Concept Stormwater Management Plan

24-26 Railway Parade, Westmead

Prepared for Sissons Architects / 25 October 2018

161634 CAAD

Taylor Thomson Whitting (NSW) Pty Ltd, Consulting Engineers | ABN 81 113 578 377
48 Chandos Street, St Leonards NSW 2065 | +612 9439 7288 | ttw.com.au

Structural
Civil
Traffic
Facade
Consulting
Engineers

Contents

1.0 Introduction

Taylor Thomson Whitting Pty. Ltd. (TTW) has been engaged by Sissons Architects to provide the associated concept Civil Engineering design and documentation for the proposed works at 24–26 Railway Parade, Westmead. This report has been prepared to highlight the proposed civil engineering works.

1.1 Development Site

The site is located within the City of Parramatta local government area as shown in Figure 1. The site covers an area of 2,522m^2 and currently contains a number of commercial stores, a pedestrian arcade and an on grade car parking area.

The site is largely roofed excluding the on grade carpark, which falls from a reduced level (RL) of 33.90 at the western boundary to an RL of 31.30 at the eastern boundary. This parking falls at approximately a 6% grade.

Figure 1: Site Location

1.2 Reference Documents

- City of Parramatta Council's Development Control Plan 2011 and Local Environmental Plan 2011
- City of Parramatta Council's Stormwater Disposal Policy
- Upper Parramatta River Catchment Trust On-Site Detention Handbook

- Architectural Drawings prepared by Sissons Architects Rev C dated October 2018
- Site Survey prepared by Freeburn Surveying dated July 2018

2.0 Proposed Works

The proposed works include (refer to Figure 2):

- Demolition of the existing buildings and on grade parking.
- Construction of three levels of basement carparking and 15 levels above accommodating a supermarket, tavern, medical centre, motel and apartments.
- Commercial loading dock facility with turn table.

The civil engineering works involved with the proposed development include the extension of Council's stormwater system with new in-ground pits and pipes, the provision of onsite detention (OSD) and stormwater quality measures. Refer to Civil Engineering drawing "SKC02" and "SKC03" for the proposed concept siteworks and stormwater management plan affixed in Appendix A.

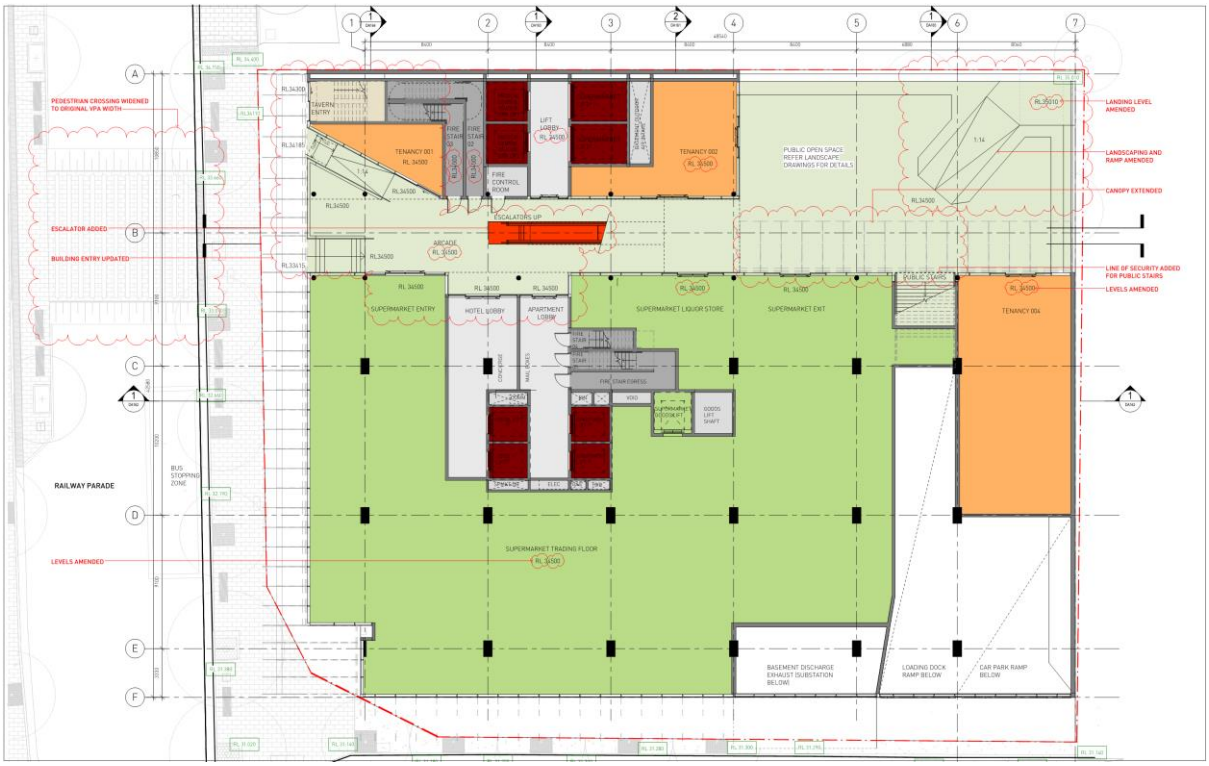


Figure 2: Architectural Plans from Sissons Architects Rev C dated October 2018.

The Council stormwater system has been documented conceptually. Final detail will include a hydraulic grade line analysis along with complete construction set of drawings to Council standards. Further survey of the topography and existing below ground services is required and will be complete prior to detail design.

3.0 Stormwater Quantity

The proposed stormwater design has been undertaken in accordance with the Upper Parramatta River Catchment Trust On-Site Detention Handbook with the requirements of Parramatta City Council.

To determine the required volume of onsite detention (OSD), the Upper Parramatta River Catchment Trust OSD spreadsheet was used. A copy of this spreadsheet and OSD

calculation has been affixed in Appendix B.

The OSD is designed to store 118 m^3 of detention storage which meets the requirement of 117 m^3 in accordance with Council's requirements. It is proposed to be located within the building footprint of the site. The overall site is designed to discharge via gravity into an extension of the existing downstream Council stormwater system located along Ashley Parade.

Pipes leading to the OSD will include the overflow from the rainwater tank and the roof areas. This internal pipe network is to be detailed by the hydraulic engineer. For storm events that exceed the capacity of the OSD, an overflow pipe at the top of the tank will allow for stormwater to be conveyed out of the building.

The total catchment captured by the OSD system is equal to 2,578m^2 inclusive of 2,227m^2 of roof catchment and 65m^2 of catchment external to the boundary due to awnings. There is expected to be a bypassing catchment of 49m^2.

The OSD will have two discharge points along with an internal emergency overflow weir should the other 2 points fail. The nominated discharge points consist of 2 orifice plates to restrict the flow to the calculated permissible site discharge; orifice plate 1 will discharge 9.21L/s and orifice plate 2 will discharge 31.33L/s. Orifice plate 3 has been designed to discharge 27.7 L/s, equivalent to the 1 in 3-month flow, into the water treatment chamber of the tank. Any flows greater than this level will overtop the high-flow weir and enter the primary chamber.

4.0 Stormwater Quality

City of Parramatta Council's water quality requirements are outlined in Part 3 of their Development Control Plan (DCP). Refer to Table 1 for the pollutant reduction targets detailed within the DCP.

The majority of the site is roof covered (2,227m^2), excluding the north eastern corner which is designated public open space (300m^2) (assumed to be paving) and some paving along the Ashley Road frontage of the site (49m^2). In addition to these catchments within the site boundary, due to the awning located along Ashley Lane and Railway Parade there is an additional external roof catchment (65m^2). As the basement footprint is roughly equal to the area of the site, there is no pervious area within the site. Stormwater quality measures including Stormwater360's Enviropods and 460mm PSorb Stormfilter cartridges have been designed to ensure pollutant targets are met.

Table 1: Stormwater Treatment Targets (Source: City of Parramatta Council's DCP 2011)

Pollutant	Performance Target Reduction Loads
Gross Pollutants	90%
Total Suspended Solids	85%
Total Phosphorus	60%
Total Nitrogen	45%
Hydrocarbons, motor oils, oil and grease	No visible oils for flows up to 50% of the one-year ARI peak flow specific for service stations, depots, vehicle body repair workshops, vehicle repair stations, vehicle sales or hire premises, car parks associated with retail premises, places of public workshop, tourist and visitor accommodation, registered

	clubs and pubs.

Stormwater quality measures have been modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC). The stormwater quality treatment train consists of 3 enviropods and 4 stormfilter cartridges. The layout of the MUSIC model and results are shown in Figure 3 and Figure 4 respectively. In accordance with the BASIX certificate, no provision for Rainwater Retention and Reuse is required, thus none has been provided.

The MUSIC-Link report detailing the modelling results with respect to Parramatta City Council's requirements has been affixed in Appendix C.

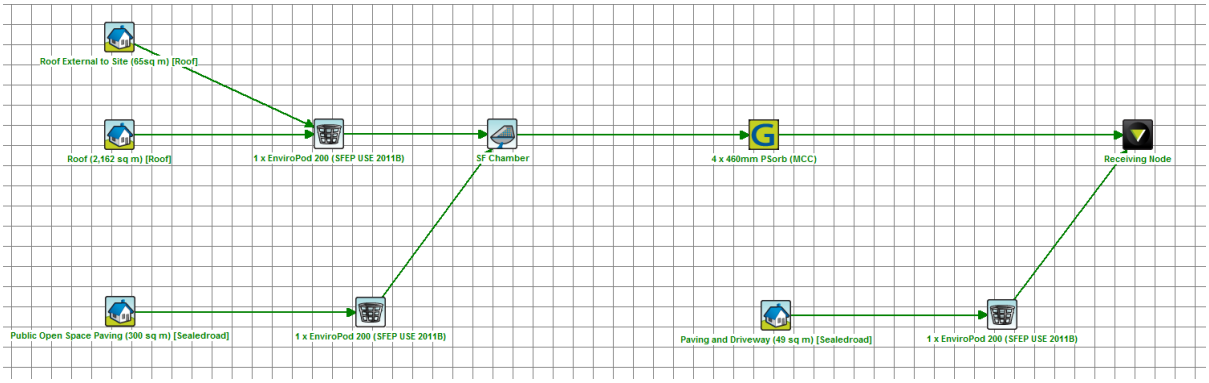
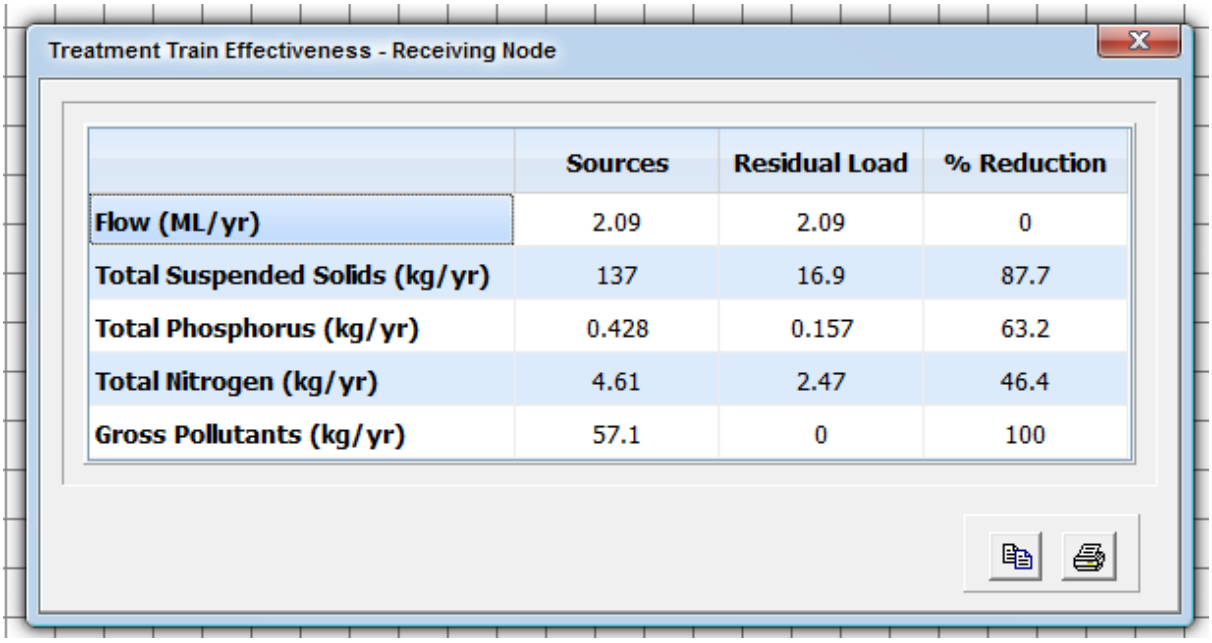


Figure 3: MUSIC Modelling Layout



	Sources	Residual Load	% Reduction
Flow (ML/yr)	2.09	2.09	0
Total Suspended Solids (kg/yr)	137	16.9	87.7
Total Phosphorus (kg/yr)	0.428	0.157	63.2
Total Nitrogen (kg/yr)	4.61	2.47	46.4
Gross Pollutants (kg/yr)	57.1	0	100

Figure 4: MUSIC Results

4.1 Stormwater Quality During Construction

During the construction stage of the project, an erosion and sediment control plan is to be implemented to prevent sediment laden stormwater from flowing into adjoining properties, bushland, roadways or receiving water bodies. Stormwater controls onsite are detailed in an erosion and sediment control plan which is in accordance with relevant regulatory authority guidelines including City of Parramatta Council's Development Control Plan and Landcom NSW's Managing Urban Stormwater, Soils and Construction ("Blue Book"). Refer to Civil

Engineering drawing reference number “SKC01” dated 19.10.2018 for the proposed concept erosion and sediment control plan.

