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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**40**	



Photo: 42_42_260_A.JPG, 00:00:51
1.14m, Deposit is coarse sediments- Gravel or Rubble in the invert , Obstruction: 21-50%, General Comments Cleaning Req for acc report, from 4 to 8 o'clock



Photo: 42_42_261_A.JPG, 00:02:10
3.28m, Obstruction, an object is wedged in the joint, at joint, reduction in cross sectional area: <5% , from 11 to 2 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**40**	



Photo: 42_42_262_A.JPG, 00:02:24
3.28m, Joint displaced longitudinaly, longitudinal displacement 21-30mm



Photo: 42_42_263_A.JPG, 00:03:46
6.96m, Finish node, grated inlet pit, Nodename: 44

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Inspection Report

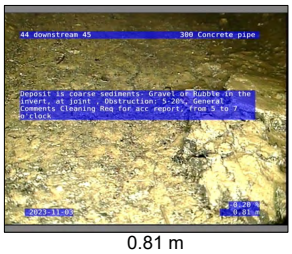
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
3/11/2023	**WO75488**	**Shane Dawes**	**41**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**4**		

Location:	**Dickson Shops**	Pipe Diameter:	**300 mm**	Start Manhole:	**44**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**45**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**19.80 m**
Location Type:	**Developed**	Lining:		Direction:	**downstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**900**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

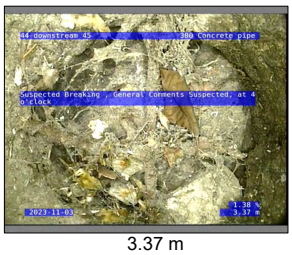
1:165 Position	Code	Observation	Grade
44			
0.00	STMH	Start node, maintenance hole, Nodename: 44	
0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
0.81	DER	Deposit is coarse sediments- Gravel or Rubble in the invert, at joint , Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 5 t	
3.37	BYY	Suspected Breaking , General Comments Suspected, at 3 o'clock	
8.19	WLC	Water level, clear flow (the invert is visible), depth 30%	
9.38	DEC	Deposit is Hard or compacted material in the invert , Defect Suspected:, Obstruction: 21-50%, General Comments Cleaning Req for acc report,	
19.80	FHGP	Finish node, grated inlet pit, Nodename: 45	
45			



0.81 m



0.81 m



3.37 m



3.37 m



8.18 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**2**	**40**	**3.54**	**70**	**4**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**41**	



Photo: 43_43_267_A.JPG, 00:00:48
0.81m, Deposit is coarse sediments- Gravel or Rubble in the invert, at joint ,
Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 5 to 7 o'clock



Photo: 43_43_267_B.JPG, 00:00:48
0.81m, Deposit is coarse sediments- Gravel or Rubble in the invert, at joint ,
Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 5 to 7 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**41**	



Photo: 43_43_268_A.JPG, 00:01:41
3.37m, Suspected Breaking , General Comments Suspected, at 3 o'clock



Photo: 43_43_268_B.JPG, 00:01:41
3.37m, Suspected Breaking , General Comments Suspected, at 3 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**41**	



Photo: 43_43_269_A.JPG, 00:02:50
8.18m, Water level, clear flow (the invert is visible), depth 30%



Photo: 43_43_269_B.JPG, 00:02:50
8.18m, Water level, clear flow (the invert is visible), depth 30%

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**41**	



Photo: 43_43_270_A.JPG, 00:03:18
9.38m, Deposit is Hard or compacted material in the invert , Defect Suspected:, Obstruction: 21-50%, General Comments Cleaning Req for acc report, from 4 to 8 o'clock



Photo: 43_43_270_B.JPG, 00:03:18
9.38m, Deposit is Hard or compacted material in the invert , Defect Suspected:, Obstruction: 21-50%, General Comments Cleaning Req for acc report, from 4 to 8 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**41**	

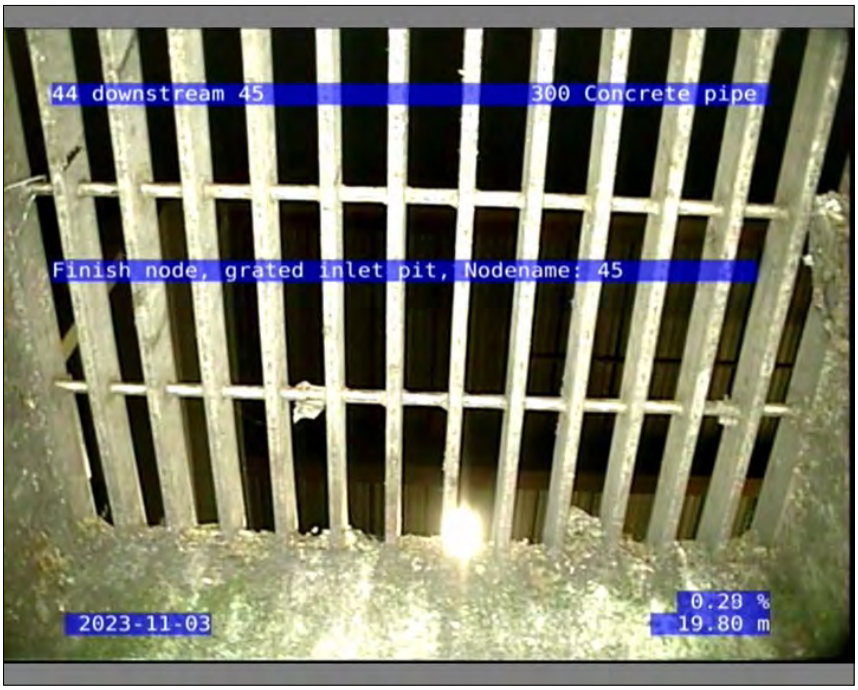


Photo: 43_43_271_A.JPG, 00:05:20
19.8m, Finish node, grated inlet pit, Nodename: 45



Photo: 43_43_271_B.JPG, 00:05:20
19.8m, Finish node, grated inlet pit, Nodename: 45

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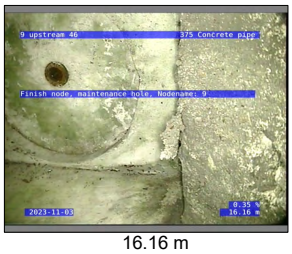
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
3/11/2023	**WO75488**	**Shane Dawes**	**42**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**1**		

Location:	**Dickson Shops**	Pipe Diameter:	**375 mm**	Start Manhole:	**9**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**46**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**16.21 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**1350**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

1:135	Position	Code	Observation	Grade
46				
	0.00	STMH	Start node, maintenance hole, Nodename: 43	
	0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
	16.16	FHMH	Finish node, maintenance hole, Nodename: 9	
9				



16.16 m



16.16 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**42**	



Photo: 44_44_276_A.JPG, 00:02:32
16.16m, Finish node, maintenance hole, Nodename: 9



Photo: 44_44_276_B.JPG, 00:02:32
16.16m, Finish node, maintenance hole, Nodename: 9

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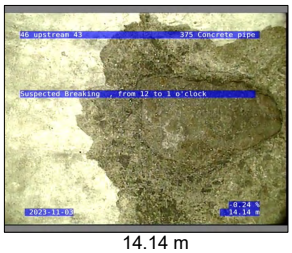
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
3/11/2023	**WO75488**	**Shane Dawes**	**43**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**3**		

Location:	**Dickson Shops**	Pipe Diameter:	**375 mm**	Start Manhole:	**46**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**43**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**22.57 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**1150**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

1:180 Position	Code	Observation	Grade
43			
0.00	STMH	Start node, maintenance hole, Nodename: 43	
0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
14.14	BYY	Suspected Breaking , from 12 to 1 o'clock	
17.33	RRT	Recently cut Tap roots, reduction in cross sectional area, at joint, Obstruction: <5%, General Comments Cleaning Req for acc report,	
21.22	CNGO	Connection, good workmanship, connection appears to be open, diameter 150mm , at 10 o'clock	
22.36	RT	Tap Roots, reduction in cross sectional area , Obstruction: 51-75%, General Comments Cleaning Req for acc report, from 6 to 12 o'clock	
22.57	SAR	Inspection (survey) abandoned, roots, General Comments Cleaning Req for acc report	



14.14 m



14.14 m



17.33 m



17.33 m



21.22 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**2**	**10**	**0.66**	**15**	**3**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**43**	

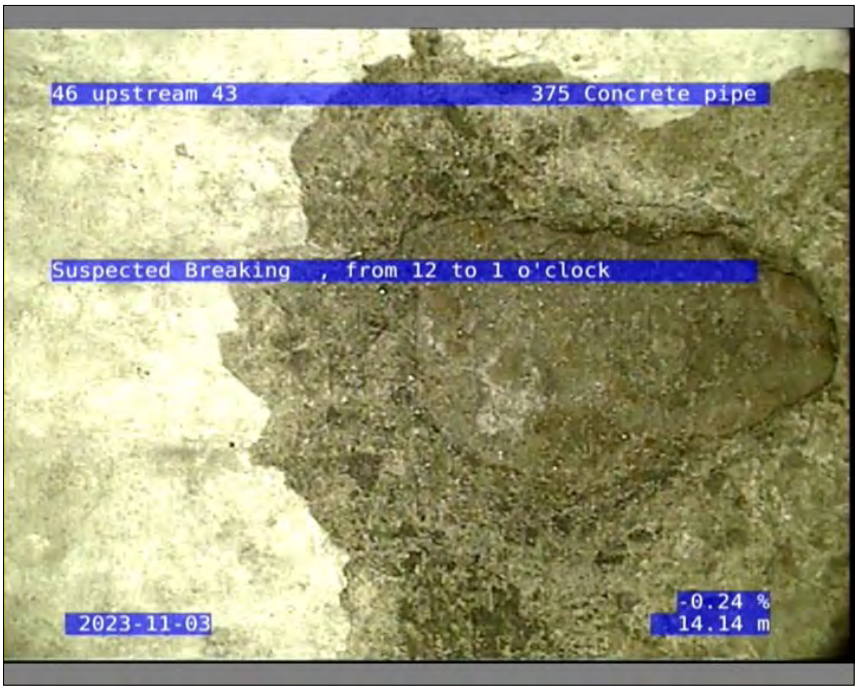


Photo: 45_45_279_A.JPG, 00:02:25
14.14m, Suspected Breaking , from 12 to 1 o'clock



Photo: 45_45_279_B.JPG, 00:02:25
14.14m, Suspected Breaking , from 12 to 1 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**43**	



Photo: 45_45_280_A.JPG, 00:03:09
17.33m, Recently cut Tap roots, reduction in cross sectional area, at joint, Obstruction: <5%, General Comments Cleaning Req for acc report, at 10 o'clock



Photo: 45_45_280_B.JPG, 00:03:09
17.33m, Recently cut Tap roots, reduction in cross sectional area, at joint, Obstruction: <5%, General Comments Cleaning Req for acc report, at 10 o'clock

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Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**43**	



Photo: 45_45_281_A.JPG, 00:04:08
21.22m, Connection, good workmanship, connection appears to be open, diameter 150mm , at 10 o'clock



Photo: 45_45_281_B.JPG, 00:04:08
21.22m, Connection, good workmanship, connection appears to be open, diameter 150mm , at 10 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**43**	



Photo: 45_45_282_A.JPG, 00:04:45
22.36m, Tap Roots, reduction in cross sectional area , Obstruction: 51-75%, General Comments Cleaning Req for acc report, from 6 to 12 o'clock

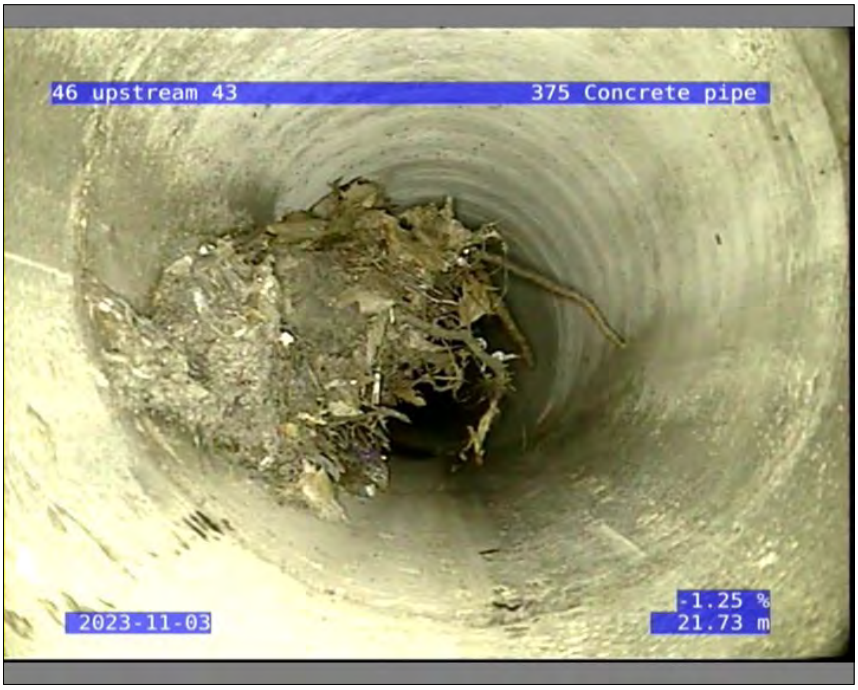


Photo: 45_45_282_B.JPG, 00:04:45
22.36m, Tap Roots, reduction in cross sectional area , Obstruction: 51-75%, General Comments Cleaning Req for acc report, from 6 to 12 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**43**	



Photo: 45_45_283_A.JPG, 00:05:02
22.57m, Inspection (survey) abandoned, roots, General Comments Cleaning Req for acc report

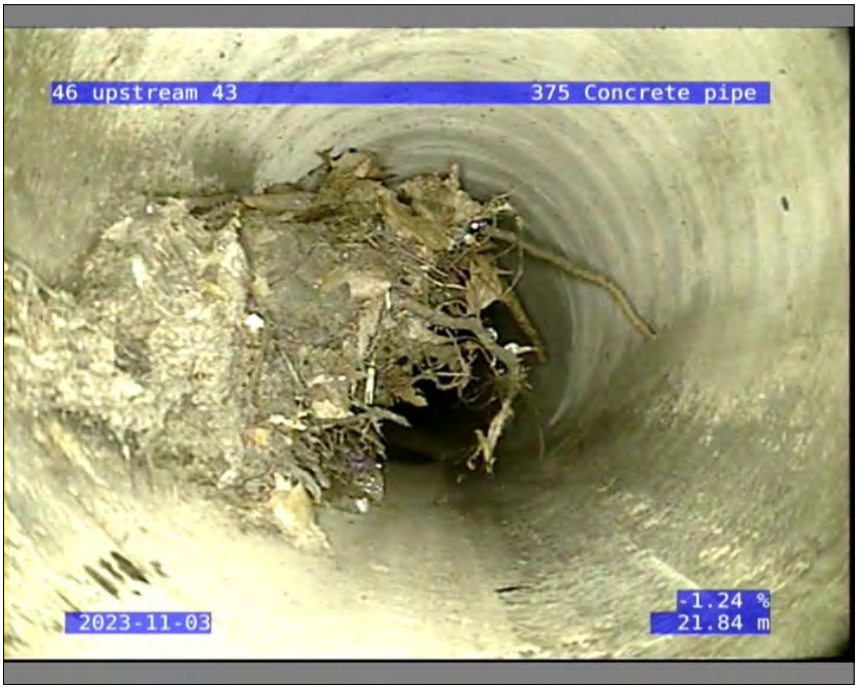


Photo: 45_45_283_B.JPG, 00:05:02
22.57m, Inspection (survey) abandoned, roots, General Comments Cleaning Req for acc report

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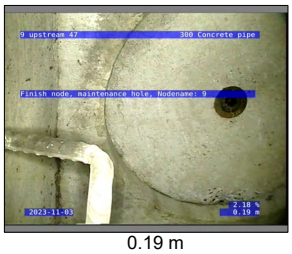
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
3/11/2023	**WO75488**	**Shane Dawes**	**44**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**1**		

Location:	**Dickson Shops**	Pipe Diameter:	**300 mm**	Start Manhole:	**9**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**47**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**0.19 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**1150**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

1:50	Position	Code	Observation	Grade
47	0.00	STMH	Start node, maintenance hole, Nodename: 47	
9	0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
	0.19	FHMH	Finish node, maintenance hole, Nodename: 9	



0.19 m



0.19 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**44**	



Photo: 46_46_286_A.JPG, 00:01:09
0.19m, Finish node, maintenance hole, Nodename: 9



Photo: 46_46_286_B.JPG, 00:01:09
0.19m, Finish node, maintenance hole, Nodename: 9

Binder 3a,293

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Inspection Report

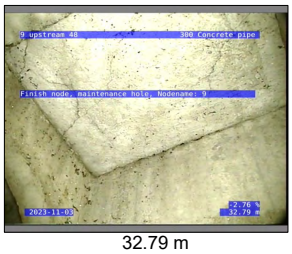
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
3/11/2023	**WO75488**	**Shane Dawes**	**45**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**1**		

Location:	**Dickson Shops**	Pipe Diameter:	**300 mm**	Start Manhole:	**9**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**48**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**32.79 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**1150**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

1:270 Position	Code	Observation	Grade
48			
0.00	STMH	Start node, maintenance hole, Nodename: 48	
0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
32.79	FHMH	Finish node, maintenance hole, Nodename: 9	
9			



32.79 m



32.79 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**45**	



Photo: 47_47_290_A.JPG, 00:05:49
32.79m, Finish node, maintenance hole, Nodename: 9



Photo: 47_47_290_B.JPG, 00:05:49
32.79m, Finish node, maintenance hole, Nodename: 9

Binder 3a,295

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Inspection Report

Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
3/11/2023	**WO75488**	**Shane Dawes**	**46**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**2**		

Location:	**Dickson Shops**	Pipe Diameter:	**300 mm**	Start Manhole:	**48**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**49**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**48.61 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

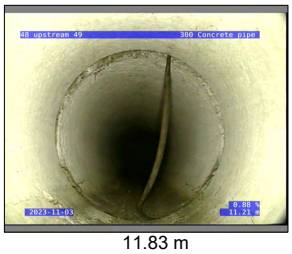
Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**900**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

1:390	Position	Code	Observation	Grade
49				
	0.00	STMH	Start node, maintenance hole, Nodename: 49	
	0.00	WLC	Water level, clear flow (the invert is visible), depth 0%	
	11.83	JDL	Joint displaced longitudinaly, longitudinal displacement >30mm	
	11.94	OBC	Obstruction, an object is entering through a connection, at joint, reduction in cross sectional area: <5% , from 12 to 6 o'clock	
	48.61	FHMH	Finish node, maintenance hole, Nodename: 48	
48				



11.83 m



11.83 m



11.94 m



11.94 m



48.61 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**1**	**5**	**0.1**	**5**	**2**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**46**	



Photo: 48_48_294_A.JPG, 00:02:57
11.83m, Joint displaced longitudinaly, longitudinal displacement >30mm



Photo: 48_48_294_B.JPG, 00:02:57
11.83m, Joint displaced longitudinaly, longitudinal displacement >30mm

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**46**	



Photo: 48_48_293_A.JPG, 00:02:31
11.94m, Obstruction, an object is entering through a connection, at joint, reduction in cross sectional area: <5% , from 12 to 6 o'clock



Photo: 48_48_293_B.JPG, 00:02:31
11.94m, Obstruction, an object is entering through a connection, at joint, reduction in cross sectional area: <5% , from 12 to 6 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**3/11/2023**	**46**	



Photo: 48_48_295_A.JPG, 00:08:27
48.61m, Finish node, maintenance hole, Nodename: 48



Photo: 48_48_295_B.JPG, 00:08:27
48.61m, Finish node, maintenance hole, Nodename: 48

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Inspection Report

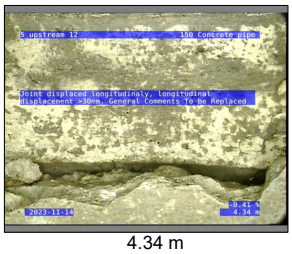
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
14/11/2023	**WO75488**	**Shane Dawes**	**47**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**3**	**1**		

Location:	**Dickson Shops**	Pipe Diameter:	**150 mm**	Start Manhole:	**5**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**12**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**4.90 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

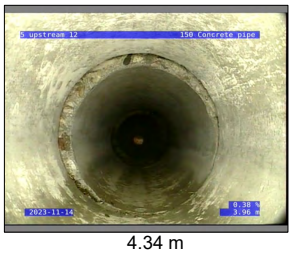
Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**900**
Pipe Unit Length:		Perciptiation:	**No**

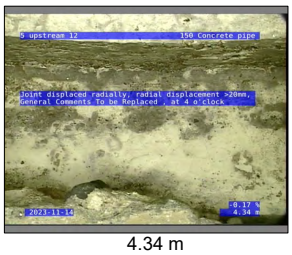
Comments:

1:50	Position	Code	Observation	Grade
12				
	0.00	STMH	Start node, maintenance hole, Nodename: 12	
	0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
	4.34	JDL	Joint displaced longitudinaly, longitudinal displacement >30mm, General Comments To be Replaced	
	4.34	JDR	Joint displaced radially, radial displacement >20mm, General Comments To be Replaced , at 4 o'clock	
5				
	4.90	CNPO	Connection, poor workmanship, connection appears to be open , diameter 100mm	
	4.90	FHMH	Finish node, maintenance hole, Nodename: 5	



4.34 m


4.34 m



4.34 m


4.34 m



4.9 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	**5**	**1.02**	**5**	**3**	**0**	**0**	**0**	**0**	**1**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**47**	

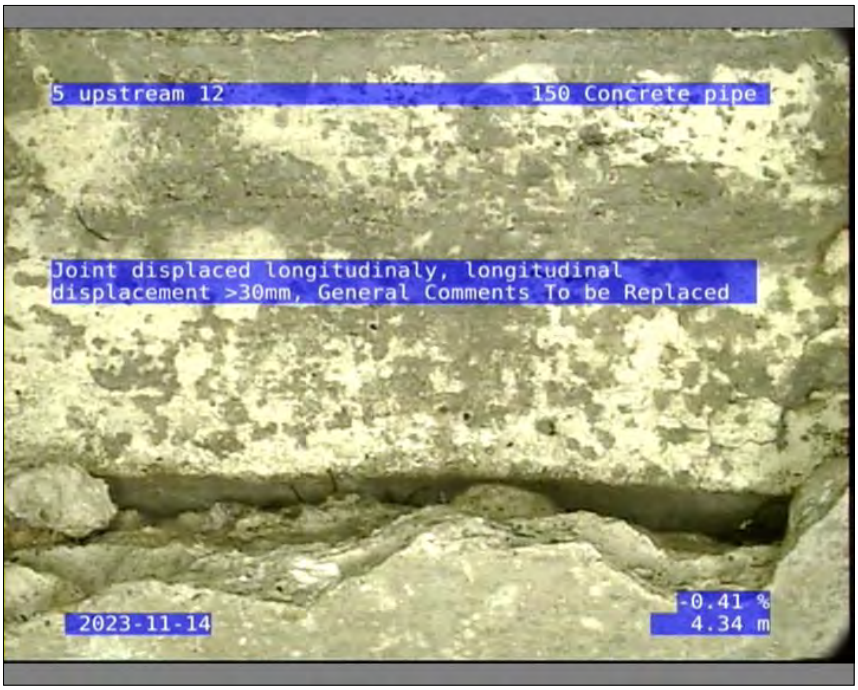


Photo: 49_49_298_A.JPG, 00:02:14
4.34m, Joint displaced longitudinaly, longitudinal displacement >30mm, General Comments To be Replaced



Photo: 49_49_298_B.JPG, 00:02:14
4.34m, Joint displaced longitudinaly, longitudinal displacement >30mm, General Comments To be Replaced

Binder 3a,301

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**47**	

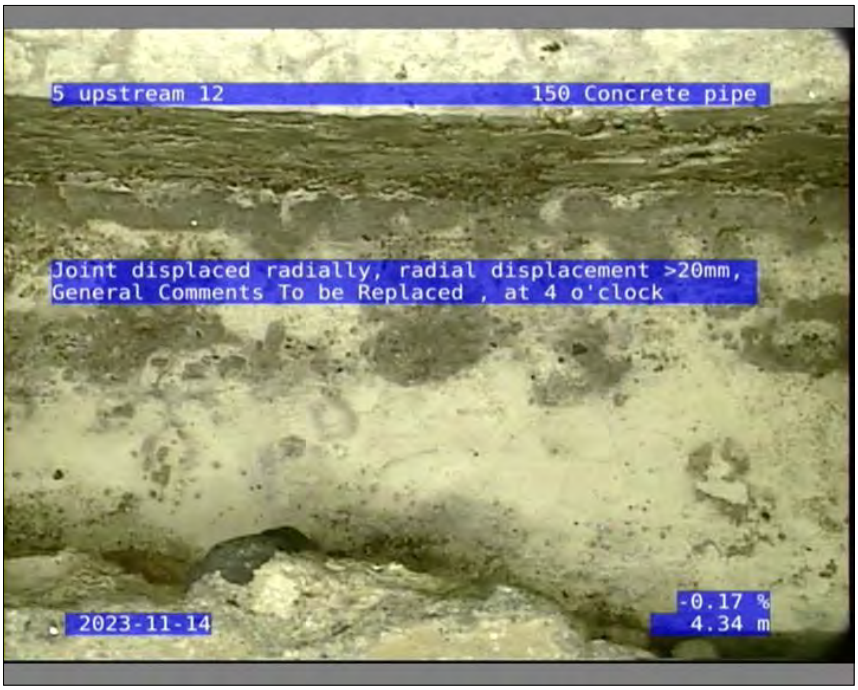


Photo: 49_49_301_A.JPG, 00:04:05
4.34m, Joint displaced radially, radial displacement >20mm, General Comments To be Replaced , at 4 o'clock



Photo: 49_49_301_B.JPG, 00:04:05
4.34m, Joint displaced radially, radial displacement >20mm, General Comments To be Replaced , at 4 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**47**	



Photo: 49_49_299_A.JPG, 00:03:29
4.9m, Connection, poor workmanship, connection appears to be open , diameter 100mm



Photo: 49_49_299_B.JPG, 00:03:29
4.9m, Connection, poor workmanship, connection appears to be open , diameter 100mm

Binder 3a,303

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**47**	



Photo: 49_49_300_A.JPG, 00:04:05
4.9m, Finish node, maintenance hole, Nodename: 5



Photo: 49_49_300_B.JPG, 00:04:05
4.9m, Finish node, maintenance hole, Nodename: 5

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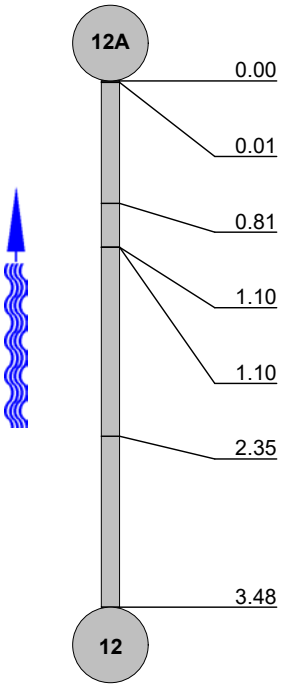
Inspection Report

Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
14/11/2023	**WO75488**	**Shane Dawes**	**48**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**5**	**1**		

Location:	**Dickson Shops**	Pipe Diameter:	**150 mm**	Start Manhole:	**12**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**12A**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**3.48 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**800**
Pipe Unit Length:		Perciptiation:	**No**

Comments:



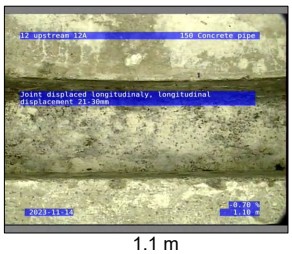
1:50 Position	Code	Observation	Grade
0.00	STGP	Start node, grated inlet pit, Nodename: 12A	
0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
0.81	BM	Breaking, some pieces are missing , length of break 100, General Comments Suspected, at 2 o'clock	
1.10	JDL	Joint displaced longitudinaly, longitudinal displacement 21-30mm	
1.10	JDR	Joint displaced radially, radial displacement 11-20mm , at 4 o'clock	
2.35	JDR	Joint displaced radially, radial displacement 11-20mm , at 4 o'clock	
3.48	FHGP	Finish node, grated inlet pit, Nodename: 12	



0.81 m



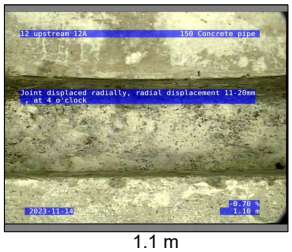
0.81 m



1.1 m



1.1 m



1.1 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
4	**67**	**20.68**	**72**	**5**	**0**	**0**	**0**	**0**	**1**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**48**	



Photo: 50_50_304_A.JPG, 00:01:07
0.81m, Breaking, some pieces are missing , length of break 100, General Comments Suspected, at 2 o'clock



Photo: 50_50_304_B.JPG, 00:01:07
0.81m, Breaking, some pieces are missing , length of break 100, General Comments Suspected, at 2 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**48**	



Photo: 50_50_305_A.JPG, 00:02:31
1.1m, Joint displaced longitudinaly, longitudinal displacement 21-30mm



Photo: 50_50_305_B.JPG, 00:02:31
1.1m, Joint displaced longitudinaly, longitudinal displacement 21-30mm

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**48**	



Photo: 50_50_306_A.JPG, 00:02:36
1.1m, Joint displaced radially, radial displacement 11-20mm , at 4 o'clock



Photo: 50_50_306_B.JPG, 00:02:36
1.1m, Joint displaced radially, radial displacement 11-20mm , at 4 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**48**	



Photo: 50_50_307_A.JPG, 00:03:29
2.35m, Joint displaced radially, radial displacement 11-20mm , at 4 o'clock



Photo: 50_50_307_B.JPG, 00:03:29
2.35m, Joint displaced radially, radial displacement 11-20mm , at 4 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**48**	



Photo: 50_50_308_A.JPG, 00:04:17
3.48m, Finish node, grated inlet pit, Nodename: 12



Photo: 50_50_308_B.JPG, 00:04:17
3.48m, Finish node, grated inlet pit, Nodename: 12

Binder 3a,310

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Inspection Report

Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
14/11/2023	**WO75488**	**Shane Dawes**	**49**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**5**	**5**		

Location:	**Dickson Shops**	Pipe Diameter:	**225 mm**	Start Manhole:	**28B**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**43**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**6.01 m**
Location Type:	**Developed**	Lining:		Direction:	**downstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**800**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

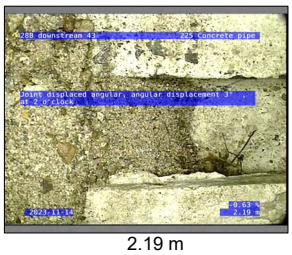
1:60	Position	Code	Observation	Grade
28B	0.00	STMH	Start node, maintenance hole, Nodename: 28B	
	0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
	1.53	DES	Deposit is fine sediments- Sand or Silt in the invert, at joint , Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 4 t	
	2.19	JDA	Joint displaced angular, angular displacement 3° , at 2 o'clock	
	5.99	EYY	Suspected Exfiltration, at joint, General Comments To be Replaced, from 2 to 4 o'clock	
	6.01	CNPO	Connection, poor workmanship, connection appears to be open , diameter 300mm	
	6.01	CXD	Defective Connection - The connecting pipe is damaged, magnitude of obstruction 5-20%, General Comments To be Replaced, at 2 o'clock	
	6.01	VV	Void visible through defect, at joint, General Comments To be Replaced	
43	6.01	SV	Soil visible through defect, at joint, General Comments To be Replaced	
	6.01	RT	Tap Roots, reduction in cross sectional area, at joint, Obstruction: 21-50%, General Comments To be Replaced, from 5 to 9 o'clock	
	6.01	FHJ	Finish node, junction or connection with another conduit, Nodename: 43 , General Comments To be Replaced	



1.53 m



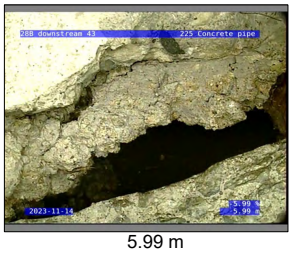
1.53 m



2.19 m



2.19 m



5.99 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
2	**120**	**19.96**	**120**	**5**	**3**	**40**	**11.64**	**70**	**5**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	



Photo: 51_51_311_A.JPG, 00:00:56
1.53m, Deposit is fine sediments- Sand or Silt in the invert, at joint , Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 4 to 8 o'clock



Photo: 51_51_311_B.JPG, 00:00:56
1.53m, Deposit is fine sediments- Sand or Silt in the invert, at joint , Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 4 to 8 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	



Photo: 51_51_312_A.JPG, 00:01:52
2.19m, Joint displaced angular, angular displacement 3° , at 2 o'clock



Photo: 51_51_312_B.JPG, 00:01:52
2.19m, Joint displaced angular, angular displacement 3° , at 2 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	



Photo: 51_51_319_A.JPG, 00:04:56
5.99m, Suspected Exfiltration, at joint, General Comments To be Replaced, from 2 to 4 o'clock



Photo: 51_51_319_B.JPG, 00:04:56
5.99m, Suspected Exfiltration, at joint, General Comments To be Replaced, from 2 to 4 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	



Photo: 51_51_313_A.JPG, 00:03:28
6.01m, Connection, poor workmanship, connection appears to be open , diameter 300mm



Photo: 51_51_313_B.JPG, 00:03:28
6.01m, Connection, poor workmanship, connection appears to be open , diameter 300mm

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	

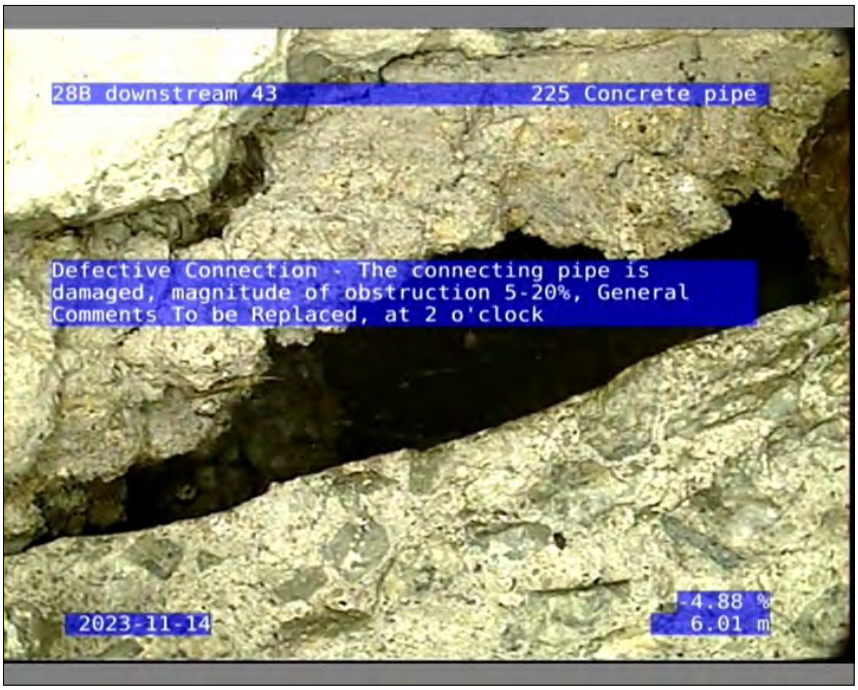


Photo: 51_51_314_A.JPG, 00:03:40
6.01m, Defective Connection - The connecting pipe is damaged, magnitude of obstruction 5-20%, General Comments To be Replaced, at 2 o'clock



Photo: 51_51_314_B.JPG, 00:03:40
6.01m, Defective Connection - The connecting pipe is damaged, magnitude of obstruction 5-20%, General Comments To be Replaced, at 2 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	

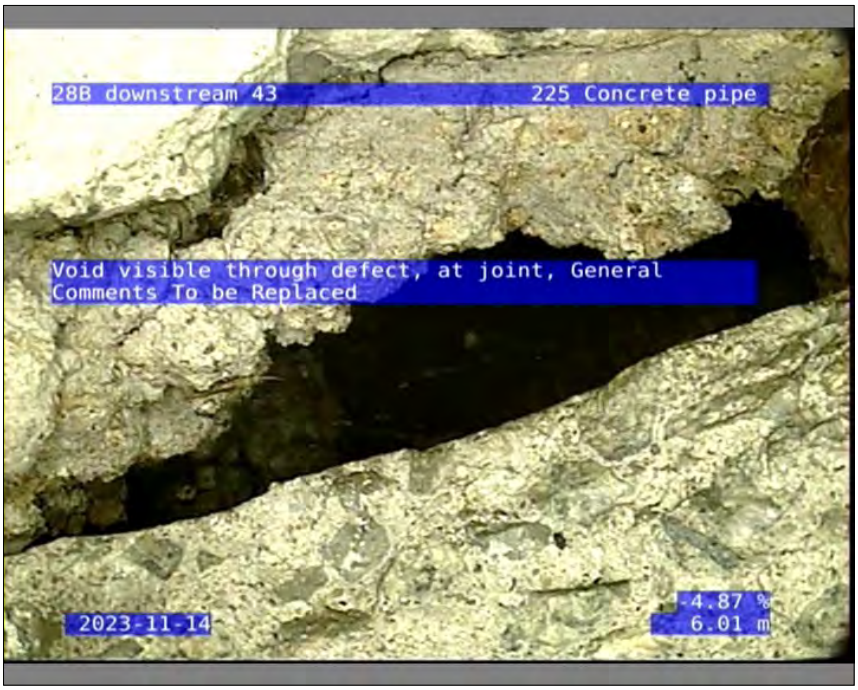


Photo: 51_51_315_A.JPG, 00:03:45
6.01m, Void visible through defect, at joint, General Comments To be Replaced



Photo: 51_51_317_B.JPG, 00:03:45
6.01m, Void visible through defect, at joint, General Comments To be Replaced

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	



Photo: 51_51_316_A.JPG, 00:03:52
6.01m, Soil visible through defect, at joint, General Comments To be Replaced



Photo: 51_51_317_B.JPG, 00:03:52
6.01m, Soil visible through defect, at joint, General Comments To be Replaced

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	

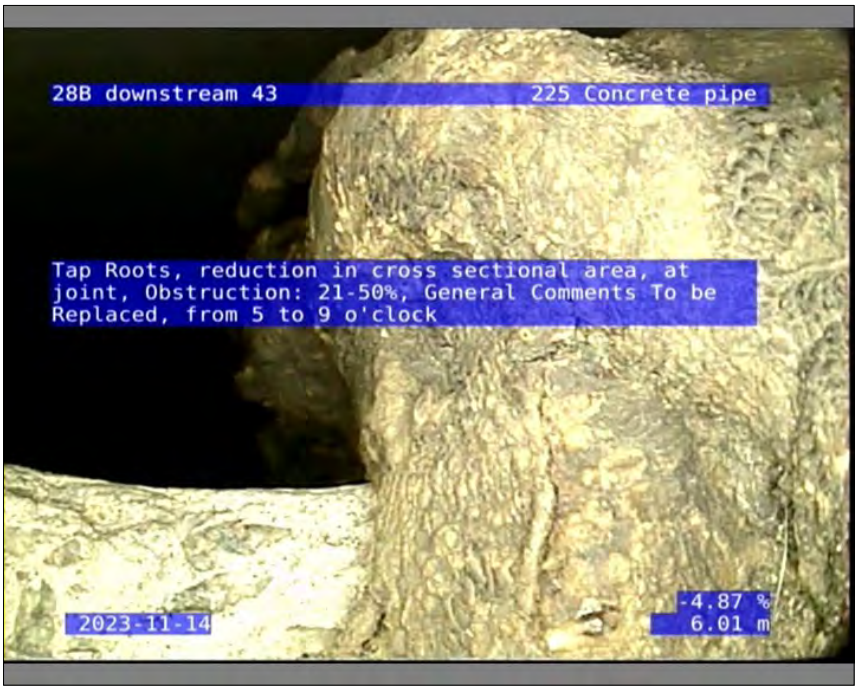


Photo: 51_51_317_A.JPG, 00:04:23
6.01m, Tap Roots, reduction in cross sectional area, at joint, Obstruction: 21-50%, General Comments To be Replaced, from 5 to 9 o'clock



Photo: 51_51_317_B.JPG, 00:04:23
6.01m, Tap Roots, reduction in cross sectional area, at joint, Obstruction: 21-50%, General Comments To be Replaced, from 5 to 9 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**49**	



Photo: 51_51_318_A.JPG, 00:04:56
6.01m, Finish node, junction or connection with another conduit, Nodename: 43 ,
General Comments To be Replaced



Photo: 51_51_318_B.JPG, 00:04:56
6.01m, Finish node, junction or connection with another conduit, Nodename: 43 ,
General Comments To be Replaced

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Inspection Report

Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
14/11/2023	**WO75488**	**Shane Dawes**	**50**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**1**		

Location:	**Dickson Shops**	Pipe Diameter:	**225 mm**	Start Manhole:	**28B**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**28**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**0.53 m**
Location Type:	**Developed**	Lining:		Direction:	**downstream**

Purpose of inspection :	**Structural exam**	Cleaning:	**cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:	**Circular**	Start Manhole Depth:	**800**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

1:50	Position	Code	Observation	Grade
28B	0.00	STGP	Start node, grated inlet pit, Nodename: 20B	
	0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
	0.53	SAOB	Inspection (survey) abandoned, obstruction , General Comments Cleaning Req for acc report	



0.52 m



0.52 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**

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P.O Box 575
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Email: info@flexibledrain.com

Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shops	**Dickson**	**14/11/2023**	**50**	



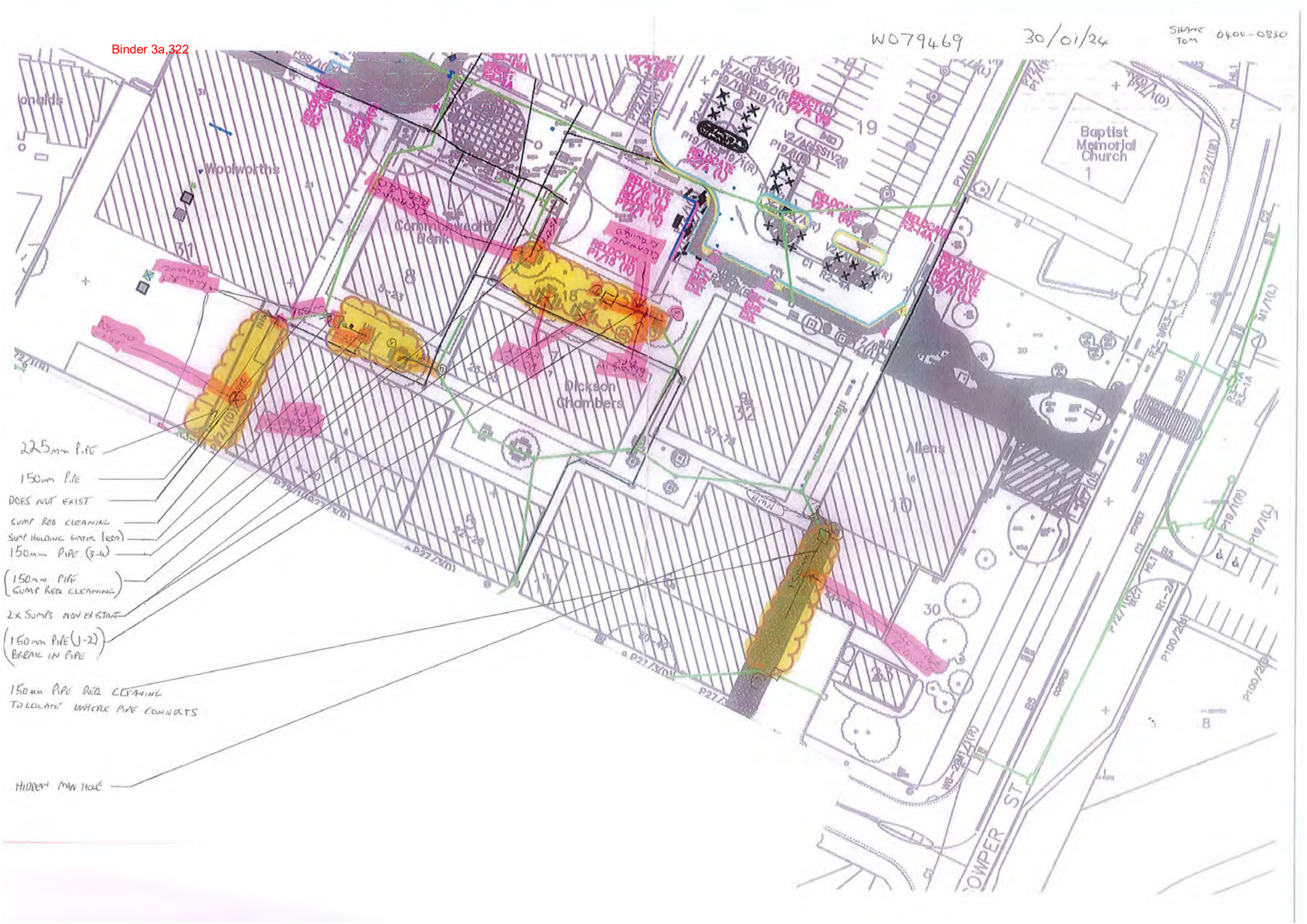
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0.52m, Inspection (survey) abandoned, obstruction , General Comments Cleaning Req for acc report



Photo: 52_52_322_B.JPG, 00:00:46
0.52m, Inspection (survey) abandoned, obstruction , General Comments Cleaning Req for acc report

Binder 3a,322

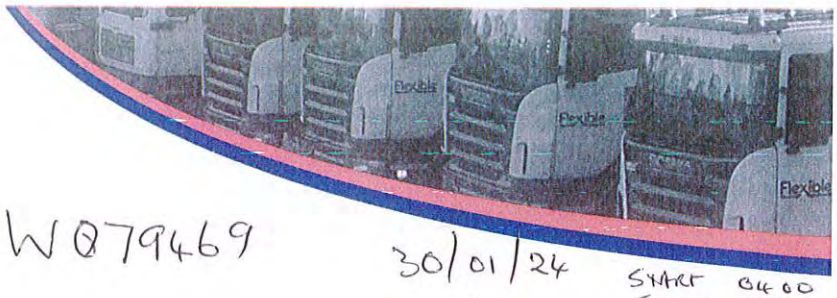
W079469 30/01/24 SHANE TOM 0400-0850




Binder 3a,323
NOTE: GAPS IN WAE INFORMATION FOR EXISTING SW PIPE NETWORK CLOUDED IN PURPLE.
ANTILL ST
BADHAM ST
COWPER ST
DICKSON PL
TC97-143 APPD.
TC98-185 APPD.
Health Centre
Dickson Park
Baptist Memorial Church
Swimming Pool
Library
McDonalds
Woolworths
Commonwealth Bank
Dickson Chambers
Aldents
Canberra Tradesmens Union Club
Garages
Shops
BICYCLE MUSEUM
DONNER HOUSE
MELBA ST
DUNHARESQ STREET

Binder 3a,324

Flexible
When Performance Matters



WQ79469

30/01/24 START 0400
FINISH 08:30

SHANE/TOM

	SER	RUN	PIPE SIZE	RUN LENGTH	
	1	1-2	150mm	10.39m	5.14m - SIMPLE CRACK APPROX 5mm THICK
					INSPECTION ABANDONED ROOTS/LEAVES
	2	2-1	150mm	2.19m	2.09m - BROKEN PIPE APPROXIMATELY 200mm LONG
					INSPECTION ABANDONED ROOTS/LEAVES
	3	3-4	150	2.98m	1.51m - DEPOSITE HARD/COMPACTED MATERIAL IN
					THE INVERT 5-20%

Binder 3a,325

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Fax:
Email: info@flexibledrain.com

Table of contents

Project Name:	Project number:	Date:	Contact:	
WO79469		30/01/2024		

Inspection: 1

Section: 1, 1 --- 2 1

Section: 2, 2 --- 1 5

Section: 3, 3 --- 4 9

Binder 3a,326

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Fyshwick ACT 2609
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Inspection Report

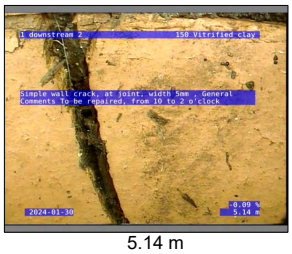
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
30/01/2024	**WO79469**	**Shane Dawes**	**1**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**5**		

Location:	**Dickson Shopping Centre**	Pipe Diameter:	**150 mm**	Start Manhole:	**1**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**2**
State:	**ACT**	Pipe Material:	**Vitrified clay**	Section Length :	**12.39 m**
Location Type:	**Developed**	Lining:		Direction:	**downstream**

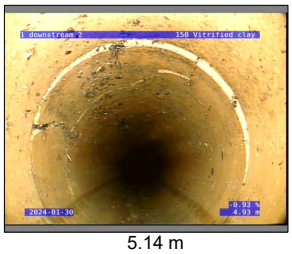
Purpose of inspection :	**Operational exam**	Cleaning:	**not cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:		Start Manhole Depth:	**350**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

1:105 Position	Code	Observation	Grade
1			
0.00	STGP	Start node, grated inlet pit, Nodename: 1	
0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
5.14	CSW	Simple wall crack, at joint, width 5mm , General Comments To be repaired, from 10 to 2 o'clock	
12.39	DEZ	Other Deposits in the invert, Compo, at joint , Obstruction: >75%, General Comments Cleaning Req for acc report, from 12 to 12 o'clock	
12.39	SAOB	Inspection (survey) abandoned, obstruction , General Comments Cleaning Req for acc report	



5.14 m



5.14 m



12.38 m



12.38 m



12.38 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	**1**	**0.08**	**1**	**1**	**1**	**60**	**4.84**	**60**	**5**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**1**	



Photo: 1_1_4_A.JPG, 00:02:00
5.14m, Simple wall crack, at joint, width 5mm , General Comments To be repaired, from 10 to 2 o'clock



Photo: 1_1_4_B.JPG, 00:02:00
5.14m, Simple wall crack, at joint, width 5mm , General Comments To be repaired, from 10 to 2 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**1**	



Photo: 1_1_5_A.JPG, 00:03:35
12.38m, Other Deposits in the invert, Compo, at joint , Obstruction: >75%, General Comments Cleaning Req for acc report, from 12 to 12 o'clock



Photo: 1_1_5_B.JPG, 00:03:35
12.38m, Other Deposits in the invert, Compo, at joint , Obstruction: >75%, General Comments Cleaning Req for acc report, from 12 to 12 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**1**	



Photo: 1_1_6_A.JPG, 00:03:42
12.38m, Inspection (survey) abandoned, obstruction , General Comments Cleaning Req for acc report



Photo: 1_1_6_B.JPG, 00:03:42
12.38m, Inspection (survey) abandoned, obstruction , General Comments Cleaning Req for acc report

Binder 3a,330

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Inspection Report

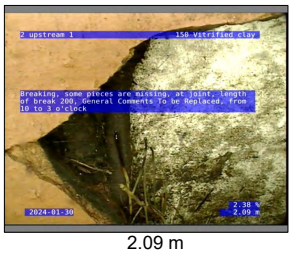
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
30/01/2024	**WO79469**	**Shane Dawes**	**2**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**5**	**3**		

Location:	**Dickson Shopping Centre**	Pipe Diameter:	**150 mm**	Start Manhole:	**2**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**1**
State:	**ACT**	Pipe Material:	**Vitrified clay**	Section Length :	**2.19 m**
Location Type:	**Developed**	Lining:		Direction:	**upstream**

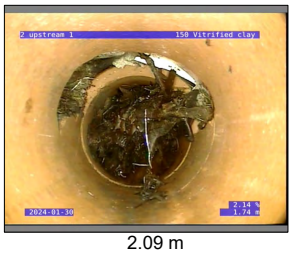
Purpose of inspection :	**Operational exam**	Cleaning:	**not cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:		Start Manhole Depth:	**550**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

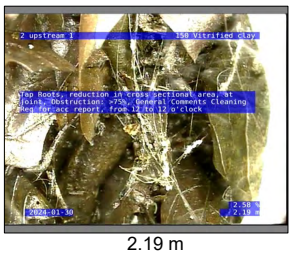
1:50	Position	Code	Observation	Grade
1	0.00	STGP	Start node, grated inlet pit, Nodename: 1	
	0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
	2.09	BM	Breaking, some pieces are missing, at joint, length of break 200, General Comments To be Replaced, from 10 to 3 o'clock	
	2.19	RT	Tap Roots, reduction in cross sectional area, at joint, Obstruction: >75%, General Comments Cleaning Req for acc report, from 12 to 12 o'cloc	
	2.19	SAR	Inspection (survey) abandoned, roots, General Comments Cleaning Req for acc report	



2.09 m



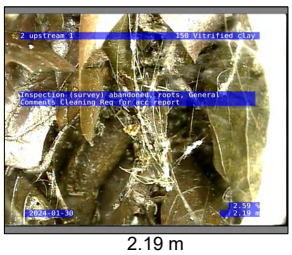
2.09 m



2.19 m



2.19 m



2.19 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	**60**	**27.43**	**60**	**5**	**1**	**10**	**4.57**	**10**	**3**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**2**	



Photo: 3_3_9_A.JPG, 00:01:50
2.09m, Breaking, some pieces are missing, at joint, length of break 200, General Comments To be Replaced, from 10 to 3 o'clock



Photo: 3_3_9_B.JPG, 00:01:50
2.09m, Breaking, some pieces are missing, at joint, length of break 200, General Comments To be Replaced, from 10 to 3 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**2**	



Photo: 3_3_10_A.JPG, 00:02:07
2.19m, Tap Roots, reduction in cross sectional area, at joint, Obstruction: >75%, General Comments Cleaning Req for acc report, from 12 to 12 o'clock



Photo: 3_3_10_B.JPG, 00:02:07
2.19m, Tap Roots, reduction in cross sectional area, at joint, Obstruction: >75%, General Comments Cleaning Req for acc report, from 12 to 12 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**2**	



Photo: 3_3_11_A.JPG, 00:02:12
2.19m, Inspection (survey) abandoned, roots, General Comments Cleaning Req for acc report



Photo: 3_3_11_B.JPG, 00:02:12
2.19m, Inspection (survey) abandoned, roots, General Comments Cleaning Req for acc report

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Inspection Report

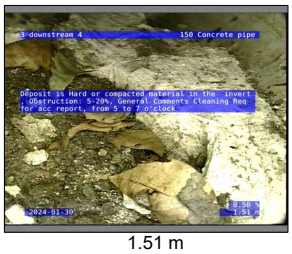
Date:	Asset Owner's Job Ref:	Operator:	Section Number:	Section ID:	Standard:
30/01/2024	**WO79469**	**Shane Dawes**	**3**		**WSA 05-2006**
Method of inspection:	LRP:	Structural Grade:	Service Grade:	Expected Length	
Television Camera	**Other**	**1**	**5**		

Location:	**Dickson Shopping Centre**	Pipe Diameter:	**150 mm**	Start Manhole:	**3**
Suburb:	**Dickson**	Pipe Width:		Finish Manhole:	**4**
State:	**ACT**	Pipe Material:	**Concrete pipe**	Section Length :	**2.98 m**
Location Type:	**Developed**	Lining:		Direction:	**downstream**

Purpose of inspection :	**Operational exam**	Cleaning:	**not cleaned**
Use of pipe:		Flow Control:	**No measures**
Shape of Pipe:		Start Manhole Depth:	**700**
Pipe Unit Length:		Perciptiation:	**No**

Comments:

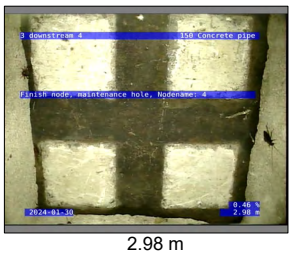
1:50	Position	Code	Observation	Grade
3				
	0.00	STGP	Start node, grated inlet pit, Nodename: 3	
	0.01	WLC	Water level, clear flow (the invert is visible), depth 0%	
	1.51	DEC	Deposit is Hard or compacted material in the invert , Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 5 to 7 o'clock	
	2.98	FHMH	Finish node, maintenance hole, Nodename: 4	
4				



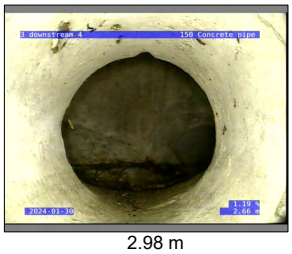
1.51 m



1.51 m



2.98 m



2.98 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**1**	**30**	**10.07**	**30**	**5**

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**3**	



Photo: 4_4_14_A.JPG, 00:01:03
1.51m, Deposit is Hard or compacted material in the invert , Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 5 to 7 o'clock



Photo: 4_4_14_B.JPG, 00:01:03
1.51m, Deposit is Hard or compacted material in the invert , Obstruction: 5-20%, General Comments Cleaning Req for acc report, from 5 to 7 o'clock

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Inspection Pictures

Location:	Suburb:	Date :	Section number:	Sewer Ref.:
Dickson Shopping Centre	**Dickson**	**30/01/2024**	**3**	



Photo: 4_4_15_A.JPG, 00:02:03
2.98m, Finish node, maintenance hole, Nodename: 4



Photo: 4_4_15_B.JPG, 00:02:03
2.98m, Finish node, maintenance hole, Nodename: 4

Appendix E

Geotechnical Site Investigation Report

Binder 3a,338

GEOTECHNICAL INVESTIGATION REPORT

FORTIFY GEOTECH

Dickson Shops & Streetscape Upgrade

CLIENT

OCULUS

ADDRESS

Block 33, Section 30, Dickson, ACT

DATE

January 2025



Binder 3a,339
2/157 Newcastle St, Fyshwick, ACT, 2609
PO Box 9225, Deakin ACT 2600

ACT Geotechnical Engineers
trading as Fortify Geotech
ABN:19 063 673 530

(02) 6285 1547
FortifyGeotech.com.au

23 January 2025
Our ref: AP/C15916

Client: OCULUS

Via email: PETA@OCULUS.INFO

Attention: Peta

DICKSON SHOPS & STREETSCAPE UPGRADE
BLOCK 33, SECTION 30, DICKSON, ACT
Geotechnical Investigation Report

We are pleased to present our geotechnical investigation report for the proposed Dickson Shops & Streetscape Upgrade at Dickson shops area, in Dickson ACT.

The report outlines the methods and results of exploration, describes site subsurface conditions and provides recommendations for building footing design, excavation conditions, excavation support, preparation of subgrades, stability of cut and fill batters, retaining wall design, earthquake classification, site drainage and other geotechnical advice.

Should you require any further information regarding this report, please do not hesitate to contact our office.

Yours faithfully,

Fortify Geotech Pty Ltd

Written by:



Ajaya Poudel
Geotechnical Engineer
M. Eng (Civil)

Reviewed by:



Jeremy Murray
Senior Geotechnical Engineer | Director
FIEAust CPEng Eng Exec NER RPEQ APEC Engineer IntPE(Aust)
Registered Professional Engineer of Queensland (RPEQ) #19719
NSW Professional Engineer Registration #PRE0001487

About us

We work with our clients to provide practical advice and solutions tailored to each project. Our professional services are reliable, responsive and efficient.

Our highly capable Geotechnical Engineers and Geologists have a comprehensive understanding of the industry. We provide the best engineering solution for complicated geotechnical engineering issues. This has earned us a solid reputation with our Construction Industry, Municipal and Government clients.

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- Residential
- Commercial
- Transport Infrastructure
- Industrial Developments of all sizes.

SERVICES

- Geotechnical Site Investigations and Reporting;
- Engineering Geology;
- Mining/Rock Geotechnics;
- Foundation Engineering;
- Dam Engineering; Embankment Design and Specification;
- Geotechnical Design Recommendations;
- Pavement Engineering and Design;
- Pavement Condition Surveys;
- Slope Stability and Risk Assessments;
- Geotechnical and Hydrological Instrumentation and Monitoring;
- Footing and Excavation Supervision and Certifications;
- Excavated soil/rock assessments and VENM assessments;
- Supervision and Certification of Earthworks and Controlled Fill, including Level 1 supervision;
- Geotechnical Construction Specifications;
- Deep Excavation Support; and
- Slope/Retaining Structure Analysis and Design

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2.2 Topography and Drainage 2
2.3 Regional Geology 2
3 INVESTIGATION METHODS 3
4 INVESTIGATION RESULTS 3
4.1 Subsurface Conditions 3
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Appendix A: Borehole Logs BH1 to BH7

Appendix B: Definitions of Geotechnical Engineering Terms

Binder 3a,343

FORTIFY
GEOTECH

Geotechnical Investigation Report

Dickson Shops & Streetscape Upgrade - Block 33, Section 30, Dickson, ACT

QUALITY INFORMATION

Revision history

Reference/ Revision	Description	Date	Author	Reviewer
AP/C15916 Rev0	Geotechnical Investigation Report	22/01/2025	AP	JM

OCULUS

Dickson Shops & Streetscape Upgrade – Block 33, Section 30, Dickson, ACT

Geotechnical Investigation Report

1 INTRODUCTION

At the request of Oculus, Fortify Geotech Pty Ltd carried out a geotechnical investigation for a proposed Dickson Shops & Streetscape Upgrade at Dickson shops area, in Dickson, ACT.

It has been indicated that the project will comprise stormwater system upgrade, lighting replacement, paving replacement, furniture installation, planter bed retaining walls, decking, landscape terraces, and soft landscaping works.

The aim of the investigation was to:

(i) Identify subsurface conditions including the extent and nature of any fill materials, soil strata, bedrock type and depth, and groundwater presence.

(ii) Provide site classification to AS2870 “Residential Slabs & Footings”.

(iii) Advise on suitable footings systems, founding depths, allowable bearing pressures and

(iv) Advise on design soil parameters, including unit weight, internal friction angle, cohesion, Young’s Modulus, Ka, Ko, & Kp.

(v) Advise on excavation conditions and suitability of excavated material for use as structural fill.

(vi) Provide guidelines for construction of controlled fill platforms.

(vii) Advise on stable batter slopes and retaining wall design parameters.

(viii) Provide earthquake classification of this site.

(ix) Advise on subgrade preparation and design CBR values

(x) Advise on drainage

2 SITE DESCRIPTION & GEOLOGY

2.1 SITE LOCATION AND SITE DESCRIPTION

The site is located within the Dickson Shops precinct, in proximity to the existing Woolworths, the Commonwealth Bank, and Australia Post. It is bounded by Dickson Place to the north and south, Cowper Street to the east, and Badham Street to the west. Figure 1 at the end of this report is a recent aerial photo showing the present site locality.

2.2 TOPOGRAPHY AND DRAINAGE

The majority of the investigated area falls within the vicinity of the local shop's building perimeter, which is predominantly covered with brick pavers. While the brick paver surface is generally flat in certain sections, signs of deformation were observed in some areas. Figure 2 is a recent satellite image showing the approximate location of the investigated boreholes. Drainage in surrounding streets is expected to be through pits and pipe network via street guttering.

2.3 REGIONAL GEOLOGY

The MinView online Seamless Geology map (*Reference 1)* indicates the site to be covered by Quaternary age alluvial deposits of unconsolidated grey to brown to beige humic (±)micaceous silty clay, quartz-(±)lithic silt, fine- to medium-grained quartz-rich to quartz-lithic sand, polymictic pebble to cobble gravel (as sporadic lenses); sporadic palaeosol horizons, underlain by Silurian age Canberra Formation bedrock, which includes mudstone, siltstone, minor sandstone, limestone, hornfels, dacitic ignimbrite volcaniclastics, minor agglomerate and lithic tuff. Plate 2-1 shows the seamless geology map extract.

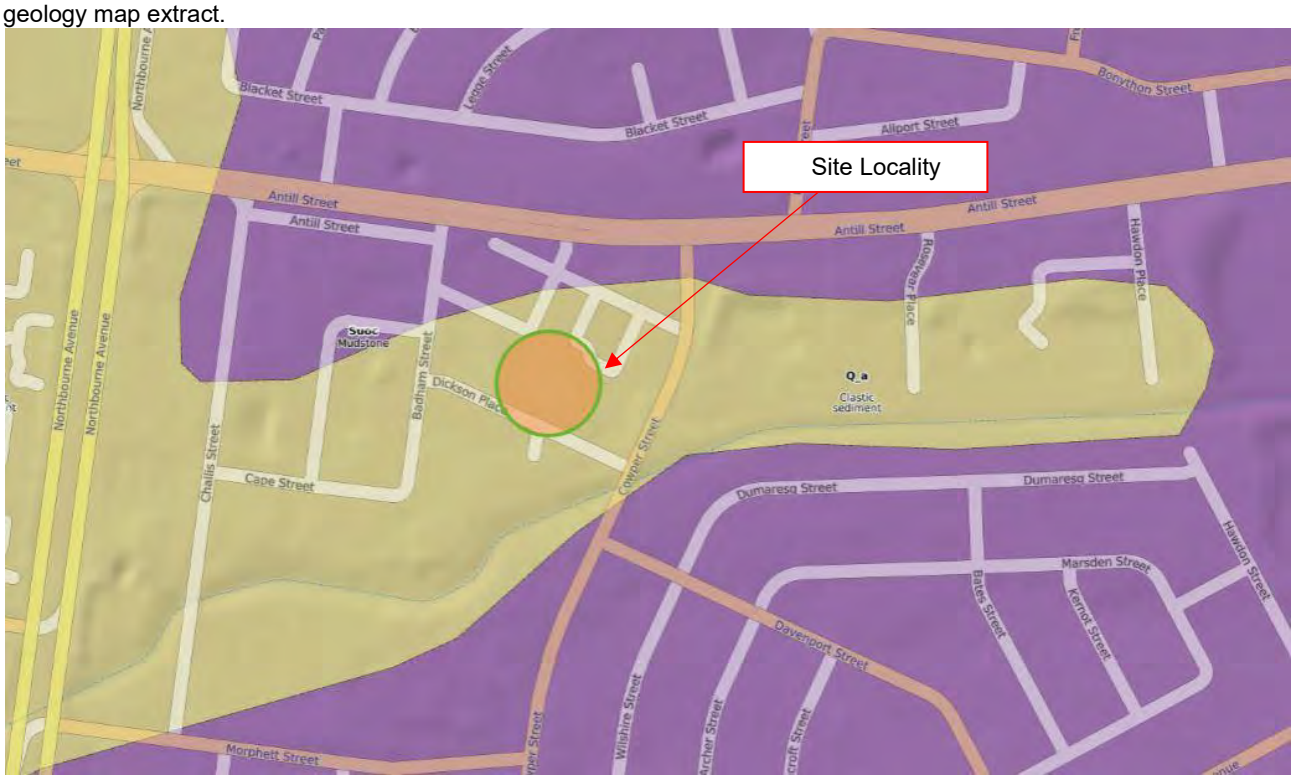


Plate 2-1: Seamless geology map extract

3 INVESTIGATION METHODS

To establish the subsurface conditions, a 50mm diameter push tube was used to drill five (5) boreholes, designated BH1 to BH5, on 20 January 2025. Additionally, two more boreholes, designated BH6 & BH7, were also drilled using concrete coring to check the thickness of the existing concrete slab. The investigation boreholes were targeted to drill to 2m depth from existing ground level, however, some of the boreholes encountered earlier refusal. The subsurface profiles were logged in general accordance with AS1726-2017 (*Reference 2*). The locations of the boreholes are shown on Figure 2, and the detailed logs are included in Appendix A. Definitions of geotechnical engineering terms used in the report on the borehole logs, including a copy of the USCS chart, are provided in Appendix B.

4 INVESTIGATION RESULTS

4.1 SUBSURFACE CONDITIONS

In summary, the results of the investigation indicate that the subsurface profile across the site comprises brick pavement over gravel and concrete slab, which is underlain by alluvial soil. The logs in Appendix A can be referred to for more detail. The investigation by 7 boreholes found the subsurface profile to comprise as shown in Table 4-1a.

Table 4-1a: Subsurface Profile Summary

Geological Profile	Unit	Description
BRICK PAVERS	Unit 1	Approximately 50mm thick layer of brick pavers
FILL	Unit 2a	Sandy GRAVEL/(DGB20): fine gravel/fine to coarse gravel, fine to coarse sand, grey/dark grey/black, dry, medium dense/medium dense to dense.
	Unit 2b	Silty Sandy CLAY: low to medium plasticity clay, fine to coarse sand, grey, brown, dry of plastic limit, firm.
CONCRETE SLAB	Unit 3	CONCRETE SLAB: Plain concrete slab with approx. 25mm thick on the streets and approx. 40mm thick on building slab.
SLOPEWASH	Unit 4	Silty SAND: fine to coarse sand, low plasticity silt, grey, trace of ferruginous nodules, dry to moist, medium dense.
ALLUVIAL SOIL	Unit 5a	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, mottled red and yellow brown, trace of ferruginous nodules, stiff to very stiff.
	Unit 5b	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, yellow brown, dry of plastic limit, very stiff.
	Unit 5c	Clayey Silty SAND: fine to coarse sand, low plasticity silt, low to medium plasticity clay, grey, dry to moist, dense.

The depth intervals of encountered soil in each borehole are shown in Table 4-1b.

Table 4-1b: Depth Interval of Each Soil Unit in Each Borehole

Geological Profile	Unit	Depth Interval Below Ground Level in Each Borehole (m)						
		BH1	BH2	BH3	BH4	BH5	BH6	BH7
BRICK PAVERS	Unit 1	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05	0-0.05
FILL	Unit 2a	0.05-0.2	0.05-0.2	0.05-0.15	0.05-0.15	0.05-0.2	0.05-0.26	0.05-0.26
	Unit 2b	-	0.2-0.3	-	-	-	-	-
CONCRETE SLAB	Unit 3	-	Refusal on Hard Surface at 0.3m below (*Likely Concrete Slab*)	0.15-0.175	-	-	0.26-0.3	0.26-0.3
SLOPEWASH	Unit 4	-		0.175-0.4	-	-		
ALLUVIAL SOIL	Unit 5a	0.2-1.0		0.4-0.9	0.15-1.0	0.2-0.85		
	Unit 5b	1.0->1.9		0.9->1.6	-	-		
	Unit 5c				1.0->1.5	0.85->1.5		

4.2 GROUNDWATER

Groundwater was not encountered in the boreholes and the soils were mostly dry & dry to moist. Permanent groundwater is not expected within at least 2m depth of existing ground surface levels. However, temporary, perched seepages could be encountered within the more pervious alluvial soils following rainfall.

5 DISCUSSION & RECOMMENDATIONS

5.1 GEOTECHNICAL PARAMETERS

Table 5-1 shows the estimated geotechnical parameters of the soil/rock units based on our visual assessment.

Table 5-1: Estimated Geotechnical Parameters

Geological Profile	Unit	Bulk Density γ_b (kN/m^3)	Cu (kPa)	Ø' (degrees)	Young's Modulus (MPa)	Poisson's Ratio	K_a	K_o	K_p
BRICK PAVEMENT	Unit 1	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
FILL	Unit 2a	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
	Unit 2b	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
CONCRETE SLAB	Unit 3	N. A	N. A	N. A	N. A	N. A	N. A	N. A	N. A
SLOPEWASH	Unit 4	19	0	25	20	0.35	0.41	0.58	2.45
ALLUVIAL SOIL	Unit 5a	20	50	25	30	0.3	0.41	0.58	2.45
	Unit 5b	20	75	25	30	0.3	0.41	0.58	2.45
	Unit 5c	20	25	30	30	0.3	0.33	0.50	3.0

Where,

γ_b = in-situ, dry unit weight, in kN/m^3
Cu = undrained cohesion, in kPa
Ø' = effective internal friction angle, in degrees
K_a = active pressure coefficient
K_0 = at rest coefficient
K_p = passive pressure coefficient

The above values can be used in software programs for design; however, it is recommended that the values for lateral earth pressures in Section 5.5 be used as a minimum.

5.2 SITE CLASSIFICATION

Due to the presence of mature trees within the influence distance of the proposed upgrade area, the site is designated as a Class "P" (problem) site in accordance with AS2870. (*Reference 3*)

With consideration to the reactivity of the soils within the depth of suction change, in terms of potential shrink-swell movements that may occur due to the soil moisture changes, including the additional suction induced by the trees in accordance with the method described by AS2870-2011 Appendix H, a characteristic ground surface movement "ys", is

estimated to be between 20mm to 40mm. Therefore the surface movement is equivalent to that of a Class “M” (moderately reactive) site.

Should earthworks (cut or fill) be undertaken on the site, or other activities which may cause abnormal moisture conditions to impact the soils within or near the building envelope beyond those addressed herein, the site classification shall be reassessed.

5.3 BUILDING FOOTINGS & GROUND SLABS

AS2870 provides “deemed-to-comply” footing/slab designs, which for a Class “M” site includes stiffened rafts, stiffened footing slabs, waffle rafts, and strip and/or pad footings with above ground floors. Footings and slabs should be designed in accordance with the principles of AS2870.

Footings including thickened sections of slabs must be founded below any topsoil, loose material and uncontrolled fill, into the alluvial soils. A depth of ~0.15/0.4m from existing levels may be required to reach a suitable founding stratum. Shallow excavations are expected to expose stiff to very stiff alluvial soils over the foundation, and suitable footings include shallow strip/pad footings foundations in the stiff alluvial soil.

If designing footings based on engineering principles, recommended allowable end-bearing pressures for various footing systems and likely foundation materials are provided in Table 5-3.

Table 5-3: Recommended Allowable End-Bearing Pressures for Footings

Foundation Material Type	Unit	Depth Below Existing Surface Level	Allowable End-Bearing Pressure			Allowable Shaft Adhesion on Piles	
			Strips	Pads	Piles	Downward Loading	Uplift
BRICK PAVEMENT	Unit 1	-	-	-	-	-	-
FILL	Unit 2a	-	N. A	N. A	N. A	N. A	N. A
	Unit 2b	-	N. A	N. A	N. A	N. A	N. A
CONCRETE SLAB	Unit 3	-	N. A	N. A	N. A	N. A	N. A
SLOPEWASH	Unit 4	-	N. A	N. A	N. A	N. A	N. A
ALLUVIAL SOIL	Unit 5a	Below 0.15m/0.4m	125kPa	150kPa	200kPa	20kPa	10kPa
	Unit 5b	Below 0.9m/1.0m	150kPa	200kPa	200kPa	20kPa	10kPa
	Unit 5c	Below >0.85m/>1.0m	150kPa	200kPa	250kPa	25kPa	12.5kPa

At allowable bearing pressure foundation settlement would be less than 1% of the footing width. All footings should be inspected and approved by an experienced geotechnical engineer to confirm the foundation material and design values, and to ensure the excavations are clean and stable.

Ground slabs can be constructed on the natural soils, following the removal of any topsoil and loose material. Following excavation to required level, slab areas on soil should be test rolled by a pad foot roller to check for any weak, wet or deforming soils that may require replacement. Suitable replacement fill should be compacted in not thicker than 150mm layers to not less than 95%ModMDD.

If required for design of ground slabs, a modulus of subgrade reaction of 50kPa/mm can be assumed for a natural alluvial soil or controlled fill foundation.

5.4 EXCAVATION CONDITIONS AND EXCAVATION SUPPORT

Proposed excavation depths have not been advised. The alluvial soil within the upper ~1.5/1.9m are readily diggable by backhoe and medium sized excavator.

The low/medium plasticity alluvial soils and weathered bedrock can be used in controlled fill construction of building platforms, although rock particles should be broken down to <75mm size. Any medium to high plasticity soil, and silty topsoil material are not typically used in controlled fill construction, but the topsoil could be used in non-structural applications such as landscaping, while high plasticity clays could be used as a clay capping/lining material.

If imported fill is required, a suitable select fill material would include a low or medium plasticity soil such as clayey sand or gravelly clayey sand, containing between 25% and 50% fines less than 0.075mm size (silt and clay), and no particles greater than 75mm size.

5.5 LOW RETAINING WALLS

Retaining walls constructed in open excavation, with the gap between the excavation face and the wall backfilled later, can be designed for an earth pressure distribution given by:

$$\sigma h = (K\gamma' h) + Kq$$

where,

σh	is the horizontal earth pressure acting on the back of the wall, in kPa
K	is the dimensionless coefficient of earth pressure; this can be assumed to be 0.4 when the top of the wall is unrestrained horizontally, and 0.6 when the top of the wall is restrained (i.e. by building slabs etc.)
γ'	is the effective unit weight of the backfill, and can be assumed to be 20kN/m3 for a lightly compacted soil backfill
h	is the height of the backfill, in metres
q	is any uniform distributed vertical surcharge acting on the top of the backfill, in kPa

5.6 CONTROLLED FILL CONSTRUCTION

For construction of any new fill foundation platforms and road subgrades, it is recommended that:

- Areas are fully stripped of all topsoil and uncontrolled fill material. A typical stripping depth of ~0.15m/0.4m is expected. Stripped foundations should be test rolled by a vibratory pad-foot roller of not less than 9 tonne static mass to check for any weak or wet areas that would require replacement. No fill should be placed until a geotechnical engineer has confirmed the suitability of the foundation.

- Controlled fill comprising suitable site excavated or imported materials of not greater than 75mm maximum particle size, be compacted in not greater than 150mm layers to a Density Ration not less than 95%ModMDD at about OMC.

- Fill placement and control testing be overviewed and certified by a geotechnical engineer at Level 1 or 2 involvement of AS3798 – 2007 “Guidelines on Earthworks for Commercial & Residential Developments”. (*Reference 4*)

5.7 DESIGN CBR VALUES

On-grade carpark, and access ramp subgrades should be stripped of all unsuitable material (uncontrolled fill/topsoil), and soil subgrades then test rolled by a pad-foot roller to check for any wet or otherwise weak spots which may require additional removal. Suitable replacement fill can be compacted in not thicker than 150mm layers, to not less than 95%ModMDD.

Carpark and access road pavements are expected to comprise alluvial soils, and pavements can be designed for a subgrade CBR value of 3% (for high plasticity clay subgrades) and *5% (for low and medium plasticity clay subgrades)*, when compacted to 95%ModMDD. A geotechnical engineer should inspect prepared subgrades to confirm design values and preferably view a test roll to identify any soft spots or other weaknesses.

5.8 EARTHQUAKE SITE FACTOR

Table 2.3 of AS1170.4 “Minimum Design Loads on Structures - Part 4: Earthquake Loads” lists the earthquake acceleration coefficients for major centres to be considered in structural design. The Canberra area has an acceleration coefficient of 0.08.

Section 4.2 of AS1170.4 “Minimum Design Loads on Structures – Part 4: Earthquake Loads” lists the site sub-soil classes to be considered in structural design. The site is classified as a “Class C_e – Shallow Soil Site”.

5.9 SITE DRAINAGE & SCOUR PROTECTION

Suitable surface drainage should be provided to ensure rainfall run-off or other surface water cannot pond against streetscape structures and ground slabs or pavements. Drainage should be provided behind all retaining walls, and subsoil drains should be installed along the upslope sides of access roads/street and carparks.

5.10 HOLD POINTS FOR GEOTECHNICAL INSPECTIONS

The following should be used as a guideline for hold points that require geotechnical inspections:

- All Footing excavations prior to pouring concrete
- All ground slabs to confirm the soil profile and bearing in adequate material.
- All unsupported excavations deeper than 1.5m to ensure batter stability
- Between 10% and 20% of all ground anchors be fully logged by a geotechnical engineer to confirm the design assumption for bond stress are correct
- All mobile crane and concrete pump foundations prior to mobile crane setting up on site
- All scaffold and formwork foundations on soil
- Vibration monitoring where rock hammering for the basement excavation is being conducted
- All ground slab and pavement subgrade foundations

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REFERENCES

Reference 1 minview.geoscience.nsw.gov.au.

Reference 2 AS 1726:2017 “Geotechnical Site Investigations”

Reference 3 Standards Australia, “AS2870 - Residential slabs and footings - Construction”, 2011.

Reference 4 Standards Australia, “AS3798 - Guidelines on Earthworks for Commercial & Residential Developments”, 1996.

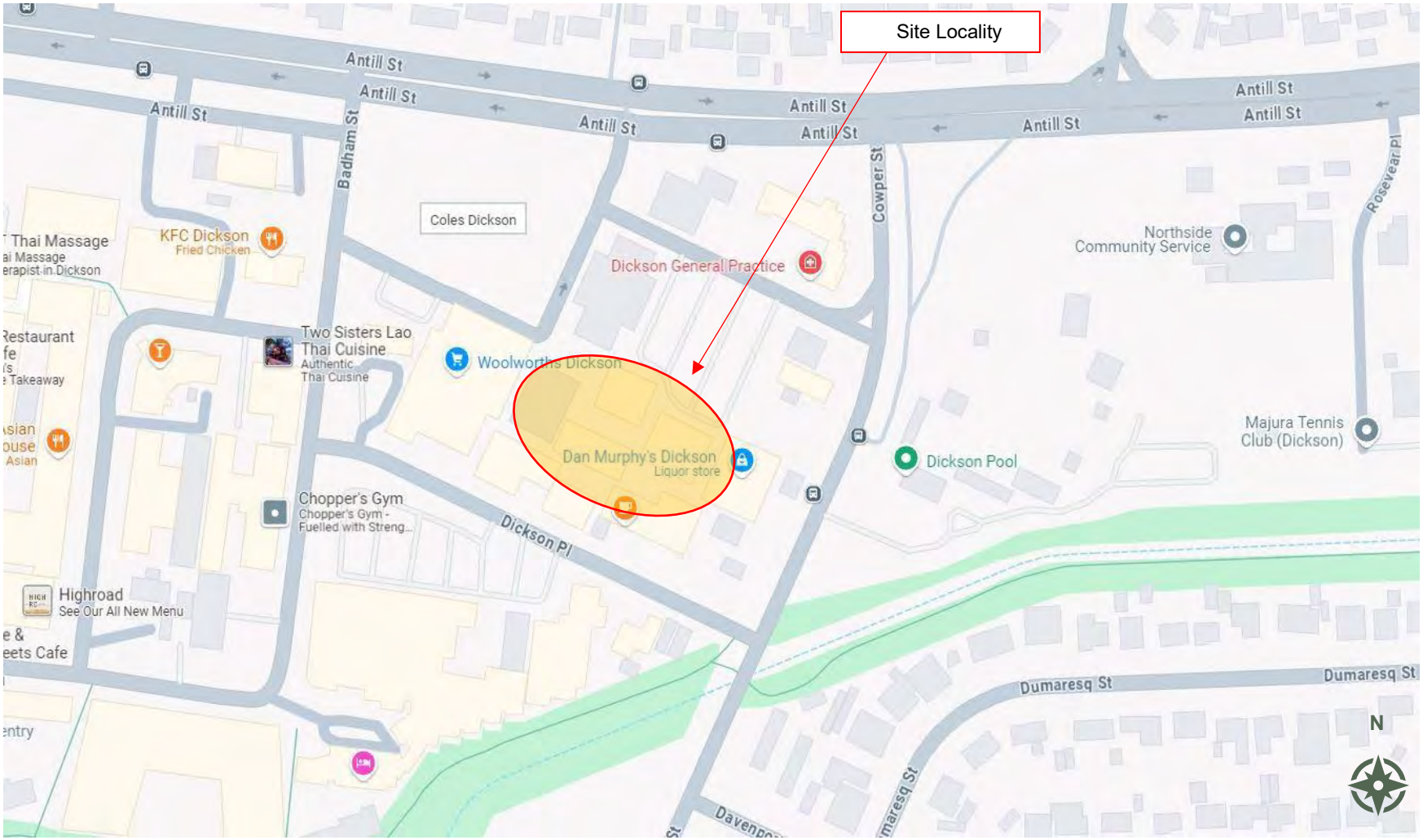


FIGURE 1: SITE LOCALITY

C15916

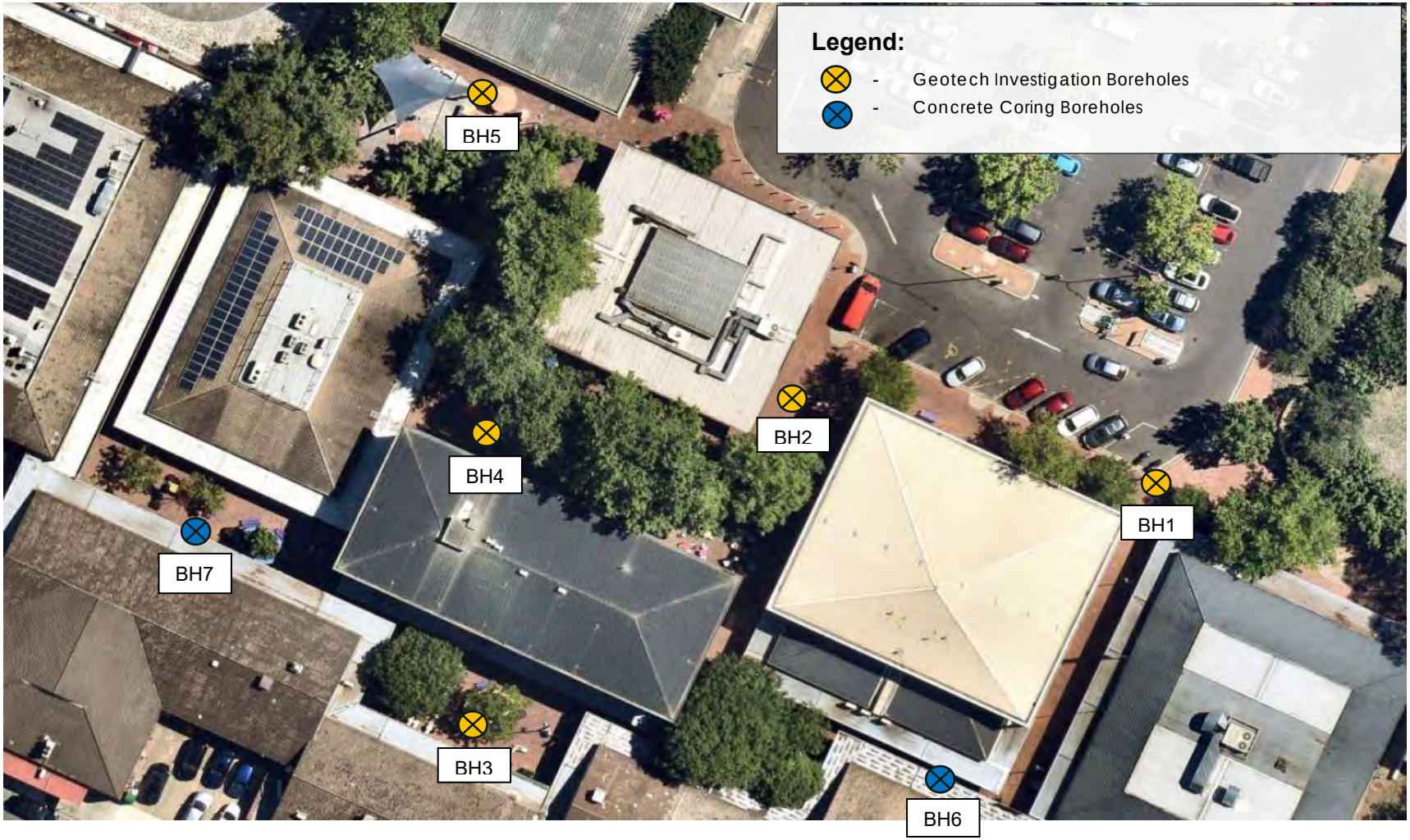


FIGURE 2: AERIAL PHOTO WITH APPROXIMATE BOREHOLE LOCATIONS | C15916

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Appendix A

Borehole Logs BH1 to BH7

Binder 3a,357

Borehole Log

Borehole No.	**BH1**
Sheet	1 of 1
Job No.	C15916

CLIENT: OCULUS

PROJECT: Dickson Shops & Streetscape Upgrade
Dickson, ACT

Location : See Report

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Equipment Type : Push Tube
Hole Diameter : 50mm

Sample No.	Water	Method/ Casing	RL (m)	Depth (m)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Moisture Condition	Consistency or Relative Density	Field Test Results	Geological Profile
			0.05				FILL: BRICK LAYER: Approx 50mm thick layer of brick, red	D			BRICK PAVEMENT
						GP	Sandy GRAVEL: fine gravel, fine to coarse sand, grey	D	MD	DCP	FILL
			0.2			CL-Cl	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, grey, brown, mottled grey & brown, trace of ferruginous nodules	*w*<PL	St-VSt	5 8 22 14 18 15 18	ALLUVIAL SOIL
	None Encountered			1.0		CL-Cl	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, grey, brown, mottled grey & brown	*w*<PL	VSt		
			1.9				BOREHOLE TERMINATED AT 1.9m Target Stratum				
			2.0								

Dynamic Cone Penetrometer Test. Results in Blows per 100mm

Logged By : AP Date : 21/1/25 | Checked By : JM Date : 22/1/25

BOREHOLE/EXCAVATION LOG GINT FILE - DICKSON SHOPS & STREETSCAPE UPGRADE.GPJ EXC.GDT 22/1/25

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Binder 3a,358

Borehole Log

Borehole No.	**BH2**
Sheet	1 of 1
Job No.	C15916

CLIENT: OCULUS

PROJECT: Dickson Shops & Streetscape Upgrade
Dickson, ACT

Location : See Report

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Equipment Type : Push Tube
Hole Diameter : 50mm

Sample No.	Water	Method/ Casing	RL (m)	Depth (m)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Moisture Condition	Consistency or Relative Density	Field Test Results	Geological Profile
	None Encountered		0.05				FILL: BRICK LAYER: Approx 50mm thick layer of brick, red	D			BRICK PAVEMENT
						GP	Sandy GRAVEL: fine gravel, fine to coarse sand, grey	D	MD		FILL
			0.2			CL-ML	Silty Sandy CLAY: low to medium plasticity clay, fine to coarse sand, grey, brown	*w*<PL	F		
			0.3				BOREHOLE TERMINATED AT 0.3m Refusal				
				1.0							
			2.0								

Logged By : AP Date : 21/1/25 | Checked By : JM Date : 22/1/25

BOREHOLE/EXCAVATION LOG GINT FILE - DICKSON SHOPS & STREETSCAPE UPGRADE.GPJ EXC.GDT 22/1/25

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Binder 3a,359

Borehole Log

Borehole No.	**BH3**
Sheet	1 of 1
Job No.	C15916

CLIENT: OCULUS

PROJECT: Dickson Shops & Streetscape Upgrade
Dickson, ACT

Location : See Report

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Equipment Type : Push Tube
Hole Diameter : 50mm

Sample No.	Water	Method/ Casing	RL (m)	Depth (m)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Moisture Condition	Consistency or Relative Density	Field Test Results	Geological Profile
	None Encountered		0.05			GP	FILL: BRICK LAYER: Approx 50mm thick layer of brick, red	D			BRICK PAVEMENT
							Sandy GRAVEL: fine gravel, fine to coarse sand, grey	D	MD		FILL
			0.15 0.18			SM	PLAIN CONCRETE LAYER: Approx 25mm thick concrete slab	D			CONCRETE SLAB
							Silty SAND: fine to coarse sand, low plasticity silt, grey, trace of ferruginous nodules	D-M	MD		SLOPEWASH
			0.4			CL-Cl	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, yellow brown, trace of ferruginous nodules	*w*<PL	St-VSt		ALLUVIAL SOIL
			0.9			CL-Cl	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, yellow brown	*w*<PL	VSt		
			1.6	**1.0**			BOREHOLE TERMINATED AT 1.6m Refusal				
			2.0								

Logged By : AP Date : 21/1/25 | Checked By : JM Date : 22/1/25

BOREHOLE/EXCAVATION LOG GINT FILE - DICKSON SHOPS & STREETSCAPE UPGRADE.GPJ EXC.GDT 22/1/25

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Borehole Log

Borehole No.	**BH4**
Sheet	1 of 1
Job No.	C15916

CLIENT: OCULUS

PROJECT: Dickson Shops & Streetscape Upgrade
Dickson, ACT

Location : See Report

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Equipment Type : Push Tube
Hole Diameter : 50mm

Sample No.	Water	Method/ Casing	RL (m)	Depth (m)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Moisture Condition	Consistency or Relative Density	Field Test Results	Geological Profile
	None Encountered		0.05				FILL: BRICK LAYER: Approx 50mm thick layer of brick, red	D			BRICK PAVEMENT
						GP	Sandy GRAVEL: fine to coarse gravel, fine to coarse sand, grey, dark grey	D	MD	DCP	FILL
			0.15			CL-CI	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, yellow brown, trace of ferruginous nodules	*w*<PL	St-VSt	17 12 11 8 10	ALLUVIAL SOIL
				1.0		SC-SM	Clayey Silty SAND: fine to coarse sand, low plasticity silt, low to medium plasticity clay, grey	D-M	D		
			1.5				BOREHOLE TERMINATED AT 1.5m Refusal				
			2.0								

Dynamic Cone Penetrometer Test. Results in Blows per 100mm

Logged By : AP Date : 21/1/25 | Checked By : JM Date : 22/1/25

BOREHOLE/EXCAVATION LOG GINT FILE - DICKSON SHOPS & STREETSCAPE UPGRADE.GPJ EXC.GDT 22/1/25

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Borehole Log

Borehole No.	**BH5**
Sheet	1 of 1
Job No.	C15916

CLIENT: OCULUS

PROJECT: Dickson Shops & Streetscape Upgrade
Dickson, ACT

Location : See Report

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Equipment Type : Push Tube
Hole Diameter : 50mm

Sample No.	Water	Method/ Casing	RL (m)	Depth (m)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Moisture Condition	Consistency or Relative Density	Field Test Results	Geological Profile
	None Encountered		0.05				FILL: BRICK LAYER: Approx 50mm thick layer of brick, red	D			BRICK PAVEMENT
						GW	Sandy GRAVEL (DGB20): fine to coarse gravel, fine to coarse sand, dark grey, black	D	MD-D	DCP 11	FILL
			0.2			CL-CI	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, grey, brown, mottled grey & brown, trace of ferruginous nodules	*w*<PL	St	10	ALLUVIAL SOIL
										10	
			0.45			CL-CI	Sandy CLAY: low to medium plasticity clay, fine to coarse sand, mottled red and yellow brown, trace of ferruginous nodules	*w*<PL	St-VSt	12	
										13	
			0.85			SC-SM	Clayey Silty SAND: fine to coarse sand, low plasticity silt, low to medium plasticity clay, grey	D-M	D	14	
			1.5	1.0							
							BOREHOLE TERMINATED AT 1.5m Refusal				
			2.0								

Dynamic Cone Penetrometer Test. Results in Blows per 100mm

Logged By : AP Date : 21/1/25 | Checked By : JM Date : 22/1/25

BOREHOLE/EXCAVATION LOG GINT FILE - DICKSON SHOPS & STREETSCAPE UPGRADE.GPJ EXC.GDT 22/1/25

Binder 3a,362

Borehole Log

Borehole No.	**BH6**
Sheet	1 of 1
Job No.	C15916

CLIENT: OCULUS

PROJECT: Dickson Shops & Streetscape Upgrade
Dickson, ACT

Location : See Report

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Equipment Type : Push Tube
Hole Diameter : 50mm

Sample No.	Water	Method/ Casing	RL (m)	Depth (m)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Moisture Condition	Consistency or Relative Density	Field Test Results	Geological Profile
	None Encountered		0.05			GP	FILL: BRICK LAYER: Approx 50mm thick layer of brick, red	D			BRICK PAVEMENT
							Sandy GRAVEL: fine gravel, fine to coarse sand, grey	D	MD		FILL
			0.26				PLAIN CONCRETE LAYER: Approx 40mm thick concrete slab	D			CONCRETE SLAB
			0.3				BOREHOLE TERMINATED AT 0.3m Target Stratum				
				1.0							
			2.0								

Logged By : AP Date : 21/1/25 | Checked By : JM Date : 22/1/25

BOREHOLE/EXCAVATION LOG GINT FILE - DICKSON SHOPS & STREETSCAPE UPGRADE.GPJ EXC.GDT 22/1/25

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Borehole Log

Borehole No.	**BH7**
Sheet	1 of 1
Job No.	C15916

CLIENT: OCULUS

PROJECT: Dickson Shops & Streetscape Upgrade
Dickson, ACT

Location : See Report

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Equipment Type : Push Tube
Hole Diameter : 50mm

Sample No.	Water	Method/ Casing	RL (m)	Depth (m)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Moisture Condition	Consistency or Relative Density	Field Test Results	Geological Profile
	None Encountered		0.05			GP	FILL: BRICK LAYER: Approx 50mm thick layer of brick, red	D			BRICK PAVEMENT
							Sandy GRAVEL: fine gravel, fine to coarse sand, grey	D	MD		FILL
			0.26 0.3				PLAIN CONCRETE LAYER: Approx 40mm thick concrete slab	D			CONCRETE SLAB
							BOREHOLE TERMINATED AT 0.3m Target Stratum				
				1.0							
			2.0								

Logged By : AP Date : 21/1/25 | Checked By : JM Date : 22/1/25

BOREHOLE/EXCAVATION LOG GINT FILE - DICKSON SHOPS & STREETSCAPE UPGRADE.GPJ EXC.GDT 22/1/25

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Appendix B

Definitions of Geotechnical Engineering Terms

DESCRIPTION AND CLASSIFICATION OF SOIL

The methods of description and classification of soils used in this report are based on the Australian Standard 1726 – 2017, Geotechnical site investigations. In general, soils are described along the following characteristics: soil name, plasticity or behavioural or particle characteristics of the primary soil component, colour, secondary soil components' plasticity or behavioural or particle characteristics, condition, structure, inclusions, strength or density and origin.

