FIGURES

m 0409 912 631 e mark.tooker@tookerandassociates.com.au a 30 Walworth Avenue, Newport abn 39 619 046 070

0 10 000 20 000 30 000 40 000 50 000 100 000
scale: 1:1000 @A1

FIGURE 1

01 **Site Context**
1:1000

Stanton Dahl Architects
PO Box 833, Epping, NSW 1710, Australia
Tel +61 2 8876 5300
www.stantondahl.com.au

Rev	Issue	Date
P1	Prelim Issue for Co-ord	13/03/24
P2	Issue to QS	12/04/24
P3	Revised Design Issued for QS Cost Estimate	03/06/24
P4	Issue For Co-ordination	01/07/24
P5	Issue for Client Review & Co-ordination	15/11/24
P6	Issue for Consultant Co-ordination	19/12/24
P7	Issue for Consultant Co-ordination	10/03/25

Amendments

Stanton Dahl Architects

Eileen O'Connor Catholic School

CATHOLIC SCHOOLS Broken Bay

RP INFRASTRUCTURE

Eileen O'Connor Catholic School

Catholic Schools Office, Broken Bay Diocese (CSBB)
84 Gavenlock Road,
Mardi, NSW 2259

Drawn; RW
Checked; DM
Plot date; 9/3/2025

Scale; 1:1000 as noted @ A1

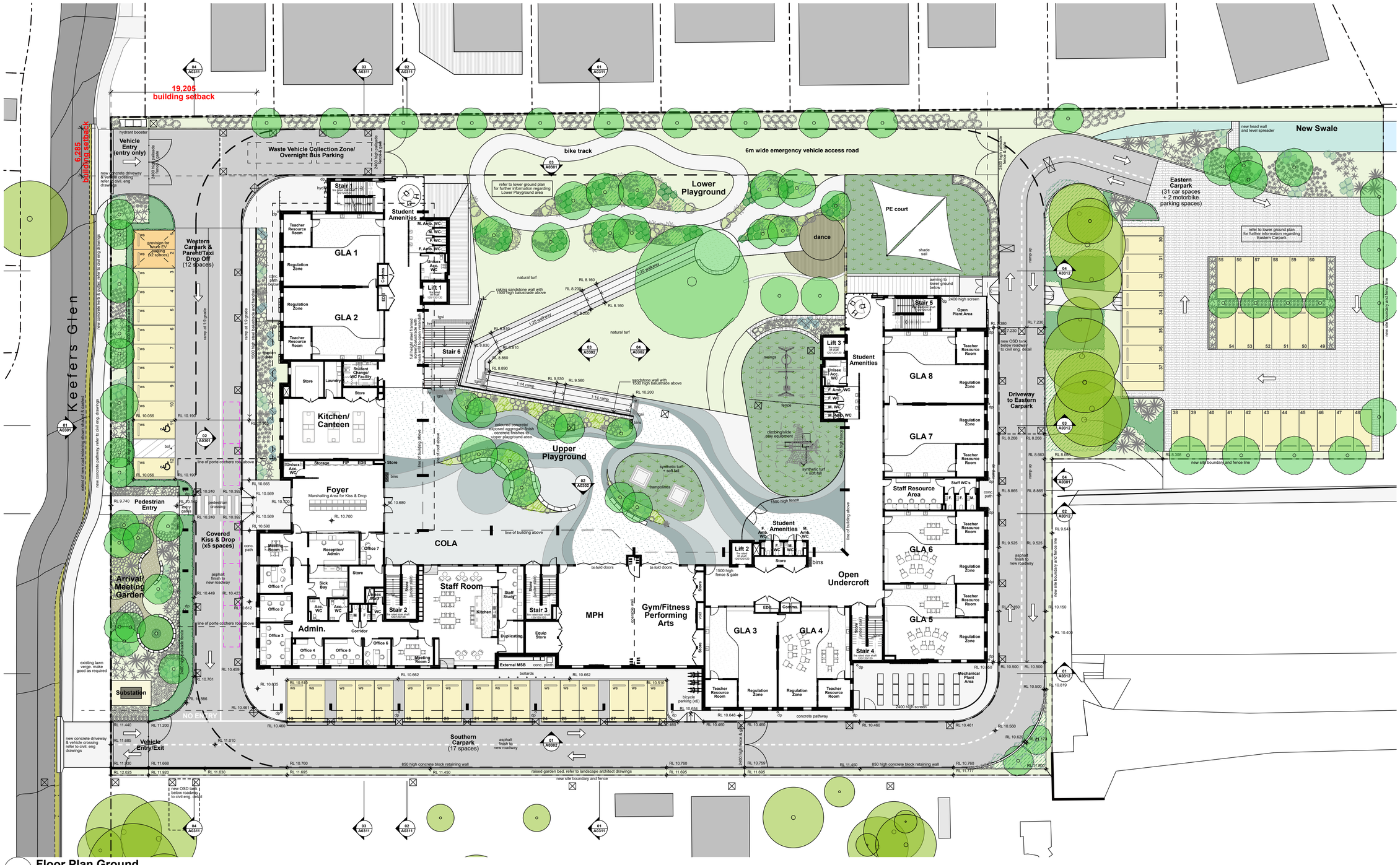
Project No;
2637.20

Drawing No; A0101
Revision#; P7

Campus Plan

0 2000 4000 6000 8000 10 000 20 000
scale: 1:250 @A1

FIGURE 2



01 Floor Plan Ground
1:250

Legend (floor plans)
note: drawing may not contain all items listed below

- D01 door numbers (as scheduled) (prefix ex. for existing door)
- W01 window numbers (as scheduled) (prefix ex. for existing window)
- BW01 wall type (as scheduled)
- G01 gate numbers (as scheduled)
- V01 vent numbers (as scheduled)

ac	air conditioner condenser
acc	accessible
adhc	adhc ageing, disability & home care
amb	ambulant
ap	access panel
bal(1)	balustrade (type)
bfc	broom finish concrete
bol	bollard
bsn(1)	basin (type)
cbus	c-bus control
cfc	compressed fibre cement
cft	ceramic floor tile
cj	control joint
cthl	clothes line
col	column
comms	communications
conc	concrete
cpt	carpet
ct	cooktop
dgpo	double general purpose outlet
dp	downpipe
dw	dishwasher
edb	electrical distribution board
fbx	floor box
fip	fire indicator panel
ej	expansion joint
ev	electric vehicle charging station
ex.	existing
fb(1)	face brickwork
fc	fibre cement
fe	fire extinguisher
ffl	finished floor level
fhr	fire hose reel
fm	floor mat
FRL	Fire Resistance Level
frz	freezer
fs	fridge space
ft	fence
fw	floor waste
gb	garbage bin
gpo	general purpose outlet
gt	gate
gtd	grated drain
hlc	high level cupboard
hr(1)	handrail (type)
ht	hose tap
hwu	hot water unit
hyd	hydrant
lb	letter box
lcd	lcd screen (wall mounted)
lin	linen cupboard
mh	manhole
mw	microwave
nts	not to scale
o/a	overall
ofc	off form concrete
pav(1)	paving (type)
pos	private open space
rs	refridgerator space
rsh	recessed soap holder
rw(1)	retaining wall (type)
rwt	rainwater tank
sc	steel column
sfc	steel float concrete
shr	shower
sj	saw cut joint
snk	sink
spd	spoon drain
sshr	safety shower
sv(1)	sheet vinyl (type)
swp	stormwater pit
tfb	timber floorboards
tgsi	tactile ground surface indicator
u/b	under-bench oven
vb	vanity bench
wc	water closet
wm	washing machine
wo	wall oven
ws	wheel stop
wt	wash trough

note:
1. furniture shown dashed on plan to be provided by client.
2. for full extent of banking & landscaping, refer to (t.b.c).
3. wall thickness based on brickwork & stud width only without internal wall linings.
4. for pinboards / whiteboards sizing & quantity refer to specification.
5. loose furniture layout removed for clarity.

note:
1. remove existing floor finish and apply levelling compound to existing subfloor as required to make level for new floor finish
2. provide compliant threshold and clearances at all doors as per A.S. 1428.1- 2009.

note:
- the anticipated 10 year movement along masonry joints is less than 10mm (confirmed by structural engineer), hence is not shown on the drawings
- any future A/C units to be >1m from balustrade
- contractor to pay careful attention to insulation and lining alignment around bathrooms
- Ensure DPs straight from clad walls above to brickwork below

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Rev	Issue	Date
P11	Issue for Consultant Co-ordination	19/12/24
P12	Issue for Consultant Co-ordination	31/01/25
P13	Issue for Consultant Co-ordination	10/03/25

Amendments

Stanton Dahl Architects

Eileen O'Connor Catholic School

Eileen O'Connor Catholic School

Catholic Schools Office, Broken Bay Diocese (CSBB)
84 Gavenlock Road,
Mardi, NSW 2259

Drawn; RW
Checked; DM
Plot date; 9/3/2025

Scale;1:250 as noted @ A1

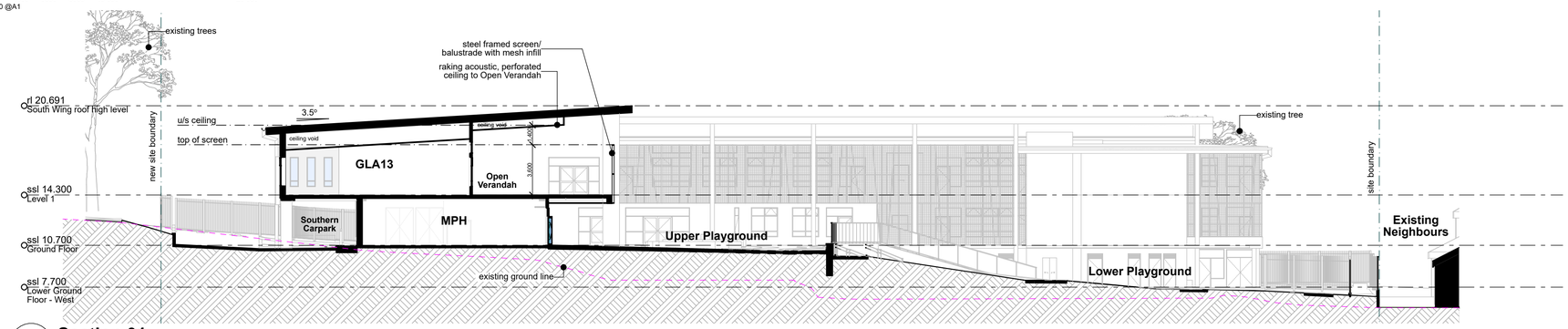
Project No;
2637.20

Drawing No; A0202
Revision#; P13

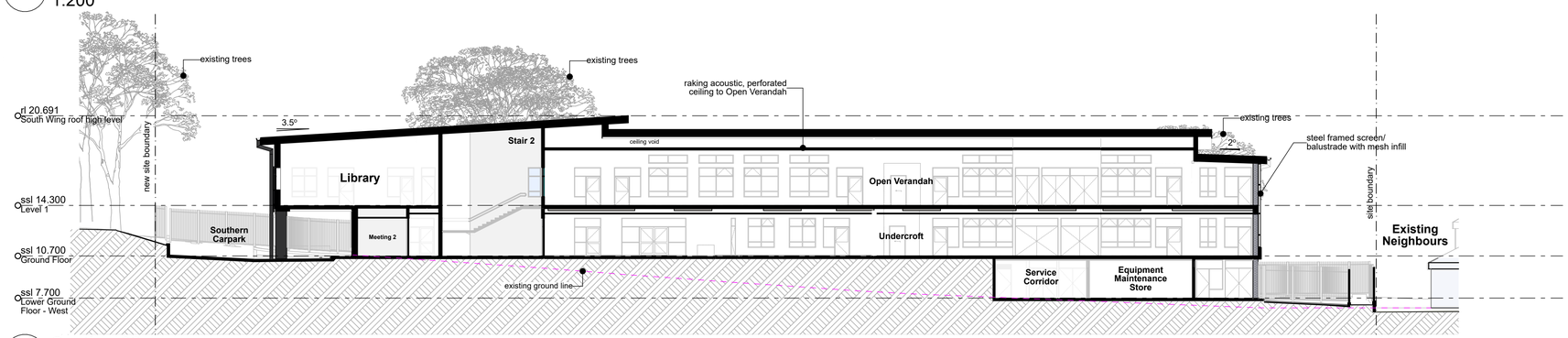
Floor Plan Ground

FIGURE 3

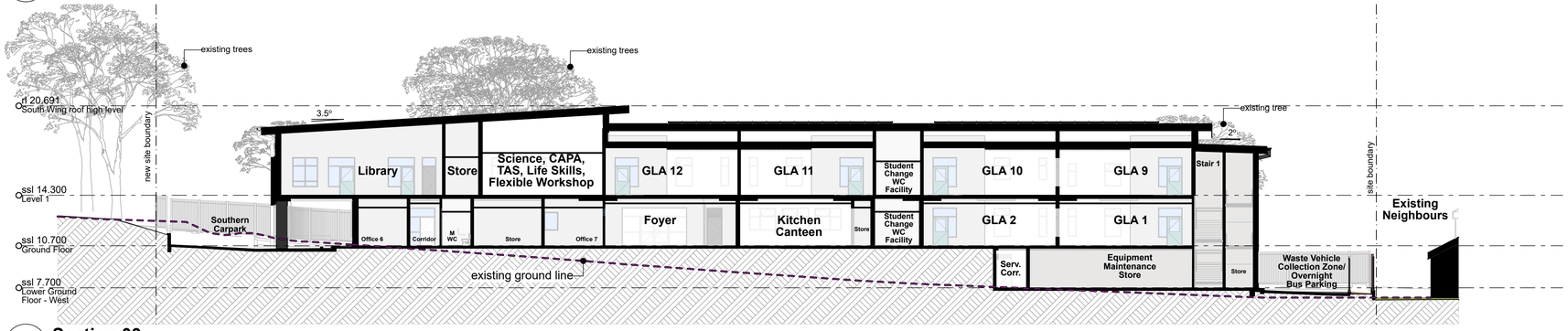
0 2000 4000 6000 8000 10 000 20 000
scale: 1:200 @A1



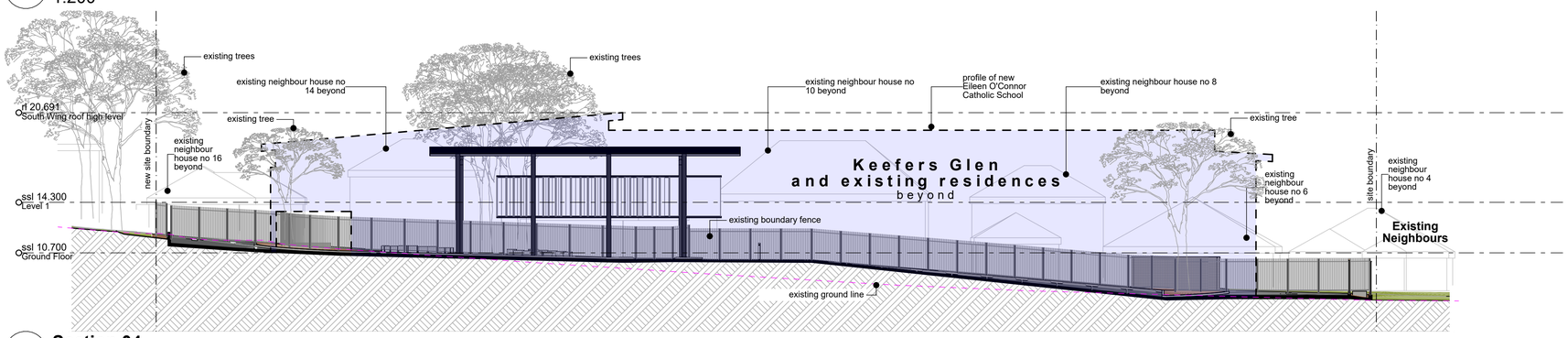
01 Section 01
1:200



02 Section 02
1:200



03 Section 03
1:200



04 Section 04
1:200

Legend (elevation & sections)
note: drawing may not contain all items listed below

ald	aluminium framed glazed door suite
alw	aluminium framed window
dms	decorative metal screen
dp	downpipe
eg	eaves gutter
egl	existing ground line
fb	face brickwork
lwc	lightweight cladding
mdr	metal deck roof
rw	retaining wall
sh	window sunhood

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Rev	Issue	Date
P5	Issue for Client Review & Co-ordination	15/11/24
P6	Issue for Consultant Co-ordination	19/12/24
P7	Issue for Consultant Co-ordination	10/03/25

Amendments

Stanton Dahl Architects

Eileen O'Connor Catholic School

CATHOLIC SCHOOLS Broken Bay

RP INFRASTRUCTURE

Eileen O'Connor Catholic School

Catholic Schools Office, Broken Bay Diocese (CSBB)
84 Gavenlock Road,
Mardi, NSW 2259

Drawn; RW
Checked; DM
Plot date; 9/3/2025

Scale; 1:200 as noted @ A1

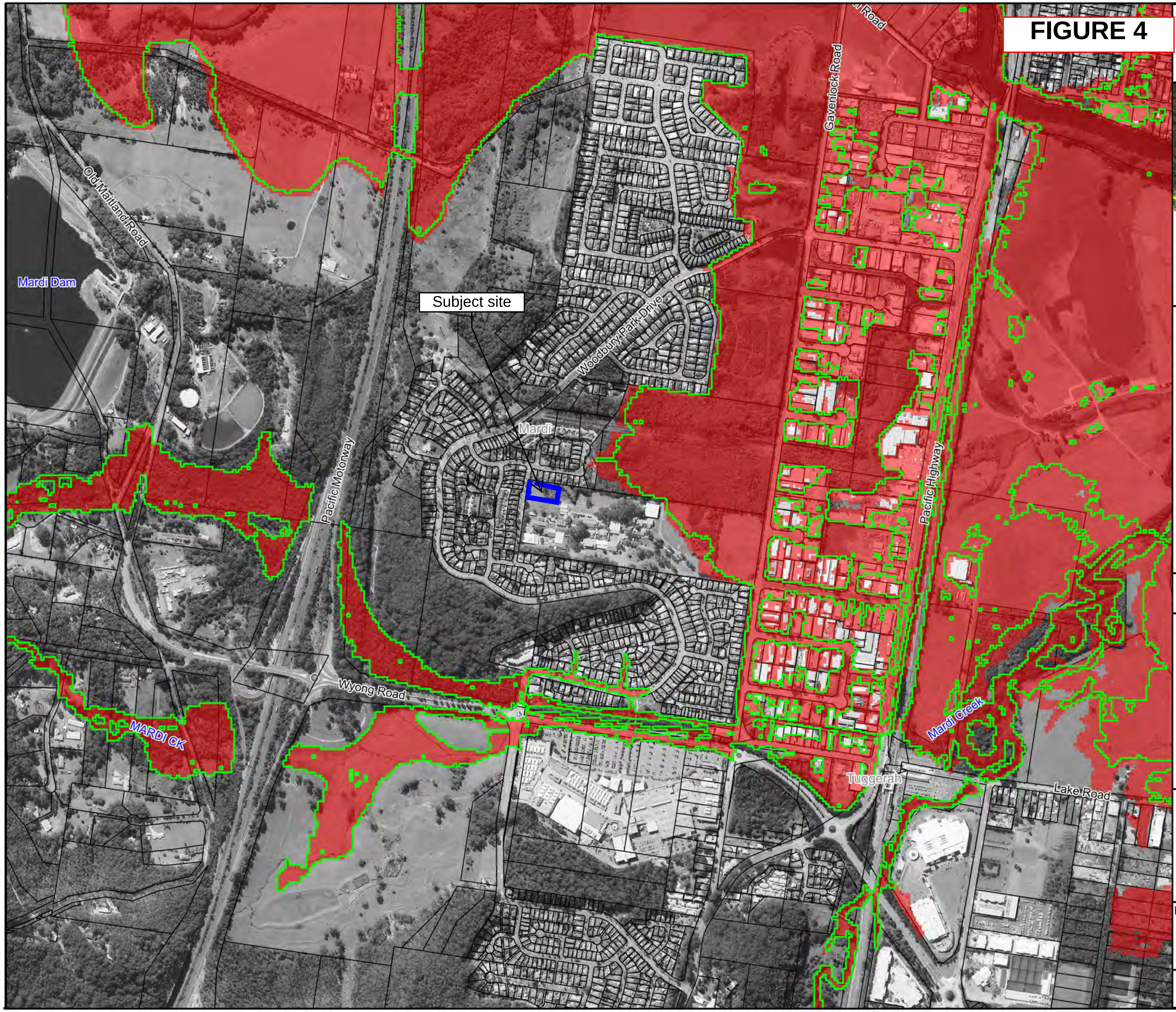
Project No;
2637.20

Drawing No; A0311

Revision#; P7

Sections 1

FIGURE 4



Central Coast Council

LEGEND

- Existing 1%AEP Inundation Extent
- 1%AEP Inundation Extent with 30% Increase in Rainfall and 0.9m Increase in Tuggerah Lake Level

Notes:
Aerial photograph dated 2014

N W E S

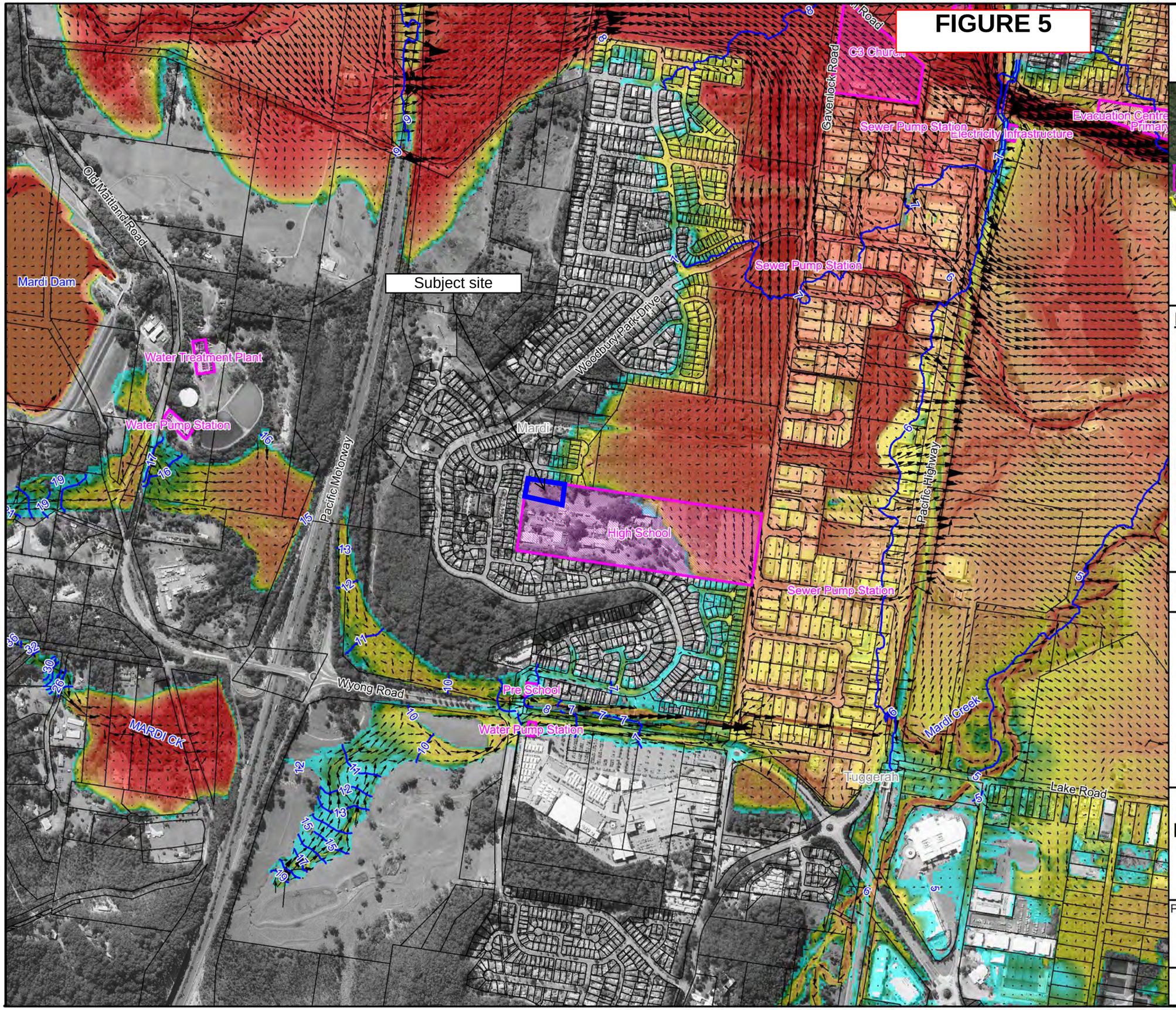
Scale 1:10,000 (at A3)
0 0.25 0.5 Km

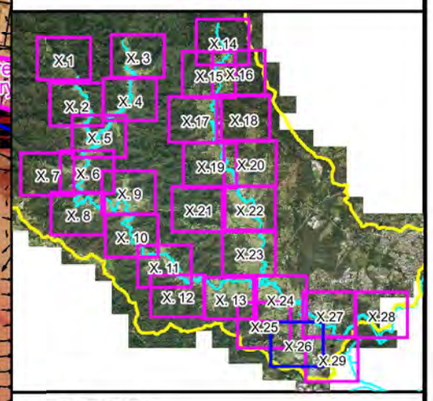
Figure A17.26: Peak 1% AEP Flood Extent 30% increase in Rainfall & 0.9m Increase in Tuggerah Lake Level

Prepared By:
Catchment Simulation Solutions
Suite 2.01, 210 George St
Sydney, NSW 2000

File Name: Figure A17.26 CC30 1%AEP.wor

FIGURE 5





Central Coast Council

LEGEND

- 6 Peak Water Level Contour (mAHD)
- Critical Facility

Depths (m)	Velocity Vector (m/s)
< = 0.2	
0.5	→ 1 m/s
1.0	→ 2 m/s
2.0	→ 4 m/s
3.0	

Notes:
Aerial photograph dated 2014

N
W E
S

Scale 1:10,000 (at A3)

0 0.25 0.5 Km

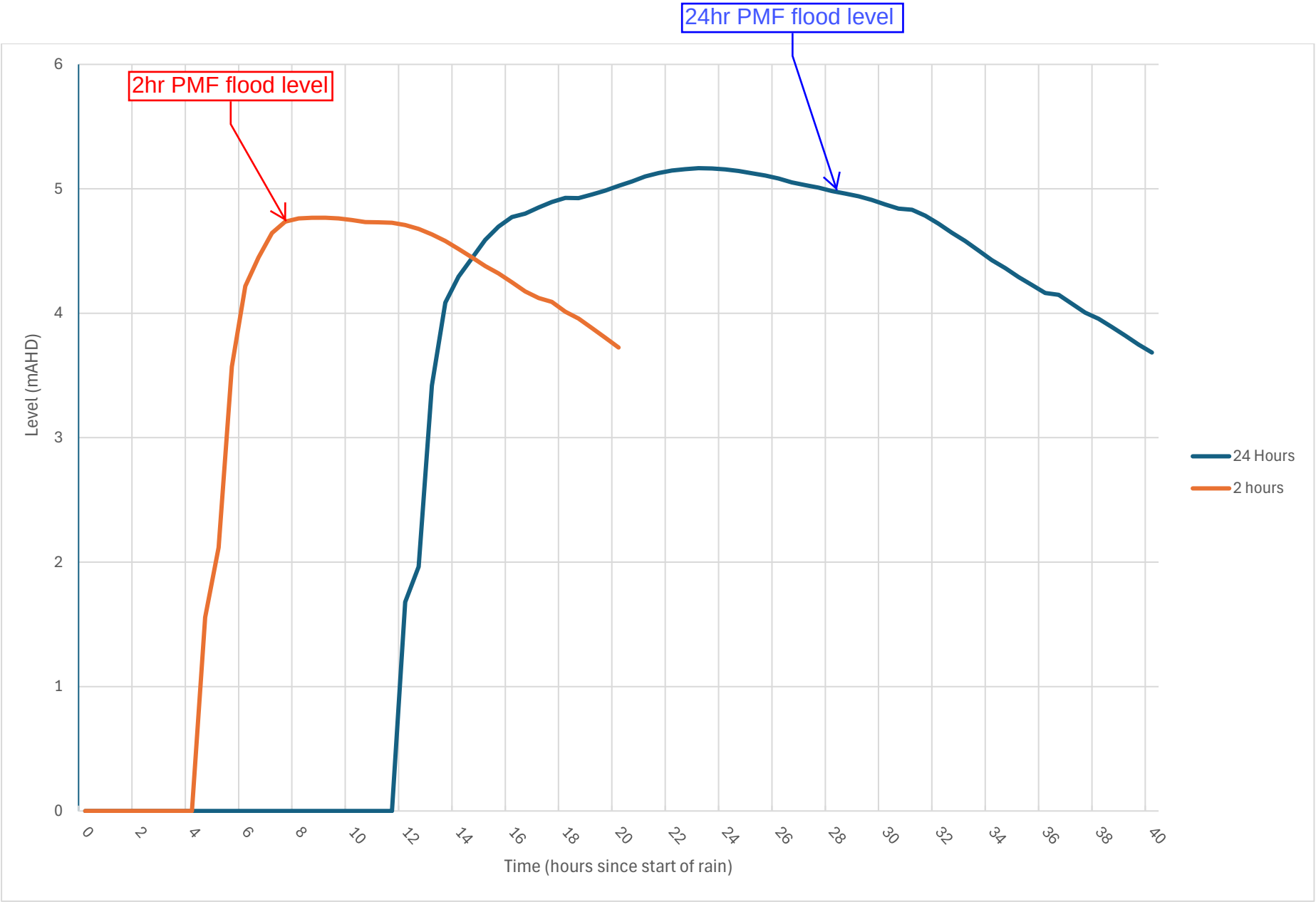
Figure A4.26: Peak Floodwater Depths, Velocities and Levels for the PMF

Prepared By:

Catchment Simulation Solutions
Suite 2.01, 210 George St
Sydney, NSW 2000

File Name: Figure A4.26 Peak Flood Depths PMF.wor

FIGURE 6



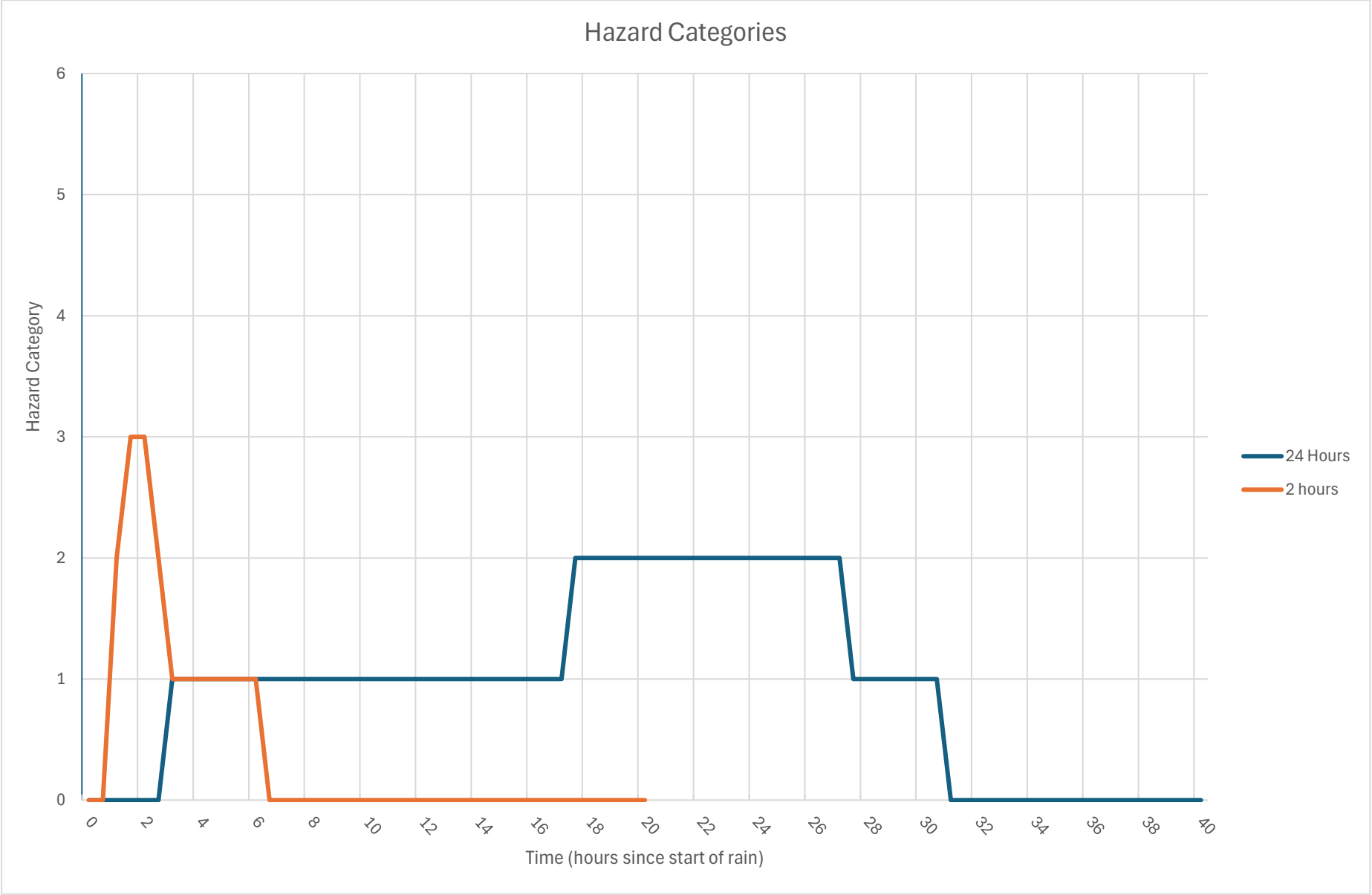
Flood Types - Short and Long Duration Response Times