5.0 Conclusion

Stormwater is collected onsite using a pit and pipe stormwater system, with flowrates controlled using an OSD. The total proposed onsite detention volume is equal to 118m^3. Discharge of stormwater will occur to the nearest Council downstream pit along Ashley Lane. Captured stormwater will be treated using water quality measures including 4 Enviropods and 4 PSorb Stormfilter cartridges. An erosion and sediment control plan has been prepared for the site detailing the management of stormwater during construction.

Prepared by
TAYLOR THOMSON WHITTING (NSW) PTY LTD

KIERAN SMITH
Civil Engineer

Approved By
TAYLOR THOMSON WHITTING (NSW) PTY LTD

PAUL YANNOULATOS
Technical Director

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Appendix A

Concept Civil Engineering Plans

PROPOSED MIXED USE DEVELOPMENT
24-26 RAILWAY PARADE

GENERAL NOTES

1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Engineer
2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
3. Make smooth connection with all existing works.
4. Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
5. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority, the Contractor is to ensure that the drawings used for construction have been approved by all relevant authorities prior to commencement site.
6. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
7. For all temporary batters refer to geotechnical recommendations.

REFERENCE DRAWINGS

1. These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
SISSONS ARCHITECTS	LOWER GROUND-ASHLEY LANE	DA115	C	OCT 2018
SISSONS ARCHITECTS	LB1 STORE_LOADING DOCK PLAN	DA114	C	OCT 2018
SISSONS ARCHITECTS	UPPER GROUND PLAN	DA116	C	OCT 2018
FREEBURN SURVEYING	DETAIL SURVEY	33005		JUL 2018

SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : S.S.M. 46849 R.L. 38.447
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM
Coordinate system : CONTACT THE SURVEYOR
Survey prepared by : PROUST & GARDNER
Setout Points : CONTACT THE SURVEYOR

Taylor Thomson Whitting does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

UNDERGROUND SERVICES - WARNING

The locations of underground services shown on Taylor Thomson Whittings drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate.

The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation.

Taylor Thomson Whitting does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.

The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.
Taylor Thomson Whitting plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from : **Proust & Gardner**

Taylor Thomson Whitting makes no guarantees that the boundary or easement information shown is correct.
Taylor Thomson Whitting will accept no liabilities for boundary inaccuracies. The contractor/builder is advised to check/confirm all boundaries in relation to all proposed work prior to the commencement of construction. Boundary inaccuracies found are to be reported to the superintendent prior to construction starting.

SAFETY IN DESIGN

Contractor to refer to Appendix B of the Civil Specification for the Civil Risk and Solutions Register.

EXISTING SERVICES
Contractor to be aware existing services are located within the site. Location of all services to be verified by the Contractor prior to commencing works. Contractor to confirm with relevant authority regarding measures to be taken to ensure services are protected or procedures are in place to demolish and/or relocate.

EXISTING STRUCTURES
Contractor to be aware existing structures may exist within the site. To prevent damage to existing structure(s) and/or personnel, site works to be carried out as far as practicably possible from existing structure(s).

EXISTING TREES
Contractor to be aware existing trees exist within the site which need to be protected. To prevent damage to trees and/or personnel, site works to be carried out as far as practicably possible from existing trees. Advice needs to be sought from Arborist and/or Landscape Architect on measures required to protect trees.

GROUNDWATER
Contractor to be aware ground water levels are close to existing surface level. Temporary de-watering may be required during construction works.

EXCAVATIONS
Deep excavations due to stormwater drainage works is required. Contractor to ensure safe working procedures are in place for works. All excavations to be fenced off and batters adequately supported to approval of Geotechnical Engineer.

GROUND CONDITIONS
Contractor to be aware of the site geotechnical conditions.

HAZARDOUS MATERIALS
Existing asbestos products & contaminated material may be present on site. Contractor to ensure all hazardous materials are identified prior to commencing works. Safe working practices as per relevant authority to be adopted and appropriate PPE to be used when handling all hazardous materials.

CONFINED SPACES
Contractor to be aware of potential hazards due to working in confined spaces such as stormwater pits, trenches and/or tanks. Contractor to provide safe working methods and use appropriate PPE when entering confined spaces.

MANUAL HANDLING
Contractor to be aware manual handling may be required during construction. Contractor to take appropriate measures to ensure manual handling procedures and assessments are in place prior to commencing works.

WATER POLLUTION
Contractor to ensure appropriate measures are taken to prevent pollutants from construction works contaminating the surrounding environment.

SITE ACCESS/EGRESS
Contractor to be aware site works occur in close proximity to footpaths and roadways. Contractor to erect appropriate barriers and signage to protect site personnel and public.

VEHICLE MOVEMENT
Contractor to supply and comply with traffic management plan and provide adequate site traffic control including a certified traffic marshall to supervise vehicle movements where necessary.

CIVIL SAFETY IN DESIGN

Taylor Thomson Whitting (NSW) Pty Ltd operates under Safe Work Australia's Code of Conduct for the Safe Design of Structures.
These drawings shall be read in conjunction with the Taylor Thomson Whitting Transfer of Information Letter and Civil Risk and Solutions Register.
Under the Code of Conduct it is the Client's responsibility to provide a copy of the Civil Risk and Solutions Register to the Principal Contractor.
It is the Principal Contractor's responsibility to review the hazards and risks identified during the design process to ensure a safe workplace is maintained for the construction, maintenance and eventual demolition of the civil infrastructure.

SITEWORKS NOTES

1. All basecourse material to comply with RMS specification No 3051 and compacted to minimum 98% modified standard dry density in accordance with AS 1289 5.2.1.
2. All trench backfill material shall be compacted to the same density as the adjacent material.
3. All service trenches under vehicular pavements shall be backfilled with an approved select material and compacted to a minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1

SURVEY LEGEND

+18.48	Surface level
19	Contour
	Kerb line
	Batter
	Retaining wall
EASEMENT FOR _____(_m WIDE)	Easement
	Fence
	Tree to be removed/be retained
	Boundary
SGN	Sign
H	Hydrant
MH	Manhole
G	Gas
SV	Stop Valve
W	Water
TEL	Telecomunications
	Grate
S	Sewer Manhole
E	Electricity
ELP	Electric Light Pole
PM 1234	Permanent Mark
BM 51.10	Bench Mark

EXISTING SEVICES LEGEND

S	Existing sewer
W	Existing water
EU	Existing underground electrical
EA	Existing aerial electrical
T	Existing communications
G	Existing gas
SW	Existing stormwater

SITE LOCALITY PLAN
NOT TO SCALE - IMAGE COURTESY OF NSW SPATIAL INFORMATION EXCHANGE

DRAWING SCHEDULE

Drawing No.	Drawing Title
SKC00	COVER, GENERAL NOTES AND DRAWING SCHEDULE SHEET
SKC01	CONCEPT EROSION AND SEDIMENT CONTROL PLAN AND DETAILS SHEET
SKC02	CONCEPT STORMWATER CATCHMENT PLAN
SKC03	CONCEPT STORMWATER MANAGEMENT PLAN (LOWER GROUND FLOOR)
SKC04	CONCEPT OSD DETAILS SHEET
SKC05	CONCEPT ASHLEY LANE STORMWATER PLAN AND SECTIONS

CONTRACTOR IS TO LOCATE ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK

FileName: SKC00.dwg - USER: Kerans - Plot File Created: Oct 25, 2018 - 1:42pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
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P3	ISSUED FOR DA	CV	CV	28.05.18
P2	ISSUED FOR DA	CV	JH	05.12.17
P1	ISSUED FOR DA	CV	RG	11.11.17

Architect
SISSONS ARCHITECTS
Studio 5, Level 2
81 Alexander St, Crows Nest, NSW 2065

Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
COVER, LEGENDS, NOTES & DRAWING SCHEDULE SHEET

Scale : A1 NTS | Drawn KS | Authorised
Job No 161634 | Drawing No SKC00 | Revision P4
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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING SKC00

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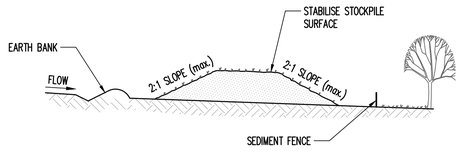
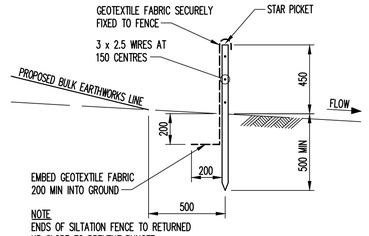


STOCKPILE
NTS



SILTATION FENCE DETAIL
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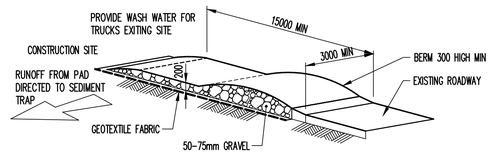
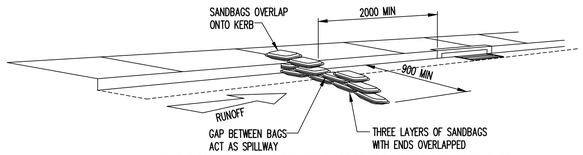


TEMPORARY CONSTRUCTION EXIT
NTS



SANDBAG KERB SEDIMENT TRAP
NTS

EROSION AND SEDIMENT CONTROL NOTES

1. All work shall be generally carried out in accordance with
   (A) Local authority requirements,
   (B) EPA – Pollution control manual for urban stormwater,
   (C) LANDCOM NSW – Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities. The erosion and sediment control plan shall be implemented and adopted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. When stormwater pits are constructed prevent site runoff entering the pits unless silt fences are erected around pits.
5. Minimise the area of site being disturbed at any one time.
6. Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
7. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
8. Control water from upstream of the site such that it does not enter the disturbed site.
9. All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
10. All vehicles leaving the site shall be cleaned and inspected before leaving.
11. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
12. Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

1. Prior to commencement of excavation the following soil management devices must be installed.
1.1. Construct silt fences below the site and across all potential runoff sites.
1.2. Construct temporary construction entry/exit and divert runoff to suitable control systems.
1.3. Construct measures to divert upstream flows into existing stormwater system.
1.4. Construct sedimentation traps/basin including outlet control and overflow.
1.5. Construct turf lined swales.
1.6. Provide sandbag sediment traps upstream of existing pits.
2. Construct geotextile filter pit surround around all proposed pits as they are constructed.
3. On completion of pavement provide sand bag kerb inlet sediment traps around pits.
4. Provide and maintain a strip of turf on both sides of all roads after the construction of kerbs.

