\SportEng\BNE - Actuals - Documents\General\OFFICE TRANSFERS\10332-00 Major Bay Reserve Synthetic Pitch\Drawings\SHEETS\F600 - B.dwg

# Appendix B Environmental Aspects and Impacts List

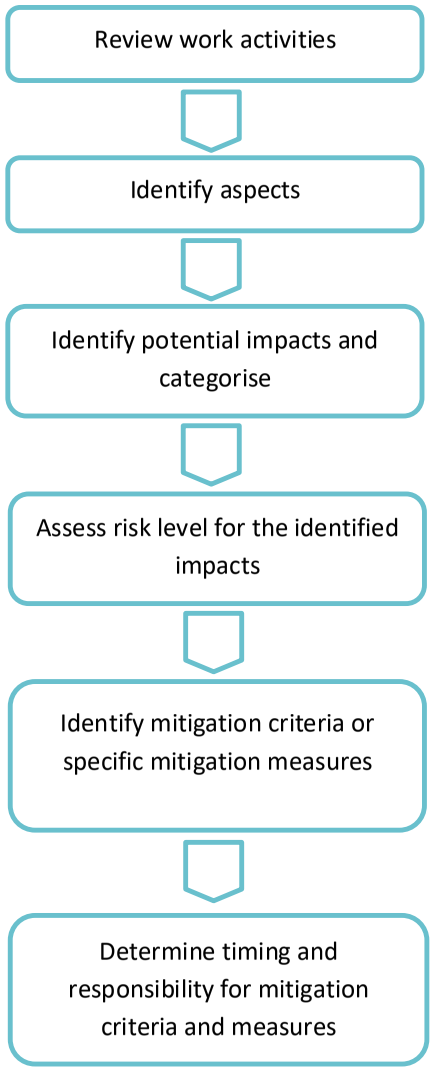
**Environmental Aspects and Impacts: Sid Richards Playing Field 3, Majors Bay Reserve, Concord, NSW 2137**

The process used to develop possible mitigation measures after an environmental risk has been identified, is illustrated in the Figure to the right.

The mitigation measures developed to control the identified environmental impacts are presented in the following tables. Also shown are the associated levels of risk of impact and responsible party for implementation of the respective mitigation measure. In accordance with the roles and responsibilities described in Section 2.1.

As defined in ISO 14001, an environmental aspect is "an element of an organisation's activities, products or services that can interact with the environment" (SAI Global, 2004). Environmental aspects within this project are specific actions or items that could cause an impact.

The risk assessment matrix on the following page is used to determine the level of risk for identified potential impacts from the proposed works.



| Severity | How severe are potential adverse impacts on: | | | What is the likelihood (risk) of this level of severity? | | | |
|---|---|---|---|---|---|---|---|
| | **Human Health** | **Environment** | **Construction schedule and/or project costs** | **Very Likely** | **Likely** | **Unlikely** | **Very Unlikely** |
| **Catastrophic** | Death, life-threatening injuries, permanent disability / ill health | Catastrophic environmental incident, serious risk and/or damage to onsite or offsite receptors, regulatory involvement, significant onsite and offsite remediation, financial penalties enforced, legal action | Severe delays, significant cost increases, possible project termination | 16 | 15 | 13 | 10 |
| **Major** | Major illness or injury requiring surgery / hospitalisation | Major environmental incident, onsite and offsite contaminant migration, regulatory notification and remediation needed | Lengthy project delays / major cost increases | 14 | 12 | 9 | 6 |
| **Moderate** | Injury or illness requiring treatment and resulting in lost time | Moderate environmental incident, contained onsite, requires some remedial action | Moderate project delays and cost increases | 11 | 8 | 5 | 3 |
| **Minor** | Minor injury or exposure not requiring medical attention | Minor environmental incident, localised | Minor project delays / some additional costs | 7 | 4 | 2 | 1 |

Should additional environmental impacts relating to changed or additional work activities be identified during the project, the risks are to be assessed according to this procedure. Following this risk assessment system, mitigation measures must be selected as required, with responsibility allocated and the details documented in the relevant table, as part of the ongoing review of the CEMP.

| Erosion and Sedimentation Risks | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Pre-construction | | | | | |
| Erosion and sediment control design | Inappropriate design, resulting in offsite transport of sediment to roads, and/or stormwater drains | 12 | An approved erosion and sediment control plan (ESCP) is to be implemented with controls in place. | 4 | Project Manager / Site Manager |
| Construction | | | | | |
| Site preparation | Sediment mobilisation and surface runoff from site establishment and clearing. | 12 | Prior to commencement of site work, install all erosion and sediment control measures based on an erosion and sediment control plan and ensure controls are operational in accordance with approved ESCP. | 4 | Site Manager |
| Vehicle traffic leaving site | Sediment tracked offsite by vehicle wheels. | 8 | Appropriate measures are to be implemented during the construction period to ensure vehicles leaving the premises are sufficiently free from dirt, aggregate or other materials such that material are not transported onto public roads. These may include shake-down areas at access points and truck wash-down facilities. | 4 | Site Manager |
| Transport of materials to and from site | Loss of load resulting in pollution of roads | 5 | Truck loads shall be covered. Should any material be transported onto the road or any spills occur it is to be cleaned up prior to cessation of the same day's work and/or commencement of any rain event. | 2 | Site Manager |
| Stormwater run-off | Run-off resulting in soil erosion. | 12 | Do not stockpile materials on drainage lines. Ensure stockpile slopes and batters are not excessive. Control stormwater runoff during construction in accordance with the ESCP. | 5 | Site Manager |

| Erosion and Sedimentation Risks Cont. | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Exposed surfaces and stockpiling of fill and construction materials | Offsite transport of sediment to roads and stormwater drains. Loss of fill material. | 12 | Maintain a project ESCP: Daily operational check of control measures by Site Manager or nominated person. Additional inspections to be carried out by the Site Manager after each storm event to assess adequacy of the erosion control measures, repair/replace any dysfunctional erosion control devices, and clean up any sediment that has left the site or is deposited on public land or drainage channels. | 5 | Site Manager |

| Water Quality | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Pre-construction | | | | | |
| Design of erosion and sedimentation control | Inappropriate design, resulting in localised ponding or flooding, excessive runoff, erosion and pollution of local area. | 12 | Controls to be installed in accordance with the ESCP. Any discharge to the street stormwater system is to be tested and approved by the Council in writing prior to discharge. | 4 | Contractor / Site Manager |
| Construction | | | | | |
| Discharge of waters from site | Discharge of sediment laden waters into watercourses. | 14 | Any discharge to the street stormwater system is to be tested and approved by the Council in writing prior to discharge. Implement ESCP. | 2 | Site Manager |
| Plant and equipment refueling, chemical use and storage | Accidental spills and leaks into nearby watercourses during refueling of equipment or storage of fuels and chemical. | 8 | Refuel plant and equipment in a location away from drains and watercourses. Ensure sufficient spill response kits are accessible on site at all times. Chemicals to be stored on site must comply with the management measures in the CEMP. Ensure site induction covers dangerous / hazardous goods and appropriate spill response procedure. | 2 | Site Manager |
| General use of construction site | Waste, litter etc. entering waterways via stormwater drains. | 4 | Ensure contractors leave the construction work sites free of debris and other rubbish (daily) and at the completion of the works. Provide sufficient number of and type of suitable receptacles on site for general waste, recyclable materials and other waste types (as required). | 2 | Project Manager / Site Manager |

| Noise and Vibration Management | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Pre-construction/Construction | | | | | |
| Pre-construction and construction activities resulting in noise complaints | Disturbance of onsite receptors/personnel, local residents, potential noise complaints. Non-conformance with Consent Conditions. | 8 | Comply with defined work hours: 7.00am to 6.00pm Monday to Friday, 8.00am to 1:00pm Saturdays, no work on Sundays or public holidays or as stipulated within any DA conditions for the site.<br><br>All subcontractors to be managed to ensure they work only within defined hours and in a manner to minimise noise and vibration. Stakeholders and neighbours must be kept notified in advance of potential high impact activities. | 4 | Site Manager |

| Traffic Management | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Pre-construction / construction | | | | | |
| Parking due to construction related vehicles | Loss of parking availability in local streets | 8 | All site personnel are to be advised of parking allocations. Ensure work vehicles and plant/equipment do not obstruct vehicular or pedestrian traffic on roadways, footpaths or access to land uses unless absolutely necessary. | 4 | Site Manager |
| Construction traffic movements to and from site (imported materials, off site disposal, deliveries and site staff) | Increased traffic volume on roads during construction. | 14 | Haul routes to be identified and communicated to staff, personnel and subcontractors. Co-ordinate importation / off site disposal of materials and deliveries to avoid peak periods where feasible. Implement traffic management plans, including use of designated routes. Implement traffic control plan, including traffic controller where necessary. | 9 | Site Manager |
| Pedestrian movements surrounding construction site / site occupant movements | Pedestrian/occupant confusion, interference with vehicles, potential incident due to conflict between pedestrian/occupant and construction access points. | 15 | Identify traffic controls required. Restrict site access to personnel and authorised people only in accordance with WorkCover 2017 Regulations. Provide appropriate restriction signage. | 9 | Project Manager |

| Heritage Management | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Construction | | | | | |
| Discovery of unexpected find of heritage item/artifact | Impact on that heritage item in the event that correct steps are not taken. | 8 | Establish a heritage protocol for unexpected heritage finds and agree with CCBC | 5 | Site Manager |

| Air Quality | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Pre-construction | | | | | |
| Design of Materials Management Plan | Fill materials excavated from the site contain asbestos and may also have the potential to generate hazardous ground gases | 12 | An approved Materials Management Plan (MMP) is to be implemented with controls in place.<br><br>Air quality monitoring adjoining work areas and site boundaries. | 4 | Project Manager / Site Manager |
| Construction | | | | | |
| Operation of plant and equipment | Air pollution from emissions | 1 | Ensure equipment and machinery is maintained and not left idling when not in use. | 1 | Site Manager |
| Vehicle movement, earthworks, handling and transport of spoil and fill | Dust generated from earthworks, including materials handling and wheel dust | 12 | Comply with all requirements of the MMP for excavation of fill materials.<br><br>General: Cover all loads of excavated material and other erodible materials that are transported to and from the work site. Avoid or restrict dust generating activities during windy conditions. | 4 | Site Manager |
| Management of stockpiles, exposed areas and general site | Wind erosion of exposed surfaces and stockpiles | 12 | Comply with all requirements of the MMP for excavation of fill materials.<br>.<br><br>General: Keep areas adjacent to the work sites free of construction soil or dust. Monitor all work sites, general work areas, stockpiles and skip bins for dust generation and water down or cover affected areas especially stockpiles of waste material. Minimise soil and vegetation disturbance, in order to minimise dust generation. | 4 | Site Manager |

| Air Quality Cont. | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Excavation works | Release of dust from excavation | 12 | Comply with all requirements of the MMP for excavation of fill materials.<br><br>General: Implement dust suppression measures appropriate for the specific works; no dust is to leave the site. Wetting down / water carts can be used to minimise dust release. | 4 | Site Manager |

| Waste Management | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Pre-construction | | | | | |
| Design of Materials Management Plan | Fill materials excavated from the site contain asbestos and other contaminants including dioxins, which may limit potential waste management actions | 12 | An approved Materials Management Plan (MMP) is to be implemented with controls in place. | 9 | Project Manager / Site Manager |
| Construction | | | | | |
| Earthworks and construction | Generation of waste including potentially recyclable or reusable materials | 12 | Waste Management is to be based on the waste hierarchy, and is to maximise recycling and reuse of waste material and construction wastes, and to minimise waste to landfill. Waste management is to include the following steps. All material leaving site is to be disposed of at a suitable location lawfully able to accept the waste it is receiving. All material leaving the site is to be disposed of in accordance with the provisions of the Protection of the Environment Operations Act 1997 and the NSW EPA (2014) Waste Classification Guidelines, Part 1: Classifying Waste. The waste disposal facility must be appropriately licensed to receive the class of waste being delivered as described in the respective waste classification. Monitor waste volumes and record their method and location of disposal and whether or not that location was a place that could lawfully be used as a waste facility for that waste. | 9 | Project Manager |

| Waste Management Cont. | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Impact** | **Risk of Impact** | **Mitigation Criteria or Management Measure** | **Risk After Mitigation / Management** | **Responsibility** |
| Earthworks and construction | Generation of waste leading to disposal - construction waste | 7 | Provide a sufficient number of and type of suitable receptacles onsite for general waste, recyclable materials and other waste types (as required). Maximise segregation of wastes. Recycle and divert from landfill surplus soil, rock, and other excavated material where possible. Separately collect and stream quantities of waste concrete, bricks, blocks, timber, metals, plasterboard, paper, and packaging, glass, and plastics and offer them for recycling where practical. Ensure that no waste from the site is conveyed to or deposited at any place that cannot lawfully be used as a waste facility for that waste. | 2 | Project Manager |

# Appendix C Weekly Environmental Checklist

Notes:

1. This checklist is to be used as a guide for the weekly monitoring of environmental issues by the Site Manager. The Site Manager should review, amend and update this checklist to ensure compliance with relevant legislation, guidelines and this CEMP.
2. The checklist is to be completed, reviewed and signed at the end of each week and filed as a component of the Project's records.
3. The weekly checklist applies to the entire site until construction has been completed. After this time, the monitoring/reporting component of the CEMP will be reassessed. As some activities become completed, some items in the weekly checklist may no longer be applicable.
4. Additionally, general site conditions should be checked daily for compliance and to ensure controls in general appear to be maintained in good conditions such as the erosion and sediment controls and stockpile controls.

