15 September 2017

Project No. 00013808

FDC Construction & Fitout (NSW) Pty Ltd
22 - 24 Junction Street
FOREST LODGE NSW 2037

ATTENTION Ms Katrina Rollason
katrinar@fdcbuilding.com.au

Dear Katrina

**SYDNEY OLYMPIC PARK PUB | STORMWATER DRAINAGE PHILOSOPHY**

**Site Description**

The site is located within Sydney Olympic Park, to the east of ANZ Stadium. The Nearmaps image below shows the location of the proposed pub.


The subject site portioned off for the proposed development is approximately 970m$^2$. In its current state, the entire 970m$^2$ is imperviously paved area with a few tree plots located within. Runoff from the existing pavement is either discharged via sheet flow to the northeast, or captured in the existing stormwater drainage network.

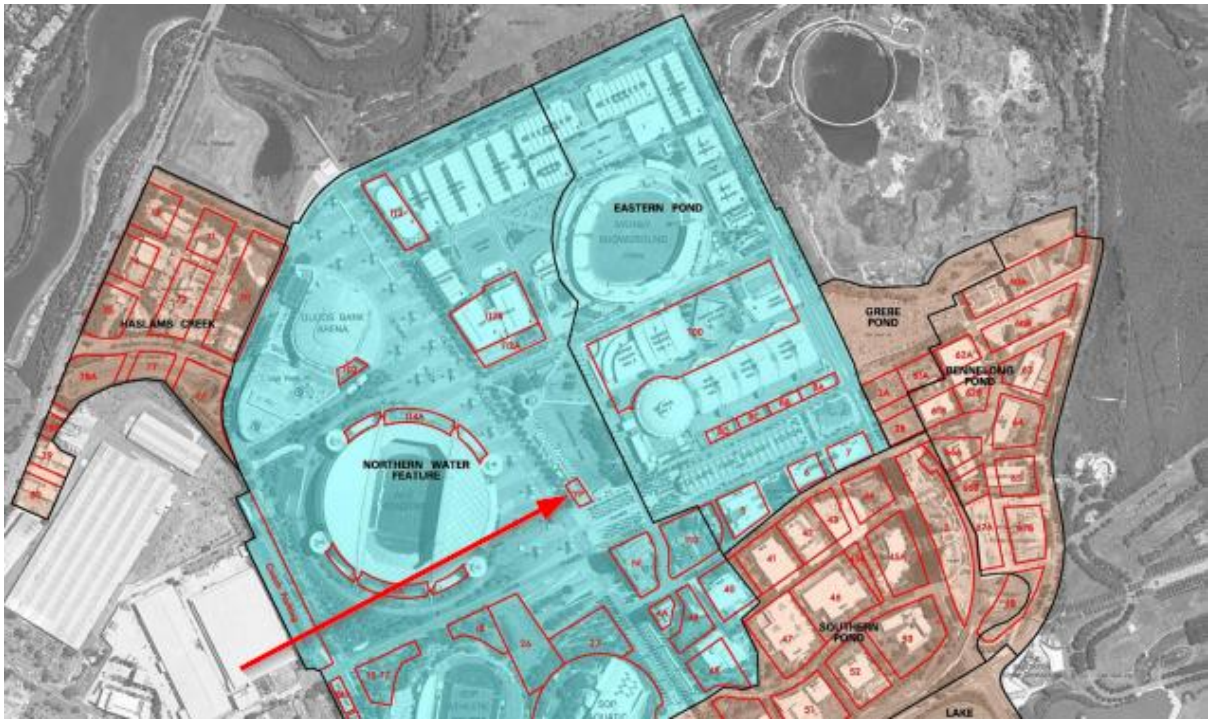
It is proposed that a new pub will be constructed on the site. The proposed stormwater management philosophy will include:

- Capture roofwater with a series of gutters and downpipes and convey via subsurface pipe to the existing surface stormwater drainage network;
- Capture surface runoff via series of surface inlet pits; and
- Modify existing surface levels as required in order to provide overland flow paths to safe points of discharge.

**SOPA Guidelines**

A review was undertaken of the Sydney Olympic Park Authority (SOPA) Stormwater Management and Water Sensitive Urban Design Policy (WSUD Policy) to understand the requirements the proposed pub would need to meet.