WATER QUALITY TESTING REQUIREMENTS

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.This should include comments from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

EROSION AND SEDIMENT CONTROL LEGEND

- Siltation fence
- Sandbag sediment trap
- Catch drain

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Rev	Description	Eng	Draft	Date
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P2	ISSUED FOR DA	CV	JH	07.12.17
P1	ISSUED FOR DA	CV	RG	11.11.17

Architect
SISSONS ARCHITECTS
Studio 5, Level 2
81 Alexander St, Crows Nest, NSW 2065

Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
EROSION AND SEDIMENT CONTROL PLAN

Scale : A1
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Authorised

Job No
161634

Drawing No
SKC01

Revision
P4

Plot File Created: Oct 25, 2018 - 10:26am

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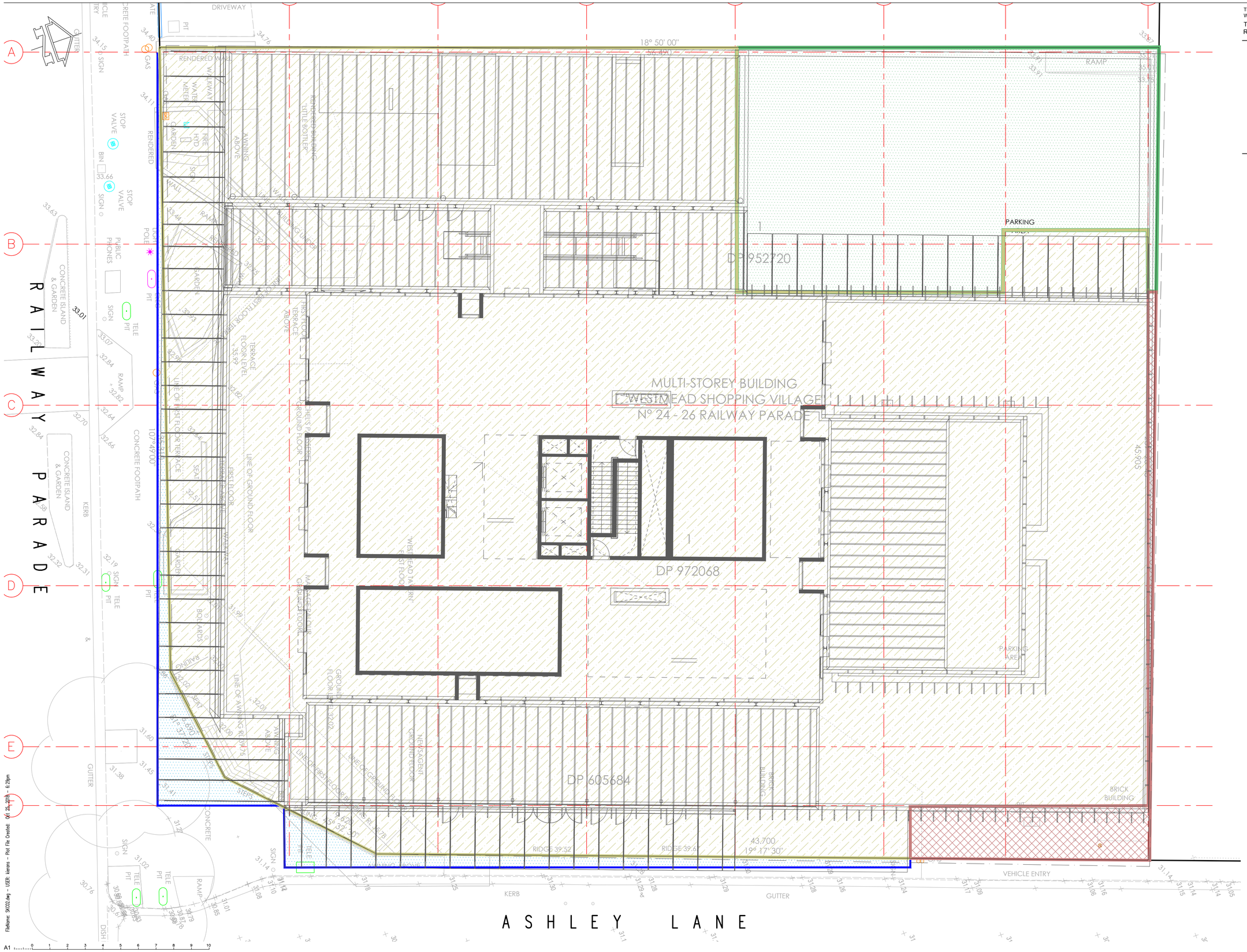
CATCHMENT LEGEND

- Roof catchment area to OSD = 216m^2
- Ground floor catchment area to OSD = 300m^2
- OSD bypass catchment area = 49m^2
- External catchment area to OSD = 65m^2



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Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

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PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
CONCEPT STORMWATER CATCHMENT PLAN

Scale : A1 1:100 | Drawn RG | Authorised

Job No 161634 | Drawing No SKC02 | Revision P5

Plot File Created: Oct 25, 2018 - 6:29pm

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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING SKC00

SITEWORKS LEGEND

- ● F22.20 — Finished surface level
- Stormwater pit, flow direction and line with
  - IL10.00 — Invert level upstream
  - 600 ø 'Z' — Pipe size and class
  - 1.25% — Pipe grade
  - Q=345 L/s — Flow (Litres per second)
  - IL9.65 — Invert level downstream

STORMWATER DRAINAGE NOTES

1. All osd inlets to discharge to stormwater/ hey chamber. inlet location to be coordinated at detail design.
2. All pipe services crossing clash to be confirmed at detailed design.
3. Emergency/blocked orifice flow to be conveyed to kerb inlet pit via new ø375 pipe. For all storm events, up to and including the 1% aep storm event.

PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets – **SKC04**
Final internal pit dimensions are to comply with AS3500

Type	Description	Cover (Clear Opening)	Number
A	Surface inlet pit	900 x 600 Class C galvanised mild steel grate hinged to frame	2
		900 x 600 Class C galvanised mild steel grate on vehicular crossing	1A
		900 x 600 Class C galvanised mild steel grate with 1.8m lintel	1,3
B	OSD Access lid	900 x 900 Class C galvanised mild steel grate hinged to frame (lockable)	4,5,6,15
		900 x 900 Class D cast iron cover with concrete infill	7–14

STORMWATER ENTRY TO THE SYSTEM

PROPOSED 118m³ ONSITE DETENTION TANK – REFER SKC04 FOR DETAILS

PIPE TO BE SUSPENDED FROM SOFFIT OF SLAB ABOVE

GRATED DRAIN ON BOUNDARY TO COLLECT RUNOFF AND DRAIN TOWARDS NEW PIT FOR TREATMENT.

FOR CONTINUATION REFER TO DRAWING SKC05

RAILWAY PARADE

ASHLEY LANE

MULTI-STOREY BUILDING "WESTMEAD SHOPPING VILLAGE" N° 24 - 26 RAILWAY PARADE

DP 952720

DP 972068

DP 605[illegible]

Rev	Description	Eng	Draft	Date
P6	ISSUED FOR DA	CV	DM	24.08.18
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Architect
SISSONS ARCHITECTS
Studio 5, Level 2
81 Alexander St, Crows Nest, NSW 2065

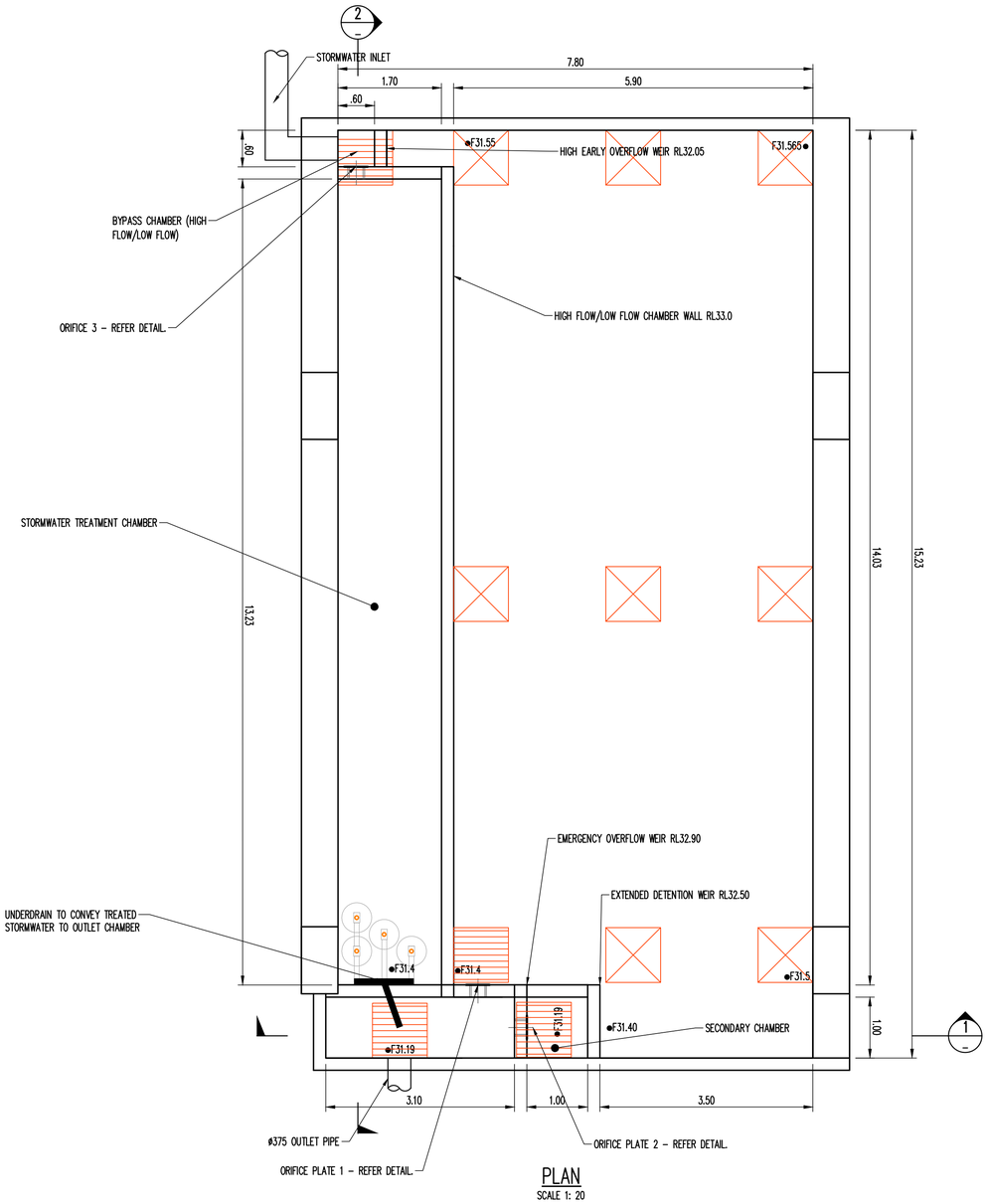
Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

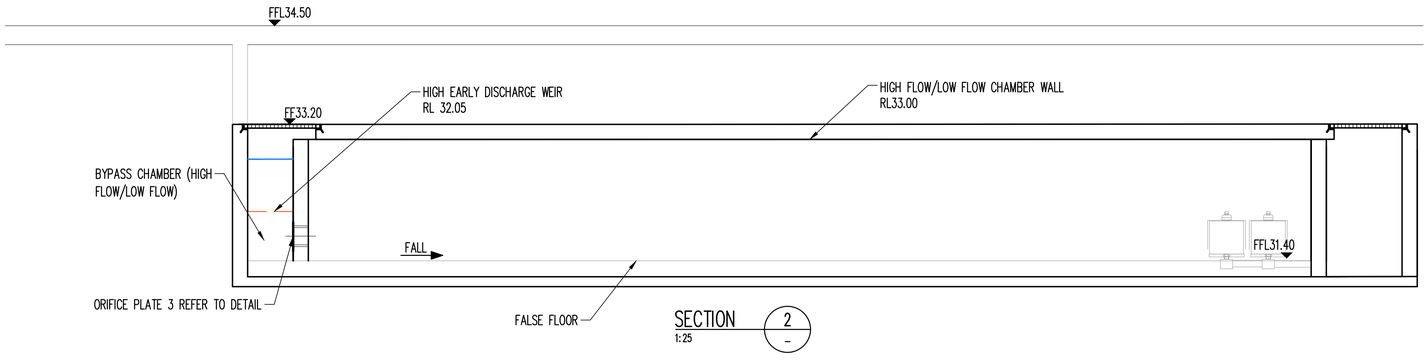
Sheet Subject
STORMWATER CONCEPT PLAN LOWER GROUND FLOOR

Scale : A1 — 1:100
Drawn — AI
Authorised
Job No — 161634
Drawing No — SKC03
Revision — P7
Plot File Created: Oct 25, 2018 - 10:26am