FIGURE 7

Westfield Shopping Centre Flood Refuge

Flood Hazard Locations along Evacuation Route to Westfield Shopping Centre

LOCATION G


Hazard Categories
Hazard Category
6
5
4
3
2
1
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
Time (hours since start of rain)
24 Hours
2 hours

ATTACHMENT A

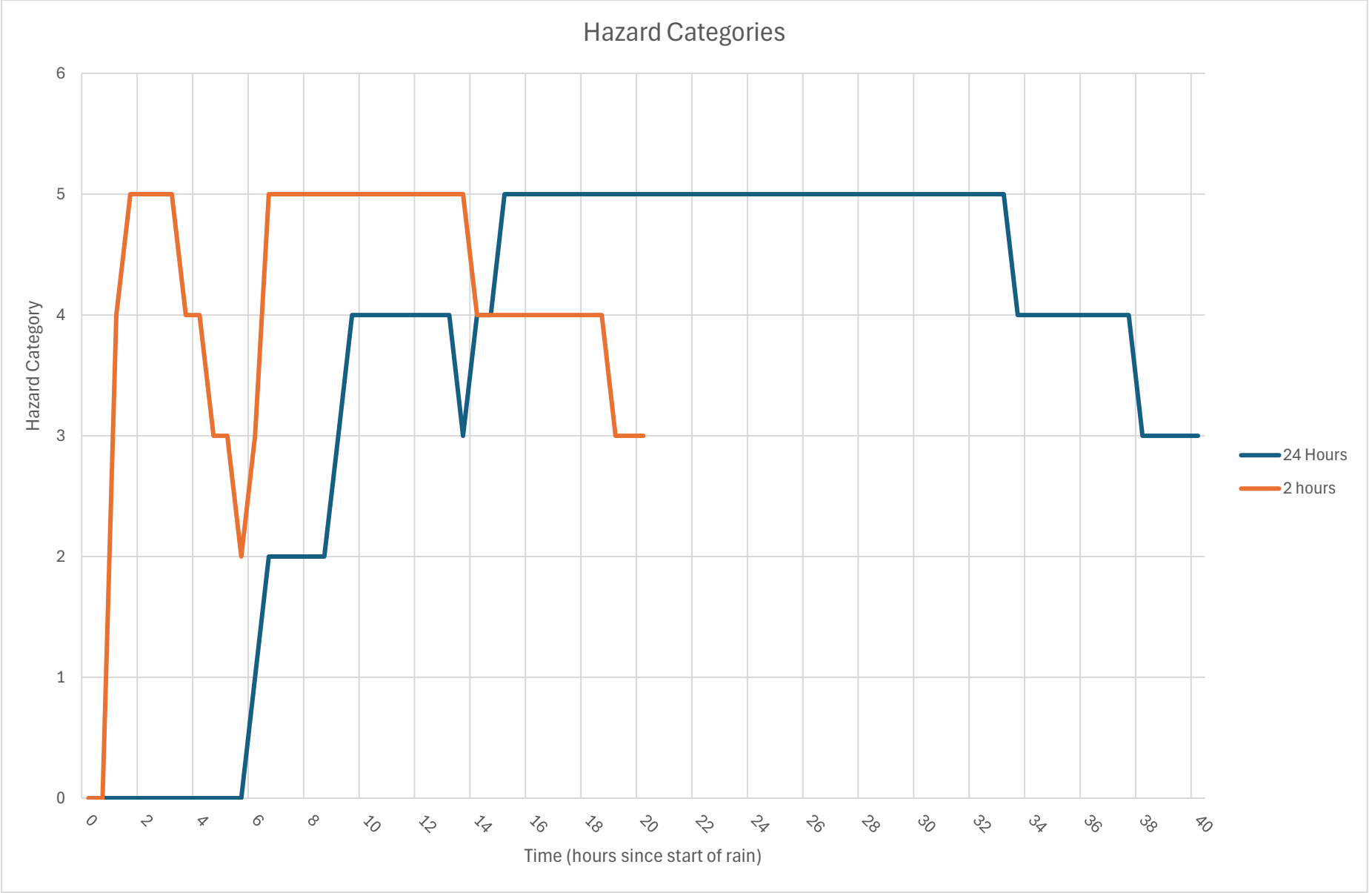
PMF flood hazard behaviour

Long and short duration floods

Source – Catchment Simulation Solutions Pty Ltd

m 0409 912 631 e mark.tooker@tookerandassociates.com.au a 30 Walworth Avenue, Newport abn 39 619 046 070

LOCATION A


Hazard Categories
Hazard Category
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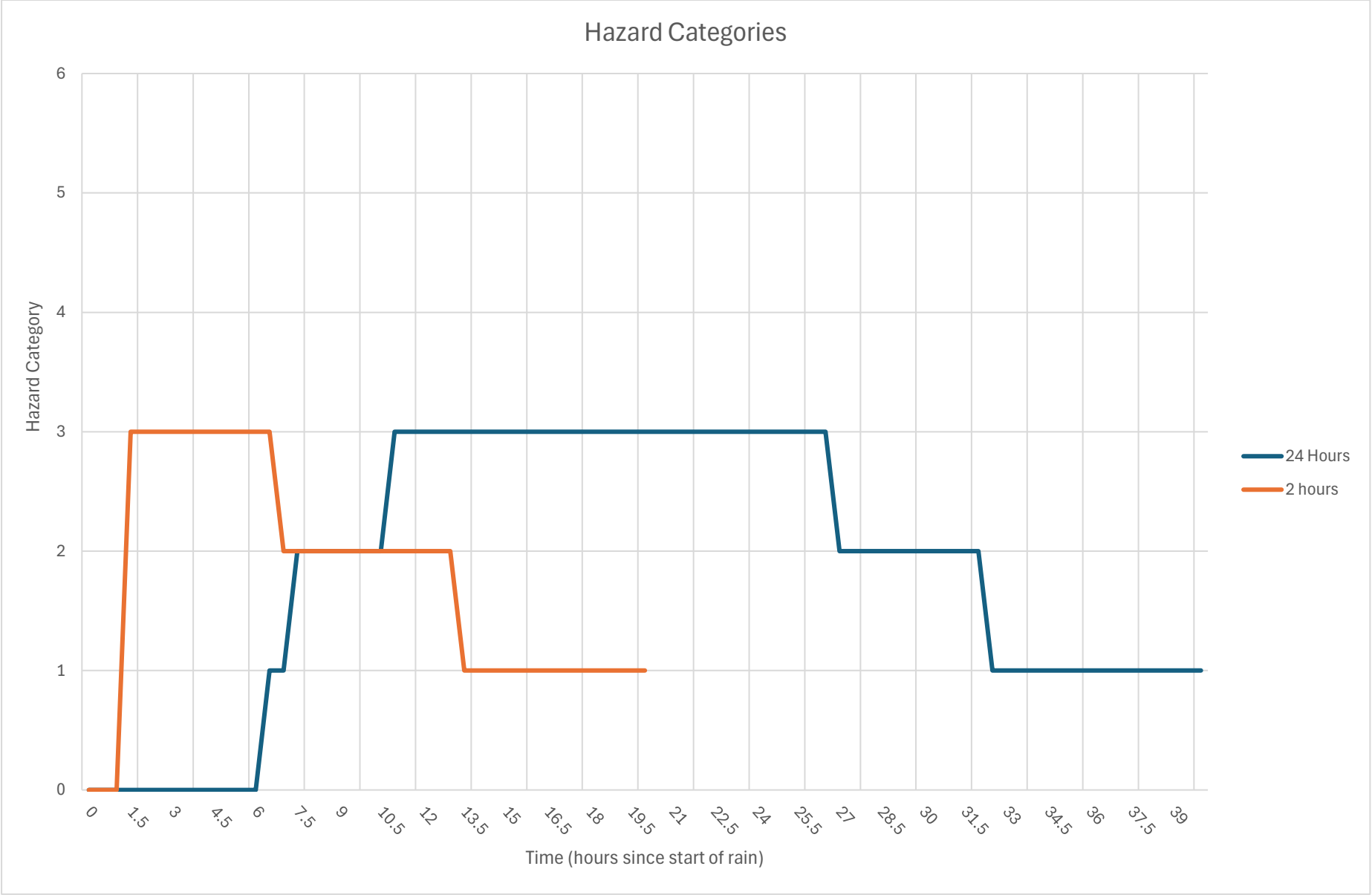
1
2
3
4
5
6
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
Time (hours since start of rain)
24 Hours
2 hours

LOCATION B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Hazard Category
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2
3
4
5
6
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1.5
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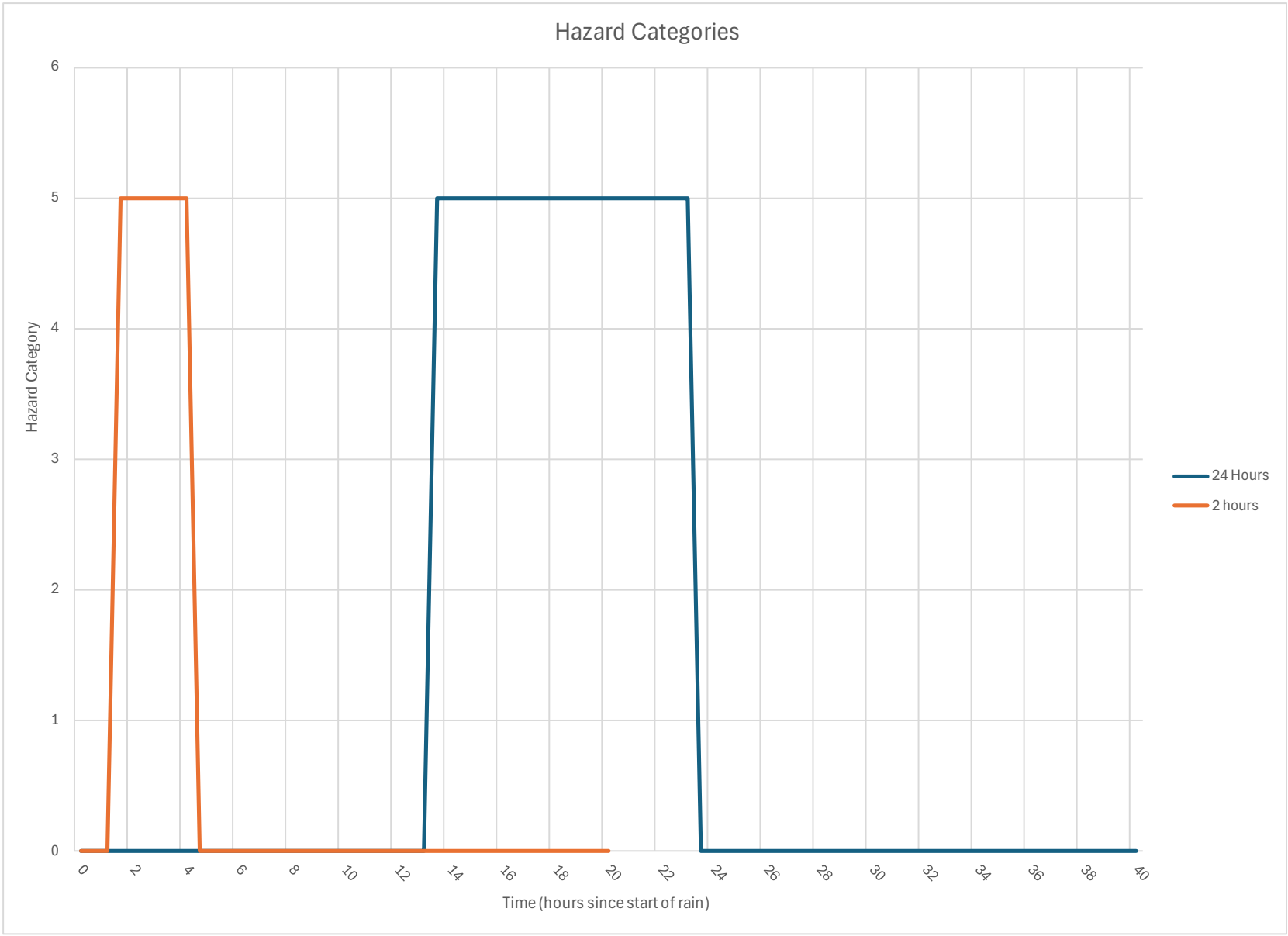
4.5
6
7.5
9
10.5
12
13.5
15
16.5
18
19.5
21
22.5
24
25.5
27
28.5
30
31.5
33
34.5
36
37.5
39
Time (hours since start of rain)
24 Hours
2 hours

LOCATION C


Hazard Categories
Hazard Category
Time (hours since start of rain)
24 Hours
2 hours
0
1
2
3
4
5
6
0
2
4
6
8
10
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14
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18
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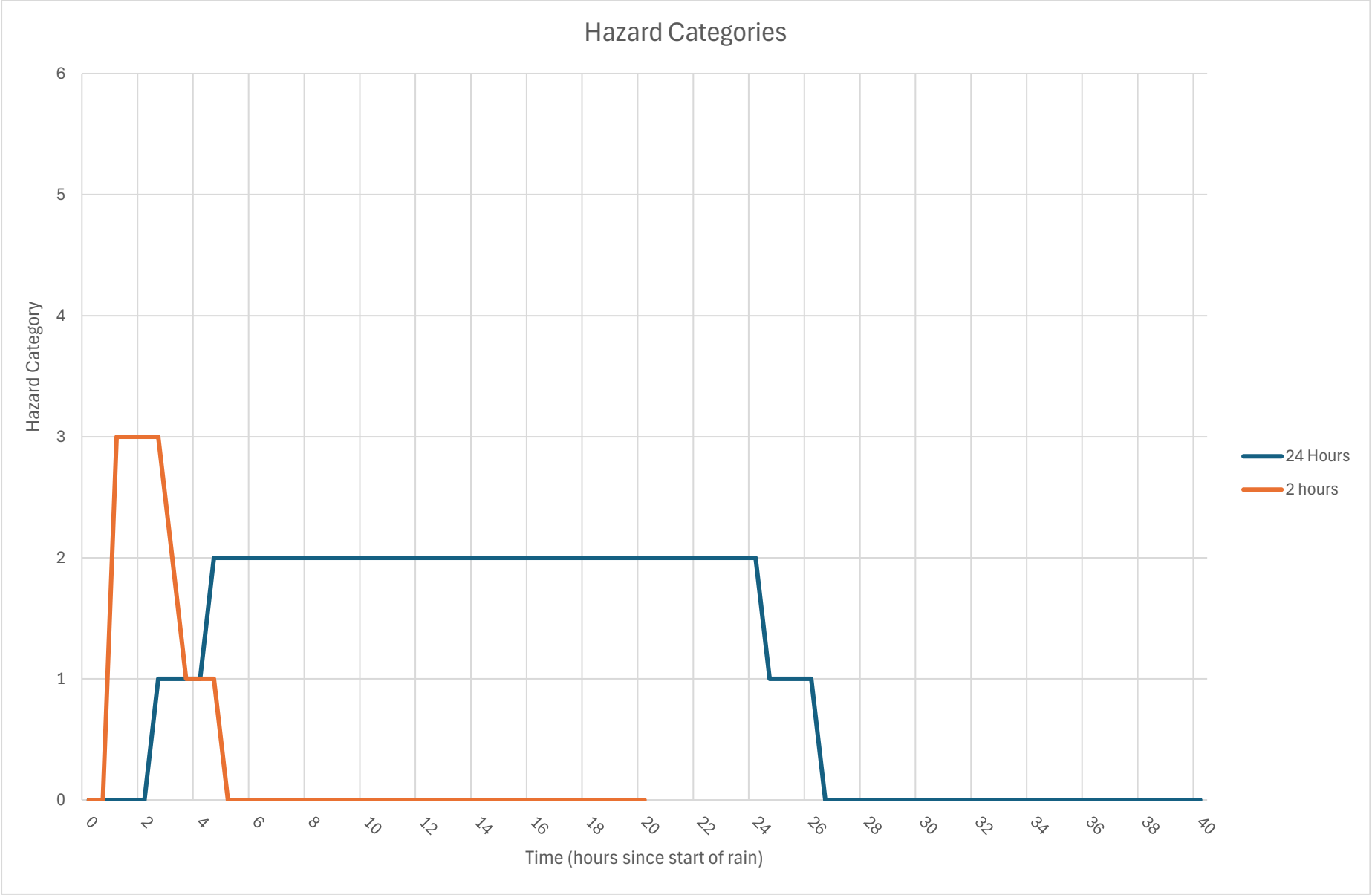
22
24
26
28
30
32
34
36
38
40

LOCATION D


Hazard Categories
Hazard Category
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6
8
10
12
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20
22
24
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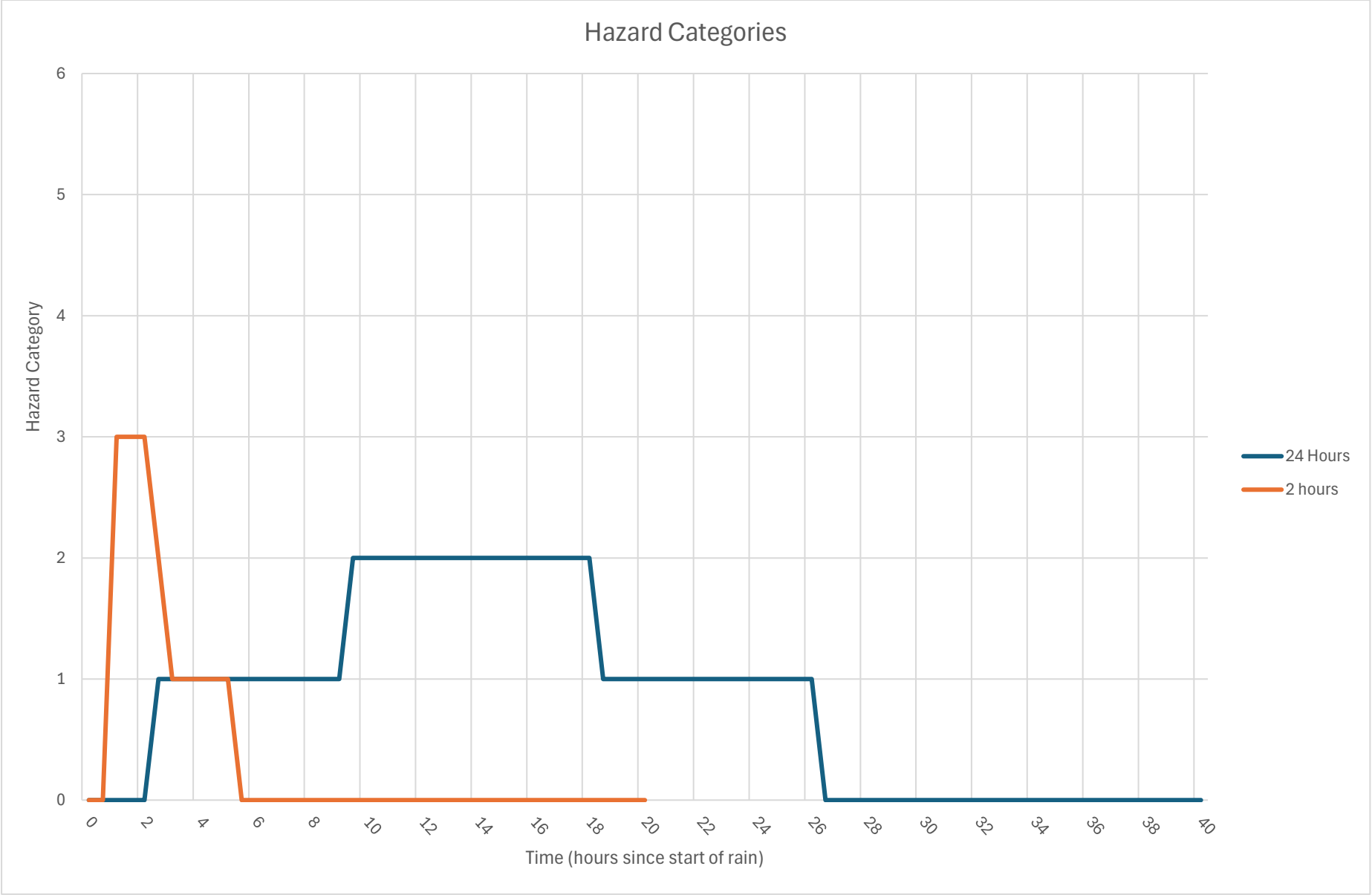
32
34
36
38
40
Time (hours since start of rain)
24 Hours
2 hours

LOCATION E


Hazard Categories
Hazard Category
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12
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18
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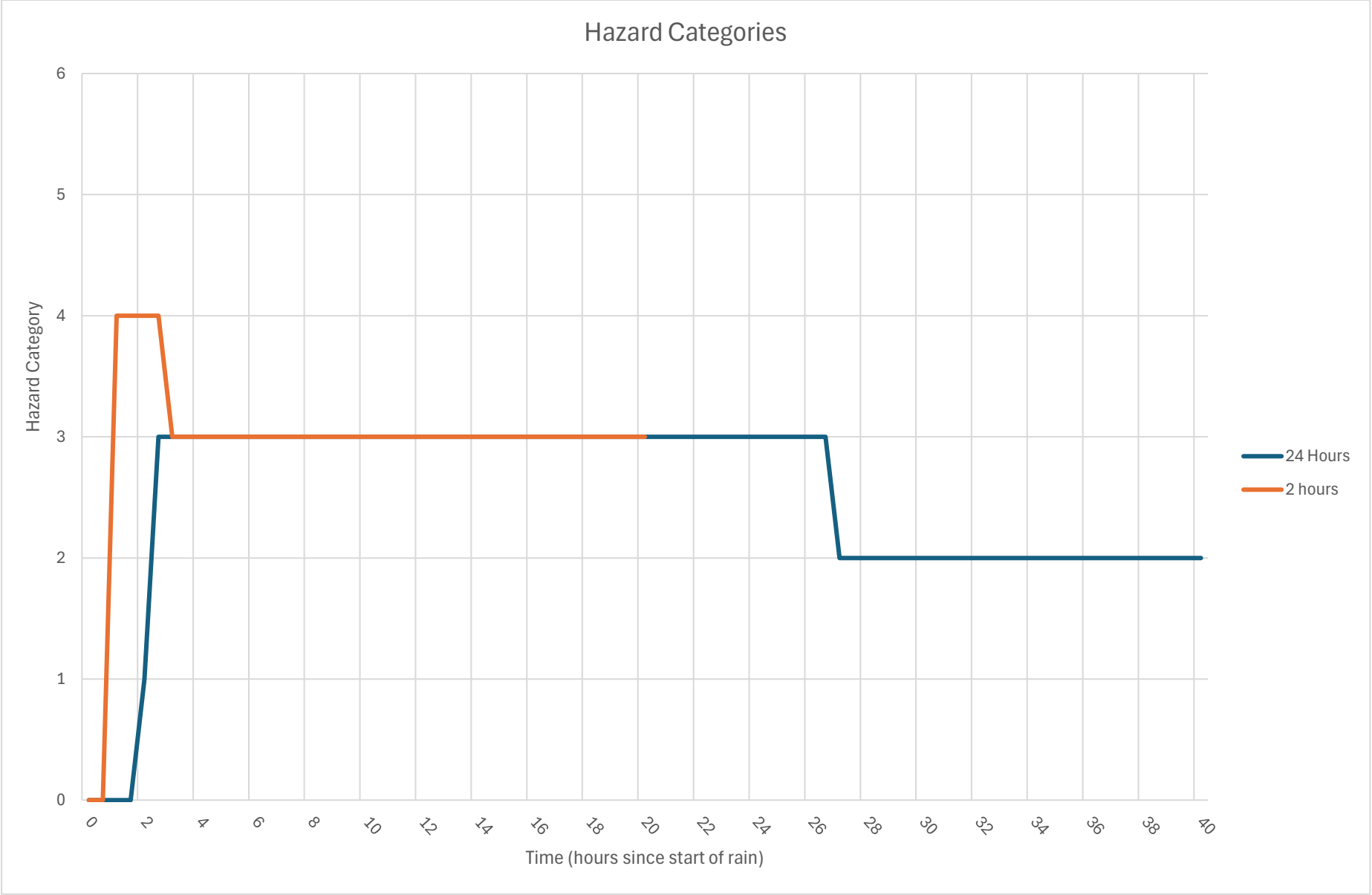
22
24
26
28
30
32
34
36
38
40
Time (hours since start of rain)
24 Hours
2 hours

LOCATION F


Hazard Categories
Hazard Category
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4
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2
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2
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6
8
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16
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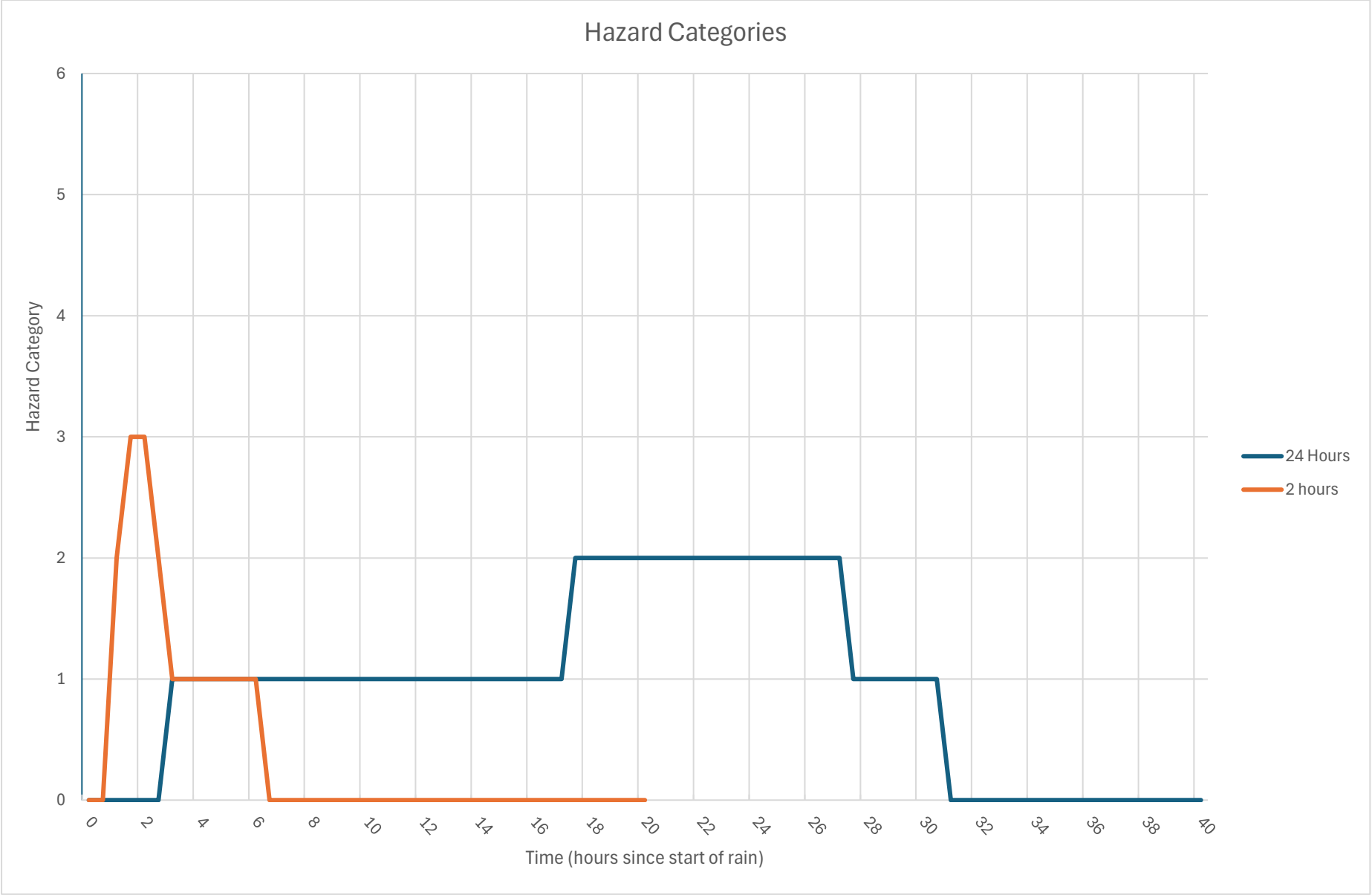
32
34
36
38
40
Time (hours since start of rain)
24 Hours
2 hours

LOCATION G


Hazard Categories
Hazard Category
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3
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8
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12
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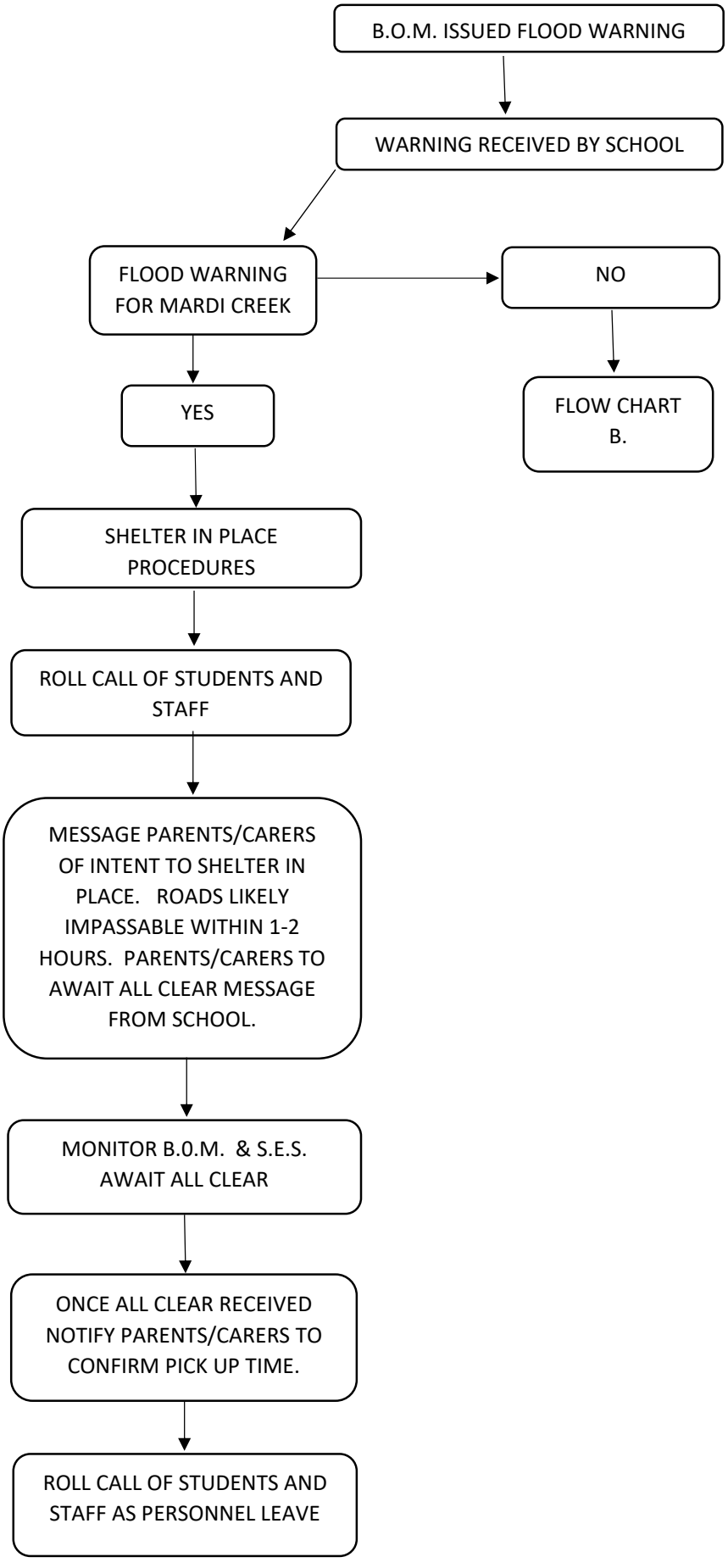
16
18
20
22
24
26
28
30
32
34
36
38
40
Time (hours since start of rain)
24 Hours
2 hours

ATTACHMENT B

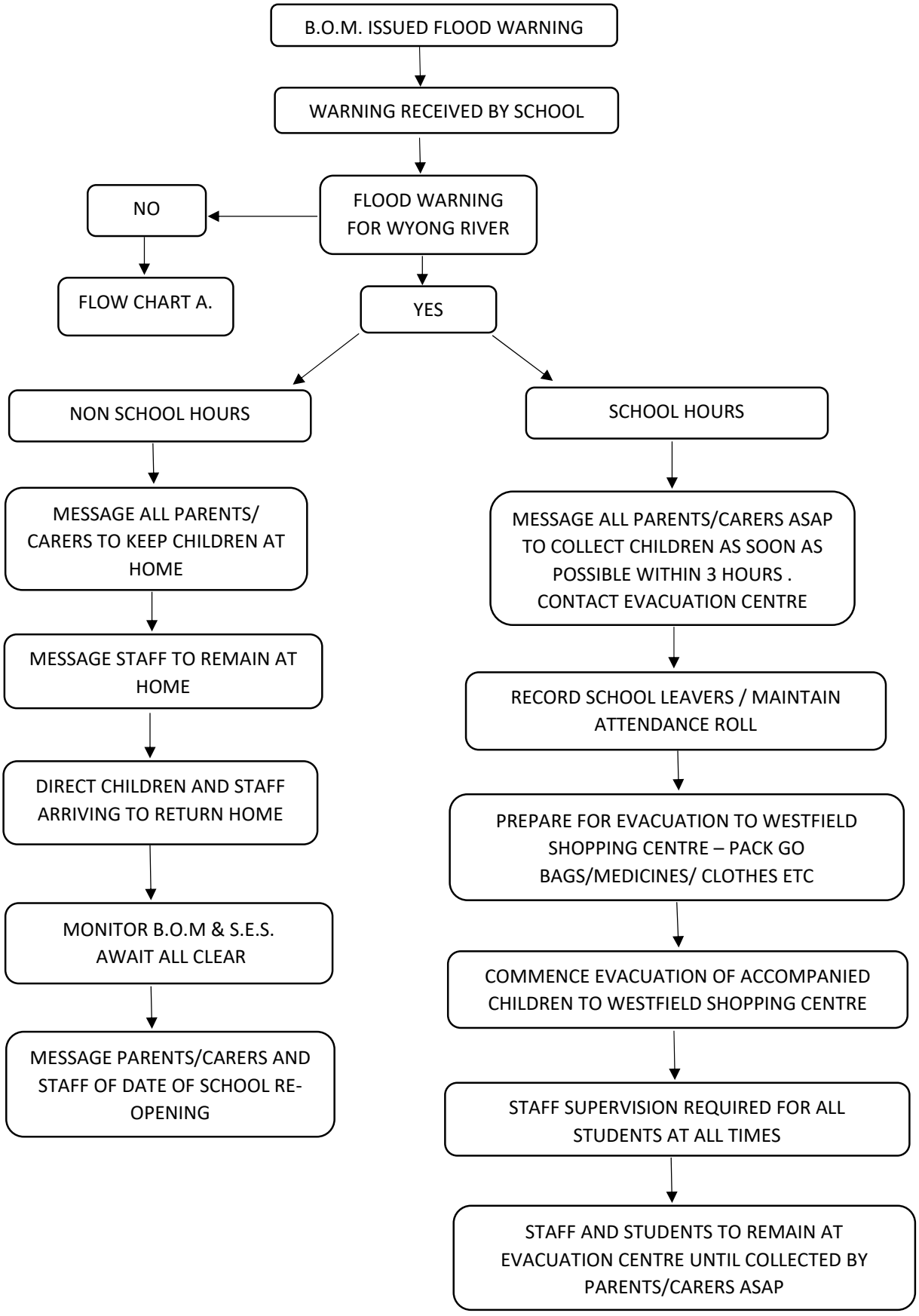
Flood Emergency Decision Flow Charts

m 0409 912 631 e mark.tooker@tookerandassociates.com.au a 30 Walworth Avenue, Newport abn 39 619 046 070

FLOW CHART A


B.O.M. ISSUED FLOOD WARNING
WARNING RECEIVED BY SCHOOL
FLOOD WARNING FOR MARDI CREEK
NO
FLOW CHART B.
YES
SHELTER IN PLACE PROCEDURES
ROLL CALL OF STUDENTS AND STAFF
MESSAGE PARENTS/CARERS OF INTENT TO SHELTER IN PLACE. ROADS LIKELY IMPASSABLE WITHIN 1-2 HOURS. PARENTS/CARERS TO AWAIT ALL CLEAR MESSAGE FROM SCHOOL.
MONITOR B.0.M. & S.E.S. AWAIT ALL CLEAR
ONCE ALL CLEAR RECEIVED NOTIFY PARENTS/CARERS TO CONFIRM PICK UP TIME.
ROLL CALL OF STUDENTS AND STAFF AS PERSONNEL LEAVE

FLOW CHART B.