Environmental Weekly Checklist

Project: Sid Richards Playing Field 3, Majors Bay Reserve, Concord, NSW 2137

Week Ending:.....

| Action | Yes/ No/ NA | Comments/ Actions |
|---|---|---|
| **GENERAL OBLIGATIONS** | | |
| Have all site managers, operators and staff undergone site induction and are aware of the appropriate method statements/procedures and environmental responsibilities that apply to their work? Has a written record been kept? | | |
| **NOISE & VIBRATION** | | |
| Are construction activity times being complied with? | | |
| Are all work activities limited to the approved time periods? | | |
| Are noise suppressors on site in working order? | | |
| Are all reasonable practicable steps to reduce construction noise and vibration taken? | | |
| **ODOUR & AIR POLLUTION** | | |
| Are requirements of the Materials Management Plan are being implemented? | | |
| Is the disturbed area being minimised? | | |
| Is dust suppressed on disturbed areas (including stockpiles)? | | |
| Are odour emissions from portaloos minimal? | | |
| Is dust control applied, as requested, to landscaping activities? | | |
| Are vehicle loads covered, as required, to prevent air pollution? | | |
| Is machinery inspected and maintained to prevent noxious emissions? | | |
| Machinery on site is not left idling when not in use. Is this statement correct? | | |
| **SITE ACCESS & TRAFFIC** | | |
| Have Council / residents been informed of upcoming traffic disruptions? | | |

| | | |
|---|---|---|
| **EROSION AND SEDIMENTATION** | | |
| Are erosion and sedimentation controls designed and installed according to Blue Book specifications prior to commencement of works and according to design specifications (including diversion drains where appropriate)? | | |
| Are controls functioning and trapping approximately 80- 90% of sediment? | | |
| Are erosion and sediment controls being maintained weekly, or after every rain event, e.g. sediment removed, materials repaired or replaced? | | |
| Are stockpiles located greater than 25 metres from water flow paths/spoon drains and controls used to prevent sediment escaping (e.g. silt fences, spray grass, sediment pond)? | | |
| Are erosion/sedimentation controls installed at vehicle wash-down areas? | | |
| Are controls decommissioned according to Blue Book specifications when replaced/removed? Has approval been sought prior to removal of controls when construction and revegetation works ceases? (Liaise with Project Manager and Site Manager). | | |
| Are inspections of erosion and sediment controls conducted daily/following incidents? | | |
| **WASTE MANAGEMENT** | | |
| Are requirements of the Materials Management Plan are being implemented? | | |
| Is waste reused on site where possible? | | |
| Is waste separation occurring on site? | | |
| Is waste stockpiled according to Materials Management Plan? | | |
| Is all litter generated on site being disposed of using onsite, covered bins? | | |
| Is the site tidy and free from windblown waste? | | |
| Are waste materials leaving site covered to prevent windblown litter as required? | | |
| Is waste being disposed to appropriate waste management centres? | | |
| Have waste disposal dockets been maintained and recorded? | | |
| Is construction / demolition, contaminated wastes and / or asbestos disposed of offsite? If disposed of onsite, is this in an appropriately bundled and designated area?<br>In the case of asbestos, has the Asbestos Management Plan been implemented? | | |
| When handling excavated fill materials / waste have the appropriate precautions been implemented as listed in the Environmental Aspect and Impact list? | | |

| | | |
|---|---|---|
| **WASTE MANAGEMENT** | | |
| Are "Portaloo" toilets established on site and emptied as per relevant regulations? | | |
| **WATER POLLUTION** | | |
| Are vehicles stored in an appropriate area i.e. compound located greater than 50m from water flow path? | | |
| Is equipment refuelled/ maintained offsite or in the vehicle compound? | | |
| Are appropriate spill containment information (SDS) and/or spill kits kept on site? | | |
| Are site managers and operators aware of spill kit locations and procedures? | | |
| Is chemical/fuel storage appropriately located at 25m distance away from water flow paths? | | |
| Is bund height and bund condition sufficient (sufficient volume to contain 120% of largest container within bunded area? | | |
| Are concrete/agitator trucks leaving the site and returning to base for wash-out | | |
| Is a schedule of hazardous chemicals maintained? | | |
| **EMERGENCY/ INCIDENT RESPONSE** | | |
| Were emergency/ incident procedures implemented as required? | | |
| **INCIDENTS** | | |
| Are Environmental Incident Reports completed and investigated? | | |

**SIGNED:**..... **DATE:**

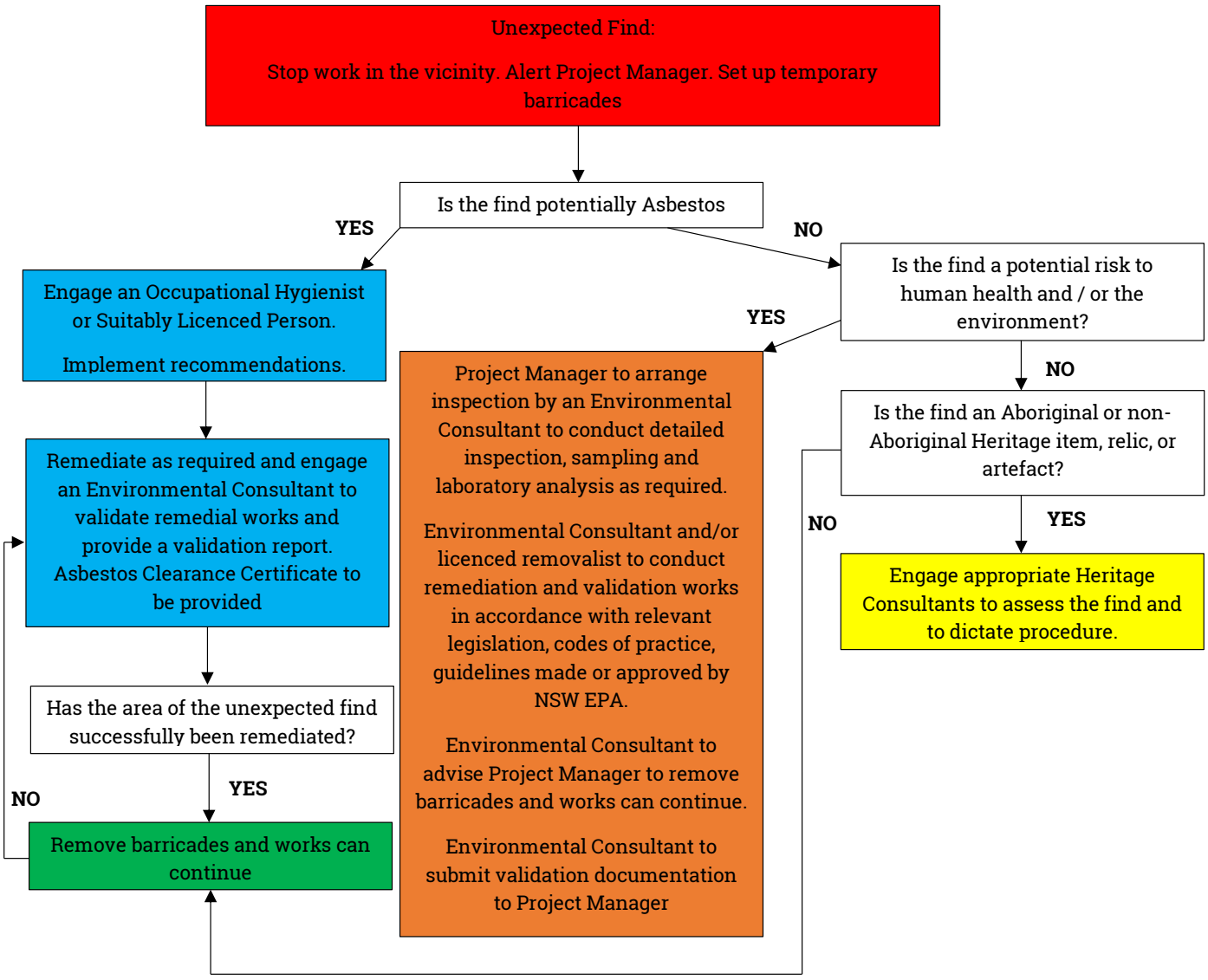
(Site Manager)

**REVIEW/SYSTEM CHECK:**
**Environmental Weekly Checklist has been reviewed. All necessary NCRs have been raised.**

**SIGNED:**..... **DATE:**

(Project Manager)

# Appendix D Unexpected Finds Protocol Example



# APPENDIX F. FLOOD IMPACT ASSESSMENT REPORT PREPARED BY HYDROSPATIAL PTY LTD

# Majors Bay Reserve

# Flood Impact Assessment Report

Prepared For

City of Canada Bay and Complete Urban Pty Ltd

March 2019

HydroSpatial Pty Ltd

ABN: 23 624 304 070

Suite 10, Level 14, 70 Pitt Street, Sydney NSW 2000

Contact: Erika Taylor

Email: Erika.Taylor@HydroSpatial.com.au

Mobile: 0423 624 696

| | |
|---|---|
| Job Details | Majors Bay Reserve Flood Impact Assessment |
| Client | City of Canada Bay and Complete Urban Pty Ltd |
| Author | Erika Taylor |
| Job Number | 18013 |
| Proposal Number | P18051501 |

| Document | | | | |
|---|---|---|---|---|
| Version | Type | Review | Release | Date |
| 00 | Draft | N/A | Internal | 30/07/2018 |
| 01 | Draft | Erika Taylor | Submission | 03/08/2018 |
| 02 | Final | Erika Taylor | Submission | 01/03/2019 |

| Document Approval | |
|---|---|
| Erika Taylor<br>Director | Signature<br>  |

HYDROSPATIAL

# Table of Contents



# Table of Tables

## Table of Figures



## Appendices

# 1 Introduction

Majors Bay Reserve (herein referred to as the site) is within the City of Canada Bay Local Government Area (LGA). The site is located north of Norman Street and west of Nullawarra Avenue Concord, shown on Figure 1.

It was proposed that a new car-park, new amenities building and new synthetic soccer fields be constructed within the site. Two option configurations were investigated; option 1 was located near the junction of Majors Bay Road and Norman Street, and option 2 was located near the junction of Nullawarra Avenue and Norman Street.

# 2 Data Collection

## 2.1 Topographic Data

The Airbourne Laser Survey (ALS) was obtained from Spatial Services, a unit of Department Finance, Services and Innovation. The ALS was acquired in April 2013. The horizontal accuracy was 0.8 m and the vertical accuracy was 0.3 m. The 1 m Digital Elevation Model (DEM) generated from the ALS data is shown on Figure 2.

## 2.2 Stormwater Asset Data

The publicly-owned underground stormwater data was obtained from the City of Canada Bay Council. This included the location of the pits and pipes, as well as the pipe dimensions.

## 2.3 ARR Data Hub

The ARR Data Hub was used to extract the ARR 2016 parameters relevant to the Majors Bay Catchment Area, detailed in Appendix A.

## 2.4 Design Rainfall Data

The very frequent to rare occurrence design rainfall data was obtained from the Bureau of Meteorology's 2016 Rainfall Intensity-Frequency-Duration (IFD) Data System online. The design rainfall data is detailed in Table 2-1.