GENERAL DEFINITION - SOIL

SOIL In engineering usage, soil is a natural aggregate of mineral grains which can be separated by such gentle mechanical means as agitation in water, can be remoulded and can be classified according to the Unified Soil Classification System.

SOIL ORIGIN

Soil origins fall into the following categories:

Residual soil: Soils which have been formed in-situ by the chemical weathering of parent rock. These soils no longer retain any visible structure or fabric of the parent soil or rock material.

Extremely weathered material: Formed directly from in situ weathering of geological formations. Although this material of soil strength it retains the structure and/or fabric of the parent rock material.

Alluvial soil: Deposited by streams and rivers.

Estuarine soil: Deposited in coastal estuaries, and including sediments carried by inflowing rivers and streams, and tidal currents.

Marine soil: Deposited in a marine environment.

Lacustrine soil: Deposited in freshwater lakes.

Aeolian soil: Carried and deposited by wind.

Colluvial soil: Soil and rock debris transported down slopes by gravity, with or without the assistance of flowing water.

Topsoil: Mantle of surface and/or near-surface soil often but not always defined by high levels of organic material, both dead and living.

Fill: Any material which has been placed by anthropogenic processes.

SOIL CLASSIFICATION

PARTICLE SIZE DEFINITIONS

Soil components are described according to the predominating particle size, qualified by the grading of other particles present (e.g. sandy clay) on the following basis:

Classification	Components	Subdivision	Particle Size (mm)
Oversize	Boulders		>200
	Cobbles		63 to 200
Coarse grained soil	Gravel	Coarse	19 to 63
		Medium	6.7 to 19
		Fine	2.36 to 6.7
	Sand	Coarse	0.6 to 2.36
		Medium	0.21 to 0.6
		Fine	0.075 to 0.21
Fine grained soil	Silt		0.002 to 0.075
	Clay		<0.002

MOISTURE CONDITION

Coarse Grained Soil		Fine Grained Soil	
Dry (D)	Non-cohesive and free-running.	Moist, dry of plastic limit (w<W_P)	Hard and friable or powdery.
Moist (M)	Soil feels cool, darkened in colour. Soil tends to stick together.	Moist, near plastic limit (w≈W_P)	Soils can be moulded at a moisture content approximately equal to the plastic limit.
Wet (W)	As for moist, with free water forming when handled.	Moist, wet of plastic limit (w>W_P)	Soils usually weakened and free water forms on hands when handling.
		Wet, near liquid limit (w≈W_L)	Near liquid limit.
		Wet, wet of liquid limit (w>W_L)	Wet of liquid limit.

CONSISTENCY/RELATIVE DENSITY

Cohesive soils are classified on the ease by which the soil can be remoulded and can be either assessed in the field by tactile means, by laboratory testing or through mechanical determination methods. Non-cohesive soils are classified on the basis of relative density, generally from the results of in-situ penetration tests and terms for both are defined as below:

Cohesive Soils			Non-cohesive Soils	
Consistency	**Indicative Undrained Shear Strength s_u(kPa)**	**Field Guide to Consistency**	**Term**	**Relative Density (%)**
Very soft (VS)	≤12	Exudes between the fingers when squeezed in hand.	Very Loose (VL)	≤15
Soft (S)	>12 - ≤25	Can be moulded by light finger pressure.	Loose (L)	>15 - ≤35
Firm (F)	>25 - ≤50	Can be moulded by strong finger pressure.	Medium Dense (MD)	>35 - ≤65
Stiff (St)	>50 - ≤100	Cannot be moulded by fingers.	Dense (D)	>65 - ≤85
Very Stiff (VSt)	>100 - ≤200	Can be indented by thumb nail.	Very Dense (VD)	>85
Hard (H)	>200	Can be indented with difficulty by thumb nail.		
Friable (Fr)	-	Can be easily crumbled or broken into small pieces by hand.		

MINOR COMPONENTS

Descriptive Term	Assessment Guide	Proportion of minor component in:
With	Easily detectable by visual or tactile means and little difference between general properties and properties of primary component.	Coarse grained soils: Fines – 5 to 12% Accessory coarse component – 15 to 30% Fine grained soils: Coarse component - 15 to 30%
Trace	Detectable by visual or tactile means but little or no difference between general properties and properties of primary component.	Coarse grained soils: Fines – <5% Accessory coarse component – <15% Fine grained soils: Coarse component - <15%

CEMENTATION

Where cementation is present in soils, they can be either weakly cemented where they are easily disaggregated by hand in air or water or moderately cemented where effort is required to disaggregate the soil by hand in air or water.

SAMPLING

Sampling is carried out during drilling to allow engineering examination (and laboratory testing where required) of soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are generally taken by one of two methods:

1. Driving or pushing a thin walled sample tube into the soil and withdrawing with a sample of soil in a relatively undisturbed state.
2. Core drilling using a retractable inner tube (R.I.T.) core barrel.

Such samples yield information on structure and strength in additions to that obtained from disturbed samples and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling are given in the report.

PENETRATION TESTING

The relative density of non-cohesive soils is generally assessed by in-situ penetration tests, the most common of which is the standard penetration test. The test procedure is described in Australian Standard 1289 “Testing Soils for Engineering Purposes” – Test No. F3.1.

The standard penetration test is carried out by driving a 50mm diameter split tube penetrometer of standard dimensions under the impact of a 63kg hammer having a free fall of 750mm.

The “N” value is determined as the number of blows to achieve 300mm of penetration (generally after disregarding the first 150mm penetration through possibly disturbed material). The results of these tests can be related empirically to the engineering properties of the soil.

The test is also used to provide useful information in cohesive soils under certain conditions, a good quality disturbed sample being recovered with each test. Other forms of in situ testing are used under certain conditions and where this occurs, details are given in the report.

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FORTIFY GEOTECH

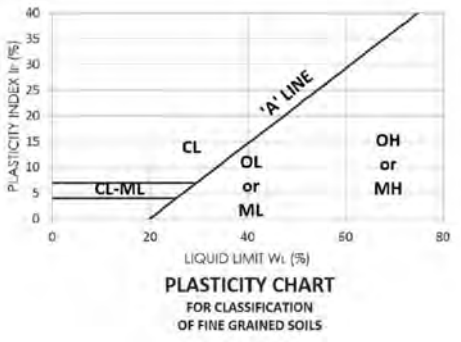
Unified Soil Classification System (Metricated)
Data for Description Identification and Classification of Soils

MAJOR DIVISIONS			DESCRPTION				FIELD IDENTIFICATION						LABORATORY CLASSIFICATION				
			Group Symbol	Graphic Symbol	TYPICAL NAME	DESCRIPTIVE DATA		GRAVELS AND SANDS				Group Symbol	% < 0.075 mm	PLASTICITY OF FINE FRACTION	Coefficient of Uniformity C_u	Coefficient of Curvature C_c	Notes
								GRADATIONS		NATURE OF FINES	DRY STRENGTH						
COARSE GRAINED SOILS	More than 65% by dry mass, less than 63mm is greater than 0.075mm.	GRAVELS More than 50% of coarse grains are greater than 2.36mm.	GW		Well graded gravels and gravel-sand mixtures, little or no fines	Give soil name, indicate approximate percentages of sand and gravel, particle characteristics including particle size subdivision, particle shape, colour, secondary component characteristics and other pertinent descriptive information, symbols in parenthesis. For undisturbed soil add information on structure including zoning, defects and cementing, moisture condition, and relative density. Example: (SP) SAND, trace silt, grey, medium grained, medium dense; dry; Tomago Sand Beds.	COARSE GRAINED SOILS	GOOD	Wide range in grain size	"Clean" materials (not enough fines to bond coarse grains)	None	GW	0-5	-	>4	Between 1 and 3	1. Identify fines by the method given for fine grained soils. 2. For fines contents between 5% and 12%, the soil shall be given a dual classification comprising the two group symbols separated by a dash, e.g. for a gravel with between 5% and 12% silt fines, the classification is GP-GM. 3. Soils that are dominated by boulders, cobbles or peat (Pt) are described separately and are not classified.
			GP		Poorly graded gravels and gravel-sand mixtures, little or no fines		More than 65% of material less than 63mm is greater than 0.075mm.	POOR	Predominantly one size or range of sizes			GP	0-5	-	Fails to comply with above		
		GRAVELLY SOILS	GM		Silty gravels, gravel-sand-silt mixtures			GOOD TO FAIR	"Dirty" materials (Excess of fines)	Fines are silty (1)	None to medium	GM	12-50	Below 'A' line and I_P >7	-	-	
			GC		Clayey gravels gravel-sand-clay mixtures					Fines are clayey (1)	Medium to high	GC	12-50	Above 'A' line and I_P >7	-	-	
		SANDS More than 50% of coarse grains are less than 2.36mm.	SW		Well graded sands and gravelly sands, little or no fines			GOOD	Wide range in grain size	"Clean" materials (not enough fines to bond coarse grains)	None	SW	0-5	-	>6	Between 1 and 3	
			SP		Poorly graded sands, little or no fines			POOR	Predominantly one size or range of sizes			SP	0-5	-	Fails to comply with above		
		SANDY SOILS	SM		Silty sand, sand-silt mixtures			GOOD TO FAIR	"Dirty" materials (Excess of fines)	Fines are silty (1)	None to medium	SM	12-50	Below 'A' line or I_P <4	-	-	
			SC		Clayey sands, sand-clay mixtures					Fines are clayey (1)	Medium to high	SC	12-50	Above 'A' line and I_P >7	-	-	
FINE GRAINED SOILS	More than 35% by dry mass, less than 63mm is less than 0.075mm.	Liquid Limit less than 50%.	ML		Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.	Give soil name, indicate degree and character of plasticity, colour, secondary component characteristics other pertinent descriptive information, symbols in parenthesis. For undisturbed soil add information on structure including zoning, defects and cementing, moisture condition, and consistency. Example: (Cl) CLAY, with gravel, red-brown, medium plasticity, very stiff; gravel 20%, fine to medium, sub-rounded; moist, with desiccation cracks; residual.	FINE GRAINED SOILS	SILT AND CLAY FRACTION												
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		More than 35% of material less than 63mm is smaller than 0.075mm.	Fraction smaller than 0.2 mm AS sieve size									
			OL		Organic silts and organic silty clays of low plasticity			DRY STRENGTH	DILANTANCY	TOUGHNESS							
		Liquid Limit more than 50%.	MH		Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts		A 0.075mm particle is about the smallest particle visible to the naked eye.	None to low	Slow to rapid	Low		ML					
			CH		Inorganic clays of high plasticity, fat clays			Medium to high	None to slow	Medium		CL, CI					
			OH		Organic clays of medium to high plasticity			Low to medium	Slow	Low		OL					
								Low to medium	None to slow	Low to medium		MH					
								High to very high	None	High		CH					
								High to high	None to very slow	Low to medium		OH					
			Pt		Peat muck and other highly organic soils		Readily identified by colour, odour, spongy feel and generally fibrous texture					PT					

Use the gradation curve of material passing 63mm for classification of fractions according to criteria for major component.

More than 35% of material is less than 63mm passing 0.075mm.	
	Below 'A' line
	Above 'A' line
	Below 'A' line
	Below 'A' line
	Above 'A' line
	Below 'A' line

* Effervescence with H_2O_2



PLASTICITY CHART
FOR CLASSIFICATION OF FINE GRAINED SOILS

DESCRIPTION AND CLASSIFICATION OF ROCK

The methods of description and classification of rock used in this report are based on the Australian Standard 1726 – 2017, Geotechnical site investigations. In general, descriptions cover the following properties for rock – rock name, grain size, colour, fabric and texture, inclusions or minor components, moisture content, durability, rock material condition including strength and weathering and/or alteration, defects and geological description.

GENERAL DEFINITIONS – ROCK

ROCK In engineering usage, rock is a natural aggregate of minerals connected by strong and permanent cohesive forces. Since "strong" and "permanent" are subject to different interpretations, the boundary between rock and soil is necessarily an arbitrary one. Rock material is intact rock that is bounded by defects.

DEFECT Discontinuity, fracture, break or void in the material or materials across which there is little or no tensile strength.

STRUCTURE The nature and configuration of the different defects within the rock mass and their relationship to each other.

ROCK MASS The entirety of the system formed by all of the rock material and all the defects that are present.

DESCRIPTIVE TERMS

ROCK NAME Simple rock names are used rather than precise geological classification. Rock names fall into category types of sedimentary rocks, igneous rocks, metamorphic rocks and duricrust rocks.

PARTICLE SIZE

Grain size terms for sedimentary rocks with predominantly sand sized grains are:

Coarse grained – mainly 0.6mm to 2mm.

Medium grained – mainly 0.2mm to 0.6mm.

Fine grained – mainly 0.06mm (just visible) to 0.2mm.

In igneous and metamorphic rock types, where significant, the following terms are used to describe the dominant or average grain size and/or the grain size may be recorded in millimetres:

Coarse grained – mainly greater than 2mm.

Medium grained – mainly 0.06mm to 2mm.

Fine grained – mainly less than 0.06mm (just visible).

If readily identifiable, the minerals should be described.

FABRIC

When the arrangement of grains shows an alignment, a preferred orientation or a layering that is visible, descriptive terms for sedimentary rocks are bedding and lamination. Bedding is layering produced by changes in sedimentation. Lamination is similar to bedding but developed in layer thicknesses of less than 20mm. Fabric descriptive terms for metamorphic rocks are foliation, which is the parallel arrangement of minerals due to metamorphic processes and cleavage, which is a type of foliation developed in fine grained metamorphic rocks such as slates. For igneous rocks, flow banding is a layering produced during flow of a partially solidified igneous rock that causes crystals to become oriented.

INDISTINCT FABRIC

Where layering or fabric is just visible. There is little effect on strength properties.

DISTINCT FABRIC

Where layering or fabric is easily visible. The rock may break more easily parallel to the fabric.

ROCK WEATHERING DEFINITIONS

Extremely Weathered (XW)	Rock substance affected by weathering to the extent that the rock exhibits soil properties, i.e. it can be remoulded and can be classified according to the Unified Soil Classification System, but the texture of the original rock is still evident.
Highly Weathered (HW)	Rock substance affected by weathering to the extent that limonite staining or bleaching affects the whole of the rock substance and other signs of the chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock usually as a result of iron leaching or deposition. The colour and strength of the original fresh rock substance is no longer recognisable.
Moderately Weathered (MW)	Rock substance affected by weathering to the extent that staining extends throughout the whole of the rock substance and the original colour of the fresh rock is no longer recognisable.
Slightly Weathered (SW)	Rock substance affected by weathering to the extent that partial staining or discolouration of the rock substance, usually limonite, has taken place. The colour and texture of fresh rock is recognisable.
Fresh (FR)	Rock substance unaffected by weathering.

The degrees of rock weathering may be gradational. Intermediate stages are described by dual symbols with the prominent degree of weathering first (e.g. EW-HW).

The various degrees of weathering do not necessarily define strength parameters as some rocks are of low strength, even when fresh, to the extent that they can be broken by hand across the fabric, and some rocks may increase in strength during the weathering process.

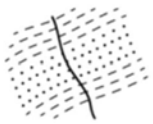
ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the direction normal to the bedding. The test procedure is described by the International Society of Rock Mechanics.

Term	**Point Load Strength Index $I_{s(50)}$ MPa**	**Field Guide**	**Approx Unconfined Compressive Strength MPa***
Very Low Strength (VL)	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.	0.6 to 2
Low Strength (L)	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.	2 to 6
Medium Strength (M)	0.3 to 1	Readily scored with a knife; a piece of core 150mm long x 50mm dia. can be broken by hand with difficulty.	6 to 20
High Strength (H)	1 to 3	A piece of core 150mm long x 50mm dia. cannot be broken by hand but can be broken by a pick with a single firm blow, rock rings under hammer.	20 to 60
Very High Strength (VH)	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.	60 to 200
Extremely High Strength (EH)	more than 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.	more than 200

ROCK DEFECT TYPES

This classification applies to the range of possible rock defect types that are types of natural fractures along which the core is discontinuous. These include bedding plane partings, joints and other rock defects, but exclude known artificial fractures such as drilling breaks.

Term		Description	Diagram
Parting		A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering (e.g. bedding) or a planar anisotropy in the rock material (e.g. cleavage). May be open or closed.	
Joint		A surface or crack with no apparent shear displacement an across which the rock has little or no tensile strength, but which is not parallel to layering or to planar anisotropy in the rock material. May be open or closed.	
Sheared Surface		A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.	
Sheared Zone		Zone of rock material with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.	
Seams	Sheared Seam	Seam of soil material with roughly parallel almost planar boundaries, composed of soil materials with roughly parallel near planar, cuved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.	
	Crushed Seam	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.	
	Infilled Seam	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1mm thick may be described as a veneer or coating on a joint surface.	
	Extremely Weathered Seam	Seam of soil material, often with gradational boundaries. Formed by weathering of the rock material in place.	

The spacing, length (sometimes called persistence), aperture (openness), and seam thickness should generally be described directly in millimetres or metres.

ROCK DEFECT DESCRIPTIONS

DEFECT ROUGHNESS TERMS		DEFECT SHAPE TERMS		DEFECT COATING TERMS	
Term	**Description**	**Term**	**Description**	**Term**	**Description**
Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.	Planar	The defect does not vary in orientation.	Clean	No visible coating.
Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.	Curved	The defect has a gradual change in orientation.	Stained	No visible coating but surfaces are discoloured.
Smooth	Smooth to touch. Few or no surface irregularities.	Undulating	The defect has a wavy surface.	Veneer	A visible coating or soil or mineral, too thin to measure; may be patchy.
Polished	Shiny smooth surface.	Stepped	The defect has one or more well defined steps.	Coating	A visible coating up to 1mm thick. Thicker soil material should be described using appropriate defect terms (e.g. infilled seam). Thicker rock strength material should be described as a vein.
Slickensided	Grooved or striated surface, usually polished.	Irregular	The defect has many sharp changes of orientation.		

Appendix F

Tree Management Plan

25 October 2024 Reference No. 11039

Tree Management Plan

Dickson Shops
Dickson Place ACT 2602

Client:
Peta Miskovich
OCULUS

Author:
Bruno Wright
Consulting Arborist
Canopy the Tree Experts Pty Ltd

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Introduction

This Tree Management Plan (TMP) was commissioned by Oculus for the protection of 28 trees located at the Dickson Place ACT 2602 as part of the Dickson Shops upgrades design submission.

This was prepared by Bruno Wright, the consulting arborist of Canopy the Tree Experts Pty Ltd., who may be reached through bruno@canopygroup.com.au and 6161 1800.

This report was updated by Dominic Grey, a consulting arborist working with Canopy the Tree Experts Pty Ltd., who may be reached through dominic@canopygroup.com.au and 6161 1800.

Construction activities that will occur with the TPZs of the trees;

- Demolition of existing raised garden beds surrounding established trees,
- Demolition of existing paving,
- Excavation of existing services and their re-establishment,
- Construction hydraform permeable paving, timber decking to tree surrounds, garden beds at natural ground level and re-establishment of existing raised garden beds.

34 trees were assessed as part of the Preliminary Arboricultural Report (PAR), 6 trees are to be removed.

Majority of the trees that will be affected by construction are Plane trees. Plane trees are often chosen for their ability to withstand the pressures of intense urban environments and are relatively resilient to construction activities.

The time between the demolition of the raised garden bed retaining walls around the large plane trees and the construction of the new walls will be most critical and must be managed to minimise soil moisture loss and root damage. Refer to *Root Protection* in *Appendix A* for further details.

Excavation of existing paving and the reinstatement must be mindful of root loss and where roots larger than 50mm need to be cut within the SRZ and arborist must be consulted.

The following table identifies each tree and shows the extent of the TPZ and the SRZ. The process involved in the revitalisation of Dickson shops and common areas is quite different from most development sites. In all cases the permeable surface around the trees is increased, resulting in a benefit for the trees.

Therefore, the investigation into each tree in the following table shows the improvements made to spaces within the TPZ. The unknown factors that will impact the trees during construction are the extent of damage to root systems during demolition of existing retaining walls, surface paving, any soil level changes and the repair or installation of new infrastructure.

This Tree Management Plan does not act as a Pruning Plan for these trees. A Pruning Plan will be provided separately covering recommended pruning for luminaires and pedestrian access around the trees.

Methodology

The trees were visually assessed from ground level without the use of further testing devices or equipment. Measurements of the trunks, height and canopy spread were taken using a manual clinometer and tape measure. The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) have been calculated as per the Urban Forest Act 2023.

Site Visit and Assessment

The trees were assessed from ground level by Bruno Wright using the VTA Method. The diameter of the trunks was measured to calculate the Tree Protection Zone and the canopy radii and height were measured to help establish the significance of the tree in the surrounding landscape. Photos were taken of the trees and the surrounding landscape to aid in recording the general condition of the trees and features of the site to establish a benchmark against which to measure site conditions during and after construction. The photos are also valuable as a reference when studying the design plans at the office. Identification of the tree species was based on broad features visible from the ground at the time of the inspection.

Tree Protection Plan

Drawing – The Protection Plan was developed using Autocad software. Scaled the Tree Protection Zones were added to the design drawing which was provided by the client.

Protection Specifications—In the process of studying the architectural plans, a list of design features that may impact the tree was compiled. Specifications for adequate tree protection were then selected that are sensitive to the project's needs without unreasonably risking the tree's viability.

It is expected that excluding portions of the root protection zone with a temporary construction fence will be impractical due to the nature of the works and is unlikely to improve the quality of the tree protection. Provided the trunks are protected and adequate surface protection is in place, it is very unlikely that the viability of the tree will be threatened.

Version History

Report Version	Version Date	Revised By	Description
Dickson Shops TMP Draft 12 June 2024 1	17/06/2024	Bruno Wright	Draft
Dickson Shops TMP 25102024 Final Sketch Plan (FSP)	25/10/2024	Dominic Grey	Final Sketch Plan (FSP)

Bruno Wright conducted the tree assessment on site to develop the tree schedule data and drafted the Dickson Shops TMP Draft 12 June 2024 1. Dominic Grey updated the reporting using new information and plans (see *Plans Referenced*) regarding activities and encroachments within the TPZ and tree management/protection practices.

Plans Referenced

Plan Name	Plan No.	Date
Appendix E - Stormwater Investigation & Design Report	SKP-CVL-007	30 May 2024
L200-LANDSCAPE GENERAL ARRANGEMENT PLAN	L200 Issue: B	
L002-EXISTING SURVEY PLAN	L002	
OC_Dickson Shops_L200_GA Plan		
L005-LEGEND	L005	
Landscape Tree Management Plan	L110 Issue: B	4 October 2024
Existing Tree Schedule	L111 Issue: B	4 October 2024
Landscape Details	L801 Issue: B	4 October 2024
Stormwater Drainage Overall Layout Plan (Option 3 – Complete Renewal)	C020 REV: P2	2 October 2024
Stormwater Drainage Overall Layout Plan Sheet 1 - 7 (Option 3 – Complete Renewal)	C021 – C027 REV: P2	2 October 2024
Structures FN14 and FN15 Steelwork Section and Details	ST_01-105 REV: P1	2 October 2024
Structures Typical Landscape Details – Sheet 1	ST_01-120 REV: P2	2 October 2024
STORMWATER DRAINAGE SCHEDULES (OPTION 3-COMPLETE RENEWAL)	C075 REV: P2	2 October 2024
Landscape Tree Management Plan Sections 1	L112 Issue: B	4 October 2024
Landscape Tree Management Plan Sections 2	L113 Issue: B	4 October 2024
Landscape Tree Management Plan Sections 3	L114 Issue: B	4 October 2024

General comments for Tree Schedule

Retaining Wall Encroachments

The new replacement structural retaining walls for the raised garden beds will increase the root volume and exposed soil area around the trees. This will be achieved by ensuring the new retaining walls are built to a radius from the tree, no closer than the distance from the tree to the widest point of the current raised garden beds.

The footings for the new wall approximately 1200mm wide and 320mm deep, centered underneath the wall. The footing of the new wall will have to accommodate the condition and location of the roots once the old wall is removed.

Refer to documents:

- *Structures FN14 and FN15 Steelwork Section and Details*, Drawing No. ST_01-105 REV: P1
- *Structures Typical Landscape Details – Sheet 1*, Drawing No. ST_01-120 REV: P2

Refer to *Raised Garden Bed Retaining Wall Replacement* in *Appendix A* for further details on safely replacing the retaining walls.

The new non-structural retaining walls are proposed to have a concrete footing of 300mm deep x 150mm wide, with 100mm coarse sub base below. Where sub base is to go underneath concrete footings, the roots should be retained with the sub base lightly compacted around them.

It is recommended that pier footings be used instead for the non-structural retaining walls, excavated using hydrovaccing with an eco lance, to reduce the impact to the tree roots. Using a higher grade concrete, these footings can be cast with tree roots in situ, greatly reducing the impact to the tree.

Permeable Area Around Base of Trees

The root flare at natural ground level measured on the mature plane trees reached out as far as between 1.2m to 1.6m. The largest recorded DBH for a tree planted at ground level is 389mm. This is a Platanus *acerifolia*, which are known to have wide root flare. A diameter of 4.1m (radius of 2.05m from the centre of the tree, assuming a diameter at base of 500mm) will accommodate a mature tree size and the wide root flare of Platanus *acerifolia*, allowing adequate space for the mature trees to further grow and adequate volume for newly planted trees to establish, reducing the likelihood of disruption to the pavers.

This diameter will ensure that the MIS Standard of 2.4m x 2.4m or 5.76m^2 of exposed natural ground is maintained through all stages of the tree's life.

Tree Protection Fencing

Tree Protection Fencing (TPF) has, generally, been deemed an impractical method for protecting the trees due to the very close proximity of work to all trees. **However**, once the development work is no longer in close proximity to the trees (2m or more), TPF should be installed around the trees as close to the TPZ radius as practical to protect the canopy. This is impractical for trees in garden beds provided the trunk and branch protection remains in place.

Stormwater Pit Encroachment

A number of trees have grated pits (round, square and/or rectangular) being installed within the TPZ as part of the stormwater service installation. The encroachment of the excavation of the pits is currently unknown due to the external dimensions of the pits not available at this time. However, an additional 150-300mm will need to excavated on all sides to allow adequate room for the workers to install the pits.

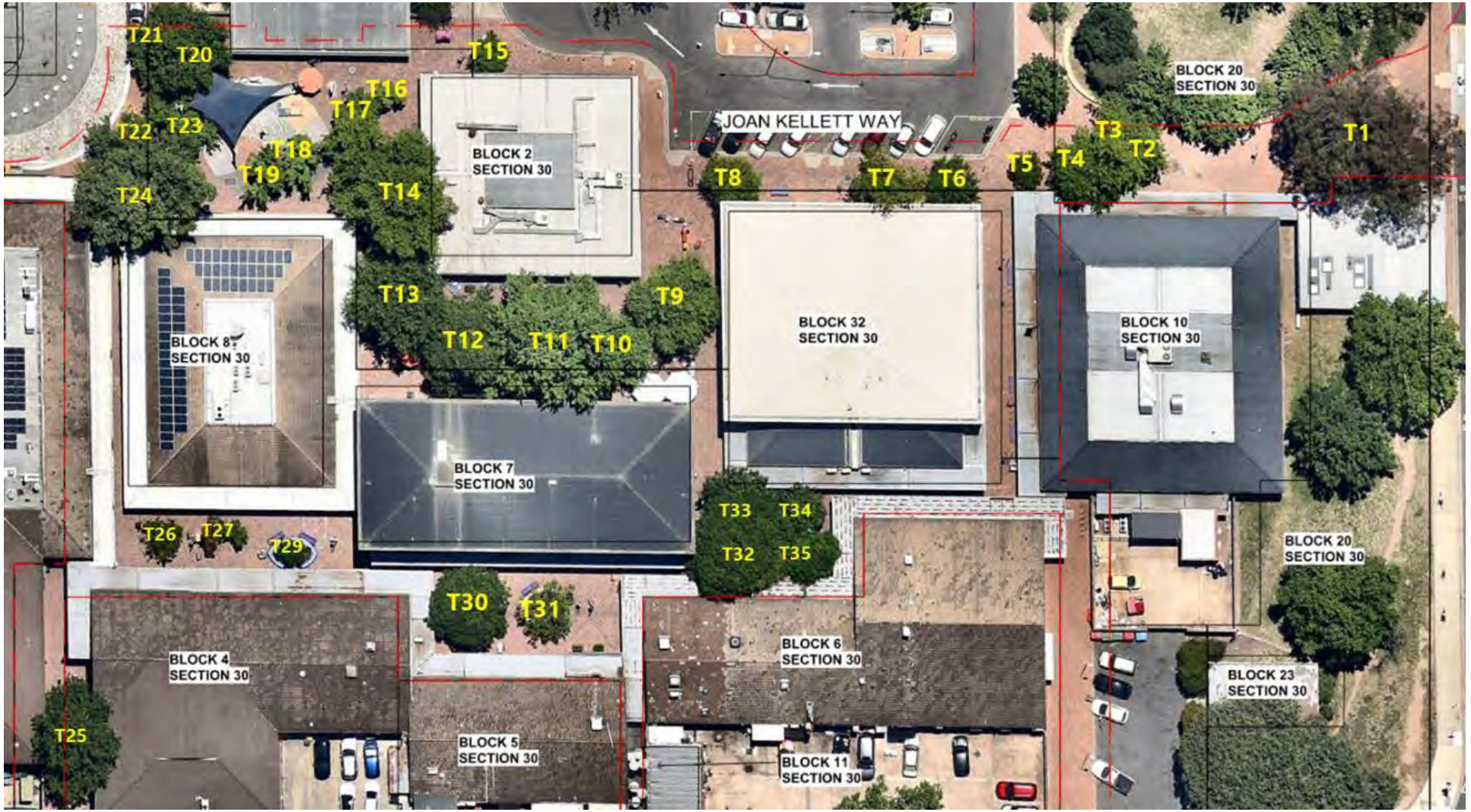
Refer to *STORMWATER DRAINAGE SCHEDULES (OPTION 3- COMPLETE RENEWAL)*, Drawing No. C075 REV: P2 for additional information regarding the grated pits.

Soil level changes within TPZ

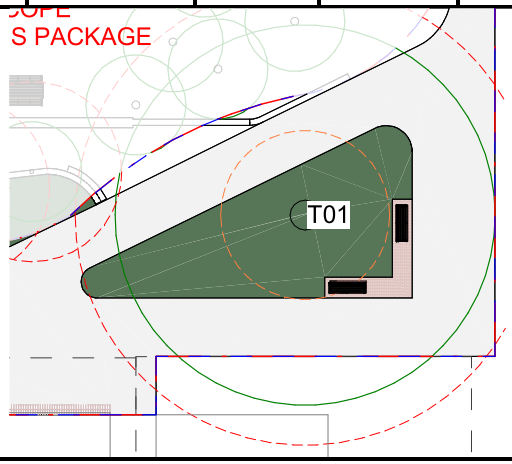
There is a minor encroachment into all trees but two, consisting of soil changes less than 100mm. It is unknown the total area for each tree that these soil changes encompass.

Trees 3 and 25 have a soil change of more than 100mm. Refer to the *Protected Tree Schedule* for further details.

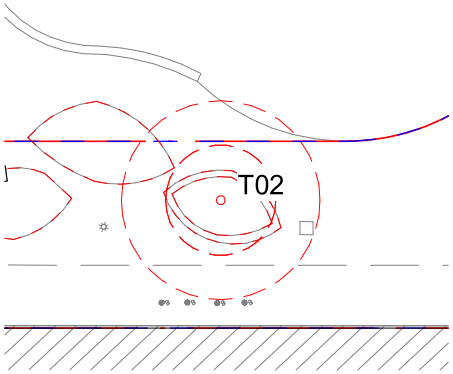
Tree Location Plan

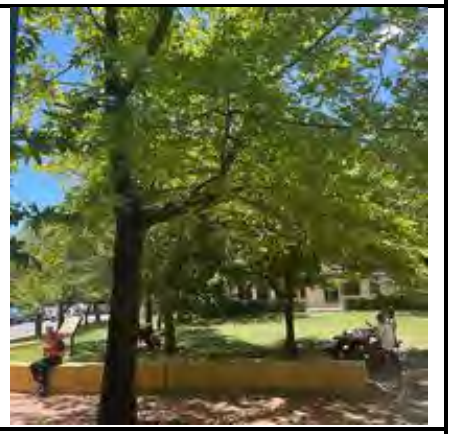


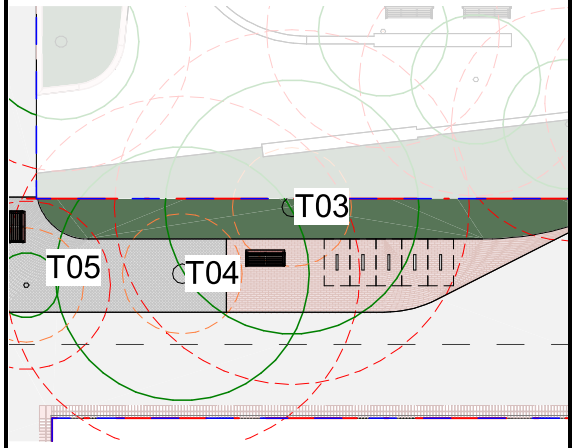
Protected Tree Schedule

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T1	Eucalyptus macarthurii - Cambden Gum	Reasonable	Good	5100	18	no	Public Tree	no	7.8	2 stems, lowest point of canopy 1.87m	
										Due to the close proximity of the installation of the seats and replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. Installation of seating will encroach on SRZ by 8.8%. There is no change in the existing areas of hard paving.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T2	Platanus x acerifolia - London Plane Tree	Reasonable	Good	60	2.5	no	Not Protected	no			
	 Snapshot taken from Demolition And Tree Removal Plan L100 Issue B									This tree is endorsed to be removed by UTS.	

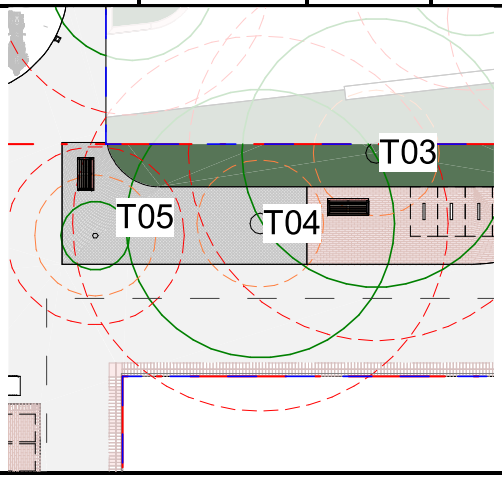
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T3	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1200	5.5	no	Public Tree	no	4.28	Lowest branch 2.7m measured at trunk	



Due to the close proximity of the installation of the replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
The existing permeable surface surrounding the tree, is roughly the same area of the SRZ. New paving will cover about 19% of the SRZ.
The removal of concrete within the TPZ and the installation of permeable paving provides an area of 45.2m^2 area available for root development. With the new paving, a soil level increase of 138mm, distanced approximately 1.2m from the tree will be required.
Overall, this is an improvement of the available exposed soil area for the tree.
There is a very minor encroachment from the installation of the proposed stormwater drain (225mm dia.) south of the tree, approximately 6.8m from the tree, in line with the TPZ border.

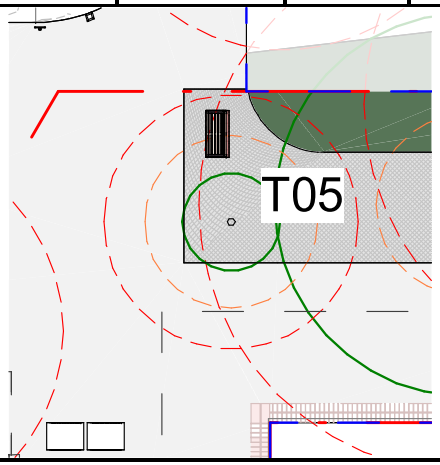
Snapshot taken from Landscape General Arrangement Plan L200 Issue B

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T4	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1220	6	no	Public Tree	no	3.68	Low branch 4.1m	



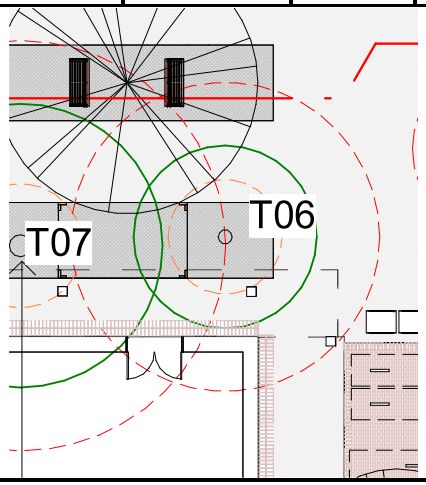
Due to the close proximity of the installation of the replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
The existing permeable surface surrounding the tree, is roughly the same area of the SRZ. New paving will cover about 19% of the SRZ. The proposed new construction increases the permeable paving area available for root growth to 15m². Area available for the tree under the TPZ is 15m² and 37.2m² by removing concrete outside the SRZ.
Overall, this is an improvement of the available exposed soil area for the tree.
There is a minor encroachment from the installation of the proposed stormwater drain (225 & 150mm dia.) south and west of the tree, approximately 4.8m and 5.3m, respectively.

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T5	Pistacia chinensis - Chinese Pistachio	Reasonable	Good	1090	3	no	Public Tree	no	2.17	3 stems	
										Due to the close proximity of the installation of the stormwater piping and replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. The existing permeable surface surrounding the tree, is roughly the same area of the SRZ. New paving will cover about 39% of the SRZ. The proposed new construction decreases the permeable paving area in the SRZ but increases total area available for root growth under the TPZ to 22m^2. The tree is in its early mature stage and can manage pavement changes. There is a major encroachment from the installation of the proposed stormwater drain (150mm dia.) directly underneath the tree. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ. If open trench installation is required, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

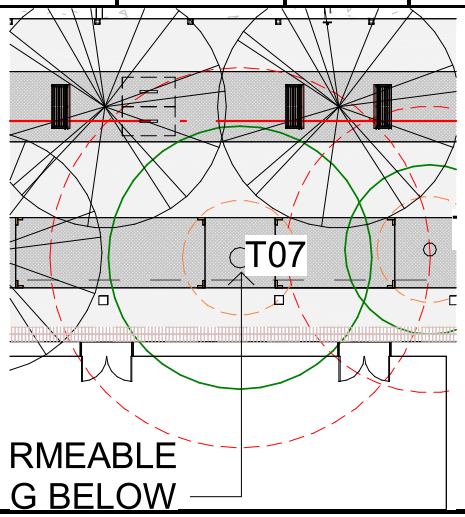
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T6	Platanus x acerifolia - London Plane Tree	Reasonable	Good	680	4	no	Public Tree	no	2.68	Low 2.6m	



Due to the close proximity of the stormwater piping and replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
The existing permeable surface surrounding the tree, is smaller than the new area of permeable paving proposed. The tree will have a total of 26.2m² available under the TPZ. The new construction will encroach into the SRZ by 24% but there is an overall benefit for the tree given the increase in permeable paving area available for root growth.
Overall, this is an improvement of the available exposed soil area for the tree.
There is a minor encroachment from the installation of the proposed stormwater drain (300mm dia.) south of the tree, approximately 2.5m from the tree.

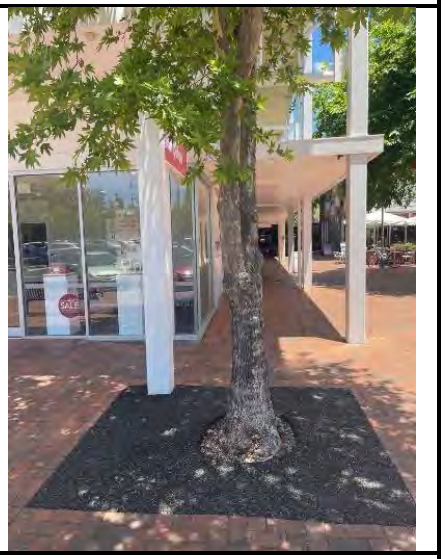
Snapshot taken from Landscape General Arrangement Plan L200 Issue B

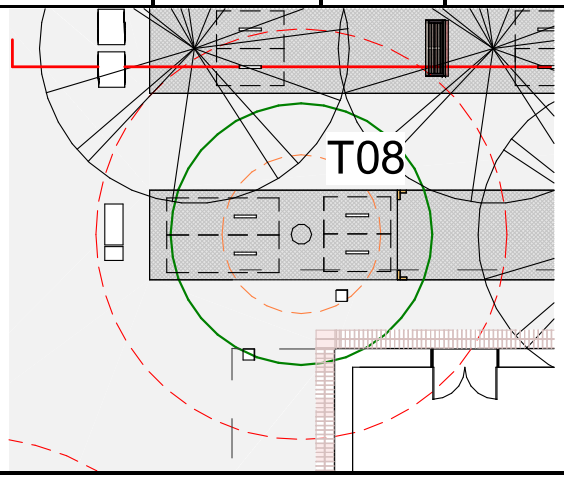
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T7	Platanus x acerifolia - London Plane Tree	Reasonable	Good	830	5.5	no	Public Tree	no	3.35	Low 3.1m	



Due to the close proximity of the stormwater piping and replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
The existing permeable surface surrounding the tree, is smaller than the new area of permeable paving proposed. The tree will have a total of 45m² available under the TPZ. The new construction will encroach into the SRZ by 45% but there is an overall benefit for the tree given the increase in permeable paving area available for root growth.
Overall, this is an improvement of the available exposed soil area for the tree.
There is an existing comms pit within the SRZ and stormwater sump within the TPZ (SW of tree).
There is a moderate encroachment from the installation of the proposed stormwater drain (300mm dia.) south and west of the tree, approximately 2.5m and 4.2m, respectively, from the tree.

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

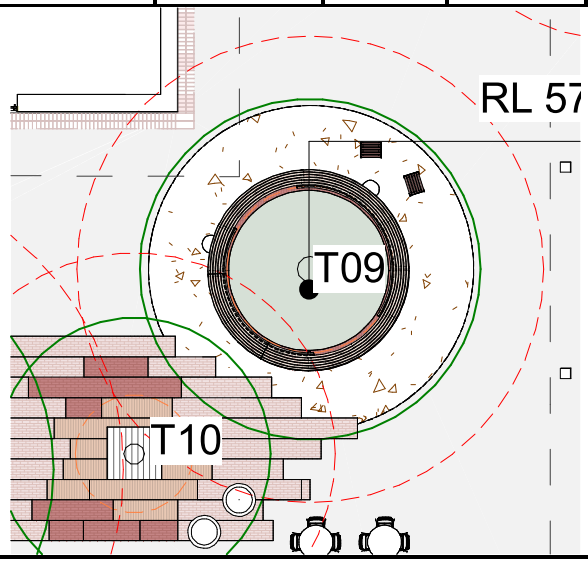
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T8	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1000					2.7	Low 2.7	



Due to the close proximity of the installation of the replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
The existing permeable surface surrounding the tree, is roughly 6m² and is smaller than the new area of permeable paving proposed. The tree will have a total of 24m² available under the TPZ. The new construction will encroach into the SRZ by 37% but there is an overall benefit for the tree given the increase in permeable paving area available for root growth.
Overall, this is an improvement of the available exposed soil area for the tree.

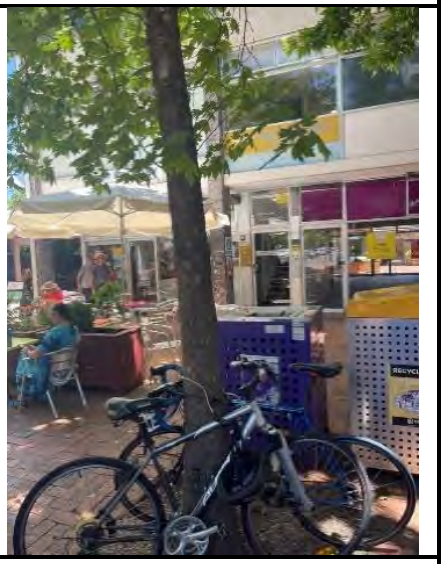
Snapshot taken from Landscape General Arrangement Plan L200 Issue B

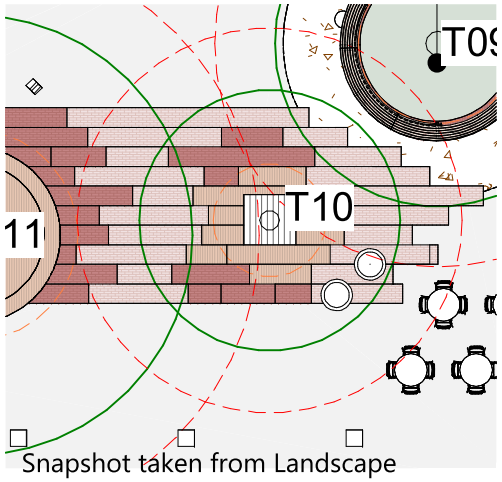
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T9	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1390	7	no	Public Tree	no	5.15	Phototropic lean towards the east, low 3.1	



Due to the close proximity of the replacement retaining wall, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
The replacement raised garden bed retaining wall will increase the garden bed area and volume for the tree, where the new circular wall will be no closer than the furthest point of current elliptical wall, a radius of approximately 2.25m. Great care must be taken during the replacement of the retaining wall. Until the old retaining wall is removed it is not possible to know the extent of the existing footing. The footing of the new wall will have to accommodate the condition and location of the roots once the old wall is removed.
The old pavement is to be removed with similar pavement replacement.
There is a minor encroachment from the installation of the proposed stormwater drain (225mm dia.) south of the tree, approximately 4.8m from the tree.

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

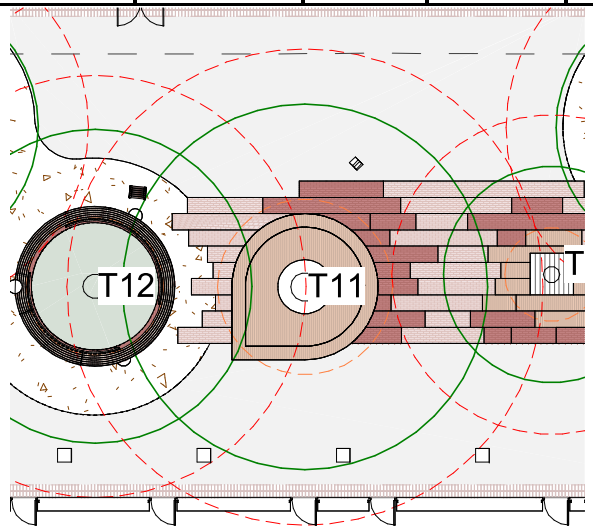
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T10	Platanus x acerifolia - London Plane Tree	Reasonable	Good	610	7	no	Public Tree	no	3.18	Low 2.9	



Snapshot taken from Landscape General Arrangement Plan L200 Issue B

Due to the close proximity of the installation of the brick play element construction and replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
There will be an increase in permeable paving within the SRZ from 2.2m² to 12.8m². Overall, this is an improvement of the available exposed soil area for the tree.
There is a moderate encroachment from the brick play element next to this tree. At the closest point, the wall is 1m south of the tree. The footings are 150mm deep and extend 300mm past each of the wall elements. The decking will be supported by pier foundations around the tree, within the SRZ, which are to be excavated using hydrovaccing with an eco lance. The walls occupy, approximately 7m² within the TPZ (8.3% encroachment), not including the footings extending outwards.
The playground element around this tree is still under development.
There is a major encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 0.7m north of the tree. This is within the SRZ with a radius of 1.79m. A grated pit is part of this piping, 5.2m NW of the tree. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.

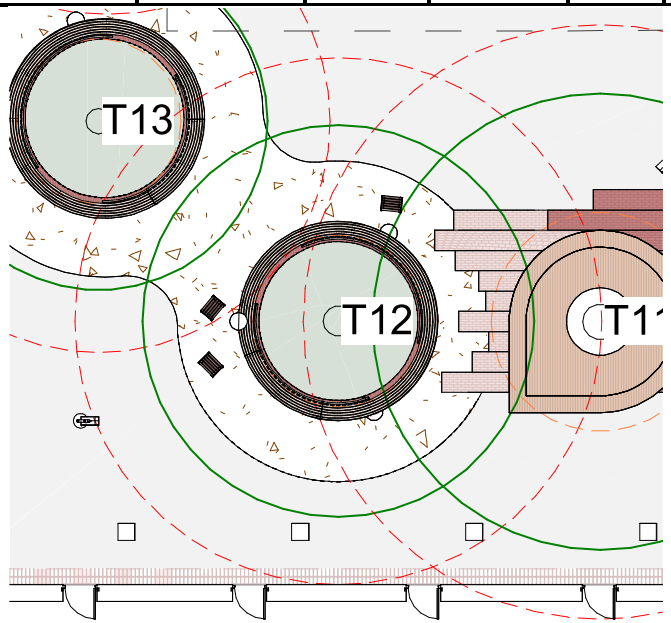
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T11	Platanus x acerifolia - London Plane Tree	Reasonable	Good	2710					5.5	Low 2.5	

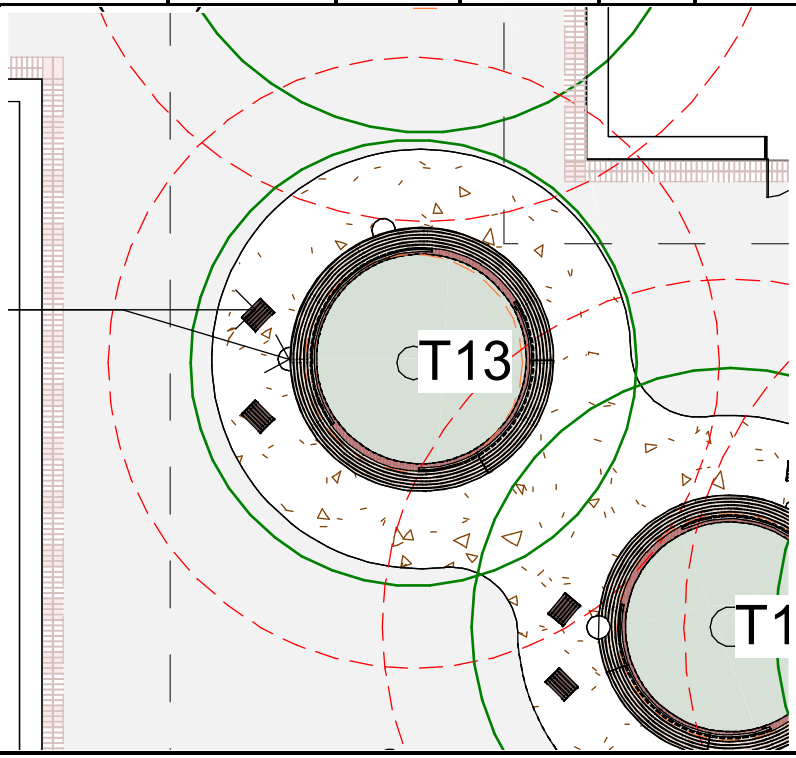


Due to the close proximity of the installation of the replacement retaining wall and paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
There will be an increase in permeable paving within the SRZ from 16m² to 24.6m². The TPZ area will have no change in surface permeability.
The calculated SRZ area is 36m² but this is not a reflection of the actual conditions. Overall, there is an improvement of the available exposed soil area for the tree.
The old pavement is to be removed with similar pavement replacement.
The replacement raised garden bed retaining wall will increase the garden bed area and volume for the tree, where the new circular wall will be no closer than the furthest point of current elliptical wall, a radius of approximately 2.0m. Great care must be taken during the replacement of the retaining wall. Until the old retaining wall is removed it is not possible to know the extent of the existing footing. The footing of the new wall will have to accommodate the condition and location of the roots once the old wall is removed.
The timber decking finish must maintain a spacing of, at least, 50mm from the tree trunk to allow for movement and growth.

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

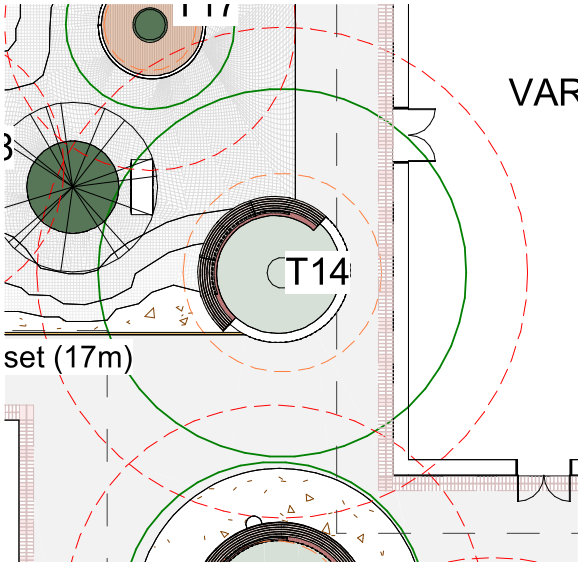
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
						There is a moderate encroachment from the installation of the proposed stormwater drain (225mm dia.) with a grated pit, approximately, 4.4m NE of the tree and another, approximately, 6m south of the tree. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.				
T12	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1530	12	no	Public Tree	no	4.68	Low 4.5m	

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
	 Snapshot taken from Landscape General Arrangement Plan L200 Issue B									Due to the close proximity of the installation of the replacement retaining wall and paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. There will be an increase in available root area within the SRZ from 9m² to 21m². The TPZ area will have no change in surface permeability. Overall, there is an improvement of the available exposed soil area for the tree. The old pavement is to be removed with similar pavement replacement. The replacement raised garden bed retaining wall will increase the garden bed area and volume for the tree, where the new circular wall will be no closer than the furthest point of current elliptical wall, a radius of approximately 2.15m. Great care must be taken during the replacement of the retaining wall. Until the old retaining wall is removed it is not possible to know the extent of the existing footing. The footing of the new wall will have to accommodate the condition and location of the roots once the old wall is removed. There is a moderate encroachment from the installation of the proposed stormwater drain (225mm dia.) approximately 5.6m south of the tree.	
T13	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1380	12	no	Public Tree	no	4.45	Low 2.5	

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
										Due to the close proximity of the installation of the replacement retaining wall and paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. There will be an increase in available root area within the SRZ from 9.2m² to 20m². The TPZ area will have no change in surface permeability. Overall, there is an improvement of the available exposed soil area for the tree. The old pavement is to be removed with similar pavement replacement. The replacement raised garden bed retaining wall will increase the garden bed area and volume for the tree, where the new circular wall will be no closer than the furthest point of current elliptical wall, a radius of approximately 2.2m. Great care must be taken during the replacement of the retaining wall. Until the old retaining wall is removed it is not possible to know the extent of the existing footing. The footing of the new wall will have to accommodate the condition and location of the roots once the old wall is removed. There is a major encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 2.1m west of the tree. This is within the SRZ with a radius of 2.53m. A grated pit is part of this piping, approximately 3.4m SW of the tree. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

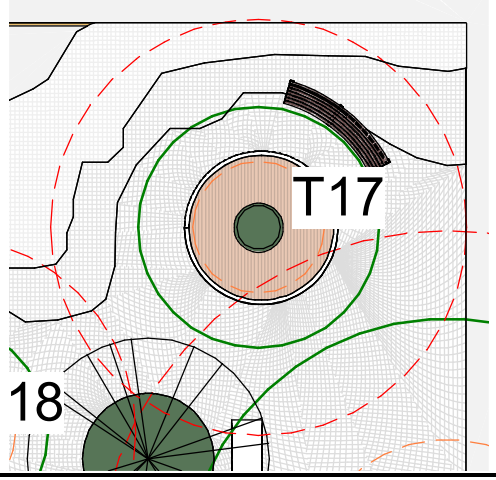
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T14	Platanus x acerifolia - London Plane Tree	Reasonable	Good	2710	12	no	Public Tree	no	6.75	East measurement too far over building to be accurate. Lowest 2.5	



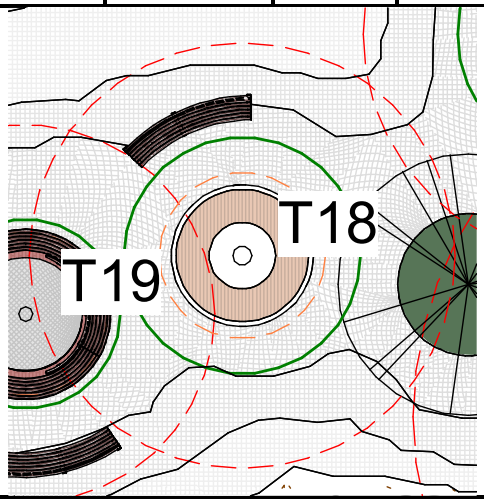
Due to the close proximity of the installation of the replacement retaining wall and paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.

The old pavement is to be removed with similar pavement replacement
The existing garden bed is circular however, not concentric around the tree. Should the garden bed replaced, the new circular wall will be no closer than the furthest point of current wall, a radius of approximately 1.05m.
Great care must be taken during the replacement of the retaining wall. Until the old retaining wall is removed it is not possible to know the extent of the existing footing. The footing of the new wall will have to accommodate the condition and location of the roots once the old wall is removed.
There is a major encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 1.2m west of the tree. This is within the SRZ with a radius of 3.36m.
A grated pit is part of this piping, approximately 3.1m west of the tree.
Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.

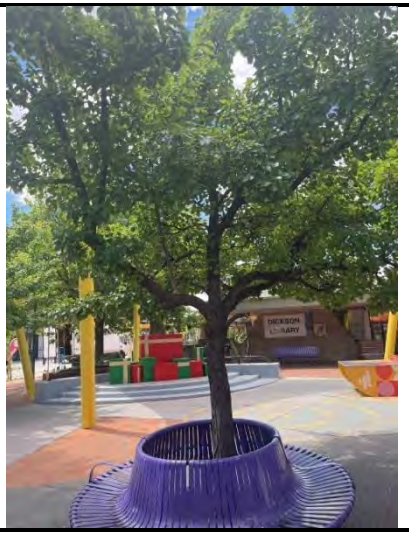
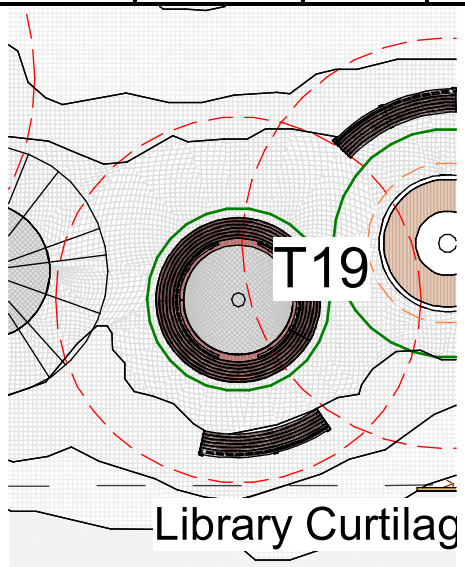
Snapshot taken from Landscape General Arrangement Plan L200 Issue B

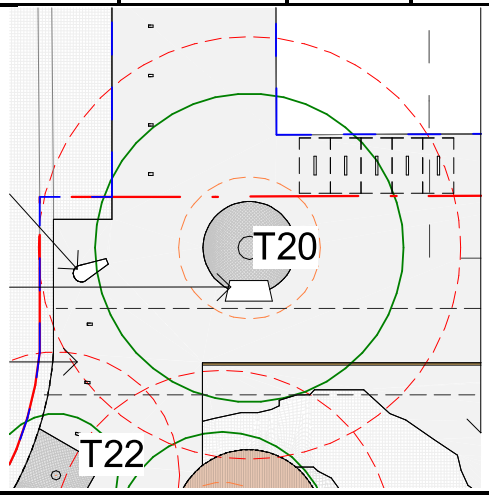
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T17	Pyrus ussuriensis - Manchurian Pear	Reasonable	Good	300	3.5	no	Public Tree	no	2.75	Low 2m	
										Due to the close proximity of the installation of the replacement retaining wall and paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. The old pavement is to be removed with permeable pavement replacement. There is a moderate encroachment from the raised decking retaining wall. Distanced 1.5m from the tree centre with a concrete footing 300mm deep x 150mm wide and a further 100mm sub base below. There is a minor encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 3.2m NE of the tree.	

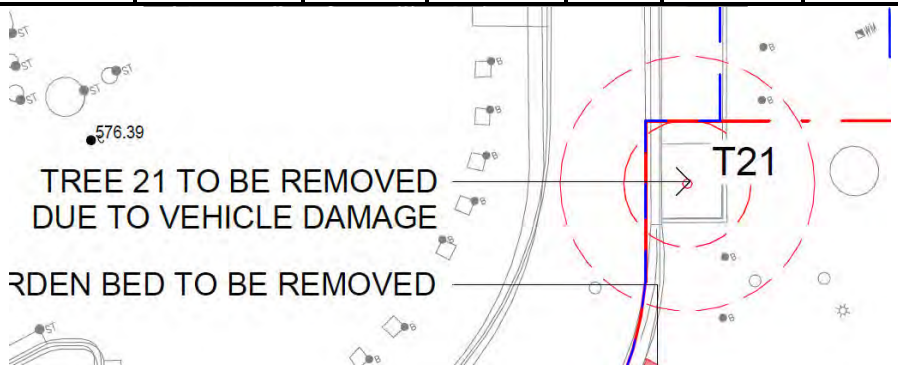
Snapshot taken from Landscape General Arrangement Plan L200 Issue B

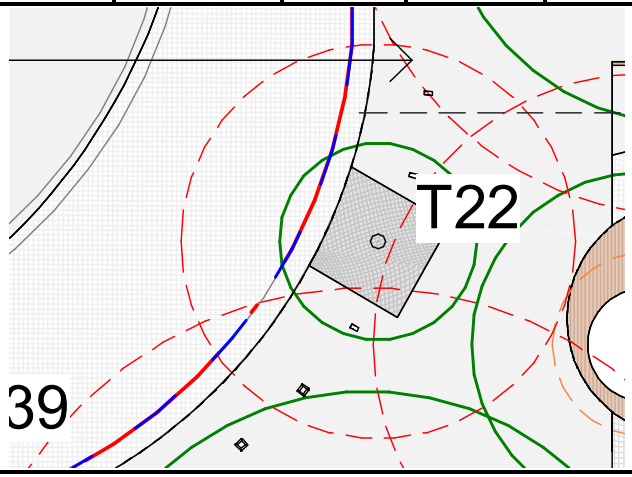
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T18	Pyrus ussuriensis - Manchurian Pear	Reasonable	Good	630	3	no	Public Tree	no	2.48	Low 1.5	
										Due to the close proximity of the installation of the replacement retaining wall and paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. The old pavement is to be removed with permeable pavement replacement. There is a minor encroachment from the curved seating around tree which will require small subsoil encroachments in order to fix them in place. There is a moderate encroachment from the installation of the proposed stormwater drain (225mm dia.) with a grated pit, approximately 3.2m west of the tree. This outside the SRZ with a radius of 1.82m.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

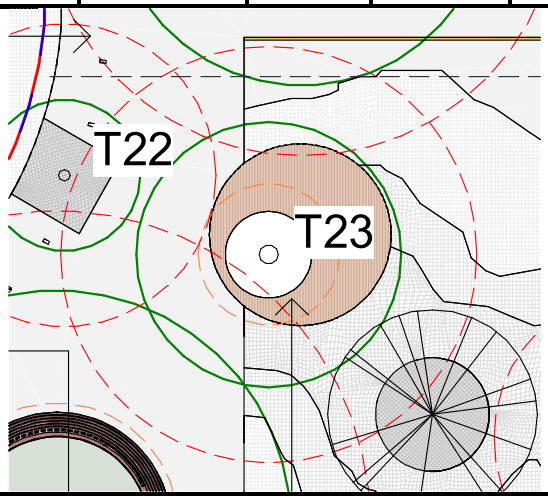
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
	Pyrus ussuriensis - Manchurian Pear	Reasonable	Good	610	3.25	no	Public Tree	no	2.63	Low 2m	
T19	 Snapshot taken from Landscape General Arrangement Plan L200 Issue B										Due to the close proximity of the installation of the replacement retaining wall and paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. There will be an increase in permeable paving within the SRZ and the TPZ. There is permeable paving planned under the extent of the TPZ and the area within the SRZ will have exposed soil. Overall, there is an improvement of the available exposed soil area for the tree. The old pavement is to be removed with permeable pavement replacement. There is a minor encroachment from the curved seating around tree which will require small subsoil encroachments in order to fix them in place. There is a major encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 2.2m south of the tree. This is in close proximity of the SRZ with a radius of 1.79m. A grated pit is part of this installation, approximately 3.8m SE of the tree. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
							grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.				
T20	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1200	10	no	Public Tree	no	5.08	Low 2.2	
	 Snapshot taken from Landscape General Arrangement Plan L200 Issue B						Due to the close proximity of the installation of the replacement retaining wall, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. Tree 20 has paving right up to base of trunk. There will be an increase in permeable paving/decking within the TPZ. There is an extra 16.3m^2 of permeable paving planned under the extent of the TPZ. Overall, there is an improvement of the available exposed soil area for the tree. There is a major encroachment from the installation of the proposed stormwater drain (525mm dia.) with two round grated pits as part of this installation, approximately 2.8m south of the tree. This is in close proximity of the SRZ with a radius of 2.38m. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or			

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
							grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.				
T21	Zelkova serrata - Zelkova	Reasonable	Good	0	1.75	no	Public Tree	no		New planting	
	 Snapshot taken from Demolition And Tree Removal Plan L100 Issue B						This tree has no construction issues. It may be more prudent to replant rather than trying to retain it during demolition and construction. This tree has had significant damage from motor vehicles.				

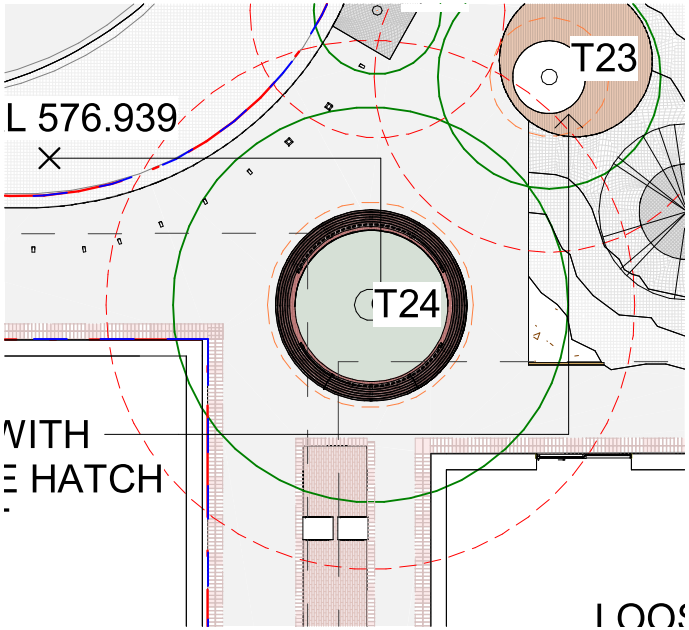
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T22	Zelkova serrata - Zelkova	Reasonable	Good	0					0	New planting	
										This tree has had significant damage from motor vehicles and is to be retained. This tree has no construction issues. The exposed garden bed edging is to be removed and replaced with permeable paving.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

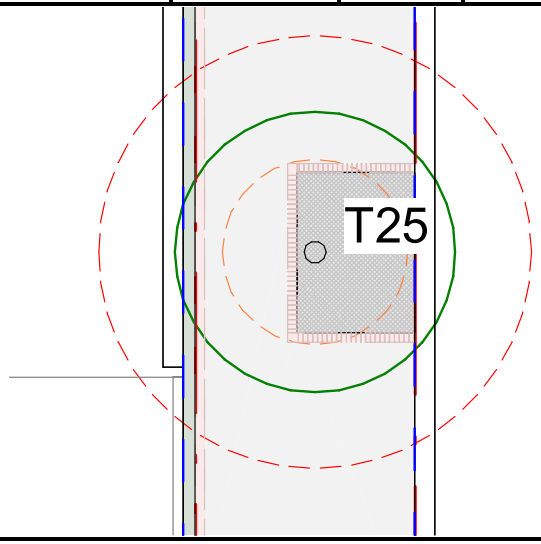
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T23	Pyrus ussuriensis - Manchurian Pear	Reasonable	Good	730	3	no	Public Tree	no	3.2	Low 2.6	
										Due to the close proximity of the installation of the replacement paving and seating removal, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. There will be an available root area under the raised decking platform of 18m². Overall, there is an improvement of the available exposed soil area for the tree. There is a major encroachment from the non-structural retaining walls for the decking around this tree, with a SRZ of 1.93m. The inner radius of footings is approximately 1.15m from the centre of the tree, and the non-concentric outer radius is between 1.4m and 3.4m from the centre of the tree. Hydrovaccing with an eco lance must be used to excavated these footings and the Project Arborist present to supervise.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

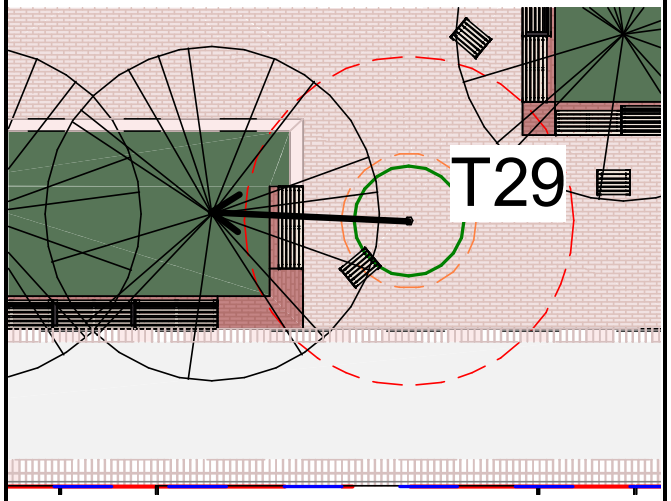
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
							This deck is required to maintain a 3m spacing from the garden bed of tree 22 for pedestrian and cyclist access. In order to make this spacing, the decking around tree 23 must be offset, resulting in footings within the SRZ. There is a minor encroachment from the installation of the proposed stormwater drain (525mm dia.) NW, approximately 4.0m from the tree and another 5.5m SW (225mm dia.).				
T24	Platanus x acerifolia - London Plane Tree	Reasonable	Good	2690	12	no	Public Tree	no	7.03	Low 3.5	

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
										Due to the close proximity of the installation of the replacement retaining wall, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. There will be an available root area within the raised garden bed of 18m². Overall, there is an improvement of the available exposed soil area for the tree. The old pavement is to be removed with similar pavement replacement. The replacement raised garden bed retaining wall will increase the garden bed area and volume for the tree, where the new circular wall will be no closer than the furthest point of current elliptical wall, a radius of approximately 2.0m. Great care must be taken during the replacement of the retaining wall. Until the old retaining wall is removed it is not possible to know the extent of the existing footing. The footing of the new wall will have to accommodate the condition and location of the roots once the old wall is removed. There is a major encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 1.3m west of the tree. This is within the SRZ with a radius of 3.35m. Two additional installations of piping are 4.4m north and 3.8m east of the tree. Four grated pits are to be installed as part of this piping, 4.7m north, 5.3m east, 4.5m south and 6.4m NW of the tree. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.	

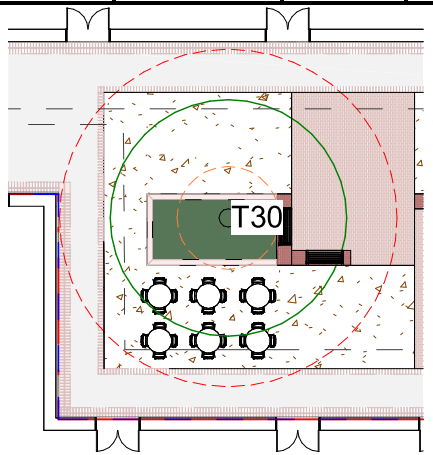
Snapshot taken from Landscape General Arrangement Plan L200 Issue B

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T25	Platanus x acerifolia - London Plane Tree	Reasonable	Good	1220	9	no	Public Tree	no		Low 1.6	
	 Snapshot taken from Landscape General Arrangement Plan L200 Issue B									Due to the close proximity of the installation of the replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. The existing permeable surface surrounding the tree, is roughly 3.5m² and is smaller than the new area of permeable paving proposed. The tree will have a total of 11.7m² available under the TPZ. The new construction will not encroach into the SRZ and there is an overall benefit for the tree given the increase in permeable paving area available for root growth. Overall, this is an improvement of the available exposed soil area for the tree. There is a major encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 2.0m west of the tree. This is within the SRZ with a radius of 2.4m. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.	

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
							While the overall soil change is 154mm, this is broken into a cut of 86mm and fill of 68mm on either side of the tree to level out the overall gradient. This is very minor considering the soil change is less than 100mm in any one spot and permeable paving will be used in this zone.				
T29	Acer sp. - Maple	Reasonable	Good	270	1.75	No	Public Tree	No	1.68	Low branching at 1.6m.	

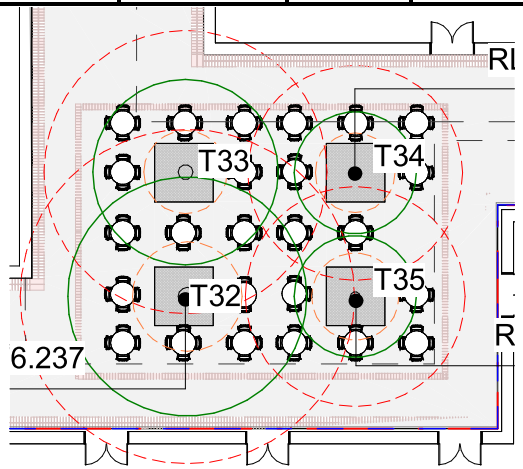
Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
										The tree is in juvenile stage and it has been sugested that it should be relocated. Critical to transpanting is the management of the root system The fact that it is situated is a raised gards bed will make it esaier to relocate as the roots will have been restricted by the retaining wall and there will be less need to excavate to maintain suficient root system. The unknown is the damage that demolishing the retaining wall may do to the root system and extent that roots may have developed downward. A framing structure must be carefully installed to lift from beneith the rootball. The accepted transplanting specifications for minimum rootball size is 10 X trunk diameter with the depth of the root ball determined by soil type and tree type. In this case I would suggest that 500mm depth is sufficient. 1. With a trunk diameter of 85mm the minimum rootball volumn would be .455m^3 Weight aproximatly 728kg 2. The existing volumn within the retaining wall at 500mm depth is 4.5m^3. (area calculated from supplied L002-EXISTING SURVEY PLAN DWG) Weight approximatly 7200kg 3. A compromise rootball at a diameter of 2600mm would give a weight of 4,200kg. Plus the weight of the framing structure to support the rootball to each scenario. Replanting site at natural ground level should ensure adequate drainage and be of suficient size to allow new root growth. New soil around rootball must not differ significanlty form existing rootball soil type. Carefull management during establishment will be critical to tree survival.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

Tree Id	Species	Health	Condition	Trunk Circ. (mm)	Height	Hollows Present	Protection Status	Listed Weed Species	Ave. Canopy Width	Comments	Photos
T30	Pistacia chinensis - Chinese Pistachio	Reasonable	Good	950	5	no	Public Tree	no	3.93	Low 1.7	
										Due to the close proximity of the installation of the replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. The existing permeable surface surrounding the tree, is roughly 2.5m² and is smaller than the new permeable area proposed. The tree will have a total of 12.5m² available under the TPZ. The new construction will not encroach into the SRZ and there is an overall benefit for the tree given the increase in permeable area available for root growth. Overall, this is an improvement of the available exposed soil area for the tree. There is a major encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 1.9m north of the tree. This is within the SRZ with a radius of 2.16m. A grated pit is part of this piping, 4.2m NW of the tree. Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.	

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

T32	Pistacia chinensis - Chinese Pistachio	Reasonable	Good	1140	5.5	no	Public Tree	no	5.53	Low 1.9	

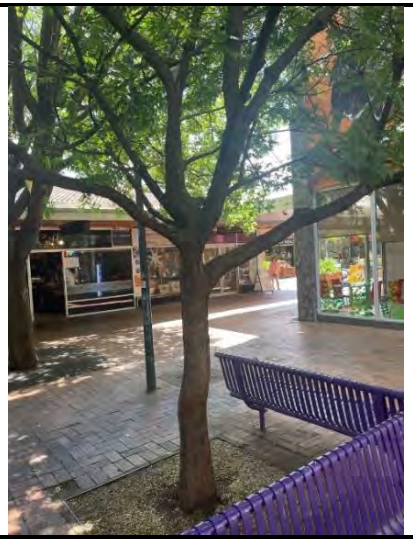
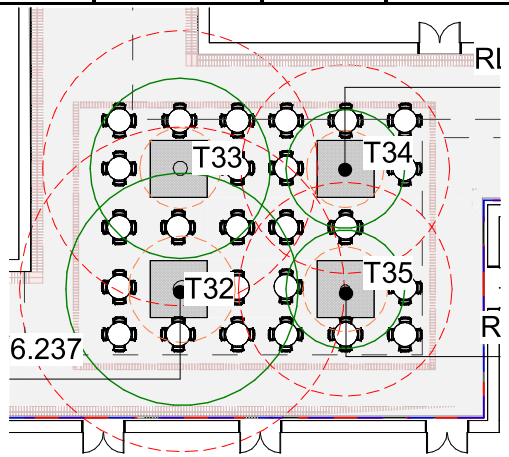


Due to the close proximity of the installation of the replacement paving, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.
The new area of permeable paving is about 6m^2. This is approximately the same as the existing permeable pavement. There is little difference between existing and propose surfaces.
The old pavement is to be removed with similar pavement replacement.
Overall, this is an improvement of the available exposed soil area for the tree.

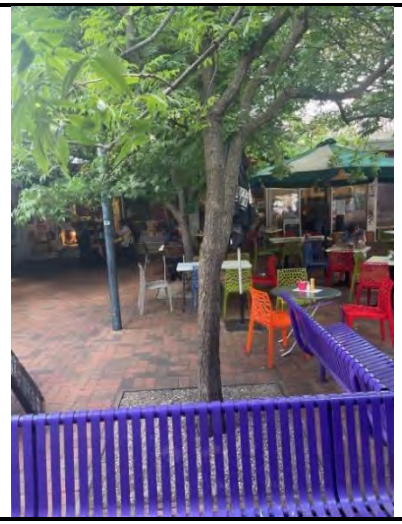
There is a major encroachment from the installation of the proposed stormwater drain (225 & 375mm dia.), with three pipes meeting at a grated pit, approximately 2.0m NW of the tree, with the closest pipe within 1m of the tree. This is within the SRZ with a radius of 2.34m.

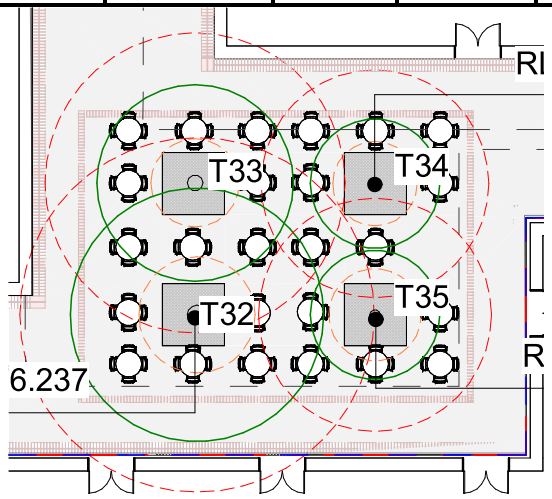
Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

T33	Pistacia chinensis - Chinese Pistachio	Reasonable	Good	590	4	no	Public Tree	no	3.78	Low 1.6	
						Due to the close proximity of the installation of the replacement paving and seating removal, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. The new area of permeable paving is about 6m². This is approximately the same as the existing permeable pavement. There is little difference between existing and propose surfaces. The old pavement is to be removed with similar pavement replacement. Overall, this is an improvement of the available exposed soil area for the tree. There is a moderate encroachment from the installation of the proposed stormwater drain (225mm dia.), approximately 2.0m west of the tree. This is outside the SRZ with a radius of 1.77m. Due to the close proximity to the SRZ, it is recommended that tunnel boring and in situ pipe replacement is used to avoid excavation within the SRZ. If open trench installation is required for the pipe, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.			

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

T34	Pistacia chinensis - Chinese Pistachio	Reasonable	Good	530	3.5	no	Public Tree	no	2.53	Low 2.3	



Due to the close proximity of the installation of the replacement paving and seating removal, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m.

The new area of permeable paving is about 6m^2. This is approximately the same as the existing permeable pavement. There is little difference between existing and propose surfaces. Care must be taken when removing existing paving and replacing it with new paving.

The old pavement is to be removed with similar pavement replacement.

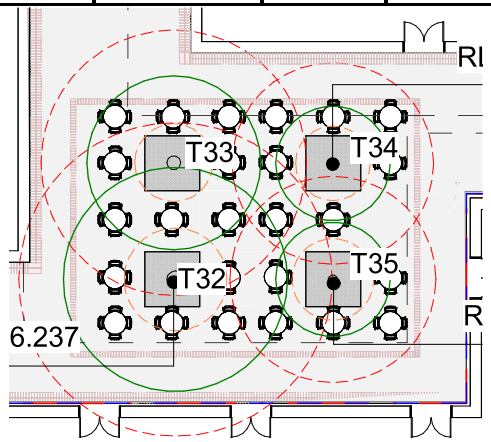
Overall, this is an improvement of the available exposed soil area for the tree.

There is a major encroachment from the installation of the proposed stormwater drain (375mm dia.), approximately 1.4m south of the tree. This is inside the SRZ with a radius of 1.69m.

A grated pit is to be installed 2.0m SE of the tree.

Tunnel boring in situ pipe instalment is recommended to avoid open trench excavation within the SRZ for the piping. If open trench installation is required for either the piping or grate pit, this must be conducted using hydrovaccing with an eco lance and the site arborist must be present to supervise.

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

T35	Pistacia chinensis - Chinese Pistachio	Reasonable	Good	660	3.5	no	Public Tree	no	2.8	1.6 low	
						Due to the close proximity of the installation of the replacement paving and seating removal, tree protection fencing will be impractical. Trunk and branch protection must be used instead to a height of 2m. The new area of permeable paving is about 6m². This is roughly the same as the existing permeable pavement. There is little difference between existing and propose surfaces. Care must be taken when removing existing paving and replacing it with new paving. The old pavement is to be removed with similar pavement replacement. Overall, this is an improvement of the available exposed soil area for the tree. Stormwater diagrams show pipes under the TPZ and close to the SRZ. There is a moderate encroachment from the installation of the proposed stormwater drain (375mm dia.), approximately 3.0m north of the tree.			

Snapshot taken from Landscape General Arrangement Plan L200 Issue B

Appendix A

Tree Protection Specifications

1. Approval of the Tree Management Plan

This Tree Management Plan (TMP) must be approved by the Conservator of Flora and Fauna (the Conservator) in accordance with Section 78 of the Urban Forest Act 2023.
A colour, A4 size copy of the final version of all sheets of this TMP is to be available to all workers on the site during the period of demolition, excavation, construction and landscaping.

2. Compliance

Once this Tree Management Plan has been approved, failure to comply with the measures outlined, may incur an on-the-spot fines issued by the Conservator.
A copy of this Tree Management Plan (TMP) must be available on-site and included in the site induction process. All specified tree protection measures must be installed before any demolition or other works can commence. Contractors working on the site must be provided with a copy of this TMP. The project arborist must inspect and certify that tree protection specifications have been met and that installations are correct.

3. Induction

All workers on the site must be inducted into the TMP before they begin work to inform them of their responsibilities regarding the tree protection. All workers on site must be provided access to an A3 colour copy of the TMP to reference.

4. Changes to the TMP

No changes to this TMP are to occur until the project arborist has been consulted. Any changes to the TMP must be carried out by an arborist and approved by the Conservator.

5. Tree Protection Zone

Under the *Urban Forest Act 2023*, the Tree Protection Zone of a tree is extended 2m past the vertical projection of the dripline and no less than 4m from the trunk. Where tree protecting fencing is specified, it is to be placed in accordance to the ACT TPZ. Refer to 'Prohibited Activities' below.

6. Trunk Protection

Prior to commencement of work on site, trunk guard is to be installed around the trunk of the tree and maintained in good condition until all work including landscaping has been completed. **See Appendix D** for specification and sourcing.

7. Monitoring

All workers on site must immediately notify the project manager if any of following occur:

- Accidental mechanical damage to the trunk, branches or roots
- The tree appears to be in decline, or has a thinning canopy, large branch failures, insect infestation or if concerns are raised about the trees' health or viability.

8. Site Inspections

The Project Arborist shall attend site for the following reasons:

a) Prior to any excavation greater than 10% of the TPZ area.
b) Advice on branch and/or root pruning.
c) Tree appears to be decline, canopy thinning, large branch failures, insect infestation or accidental mechanical damage.
d) The Surface Protection installations prior to the commencement of work on the site.

9. Prohibited Activities

Unless allowed elsewhere in this TMP, the following activities are prohibited within the RPZ during the period of demolition and construction:

a) Entry onto or across unprotected surfaces
b) Excavation for any purpose including service installation
c) Erection of site sheds or structures
d) Changes in ground surface level - no scalping or fill
e) Movement or parking of vehicles or machinery
f) Storage of building supplies and materials
g) Cleaning or washing of equipment
h) Spillage or disposal of materials or waste

10. Exclusion Fence

It is expected that excluding portions of the root protection zone with a temporary construction fence will be impractical due to the nature of the works and is unlikely to improve the quality of the tree protection. Provided the trunk is protected and adequate surface protection is in place, it is very unlikely that the viability of the tree will be threatened.

11. Signs

Tree protection signs, as depicted in **Appendix B**, are to be displayed in prominent locations on the site prior to work commencing on site. The signs must clearly state that there is a TMP in place for the tree and that an induction is required before starting work on site.

12. Irrigation

8 weeks prior to work commencing on site, an irrigation line with slow drippers is to be installed in the alley way within the TPZ to supply 600l of water to the tree. The irrigation system **must be calibrated** to deliver the correct amount of water. We recommend investigating the use of an electronic irrigation timer equivalent to the B-hyve Smart Hose Watering Timer. Every 4 weeks during the construction period the irrigation must be used to supply 600l of water to the tree. This irrigation program may be changed on the advice of a consulting arborist. If there is a period of unusually wet or unusually dry weather the project arborist is to inspect the tree and site and advise on changes to the irrigation program.
Alternatively, where an irrigation system is impractical, the trees may be watered by hand/portable water tank and hose as close to the recommended amount.
Where a levee is not installed, the flow of water is to be reduced to minimise water runoff, ensuring the tree is receiving the required amount.
Where unsure, contact the Project Arborist when establishing wastering system (irrigation or by hand/hose) to ensure the correct amount.

13. Levee & Mulch

Due to the nature of the development work (replacement of paving), levees and mulching of the TPZ may be impractical. Unless specified by the Project Arborist these measures are not required.

Levee

After the irrigation has been installed, construct a levee (to minimise water runoff and retain moisture) where specified in this report.

The levee must be constructed by hand and be;

a) Approximately 100mm above the existing ground level to retain moisture and stimulate absorptive root development.
b) Downhill from the tree along the perimeter of the RPZ tree and follow the line of surface contour.
c) No excavation or machinery to enter RPZ and Tree Protection Specification No. 10 (Prohibited Activities) still apply.

Mulch

Once the irrigation lines are installed, a 50mm thick layer of mulch must be laid over the top of the irrigation within the RPZ area before the load sharing mats or ply board are positioned.

14. Surface Protection

Where machinery or vehicles need to travel through a TPZ, surface protection must be used.
Where the exposed surface is natural ground, mulch (to 100mm thickness) must be placed underneath the load sharing surfaces, as shown in **Appendix C** within the TPZ.
Should paving already be in place, the mulch is not necessary but the mats must still be used.
For machinery and vehicles heavier than 2.5ton, the project arborist must be notified first.

15. Demolition

Demolition is not to commence until the above-mentioned tree protection specifications are in place.

16. Pruning

No pruning of, or branch removal from the tree is permitted without consulting the Project Arborist and a Pruning Plan approved by the Conservator. Any pruning undertaken must meet the below criteria.

a) All cuts made are within the scope and according to the Pruning Plan and;
b) The pruning is carried out by an arborist with at least AQF level 3 qualification and;
c) The pruning is carried out following the clauses 4 & 5 of the AS4373-2007 'Pruning of amenity trees

17. Canopy Protection

If any conflict with the canopy is likely to occur, then:

a) A spotter is to be in place to ensure the canopy is avoided
b) Where the canopy cannot be avoided, the Project Arborist is to be contacted and branch tying or pruning can be considered in consultation with UTS
c) A new method is to be utilised

18. Services Connections

No excavation for service connections, such as lines for water, gas, electricity, sewer and storm water, is to be carried out within the TPZ beyond what is approved in this Tree Management Plan. Any further excavation that is required must be approved by the Project Arborist and UTS.

19. Root Protection

If any roots of the tree are likely to be cut within the TPZ by any excavation, then:

a) Excavation of existing pavers is to be carried out by hand in a manner that will prevent damage to the tree roots.
b) Roots exposed by excavation works must be covered immediately. Where they must remain exposed, they are to be covered immediately by, at least, one layer of hessian and wetted daily to ensure consistent moisture. Twice daily on hot sunny days.
c) Any damaged roots must be pruned back to an appropriate union using sharp tools providing a clean cut. This is to be undertaken by an AQF 5 arborist and UTS notified.
d) Any proposed tree root pruning to be undertaken, not specified in this TMP, must firstly be approved by the Project Arborist and UTS.
e) Any excavation face on the tree side within the TPZ is to be kept moist until back-filling is completed. The recommended method is to drape the faces with a thick textile (hessian for example) which is kept moist with micro sprays.
f) Back-filling is to be carried out as soon as possible.

20. Excavation Within The TPZ

No alterations to the natural soil level within the Tree Protection Zone (TPZ) are allowed, including digging, scraping, or soil compaction, except for works specified in this TMP and approved by UTS.
Where soil excavation is required within the TPZ, the excavation must be carefully done using hydrovaccing with an eco lance or by hand.
Soil excavation outside the scope of this report must be passed by the Project Arborist and approved by UTS.

21. Tree Protection Fencing

Tree protection fencing must be erected where specified and must remain in place until the completion of development works. Tree protection fencing is to be a sturdy 1.8m tall steel mesh fence with base supports. Signs, similar to *Appendix B*, are to be fixed to the fencing and visible from all sides.
During the demolition stage, dust cover sheets must be attached to the fencing to stop the spread of debris and contamination of the soil.

22. Paving Replacement

All paving replacement within the TPZ of all trees must be undertaken by hand to minimise damage to any tree roots found underneath.
Machinery will be too aggressive and likely tear or crush any roots underneath the paving.
Any sub base material required for new paving within the TPZ may be lightly compacted. Too much compaction will suffocate the tree roots, causing them to die and reduce the tree's health.