FileName: SKC03.dwg - USER: kkerans - Plot File Created: Oct 25, 2018 - 10:26am



PLAN
SCALE 1: 20



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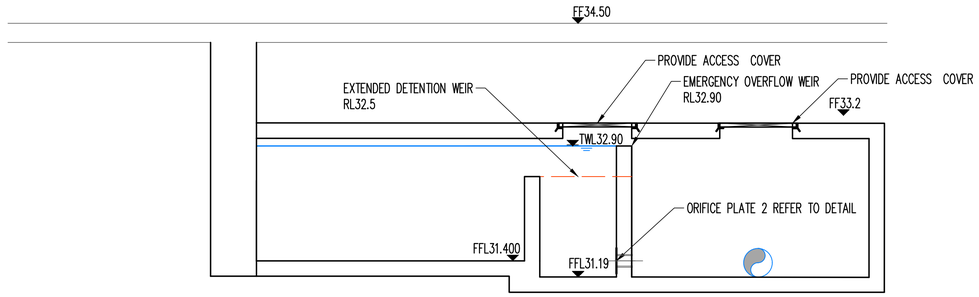
1:25



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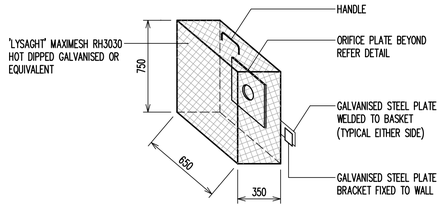
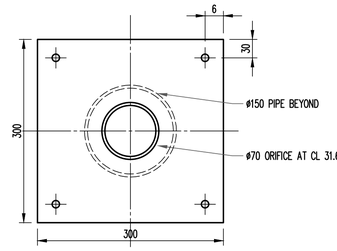
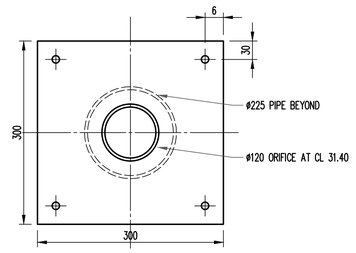


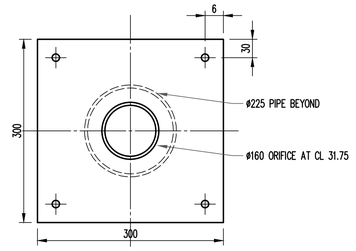
TRASH SCREEN
SCALE 1:10



ORIFICE PLATE 1 DETAIL
NTS



ORIFICE PLATE 2 DETAIL
NTS



ORIFICE PLATE 3 DETAIL
NTS

WEIR	RL	STORMWATER ACTION
Stormwater Treatment Chamber	Up to 32.05	Stormwater up to and including the 1 in 3 month flow enters the inflow pit and flows through Orifice 3 into the treatment chamber. It is then treated by the stormfilter and discharges to the outlet chamber via underdrain
Primary Chamber	32.05 - 32.50	Stormwater inflow exceeds the 1 in 3 month flow and overtops the high early discharge weir and enters the primary chamber. Stormwater discharges to outlet chamber through Orifice 1
Secondary Chamber	32.50 - 32.90	Stormwater overtops the extended detention weir and enters the secondary chamber, discharging to outlet chamber through Orifice 2
Emergency Overflow	32.90	For stormwater events that exceed the capacity of the OSD system or due to blockage an emergency weir exists to allow stormwater to be directed to the 375 outlet pipe.

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P5	ISSUED FOR DA	KS	KS	19.10.18
P4	ISSUED FOR DA	CV	EW	24.08.18
P3	ISSUED FOR DA	CV	CV	28.05.18
P2	ISSUED FOR DA	CV	JH	08.12.17
P1	ISSUED FOR DA	CV	RG	11.11.17

Architect
SISSONS ARCHITECTS
Studio 5, Level 2
81 Alexander St, Crows Nest, NSW 2065

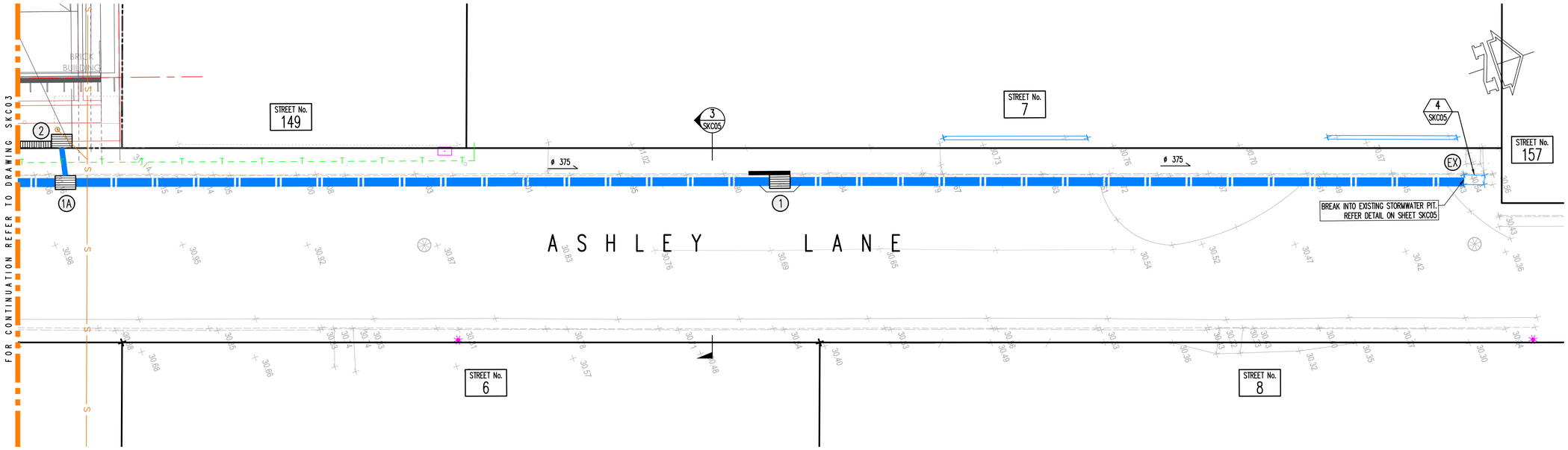
Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
DETAILS SHEET

Scale : A1 AS SHOWN | Drawn PW | Authorised
Job No 161634 | Drawing No SKC04 | Revision P5
Plot File Created: Oct 25, 2018 - 10:26am

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING SKC00



PLAN
SCALE 1: 100

SITEWORKS LEGEND

- ● F22.20 — Finished surface level
- IL10.00 / 600 ø 'Z' / 1.25% / Q=345 L/s / IL9.65 — Stormwater pit, flow direction and line with
  - Invert level upstream
  - Pipe size and class
  - Pipe grade
  - Flow (Litres per second)
  - Invert level downstream

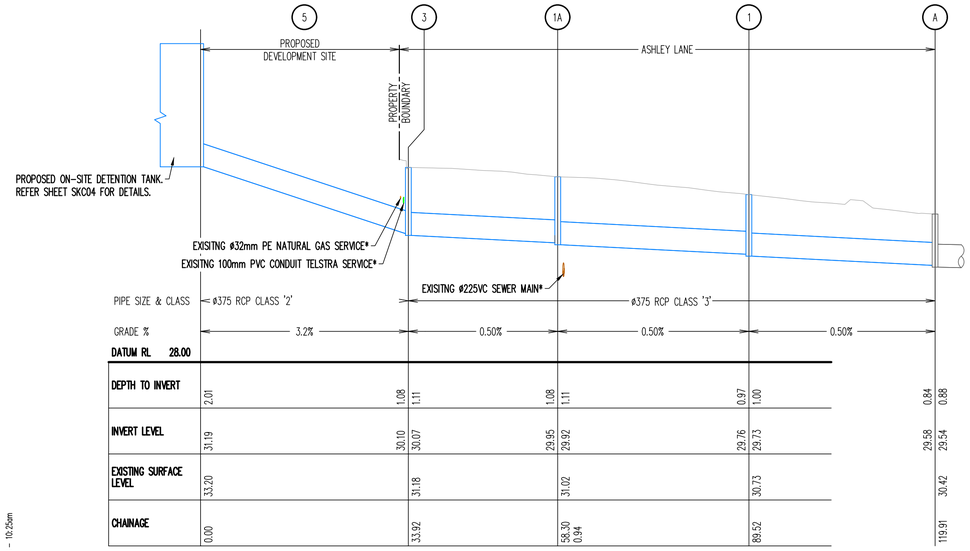
STORMWATER DRAINAGE NOTES

1. All osd inlets to discharge to stormwater/ hey chamber. inlet location to be coordinated at detail design.
2. All pipe services crossing clash to be confirmed at detailed design.
3. Emergency/blocked orifice flow to be conveyed to kerb inlet pit via new ø375 pipe. For all storm events, up to and including the 1% aep storm event.

PIT SCHEDULE

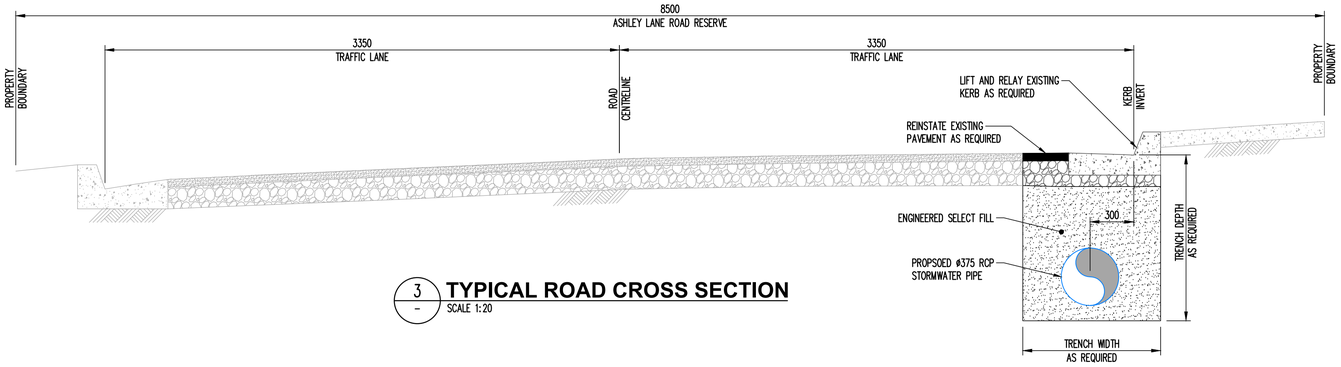
Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets – **SKC04**
Final internal pit dimensions are to comply with AS3500

Type	Description	Cover (Clear Opening)	Number
A	Surface inlet pit	900 x 600 Class C galvanised mild steel grate hinged to frame	2
		900 x 600 Class C galvanised mild steel grate on driver way	1A
		900 x 600 Class C galvanised mild steel grate with 1.8m lintel	1,3
B	OSD Access lid	900 x 900 Class C galvanised mild steel grate hinged to frame (lockable)	4,5,6,16
		900 x 900 Class D cast iron cover with concrete infill	7–15

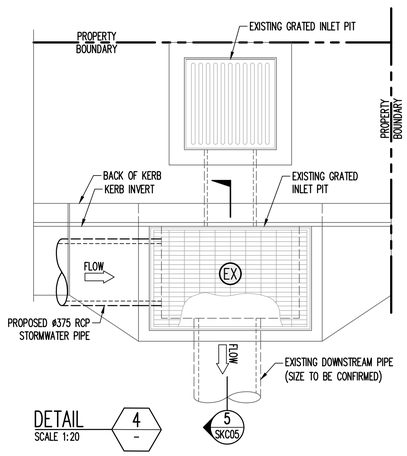


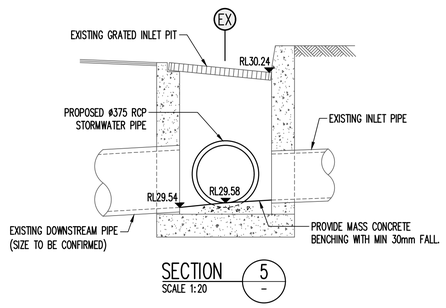
STORMWATER LONGITUDINAL SECTION
SCALE H1:500 V1:50

* APPROXIMATE SERVICE DEPTHS SHOWN ONLY. SERVICES ARE TO BE LOCATED AND DEPTHED PRIOR TO DETAILED DESIGN PHASE.