B.O.M. ISSUED FLOOD WARNING
WARNING RECEIVED BY SCHOOL
FLOOD WARNING FOR WYONG RIVER
NO
FLOW CHART A.
YES
NON SCHOOL HOURS
MESSAGE ALL PARENTS/ CARERS TO KEEP CHILDREN AT HOME
MESSAGE STAFF TO REMAIN AT HOME
DIRECT CHILDREN AND STAFF ARRIVING TO RETURN HOME
MONITOR B.O.M & S.E.S. AWAIT ALL CLEAR
MESSAGE PARENTS/CARERS AND STAFF OF DATE OF SCHOOL RE-OPENING
SCHOOL HOURS
MESSAGE ALL PARENTS/CARERS ASAP TO COLLECT CHILDREN AS SOON AS POSSIBLE WITHIN 3 HOURS . CONTACT EVACUATION CENTRE
RECORD SCHOOL LEAVERS / MAINTAIN ATTENDANCE ROLL
PREPARE FOR EVACUATION TO WESTFIELD SHOPPING CENTRE – PACK GO BAGS/MEDICINES/ CLOTHES ETC
COMMENCE EVACUATION OF ACCOMPANIED CHILDREN TO WESTFIELD SHOPPING CENTRE
STAFF SUPERVISION REQUIRED FOR ALL STUDENTS AT ALL TIMES
STAFF AND STUDENTS TO REMAIN AT EVACUATION CENTRE UNTIL COLLECTED BY PARENTS/CARERS ASAP

APPENDIX 4

COMMUNICATION LOG WITH 8 THE SHEILING

COMMUNCIATIONS LOG FOR PROPOSED PROJECT FOR THE NEW EILEEN O'CONNOR SCHOOL

The following table outlines the communication attempts to contact the residents/strata associated with 8 The Sheiling, Mardi NSW 2259 to discuss a proposed easement agreement for drainage services into 100 Gavenlock Rd, Mardi, NSW, 2259
These attempts were made by Keith Cookson – Catholic Schools Broken Bay (CSBB) Capital Manager keith.cookson@dbb.catholic.edu.au or 0487731265

Date	Communication	Detail
17/7/24	Easement letter emailed	Owen Small owen.small@cobbsvillagemanagement.com.au, listed as the Director of Cobbs Village Management who manage 8 The Sheiling, Mardi, NSW, 2259
22/7/24	Telephone Call	Contacted CVM on 02 4353 5737 with no response
24/7/24	Telephone Call	Contacted CVM on 02 4353 5737 with no response
26/7/24	Telephone Call	Contacted CVM on 02 4353 5737 with no response and found number is disconnected
29/7/24	Site Visit	Attended address listed as CVM office, 17 Brickendon Ave, Mardi, 2259 NSW and found no one available. Spoke with 2 local residents walking around 8 The Sheiling asking how to contact management however they were not sure.
12/9/24	Easement letter delivered	Delivered easement letter to address listed under CVM, 17 Brickendon Ave, Mardi, NSW 2259
23/9/24	Response to letter	Response received from owner at 17 Brickendon Ave, Mardi, NSW 2259 stating that they have recently purchased the property and advised that Elite Strata & Property Services may manage properties previously under Cobbs Village Management
4/10/24	Telephone Call	Contacted Elite Strata & Property Services on 02 4352 1022 to confirm their management of 8 The Sheiling
9/10/24	Telephone call and email	Spoke with Elite Strata & Property Services who confirmed their management of properties previously under Cobbs Village Management however could not confirm management of 8 The Sheiling. Followed up with an email for further information and discussions

APPENDIX

1. SURVEY
2. STORMWATER CONCEPT DRAWINGS
3. FERP
4. COMMUNICATION LOG WITH 8 THE SHEILING
5. COUNCIL PRE DA NOTES
6. FLOOD INFORMATION CERTIFICATE
7. MUSIC RESULTS
8. MUSIC-LINK REPORT
9. DRAINS MODEL 1 RESULTS
10. DRAINS MODEL 2 RESULTS
11. DRAINS MODEL 3 RESULTS
12. DRAINS MODEL 1 DATA
13. DRAINS MODEL 2 DATA
14. DRAINS MODEL 3 DATA
15. SQIDEP FOR STORMSACK
16. SQIDEP FOR ATLANFILTER

APPENDIX 5

COUNCIL PRE DA NOTES

RECORD OF PRE-DEVELOPMENT ADVICE

APPLICANT DETAILS

Name	Penny Smith		
Company	EPM Projects Pty Ltd		
Phone	0490 799 390	Email	psmith@epmprojects.com.au

MEETING DETAILS - PDA/127/2024

Date	Wednesday 10 July 2024	Time	11am-12pm
Venue	Microsoft Teams	Fees	PAID - $2,795

PROPERTY DETAILS

Description of proposed development	Subdivision & New Educational Establishment for 200 Students with a Disability - State Significant Development
Estimated development cost	$46,000,000
Address	School St Peters Catholic College, 84 Gavenlock Road, MARDI NSW 2259

ATTENDEES

Council Representatives

Name	Position	Phone Number
Ross Edwards	Town Planner	(02) 4306 7900
Belinda Jennett	Observer	
Sevie Crayn	Ecologist	
Steve McDonald	Traffic Engineer	
Johnson Zhang	Water & Sewer	
Brendan Dee	Senior Development Engineer	

RECORD OF PRE-DEVELOPMENT ADVICE

Col Downey	Waste	
Craig Glynn	Trees (comments)	
Andrew Dewar	Flooding Engineer	
Mark Wasson	Urban Design	

Applicant Representatives

Name	Position / Company	Phone Number
Richard Yates	Civil Engineer	
Keith Cookson	Broken Bay Diocese Catholic Schools - Representative	
James McCallum	Engineering Consultant - James Taylor & Associates	
Penny Smith	Lead Planner – EPM Projects	
Hayden Dimitrovski	Traffic Engineer - Traffix	
Alison Holland	RP Infrastructure	
Salma Malik	RP Infrastructure	
Domenic Marra	Stanton Dahl Architects	

RECORD OF ADVICE

SUBJECT SITE

- Subject site is legally described as Lot 9/4 DP3368 at No. 84 Gavenlock Road, Mardi.
- The site has an area of approximately 13.17ha and is currently occupied by an existing educational establishment – St Peter's Catholic College which caters for years 7 to 12 (refer to Figure 1).
- The site is zoned R2 Low Density Residential and C3 Environmental Management pursuant to the *Central Coast Local Environmental Plan 2022*.

- The site is within bushfire prone land, is subject to flooding, contains an existing dam and is subject to Class 3, 4 and 5 acid sulfate soils.
- The site adjoins existing residential development to the west, south and north of the site and industrial development to the east of the site.

***Figure 1**: Aerial view of subject site Nearmap dated 12 August 2023*

***Figure 2:** Bushfire prone land*

RECORD OF PRE-DEVELOPMENT ADVICE

Figure 3: *Flood prone land mapping indicating 1% AEP*

Figure 4: *Flood prone land mapping indicating Probable Maximum Flood (PMF) Level*

Figure 5: *Identified dams and 40m buffer zone on the site*

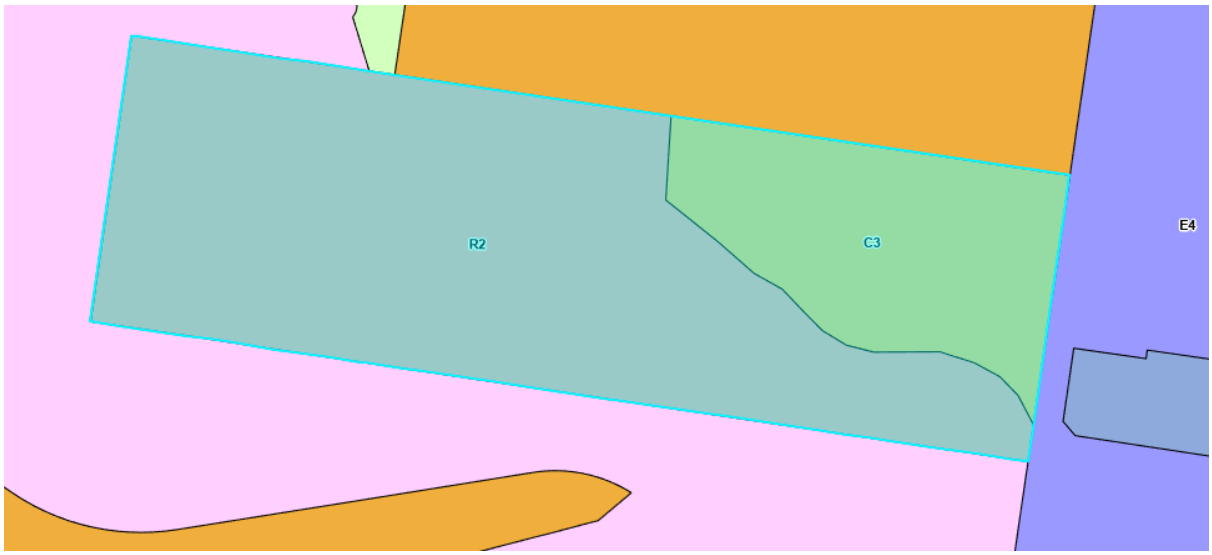


Figure 6: *Zoning map indicating the site is zoned R2 Low Density Residential and C3 Environmental Management.*

RECORD OF PRE-DEVELOPMENT ADVICE

PROPOSAL

The proposal involves a 2 lot subdivision and the construction of an educational establishment (school) for 200 children and 71 staff. The school will provide education to support tailored interventions and in-class support. The proposed development is identified as State Significant Development (SSD). The development involves:

- Subdivision of land: Subdivision is proposed to create a separate allotment for the new Eileen O'Connor Catholic School. This will be included within the SSD development application.
- Demolition of existing sheds, netball courts and infill of existing dam
- Construction of three storey school campus comprising of 20 General Learning Areas catering for 2 streams of Kindergarten to Year 6 and a single stream Years 7-12.
- Flexible workspaces for Kitchen, TAS/STEAM, Visual Arts.
- State of the art Library.
- Multi-purpose hall to cater for activities including gym, fitness, performing arts space.
- Sensory indoor and outdoor play spaces.
- Basketball court.
- Landscaping.
- Complimentary learning spaces to support collaboration with allied health professionals for tailored interventions and in-class support.
- Amenities, storerooms and staffroom.
- Two car parking areas for cars and buses.
- Covered kiss and drop area within the site.
- Ancillary works for stormwater and services.

RECORD OF PRE-DEVELOPMENT ADVICE

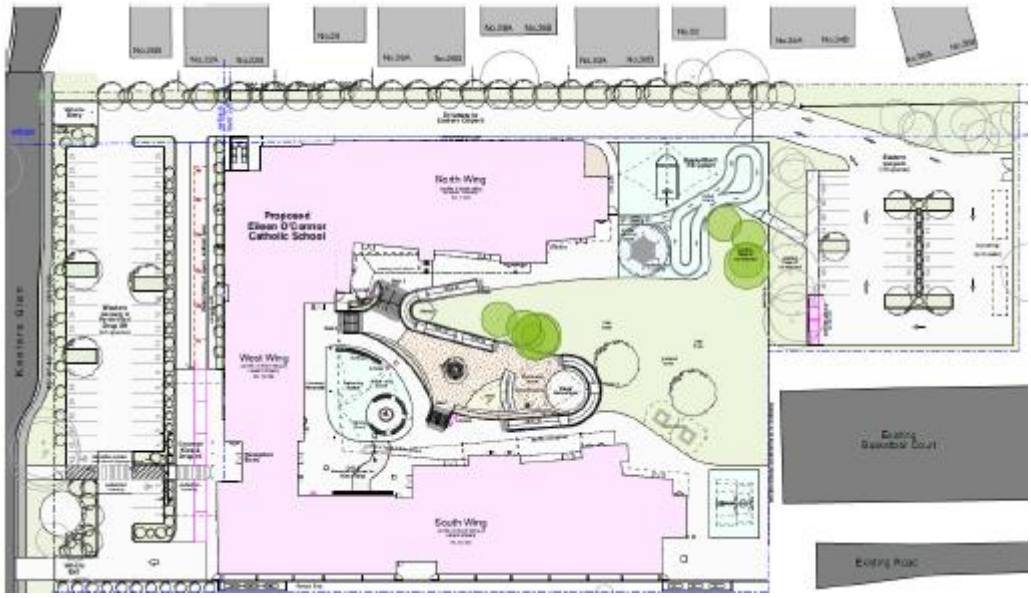


***Figure 7**: Site Plan*

***Figure 8:** Elevations*

RECORD OF PRE-DEVELOPMENT ADVICE

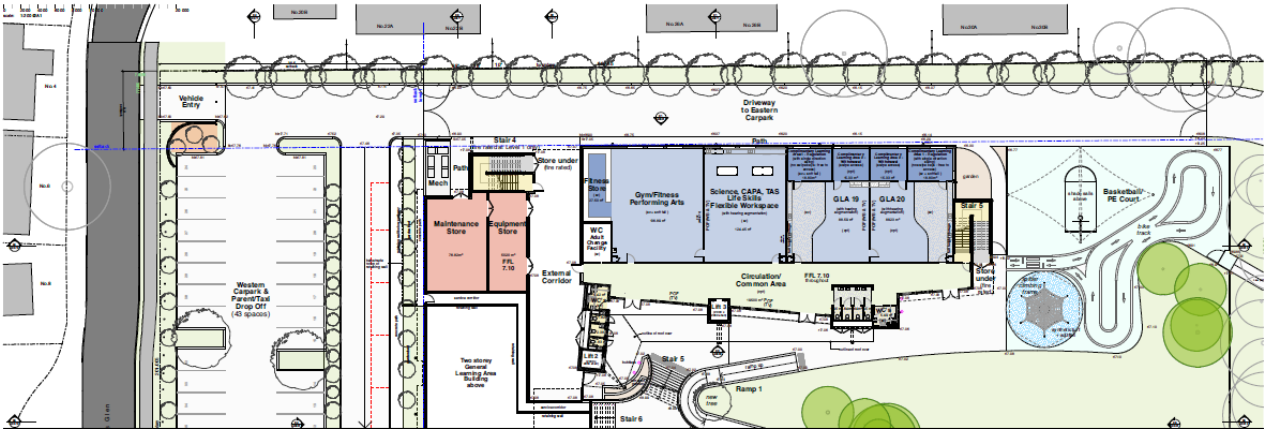


Figure 9: *Floor plan – Level 1*

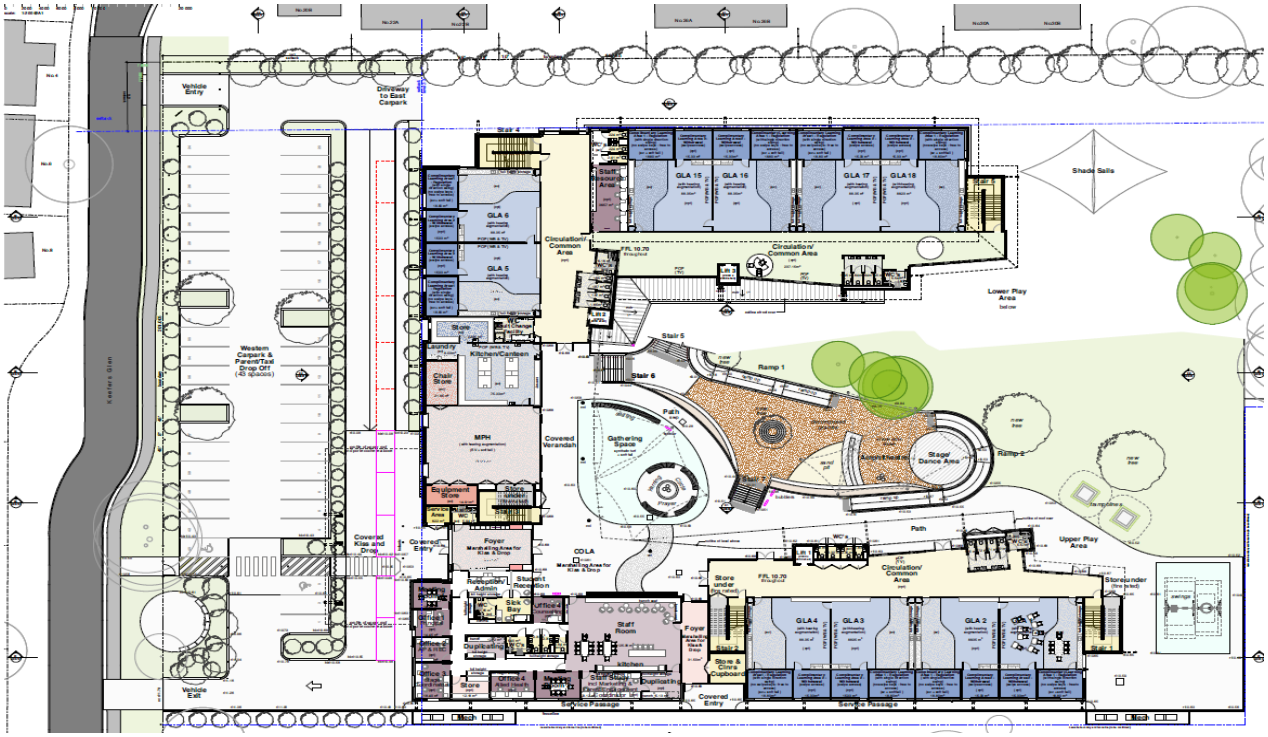


Figure 10: *Floor plan – Level 2*

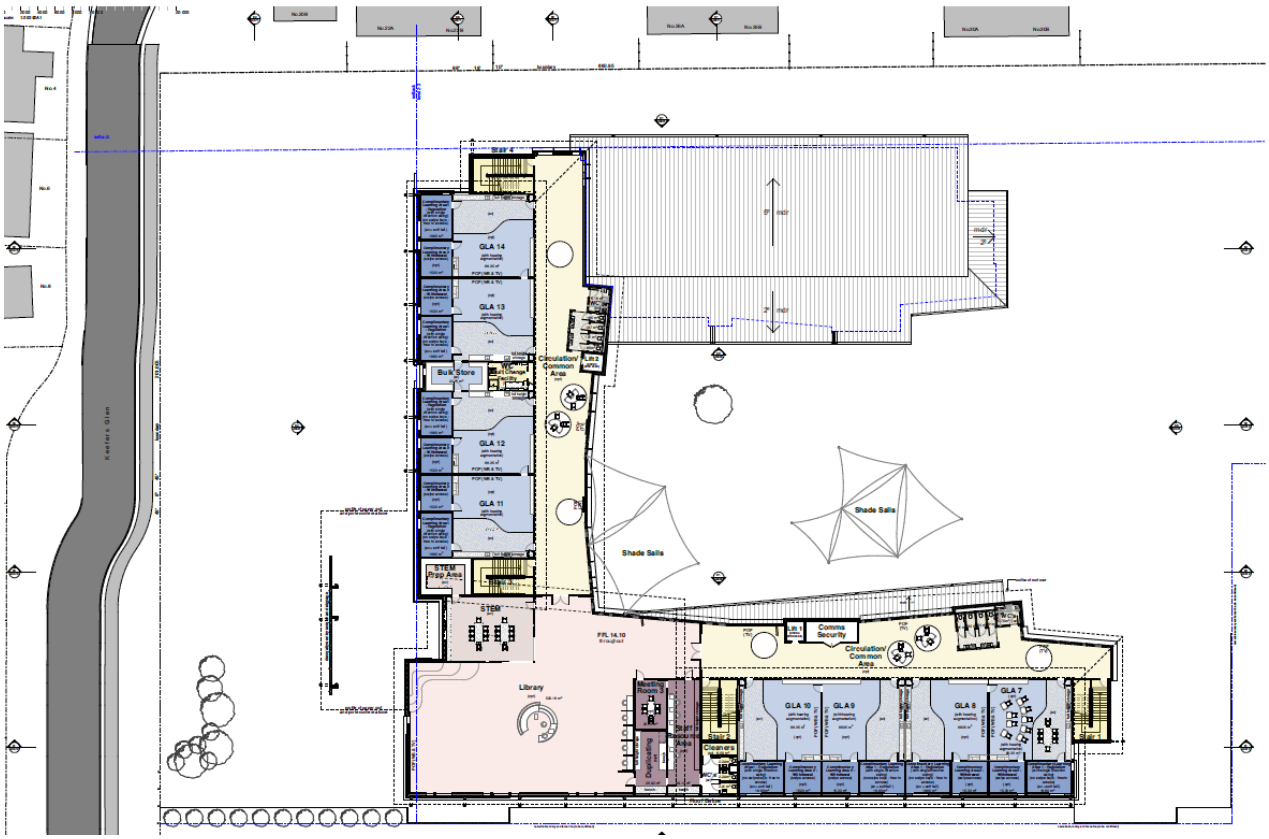


Figure 11: *Floor plan – Level 3*

MEETING AGENDA

The following matters were raised by the applicant which have been covered in this advice:

- Subdivision of land – Subdivision is proposed to create a separate allotment for the new school.
- Vehicular access via Keefers Glen.
- Car parking.
- Stormwater drainage.

The above matters have been addressed throughout the report.

PLANNING

s. 4.15 (1)(a)(i) of the *Environmental Planning and Assessment Act 1979*: Provisions of Relevant Instruments/ Plans/ Polices

Rural Fires Act 1997

Accessed here: Rural Fires Act 1997

The subject site is bushfire affected. The NSW Rural Fire Service (NSW RFS) has, under the *Rural Fires Act 1997*, a statutory obligation to protect life, property and the environment through fire suppression and fire prevention. Section 4.14 of the *Environmental Planning and Assessment Act 1979* indicates that all new development on bush fire prone land to comply with *Planning for Bush Fire Protection 2019* (PBP 2019). The proposed Development Application (DA) must be accompanied by a Bush Fire Assessment Report (BFAR) that explains how compliance with PBP 2019 is to be achieved.

In addition to the above the proposed school is identified as 'integrated development' for the purposes of Section 100B (special fire protection purpose) of the *Rural Fires Act 1997* and is required to be assessed by the Rural Fire Service. The applicant is advised to liaise with RFS regarding the proposed development of land prior to the DA lodgement.

Water Management Act 2000

Accessed here: Water Management Act 2000

The proposed development involves works within 40 metres of a watercourse and will require a controlled activity approval under the *Water Management Act 2000*. You will need to identify the development as 'Nominated Integrated Development'. It is strongly recommended that the NSW Dept of Natural Resources Access Regulator be contacted to discuss the proposal in regard to riparian zones, offsets and watercourse crossings etc prior to lodging a development application.

State Environmental Planning Policy (Planning Systems) 2021

Accessed here: State Environmental Planning Policy (Planning Systems) 2021

The proposed capital investment value has been identified at $46,000,000.

In accordance with Clause 2.6 (1) this SEPP, the proposed new educational establishment on this site which has a value greater than $20 million is deemed to be state significant development (SSD).

State Environmental Planning Policy (Biodiversity and Conservation) 2021

Accessed here: State Environmental Planning Policy (Biodiversity and Conservation) 2021 - NSW Legislation

- Chapter 4 Koala Habitat Protection 2021

  The subject site is over 1ha in size does not have an approved koala plan of management applying to the land. The SEE will have to demonstrate the proposed development will not impact on the Koala habitat. If Council is not satisfied that the development will not cause adverse impact on Koala habitat, a Koala Assessment Report may be requested to be prepared by a suitably qualified and experienced person.

State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)

Accessed here:
State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)

- Chapter 4 – Remediation of Land

  Clause 4.6 (b) requires that consent not be granted until Council has considered whether the land is contaminated. If the land is contaminated, the Council needs to be satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purposes for which the development is proposed to be carried out. Details of the potential contamination of the subject site needs to be provided as part of the development application which can be in the form of a preliminary site investigation report.

State Environmental Planning Policy (Transport and Infrastructure) 2021

Accessed here: State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP)

- Chapter 3 – Educational establishments and child care facilities

  The proposed development which is for the intent of an educational establishment is required to address the controls under Part 3.4 of this SEPP. Compliance with the SEPP is to be demonstrated within the Statement of Environmental Effects.

  Particular consideration should be given to how the proposed development satisfies the design quality principles set out in Schedule 8 of this SEPP and the whether the development enables the use of the school facilities to be shared with the community.

Please refer to the comments provided by Council's Urban Design Officer.

- Clause 3.58 – Traffic-generating development

  The proposed new educational establishment which will accommodate 200 students is deemed to be traffic generating development and will be referred to TfNSW for comments regarding the proposal. A traffic and car parking impact assessment report should accompany the development application.

State Environmental Planning Policy (Sustainable Buildings) 2022

Accessed here: State Environmental Planning Policy (Sustainable Buildings) 2022

Any development application lodged with Council will need to be accompanied with a BASIX Certificate in accordance with the requirements of this SEPP. Please note, any BASIX certificate accompanying a development must have been issued no earlier than 3 months before the date on which the application is made.

Central Coast Local Environmental Plan 2022

Accessed here: Central Coast Local Environmental Plan 2022

Permissibility

- The proposed educational establishment is permitted within the R2 Low Density Residential zone per the *Central Coast Local Environmental Plan 2022* (CCLEP) with Council consent. The development is defined as an educational establishment which is defined follows:

  Educational establishment *means a building or place used for education (including teaching), being –*

  a) a school, or

  b) a tertiary institution, including a university or a TAFE establishment, that provides formal education and is constituted by or under an Act.

  The proposed development is to demonstrate consistency with the objectives of the R2 zone in accordance with Clause 2.3 of the CCLEP 2022.

Relevant Clauses

- Clause 4.1 - Minimum subdivision lot size:

The Lot Size Map identifies the minimum lot size as 450m² for the area of the site zoned R2. The proposed development will involve a 2 lot subdivision which will create lots which are large than the minimum required 450m².

The proposed 2 lot subdivision will need to demonstrate that the proposed lots can be suitably serviced with all services outlined under Clause 7.6 of the CCLEP 2022 and the matters raised by Council's officers within this report.

Concern is raised with the proposed vehicular access to the development from Keefers Glen, as the intended traffic will have a detrimental impact on the traffic movements and car parking through the existing residential area and impact on the amenity of the existing residents. The proposed vehicular access to the intended development should utilise the existing vehicular access to the site from Gavenlock Road. Please refer to the comments provided by Council's Traffic and Engineer.

- Clause 4.3 – Height of Buildings:

  This clause requires buildings to comply with the Height of Buildings Map (HOB). The HOB indicates that the site is not subject to a maximum building height. The proposed building of two storeys will be considered on merit.

- Clause 4.4 - Floor space ratio:

  The floor space ratio map indicates the subject site is not subject to maximum FSR. The proposed FSR of the development on site will be considered on merit.

- Clause 5.21 – Flood Planning:

  The site is at or below the flood planning level. It is recommended the applicant apply for a Flood Level Certificate to confirm building levels.

  The development application must address this flooding risk to ensure Council is satisfied that the development–

  a) *is compatible with the flood function and behaviour on the land, and*
  b) *will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and*
  c) *will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and*
  d) *incorporates appropriate measures to manage risk to life in the event of a flood, and*
  e) *will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.*

Please refer to the comments provided by Council's Development Engineer in relation to flooding requirements.

- Clause 5.22 – Special Flood Considerations:

The proposed development for the intent of a 2 lot subdivision and a new educational establishment is deemed to be a sensitive and hazardous development as the existing site is between the flood planning area and the probable maximum flood level.

Council has traffic concerns in relation to the proposed vehicular access to the proposed lot from Keefers Glen and therefore access to the new site will be required to use the existing vehicular access from Gaven lock Road which is impacted by flooding. Therefore, the proposed development will be impacted by flooding and a flooding report will be required which demonstrates that the proposed development is acceptable and satisfies the provisions of this clause. Please refer to the comments provided by Council's Flooding Engineer.

- Clause 5.23 – Public Bushland

The clause applies to the entire LGA. Council is required to consider the likely effects of the development on adjoining public bushland (owned by the Council or public authority). The development must not encroach on public bushland. Where appropriate, the Ecological Assessment/BDAR is to provide recommendations to minimise impact of the development such as erosion and sediment control and measures to prevent the spread and establishment of invasive weeds.

- Clause 7.1 – Acid Sulfate Soils:

The area of the proposed works is mapped as potentially containing class 3, 4 and 5 acid sulfate soils, therefore, the provisions of Clause 7.1 of the CCLEP 2022 are to be addressed which may require the preparation of a preliminary acid sulphate soils management plan (ASSMP).

- Clause 7.6 - Essential services:

The consent authority cannot grant consent unless it is satisfied that all services that are essential for the development are available or that adequate arrangements have been made to make them available when required. The site is currently serviced, and the development application must address the provisions of this Clause.

Concern is raised with the proposed vehicular access to the development from Keefers Glen, as the intended traffic will have a detrimental impact on the traffic movements and car parking through the existing residential area and impact on the amenity of the existing residents. The proposed vehicular access to the intended development should utilise the

existing vehicular access to the site from Gavenlock Road. Please refer to the comments provided by Council's Traffic and Engineer.

s. 4.15(1)(a)(ii) of the *Environmental Planning and Assessment Act 1979:* Draft Environmental Planning Instruments

No draft Environmental Planning Instruments apply to this application.

s. 4.15(1)(a)(iii) of the *Environmental Planning and Assessment Act 1979*: Provisions of any development control plan

Central Coast Development Control Plan 2022

Accessed here: Central Coast Development Control Plan 2022

The Environmental Impact Statement (EIS) must demonstrate compliance with the following development controls as relevant. Justification for any non-compliances will be required, demonstrating the proposal will still achieve objectives of the relevant clause(s) and the development will be assessed on a merit basis.