23. Raised Garden Bed Retaining Wall Replacement

Trees within raised garden beds will need to be treated carefully during the retaining wall replacement process. Tree roots will become exposed to mechanical damage, contamination and dehydration. To best protect the roots:

- Removal of the existing retaining walls should not occur within a week of tree watering to allow the soil moisture to drop and soil cohesion increase. This will reduce the amount of soil that falls away.
- The removal of the retaining walls is to be undertaken by hand, no machinery is to be used in the demolition.
- Water and hessian mats are to be on hand so that all exposed roots can be wetted immediately and covered in hessian, which is then wetted, as soon as possible.
  Once the demolition is complete, the hessian should be wrapped around the soil root zone and may be wrapped firmly. The hessian will need to be wetted daily, twice daily on a hot sunny day. (Tree roots with a thickness of 10mm (equivalent to your pinky finger) will die within 1 minute when exposed to direct sunlight on a hot day).
  Formwork may be used, if needed, to shore up the sides of the soil root zone for stability
- Replacement walls must be installed as soon as possible, preferably within 3 days. Hessian wrapping and watering is a temporary measure.
- Where soil needs to be added due to loss or expansion of the garden beds, it must be native soil similar to the existing soil. The added soil may be coarser, but not finer in texture.
- Where roots larger than 50mm require pruning, the Project Arborist must be consulted.

Stormwater Service Installation

For further information regarding the encroachment of the proposed stormwater service installation, refer to the below documents:

- *Landscape Tree Management Plan*, Drawing L110, Issue B
- *Stormwater Drainage Overall Layout Plan* (*Option 3 – Complete Renewal*), Drawing No. C020, REV: P2 and subsequent plans.

The measurements for the distances from the tree and nearby stormwater services provided in the below *Tree Schedule* have been taken from both the aforementioned documents. The distances measured across the two documents do vary slightly and where fine detail is required to confirm the encroachment into the TPZs, the documents should be directly consulted.

There are two acceptable methods for the installation of stormwater service piping, hydrovaccing with an eco lance and tunnel boring for new piping and in situ upgrades. These methods are particularly helpful in ensuring tree roots are not damaged. The eco lance tip used in hydrovaccing ensures the water pressure is low enough to not damage the epidermis/bark of the roots however still wetting and breaking apart the soil. Hydrovaccing with an eco lance is an open trench installation. For further details on hydrovaccing with an eco lance, refer to *Appendix F*.

Tunnel boring allows the soil and roots (where they have not grown inside the piping) to remain relatively undisturbed while digging laterally and installing the piping in place. Where possible, tunnel boring should be done below 600mm, below the root zone to avoid them. This method does not require an open trench.

We recommend the use of tunnel boring, at least, where the encroachment is considered major and/or inside the SRZ and for the replacement of existing services using the method of breaking the existing piping in situ and installing the new piping. Where the encroachment is considered moderate or lower and outside the SRZ, hydrovaccing with an eco lance is an acceptable method, but may require the supervision of the Project Arborist.

Should hydrovaccing with an eco lance be required, due to the stormwater regulatory authority requiring an open trench installation, where the encroachment is considered major and/or inside the TPZ, the Project Arborist must be present for supervision.

Binder 3a,420

Appendix B

Tree Protection Sign



Appendix C

Surface Protection

Load Sharing Surfaces Equivalent To:

Alturnamats (www.makinex.com.au) or Trakmats (www.trakmats.com.au) used to prevent compaction in sections of the Tree Protection Zone (TPZ^{TMP}) that cannot be fenced.

Installation Method

1. For loads less than 3 tonnes:
   - ✓ Spread 75-100mm wood chip over the area to be protected.
   - ✓ Lay protective mats (Alturnamats or Trakmats) edge to edge over the area.
   - ✓ Where loads traffic is restricted to pedestrian traffic only, 25mm thick plywood may be used in place of Mats.
   - ✓ Connect the mats together with Mat Joining Links (or equivalent)



   - ✓ Pin the mats into place to prevent movement.

2. For loads of 3.0 - 6.0 tonne
   - ✓ Lay rumble boards of 120 x 65mm hardwood across the area to be protected at 600mm spacing.
   - ✓ Spread 75-100mm wood chip over the area to be protected,
   - ✓ Lay protective mats (Alturnamats or Trakmats) edge to edge over the area.
   - ✓ Connect the mats together with Mat Joining Links (or equivalent).
   - ✓ Pin the mats into place to prevent movement.

The installation is to be checked regularly and maintained in good condition.

An alternative installation

3. Where scaffold is used adjacent to a protected tree, the load sharing surface can be replaced by a floor inserted at the base of the scaffold, at up to 500mm above the ground to prevent pedestrians and loads directly on the ground surface.



Appendix D

Trunk Protection



- Tree Guard is available from Arborist Network (02) 98351234
- A similar product may be substituted if it provides similar protection, in particular the soft padding effect of the polystyrene and the semi-rigid nature of the plywood.
- The individual lengths of trunk guard are to be at least 1.5m long and installed so that the bottom is at natural ground level.
- The gaps between strips of are not to exceed 20mm.
- Two predrilled metal strips are to be used to hold the lengths in place located approximately 400mm from either end of the lengths.
- The metal strips are to be installed using 12mm screws, screwed into the ply of the Trunk Guard. (It may be useful to hold the lengths in place temporarily with elastic straps until the screws can be installed) Hammering of screws or nails is to be avoided.

Appendix E

Tree Planting Methodology

The below planting methodology does not guarantee the survival of a planted tree.

Potted Plants

1. The diameter for the hole for the new planting is to be, at least, twice the diameter of the root ball of the new planting. The depth is to be height of the pot less 2-3 inches. This is to ensure the root collar is not buried.
2. Keep all soil excavated from digging the hole as this may be reused, however separate topsoil and subsoil. Where increased soil performance is desired, the subsoil may be mixed with a fine mulch garden mix at, no more than, a 1:1 ratio.
3. ACT has very high clay content clay, which can impede soil drainage. Clay breaker (gypsum) may be used as per product instructions to increase soil drainage. Spread in and around the hole, then watered in.
   Where the area is known for long periods of rain or waterlogging, a subsoil drain may be needed (tree specie specific). A slip trench on the lower side of the tree, backfilled with blue metal can be used as a subsoil drain.
4. The hole walls should be scored with the edge of a shove, or similar, to allow a break for tree roots to penetrate and reduce root girdling.
5. Once the tree is removed from the container, it must be handled by the root ball and not the trunk. Using sharp secateurs, prune any girdling roots or roots starting to grow around the root ball.
6. The root ball must be watered, prior to planting, to the point of being moist but not soaking.
7. Ensure the tree is centered in the hole and the root collar is one inch above the natural ground level.
8. As the soil is being placed back into the hole, firm the soil with light compaction (pressing with hands or foot). Once hole is ¾ full, moisten soil and then finish filling once water has drained. Allow enough in the top part of the hole to finish filling using the topsoil kept aside.
9. Install a mulch dish/saucer around the tree. Keep it 30cm from the tree to avoid buildup against the root collar.
10. Where the tree will be susceptible to strong winds, staking is recommended. Using, at least, two 50mm square wooden stakes or steel star pickets, tie 50mm jute webbing to the stakes and loop around the tree.
    Ensure the stakes are not within the radius of the tree root ball and the jute webbing must not be tight, slacken until slightly loose. The tree must be able to move slightly and establish root buttressing in response to windy events.
    Do not use wire or twine as these will cut and/or pinch the tree.
11. Stakes may require yearly inspection and adjustment. Remove stakes once tree is established (typically 3 – 5 years).
12. Ensure, when watering trees not to over water, especially with high clay content soil as this will lead to drowning. When watering, water the ground under the tree out to the dripline, do not focus all water at base of tree trunk.

Appendix E

Definitions

Directional Canopy Radii'

Canopy radii were measured at 90° intervals starting at north by stepping. Where it is indicated that a more accurate radius may be important, it was measured by tape measure.
The four radial canopy diameters are shown (in meters) in the 'table. Where measurement of these would require entry onto neighbouring blocks or access was difficult, the measurements have been estimated. If required, the broadest canopy diameter is also measured to determine if a tree is regulated.

Health

Health is an indication of the tree's health and vigour. It has been judged against the following range:
Very Good (VG), Good (G), Fair (F), Poor (P), or Very Poor (VP)
General comments on the tree's health and vigour, and specific comments on evidence of insect infestation or disease presence in the tree are included in the Comments Column if significant.

Structure

The structural integrity of the tree has been judged against the following range:
Very Good (VG), Good (G), Fair (F), Poor (P), or Very Poor (VP)
General comments on the tree's structure and specific comments on evidence of Root Zone Disturbance and Structural Damage to the tree are included in the Comments Column if significant.

Tree Protection Status

The legal status of each tree is given as one of the following:
Not Regulated - no protection required, can be retained, or removed.
Pest Plant - is a weed: no protection required, may be removed without permit (or retained depending on level of classification).
Regulated Tree - a tree that, due to its size, is classified as a 'Regulated Tree' under 'Urban Forest Act 2023' and therefore a permit would be required to:

- Remove the tree.
- Prune the tree, except where the pruning is done by a qualified arborist and is done to the 'Australian Standard for Pruning of Amenity Trees' AS 4373.
- Carry out ground works within 2m of the 'drip line' of the tree.

A Tree Management Plan that is formulated according to the 'Notifiable Instrument NI2023-823: Urban Forest (Tree Management Plans) Guidelines 2023 (No 1)' is designed to act as an application for the Tree Damaging Activities associated with this development.

Comments

Any comments that are relevant are recorded in this column especially those related to health and structure and value.

Circumference

Trunk Circumference for the calculation of the Tree Protection Zone as per Australian Standard AS4970-2009 (TPZ4970) is the trunk circumference at 1.4m above ground level. It is expressed in metres and lists the individual trunk circumferences if there are more than 1 trunk at that height. These are used to calculate the DBH and subsequently the Radius TPZ4970. Where there is more than one trunk at 1.4 m AGL then the DBH is calculated by the formula presented in AS4970-2009. (Branches, c.f. trunks, are not included).

Radius TPZ

The radius of the Root Protection Zone component of the Tree Protection Zone as calculated from the trunk diameter at 1.4m AGL as recommended by the AS4970-2009. Note the final TPZ4970 may need to be extended to include crown protection

D10 TPZ

This is a construct of Canopy Tree Experts. It is the distance from the centre of the trunk to a straight-line excavation past the trunk that would excise 10% of the area of the TPZ4970. This measurement has no regulatory standing. It is only an indication how much root loss may occur with such an excavation but should be interpreted in conjunction with on-site observations as to where active absorptive roots are likely to be, species knowledge and water availability. It is presented here as one example of how a 10% loss of TPZ4970 area could occur.

Radius SRZ

The figure given here approximates the Structural Root Zone diameter as proposed in AS4970-2009. It is approximate as it is calculated from the circumference at 1.4m AGL + 20%, instead of the measurement at the root buttress. It is an indication only of the size of root ball required for tree stability

Accurate calculation of the SRZ may be required if a major encroachment into the TPZ4970 is envisaged.

Appendix

Hydrovaccing Methodology

Hydrovaccing must be used for excavations within the TPZ and the tree root zone, however once past the tree root zone (typically a depth of 600mm) and no more roots are visible, full power and a more aggressive lance tip may be used to accelerate the process.

When Hydrovaccing is applied, the exposed roots are to be keep moist with wetted until soaking hessian sheets. The exposed roots must be covered with native soil within 72 hours.
Only an experienced and competent hydro excavation operator (the Operator) shall operate Hydrovac excavation equipment.

Due to suction pressure of a wider hose, a hose less than 6 inches in diameter is recommended within the TPZ.

The Operator is required to use a 45° flat fan nozzle. A flat fan nozzle is of short length, single orifice fitting, called eco lance that is inserted into the digging end of the wand and as such there is a single concentrated jet of water exiting from the tip of nozzle which then sprays water evenly. The spray is wide and reduces the pressure impact on the roots.

The maximum water pressure to be used at any time with a flat fan straight tip nozzle during hydro excavation within a TPZ shall be 2,000 psi.
The pressurised blast wand should never remain motionless.
A minimum distance of 100mm shall always be maintained between the end of the pressure wand nozzle and the subsoil.

If major damage to roots over 40mm diameter occurs while undertaking hydro excavation, the Operator must stop the operation immediately and call site arborist.
Backfill and restoration of disturbed areas is to be undertaken within 72 hours.
Compliance with Arboricultural Standards: Utilizing eco lances demonstrates a commitment to Arboricultural best practices and compliance with regulations aimed at protecting trees and their root systems during construction activities (International Society of Arboriculture, 2020).

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Appendix G

Tree Pruning Plan

Binder 3a,430

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E: bruno@canopygroup.com.au

11 November 2024

Job Reference #: 11794

Tree Pruning Plan

Dickson Place, Dickson ACT 2602



Photo sourced from Fulcrum software. Photo is indicative of site.

Client Name:

Peta Miskovich
Oculus

Author:

Dominic Grey
Consulting Arborist

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Introduction

This Tree Pruning Plan (TPP) was prepared by AQF5 Arborist, Dominic Grey, working with Canopy the Tree Experts Pty Ltd. The TMP was commissioned by Peta Miskovich to prune protect trees at Dickson Place, Dickson during the following construction activities:

- Pruning of branches to make space for luminaires and allow for the throw of light.
- Canopy lift pruning to allow for safe access underneath the trees for pedestrians.

Background

This report is to be submitted as part of the Final Sketch Plan for Package A – Dickson Shops Upgrade Dickson, ACT.
Documents referenced to write this TPP:

- Landscape Tree Management Plan, Drawing No. L110, Issue: B.
- Electrical Services Proposed lighting Layout, Drawing No. E100, Rev: P3

Method and limits

Dominic Grey inspected the trees for purpose of pruning on November 20, 2024. Using himself to determine adequate clearance underneath the canopies, with a height of approximately 1.8m, by walking underneath without interference.
Luminaire positions were measured from trees and marked by the tape measure/arrow in the photos.
In the photos below, red lines indicate the location of the pruning cut to be made. Red arrows point to a tape measure which indicates the approximate location of the proposed luminaire in some photos.

Compliance

A copy of this Tree Pruning Plan must be available on-site. All pruning approved in this plan must be undertaken by, at least, an AQF 3 qualified arborist.
It is recommended that the deciduous trees are pruned in winter to reduce the likelihood of epicormic growth from pruning wounds, however the pruning required is minor and may be conducted with the trees in leaf, if required, due to timing.

Inspection and Reporting

The project arborist must inspect and certify that the tree pruning has been conducted in accordance to AS4373 – 2007 *Pruning of Amenity Trees*.

Copyright Release

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Luminaire Pruning Specifications

Luminaire east of tree 1

Figure 1: Tree 1 removal of the lower limb.



Luminaire southeast of tree 9

Figure 2: Tip pruning on tree 9.



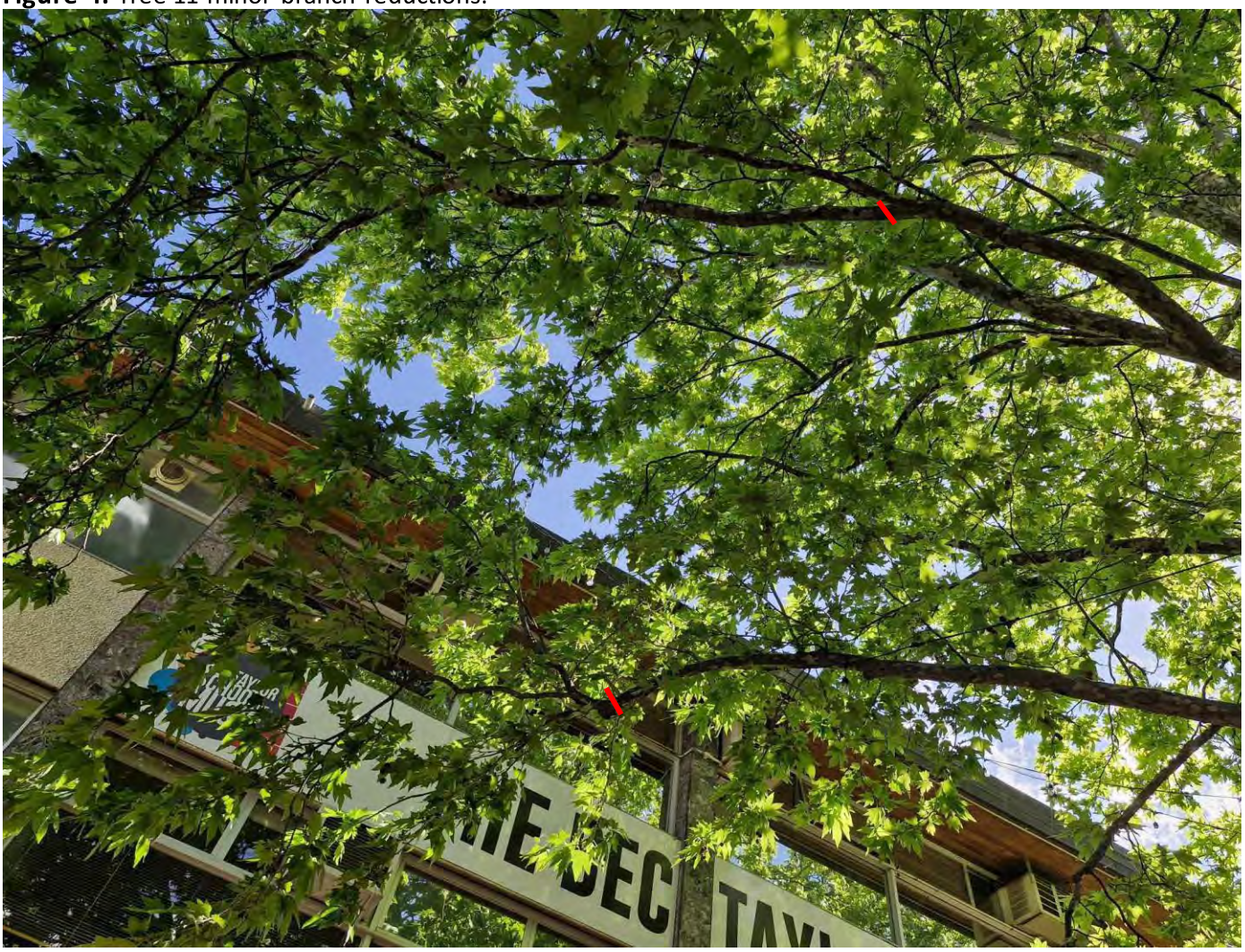
Luminaire northwest of tree 9

Figure 3: Tree 11 branch reduction.



Luminaire southwest of tree 10

Figure 4: Tree 11 minor branch reductions.

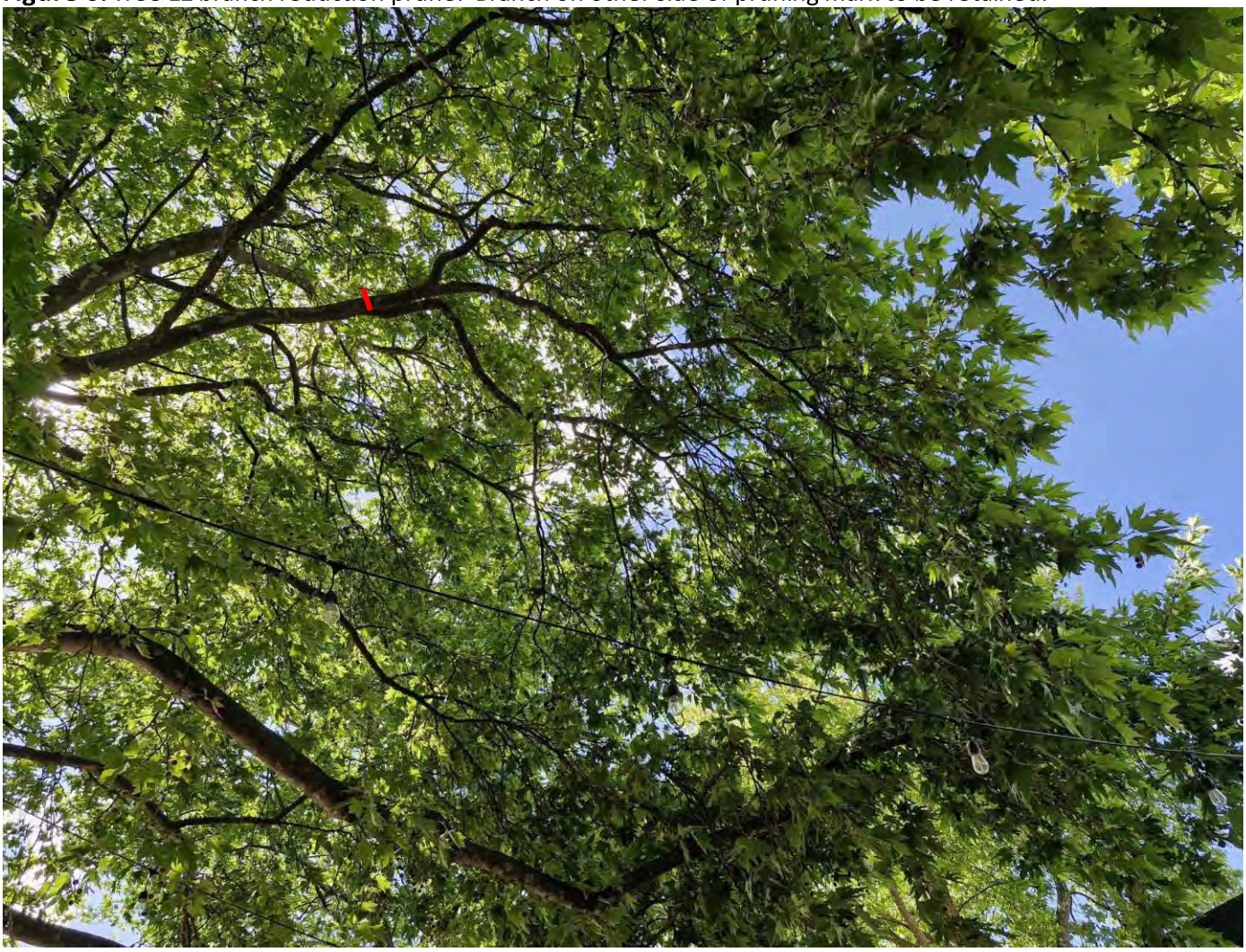


Luminaire north of tree 11

Figure 5: Tree 12 minor branch reduction.



Figure 6: Tree 12 branch reduction prune. Branch on other side of pruning mark to be retained.



Luminaire west of tree 11

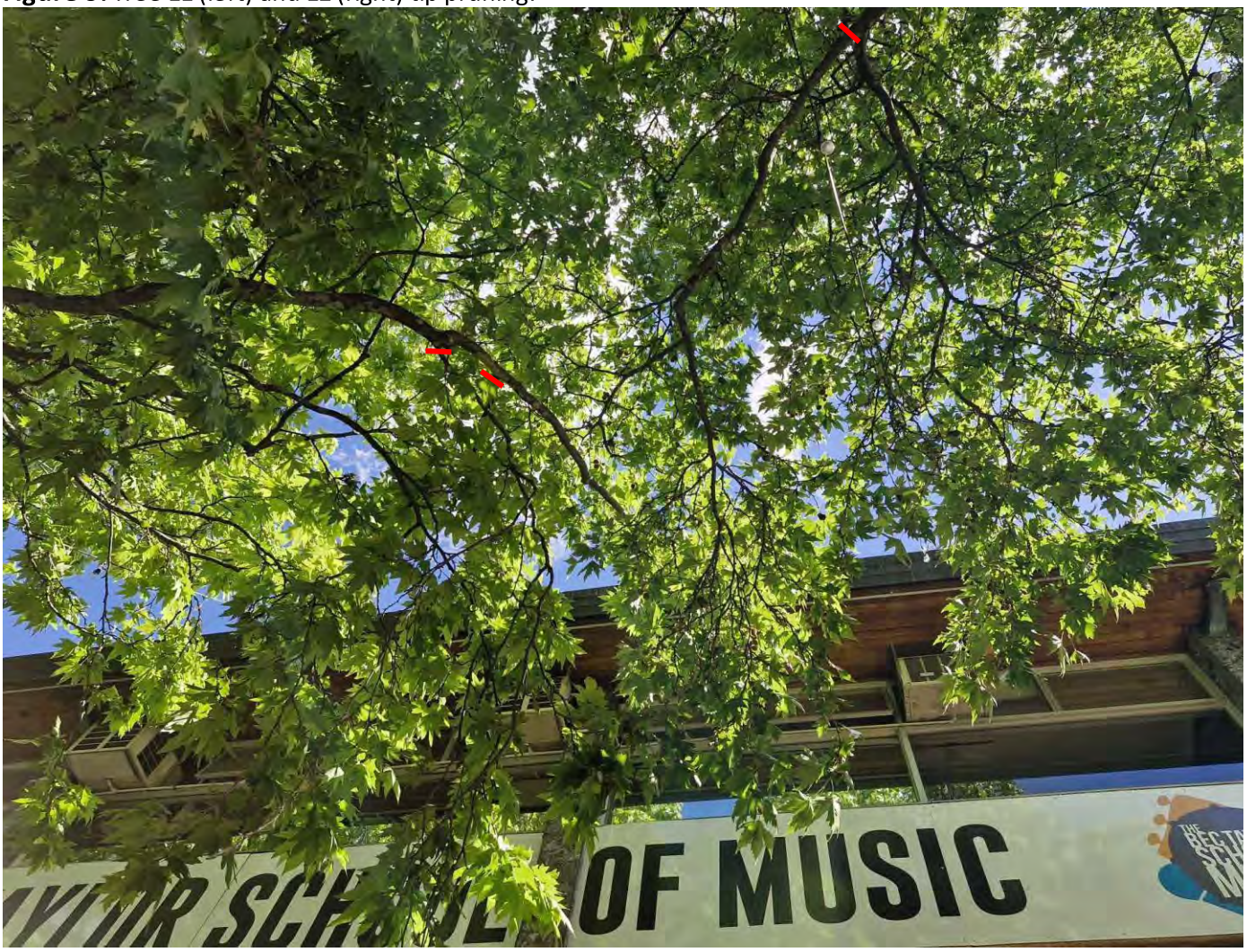
Figure 7: Tree 11 minor branch removal. No suitable unions to prune back to.



Figure 8: Tree 11 tip pruning.



Figure 9: Tree 11 (left) and 12 (right) tip pruning.



Luminaire west of tree 17

Figure 10: Tree 14 branch reduction prune.

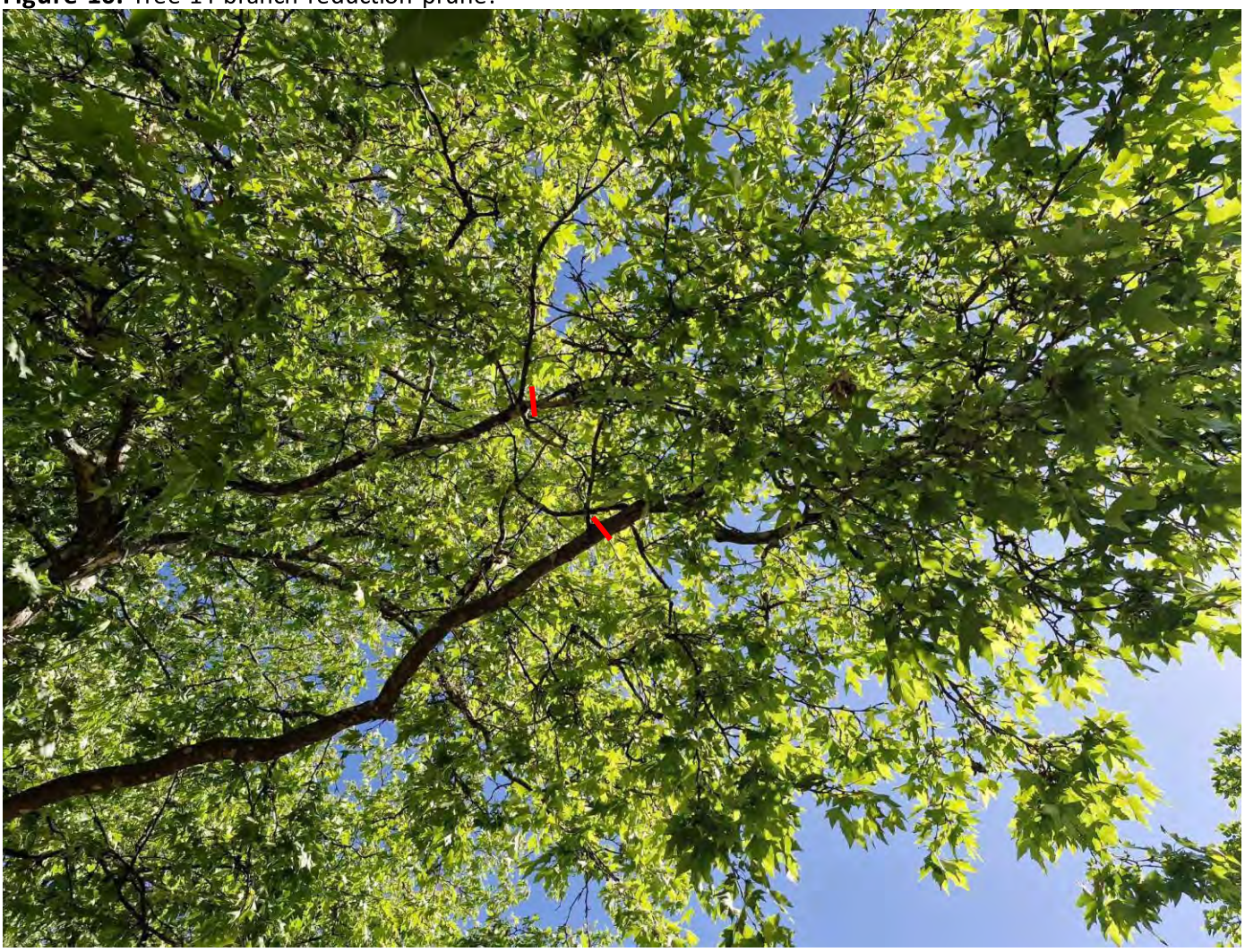
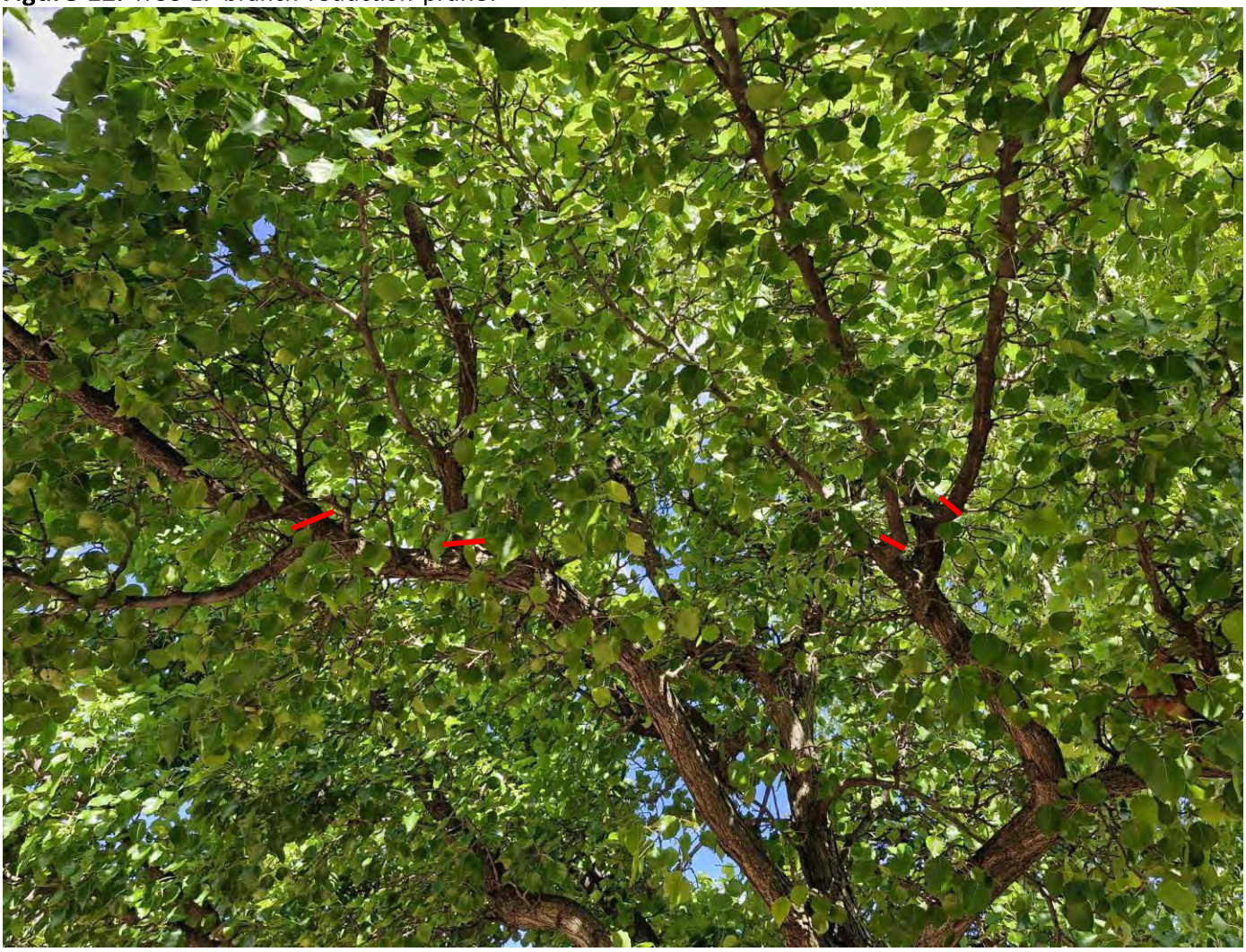


Figure 11: Tree 18 branch reduction prune.



Figure 12: Tree 17 branch reduction prune.



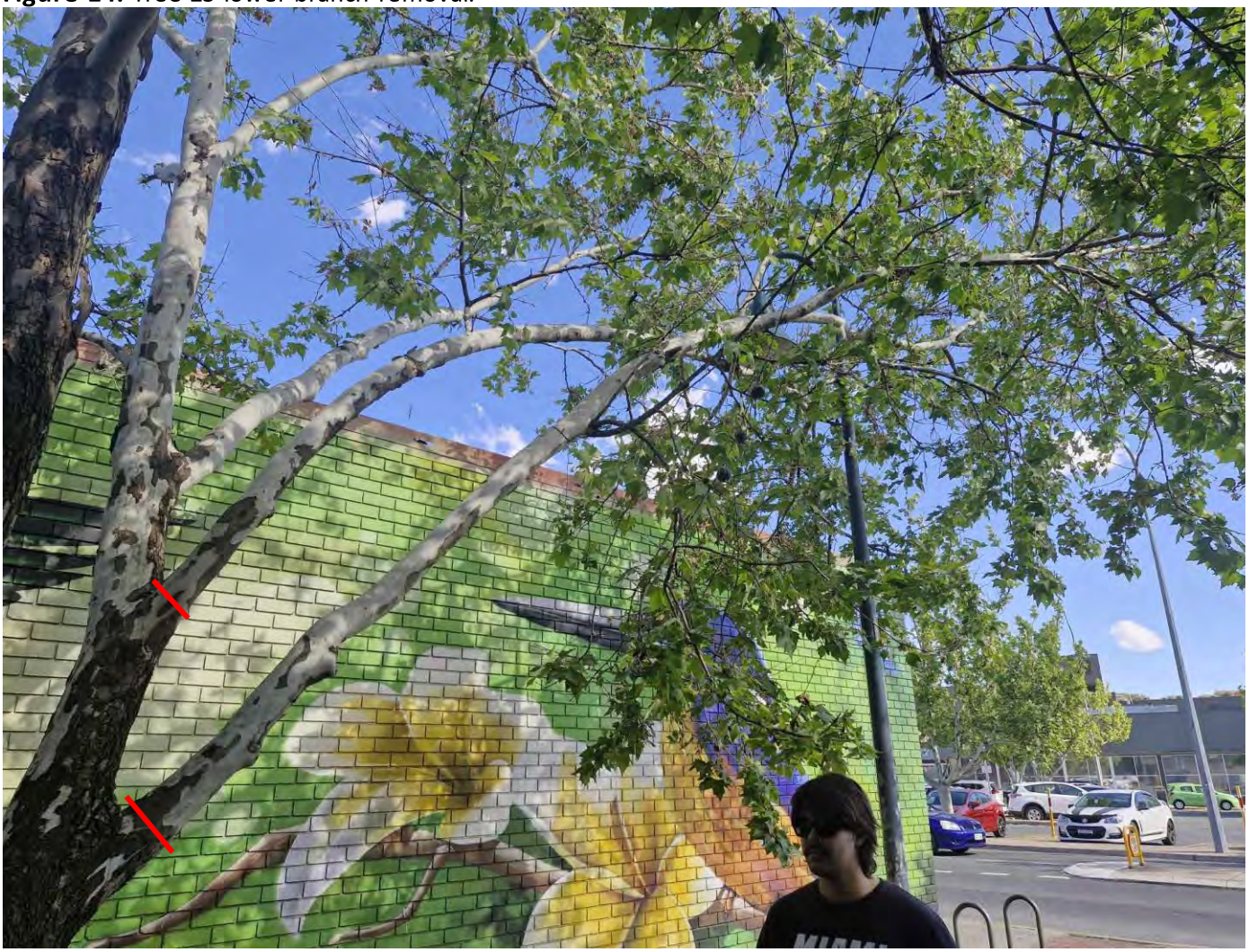
Luminaire southwest of tree 19

Figure 13: Tree 19 minor tip pruning.



Luminaire south of tree 25

Figure 14: Tree 25 lower branch removal.

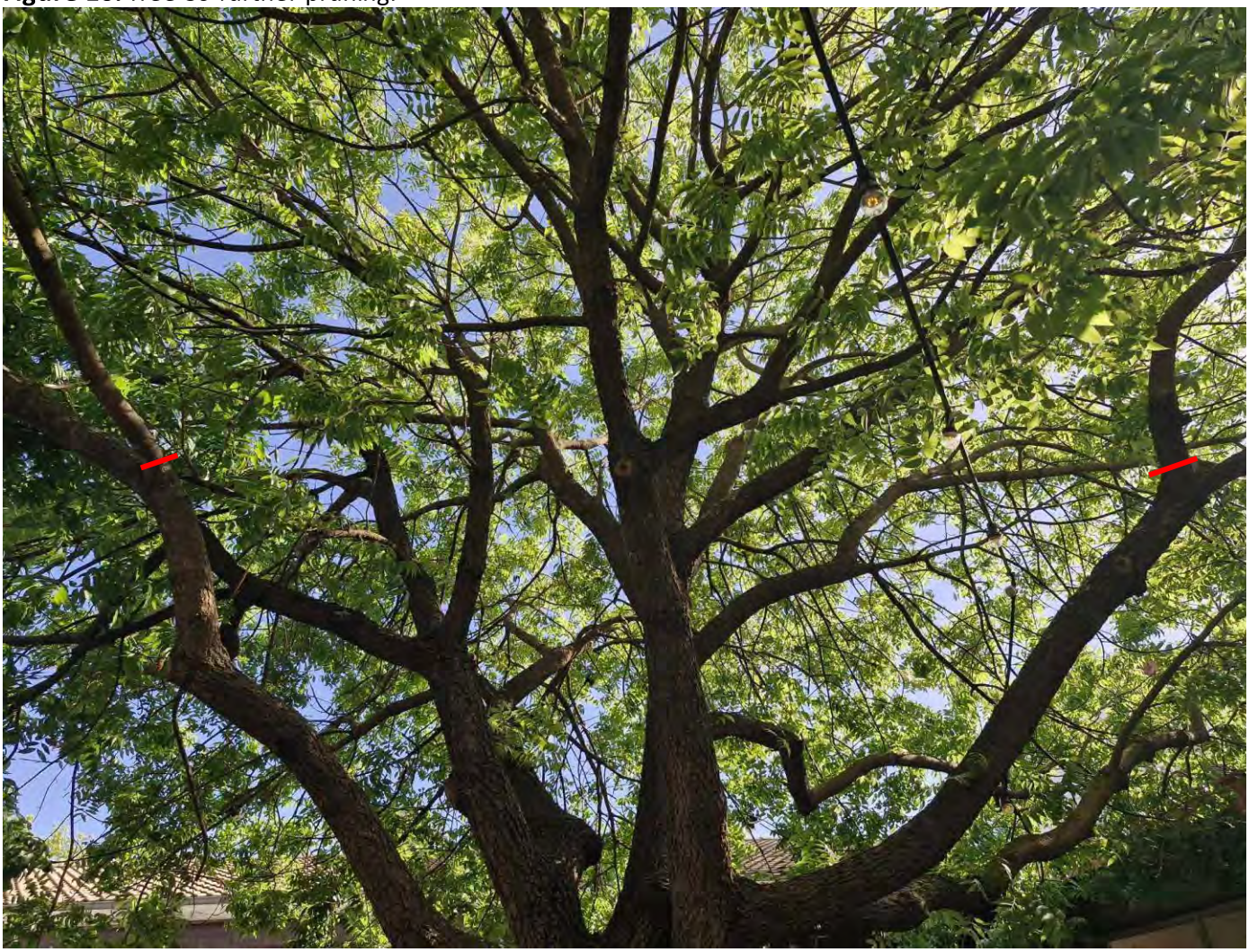


Luminaire north of tree 30

Figure 15: Tree 30 branch reduction.



Figure 16: Tree 30 further pruning.



Suspended luminaire east/west between trees 32 - 35

Figure 17: Tree 32 on the right, looking eastward across the courtyard.



Figure 18: Tree 32, further pruning.



Figure 19: Tree 34 branch reduction for suspended luminaire clearance.



Figure 20: Tree 35, branch removals for suspended luminaire.



Pedestrian Clearance Pruning Specifications

Tree 3: Epicormic growth prune for pedestrian clearance and to keep clear of Tree 2.

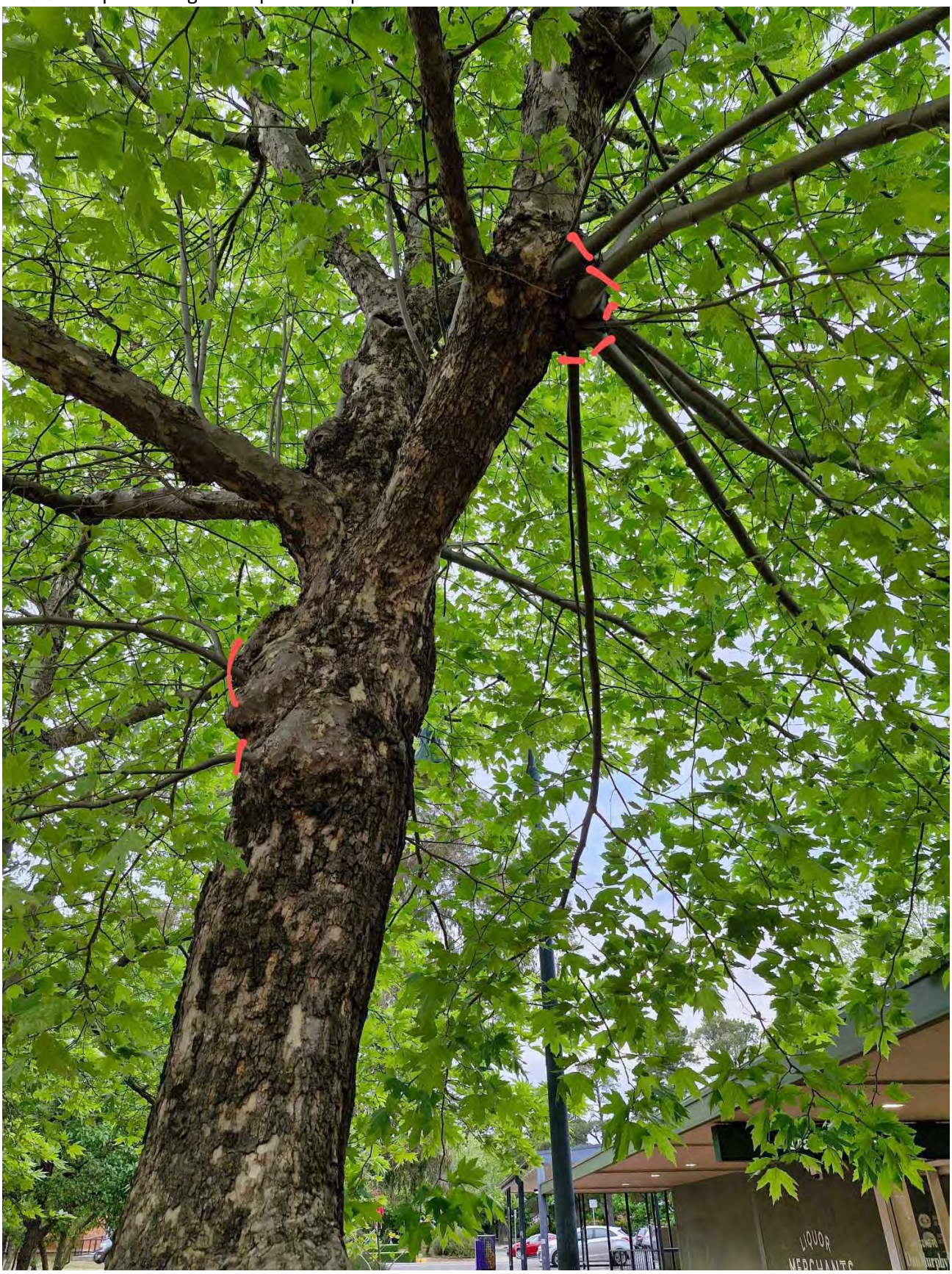



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PRICE GUARANTEE

Binder 3a,456



Tree 4: Epicormic growth prune for pedestrian clearance.



Binder 3a,458

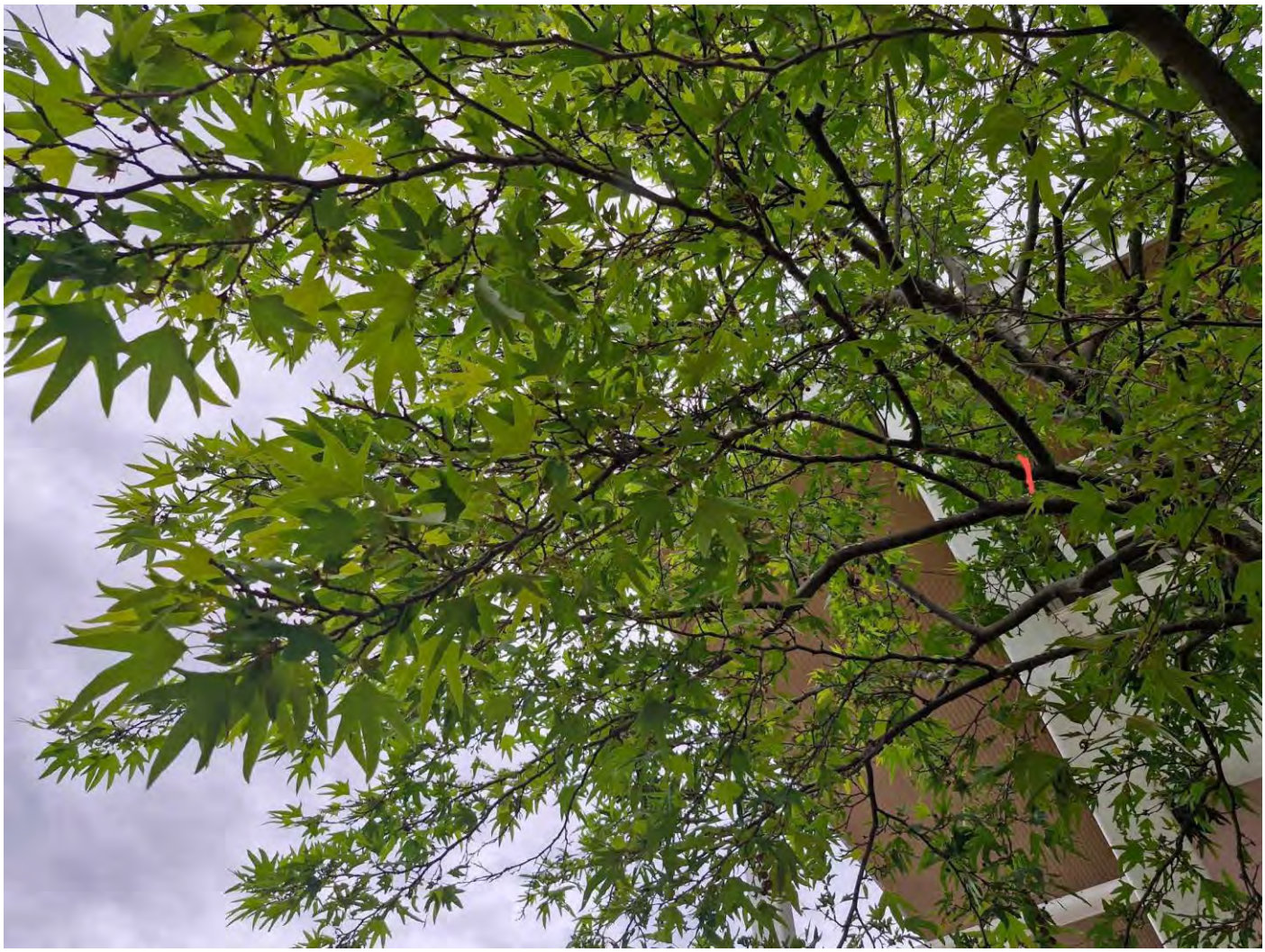


Tree 5: Canopy lift pruning of second order branches only to achieve ground clearance of approximately 2m. Lines are indicative of pruning.



Tree 6: Canopy lift prune of pendulous branches.





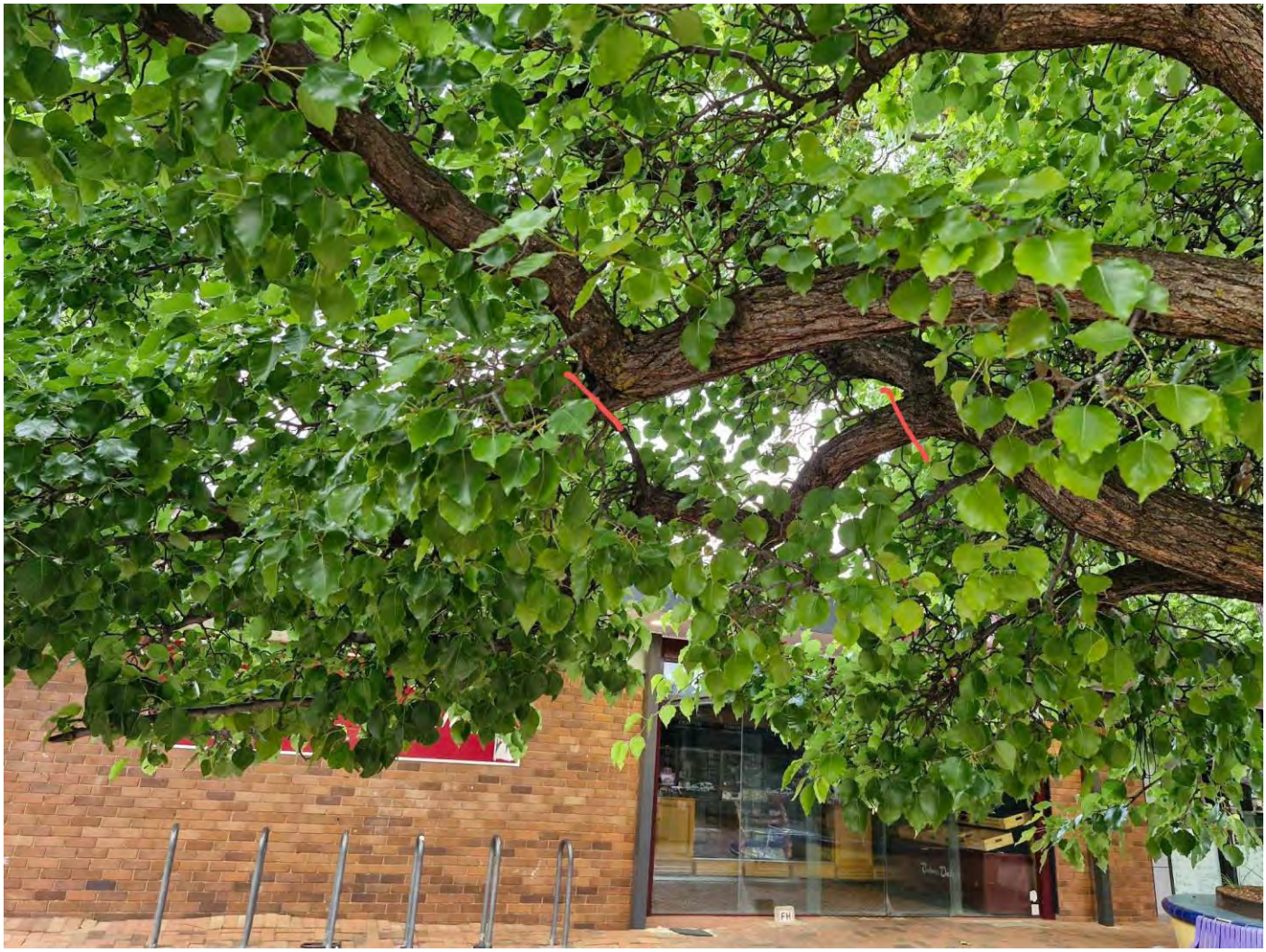
Tree 8: Lower epicormic growth removal.



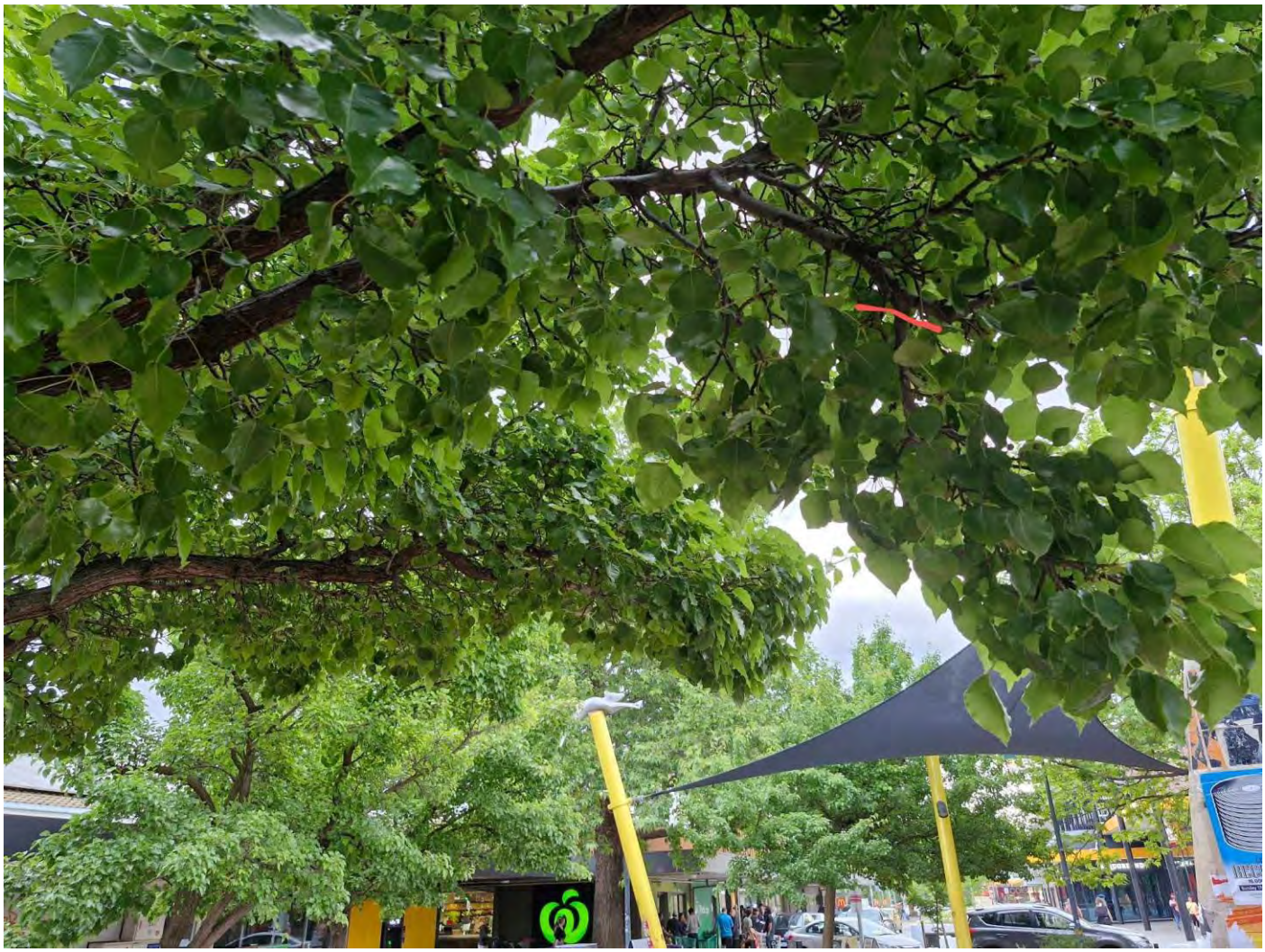
Tree 12: Canopy lift pruning of pendulous tips to achieve ground clearance of 2.5m. To be applied around this tree.



Tree 17: Lower branch removal and pendulous branch prune.



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Binder 3a,466



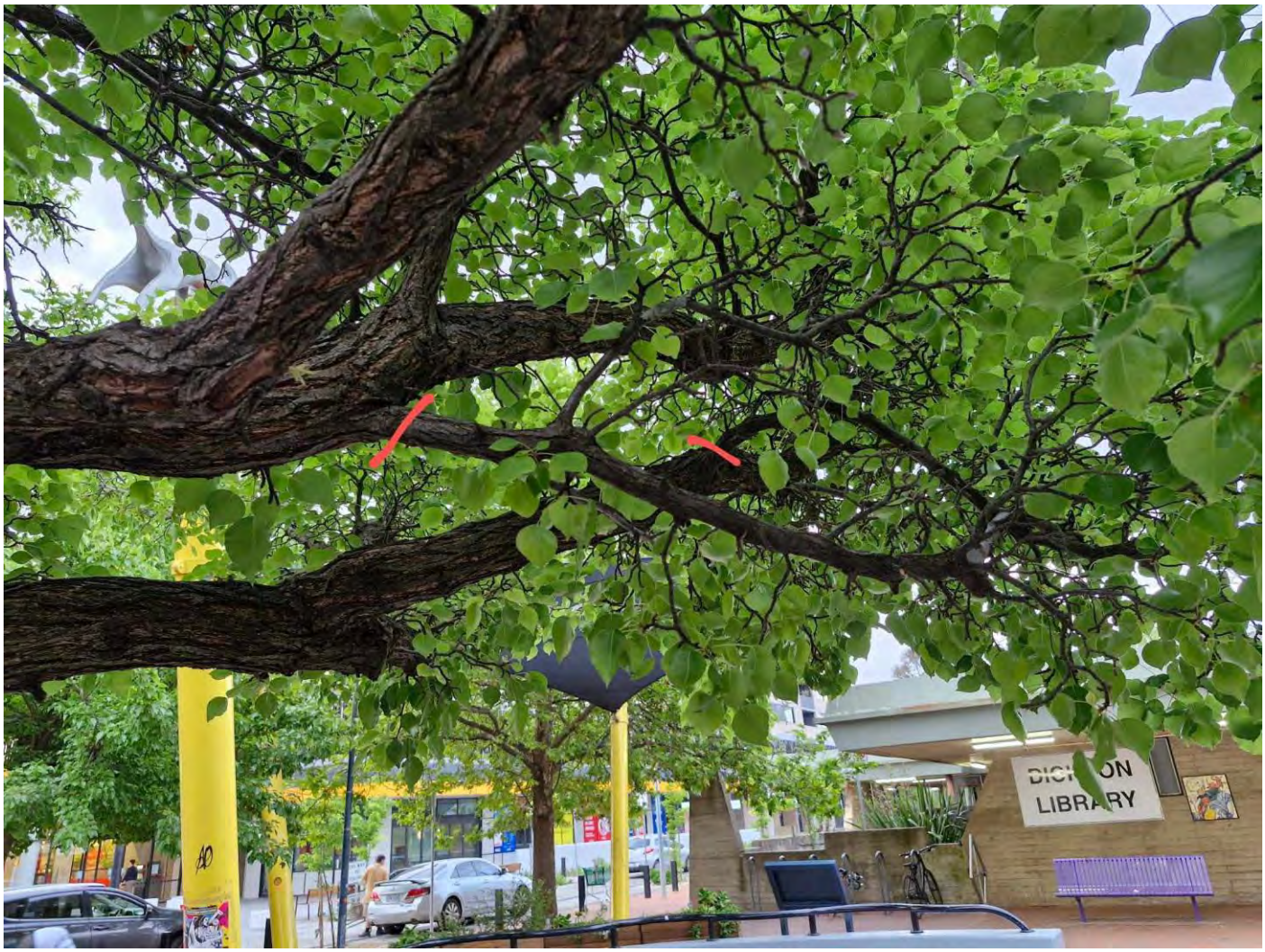
Tree 18: Low hanging branch removal.





Tree 19: Low hanging branch removal.




LIBRARY



Binder 3a,472



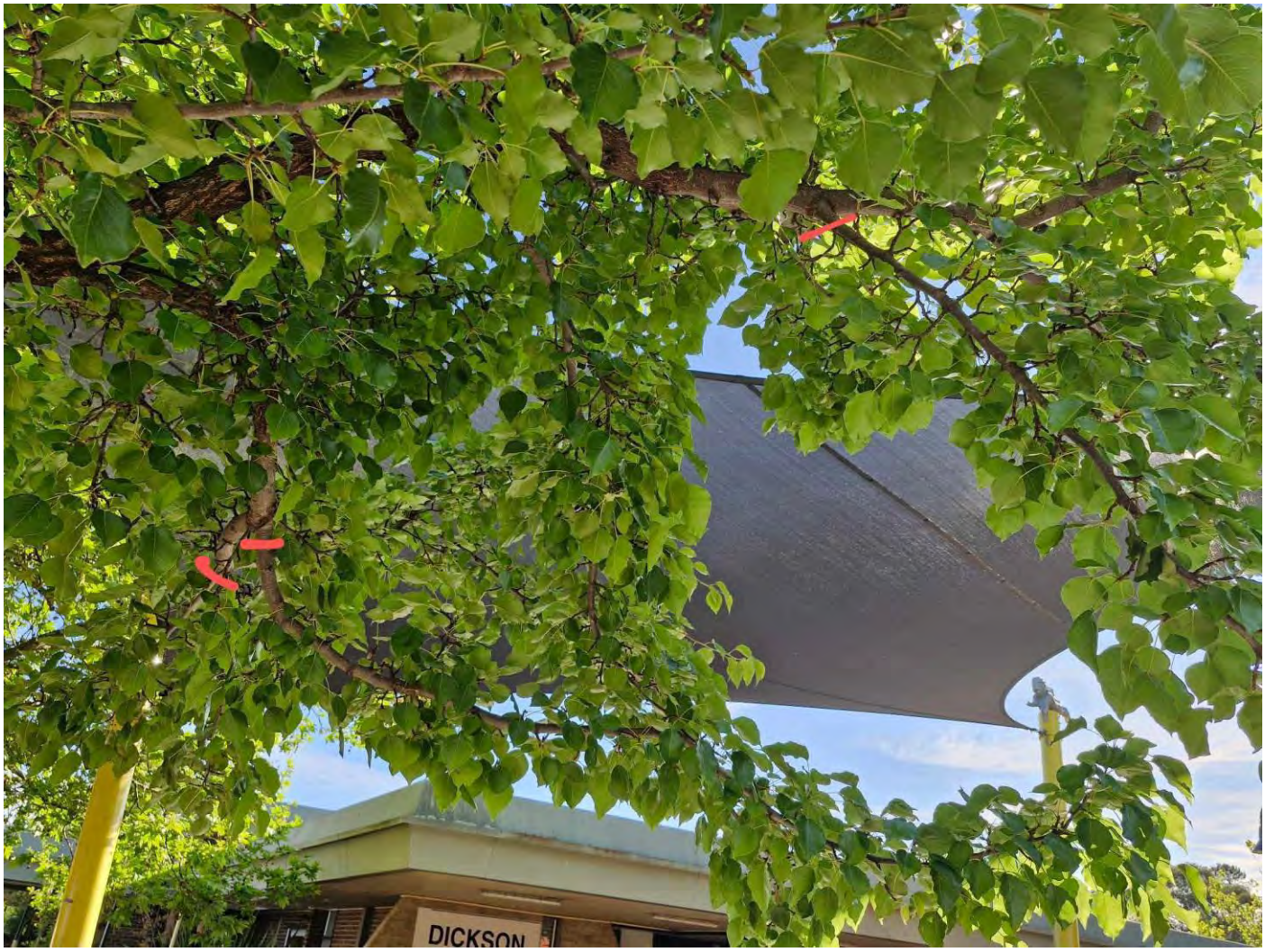
Tree 20: Lower epicormic growth prune at trunk and overall tip prune of outer canopy to achieve 2.5m ground clearance.



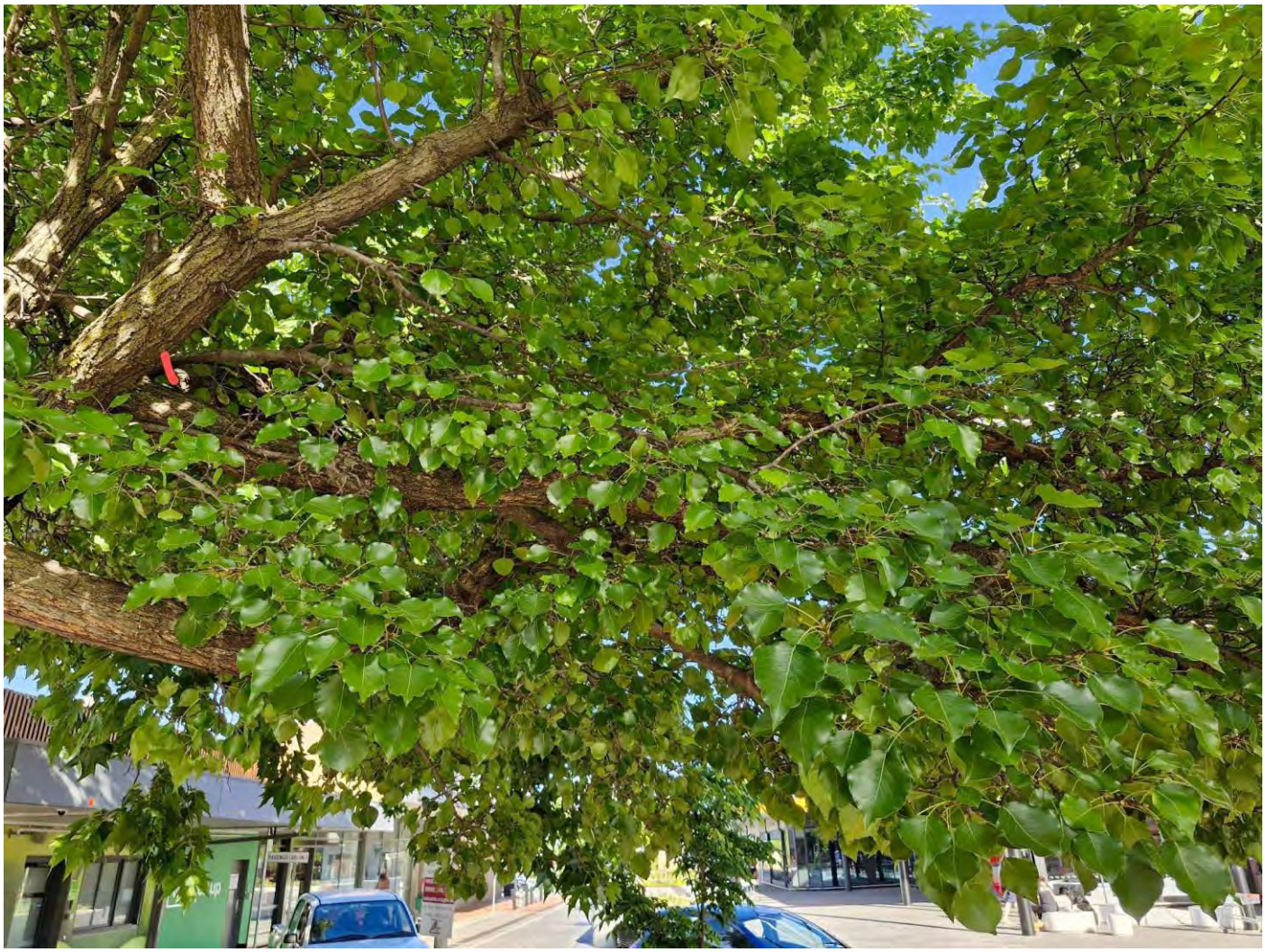
Red line indicative of tip pruning level.



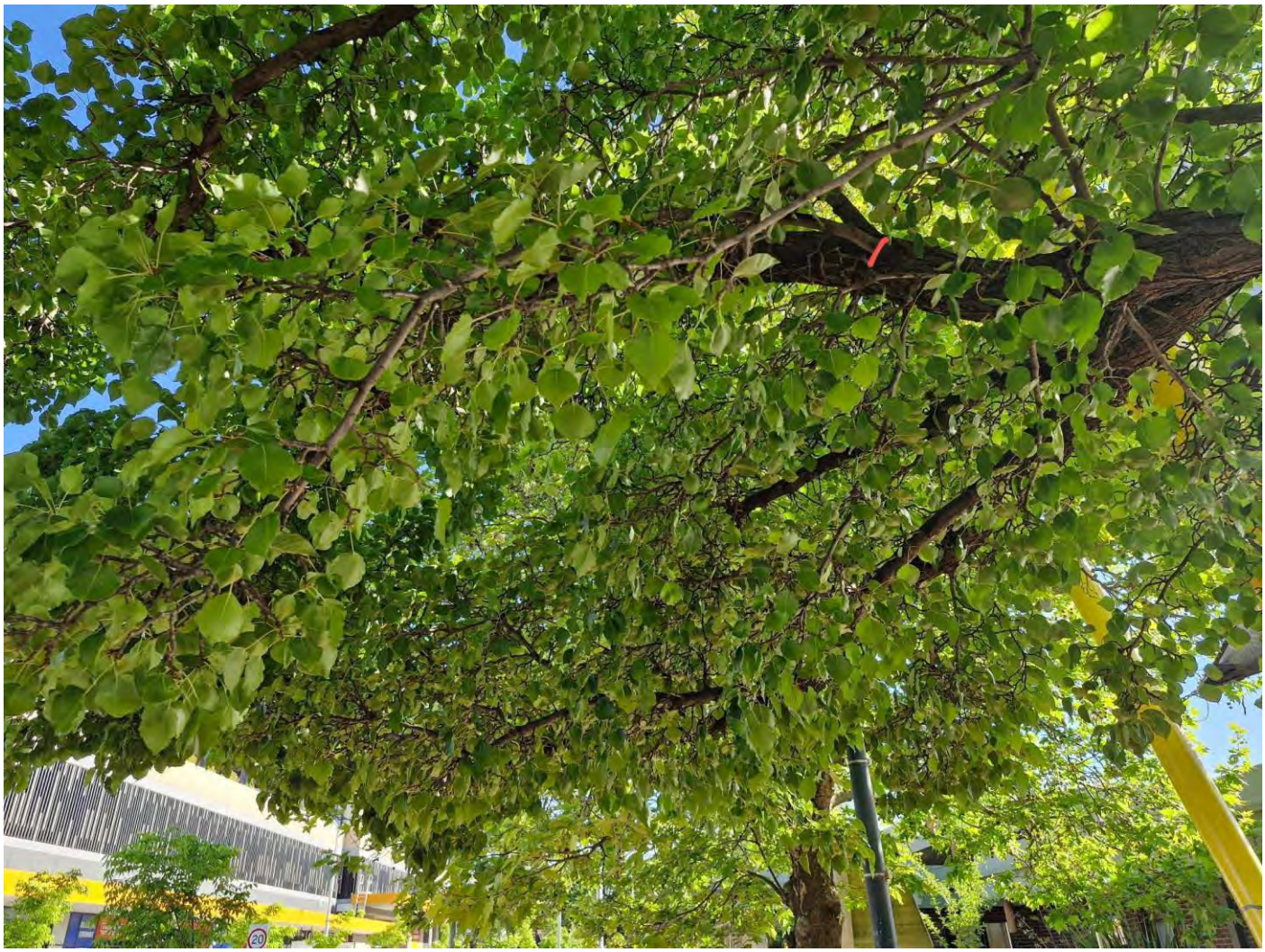
Tree 23: Low hanging and downward growing pendulous branches removal.



Binder 3a,476



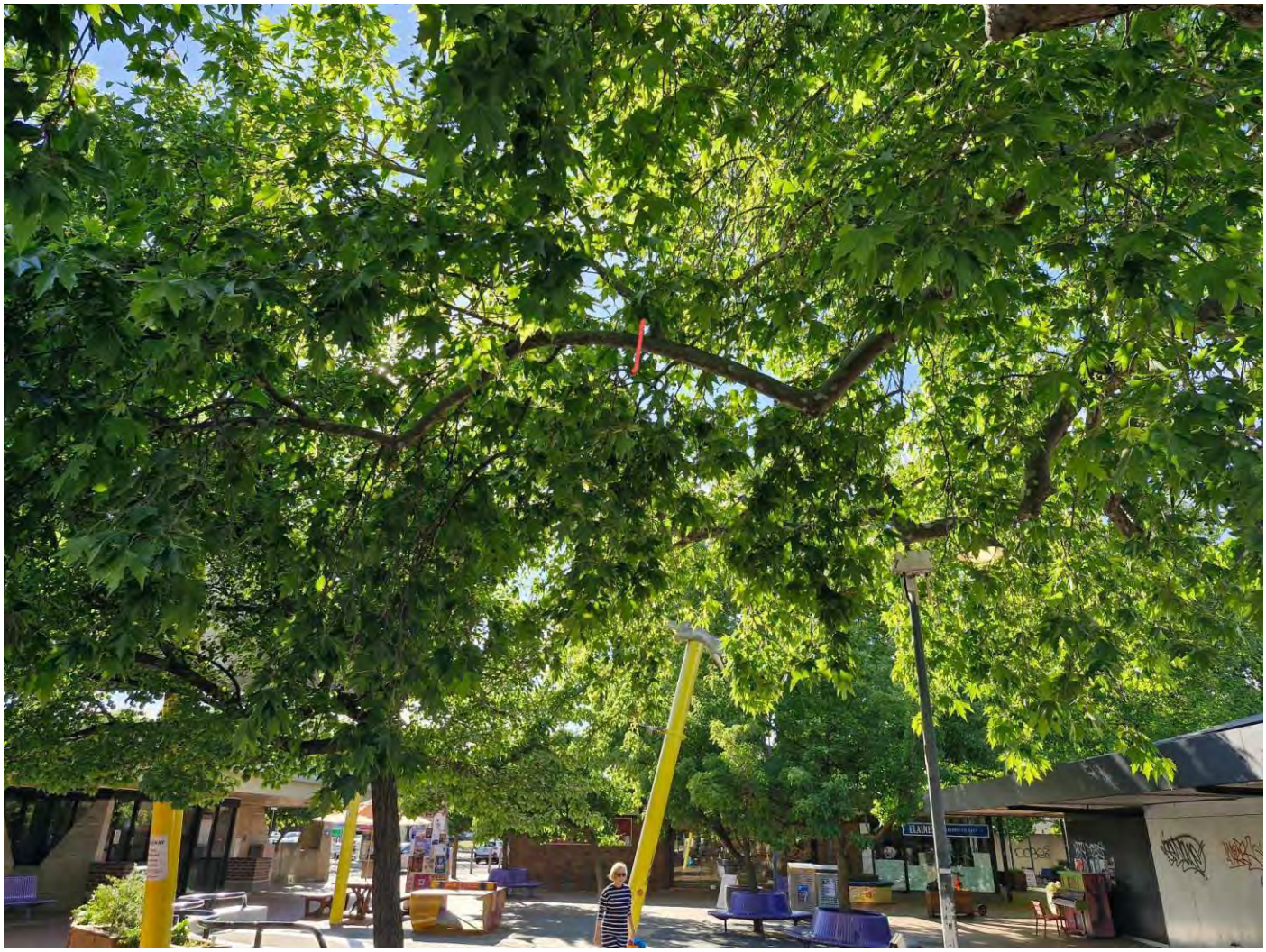
Binder 3a,477



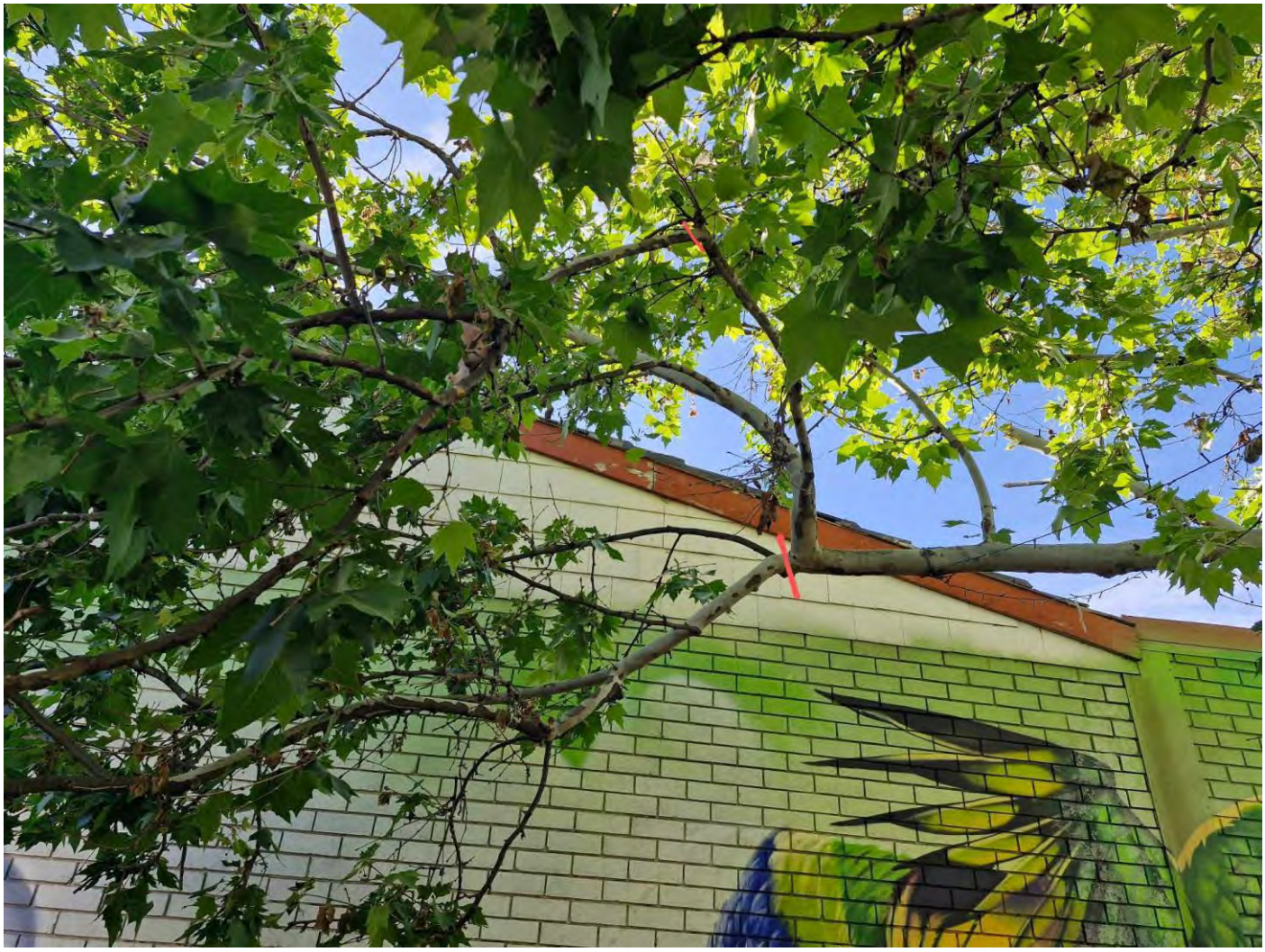
Tree 24: Tip pruning and low branch reduction.

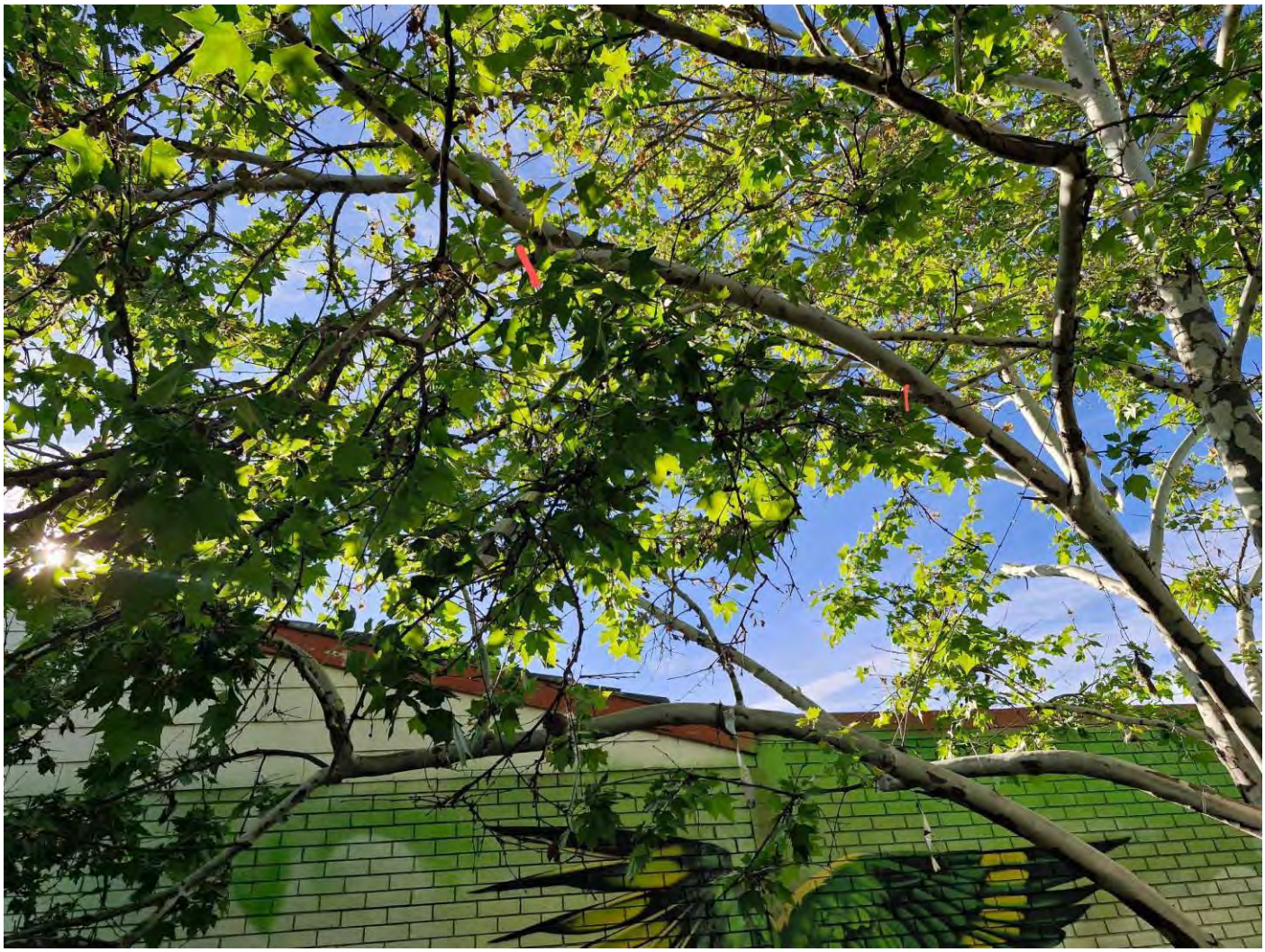


Branch reduction prune on lower northern branch.



Tree 25: Branch reduction in northern canopy.

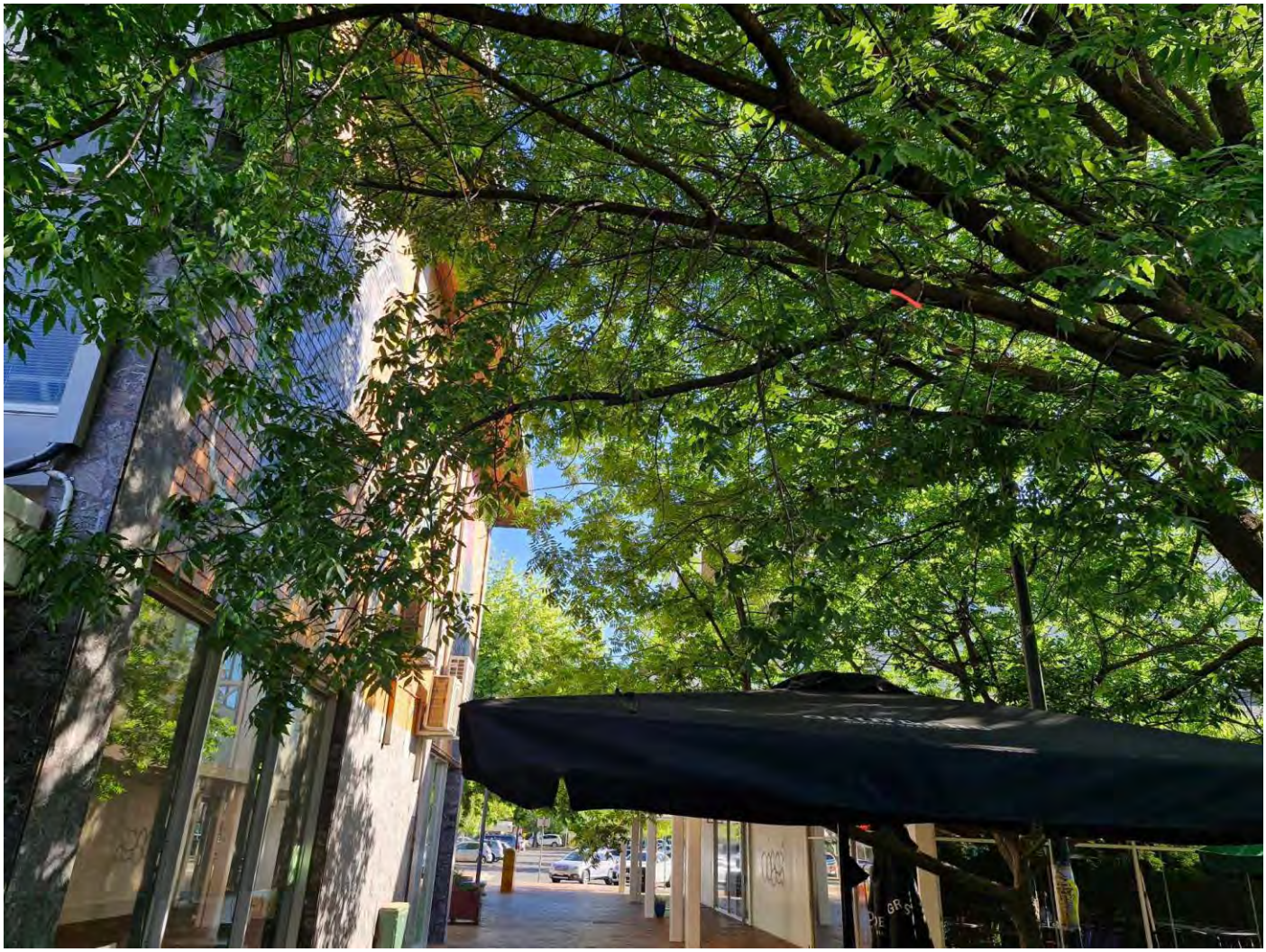




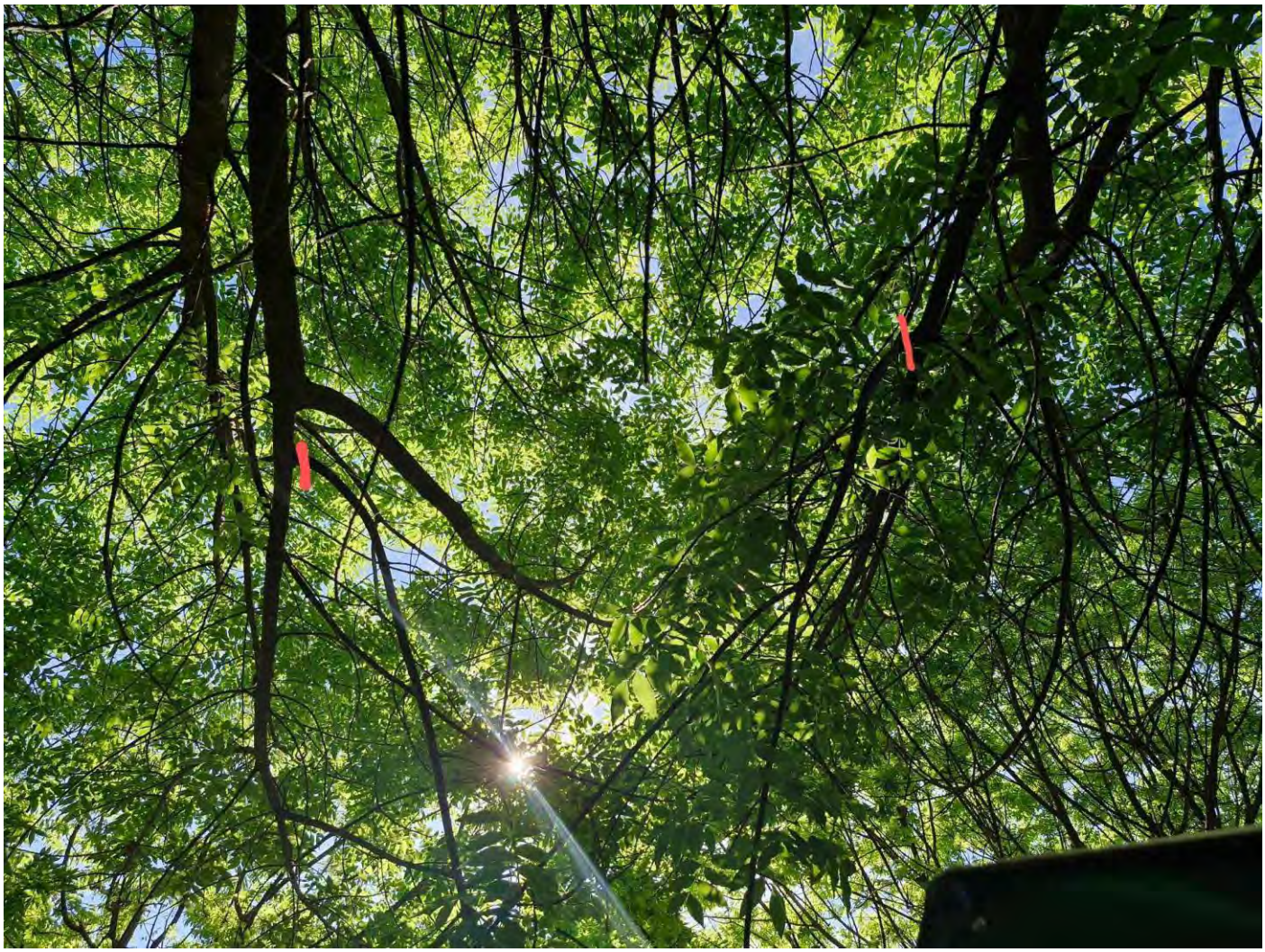
Tree 30: Tip pruning on lower pendulous branches. Red line indicative of level.



Tree 32: Lower western branch prune.



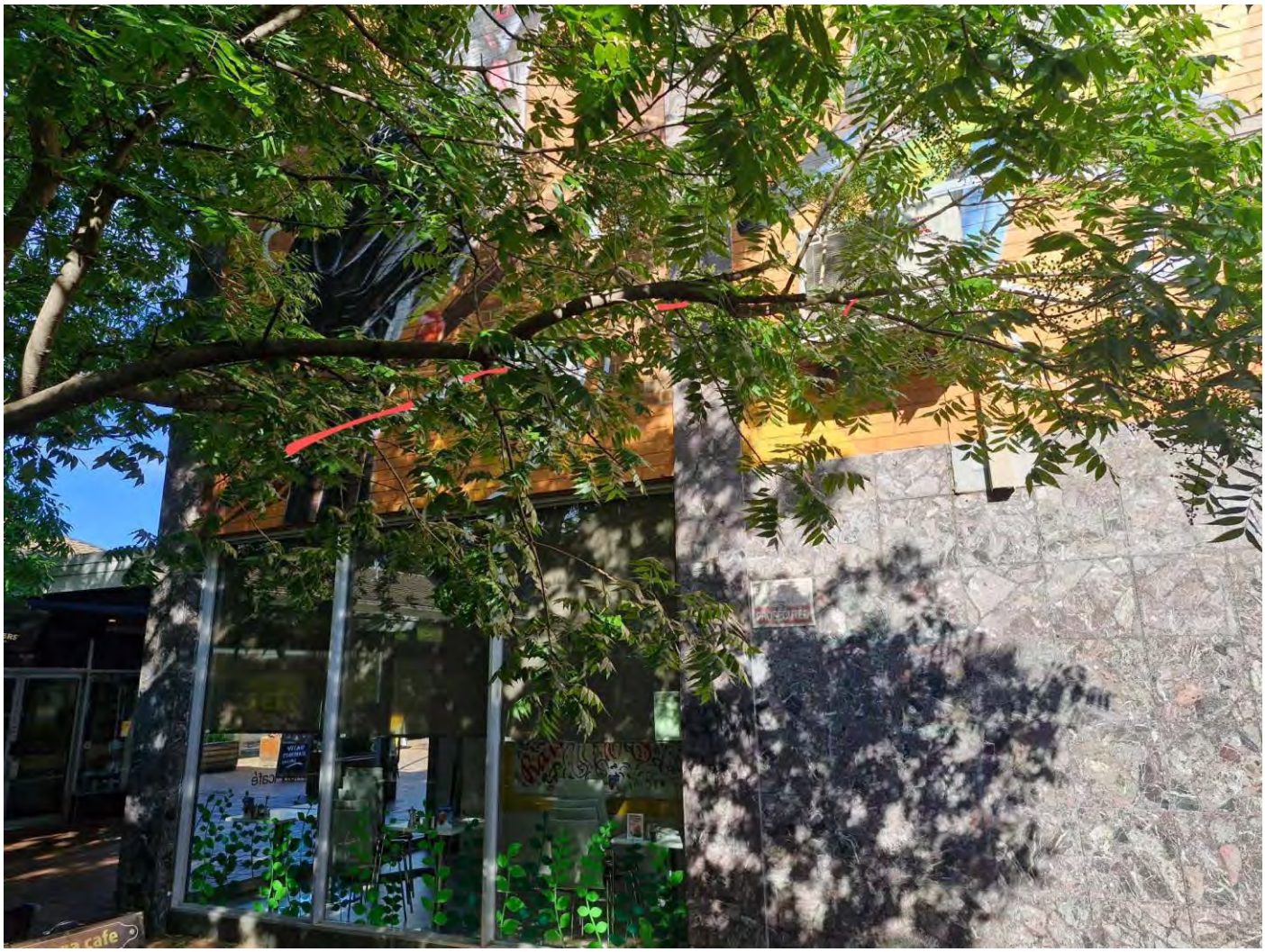
Lower eastern branch prune.