It was determined that the site was located within the blue shaded area. See image below.




The blue area represents the WRAMS stormwater harvesting catchment.

**Consultation with SOPA**

Several discussions were undertaken between Lindsay Dynan, FDC and SOPA to understand the site specific water management requirements. Following these discussions, guidance was provided by Ben Woods, SOPA's Director of Property Development. It was concluded that:

- Provided the development can meet its demands using the WRAMS recycled water network, rainwater tanks will not be required. A water balance will need to be provided to support this.
- As the site is impervious in its current state, water quality treatment measures may be minimal, however, a MUSIC model must be provided to show the "Post-Development" pollutant levels are less than or equal to the existing site pollutant levels.
- As the site is impervious in its current state, provided the proposed development reduces the area of impervious portion, onsite detention will not be required.

**Water Balance**

The proposed development water balance has been undertaken using recorded rainfall data from the closest available weather station. The following table summarises the annual rainfall from Station 66212.

Summary statistics for all years — Information about climate statistics

| Statistic | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lowest | 18.4 | 6.2 | 64.0 | 24.8 | 4.8 | 31.2 | 15.0 | 10.6 | 26.0 | 17.2 | 27.6 | 32.8 | 943.8 |
| Highest | 343.6 | 152.6 | 363.2 | 412.8 | 116.8 | 327.0 | 83.4 | 257.2 | 93.0 | 92.0 | 171.6 | 224.2 | 1303.8 |

The table below demonstrates how this rainfall data is converted to volume of runoff from the site catchment area.

| | | |
|---|---|---|
| **Site Area** | 970 $m^2$ | 970 $m^2$ |
| **Annual Rainfall** | 943.8 mm | 1303.8 mm |
| **Runoff Volume** | 0.915 ML/year | 1.265 ML/year |

As can be seen in the table above, the anticipated runoff volume leaving the site and being collected within the WRAMS system is calculated to be between 0.915 and 1.265 ML/year.

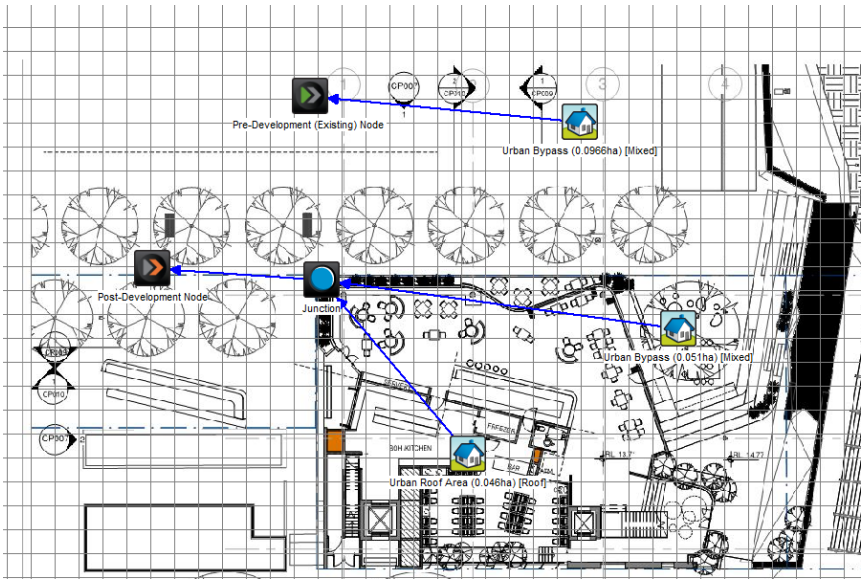
The water usage was estimated using the Managing Urban Stormwater Part E – Water Sensitive Urban Design, Potable Water Guide Calculator for a Commercial development.

| | Demand Type | Quantity | Usage Assumption | Demand (KL/yr/item) | Volume (KL/yr) |
|---|---|---|---|---|---|
| **Non-Potable** | Toilet | 18 | - | 23 | 414 |
| **Non-Potable** | Urinal | 8 | - | 0.73 | 5.84 |
| **Non-Potable** | Landscaping | 75 $m^2$ | - | 0.72 | 54.75 |
| **Potable** | Wash Basin | 16 | 320 | 0.9125 | 292 |

The results in the table above indicate the volume of non-potable demands per year does not exceed the total volume produced per year within the catchment area. The volume of runoff from the site, contributing to the WRAMS recycled water supply is conservatively 440.4 kL/yr in excess of the non-potable demand.