3 – TYPICAL ROAD CROSS SECTION
SCALE 1:20





SECTION 5
SCALE 1:20

0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6m
1:20 A1 1:40 A3

0 1 2 3 4 5 6 7 8m
1:100 A1 1:200 A3

0 5 10 15 20 25 30 35 40m
1:500 A1 1:1000 A3

FileName: SKC05.dwg – USER: kierans – Plot File Created: Oct 25, 2018 - 10:25am

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P2	ISSUED FOR DA	KS	KS	19.10.18
P1	ISSUED FOR DA	CV	DM	24.08.18

Architect
SISSONS ARCHITECTS
Studio 5, Level 2
81 Alexander St, Crows Nest, NSW 2065

Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
CONCEPT ASHLEY LANE STORMWATER PLAN AND SECTIONS

Scale : A1	Drawn	Authorised
1:100	AI	

Job No	Drawing No	Revision
161634	SKC05	P2

Plot File Created: Oct 25, 2018 - 10:25am

Appendix B

On Site Detention Calculation Sheet for Upper Parramatta River Catchment

On-Site Detention Calculation Sheet for Upper Parramatta River Catchment
HED Secondary Outlet

Project:	**24-26 Railway Parade Westmead, Westmead**
Site Address	**24-26 Railway Parade Westmead Westmead**
Job No:	**161634**
Designer:	**Kieran Smith**
Telephone:	**(02) 9249 7288**

Site Data

OSD Area:	**Upper Parramatta River Catchment**						
L.G.A	**Parramatta City Council**						
Site Area	**0.2578**	ha	**2,578**	m^2			
Total Roof Area	**0.2227**	ha	**2,227**	m^2			
Area of Site draining to OSD Storage	**0.2528**	ha	**2,528**	m^2	**Satisfactory**		
Residual Site Area (Lot Area - Roof Area)	**0.035**	ha					
Area Bypassing Storage	**0.005**	ha					
Area Bypassing / Residual Site Area	**14.2%**				**Satisfactory**	**30% Max**	
No. of Dwellings on Site	**1**				**Satisfactory**		
Site Area per Dwelling	**0.258**	ha					
Roof Area per Dwelling	**0.223**	ha					

Basic OSD Parameters

		Extended Detention			Detention	
Basic SSR Vols	Ext Detention Storage	**300**	m^3/ha	Total Storage	**455**	m^3/ha
Basic SRDs	Primary Outlet	**40**	L/s/ha	Secondary Outlet	**150**	L/s/ha

OSD Tank Bypass

Residual Lot Capture in OSD Tank	**86%**				
Adjusted SRDs	**36**	L/s/ha		**122**	L/s/ha

OSD Calculations

		Extended Detention				Detention	
Basic SSR Volume	Ext Detention Storage	**77.34**	m^3		Total Storage	**117.30**	m^3
Total Rainwater Tank Credits		**0.00**	m^3			**0.00**	m^3
Storage Volume					Total	**117.30**	m^3
Storage Volume	Ext Detention Storage	**77.34**	m^3		Flood Detention Storage	**39.96**	m^3
OSD Discharges	Primary Outlet	**9.21**	L/s		Secondary Outlet	**31.33**	L/s
RL of Top Water Level of Storage		**32.500**	m			**32.900**	m
RL of Orifice Centre-line		**31.600**	m			**31.400**	m
Number of Orifices		**1**				**1**	
Estimated Downstream Flood Level		**30.10**	1.5 yr ARI			**30.90**	100 yr ARI
Downstream FL - RL of Orifice Cente-line		**-1.50**	**Satisfactory**		**Satisfactory**	**-0.50**	m
Design Head to Orifice Centre		**0.900**	m		TWL Ext Detn Storage - RL Orifice	**1.100**	m
Calculated Orifice Diameter		**68**	mm	**Satisfactory**	**Satisfactory**	**120**	mm

Overflow Weir & Freeboard Calculation

RL of Minimum Habitable Floor Level			**34.500**	m
RL of Minimum Garage Floor Level			**34.500**	m
Length of Overflow Weir			**2.40**	m
Site Runoff Coefficient		**Parramatta City Council**	**0.75**	
Storm Intensity (5 min 100 yr ARI)			**209**	mm/h
Peak Flow over Weir			**110.1**	L/s
Depth of Flow over Weir			**92**	mm
Freeboard to Habitable Floor		**Satisfactory**	**1508**	mm
Freeboard to Garage Floor		**Satisfactory**	**1508**	mm

Rainwater Tank Calculations (per Dwelling)

Only Complete this Section if a Rainwater Tank Airspace Credit is Claimed

The calculations assume that the same size rainwater tank is installed on each dwelling

				Min	Max
% of Roof draining to Rainwater Tank	80.0%		Satisfactory	0.0%	100%
Total Rainwater Tank Volume	0.00	kL	Minimum 0.0 kL		
Min Volume that triggers Top-up	0.00	kL	Note - Min Vol in Tank < 10% Total Tank Vol		
Total Tank Vol - Min Top-up Vol	0.00	kL			
Dedicated Airspace					
Dedicated Airspace	1.00	kL	Airspace > Max Credit - Reduce Airspace		
	Extended Detention			Detention	
Dedicated Airspace Credit	0.50	kL		1.00	kL
Maximum Tank PSD	40	L/s/ha			
Maximum Tank Discharge	10.3	L/s			
Maximum Head to Centre of Tank Orifice	0.000	m	Unacceptable - Enter Max Head		
Calculated Orifice Diameter	0	mm	Unacceptable -Min Diam 25 mm		
Dynamic Airspace					
Maximum Dynamic Storage (Nett Vol)	-1.00	kL	Controls minimum % Roof to Rainwater Tank		
Daily Demand on Rainwater Tank	3	kL/d	Daily Demand may be Too High		
Dynamic Airspace at start of Storm	#NUM!	kL			
	Extended Detention			Detention	
Dynamic Airspace Credit	0.00	kL		0.00	kL
Combined Rainwater Tank Credit	0.50	kL		1.00	kL
Maximum Rainwater Tank Credit	0.00	kL		0.00	kL
Rainwater Tank Credit per Dwelling	0.00	kL		0.00	kL
Rainwater Tank Credit for the Site	0.00	m^3		0.00	m^3

Signature: 

Date: 25/10/18

ORIFICE 3 CALCULATIONS		
Storm Intensity (5 min 1 in 3 month ARI)	**52.60**	mm/h
Site Runoff Coefficient	**0.75**	
Area of Site draining to OSD Storage	**0.25**	ha
Peak Flow	**27.70**	L/s
RL of Top Water Level of Storage	**32.050**	m
RL of Orifice Centre-line	**31.750**	m
Number of Orifices	**1**	
Design Head to Orifice Centre	**0.30**	m
Calculated Orifice Diameter	**156**	mm

Appendix C

MUSIC-Link Report

PARRAMATTA CITY COUNCIL

MUSIC-*link* Report

Project Details		Company Details	
Project:	24-26 Railway Parade Westmead	**Company:**	Taylor Thomson Whitting
Report Export Date:	28/05/2018	**Contact:**	C.Veleski
Catchment Name:	180528 24-26 Railway Parade MUSIC Model	**Address:**	48 Chandos St, St. Leonards NSW 2065
Catchment Area:	0.258ha	**Phone:**	9439 7288
Impervious Area*:	100%	**Email:**	christopher.veleski@ttw.com.au
Rainfall Station:	67035 LIVERPOOL(WHITLAM		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1967 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	857mm		
Evapotranspiration:	1261mm		
MUSIC Version:	6.2.1		
MUSIC-link data Version:	6.22		
Study Area:	Parramatta		
Scenario:	Parramatta Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: Receiving Node	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	0.00149%	Sedimentation Basin Node	1	Urban Source Node	4
TSS	87.7%	GPT Node	3		
TP	63.2%	Generic Node	1		
TN	46.4%				
GP	100%				

Comments

For DA

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	1 x EnviroPod 200 (SFEP USE 2011B)	Hi-flow bypass rate (cum/sec)	None	99	0.02
GPT	1 x EnviroPod 200 (SFEP USE 2011B)	Hi-flow bypass rate (cum/sec)	None	99	0.02
GPT	1 x EnviroPod 200 (SFEP USE 2011B)	Hi-flow bypass rate (cum/sec)	None	99	0.02
Receiving	Receiving Node	% Load Reduction	None	None	0.00149
Receiving	Receiving Node	GP % Load Reduction	90	None	100
Receiving	Receiving Node	TN % Load Reduction	45	None	46.4
Receiving	Receiving Node	TP % Load Reduction	60	None	63.2
Receiving	Receiving Node	TSS % Load Reduction	85	None	87.7
Sedimentation	SF Chamber	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Paving and Driveway (49 sq m)	Area Impervious (ha)	None	None	0.005
Urban	Paving and Driveway (49 sq m)	Area Pervious (ha)	None	None	0
Urban	Paving and Driveway (49 sq m)	Total Area (ha)	None	None	0.005
Urban	Public Open Space Paving (300 sq m)	Area Impervious (ha)	None	None	0.03
Urban	Public Open Space Paving (300 sq m)	Area Pervious (ha)	None	None	0
Urban	Public Open Space Paving (300 sq m)	Total Area (ha)	None	None	0.03
Urban	Roof (2_162 sq m)	Area Impervious (ha)	None	None	0.216
Urban	Roof (2_162 sq m)	Area Pervious (ha)	None	None	0
Urban	Roof (2_162 sq m)	Total Area (ha)	None	None	0.216
Urban	Roof External to Site (65sq m)	Area Impervious (ha)	None	None	0.007
Urban	Roof External to Site (65sq m)	Area Pervious (ha)	None	None	0
Urban	Roof External to Site (65sq m)	Total Area (ha)	None	None	0.007

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	SF Chamber	Notional Detention Time (hrs)	8	12	0.0613
Sedimentation	SF Chamber	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber	Total Suspended Solids - k (m/yr)	8000	8000	1
Urban	Paving and Driveway (49 sq m)	Field Capacity (mm)	80	80	70
Urban	Paving and Driveway (49 sq m)	Groundwater Daily Recharge Rate (%)	25	25	50
Urban	Paving and Driveway (49 sq m)	Impervious Area Rainfall Threshold (mm/day)	1	1	1.5
Urban	Paving and Driveway (49 sq m)	Pervious Area Infiltration Capacity coefficient - a	200	200	210
Urban	Paving and Driveway (49 sq m)	Pervious Area Infiltration Capacity exponent - b	1	1	4.7
Urban	Paving and Driveway (49 sq m)	Pervious Area Soil Storage Capacity (mm)	120	120	170
Urban	Public Open Space Paving (300 sq m)	Impervious Area Rainfall Threshold (mm/day)	1	1	1.5
Urban	Roof (2_162 sq m)	Impervious Area Rainfall Threshold (mm/day)	1	1	0.3
Urban	Roof External to Site (65sq m)	Impervious Area Rainfall Threshold (mm/day)	1	1	0.3

Only certain parameters are reported when they pass validation

Appendix D

Parramatta City Council Stormwater Design Checklist

PARRAMATTA CITY COUNCIL

STORMWATER & OSD DOCUMENTATION DA CHECKLIST

Disclaimer: The information provided by you on this form will be used by Parramatta City Council or its agents to process this application. Once collected by Council, the information can be accessed by you in accordance with Council's Access to Information Policy and Privacy Management Plan or in special circumstances, where Commonwealth legislation requires or where you give permission for third party access.

- The purpose of this form is to confirm that your stormwater design and OSD drawings (where necessary) have been prepared in line with Council requirements.
- It will ensure that quality submissions are lodged with necessary and correct information to prevent delay of the assessment of the development application
- A correctly completed form is required to enable lodgement of your DA/s96.
- It is essential that the Design Engineer carefully reads this checklist as any inaccurate or incomplete checklists will prevent the lodgement of your application.
- N/A shall be indicated adjacent to any details or information that are not relevant.

PROPERTY DETAILS

1. Property Details	Unit No:	House No: 24-26
Address	Street: Railway Parade	
	Suburb: Westmead	Postcode: 2145
Lot/DP/SP etc	Lot:	DP/SP etc:
	DA Number: (office use only)	

TYPE OF DEVELOPMENT

MINOR DEVELOPMENTS NO OSD

May include single and secondary dwellings, alterations and additions with No OSD.

PAGE 2

MAJOR DEVELOPMENTS with OSD

May include duplexes, townhouses, residential flat buildings, commercial premises, major developments.

PAGE 3 - 7

PARRAMATTA CITY COUNCIL

STORMWATER & OSD DOCUMENTATION DA CHECKLIST

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Minor Developments - No OSD

Stormwater Drainer/ Plumber (or Engineer's) Details & Declaration

This form is to be completed by a Licensed Drainer/Plumber (or a Registered Stormwater Engineer).