- Part 1.2 - Notification of Development Proposals

  The proposed development will be notified as per APPENDIX A – NOTIFICATION TABLE of Part 1.2.

- Part 2: Development Provisions

  2.4 Subdivision

  The proposed 2 lot subdivision is required to address the provisions outlined under Chapter 2.4 of the CCDCP 2022.

  Concern is raised with the proposed vehicular access to the development from Keefers Glen, as the intended traffic will have a detrimental impact on the traffic movements and car parking through the existing residential area and impact on the amenity of the existing residents. The proposed vehicular access to the intended development should utilise the existing vehicular access to the site from Gavenlock Road. Please refer to the comments provided by Council's Traffic and Engineer.

2.13 Transport and Parking

Clause 2.13.3 of CCDCP 2022 requires the following car parking to be provided for the school containing primary and high school students:

Primary school:

1 space per staff member and 14 drop off spaces (can be on-street) per 100 students.

Secondary school:

1 space per staff and 7 drop off spaces (maybe onstreet)

Minimum of 2 spaces for disabled students to be provided on site for Primary and Secondary and 1 space for Pre-schools
1 space per 8 senior/adult students for student parking

Bus standing areas, parent drop-off and set-down are to be provided subject to a Transport Management Plan (TMP) based on anticipated mode split Adequate 'Kiss-and-Ride' facility is to be provided at all education establishments and is to be addressed in the TMP.

It is suggested that details of the staff levels and the number of students (primary and secondary) are outlined within the required traffic and parking assessment report to demonstrate that the site can cater for the required car parking in accordance with the DCP car parking requirements and that there will be no impact on traffic movements in the vicinity of the site.

Any variations to the required car parking requirements are to be suitably justified within the EIS and required traffic and parking impact assessment report.

2.14 Site Waste Management

The proposal is to be designed in accordance with the requirements of Chapter 2.14 of the CCDCP – Site Waste Management and this DCP chapter is to be addressed in the EIS. A Waste Management Plan is to be submitted with any Development Application, addressing demolition, construction and on-going waste.

- Part 3: Environmental Controls

3.1 Floodplain Management and Water Cycle Management

This chapter sets out the development controls for land subject to flood related development controls, including prescriptive criteria (Clause 3.1.4.1), performance based assessment provisions, and identifies when a Floodplain Management Plan is required. Refer to the comments provided by Council's Development Engineer within this report.

3.5 Tree and Vegetation Management

Should the application include tree removal then a tree removal and retention plan is required to be provided. Tree Protection Zones and protection measures for trees to be retained, must be shown on the plan. This plan must be based on the advice of an AQF5 qualified Arborist and must specifically include consideration of any area where deep excavation is required. A landscape plan should also accompany the development application which details the existing and proposed vegetation to be provided on site.

- Related Documents

Waste Control Guidelines
Masterplans

Other Matters

Acoustic

An acoustic report should be provided with the application to demonstrate that the proposed educational establishment will not have a detrimental impact on the adjoining residences. Please refer to Council's Environmental Health Officers comments.

Crime and Safety Report

A report is required to ensure the proposal has been designed following consideration of the *Crime Prevention through Environmental Design* (CPTED) strategies relating to surveillance, access control, territorial reinforcement, and space management.

CPTED is a crime prevention strategy that focuses on the planning, design and structure of cities and neighbourhoods. It reduces opportunities for crime by using design and place management principles that reduce the likelihood of essential crime ingredients (law, offender, victim or target, opportunity) from intersecting in time and space. Further information can be found on the NSW Police website.

CPTED refers to the principles specified under the *Crime Prevention and the Assessment of Development Applications* published by Department of Urban Affairs and Planning Guidelines for consideration under section 4.15 of the *Environmental Planning and Assessment Act 1979* as

amended. Under this section, all councils are required to consider and implement CPTED principles when assessing Development Applications.

Grant Funding:

Grant funding is a way to help build thriving communities.

The Central Coast Council Grant Finder Portal provides a comprehensive list of all grant and funding opportunities available for Central Coast businesses, community groups, not-for-profits and individuals.

For more details in this matter please call on 4325 8861 or email grants@centralcoast.nsw.gov.au.

Estimated Development Costs

This guide explains how Council determines the 'estimated cost of works' and the application fees payable and is applicable to Development Applications, Construction Certificates and Complying Development Certificates.

As of 4 March 2024, the *Environmental Planning and Assessment Amendment (Estimated Development Cost) Regulation 2023* (EDC Reg), *State Environmental Planning Policy Amendment (Estimated Development Cost) 2023* (SEPP Amendment) , *Environmental Planning and Assessment Regulation 2021* (EPA Reg) and relevant local and state environmental planning policies have been amended to include a new definition for *'estimated development costs'* (EDC).

The new EDC definition has replaced the current definitions of 'cost of development' and 'capital investment value' used across the planning system which affect the calculation of fees in connection with planning applications, the trigger for certain developments to be dealt with as regionally significant development, State significant development or State significant infrastructure, and determination as to whether development is BASIX development. The definition, which will be inserted in the EPA Reg as the new section 6, will define EDC as:

'the estimated cost of carrying out the development, including the following -:
(a) the design and erection of a building and associated infrastructure,
(b) the carrying out of a work,
(c) the demolition of a building or work,
(d) fixed or mobile plant and equipment.

Section 6(2) will provide that EDC does **not** include:

(a) amounts payable, or the cost of land dedicated or other benefit provided, under a condition imposed under the Act, Division 7.1 or 7.2 or a planning agreement,
(b) costs relating to a part of the development that is the subject of a separate development consent or approval,
(c) and costs, including costs of marketing and selling land,
(d) costs of the ongoing maintenance or use of the development,
(e) GST.

The EDC Reg will also insert a new section 251 which will apply where a fee specified in Schedule 4 to the EPA Reg relating to an application is based on the EDC of proposed development. Section 251(2) will require a consent authority to *'use the estimated development cost specified in the application, unless, in the consent authority's opinion, the specified estimated development cost is not genuine or accurate.'*

The NSW Department of Planning & Environment (DPE) has recommended that councils require applications with an EDC that is greater than $3 million be accompanied by a detailed quantity surveyor report which has been prepared by a quantity surveyor certified by the Australian Institute of Quantity Surveyors (AIQS), or a quantity surveyor chartered by the Royal Institute of Chartered Surveyors (RICS). However, for applications with an EDC of less than $3 million, the DPE has recommended that councils require a cost estimate report. The purpose of this distinction is to allow councils to use a single cost report to determine fees, planning pathway or anything else that refers to EDC.

Government Information (Public Access)

Under the Government Information (Public Access) Act 2009 (NSW) (GIPA Act), you are entitled to see a lot of information that Council holds in records such as Development Application approvals and approved Plans. You can informally apply for this information from Council. Information will be informally released if there is no overriding public interest against release of the information. For example, you may be entitled to information about yourself, but not someone else. The Informal Information Access Request Form includes guidelines to help you with lodging your request. There is no fee for the request, however charges may apply for if you require a printed copy from Council. If the floor, elevation or section plans are requested and you are not the property owner, you may be requested by Council to provide written consent from the property owner.

You also need to be aware of copyright restrictions as this can impact Council's ability to provide access to certain information. In certain circumstances, Council requires consent from a document or plan copyright owner before we can provide you with a copy of the requested documents. This is because of copyright restrictions imposed on Council under the Copyright Act 1968 (Cth). The form, Consent to Council – Copyright Form, includes information on how to locate the copyright owner. Please have the copyright owner complete the form and provide it with your request.

RECORD OF PRE-DEVELOPMENT ADVICE

Complete the informal access to information form if you are unable to provide copyright owners consent.

ENGINEERING

Stormwater Runoff Management (Quantity & Quality)

- The applicant has provided on-site detention (OSD) provisions for the site to attenuate post-development discharge to pre-development flows or to capacity of existing infrastructure.
- Stormwater discharged to the Keffers Glen road drainage infrastructure shall not exceed to existing hydraulic capacity. The legal point of discharge (LPD) for the development shall be the existing kerb inlet pit in Keffers Glen. An extension of a new 375mm RCP (minimum) within the road reserve to the site boundary with be required.
- For the catchment that does not discharge to Keffers Glen, Council's preference is to utilise and discharge to the existing private drainage infrastructure provided at the natural low point that drains the adjoining development to the north.
- The applicant shall demonstrate that a reasonable attempt has been made with the adjoining land-owner to negotiate obtaining owners consent and a drainage easement to utilise the existing private drainage infrastructure for discharge from the development.
- Infrastructure may need to be upgraded due to limited hydraulic capacity or discharge from the site attenuated to acceptable flows.
- Upon demonstration that obtaining a downstream easement is not attainable/viable, council may then consider controlled discharge downstream to the northern wetland (endangered ecological community/C2 conservation land).
- The applicant shall demonstrate that via water quality modelling (MUSIC) that stormwater runoff can be treated to acceptable water quality targets in accordance with Council's Civil Works design/water quality guidelines.
- The proposed level spreader drainage system shall be designed in accordance with industry best practice/guidelines and disperse flow downstream ensuring appropriate scour and erosion protection measures are provided.
- A downstream easement (i.e. overland flow path) will be required to be obtained through the downstream property (i.e. St Peter's Catholic College) for the treatment of runoff/overland flow from the site (via bio-retention swale or the like). Evidence from the downstream property owner shall be provided for the granting of the downstream easement.

- The applicant shall demonstrate that stormwater discharge from the site will not have any adverse/negative impacts to the adjoining wetland/C2 conservation land to the north.

Subdivision, Easements, 88B Requirements

- The applicant will be required to submit a subdivision plan prepared by a registered surveyor in accordance with Central Coast Development Control Plan (CCDCP) 2022, Chapter 2.4 – Subdivision.

ECOLOGY

The proposed development will be assessed in accordance with the *Biodiversity and Conservation Act 2016* (BC Act) and associated *Biodiversity Conservation Regulation 2017* (BC Regulation).

The following ecological advice relates to an updated plan the applicant has prepared in response to comments provided by the State Design Review Panel.

Much of the ecology advice provided to the applicant in the previous Pre-Development Application Meeting PDA/175/2023 has already been implemented, and the following advice, for the majority, remains unchanged.

The applicant seeks to establish a new school for special needs students, on R2 – Low Density Residential and C3 – Environmental Management zoned land.

A preliminary desktop ecological assessment was undertaken by Council's Ecologist whereby the proposed site was assessed for Biodiversity Values, utilising the Biodiversity Values Map and Threshold Tool. This tool, which was developed by the NSW Government identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

In this instance, the proposed development site does not intersect with Biodiversity Values Mapping.

However, should there be a significant impact on a threatened entity deemed likely due to the proposal or if the total required clearance of native vegetation exceeds the Biodiversity Offset Threshold of 2,500m^2, a BDAR will be necessary.

A review of the amended plan, provided in the Pre-Development Application supporting documentation appears to suggest that the proposal's impacts are very close to the Biodiversity Offset Scheme clearing threshold. The applicant has engaged a consultant ecologist who has determined that the development will trigger the Area Clearing Threshold under Biodiversity Offset Scheme and is now actively surveying the site and preparing a BDAR for the submission.

Figure 11: *Aerial image provided by the Biodiversity Values Map. No areas of Biodiversity Values Habitat is present within or adjacent the subject site. Works will not impact on areas mapped on the Biodiversity Values Map.*

Ecological Constraints

The subject lot contains Low Density Residential (R2) zoned land in the east and Environmental Management (C3) zoned land in the west, respectively. The site is located on the western side of Gavenlock Road and lies to the immediate south of Council managed land zoned C2 – Environmental Conservation, which is mapped as Swamp Mahogany - Paperbark Forest, comprised of key species *Eucalyptus robusta, Melaleuca linariifolia*, *Melaleuca styphelioides* and *Eucalyptus resinifera*.

This habitat is identified as Swamp Sclerophyll Forest on Coastal Floodplains of the NSW NC, SB and SEC Bioregions and is classified as an Endangered Ecological Community (EEC) under the BC Act.

Vegetation condition analysis has determined that the existing flora in the northern Council owned lot is in "Moderate-Good" condition and is mapped as an upland wetland. BioNet threatened species records indicate that the area is known support several vulnerable fauna species, including but not limited to *Lophoictinia isura* (Square-tailed Kite), *Glossopsitta pusilla* (Little Lorikeet) and *Hirundapus caudacutus* (White-throated Needletail).

Aerial analysis of the proposed subject site suggests that remnant fragments of vegetation from this EEC may surround the existing dam in the development footprint, as well as vegetation occurring in between the two grass fields in the east of the site.

While no mapped habitat or wildlife corridors identified on the subject site, the established trees and pockets of remnant vegetation in the east and western areas may, conceivably, be utilised by native fauna as green connectivity to traverse the urbanised area through the site and into core habitat to the southwest and into the north.

Running north to south in the eastern quarter of the lot, adjacent to the sports oval, a disturbed patch of regrowth, which has not been ground truthed exists. This patch of vegetation may comprise of good quality native vegetation and contains a mapped waterbody with a 40m buffer zone.

Dam Dewatering

The applicant is proposing to construct new facilities for a special needs school, the Eileen O'Connor School, for approximately 180 Kindergarten to Year 12 students. The facilities will be located in the north-western corner of the existing educational establishment, adjacent to Keefers Glen. The proposed works will necessitate the dewatering and infill of an existing dam onsite which is situated directly in the development footprint.

The following advice relates to the dewatering of the existing dam and is addressed by Council's *Flora and Fauna Guidelines* (2019) in more detail.

"*Dams may at times be proposed for removal to allow for development or replacement. Dams often contain aquatic vegetation that is habitat for a range of native and introduced wildlife including turtles, fish and frogs. Native fauna are protected under the Biodiversity Conservation Act 2016 and as such need to be appropriately managed during dam dewatering.*

Dams may also contain high levels of contaminants such as zinc, hydrocarbons and pesticides that also require careful remediation. If a dam is proposed to be removed, Council will include as a Condition of Consent either that the dewatering process needs to be supervised by an Ecologist or, if the dam dewatering process is more complex, a requirement to prepare a dam dewatering plan.

To streamline the development assessment process, if it is known that a dam requires dewatering this plan may also be submitted with the development application. During the dewatering process removed water must not be permitted to enter creeks or drains and as such, dewatering must occur onto land unless a pollution licence is held."

It is advised, that in this case that a dam dewatering plan be required to be submitted with the Development Application. An Ecologist will be required to supervise dewatering process to rescue wildlife and transport them safely to another location nearby. Implementation of a dewatering strategy would likely be included as a Condition of Consent should the proposal be supported.

Adjacent C2 – Environmental Conservation Swamp Sclerophyll Forest (Endangered Ecological Community)

Adjoining the site to the north exists public bushland, identified as Swamp Sclerophyll Forest, and is recognised as an Endangered Ecological Community under the *Biodiversity Conservation Act 2016*. This site is maintained, in part by a volunteer group, Wetland Care Australia – Wyong. The proposal should implement a design which avoids impacts to this area, resulting in long term preservation and conservation of the high ecological values present. Design elements which may result in degradation of this habitat should be avoided, for example discharge of stormwater into freshwater wetlands.

Direct discharge of stormwater into this conservation area would not be supported by Council.

CC LEP 2022 Clause 5.23 – Public Bushland

Public Bushland provisions were previously found under SEPP Biodiversity and Conservation 2021: Chapter 6 Bushland in Urban Areas.

The clause applies to the entire LGA. Council is required to consider the likely effects of the development on adjoining public bushland (owned by the Council or public authority). The development must not encroach on public bushland. Where appropriate, the Ecological Assessment or BDAR is to provide recommendations to minimise impact of the development such as erosion and sediment control and measures to prevent the spread and establishment of invasive weeds.

Preliminary Ecological Assessment Conclusions

- Proponent should explore design opportunities that minimise impacts to existing high value habitat features eg hollow bearing trees, stick nests, possum dreys etc, should they be located on site.
- Dam Dewatering Plan to be submitting along with an Ecological Assessment/BDAR.
- Prioritise exotic vegetation species for removal to achieve APZ compliance.
- Applicant is progressing with Ecological Surveys (BDAR) and Arboricultural Impact Assessments.
- Site is situated adjacent Swamp Sclerophyll Forest (Endangered Ecological Community). Design is to minimise impacts to this valuable wetland habitat. BDAR is to consider and address direct and indirect impacts of stormwater should the proposal opt to discharge into this area.

- Arborist Report is to include a tree retention and removal plan outlining which trees are to be removed and which are to be protected (including Tree Protection Zones).
- Tree Removal required for APZ requirements must be considered and integrate with the Arborist Report, Flora and Fauna Assessment/BDAR and impacts from the design elements, eg stormwater.
- Works are to take place in a mapped course. A controlled Activity Approval may be required under the *Water Management Act 2000*.

  All impact areas are to be considered, eg stormwater impacts on the adjoining Swamp Sclerophyll Forest and impacts to native vegetation due to street widening along Keefers Glen.
- Site is over 1HA or land is over 1HA in common ownership. The proponent must address*State Environmental Planning Policy (Biodiversity and Conservation) 2021:* Chapter 4 – Koala habitat protection 2021.

Biodiversity Development Assessment Report (BDAR)

The proposed development triggers the NSW Biodiversity Offsets Scheme and requires the submission of a Biodiversity Development Assessment Report (BDAR). The DA is required to be accompanied by a BDAR that has been prepared by an accredited person in accordance with the Biodiversity Assessment Method (BAM). The applicant notified Council that the preparation of a BDAR is underway.

The BDAR identifies:

- How the proponent proposes to avoid and minimise biodiversity impacts. Ecologists should be involved early in the project planning and development design processes so that impacts biodiversity values are avoided and minimised;
- Any potential impact that could be characterised as serious and irreversible (SAII) according to specified principles and thresholds; and
- The offset obligation required to offset the likely residual biodiversity impacts of the development or clearing proposal, expressed in biodiversity credits.

The BDAR must include figures showing the overlay of the development area on the vegetation mapping, in order to clearly identify the vegetation proposed to be cleared and that requiring offsetting. See for example Figure 3, Figure 12 and Figure 15 of the NSW BDAR template.

The BDAR or Ecological Assessment needs to be consistent, and integrate with, the required Arborist Report, Landscape Plan, Bushfire Assessment, Wastewater Report and Stormwater/Water Cycle Management Plan.

Ecological Field Surveys

Field surveys are to be undertaken in accordance with the NSW Biodiversity Assessment Method (BAM) with reference to relevant notes contained in the Threatened Biodiversity Data Collection and published threatened species survey guidelines. Where relevant published survey guidelines are not available, surveys are to be undertaken using best practice methods that can be replicated for repeat surveys. Field surveys must be less than five years old, as per the BAM.

For BDARS: The ecosystem/species credit species list generated by the BAM-C may not include all threatened species with habitat constraints on the site. To ensure all threatened species are assessed, in accordance with BAM 2020 S 1.4.1, include a table with Bionet search results in the BDAR to assess likelihood of occurrence for threatened species that have been recorded within 10km of the site. Threatened species with suitable habitat on the site are to be added to the BAM-C list to ensure they are subject to required targeted surveys.

All hollow bearing trees (HBTs) are to be mapped and number and type of hollows determined. This includes large sized tree hollows < 100m of the development HBTs must be stag watched, particularly where they have characteristics that may support threatened species such as Large Forest Owls.

The development application should not be lodged until such time as all required ecological surveys and assessments have been completed, including all required seasonal surveys for threatened flora and fauna.

What should the Flora and Fauna Assessments or Report contain?

- The impact area, including the location of Asset Protection Zones, stormwater impact areas, road widening locations, any other zones where impacts to biodiversity will occur.
- The location of any hollow-bearing trees.
- The location of any glider sap feed trees.
- The location of any stick nests with a diameter greater than 0.5m.
- The location of any other important wildlife habitat, including but not limited to rock outcrops, farm dams, creeks and streams.

- The distribution of Plant Community Types (PCTs) on the site, including the area of each PCT and the area to be cleared or disturbed.
- The location of all field survey GPS track logs, such as the location of completed parallel transects and spotlighting traverses.
- The location of all fixed survey site locations such as BAM plots and fixed ultrasonic bat recording sites.
- The distribution.
- Consideration of Direct and Indirect Impacts as well as recommendations to mitigate these impacts.

Study Area

The study area must include all areas likely to be directly impacted by the development, including roads, asset protection zones, stormwater infrastructure and wastewater disposal areas. Vegetation clearing is to be determined with reference to civil/bulk earthworks plans which may identify batters etc and provision of service connection to the development (some of these areas may be outside the property boundary).

The study area must also include areas likely to be indirectly impacted, particularly sensitive environments such as nearby Endangered Ecological Communities (EEC's). Indirect impacts include altered flow regimes, noise, light, weeds, public access and downstream impacts etc.

Landscape Features and Vegetation Mapping

Accurate identification and mapping of landscape features and vegetation communities will be required in accordance with the BAM or Council's *Flora and Fauna Guidelines* (2019) as this will inform the survey, reporting and offsetting requirements. Vegetation communities are to be identified in accordance with the NSW plant community type classification (PCT).

If particular trees or areas of vegetation are shown for retention on development plans, a formal application to modify the consent would be required if it is determined during more detailed design or construction that these trees or vegetation shown for retention will be impacted. This includes a situation where, for example, a batter, earthworks, services or roads are shown in post consent design plans that conflict with trees required by the consent to be retained.

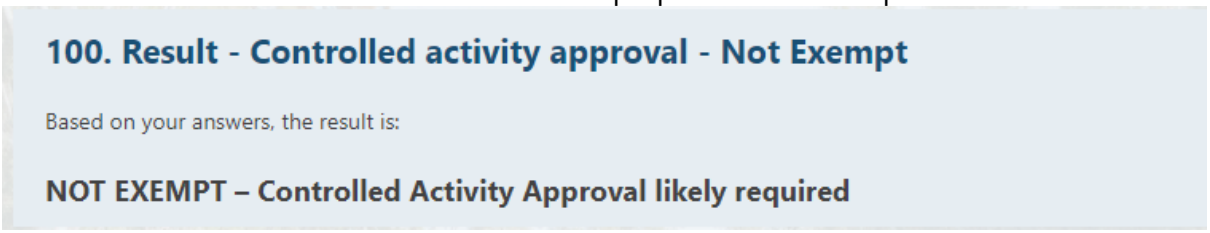
RECORD OF PRE-DEVELOPMENT ADVICE

Water Management Act 2000

The proposed development involves works within 40 metres of a watercourse and will require a controlled activity approval under the Water Management Act 2000.

Council's Ecologist completed an assessment of the proposal utilising DPIE Water's Controlled Activity Approval Exemption e-tool. Inputting the information resulted in a NOT EXEMPT result.

The applicant should complete a secondary assessment, with all the information present and consult with DPIE Water for confirmation if the proposal is not exempt.



State Environmental Planning Policy (Biodiversity and Conservation) 2021

The Koala SEPP 2021 applies in all land use zones on the Central Coast that has an area of at least 1 hectare (including adjoining land within the same ownership). The proposal requires an assessment under the SEPP. This can be addressed as part of the BDAR or Ecological Assessment. Where required, Koala Assessment Reports under the SEPP need to be prepared by a suitably qualified and experienced person, as defined by the SEPP.

Wildlife Management Plan (WMP)

A Wildlife Management Plan (WMP) ***may*** be required for the nominated clearing and dam dewatering onsite. The requirement for a WMP will be made on the advice of the consulting ecologist and or any conditions implemented under the Controlled Activity Approval, should one be required. The Ecological Assessments submitted with the application are to include a map and count of hollow bearing trees and other habitats within the development area, and a hollow replacement strategy that may include re-erection on of salvaged hollows in the riparian corridor on suitable trees.

Trees and Clearing for Asset Protection Zones

The site consists of well-established trees, landscaped areas and lies adjacent to a mapped Endangered Ecological Community. Any landscaping will need to comply with the requirements of the Bushfire Assessment Report. Impacts to trees and habitat will also need to be considered when assessing access into the site and for RFS consent conditions. Council needs to be aware of what trees are proposed to be removed and which are to be impacted by the dwelling construction, site access, bushfire safety requirements and on-site sewer management.

Tree Assessment

In order to address the proposed tree removal on the site, including for establishment of APZs and stormwater, an Arboricultural Impact Assessment is required. The assessment must be prepared by a qualified arborist (minimum AQF Level 5) and include assessment of all trees (> 3 m in height) on, or where relevant, adjoining the subject site. The report must address the impact of the proposal on health of existing trees, detail any trees unsuitable for retention and provide a Tree Protection Plan that specifies measures required to protect trees to be retained.

Any cavities (tree hollows) identified by the Arborist are to be documented in the report. Retention of existing native trees with medium to long SULE ratings is to be maximised, this is to include consideration of moving the development footprint to allow improved tree retention. All retained trees must include tree protection measures consistent with the Australian Standard AS4970-2009 Protection of Trees on Development Sites.

Development plans must identify trees for removal/retention consistent with the findings of the Arborist Report.

Landscape Plan

A detailed Landscape Plan is required to be submitted with the DA as per the site specific DCP. It must be completed by a suitably qualified Landscape Architect/Designer with input from a qualified Ecologist. An Ecologist is to be engaged to determine suitable species and planting densities. Local provenance stock must be used for all landscaping to help ensure the integrity of the adjoining Coastal Wetland is not affected. The Landscape Plan is to integrate with the Bushfire Assessment and Arborist Report.

Landscaping maintenance and replacement criteria (minimum 3 years) is required to be specified to ensure the establishment/survival of landscaping, replacement planting (where necessary) and weed removal.

TREES

Councils *Greener Places Strategy* provides that if trees are removed from public land, they should be replaced at a rate of two trees for everyone one tree removed. In the context of development applications Council often conditions the provision of replacement trees, including replacement street trees. It is acknowledged that there are some cases where replacement of two trees is not possible on the road reserve due space constraints on footpaths, the location of infrastructure (water/sewer infrastructure, for example) or other matters (such as sight lines required for vehicular safety). Any development application which requires the removal of a public tree must

appropriately justify its removal and replacement. Councils *Greener Places Strategy* is accessed via this link.

Central Coast Street Design Manual

Accessed here: Central Coast Street Design Manual & Landscape Works Specification

Council has recently adopted the Central Coast Street Design Manual and accompanying set of Standard Drawings and Technical Specifications to guide public domain works and streetscape design which was exhibited in early 2023. manual identifies additional DA requirements at various stages of the development process.

TRAFFIC

The applicant seeks vehicular access for passenger vehicles and Buses to the new school via Keefers Glen on the western boundary of the site which is essentially a narrow lane which services 16 residential dwellings.

Council will not support this proposal for the following reasons:

- The proposed special needs school will generate considerably higher passenger vehicular movements than other schools of similar size.
- Residents amenity will be severely affected by traffic and parking generated by the proposal.
- Keefers Glen was not constructed to facilitate traffic loading associated with a traffic generating development.
- The western boundary of the site is fully fenced, partly to prevent parents and students accessing the existing school via Keefers Glen.
- The existing intersections in the vicinity of Keefers Glen will not support the swept path of buses.
- All access to the new school is to be provided via the existing driveway on Gavenlock Road.

URBAN DESIGN

- Council continues to oppose vehicle access and parking from Keefers Glen. This is a narrow residential street with mature street trees that contribute to the green residential character. The application also proposes the addition of a footpath outside the school resulting in the removal of significant street trees.

- The front street setback will be occupied by an approximately 18m deep carpark for 40 cars screened by only a narrow strip of small planting and with only 3 trees within the carpark to provide any screening the continuous length of the building from the street.

- The carpark should contain a minimum of 6 significant trees (min. 10m mature height) to shade the large area of hardstand and break up and disguise the uniform appearance of the building from the street.

- It is noted that a northern landscaped setback of between 1.2 and 2m has been added. This is an improvement but is considered inadequate to for significant landscaping to screen the school and provide privacy to the private open spaces of adjoining houses. As stated in previous comments, a 2m minimum landscaped buffer must be provided along the northern boundary.

- The continuous metal screen gives the Keefers Glen elevation a solid institutional appearance.

- The amended pedestrian entry is an improvement, but further refinement of the western elevation in particular is recommended.

- The application must include a landscape plan including all species, numbers and pot sizes. If approved in its current form, the application should include some mature specimens to provide immediate screening and softening while other plants mature.

WASTE MANAGEMENT

General Comments

Resource and Waste Management Planning (RWMP) must be considered in three stages, each of which requires a distinct RWMP.

Each stage is likely to generate different materials that require a considered approach to ensure they are managed in line with Council's required outcomes.

The three distinct RWMPs are known as:

- Site Preparation (SP-RWMP) – including demolition.
- Construction (C-RWMP)
- Occupancy (O-RWMP)

Key Information – The RWMP submission must address and provide as a minimum at each stage:

- The location, types and amounts or materials and waste that will be generated.

- Travel paths of materials and waste to be transferred within the site.
- Design and details of materials and waste storage and consolidation areas.
- Detail of any onsite reuse of materials.
- Design and details of collection point arrangements (including contractor and material destination).
- Vehicle access path for all collection vehicles

For more information on what is required in the RWMP, please review the Central Coast Council DA Guidelines, Resource and Waste Management Planning document.

CCC WMP Guidelines 2023.pdf (nsw.gov.au)

All RWMP need to be submitted using Councils new format –

CCC Waste DCP - RWMP form 2023.pdf (nsw.gov.au)

Site Prep / Demolition (SP-RWMP):

- Key Info as mentioned above.
- Cover the touchpoints as found in the RWMP Guidelines

Construction (C-RWMP):

- Key Info as mentioned above.
- Cover the touchpoints as found in the RWMP Guidelines

Occupancy (O-RWMP):

- Detailed O-RWMP to cover the information described above and, in the Guidelines,
- O-RWMP to include the expected waste generation rates typical for the proposed development.
- Indicate the capture points or an interim storage points that may be required throughout the site.

- Transfer / travel path from any interim storage point to the bin consolidation area.
- Bin size and service frequency to be included in the O-RWMP.
- Bin consolidation area to be large enough to accommodate the bins commensurate with the bin size required. Bin consolidation area to be fully dimensioned on the plans to show that all bins can be safely stored.
- Identify suitable collection point for the bins to be serviced, clear of overhead obstructions.
- Swept travel path for a heavy rigid vehicle (HRV) to show that the truck can safely access the site, enter in a forward direction and exit in a forward direction. (How does the collection truck exit the site if it's a one-way entry?)
- How does the truck gain access through the gate if it is locked.
- Consideration for the noise associated from collection vehicles accessing the site and servicing the bins.

WATER & SEWER

- Water and sewer are available to the land.
- As a two lot subdivision is proposed, separate water services and sewer connection points are required for each new lots.
- Council existing water main is located along Keefers Glen and can be connected for the proposed new school. It is recommended to obtain a Flow and Pressure statement from Council to assist internal hydraulic design.
- An existing Council sewer main is located at the intersection of Keefers Glen and Brickendon Ave. A sewer main extension from Council sewer main will be required for the proposed development. Council sewer manhole G03 would be the point of connection.
- The proponent is required to submit a S305 application under the Water Management Act and obtain a S307 Certificate prior to issue of the Subdivision/Occupation Certificate.
- Water and Sewer Developer Charges will be applicable for the proposed development.

CONTRIBUTIONS

RECORD OF PRE-DEVELOPMENT ADVICE

Section 7.11 and 7.12 Contribution Plans

- A detailed contributions quote can be obtained from Council's Section 7.11 Contributions Officer. Please note that fees are required to be paid prior to issue of the construction certificate and that contributions will be adjusted to the amount applicable at the time of payment.

- Refer to the link for access to full copies of the Section 7.11 and 7.12 Plans.

Housing and Productivity Contribution (HPC)

- The HPC applies to the whole of the Central Coast Local Government area and to the following types of development:

Region	HPC class of development	Amount	HPC unit
Greater Sydney	Residential subdivision	$12,000	new dwelling lot
	Residential strata subdivision	$10,000	new strata dwelling lot
	High-density residential development	$10,000	new high-density dwelling
	Commercial development	$30	square metre of new GFA
	Industrial development	$15	square metre of new GFA
Central Coast Illawarra-Shoalhaven Lower Hunter	Residential subdivision	$8,000	new dwelling lot
	Residential strata subdivision	$6,000	new strata dwelling lot
	High-density residential development	$6,000	new high-density dwelling
	Manufactured home estate	$6,000	new dwelling site
	Commercial development	$30	square metre of new GFA
	Industrial development	$15	square metre of new GFA

- The HPC came into effect on 1 October 2023 and will apply to development applications and complying development certificates across 43 council areas in the Greater Sydney, Illawarra-Shoalhaven, Lower Hunter and Central Coast regions. The Ministerial Order sets out how the contribution will operate.

- The HPC will be required to be paid prior to issue of a construction certificate/CDC/Subdivision Certificate, depending on the type of work consented to.

FLOODING

The site is affected by flooding according to the Wyong River Floodplain Risk Management Study and Plan 2020. The Eastern portion of the Site is affected by high hazard flooding in a range of flood events including the 1%AEP event and PMF.

It is understood that the actual location of the proposed school is at the Western portion of the site in an area that is not flood affected. The proposed access via Keefers Glen is preferable from a Floodplain Management perspective as Gavenlock Road will be inundated and not trafficable during a flood event.

The proposed school is an educational establishment so would be required to satisfy CCLEP cl. 5.22 Special Flood Considerations. This clause requires that there is safe evacuation from the site in the PMF event.

While there is flood free access immediately away from the site during the PMF, the evacuation road would become cut off by hazardous floodwaters from Mardi Creek at the intersection of Wyong Road. The road would not be trafficable for vehicles or pedestrians. The Applicant would be required to demonstrate how this development satisfies CCLEP cl. 5.22 given that that the evacuation route would be isolated in the PMF event.