## Water Quality

A MUSIC model was prepared to determine the impact the proposed development will have on the quality of the water runoff, and compare this to the existing conditions. A screenshot of the model and the results can be seen below.




Treatment Train Effectiveness - Post-Development Node

| | Sources | | Residual Load | | % Reduction | |
|---|---|---|---|---|---|---|
| | Pre | Post | Pre | Post | Pre | Post |
| Flow (ML/yr) | 0.626 | 0.624 | 0.626 | 0.624 | 0 | 0 |
| Total Suspended Solids (kg/yr) | 139 | 76.6 | 139 | 76.6 | 0 | 0 |
| Total Phosphorus (kg/yr) | 0.265 | 0.181 | 0.265 | 0.181 | 0 | 0 |
| Total Nitrogen (kg/yr) | 1.96 | 1.67 | 1.96 | 1.67 | 0 | 0 |
| Gross Pollutants (kg/yr) | 17.1 | 17.1 | 17.1 | 17.1 | 0 | 0 |

Include Pre-Development

As can be seen in the screenshots above, the Post-Development pollutant loads were less than or equal to the Existing Development pollutant loads. This result was expected as the majority of the impervious pavement areas will be converted to impervious roof areas, producing less pollutants during rainfall events.

The MUSIC file has been provided with this letter for review.

**Stormwater Peak Discharge**

The existing site is considered 100% impervious, and therefore, the proposed development will not increase the impervious area of the site. As such, peak flows will be less than or equal to the existing peak flows leaving the site.

**Conclusions**

This letter has been developed based on the SOPA WSUD Policy, and following consultation with SOPA's Mr Ben Woods. As demonstrated above, it can be concluded that:

- The runoff from the site being discharged in to the existing WRAMS system exceeds the non-potable demand from the proposed development. As such, rainwater tanks will not be required for the proposed development.
- The water quality from the proposed development will be an improvement on the water quality of the runoff from the existing site. As such, no water quality treatment measures are proposed.
- The peak discharge from the proposed development will be equal to or less than the peak discharge from the existing site conditions. As such, onsite detention has not been proposed for this development.

The proposed stormwater drainage plans will be developed based on the philosophy above.