*Table 2-1: Rainfall IFD Data for the Majors Bay Catchment Area Centroid*

| Duration | 63.20% | 50%# | 20%* | 10% | 5% | 2% | 1% |
|---|---|---|---|---|---|---|---|
| 1 min | 2.26 | 2.51 | 3.27 | 3.79 | 4.3 | 4.98 | 5.49 |
| 2 min | 3.76 | 4.09 | 5.14 | 5.87 | 6.6 | 7.58 | 8.33 |
| 3 min | 5.21 | 5.69 | 7.22 | 8.27 | 9.32 | 10.7 | 11.8 |
| 4 min | 6.53 | 7.17 | 9.18 | 10.6 | 11.9 | 13.8 | 15.2 |
| 5 min | 7.72 | 8.51 | 11 | 12.7 | 14.4 | 16.6 | 18.3 |
| 10 min | 12.2 | 13.6 | 17.8 | 20.7 | 23.5 | 27.2 | 30.1 |
| 15 min | 15.2 | 16.9 | 22.3 | 25.9 | 29.5 | 34.1 | 37.6 |
| 20 min | 17.5 | 19.4 | 25.5 | 29.6 | 33.6 | 38.9 | 42.9 |
| 25 min | 19.3 | 21.4 | 28 | 32.5 | 36.8 | 42.6 | 46.9 |
| 30 min | 20.8 | 23 | 30 | 34.8 | 39.4 | 45.5 | 50.2 |
| 45 min | 24.2 | 26.7 | 34.5 | 39.8 | 45 | 52 | 57.3 |
| 1 hour | 26.9 | 29.5 | 37.8 | 43.6 | 49.2 | 56.8 | 62.7 |
| 1.5 hour | 30.9 | 33.8 | 43 | 49.4 | 55.8 | 64.5 | 71.3 |
| 2 hour | 34.2 | 37.3 | 47.3 | 54.3 | 61.4 | 71.1 | 78.8 |
| 3 hour | 39.5 | 43 | 54.6 | 62.9 | 71.3 | 82.9 | 92.2 |
| 6 hour | 51.5 | 56.5 | 72.8 | 84.6 | 96.7 | 114 | 127 |
| 12 hour | 68.6 | 76.3 | 101 | 120 | 139 | 165 | 186 |
| 24 hour | 91.6 | 104 | 143 | 172 | 201 | 241 | 273 |
| 48 hour | 119 | 136 | 194 | 235 | 277 | 332 | 375 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **72 hour** | 134 | 155 | 221 | 269 | 317 | 379 | 426 |
| **96 hour** | 144 | 166 | 238 | 288 | 339 | 403 | 452 |
| **120 hour** | 151 | 174 | 247 | 298 | 350 | 415 | 465 |
| **144 hour** | 156 | 179 | 253 | 304 | 355 | 420 | 470 |
| **168 hour** | 160 | 183 | 256 | 306 | 357 | 421 | 471 |

Note:

# The 50% AEP IFD does not correspond to the 2 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 1.44 ARI.

* The 20% AEP IFD does not correspond to the 5 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 4.48 ARI.

The Probable Maximum Precipitation (PMP) was calculated using the Bureau of Meteorology's Generalised Short-Duration Method (Ref 4). The PMP rainfall data is detailed in Table 2-2.

*Table 2-2: PMP IFD Data for the Majors Bay Catchment*

| Duration | Rainfall Depth (mm) |
|---|---|
| **0.25 hr** | 164.5 |
| **0.5 hr** | 238 |
| **0.75 hr** | 301 |
| **1 hr** | 348.25 |
| **1.5 hr** | 399 |
| **2 hr** | 448 |
| **2.5 hr** | 472.5 |
| **3 hr** | 498.75 |
| **4 hr** | 544.25 |
| **5 hr** | 588 |
| **6 hr** | 619.5 |

## 2.5 Design Sea Level Data

The design sea level data was obtained from the New South Wales (NSW) Government's Office of Environment and Heritage (OEH) Floodplain Risk Management Guide (Ref 6). The simplistic approach with a steady state ocean boundary was used because the critical rainfall duration (45 minutes, as discussed in Section 3.6) was significantly shorter than the duration between high and low tide (approximately 6 hours). The catchment was identified as a Waterway Entrance Type A, located south of Crowdy Head. Table 2-3 details the design sea level data based on the aforementioned catchment characteristics.

*Table 2-3: Combinations of Catchment Flooding and Oceanic Inundation Scenarios*

| Design Event | Rainfall Event | Ocean Water Level Event | Ocean Water Level |
|---|---|---|---|
| **10% AEP** | 10% AEP | HHWS | 1.25 m AHD |
| **1% AEP** | 1% AEP | 5% AEP | 1.40 m AHD |
| **PMF** | PMF | 1% AEP | 1.45 m AHD |

## 2.6 Proposed Development Options

Details of the proposed design options to be investigated were provided by Complete Urban Pty Ltd. From this:

- Option 1 – consisted of one full sized soccer field and six 'five-a-side' soccer fields constructed from synthetic turf and a new amenities building. Option 1 was located near the junction of Majors Bay Road and Norman Street. The configuration of Option 1 is shown on Image 2-1.
- Option 2 – consisted of one full sized soccer field and four 'five-a-side' soccer fields constructed from synthetic turf, a new amenities building and an open car-park. Option 2 was located near the junction of Nullawarra Avenue and Norman Street. The configuration of Option 2 is shown on Image 2-2.

*Image 2-1: Proposed Development Option 1*

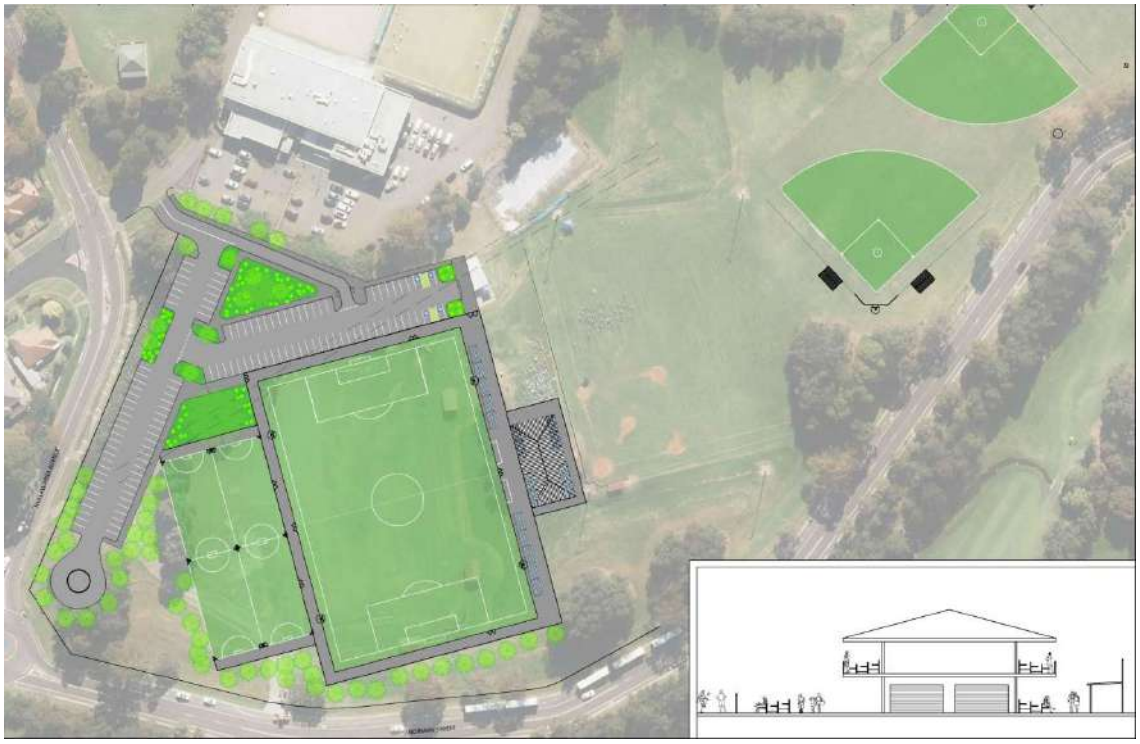


*Image 2-2: Proposed Development Option 2*

# 3 Hydrologic Model

The hydrologic model developed for this study used the Watershed Bounded Network Model (WBNM) software (Ref 3). The WBNM version used was 2017_V001.

## 3.1 Sub-catchment Delineation

The hydrologic catchment area was approximately 242 ha. A total of 16 sub-catchments were delineated across the Majors Bay Catchment Area. The sub-catchments had an average size of 11 ha. The sub-catchment delineation is shown on Figure 3.

## 3.2 Lag Parameter

The time difference between the centroids of the rainfall hyetograph and the runoff hyetograph is a function of catchment characteristics (such as area, shape and slope) and a specified lag parameter within WBNM. A lag parameter value of 1.7 was used for this study and corresponds to the NSW data detailed in the WBNM documentation.

## 3.3 Routing Parameter

Routing of flows from upstream to downstream through the sub-catchments can be calculated by a number of different methods within WBNM, including the nonlinear routing, time-delay routing and Muskingum routing methods. The nonlinear routing method with a parameter value of 1.0 was used for this study. This parameter value corresponds with the WBNM recommended value for natural channels.

## 3.4 Impervious Area

The proportion of pervious to impervious surface area across a region will influence the rate at which runoff will occur from the region. The percentage of impervious surface area within individual sub-catchments was based on the proportion and type of land uses within the sub-catchments (corresponding to the hydraulic roughness extents, discussed in Section 4.2). The impervious percentage per land use type is summarised in Table 3-1.

*Table 3-1: Impervious Percentage*

| | Impervious Percentage |
|---|---|
| Roadway Area | 90% |
| Urban Area | 60% |
| Waterway Area | 0% |
| Light Vegetation Area | 20% |

## 3.5 Rainfall Losses

Rainfall or storm losses represent the amount of rainfall that does not contribute to runoff due to interception by vegetation, infiltration into the soil, retention on the surface (depression storage), and transmission loss through stream beds and banks. A number of different methods are available within WBNM to estimate the rainfall losses, including the initial loss –

continuing loss (IL-CL) method, the Horton method and the time-varying method. The IL/CL method was used for this study.

The initial loss and continuing loss values were obtained from the ARR Data Hub (discussed in Section 2.3). As noted on the ARR Data Hub, the losses are not directly applicable to urban areas. In this case, the initial loss values supplied on the ARR Data Hub have been adjusted by 60% of the value; coinciding with the Australian estimates of the Effective Impervious Area (EIA) to Total Impervious Area (TIA) ratio, as per Book 5, Chapter 3, Section 3.4.2.2 of ARR 2016. Therefore, the storm continuing loss applied was 1.8 mm/hr and the storm initial loss applied was 19.8 mm.

The burst loss was calculated by subtracting the median preburst depth from the storm initial loss, as summarised in Table 3-2.

*Table 3-2: Burst Losses*

| Storm Event | Storm Duration | Storm Initial Loss (mm) | Median Preburst Depth (mm) | Burst Loss (mm) |
|---|---|---|---|---|
| **1% AEP** | 15 minute * | 19.8 | 2.4 | 17.4 |
| **1% AEP** | 20 minute * | | 2.4 | 17.4 |
| **1% AEP** | 25 minute * | | 2.4 | 17.4 |
| **1% AEP** | 30 minute * | | 2.4 | 17.4 |
| **1% AEP** | 45 minute * | | 2.4 | 17.4 |
| **1% AEP** | 60 minute | | 2.4 | 17.4 |
| **1% AEP** | 90 minute | | 1.9 | 17.9 |
| **1% AEP** | 120 minute | | 2.4 | 17.4 |
| **1% AEP** | 180 minute | | 3.8 | 16 |
| **1% AEP** | 270 minute * | | 14.5 | 5.3 |
| **1% AEP** | 360 minute | | 14.5 | 5.3 |
| **10% AEP** | 15 minute * | | 3 | 16.8 |
| **10% AEP** | 20 minute * | | 3 | 16.8 |
| **10% AEP** | 25 minute * | | 3 | 16.8 |
| **10% AEP** | 30 minute * | | 3 | 16.8 |
| **10% AEP** | 45 minute * | | 3 | 16.8 |
| **10% AEP** | 60 minute | | 3 | 16.8 |
| **10% AEP** | 90 minute | | 5.8 | 14 |
| **10% AEP** | 120 minute | | 4.8 | 15 |
| **10% AEP** | 180 minute | | 5.6 | 14.2 |
| **10% AEP** | 270 minute * | | 5.6 | 14.2 |
| **10% AEP** | 360 minute | | 14.8 | 5 |

Note:

* Median preburst depths were unavailable for these storm durations, therefore the median preburst depth for the next highest storm duration was adopted.

## 3.6 Results

Using the "ensemble" approach from ARR 2016, the critical duration and critical pattern is that which produced the peak discharge one higher than the highest average discharge. To determine this, box and whisker plots were analysed for the sub-catchment directly upstream of the location of interest, Majors Bay Reserve (MBR040).