Tree 33: Pendulous branch prune in eastern canopy.



Pendulous branch prune in western canopy.



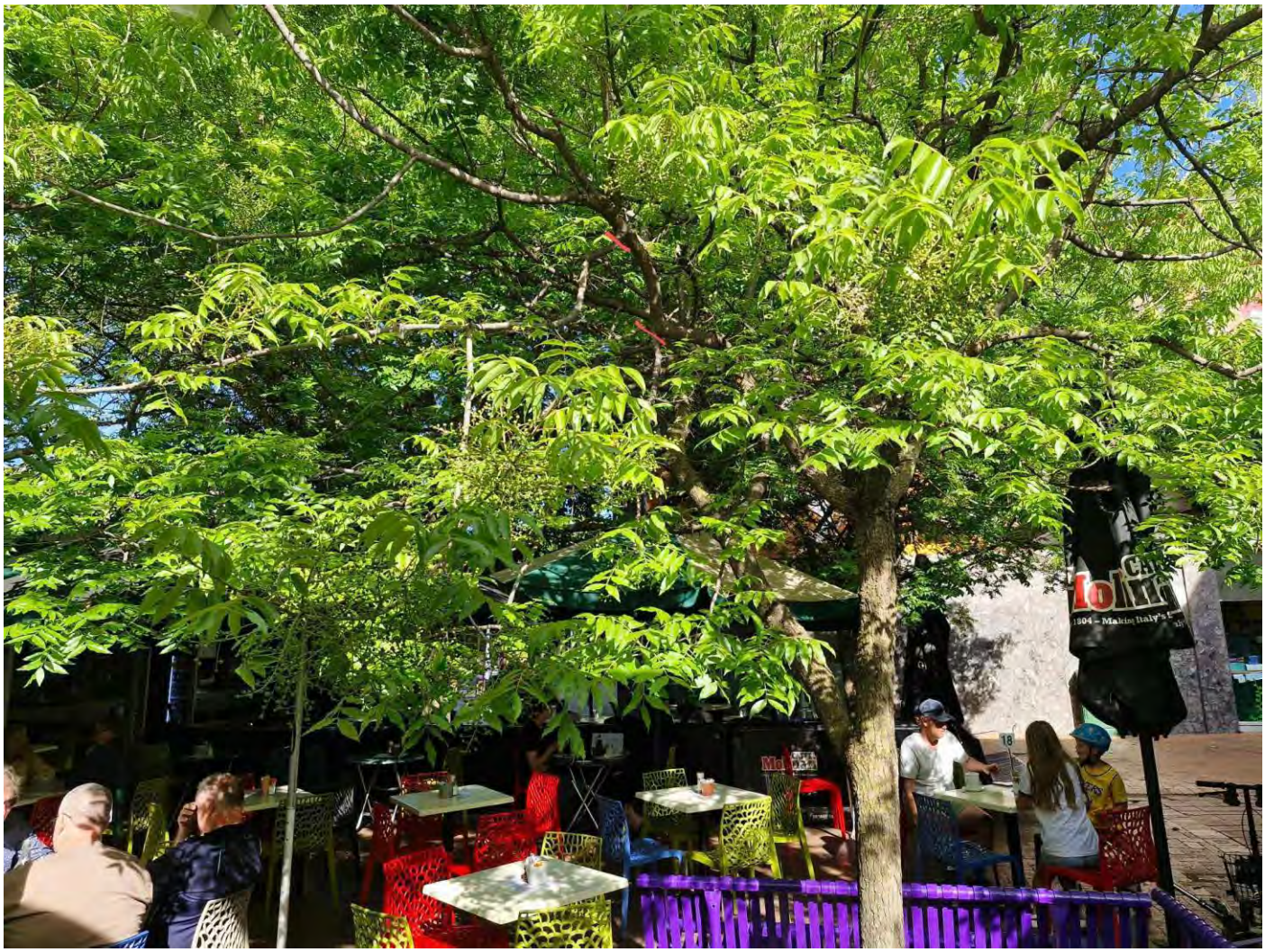
Tree 34: Eastern canopy lower branch prune.



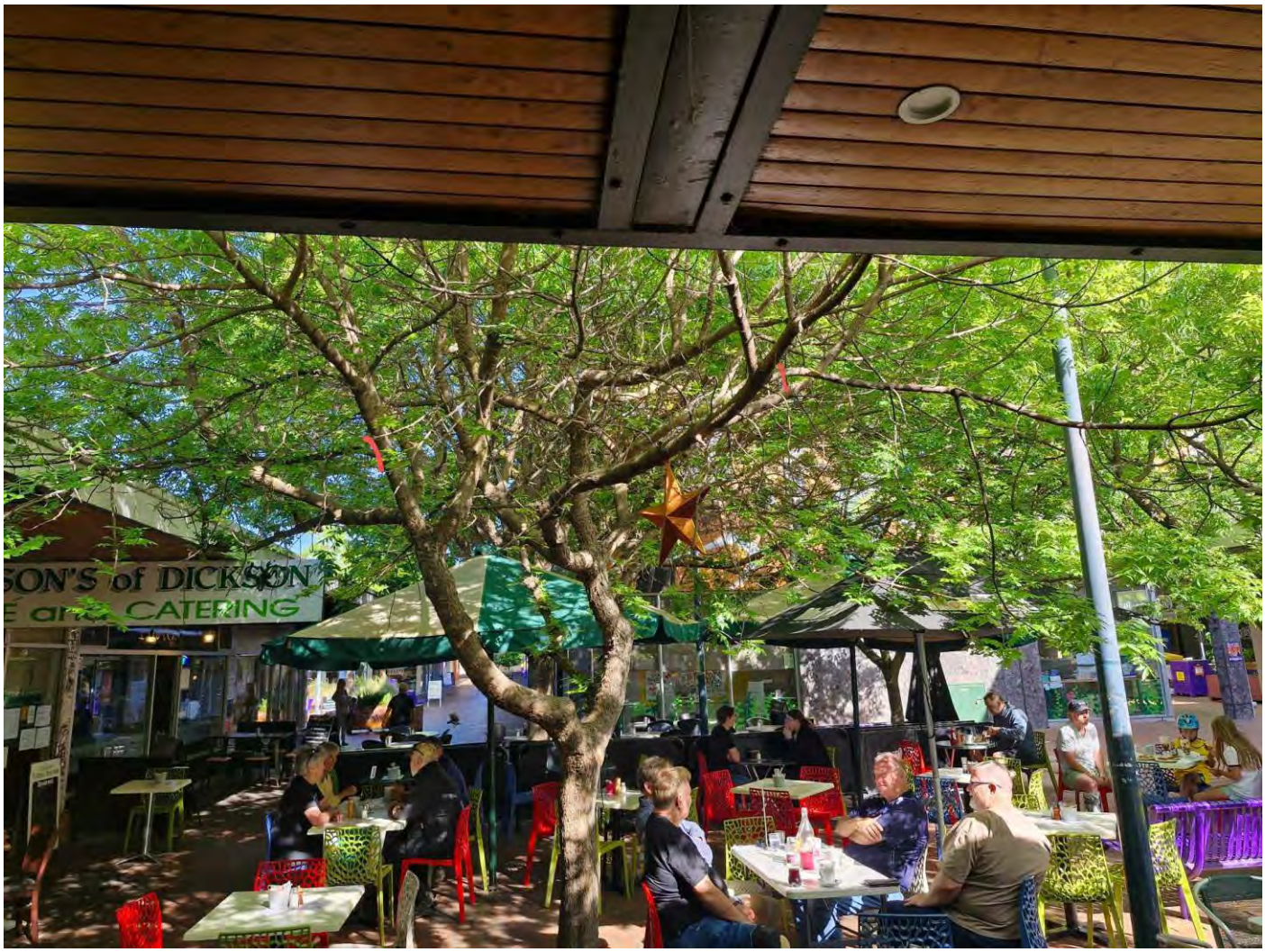
Downward goring branches removal in western canopy.



Downward goring branches removal in western canopy.



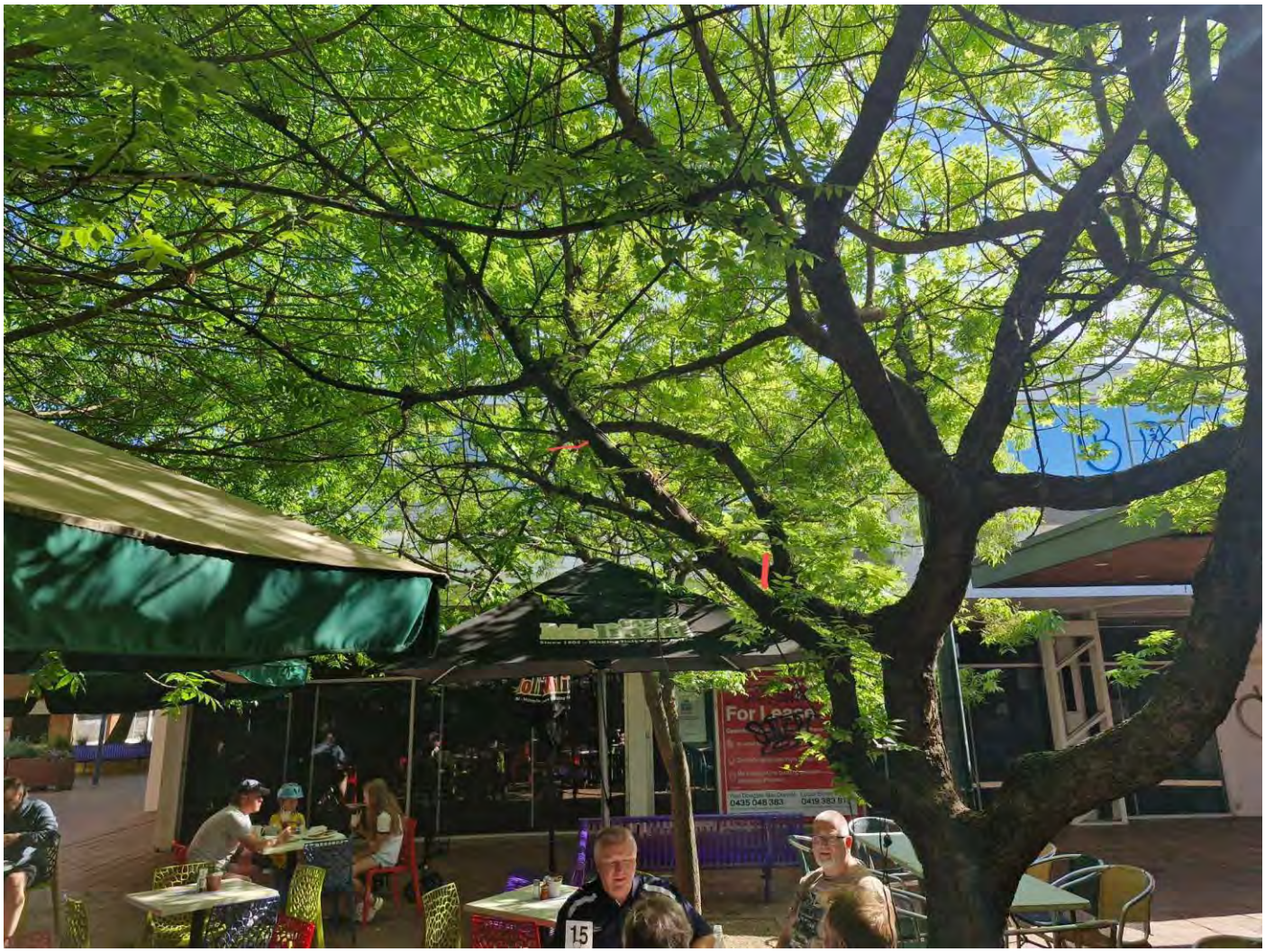
Tree 35: Low hanging branch removal to clear space for pedestrians and temporary shelters for eateries.



Binder 3a,491



Binder 3a,492



Appendix H

Traffic Technical Memo

Memo

To:	Peta Miskovich – Oculus
From:	Sunny Chen – WSP
Subject:	**Dickson Shops Northern Car Park – Traffic Assessment**
Our ref:	PS208025-WSP-SYD-PAM-MEM-001 RevF
Date:	**24 April 2025**

WSP has been requested to undertake an assessment of the Northern Car Park area for the Dickson Shops and Streetscape project, in line with PCR 003. The objective of this assessment is to develop a car park layout that is rationalised in conjunction with the proposed changes to Joan Kellett Way.

In the course of preparing this memo, a desktop assessment of the car park has been undertaken, relevant background material including WSP's transport feasibility study (revision D dated 25/10/2024) has been reviewed, and a car parking layout concept design has been prepared. The extent of the car park considered within this review is generally illustrated in Figure 1.1

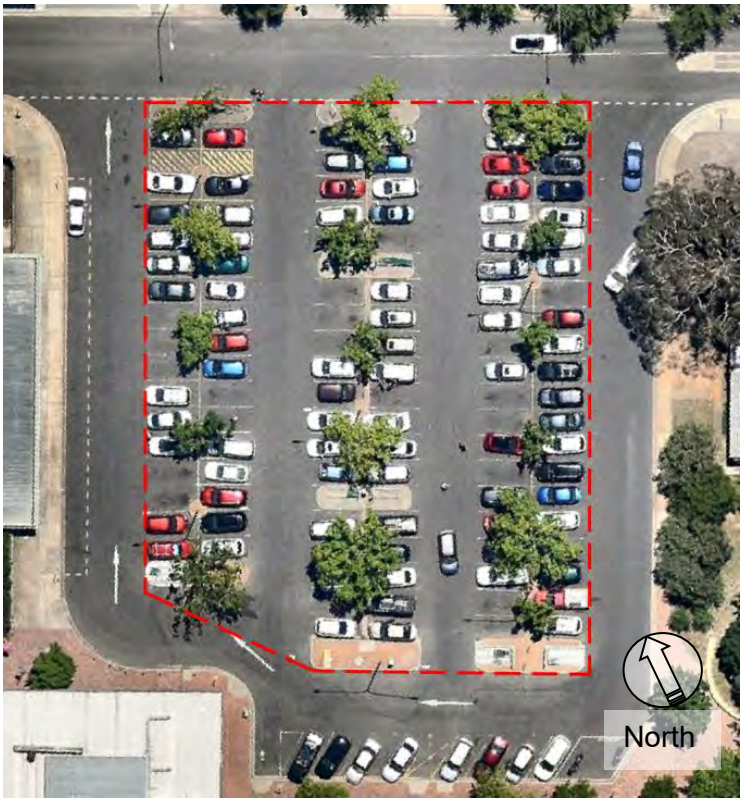


Figure 1.1 Extent of Northern Car Park assessment area

Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
www.wsp.com

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

WSP Australia Pty Limited ABN 80 078 004 798

1. Summary of Existing Car Park

Key features of the existing car park are as follows:

- One-way outer loop circulation road
- Two x central two-way north-south parking aisles
- A grand total of 130 parking spaces within the Northern Car Park, including around the periphery of the outer loop road.
  - 108 of these car parking bays are within the scope area of this review (see Figure 1.1), including 4 DDA bays in the north-western corner.
- All bays are provided in a 90-degree arrangement, with dimensions of 2.6m width by 5.4m length. All bays are accessed by an aisle of at least 5.8m wide.
  - It is noted the central parking bays are separated by a low height landscaping strip, however this is able to be overhung by vehicles and therefore does not impact the effective 5.4m bay length.

The Transport Feasibility Study noted that within this car park area, the peak car parking occupancy was observed to be for 120 parking bays.

2. Concept Design

2.1 Objectives

In preparing this concept design, the following items were considered to be key principles and objectives:

- Interface appropriately with the changes to the existing car park circulation aisle south of the car park, proposed as part of Package A works.
- Improve parking operation and pedestrian access.
- Minimise net loss of car parking bays.
- Minimise extent of works required.

It is noted with respect to these objectives, achieving improvements in some areas may result in impacts to another. In particular, improving pedestrian access through or across the car park would generally necessitate the removal of some car parking bays. As such, opportunities have been sought to keep parking impacts to a minimum.

2.2 Design Overview

A draft concept design has been prepared with consideration to the above. A snapshot of the design is shown in Figure 2.1, with the full plan attached in Appendix A along with swept path diagrams.



Figure 2.1 Concept design overview

2.2.1 Vehicle Circulation

The concept design proposes to retain the one-way nature of the outer loop circulation road, however the two central parking aisles are proposed to be converted into one-way aisles. During busy periods, a one-way parking arrangement typically reduces delays and congestion both when entering/exiting a parking space, and at aisle intersection points.

It is noted that the modifications to the southern end of the circulation aisle result in a reduced circulation aisle width. If two-way parking aisles were to be retained, this narrower circulation aisle would result in increased risk of collision between vehicles, and increased congestion as a car turning into a parking aisle would have more difficulty manoeuvring past a car waiting to exit the parking aisle.

2.2.2 Car Parking

All car parking bays retain the existing dimensions of 2.6m width by 5.4m length, in accordance with AS2890.1:2004.

Two car parking spaces have been impacted by two separate design changes, however both of these two bays have been reinstated elsewhere via the removal of existing kerb islands and relocation of trolley return bays and ticket machines to ensure there is no net loss in car parking. It is noted that as part of the works, the existing taxi zone will be reduced in length.

The two impacted car parking spaces are as follows:

- One bay impacted as a result of the Package A realignment works, where accessing the bay would require the vehicle to conflict with the outer circulation aisle. Refer Figure 2.2 below.
- One bay converted into a P 15min bay.

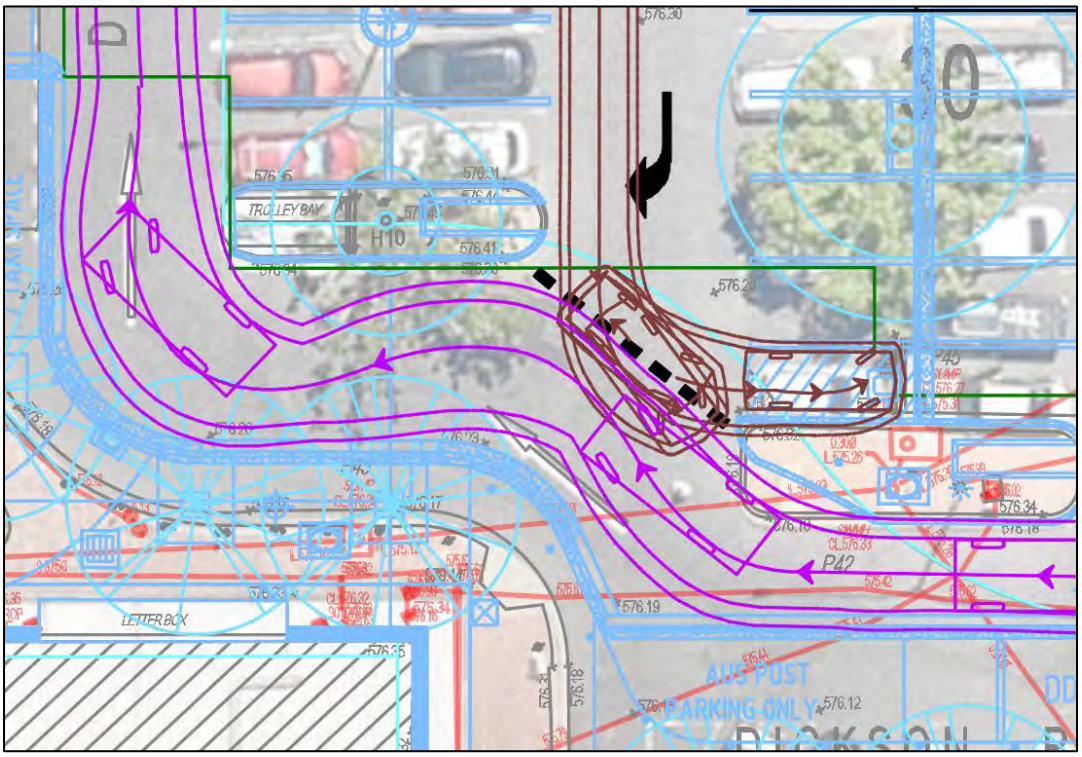


Figure 2.2 Car parking space impacted by Package A realignment works

Two new car parking bays have been proposed in place of a set of trolley return bays towards the southern end of the central parking aisle.

A summary of existing and proposed car parking provisions within the Northern Car Park is provided in Table 2.1.

Table 2.1 Summary of car parking provisions

Parking Type	Existing Provision	Proposed Provision	Net Change
Standard 2P	104	104	No change
DDA	8	8	No change
Short-term (5min/15min)	4	4	No change
Australia Post Loading	1	1	No change
Taxi Zone	40 metres (approx. 6)	26m (approx. 4)	-2 spaces

2.2.3 Pedestrian Access

Consideration could be given to creating an informal pedestrian pathway across the northern end of the car park by removing a set of car parking bays. Figure 2.3 illustrates six bays which could be converted into No Stopping bays through the implementation of line marking, though it is noted that two of these bays are already in this condition as they are currently used as DDA shared areas. Therefore, this option would result in a net impact to four car parking spaces.

This informal pathway would provide pedestrians with a means of crossing the car park east-west near the northern end, without needing to either walk along the road or squeeze between parked vehicles. It is noted that this pedestrian route would also be clear of the proposed parallel parking bays on the western side of the car park.

If this option proceeds it would result in a net loss of five car parking spaces in total and further consideration would also need to be given to installing kerb ramps at the existing footpaths for accessibility.

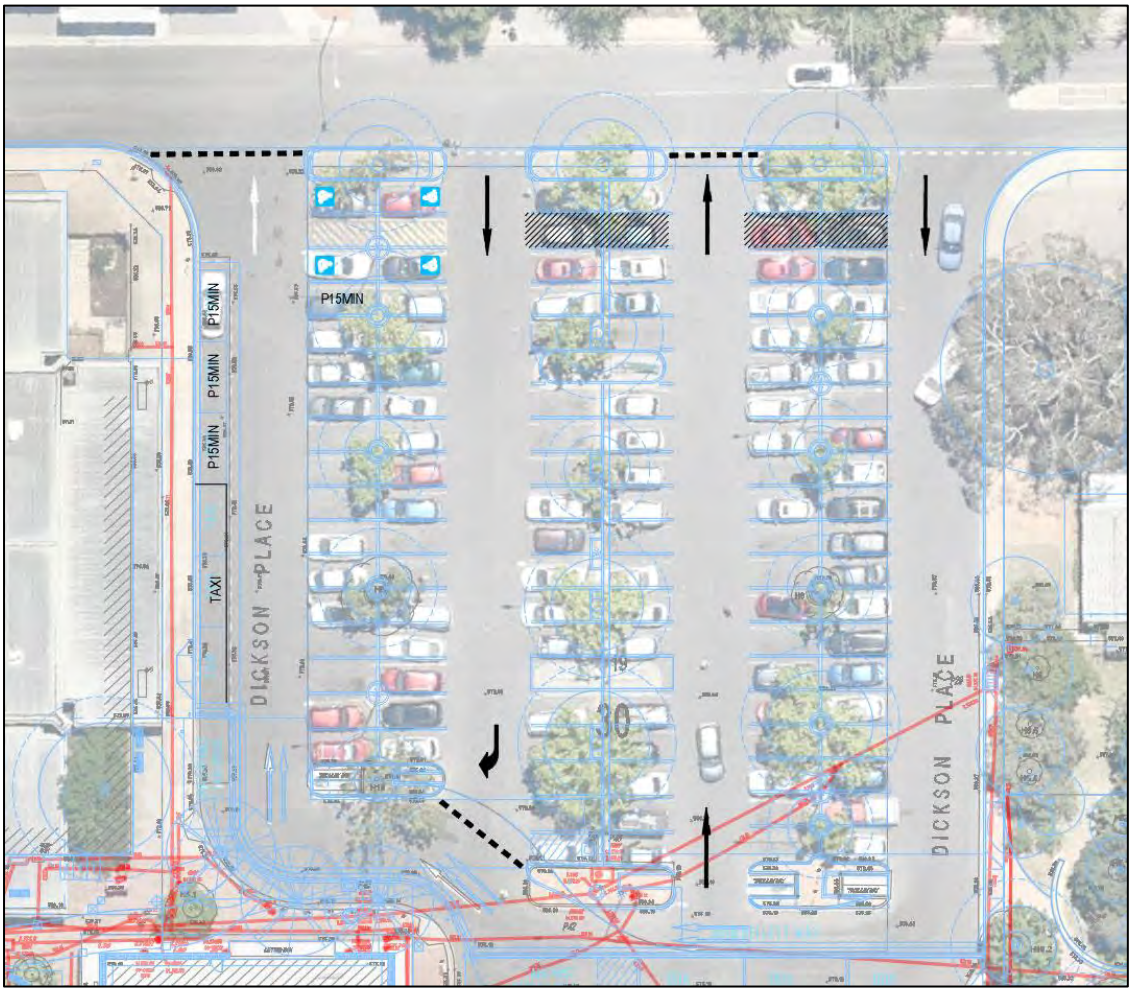


Figure 2.3 Pedestrian access option

2.2.4 Other Considerations

The concept design has sought to retain all existing landscaping within the car park area, including trees and planting zones.

A swept path review using the Austroads 6.4m truck and a 6.96m delivery van has determined that the existing trolley bay at the south-eastern corner of the car park is impacted. The trolley bay will need to be removed, shortened, or relocated and may require consultation with nearby supermarket operators. If the trolley bay is relocated, there is potential to impact additional car parking.

The swept path diagrams have been attached in Appendix A for reference.

WSP is to be advised if a vehicle larger than the 6.96m delivery van is required to circulate the car park, as this may result in further impacts along the circulation route.

2.3 Summary of Design Performance

A high-level assessment of the outcomes of the proposed concept design against the objectives listed in Section 2.1 is presented in Table 2.2.

Table 2.2 Summary of design outcomes

Objective	Performance Indicator	Comment
Interface with Package A works	●	Package A works have been considered and car park has been modified to suit.
Improve parking operation	●	Circulation modified to improve potential congestion issues and create more uninterrupted flows throughout car park.
Improve pedestrian accessibility	N/A	Pedestrian accessibility remains unchanged.
Minimise net loss of car parking	N/A	No overall net loss of car parking
Minimise extent of works required	●	Existing car parking arrangement otherwise retained as existing.
Key: ● Improvement; ● Some impacts; ● Negatively impacted		

Should the need to provide improved pedestrian accessibility outweigh the desire to minimise loss of car parking, a new informal pedestrian pathway could be provided across the northern end of the car park, where there may be desire lines that are currently unserved. This would impact an additional four car parking spaces, equating to a total net loss of five car parking spaces.

Please do not hesitate to contact the undersigned should you wish to discuss further.

Yours sincerely,



Sunny Chen

WSP

Senior Engineer – Traffic, Planning & Design

Appendix A Concept Design Layout and Swept Path Diagrams

Binder 3a,501



INDICATIVE LAYOUT SHOWN IN THIS SKETCH
RESULTS IN NO LOSS OF CAR PARKING WITHIN
THE DICKSON SHOPS NORTHERN CAR PARK

PS208025 SK009

DICKSON SHOPS NORTHERN CAR PARK
CONCEPT LAYOUT SKETCH
S.C. 08.04.2025

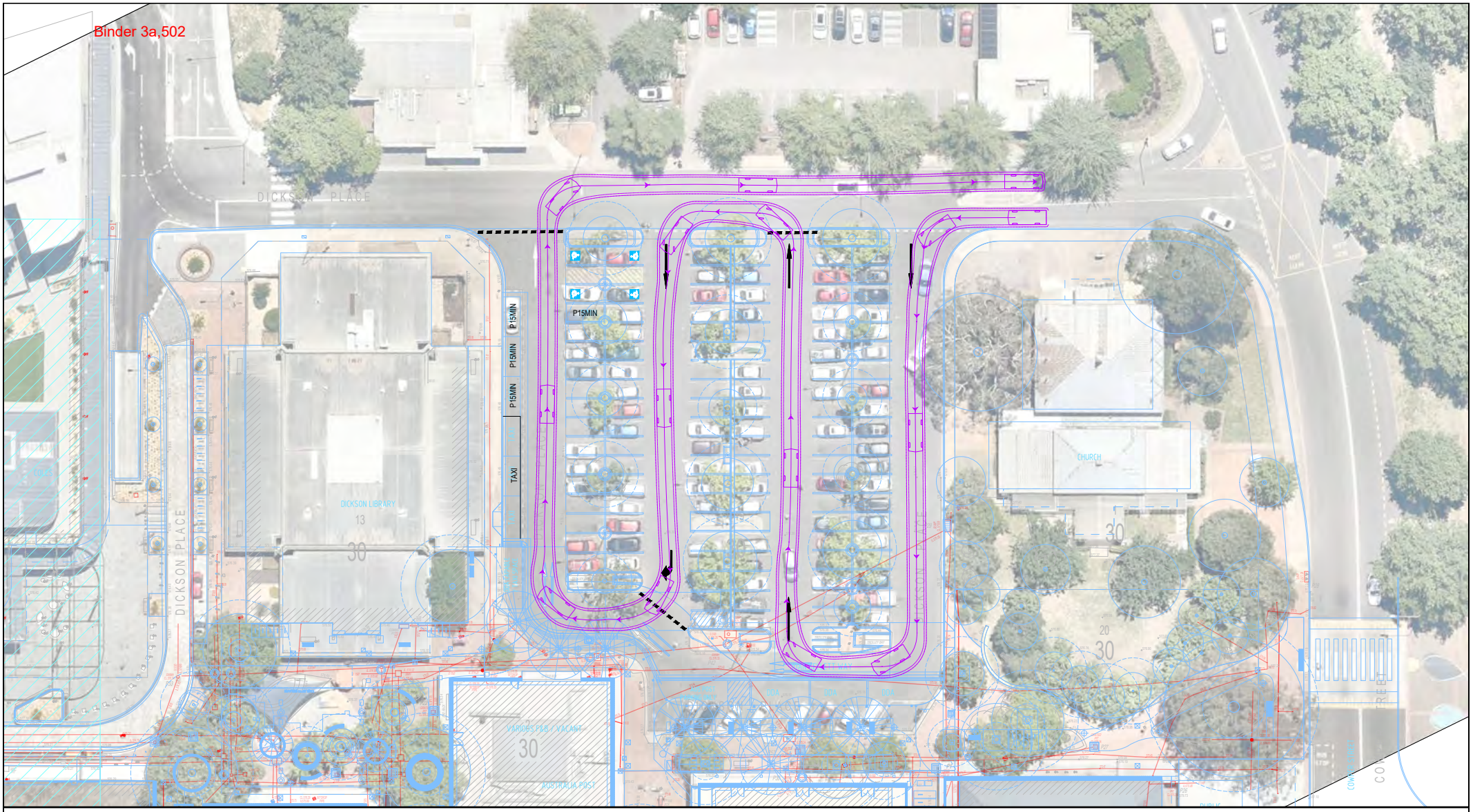
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wsp

NORTH

Binder 3a,502



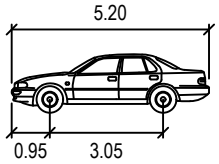
VEHICLE LEGEND

B99CAR 300mm CLEARANCE

B99CAR OVERHANG

B99CAR CENTRELINE

AUSTROADS B99CAR



B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.00
Steering Angle	: 33.50

PS208025 SK010

AUSTROADS B99 CAR
FULL SITE CIRCULATION MANOEUVRES
S.C. 08.04.2025

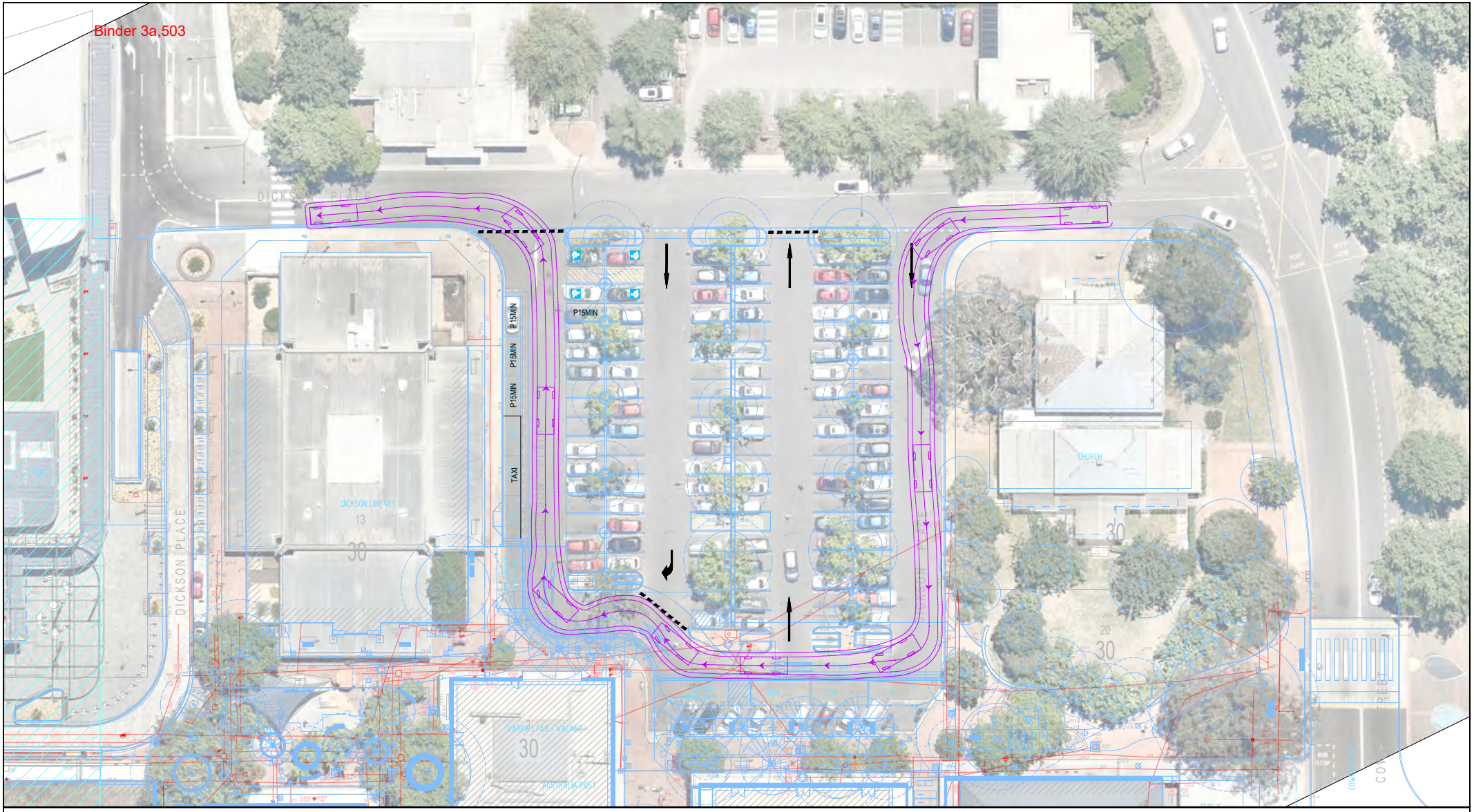
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Binder 3a,503



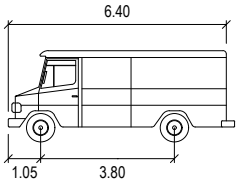
VEHICLE LEGEND

6.4m TRUCK 600mm CLEARANCE

6.4m TRUCK OVERHANG

6.4m TRUCK CENTRELINE

AUSTROADS 6.4m TRUCK



SRV	meters
Width	: 2.30
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 38.0

PS208025 SK011

AUSTROADS 6.4m TRUCK
OUTER CIRCULATION MANOEUVRE
S.C. 08.04.2025

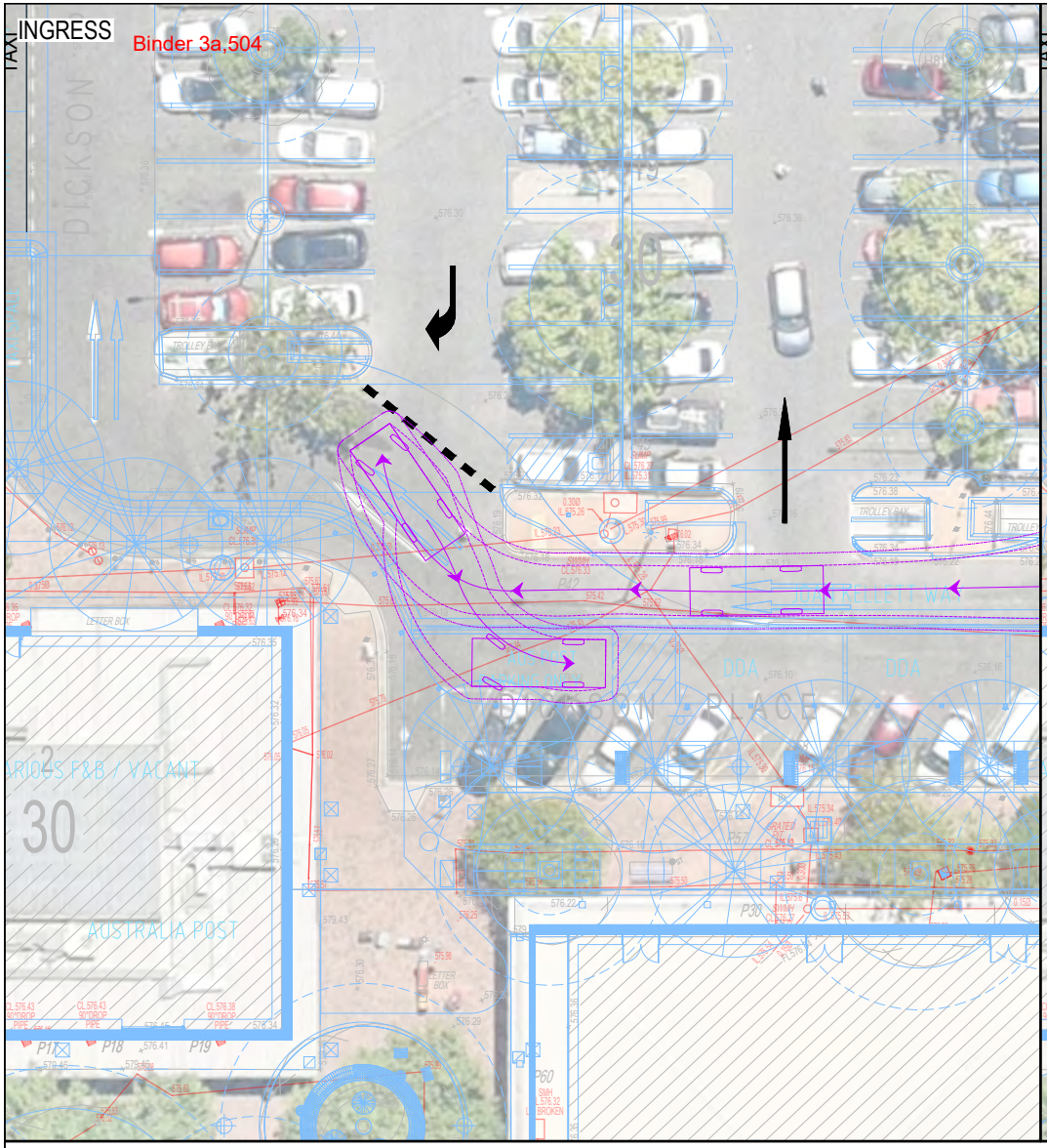
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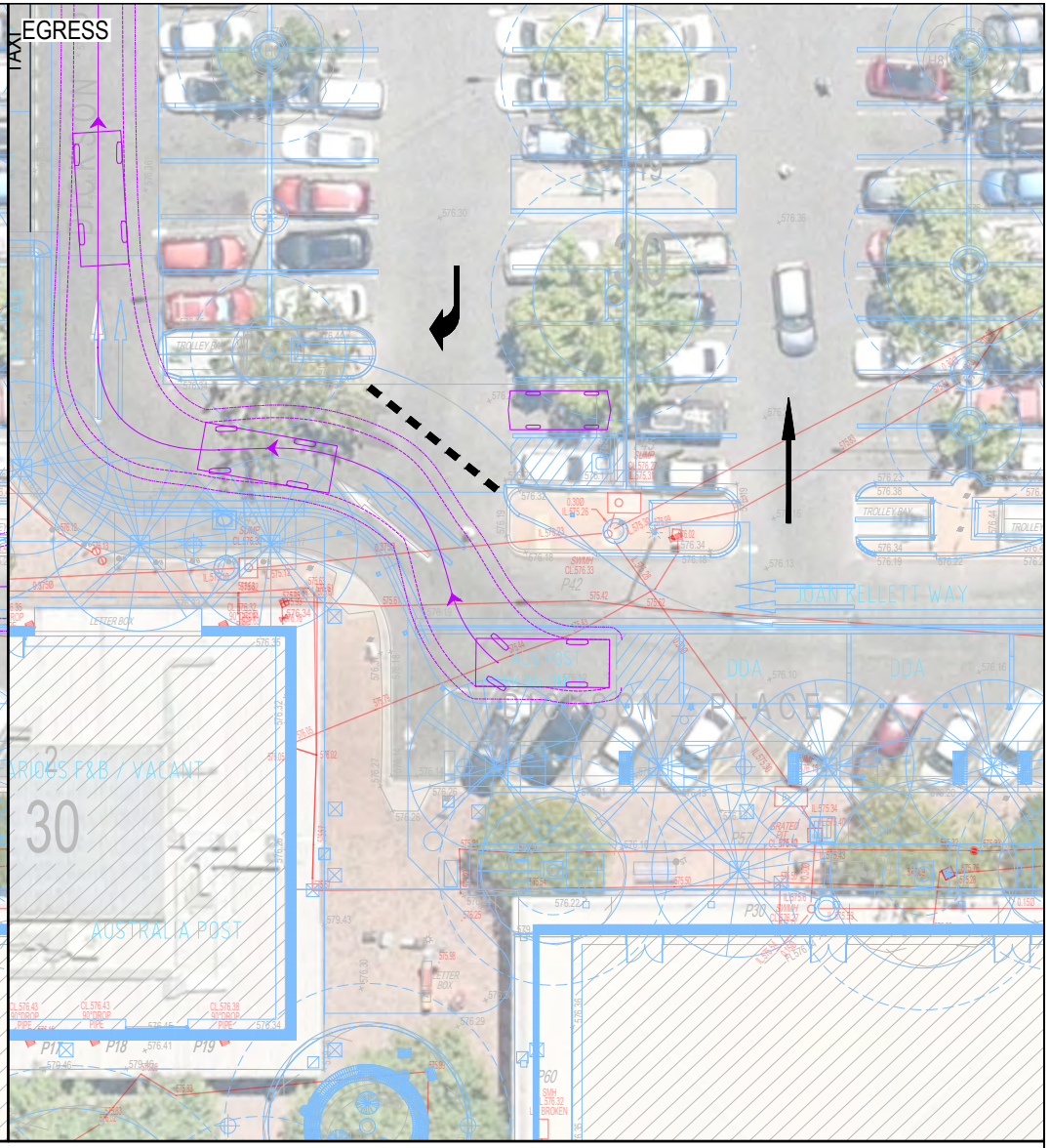
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SWEPT PATH ASSESSMENT UNDERTAKEN AT 5 km/h GIVEN LOW SPEED ENVIRONMENT

wsp

NORTH





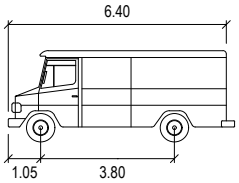
VEHICLE LEGEND

6.4m TRUCK 600mm CLEARANCE

6.4m TRUCK OVERHANG

6.4m TRUCK CENTRELINE

AUSTROADS 6.4m TRUCK



SRV	meters
Width	: 2.30
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 38.0

PS208025 SK012

AUSTROADS 6.4m TRUCK
LOADING BAY ACCESS
S.C. 08.04.2025

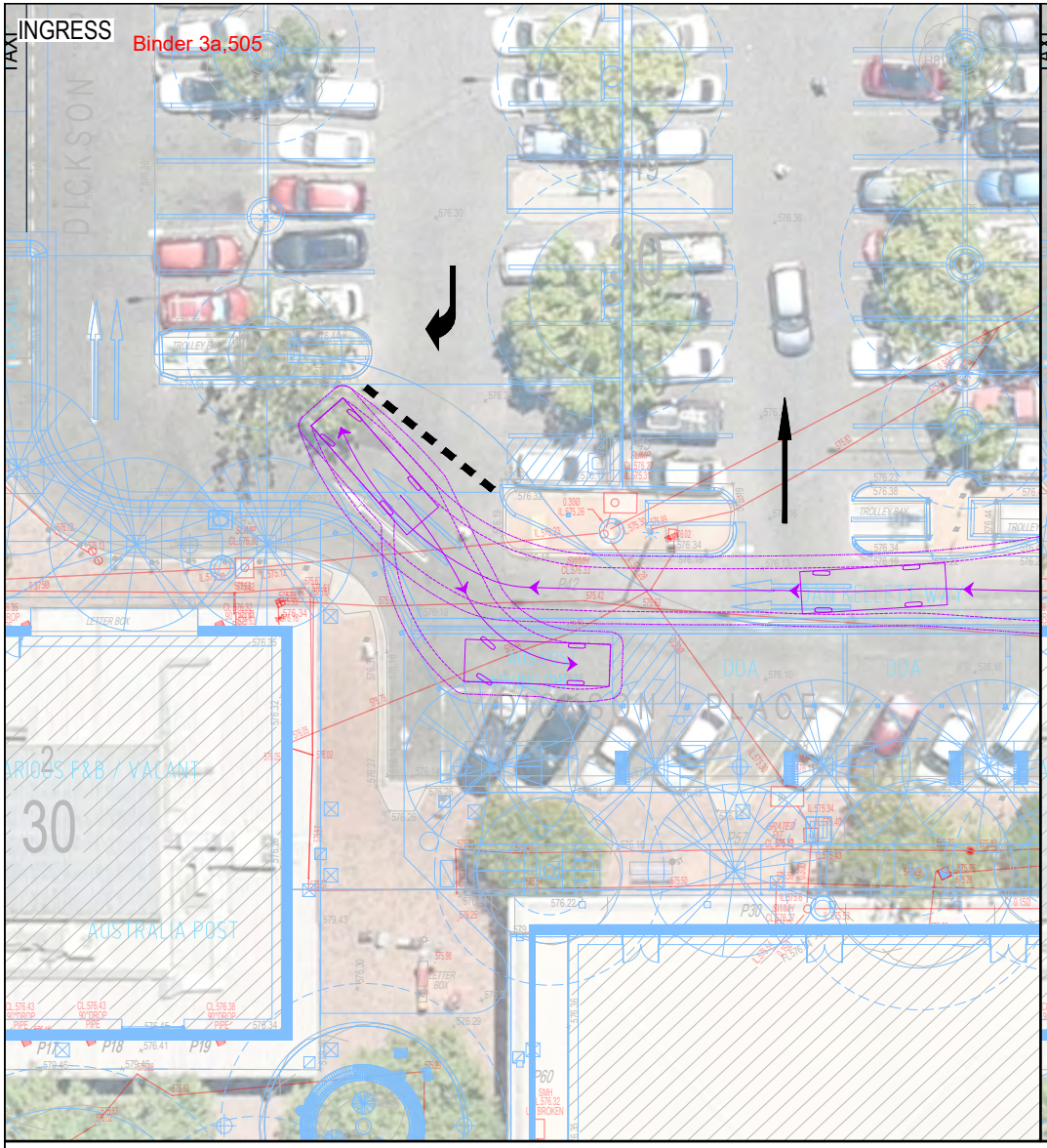
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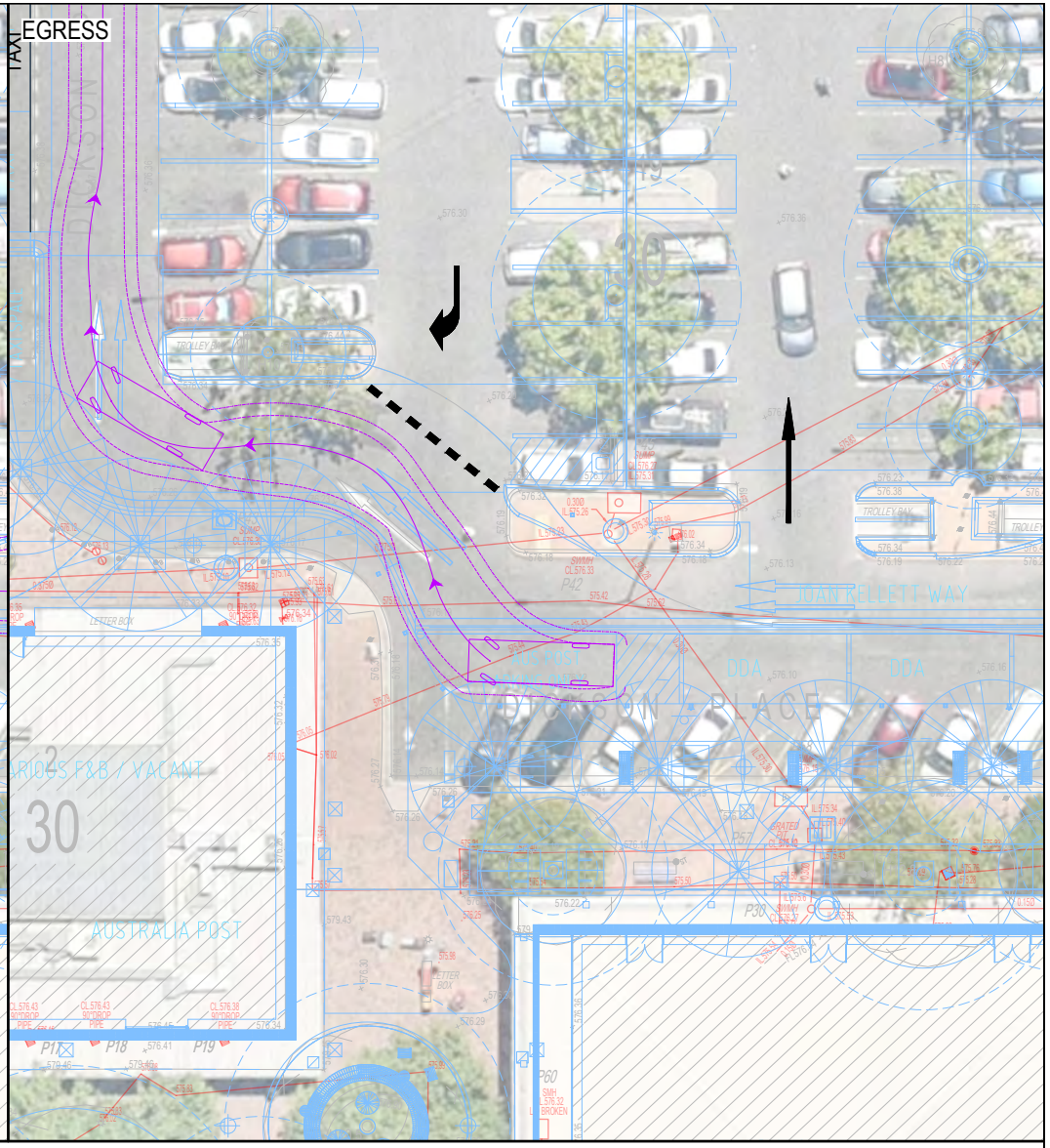
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SWEPT PATH ASSESSMENT UNDERTAKEN AT 5 km/h GIVEN LOW SPEED ENVIRONMENT

wsp

NORTH





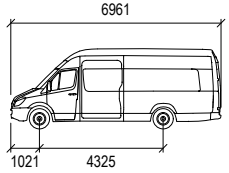
VEHICLE LEGEND

6.96m DELIVERY TRUCK 600mm CLEARANCE

6.96m DELIVERY TRUCK OVERHANG

6.96m DELIVERY TRUCK CENTRELINE

6.96m DELIVERY TRUCK



6.96m Delivery Van

		mm
Width	:	2020
Track	:	1977
Lock to Lock Time	:	6.0
Steering Angle	:	35.0

PS208025 SK013

6.96m DELIVERY VAN
LOADING BAY ACCESS
M.H. 08.04.2025

0 10 20m

SCALE 1:500 @A3

SWEPT PATH ASSESSMENT UNDERTAKEN AT 5 km/h GIVEN LOW SPEED ENVIRONMENT

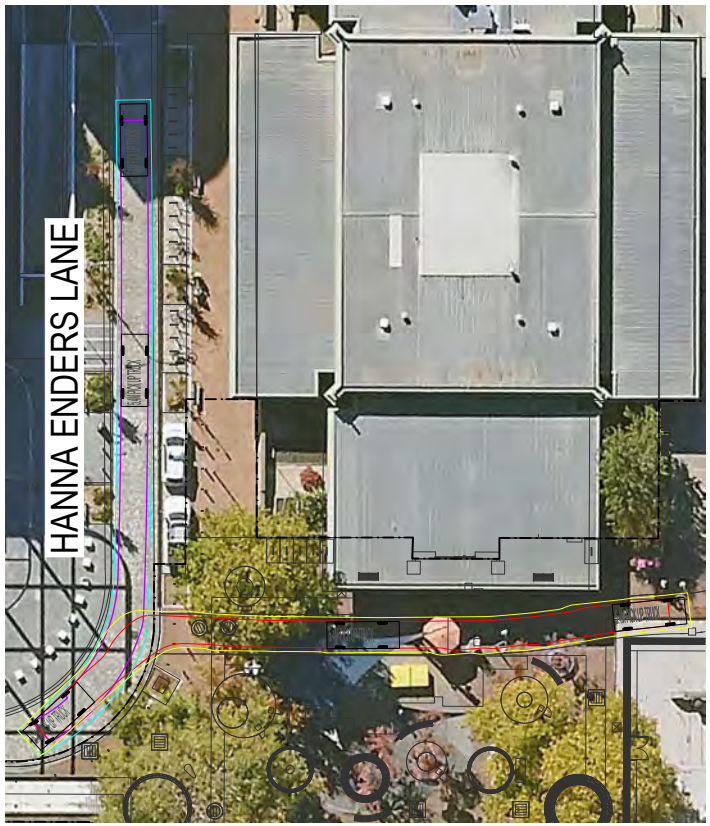
wsp

NORTH

Appendix I

Additional Swept Path Sketches

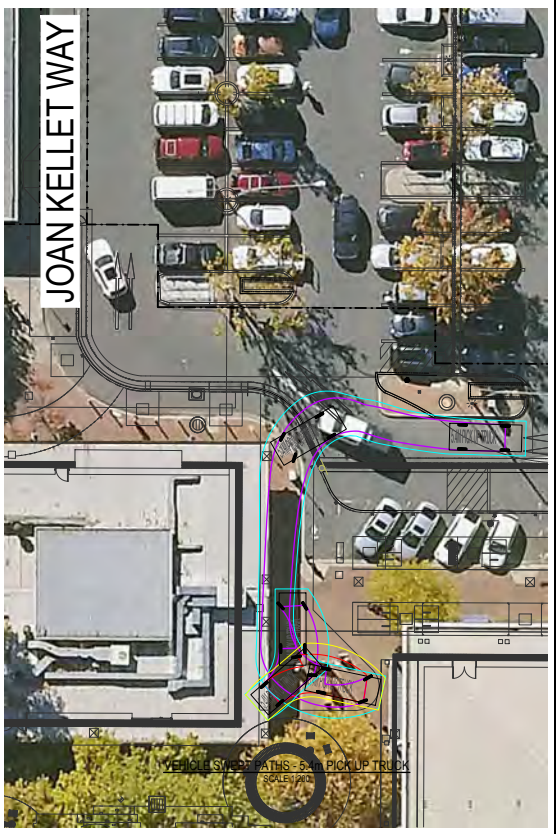
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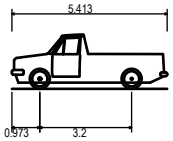


VEHICLE SWEPT PATHS - 5.4m PICK UP TRUCK
SCALE 1:200



VEHICLE SWEPT PATHS - 5.4m PICK UP TRUCK
SCALE 1:200





5.4m PICK UP TRUCK

Overall Length	5.413m
Overall Width	2.004m
Overall Body Height	1.895m
Min Body Ground Clearance	0.218m
Track Width	2.004m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.355m

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ARCHITECT: OCULUS

PROJECT: DICKSON SHOPS AND STREETSCAPE

TITLE: VEHICLE TRACKING SHEET 1

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1:200	J.L	J.L
PROJECT NUMBER:	DRAWN:	DATE:
PS208025	J.C	28/05/2025

DRAWING No: SKP-CVL-041 REV: P1

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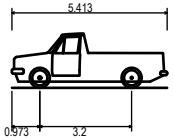
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Binder 3a,508



VEHICLE SWEPT PATHS - 5.4m PICK UP TRUCK
SCALE 1:200



5.4m PICK UP TRUCK

Overall Length	5.413m
Overall Width	2.004m
Overall Body Height	1.895m
Min Body Ground Clearance	0.218m
Track Width	2.004m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.355m



VEHICLE SWEPT PATHS - 5.4m PICK UP TRUCK
SCALE 1:200

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ARCHITECT: OCULUS

PROJECT: DICKSON SHOPS AND STREETSCAPE
TITLE: VEHICLE TRACKING SHEET 2

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PROJECT NUMBER:	DRAWN:	DATE:
PS208025	J.C	28/05/2025

DRAWING No: SKP-CVL-041 REV: P1

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DATE PLOTTED: 30/05/2025 5:29:03 PM BY : CABOTINO, JAYVEE

Appendix J

Pavement Technical Memo

Binder 3a,510

Memo

To:	TCCS Design Acceptance Team
From:	WSP (Civil team)
Subject:	**Pavement Calculations**
Our ref:	PS208025_Dickson Shops_Package A_Public Realm Works
Date:	**30 May 2025**

Introduction

The proposed public realm improvements for revitalisation of Dickson Shops precinct provides an opportunity to renew and construct paving within the site. Consequential pavement works are also required where permanent changes are to be made to existing car parking bays, and circulatory road for the northern car park (Joan Kellet way).

Overall, there are three pavement types to be considered:

- Flexible pavements (asphalt) for any upgrades within the northern car park and the circulatory road (Joan Kellet Way) to be consistent with the existing flexible pavement (calculations in Appendix A of this note);
- Rigid pavements (in-situ concrete) in line with the Landscape public realm paving selections for areas within new parking bays (calculations in Appendix B of this note); and
- Segmental paving units in line with the Landscape public realm paving selections for hardscape areas within precinct (calculations in Appendix C of this note).

This memo summarises the technical parameters adopted for the pavement designs, and outlines the assessments undertaken to determine the appropriate pavement build up for roads and areas subject to vehicle loading.

Standards

- Austroads Guide to Pavement Technology Part 2: Pavement Structural Design 2024
- C&CAA T51 Guide to Residential Streets and Paths 2004
- PA02 Concrete Segmental Pavements Design Guide for Residential Accessways, Roads and Commercial Spaces 2022
- Municipal Infrastructure Standards 01 Street Planning and Design 2021
- Municipal Infrastructure Standards 03 Pavement Design 2021
- Municipal Infrastructure Technical Specification 04 - Flexible Pavements 2019
- Municipal Infrastructure Technical Specification 07 - Segmental Paving 2019
- Municipal Infrastructure Technical Specification 10 - Concrete Works 2019

Referenced Documents

- Dickson Shops & Streetscape Upgrade Block 33, Section 30, Dickson, ACT Geotechnical Investigation Report Ref: AP/C15916, prepared by Fortify Geotech in January 2025.

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We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

WSP Australia Pty Limited ABN 80 078 004 798

General Design Parameters

- Design Life: 20 years (Flexible), 40 years (Rigid)
- Design CBR: 5% (for low and medium plasticity clay subgrades)
- Rigid Pavement (In-situ Concrete) : assumed no shoulder provided
- Minimum thickness for Pavers and Flags : 60mm (in accordance with MITS 07 Table 7-5 and 7.6)
- Traffic loading: as noted in each calculation

Appendix A Flexible (Asphalt) Pavement Calculations

Surfacing Selection(Wearing Course)

Acceptable Asphalt surfacing materials have been selected to MIS 03 Table 03-2

Table 1 - Asphalt surfacing materials selection

Site Location	Road Category	Acceptable Materials	Selected Material
Circulatory road	Collector roads	AC10 and AC14	Not Applicable
Circulatory road	Access roads	FGG10 and AC10	AC10
Parking Bays	Rear Lanes	FGG10 and AC10	AC10

Dense Graded Asphalt AC10 is adopted for the wearing course.

Dense Graded Aspahlt to also be considered for intermediate course (where used)

Asphalt Material Thickness

Typical Asphalt layers have been determined from AGPT Part 2 Table 12.1 as below

Table 2 - Typical Asphalt layers to AGPT Part 2

Material	Nominal Size	Thickness Range	Selected Thickness	Intended Application
Dense Graded Asphalt	20mm	50-100mm	75mm	Intermediate course
Dense Graded Asphalt	14mm	35-50mm	30mm	Wearing course
Dense Graded Asphalt	10mm	25-40mm	30mm	Wearing course

Design Traffic

The precinct roads and accesses within the site fall are assumed to generally fall within the definition of an Access Streets Type A and Rear Lanes in MIS 01.

Table 01-1 functional classifications (residential zones incl CZ5) outlined below characteristics for these street categories.

- Access Street A 0 – 300 vph
- Rear Lane 0 – 160 vph

Similarly, below Design Traffic values are advised in MIS03 Table 03-1

- Access Street (Type A) : 20-year Design Traffic – 6 x 104
- Rear Lane : 20-year Design Traffic – as per connecting street

AGPT Part 2 Table 12.2 also provides heavy vehicle group traffic volumes to indicative design traffic (ESA) as below.

Table 3 - Indicative design traffic (ESA) to AGPT Part 2

Site Location	**AGPT Street Type considered**	**Design Period (years)**	**Heavy Vehicles(%)**	**Cumulative HVAG**	**ESA/ HVAG**	**Indicative design traffic (ESA)**
Circulatory road	Local access with no buses	20	4	128 480	0.3	4×10^4
Circulatory road	Local access with buses	20	6	240 900	0.3	8×10^4
Parking Bays	Minor with single lane traffic	20	3	13 140	0.2	3×10^3

As the ESA values in AGPT are higher, these are adopted for the empirical design.

Emprical Thickness Design

Empirical Design was completed to Figure 12.2 AGPT Part 2 as below.

Figure 1 - Design Chart (Extract from AGPT Fig 12.2)

Design Outputs

For a Design CBR value : 5%, pavement thickness have been determined as follows

Table 4 - Design Pavement Thicknesses

Site Location	AGPT Street Type considered	Minimum thickness of material required	Total thickness of material provided	Base thickness provided
Circulatory road	Local access with buses	300mm (incl min 100mm base)	350mm	125mm
Parking Bays	Minor with single lane traffic	230mm (incl min 100mm base)	275mm	125mm

Note: Dense graded asphalt of thickness < 40 mm is considered to contribute to the required total thickness over the in-situ subgrade; with a minimum 100 mm thickness of base material to be provided. As wearing course is less than 40mm, this is not considered in the pavement build-up, but intermediate layer thickness (where provided) is included.

Appendix B Rigid (Concrete) Pavement Calculations

Design Traffic

The parking bays within the site fall are assumed as “Minor streets with single lane traffic” for the purpose of determining design traffic. AGPT Part 2 Table 12.2 also provides heavy vehicle group traffic volumes to indicative design traffic (ESA) as below.

Table 1 - Indicative design traffic (ESA) to AGPT Part 2

Site Location	AGPT Street Type considered	Design Period (years)	Heavy Vehicles(%)	Cumulative HVAG	ESA/ HVAG	Indicative design traffic (ESA)
Parking Bays	Minor with single lane traffic	20	3	13 140	0.2	3×10^3

C&CAA T51 Table 5.2 also provides heavy vehicle group traffic volumes to indicative design traffic (ESA) as below.

Table 2 – Commercial axle groups by street type

Site Location	AGPT Street Type considered	Design Period (years)	Design CV Axle Group
Parking Bays	Minor: single lane traffic	20	2.5 x 104

As the ESA values in AGPT are higher, the cumulative HVAG are adopted for the empirical design.

Concrete Base Thickness

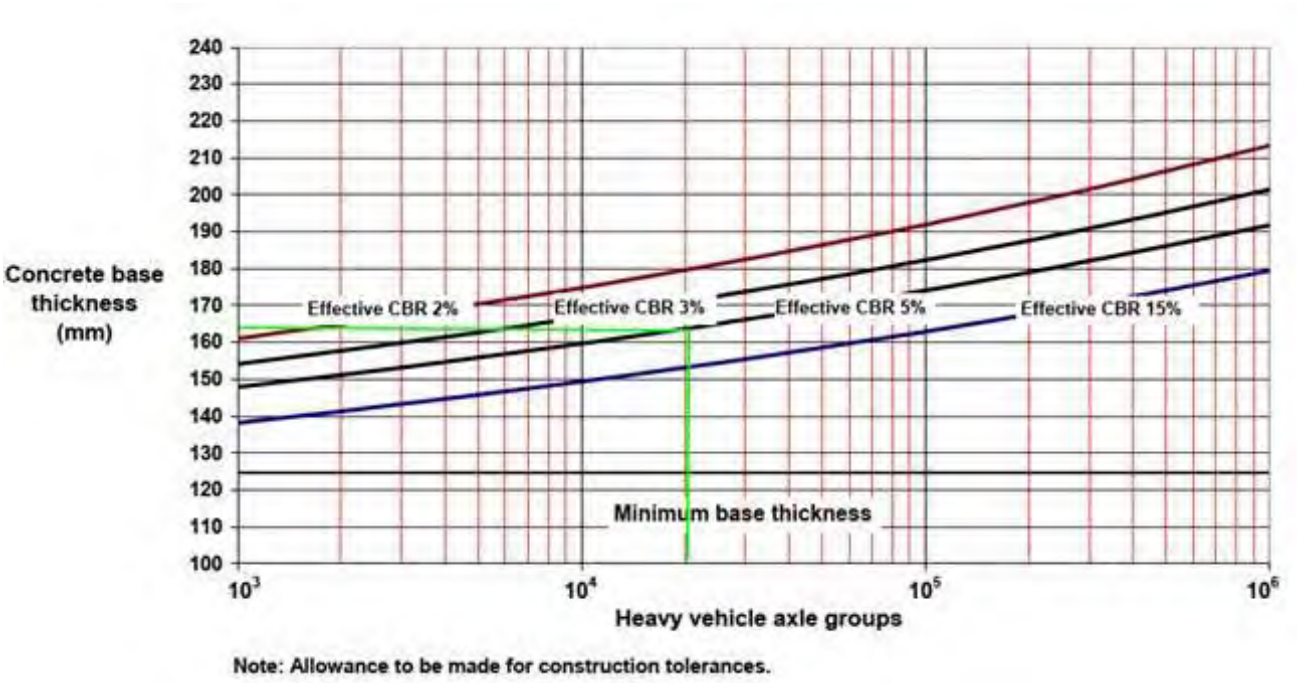
Different approaches have been used to determine the concrete base thickness, i.e using the simplified C&CAA T51 procedure, as well as the more detailed procedure in AGPT Part 2 for lightly traffic roads.

Figure 1 -Concrete Base Thickness to C&CAA T51



The C&CAA T51 procedure indicates a concrete base thickness of 160mm

Figure 2 - Concrete Base Thickness to AGPT Part 2



AGPT Part 2 advises on a minimum concrete base thickness of 125 mm to allow passage of an occasional overloaded vehicle, and the design indicates a concrete base thickness of approx. 165mm

Subbase Thickness

From C&CAA T51 Table 7.1, a minimum subbase thickness of 125mm is recommended for CBR 5% or less, for concrete base thickness of 125-150mm; and the minimum subbase thickness increases to 150mm for CBR 5% or less, with a concrete base above 150mm.

Reinforcement Design

C&CAA T51 recommends minimum reinforcing fabric to AS/NZS 4671 in Table 9.5, as SL62, and SL72 for 125mm and 150mm concrete base thickness respectively. For lightly trafficked streets and for slab lengths less than 15 m, AGPT Part 2 Table 12.6 advises that the minimum steel reinforcement fabric size is SL62 for 125mm concrete base, and SL82 for 150mm concrete base.

As the AGPT sizes are greater, these are adopted for this design.

Design Outputs

For a Design CBR value : 5%, pavement thickness have been determined as follows for the trafficked pavement.

Table 3 - Design Pavement Thicknesses

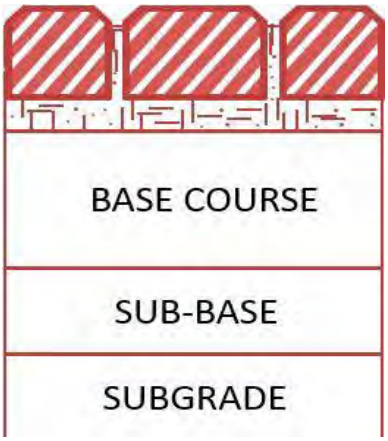
Site Location	AGPT Street Type considered	Minimum base thickness	Minimum subbase thickness	Base thickness provided	Subbase thickness provided
Parking Bays	Minor with single lane traffic	165mm	125mm	175mm	150mm

Appendix C Segmental Pavement Calculations

Binder 3a,521

Concrete Segmental Pavement Design: Dickson Shops and Streetscape

Company name:	WSP Australia Pty
Address	Level 2, 121 Marcus Clarke Street, Canberra, ACT 2601



Pavement Structure

Layer system with base and sub-base

Calculated pavement design parameters

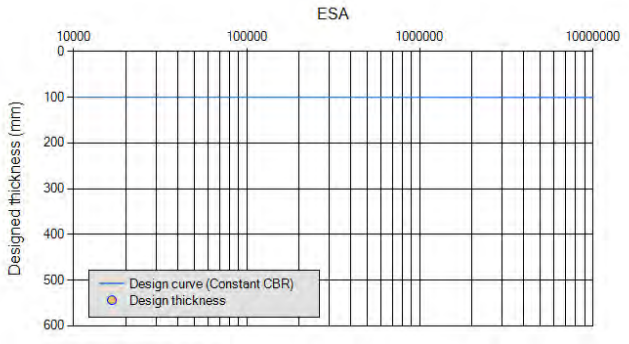
Thickness (m); Eq.1	Vertical stress (kPa); Eq.2	Radial stress (kPa); Eq.3	Vertical strain; Eq.5	N; Eq.6-7
0.687	47.19	1.059	0.001545	107984

Pavement design details

ESA	Tire pressure, (KPa)	Subgrade CBR
3000	700	3

Pavement layers	Layer thickness (mm)	Material modulus (MPa)	Material Poisson ratio
Paving layer	60	3200	0.30
Bedding sand layer	30	200	0.35
Base course layer	150	350	0.35
Sub-base course layer	100	250	0.35
Subgrade layer	---	30	0.40

Design curve: sub-base thickness



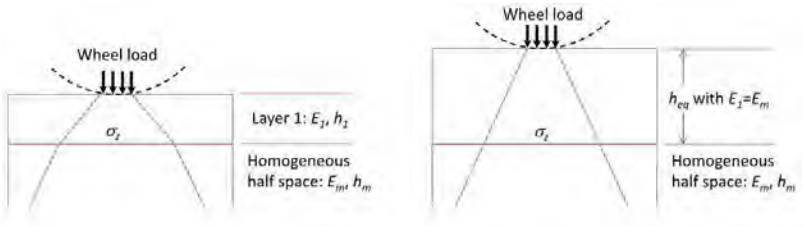
Design methodology

To calculate the stresses in a multi-layered pavement system, for ease of analysis, the layered system is converted into an equivalent homogeneous layer with a single material property. This procedure is known as the Method of Equivalent Thickness (MET) which was originally developed by Odemark (1949).

The idea behind Odemark's theory is that the vertical stresses at the interface between the top layer with stiffness E1 and thickness h1 and the homogeneous sub-grade half space with stiffness Em are the same as the stresses at an equivalent depth heq with stiffness Em.

For a two-layered system, the figure below shows how the vertical stresses caused by the wheel load are distributed throughout each layer.

Via assuming the same vertical stress at the interface between the top layer and the underlying half space, an equivalent thickness (heq) for the homogenous material to that of the multi layered system on the left can be derived.



Odemark's equivalent thickness theory

The Method of Equivalent Thickness (MET), which was originally developed by Odemark (1949), was used to calculate the thickness of equivalent homogenous sub layer using the following equation:

$$h_{eq} = nh_1\left(\frac{E_1}{E_m}\right)^{0.33}\sqrt[3]{\frac{1-\nu_2^2}{1-\nu_1^2}} \quad \text{.....(1)}$$

where, v1 and v2 are Poisson ratios of the top layer and subgrade (half space) layer respectively, h1 is thickness of the top layer, E1 and Em are moduli of top and half space respectively.

For a road pavement with a base and sub-base structure, the equivalent layer thickness for the layers above the subgrade can be calculated as follows:

$$h_{eq(pavement)} = h_{eq(paver)} + h_{eq(sand)} + h_{eq(base)} + h_{eq(sub-base)}$$

The vertical and radial stresses were calculated at various depths using the Boussinesq's equations below:

$$\sigma_z = p\left[\frac{z^3}{(a^2+z^2)^{3/2}} - 1\right] \quad \text{.....(2)}$$

$$\sigma_r = \sigma_t = \frac{p}{2}\left[\frac{2z(1+\upsilon)}{(a^2+z^2)^{1/2}} - \frac{z^3}{(a^2+z^2)^{3/2}} - (1+2\upsilon)\right] \quad \text{.....(3)}$$

where, a is the radius of the circular loading area, p is contact pressure (from the wheel), z is the depth below the surface, v is Poisson ratio, and σz, σr and σt are vertical, radial and tangential stresses respectively.

In all cases, the radius of loading area was assumed to be 0.15m and tyre contact pressure (kPa) as mentioned above.

Then vertical strain at the top of subgrade layer and radial strain at the bottom of the base/sub-base layer were calculated using the following equations:

$$\varepsilon_r = \frac{1}{E}[\sigma_r - \upsilon(\sigma_t + \sigma_z)] \quad \text{.....(4)}$$

$$\varepsilon_z = \frac{1}{E}[\sigma_z - \upsilon(\sigma_r + \sigma_t)] \quad \text{.....(5)}$$

where, εz and εr are vertical and radial strains respectively. The compressive and tensile stresses were considered as negative and positive respectively.

Failure equation:

The failure criteria that is assessed for rutting and fatigue are given by Valkering (1974) and Austroads (2012) respectively as following:

$$\varepsilon = 2.8 \times 10^{-2} \times N^{-0.25} \quad \text{.....(6)}$$

$$N = RF\left[\frac{(113000/E^{0.804} + 191)}{\mu\varepsilon}\right]^{12} \quad \text{.....(7)}$$

where, ε is the permissible subgrade compressive strain (macrostrain) and N is the number of strain repetition.

Using eq.5 and eq.6, the base/subbase thickness or modulus of subbase was calculated by numerical iterations. The calculated parameters by the above equations are given above.

Rutting failure mode is generally more common when using unbound base and sub base materials such as crushed rock or gravel where compressive strain at the top of the layer leads to permanent deformation /fatigue. Tensile failure is a result of tensile strains at the bottom of the layer, which are more common in cement-bound materials. DesignPave optimises the design thickness so that N from eq.(6) and eq.(7) were higher than design traffic or ESA.

Disclaimer:

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Full responsibility for the use of the software package for any project, the collection and storage of data, and the interpretation of results remains wholly with the users.

The DesignPave software package is provided only as a tool to aid design and to give general guidance about the construction of concrete block pavements and is not appropriate for use on other types of pavement. The results of this program are for guidance purposes only and all assumptions and calculations should be confirmed by users before construction begins. The software is not intended as a replacement for engineering skill and judgement, and users should consult with suitably experienced and professionally qualified civil engineers to finalise and validate designs.

The program assumes that the pavers, the bedding and jointing sands, the base, the sub-base and the construction standards will all meet or exceeded the standard set out in the manual, the program help screens, or the program printout.

Failure to meet any of these requirements may invalidate the analysis.

No warranties, either expressed or implied, are given, and by choosing to use this software users accept any and all liabilities arising from its use.

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Appendix K

Lighting Technical Memo

Binder 3a,526

Memo

To:	TCCS Design Acceptance Team
From:	WSP (Lighting design team)
Subject:	**Dickson Shopping Centre lighting calculation outputs**
Our ref:	PS208025_Dickson Shops_Package A_ lighting_calcs
Date:	**30 May 2025**

This memo summarises the lighting technical parameters used in the design of the public lighting for Dickson Shopping Centre upgrade. The design parameters are summarised below, and calculation outputs are attached.

Relevant Lighting Standards

- AS/NZS 1158 – Lighting for Roads and Public Spaces generally
- AS/NZS 1158.3.1-2020 – Lighting for Roads and Public Spaces: Pedestrian Area
- AS4282: Control of the Obtrusive Effects of Outdoor Lighting
- ACT Government Municipal Infrastructure Standard (MIS) 14: Public Lighting, 2022
- ACT Government MIS 14 Standard Drawings
- ACT Municipal Infrastructure Technical Specification (MITS) 12: Public Lighting, 2022

AS/NZS1158.3.1 Lighting categories

As proposed by WSP in the FSP design report, for pedestrian zones, we have designed to public activity area sub-category **PA2**, based on the AS/NZS1158.3.1 site description of 'areas primarily for pedestrian use, e.g. suburban centres', generally pedestrian movement only, medium 'night time vehicle movements', medium 'fear of crime' and medium 'need to enhance prestige'.

We also provide calculations for pathways for pedestrian paths demonstrating compliance with subcategory PP2, corresponding to 'pedestrian and or cycle traffic only', high 'pedestrian / cycle activity' and medium 'fear of crime'.

Calculation summaries:

Calculation summaries are attached, as follows:

- Public activity areas: AGI32 illuminance calculation summaries including lux plot and tablulated results
- Pedestrian paths: Perfect Lite spacing tables for each pole height used and a range of pathway widths

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WSP Australia Pty Limited ABN 80 078 004 798

Appendix A Lighting calculation summaries

P Category Lighting - AS/NZS 1158.3.1:2005
****

WSP Australia

I-table Filename: C:\Users\AUAL217251\Desktop\EJ42_X484_C82S_Twilt_CBR_3000K_30W.cie

Job Name: Dickson Shopping Centre 4.5m mounting height

Luminaire Description: Twilight Canberra 3000K symmetric 4.5m mounting height
Lamp Wattage & Type: 30.5W
Initial Lamp Flux: 3560 lms
Maintenance Factor: 0.8
Stores Code:
Upcast Angle: 0 degrees
Arrangement: Single Side
Offset Distance: .7 m [ie. over Path]
Upward Waste Light Ratio: 2.8 %
Light Source: LED - Light Emitting Diode
Luminaire Classification: Not specified

Lighting Category: User Defined: Category PP2, AS/NZS1158.3.1-2020

Illuminance Criteria: (Maintained values)
Average Illuminance (Eav) >= 7.00 lx
Minimum Illuminance (Eph) >= 1.00 lx
Illuminance Uniformity (Up) <= 5
Vertical Illuminance (Epv) >= 0.30 lx
(Epv calculated on plane 1.5m above ground and contribution from luminaire in adjacent span used in calculations)

Calculation Grid: Dependant on Path width (refer Figure 3.8 of AS/NZS 1158.2)

Mounting Height	Maximum Spacing for different Path Widths		
	2.5	3.0	3.5
4.5	25.7	25.6	25.6

Value/s in above table are all in metres.
The table contains maximum spacings which, for the specified luminaire and lamp combination, provide compliance with the User Defined light technical parameters (LTPs) nominated above.

P Category Lighting - AS/NZS 1158.3.1:2005
****

WSP Australia

I-table Filename: C:\Users\AUAL217251\Desktop\EJ42_X484_C82S_Twilt_CBR_3000K_30W.cie

Job Name: Dickson Shopping Centre 3.2m height

Luminaire Description: Twilight Canberra 3000K symmetric 3.2m mounting height
Lamp Wattage & Type: 30.5W
Initial Lamp Flux: 3560 lms
Maintenance Factor: 0.8
Stores Code:
Upcast Angle: 0 degrees
Arrangement: Single Side
Offset Distance: .7 m [ie. over Path]
Upward Waste Light Ratio: 2.8 %
Light Source: LED - Light Emitting Diode
Luminaire Classification: Not specified

Lighting Category: User Defined: Category PP2, AS/NZS1158.3.1-2020

Illuminance Criteria: (Maintained values)
Average Illuminance (Eav) >= 7.00 lx
Minimum Illuminance (Eph) >= 1.00 lx
Illuminance Uniformity (Up) <= 5
Vertical Illuminance (Epv) >= 0.30 lx
(Epv calculated on plane 1.5m above ground and contribution from luminaire in adjacent span used in calculations)

Calculation Grid: Dependant on Path width (refer Figure 3.8 of AS/NZS 1158.2)

Mounting Height	Maximum Spacing for different Path Widths								
	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
3.2	23.2	22.2	21.5	19.8	19.0	18.2	17.7	16.4	15.8

Value/s in above table are all in metres.
The table contains maximum spacings which, for the specified luminaire and lamp combination, provide compliance with the User Defined light technical parameters (LTPs) nominated above.

PlePcat - Vers 3.10 (Built: 10/ 4/13) Run: 30/ 5/2025 at 10:34:31

Binder 3a,530

P Category Lighting - AS/NZS 1158.3.1:2005
****

WSP Australia

I-table Filename: C:\Users\AUAL217251\Desktop\EJ42_X484_C82S_Twilt_CBR_3000K_30W.cie

Job Name: Dickson Shopping Centre 2.7m height

Luminaire Description: Twilight Canberra 3000K symmetric 2.7m mounting height
Lamp Wattage & Type: 30.5W
Initial Lamp Flux: 3560 lms
Maintenance Factor: 0.8
Stores Code:
Upcast Angle: 0 degrees
Arrangement: Single Side
Offset Distance: .7 m [ie. over Path]
Upward Waste Light Ratio: 2.8 %
Light Source: LED - Light Emitting Diode
Luminaire Classification: Not specified

Lighting Category: User Defined: Category PP2, AS/NZS1158.3.1-2020

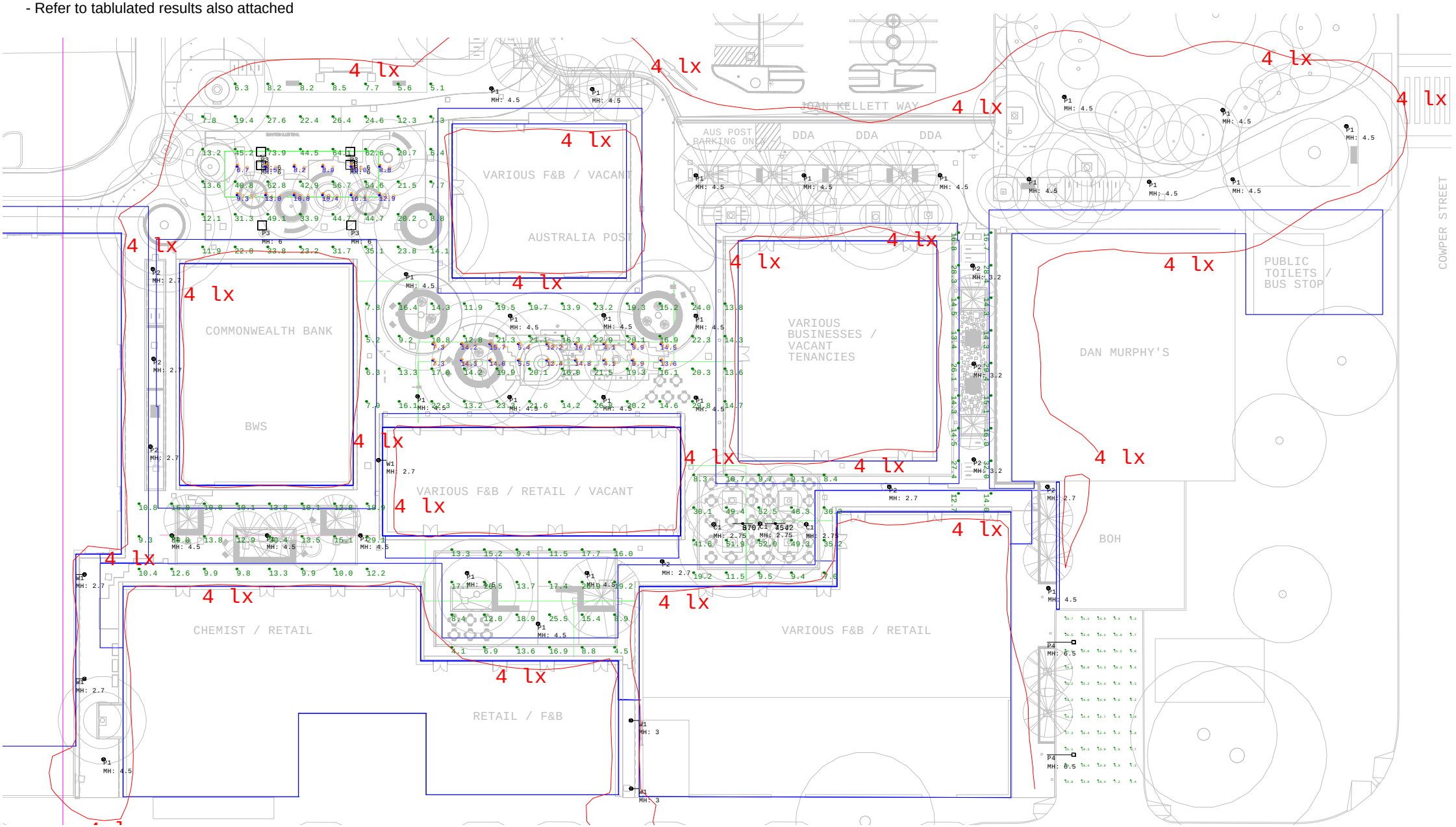
Illuminance Criteria: (Maintained values)
Average Illuminance (Eav) >= 7.00 lx
Minimum Illuminance (Eph) >= 1.00 lx
Illuminance Uniformity (Up) <= 5
Vertical Illuminance (Epv) >= 0.30 lx
(Epv calculated on plane 1.5m above ground and contribution from luminaire in adjacent span used in calculations)

Calculation Grid: Dependant on Path width (refer Figure 3.8 of AS/NZS 1158.2)

Mounting Height	Maximum Spacing for different Path Widths			
	6.0	7.0	8.0	9.0
2.7	17.0	14.7	13.6	12.0

Value/s in above table are all in metres.
The table contains maximum spacings which, for the specified luminaire and lamp combination, provide compliance with the User Defined light technical parameters (LTPs) nominated above.

NOTES:
- Calculation is for public activity area category PA2
- Lighting to adjacent out of scope areas not included in calculation
- Lighting from private buildings and awnings not included
- Building outlines and overhead awnings are included
- Refer to tablulated results also attached



Appendix L

Electrical Technical Memo

Binder 3a,533

Memo

To:	TCCS Design Acceptance Team
From:	WSP (Electrical team)
Subject:	**Voltage Drop (VD) and Earth Fault Loop Impedance Calculations (EFLI)**
Our ref:	PS208025_Dickson Shops_Package A_ Voltage Drop and EFLI Calculations
Date:	**29 May 2025**

Voltage Drop (VD) and Earth Fault Loop Impedance of each Street Light (SL) circuit connected to SLLC cubicles are calculated to verify compliance with AS/NZS3000.

Compliance with VD AS/NZS3000 requirement is met when calculated percentage is below 5% from substation transformer to the furthest SL column. Whereas compliance with EFLI AS/NZS3000 requirement is deemed satisfied when impedance of maximum circuit length (Z) is below maximum allowable earth fault loop impedance (Zs).

Calculations are done using the following references and assumptions.

Calculation References and Assumptions:

1. 5 second maximum disconnection for submains as per AS/NZS 3000.
   Type B breaker trip multiplier for 5 second disconnection time is nominally 4 times.
   Protective Device Rating = 32A Type B
2. Assumes reactance is nil as earth-fault-current loop conductors are in close proximity and are not separated by ferromagnetic materials.
3. Earth-fault-current loop conductor sizes of circuit are both 16mm² Copper
4. Table 35 from AS/NZS 3008.1.1 provides 1.26Ω/km resistance for 16mm² at a temperature of 45°C and 8.77/km resistance for 6mm² at a temperature of 45°C

The succeeding pages and calculation sheet in Appendix A illustrate the calculation method and present the findings for %VD and EFLI for each SL circuit.

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WSP Australia Pty Limited ABN 80 078 004 798

SLCC Circuit L1

Supplied from:
SL Cubicle SLCC near Woolworths

Circuit length:
300m

Load on circuit:
≈ 1.41A Single Phase

Fault Loop Impedance

Maximum allowable earth loop impedance (zs):

5 second maximum disconnection for submains as per AS/NZS 3000.

Type B breaker trip multiplier for 5 second disconnection time is nominally 4 times.

Protective device rating = 32A Type B.

Zs = Uo / Ia

= 230 / (32 x 4)

≈ **1.79Ω**

Impedance of maximum circuit length (z):

Assumes reactance is nil as earth-fault-current loop conductors are in close proximity and are not separated by ferromagnetic materials.

Earth-fault-current loop conductor sizes are both 16mm² Copper.

Table 35 from AS/NZS 3008.1.1 provides the following resistance for 16mm² multicore cables at a temperature of 45°C.

Z = 1.26Ω/km x 0.300 x 2 ≈ **0.756Ω**

Z < Zs and therefore meets the requirements of AS/NZS 3000.

Voltage Drop

- The voltage drop on the cable from the SLCC control cubicle to furthest column has been calculated to be 0.46%.

SLCC Circuit L2

Supplied from:
SL Cubicle SLCC near Woolworths

Circuit length:
500m

Load on circuit:
≈ 1.73A Single Phase

Fault Loop Impedance

Maximum allowable earth loop impedance (zs):

5 second maximum disconnection for submains as per AS/NZS 3000.

Type B breaker trip multiplier for 5 second disconnection time is nominally 4 times.

Protective device rating = 32A Type B.

Zs = Uo / Ia

= 230 / (32 x 4)

≈ **1.79Ω**

Impedance of maximum circuit length (z):

Assumes reactance is nil as earth-fault-current loop conductors are in close proximity and are not separated by ferromagnetic materials.

Earth-fault-current loop conductor sizes are both 16mm² Copper.

Table 35 from AS/NZS 3008.1.1 provides the following resistance for 16mm² multicore cables at a temperature of 45°C.

Z = 1.26Ω/km x 0.500 x 2 **≈ 1.26Ω**

Z < Zs and therefore meets the requirements of AS/NZS 3000.

Voltage Drop

- The voltage drop on the cable from the SLCC control cubicle to furthest column has been calculated to be 0.95%.

SLCC Circuit L3

Supplied from:
SL Cubicle SLCC near Woolworths

Circuit length:
175m

Load on circuit:
≈ 1.46A Single Phase

Fault Loop Impedance

As per AS/NZS 3000, earth fault loop impedance calculation and testing are not required for circuits protected by a residual current device (RCD) with a residual current rating of 30mA or less. The maximum operating time of the RCDs providing additional protection is less than the 0.4s required.

Voltage Drop

- The voltage drop on the cable from the SLCC control cubicle to furthest luminaire has been calculated to be 1.12%.

SLCC Circuit L4

Supplied from:
SL Cubicle SLCC near Woolworths

Circuit length:
175m

Load on circuit:
≈ 2.27A Single Phase

Fault Loop Impedance

As per AS/NZS 3000, earth fault loop impedance calculation and testing are not required for circuits protected by a residual current device (RCD) with a residual current rating of 30mA or less. The maximum operating time of the RCDs providing additional protection is less than the 0.4s required.

Voltage Drop

- The voltage drop on the cable from the SLCC control cubicle to furthest luminaire has been calculated to be 1.75%.