Company Details	Company & ABN:	
Engineering Details:	Registered Engineer Reference (NPER) if held:	
	Licence no & ABN:	
Family Name:	Full Given Name(s):	
Postal Address	Suburb:	Postcode:
Contact Details	Office phone:	Mobile:
	Fax:	Email:

I confirm that:

- **A true diagram or drawing of the stormwater system is attached.**
- **I am the Licensed Stormwater Drainer /Plumber (or Engineer) responsible for designing the stormwater system associated with this development proposal AND**
- **I certify that this proposal will meet accepted standards of good stormwater practice, Council and Australian Standards and will not cause nuisance or adversely affect this or other properties, AND**
- **There is no Council drainage line within or adjacent to this property, AND**
- **in my opinion, the existing stormwater drainage system is adequate to receive the stormwater from this new development OR I have proposed a new stormwater drainage system which will be adequate for the total site drainage needs from the existing and new development.**

Stormwater Drainer / Plumber or Engineer's Signature:

date:

PARRAMATTA CITY COUNCIL

STORMWATER & OSD DOCUMENTATION DA CHECKLIST

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Major Developments - OSD required

This portion of the form is to be completed by a registered and practising stormwater engineer.

Registered Stormwater Design Engineer's Details

Company & ABN: Taylor Thomson Whitting (NSW) Pty. Ltd. ABN: 81 113 578 377

Registered Stormwater Design Engineer Reference (NPER): 2071742

Is the Engineer accredited to carry out Design of Stormwater & OSD Systems: (Y)/N

Full Given Name(s): Nemesio Biason Jnr

Suburb: St Leonards Postcode: 2065

Office phone: 9439 7288 Mobile: N/A

Registered Stormwater Design Engineer's Checklist

	ITEMS	Yes (✓)	No N/A (✓)
1.	**Registered Stormwater Design Engineer** Name, Signature, and Registration of the **Stormwater Design Engineer** are clearly indicated on the submitted design documentation.	✓	
2.	**Flood Prone Land** The site is (wholly or partly) **affected by flood** as indicated on a current s149 planning certificate **AND:** Flood Level information has been obtained from Council by completing a **Flood Enquiry Application form.** This is attached. 20 year and 100 year ARI flood inundation extent line and levels (to m AHD) are clearly indicated on submitted Plan No. …….. **AND/OR:** There is a **Council stormwater** pipe, channel or watercourse **traversing the site** or within close proximity to the site AND an upstream catchment Overland Flow Assessment Report is attached for a 1 in 20 and 1 in 100 year ARI storm event flow running through site (including hydrological and hydraulic calculations). This information is attached as **Attachment - B** Overland flow paths within the site are identified on Plan No. …….		✓

PARRAMATTA CITY COUNCIL

STORMWATER & OSD DOCUMENTATION DA CHECKLIST

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3.	**Private Easements** **Existing easement - drainage is proposed through adjoining private properties.** The site already benefits from an existing drainage easement AND an up to date Certificate of Title has been provided to confirm this benefit. AND an engineer or licensed plumber has certified that the proposed system (including connection to Council's stormwater system) is adequate and operational. Written confirmation of this is attached. _____- **OR,** **New easement - drainage proposed through adjoining private properties.** A new easement(s) over downstream property/ies is required to enable the site and/or the OSD system to be drained by gravity AND this is indicated on submitted Plan No. ……... The permission of all affected downstream property owners has been obtained for such easement(s) AND written approval of this is attached. An engineer (or licensed plumber) has certified that the proposed system (including connection to Council's stormwater system) is adequate and operational. Written confirmation of this is attached.		✓

4.	**Stormwater Design Preparation and Documents:**
	
	A **site inspection** was undertaken in preparation of the stormwater system design.
	
	A survey by a Registered Surveyor has been prepared to AHD and is attached.
	
	• The stormwater system and OSD system are designed in accordance with:
	  • Councils **Stormwater Disposal Policy (2015)** and other relevant Policies
	  • Council's **Development Design Guidelines (2015)**, Policies and Engineering Specifications and DCP 2011.
	  • **Upper Parramatta River Catchment Trust On Site Detention Handbook** (Ed 3 or 4) (unless overridden by Council's Policies)
	  • **Australian Standards and National Construction Codes (2015)**.
	
	• **Stormwater designs are consistent** with architectural and landscape designs for the development and correspond with levels, building locations, requirements of any Flood/Overland Flow Assessment, trees to be retained or planted, utilities, services and easements.
	
	• Stormwater designs adequately incorporate **Water Sensitive Urban Design Principles** and are generally in accordance with **Council's DCP 2011**, **Development Design Guidelines (2015)** and **WSUD Technical Guidelines for Western Sydney (2004),** and/or other approved reference.
	
	• The submitted **stormwater plans**:
	  • are based on a Survey Plan prepared by a registered surveyor
	  • provide spot levels to mAHD and contours (with extensions into adjoining properties)
	  • provide location of any existing easements
	  • provide locations of existing trees and structures
	  • are to a 1:100 scale
		✓	

5.	**On Site Retention (OSR) and Water Sensitive Urban Design (WSUD):**		
	The site is greater than 2000m^2 and WSUD/OSR requirements of Council's DCP 2011 have been addressed. Full details of the OSR/WSUD system are attached.	✓	

PARRAMATTA CITY COUNCIL

STORMWATER & OSD DOCUMENTATION DA CHECKLIST

Disclaimer: The information provided by you on this form will be used by Parramatta City Council or its agents to process this application. Once collected by Council, the information can be accessed by you in accordance with Council's Access to Information Policy and Privacy Management Plan or in special circumstances, where Commonwealth legislation requires or where you give permission for third party access.

6.	The site immediately **drains to a Council Reserve** or other Council land and Council does not accept a piped drainage line across this land. As a result OSD is not proposed and an OSR/WSUD system is proposed instead. Full details of the OSR/WSUD system are attached.		✓
7.	The site immediately **drains to a floodway and OSD here is predicted to adversely affect mainstream flooding.** A demonstration of this is attached. As a result OSD is not proposed and an OSR/WSUD system is proposed instead. Full details of the OSR/WSUD system are attached.		✓
8.	**For Development Requiring OSD** **Residential Development (Duplexes)** The OSD system comprises below ground tanks as required for residential development. **Non residential development only**: The **depth of above ground detention basins** does not exceed 300mm in landscaped areas and 150mm over impervious surfaces.		✓
9.	**OSD Design** The OSD design (DWG Nos SKC03 & SKC04) is generally consistent with the requirements of the Upper Parramatta River Catchment Trust On Site Detention Handbook (Ed 3 or 4). and showing the following details: • Site layout showing all buildings, pathways, roadways and landscaped areas; • Areas to be drained to OSD • Location, levels and extent of all detention tanks, pits and pipes • Location and levels of all collecting stormwater system including downpipes, surface collection pits, grated drains and Water Sensitive Urban Design (WSUD) and OSR features • Areas of the site that by-pass detention system/s • Location of any other constraints, e.g. easements, Sydney Water Assets (water/ sewer pipes) & Electricity Overhead Cables; **OSD storage tank detail designs** (or OSD storage basins for non-residential development) and surface collection pits include: • All design dimensions including levels and inverts to AHD and OSD volumes • Cross-Sectional details • Discharge Control Pit/s • Safe and practical maintenance access The above details are shown on A1 or A3 size plans with a scale of 1:100 and/or 1:50 **The OSD storage volume** has been calculated using the Upper Parramatta River Catchment Trust On Site Detention Handbook (3rd or 4th edition) calculation sheet. The completed Design Summary Calculation Sheet has been signed by the Stormwater Design Engineer and attached as **Attachment - C.** **The areas of the site** (including roofs) to be drained to any rainwater collection system and to the OSD system have been determined and are clearly indicated on Plan No. ……	✓	

PARRAMATTA CITY COUNCIL

STORMWATER & OSD DOCUMENTATION DA CHECKLIST

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9.	**OSD Design (continued)** The remaining percentage of the total site area not drained to the roofwater and OSD systems is ….2…% (to be not more than 15%). This is not a 'drowned outlet'. Because the designed **discharge flow rate** is greater than 30l/s, a connection to the nearest Council stormwater pit has been shown with associated levels. Overland flow from adjacent properties has been intercepted and disposed separately without discharging into any proposed OSD system.	✓	

Registered Stormwater Design Engineer's Declaration

I confirm that, as the Registered Stormwater Design Engineer responsible for designing the stormwater system associated with this development proposal, that I have done so with a full understanding of the relevant Council requirements and have read, understood and completed this checklist accurately.

Registered Stormwater Design Engineer's Signature: date: 26/10/2018

Council Development Engineer's Notes

Development Engineer Name:

Signature: date:

PARRAMATTA CITY COUNCIL

STORMWATER & OSD DOCUMENTATION DA CHECKLIST

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PART 4 - Applicant Declaration

6. Declaration

I confirm that as the design engineer/project designer responsible for designing the stormwater system associated with this development proposal that I have done so with a full understanding of the relevant Council requirements and have read, understood and completed this checklist accurately.

Engineer's signature  date: 26/10/2018

Engineer's name Kieran Smith

PART 5 - Council's Officers Sign-off

7. Declaration

Council Officers signature date:

Council Officers name

ONLINE application tracking

You can log onto www.parracity.nsw.gov.au/development to track the progress of any application lodged after 30 June 2005. The information you supply on this form and any related documentation will be publicly available on this Council website.

Parramatta City Council
30 Darcy Street, Parramatta 2150
PO Box 32, Parramatta 2124

DX 8279 Parramatta
phone: 9806 5524
fax: 9806 5917

Taylor Thomson Whitting

Structural
Civil
Traffic
Facade

30th October 2018 161634

City of Parramatta Council
126 Church Street
Parramatta NSW 2150

Attention: Greg Gavel

24 – 26 Railway Pde, Westmead

DA/381/2018

Dear Greg,

We refer to Council's email dated 10th July 2018 requesting for further information for DA/381/2018.

Please find attached to this letter, a table outlining our responses and relevant documents to Council's request for your assessment.

With the additional information provided we consider that the Council's request for is now satisfied, and we seek your approval for DA/381/2018.

Should you require anything further please contact the undersigned on 0294397288.

Yours faithfully
TAYLOR THOMSON WHITTING (NSW) PTY LTD

Nemesio Biason
Associate

P:\2016\1616\161634\Letters\181030 Cover letter to council.docx

APPENDIX A

DA/381/2018 Additional Information	TTW's Comments
On-site Detention/ Treatment Facility	
○ Plans to indicate stormwater entry into system	Refer to revised drawing SKC03 and SKC04 indicating the stormwater entry into the system.
○ Currently the discharge from the treatment chamber passes through orifice 1. Discharge from the treatment chamber is to bypass orifice 1 and discharge to the outlet chamber.	OSD tank has been revised so that water within the treatment chamber has no interaction with Orifice 1. All flow from the treatment chamber will discharge via underdrain to the outlet chamber, refer drawing SKC04.
○ Primary storage currently cannot access primary outlet (orifice 1)	OSD tank has been revised so that Primary Storage accesses outflow chamber through Orifice 1, refer drawing SKC04.
○ Storage will inadvertently return to treatment chamber prior to accessing the secondary outlet (orifice 2)	OSD tank has been revised so that flows that enter the primary chamber can no longer access the treatment chamber (due to a combination of the high early overflow weir at RL 32.05 and the High Flow/Low Flow Chamber Wall at RL 33.00). Water within the primary chamber will overflow into the secondary chamber at RL 32.50 and flow into the outlet chamber through Orifice 2.
○ The application of edition 4 design handbook has increased the complexity of the interface of the treatment facility and the OSD facility. As discussed, edition 3 design handbook can offer a more simple design.	The OSD tank is designed as per the intent of edition 4.
Stormwater drainage within Ashley Lane	
○ The entire proposed stormwater drainage system within Ashley Lane shall be provided for Council assessment.	Refer to drawing SKC05 for the proposed stormwater drainage system within Ashley Lane with additional information provided.
○ A typical cross-section of Ashley Lane including the proposed pipeline and all street characteristics shall be provided.	Refer to drawing SKC05 for the typical road cross section of Ashley Lane including proposed stormwater pipe, pit, kerb details and road reserve.
○ Connection details with Council's existing drainage infrastructure shall be provided.	Refer to drawing SKC05 for the proposed connection details with Council's existing stormwater drainage system within Ashley Lane.
○ A longitudinal section of the proposed pipework to be provided.	Refer to drawing SKC05 for the longitudinal section of the proposed pipeline
Stormwater General	

○ All details including invert levels, surface levels, pipe diameter, pipe gradient, pipe class, pit dimensions shall be provided.	Refer to SKC03 and SKC04 for stormwater details including all requested information.
Survey Plan	
○ A survey plan (AHD) prepared by a registered surveyor shall be provided to Council. Ref: Registered Stormwater Design Engineer's Checklist-item 4.	A survey plan with levels in AHD is attached in Appendix C.