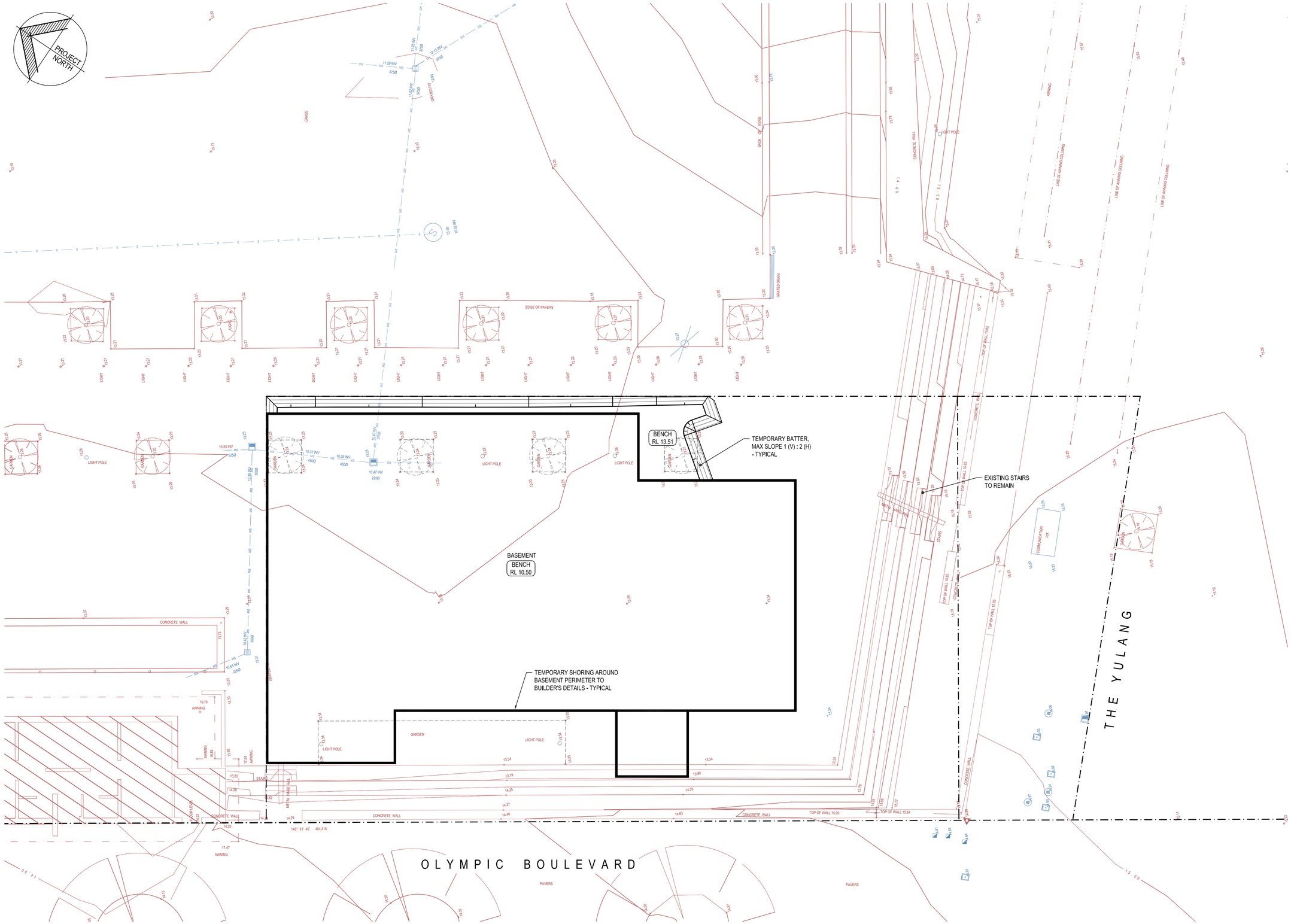
Should you require any further advice or clarification of any of the above, please do not hesitate to contact us.

Yours faithfully
LINDSAY DYNAN
CONSULTING ENGINEERS PTY LIMITED

**Mathew McNamara**
Associate Civil Engineer

Attachments

(i) MUSIC model




BULK EARTHWORKS PLAN
SCALE 1:100

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PROJECT
PROPOSED
SYDNEY OLYMPIC PARK PUB
HOMEBUSH NSW

CLIENT
FDC CONSTRUCTION AND FITOUT PTY LTD

## NOTES

THE POSITION OF ALL EXISTING SERVICES SHOWN SHOULD BE REGARDED AS APPROXIMATE AND NOT NECESSARILY COMPREHENSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATIONS OF ALL EXISTING SERVICES (WHETHER SHOWN OR NOT) AND INFORM ALL RELEVANT AUTHORITIES PRIOR TO ANY EXCAVATION.

DURING CONSTRUCTION, THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART OF THE STRUCTURE SHALL BE OVER-STRESSED. TEMPORARY STRUCTURES, FORMWORK, FALSEWORK, TEMPORARY BRACING, SHORING AND THE LIKE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

THE STABILITY OF TEMPORARY BATTERS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR TO VERIFY SETOUT BEFORE COMMENCING EARTHWORKS. REFER ANY DISCREPANCIES TO ENGINEER.

WHERE SITE IS IN CUT ADJACENT TO SITE BOUNDARY, TOP OF RETAINING WALLS TO BE CONSTRUCTED FLUSH WITH EXISTING SURFACE OF NEIGHBOURING PROPERTIES TO AVOID IMPOUNDING WATER ON NEIGHBOURING PROPERTIES.

ALL EXPOSED/DISTURBED AREAS TO BE TREATED IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.

BULK EARTHWORKS CONTOURS ARE SHOWN AT 0.1m INTERVALS.

EXISTING CONTOURS ARE SHOWN AT 0.25m INTERVALS.