ENVIRONMENTAL HEALTH

Acid Sulfate Soils

Works associated with site preparation, dam dewatering and infilling have the potential to present an environmental risk when undertaken on land mapped as Class 4 ASS as they may include works beyond 2 m below the natural ground surface.

As such, investigation is required to determine if acid sulfate soils are actually present and whether they are present in such concentrations as to pose a risk to the environment. A suitably qualified and experienced consultant should be engaged to undertake a Preliminary Acid Sulfate Soils Assessment in accordance with the Acid Sulfate Soils Assessment Guidelines (1998).

Dam Dewatering

If water from dam dewatering is to be directed to stormwater, a Dewatering Management Plan would be required. The objective of the DWMP would be to outline the procedures and methodology for the treatment and discharge of water derived from dewatering activities to prevent water pollution. The plan would be prepared by a suitably qualified and experienced consultant.

Acoustic Assessment

The land to the south and west of the site is zoned R1 General Residential and contains a mix of low and medium density dwellings. The properties, particularly on Brickendon Avenue and Keefers Glen are in very close proximity to the site.

To allow for proper assessment of the impacts of construction and ongoing operation of the school on the surrounding residential receivers, an acoustic report is requested to be prepared by a suitably qualified acoustic consultant that meets the technical eligibility criteria for membership with the Association of Australasian Acoustical Consultants. The report must be prepared in accordance with the NSW EPAs Noise Policy for Industry (2017). This report should include a Noise Management Plan that details noise mitigation measures and recommendations to mitigate noise impacts both during construction and ongoing use.

Soil water management plan

Provide a Soil and Water Management Plan in accordance with Section 2.3 of the 'Blue Book' *(Managing Urban Stormwater: Soils and Construction, Landcom, 2004)*. The plan shall be prepared by a suitably qualified environmental/civil consultant. Section 9.3 of the Blue Book provides guidance on preparing a Soil and Water Management Plan for medium-density development.

SUMMARY OF ADVICE

The following comments comprise a summary of the key issues identified within this advice, with identified recommendations, if appropriate:

- In accordance with Clause 2.6 (1) of SEPP (Planning Systems) 2021, the proposed new educational establishment on this site which has a value greater than $20 million is deemed to be state significant development (SSD).

- The proposed development is deemed to be integrated development (special fire protection purposes) under Clause 100B of the *Rural Fires Act 1997* and requires concurrence from the NSW RFS. All bushfire Asset Protection Zones (APZs) are to be contained within the R2 portion of the site as per the required bushfire report which is to be prepared by a suitably qualified bushfire consultant.

  The proposed development also involves works within 40 metres of a watercourse and will require a controlled activity approval under the *Water Management Act 2000*. Therefore, the proposed development will be integrated development under Section 91 of the *Water Management Act 2000*.

- The proposed development is to comply with the relevant provisions of the *SEPP (Transport and Infrastructure) 2021, SEPP (Resilience and Hazards) 2021 and SEPP (Biodiversity and Conservation) 2021* that are relevant to this proposal.

- The proposed development is to comply with the provisions of the *Central Coast Local Environmental Plan 2022* and the *Central Coast Development Control Plan 2022*.

- The proposed vehicular access to the development from Keefers Glen is **not supported by Council**, as the intended traffic will have a detrimental impact on the traffic movements and car parking through the existing residential area and impact on the amenity of the existing residents. The proposed vehicular access to the intended development should utilise the existing vehicular access to the site from Gavenlock Road.

- A Traffic and Parking Impact Assessment is required to demonstrate that the proposed development has sufficient car parking or on any vehicle's movements in the vicinity of the site.

- An acoustic report prepared by a suitably qualified acoustic engineer that the development will not have a detrimental impact on the adjoining residential areas.

- The site is subject to flooding and ecological constraints as raised by Council's Flooding Engineer and Ecologist within this report.

- A flood assessment report is required to demonstrate that the proposed development will not be impacted by flooding.

- A preliminary site investigation report is required to demonstrate that the site is not contaminated and is suitable for the school development.

- A waste management plan is required for the demolition, construction and ongoing waste management of the development.

- The comments provided by Council's Ecologist, Waste Officer, Flooding Engineer, Development Engineer, Environmental Health Officer and Urban Design officer should be taken into consideration as part of the intended development.

Should you wish to discuss any of the above, please contact Ross Edwards, on email ross.edwards@centralcoast.nsw.gov.au

DA LODGEMENT REQUIREMENTS

Recommended/ Required Documentation

The following documentation is to be submitted with any Development Application:

- Architectural plans, including site plan, floor plans, elevations, sections and long sections. Provide dimensions, loading areas, and waste storage areas on floor plans.

- Survey Plan.
- Environmental Impact Statement.
- Quantity Surveyors Report.
- Flood Assessment Report.
- Traffic and Parking Impact Assessment.
- Acoustic Report.
- Arborist Report containing a tree removal and retention plan.
- Landscape Plan.
- Biodiversity Development Assessment Report (BDAR)
- Vegetation Management Plan and Wildlife Management Plan, pending recommendations from the submitted BDAR and or Controlled Activity Approval, should one be required.
- Dam Dewatering Plan.
- Preliminary Civil Engineering Plans.
- Erosion and Sedimentation Control Plan.
- A Bushfire Assessment Report in accordance with *Planning for Bushfire Protection 2019*.
- Landscape Plan.
- Servicing plan.
- Cut and fill plan.
- Operational Management Plan (including hours of operation, lighting, noise control, waste management, servicing, carparking and any other relevant information).
- Access Report.
- Waste Management Plan using Council's template.
- Preliminary acid sulfate soils management plan (ASSMP).
- Soil and Water Management Plan.

RECORD OF PRE-DEVELOPMENT ADVICE

The *Environmental Planning and Assessment Regulation 2021* (Regulation) requires certain applications for development to be in an approved form. The approved form is defined in Schedule 7 of that Regulation as a form approved by the Planning Secretary and published on the NSW Planning Portal. This document lists the mandatory documents and drawings that are part of the approved form.

Planning circular – PS 22-004 also advises councils, applicants and practitioners of updated requirements for development applications, complying development certificate applications and State significant development applications made under the *Environmental Planning and Assessment Act 1979*.

You may also wish to review Councils Guide for Applicants on Supporting Document Requirements, accessed here: Supporting Document Guide

Development Application Forms

When submitting your development application to Council via the NSW Planning Portal, you will be required to submit supporting documents with your application. Some of these will be forms provided by Council for you to fill in, including:

- Part B – Application Detail and Owner(s) Consent Form

ePlanning Tools

The Planning Enquiry tool within Central Coast Council's ePlanning Portal allows you to view the following information related to your property: land zone; bushfire status; flooding status; maximum building height; maximum floor space ratio; and minimum subdivision lot size. In addition, this tool can provide the Gosford LEP and DCP planning controls relevant to your proposed development: Online maps | Central Coast Council (nsw.gov.au)

NSW Department of Planning and Environment "Your Guide to the DA Process"

This website, Your guide to the DA process | Planning (nsw.gov.au) explains the development assessment and construction approval process to help you in preparing and lodging assessment ready development applications (DAs) as well as explaining the next steps to get them building.

Fee Quote

Our Customer Service Staff will be able to provide you a fee quote for Development Application Fees and Construction Certificate Fees on 02 4306 7900 or email at ask@centralcoast.nsw.gov.au

Disclaimer

RECORD OF PRE-DEVELOPMENT ADVICE

The information provided verbally and/or within the text of any document by Central Coast Council is for the purpose of assisting you with understanding the planning controls relating to your land and/or proposed development and the application process that may be applicable. It is recommended that anyone contemplating the carrying out of development or the purchasing of land in the Central Coast Local Government Area (LGA) obtain their own planning advice from a suitably qualified professional such as a town planner or private solicitor specialising in land use and/or planning law. Please note that Council is not able to recommend the name or contact details of such professionals.

Ross Edwards
Principal Development Planner
DEVELOPMENT ASSESSMENT

Antonia Stuart
Section Manager
DEVELOPMENT ASSESSMENT

Date: 13 August 2024

APPENDIX 6

FLOOD INFORMATION CERTIFICATE

Flood Information Certificate

Property Address:	84 Gavenlock Rd, MARDI
Lot /DP:	9/DP3368
Date Prepared:	30 April 2024
Source of information:	Wyong River Floodplain Risk Management Study and Plan, 2020

This Flood Certificate provides advice furnished in good faith by the council relating to the likelihood of the land identified above being flooded and to the nature or extent of any such flooding ("flood risk") .

Flood level and flood planning advice is provided in the tables below and as maps in the Appendix. This advice regarding flood risk has been derived from the flood study listed above. Should you have any enquiries concerning this certificate, please do not hesitate to contact Andrew Dewar on 02 4306 7900 during the hours of 8.00am to 4.15pm Monday to Friday

Flood Level Information Table

Flood Event	Minimum Level (m AHD)	Maximum Level (m AHD)
PMF	6.27	6.49
1% AEP	4.24	4.25
5% AEP	3.05	3.72

Planning Information Table

Flood Control Lot	☒
Minimum Habitable Floor Level	4.75m AHD
Complying Development: Flood Exclusionary Categories	
(a) Flood Storage Area	☒
(b) Floodway Area	☐
(c) Flow Path	☐
(d) High Hazard Area (H3, H4, H5, H6 Hazard Categorisation)	☒
(e) High Risk Area	☐

Central Coast Council
P 1300 463 954 I **E** ask@centralcoast.nsw.gov.au

Flood Information Certificate

Minimum Habitable Floor Level in the Planning Information Table above is also known as the Flood Planning Level. It is derived from the maximum 1% AEP Flood Level plus 0.5m freeboard and an allowance for sea level rise if applicable. For large lots the maximum 1% AEP flood level may vary across the lot; as such the Minimum Habitable Floor Level would vary at different locations on the lot, which may result in a lower Minimum Habitable Floor Level than the one quoted in the Planning Information Table. Note that Minimum Habitable Floor Levels are based on a flood size that has a 1% chance each year of either being reached or exceeded. Larger floods still have a small chance of occurring. For this reason, Council recommends that property owners consider the merits of choosing a floor level above the minimum floor level if practical to do so.

Flood Mapping related to this address is included in the Appendix. On the Environmental Layers you can choose to view 1% AEP (1 in 100y) flood extents, as well as Flood Precincts, which are referred to in the Development Control Plan.
https://maps.centralcoast.nsw.gov.au/public/

Development Controls set appropriate floor levels, construction materials, pedestrian and vehicular access, car parking and impacts on surrounding property for a proposed development; either complying development (fast tracked - see below) or a DA. Council's development controls vary depending on the location:

- Former Gosford: LEP 2014 Clauses 5.21 & 7.3, DCP 2013 Chapter 6.7
- Former Wyong: LEP 2013 Clauses 5.21 & 7.3, DCP 2013 Chapter 3.3

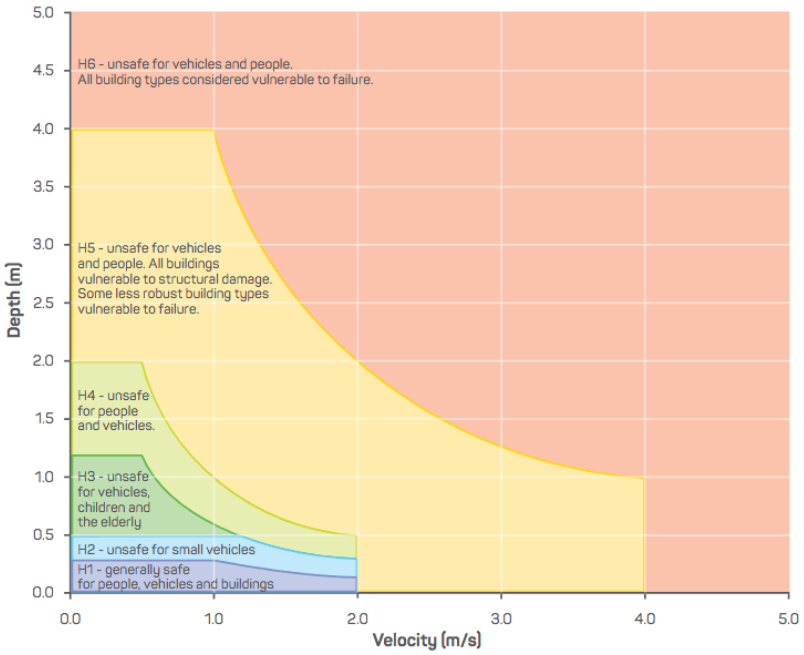
https://www.centralcoast.nsw.gov.au/plan-and-build/planning-controls-and-guidelines

Complying Development is a fast-track approval process for straightforward residential, commercial and industrial development (e.g. Granny Flats). From 1 July 2021, all Complying Development Certificate (CDC) applications must be lodged through the online NSW Planning Portal. If the application meets specific criteria it can be determined by a registered certifier. Under Clause 3A.38 of the Codes SEPP 2008 Development must not be carried out on any part of a *flood control lot* that is considered to be in one of the following exclusionary categories: (a) flood storage area, (b) floodway area, (c) flow path, (d) high hazard area, (e) high risk area. Complying Development may be allowable at this address if none of the five flood exclusionary categories in the Planning Information Table above are marked "Yes".
https://www.planning.nsw.gov.au/Assess-and-Regulate/Development-Assessment/Planning-Approval-Pathways/Complying-development

Flood Hazard: Flooding has the potential to cause loss: loss of life, injury or economic loss. The degree of hazard varies with the severity of flooding and is affected by flood behaviour (extent, depth, velocity, isolation, rate of rise of floodwaters, duration), topography and emergency management.

Council classifies flood hazard using thresholds related to the stability of people as they walk or drive through flood waters, or shelter in a building during a flood. This method classifies hazard on a spectrum of H1 to H6 as described by the hazard vulnerability curves below. For further information refer to: Flood Hazard: Guideline 7.3, Australian Institute for Disaster Resilience 2017 https://knowledge.aidr.org.au/media/3518/adr-guideline-7-3.pdf

Flood Information Certificate



Source – Australian Institute for Disaster Resilience 2017. Hydraulic Hazard: refer also to Australian Rainfall and Runoff Section 7.2.7 General Flood Hazard Curves (Figure 6.7.9) http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/

Disclaimers

a. This certificate is based on Council's relevant flood study, which covers a large area and utilises *airborne laser scanning* ground level data. Flood depths as shown on the maps at specific locations may not accurately account for localised changes in ground topography; the accuracy of flood depth information at a specific location may be improved by taking the flood level and subtracting the accurate ground level at a particular location, which could be established by a Registered Surveyor.

b. Without limiting s.733 of the *Local Government Act* 1993, Council expressly disclaims all and any liability and responsibility in respect of loss, damage or injury to person or property arising from anything done or omitted to be done by any person in reliance, whether wholly or in part, upon any part of this information. Any person having regard to the information contained in this document is encouraged to seek, at their discretion, all other sources of information on the subject matter as they consider appropriate, which may include local knowledge and/or professional advice.

c. Council does not, and cannot, warrant that it will, in its capacity as a consent authority under the *Environmental Planning and Assessment Act 1979*, grant consent to a DA that seeks to erect or use dwellings or other structures on the above property that conform with the levels set out in the above information. Council assesses DAs based on merit, which must consider various development controls as set out in the LEP and DCP. For any development proposal on a *Flood Control Lot* Council recommends the applicant to engage the services of a professional engineer who specialises in Flood Risk Management.

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Flood Information Certificate

Glossary

AEP	*Annual Exceedance Probability*: The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage. For example, the 1% AEP flood has a 1% probability of occurring in any given year. This flood is sometimes referred to as 1 in 100, 100yr ARI or Q100
AHD	*Australian Height Datum* is the reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.
Airborne Laser Scanning	A ground level measurement system in which a laser is emitted from an instrument in an aircraft and directed to the ground in a scanning pattern
DA	Development Application
DCP	Development Control Plan
Flood Control Lot	A land parcel that is subject to flood related development controls
Flood Hazard	Flooding which has the potential to cause loss: loss of life, injury or economic loss. The degree of hazard varies with the severity of flooding and is affected by flood behaviour (extent, depth, velocity, isolation, rate of rise of floodwaters, duration), topography and emergency management.
Flood Storage Area	Areas that are important for the temporary storage of floodwaters during the passage of flood.
Floodway Area	Those areas where a significant volume of water flows during floods.
Flow Path	Those areas where a flow path is identified in the relevant flood study, generally associated with velocities greater than 1 metre per second in the 1% AEP flood.
Freeboard	A factor of safety used in relation to the setting of floor levels. The typical freeboard set by the NSW Government is 0.5m, unless Council can demonstrate a different freeboard can apply as defined in an adopted Floodplain Risk Management Plan.
Ground Levels	Highest and lowest ground levels on the property, predominately based on ground level information databases created by *Airborne Laser Scanning*. A Registered Surveyor can confirm exact ground levels.
High Hazard Area	Those areas where flooding has the potential to be unsafe or cause damage. Council considers those areas that are Hazard Category H3 or above in a 1% AEP flood to be high hazard. Refer to Section on Flood Hazard below.
High Risk Area	Those areas of high flood risk as identified in a flood study or Floodplain Risk Management Plan.
LEP	Local Environment Plan
PMF	The *Probable Maximum Flood* is an extreme flood deemed to be the largest flood that could conceivably occur at a specific location. It is generally not physically or economically possible to provide complete protection against this flood event but should be considered for emergency response. The PMF defines the extent of flood prone land (i.e. the floodplain).

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Flood Information Certificate

PMF Flood Extents

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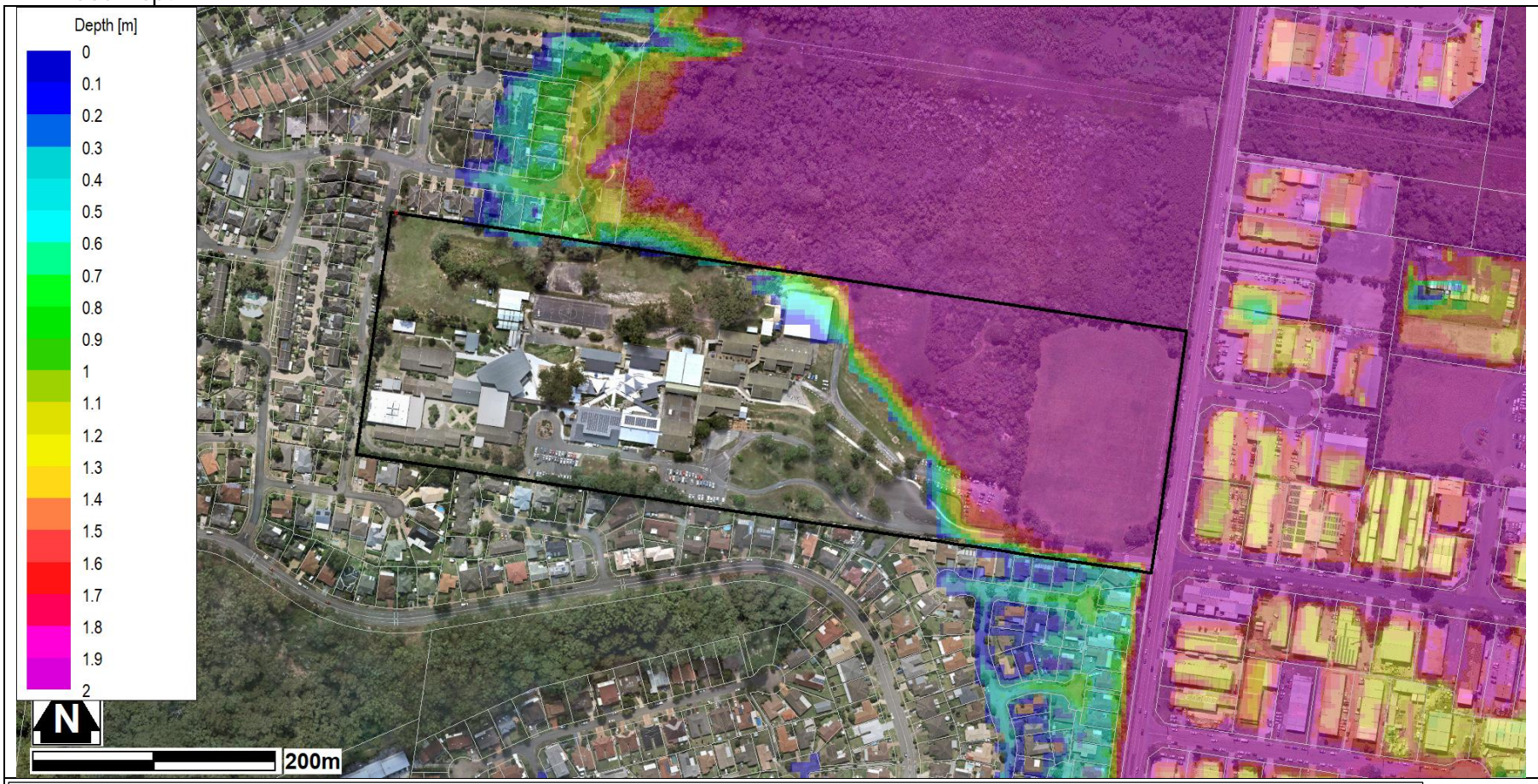
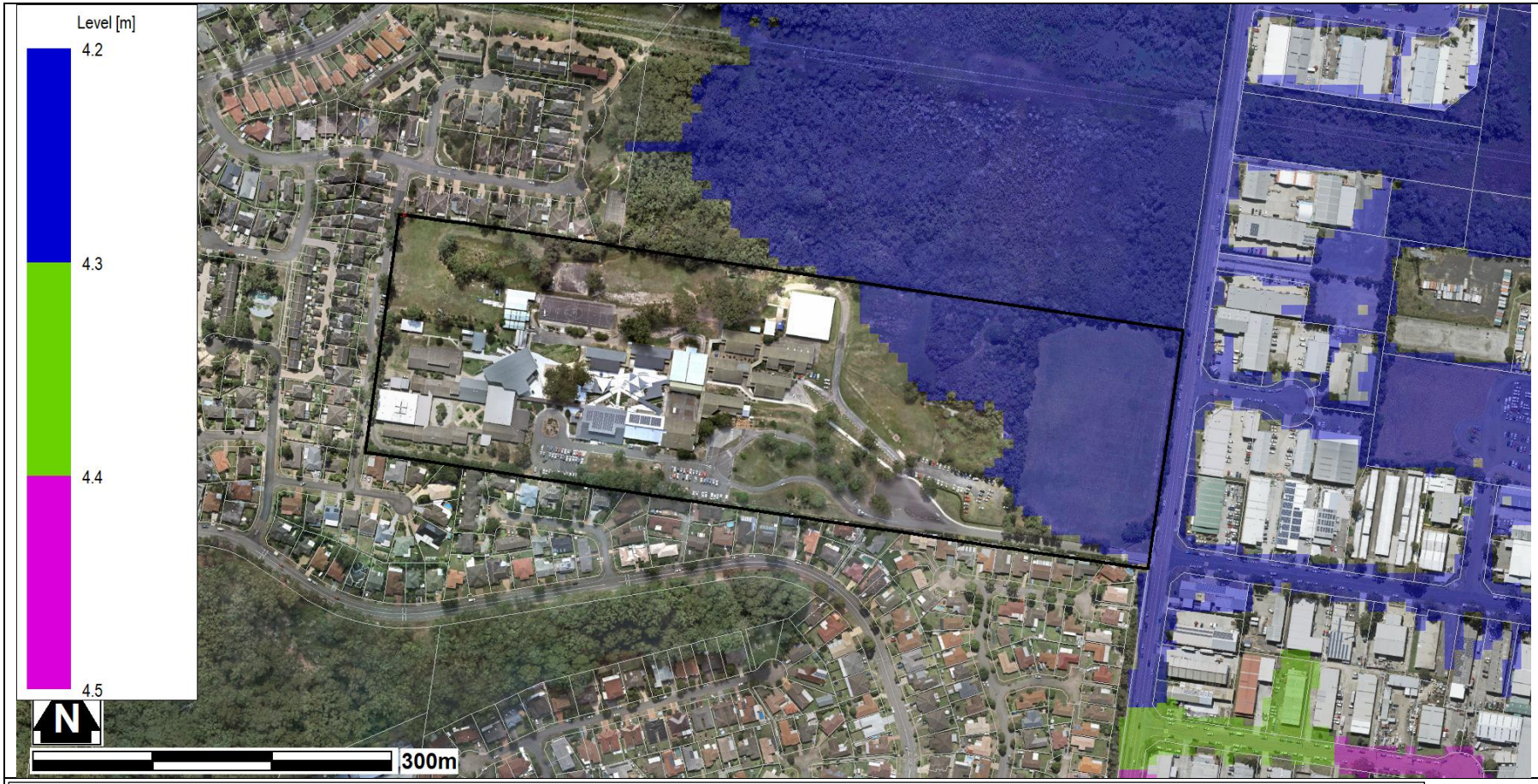
Flood Information Certificate

PMF Flood Depth



Flood Information Certificate

1% AEP Flood Extents



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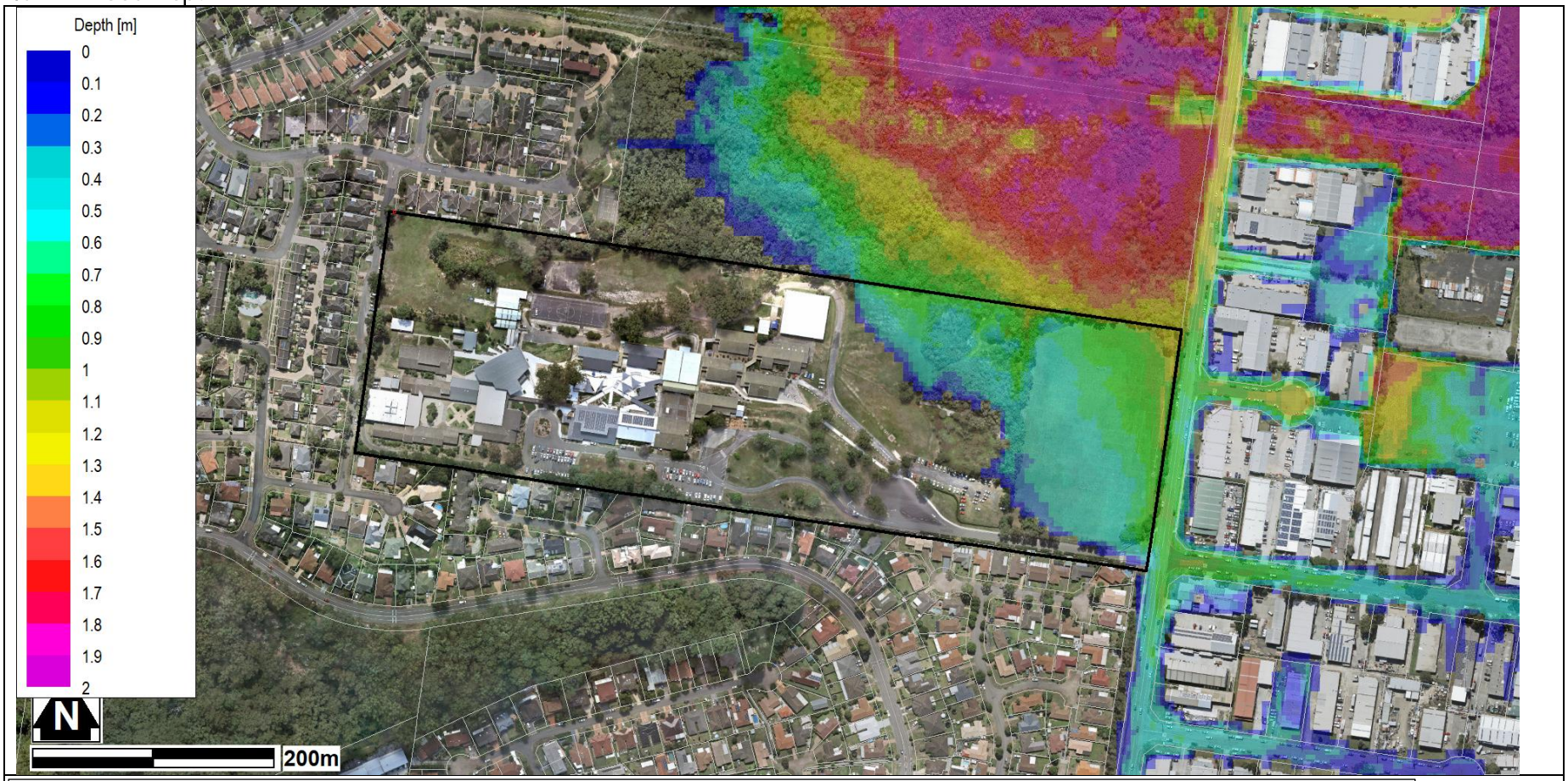
Flood Information Certificate

1% AEP Flood Depth



Flood Information Certificate

5% AEP Flood Extents

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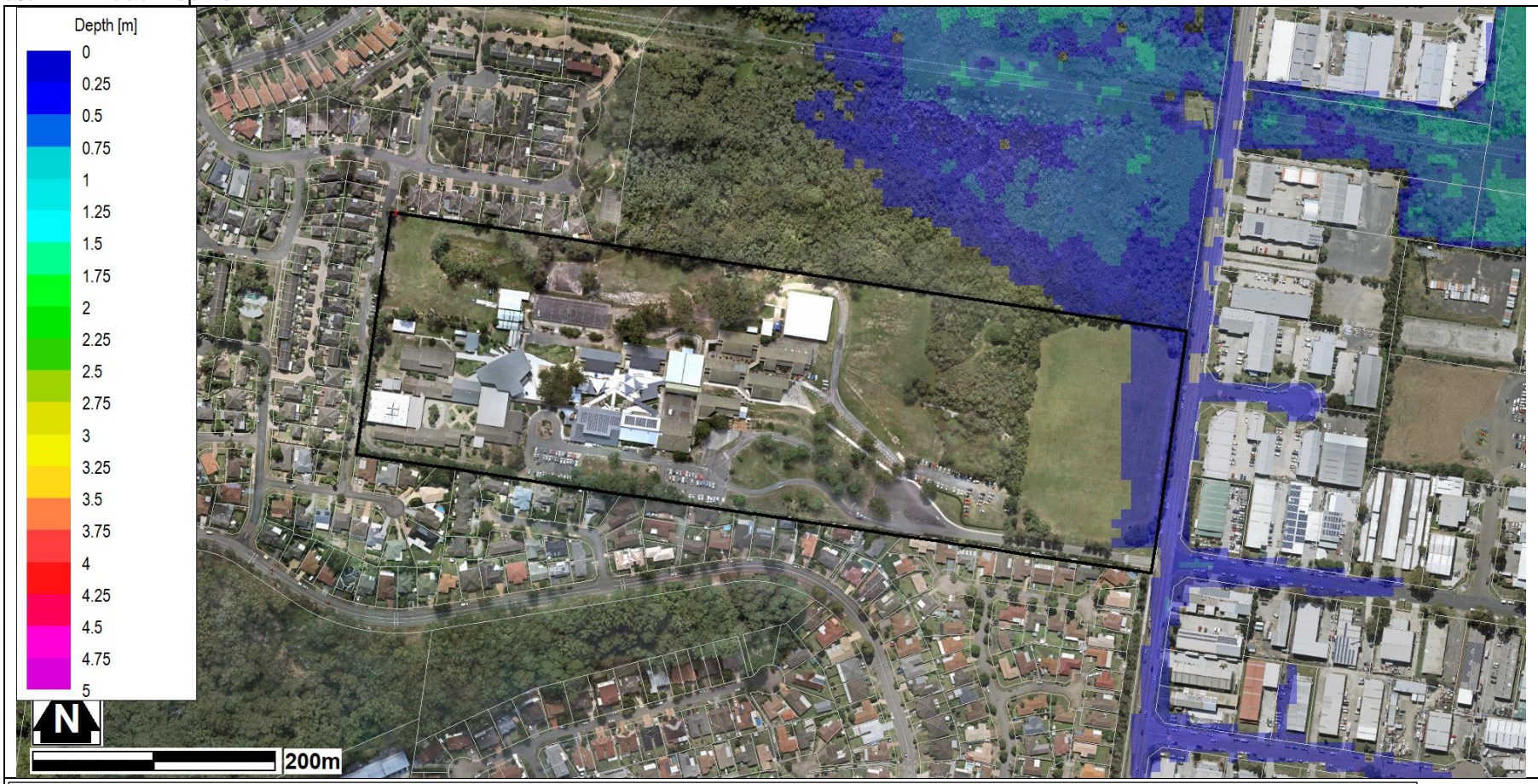
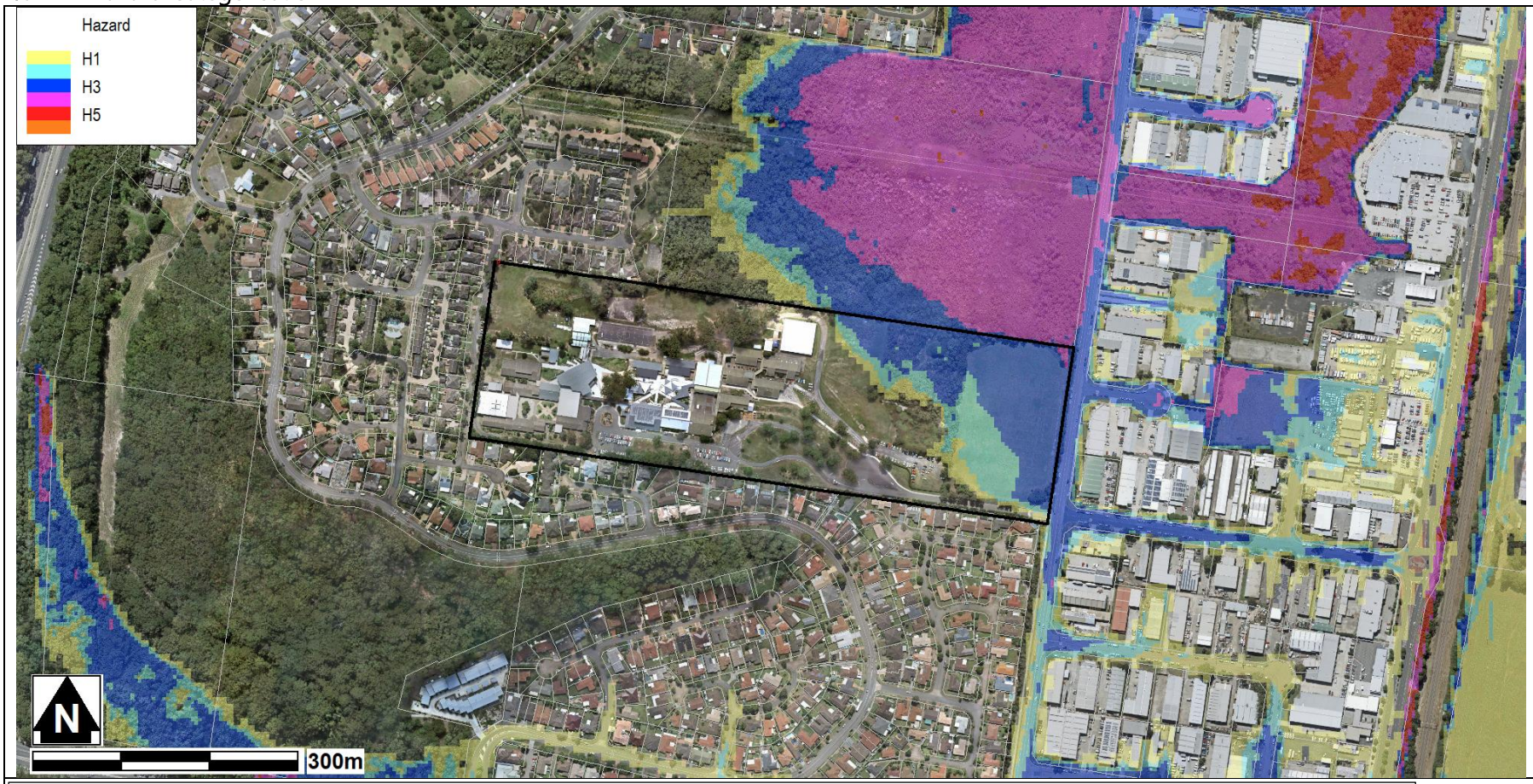
Flood Information Certificate