APPENDIX B

- Drawings**, SKC03, SKC04, SKC05**

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING SKC00

SITEWORKS LEGEND

- ● F22.20 — Finished surface level
- Stormwater pit, flow direction and line with
  - IL10.00 — Invert level upstream
  - 600 ø 'Z' — Pipe size and class
  - 1.25% — Pipe grade
  - Q=345 L/s — Flow (Litres per second)
  - IL9.65 — Invert level downstream

STORMWATER DRAINAGE NOTES

1. All osd inlets to discharge to stormwater/ hey chamber. inlet location to be coordinated at detail design.
2. All pipe services crossing clash to be confirmed at detailed design.
3. Emergency/blocked orifice flow to be conveyed to kerb inlet pit via new ø375 pipe. For all storm events, up to and including the 1% aep storm event.

PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets – **SKC04**
Final internal pit dimensions are to comply with AS3500

Type	Description	Cover (Clear Opening)	Number
A	Surface inlet pit	900 x 600 Class C galvanised mild steel grate hinged to frame	2
		900 x 600 Class C galvanised mild steel grate on vehicular crossing	1A
		900 x 600 Class C galvanised mild steel grate with 1.8m lintel	1,3
B	OSD Access lid	900 x 900 Class C galvanised mild steel grate hinged to frame (lockable)	4,5,6,15
		900 x 900 Class D cast iron cover with concrete infill	7–14

STORMWATER ENTRY TO THE SYSTEM

PROPOSED 118m³ ONSITE DETENTION TANK – REFER SKC04 FOR DETAILS

PIPE TO BE SUSPENDED FROM SOFFIT OF SLAB ABOVE

GRATED DRAIN ON BOUNDARY TO COLLECT RUNOFF AND DRAIN TOWARDS NEW PIT FOR TREATMENT.

FOR CONTINUATION REFER TO DRAWING SKC05

RAILWAY PARADE

ASHLEY LANE

MULTI-STOREY BUILDING "WESTMEAD SHOPPING VILLAGE" N° 24 - 26 RAILWAY PARADE

DP 952720

DP 972068

DP 605[illegible]

Rev	Description	Eng	Draft	Date
P6	ISSUED FOR DA	CV	DM	24.08.18
P5	ISSUED FOR DA	CV	CV	28.05.18
P4	ISSUED FOR DA	CV	JH	08.12.17
P3	ISSUED FOR DA	CV	JH	05.12.17
P2	ISSUED FOR DA	CV	RG	11.11.17
P1	PRELIMINARY	CV	AI	05.09.17
P7	ISSUED FOR DA	KS	KS	19.10.18

Architect
SISSONS ARCHITECTS
Studio 5, Level 2
81 Alexander St, Crows Nest, NSW 2065

Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
STORMWATER CONCEPT PLAN LOWER GROUND FLOOR

Scale : A1 — 1:100
Drawn — AI
Authorised
Job No — 161634
Drawing No — SKC03
Revision — P7
Plot File Created: Oct 25, 2018 - 10:26am

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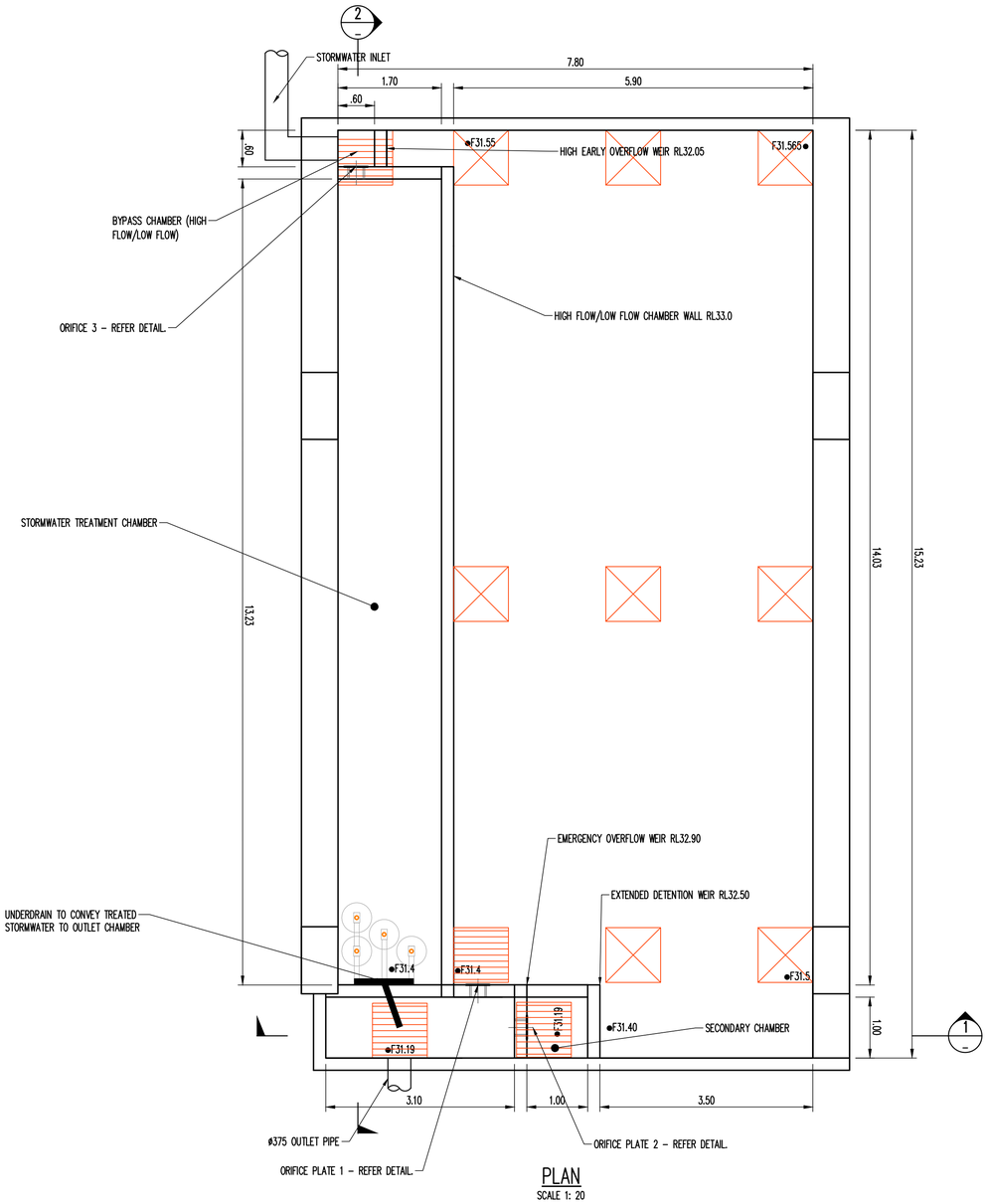

PLAN
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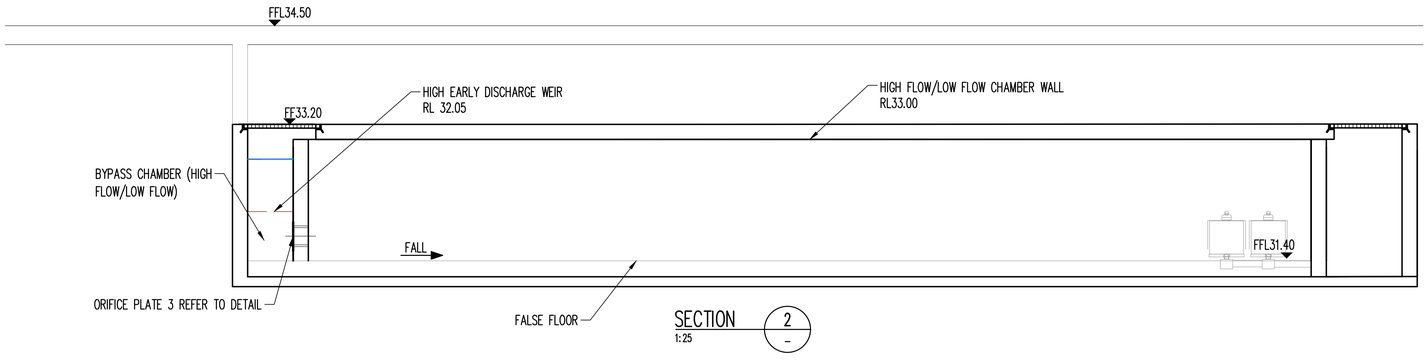

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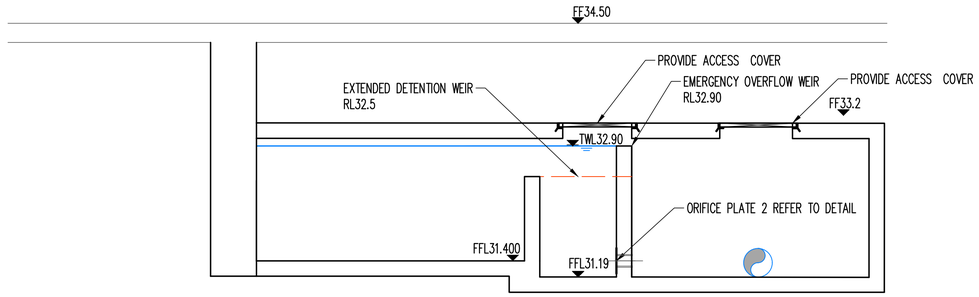

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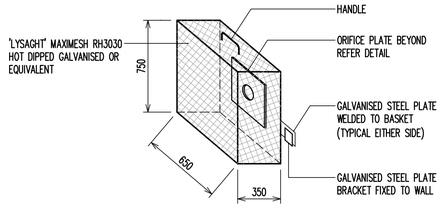

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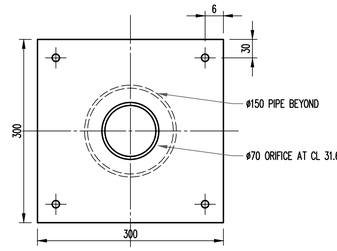
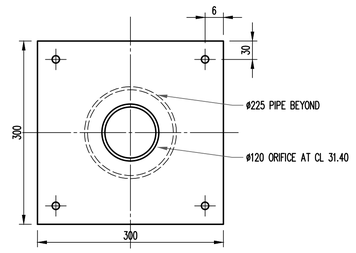


ORIFICE PLATE 1 DETAIL
NTS



ORIFICE PLATE 2 DETAIL
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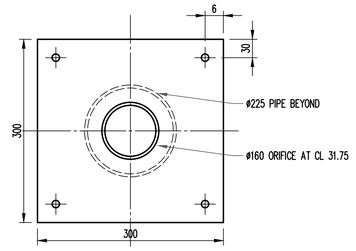

ORIFICE PLATE 3 DETAIL
NTS

WEIR	RL	STORMWATER ACTION
Stormwater Treatment Chamber	Up to 32.05	Stormwater up to and including the 1 in 3 month flow enters the inflow pit and flows through Orifice 3 into the treatment chamber. It is then treated by the stormfilter and discharges to the outlet chamber via underdrain
Primary Chamber	32.05 - 32.50	Stormwater inflow exceeds the 1 in 3 month flow and overtops the high early discharge weir and enters the primary chamber. Stormwater discharges to outlet chamber through Orifice 1
Secondary Chamber	32.50 - 32.90	Stormwater overtops the extended detention weir and enters the secondary chamber, discharging to outlet chamber through Orifice 2
Emergency Overflow	32.90	For stormwater events that exceed the capacity of the OSD system or due to blockage an emergency weir exists to allow stormwater to be directed to the 375 outlet pipe.