Appendix A Calculation Sheet

Binder 3a,538

Project: PS208025
Description: DICKSON SHOP PACKAGE A
Date: 29/05/2025
By RC

			Luminaire Type																					
	Length (m)	Cable Size	C1		L1		L2		P1		P2-A		P2-B		P3		P4		P6		W1		Total Power (W)	Current (A)	Voltage Drop	Voltage Drop %
SLCC			#	W	#m	W/m	#m	W/m	#	W	#	W	#	W	#	W	#	W	#	W	#	W				
L1	300	16							4	30.5	1	30.5		30.5	1	54		72	1	54	1	30.5	291	1.41	1.07	0.46
L2	500	16	3	24					4	30.5	1	30.5	1	30.5		54	1	72		54	1	30.5	357.5	1.73	2.18	0.95
L3	175	6			45	6.7																	301.5	1.46	2.58	1.12
L4	175	6					70	6.7															469	2.27	4.02	1.75

Uo	Ia	Zs
230	128	1.796875
230	128	1.796875
N/A - RCD PROTECTION		
N/A - RCD PROTECTION		

AS PER TABLE 36 AS/NZS3008

R	L	n	Z
1.26	0.3	2	0.756
1.26	0.5	2	1.26
N/A - RCD PROTECTION			
N/A - RCD PROTECTION			

NOTES

1) Calculations based on 6mm2 Copper Cables: Voltage Drop = 8.77 @45˚C(TABLE 42 AS/NZS3008)

2) Calculations based on 16mm2 Copper Cables: Voltage Drop = 2.19 @45˚C(TABLE 42 AS/NZS3008)

4) Single phase used in calculations with multiplier = 1.155 (AS/NZS3008)

5) Calculations excludes consumer mains from network supply

EFLI is compliant if, Zs > (greater than) Z

Appendix M

Stormwater Drainage Technical Memo

Binder 3a,540

Memo

To:	TCCS Design Acceptance Team
From:	WSP (Civil team)
Subject:	**Proposed Stormwater Upgrades**
Our ref:	PS208025_Dickson Shops_Package A_Stormwater Upgrade Works
Date:	**30 May 2025**

1.1 Introduction

One of CRA's key objectives for undertaking the stormwater upgrade works concurrent with the public realm upgrades is to minimise disruption to local businesses.

The key items of the agreed scope of stormwater investigation are outlined below:

1. Review available background documentation provided including Site survey, WAE drawings of inground services incl stormwater, Existing Geotechnical report, Dial Before You Dig (DBYD) records, Flood mapping
2. Review previous stage concept designs and drainage reports.
3. Scope and prepare Civil input to requirements for any additional surveys and investigations relevant to the Civil design.
4. Scope and prepare CCTV Drainage specifications (as required).
5. Develop hydraulic models for network to assess capacity (main trunks only)
6. Review CCTV survey report and videos to identify location and extents of defects.

Site-specific flood risks assessments, flood modelling, and any investigation outside the site extents are not part of the current scope (as project focus is on renewal of defective pipes and pits).

This memo summarises the technical parameters adopted for the stormwater designs, and outlines the analysis undertaken including hydraulic modelling parameters/outputs, and pipe loading calculations.

1.2 Existing Stormwater Layout

1.2.1 Survey Plan

Initial topographical and feature survey of the site completed by Veris was provided, captured on plans: 22023-085_DT_001_Rev D.dwg, and 22023-085_DT_001_Rev E.dwg However, the is lacking data for sections of the existing stormwater network. Several existing pit invert and cover levels, pit sizes, and pipe diameters are noted to be missing, and pipe network connectivity may need to be further validated.

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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

WSP Australia Pty Limited ABN 80 078 004 798

2. Stormwater Drainage Investigations

2.1 Visual Condition

2.1.1 Site Walkover

From a site walkover, visible features of the existing stormwater drainage features were observed by the WSP team. Some of the grated pits were noted to be very shallow (less than 400mm below surface), with some pipe connections from downpipes approx. 100mm below the pavement surface.

Most pits grates were noted to be 300 x 300mm or 450 x 450mm on plan, and though the visit was on a dry day, stagnant water was visible in some locations. The existing segmental paving surface was noted to have some low-lying areas outside the location of stormwater inlets, possibly from subsidence or root heave. Some leaf fall was also noted in areas with established trees.



Figure 2.1 - Section of existing pavement with low lying area



Figure 2.2 - Existing stormwater pit observed with leaves and stagnant water

2.2 Site Flooding

2.2.1 TCCS Observations

There is some anecdotal evidence of flooding within the Dickson Shopping precinct. Photographic evidence provided by TCCS shows flooding of the open spaces within the shopping precinct as observed in February 2022. It is unclear what date the rainfall event occurred, but several spaces of the courtyards appear to have stormwater ponding on the paving surfaces.



Figure 2.3 - Stormwater ponding outside Bakers Delight (February 2022)



Figure 2.4 - Stormwater ponding southeast of the Post Office (February 2022)

Further (undated) images from the site supports the February 2022 evidence of flooding observations, but at this time of writing, the magnitude of the storm event or rarity of the rainfall at the time the photographs were taken, is yet to be determined.



Figure 2.5 - Stormwater Ponding in the Dickson Library Frontage (undated)



Figure 2.6 - Surface Water ponding in the open areas next to the Post Office (undated)

A representative of TCCS advised that regular maintenance of the pipe network was carried out, with leaves cleaned and tree roots cut every 6 months to ensure its hydraulic function.

2.2.2 ACTMapi viewer data

Flood Maps which indicate the level of flooding expected during a major flood event, with a 1 % Annual Exceedance Probability (AEP). The flood mapping for the Dickson shops precinct indicates no risk within the site boundary, but highlights some flooding (of up to 0,25m) along an entrance, south of the site, off Dickson Place.

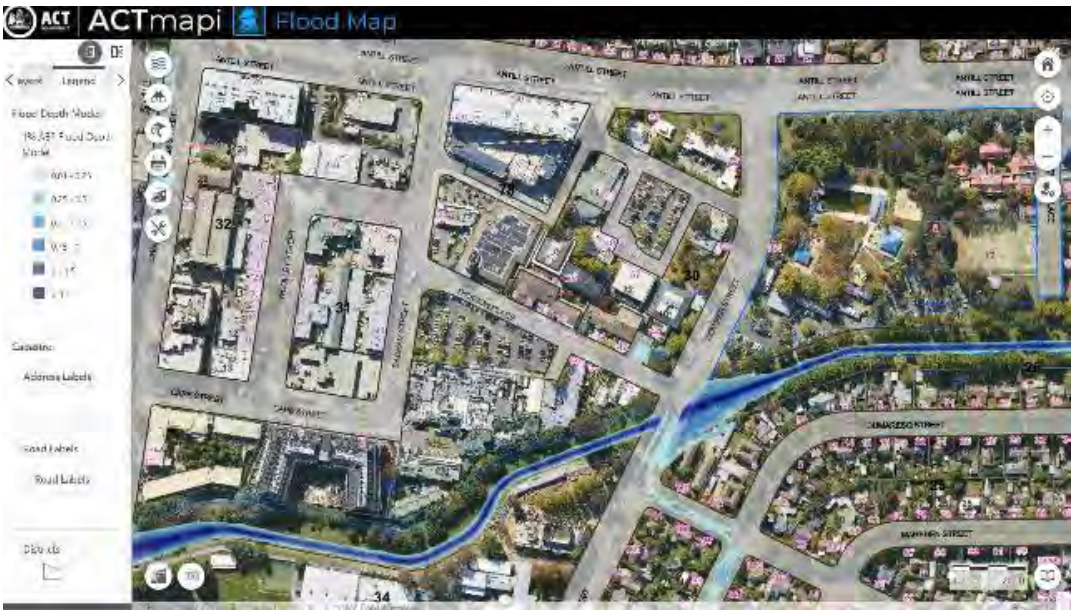


Figure 2.7 - ACTMapi Viewer2016 1% AEP Flood Depth and Extents Map

2.2.3 Sullivan Creek Hydrologic Modelling

As part of Hydrologic study of the Sullivan Creek catchment undertaken by Calibre Consulting on behalf of the Environment, Planning and Sustainable Development Directorate (ESPDD), the TUFLOW hydraulic model for the catchment (which includes the Dickson Shop Precinct), was recalibrated and the model was rerun for existing conditions. Flood maps for existing conditions in a 1% AEP storm event depict flooding of between 0.05m and1m along the Cowper Street Creek crossing, extending along Dickson Place, and sections of Badham Street.



Figure 2.8 – ARR 2016 1% AEP Flood Depths Baseline Conditions

Based on an earlier mitigation design, two levees were proposed at the northern side and southern side of the Dickson Channel to alleviate the 1% AEP flooding at the Cowper Street Bridge. Though the flood depth map indicates that these measures curtail the flood there is a still some flooding along Cowper Street but only to the Dickson Place junction approach. However, the flooded areas are outside the Dickson Shops project site boundary.



Figure 2.9 - ARR 2016 1% Flood Depth map - proposed earlier Mitigation Measures

Further optimisation of a solution was considered as part of the Calibre study with a focus on channel naturalisation combined with other the mitigation measures, and flood maps from the 1% AEP modelling of this scenario indicate the flood risks can be contained within the Dickson Channel banks, with no spill unto Cowper Street.



Figure 2.10 - ARR 2016 1% Flood Depth map - proposed updated Mitigation Measures

2.3 CCTV Survey Investigation

2.3.1 Methodology

TCCS commissioned a stormwater drainage closed-circuit television (CCTV) investigation in accordance with WSA 05-2006, to determine the condition of the existing inground stormwater infrastructure within the Dickson Shops precinct.

The inspection reports indicate that the procedure adopted was a structural examination, with the pipes cleaned prior to the survey, and no flow control measures implemented. It is also noted that the survey was completed in a dry period, and the inspection direction was both upstream and downstream. The CCTV survey report also noted that all pipes are circular shaped, most were made of concrete, with a few sections noted as vitrified clay.

Though most of the pipe sections were surveyed to the upstream or downstream pit, a small number of surveys were abandoned due to blockage.

2.3.2 Structural Condition Assessment

The structural condition assessment relates to the assessment of the pipe and pit structures and observations of any failures. Through the CCTV survey inspection, varied structural defects were identified for the existing stormwater drainage assets, with some notable defects including:

- Longitudinal and circumferential cracking:
- Spalling/broken concrete and holes in the pipe;
- Pipe joint displacement, open joints and dislocation;
- Multiple cracks and collapsed pipe sections;

2.3.3 Service Condition Assessment

Aside the structural condition, and the CCTV survey also assessed the serviceability of the existing stormwater drainage assets with regards to defects that affect hydraulic performance, not structural performance of a pipe and pits. Some of the service defects identified include:

- Pipe blockages due to debris and sedimentation;
- Pipe root ingress;
- Intruding connections;
- Defective construction;

Refer to the CCTV Drainage Survey inspection reports included in the Summary Report for further details

3. Stormwater Drainage Renewal

3.1 Renewal Summary

The objective of the Stormwater Renewals is to provide upgrades that will enhance the existing stormwater assets and provide a higher level of service. This will also provide an extended life of the asset and reduce the need for frequent stormwater maintenance.

The new pipework is also to be installed in a new trench wrapped in root protection barrier.

It is noted that the proposed renewals works are spatially constrained by existing inground utilities and buried structures, as well as restrictions for tree protection zones.

3.2 Standards

- Municipal Infrastructure Standards 01 Street planning and design 2021
- Municipal Infrastructure Standards 08 Stormwater 2024
- Australian Rainfall & Runoff Guidelines (ARR 2019)
- AS/NZS 3500.3:2021 Plumbing and drainage, Part 3: Stormwater drainage
- AS/NZS 3725:2007 Design for installation of buried concrete pipes
- AS/NZS 2566.1:1998 Buried flexible pipelines, Part 1: Structural design
- AS3996:2019 Access Covers and Grates

3.3 Referenced Documents

- Dickson Shops & Streetscape Upgrade Block 33, Section 30, Dickson, ACT Geotechnical Investigation Report Ref: AP/C15916, prepared by Fortify Geotech in January 2025.
- CCTV survey investigation report (Project Name: WO75488), prepared by Flexible Australia in October and November 2023.
- CCTV survey investigation report (Project Name: WO79469), prepared by Flexible Australia in January 2024.
- Topographical Survey 22023-085B_DT_001_RevD, and 22023-085B_DT_001_RevE, completed by Veris in April 2024 and August 2024 respectively.

3.3.1 Catchments and Site Slopes

The existing Dickson shop precinct areas comprise mostly impermeable surfaces such as e.g. roofs. segmental pavement, concrete pavement with some minimal pervious surfaces within the soft landscaped estate, verges, garden beds and tree pits. Existing stormwater catchments have been investigated and delineated on plan as shown below. However, exact roof layout and downpipe connections are still unclear.

Within the site stormwater is collected via a number of systems. Runoff from the roofs primarily discharge to the surface or connect to existing pipe network via downpipes, while the surface areas are drained via grated pits into the inground drainage system. A further assessment of existing paving surface slopes indicates resultant slopes and directions, as well as identifying flat areas within the courtyards.



Figure 11 - Stormwater drainage catchments

3.4 Hydraulic Analysis

3.4.1 Rainfall Data

Rainfall data from the 2016 Bureau of Meteorology (BoM) Rainfall IFD is to be applied for hydraulic modelling.

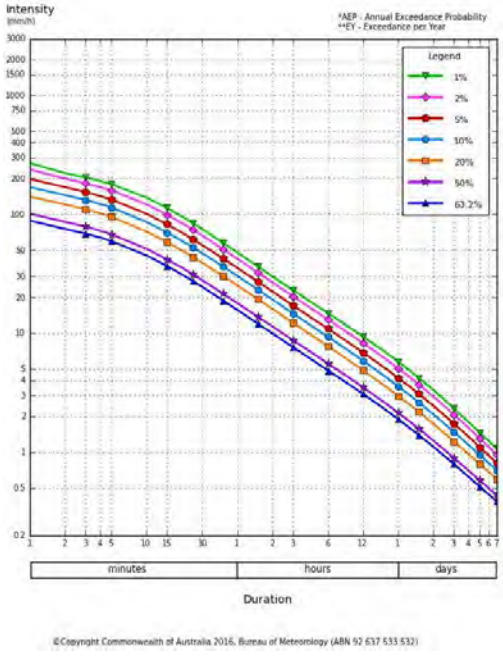


Figure 3.12 - BoM Rainfall Intensities for Dickson Shops Precinct

3.4.2 Existing Network

Details of existing stormwater network was generally taken from the survey for which survey and field work constraints and restrictions that have limited data quality. Some of the issues reported by the surveyor include inaccessible pits, presence of accumulated debris, and inability to prove the direction of the incoming and outgoing pipes from the pits. Aside details of know pits, a few pits are also missing from the detailed survey, and positions and sizes had to be assumed (by interpolation or extrapolating levels and direction of the rest of the stormwater network).

Overall, the survey connectivity is also questionable and may need to be proven. Several pipe sizes, and levels seemed erroneous, and the data suggested some upstream invert levels were lower than downstream levels, and smaller diameter pipes were installed downstream of larger diameter pipes. The positions of existing downpipes connections are also not captured in survey, and this raises further concerns about the points of the roof connection to the below ground stormwater.

3.4.3 Proposed Network

The existing stormwater network was modelled using InfoDrainage software for several AEP storm return periods and durations to establish the critical storm events, and the network's response. InfoDrainage uses a 1D simulation to determine the flows through the stormwater network applying rainfall-runoff generated from the catchments draining into the pits. The modelling outputs are included in Appendix A.

The proposed network generally follows the existing layout line, but with upgrades to gradients and sizing where feasible.

Minimum vertical clearances from other utilities for proposed stormwater network could not be verified due to limited existing inground services information. At some locations, horizontal clearances of other utilities with existing stormwater network violate MIS 08 Section 7.7.8 requirements. This non-compliance cannot be address as the existing pipe corridor is retained to avoid impact to tree roots, and the site is spatially constrained.

The depths for the proposed stormwater network is constrained by downstream pit invert levels and therefore some upgraded upstream pipes will have shallower cover depths to accommodate upsizing of diameters, and higher-class strength pipe materials and/or concrete encasement is required to provide protection to these pipes.

Loading calculations for proposed pipes are provided in Appendix B (plastic) and Appendix C (concrete) of this report.

3.5 Wider Considerations

3.5.1 Safety in Design

From the early design process, several Safety risks have been identified, particularly in regards the proposed stormwater improvements and existing site conditions. These are captured in the project wide Safety in Design matrix included in the main Summary Report.

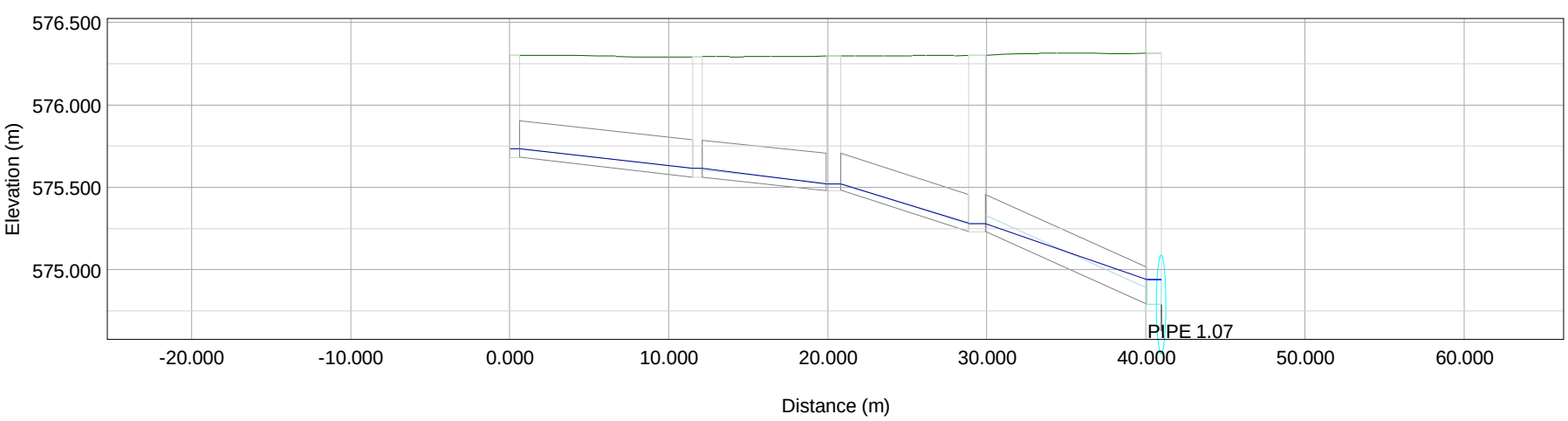
3.5.2 Departures from Standards

Though the stormwater issues are still being investigated, and solutions are still being developed, proposed stormwater drainage measures have considered the TCCS Stormwater Municipal Infrastructure Standards 08 (MIS 08) requirements and how these can be achieved. Items relevant to Stormwater are captured in the Non-conformance list included in the main Summary Report.

Appendix A Stormwater Hydraulic Modelling Report

		Page 1
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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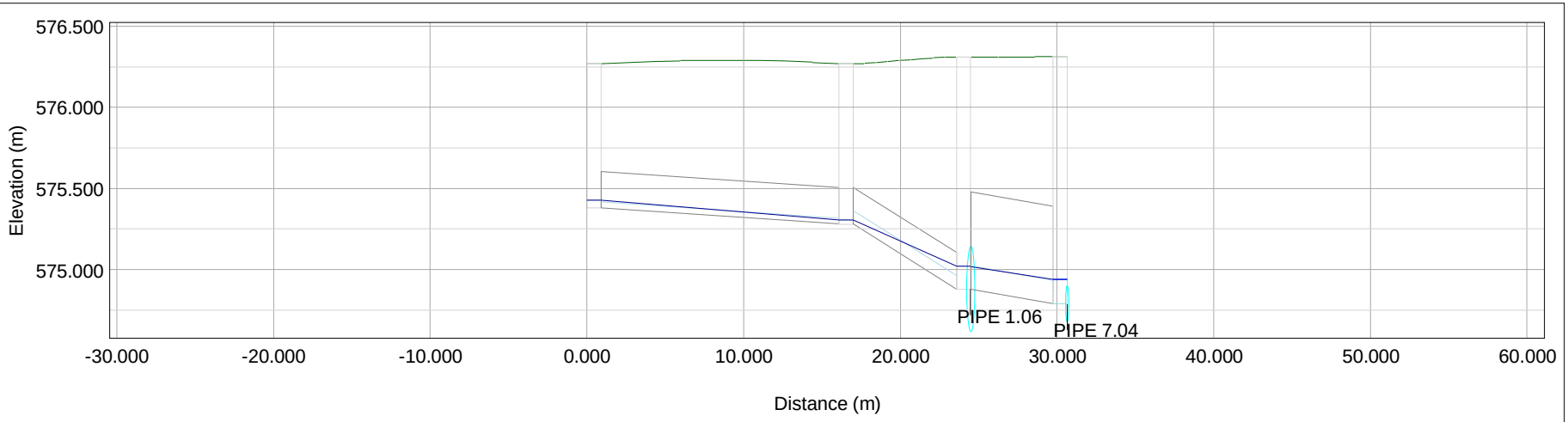
Junction	P7.00	P7.01	P7.02	P7.03	P1.07
Type	Manhole	Manhole	Manhole	Manhole	Manhole
CE (m)	576.300	576.292	576.297	576.301	576.314
IE (m)	575.680	575.560	575.480	575.230	574.790

Connection	PIPE 7.01	PIPE 7.02	PIPE 7.03	PIPE 7.04
Type	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No
Length (m)	10.898	7.815	8.044	10.150
Diam (mm)	225	225	225	225
Height (mm)				
U/S IE (m)	575.680	575.560	575.480	575.230
D/S IE (m)	575.560	575.480	575.230	574.790
C. Splay (mm)				

SWC					
Type					
EE (m)					
BE (m)					

		Page 2
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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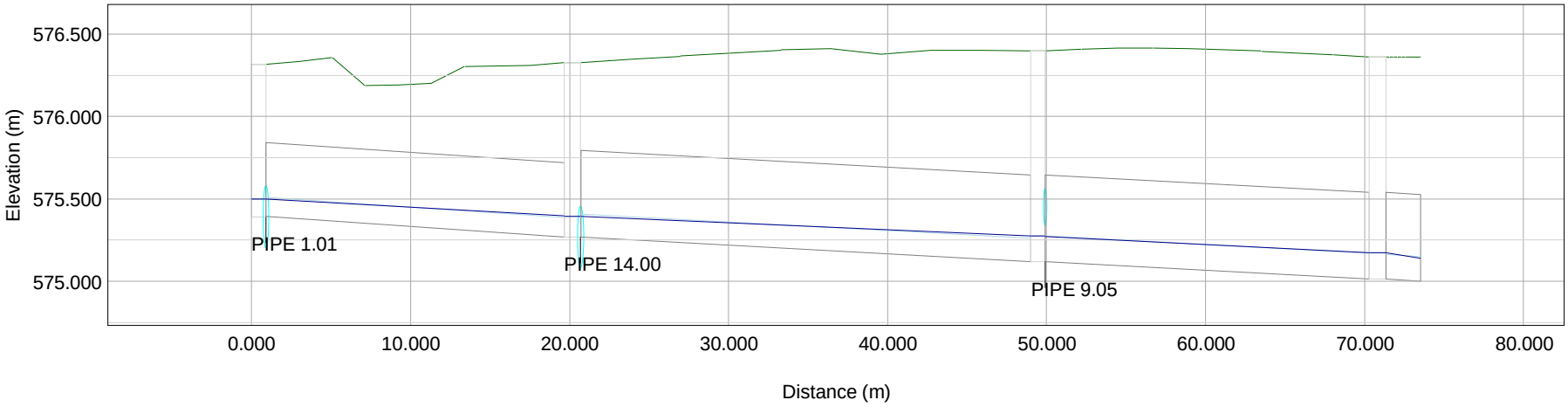
Junction	P8.00	P8.01	P1.06	P1.07
Type	Manhole	Manhole	Manhole	Manhole
CE (m)	576.270	576.270	576.310	576.314
IE (m)	575.380	575.280	574.880	574.790

Connection	PIPE 8.01	PIPE 8.02	PIPE 1.07
Type	Pipe	Pipe	Pipe
Curved	No	No	No
Length (m)	15.174	6.622	5.262
Diam (mm)	225	225	600
Height (mm)			
U/S IE (m)	575.380	575.280	574.880
D/S IE (m)	575.280	574.880	574.790
C. Splay (mm)			

SWC				
Type				
EE (m)				
BE (m)				

		Page 3
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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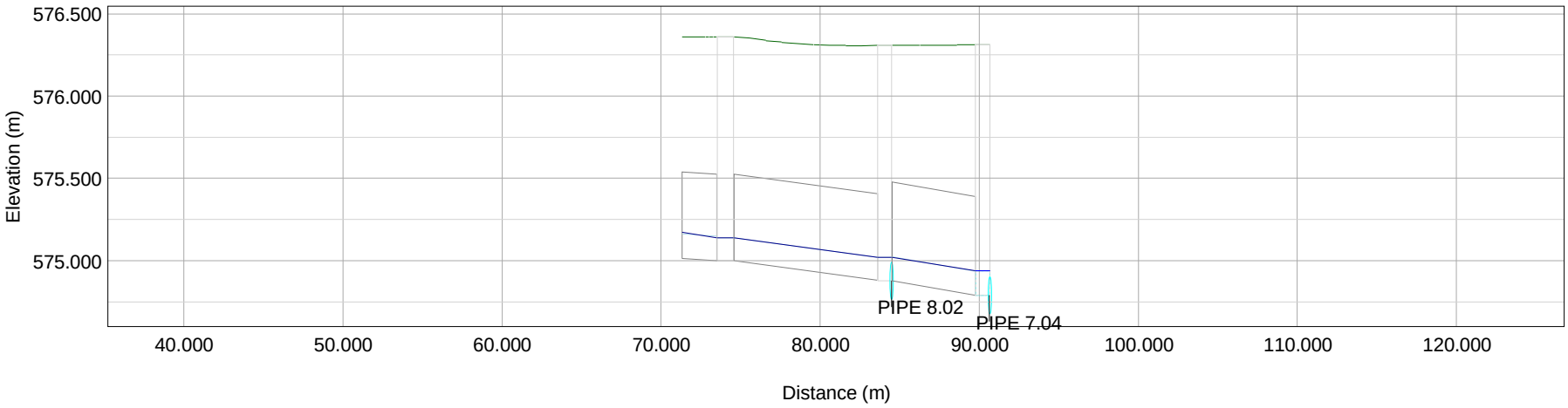


Junction	P1.01	P13.00	P1.03	P1.04
Type	Manhole	Manhole	Manhole	Manhole
CE (m)	576.318	576.326	576.400	576.360
IE (m)	575.392	575.269	575.120	575.015

Connection	Pipe 1.02	PIPE 1.03	PIPE 1.04	PIPE 1.05
Type	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No
Length (m)	18.743	28.317	20.368	2.184
Diam (mm)	450	525	525	525
Height (mm)				
U/S IE (m)	575.392	575.269	575.120	575.015
D/S IE (m)	575.269	575.120	575.015	575.000
C. Splay (mm)				
SWC				
Type				
EE (m)				
BE (m)				

		Page 4
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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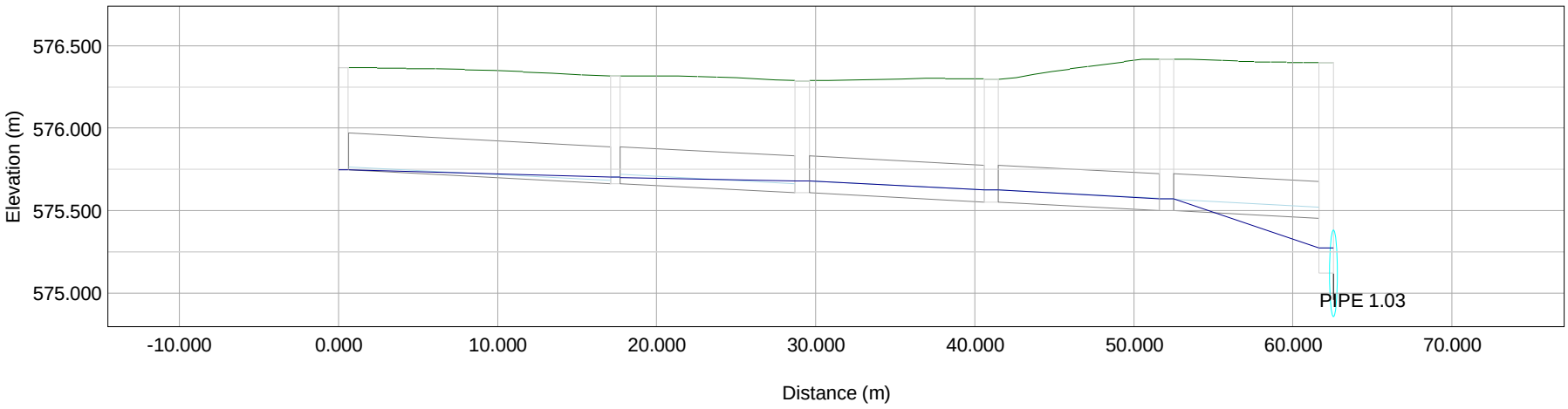
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Junction	P1.05	P1.06	P1.07
Type	Manhole	Manhole	Manhole
CE (m)	576.360	576.310	576.314
IE (m)	575.000	574.880	574.790
Connection	PIPE 1.05	PIPE 1.06	PIPE 1.07
Type	Pipe	Pipe	Pipe
Curved	No	No	No
Length (m)	2.184	9.034	5.262
Diam (mm)	525	525	600
Height (mm)			
U/S IE (m)	575.015	575.000	574.880
D/S IE (m)	575.000	574.880	574.790
C. Splay (mm)			
SWC			
Type			
EE (m)			
BE (m)			

		Page 5
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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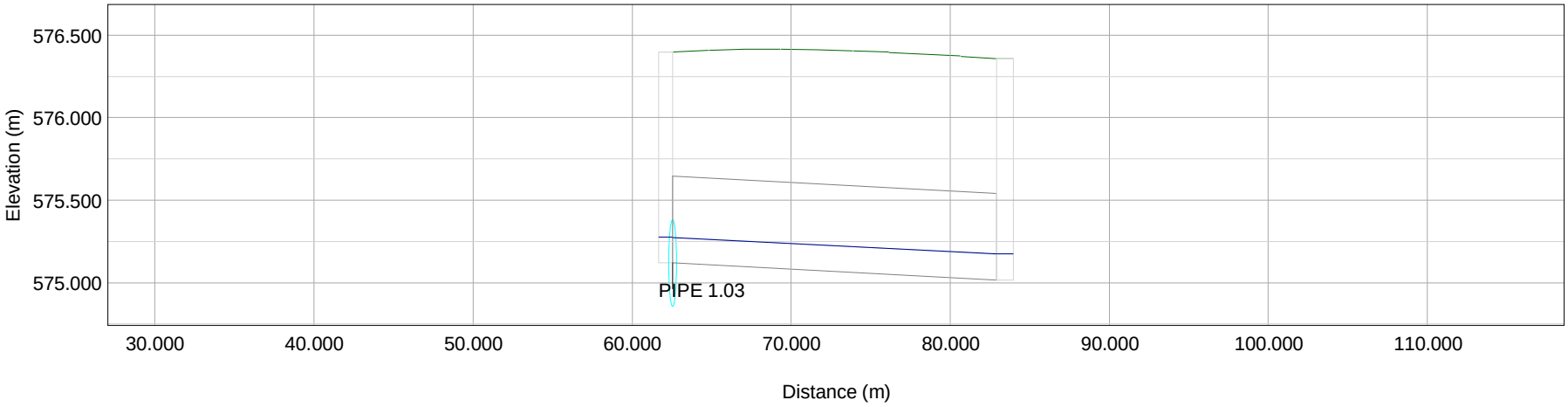


Junction	P9.00	P9.01	P9.02	P9.03	P9.04	P1.03
Type	Manhole	Manhole	Manhole	Manhole	Manhole	Manhole
CE (m)	576.370	576.320	576.290	576.300	576.420	576.400
IE (m)	575.747	575.664	575.608	575.552	575.500	575.120

Connection	PIPE 9.01	PIPE 9.02	PIPE 9.03	PIPE 9.04	PIPE 9.05
Type	Pipe	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No	No
Length (m)	16.481	11.009	11.005	10.115	9.149
Diam (mm)	225	225	225	225	225
Height (mm)					
U/S IE (m)	575.747	575.664	575.608	575.552	575.500
D/S IE (m)	575.664	575.608	575.552	575.500	575.452
C. Splay (mm)					
SWC					
Type					
EE (m)					
BE (m)					

		Page 6
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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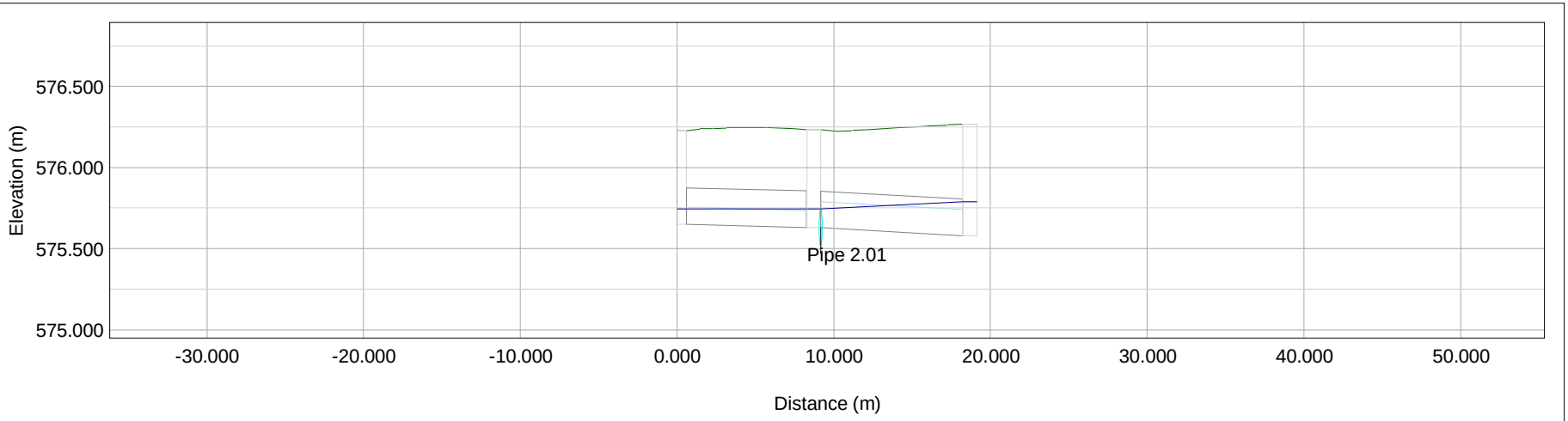
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Junction	P1.03	P1.04
Type	Manhole	Manhole
CE (m)	576.400	576.360
IE (m)	575.120	575.015
Connection	PIPE 1.04	
Type	Pipe	
Curved	No	
Length (m)	20.368	
Diam (mm)	525	
Height (mm)		
U/S IE (m)	575.120	
D/S IE (m)	575.015	
C. Splay (mm)		
SWC		
Type		
EE (m)		
BE (m)		

		Page 7
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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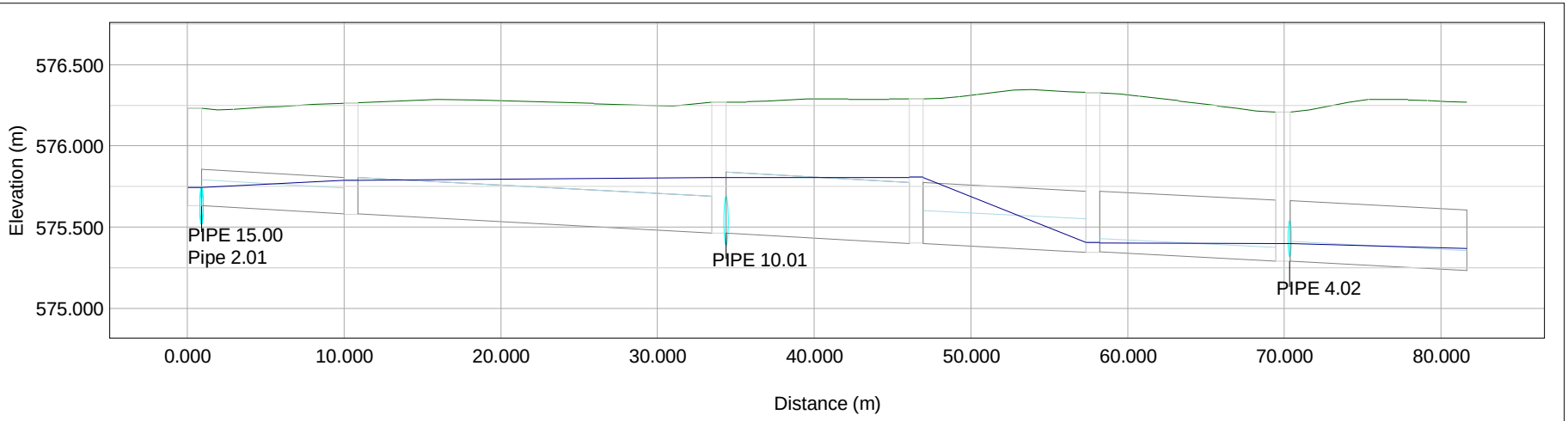
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Junction	P10.01	P2.02	P3.00
Type	Manhole	Manhole	Manhole
CE (m)	576.225	576.233	576.266
IE (m)	575.650	575.630	575.580
Connection	PIPE 15.00	PIPE 3.01	
Type	Pipe	Pipe	
Curved	No	No	
Length (m)	7.667	9.082	
Diam (mm)	225	225	
Height (mm)			
U/S IE (m)	575.650	575.630	
D/S IE (m)	575.630	575.580	
C. Splay (mm)			
SWC			
Type			
EE (m)			
BE (m)			

		Page 8
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
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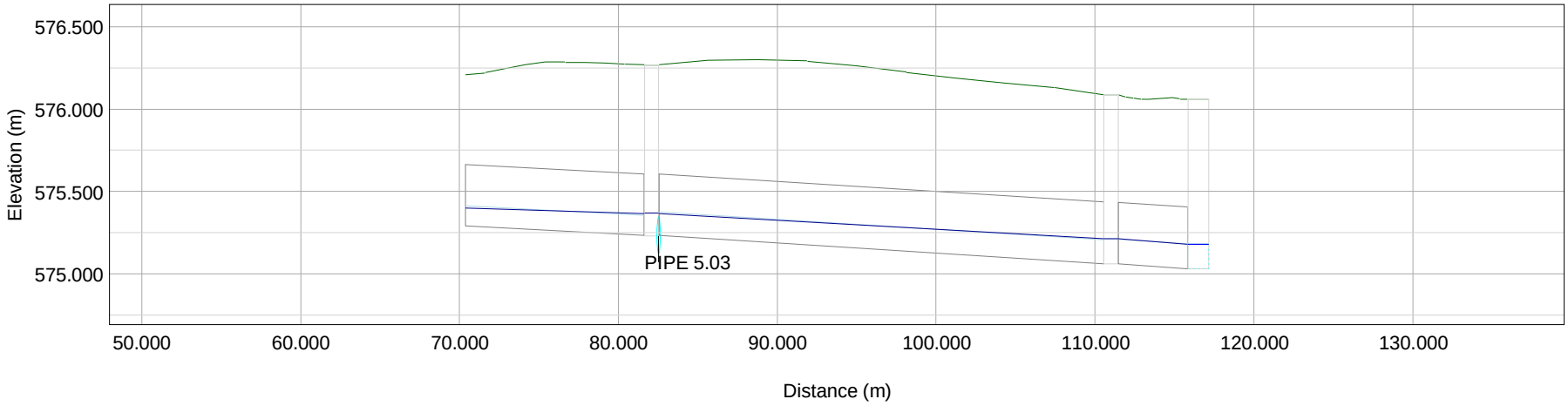


Junction	P2.02	P3.00	P3.01	P3.02	P3.03	P3.04
Type	Manhole	Manhole	Manhole	Manhole	Manhole	Manhole
CE (m)	576.233	576.266	576.270	576.290	576.330	576.210
IE (m)	575.630	575.580	575.464	575.400	575.346	575.290

Connection	PIPE 3.01	PIPE 3.02	PIPE 3.03	PIPE 3.04	PIPE 3.05	PIPE 3.06
Type	Pipe	Pipe	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No	No	No
Length (m)	9.082	22.588	11.687	10.376	11.233	11.280
Diam (mm)	225	225	375	375	375	375
Height (mm)						
U/S IE (m)	575.630	575.580	575.464	575.400	575.346	575.290
D/S IE (m)	575.580	575.464	575.400	575.346	575.290	575.232
C. Splay (mm)						
SWC						
Type						
EE (m)						
BE (m)						

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Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 03	Horizontal Scale 1:400, Vertical Scale 1:40	

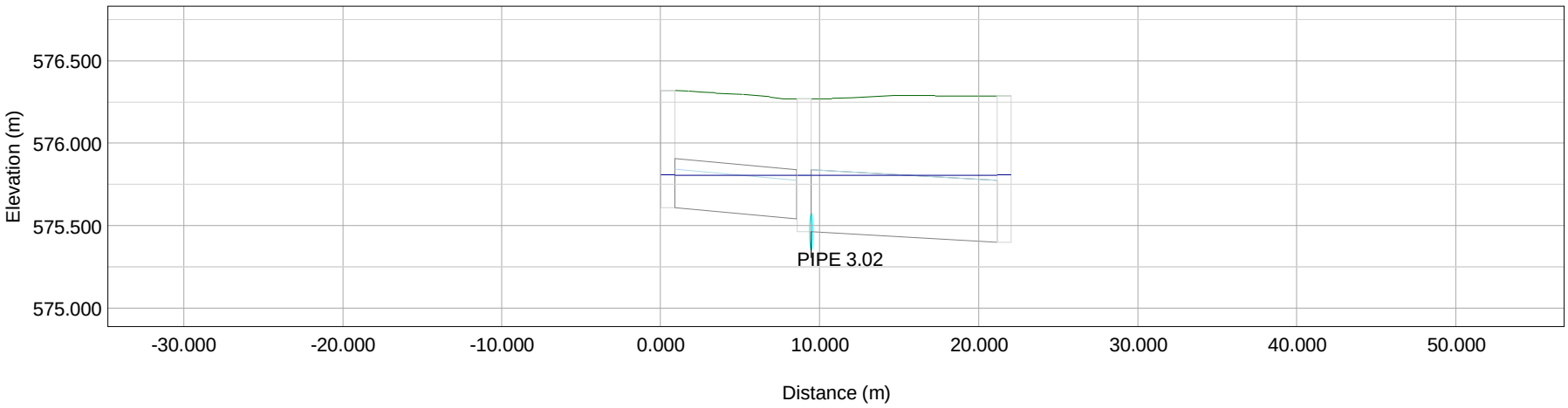
2/2



Junction		P3.05		P3.06	P3.07
Type		Manhole		Manhole	Manhole
CE (m)		576.270		576.089	576.061
IE (m)		575.232		575.060	575.030
Connection	PIPE 3.06		PIPE 3.07		PIPE 3.08
Type	Pipe		Pipe		Pipe
Curved	No		No		No
Length (m)	11.280		28.015		4.372
Diam (mm)	375		375		375
Height (mm)					
U/S IE (m)	575.290		575.232		575.060
D/S IE (m)	575.232		575.060		575.030
C. Splay (mm)					
SWC					
Type					
EE (m)					
BE (m)					

		Page 10
Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 10 (1)	Horizontal Scale 1:400, Vertical Scale 1:40	

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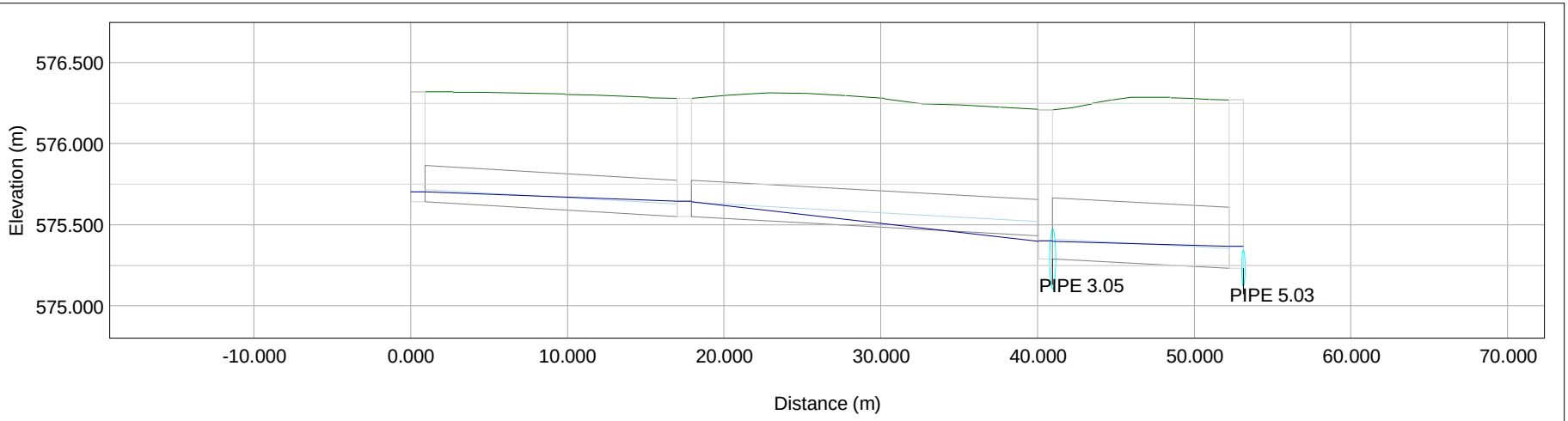
Junction	P10.00	P3.01	P3.02
Type	Manhole	Manhole	Manhole
CE (m)	576.323	576.270	576.290
IE (m)	575.609	575.464	575.400

Connection	PIPE 10.01	PIPE 3.03
Type	Pipe	Pipe
Curved	No	No
Length (m)	7.659	11.687
Diam (mm)	300	375
Height (mm)		
U/S IE (m)	575.609	575.464
D/S IE (m)	575.540	575.400
C. Splay (mm)		

SWC		
Type		
EE (m)		
BE (m)		

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Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 04	Horizontal Scale 1:400, Vertical Scale 1:40	

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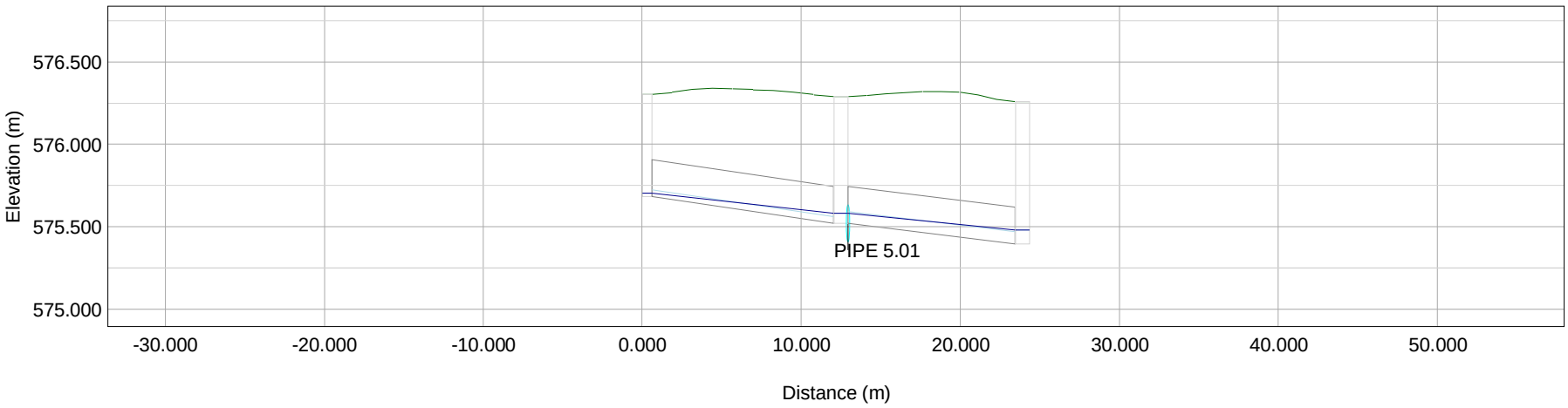
Junction	P4.00	P4.01	P3.04	P3.05
Type	Manhole	Manhole	Manhole	Manhole
CE (m)	576.320	576.280	576.210	576.270
IE (m)	575.640	575.550	575.290	575.232

Connection	PIPE 4.01	PIPE 4.02	PIPE 3.06
Type	Pipe	Pipe	Pipe
Curved	No	No	No
Length (m)	16.113	22.148	11.280
Diam (mm)	225	225	375
Height (mm)			
U/S IE (m)	575.640	575.550	575.290
D/S IE (m)	575.550	575.430	575.232
C. Splay (mm)			

SWC				
Type				
EE (m)				
BE (m)				

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Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 11	Horizontal Scale 1:400, Vertical Scale 1:40	

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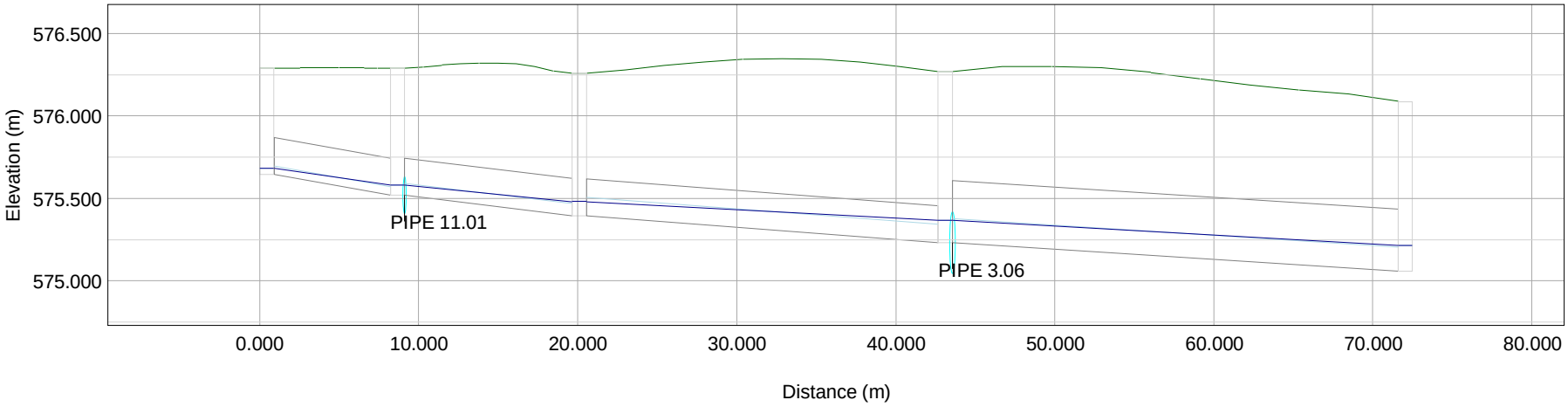
Junction	P11.00	P5.01	P5.02
Type	Manhole	Manhole	Manhole
CE (m)	576.305	576.290	576.260
IE (m)	575.683	575.519	575.395

Connection	PIPE 11.01	PIPE 5.02
Type	Pipe	Pipe
Curved	No	No
Length (m)	11.440	10.519
Diam (mm)	225	225
Height (mm)		
U/S IE (m)	575.683	575.519
D/S IE (m)	575.519	575.395
C. Splay (mm)		

SWC		
Type		
EE (m)		
BE (m)		

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Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 05	Horizontal Scale 1:400, Vertical Scale 1:40	

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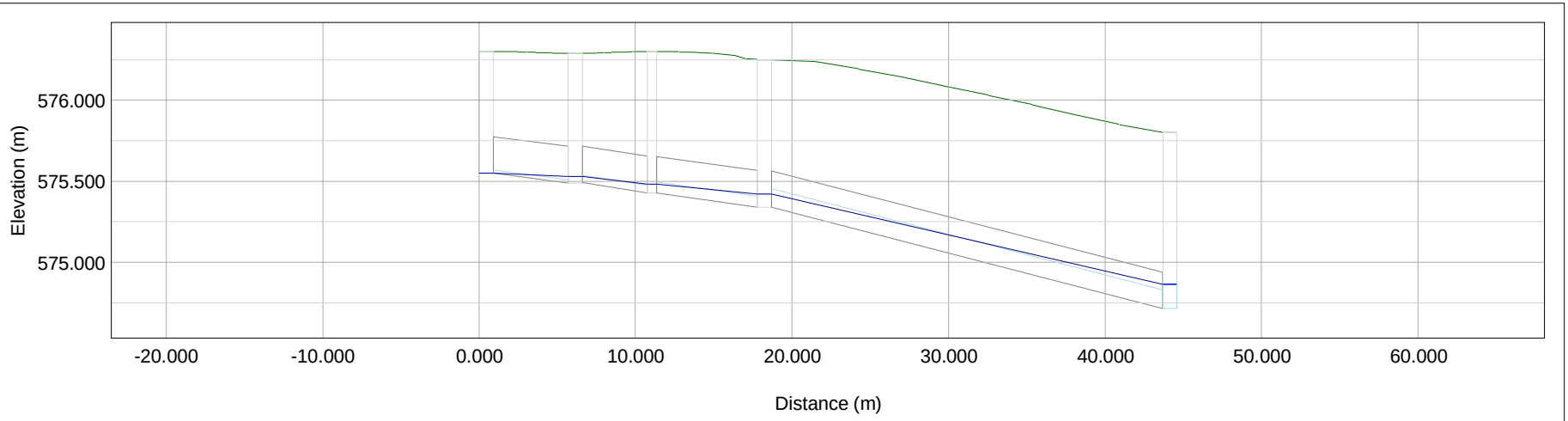


Junction	P5.00	P5.01	P5.02	P3.05	P3.06
Type	Manhole	Manhole	Manhole	Manhole	Manhole
CE (m)	576.290	576.290	576.260	576.270	576.089
IE (m)	575.645	575.519	575.395	575.232	575.060

Connection	PIPE 5.01	PIPE 5.02	PIPE 5.03	PIPE 3.07
Type	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No
Length (m)	7.319	10.519	22.134	28.015
Diam (mm)	225	225	225	375
Height (mm)				
U/S IE (m)	575.645	575.519	575.395	575.232
D/S IE (m)	575.519	575.395	575.232	575.060
C. Splay (mm)				
SWC				
Type				
EE (m)				
BE (m)				

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Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 06	Horizontal Scale 1:400, Vertical Scale 1:40	

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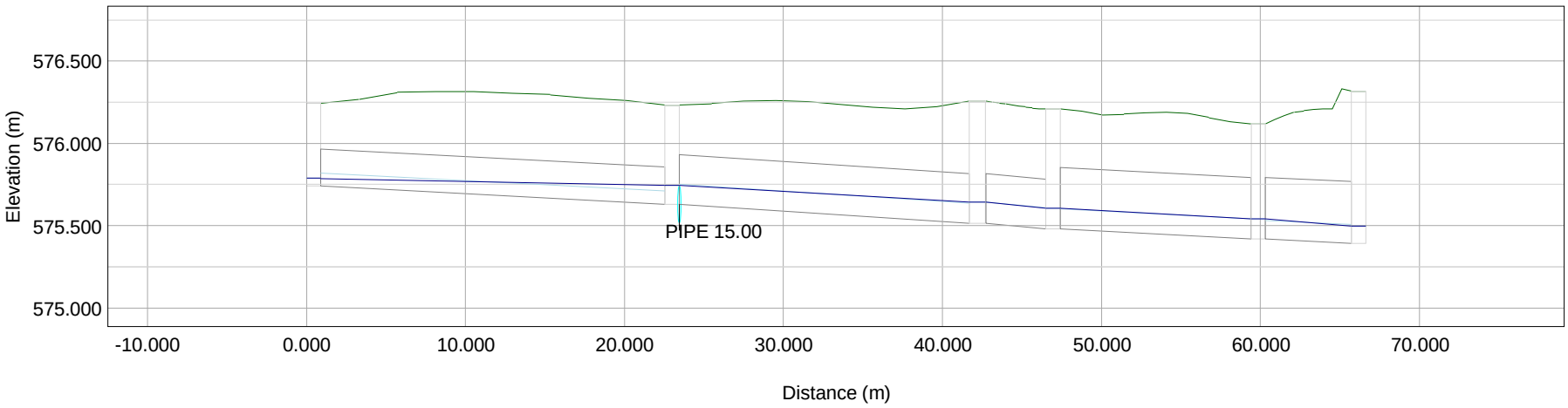
Junction	P6.00	P6.01	P6.02	P6.03	P6.04
Type	Manhole	Manhole	Manhole	Manhole	Manhole
CE (m)	576.300	576.290	576.300	576.250	575.800
IE (m)	575.550	575.490	575.428	575.340	574.715

Connection	PIPE 6.01	PIPE 6.03	PIPE 6.04
Type	Pipe	Pipe	Pipe
Curved	No	No	No
Length (m)	4.791	6.430	24.997
Diam (mm)	225	225	225
Height (mm)			
U/S IE (m)	575.550	575.428	575.340
D/S IE (m)	575.490	575.340	574.715
C. Splay (mm)			

SWC			
Type			
EE (m)			
BE (m)			

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Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 02	Horizontal Scale 1:400, Vertical Scale 1:40	

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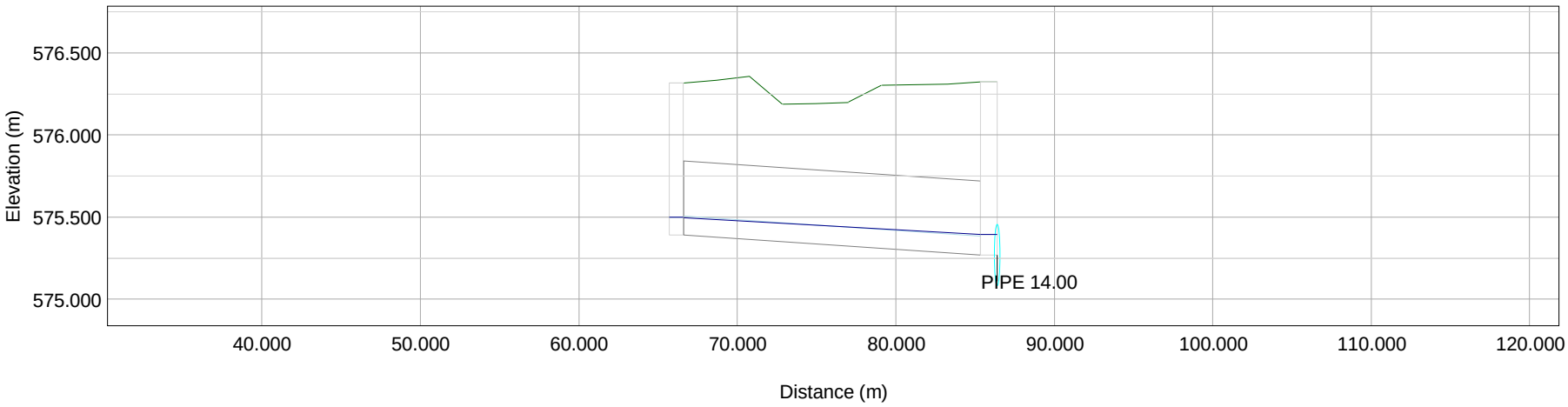


Junction	P2.00	P2.02	P2.03	P2.04	P2.05	P1.01
Type	Manhole	Manhole	Manhole	Manhole	Manhole	Manhole
CE (m)	576.244	576.233	576.258	576.210	576.118	576.318
IE (m)	575.740	575.630	575.515	575.480	575.419	575.392

Connection	Pipe 2.01	PIPE 2.03	PIPE 2.04	PIPE 2.05	PIPE 1.01
Type	Pipe	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No	No
Length (m)	21.650	18.218	3.779	12.008	5.399
Diam (mm)	225	300	300	375	375
Height (mm)					
U/S IE (m)	575.740	575.630	575.515	575.480	575.419
D/S IE (m)	575.630	575.515	575.480	575.419	575.392
C. Splay (mm)					
SWC					
Type					
EE (m)					
BE (m)					

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Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	
Modified date 05/11/2024 File Dickson option 3 - 20250605 (INFODRAINAGE 2025).i...	Designed by M.B Checked by H.S	
	InfoDrainage 2025.1	
Profile - 02	Horizontal Scale 1:400, Vertical Scale 1:40	

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Junction	P1.01	P13.00
Type	Manhole	Manhole
CE (m)	576.318	576.326
IE (m)	575.392	575.269
Connection	Pipe 1.02	
Type	Pipe	
Curved	No	
Length (m)	18.743	
Diam (mm)	450	
Height (mm)		
U/S IE (m)	575.392	
D/S IE (m)	575.269	
C. Splay (mm)		
SWC		
Type		
EE (m)		
BE (m)		

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junctions Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Name	Junction Type	Easting (m)	Northing (m)	Sealed	Cover Elevation (m)	Depth (m)	Invert Elevation (m)	Chamber Shape
P9.04	Manhole	694647.333	6097143.383	☐	576.420	0.920	575.500	Rectangular
P1.03	Manhole	694643.322	6097151.606	☐	576.400	1.280	575.120	Rectangular
P13.00	Manhole	694669.430	6097140.640	☑	576.326	1.058	575.269	Circular
P9.00	Manhole	694645.434	6097110.141	☐	576.370	0.623	575.747	Rectangular
P1.04	Manhole	694624.844	6097160.173	☑	576.360	1.345	575.015	Circular
P1.05	Manhole	694622.852	6097161.069	☑	576.360	1.360	575.000	Circular
P10.00	Manhole	694694.953	6097072.283	☐	576.323	0.714	575.609	Rectangular
P7.03	Manhole	694611.280	6097146.229	☑	576.301	1.071	575.230	Circular
P1.01	Manhole	694686.955	6097133.991	☐	576.318	0.926	575.392	Rectangular
P9.01	Manhole	694630.848	6097117.814	☐	576.320	0.656	575.664	Rectangular
P7.00	Manhole	694599.603	6097122.155	☐	576.300	0.620	575.680	Rectangular
P7.02	Manhole	694607.707	6097139.022	☐	576.297	0.817	575.480	Rectangular
P1.07	Manhole	694611.469	6097156.377	☐	576.314	1.524	574.790	Rectangular
P7.01	Manhole	694604.411	6097131.936	☐	576.292	0.732	575.560	Rectangular
P1.06	Manhole	694616.453	6097154.691	☐	576.310	1.430	574.880	Rectangular
P11.00	Manhole	694623.563	6097112.941	☐	576.305	0.622	575.683	Rectangular
P5.01	Manhole	694618.320	6097102.773	☐	576.290	0.771	575.519	Rectangular
P5.00	Manhole	694613.951	6097108.644	☐	576.290	0.645	575.645	Rectangular
P6.02	Manhole	694594.870	6097112.135	☐	576.300	0.872	575.428	Rectangular
P8.01	Manhole	694617.911	6097148.231	☐	576.270	0.990	575.280	Rectangular
P3.05	Manhole	694646.840	6097087.044	☐	576.270	1.038	575.232	Rectangular
P8.00	Manhole	694631.619	6097141.725	☐	576.270	0.890	575.380	Rectangular
P5.02	Manhole	694626.955	6097096.765	☐	576.260	0.865	575.395	Rectangular
P6.03	Manhole	694588.958	6097114.666	☐	576.250	0.910	575.340	Rectangular
P2.03	Manhole	694688.052	6097113.307	☑	576.258	0.743	575.515	Circular
P6.01	Manhole	694596.782	6097115.820	☐	576.290	0.800	575.490	Rectangular
P4.01	Manhole	694666.982	6097106.512	☐	576.280	0.730	575.550	Rectangular
P3.00	Manhole	694700.270	6097098.600	☐	576.266	0.686	575.580	Rectangular
P3.02	Manhole	694679.380	6097082.581	☐	576.290	0.890	575.400	Rectangular
P2.02	Manhole	694704.913	6097106.406	☐	576.233	0.603	575.630	Rectangular
P12.00	Manhole	694670.360	6097142.740	☐	576.327	0.877	575.450	Rectangular
P6.00	Manhole	694601.038	6097113.620	☐	576.300	0.750	575.550	Rectangular
P2.00	Manhole	694725.457	6097099.575	☐	576.244	0.504	575.740	Rectangular

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details: Type: Junctions Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

P2.04	Manhole	694689.547	6097116.778	☐	576.210	0.730	575.480	Rectangular
P10.01	Manhole	694710.022	6097112.122	☐	576.225	0.575	575.650	Rectangular
P4.00	Manhole	694654.266	6097116.409	☐	576.320	0.680	575.640	Rectangular
P3.07	Manhole	694630.094	6097060.849	☐	576.061	1.031	575.030	Rectangular
P3.03	Manhole	694669.213	6097084.653	☐	576.330	0.984	575.346	Rectangular
P9.02	Manhole	694633.736	6097128.438	☐	576.290	0.682	575.608	Rectangular
P3.01	Manhole	694690.272	6097078.345	☐	576.270	0.806	575.464	Rectangular
P9.03	Manhole	694638.575	6097138.321	☐	576.300	0.748	575.552	Rectangular
P3.04	Manhole	694658.090	6097086.228	☐	576.210	0.920	575.290	Rectangular
P6.04	Manhole	694575.037	6097093.904	☐	575.800	1.085	574.715	Rectangular
P3.06	Manhole	694634.317	6097061.983	☐	576.089	1.029	575.060	Rectangular
P2.05	Manhole	694687.755	6097128.652	☐	576.118	0.699	575.419	Rectangular

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junctions Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Name	Diameter (m)	Length (m)	Width (m)	Lock
P9.04		0.900	0.900	None
P1.03		0.900	0.900	None
P13.00	1.050			None
P9.00		0.600	0.600	None
P1.04	1.050			None
P1.05	1.050			None
P10.00		0.900	0.900	None
P7.03	1.050			None
P1.01		0.900	0.900	None
P9.01		0.600	0.600	None
P7.00		0.600	0.600	None
P7.02		0.900	0.900	None
P1.07		0.900	0.900	None
P7.01		0.600	0.600	None
P1.06		0.900	0.900	None
P11.00		0.600	0.600	None
P5.01		0.900	0.900	None
P5.00		0.900	0.900	None
P6.02		0.600	0.600	None
P8.01		0.900	0.900	None
P3.05		0.900	0.900	None
P8.00		0.900	0.900	None
P5.02		0.900	0.900	None
P6.03		0.900	0.900	None
P2.03	1.050			None
P6.01		0.900	0.900	None
P4.01		0.900	0.900	None
P3.00		0.900	0.900	None
P3.02		0.900	0.900	None
P2.02		0.900	0.900	None
P12.00		0.600	0.830	None
P6.00		0.900	0.900	None
P2.00		0.900	0.900	None
P2.04		0.900	0.900	None
P10.01		0.600	0.600	None
P4.00		0.900	0.900	None
P3.07		1.300	0.830	None
P3.03		0.900	0.900	None
P9.02		0.900	0.900	None
P3.01		0.900	0.900	None
P9.03		0.900	0.900	None
P3.04		0.900	0.900	None
P6.04		0.900	0.900	None
P3.06		0.900	0.900	None
P2.05		0.900	0.900	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
	Inlet	Surface Catchment 9 Surface Catchment 24	(None)	HEC-22

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junctions Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P9.04	**Gutter Details**			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	PIPE 9.04	(None)	No Restriction
P1.03	Inlet	Roof Catchment 1B	(None)	No Restriction
	Inlet (1)	PIPE 1.03 PIPE 9.05	(None)	No Restriction
P13.00	Inlet (1)	PIPE 14.00	(None)	No Restriction
	Inlet (2)	Pipe 1.02 Roof Catchment 2A	(None)	No Restriction
P9.00	Inlet	Surface Catchment 6	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P1.04	Inlet	PIPE 1.04	(None)	No Restriction
	Inlet (1)	Surface Catchment 2	(None)	No Restriction
P1.05	Inlet	PIPE 1.05 Roof Catchment 1A	(None)	No Restriction
P10.00	Inlet	Roof Catchment 5A	(None)	No Restriction
P7.03	Inlet	PIPE 7.03 Roof Catchment 9D	(None)	No Restriction
P1.01	Inlet	PIPE 1.01	(None)	No Restriction
	Inlet (1)	Surface Catchment 7	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P9.01	Inlet (1)	PIPE 9.01 Roof Catchment 12C	(None)	No Restriction
P7.00	Inlet	Roof Catchment 11A	(None)	No Restriction

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details: Type: Junctions Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P7.02	Inlet	PIPE 7.02	(None)	No Restriction
	Inlet (1)	Surface Catchment 26 Surface Catchment 19	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	9.000		
	Depression (mm)	0		
	Clogging (%)	50		
P1.07	Inlet	PIPE 1.07 PIPE 7.04 Roof Catchment 11B	(None)	No Restriction
	Inlet (2)	Surface Catchment 1	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P7.01	Inlet	PIPE 7.01	(None)	No Restriction
	Inlet (1)	Surface Catchment 25	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.600		
	Width (m)	0.600		
	Depression (mm)	0		
	Clogging (%)	50		
P1.06	Inlet	PIPE 1.06 PIPE 8.02	(None)	No Restriction
P11.00	Inlet	Roof Catchment 12D	(None)	No Restriction
P5.01	Inlet	Roof Catchment 8A	(None)	No Restriction
	Inlet (1)	PIPE 5.01 PIPE 11.01	(None)	No Restriction
P5.00	Inlet	Surface Catchment 22	(None)	No Restriction
	Inlet	PIPE 6.02	(None)	No Restriction
	Inlet (1)	Roof Catchment 8B	(None)	No Restriction
	Inlet (2)	Surface Catchment 8	(None)	HEC-22

Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	Date: 05/11/2024 Designed by: M.B / Checked by: H.S / Approved By: J.L	
Report Details: Type: Junctions Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P6.02	**Gutter Details**			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.400		
	Width (m)	0.400		
	Depression (mm)	0		
	Clogging (%)	50		
P8.01	Inlet	PIPE 8.01	(None)	No Restriction
	Inlet (1)	Surface Catchment 12	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P3.05	Inlet	Surface Catchment 10	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	In Sag		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	PIPE 5.03 PIPE 3.06 Roof Catchment 12F Roof Catchment 7A	(None)	No Restriction
	Inlet	Roof Catchment 9A	(None)	No Restriction
	Inlet (1)	Surface Catchment 11	(None)	HEC-22

Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	Date: 05/11/2024 Designed by: M.B / Checked by: H.S / Approved By: J.L	
Report Details: Type: Junctions Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia	

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P8.00	**Gutter Details**			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P5.02	Inlet	Surface Catchment 27	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	PIPE 5.02 Roof Catchment 12E Roof Catchment 7B	(None)	No Restriction
P6.03	Inlet	PIPE 6.03	(None)	No Restriction
	Inlet (1)	Roof Catchment 10A	(None)	No Restriction
	Inlet (2)	Surface Catchment 23	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P2.03	Inlet	PIPE 2.03 Roof Catchment 3A	(None)	No Restriction
P6.01	Inlet	Roof Catchment 9C	(None)	No Restriction
	Inlet (1)	PIPE 6.01	(None)	No Restriction
	Inlet	Surface Catchment 16	(None)	HEC-22

Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	Date: 05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junctions Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P4.01	**Gutter Details**			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	In Sag		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	PIPE 4.01 Roof Catchment 12B Roof Catchment 3B	(None)	No Restriction
P3.00	Inlet	Surface Catchment 21	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	PIPE 3.01 Roof Catchment 3D	(None)	No Restriction
P3.02	Inlet	Surface Catchment 15	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	In Sag		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	Roof Catchment 3C PIPE 3.03	(None)	No Restriction
P2.02	Inlet	Roof Catchment 4B	(None)	No Restriction
	Inlet (1)	PIPE 15.00 Pipe 2.01	(None)	No Restriction
	Inlet	Surface Catchment 13	(None)	HEC-22

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junctions Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P12.00	**Gutter Details**			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Curb			
	Location	On Grade		
	Curb Length (m)	0.600		
	Height (m)	0.120		
	Depression (mm)	75		
	Clogging (%)	20		
P6.00	Inlet	Surface Catchment 5	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P2.00	Inlet (1)	Roof Catchment 4A	(None)	No Restriction
P2.04	Inlet	Surface Catchment 18	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	In Sag		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	PIPE 2.04	(None)	No Restriction
P10.01	Inlet	Surface Catchment 20	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.600		
	Width (m)	0.600		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet	Surface Catchment 17	(None)	HEC-22

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details: Type: Junctions Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P4.00	**Gutter Details**			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	In Sag		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	Roof Catchment 2B	(None)	No Restriction
P3.07	Inlet	PIPE 3.08	(None)	No Restriction
P3.03	Inlet	PIPE 3.04	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	In Sag		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	Surface Catchment 4	(None)	No Restriction
P9.02	Inlet	Roof Catchment 9B	(None)	No Restriction
	Inlet (1)	PIPE 9.02	(None)	No Restriction
P3.01	Inlet	Roof Catchment 4C	(None)	No Restriction
	Inlet (2)	PIPE 10.01 PIPE 3.02	(None)	No Restriction
P9.03	Inlet	PIPE 9.03	(None)	No Restriction
P3.04	Inlet	Surface Catchment 3	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	In Sag		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
	Inlet (1)	PIPE 4.02 PIPE 3.05 Roof Catchment 6A Roof Catchment 12A	(None)	No Restriction
	Inlet	PIPE 6.04	(None)	No Restriction
	Inlet (1)	Surface Catchment 28	(None)	HEC-22

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junctions Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
P6.04	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		
P3.06	Inlet	PIPE 3.07	(None)	No Restriction
P2.05	Inlet	PIPE 2.05	(None)	No Restriction
	Inlet (1)	Surface Catchment 14	(None)	HEC-22
	Gutter Details			
	Long. Slope (1:x)	0.10		
	Road Cross Slope (1:x)	0.10		
	Gutter Cross Slope (1:x)	0.10		
	Gutter Width (m)	0.001		
	Manning's n	0.014		
	Grate			
	Location	On Grade		
	Grate Length (m)	0.900		
	Width (m)	0.900		
	Depression (mm)	0		
	Clogging (%)	50		

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junctions Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
P9.04	Outlet	PIPE 9.05	Free Discharge
P1.03	Outlet	PIPE 1.04	Free Discharge
P13.00	Outlet	PIPE 1.03	Free Discharge
P9.00	Outlet	PIPE 9.01	Free Discharge
P1.04	Outlet	PIPE 1.05	Free Discharge
P1.05	Outlet	PIPE 1.06	Free Discharge
P10.00	Outlet	PIPE 10.01	Free Discharge
P7.03	Outlet	PIPE 7.04	Free Discharge
P1.01	Outlet	Pipe 1.02	Free Discharge
P9.01	Outlet	PIPE 9.02	Free Discharge
P7.00	Outlet	PIPE 7.01	Free Discharge
P7.02	Outlet	PIPE 7.03	Free Discharge
P7.01	Outlet	PIPE 7.02	Free Discharge
P1.06	Outlet	PIPE 1.07	Free Discharge
P11.00	Outlet	PIPE 11.01	Free Discharge
P5.01	Outlet	PIPE 5.02	Free Discharge
P5.00	Outlet	PIPE 5.01	Free Discharge
P6.02	Outlet	PIPE 6.03	Free Discharge
P8.01	Outlet	PIPE 8.02	Free Discharge
P3.05	Outlet	PIPE 3.07	Free Discharge
P8.00	Outlet	PIPE 8.01	Free Discharge
P5.02	Outlet	PIPE 5.03	Free Discharge
P6.03	Outlet	PIPE 6.04	Free Discharge
P2.03	Outlet	PIPE 2.04	Free Discharge
P6.01	Outlet	PIPE 6.02	Free Discharge
P4.01	Outlet	PIPE 4.02	Free Discharge
P3.00	Outlet	PIPE 3.02	Free Discharge
P3.02	Outlet	PIPE 3.04	Free Discharge
P2.02	Outlet	PIPE 2.03	Free Discharge
	Outlet (1)	PIPE 3.01	Free Discharge
P12.00	Outlet	PIPE 14.00	Free Discharge
P6.00	Outlet	PIPE 6.01	Free Discharge
P2.00	Outlet	Pipe 2.01	Free Discharge
P2.04	Outlet	PIPE 2.05	Free Discharge
P10.01	Outlet	PIPE 15.00	Free Discharge
P4.00	Outlet	PIPE 4.01	Free Discharge
P3.03	Outlet	PIPE 3.05	Free Discharge
P9.02	Outlet	PIPE 9.03	Free Discharge
P3.01	Outlet	PIPE 3.03	Free Discharge
P9.03	Outlet	PIPE 9.04	Free Discharge
P3.04	Outlet	PIPE 3.06	Free Discharge
P3.06	Outlet	PIPE 3.08	Free Discharge
P2.05	Outlet	PIPE 1.01	Free Discharge

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Summary Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analyzed (ha)
Roof Catchment 1A	P1.05		Time of Concentration	0.035	100	0	100	0.035
Roof Catchment 1B	P1.03		Time of Concentration	0.038	100	0	100	0.038
Roof Catchment 2A	P13.00		Time of Concentration	0.029	100	0	100	0.029
Roof Catchment 2B	P4.00		Time of Concentration	0.028	100	0	100	0.028
Roof Catchment 3A	P2.03		Time of Concentration	0.020	100	0	100	0.020
Roof Catchment 3D	P3.00		Time of Concentration	0.021	100	0	100	0.021
Roof Catchment 3C	P3.02		Time of Concentration	0.023	100	0	100	0.023
Roof Catchment 3B	P4.01		Time of Concentration	0.022	100	0	100	0.022
Roof Catchment 4A	P2.00		Time of Concentration	0.016	100	0	100	0.016
Roof Catchment 4C	P3.01		Time of Concentration	0.015	100	0	100	0.015
Roof Catchment 4B	P2.02		Time of Concentration	0.015	100	0	100	0.015
Roof Catchment 5A	P10.00		Time of Concentration	0.031	100	0	100	0.031
Roof Catchment 6A	P3.04		Time of Concentration	0.021	100	0	100	0.021
Roof Catchment 7B	P5.02		Time of Concentration	0.011	100	0	100	0.011
Roof Catchment 7A	P3.05		Time of Concentration	0.011	100	0	100	0.011
Roof Catchment 8A	P5.01		Time of Concentration	0.018	100	0	100	0.018
Roof Catchment 8B	P6.02		Time of Concentration	0.017	100	0	100	0.017
Roof Catchment 9A	P8.00		Time of Concentration	0.018	100	0	100	0.018
Roof Catchment 9D	P7.03		Time of Concentration	0.028	100	0	100	0.028
Roof Catchment 9B	P9.02		Time of Concentration	0.026	100	0	100	0.026
Roof Catchment 9C	P6.01		Time of Concentration	0.017	100	0	100	0.017

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
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Report Details:	WSP:		
Type: Inflow Summary Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Roof Catchment 10A	P6.03		Time of Concentration	0.073	100	0	100	0.073
Roof Catchment 11B	P1.07		Time of Concentration	0.028	100	0	100	0.028
Roof Catchment 11A	P7.00		Time of Concentration	0.028	100	0	100	0.028
Roof Catchment 12A	P3.04		Time of Concentration	0.005	100	0	100	0.005
Roof Catchment 12D	P11.00		Time of Concentration	0.006	100	0	100	0.006
Roof Catchment 12B	P4.01		Time of Concentration	0.012	100	0	100	0.012
Roof Catchment 12C	P9.01		Time of Concentration	0.011	100	0	100	0.011
Roof Catchment 12F	P3.05		Time of Concentration	0.013	100	0	100	0.013
Roof Catchment 12E	P5.02		Time of Concentration	0.011	100	0	100	0.011
Surface Catchment 1	P1.07		Time of Concentration	0.088	100	0	100	0.088
Surface Catchment 2	P1.04		Time of Concentration	0.026	100	0	100	0.026
Surface Catchment 3	P3.04		Time of Concentration	0.006	100	0	100	0.006
Surface Catchment 4	P3.03		Time of Concentration	0.018	100	0	100	0.018
Surface Catchment 5	P6.00		Time of Concentration	0.005	100	0	100	0.005
Surface Catchment 6	P9.00		Time of Concentration	0.031	100	0	100	0.031
Surface Catchment 7	P1.01		Time of Concentration	0.236	100	0	100	0.236
Surface Catchment 8	P6.02		Time of Concentration	0.006	100	0	100	0.006
Surface Catchment 9	P9.04		Time of Concentration	0.015	100	0	100	0.015
Surface Catchment 10	P3.05		Time of Concentration	0.016	100	0	100	0.016
Surface Catchment 11	P8.00		Time of Concentration	0.022	100	0	100	0.022
Surface Catchment 12	P8.01		Time of Concentration	0.022	100	0	100	0.022
Surface Catchment 13	P12.00		Time of Concentration	0.062	100	0	100	0.062
Surface Catchment 14	P2.05		Time of Concentration	0.166	100	0	100	0.166
Surface Catchment 15	P3.02		Time of Concentration	0.007	100	0	100	0.007
Surface Catchment 16	P4.01		Time of Concentration	0.009	100	0	100	0.009
Surface Catchment 17	P4.00		Time of Concentration	0.025	100	0	100	0.025

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Summary Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Surface Catchment 18	P2.04		Time of Concentration	0.044	100	0	100	0.044
Surface Catchment 19	P7.02		Time of Concentration	0.005	100	0	100	0.005
Surface Catchment 20	P10.01		Time of Concentration	0.034	100	0	100	0.034
Surface Catchment 21	P3.00		Time of Concentration	0.008	100	0	100	0.008
Surface Catchment 22	P5.00		Time of Concentration	0.020	100	0	100	0.020
Surface Catchment 23	P6.03		Time of Concentration	0.006	100	0	100	0.006
Surface Catchment 24	P9.04		Time of Concentration	0.010	100	0	100	0.010
Surface Catchment 25	P7.01		Time of Concentration	0.005	100	0	100	0.005
Surface Catchment 26	P7.02		Time of Concentration	0.004	100	0	100	0.004
Surface Catchment 27	P5.02		Time of Concentration	0.019	100	0	100	0.019
Surface Catchment 28	P6.04		Time of Concentration	0.011	100	0	100	0.011
TOTAL		**0.0**		**1.570**				**1.570**

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Network Design Criteria Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Flow Options

Peak Flow Calculation	Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimize Excavation
Design Level	Level Crowns
Min. Cover Depth (m)	0.600
Min. Slope (1:x)	500.00
Max. Slope (1:x)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☑
Reduce Channel Depths	☑

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:x)	Max. Slope (1:x)
100	0.00	0.00
150	0.00	0.00

Manhole Options

Apply Offset	☐

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Outfall Details Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Outfalls

Outfall	Outfall Type	Fixed Surcharged Elevation (m)	Elevation Curve
P1.07	Fixed Surcharged Elevation	574.940	
ARR : 10 %: +20 %: 30 mins		574.940	
ARR : 1 %: +20 %: 30 mins		574.940	
P3.07	Fixed Surcharged Elevation	575.180	
ARR : 10 %: +20 %: 30 mins		575.180	
ARR : 1 %: +20 %: 30 mins		575.180	
P6.04	Fixed Surcharged Elevation	574.865	
ARR : 10 %: +20 %: 30 mins		574.865	
ARR : 1 %: +20 %: 30 mins		574.865	

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Title: Rainfall Analysis Criteria	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Reduced
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform First Flush Analysis	☐

Rainfall

ARR

Type: ARR

Latitude	0.000
Longitude	0.000
ARR Data Hub Text File	ARR DATA.txt
BOM Design Rainfall	BOM DESIGN.csv

AEP

AEP (%)	Increase Rainfall (%)
10.000	20.000
1.000	20.000

Storm Durations

Duration (mins)	Run Time (mins)
30	60

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflows Summary Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m^3)
Roof Catchment 1A	ARR: 1 %: +20 %: 30 mins: 6	0.03	11.4	12.395
Roof Catchment 1B	ARR: 1 %: +20 %: 30 mins: 6	0.04	12.5	13.498
Roof Catchment 2A	ARR: 1 %: +20 %: 30 mins: 6	0.03	9.6	10.418
Roof Catchment 2B	ARR: 1 %: +20 %: 30 mins: 6	0.03	9.1	9.882
Roof Catchment 10A	ARR: 1 %: +20 %: 30 mins: 6	0.07	24.0	26.016
Roof Catchment 9A	ARR: 1 %: +20 %: 30 mins: 6	0.02	6.0	6.457
Roof Catchment 9D	ARR: 1 %: +20 %: 30 mins: 6	0.03	9.3	10.050
Roof Catchment 9B	ARR: 1 %: +20 %: 30 mins: 6	0.03	8.5	9.195
Roof Catchment 9C	ARR: 1 %: +20 %: 30 mins: 6	0.02	5.7	6.160
Roof Catchment 12A	ARR: 1 %: +20 %: 30 mins: 6	0.01	1.7	1.871
Roof Catchment 12D	ARR: 1 %: +20 %: 30 mins: 6	0.01	1.8	1.970
Roof Catchment 3A	ARR: 1 %: +20 %: 30 mins: 6	0.02	6.7	7.284
Roof Catchment 3D	ARR: 1 %: +20 %: 30 mins: 6	0.02	7.0	7.626
Roof Catchment 3C	ARR: 1 %: +20 %: 30 mins: 6	0.02	7.5	8.100
Roof Catchment 3B	ARR: 1 %: +20 %: 30 mins: 6	0.02	7.2	7.761
Roof Catchment 4A	ARR: 1 %: +20 %: 30 mins: 6	0.02	5.3	5.749
Roof Catchment 4C	ARR: 1 %: +20 %: 30 mins: 6	0.01	4.9	5.275
Roof Catchment 4B	ARR: 1 %: +20 %: 30 mins: 6	0.01	4.8	5.236
Roof Catchment 5A	ARR: 1 %: +20 %: 30 mins: 6	0.03	10.3	11.204

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflows Summary Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Roof Catchment 6A	ARR: 1 %: +20 %: 30 mins: 6	0.02	7.0	7.539
Roof Catchment 8A	ARR: 1 %: +20 %: 30 mins: 6	0.02	5.9	6.334
Roof Catchment 8B	ARR: 1 %: +20 %: 30 mins: 6	0.02	5.8	6.235
Roof Catchment 7B	ARR: 1 %: +20 %: 30 mins: 6	0.01	3.6	3.860
Roof Catchment 7A	ARR: 1 %: +20 %: 30 mins: 6	0.01	3.7	4.004
Roof Catchment 12B	ARR: 1 %: +20 %: 30 mins: 6	0.01	3.9	4.271
Roof Catchment 12C	ARR: 1 %: +20 %: 30 mins: 6	0.01	3.7	4.034
Roof Catchment 12F	ARR: 1 %: +20 %: 30 mins: 6	0.01	4.3	4.675
Roof Catchment 12E	ARR: 1 %: +20 %: 30 mins: 6	0.01	3.7	4.019
Roof Catchment 11B	ARR: 1 %: +20 %: 30 mins: 6	0.03	9.3	10.097
Roof Catchment 11A	ARR: 1 %: +20 %: 30 mins: 6	0.03	9.3	10.121
Surface Catchment 1	ARR: 1 %: +20 %: 30 mins: 6	0.09	29.0	31.417
Surface Catchment 2	ARR: 1 %: +20 %: 30 mins: 6	0.03	8.5	9.204
Surface Catchment 9	ARR: 1 %: +20 %: 30 mins: 6	0.01	4.9	5.338
Surface Catchment 11	ARR: 1 %: +20 %: 30 mins: 6	0.02	7.3	7.950
Surface Catchment 12	ARR: 1 %: +20 %: 30 mins: 6	0.02	7.3	7.914
Surface Catchment 13	ARR: 1 %: +20 %: 30 mins: 6	0.06	20.4	22.072
Surface Catchment 7	ARR: 1 %: +20 %: 30 mins: 6	0.24	78.1	84.604
Surface Catchment 14	ARR: 1 %: +20 %: 30 mins: 6	0.17	54.8	59.394
Surface Catchment 18	ARR: 1 %: +20 %: 30 mins: 6	0.04	14.5	15.682
Surface Catchment 20	ARR: 1 %: +20 %: 30 mins: 6	0.03	11.3	12.188
Surface Catchment 21	ARR: 1 %: +20 %: 30 mins: 6	0.01	2.5	2.759
Surface Catchment 4	ARR: 1 %: +20 %: 30 mins: 6	0.02	5.9	6.367

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflows Summary Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Surface Catchment 3	ARR: 1 %: +20 %: 30 mins: 6	0.01	2.0	2.159
Surface Catchment 16	ARR: 1 %: +20 %: 30 mins: 6	0.01	2.8	3.065
Surface Catchment 17	ARR: 1 %: +20 %: 30 mins: 6	0.03	8.4	9.066
Surface Catchment 6	ARR: 1 %: +20 %: 30 mins: 6	0.03	10.3	11.192
Surface Catchment 22	ARR: 1 %: +20 %: 30 mins: 6	0.02	6.5	6.994
Surface Catchment 5	ARR: 1 %: +20 %: 30 mins: 6	0.00	1.6	1.754
Surface Catchment 8	ARR: 1 %: +20 %: 30 mins: 6	0.01	2.1	2.285
Surface Catchment 23	ARR: 1 %: +20 %: 30 mins: 6	0.01	1.9	2.096
Surface Catchment 28	ARR: 1 %: +20 %: 30 mins: 6	0.01	3.7	4.034
Surface Catchment 24	ARR: 1 %: +20 %: 30 mins: 6	0.01	3.2	3.437
Surface Catchment 25	ARR: 1 %: +20 %: 30 mins: 6	0.00	1.6	1.772
Surface Catchment 26	ARR: 1 %: +20 %: 30 mins: 6	0.00	1.2	1.257
Surface Catchment 19	ARR: 1 %: +20 %: 30 mins: 6	0.00	1.6	1.724
Surface Catchment 27	ARR: 1 %: +20 %: 30 mins: 6	0.02	6.2	6.751
Surface Catchment 10	ARR: 1 %: +20 %: 30 mins: 6	0.02	5.3	5.722
Surface Catchment 15	ARR: 1 %: +20 %: 30 mins: 6	0.01	2.3	2.531

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junctions Summary Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
P9.04	ARR: 1 %: +20 %: 30 mins: 4	576.420	575.500	575.603	0.103	13.3	0.084	0.000	12.6	13.213	OK
P1.03	ARR: 1 %: +20 %: 30 mins: 4	576.400	575.120	575.354	0.234	103.3	0.190	0.000	105.3	117.958	OK
P13.00	ARR: 1 %: +20 %: 30 mins: 4	576.326	575.269	575.465	0.196	80.5	0.170	0.000	81.9	91.362	OK
P9.00	ARR: 10 %: +20 %: 30 mins: 1	576.370	575.747	575.747	0.000	0.0	0.000	0.000	0.0	0.000	OK
P1.04	ARR: 1 %: +20 %: 30 mins: 4	576.360	575.015	575.252	0.237	112.3	0.205	0.000	113.2	127.095	OK
P1.05	ARR: 1 %: +20 %: 30 mins: 4	576.360	575.000	575.206	0.206	122.7	0.178	0.000	123.1	139.460	OK
P10.00	ARR: 1 %: +20 %: 30 mins: 4	576.323	575.609	575.953	0.344	12.5	0.279	0.000	11.4	11.122	Surcharged
P7.03	ARR: 1 %: +20 %: 30 mins: 6	576.301	575.230	575.297	0.067	18.1	0.058	0.000	17.9	20.166	OK
P1.01	ARR: 1 %: +20 %: 30 mins: 3	576.318	575.392	575.544	0.152	48.8	0.123	0.000	48.7	63.812	OK
P9.01	ARR: 1 %: +20 %: 30 mins: 4	576.320	575.664	575.730	0.066	4.5	0.024	0.000	4.0	4.032	OK
P7.00	ARR: 1 %: +20 %: 30 mins: 6	576.300	575.680	575.751	0.071	9.3	0.026	0.000	9.2	10.121	OK
P7.02	ARR: 1 %: +20 %: 30 mins: 6	576.297	575.480	575.532	0.052	9.0	0.042	0.000	8.9	10.117	OK
P1.07	ARR: 1 %: +20 %: 30 mins: 4	576.314	574.790	574.951	0.161	153.6	0.000	0.000	153.6	175.979	OK
P7.01	ARR: 1 %: +20 %: 30 mins: 6	576.292	575.560	575.632	0.072	9.2	0.026	0.000	9.0	10.119	OK
P1.06	ARR: 1 %: +20 %: 30 mins: 4	576.310	574.880	575.072	0.192	128.2	0.156	0.000	128.8	145.722	OK
P11.00	ARR: 1 %: +20 %: 30 mins: 6	576.305	575.683	575.711	0.028	1.8	0.010	0.000	1.8	1.970	OK
P5.01	ARR: 1 %: +20 %: 30 mins: 6	576.290	575.519	575.605	0.086	14.0	0.070	0.000	13.5	15.295	OK
P5.00	ARR: 1 %: +20 %: 30 mins: 6	576.290	575.645	575.695	0.050	6.5	0.040	0.000	6.4	6.994	OK
P6.02	ARR: 1 %: +20 %: 30 mins: 6	576.300	575.428	575.505	0.077	11.3	0.028	0.000	11.2	12.394	OK
P8.01	ARR: 1 %: +20 %: 30 mins: 6	576.270	575.280	575.315	0.035	5.8	0.028	0.000	5.7	6.457	OK
P3.05	ARR: 1 %: +20 %: 30 mins: 10	576.270	575.232	575.425	0.193	65.2	0.156	0.000	64.2	84.774	OK
P8.00	ARR: 1 %: +20 %: 30 mins: 6	576.270	575.380	575.444	0.064	6.0	0.052	0.000	5.8	6.457	OK
P5.02	ARR: 1 %: +20 %: 30 mins: 4	576.260	575.395	575.525	0.130	25.2	0.105	0.000	24.4	23.186	OK
P6.03	ARR: 1 %: +20 %: 30 mins: 5	576.250	575.340	575.466	0.126	41.4	0.102	0.000	41.1	38.400	OK
P2.03	ARR: 1 %: +20 %: 30 mins: 1	576.258	575.515	575.705	0.190	48.9	0.165	0.000	47.4	49.639	OK
P6.01	ARR: 1 %: +20 %: 30 mins: 6	576.290	575.490	575.543	0.053	5.7	0.043	0.000	5.6	6.160	OK
P4.01	ARR: 1 %: +20 %: 30 mins: 9	576.280	575.550	575.694	0.144	23.2	0.117	0.000	22.7	31.659	OK
P3.00	ARR: 1 %: +20 %: 30 mins: 4	576.266	575.580	575.878	0.298	32.0	0.241	0.000	0.0	32.207	Surcharged
P3.02	ARR: 1 %: +20 %: 30 mins: 4	576.290	575.400	575.952	0.552	9.1	0.447	0.000	0.0	9.139	Surcharged

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details: Type: Junctions Summary Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