Chart 3-1 shows the box and whisker plot for the range of durations and patterns for the 1% AEP event. From this, the 45 minute duration was found to produce the highest average discharge of the durations investigated. Chart 3-2 shows the hydrographs for the range of temporal patterns for the 1% AEP event with the 45 minute storm duration. From this, temporal pattern 6 was found to produce the peak discharge one higher than the average discharge for this duration.

Chart 3-3 shows the box and whisker plot for the range of durations and patterns for the 10% AEP event. From this, the 60 minute duration was found to produce the highest average discharge of the durations investigated. Chart 3-4 shows the hydrographs for the range of temporal patterns for the 10% AEP event with the 60 minute storm duration. From this, temporal pattern 7 was found to produce the peak discharge one higher than the average discharge for this duration.

Therefore, the critical duration and critical pattern adopted for the study area was:

- 1% AEP event, 45 minute duration, temporal pattern 6
- 10% AEP event, 60 minute duration, temporal pattern 7

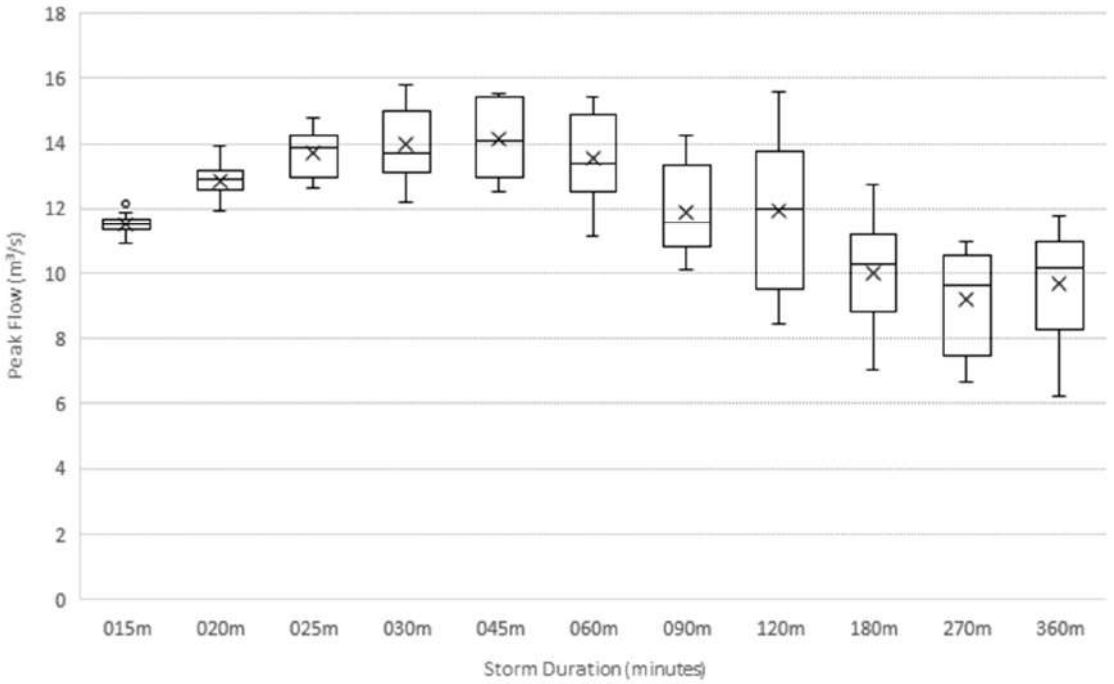



*Chart 3-1: Box and whisker plot for sub-catchment MBR040 - 1% AEP event*

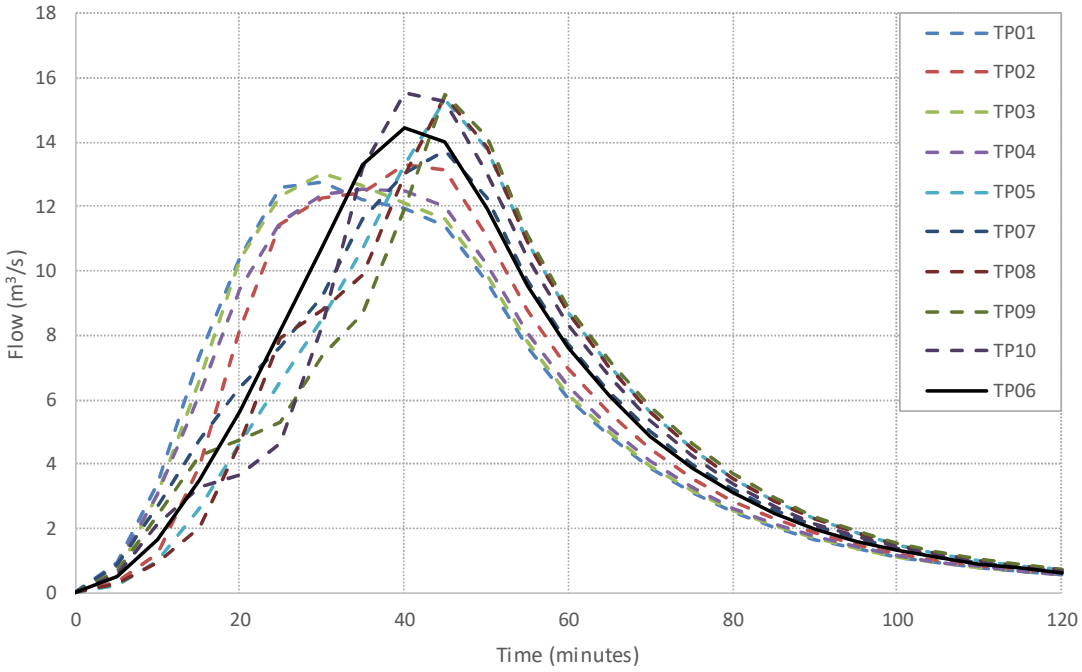



*Chart 3-2: Hydrographs for sub-catchment MBR040 - 1% AEP event with 45 minute storm duration*

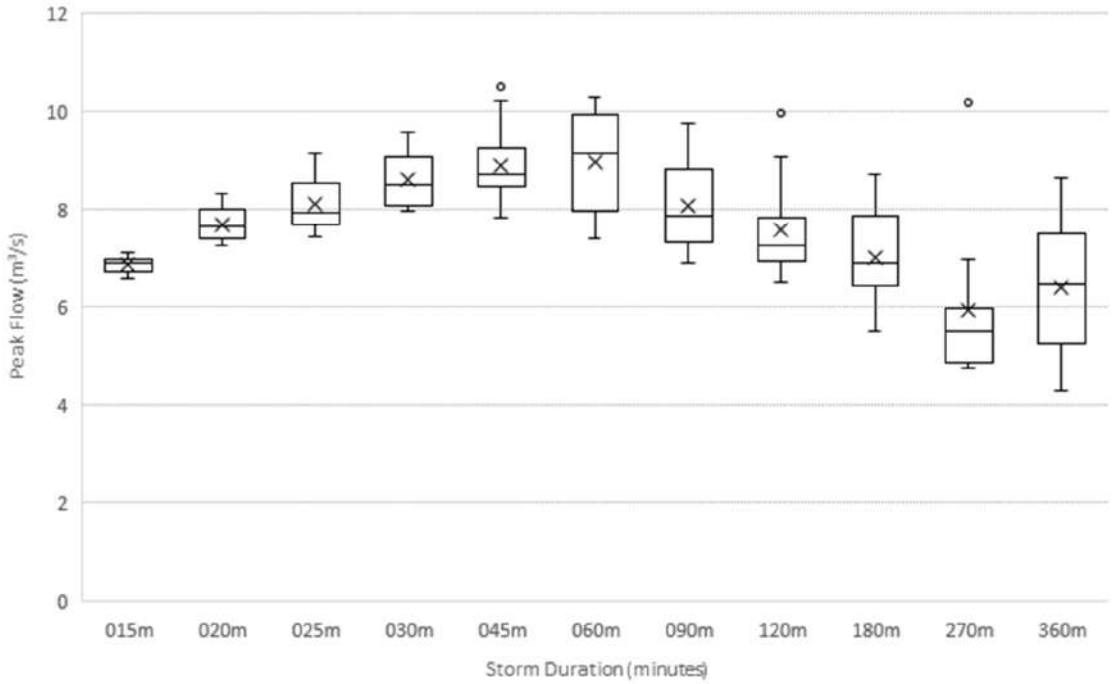



*Chart 3-3: Box and whisker plot for sub-catchment MBR040 - 1% AEP event*

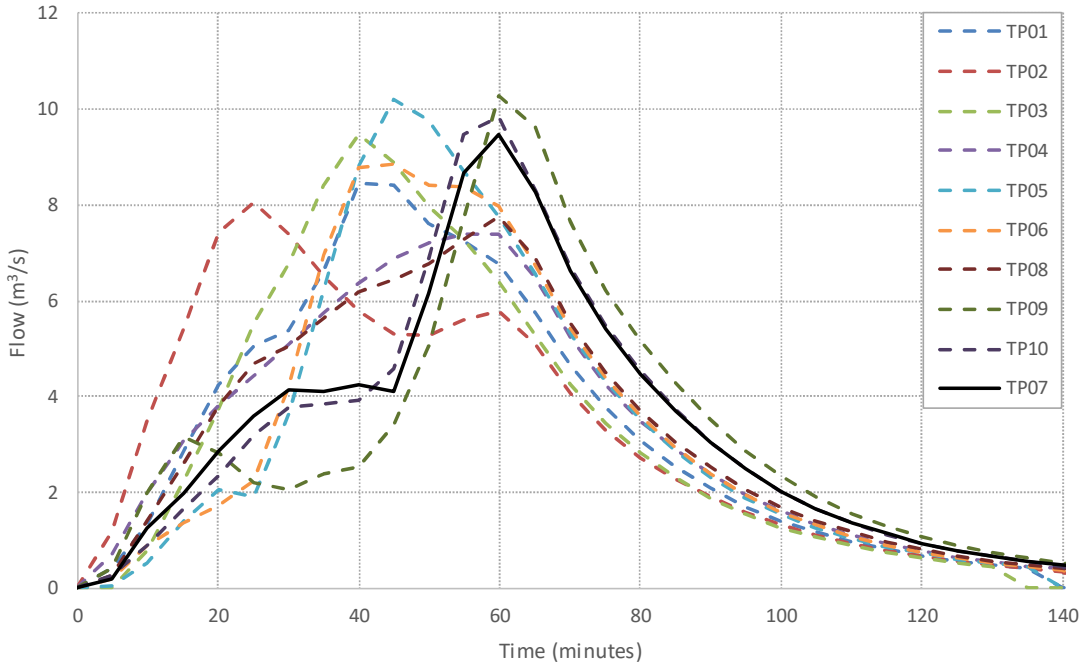



*Chart 3-4: Hydrographs for sub-catchment MBR040 - 10% AEP with 60 minute storm duration*

# 4 Hydraulic Model

The hydraulic model developed for this study used the TUFLOW software (Ref 2). The TUFLOW version used was 2017-09-AC with double precision.

## 4.1 Flow Boundaries

The rainfall runoff was extracted from the WBNM model. The total routed flows were extracted for sub-catchment MBR040, and the local flows were extracted for the sub-catchments that were downstream of or independent to sub-catchment MBR040. The flows were applied to the downstream point of the sub-catchments so as not to duplicate routing in the hydraulic model (that had already been calculated in the hydrologic model).

The sea water levels were as per the NSW guidelines, discussed in Section 2.5. These conditions were applied along the model boundary, coinciding with the embayment.

## 4.2 Hydraulic Roughness

The hydraulic roughness (Manning's 'n') represents the hydraulic efficiency of the flow paths within the TUFLOW model. Various industry references provide guidelines for acceptable hydraulic roughness ranges for varying land use types including Open Channel Hydraulics (Chow, 1959), Open Channel Flow (Henderson, 1966), and the Australian Rainfall and Runoff: Revision Project 15 Two Dimensional Modelling in Urban and Rural Floodplains (Engineers Australia, November 2012). Using these guidelines, the Manning's "n" values for varying land use types within the study area were determined, as detailed in Table 4-1. The spatial extents of these land use types (and thus the hydraulic roughness) throughout the study area were based upon the aerial photography and are shown in Figure 4.

*Table 4-1: Hydraulic Roughness Values*

| | Manning's Roughness "n" Values |
|---|---|
| Roadway Area | 0.02 |
| Urban Area | 0.05 |
| Waterway Area | 0.03 |
| Light Vegetation Area | 0.03 |

## 4.3 Proposed Development Option Schematisation

The proposed buildings were modelled as no-flow, completely impermeable features in the 2D domain of the hydraulic model. The proposed playing fields were schematised as raised ground level features in the 2D domain of the hydraulic model.