## LEGEND

- BENCH RL 10.50 — BULK EARTHWORKS SPOTLEVEL
- × 13.30 — EXISTING SPOTLEVEL
- BULK EARTHWORKS CONTOUR
- 1.5 . 0.0 — EXISTING CONTOUR
- S — EXISTING SEWER LINE
- SW — EXISTING STORMWATER LINE
- BOUNDARY LINE

BULK EARTHWORKS LEVELS SHOWN ARE NOMINAL ONLY. ALL LEVELS TO BE CONFIRMED DURING DETAIL DESIGN.

| REV | DATE | DRAWING STATUS | DRN | APP |
|---|---|---|---|---|
| C | 15/09/17 | RE-ISSUED FOR DEVELOPMENT APPLICATION | M.B. | M.M. |
| B | 31/08/17 | RE-ISSUED FOR DEVELOPMENT APPLICATION | M.B. | M.M. |
| A | 18/08/17 | ISSUED FOR DEVELOPMENT APPLICATION | J.F. | M.M. |

TITLE
BULK EARTHWORKS PLAN

| DRAWING STATUS | | | SHEET SIZE |
|---|---|---|---|
| FOR APPROVAL | | | A1 |
| DRAWN | DESIGNED | APPROVED | SCALE |
| M.Bector | S.Keverian | M.McNamara | 1:100 |
| PROJECT No. | | DRAWING No. | REVISION |
| 13808 | | DA - 0001 | C |

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PLOTTED: 15/09/2017 4:53 PM


## EROSION & SEDIMENT CONTROL PLAN

SCALE 1:300

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PROJECT

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HOMEBUSH NSW

CLIENT

FDC CONSTRUCTION AND
FITOUT PTY LTD

## NOTES

FOR BULK EARTHWORKS REFER TO DRAWING 13808-DA-0001

THE ARRANGEMENT OF SEDIMENT AND EROSION CONTROL MEASURES SHOWN ARE INDICATIVE ONLY AND RELATE TO A PARTICULAR STAGE OF THE CONSTRUCTION WORKS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DESIGN, CONSTRUCT AND MAINTAIN ANY ADDITIONAL MEASURES THAT MAY BE REQUIRED FOR THE CONTRACTOR'S CONSTRUCTION METHODOLOGIES, IN ORDER TO MEET ALL CONDITIONS AND REQUIREMENTS IMPOSED BY ANY STATUTORY AUTHORITY.

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ALL EXPOSED/DISTURBED AREAS TO BE TREATED IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.

EXISTING CONTOURS ARE SHOWN AT 0.25m INTERVALS.

## LEGEND

- SEDIMENT CONTROL FENCE, REFER TO DRAWING 13808-DA-0003 FOR DETAILS
- GT GEOTEXTILE INLET FILTER, REFER TO DRAWING 13808-DA-0003 FOR DETAILS
- APPROXIMATE AREA OF CONSTRUCTION SITE COMPOUND, FINAL LOCATION TO BE DETERMINED ON-SITE
- EXISTING SPOTLEVEL
- EXISTING CONTOUR
- EXISTING SEWER LINE
- EXISTING STORMWATER LINE
- PROPOSED CONSTRUCTION SITE FENCE
- BOUNDARY LINE

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|---|---|---|---|---|
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EROSION & SEDIMENT CONTROL PLAN

| DRAWING STATUS | | | SHEET SIZE |
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| DRAWN | DESIGNED | APPROVED | SCALE |
| M.Bector | S.Keverian | M.McNamara | 1:300 |
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| 13808 | | DA - 0002 | C |