P2.02	ARR: 1 %: +20 %: 30 mins: 4	576.233	575.630	575.800	0.170	42.9	0.138	0.000	10.0	42.822	OK
P12.00	ARR: 1 %: +20 %: 30 mins: 1	576.327	575.450	575.494	0.044	14.4	0.022	0.000	14.2	17.109	OK
P6.00	ARR: 10 %: +20 %: 30 mins: 1	576.300	575.550	575.550	0.000	0.0	0.000	0.000	0.0	0.000	OK
P2.00	ARR: 1 %: +20 %: 30 mins: 1	576.244	575.740	575.815	0.075	6.6	0.060	0.000	5.6	5.769	OK
P2.04	ARR: 1 %: +20 %: 30 mins: 10	576.210	575.480	575.663	0.183	50.1	0.148	0.000	49.7	63.930	OK
P10.01	ARR: 1 %: +20 %: 30 mins: 4	576.225	575.650	575.799	0.149	0.4	0.054	0.000	0.2	0.215	OK
P4.00	ARR: 1 %: +20 %: 30 mins: 9	576.320	575.640	575.738	0.098	13.1	0.080	0.000	13.0	17.742	OK
P3.07	ARR: 1 %: +20 %: 30 mins: 10	576.061	575.030	575.203	0.173	63.4	0.000	0.000	63.5	84.165	OK
P3.03	ARR: 1 %: +20 %: 30 mins: 10	576.330	575.346	575.456	0.110	5.3	0.089	0.000	5.0	6.376	OK
P9.02	ARR: 1 %: +20 %: 30 mins: 4	576.290	575.608	575.719	0.111	14.3	0.090	0.000	13.8	13.224	OK
P3.01	ARR: 1 %: +20 %: 30 mins: 4	576.270	575.464	575.951	0.487	24.6	0.395	0.000	0.6	25.115	Surcharged
P9.03	ARR: 1 %: +20 %: 30 mins: 4	576.300	575.552	575.660	0.108	13.8	0.088	0.000	13.3	13.221	OK
P3.04	ARR: 1 %: +20 %: 30 mins: 10	576.210	575.290	575.454	0.164	36.8	0.133	0.000	36.4	48.467	OK
P6.04	ARR: 10 %: +20 %: 30 mins: 1	575.800	574.715	574.865	0.150	19.5	0.000	0.000	19.5	24.989	OK
P3.06	ARR: 1 %: +20 %: 30 mins: 10	576.089	575.060	575.256	0.196	64.2	0.159	0.000	63.4	84.165	OK
P2.05	ARR: 1 %: +20 %: 30 mins: 10	576.118	575.419	575.594	0.175	49.7	0.142	0.000	49.4	63.872	OK

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connections Summary Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
PIPE 2.04	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P2.03	P2.04	576.258	575.712	0.196	49.601	1.0	0.51	47.3	OK
PIPE 1.04	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P1.03	P1.04	576.400	575.354	0.235	117.958	1.1	0.34	105.3	OK
PIPE 1.05	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P1.04	P1.05	576.360	575.252	0.221	127.095	1.3	0.32	113.2	OK
PIPE 1.06	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P1.05	P1.06	576.360	575.206	0.199	139.460	1.6	0.25	123.1	OK
PIPE 1.07	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P1.06	P1.07	576.310	575.072	0.176	145.722	1.9	0.16	128.8	OK
PIPE 7.03	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P7.02	P7.03	576.297	575.538	0.066	10.115	1.1	0.14	10.8	OK
PIPE 7.04	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P7.03	P1.07	576.301	575.297	0.108	20.166	0.9	0.19	17.9	OK
PIPE 9.03	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P9.02	P9.03	576.290	575.719	0.110	13.224	0.7	0.43	13.8	OK
PIPE 9.04	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P9.03	P9.04	576.300	575.660	0.106	13.221	0.7	0.41	13.3	OK
PIPE 9.05	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P9.04	P1.03	576.420	575.603	0.098	13.213	0.8	0.39	12.6	OK
PIPE 4.01	ARR: 1 %: +20 %: 30 mins: 9	Pipe	P4.00	P4.01	576.320	575.738	0.121	17.742	0.6	0.39	13.0	OK
PIPE 4.02	ARR: 1 %: +20 %: 30 mins: 9	Pipe	P4.01	P3.04	576.280	575.694	0.134	31.659	0.9	0.69	22.7	OK
PIPE 3.07	ARR: 1 %: +20 %: 30 mins: 10	Pipe	P3.05	P3.06	576.270	575.425	0.194	84.774	1.1	0.47	64.2	OK
PIPE 5.01	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P5.00	P5.01	576.290	575.695	0.068	6.994	0.6	0.11	6.4	OK
PIPE 5.02	ARR: 1 %: +20 %: 30 mins: 5	Pipe	P5.01	P5.02	576.290	575.615	0.113	15.293	0.8	0.34	16.3	OK
PIPE 5.03	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P5.02	P3.05	576.260	575.525	0.168	23.186	0.8	0.63	24.4	OK
PIPE 10.01	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P10.00	P3.01	576.323	575.953	0.300	11.122	0.2	0.12	11.4	Surcharged
PIPE 3.03	ARR: 10 %: +20 %: 30 mins: 5	Pipe	P3.01	P3.02	576.270	575.837	0.375	0.439	0.0	0.01	1.6	OK
PIPE 3.04	ARR: 10 %: +20 %: 30 mins: 1	Pipe	P3.02	P3.03	576.290	575.807	0.203	0.000	-0.0	0	0.0	Surcharged

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details: Type: Connections Summary Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.02	ARR: 1 %: +20 %: 30 mins: 10	Pipe	P3.00	P3.01	576.266	575.839	0.225	0.303	0.2	0.09	2.8	Surch arged
PIPE 8.01	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P8.00	P8.01	576.270	575.444	0.049	6.457	0.9	0.16	5.8	OK
PIPE 6.04	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P6.03	P6.04	576.250	575.451	0.131	38.407	1.4	0.49	34.4	OK
PIPE 6.01	ARR: 10 %: +20 %: 30 mins: 1	Pipe	P6.00	P6.01	576.300	575.550	0.019	0.000	0.0	0	0.0	OK
PIPE 2.03	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P2.02	P2.03	576.233	575.800	0.183	42.346	0.9	0.53	40.5	OK
PIPE 3.01	ARR: 10 %: +20 %: 30 mins: 6	Pipe	P2.02	P3.00	576.233	575.751	0.169	0.122	0.3	0.03	1.1	OK
PIPE 3.06	ARR: 1 %: +20 %: 30 mins: 3	Pipe	P3.04	P3.05	576.210	575.449	0.173	48.479	0.7	0.28	34.8	OK
PIPE 3.05	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P3.03	P3.04	576.330	575.469	0.149	6.373	0.2	0.05	6.2	OK
PIPE 6.02	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P6.01	P6.02	576.290	575.543	0.065	6.160	0.6	0.1	5.6	OK
PIPE 6.03	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P6.02	P6.03	576.300	575.505	0.094	12.394	0.7	0.21	11.2	OK
PIPE 7.01	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P7.00	P7.01	576.300	575.751	0.071	10.121	0.9	0.2	9.2	OK
PIPE 7.02	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P7.01	P7.02	576.292	575.632	0.062	10.119	1.0	0.2	9.0	OK
PIPE 8.02	ARR: 1 %: +20 %: 30 mins: 5	Pipe	P8.01	P1.06	576.270	575.318	0.119	6.461	0.4	0.06	6.9	OK
PIPE 9.02	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P9.01	P9.02	576.320	575.730	0.089	4.032	0.3	0.13	4.0	OK
PIPE 9.01	ARR: 10 %: +20 %: 30 mins: 1	Pipe	P9.00	P9.01	576.370	575.747	0.019	0.000	0.0	0	0.0	OK
PIPE 11.01	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P11.00	P5.01	576.305	575.711	0.057	1.970	0.2	0.03	1.8	OK
PIPE 3.08	ARR: 1 %: +20 %: 30 mins: 10	Pipe	P3.06	P3.07	576.089	575.256	0.185	84.165	1.2	0.44	63.4	OK
PIPE 1.03	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P13.00	P1.03	576.326	575.465	0.215	91.362	1.0	0.26	81.9	OK
PIPE 14.00	ARR: 1 %: +20 %: 30 mins: 4	Pipe	P12.00	P13.00	576.327	575.496	0.121	17.120	0.5	0.03	15.7	OK
PIPE 15.00	ARR: 1 %: +20 %: 30 mins: 1	Pipe	P10.01	P2.02	576.225	575.800	0.160	0.000	0.0	0.01	0.3	OK
Pipe 2.01	ARR: 1 %: +20 %: 30 mins: 6	Pipe	P2.00	P2.02	576.244	575.801	0.104	5.762	0.5	0.16	5.1	OK
Pipe 1.02	ARR: 1 %: +20 %: 30 mins: 3	Pipe	P1.01	P13.00	576.318	575.544	0.165	63.812	0.9	0.21	48.7	OK
PIPE 2.05	ARR: 1 %: +20 %: 30 mins: 10	Pipe	P2.04	P2.05	576.210	575.663	0.179	63.930	1.0	0.4	49.7	OK

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connections Summary Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 1.01	ARR: 1 %: +20 %: 30 mins: 10	Pipe	P2.05	P1.01	576.118	575.594	0.164	63.872	1.1	0.4	49.4	OK

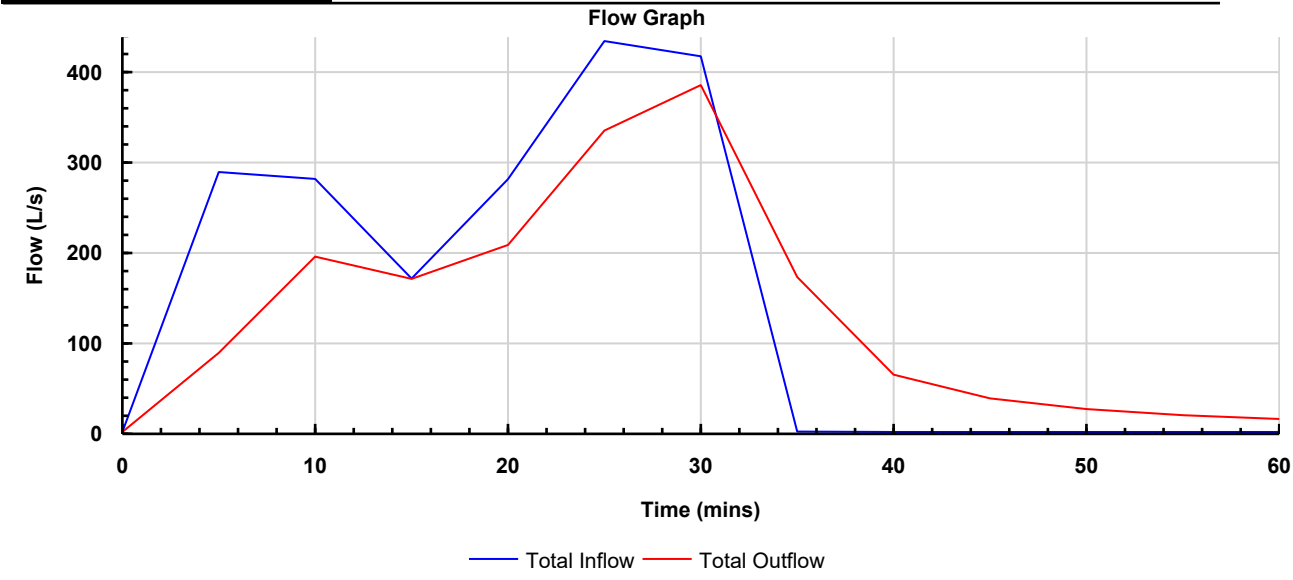
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Phase Management Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

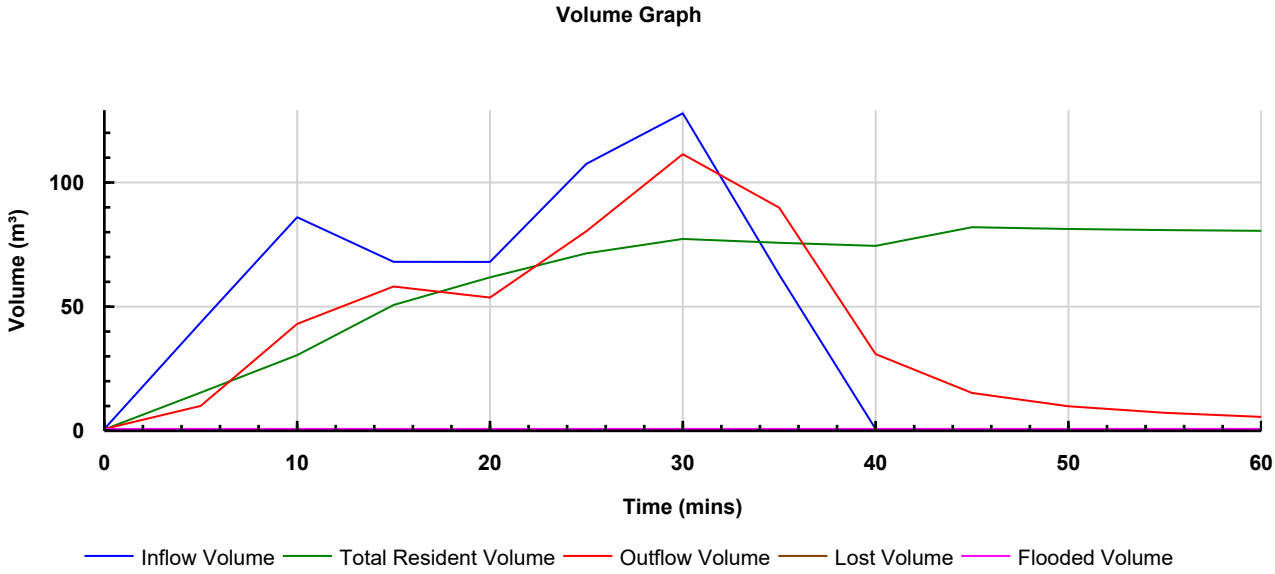
with cc 20%
ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 3

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
P1.07			133.3	175.818
P3.07			61.4	84.182
P6.04			29.3	38.404
TOTAL	434.3	562.033	385.4	509.394

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

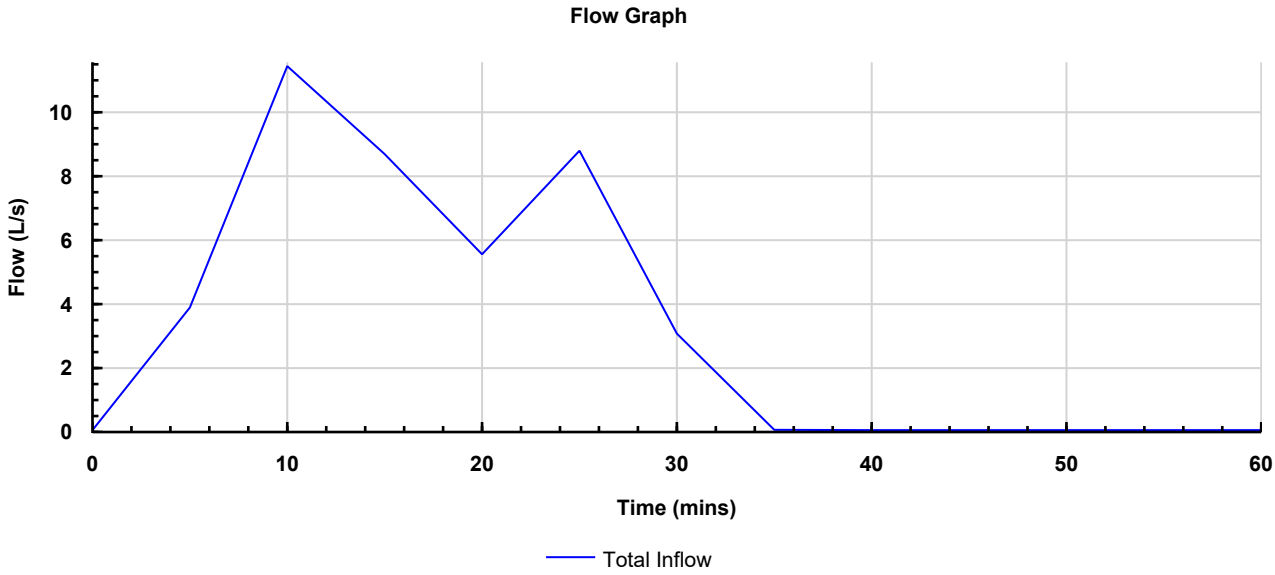
Roof Catchment 1A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	11.4
Total Inflow Volume (m³)	12.395

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.9
10	11.4
15	8.7
20	5.5
25	8.8
30	3.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Roof Catchment 1B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

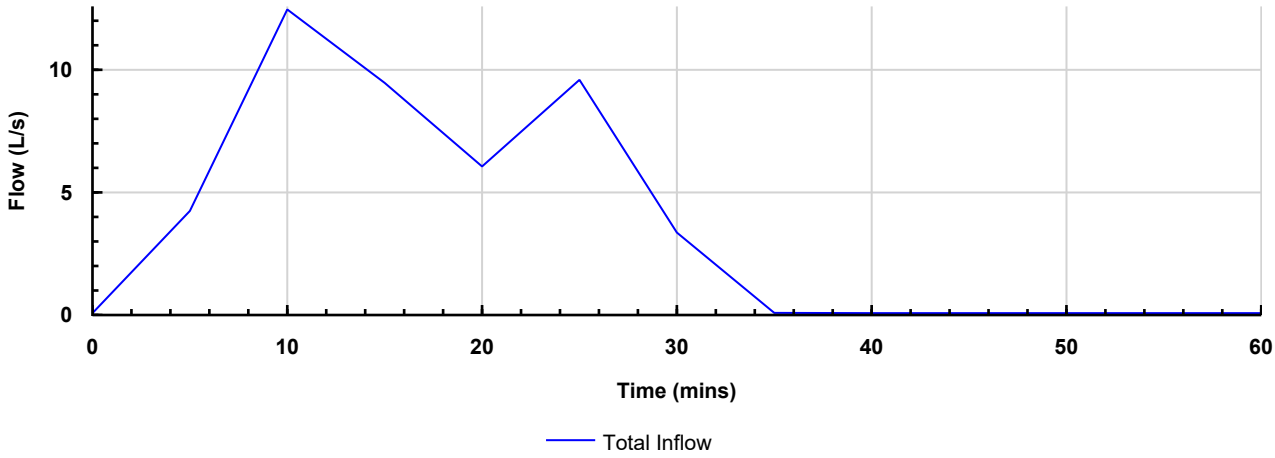
Type : Catchment Area

Inflow

Max. Inflow (L/s)	12.5
Total Inflow Volume (m³)	13.498

Graphs

Flow Graph



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	4.2
10	12.5
15	9.4
20	6.0
25	9.6
30	3.3
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

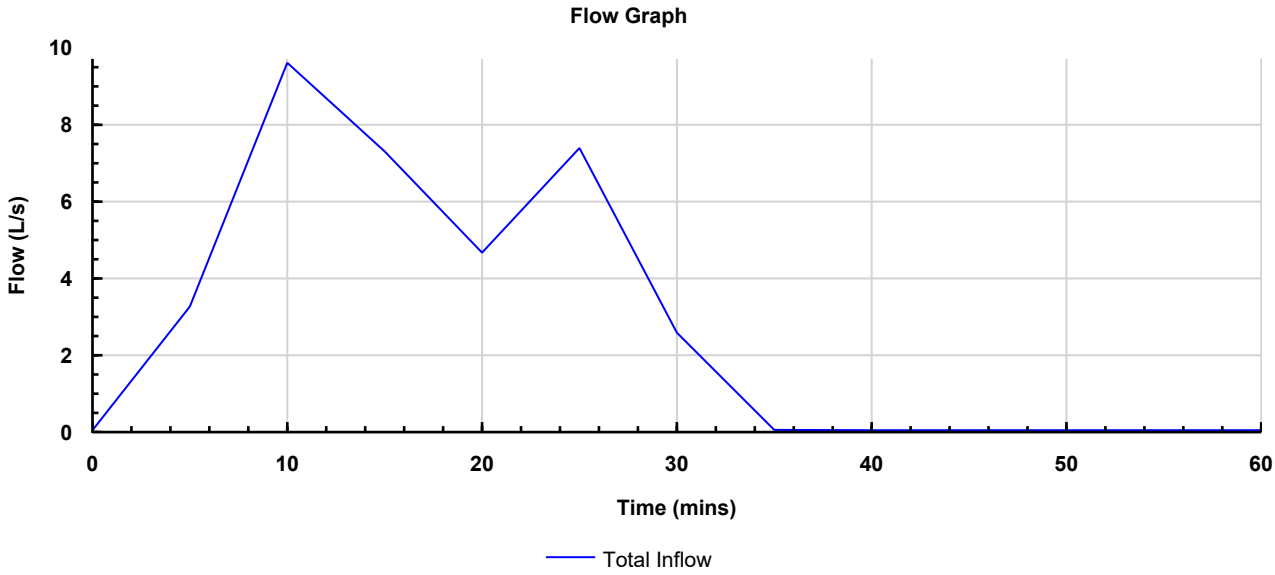
Roof Catchment 2A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	9.6
Total Inflow Volume (m³)	10.418

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.2
10	9.6
15	7.3
20	4.6
25	7.4
30	2.6
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

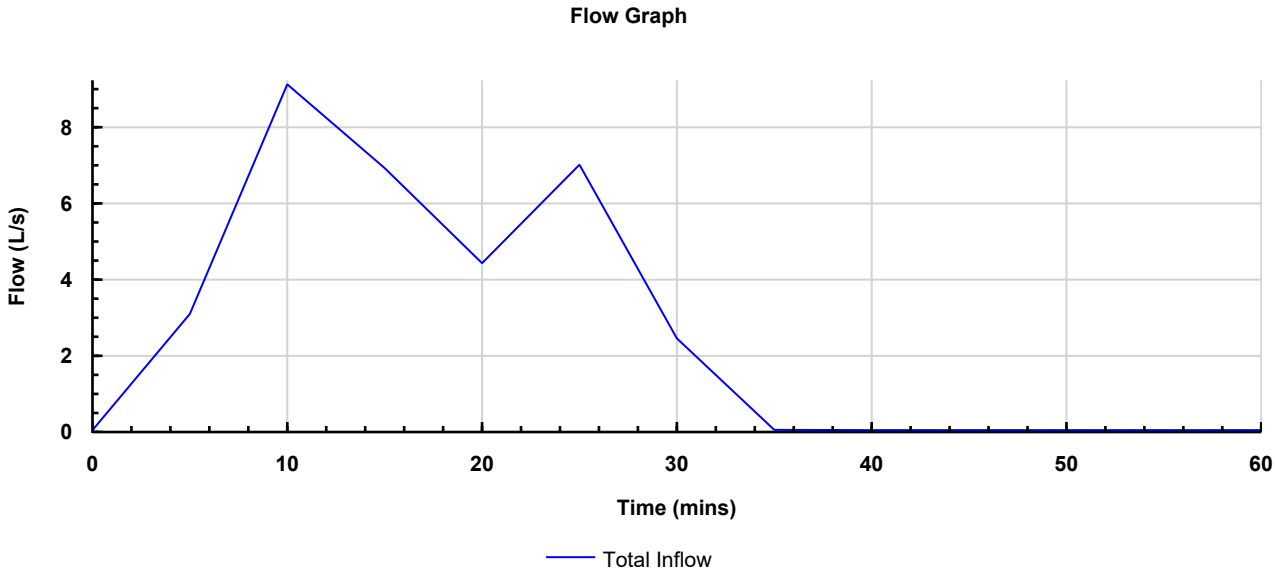
Roof Catchment 2B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	9.1
Total Inflow Volume (m³)	9.882

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.1
10	9.1
15	6.9
20	4.4
25	7.0
30	2.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

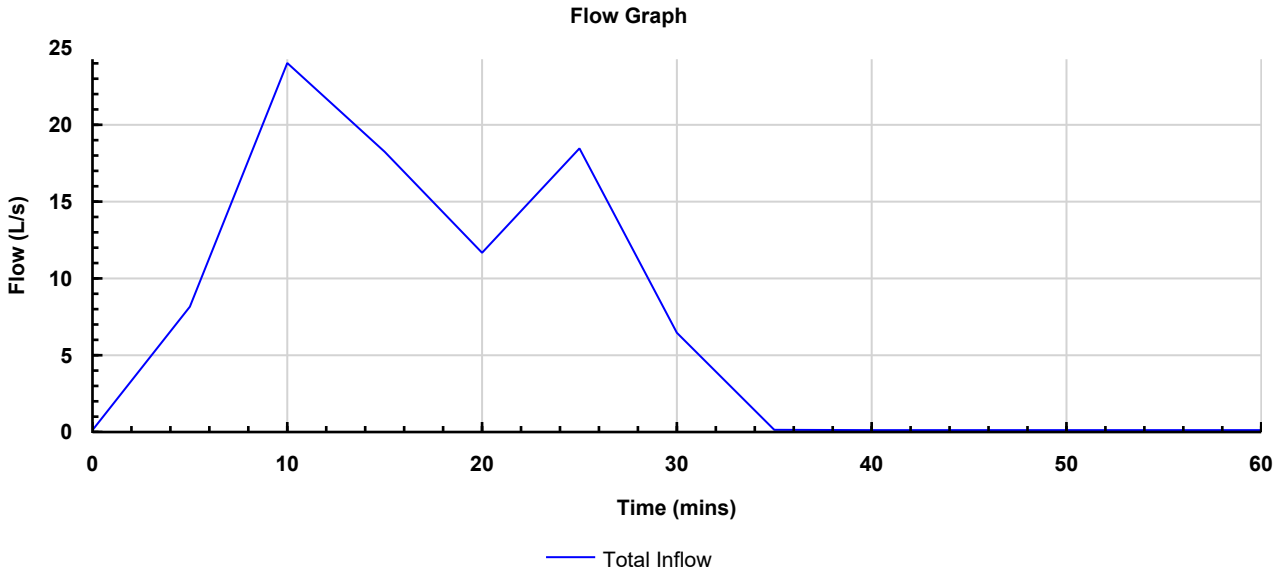
Roof Catchment 10A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	24.0
Total Inflow Volume (m³)	26.016

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	8.1
10	24.0
15	18.2
20	11.6
25	18.4
30	6.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

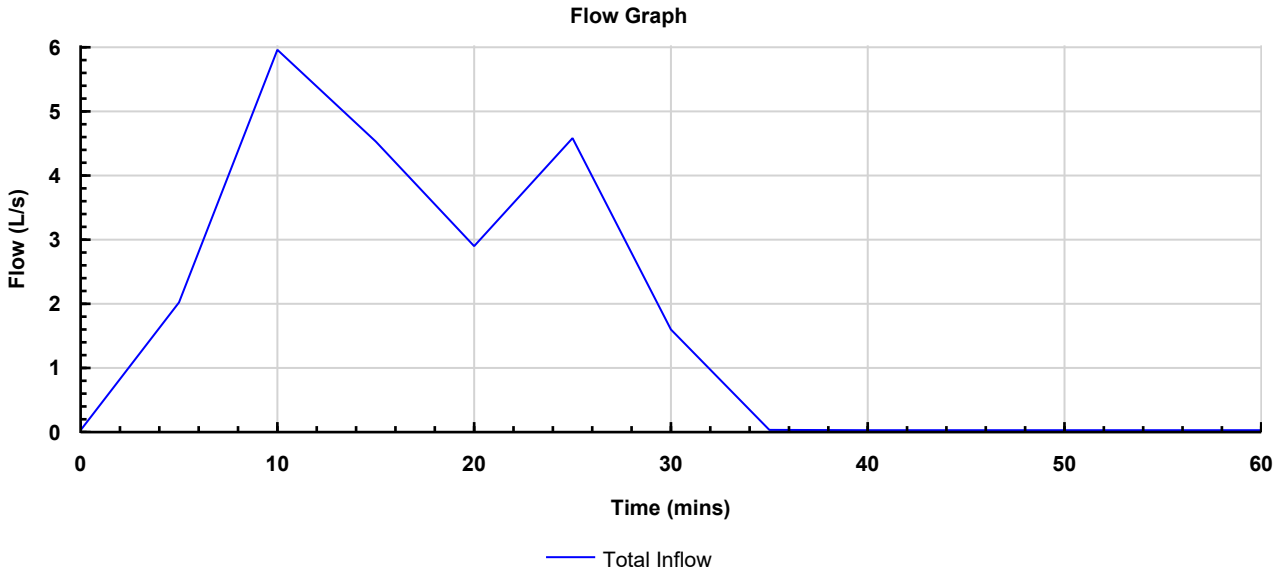
Roof Catchment 9A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	6.0
Total Inflow Volume (m³)	6.457

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.0
10	6.0
15	4.5
20	2.9
25	4.6
30	1.6
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

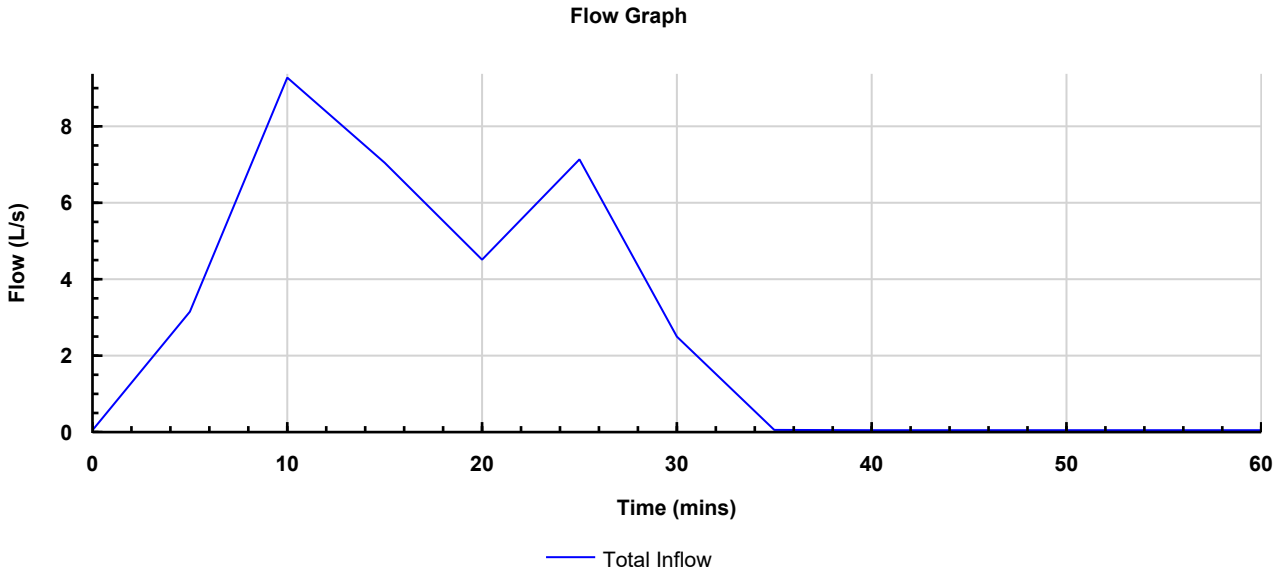
Roof Catchment 9D
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	9.3
Total Inflow Volume (m³)	10.050

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.1
10	9.3
15	7.0
20	4.5
25	7.1
30	2.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

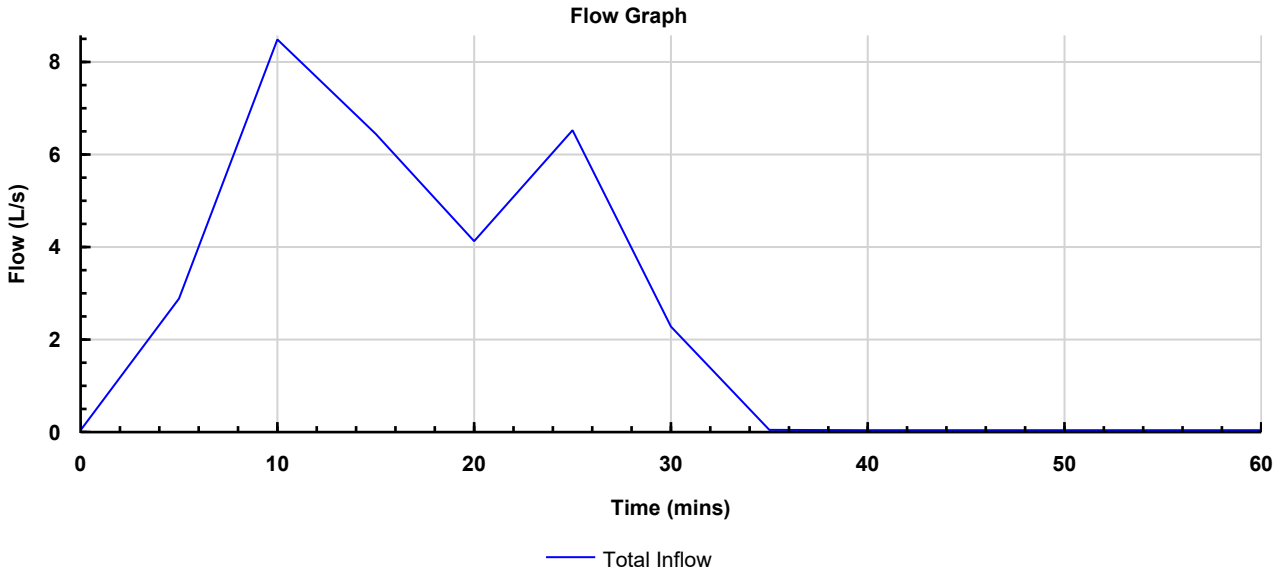
Roof Catchment 9B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	8.5
Total Inflow Volume (m³)	9.195

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.9
10	8.5
15	6.4
20	4.1
25	6.5
30	2.3
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Inflow Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

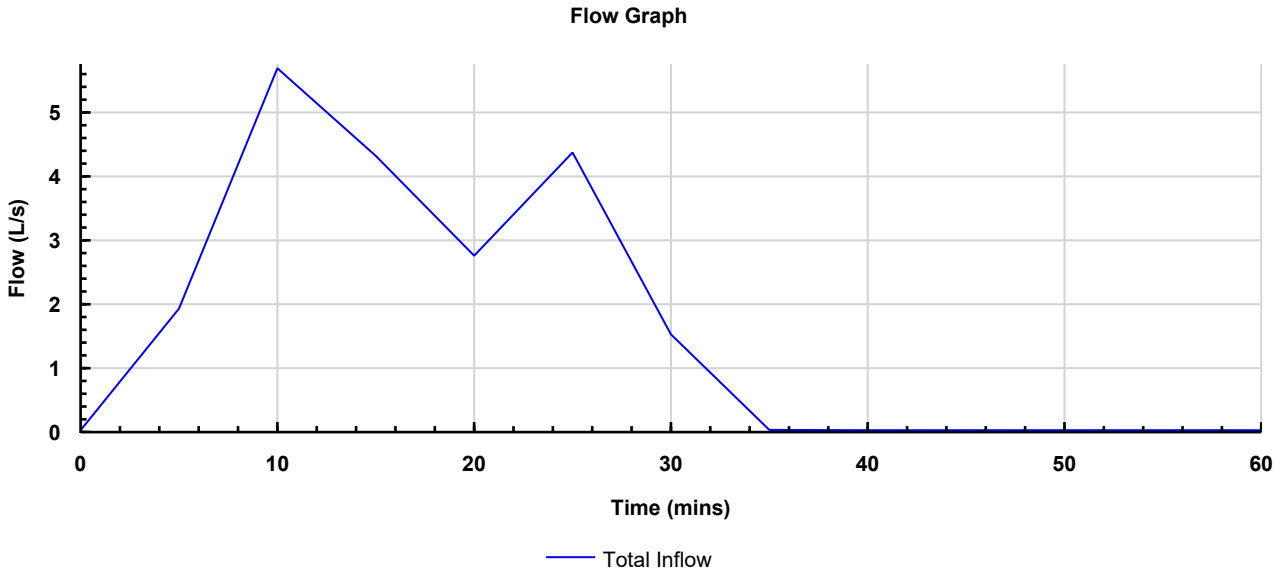
Roof Catchment 9C
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	5.7
Total Inflow Volume (m³)	6.160

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.9
10	5.7
15	4.3
20	2.7
25	4.4
30	1.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

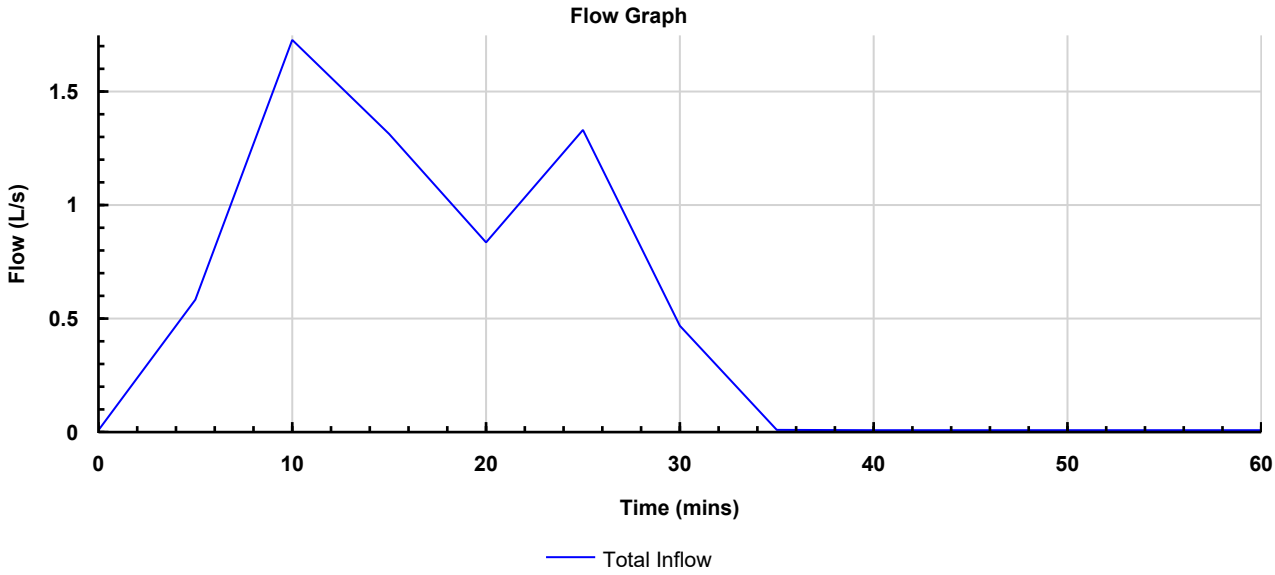
Roof Catchment 12A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	1.7
Total Inflow Volume (m^3)	1.871

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.6
10	1.7
15	1.3
20	0.8
25	1.3
30	0.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

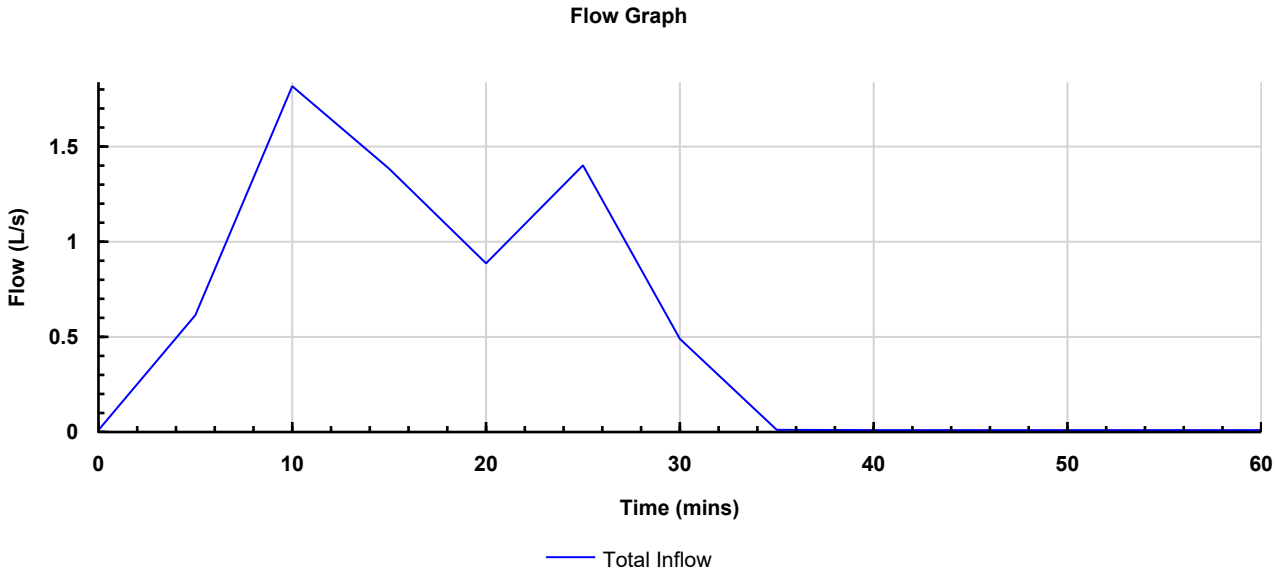
Roof Catchment 12D
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	1.8
Total Inflow Volume (m^3)	1.970

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.6
10	1.8
15	1.4
20	0.9
25	1.4
30	0.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

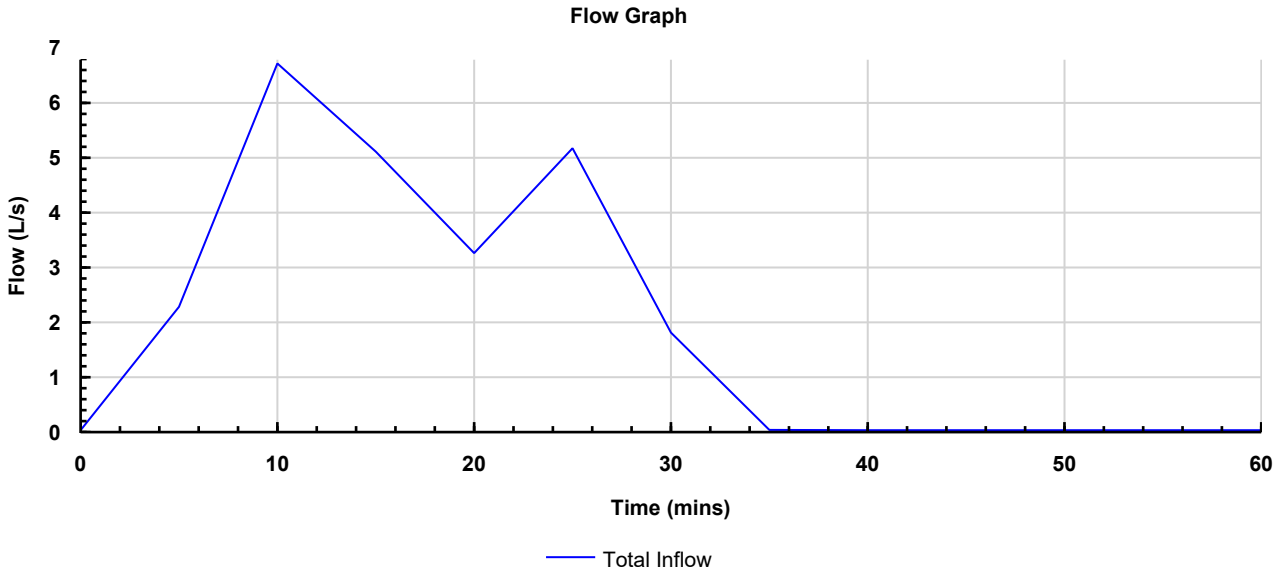
Roof Catchment 3A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	6.7
Total Inflow Volume (m³)	7.284

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.3
10	6.7
15	5.1
20	3.2
25	5.2
30	1.8
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

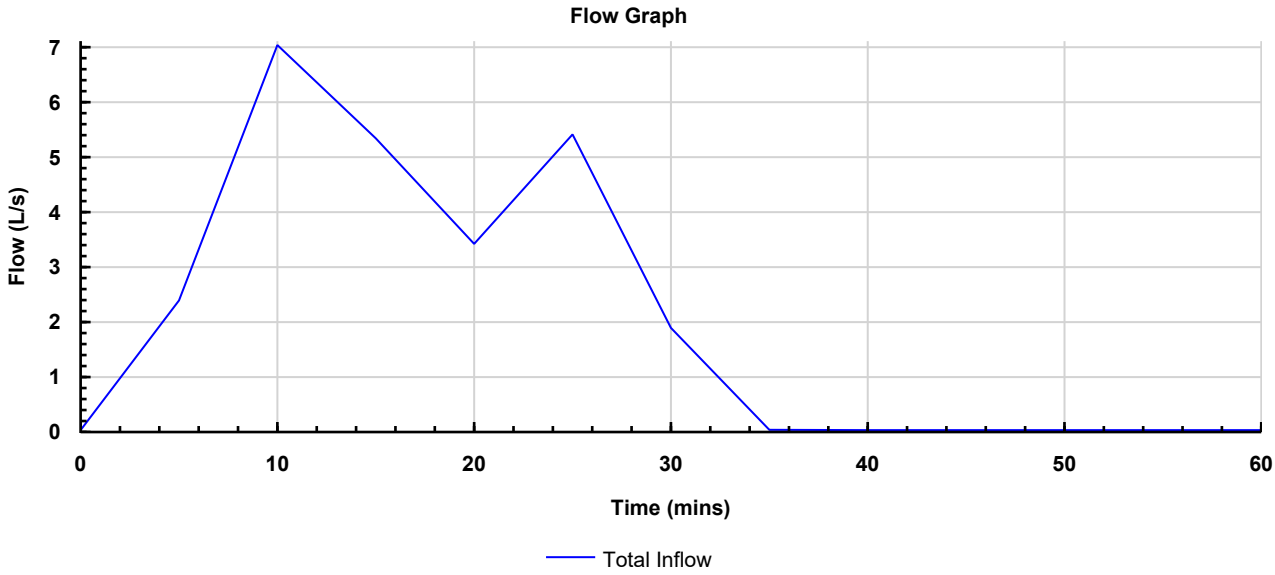
Roof Catchment 3D
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	7.0
Total Inflow Volume (m³)	7.626

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.4
10	7.0
15	5.3
20	3.4
25	5.4
30	1.9
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

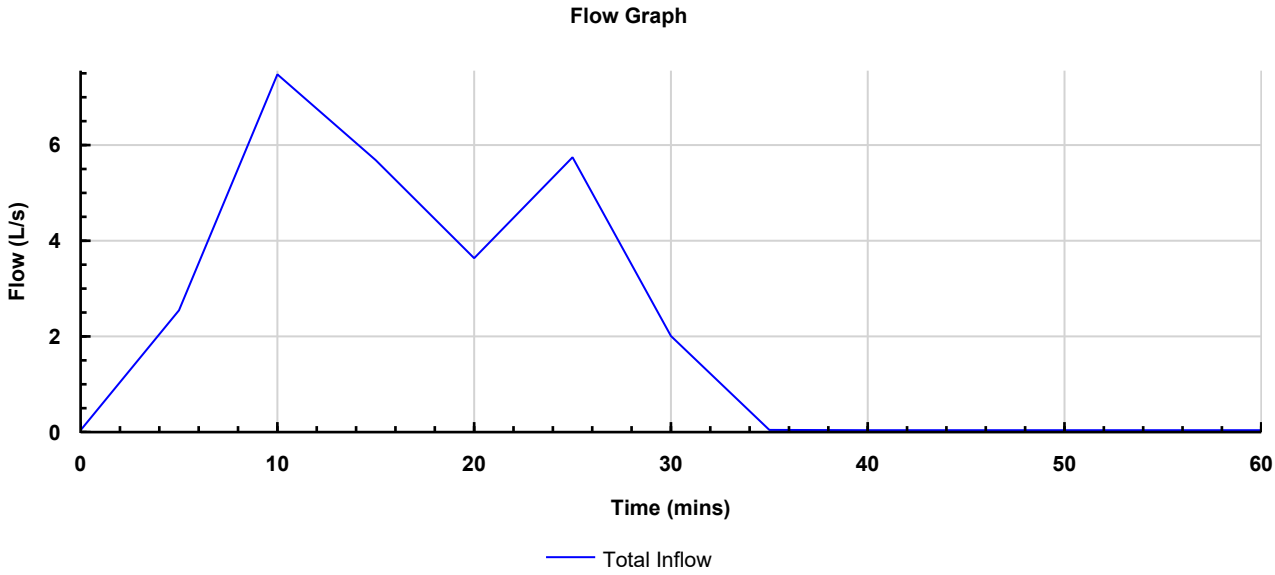
Roof Catchment 3C
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	7.5
Total Inflow Volume (m³)	8.100

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.5
10	7.5
15	5.7
20	3.6
25	5.7
30	2.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

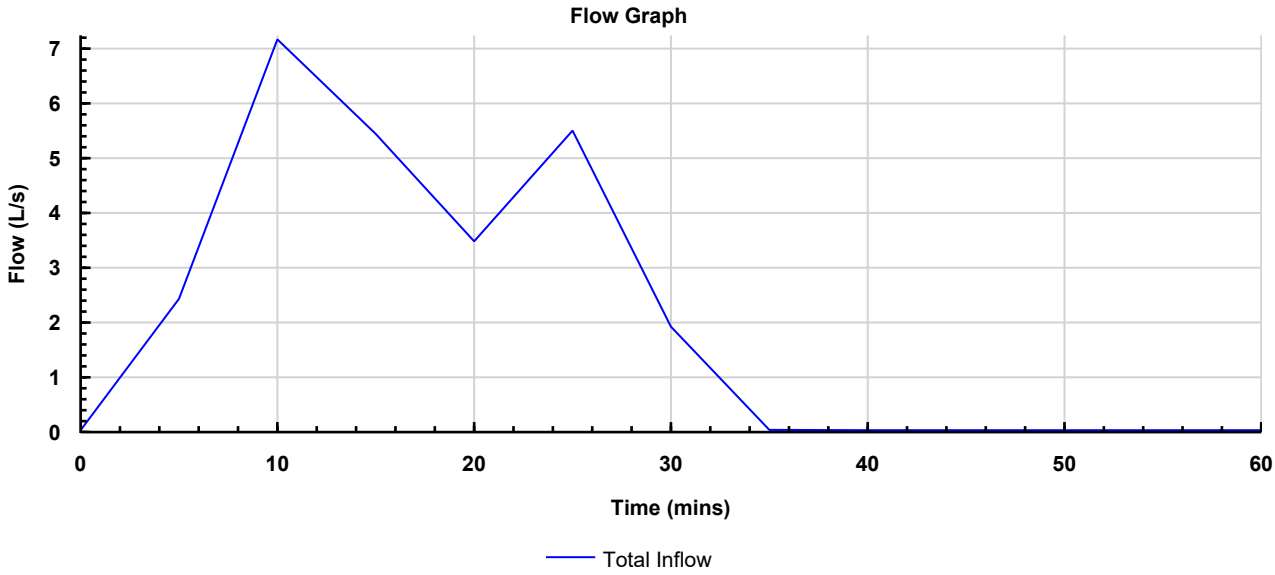
Roof Catchment 3B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	7.2
Total Inflow Volume (m³)	7.761

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.4
10	7.2
15	5.4
20	3.5
25	5.5
30	1.9
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

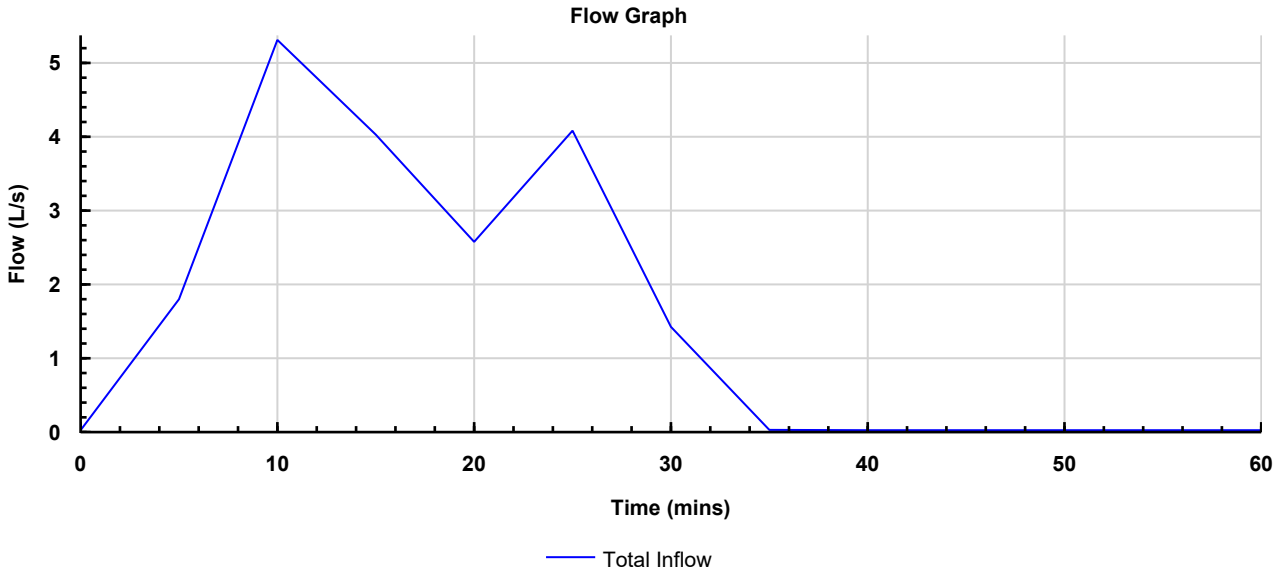
Roof Catchment 4A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	5.3
Total Inflow Volume (m³)	5.749

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.8
10	5.3
15	4.0
20	2.6
25	4.1
30	1.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

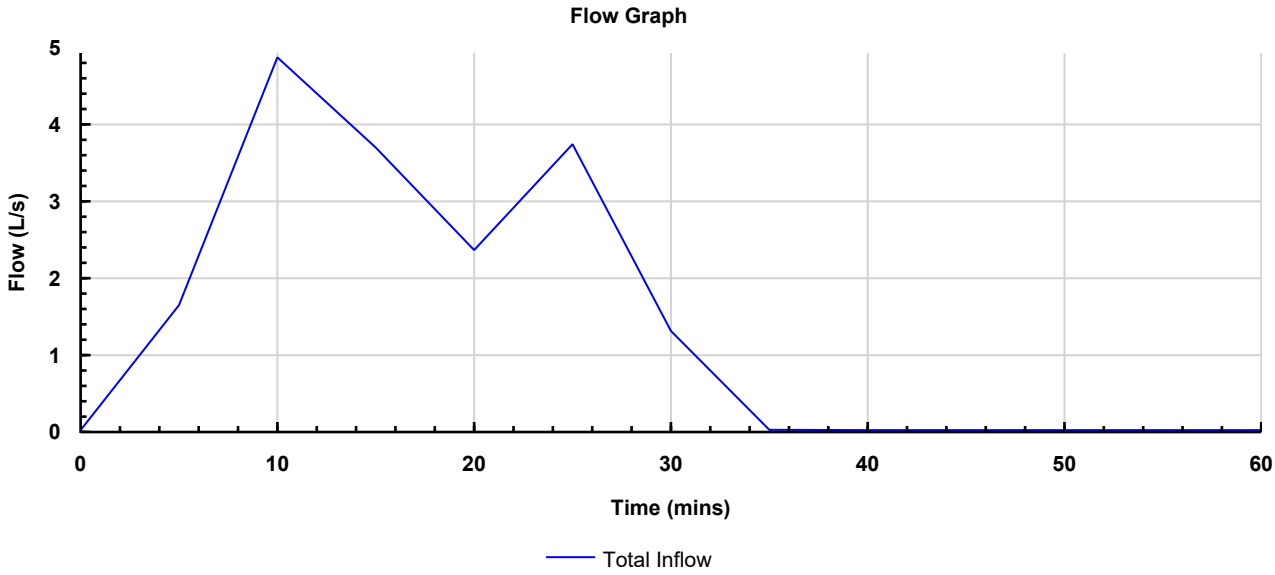
Roof Catchment 4C
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	4.9
Total Inflow Volume (m³)	5.275

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.6
10	4.9
15	3.7
20	2.4
25	3.7
30	1.3
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

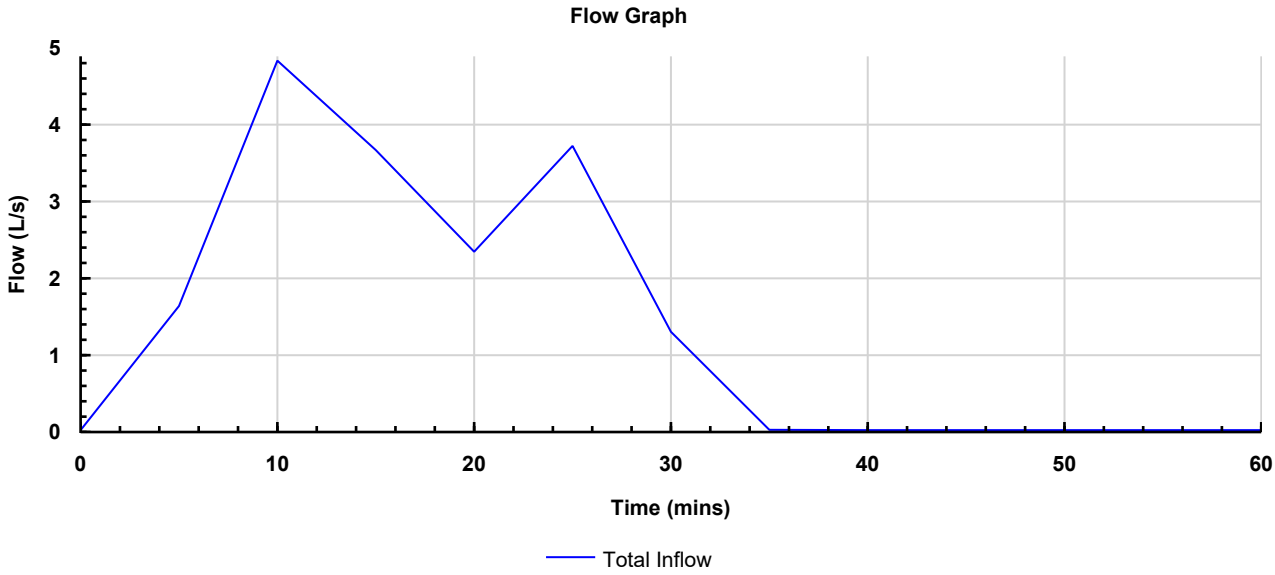
Roof Catchment 4B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	4.8
Total Inflow Volume (m³)	5.236

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.6
10	4.8
15	3.7
20	2.3
25	3.7
30	1.3
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

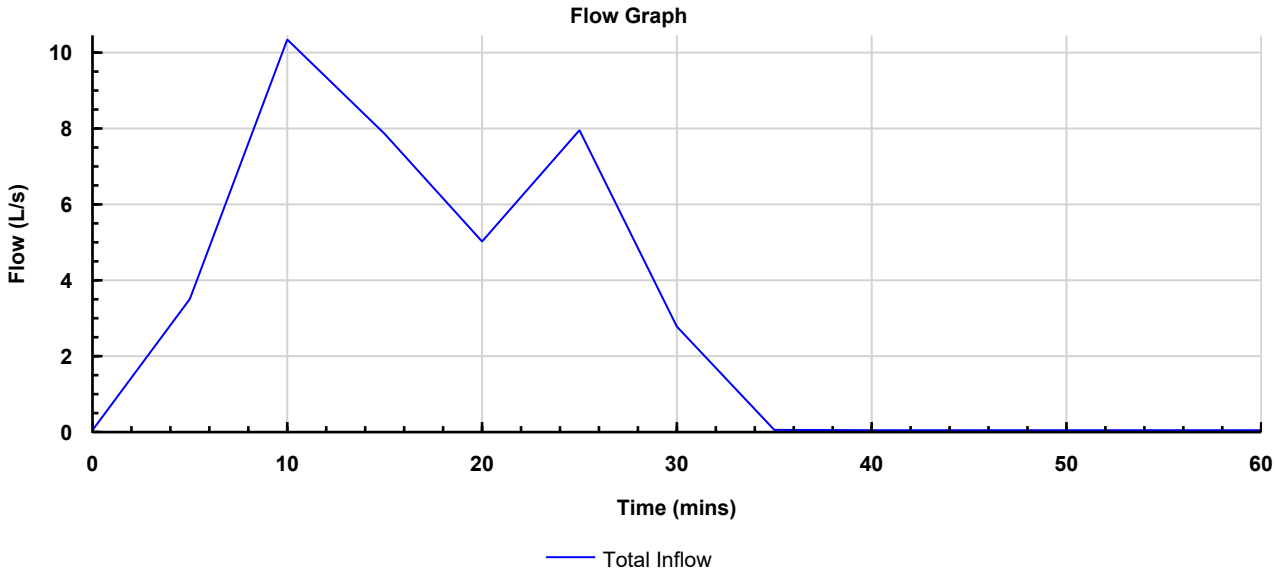
Roof Catchment 5A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	10.3
Total Inflow Volume (m³)	11.204

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.5
10	10.3
15	7.8
20	5.0
25	7.9
30	2.7
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

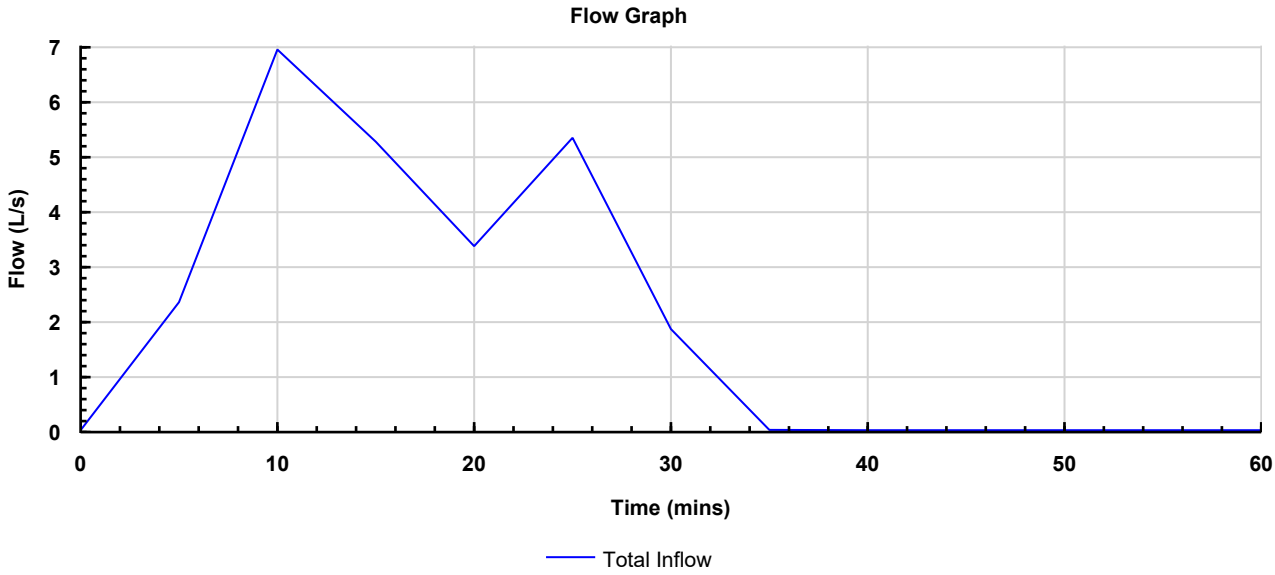
Roof Catchment 6A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	7.0
Total Inflow Volume (m³)	7.539

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.3
10	7.0
15	5.3
20	3.4
25	5.3
30	1.8
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

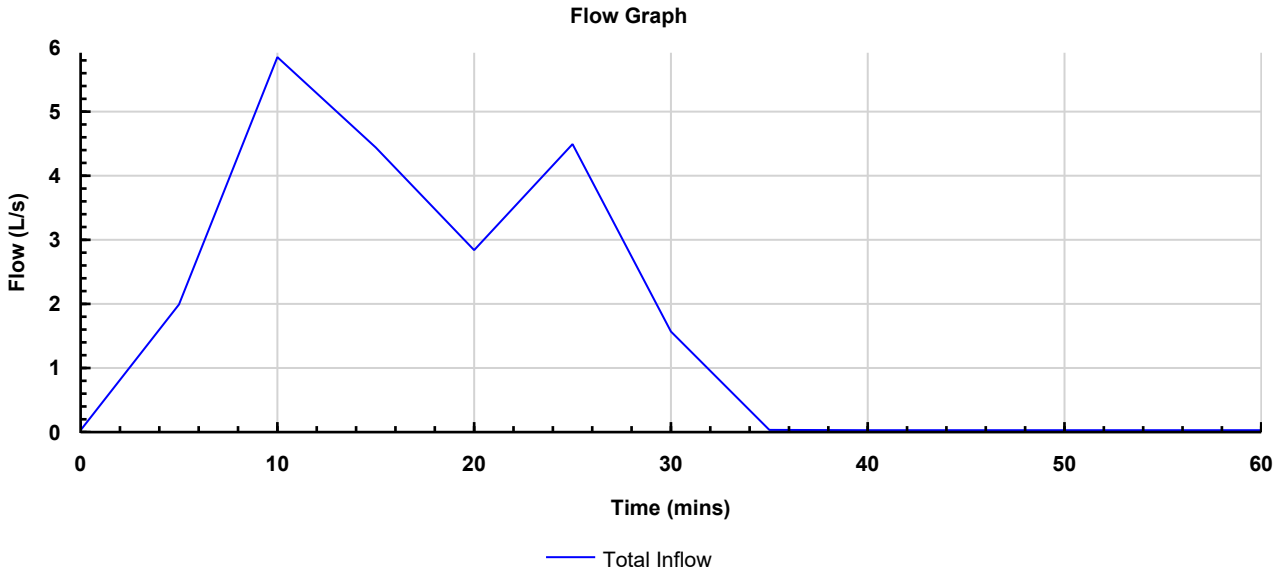
Roof Catchment 8A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	5.9
Total Inflow Volume (m³)	6.334

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.0
10	5.9
15	4.4
20	2.8
25	4.5
30	1.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

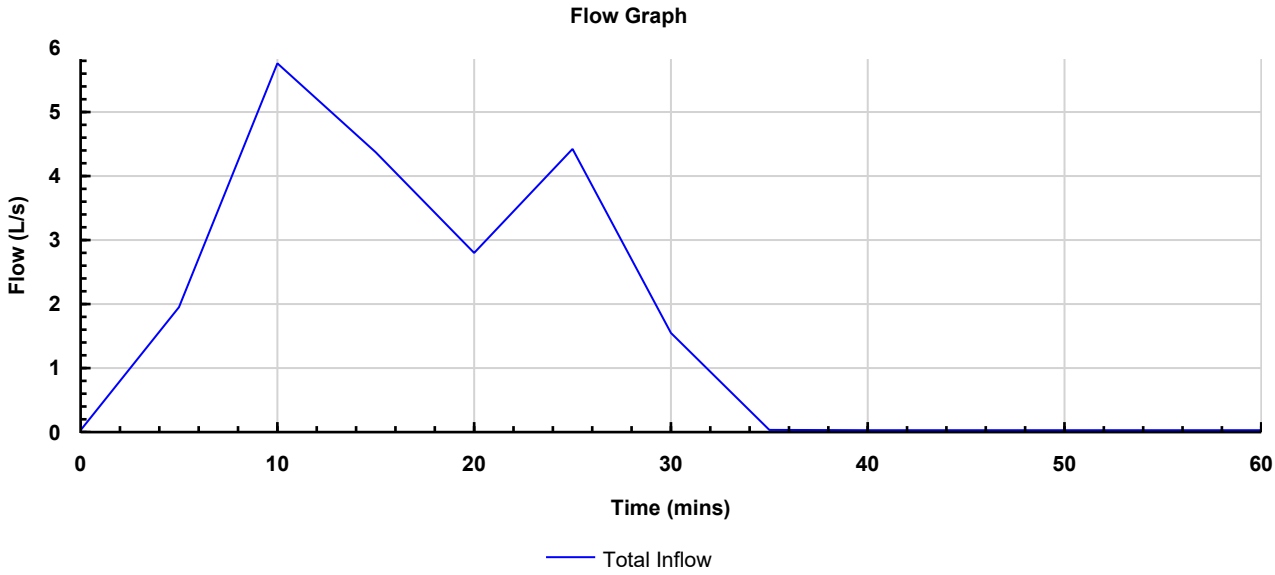
Roof Catchment 8B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	5.8
Total Inflow Volume (m³)	6.235

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.9
10	5.8
15	4.4
20	2.8
25	4.4
30	1.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

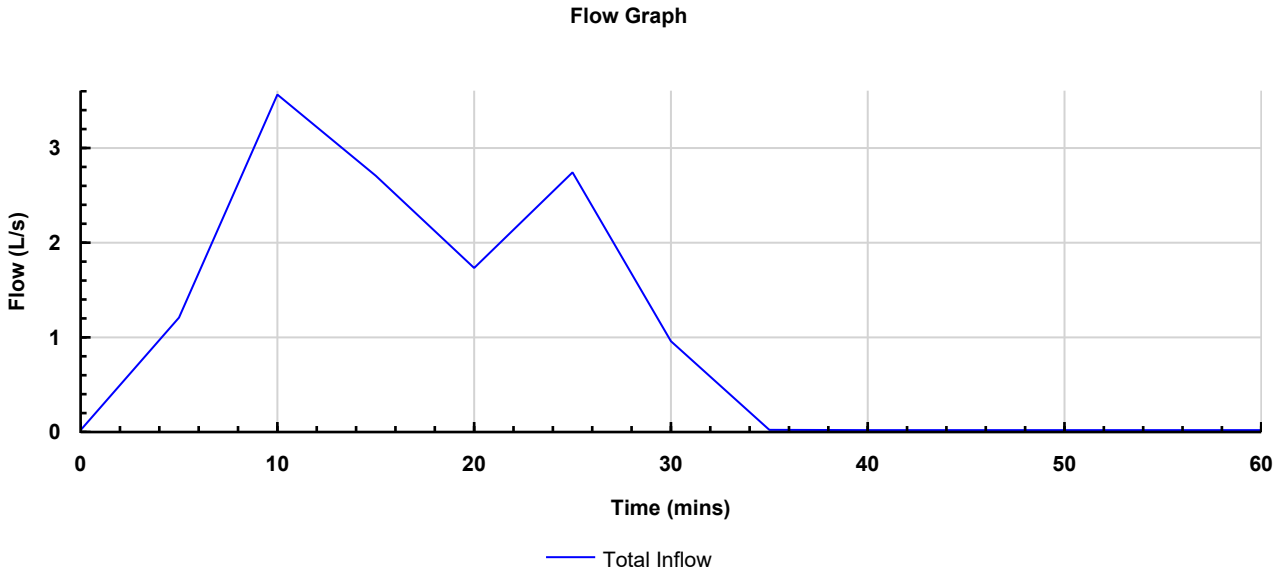
Roof Catchment 7B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	3.6
Total Inflow Volume (m³)	3.860

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.2
10	3.6
15	2.7
20	1.7
25	2.7
30	0.9
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

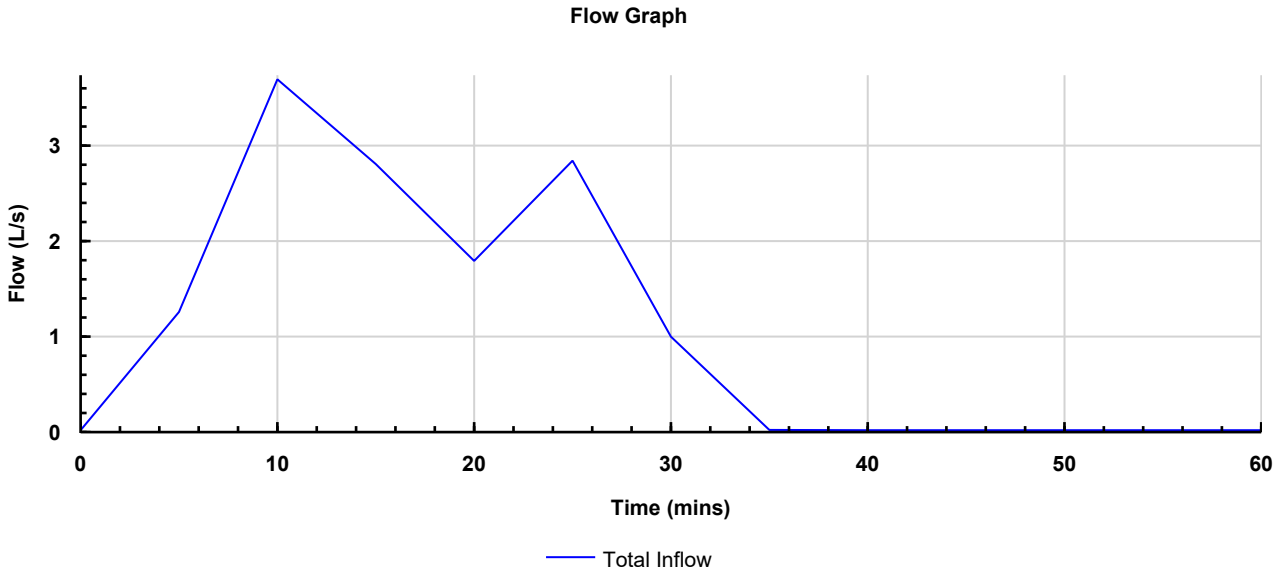
Roof Catchment 7A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	3.7
Total Inflow Volume (m³)	4.004

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.2
10	3.7
15	2.8
20	1.8
25	2.8
30	1.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

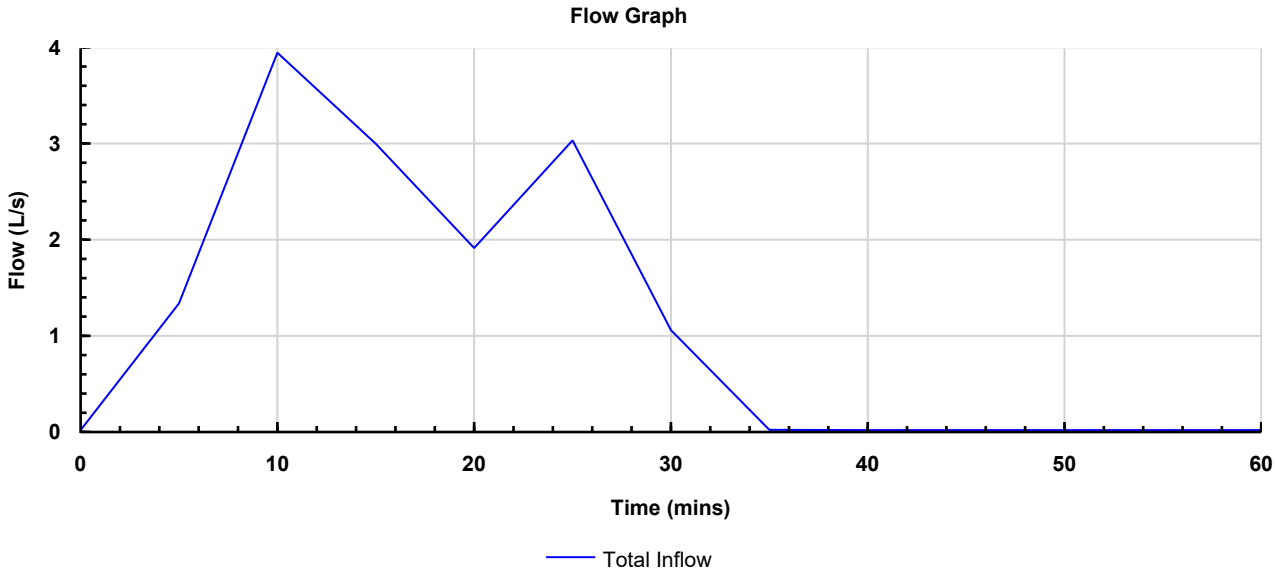
Roof Catchment 12B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	3.9
Total Inflow Volume (m³)	4.271

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.3
10	3.9
15	3.0
20	1.9
25	3.0
30	1.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

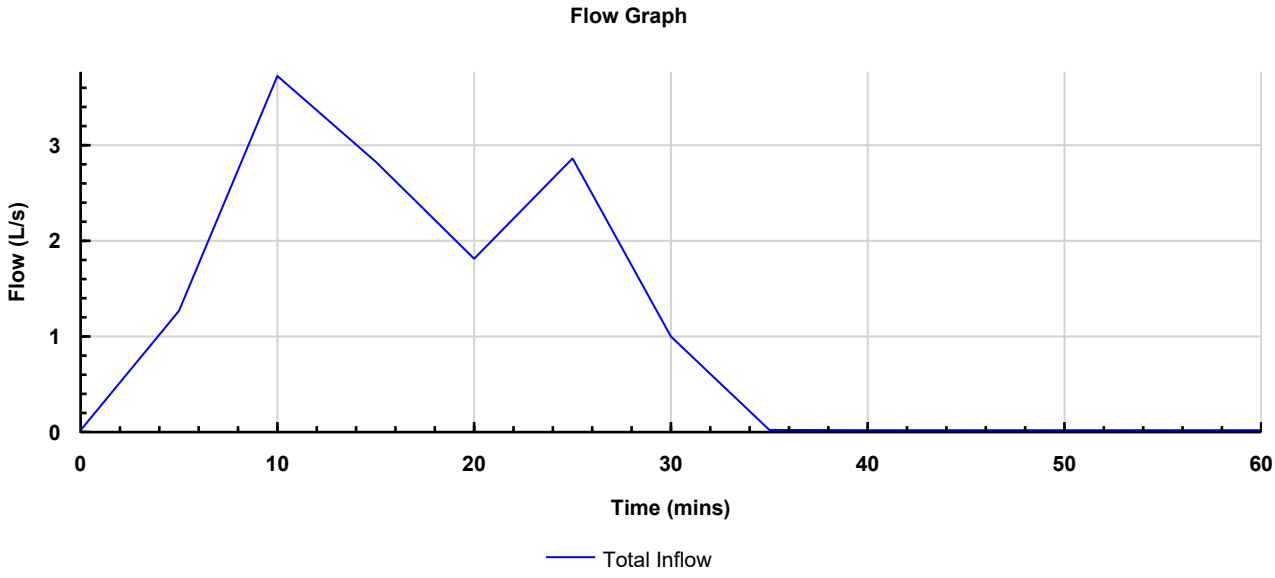
Roof Catchment 12C
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	3.7
Total Inflow Volume (m³)	4.034

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.3
10	3.7
15	2.8
20	1.8
25	2.9
30	1.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

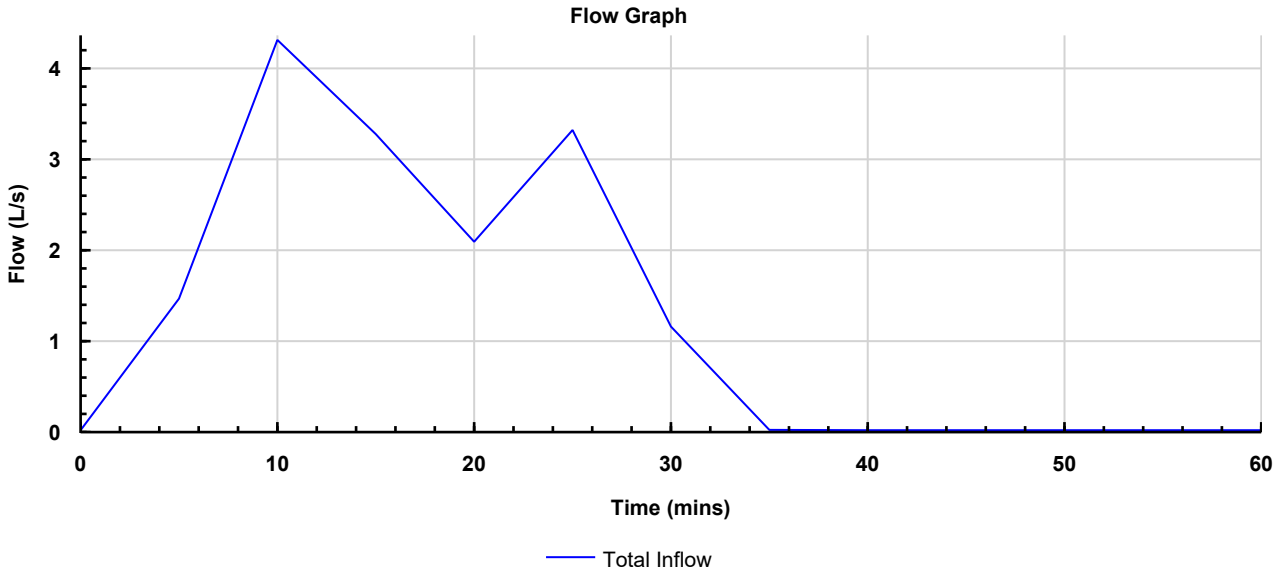
Roof Catchment 12F
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	4.3
Total Inflow Volume (m³)	4.675

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.5
10	4.3
15	3.3
20	2.1
25	3.3
30	1.1
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Inflow Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

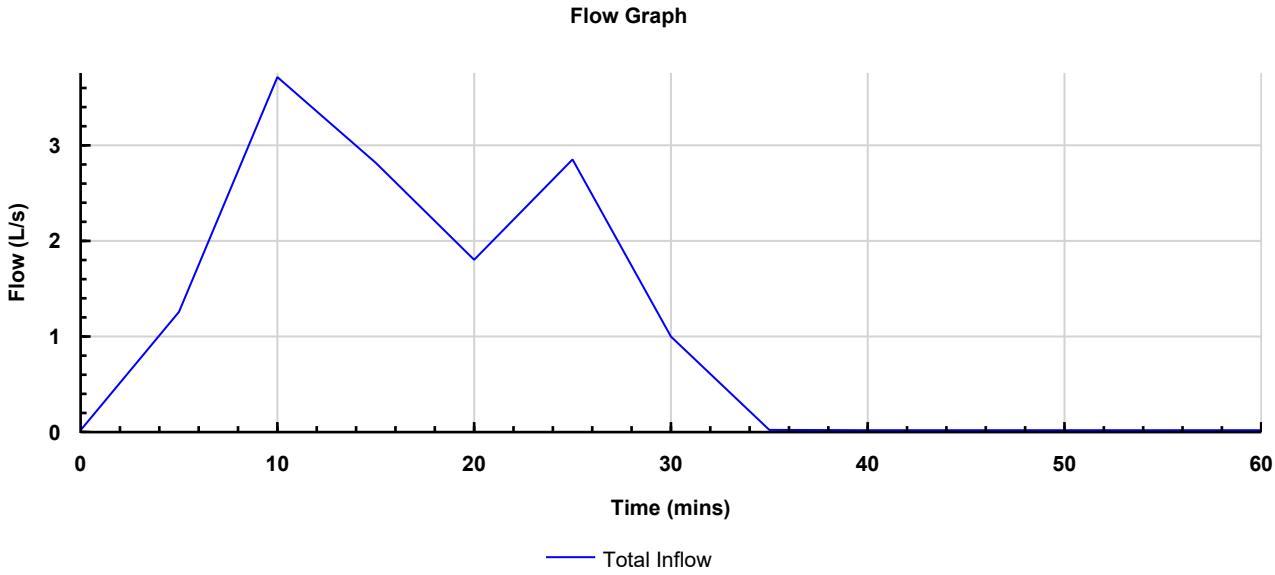
Roof Catchment 12E
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	3.7
Total Inflow Volume (m³)	4.019

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.2
10	3.7
15	2.8
20	1.8
25	2.8
30	1.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

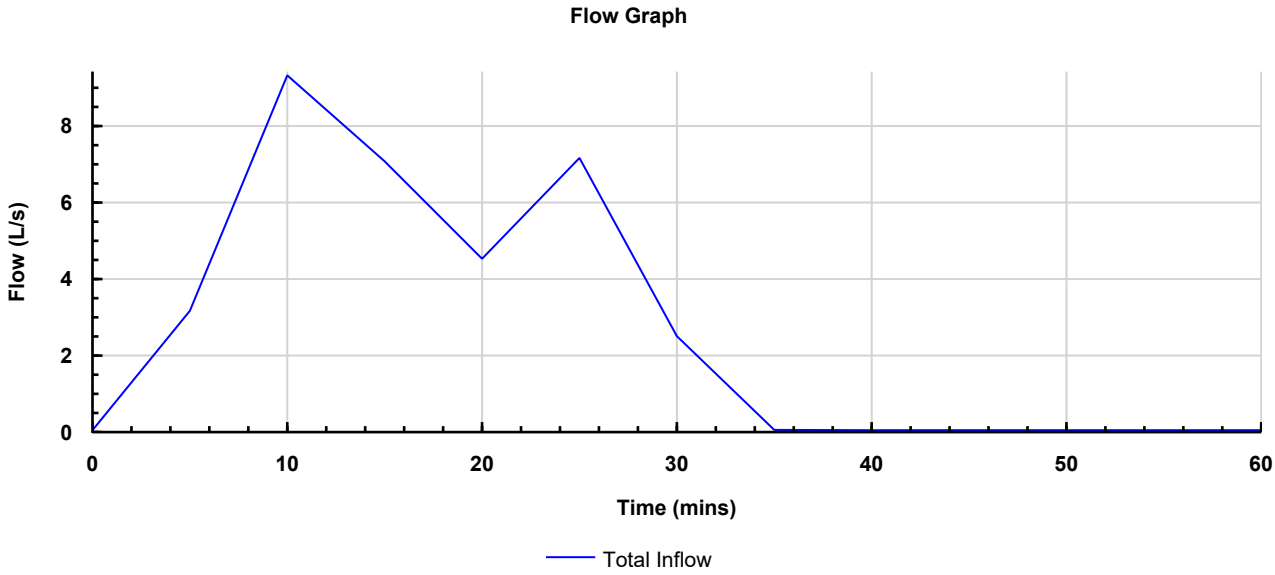
Roof Catchment 11B
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	9.3
Total Inflow Volume (m³)	10.097

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.1
10	9.3
15	7.1
20	4.5
25	7.2
30	2.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

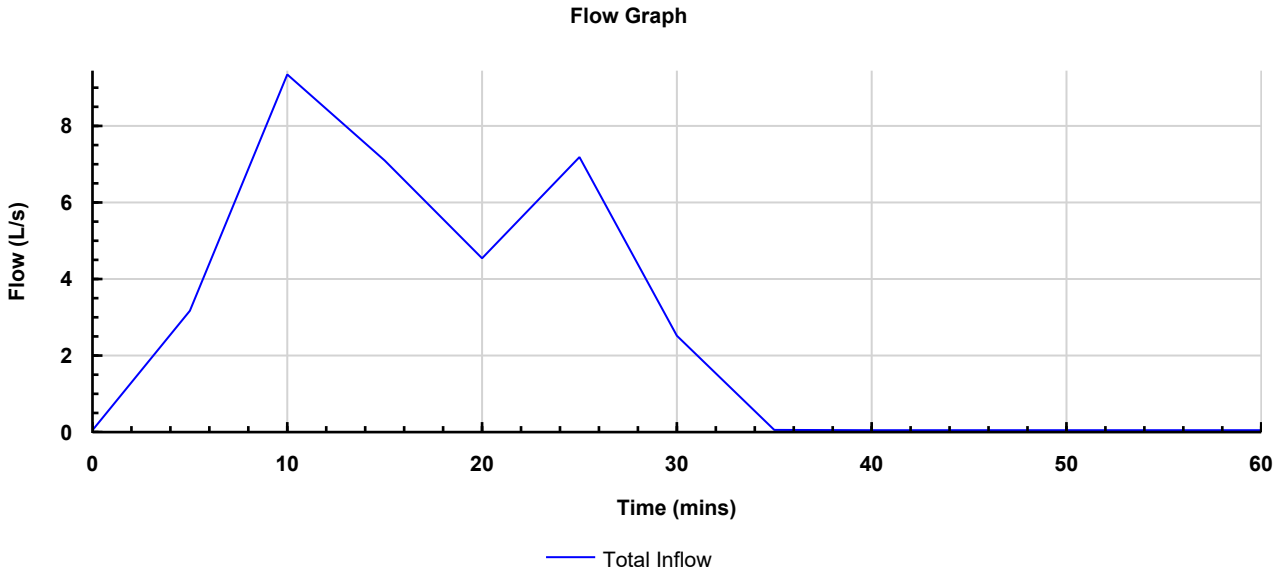
Roof Catchment 11A
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	9.3
Total Inflow Volume (m³)	10.121

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.1
10	9.3
15	7.1
20	4.5
25	7.2
30	2.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

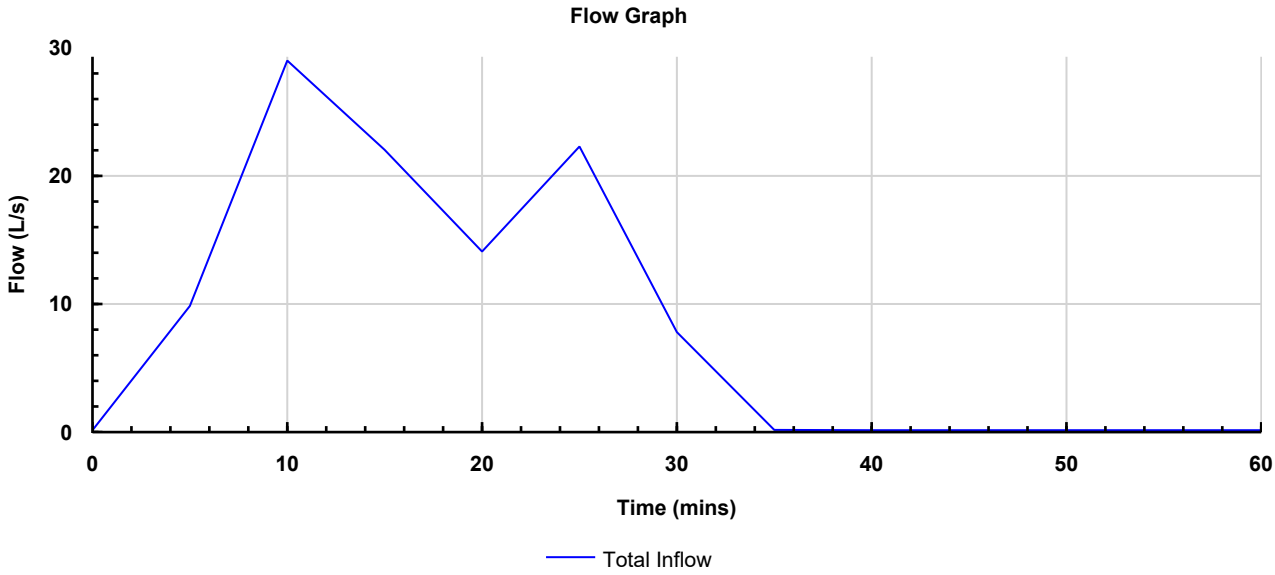
Surface Catchment 1
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	29.0
Total Inflow Volume (m³)	31.417

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	9.7
10	29.0
15	22.0
20	14.0
25	22.3
30	7.7
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

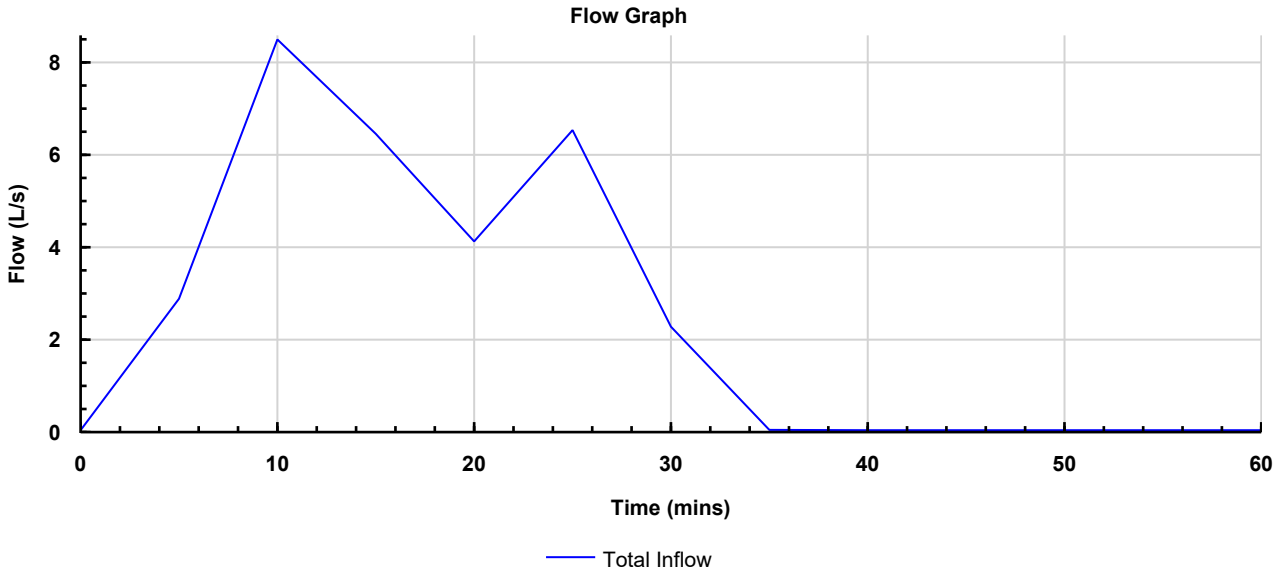
Surface Catchment 2
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	8.5
Total Inflow Volume (m³)	9.204

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.9
10	8.5
15	6.4
20	4.1
25	6.5
30	2.3
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