## 4.4 Results

Due to the urban nature of the catchment, the critical duration and critical pattern was investigated further to determine which produced the peak flood level one higher than the highest average flood level. To determine this, box and whisker plots were analysed for a point at the junction of Nullawarra Avenue and Norman Street.

Chart 4-1 shows the box and whisker plot for the range of durations and patterns for the 1% AEP event. From this, the 120 minute duration was found to produce the highest average flood level of the durations investigated. Chart 4-2 shows the hydrographs for the range of temporal patterns for the 1% AEP event with the 120 minute storm duration. From this, temporal pattern 2 was found to produce the peak flood level one higher than the average flood level for this duration.

Chart 4-3 shows the box and whisker plot for the range of durations and patterns for the 10% AEP event. From this, the 60 minute duration was found to produce the highest average flood level of the durations investigated. Chart 4-4 shows the hydrographs for the range of temporal patterns for the 10% AEP event with the 60 minute storm duration. From this, temporal pattern 9 was found to produce the peak flood level one higher than the average flood level for this duration. It should also be noted that temporal pattern 7 (which produced the peak discharge one higher than the average discharge) produced the peak flood level one lower than the average flood level for this duration.

A summary and comparison of the critical duration and pattern based upon the flow in the hydrologic model and the flood level in the hydraulic model is shown in Table 4-2.

*Table 4-2: Critical duration and temporal pattern summary*

| Event | Critical duration and pattern based on flow in hydrologic model | Critical duration and pattern based on level in hydraulic model |
|---|---|---|
| **1% AEP** | 45 minute duration, temporal pattern 6 | 120 minute duration, temporal pattern 2 |
| **10% AEP** | 60 minute duration, temporal pattern 7 | 60 minute duration, temporal pattern 9 |

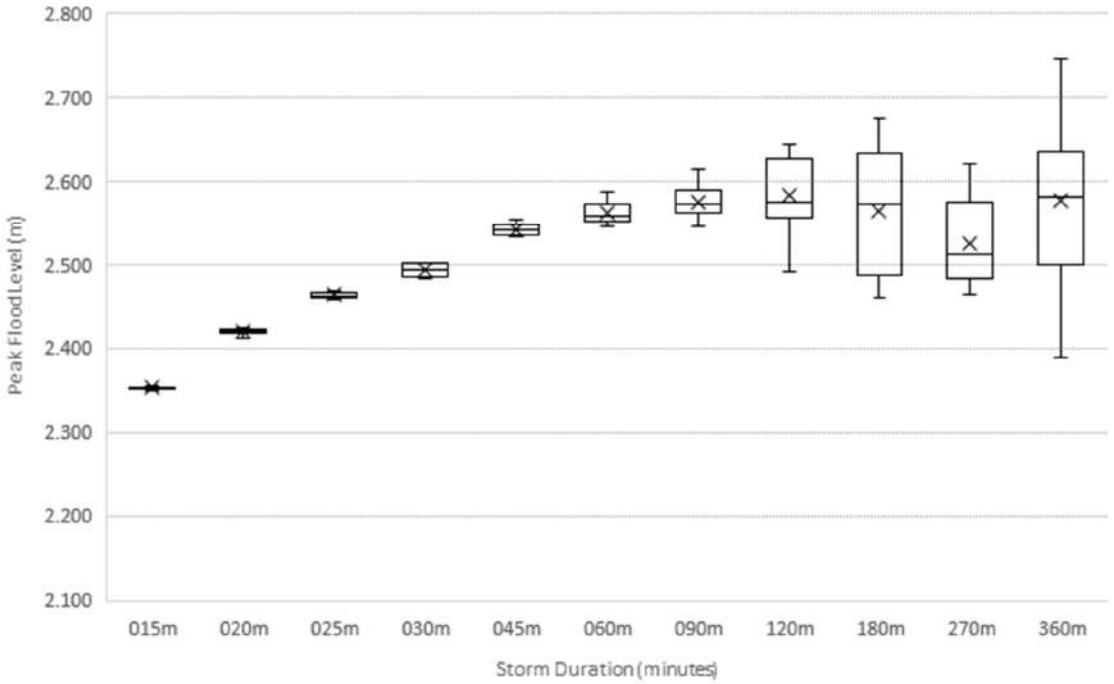



*Chart 4-1: Box and whisker plot of peak flood levels for the 1% AEP event*

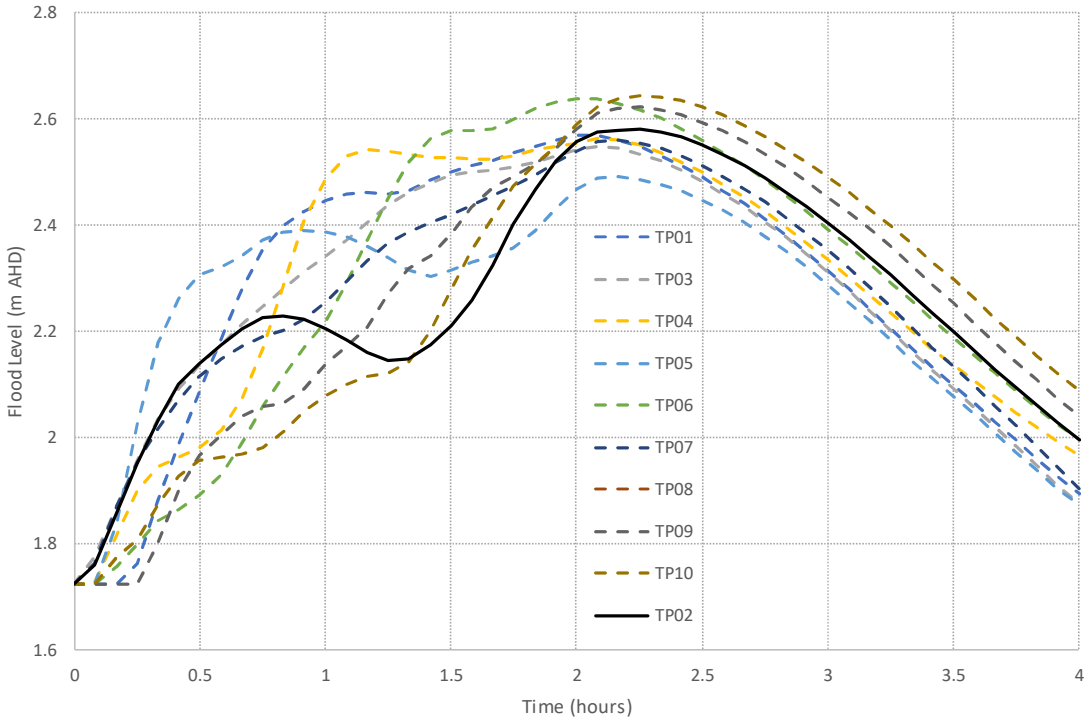



*Chart 4-2: Hydrographs of flood levels for the 1% AEP event with the 120 minute storm duration*

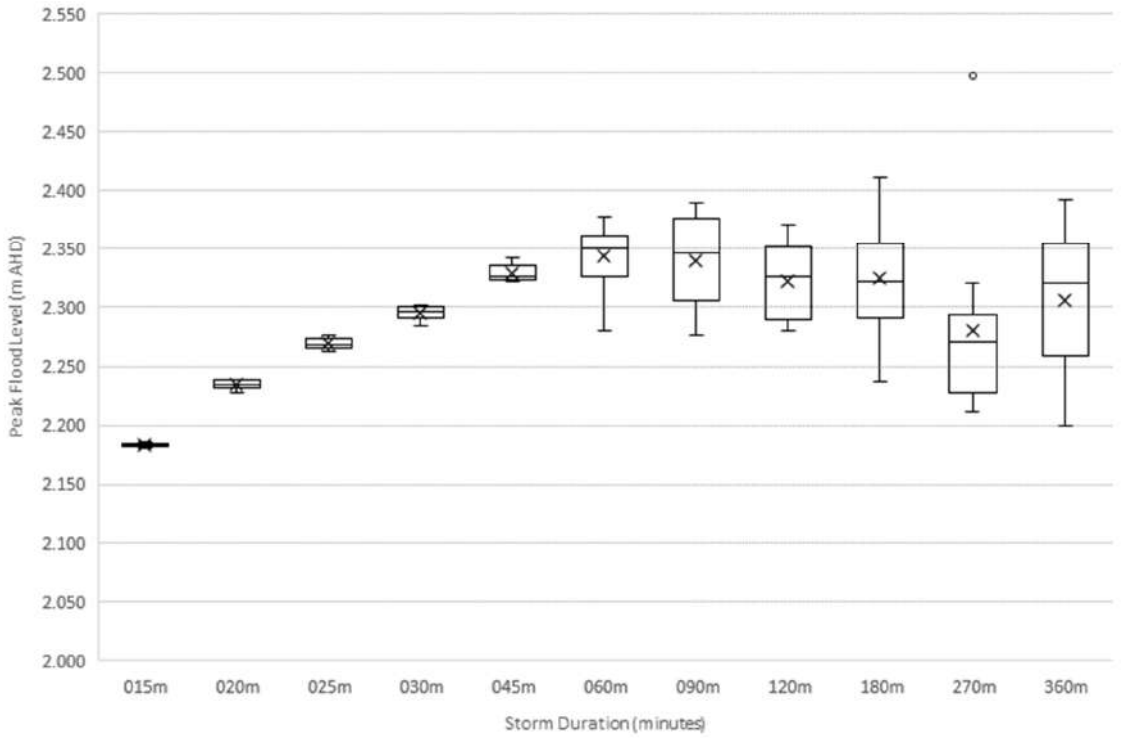



*Chart 4-3: Box and whisker plot of the peak flood levels for the 10% AEP event*

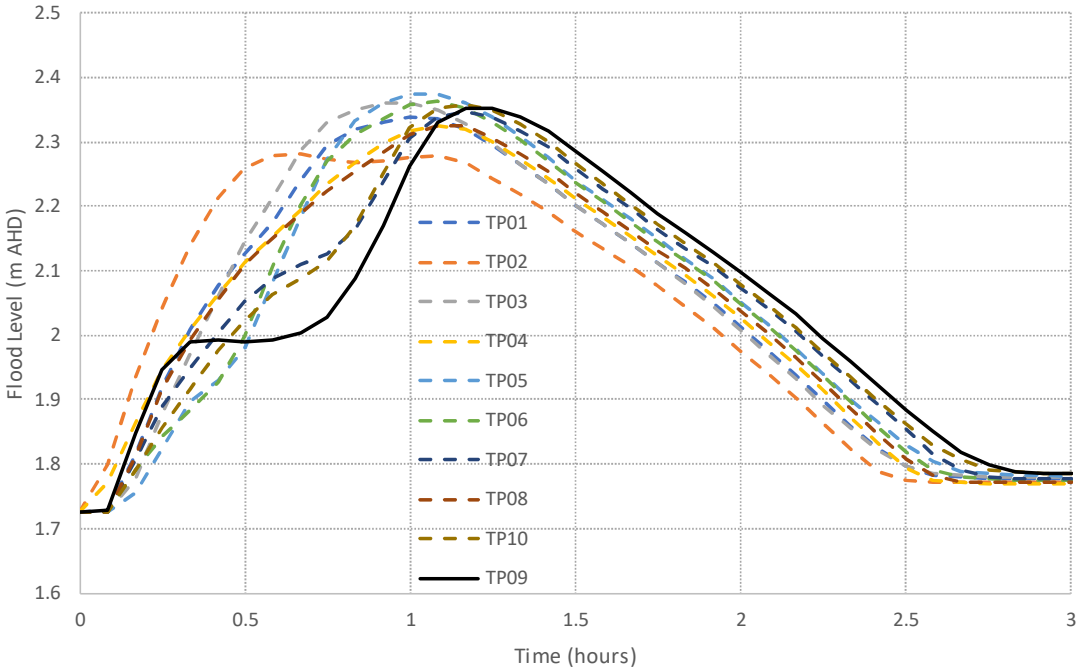



*Chart 4-4: Hydrographs of flood levels for the 10% AEP event with the 60 minute storm duration*

Due to the raised ground levels within Majors Bay Reserve, the properties and roadway area upstream of the reserve acted as a trapped topographical low point in frequent to rare rainfall events. Only in extreme rainfall events was the reserve substantially inundated. This is shown on Figure 5 to Figure 7.

The peak flood level at the roadway junction of Nullawarra Avenue and Norman Street was found to be:

- 3.40 m AHD in the PMF event;
- 2.58 m AHD in the 1% AEP event (with the 120 minute duration, temporal pattern 2); and
- 2.35 m AHD in the 10% AEP event (with the 60 minute duration, temporal pattern 9).