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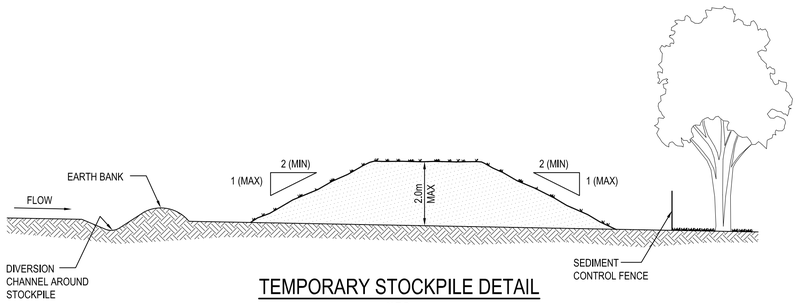
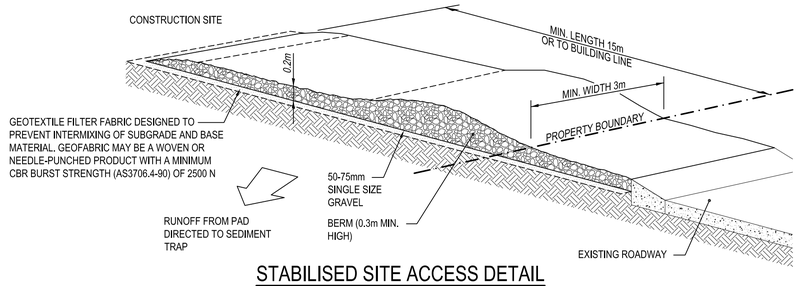



## TEMPORARY STOCKPILE DETAIL

N.T.S.

IN ACCORDANCE WITH LANDCOM 'BLUE BOOK'

SD4-1 STOCKPILES

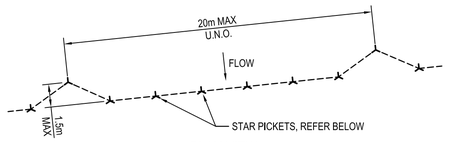



## STABILISED SITE ACCESS DETAIL

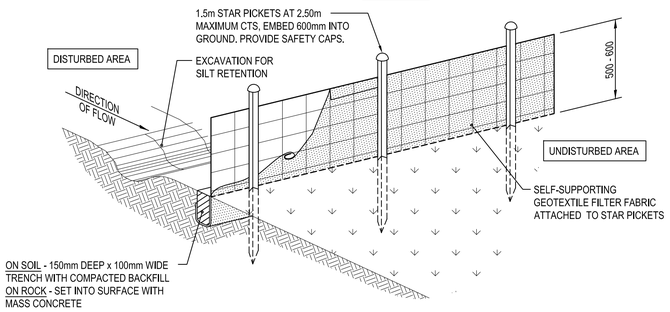
N.T.S.

IN ACCORDANCE WITH LANDCOM 'BLUE BOOK'

SD6-14 STABILISED SITE ACCESS




PLAN VIEW

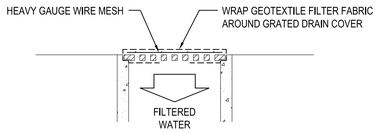



## SEDIMENT CONTROL FENCE DETAIL

N.T.S.

IN ACCORDANCE WITH LANDCOM 'BLUE BOOK'

SD6-8 SEDIMENT FENCE




## GEOTEXTILE INLET FILTER DETAIL

N.T.S.

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PROJECT

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SYDNEY OLYMPIC PARK PUB
HOMEBUSH NSW

CLIENT

FDC CONSTRUCTION AND FITOUT PTY LTD

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EROSION & SEDIMENT CONTROL DETAILS