5% AEP Flood Depths



Flood Information Certificate

1% AEP Hazard Categorisation



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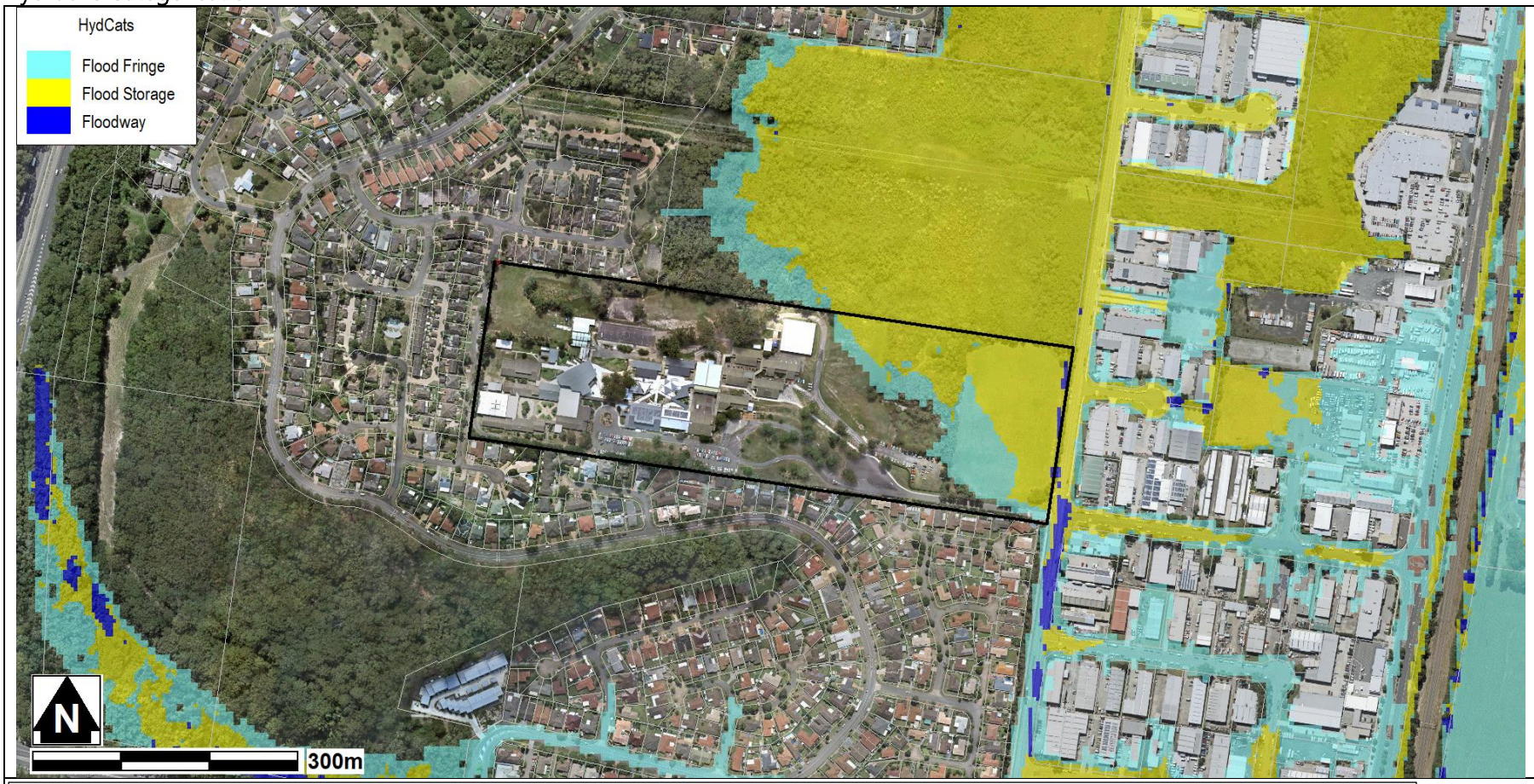
Flood Information Certificate

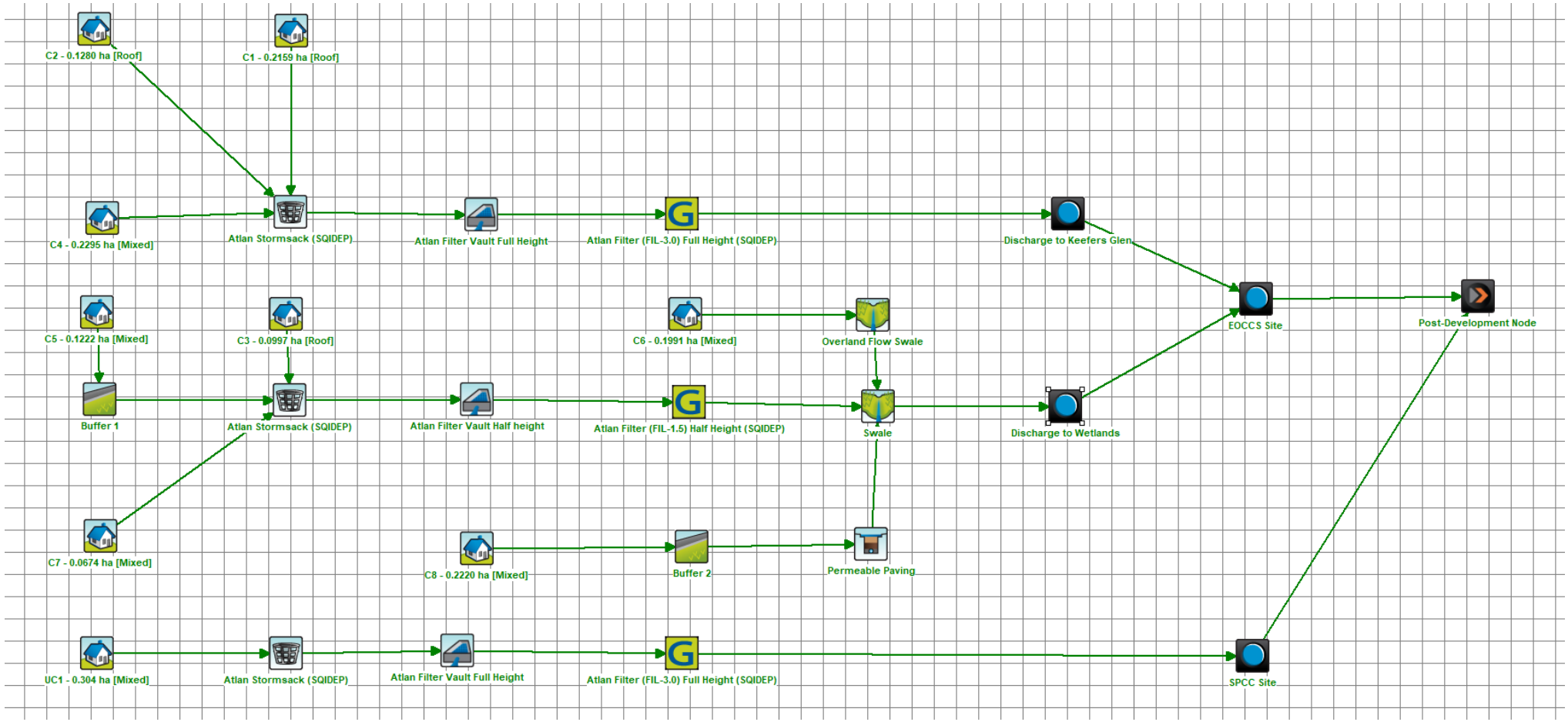
Hydraulic Categorisation



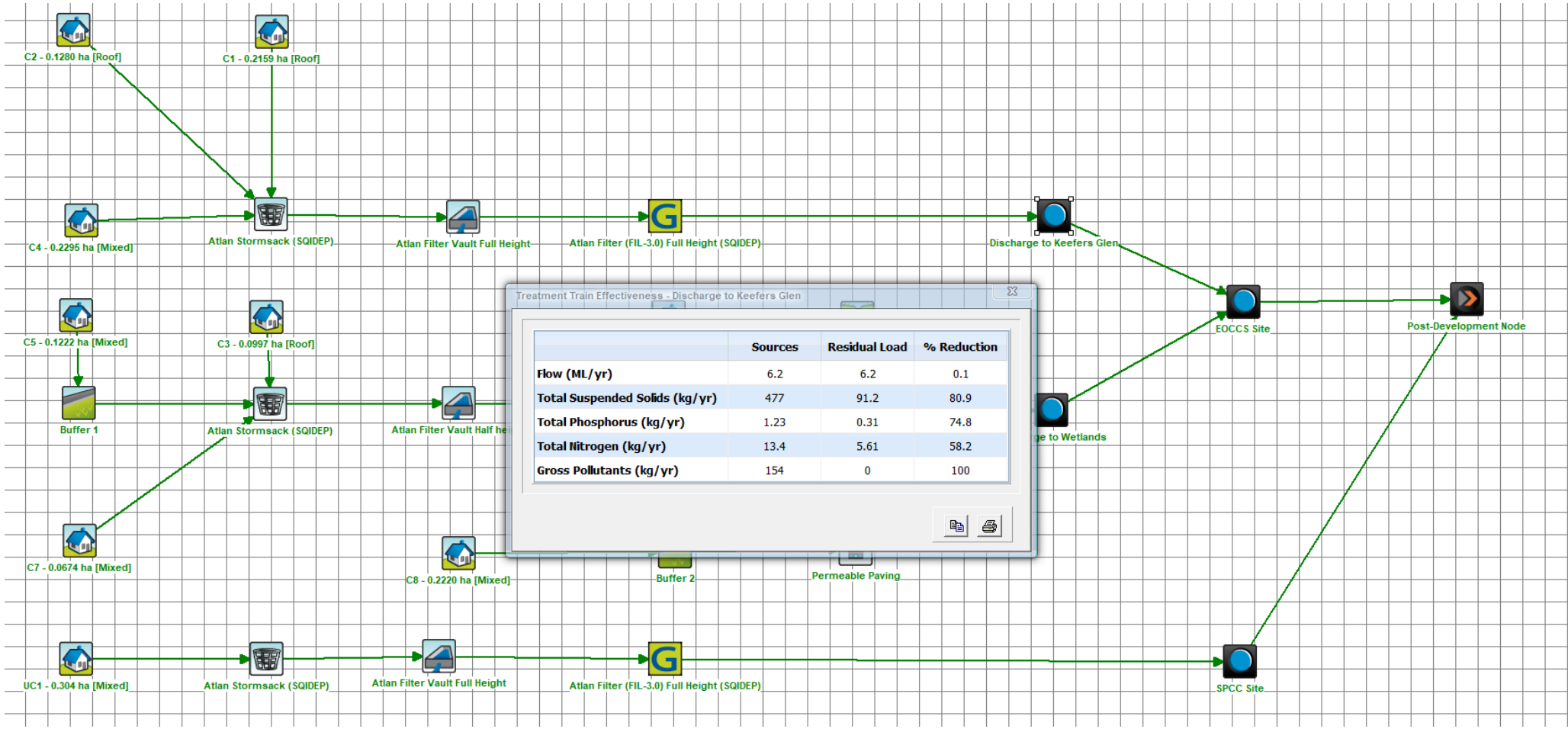
APPENDIX 7

MUSIC RESULTS

MUSIC Model - Arrangement



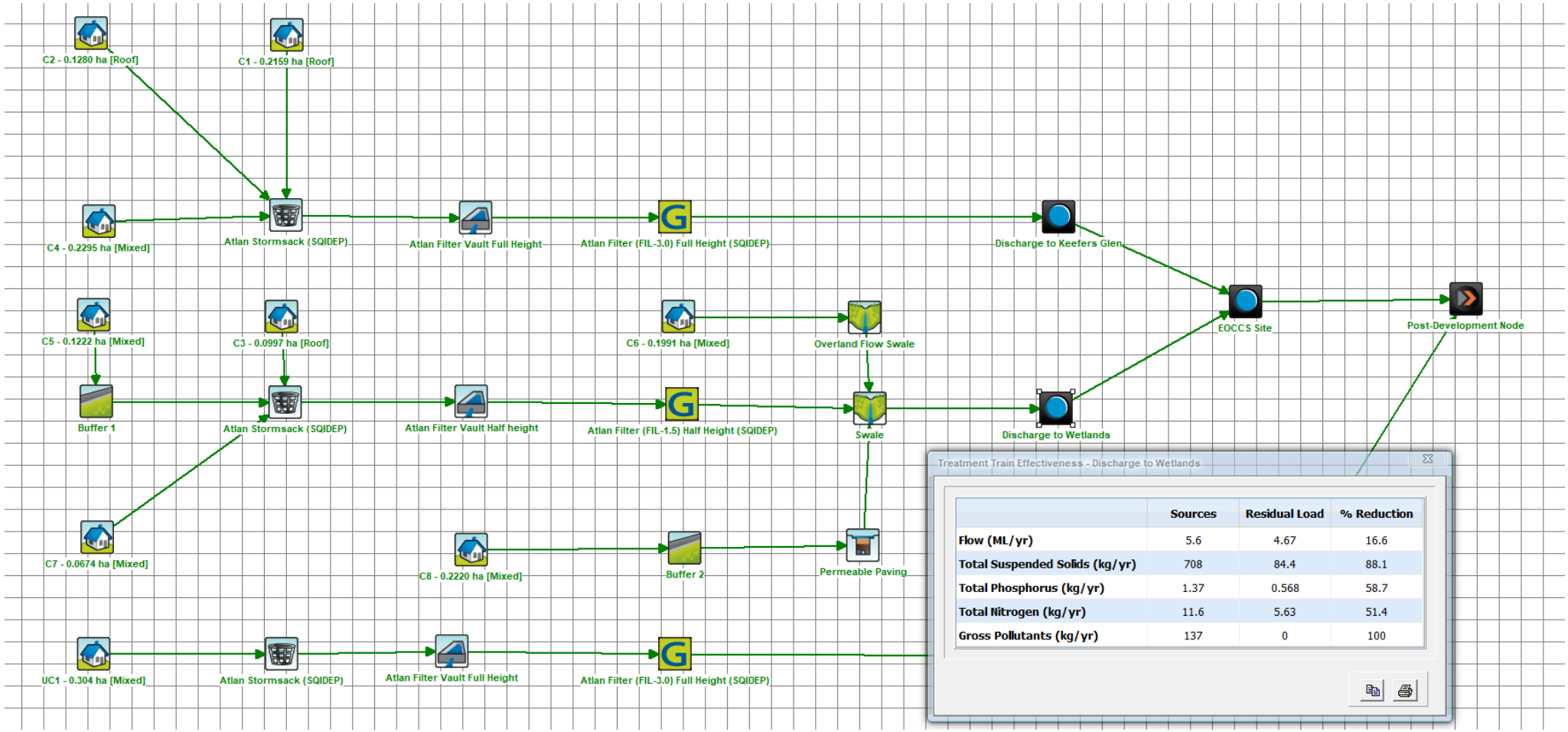
MUSIC Model - Discharge to Keefers Glen



Treatment Train Effectiveness - Discharge to Keefers Glen

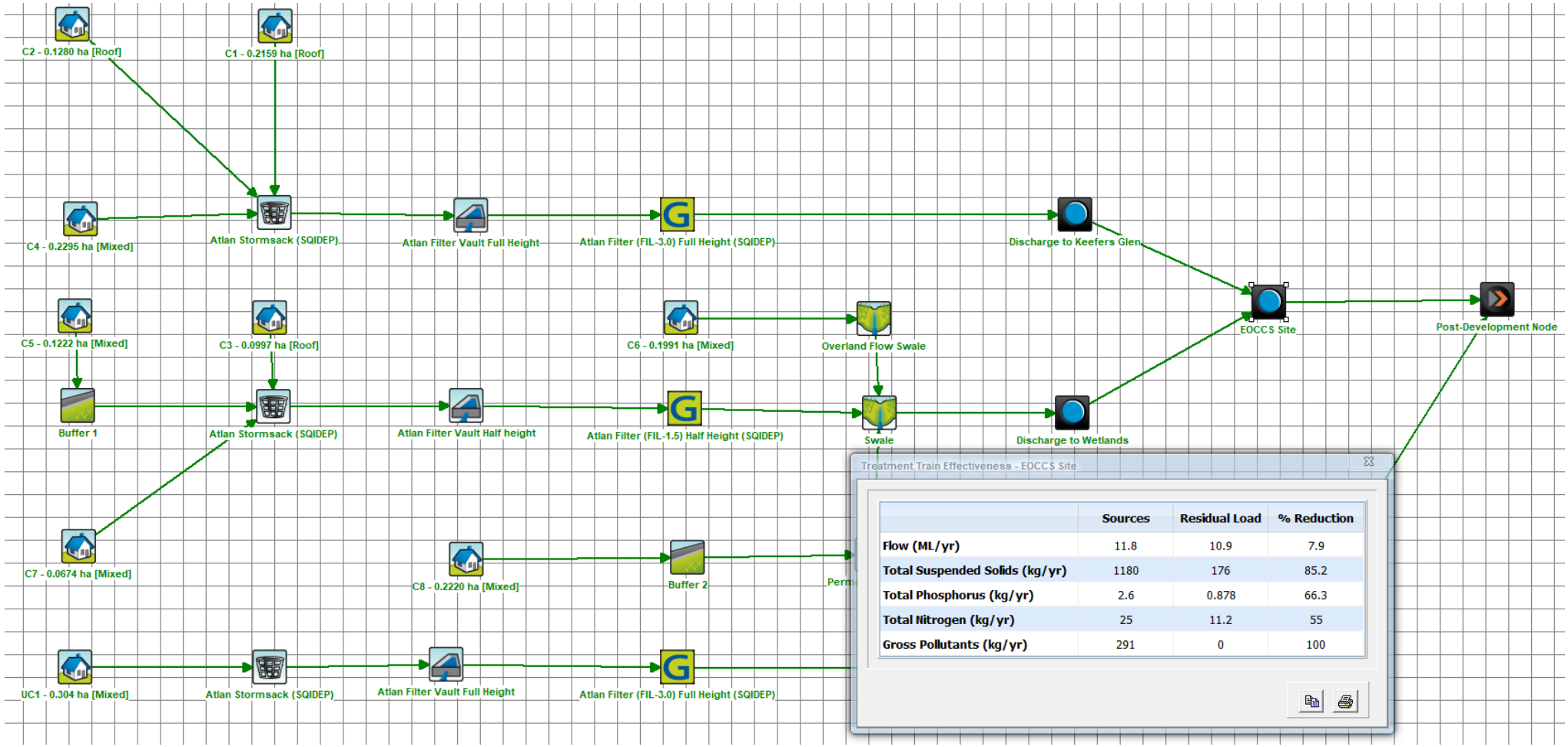
	Sources	Residual Load	% Reduction
Flow (ML/yr)	6.2	6.2	0.1
Total Suspended Solids (kg/yr)	477	91.2	80.9
Total Phosphorus (kg/yr)	1.23	0.31	74.8
Total Nitrogen (kg/yr)	13.4	5.61	58.2
Gross Pollutants (kg/yr)	154	0	100

MUSIC Model - Discharge to Wetlands



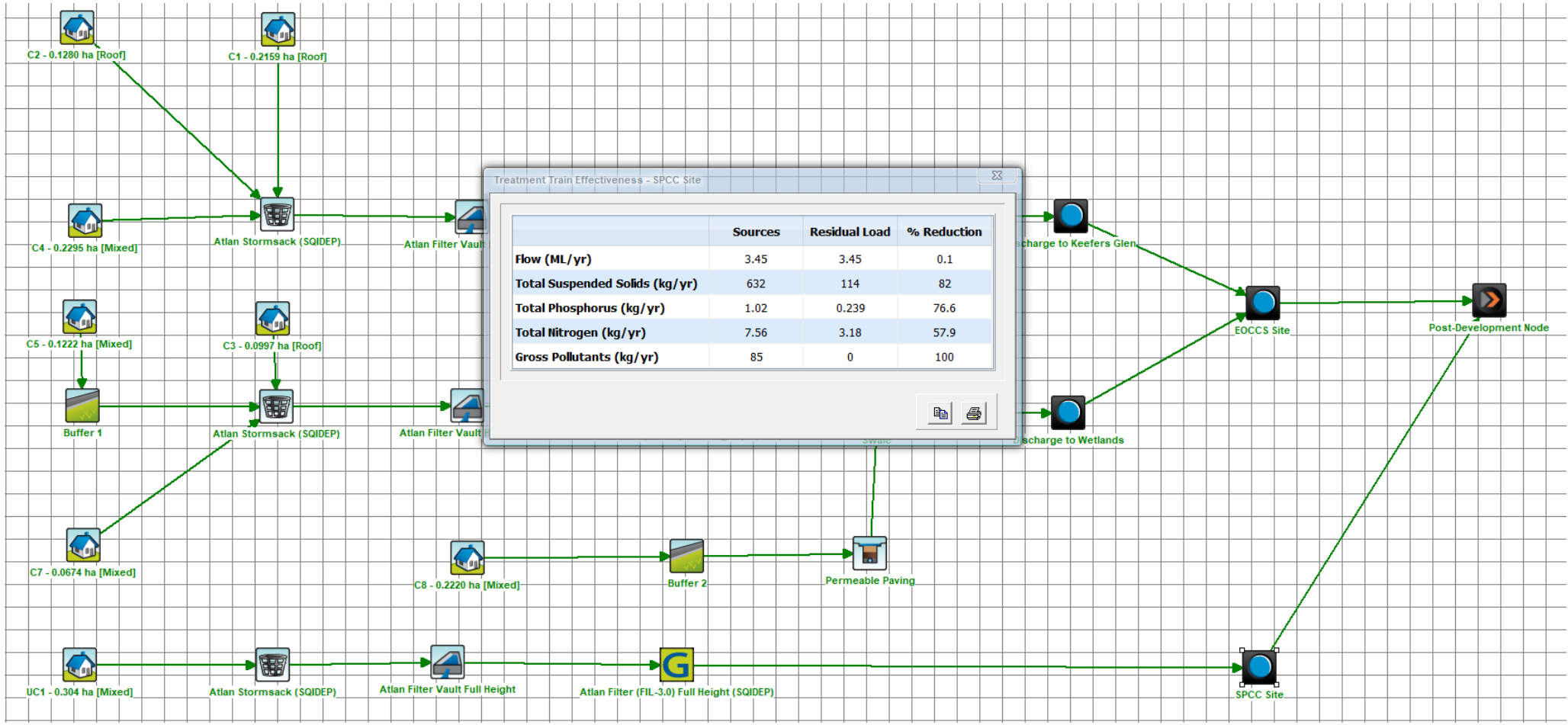
	Sources	Residual Load	% Reduction
Flow (ML/yr)	5.6	4.67	16.6
Total Suspended Solids (kg/yr)	708	84.4	88.1
Total Phosphorus (kg/yr)	1.37	0.568	58.7
Total Nitrogen (kg/yr)	11.6	5.63	51.4
Gross Pollutants (kg/yr)	137	0	100

MUSIC Model - EOCCS Site



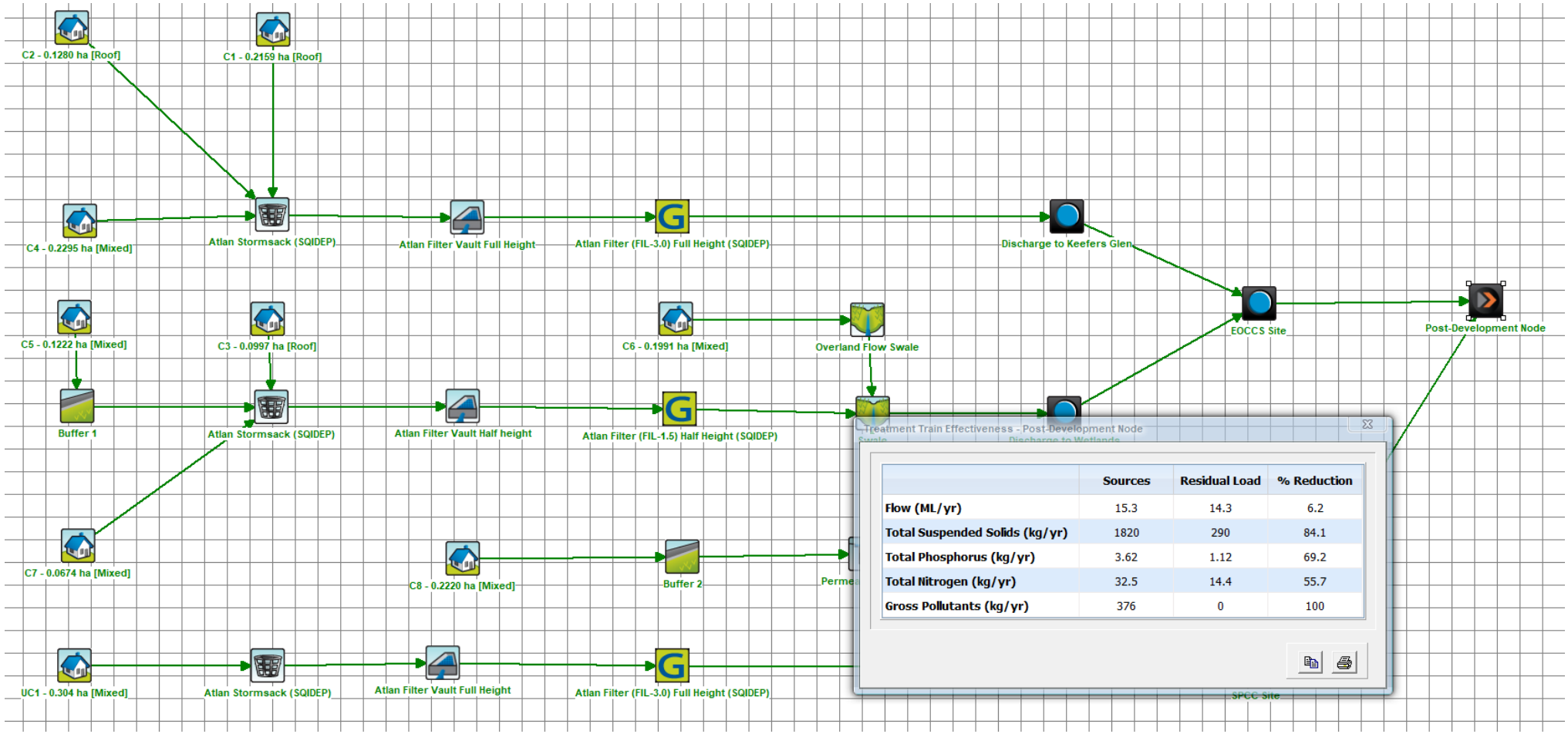
	Sources	Residual Load	% Reduction
Flow (ML/yr)	11.8	10.9	7.9
Total Suspended Solids (kg/yr)	1180	176	85.2
Total Phosphorus (kg/yr)	2.6	0.878	66.3
Total Nitrogen (kg/yr)	25	11.2	55
Gross Pollutants (kg/yr)	291	0	100

MUSIC Model - SPCC Site



	Sources	Residual Load	% Reduction
Flow (ML/yr)	3.45	3.45	0.1
Total Suspended Solids (kg/yr)	632	114	82
Total Phosphorus (kg/yr)	1.02	0.239	76.6
Total Nitrogen (kg/yr)	7.56	3.18	57.9
Gross Pollutants (kg/yr)	85	0	100

MUSIC Model - Post-Development



	Sources	Residual Load	% Reduction
Flow (ML/yr)	15.3	14.3	6.2
Total Suspended Solids (kg/yr)	1820	290	84.1
Total Phosphorus (kg/yr)	3.62	1.12	69.2
Total Nitrogen (kg/yr)	32.5	14.4	55.7
Gross Pollutants (kg/yr)	376	0	100

APPENDIX 8

MUSIC-LINK REPORT

MUSIC-*link* Report

Project Details		Company Details	
Project:	6588	**Company:**	JTA
Report Export Date:	13/03/2025	**Contact:**	James McCallum
Catchment Name:	MUSIC Model - Proposed Development + Treatment	**Address:**	314 Military Road, Neutral Bay
Catchment Area:	1.588ha	**Phone:**	0402 015 890
Impervious Area*:	73.85%	**Email:**	jmccallum@jamestaylorassociates.com.au
Rainfall Station:	66062 SYDNEY		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1974 - 31/12/1993 11:54:00 PM		
Mean Annual Rainfall:	1297mm		
Evapotranspiration:	1261mm		
MUSIC Version:	6.4.0		
MUSIC-link data Version:	6.40		
Study Area:	Lowland		
Scenario:	Central Coast Development		

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

Treatment Train Effectiveness

Node: Post-Development Node	Reduction
Flow	6.16%
TSS	84.1%
TP	69.2%
TN	55.7%
GP	100%

Treatment Nodes

Node Type	Number
Swale Node	2
Detention Basin Node	3
Media Filtration Node	1
Buffer Node	2
GPT Node	3
Generic Node	3

Source Nodes

Node Type	Number
Urban Source Node	9

Comments

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Buffer	Buffer 1	Proportion of upstream impervious area treated	None	None	0.5
Buffer	Buffer 2	Proportion of upstream impervious area treated	None	None	0.5
GPT	Atlan Stormsack (SQIDEP)	Hi-flow bypass rate (cum/sec)	None	99	0.039
GPT	Atlan Stormsack (SQIDEP)	Hi-flow bypass rate (cum/sec)	None	99	0.039
GPT	Atlan Stormsack (SQIDEP)	Hi-flow bypass rate (cum/sec)	None	99	0.039
Post	Post-Development Node	% Load Reduction	None	None	6.16
Post	Post-Development Node	GP % Load Reduction	90	None	100
Post	Post-Development Node	TN % Load Reduction	45	None	55.7
Post	Post-Development Node	TP % Load Reduction	45	None	69.2
Post	Post-Development Node	TSS % Load Reduction	80	None	84.1
Swale	Overland Flow Swale	Bed slope	0.02	0.05	0.02
Swale	Swale	Bed slope	0.02	0.05	0.02
Urban	C1 - 0.2159 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.32
Urban	C1 - 0.2159 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.82
Urban	C1 - 0.2159 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.1
Urban	C1 - 0.2159 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	C1 - 0.2159 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.89	-0.89	-0.89
Urban	C1 - 0.2159 ha	Stormflow Total Suspended Solids Mean (log mg/L)	1.3	1.3	1.3
Urban	C2 - 0.1280 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.32
Urban	C2 - 0.1280 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.82
Urban	C2 - 0.1280 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.1
Urban	C2 - 0.1280 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	C2 - 0.1280 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.89	-0.89	-0.89
Urban	C2 - 0.1280 ha	Stormflow Total Suspended Solids Mean (log mg/L)	1.3	1.3	1.3
Urban	C3 - 0.0997 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.32
Urban	C3 - 0.0997 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.82
Urban	C3 - 0.0997 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.1
Urban	C3 - 0.0997 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	C3 - 0.0997 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.89	-0.89	-0.89
Urban	C3 - 0.0997 ha	Stormflow Total Suspended Solids Mean (log mg/L)	1.3	1.3	1.3
Urban	C4 - 0.2295 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	C4 - 0.2295 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	C4 - 0.2295 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	C4 - 0.2295 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	C4 - 0.2295 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	C4 - 0.2295 ha	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15
Urban	C5 - 0.1222 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	C5 - 0.1222 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	C5 - 0.1222 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	C5 - 0.1222 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3