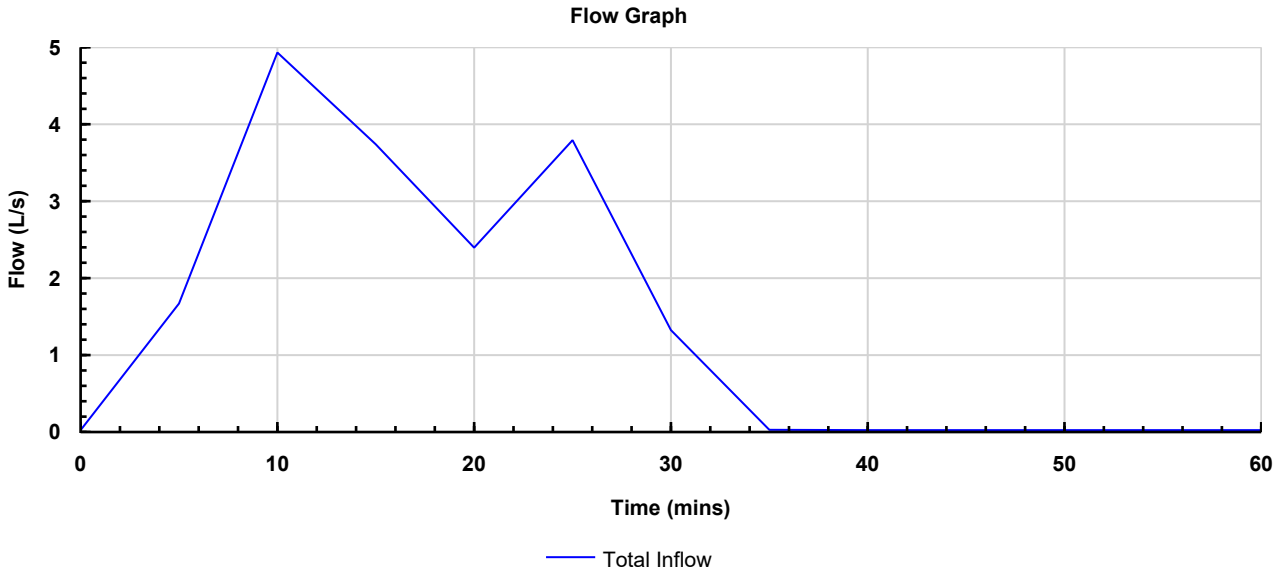
Surface Catchment 9
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	4.9
Total Inflow Volume (m³)	5.338

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.7
10	4.9
15	3.7
20	2.4
25	3.8
30	1.3
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

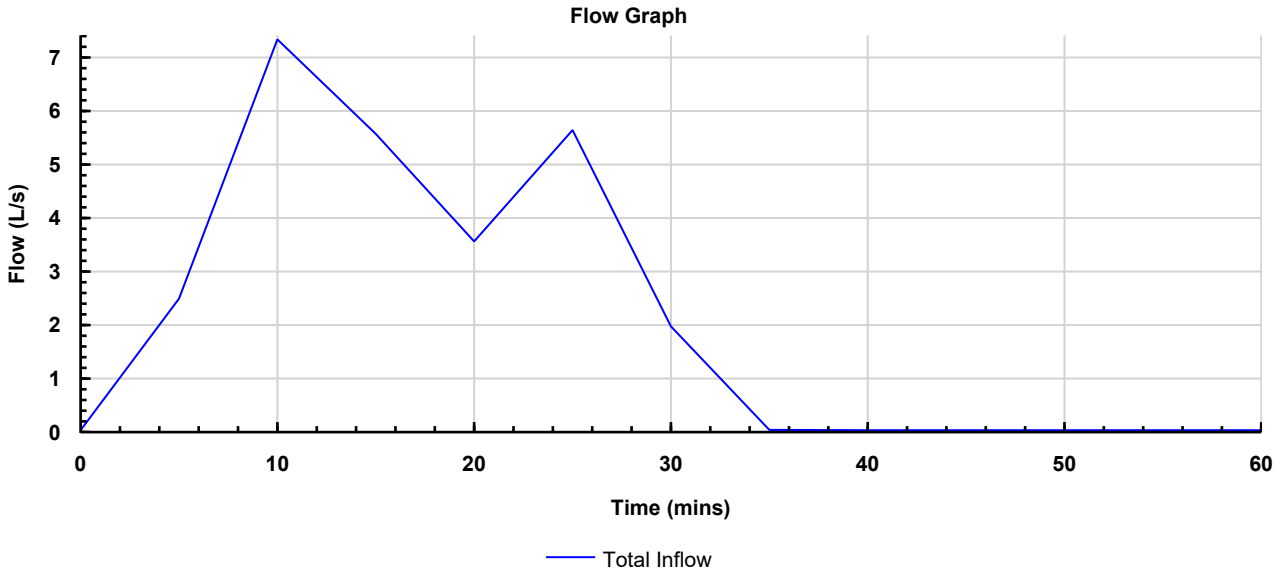
Surface Catchment 11
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	7.3
Total Inflow Volume (m³)	7.950

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.5
10	7.3
15	5.6
20	3.5
25	5.6
30	1.9
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

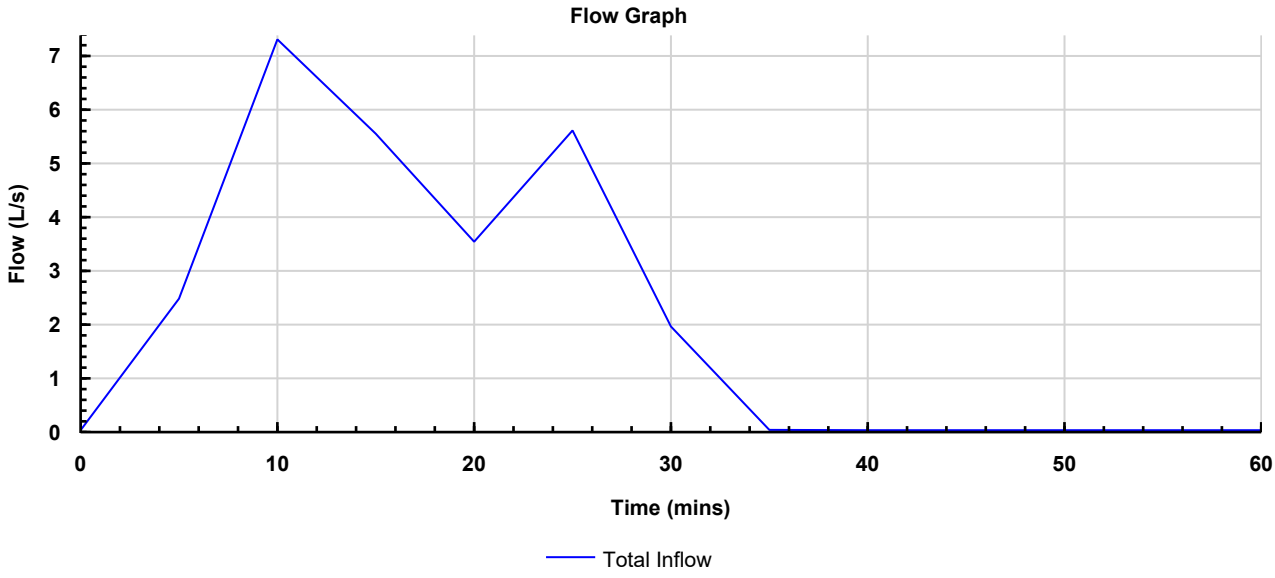
Surface Catchment 12
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	7.3
Total Inflow Volume (m³)	7.914

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.5
10	7.3
15	5.5
20	3.5
25	5.6
30	1.9
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

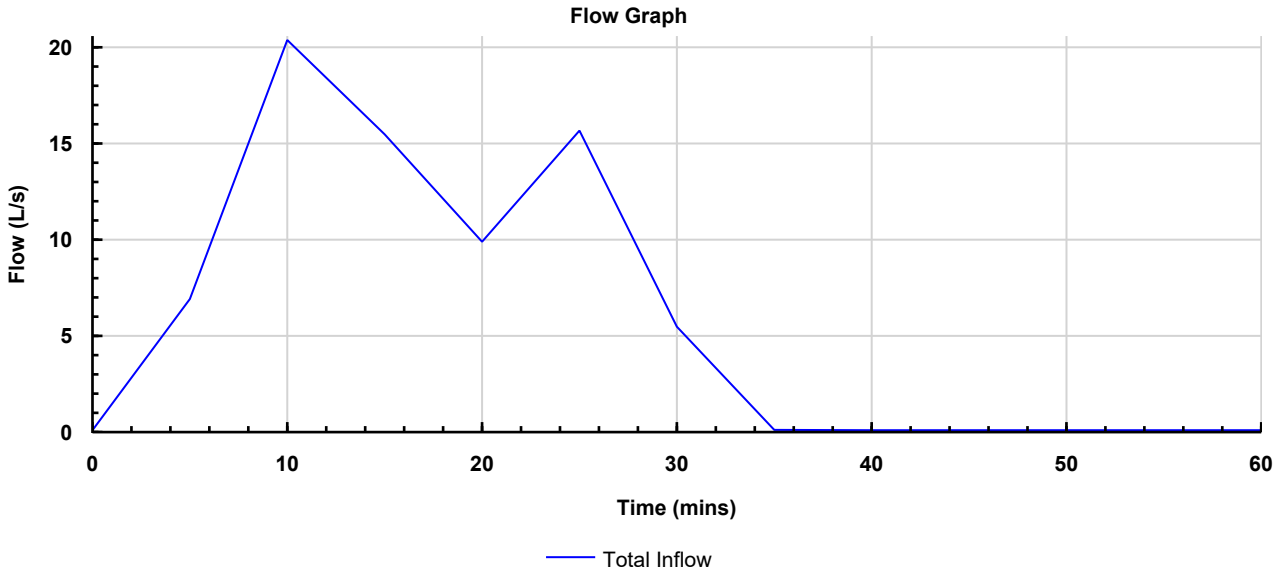
Surface Catchment 13
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	20.4
Total Inflow Volume (m³)	22.072

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	6.9
10	20.4
15	15.5
20	9.8
25	15.6
30	5.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

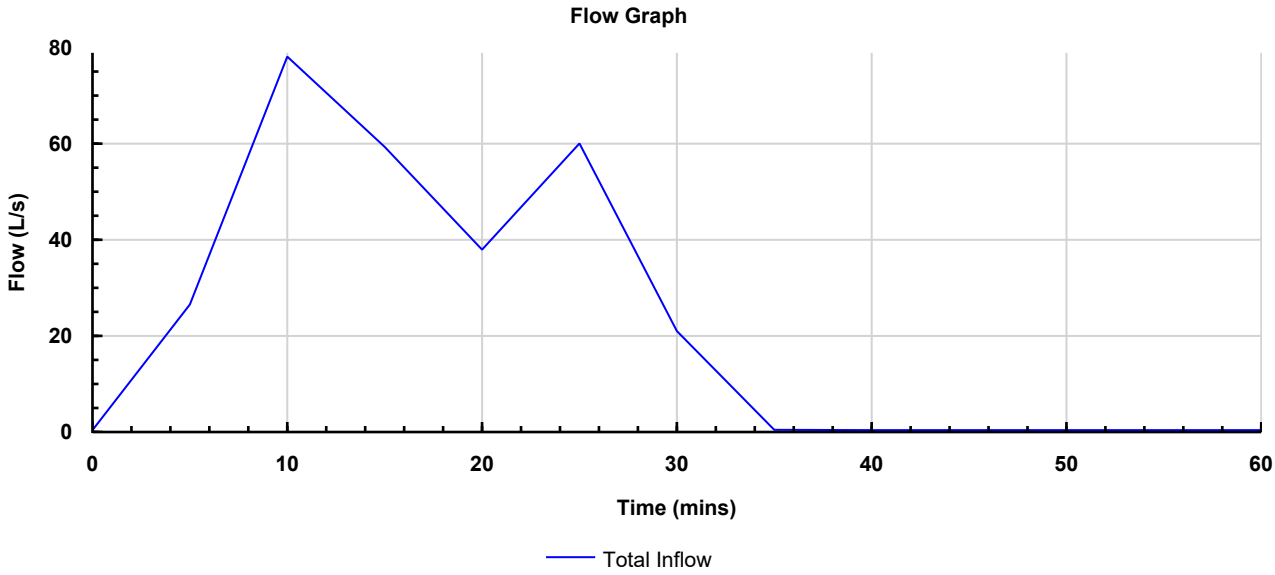
Surface Catchment 7
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	78.1
Total Inflow Volume (m³)	84.604

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	26.3
10	78.1
15	59.2
20	37.7
25	59.9
30	20.7
35	0.1
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

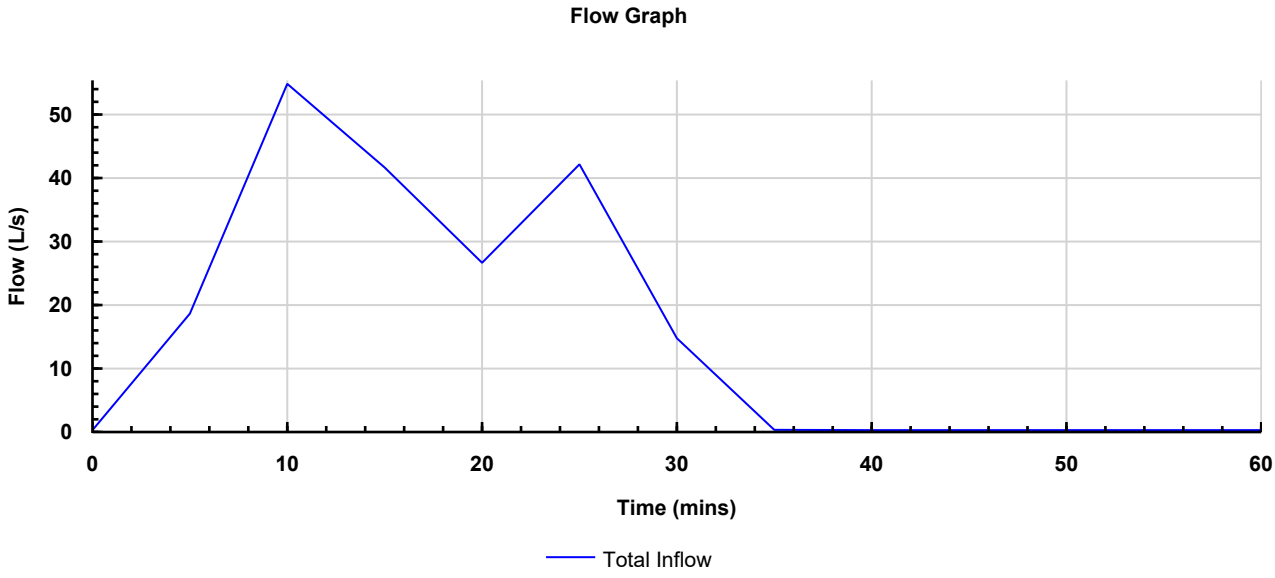
Surface Catchment 14
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	54.8
Total Inflow Volume (m³)	59.394

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	18.4
10	54.8
15	41.6
20	26.5
25	42.1
30	14.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

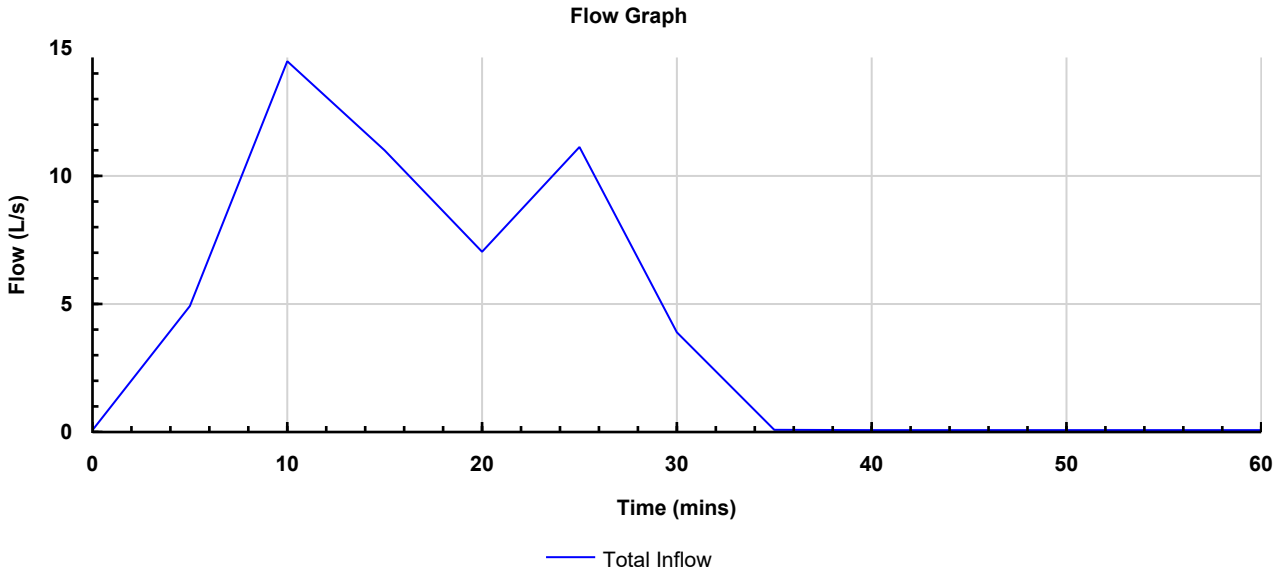
Surface Catchment 18
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	14.5
Total Inflow Volume (m³)	15.682

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	4.9
10	14.5
15	11.0
20	7.0
25	11.1
30	3.8
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

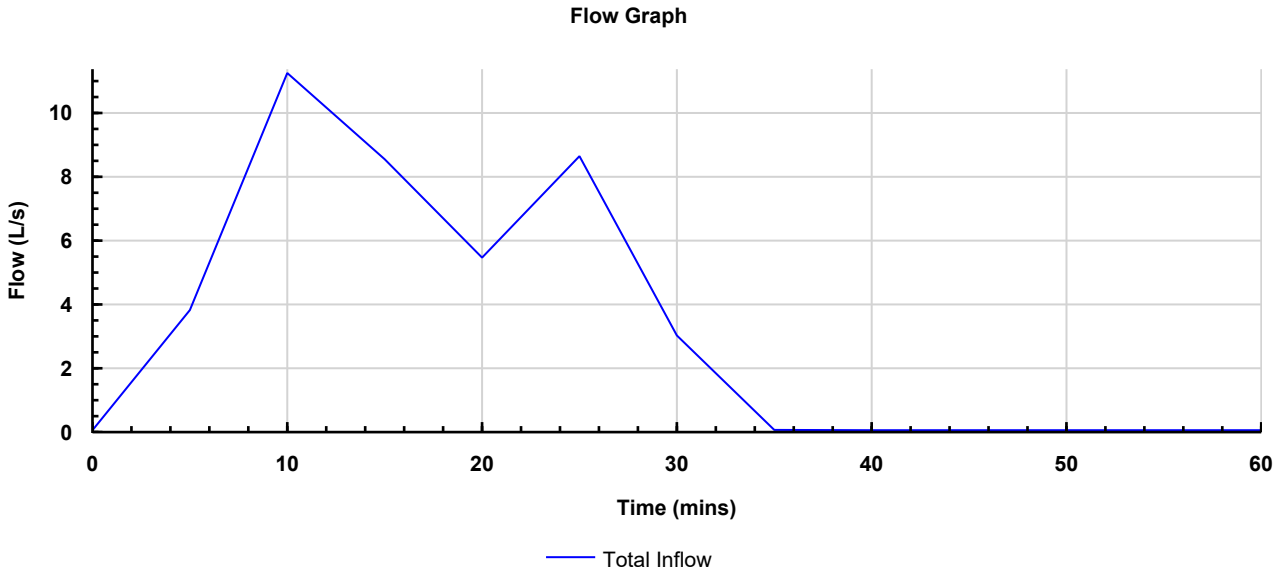
Surface Catchment 20
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	11.3
Total Inflow Volume (m³)	12.188

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.8
10	11.3
15	8.5
20	5.4
25	8.6
30	3.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

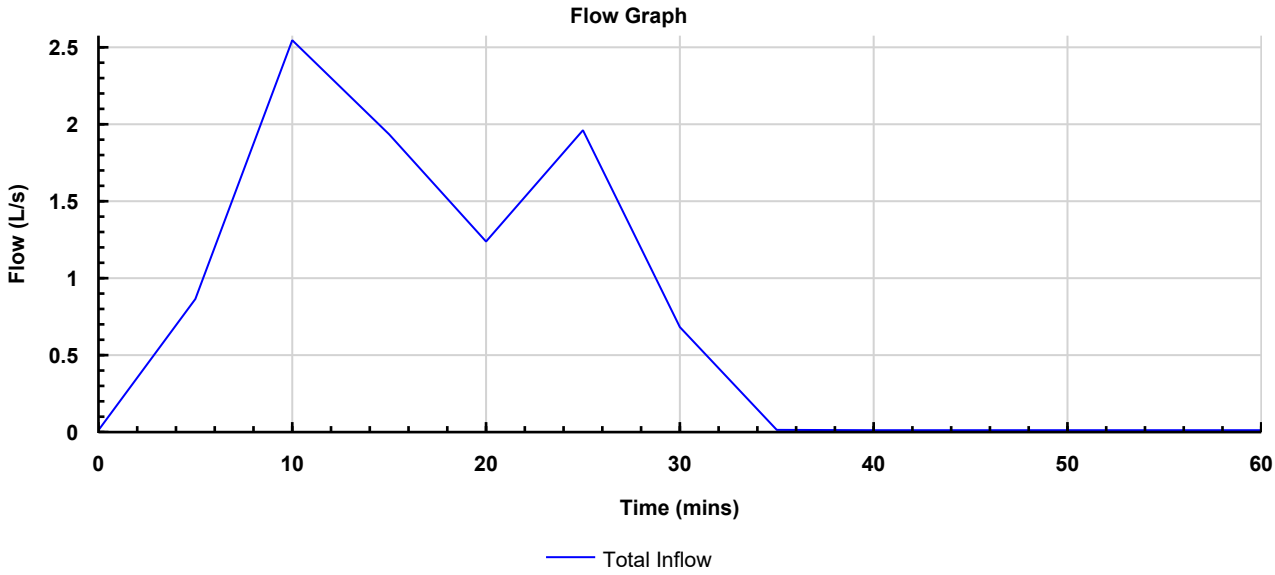
Surface Catchment 21
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	2.5
Total Inflow Volume (m³)	2.759

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.9
10	2.5
15	1.9
20	1.2
25	2.0
30	0.7
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

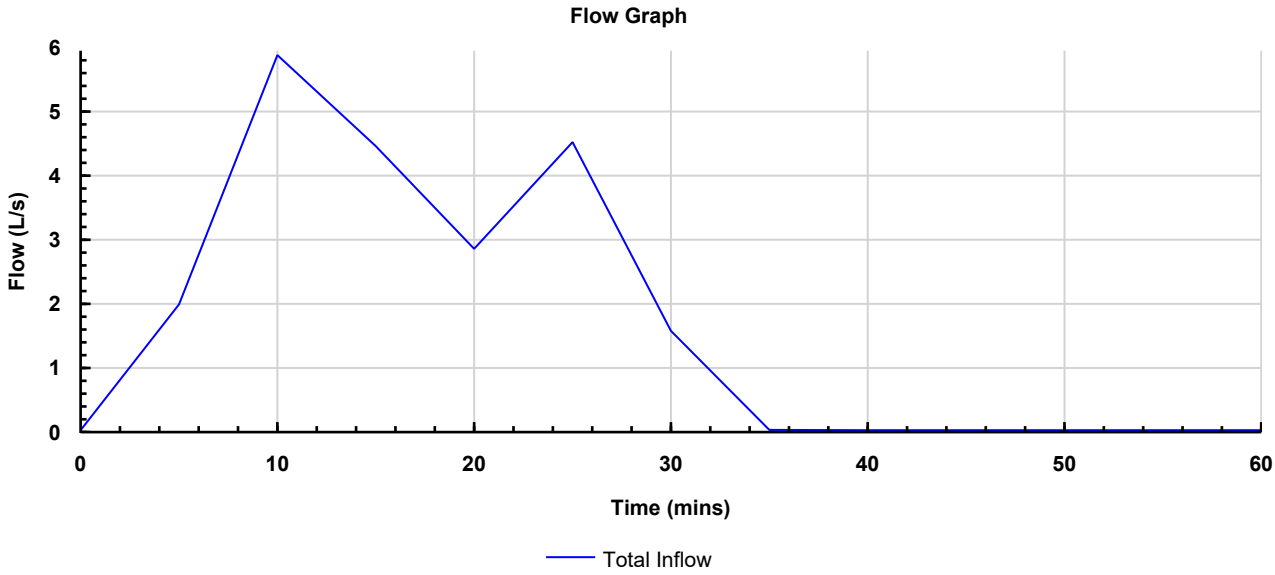
Surface Catchment 4
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	5.9
Total Inflow Volume (m³)	6.367

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.0
10	5.9
15	4.5
20	2.8
25	4.5
30	1.6
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

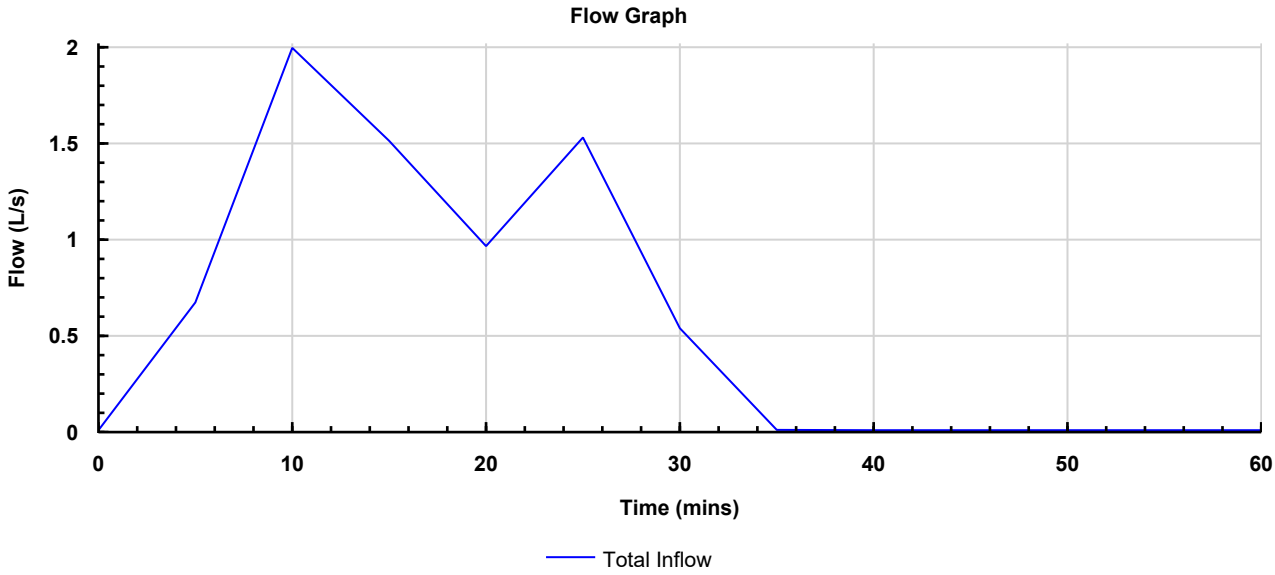
Surface Catchment 3
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	2.0
Total Inflow Volume (m³)	2.159

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.7
10	2.0
15	1.5
20	1.0
25	1.5
30	0.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

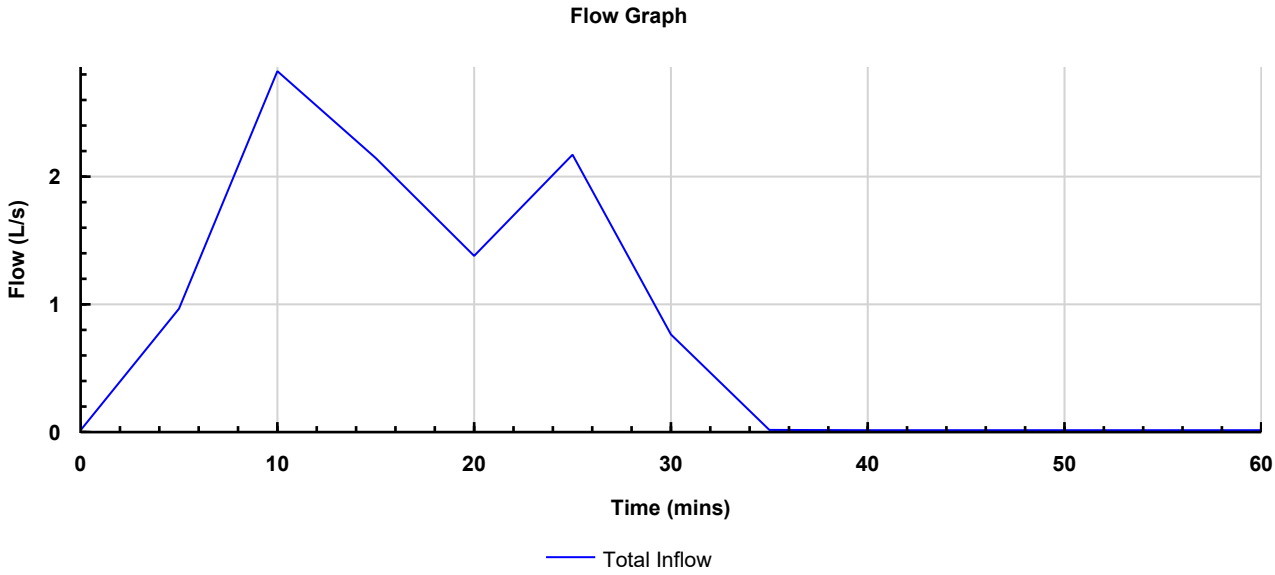
Surface Catchment 16
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	2.8
Total Inflow Volume (m³)	3.065

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.0
10	2.8
15	2.1
20	1.4
25	2.2
30	0.8
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

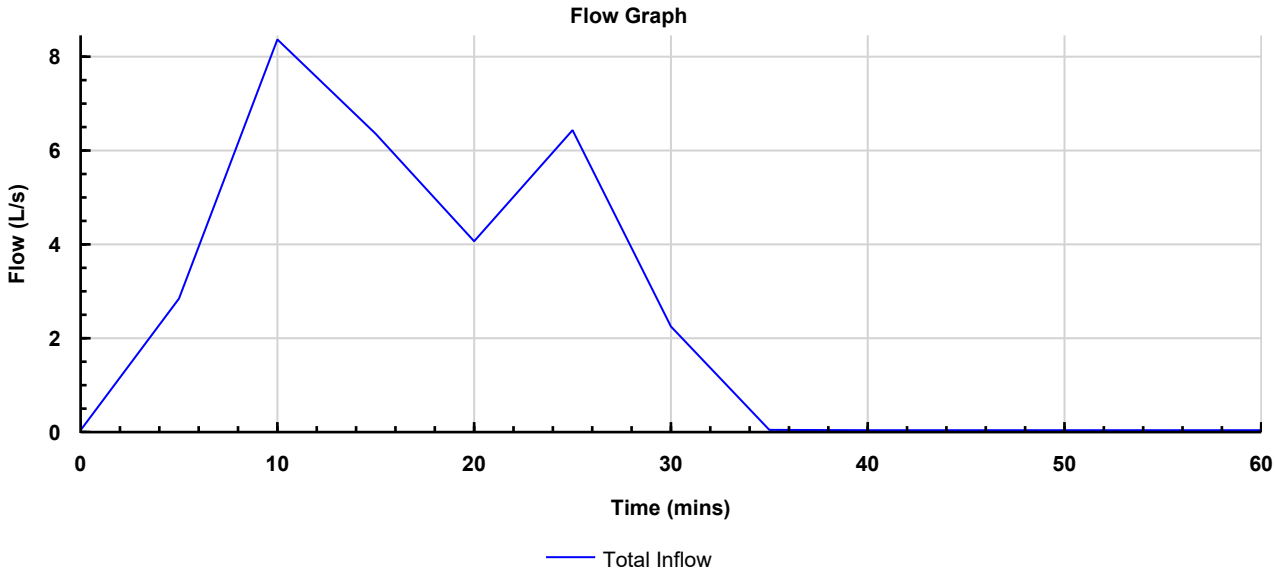
Surface Catchment 17
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	8.4
Total Inflow Volume (m³)	9.066

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.8
10	8.4
15	6.3
20	4.0
25	6.4
30	2.2
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

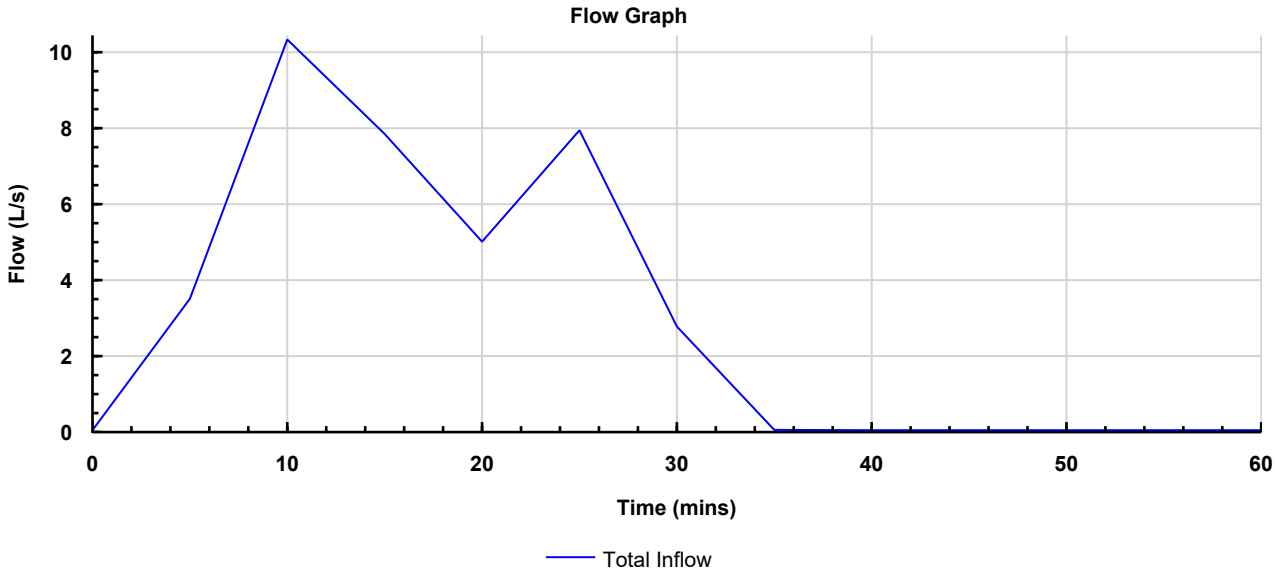
Surface Catchment 6
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	10.3
Total Inflow Volume (m³)	11.192

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	3.5
10	10.3
15	7.8
20	5.0
25	7.9
30	2.7
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

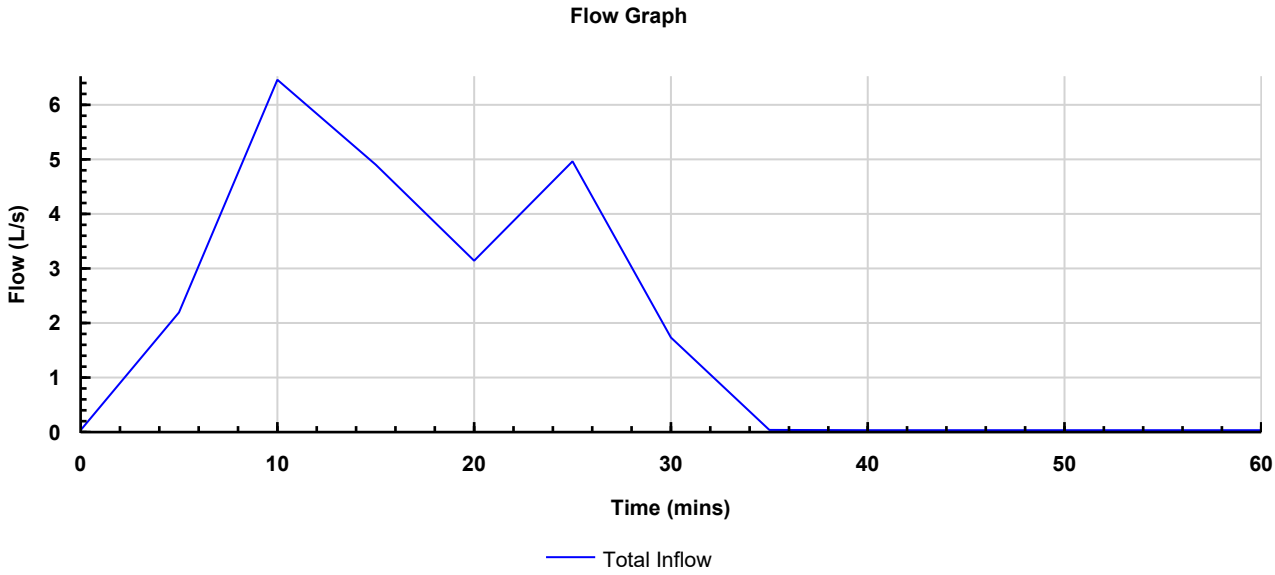
Surface Catchment 22
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	6.5
Total Inflow Volume (m³)	6.994

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.2
10	6.5
15	4.9
20	3.1
25	5.0
30	1.7
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

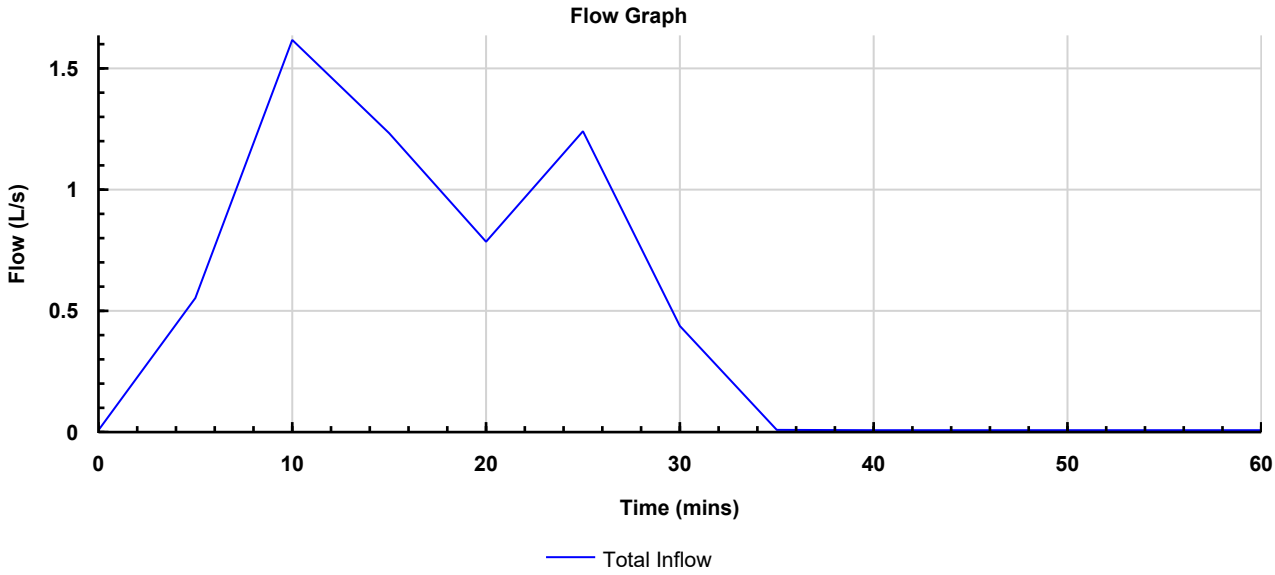
Surface Catchment 5
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	1.6
Total Inflow Volume (m³)	1.754

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.5
10	1.6
15	1.2
20	0.8
25	1.2
30	0.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

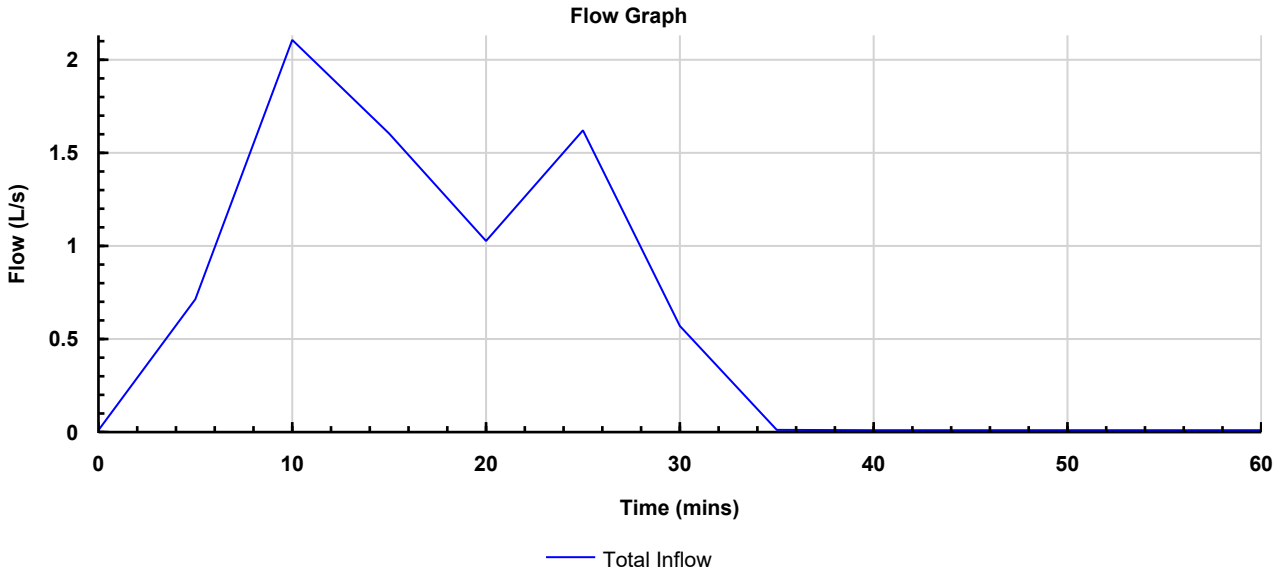
Surface Catchment 8
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	2.1
Total Inflow Volume (m³)	2.285

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.7
10	2.1
15	1.6
20	1.0
25	1.6
30	0.6
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

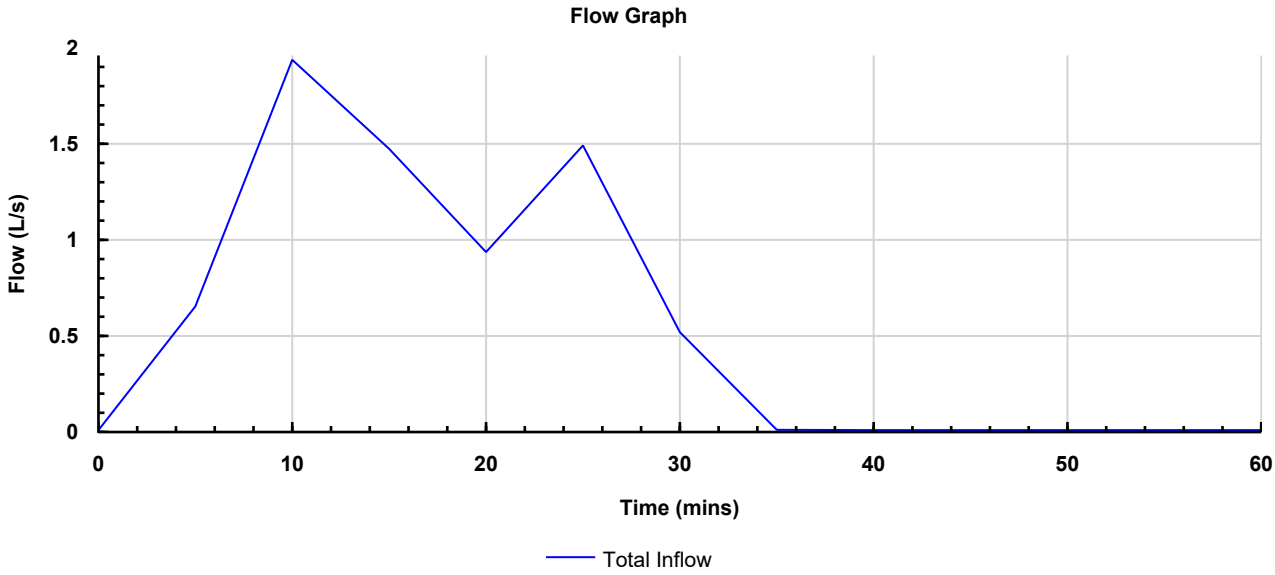
Surface Catchment 23
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	1.9
Total Inflow Volume (m³)	2.096

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.6
10	1.9
15	1.5
20	0.9
25	1.5
30	0.5
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

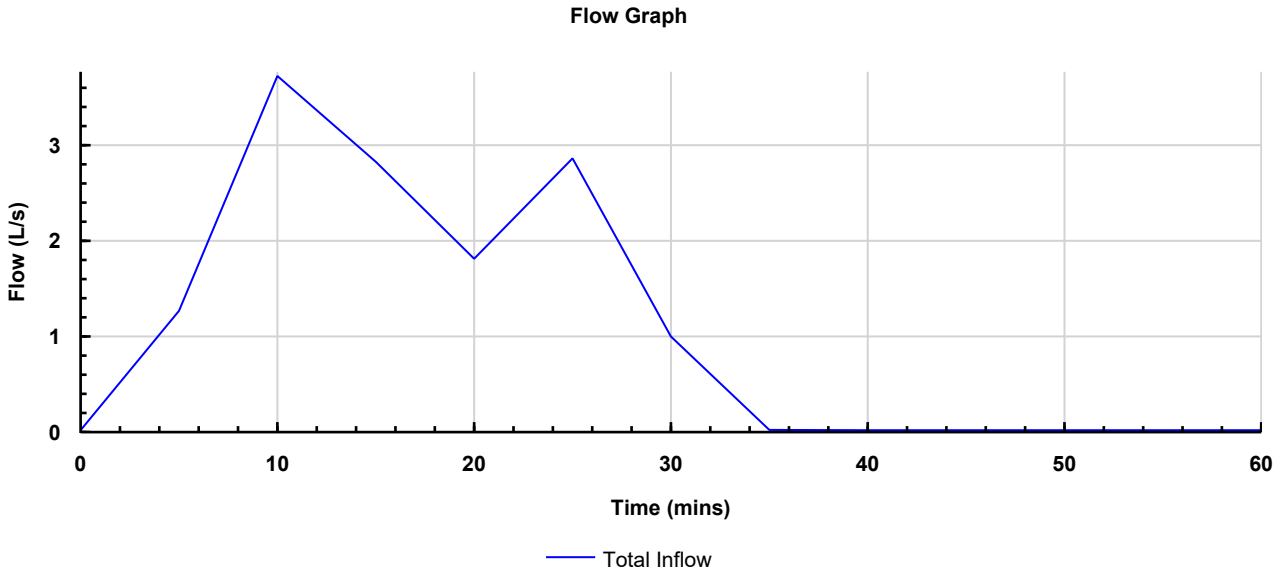
Surface Catchment 28
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	3.7
Total Inflow Volume (m³)	4.034

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.3
10	3.7
15	2.8
20	1.8
25	2.9
30	1.0
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

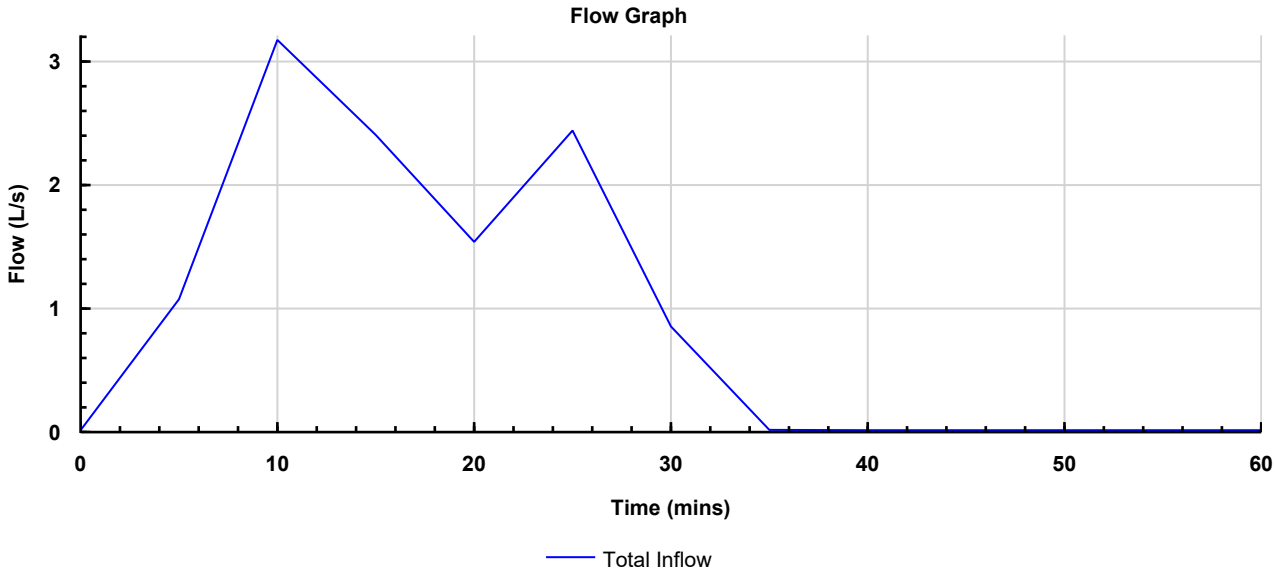
Surface Catchment 24
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	3.2
Total Inflow Volume (m³)	3.437

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.1
10	3.2
15	2.4
20	1.5
25	2.4
30	0.8
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

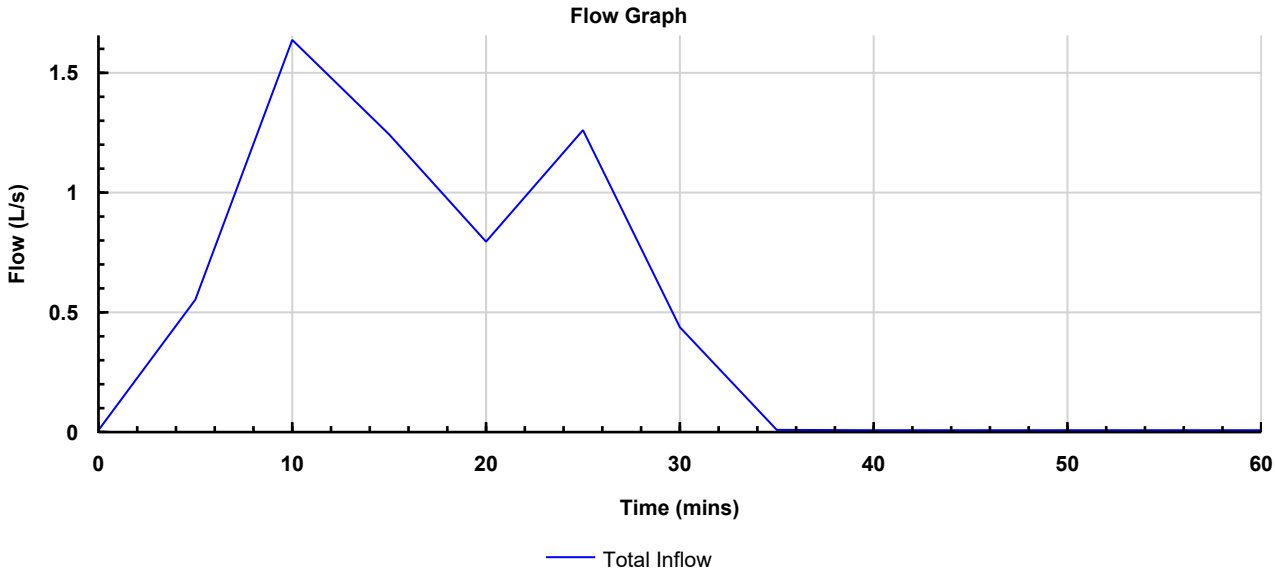
Surface Catchment 25
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	1.6
Total Inflow Volume (m³)	1.772

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.5
10	1.6
15	1.2
20	0.8
25	1.3
30	0.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops: Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	Date: 05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Inflow Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

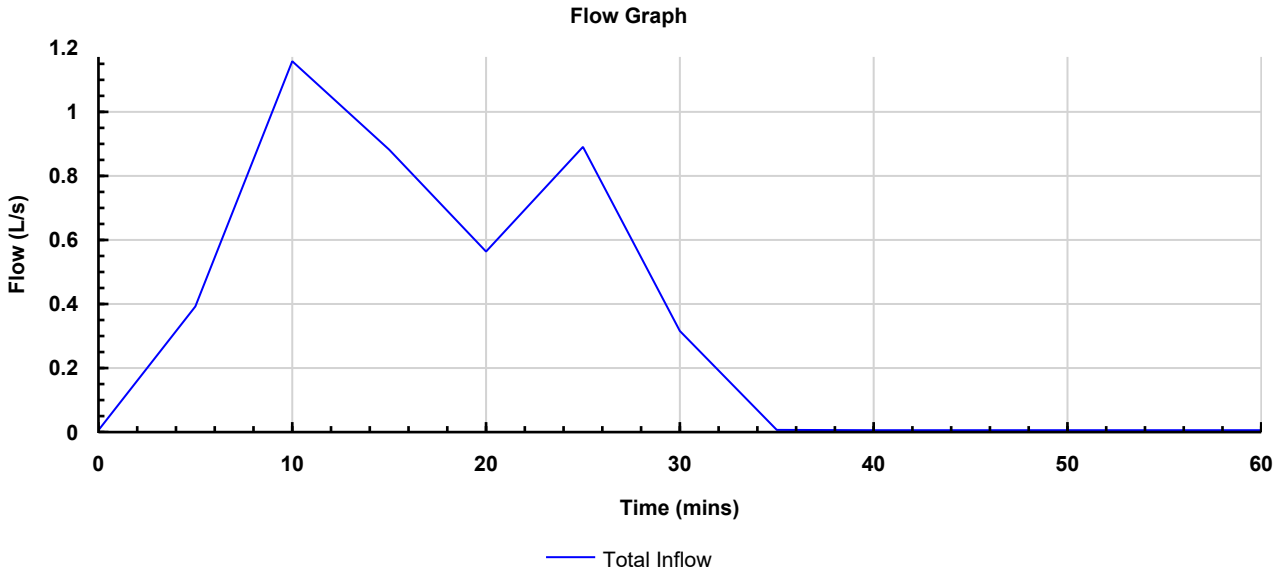
Surface Catchment 26
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	1.2
Total Inflow Volume (m³)	1.257

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.4
10	1.2
15	0.9
20	0.6
25	0.9
30	0.3
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Inflow Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

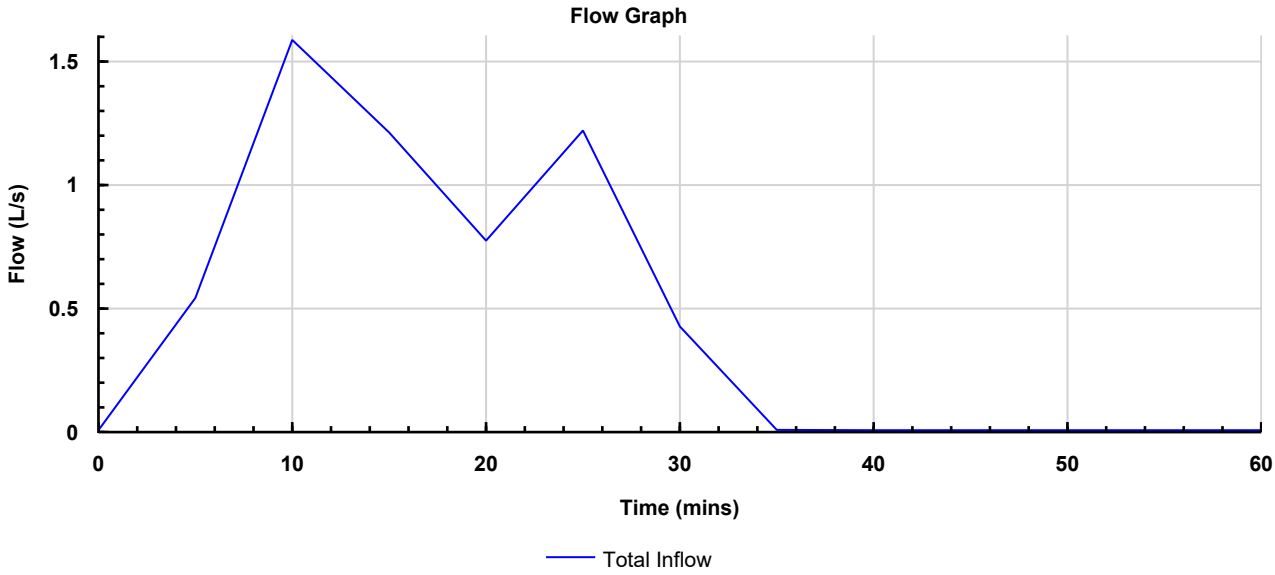
Surface Catchment 19
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	1.6
Total Inflow Volume (m^3)	1.724

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.5
10	1.6
15	1.2
20	0.8
25	1.2
30	0.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

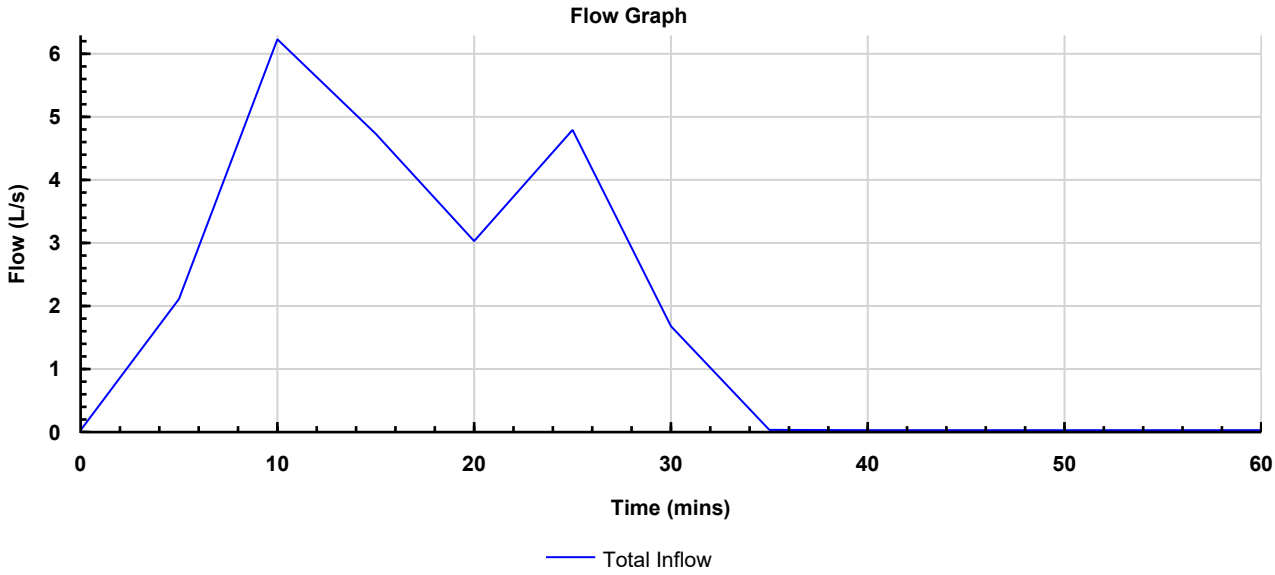
Surface Catchment 27
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	6.2
Total Inflow Volume (m³)	6.751

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	2.1
10	6.2
15	4.7
20	3.0
25	4.8
30	1.7
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

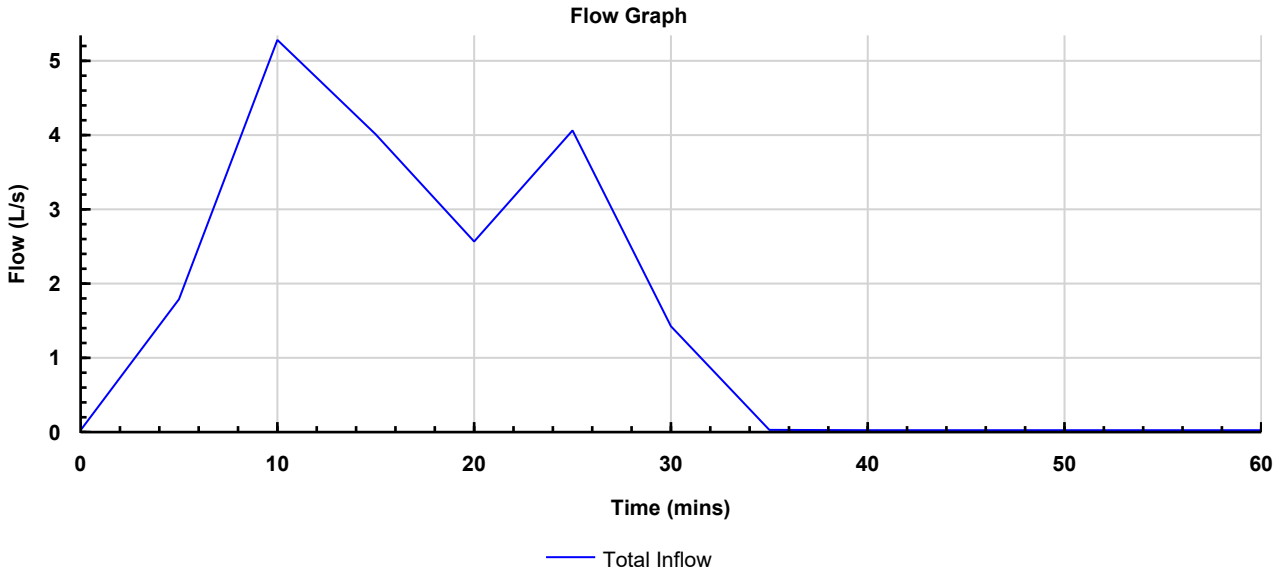
Surface Catchment 10
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	5.3
Total Inflow Volume (m³)	5.722

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	1.8
10	5.3
15	4.0
20	2.6
25	4.1
30	1.4
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Inflow Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

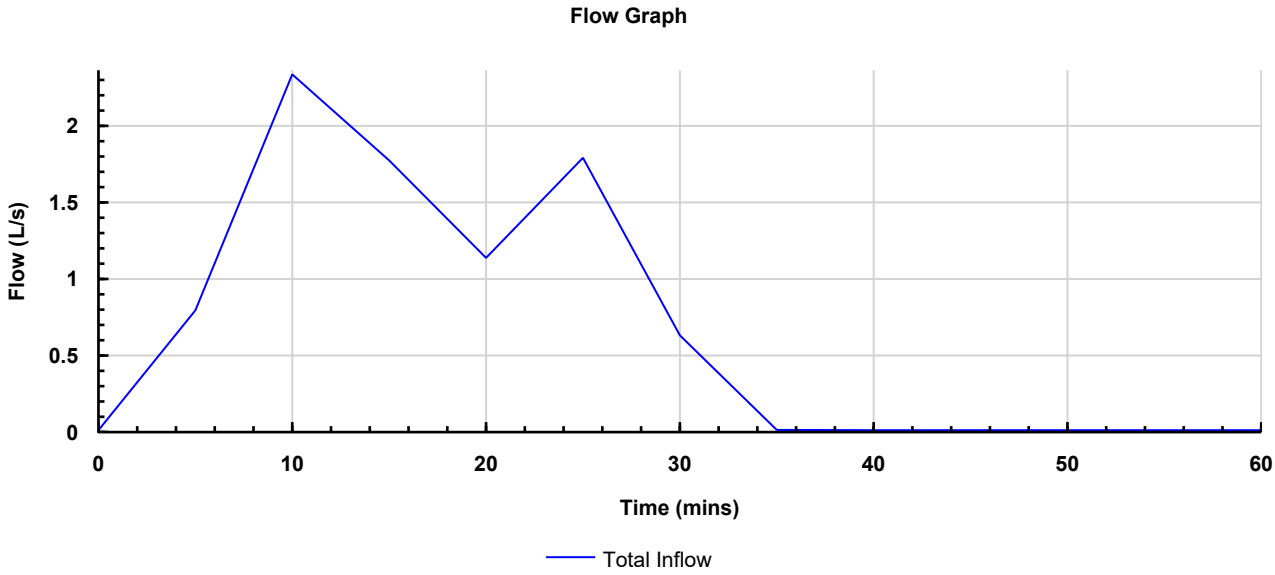
Surface Catchment 15
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Catchment Area

Inflow

Max. Inflow (L/s)	2.3
Total Inflow Volume (m³)	2.531

Graphs



Tables

Time (mins)	Total Inflow (L/s)
0	0.0
5	0.8
10	2.3
15	1.8
20	1.1
25	1.8
30	0.6
35	0.0
40	0.0
45	0.0
50	0.0
55	0.0
60	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

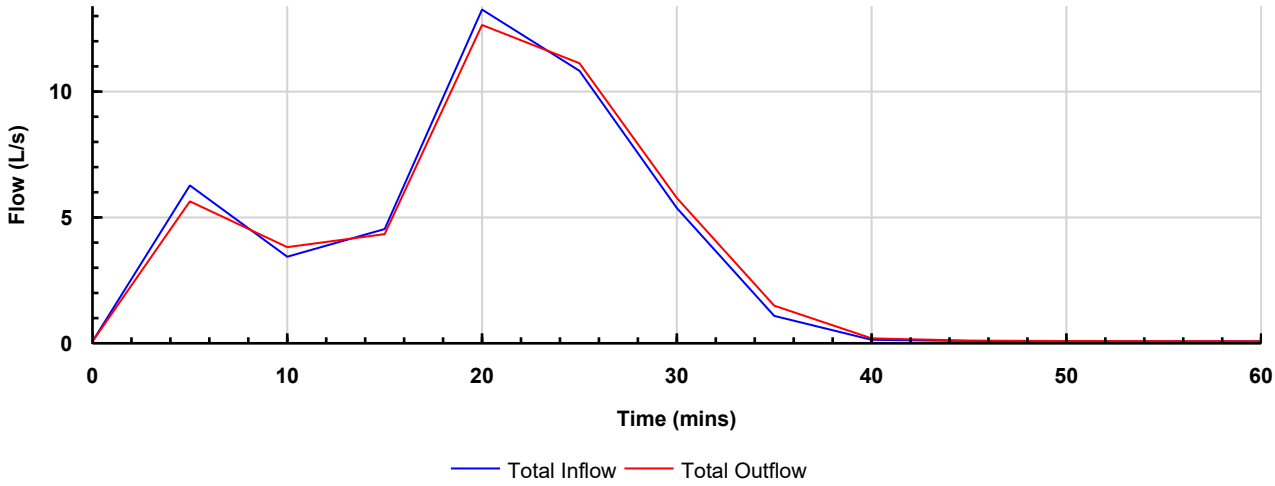


P9.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

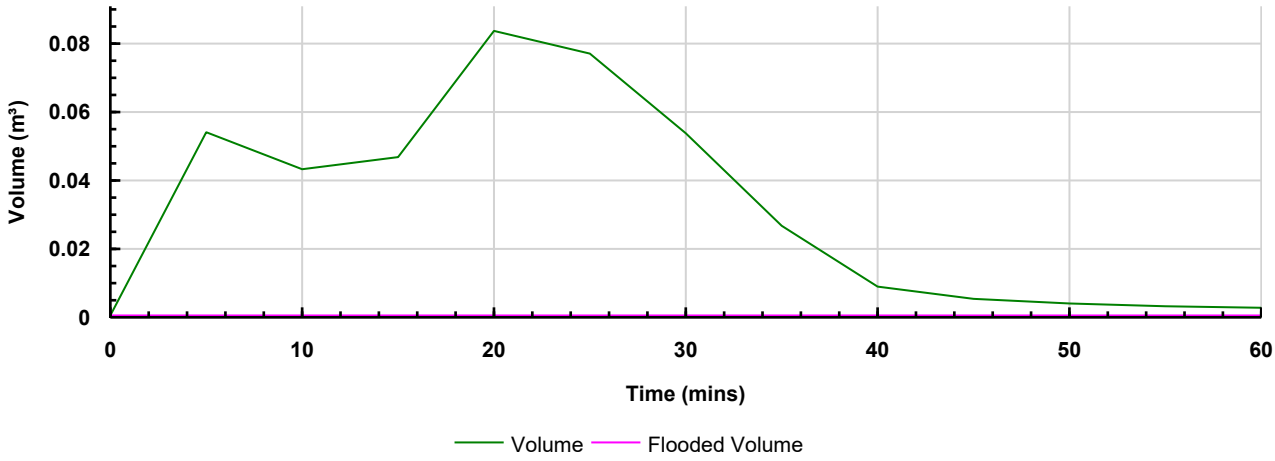
Type : Manhole

Graphs

Flow Graph

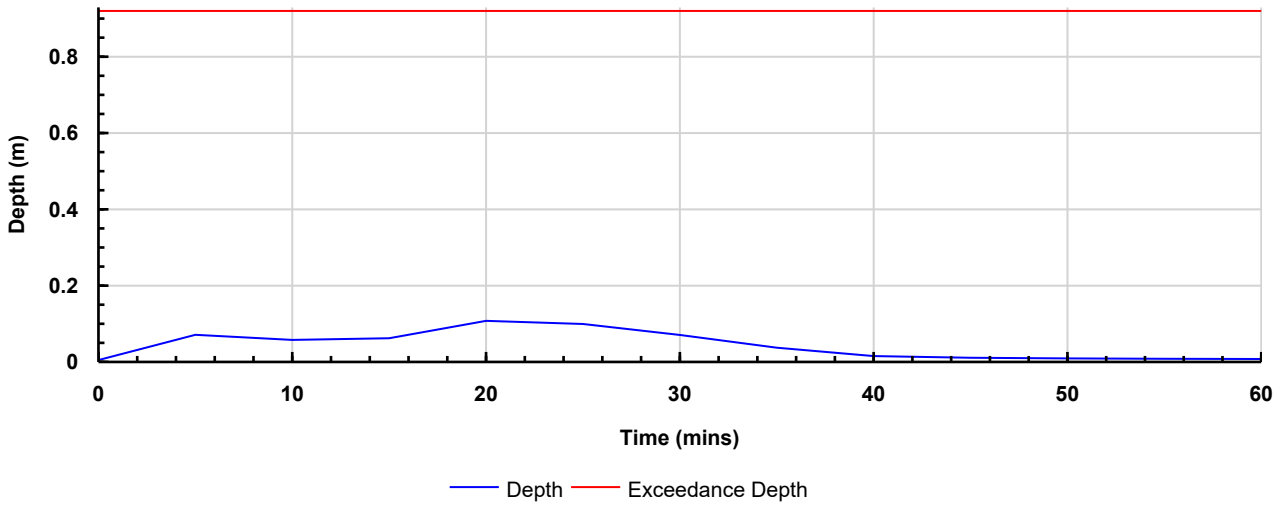


Volume Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	6.2	0.067	0.054	0.000	5.6
10	3.4	0.053	0.043	0.000	3.8
15	4.5	0.057	0.047	0.000	4.3
20	13.3	0.103	0.084	0.000	12.6
25	10.8	0.095	0.077	0.000	11.1
30	5.3	0.066	0.054	0.000	5.7
35	1.0	0.033	0.026	0.000	1.4
40	0.1	0.010	0.008	0.000	0.1
45	0.0	0.006	0.005	0.000	0.0
50	0.0	0.004	0.004	0.000	0.0
55	0.0	0.003	0.003	0.000	0.0
60	0.0	0.003	0.002	0.000	0.0

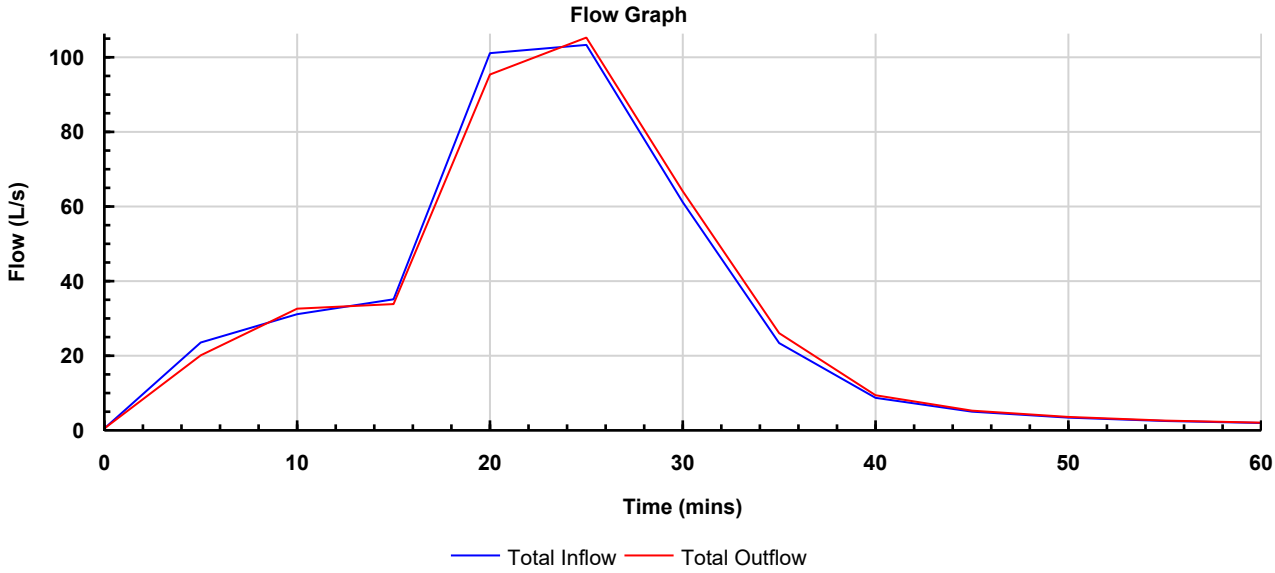
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

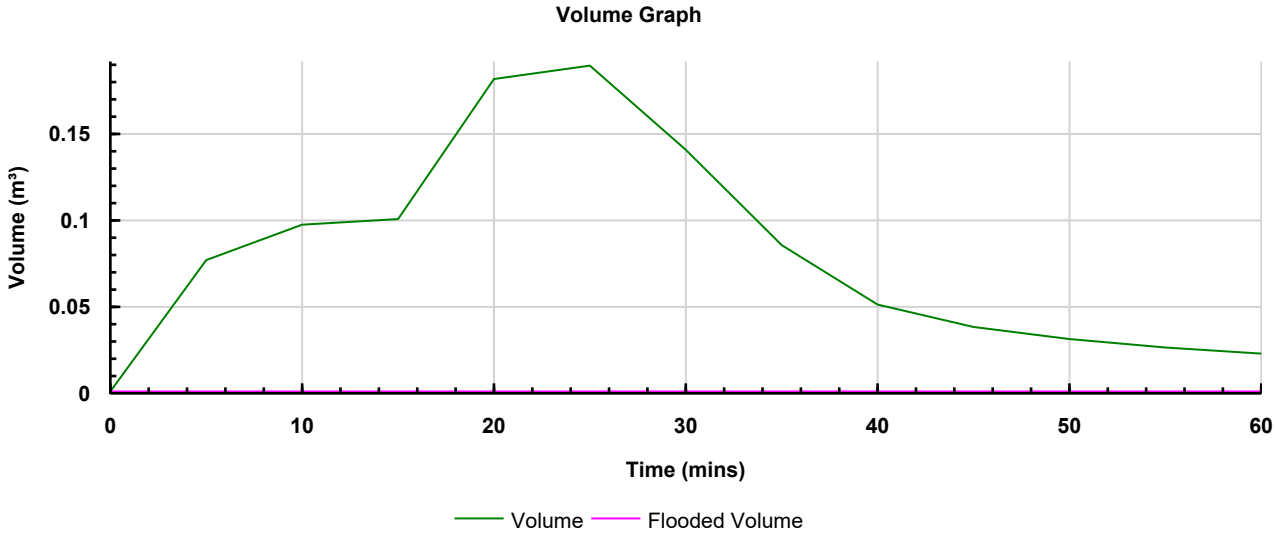


P1.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

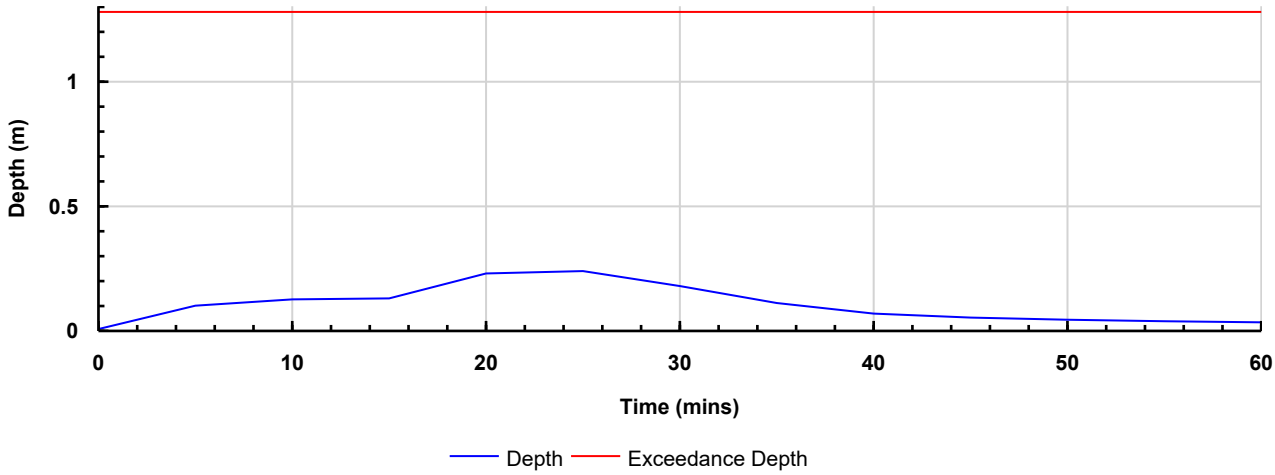
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

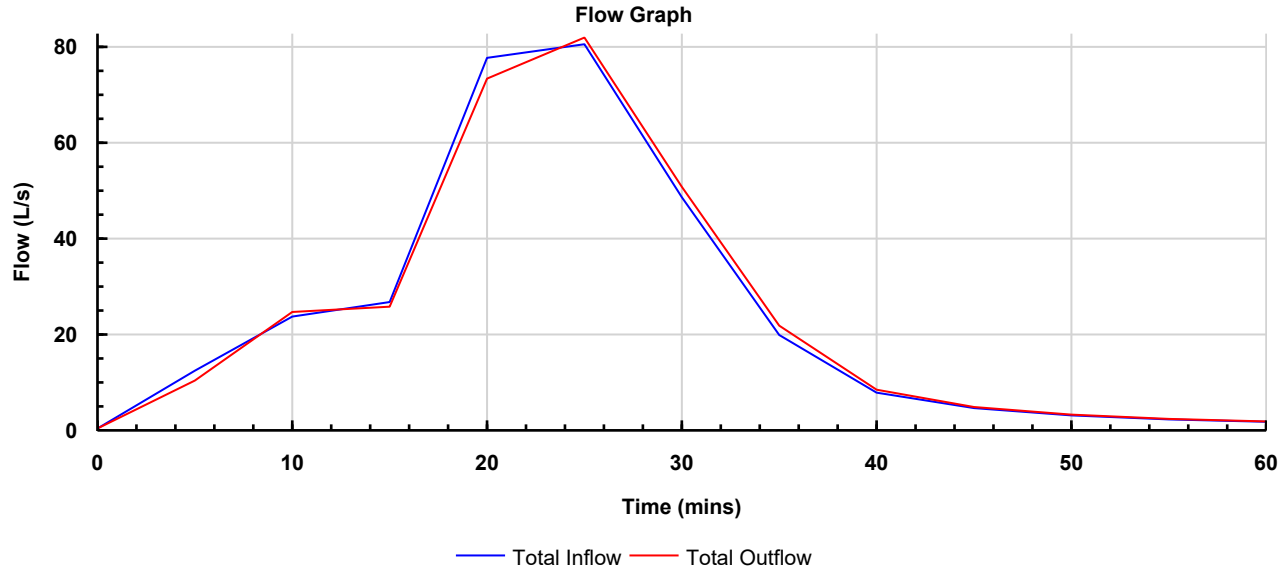
Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	23.2	0.094	0.076	0.000	19.7
10	30.8	0.120	0.097	0.000	32.3
15	34.8	0.124	0.100	0.000	33.5
20	101.1	0.224	0.182	0.000	95.3
25	103.3	0.234	0.190	0.000	105.3
30	60.9	0.174	0.141	0.000	63.9
35	23.0	0.105	0.085	0.000	25.7
40	8.2	0.062	0.051	0.000	8.9
45	4.5	0.046	0.038	0.000	4.8
50	2.9	0.038	0.030	0.000	3.1
55	2.0	0.032	0.026	0.000	2.1
60	1.5	0.027	0.022	0.000	1.6

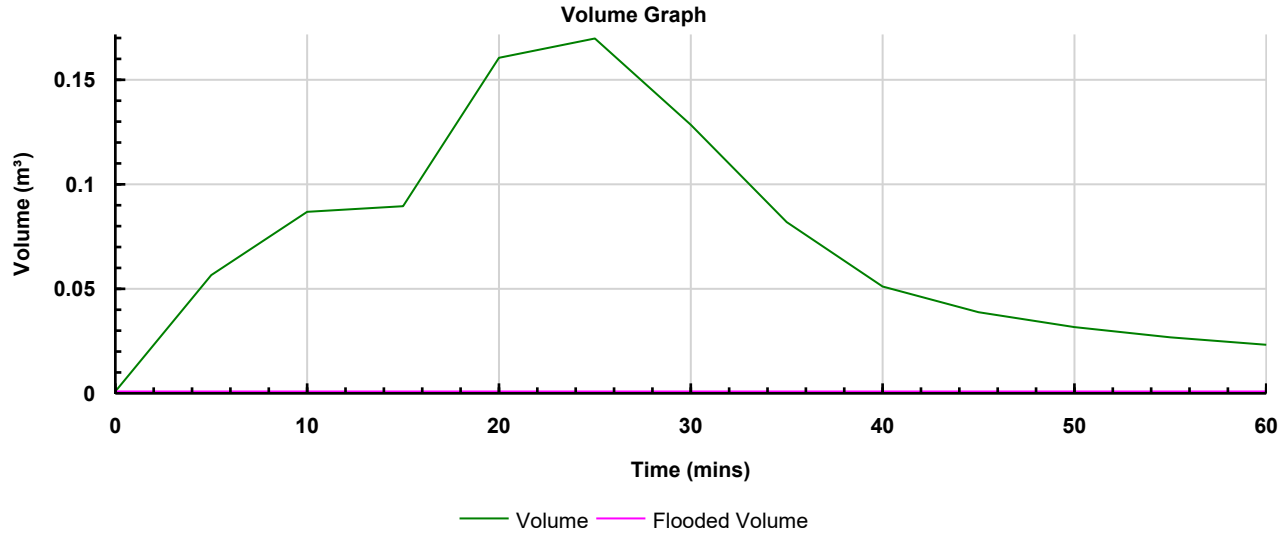
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

P13.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

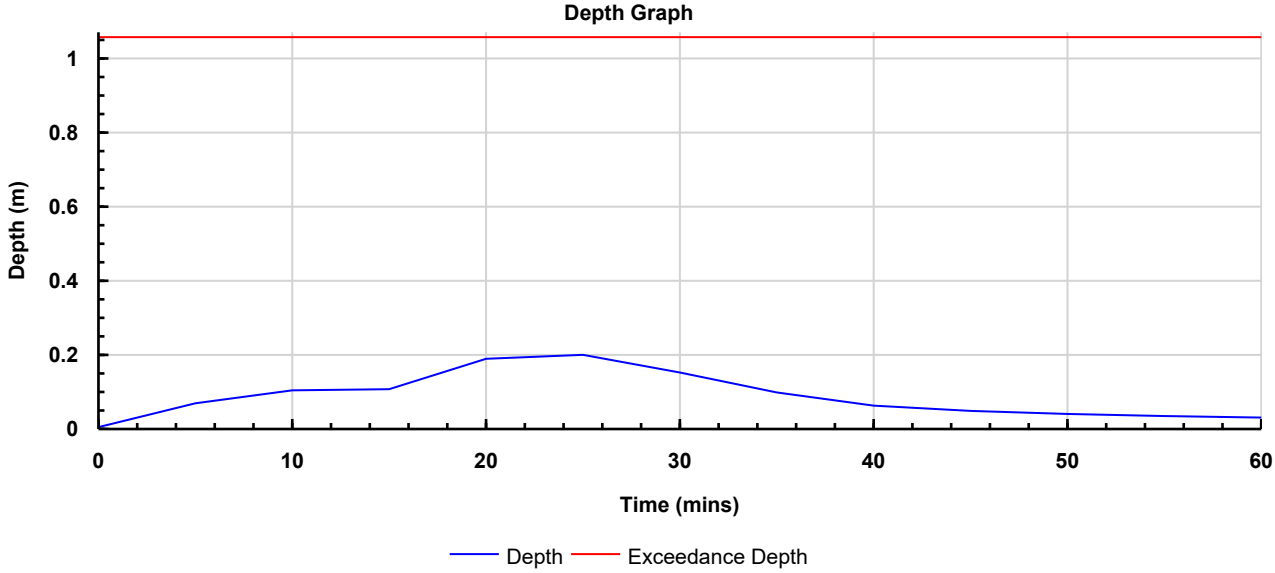
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	12.1	0.065	0.056	0.000	10.0
10	23.5	0.100	0.086	0.000	24.4
15	26.5	0.103	0.089	0.000	25.5
20	77.7	0.185	0.160	0.000	73.3
25	80.5	0.196	0.170	0.000	81.9
30	48.5	0.148	0.128	0.000	50.7
35	19.6	0.094	0.081	0.000	21.6
40	7.5	0.058	0.050	0.000	8.1
45	4.3	0.044	0.038	0.000	4.5
50	2.7	0.036	0.031	0.000	2.9
55	1.9	0.030	0.026	0.000	2.0
60	1.4	0.026	0.022	0.000	1.5

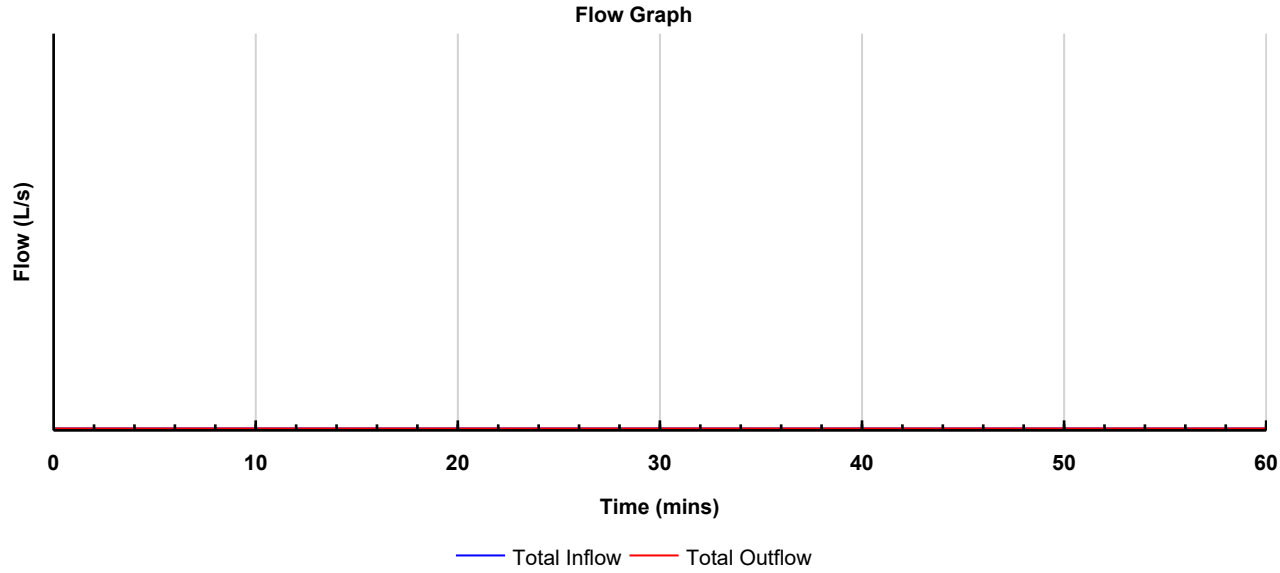
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

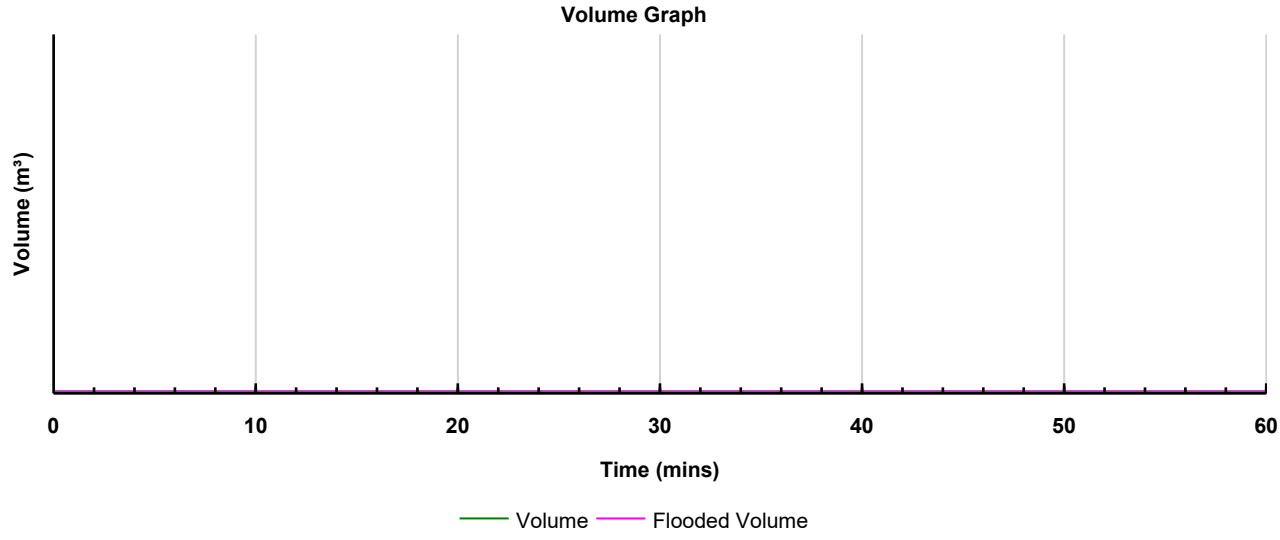


P9.00
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 1

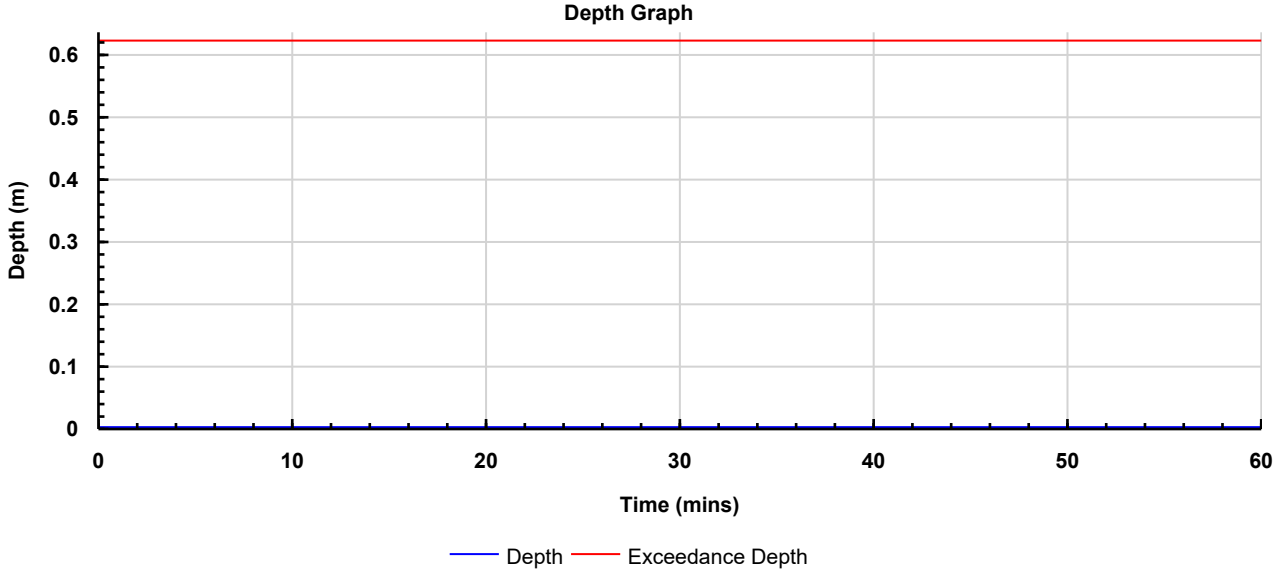
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.000	0.000	0.000	0.0
20	0.0	0.000	0.000	0.000	0.0
25	0.0	0.000	0.000	0.000	0.0
30	0.0	0.000	0.000	0.000	0.0
35	0.0	0.000	0.000	0.000	0.0
40	0.0	0.000	0.000	0.000	0.0
45	0.0	0.000	0.000	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

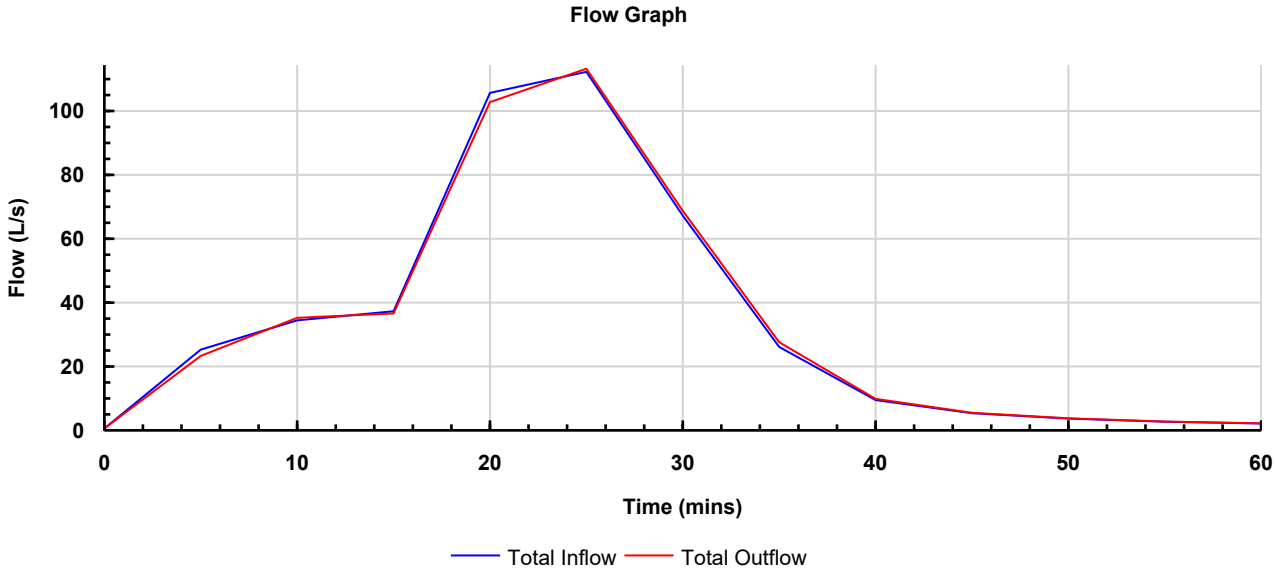
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