| DRAWING STATUS | | | SHEET SIZE |
|---|---|---|---|
| FOR APPROVAL | | | A1 |
| DRAWN | DESIGNED | APPROVED | SCALE |
| M.Bector | S.Keverian | M.McNamara | NTS |
| PROJECT No. | | DRAWING No. | REVISION |
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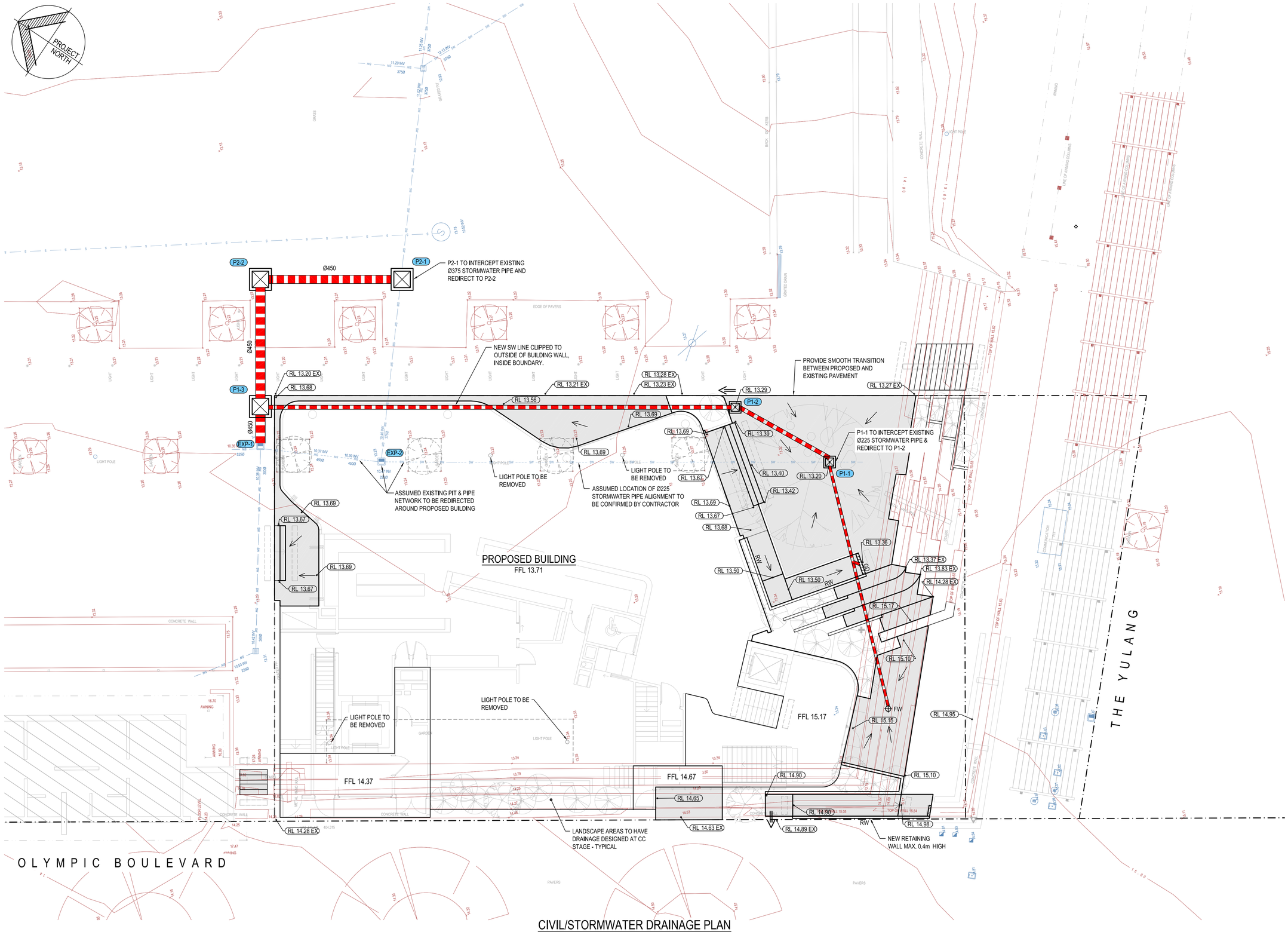


## CIVIL/STORMWATER DRAINAGE PLAN

SCALE 1:100

NOT FOR CONSTRUCTION

DO NOT SCALE - THIS DRAWING MAY BE A REDUCED COPY

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## NOTES

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ALL HANDRAILS, IF REQUIRED, ARE TO ARCHITECT'S LOCATION AND DETAILS AND SHALL COMPLY WITH AS1657.

BENCHMARKS TO BE PROVIDED PRIOR TO COMMENCEMENT OF CONSTRUCTION.

TREATMENT OF ALL EXPOSED / DISTURBED AREAS TO ARCHITECT'S DETAILS.

DETAIL OF LANDSCAPING IS TO TAKE INTO CONSIDERATION OVERLAND FLOW PATHS.

WHERE SITE IS IN CUT ADJACENT TO SITE BOUNDARY, TOP OF RETAINING WALLS TO BE CONSTRUCTED FLUSH WITH EXISTING SURFACE OF NEIGHBORING PROPERTIES TO AVOID IMPOUNDING WATER ON NEIGHBORING PROPERTIES.

EXISTING CONTOURS ARE SHOWN AT 0.25m INTERVALS.