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P5	ISSUED FOR DA	KS	KS	19.10.18
P4	ISSUED FOR DA	CV	EW	24.08.18
P3	ISSUED FOR DA	CV	CV	28.05.18
P2	ISSUED FOR DA	CV	JH	08.12.17
P1	ISSUED FOR DA	CV	RG	11.11.17

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Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
DETAILS SHEET

Scale : A1 AS SHOWN | Drawn PW | Authorised
Job No 161634 | Drawing No SKC04 | Revision P5
Plot File Created: Oct 25, 2018 - 10:26am

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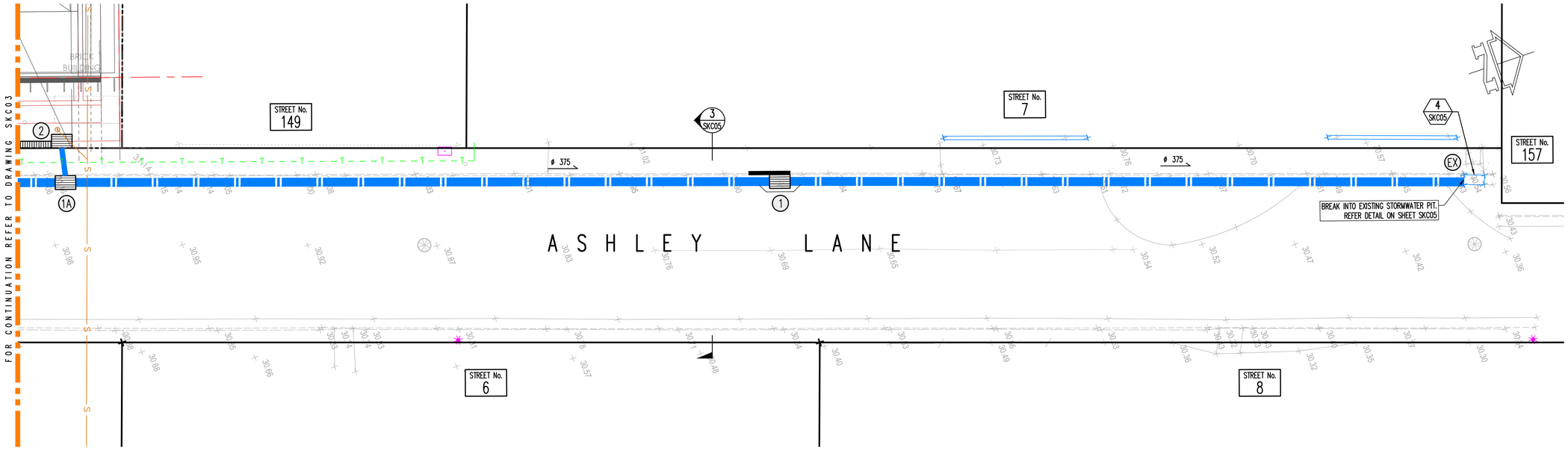


PLAN
SCALE 1: 100

SITEWORKS LEGEND

- ● F22.20 — Finished surface level
- IL10.00 / 600 ø 'Z' / 1.25% / Q=345 L/s / IL9.65 — Stormwater pit, flow direction and line with
  - Invert level upstream
  - Pipe size and class
  - Pipe grade
  - Flow (Litres per second)
  - Invert level downstream

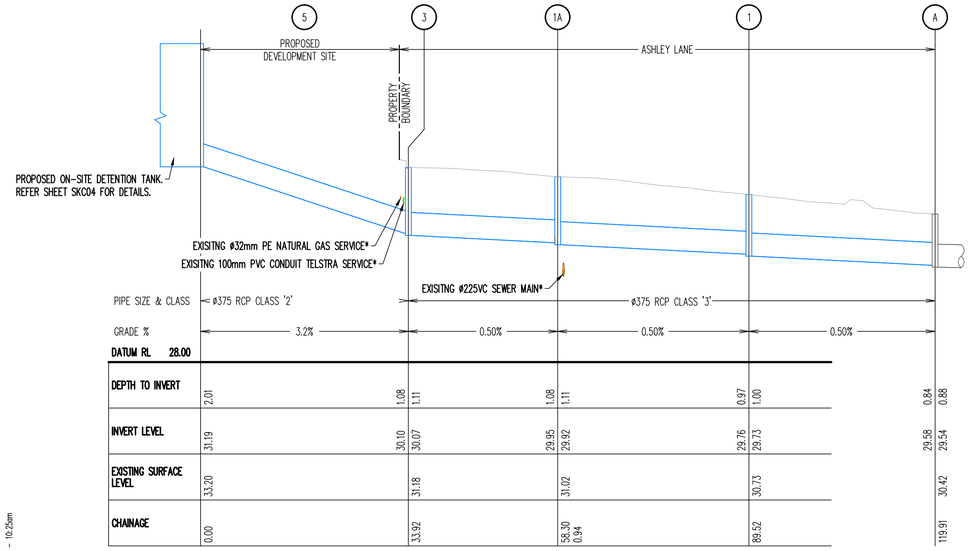
STORMWATER DRAINAGE NOTES

1. All osd inlets to discharge to stormwater/ hey chamber. inlet location to be coordinated at detail design.
2. All pipe services crossing clash to be confirmed at detailed design.
3. Emergency/blocked orifice flow to be conveyed to kerb inlet pit via new ø375 pipe. For all storm events, up to and including the 1% aep storm event.

PIT SCHEDULE

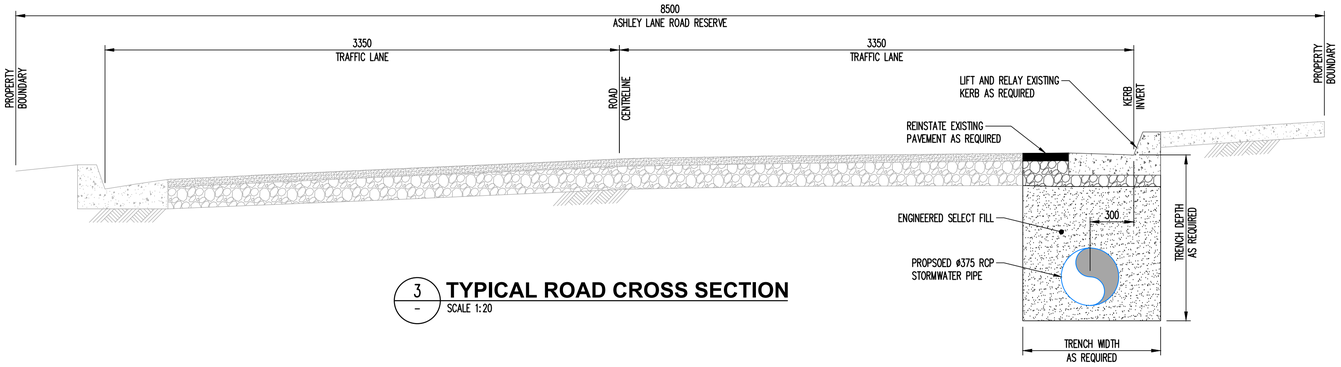
Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets – **SKC04**
Final internal pit dimensions are to comply with AS3500

Type	Description	Cover (Clear Opening)	Number
A	Surface inlet pit	900 x 600 Class C galvanised mild steel grate hinged to frame	2
		900 x 600 Class C galvanised mild steel grate on driver way	1A
		900 x 600 Class C galvanised mild steel grate with 1.8m lintel	1,3
B	OSD Access lid	900 x 900 Class C galvanised mild steel grate hinged to frame (lockable)	4,5,6,16
		900 x 900 Class D cast iron cover with concrete infill	7–15



STORMWATER LONGITUDINAL SECTION
SCALE H1:500 V1:50

* APPROXIMATE SERVICE DEPTHS SHOWN ONLY. SERVICES ARE TO BE LOCATED AND DEPTHED PRIOR TO DETAILED DESIGN PHASE.



3 – TYPICAL ROAD CROSS SECTION
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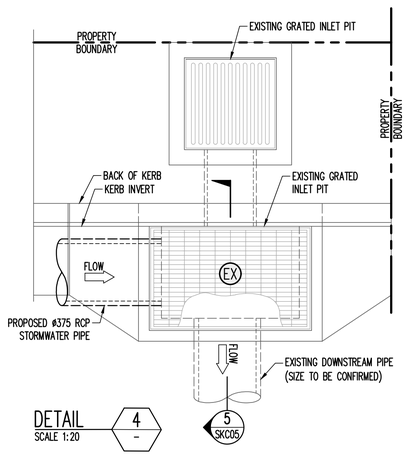

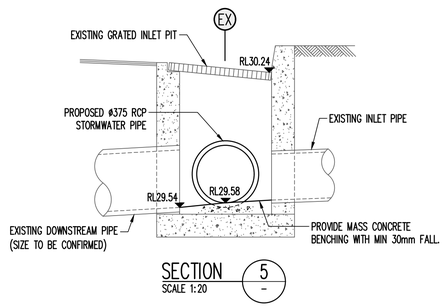

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Rev	Description	Eng	Draft	Date
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P1	ISSUED FOR DA	CV	DM	24.08.18

Architect
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Studio 5, Level 2
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Civil Engineer
Taylor Thomson Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
PROPOSED MIXED USE DEVELOPMENT, 24-26 RAILWAY PARADE WESTMEAD

Sheet Subject
CONCEPT ASHLEY LANE STORMWATER PLAN AND SECTIONS

Scale : A1	Drawn	Authorised
1:100	AI	

Job No	Drawing No	Revision
161634	SKC05	P2

Plot File Created: Oct 25, 2018 - 10:25am

APPENDIX C

- Survey plan by Proust & Gardner

Sheet 2 Adjoins

Notes:

* The position of features are indicative only.
* Services shown hereon have been located where possible by field survey. Prior to any excavation or construction on the site, the relevant authority should be contacted for possible location of any other services including those which may be underground.
* + 7.03 indicates existing surface level.
* Contours shown depict the general topography. They do not represent exact levels.
* Relationship of improvements to boundaries is diagrammatic only. Where offsets are critical they should be confirmed by further survey.
* Bearings and distances are by title only. No boundary investigation has been carried out.
* The tree sizes are approximate only. Further field inspection should be carried out where tree details are considered to critically affect design.
  The tree sizes are shown as:- trunk diameter/canopy spread/height
* Origin of levels: SSM 46849 RL 38.447

SP 3133O

SP 20170

SP 18366

1
DP 952720

1
DP 972068

1
DP 605684

MULTI-STOREY BUILDING
"WESTMEAD SHOPPING VILLAGE"
Nº 24 - 26 RAILWAY PARADE

RAILWAY

PARADE

LANE

ASHLEY

BENCH MARK
DRILL HOLE IN CONC
RL 30.47 AHD

DIAL BEFORE YOU DIG www.1100.com.au

Client: Mark Hovey	Project: Detail Survey in the vicinity of Railway Parade and Ashley Lane Westmead	FREEBURN SURVEYING	MATTHEW FREEBURN LAND, ENGINEERING & MINING SURVEYOR SUITE 2, FIRST FLOOR, "SURVEYOR HOUSE" 2 CASTLEREAGH STREET PENRITH 2750	Telephone 02 4721 2289 Fax 02 4721 5646 email a.dean@freeburnsurveyors.com or matthew@freeburnsurveyors.com	Scale 1:200 / Datum: AHD / Contour: n/a Surveyor: tb&df / Drawn By: ad / Checked: mf Date of Survey: July 2013-July 2018 / Sheet 1 of 2 AutoCAD / Issue 01-08-2018 / 33 005 DETAIL	

A1 SHEET

Notes:

* The position of features are indicative only.
* Services shown hereon have been located where possible by field survey. Prior to any excavation or construction on the site, the relevant authority should be contacted for possible location of any other services including those which may be underground.
* + 7.03 indicates existing surface level.
* Contours shown depict the general topography. They do not represent exact levels.
* Relationship of improvements to boundaries is diagrammatic only. Where offsets are critical they should be confirmed by further survey.
* Bearings and distances are by title only. No boundary investigation has been carried out.
* The tree sizes are approximate only. Further field inspection should be carried out where tree details are considered to critically affect design.
  The tree sizes are shown as:- trunk diameter/canopy spread/height
* Origin of levels: SSM 46849 RL 38.447

NORTH

SP 2188O

SP 19608

SP 44343

SP 20170

SP 3133O

SP 18366

1
DP 952720

1
DP 972068

1
DP 605484

MULTI-STOREY BUILDING
"WESTMEAD SHOPPING VILLAGE"
Nº 24 - 26 RAILWAY PARADE

ASHLEY LANE

LANE

Sheet 1 Adjoins

DIAL BEFORE YOU DIG www.1100.com.au

Client: Mark Hovey	Project: Detail Survey in the vicinity of Railway Parade and Ashley Lane Westmead	FREEBURN SURVEYING	MATTHEW FREEBURN LAND, ENGINEERING & MINING SURVEYOR SUITE 2, FIRST FLOOR, "SURVEYOR HOUSE" 2 CASTLEREAGH STREET PENRITH 2750	Telephone 02 4721 2289 Fax 02 4721 5646 email a.dean@freeburnsurveyors.com or matthew@freeburnsurveyors.com	Scale 1:200 | Datum: AHD | Contour: n/a Surveyor: tb&df | Drawn By: ad | Checked: mf Date of Survey: July 2013-July 2018 | Sheet 1 of 2 AutoCAD | Issue 01-08-2018 | 33 005 DETAIL

A1 SHEET