Only certain parameters are reported when they pass validation

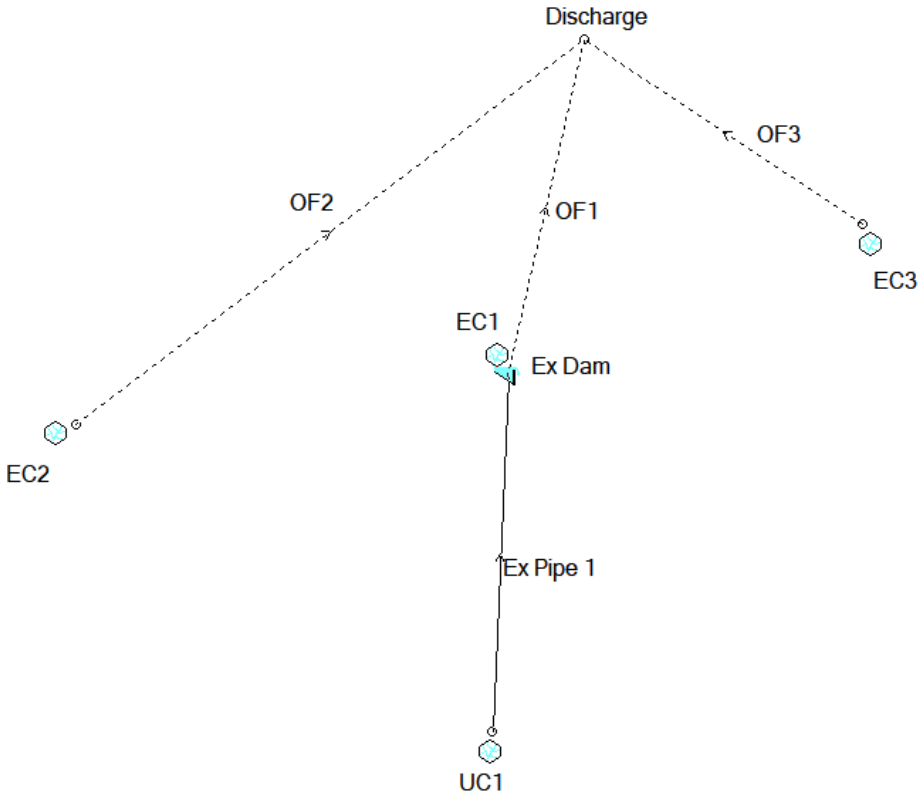
Node Type	Node Name	Parameter	Min	Max	Actual
Urban	C5 - 0.1222 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	C5 - 0.1222 ha	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15
Urban	C6 - 0.1991 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	C6 - 0.1991 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	C6 - 0.1991 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	C6 - 0.1991 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	C6 - 0.1991 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	C6 - 0.1991 ha	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15
Urban	C7 - 0.0674 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	C7 - 0.0674 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	C7 - 0.0674 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	C7 - 0.0674 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	C7 - 0.0674 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	C7 - 0.0674 ha	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15
Urban	C8 - 0.2220 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	C8 - 0.2220 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	C8 - 0.2220 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	C8 - 0.2220 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	C8 - 0.2220 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	C8 - 0.2220 ha	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15
Urban	UC1 - 0.304 ha	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	UC1 - 0.304 ha	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	UC1 - 0.304 ha	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	UC1 - 0.304 ha	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	UC1 - 0.304 ha	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	UC1 - 0.304 ha	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15

Only certain parameters are reported when they pass validation

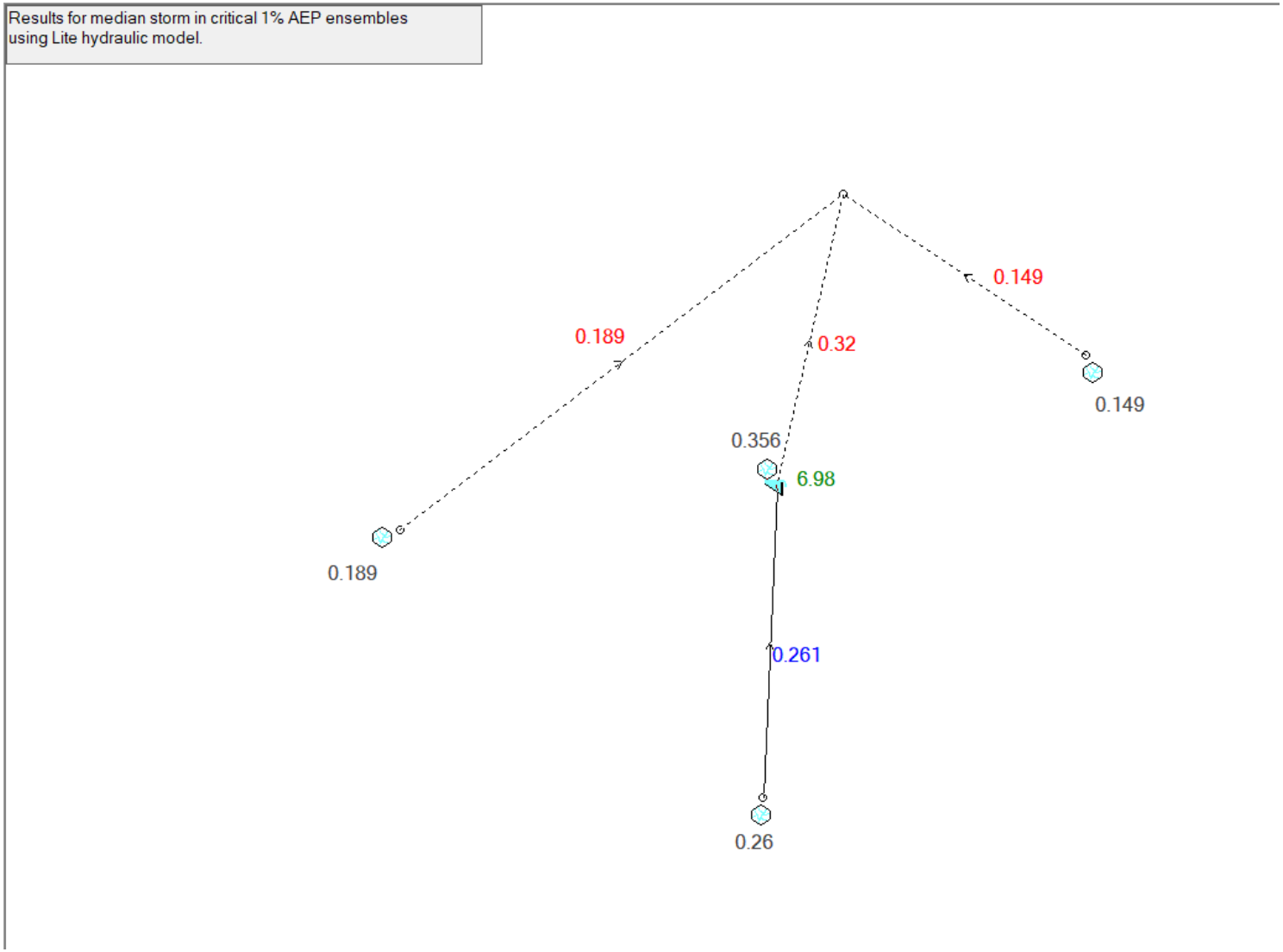
APPENDIX 9

DRAINS MODEL 1 RESULTS

DRAINS Model 1 - Arrangement

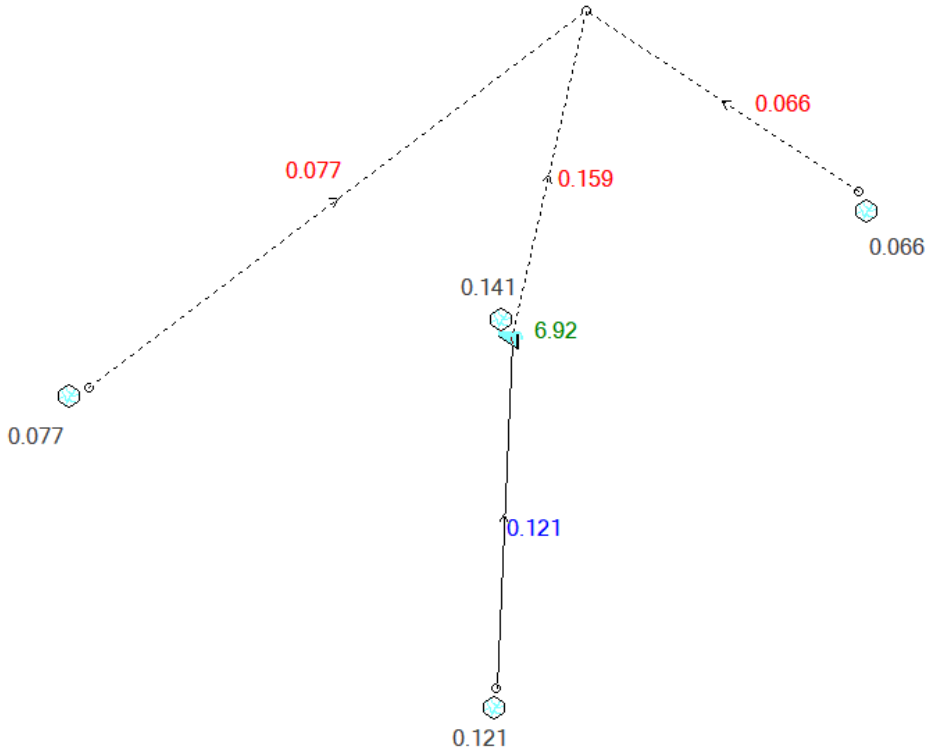


DRAINS Model 1 - Results for 1% AEP Event



DRAINS Model 1 - Results for 20% AEP Event

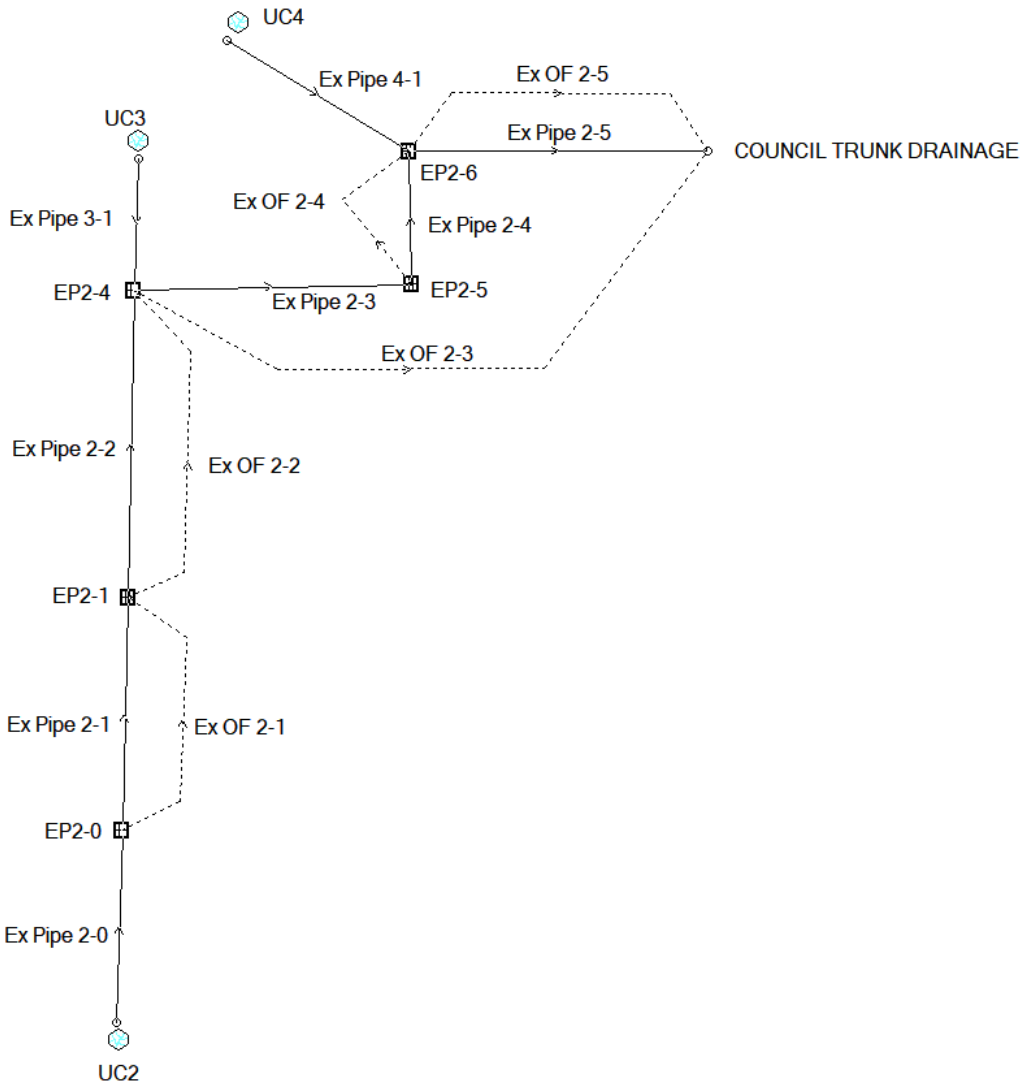
Results for median storm in critical 20% AEP ensembles using Lite hydraulic model.



APPENDIX 10

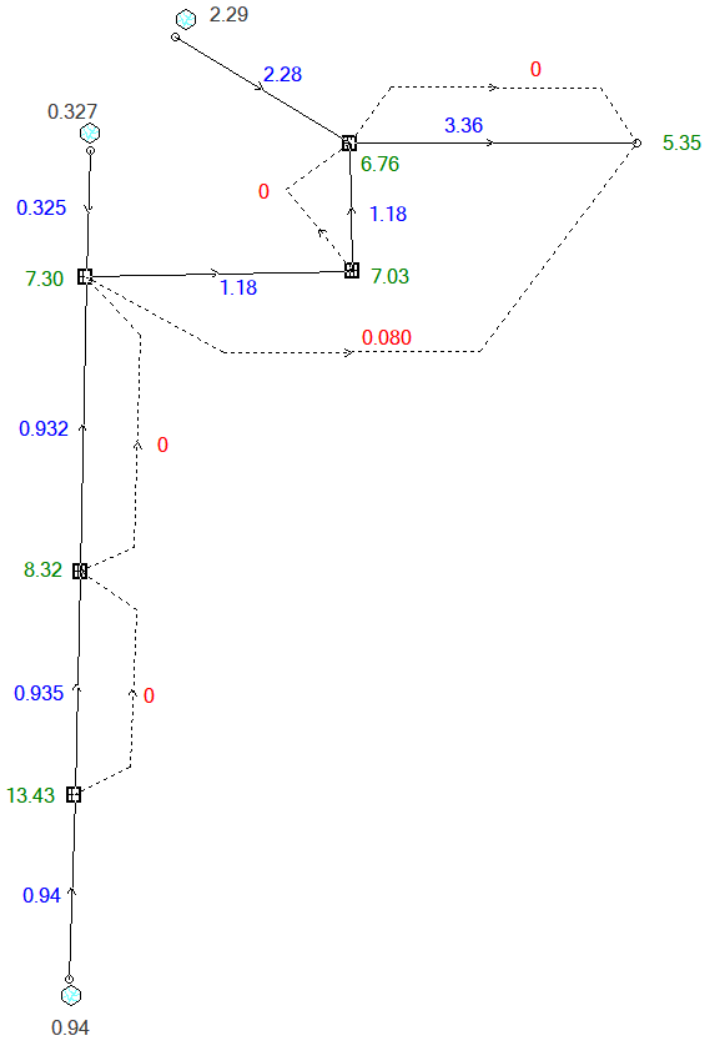
DRAINS MODEL 2 RESULTS

DRAINS Model 2 - Arrangement



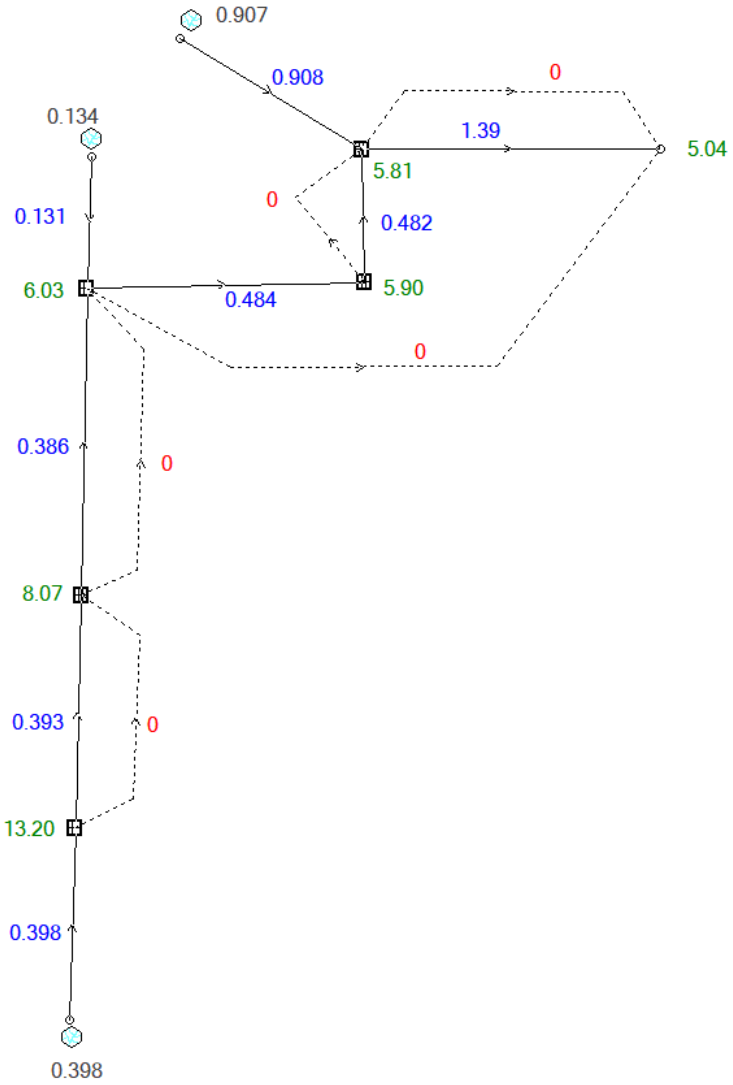
DRAINS Model 2 - Results for 1% AEP Event

Results for median storm in critical 1% AEP ensembles using Lite hydraulic model.



DRAINS Model 2 - Results for 20% AEP Event

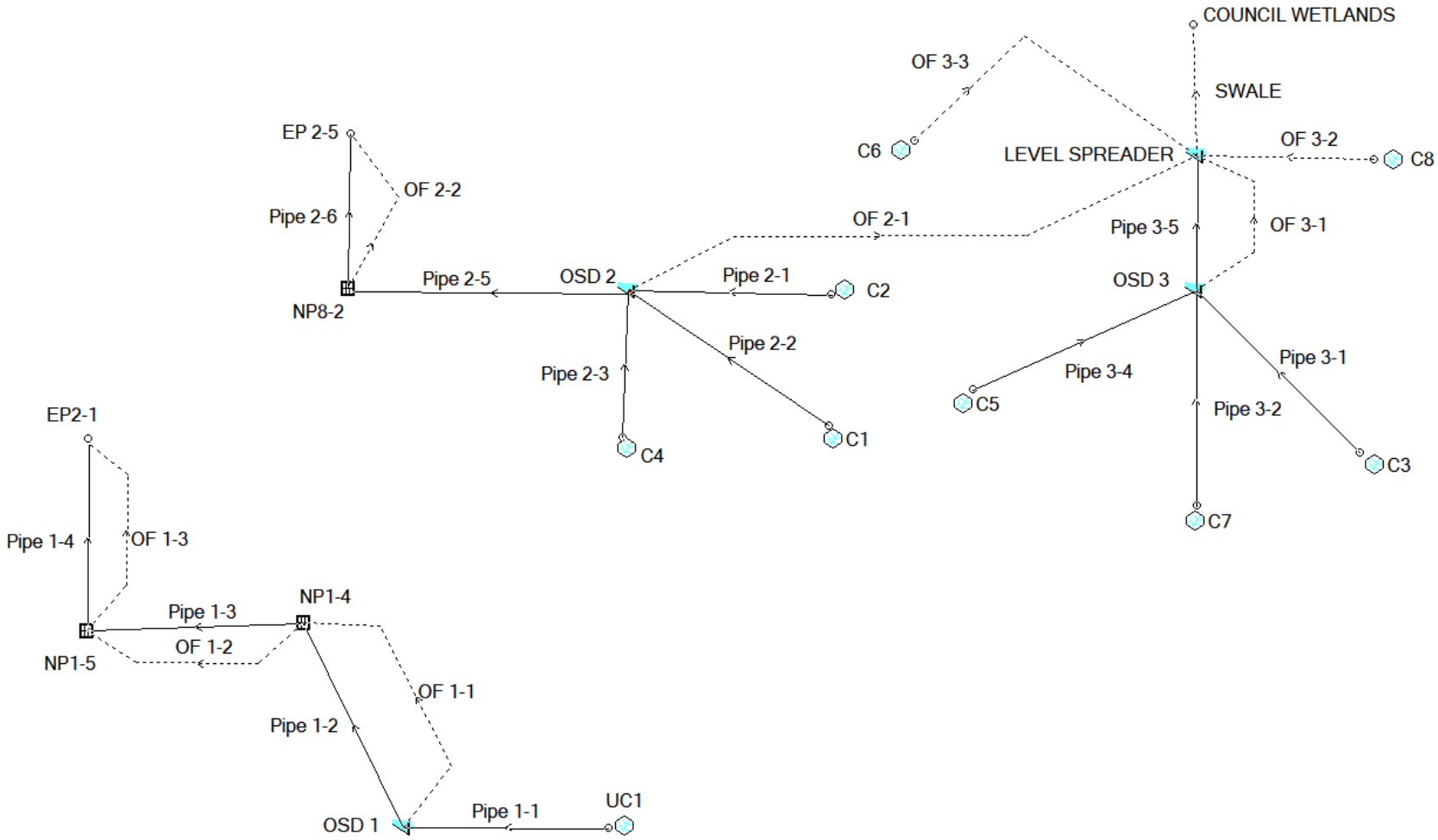
Results for median storm in critical 20% AEP ensembles using Lite hydraulic model.



APPENDIX 11

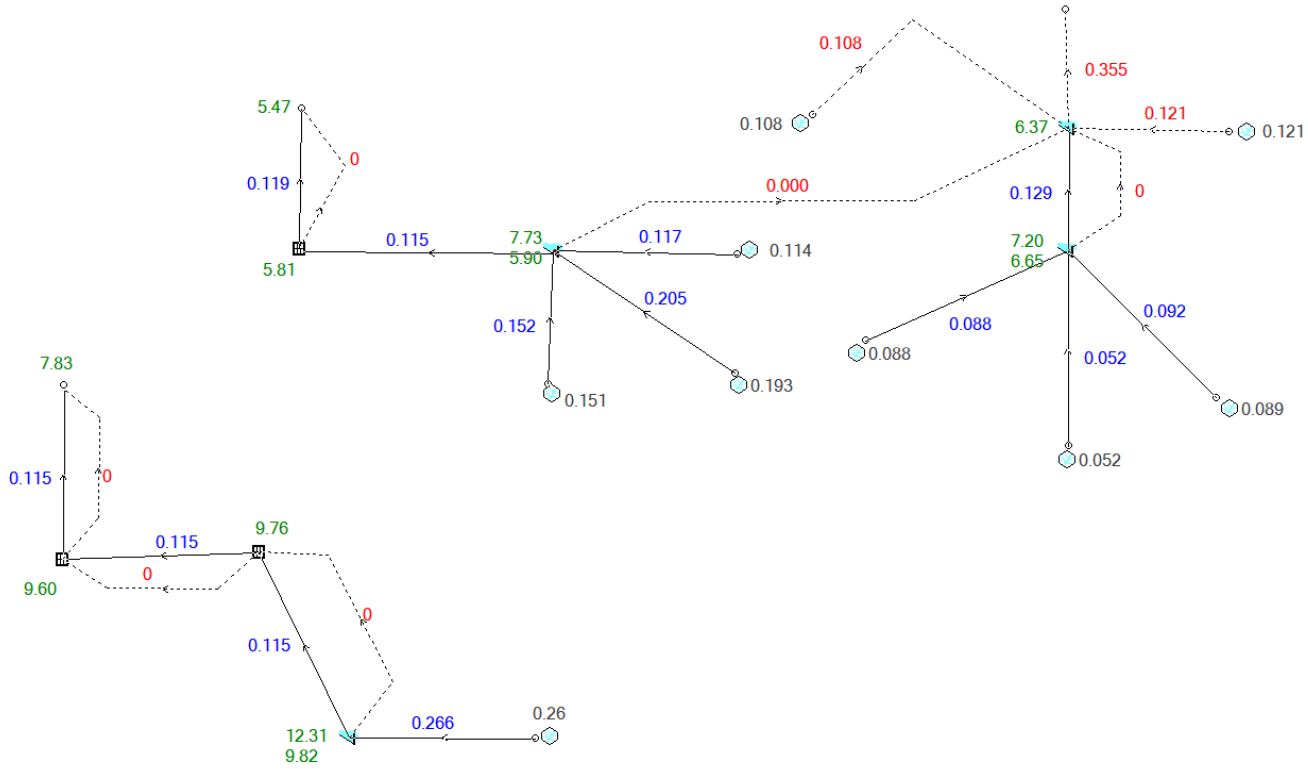
DRAINS MODEL 3 RESULTS

DRAINS Model 3 - Arrangement



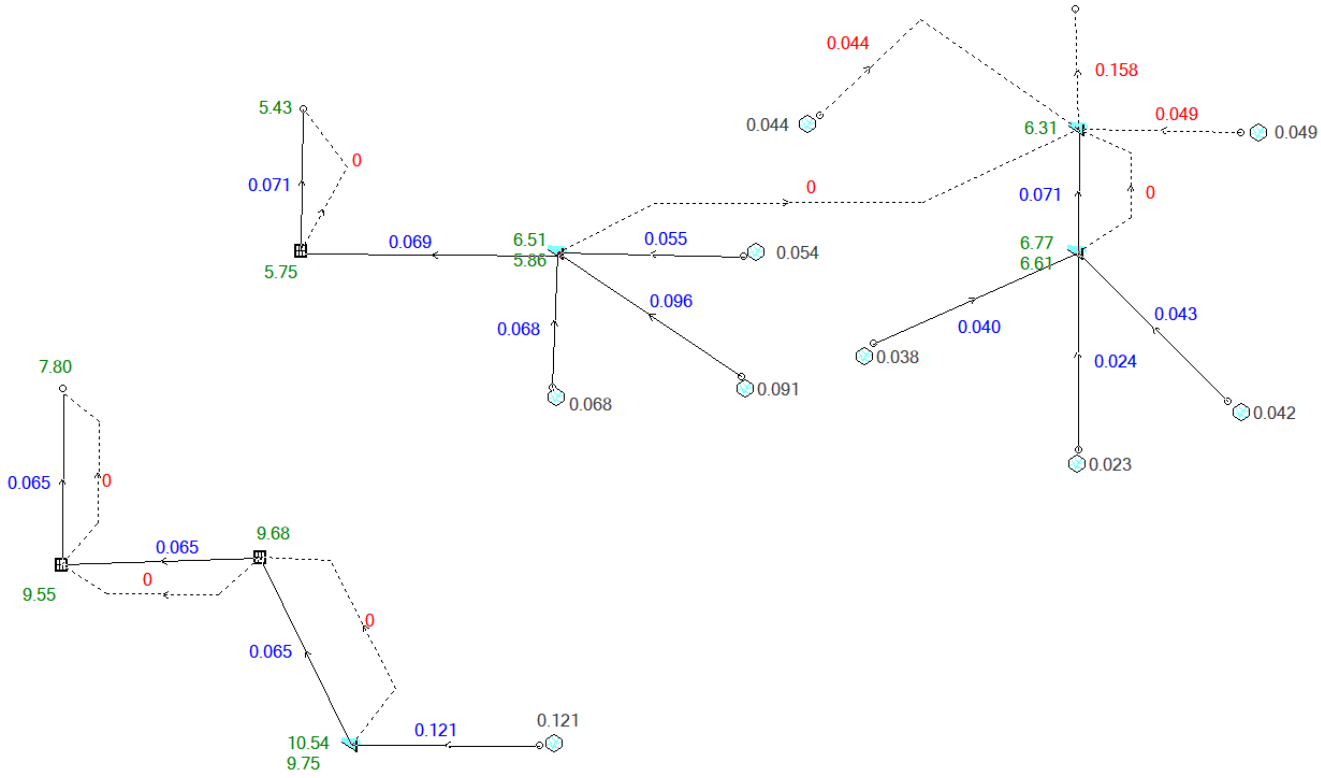
DRAINS Model 3 - Results for 1% AEP Event

Results for median storm in critical 1% AEP ensembles using Lite hydraulic model.



DRAINS Model 3 - Results for 20% AEP Event

Results for median storm in critical 20% AEP ensembles using Lite hydraulic model.



APPENDIX 12

DRAINS MODEL 1 DATA

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
N36654	Node					11.89		0		884.028	-470.833		73724		No					
N36655	Node					8.54		0		1548.611	-302.083		73725		No					
Discharge	Node					5.7		0		1313.68	-145.84		73734		No					
N36660	Node					12.91		0		1235.92	-730.48		73746		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id
Ex Dam	1	0		None						1249	-430	No			73719
	5.82	1910													
	6.82	1910													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	EIA %	Perv Area %	RIA %	EIA Time (min)	Perv Time (min)	RIA Time (min)	EIA Length (m)	Perv Length (m)	RIA Length (m)	EIA Slope(%) %	Perv Slope %	RIA Slope %	EIA Rough	Perv Rough	RIA Rough	Rainfall Multiplier
EC2	N36654	0.3921	0	100	0	3	15	0										1
EC3	N36655	0.202	78	22	0	1.5	8.5	0										1
UC1	N36660	0.304	95	5	0	2	12	0										1
EC1	Ex Dam	0.6897	7	93	0	2	13	0										1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
Ex Pipe 1	N36660	Ex Dam	65	10.51	6.32	6.45	Concrete, r	300	300	0.013	New	1	N36660	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Stor (m)	SafeDepth Minor Stor (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id
OF2	N36654	Discharge	1.3				Swale with	0.15	0.3	0.6	1	0	73728
OF3	N36655	Discharge	0.3				Swale with	0.15	0.3	0.6	1	0	73727
OF1	Ex Dam	Discharge	10	6.82	3	1.7	Swale with	0.3	0.15	0.6	3	0	73813

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
Ex Pipe 1	Concrete, r	300	0.45	-5.65	Unsafe

This model has no pipes with non-return valves

DRAINS results for the 1% AEP Event prepared from Version 2024.11.9092.23482

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
N36660	11.64		0.309				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
EC2	0.189	0	0.189	3	0	15	1% AEP, 25 min burst, Storm 3
EC3	0.149	0.141	0.008	1.5	0	8.5	1% AEP, 5 min burst, Storm 1
UC1	0.26	0.258	0.002	2	0	12	1% AEP, 5 min burst, Storm 1
EC1	0.356	0.032	0.329	2	0	13	1% AEP, 20 min burst, Storm 10

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Ex Pipe 1	0.261	3.69	11.643	6.978	1% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF2	0.189	0.189	0.159	0.16	0.1	3.83	0.62	1% AEP, 25 min burst, Storm 3
OF3	0.149	0.149	0.159	0.146	0.09	3.51	0.58	1% AEP, 5 min burst, Storm 1
OF1	0.32	0.32	1.753	0.159	0.17	3.8	1.06	1% AEP, 45 min burst, Storm 6

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Ex Dam	6.98	5280.3	0.32	0	0.32

Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - EXISTING SITE + ST PETERS
Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - EXISTING SITE + ST PETERS.drn run at 11:24:56 on 29/11/2024.

The maximum water level in these storages exceeds the maximum elevation you specified: Ex Dam.
DRAINS has extrapolated the Elevation vs Storage table to a higher Elevation. Please provide accurate values for higher elevations.