## LEGEND

- EXISTING CONTOUR
- EXISTING SPOTLEVEL
- RL 13.27 — DESIGN SPOTLEVEL
- NEW STORMWATER DRAINAGE PIT, INSTALLED TO MANUFACTURER'S SPECIFICATIONS
- NEW U.P.V.C. STORMWATER DRAINAGE PIPE LAID AT 1.0% MIN. FALL (UNO) TO OUTLET IN ACCORDANCE WITH COUNCILS SPECIFICATIONS
- GD — GRATED DRAIN 150 MIN. (WIDE) x 150 MIN. (DEEP). 1% MIN FALL TO OUTLET INSTALLED TO MANUFACTURERS SPECIFICATION
- RW — RETAINING WALL TO FUTURE DETAILS
- OVERLAND FLOW PATH
- DIRECTION OF SURFACE FALL
- FW — DENOTES NEW FLOOR WASTE, REFER TO PLAN FOR DETAILS
- BOUNDARY LINE
- EXISTING SEWER SERVICE
- EXISTING STORMWATER SERVICE
- EXISTING DEMOLISHED STORMWATER SERVICE
- EXISTING TREE
- EXISTING TREE TO BE REMOVED

SUBSOIL AND DOWNPIPES LOCATIONS AND SIZE TO BE CONFIRMED AT CC STAGE

| REV | DATE | DRAWING STATUS | DRN | APP |
|---|---|---|---|---|
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CIVIL/STORMWATER DRAINAGE PLAN

| DRAWING STATUS | | | SHEET SIZE |
|---|---|---|---|
| FOR APPROVAL | | | A1 |
| DRAWN | DESIGNED | APPROVED | SCALE |
| M.Bector | S.Keverian | M.McNamara | 1:100 |
| PROJECT No. | | DRAWING No. | REVISION |
| 13808 | | DA - 0004 | C |

PLOTTED: 15/09/2017 4:52 PM

Monday, 28 August 2017

Project No. 00013808

FDC Construction and Fitout Pty Ltd
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Forrest Lodge NSW 2037

ATTENTION Mrs Katrina Rollason
katrinar@fdcbuilding.com.au

**SYDNEY OLYMPIC PARK DESIGN COMPETITION | PUB**
**STORMWATER SYSTEM MAINTENANCE SCHEDULES**

In accordance with the Sydney Olympic Park Authority Policy (Attachment 4: Policy compliance checklist), provided in Appendix A, Table 1 is the maintenance schedule for the stormwater network installed on site.

This schedule sets out the minimum requirements to be undertaken on the site.

Should you require any further advice or clarification of any of the above, please do not hesitate to contact us.

Yours faithfully
LINDSAY DYNAN
CONSULTING ENGINEERS PTY LIMITED

Reviewed by

**Shant Keverian**
Civil Engineer

**Mathew McNamara**
Project Team Leader

# Appendix A

**Table 1 Stormwater Network Maintenance Schedule**

| Maintenance Action | Frequency | Performed By | Procedure |
|---|---|---|---|
| Inspect pit sump and remove any sediment/sludge | Six Monthly * | Maintenance Contractor | Remove grate and screen. Remove sediment/sludge build-up. |
| Inspect grate for damage or blockage | Six Monthly * | Maintenance Contractor | Check both sides of grate for corrosion, (especially corners and welds) Damage or blockage. |
| Inspect and remove any blockage of pipes | Six Monthly * | Maintenance Contractor | Remove any debris/material or blockages around pipe |
| Inspect and remove debris/litter/mulch | Six Monthly * | Maintenance Contractor | Remove blockages from grate and check if pit blocked. |
| Inspect pit walls (internal and external, if appropriate) for cracks or spalling | Annually | Maintenance Contractor | Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required. |
| Check step irons for corrosion | Annually | Maintenance Contractor | Remove grate. Examine step irons and repair any corrosion or damage. |
| Check fixing of step irons is secure | Six Monthly | Maintenance Contractor | Remove grate and ensure fixings secure prior to placing weight on step iron |
| Landscape | Annually * | Maintenance Contractor | Annual inspections of the landscaping shall be undertaken to ensure that the system operates as required. |

* And after every major storm event