# 5 Flood Impact Assessment

The peak flood level difference (or impact) between the existing conditions and the proposed development options 1 and 2 were analysed for the 1% AEP event with the 45 minute storm duration (temporal pattern 6) and the 120 minute storm duration (temporal pattern 2). The peak flood level differences within ± 0.01 m were considered within the precision tolerance of the hydraulic model and are considered to be negligible, as per the advice in Ref 5.

Figure 9 and Figure 10 show the flood level impacts of option 1 for the two aforementioned durations and temporal patterns. From this, no adverse flood level impacts were observed on adjacent land and property. There was a small area of “no longer flooded” area where the synthetic turf fields are proposed to be constructed above the existing ground level. However, as the flood water depth and volume contained in this area was relatively small, this resulted in little change to the peak flood levels.

Figure 12 and Figure 13 show the flood level impacts of option 2. From this, adverse flood level impacts were observed in the event with the 45 minute storm duration. This increase in flood level was located upstream of the proposed development on Norman Street, Nullawarra Avenue (between Nirranda and Mepunga Street), Mepunga Street, Quandong Place and Nirranda Street (with the latter three affected up to Quandong Street). The event with the 120 minute storm duration did not produce adverse flood level impacts due to the dual burst temporal pattern affecting the timing of the flood level ascension, as shown in Chart 5-1 and Chart 5-2.

Therefore, it is recommended that:

- Option 1 is viable for further investigation, with no adverse flood level impact found in the investigation; and
- Option 2 (in its current configuration) is not viable for further investigation, due to the adverse flood level impacts found in the investigation.

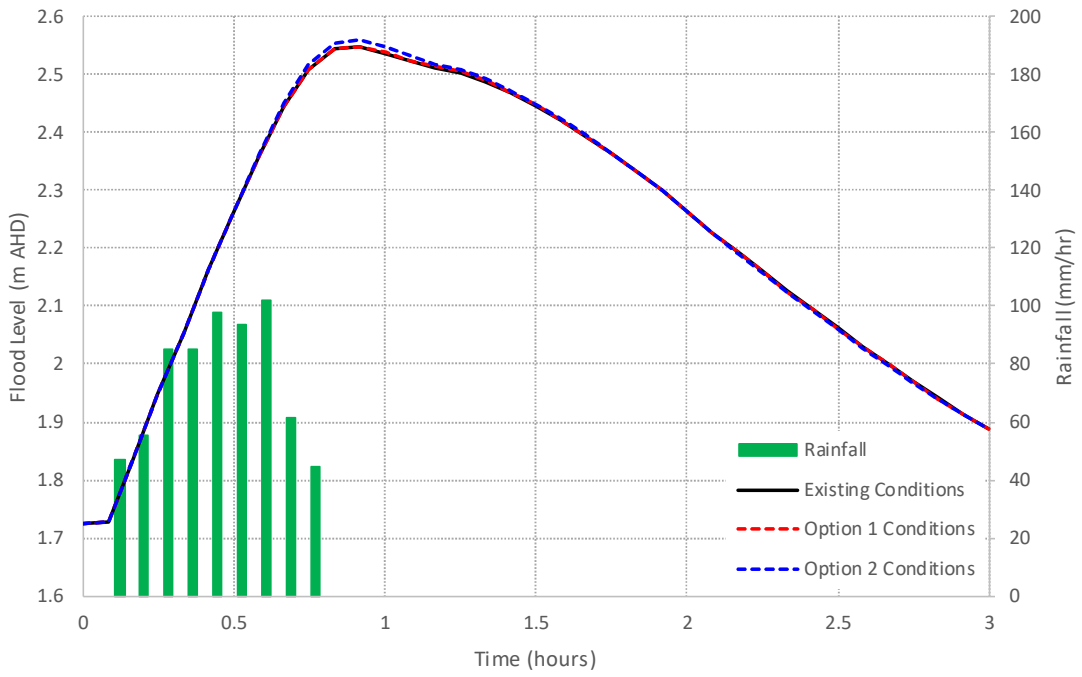



*Chart 5-1: Rainfall and flood levels for the 1% AEP event, 45 minute storm burst, temporal pattern 6*

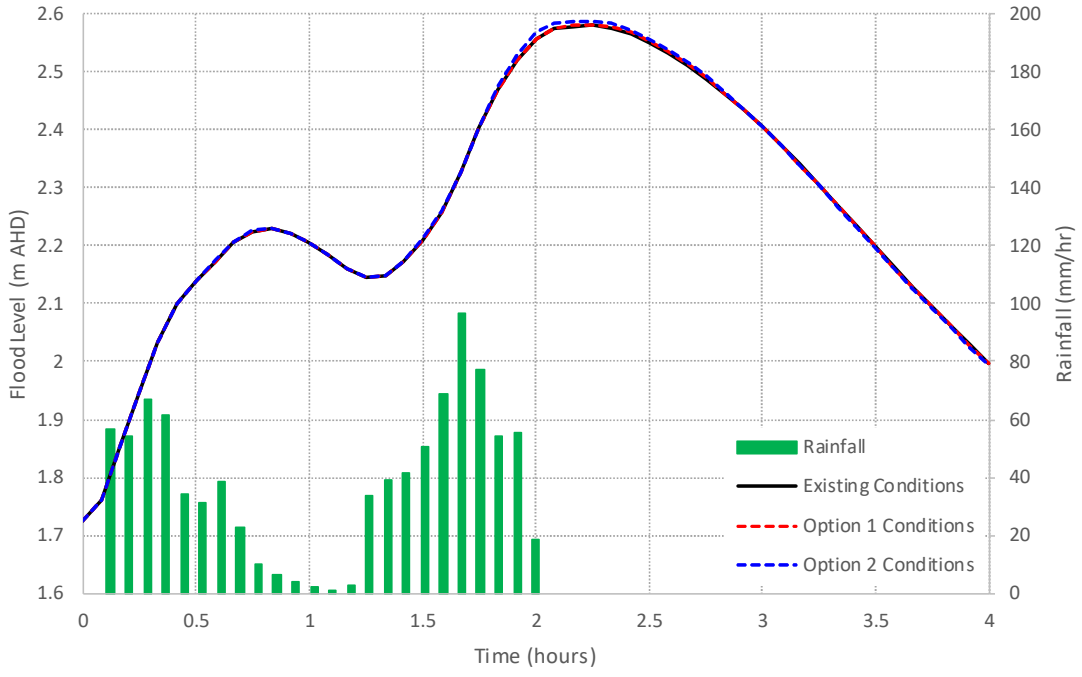



*Chart 5-2: Rainfall and flood levels for the 1% AEP event, 120 minute storm burst, temporal pattern 2*

# 6 Reference

Ref 1: Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I (Editors) (2016), Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia

Ref 2: BMT WBM (2016), TUFLOW User Manual.

Ref 3: Boyd M, Rigby E, VanDrie R (2017), Watershed Bounded Network Model (WBNM) User Guide.

Ref 4: Bureau of Meteorology (2003), The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method.

Ref 5: Institute of Engineers Australia (2012), Australian Rainfall and Runoff Revision Project 15 – Two-Dimensional Modelling in Urban and Rural Floodplains.

Ref 6: New South Wales Government's Office of Environment and Heritage (2015), Floodplain Risk Management Guide: Modelling the Interaction of Catchment Flooding and Oceanic Inundation in Coastal Waterways.

## APPENDIX G. ELECTRICAL SERVICES LIGHTING AND POWER LAYOUT PREPARED BY GARY ROBERTS AND ASSOCIATES PTY LTD

## LEGEND

- NEW CONDUIT/CABLE ROUTES
- EXISTING ITEMS
- NEW 25m FLOODLIGHTING LIGHTING POLE COMPLETE WITH PHILIPS LED OPTIVISION AS LISTED
- EXISTING 22m LIGHTING POLE TO BE REMOVED. TWO POLES ARE TO BE REUSED FOR THE NEW FUTSAL FIELD.
- EXISTING PULLING PIT
- EXISTING MAIN SWITCHBOARD
- NEW SUB BOARD
- 100A — CIRCUIT BREAKER
- nA — CIRCUIT BREAKER SIZE DETERMINED BY LOAD
- FUSE
- R1 — RELAY
- C1 — CONTACTOR
- 3 PHASE
- C2 — NORMALLY OPEN CONTACTS
- C2 — NORMALLY CLOSED CONTACTS
- SS — SURGE SUPPRESSION MINIMUM 100kA

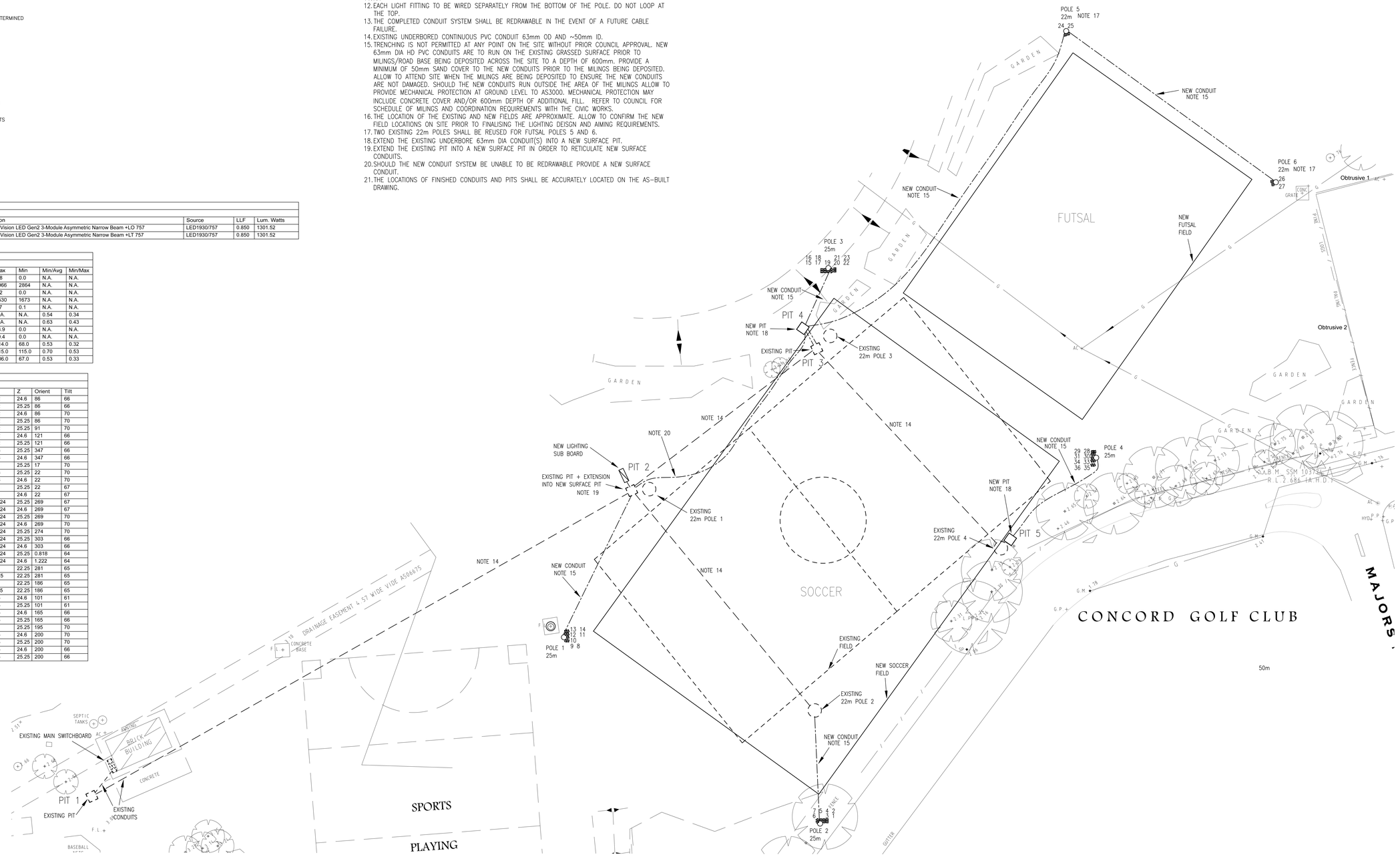
## NOTES:

1. SEAL ALL NEW CONDUITS THAT ENTER PITS WITH EXPANDING FOAM ON COMPLETION.
2. APPROXIMATE ROUTE OF EXISTING CONDUITS
3. PROVIDE FAULT LEVEL PROTECTION TO LOCAL AUTHORITY REQUIREMENTS.
4. CONFIRM ALL DIMENSIONS ON SITE. REFER TO COUNCIL FOR SCALED SURVEY PLAN.
5. PULLING PITS PROVIDED AS REQUIRED. FINISH FLUSH WITH GRASS SURFACE. CONFIRM PIT LOCATIONS WITH COUNCIL PRIOR TO INSTALLATION. LIDS: MINIMUM TO AS3966 CLASS C (150kN).
6. CONFIRM CONDUIT ROUTES WITH COUNCIL PRIOR TO INSTALLATION.
7. DO NOT PENETRATE THE EXISTING GROUND WITHOUT COUNCIL APPROVAL.
8. NA.
9. MOTOROLA PICCOLO XR OUTPUT VOLTAGE IS A DC PULSE THROUGH A TWO WIRE CIRCUIT SUITABLE FOR ACTIVATING DC LATCHING COILS. DEFAULT OUTPUT VOLTAGE IS 12V. RELAY NUMBERS ARE FOR GUIDENCE ONLY. CONFIRM PIN NUMBER AND OUTPUT WIRE COLOUR. PROVIDE INTERPOSING RELAYS AS REQUIRED. CONFIRM ALL DETAILS OF THE IRRINET SYSTEM (PICCOLO XR). REFER TO: CENTRATECH – CRAIG SIMPSON 0401 321 219 csimpson@centratech.com.au
10. NA.
11. NA
12. EACH LIGHT FITTING TO BE WIRED SEPARATELY FROM THE BOTTOM OF THE POLE. DO NOT LOOP AT THE TOP.
13. THE COMPLETED CONDUIT SYSTEM SHALL BE REDRAWABLE IN THE EVENT OF A FUTURE CABLE FAILURE.
14. EXISTING UNDERBORED CONTINUOUS PVC CONDUIT 63mm OD AND ~50mm ID.
15. TRENCHING IS NOT PERMITTED AT ANY POINT ON THE SITE WITHOUT PRIOR COUNCIL APPROVAL. NEW 63mm DIA HD PVC CONDUITS ARE TO RUN ON THE EXISTING GRASSED SURFACE PRIOR TO MILINGS/ROAD BASE BEING DEPOSITED ACROSS THE SITE TO A DEPTH OF 600mm. PROVIDE A MINIMUM OF 50mm SAND COVER TO THE NEW CONDUITS PRIOR TO THE MILINGS BEING DEPOSITED. ALLOW TO ATTEND SITE WHEN THE MILINGS ARE BEING DEPOSITED TO ENSURE THE NEW CONDUITS ARE NOT DAMAGED. SHOULD THE NEW CONDUITS RUN OUTSIDE THE AREA OF THE MILINGS ALLOW TO PROVIDE MECHANICAL PROTECTION AT GROUND LEVEL TO AS3000. MECHANICAL PROTECTION MAY INCLUDE CONCRETE COVER AND/OR 600mm DEPTH OF ADDITIONAL FILL. REFER TO COUNCIL FOR SCHEDULE OF MILINGS AND COORDINATION REQUIREMENTS WITH THE CIVIC WORKS.
16. THE LOCATION OF THE EXISTING AND NEW FIELDS ARE APPROXIMATE. ALLOW TO CONFIRM THE NEW FIELD LOCATIONS ON SITE PRIOR TO FINALISING THE LIGHTING DEISGN AND AIMING REQUIREMENTS.
17. TWO EXISTING 22m POLES SHALL BE REUSED FOR FUTSAL POLES 5 AND 6.
18. EXTEND THE EXISTING UNDERBORE 63mm DIA CONDUIT(S) INTO A NEW SURFACE PIT.
19. EXTEND THE EXISTING PIT INTO A NEW SURFACE PIT IN ORDER TO RETICULATE NEW SURFACE CONDUITS.
20. SHOULD THE NEW CONDUIT SYSTEM BE UNABLE TO BE REDRAWABLE PROVIDE A NEW SURFACE CONDUIT.
21. THE LOCATIONS OF FINISHED CONDUITS AND PITS SHALL BE ACCURATELY LOCATED ON THE AS–BUILT DRAWING.

| Luminaire Schedule | | | | | | |
|---|---|---|---|---|---|---|
| Scene: All | | | | | | |
| Symbol | Qty | Label | Description | Source | LLF | Lum. Watts |
| | 32 | BVP525 OUT T30 50K A-NB+LO_30 | Apex OptiVision LED Gen2 3-Module Asymmetric Narrow Beam +LO 757 | LED1930/757 | 0.850 | 1301.52 |
| | 4 | BVP525 OUT T30 50K A-NB+LT_30 | Apex OptiVision LED Gen2 3-Module Asymmetric Narrow Beam +LT 757 | LED1930/757 | 0.850 | 1301.52 |

| Calculation Summary | | | | | | | |
|---|---|---|---|---|---|---|---|
| Scene: All | | | | | | | |
| Label | CalcType | Units | Avg | Max | Min | Min/Avg | Min/Max |
| Eh_Spill_4 | Illuminance | Lux | N.A. | 0.8 | 0.0 | N.A. | N.A. |
| Ev_1_Cd_Seg1 | Obtrusive Light - Cd | N.A. | N.A. | 5966 | 2864 | N.A. | N.A. |
| Ev_1_III_Seg1 | Obtrusive Light - III | Lux | N.A. | 0.2 | 0.0 | N.A. | N.A. |
| Ev_2_Cd_Seg1 | Obtrusive Light - Cd | N.A. | N.A. | 6530 | 1673 | N.A. | N.A. |
| Ev_2_III_Seg1 | Obtrusive Light - III | Lux | N.A. | 1.7 | 0.1 | N.A. | N.A. |
| Futsal | Illuminance | Lux | 135.06 | N.A. | N.A. | 0.54 | 0.34 |
| Soccer | Illuminance | Lux | 234.93 | N.A. | N.A. | 0.63 | 0.43 |
| TI_1 | Obtrusive Light - TI | % | N.A. | 13.9 | 0.0 | N.A. | N.A. |
| TI_2 | Obtrusive Light - TI | % | N.A. | 19.4 | 0.0 | N.A. | N.A. |
| F_1 | Illuminance | Lux | 129.02 | 214.0 | 68.0 | 0.53 | 0.32 |
| F_2 | Illuminance | Lux | 164.43 | 215.0 | 115.0 | 0.70 | 0.53 |
| F_3 | Illuminance | Lux | 127.11 | 206.0 | 67.0 | 0.53 | 0.33 |

| Luminaire Location Summary | | | | | | |
|---|---|---|---|---|---|---|
| Scene: All | | | | | | |
| LumNo | Label | X | Y | Z | Orient | Tilt |
| 1 | BVP525 OUT T30 50K A-NB+LO_30 | 92.771 | 9.272 | 24.6 | 86 | 66 |
| 2 | BVP525 OUT T30 50K A-NB+LO_30 | 92.771 | 9.772 | 25.25 | 86 | 66 |
| 3 | BVP525 OUT T30 50K A-NB+LO_30 | 92.021 | 9.272 | 24.6 | 86 | 70 |
| 4 | BVP525 OUT T30 50K A-NB+LO_30 | 92.021 | 9.772 | 25.25 | 86 | 70 |
| 5 | BVP525 OUT T30 50K A-NB+LO_30 | 91.271 | 9.772 | 25.25 | 91 | 70 |
| 6 | BVP525 OUT T30 50K A-NB+LO_30 | 90.521 | 9.272 | 24.6 | 121 | 66 |
| 7 | BVP525 OUT T30 50K A-NB+LO_30 | 90.521 | 9.772 | 25.25 | 121 | 66 |
| 8 | BVP525 OUT T30 50K A-NB+LO_30 | 29.23 | 53.76 | 25.25 | 347 | 66 |
| 9 | BVP525 OUT T30 50K A-NB+LO_30 | 28.73 | 53.76 | 24.6 | 347 | 66 |
| 10 | BVP525 OUT T30 50K A-NB+LO_30 | 29.23 | 54.51 | 25.25 | 17 | 70 |
| 11 | BVP525 OUT T30 50K A-NB+LO_30 | 29.23 | 55.26 | 25.25 | 22 | 70 |
| 12 | BVP525 OUT T30 50K A-NB+LO_30 | 28.73 | 55.26 | 24.6 | 22 | 70 |
| 13 | BVP525 OUT T30 50K A-NB+LO_30 | 29.23 | 56.01 | 25.25 | 22 | 67 |
| 14 | BVP525 OUT T30 50K A-NB+LO_30 | 28.73 | 56.01 | 24.6 | 22 | 67 |
| 15 | BVP525 OUT T30 50K A-NB+LO_30 | 91.5 | 144.124 | 25.25 | 269 | 67 |
| 16 | BVP525 OUT T30 50K A-NB+LO_30 | 91.5 | 144.624 | 24.6 | 269 | 67 |
| 17 | BVP525 OUT T30 50K A-NB+LO_30 | 92.25 | 144.124 | 25.25 | 269 | 70 |
| 18 | BVP525 OUT T30 50K A-NB+LO_30 | 92.25 | 144.624 | 24.6 | 269 | 70 |
| 19 | BVP525 OUT T30 50K A-NB+LO_30 | 93 | 144.124 | 25.25 | 274 | 70 |
| 20 | BVP525 OUT T30 50K A-NB+LO_30 | 93.75 | 144.124 | 25.25 | 303 | 66 |
| 21 | BVP525 OUT T30 50K A-NB+LO_30 | 93.75 | 144.624 | 24.6 | 303 | 66 |
| 22 | BVP525 OUT T30 50K A-NB+LT_30 | 94.5 | 144.124 | 25.25 | 0.818 | 64 |
| 23 | BVP525 OUT T30 50K A-NB+LT_30 | 94.5 | 144.624 | 24.6 | 1.222 | 64 |
| 24 | BVP525 OUT T30 50K A-NB+LO_30 | 151 | 202 | 22.25 | 281 | 65 |
| 25 | BVP525 OUT T30 50K A-NB+LO_30 | 151.75 | 202.25 | 22.25 | 281 | 65 |
| 26 | BVP525 OUT T30 50K A-NB+LO_30 | 201.75 | 166 | 22.25 | 186 | 65 |
| 27 | BVP525 OUT T30 50K A-NB+LO_30 | 202 | 165.25 | 22.25 | 186 | 65 |
| 28 | BVP525 OUT T30 50K A-NB+LT_30 | 158.25 | 99.75 | 24.6 | 101 | 61 |
| 29 | BVP525 OUT T30 50K A-NB+LT_30 | 157.75 | 99.75 | 25.25 | 101 | 61 |
| 30 | BVP525 OUT T30 50K A-NB+LO_30 | 158.25 | 99.25 | 24.6 | 165 | 66 |
| 31 | BVP525 OUT T30 50K A-NB+LO_30 | 157.75 | 99.25 | 25.25 | 165 | 66 |
| 32 | BVP525 OUT T30 50K A-NB+LO_30 | 157.75 | 98.5 | 25.25 | 195 | 70 |
| 33 | BVP525 OUT T30 50K A-NB+LO_30 | 158.25 | 97.75 | 24.6 | 200 | 70 |
| 34 | BVP525 OUT T30 50K A-NB+LO_30 | 157.75 | 97.75 | 25.25 | 200 | 70 |
| 35 | BVP525 OUT T30 50K A-NB+LO_30 | 158.25 | 96.75 | 24.6 | 200 | 66 |
| 36 | BVP525 OUT T30 50K A-NB+LO_30 | 157.75 | 96.75 | 25.25 | 200 | 66 |




| No. | DATE | Description | Drawn |
|---|---|---|---|
| A | 24/01/19 | Tender issue | CC |
| P2 | 23/01/19 | Preliminary for discussion | CC |
| P1 | 5/01/19 | Preliminary for discussion | CC |

Electrical Engineer

GRA ELECTRICAL ENGINEERS
GARY ROBERTS & ASSOCIATES PTY LTD ACN 064331086
PHONE (02) 9457 6485
MOBILE (0412) 442 671
E-mail: grassoc@optusnet.com.au