The maximum flow in these overflow routes is unsafe: OF2

DRAINS results for the 20% AEP Event prepared from Version 2024.11.9092.23482

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi	Max Pond Volume	Min Freeboard	Overflow (cu.m/s)	Constraint

			(cu.m/s)	(cu.m)	(m)
N36660	10.66		0.134		

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
EC2	0.077	0	0.077	3	0	15	20% AEP, 45 min burst, Storm 9
EC3	0.066	0.066	0	1.5	0	8.5	20% AEP, 5 min burst, Storm 1
UC1	0.121	0.121	0	2	0	12	20% AEP, 5 min burst, Storm 1
EC1	0.141	0.011	0.13	2	0	13	20% AEP, 45 min burst, Storm 9

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Ex Pipe 1	0.121	3.46	10.659	6.92	20% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF2	0.077	0.077	1.012	0.114	0.06	2.72	0.49	20% AEP, 45 min burst, Storm 9
OF3	0.066	0.066	1.012	0.108	0.05	2.58	0.47	20% AEP, 5 min burst, Storm 1
OF1	0.159	0.16	0.276	0.122	0.11	2.93	0.89	20% AEP, 5 min burst, Storm 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Ex Dam	6.92	5168.8	0.159	0	0.159

Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - EXISTING SITE + ST PETERS
Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - EXISTING SITE + ST PETERS.drn run at 11:25:21 on 29/11/2024.

The maximum water level in these storages exceeds the maximum elevation you specified: Ex Dam.
DRAINS has extrapolated the Elevation vs Storage table to a higher Elevation. Please provide accurate values for higher elevations.

Flows were safe in all overflow routes.

APPENDIX 13

DRAINS MODEL 2 DATA

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
..	Node					15.91		0		247.642	-869.172		68427678		No					
EP2-0	OnGrade	NSW RTA S	SA2		1.5	14.22		0	0.5	253.795	-688.261	No	1.01E+08	1 x Ku	No	New	900	No		
EP2-1	OnGrade	NSW RTA S	SA2		1.5	9.23		0	0.5	258.718	-467.968	No	80326	1 x Ku	No	New	900	No		
EP2-4	OnGrade	NSW RTA S	SA2		1.5	7.3		0	0.5	264.4	-176.8	No	80325	1 x Ku	No	New	900	No		
EP2-5	OnGrade	NSW RTA S	SA2		1.5	7.25		0	0.5	527.2	-170.8	No	80759	1 x Ku	No	New	900	No		
EP2-6	OnGrade	NSW RTA S	SA2		1.5	7.2		0	0.5	524.8	-44.8	No	80320	1 x Ku	No	New	900	No		
COUNCIL T	Node					6.92		0		807.604	-44.613		80319		No					
N267825	Node					10		0		268.564	-51.997		69077480		No					
2	Node					10		0		352.25	59.996		73625525		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	EIA %	Perv Area %	RIA %	EIA Time (min)	Perv Time (min)	RIA Time (min)	EIA Length (m)	Perv Length (m)	RIA Length (m)	EIA Slope(%) %	Perv Slope %	RIA Slope %	EIA Rough	Perv Rough	RIA Rough	Rainfall Multiplier
UC2	..	2.51	13	87	0	4	25	0										1
UC3	N267825	0.667	25	75	0	3	15	0										1
UC4	2	6.2765	12	88	0	10	28.5	0										1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
Ex Pipe 2-0	..	EP2-0	20	14.27	12.84	7.15	Concrete, u	750	750	0.013	New	1	..	0					
Ex Pipe 2-1	EP2-0	EP2-1	69	12.83	7.84	7.23	Concrete, u	900	900	0.013	New	1	EP2-0	0					
Ex Pipe 2-2	EP2-1	EP2-4	75	7.69	5.48	2.95	Concrete, u	900	900	0.013	New	1	EP2-1	0					
Ex Pipe 2-3	EP2-4	EP2-5	15	5.48	5.33	1	Concrete, u	900	900	0.013	New	1	EP2-4	0					
Ex Pipe 2-4	EP2-5	EP2-6	15	5.26	5.06	1.33	Concrete, u	900	900	0.013	New	1	EP2-5	0					
Ex Pipe 2-5	EP2-6	COUNCIL T	23.9	5.06	4.6	1.92	Concrete, u	1050	1070	0.013	New	1	EP2-6	0					
Ex Pipe 3-1	N267825	EP2-4	20	5.68	5.48	1	Concrete, r	900	900	0.013	New	1	N267825	0					
Ex Pipe 4-1	2	EP2-6	10	5.34	5.16	1.8	Concrete, u	1050	1070	0.013	New	1	2	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Stor (m)	SafeDepth Minor Stor (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id
Ex OF 2-1	EP2-0	EP2-1	0.3				7.5 m road	0.3	0.15	0.6	7	0	1.01E+08	69
Ex OF 2-2	EP2-1	EP2-4	0.4				7.5 m road	0.3	0.3	0.6	3	0	80871	75
Ex OF 2-3	EP2-4	COUNCIL T	1.6				10 m roadv	0.3	0.15	0.6	1	0	80922	175
Ex OF 2-4	EP2-5	EP2-6	0.1				4 m wide p	0.3	0.3	0.6	1	0	80950	15

Ex OF 2-5	EP2-6	COUNCIL T	0.2		7.5 m road	0.3	0.3	0.6	1.5	0	80938	23.9

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
Ex Pipe 2-0	Concrete, u	750	0.6	0.57	Unsafe
Ex Pipe 2-1	Concrete, u	900	0.6	0.42	Unsafe
Ex Pipe 2-2	Concrete, u	900	0.6	0.57	Unsafe
Ex Pipe 2-3	Concrete, u	900	0.6	0.85	
Ex Pipe 2-4	Concrete, u	900	0.6	1.02	
Ex Pipe 2-5	Concrete, u	1070	0.6	0.98	
Ex Pipe 3-1	Concrete, r	900	0.45	0.85	
Ex Pipe 4-1	Concrete, u	1070	0.6	0.89	

This model has no pipes with non-return valves

DRAINS results for 1% AEP Event prepared from Version 2024.11.9092.23482

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
..	14.56		1.034				
EP2-0	13.43		0		0.79	0	None
EP2-1	8.32		0		0.91	0	None
EP2-4	7.3		0		0	0.08	Outlet System
EP2-5	7.03		0		0.22	0	None
EP2-6	6.76		0		0.44	0	None
COUNCIL T	5.35		0.351				
N267825	7.31		0.412				
2	6.82		2.473				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
UC2	0.94	0.195	0.849	4	0	25	1% AEP, 45 min burst, Storm 2
UC3	0.327	0.097	0.238	3	0	15	1% AEP, 20 min burst, Storm 8
UC4	2.287	0.437	2.079	10	0	28.5	1% AEP, 45 min burst, Storm 2

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Ex Pipe 2-0	0.94	5.97	14.56	13.428	1% AEP, 45 min burst, Storm 2
Ex Pipe 2-1	0.935	2.71	13.398	8.32	1% AEP, 45 min burst, Storm 2
Ex Pipe 2-2	0.932	2.21	8.257	7.3	1% AEP, 45 min burst, Storm 2
Ex Pipe 2-3	1.178	1.85	7.082	7.029	1% AEP, 30 min burst, Storm 6
Ex Pipe 2-4	1.179	1.85	6.809	6.756	1% AEP, 30 min burst, Storm 1
Ex Pipe 2-5	3.358	4.92	6.027	5.36	1% AEP, 45 min burst, Storm 2
Ex Pipe 3-1	0.325	0.51	7.31	7.3	1% AEP, 20 min burst, Storm 8
Ex Pipe 4-1	2.283	2.54	6.822	6.756	1% AEP, 45 min burst, Storm 2

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
Ex OF 2-1	0	0	1.286	0	0	0	0	
Ex OF 2-2	0	0	1.651	0	0	0	0	
Ex OF 2-3	0.08	0.08	2.459	0.1	0.08	2.48	0.81	1% AEP, 45 min burst, Storm 6
Ex OF 2-4	0	0	2.257	0	0	0	0	
Ex OF 2-5	0	0	2.028	0	0	0	0	

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - KEEFERS GLEN
Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - KEEFERS GLEN.drn run at 11:19:34 on 29/11/2024.

Upwelling occurred at: EP2-4
Flows were safe in all overflow routes.

DRAINS results for 20% AEP Event prepared from Version 2024.11.9092.23482

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
..	14.46		0.488				
EP2-0	13.2		0		1.02	0	None
EP2-1	8.07		0		1.16	0	None
EP2-4	6.03		0		1.27	0	None
EP2-5	5.9		0		1.35	0	None
EP2-6	5.81		0		1.39	0	None
COUNCIL T	5.04		0				
N267825	6.03		0.168				
2	5.85		1.141				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
UC2	0.398	0.087	0.311	4	0	25	20% AEP, 1 hour burst, Storm 6
UC3	0.134	0.053	0.111	3	0	15	20% AEP, 45 min burst, Storm 5
UC4	0.907	0.162	0.809	10	0	28.5	20% AEP, 1 hour burst, Storm 8

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Ex Pipe 2-0	0.398	4.69	14.455	13.199	20% AEP, 1 hour burst, Storm 6

Ex Pipe 2-1	0.393	2.99	13.199	8.074	20% AEP, 1 hour burst, Storm 6
Ex Pipe 2-2	0.386	1.49	8.074	6.027	20% AEP, 1 hour burst, Storm 6
Ex Pipe 2-3	0.484	1.38	5.966	5.897	20% AEP, 1 hour burst, Storm 6
Ex Pipe 2-4	0.482	1.1	5.845	5.815	20% AEP, 1 hour burst, Storm 6
Ex Pipe 2-5	1.385	4.01	5.721	5.037	20% AEP, 1 hour burst, Storm 6
Ex Pipe 3-1	0.131	0.57	6.03	6.027	20% AEP, 45 min burst, Storm 9
Ex Pipe 4-1	0.908	2.16	5.847	5.815	20% AEP, 1 hour burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
Ex OF 2-1	0	0	0.812	0	0	0	0	
Ex OF 2-2	0	0	1.651	0	0	0	0	
Ex OF 2-3	0	0	0.262	0	0	0	0	
Ex OF 2-4	0	0	2.257	0	0	0	0	
Ex OF 2-5	0	0	2.028	0	0	0	0	

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - KEEFERS GLEN
Run Log for DRAINS Lite v2024.11.9092.23482 - 6588 DRAINS Model - KEEFERS GLEN.drn run at 11:19:48 on 29/11/2024.

No water upwelling from any pit.
Freeboard was adequate at all pits.

Flows were safe in all overflow routes.

APPENDIX 14

DRAINS MODEL 3 DATA

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
N39252	Node					13.53		0		797.758	-899.939		80332		No					
NP1-4	OnGrade	Project Pits	900 X 900 - SURCHARG		1.5	12		0	0.5	478	-684.4	No	80328	1 x Ku	No	New	900	No		
NP1-5	OnGrade	NSW RTA S	SA2		1.5	11.95		0	0.5	250.842	-692.199	No	1.64E+08	1 x Ku	No	New	900	No		
EP2-1	Node					9.23		0		251.334	-496.274		1.5E+08		No					
N39269	Node					10		0		812.765	-489.095		80352		No					
NP8-2	OnGrade	Project Pits	900 X 900 - SURCHARG		1.5	7.7		0	0.5	524.8	-332.8	No	80348	1 x Ku	No	New	900	Yes		
EP 2-5	Node					7.25		0		527.008	-170.143		1.5E+08		No					
N39291	Node					10		0		1029.394	-476.868		80374		No					
COUNCIL V	Node					5.7		0		1413.101	-55.689		80381		No					
N55372	Node					10		0		1032.237	-339.362		4851220		No					
,	Node					10		0		1415.563	-561.501		66969508		No					
.	Node					10		0		1586.628	-504.889		66969509		No					
'1	Node					8		0		1602.011	-198.038		66969510		No					
....	Node					9		0		1118.967	-177.527		1.77E+08		No					
.,..	Node					10.7		0		1180.502	-439.047		1.78E+08		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id
OSD 1	9.6	27		Orifice		185	9.8			582.389	-898.708	No			75503438
	12.2	27													
OSD 2	5.73	136.2		Orifice		200	5.93			818.68	-335.054	No			75503437
	7.53	136.2													
OSD 3	6.5	86		Orifice		165	6.65			1415.358	-335.465	No			75503443
	7.2	86													
LEVEL SPRE	6.205	4		None						1416.793	-193.526	No			66970010
	6.215	4													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	EIA %	Perv Area %	RIA %	EIA Time (min)	Perv Time (min)	RIA Time (min)	EIA Length (m)	Perv Length (m)	RIA Length (m)	EIA Slope(%) %	Perv Slope %	RIA Slope %	EIA Rough	Perv Rough	RIA Rough	Rainfall Multiplier
UC1	N39252	0.304	95	5	0	2	12	0										1
C4	N39269	0.2295	71	29	0	3	18	0										1
C1	N39291	0.2159	100	0	0	1.5	0	0										1
C2	N55372	0.128	100	0	0	1	0	0										1
C7	,	0.0674	83	17	0	1.5	7.5	0										1
C3	.	0.0997	100	0	0	1	0	0										1
C8	'1	0.222	25	75	0	2	10	0										1
C6	....	0.1991	36	64	0	2.5	10	0										1
C5	.,..	0.1222	75	25	0	1.5	7.5	0										1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
Pipe 1-1	N39252	OSD 1	105	11.11	10.06	1	Concrete, r	450	450	0.013	New	1	N39252	0					
Pipe 1-2	OSD 1	NP1-4	10	9.6	9.5	1	Concrete, r	450	450	0.013	New	1	OSD 1	0					
Pipe 1-3	NP1-4	NP1-5	10	9.5	9.4	1	Concrete, u	450	450	0.013	New	1	NP1-4	0					
Pipe 1-4	NP1-5	EP2-1	40	9.4	7.72	4.2	Concrete, u	900	900	0.013	New	1	NP1-5	0					
Pipe 2-3	N39269	OSD 2	10	6.13	5.73	4	uPVC, unde	375	386	0.012	New	1	N39269	0					

Pipe 2-5	OSD 2	NP8-2	12	5.73	5.58	1.25	Concrete, u	600	600	0.013	New	1	OSD 2	0
Pipe 2-6	NP8-2	EP 2-5	29	5.58	5.29	1	Concrete, u	600	600	0.013	New	1	NP8-2	0
Pipe 2-2	N39291	OSD 2	80	8.93	5.73	4	Concrete, u	375	375	0.013	New	1	N39291	0
Pipe 2-1	N55372	OSD 2	10	6.13	5.73	4	Concrete, u	375	375	0.013	New	1	N55372	0
Pipe 3-2	,	OSD 3	20	6.7	6.5	1	Concrete, u	375	375	0.013	New	1	,	0
Pipe 3-5	OSD 3	LEVEL SPRE	47	6.5	6.215	0.61	Concrete, u	375	375	0.013	New	3	OSD 3	0
Pipe 3-1	.	OSD 3	20	6.7	6.5	1	Concrete, u	375	375	0.013	New	1	.	0
Pipe 3-4	.,..	OSD 3	25	7.25	6.5	3	Concrete, r	375	375	0.013	New	1	.,..	0

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Stor (m)	SafeDepth Minor Stor (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	
OF 1-1	OSD 1	NP1-4	0.2	12.4	0.9	1.45	Swale with	0.3	0.3	0.6	1	0	80818	10
OF 1-2	NP1-4	NP1-5	0.1				4 m wide p	0.3	0.15	0.6	4	0	80839	10
OF 1-3	NP1-5	EP2-1	0.2				7.5 m road	0.3	0.15	0.6	4.5	0	1.64E+08	40
OF 2-1	OSD 2	LEVEL SPRE	0.6	7.73	0.9	1.45	4 m wide p	0.3	0.15	0.6	0.5	0	80887	65
OF 2-2	NP8-2	EP 2-5	0.5				Swale with	0.3	0.3	0.6	1	0	80970	29
OF 3-1	OSD 3	LEVEL SPRE	0.8	7.4	0.9	1.45	Swale with	0.3	0.15	0.6	1	0	66969556	47
SWALE	LEVEL SPRE	COUNCIL W	0.9	6.215	4	1.45	Swale with	0.3	0.2	0.6	1	0	66969613	52
OF 3-2	'1	LEVEL SPRE	0.4				4 m wide p	0.3	0.15	0.6	1	0	1.78E+08	50
OF 3-3	....	LEVEL SPRE	0.6				7.5 m road	0.3	0.15	0.6	3	0	1.78E+08	100

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
Pipe 1-1	Concrete, r	450	0.45	-0.95	Unsafe
Pipe 1-2	Concrete, r	450	0.45	-0.49	Unsafe
Pipe 1-3	Concrete, u	450	0.6	2.01	
Pipe 1-4	Concrete, u	900	0.6	0.54	Unsafe
Pipe 2-3	uPVC, unde	386	0.5	-0.39	Unsafe
Pipe 2-5	Concrete, u	600	0.6	-0.64	Unsafe
Pipe 2-6	Concrete, u	600	0.6	1.32	
Pipe 2-2	Concrete, u	375	0.6	-0.41	Unsafe
Pipe 2-1	Concrete, u	375	0.6	-0.41	Unsafe
Pipe 3-2	Concrete, u	375	0.6	-0.41	Unsafe
Pipe 3-5	Concrete, u	375	0.6	-0.42	Unsafe
Pipe 3-1	Concrete, u	375	0.6	-0.41	Unsafe
Pipe 3-4	Concrete, r	375	0.45	-0.41	Unsafe

This model has no pipes with non-return valves

DRAINS results for 1% AEP storm event prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
N39252	12.65		0.309				
NP1-4	9.76		0.088		2.24	0	None
NP1-5	9.6		0.062		2.35	0	None
EP2-1	7.83		0.021				
N39269	7.75		0.196				
NP8-2	5.81		0		1.89	0	None
EP 2-5	5.47		0				
N39291	9.15		0.224				
N55372	7.77		0.133				
,	7.21		0.067				
.	7.24		0.104				
.,..	7.39		0.12				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
UC1	0.26	0.258	0.002	2	0	12	1% AEP, 5 min burst, Storm 1
C4	0.151	0.146	0.006	3	0	18	1% AEP, 5 min burst, Storm 1
C1	0.193	0.193	0	1.5	0	0	1% AEP, 5 min burst, Storm 1
C2	0.114	0.114	0	1	0	0	1% AEP, 5 min burst, Storm 1
C7	0.052	0.05	0.002	1.5	0	7.5	1% AEP, 5 min burst, Storm 1
C3	0.089	0.089	0	1	0	0	1% AEP, 5 min burst, Storm 1
C8	0.121	0.039	0.093	2	0	10	1% AEP, 20 min burst, Storm 4
C6	0.108	0.042	0.07	2.5	0	10	1% AEP, 20 min burst, Storm 8
C5	0.088	0.082	0.007	1.5	0	7.5	1% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe 1-1	0.266	1.67	12.65	12.31	1% AEP, 5 min burst, Storm 1
Pipe 1-2	0.115	1.21	11.161	9.759	1% AEP, 20 min burst, Storm 8
Pipe 1-3	0.115	1.68	9.735	9.6	1% AEP, 20 min burst, Storm 8
Pipe 1-4	0.115	2.65	9.6	7.828	1% AEP, 20 min burst, Storm 8
Pipe 2-3	0.152	1.3	7.752	7.733	1% AEP, 5 min burst, Storm 1
Pipe 2-5	0.115	1.17	6.769	5.808	1% AEP, 45 min burst, Storm 6
Pipe 2-6	0.119	1.68	5.808	5.469	1% AEP, 45 min burst, Storm 6
Pipe 2-2	0.205	3.09	9.147	7.733	1% AEP, 5 min burst, Storm 1
Pipe 2-1	0.117	1.06	7.766	7.733	1% AEP, 5 min burst, Storm 1
Pipe 3-2	0.052	0.47	7.209	7.198	1% AEP, 5 min burst, Storm 1
Pipe 3-5	0.129	0.99	7.098	6.37	1% AEP, 20 min burst, Storm 7
Pipe 3-1	0.092	0.84	7.24	7.198	1% AEP, 5 min burst, Storm 1
Pipe 3-4	0.088	2.38	7.389	7.198	1% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF 1-1	0	0	1.012	0	0	0	0	
OF 1-2	0	0	2.174	0	0	0	0	
OF 1-3	0	0	1.477	0	0	0	0	
OF 2-1	0	0	2.132	0	0	0	0	
OF 2-2	0	0	1.012	0	0	0	0	
OF 3-1	0	0	1.012	0	0	0	0	
SWALE	0.355	0.355	1.012	0.167	0.18	4	1.06	1% AEP, 20 min burst, Storm 7
OF 3-2	0.121	0.121	2.257	0.055	0.04	4	0.76	1% AEP, 20 min burst, Storm 4
OF 3-3	0.108	0.108	1.651	0.088	0.14	2.06	1.56	1% AEP, 20 min burst, Storm 8

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD 1	12.31	73.2	0.115	0.115	0
OSD 2	7.73	272.9	0.115	0.115	0
OSD 3	7.2	60	0.129	0.129	0
LEVEL SPRE	6.37	0.7	0.355	0	0.355

Run Log for DRAINS Lite v2025.01.9147.24925 - 6588 DRAINS Model - PROPOSED DEVELOPMENT (NODE MODEL) 20241217 Permeable Paving
Run Log for DRAINS Lite v2025.01.9147.24925 - 6588 DRAINS Model - PROPOSED DEVELOPMENT (NODE MODEL) 20241217 Permeable Paving.drn run at 17:13:19 on 13/3/2025.

The maximum water level in these storages exceeds the maximum elevation you specified: OSD 1, OSD 2, LEVEL SPREADER.
DRAINS has extrapolated the Elevation vs Storage table to a higher Elevation. Please provide accurate values for higher elevations.
No water upwelling from any pit.
Freeboard was adequate at all pits.

Flows were safe in all overflow routes.

DRAINS results for 20% AEP storm event prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
N39252	11.32		0.134				
NP1-4	9.68		0		2.32	0	None
NP1-5	9.55		0		2.4	0	None
EP2-1	7.8		0				
N39269	6.51		0.083				
NP8-2	5.75		0		1.95	0	None
EP 2-5	5.43		0				
N39291	9.08		0.098				
N55372	6.52		0.058				
,	6.8		0.029				
.	6.84		0.045				
.,..	7.35		0.052				

SUB-CATCHMENT DETAILS

Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm

	Flow Q (cu.m/s)	Max Q (cu.m/s)	Max Q (cu.m/s)	Tc (cu.m/s)	Tc (min)	Tc (min)	(min)
UC1	0.121	0.121	0	2	0	12	20% AEP, 5 min burst, Storm 1
C4	0.068	0.068	0	3	0	18	20% AEP, 5 min burst, Storm 1
C1	0.091	0.091	0	1.5	0	0	20% AEP, 5 min burst, Storm 1
C2	0.054	0.054	0	1	0	0	20% AEP, 5 min burst, Storm 1
C7	0.023	0.023	0	1.5	0	7.5	20% AEP, 5 min burst, Storm 1
C3	0.042	0.042	0	1	0	0	20% AEP, 5 min burst, Storm 1
C8	0.049	0.013	0.037	2	0	10	20% AEP, 45 min burst, Storm 9
C6	0.044	0.024	0.023	2.5	0	10	20% AEP, 30 min burst, Storm 7
C5	0.038	0.038	0	1.5	0	7.5	20% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe 1-1	0.121	1.72	11.315	10.545	20% AEP, 5 min burst, Storm 1
Pipe 1-2	0.065	1.06	10.157	9.683	20% AEP, 10 min burst, Storm 8
Pipe 1-3	0.065	1.41	9.683	9.549	20% AEP, 10 min burst, Storm 8
Pipe 1-4	0.065	1.9	9.549	7.812	20% AEP, 10 min burst, Storm 8
Pipe 2-3	0.068	0.59	6.513	6.51	20% AEP, 5 min burst, Storm 1
Pipe 2-5	0.069	1.02	6.131	5.752	20% AEP, 45 min burst, Storm 8
Pipe 2-6	0.071	1.45	5.752	5.428	20% AEP, 45 min burst, Storm 9
Pipe 2-2	0.096	2.42	9.075	6.51	20% AEP, 5 min burst, Storm 1
Pipe 2-1	0.055	0.49	6.522	6.51	20% AEP, 5 min burst, Storm 1
Pipe 3-2	0.024	1.06	6.798	6.774	20% AEP, 5 min burst, Storm 1
Pipe 3-5	0.071	0.97	6.747	6.317	20% AEP, 10 min burst, Storm 8
Pipe 3-1	0.043	1.19	6.837	6.774	20% AEP, 5 min burst, Storm 1
Pipe 3-4	0.04	1.73	7.348	6.774	20% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF 1-1	0	0	1.012	0	0	0	0	
OF 1-2	0	0	1.816	0	0	0	0	
OF 1-3	0	0	0.651	0	0	0	0	
OF 2-1	0	0	0.642	0	0	0	0	
OF 2-2	0	0	1.012	0	0	0	0	
OF 3-1	0	0	0.159	0	0	0	0	
SWALE	0.158	0.158	0.344	0.15	0.09	3.58	0.59	20% AEP, 45 min burst, Storm 3
OF 3-2	0.049	0.049	0.908	0.038	0.02	4	0.53	20% AEP, 45 min burst, Storm 9
OF 3-3	0.044	0.044	0.532	0.066	0.09	1.33	1.35	20% AEP, 30 min burst, Storm 7

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD 1	10.54	25.5	0.065	0.065	0
OSD 2	6.51	106.3	0.069	0.069	0
OSD 3	6.77	23.6	0.071	0.071	0

LEVEL SPRE	6.31	0.4	0.158	0	0.158

Run Log for DRAINS Lite v2025.01.9147.24925 - 6588 DRAINS Model - PROPOSED DEVELOPMENT (NODE MODEL) 20241217 Permeable Paving
Run Log for DRAINS Lite v2025.01.9147.24925 - 6588 DRAINS Model - PROPOSED DEVELOPMENT (NODE MODEL) 20241217 Permeable Paving.drn run at 17:13:58 on 13/3/2025.

The maximum water level in these storages exceeds the maximum elevation you specified: LEVEL SPREADER.
DRAINS has extrapolated the Elevation vs Storage table to a higher Elevation. Please provide accurate values for higher elevations.
No water upwelling from any pit.
Freeboard was adequate at all pits.

Flows were safe in all overflow routes.

APPENDIX 15

SQIDEP FOR STORMSACK

STORMWATER AUSTRALIA

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE

Applicant Information

Applicant Name	**Atlan Stormwater**
Applicant Address	130 Sandstone Place, Parkinson, QLD 4115
Website	www.atlan.com.au
Contact Email	Andy.hornbuckle@atlan.com.au

Verified Technology

Product Title	**Atlan Stormsack**
SQIDEP Pathway	**Field Evaluation via reviewed QAPP**
Reviewed Documents	The following documents form the basis of this independent evaluation: 1. Stormsack detailed performance report (Stormsack DPR) (Issue 2) Dapper, D., Waldron, S., & Nyakas, L. (2024). SQIDEP Detailed Performance Report – Stormsack (Issue 2), Drapper Environmental Consultants, Crestmead, Queensland, Australia 2. Hydraulic Performance (Treatable Flowrate) Lab Testing report (Issue 1), 5 July 2024 Dapper, D., Nyakas, L. (2024). Hydraulic Performance (Treatable Flowrate) Lab Testing report (Issue 1), Drapper Environmental Consultants, Crestmead, Queensland, Australia 3. ATLAN Stormsack Device Lab Testing Report (Issue 3), 5 July 2024 Dapper, D.; Nyakas, L. ATLAN Stormsack Device Lab Testing Report (Issue 3); Drapper Environmental Consultants: Crestmead, Queensland, Australia, 2024. 4. StormSack Performance Assessment, Report Number: MHL2325, Manly Hydraulics Laboratory, November 2014.

Technology Information

Applicant's Verified Performance Claims (ER)

Parameter	
Total suspended solids	**45%**
Total phosphorus	**47%**
Total nitrogen	**25%**
Total petroleum hydrocarbons	**Not claimed**
Gross pollutants	**100 %**

IEP's comments: Nil.
IEP's recommendations: All performance claims are considered compliant up to the treatment flow rate for the applicable device. Verified flow rates are included in the table below:

Size of Stormsack (Pit dimensions) (mm)	TFR for MUSIC modelling – high flow bypass in litres per second
450 x 450	10
600 x 600	25
600 x 900	32
900 x 900	39
1200 x 900	50
1200 x 1200	65

Test Stormwater Runoff

21 compliant stormwater events. Water chemistry was compliant with Table 1 in SQIDEP v1.3. Minimum number of aliquots collected, and samples were representative.

Test Catchment

- The field testing for the ATLAN Stormsack (200) was carried out at Griffith University, Carpark H, Parkland Campus, Griffith Way, Southport, QLD, 4215.
- The catchment area draining to the device was reported to be 1,181 m^2 directly connected to the Stormsack. The catchment was reported to be 66% impervious with the remainder including a eucalyptus forested area which drains to the Stormsack.

Maintenance Performed during monitoring

The Stormsack should be cleaned/maintained when accumulated pollutants reach the trigger level of 150mm depth in the bag, or 50% capacity by volume.

The monitored Stormsack was maintained twice during the SQIDEP monitoring program due to construction loads received from earthworks undertaken in the upstream catchment. Regular inspection of the Stormsack is recommended, as per the manufacturer's O&M manual.

Verified method:

The Reviewers have verified that the method undertaken complies with the intent and specifics of SQIDEP v1.3.

A more detailed Independent Evaluatores Report is available to get an understanding of what was checked and how the claim was verified.

Conditions/Notes

MUSIC modelling shall be carried out as follows:

A generic node is to be used in MUSIC with a high flow bypass set to the applicable TFR (see table below) for the size of the Atlan Stormsack proposed and with inlet and outlet concentrations as follows:

Pollutant	**Inlet concentration**	**Outlet Concentration**
TSS	100	55
TP	100	53
TN	10	7.5

Size of Stormsack (Pit dimensions) (mm)	TFR for MUSIC modelling – high flow bypass in litres per second
450 x 450	10
600 x 600	25
600 x 900	32
900 x 900	39
1200 x 900	50
1200 x 1200	65

Independent Reviewers

Evaluator Name	Evaluator Signature
Mark Liebman	
Baden Myers	

Issue of Verification Certificate

Acceptance by SQIDEP Governance Panel	
Acceptance by Stormwater Australia Board of Directors	
Verification Issued	
Stormwater Australia Verification Certificate Number Reference	SA-2024/12-VC

Verified under SQIDEP Version 1.3

Body of Evidence Pathway

APPENDIX 16

SQIDEP FOR ATLANFILTER

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE

Applicant Information

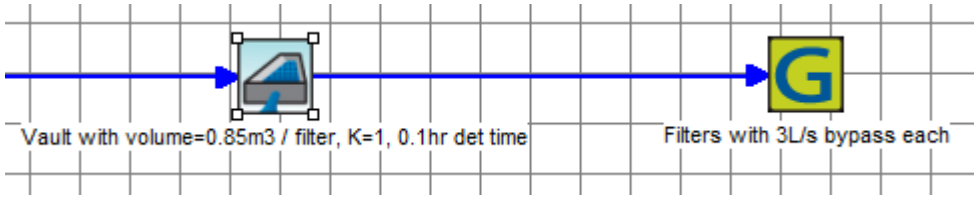
Applicant Name	**SPEL Stormwater Pty Ltd**
Applicant Address	**130 Sandstone Pl, Parkinson QLD 4115**
Phone Number	**+61 1300 773 500**
Email	**sales@spel.com.au**
Website	**www.spel.com.au**

Verified Technology	**SPELFilter**
Issue Date	**23 December 2022**
Reviewed Documents	• SPEL Body of Evidence application submission (Prepared by Drapper Environmental Consultants) • Statutory Declaration by Drapper Environmental Consultants • Hydrographs of compliant and partially compliant events at the Hilton Foods site showing inflow, outflow, rainfall and samples collected (42 items) • Sample collection and/or reset emails/site records at the Hilton Foods site (50 items) • Laboratory Chain of Custody forms, Quality Control reports, QC Compliance Reviews & Certificates of Analysis • Subsequent hydrograph plots for Hilton Foods site that included monitored outflow rates (and summary table of results) – (37 items), 17 October 2022.

Technology Information

Applicant's Verified Performance Claims	Treatable flow rate = 3 L/s per filter cartridge Total Suspended Solids (TSS) 85 % Total Phosphorus (TP) 74 % Total Nitrogen (TN) 59 % Total Petroleum Hydrocarbons 0 % Gross Pollutants 0 %

Maintenance performed during monitoring	None over 13 months

Verified method to model in MUSIC	Modelling a SPELFilter in MUSIC is as follows: 1. Use a detention basin node to represent the vault (with modified 'K' values and nominal detention time set to the treatment flow rate of the cartridges) 2. Use a generic node with the monitored pollutant reduction values and have a high flow bypass of 3 L/s per cartridge.  ● The input criteria for the node is; 1. Use a detention basin node to represent the vault ● with modified 'K' values with K=1 ● use size of 1m^2 per cartridge and 0.85m extended detention depth ● adopt a nominal detention time of 0.1 hours (plus or minus 10%). 2. Use a generic node with: ● a high flow bypass of 3 L/s per cartridge ● pollutant reductions of 85% for TSS ● pollutant reductions of 74% for TP ● pollutant reductions of 59% for TN. When entering the data into MUSIC the detention basin surface area and high flow bypass rate of the generic node is factored up depending on the number of filter cartridges proposed. All other values listed above remain the same (note: the *Notional Detention Time* is adjusted by changing the *Low Flow Pipe Diameter*).

Conditions	The limitations of the acceptance of these claims include: ● Pit insert "Stormsacks" (for coarse material capture) are used for inlets upstream of the SPELFilter installation to ensure longevity of the filters ● Regular inspection & maintenance should be performed in accordance with the Manufacturer's Maintenance Plans.

Independent Reviewers	Dr Robin Allison Dr Ricky Kwan

Accepted by Governance Panel	22 December 2022
Accepted by Stormwater Australia Board	23 December 2022