Client: CANADA BAY COUNCIL

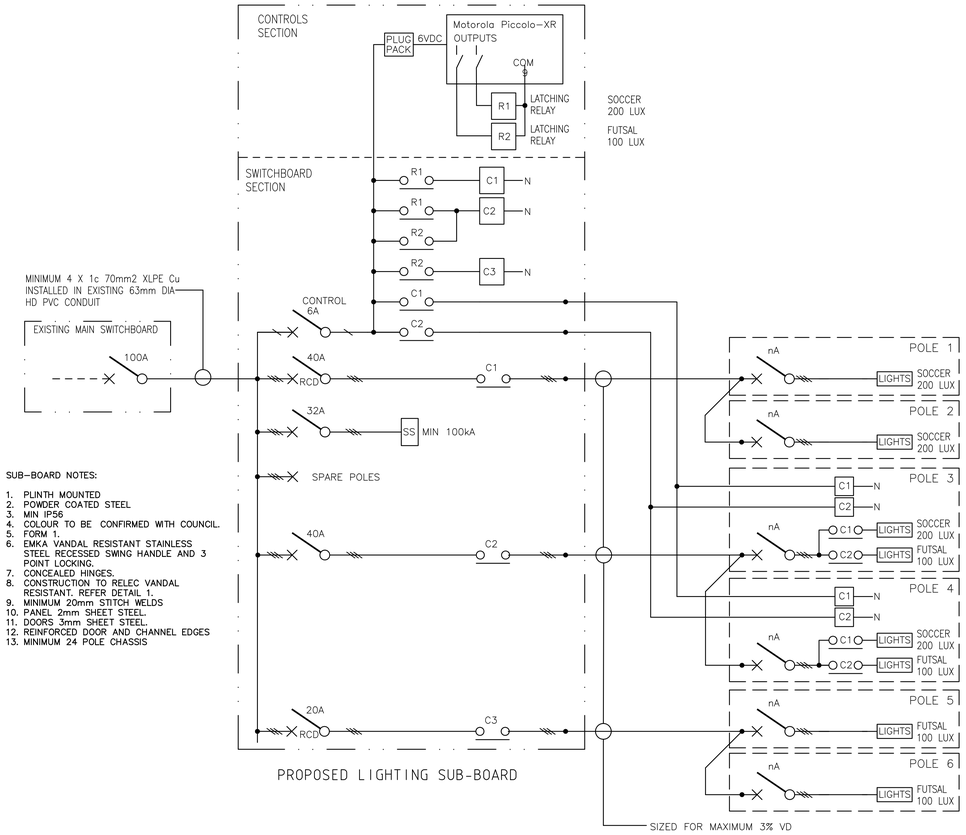
Project: MAJORS BAY RESERVE NORMAN STREET CONCORD NSW 2137

Drawing: ELECTRICAL SERVICES LIGHTING AND POWER LAYOUT

Drawing No: 430E1 Issue: A

Date: 5/01/19 Drawn: C.C. Checked: Proj.No: 431 Scale: NTS@A0

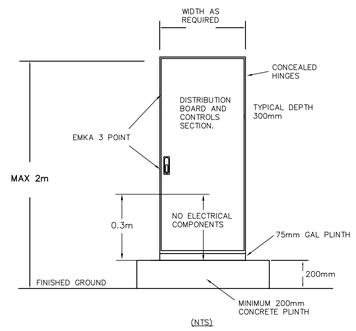
PLOT DATE:
CAD FILE:




PROPOSED LIGHTING SUB-BOARD

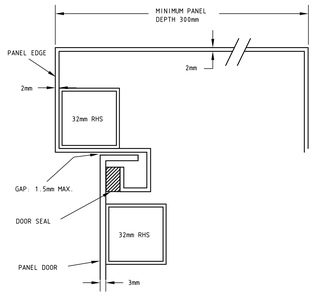
SUB–BOARD NOTES:

1. PLINTH MOUNTED
2. POWDER COATED STEEL
3. MIN IP56
4. COLOUR TO BE CONFIRMED WITH COUNCIL.
5. FORM 1.
6. EMKA VANDAL RESISTANT STAINLESS STEEL RECESSED SWING HANDLE AND 3 POINT LOCKING.
7. CONCEALED HINGES.
8. CONSTRUCTION TO RELEC VANDAL RESISTANT. REFER DETAIL 1.
9. MINIMUM 20mm STITCH WELDS
10. PANEL 2mm SHEET STEEL.
11. DOORS 3mm SHEET STEEL.
12. REINFORCED DOOR AND CHANNEL EDGES
13. MINIMUM 24 POLE CHASSIS




(NTS)

TYPICAL PANEL CONSTRUCTION FOR NEW SUB BOARD PLINTH MOUNTED




TYPICAL RELEC VANDAL RESISTANT CONSTRUCTION DETAIL (DIMENSIONS SHOWN ARE MINIMUM VALUES)

DETAIL 1

| No. | DATE | Description | Drawn |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| A | 24/01/19 | Tender issue | CC |
| P1 | 5/01/19 | Preliminary for discussion | CC |

Electrical Engineer
GRA ELECTRICAL ENGINEERS
GARY ROBERTS & ASSOCIATES PTY LTD ACN 064331086
PHONE (02) 9457 6485
MOBILE (0412) 442 671
E-mail: grassoc@optusnet.com.au

Client: CANADA BAY COUNCIL

Project: MAJORS BAY RESERVE
NORMAN STREET CONCORD
NSW 2137

Drawing: ELECTRICAL SERVICES LIGHTING AND POWER LAYOUT

Drawing No: 430E2 Issue: A

| Date: | Drawn: | Checked: | Proj.No: | Scale: |
|---|---|---|---|---|
| 5/01/19 | C.C. | | 431 | NTS@A0 |

PLOT DATE:
CAD FILE:

# APPENDIX H. ASSESSMENT OF PROPOSAL PURSUANT TO THE SYDNEY REGIONAL ENVIRONMENTAL PLAN (SYDNEY HARBOUR CATCHMENT) 2005, PREPARED BY MILESTONE (AUST) PTY LTD

**APPENDIX H**

**REVIEW OF ENVIRONMENTAL FACTORS FOR THE CONSTRUCTION OF A SYNTHETIC FIELD OVER THE EXISTING NATURAL FIELD AND RELOCATION OF SPORTS FIELD LIGHTING AT SID RICHARDS FIELD 3 AT MAJORS BAY RESERVE, CONCORD (LOT 1 DP 909052, LOT 1 DP 327309 AND LOT 6 DP 217073).**

**ASSESSMENT OF PROPOSAL PURSUANT TO THE SYDNEY REGIONAL ENVIRONMENTAL PLAN (SYDNEY HARBOUR CATCHMENT) 2005**

| Clause | Matter for Consideration | COMPLIANCE |
|---|---|---|
| Clause 21 – Biodiversity, ecology and environment protection. | (a) A development should have a neutral or beneficial effect on the quality of water entering the waterways. | **Complies.** The proposed synthetic field is within the existing Majors Bay Reserve will not alter the quality of water entering waterways. |
| | (b) Development should protect and enhance terrestrial and aquatic species, populations and ecological communities and, in particular, should avoid physical damage and shading of aquatic vegetation (such as seagrass, saltmarsh and algal and mangrove communities). | **Complies.** No impact on the ecology of the area arises from current proposal. |
| | (c) Development should promote ecological connectivity between neighbouring areas of aquatic vegetation (such as seagrass, saltmarsh and algal and mangrove communities). | **Complies** Proposed works are to be located within and continue the use of existing areas of public recreation and do not seek alteration to, maintain significant distance from, and therefore will not impact neighbouring areas of aquatic vegetation. |
| | (d) Development should avoid indirect impacts on aquatic vegetation (such as changes to flow, current and wave action and changes to water quality) as a result of increased access. | **Complies.** Existing access routes are maintained to the site with no increase in activity within the aquatic environment resulting from the proposed minor internal works. |
| | (e) Development should protect and reinstate natural intertidal foreshore areas, natural landforms and native vegetation. | **Complies.** All works are located within the bounds of the existing Majors Bay Reserve, being a public recreation area, with no new impacts to the existing waterways. |
| | (f) Development should retain, rehabilitate and restore riparian land. | **Not applicable.** No works to riparian land are proposed. |
| | (g) Development on land adjoining wetlands should maintain and enhance the ecological integrity of the wetlands and, where possible, should provide a vegetative buffer to protect the wetlands. | **Not applicable.** No works to riparian land are proposed. |
| | (h) The cumulative environmental impact of development. | **Complies.** The proposed works are compatible with the existing use of the site for public recreation and no significant additional impact will arise as a result of the proposal. |
| | (i) Whether sediments in the waterway adjacent to the development are contaminated, and what means will minimise their disturbance. | **Complies** No impact on the adjoining waterways will result from the proposed works. |

| Clause | Matter for Consideration | COMPLIANCE |
|---|---|---|
| Clause 22 - Public access to use of foreshores and waterways. | (a) Development should maintain and improve public access to and along the foreshore, without adversely impacting on watercourses, wetlands, riparian lands or remnant vegetation. | **Complies.** The proposal will have no impact on existing access arrangements at the site. |
| | (b) Development should maintain and improve public access to and from the waterways for recreational purposes (such as swimming, fishing and boating), without adversely impacting on watercourses, wetlands, riparian lands or remnant vegetation. | **Complies.** The proposal will have no impact on existing access arrangements at the site. |
| | (c) If foreshore land made available for public access is not in public ownership, development should provide appropriate tenure and management mechanisms to safeguard public access to, and public use of, that land. | **Complies** The proposal will have no impact on existing access arrangements at the site. |
| | (d) The undesirability of boardwalks as a means of access across or along land below the mean high water mark if adequate alternative public access can otherwise be provided. | **Not applicable.** The proposal will have no impact on existing access. |
| | (e) The need to minimise disturbance of contaminated sediments. | **Not applicable.** No excavation is required to facilitate the current Stage 1 proposed works. |
| Clause 23 - Maintenance of working harbour | (a) Foreshore sites should be retained so as to preserve the character and functions of a working harbour, in relation to both current and future demand. | **Not applicable.** |
| | (b) Consideration should be given to integrating facilities for maritime activities in any development. | **Not applicable.** |
| | (c) In the case of development on land that adjoins land used for industrial and commercial maritime purposes, development should be compatible with the use of the adjoining land for those purposes. | **Not applicable** |
| | (d) In the case of development for industrial and commercial maritime purposes, development should provide and maintain public access to and along the foreshore where such access does not interfere with the use of the land for those purposes. | **Not Applicable** |
| Clause 24 - Interrelationship of waterway and foreshore | (a) Development should promote equitable use of the waterway, including use by passive recreation craft. | **Complies** The use of the surrounding waterway is not affected. |

| Clause | Matter for Consideration | COMPLIANCE |
|---|---|---|
| uses | (b) Development on foreshore land should minimise any adverse impact on the use of the waterway, including the use of the waterway for commercial and recreational uses. | **Complies.** The proposal complements existing commercial uses. |
| | (c) Development on foreshore land should minimise excessive congestion of traffic in the waterways or along the foreshore. | **Complies** No increase in traffic congestion in the waterways will result from the proposed works. |
| | (d) Water-dependent land uses should have priority over other uses. | **Not applicable.** The proposal does not constitute a water dependent use. |
| | (e) Development should avoid conflict between the various uses in the waterways and along the foreshores. | **Complies.** No conflict will arise as a result of the proposed development. |
| Clause 25 - Foreshore and Waterways Scenic Quality | (a) The scale, form, design and siting of any building should be based on an analysis of:<br>(i) the land on which it is to be erected, and<br>(ii) the adjoining land, and<br>(iii) the likely future character of the locality. | **Complies.** The relocated light pole structures are compatible with the use and character of this site. |
| | (b) Development should maintain, protect and enhance the unique visual qualities of Sydney Harbour and its islands, foreshores and tributaries. | **Complies** The current proposal will not impact on the visual qualities of the Harbour. |
| | (c) The cumulative impact of water-based development should not detract from the character of the waterways and adjoining foreshores. | **Complies.** No impact on the character of the waterways will arise from the proposed development. |
| Clause 26 - Maintenance, protection and enhancement of views | (a) Development should maintain, protect and enhance views (including night views) to and from Sydney Harbour. | **Complies.** The site does not hold and is not subject to views to and from Sydney Harbour |
| | (b) Development should minimise any adverse impacts on views and vistas to and from public places, landmarks and heritage items. | **Complies.** The site is not subject to any significant or iconic views. |
| | (c) The cumulative impact of development on views should be minimised. | **Complies.** No impact arises with respect to view impacts. |
| Clause 27 - Boat Storage Facilities | (a) Development should increase the number of public boat storage facilities and encourage the use of such facilities. | **Not applicable.** |
| | (b) Development should avoid the proliferation of boat sheds and other related buildings and structures below the mean high water mark. | **Not applicable.** |
| | (c) Development should provide for the shared use of private boat storage facilities. | **Not applicable.** |

| Clause | Matter for Consideration | COMPLIANCE |
|---|---|---|
| | (d) Development should avoid the proliferation of private boat storage facilities in and over the waterways by ensuring that all such facilities satisfy a demonstrated demand. | **Not applicable.** |
| | (e) Boat storage facilities should be as visually unobtrusive as possible. | **Not applicable.** |
| | (f) In the case of permanent boat storage, the safety and utility of the development should not be adversely affected by the wave environment, and the development should avoid adverse impacts on safe navigation and single moorings. | **Not applicable.** |