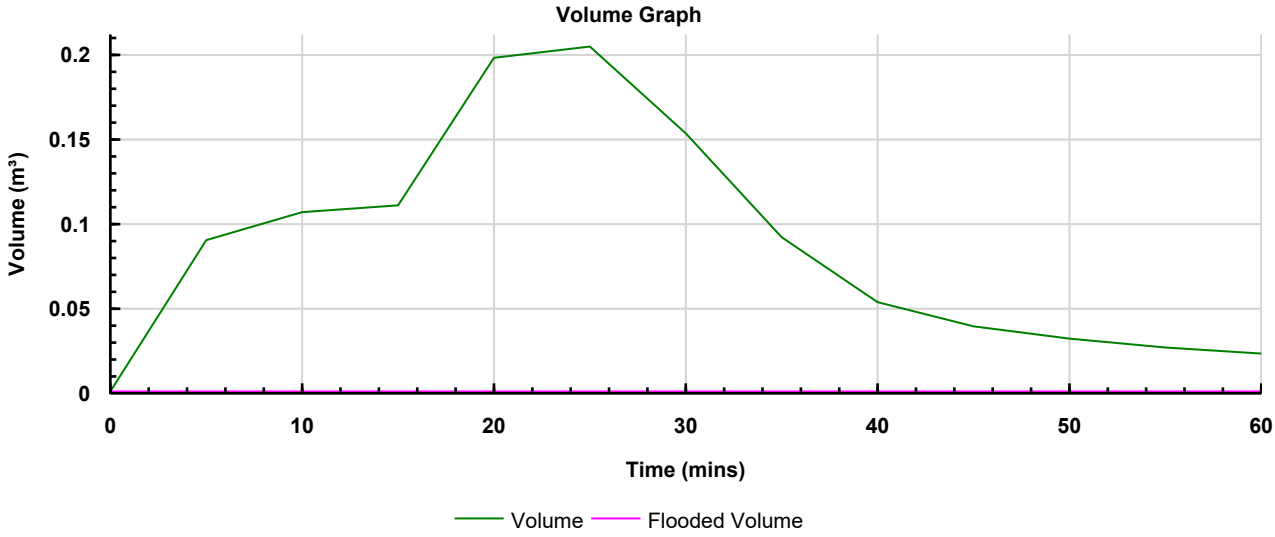


P1.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

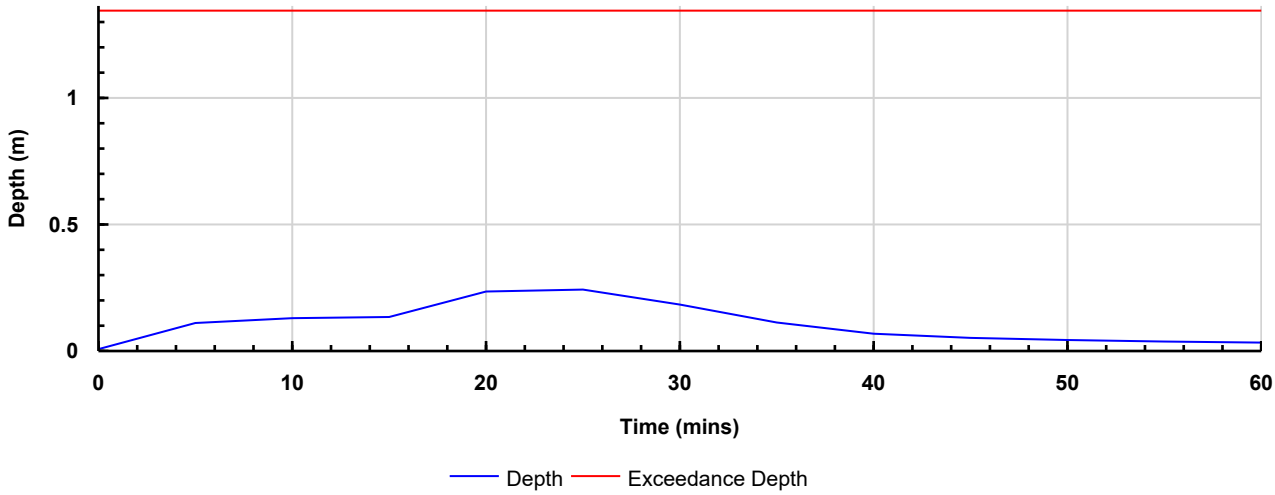
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	24.8	0.104	0.090	0.000	22.8
10	34.0	0.123	0.107	0.000	34.8
15	36.9	0.128	0.111	0.000	36.2
20	105.6	0.229	0.198	0.000	102.7
25	112.3	0.237	0.205	0.000	113.2
30	67.0	0.177	0.153	0.000	68.5
35	25.7	0.106	0.092	0.000	27.2
40	8.9	0.061	0.053	0.000	9.3
45	4.8	0.045	0.039	0.000	4.9
50	3.1	0.036	0.031	0.000	3.2
55	2.1	0.030	0.026	0.000	2.2
60	1.6	0.026	0.023	0.000	1.6

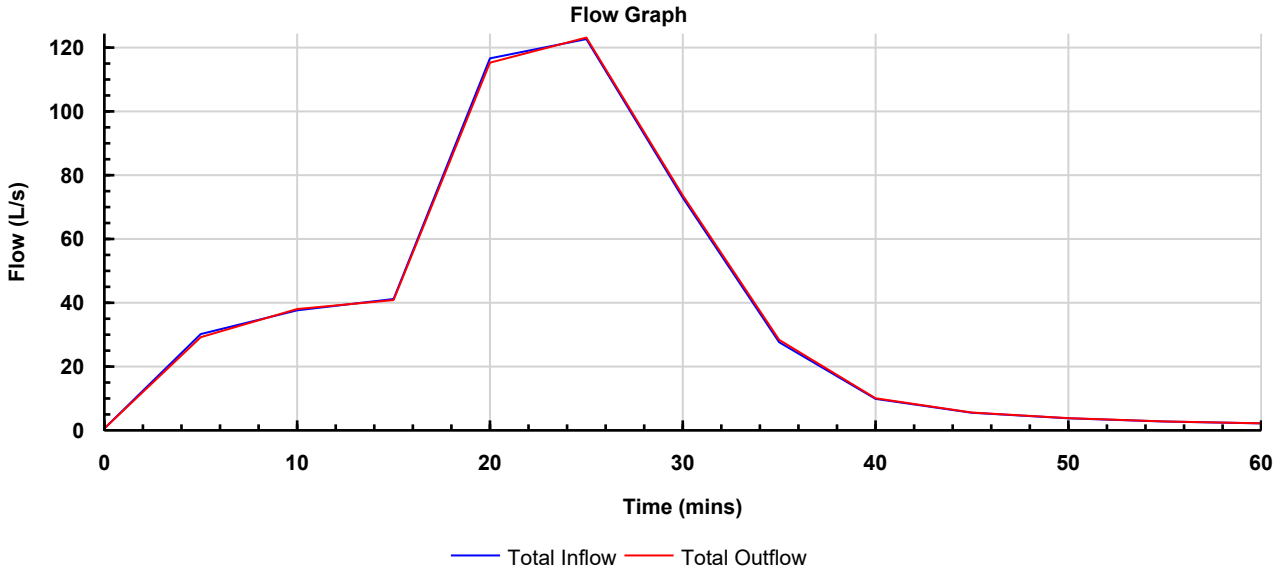
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

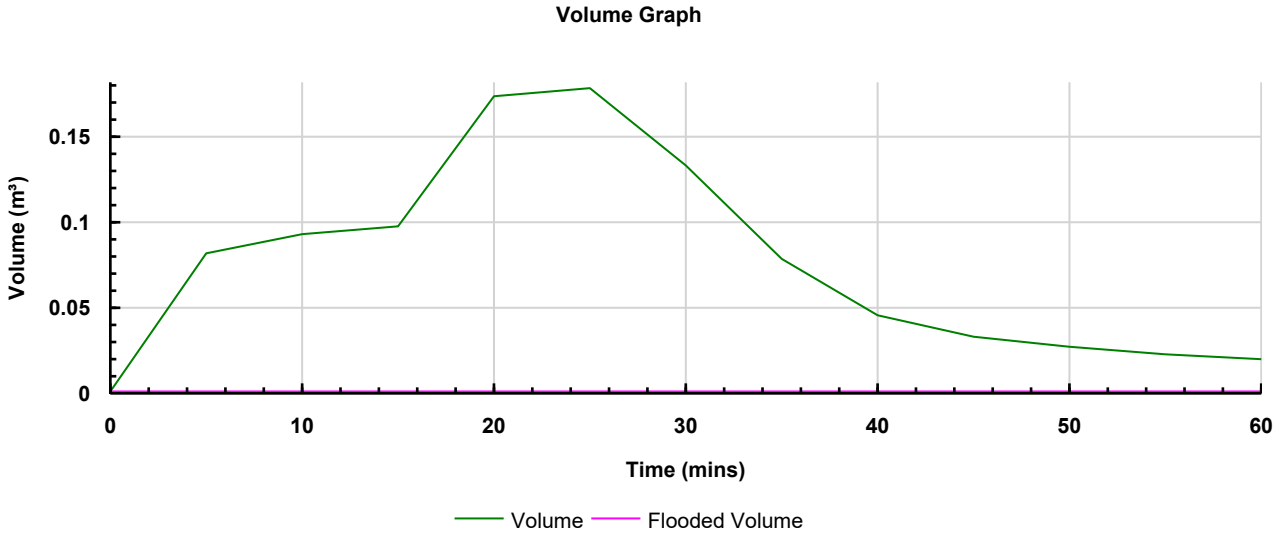


P1.05
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

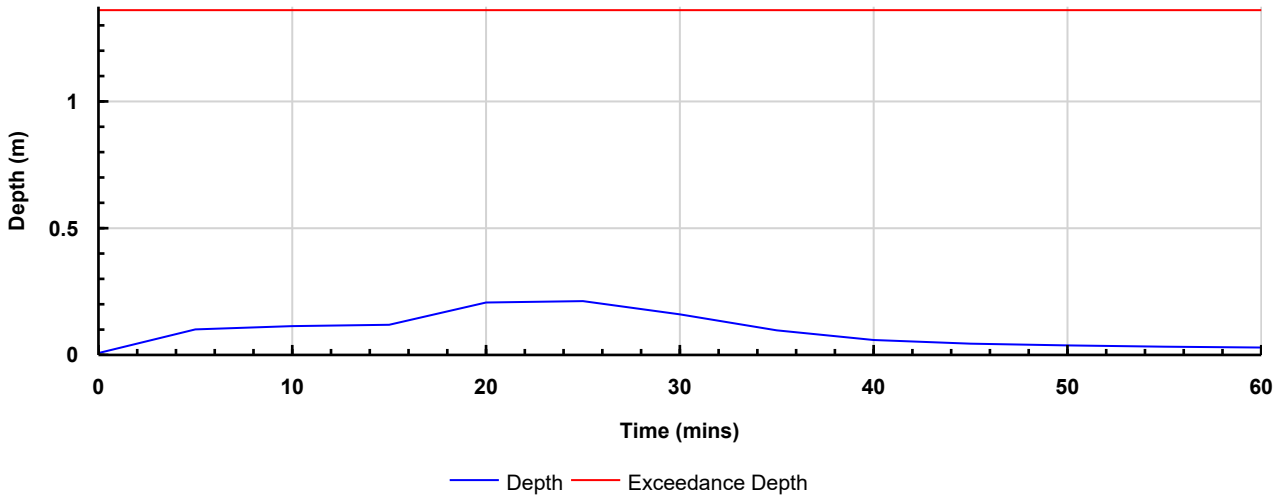
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	29.7	0.094	0.081	0.000	28.8
10	37.2	0.107	0.093	0.000	37.6
15	40.8	0.112	0.097	0.000	40.4
20	116.6	0.200	0.174	0.000	115.2
25	122.7	0.206	0.178	0.000	123.1
30	72.7	0.153	0.133	0.000	73.4
35	27.2	0.090	0.078	0.000	27.9
40	9.3	0.052	0.045	0.000	9.5
45	4.9	0.037	0.032	0.000	5.0
50	3.2	0.030	0.026	0.000	3.3
55	2.2	0.025	0.022	0.000	2.2
60	1.6	0.022	0.019	0.000	1.6

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

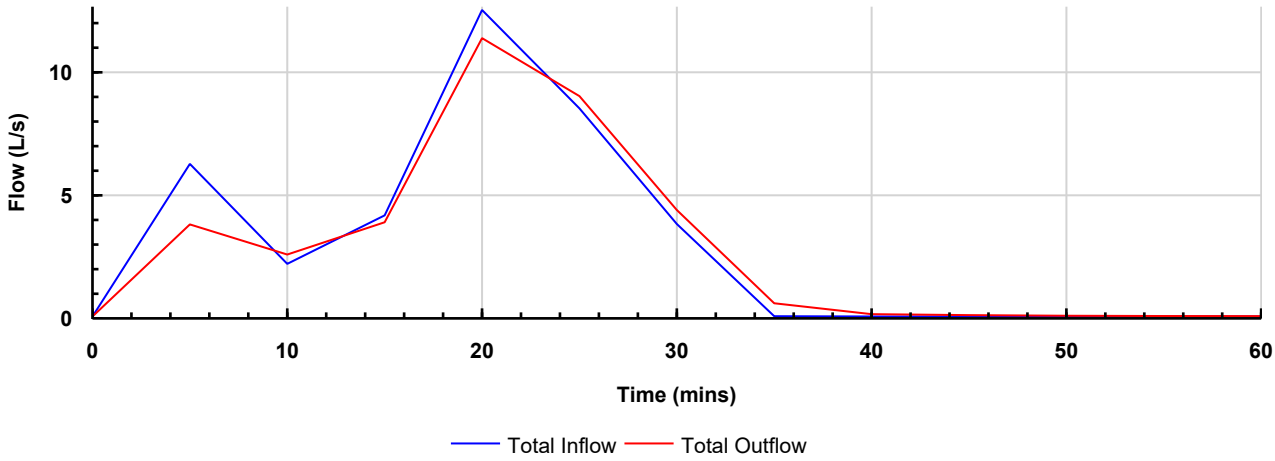


P10.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

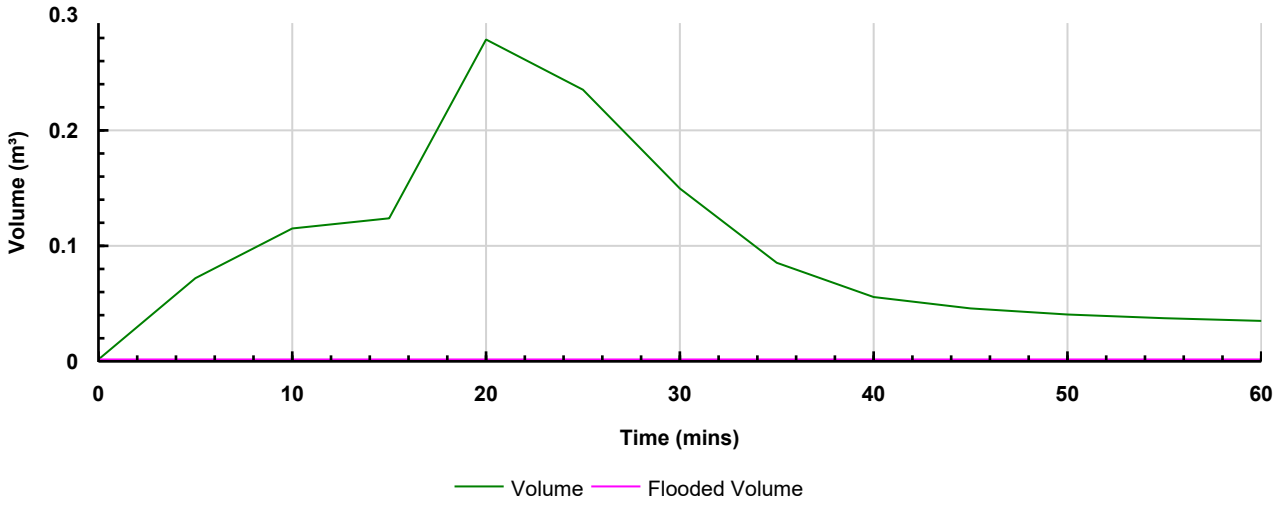
Type : Manhole

Graphs

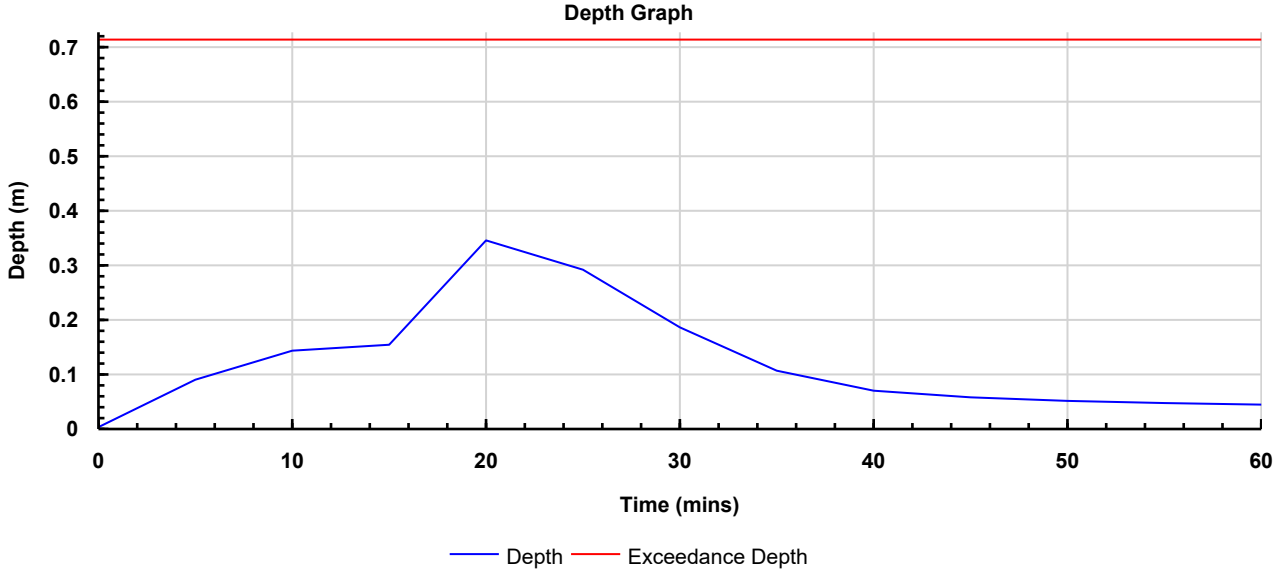
Flow Graph



Volume Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	6.2	0.087	0.071	0.000	3.8
10	2.2	0.141	0.114	0.000	2.5
15	4.1	0.152	0.123	0.000	3.9
20	12.5	0.344	0.279	0.000	11.4
25	8.5	0.290	0.235	0.000	9.0
30	3.8	0.184	0.149	0.000	4.4
35	0.0	0.104	0.084	0.000	0.5
40	0.0	0.067	0.054	0.000	0.1
45	0.0	0.055	0.044	0.000	0.1
50	0.0	0.048	0.039	0.000	0.0
55	0.0	0.044	0.036	0.000	0.0
60	0.0	0.041	0.034	0.000	0.0

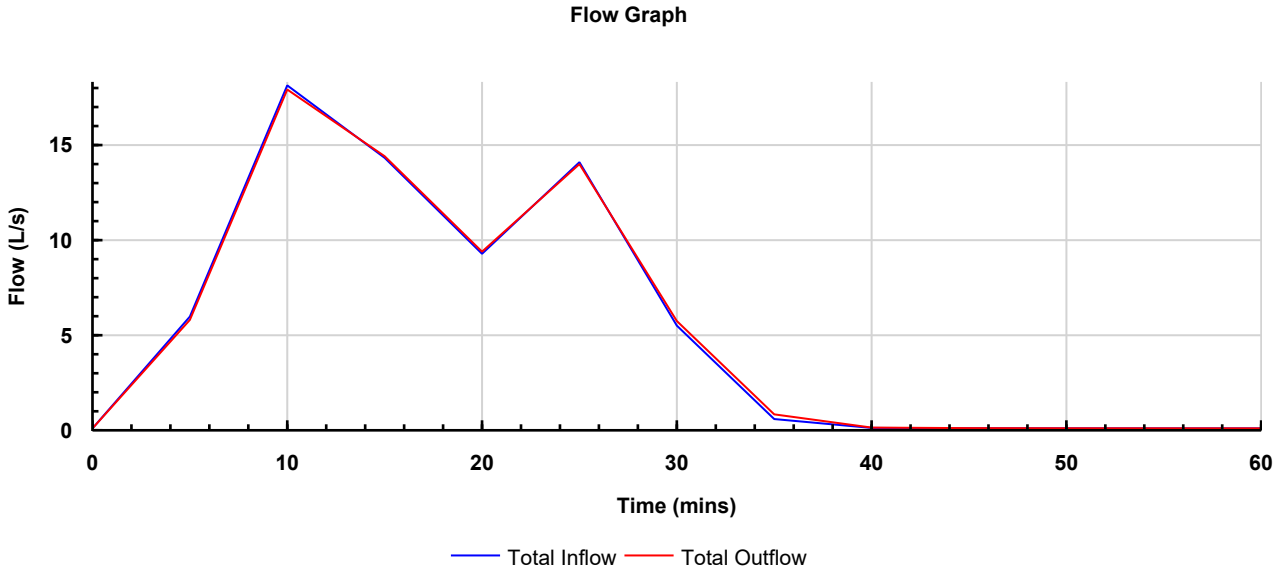
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

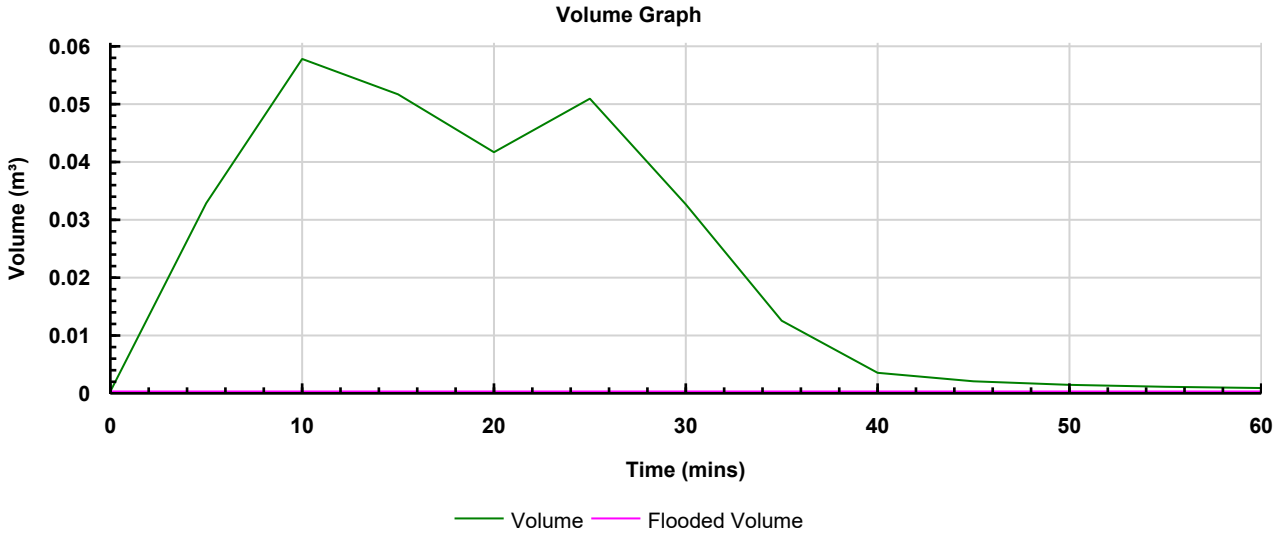


P7.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

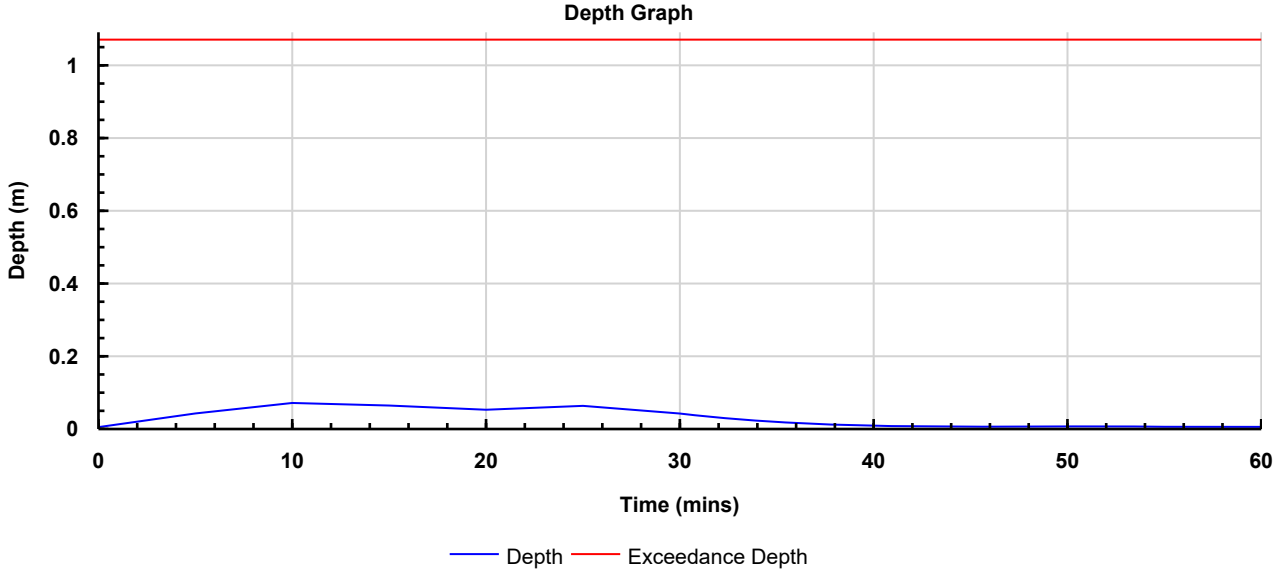
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	5.9	0.038	0.033	0.000	5.7
10	18.1	0.067	0.058	0.000	17.9
15	14.3	0.060	0.052	0.000	14.4
20	9.2	0.048	0.042	0.000	9.3
25	14.1	0.059	0.051	0.000	14.0
30	5.4	0.038	0.033	0.000	5.7
35	0.5	0.014	0.012	0.000	0.7
40	0.0	0.004	0.003	0.000	0.0
45	0.0	0.002	0.002	0.000	0.0
50	0.0	0.001	0.001	0.000	0.0
55	0.0	0.001	0.001	0.000	0.0
60	0.0	0.001	0.001	0.000	0.0

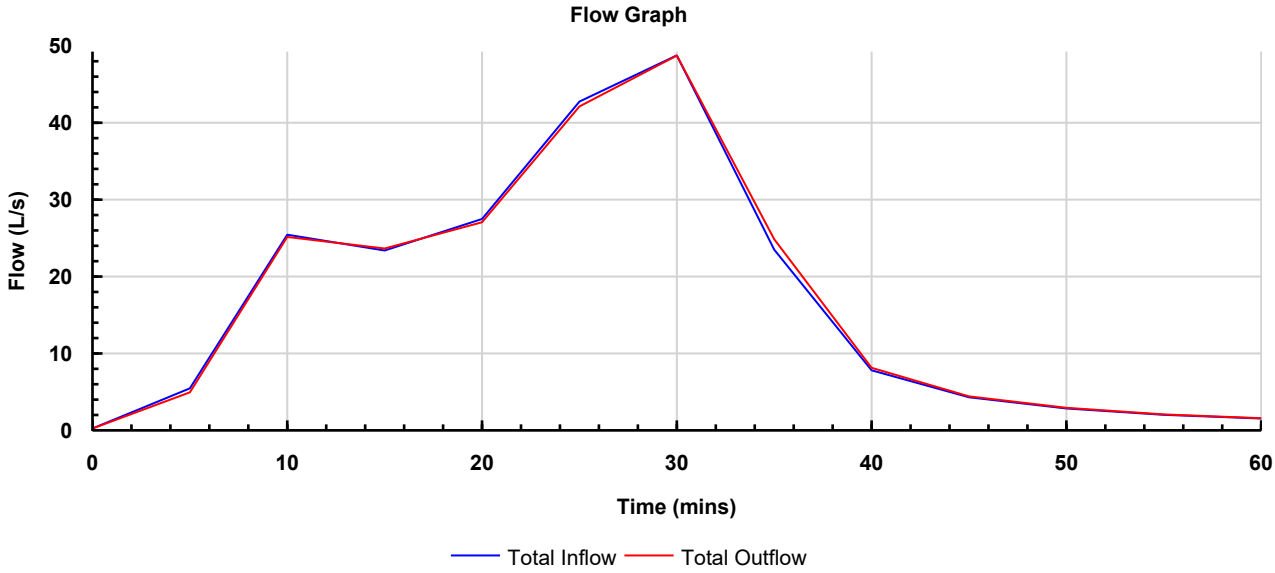
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

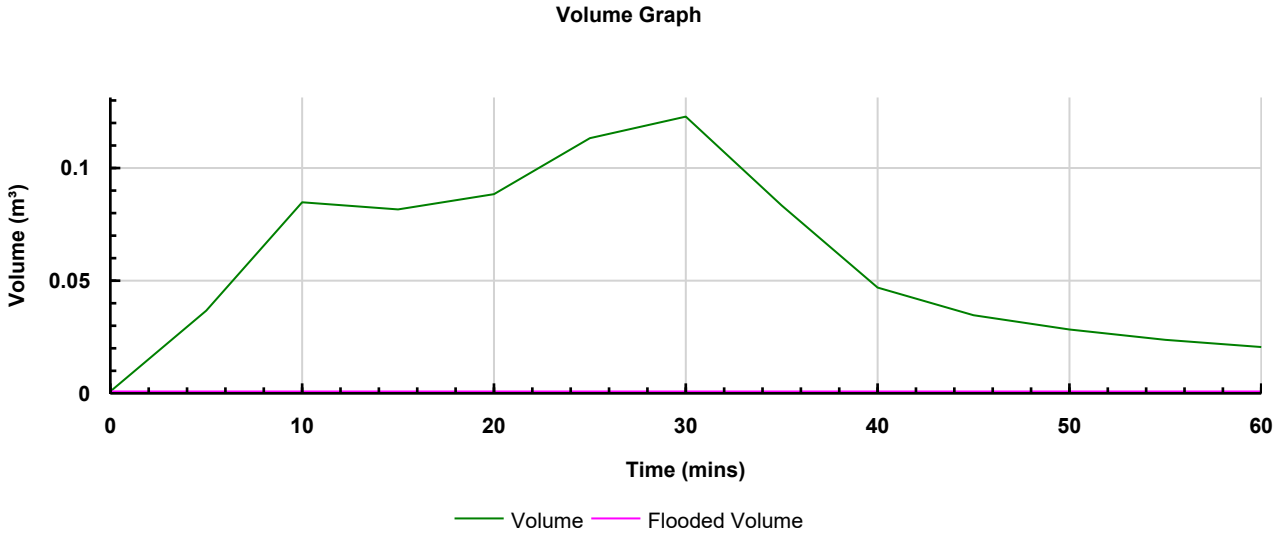


P1.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 3

Type : Manhole

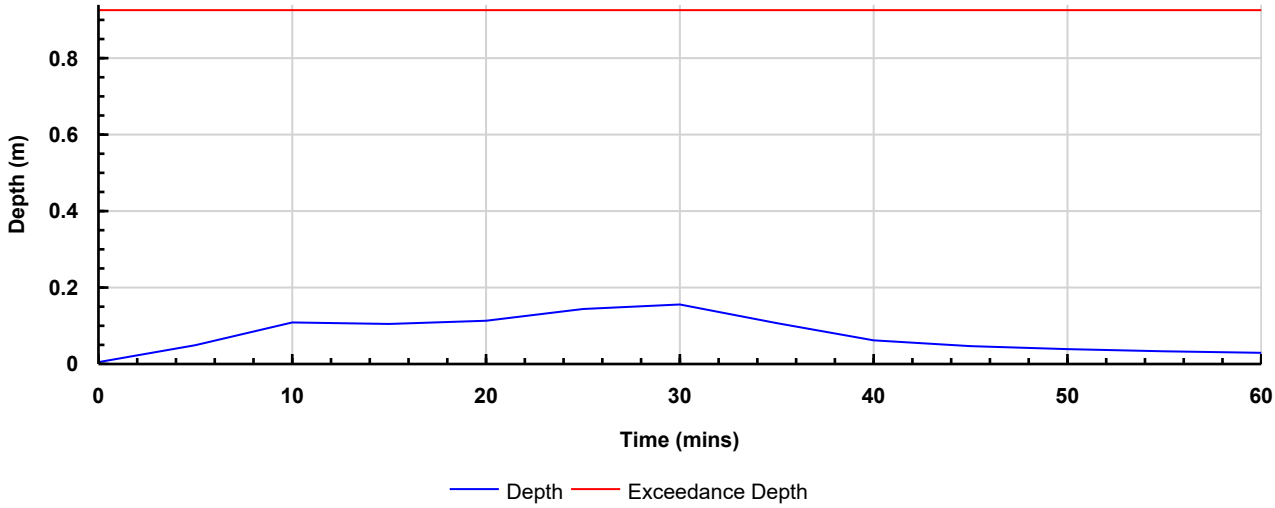
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	5.2	0.045	0.036	0.000	4.7
10	25.3	0.104	0.085	0.000	25.0
15	23.3	0.100	0.081	0.000	23.5
20	27.4	0.109	0.088	0.000	27.0
25	42.7	0.140	0.113	0.000	42.1
30	48.8	0.152	0.123	0.000	48.7
35	23.4	0.103	0.083	0.000	24.7
40	7.6	0.057	0.046	0.000	7.9
45	4.1	0.042	0.034	0.000	4.2
50	2.6	0.034	0.028	0.000	2.7
55	1.8	0.028	0.023	0.000	1.8
60	1.3	0.024	0.020	0.000	1.3

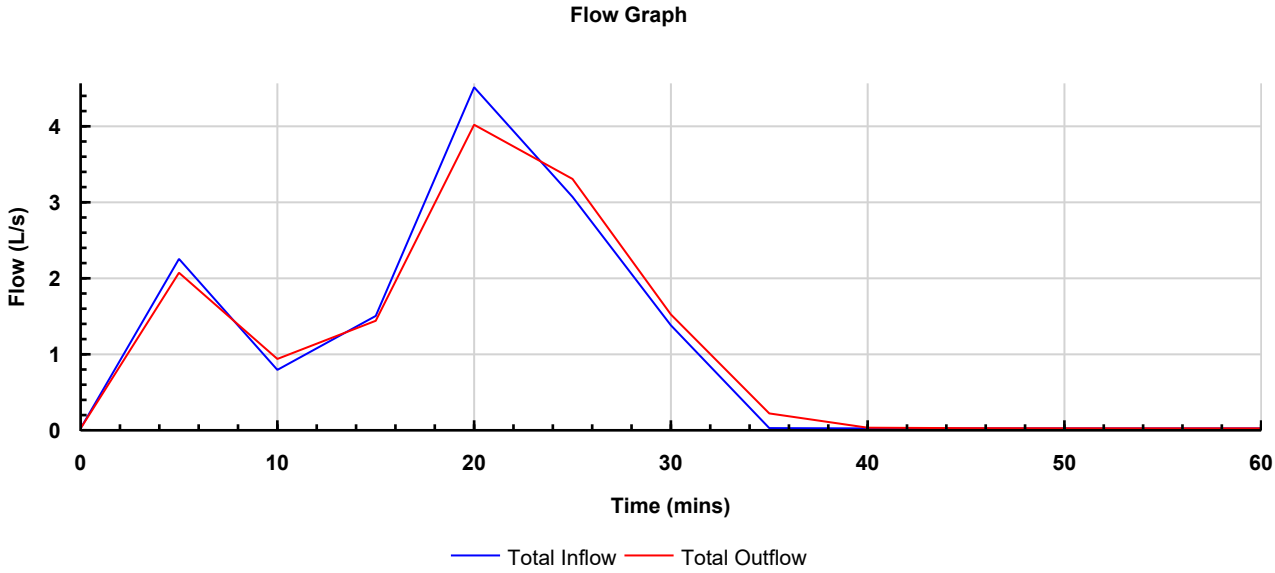
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

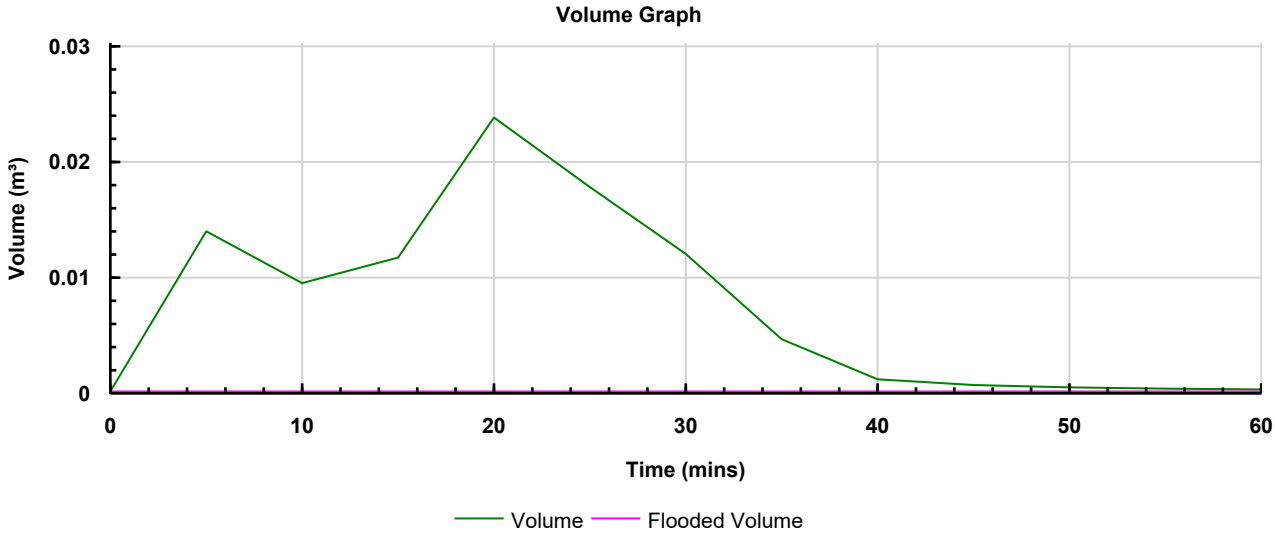


P9.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

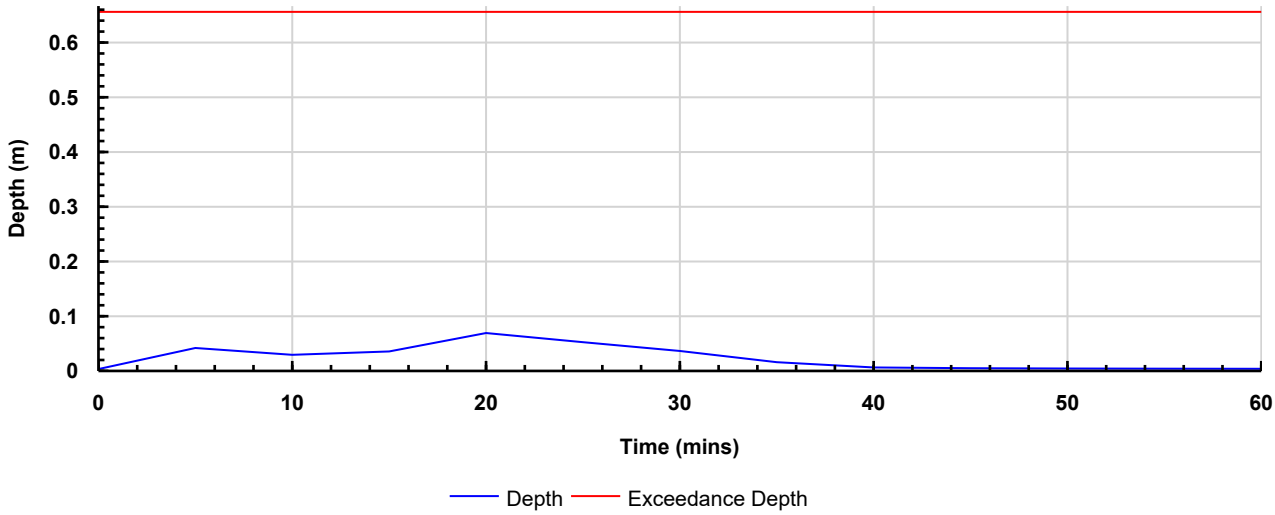
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.2	0.039	0.014	0.000	2.1
10	0.8	0.026	0.009	0.000	0.9
15	1.5	0.032	0.012	0.000	1.4
20	4.5	0.066	0.024	0.000	4.0
25	3.1	0.049	0.018	0.000	3.3
30	1.4	0.033	0.012	0.000	1.5
35	0.0	0.013	0.005	0.000	0.2
40	0.0	0.003	0.001	0.000	0.0
45	0.0	0.002	0.001	0.000	0.0
50	0.0	0.001	0.000	0.000	0.0
55	0.0	0.001	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

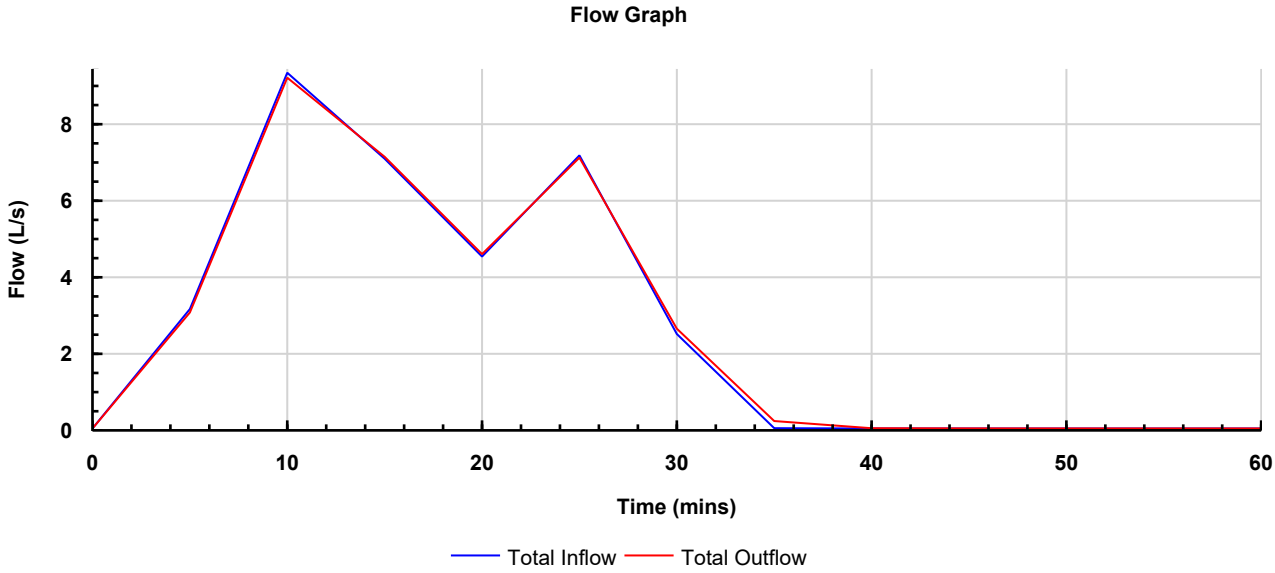
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

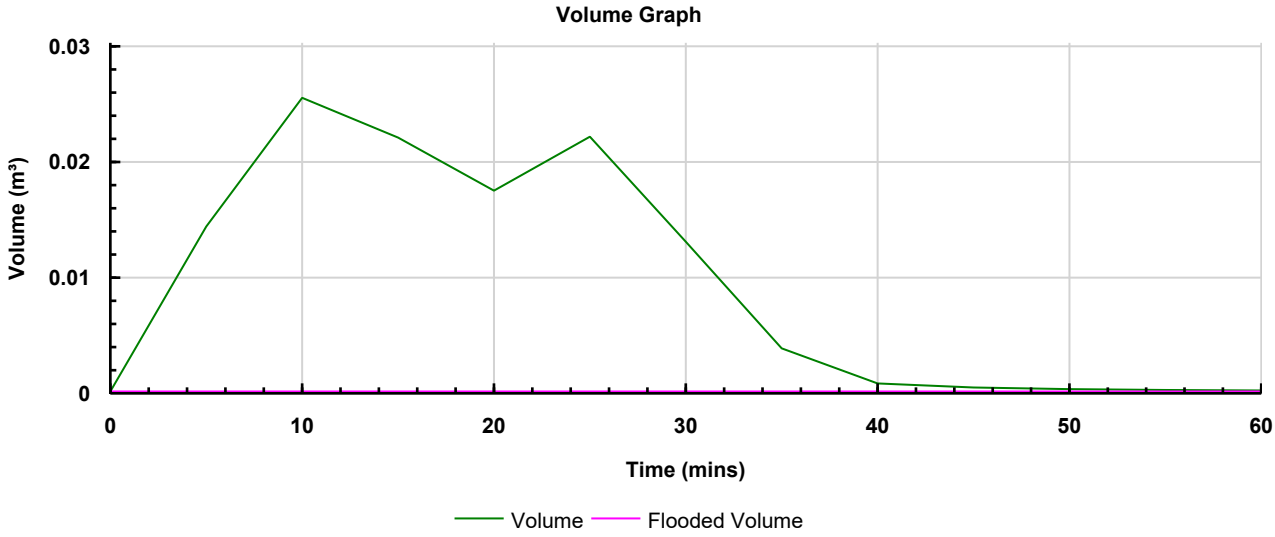


P7.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

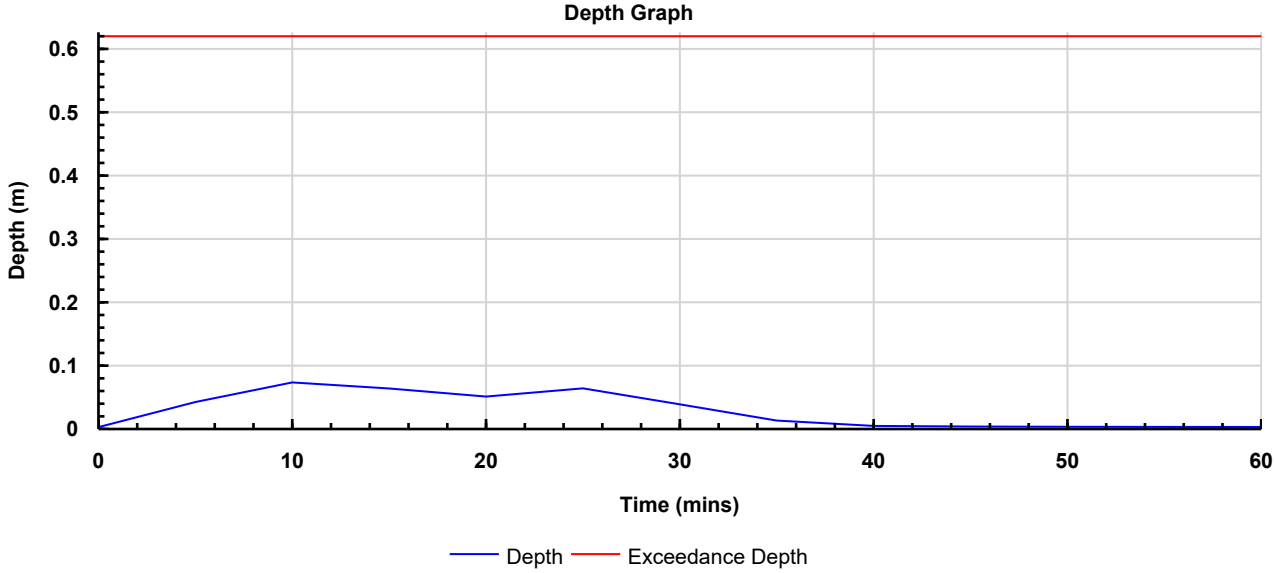
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	3.1	0.040	0.014	0.000	3.0
10	9.3	0.071	0.026	0.000	9.2
15	7.1	0.061	0.022	0.000	7.1
20	4.5	0.048	0.017	0.000	4.6
25	7.2	0.062	0.022	0.000	7.1
30	2.5	0.036	0.013	0.000	2.6
35	0.0	0.010	0.004	0.000	0.2
40	0.0	0.002	0.001	0.000	0.0
45	0.0	0.001	0.000	0.000	0.0
50	0.0	0.001	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

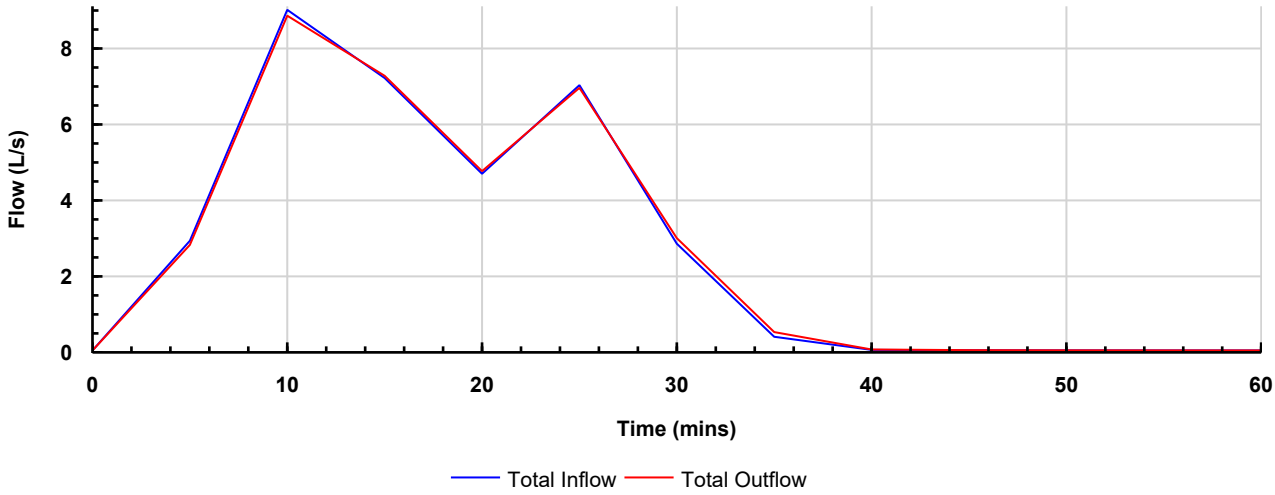


P7.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

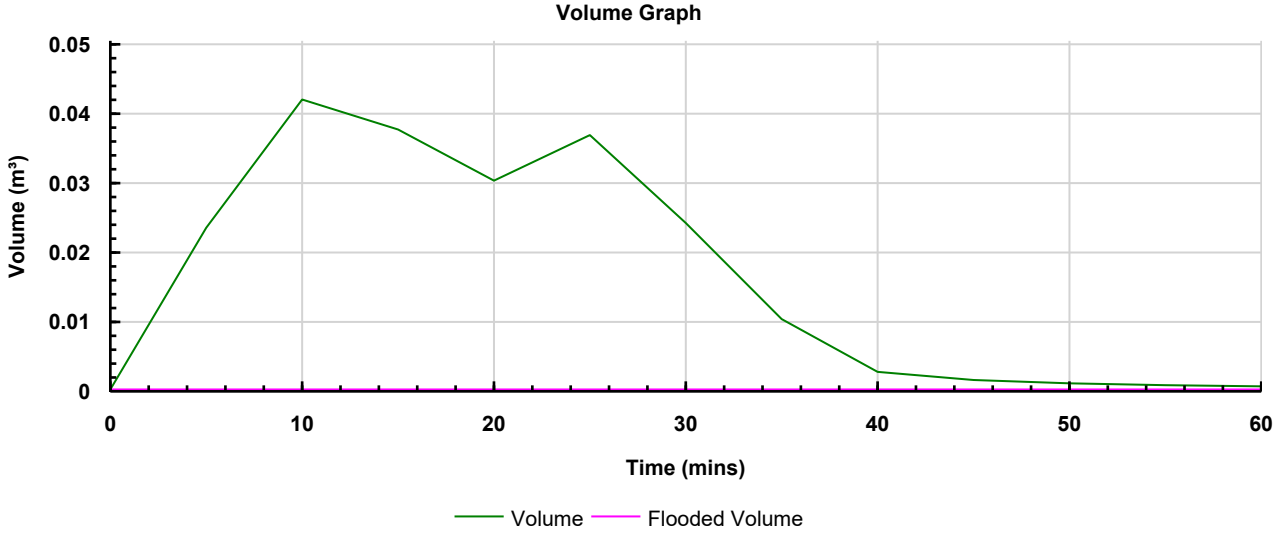
Type : Manhole

Graphs

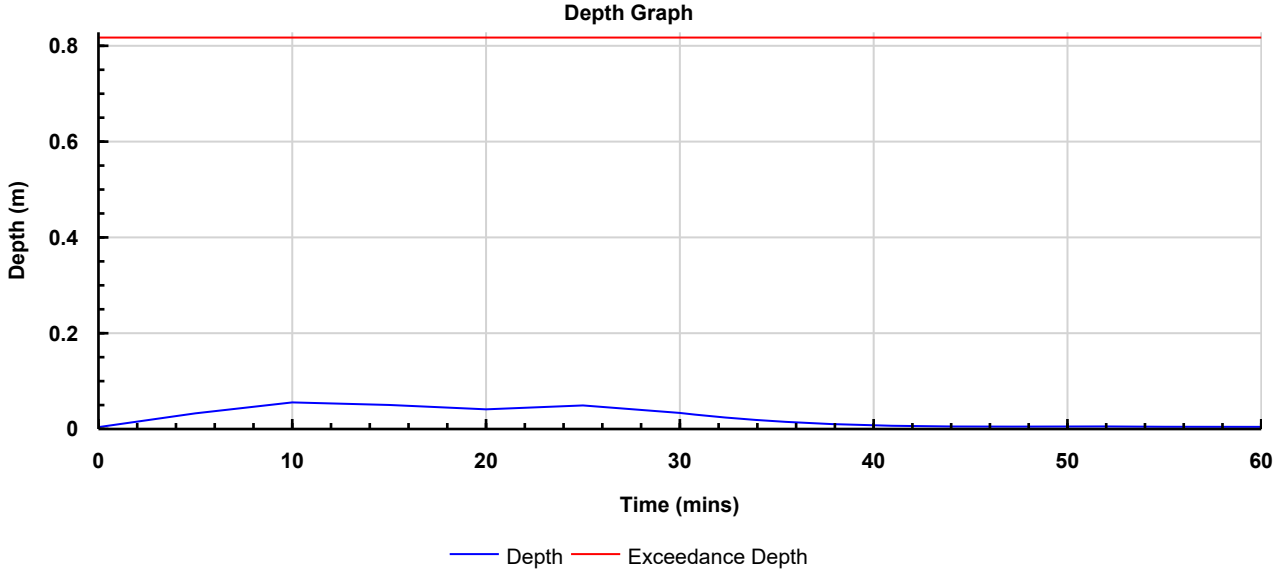
Flow Graph



Volume Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.9	0.029	0.023	0.000	2.8
10	9.0	0.052	0.042	0.000	8.9
15	7.2	0.046	0.038	0.000	7.3
20	4.7	0.037	0.030	0.000	4.7
25	7.0	0.045	0.037	0.000	7.0
30	2.8	0.030	0.024	0.000	3.0
35	0.4	0.013	0.010	0.000	0.5
40	0.0	0.003	0.003	0.000	0.0
45	0.0	0.002	0.001	0.000	0.0
50	0.0	0.001	0.001	0.000	0.0
55	0.0	0.001	0.001	0.000	0.0
60	0.0	0.001	0.000	0.000	0.0

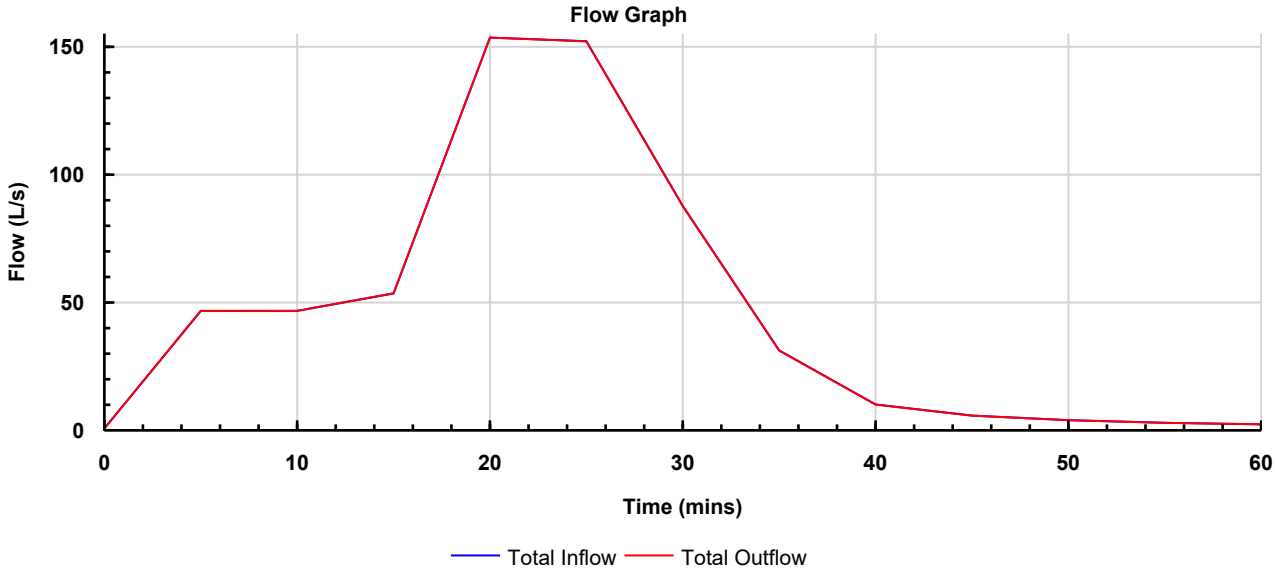
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

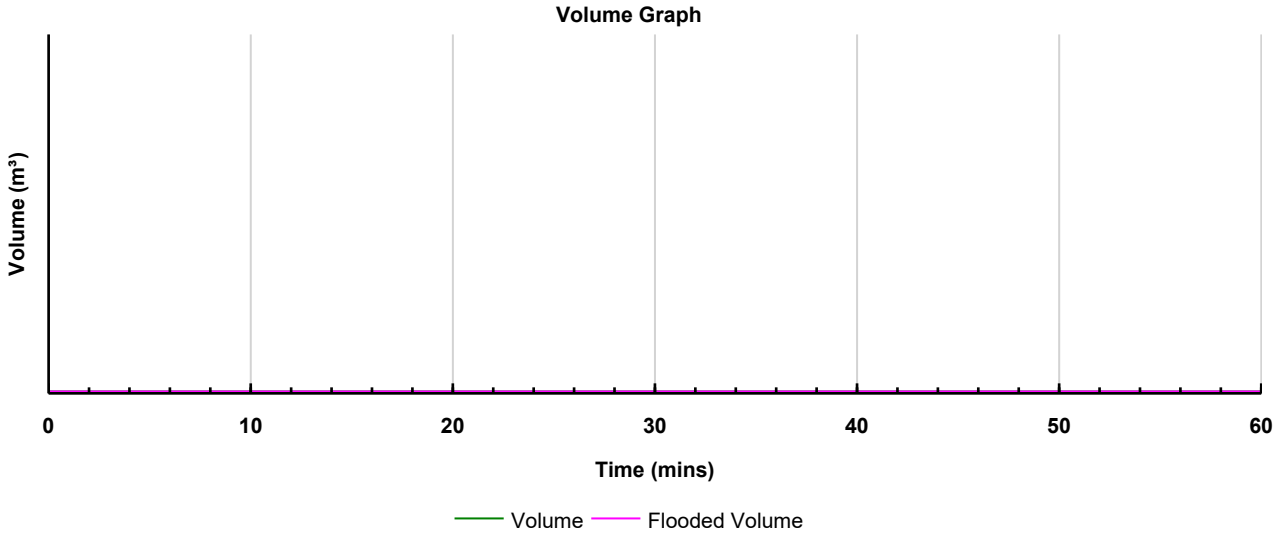


P1.07
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

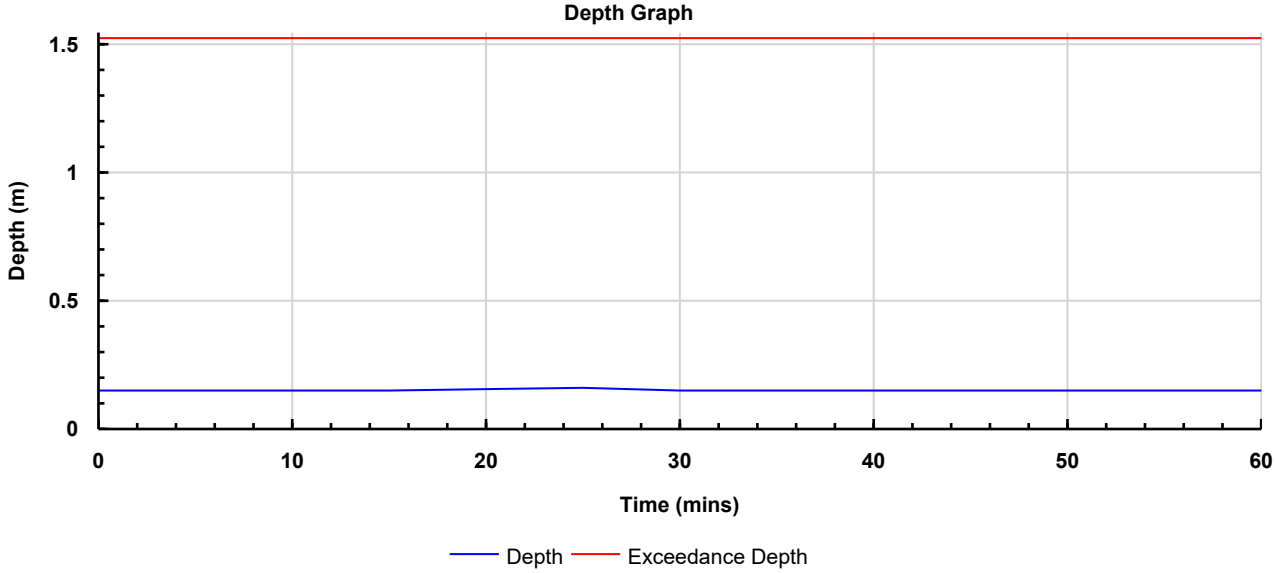
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.150	0.000	0.000	0.0
5	46.2	0.150	0.000	0.000	46.2
10	46.2	0.150	0.000	0.000	46.2
15	53.1	0.150	0.000	0.000	53.1
20	153.6	0.156	0.000	0.000	153.6
25	152.2	0.161	0.000	0.000	152.1
30	87.5	0.150	0.000	0.000	87.4
35	30.7	0.150	0.000	0.000	30.6
40	9.4	0.150	0.000	0.000	9.4
45	5.1	0.150	0.000	0.000	5.1
50	3.3	0.150	0.000	0.000	3.3
55	2.2	0.150	0.000	0.000	2.2
60	1.6	0.150	0.000	0.000	1.6

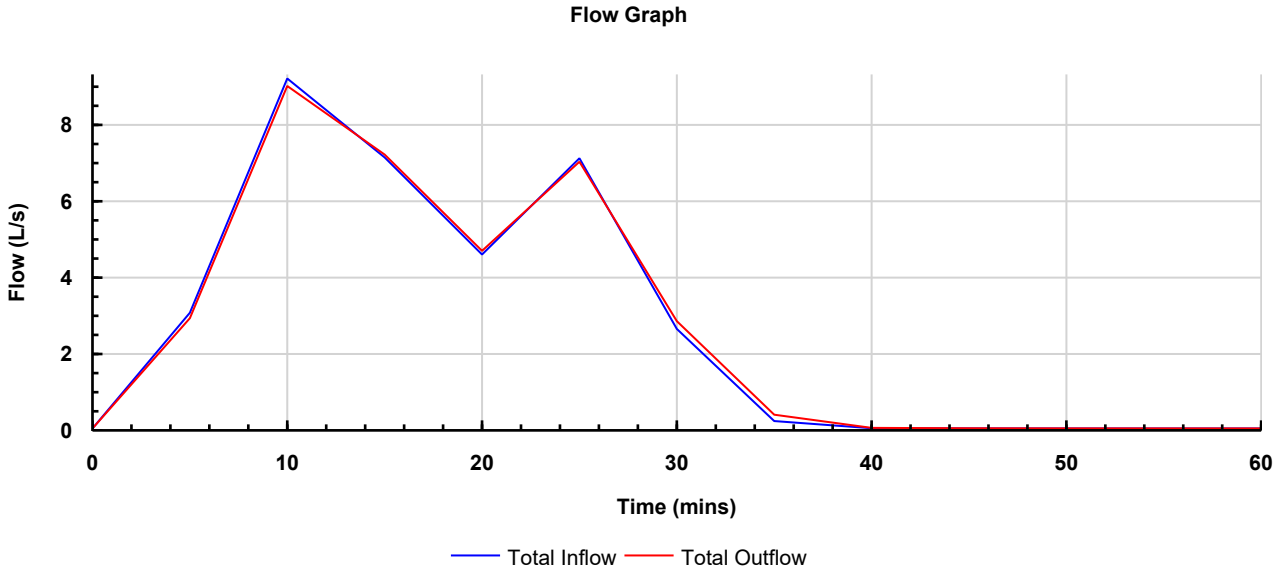
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

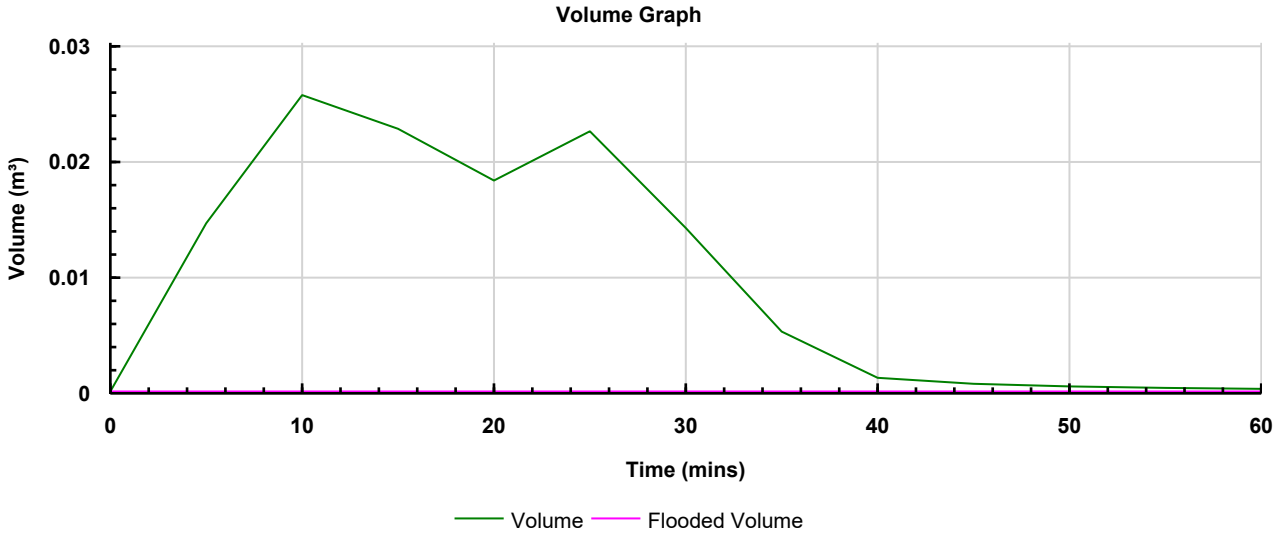


P7.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

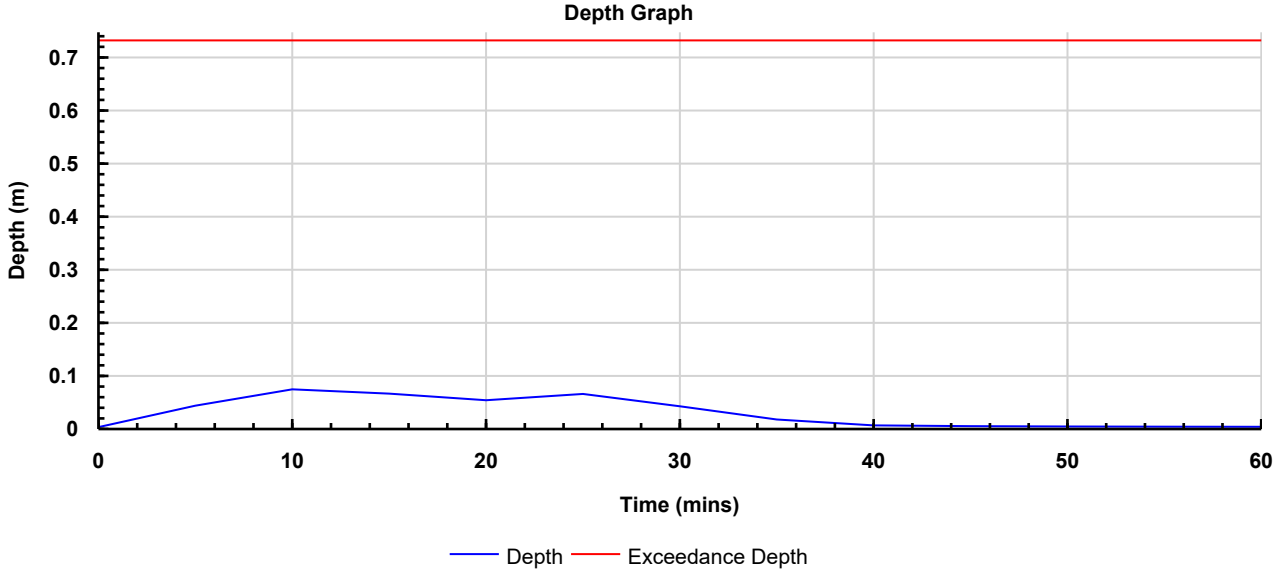
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	3.0	0.041	0.015	0.000	2.9
10	9.2	0.072	0.026	0.000	9.0
15	7.1	0.063	0.023	0.000	7.2
20	4.6	0.051	0.018	0.000	4.7
25	7.1	0.063	0.023	0.000	7.0
30	2.6	0.039	0.014	0.000	2.8
35	0.2	0.014	0.005	0.000	0.4
40	0.0	0.003	0.001	0.000	0.0
45	0.0	0.002	0.001	0.000	0.0
50	0.0	0.001	0.000	0.000	0.0
55	0.0	0.001	0.000	0.000	0.0
60	0.0	0.001	0.000	0.000	0.0

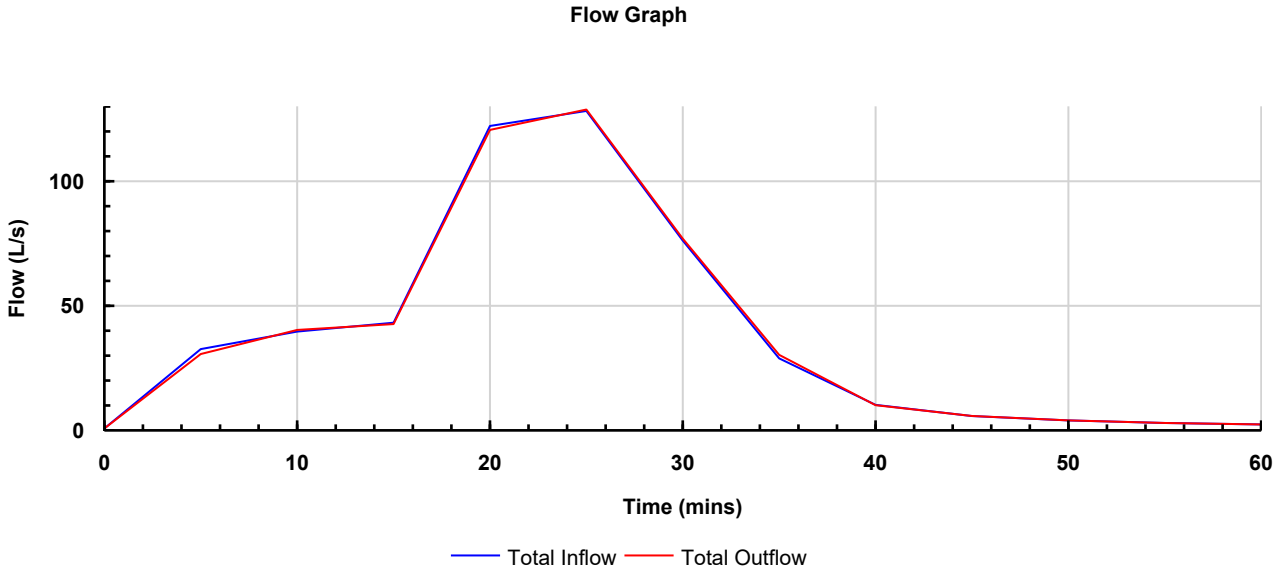
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

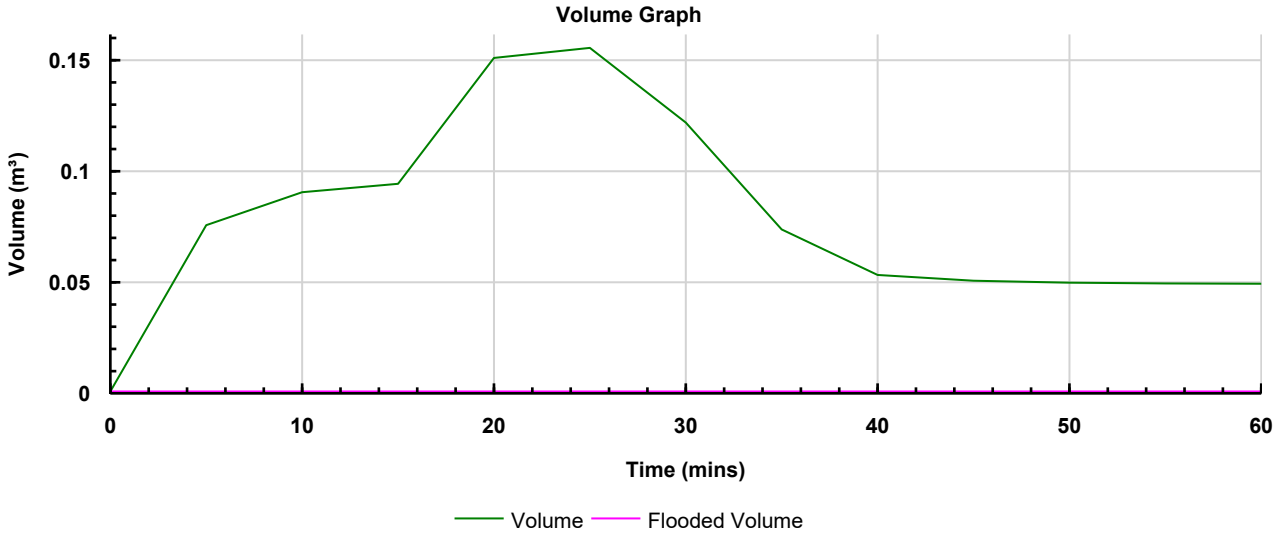


P1.06
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

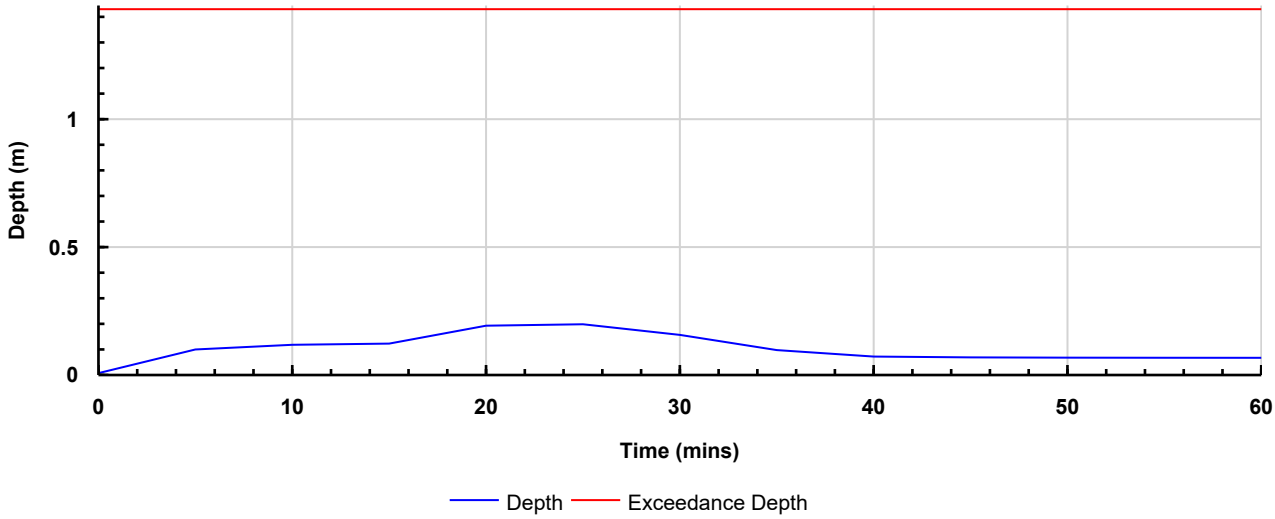
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	32.1	0.093	0.075	0.000	30.1
10	39.1	0.111	0.090	0.000	39.8
15	42.7	0.116	0.094	0.000	42.2
20	122.2	0.186	0.151	0.000	120.6
25	128.2	0.192	0.156	0.000	128.8
30	75.9	0.150	0.122	0.000	76.7
35	28.3	0.091	0.073	0.000	29.7
40	9.5	0.065	0.053	0.000	9.4
45	5.0	0.062	0.050	0.000	5.0
50	3.3	0.061	0.049	0.000	3.3
55	2.2	0.060	0.049	0.000	2.2
60	1.6	0.060	0.049	0.000	1.6

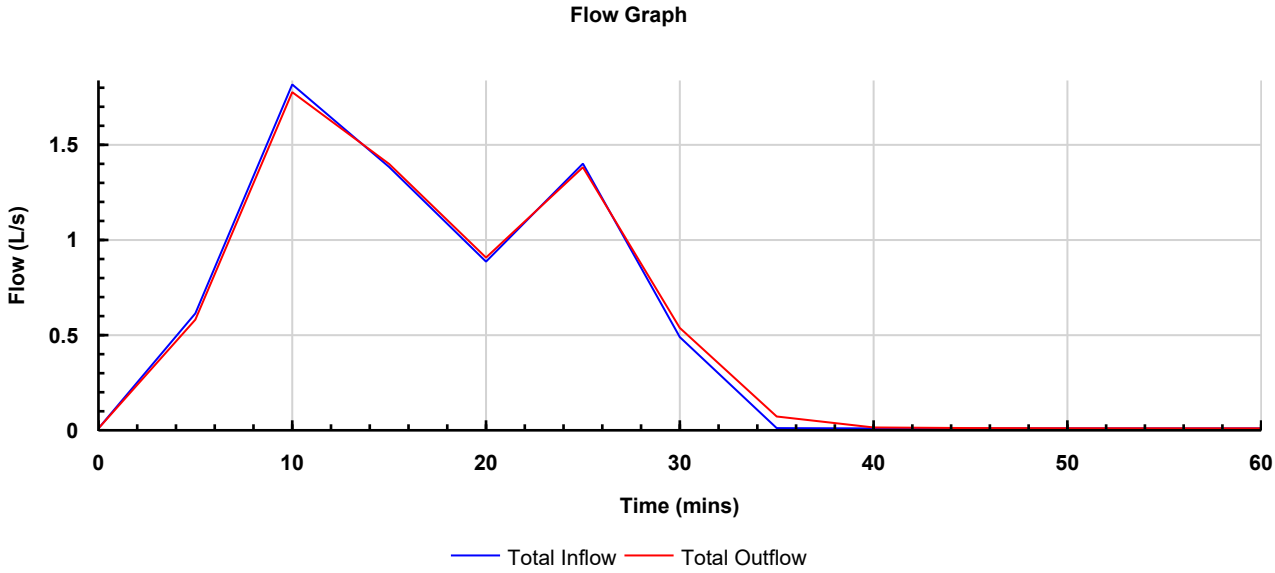
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

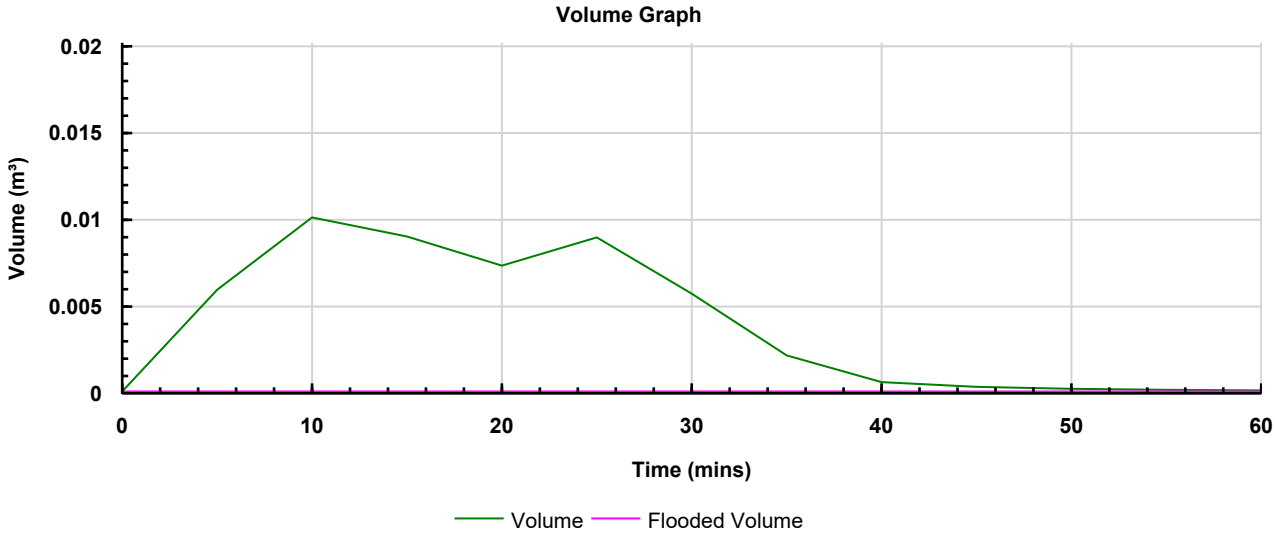


P11.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

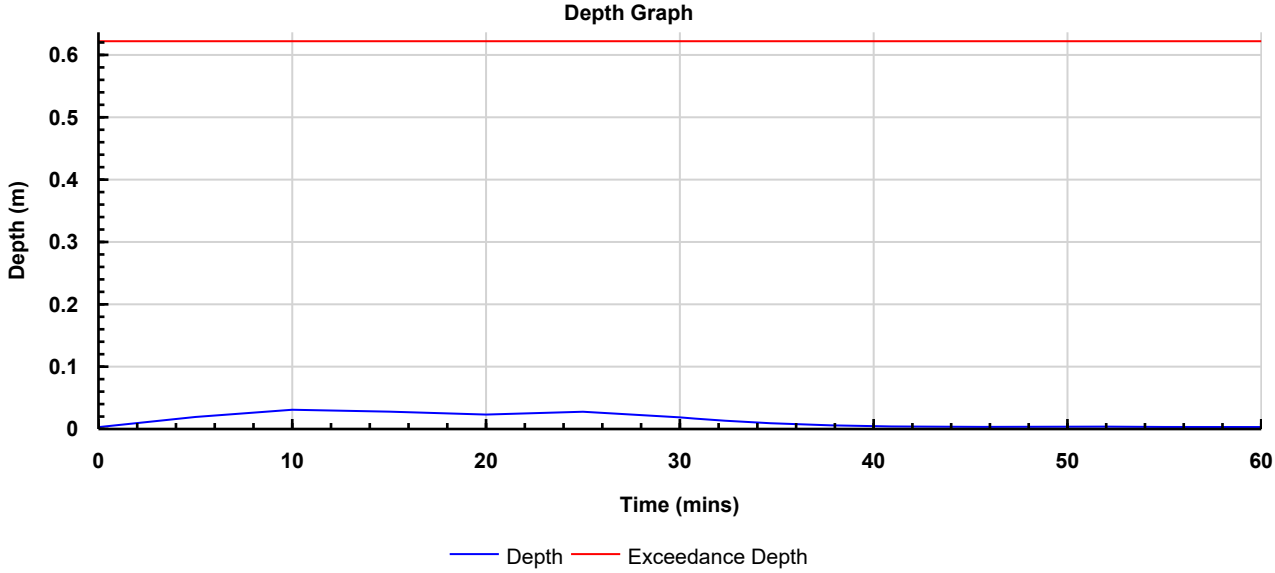
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.6	0.016	0.006	0.000	0.6
10	1.8	0.028	0.010	0.000	1.8
15	1.4	0.025	0.009	0.000	1.4
20	0.9	0.020	0.007	0.000	0.9
25	1.4	0.025	0.009	0.000	1.4
30	0.5	0.016	0.006	0.000	0.5
35	0.0	0.006	0.002	0.000	0.1
40	0.0	0.002	0.001	0.000	0.0
45	0.0	0.001	0.000	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

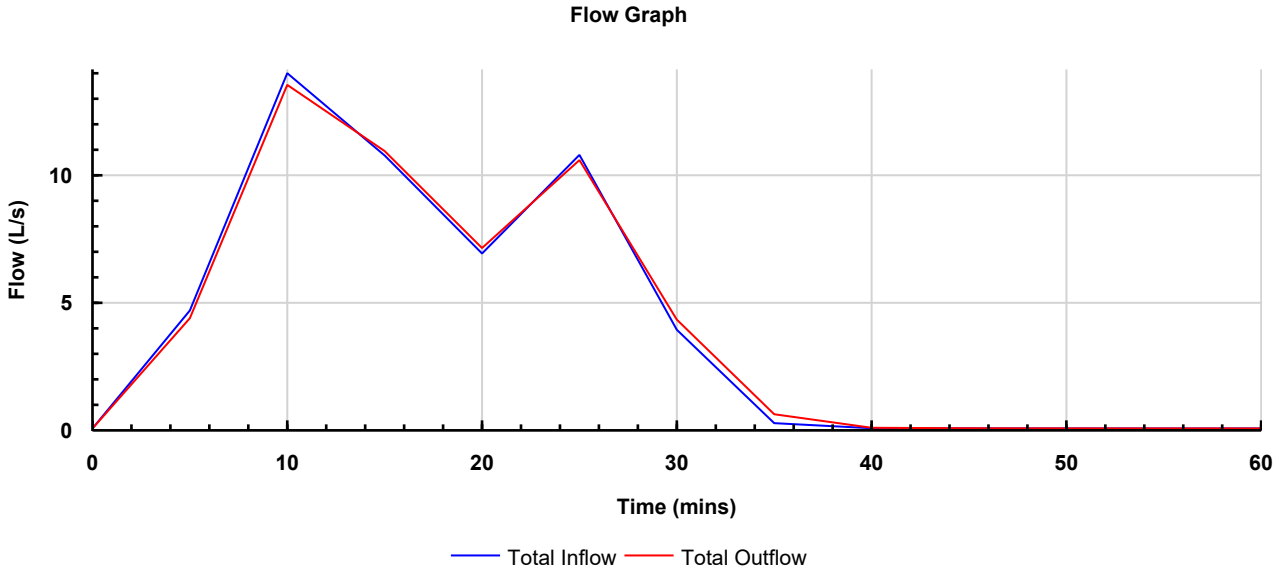
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

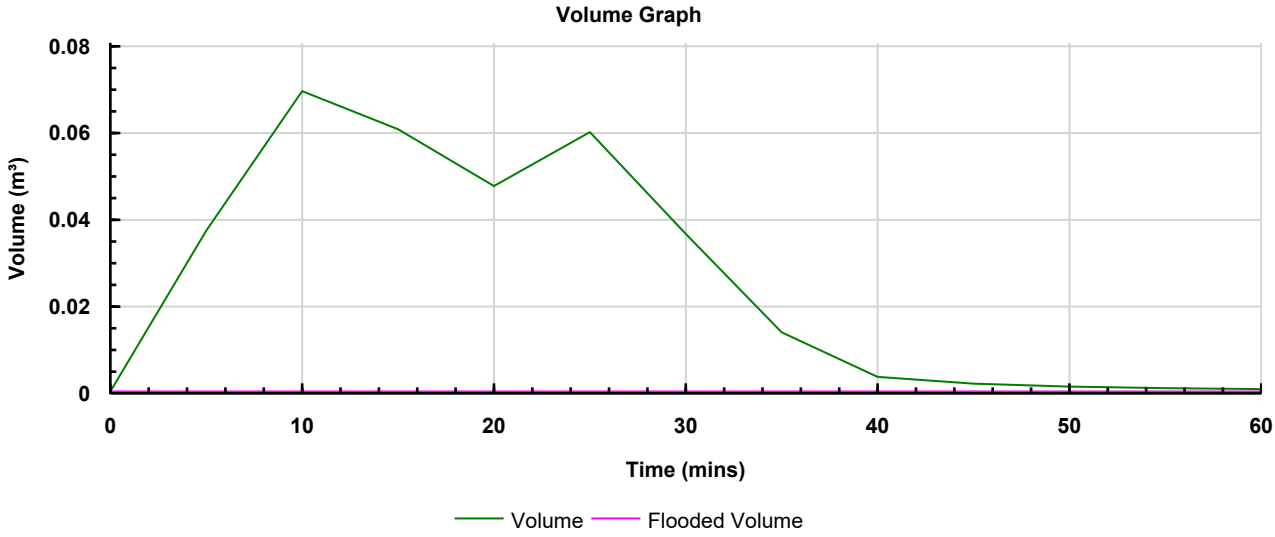


P5.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

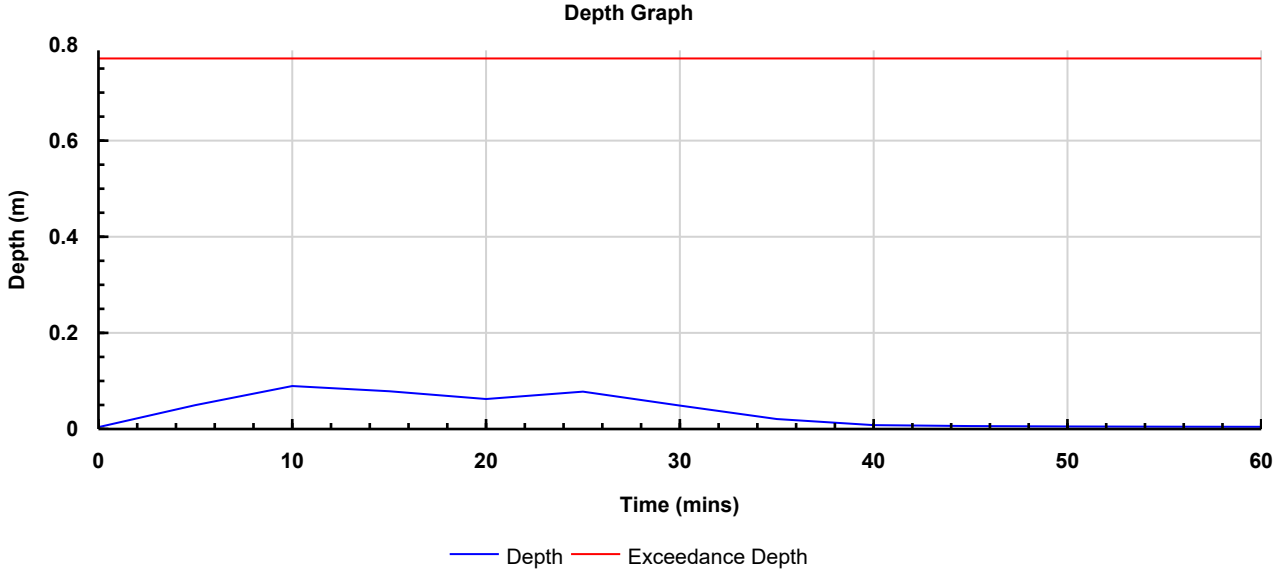
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	4.7	0.046	0.037	0.000	4.3
10	14.0	0.086	0.070	0.000	13.5
15	10.8	0.075	0.061	0.000	10.9
20	6.9	0.059	0.048	0.000	7.1
25	10.8	0.074	0.060	0.000	10.6
30	3.9	0.045	0.037	0.000	4.3
35	0.2	0.017	0.014	0.000	0.6
40	0.0	0.004	0.003	0.000	0.0
45	0.0	0.002	0.002	0.000	0.0
50	0.0	0.001	0.001	0.000	0.0
55	0.0	0.001	0.001	0.000	0.0
60	0.0	0.001	0.001	0.000	0.0

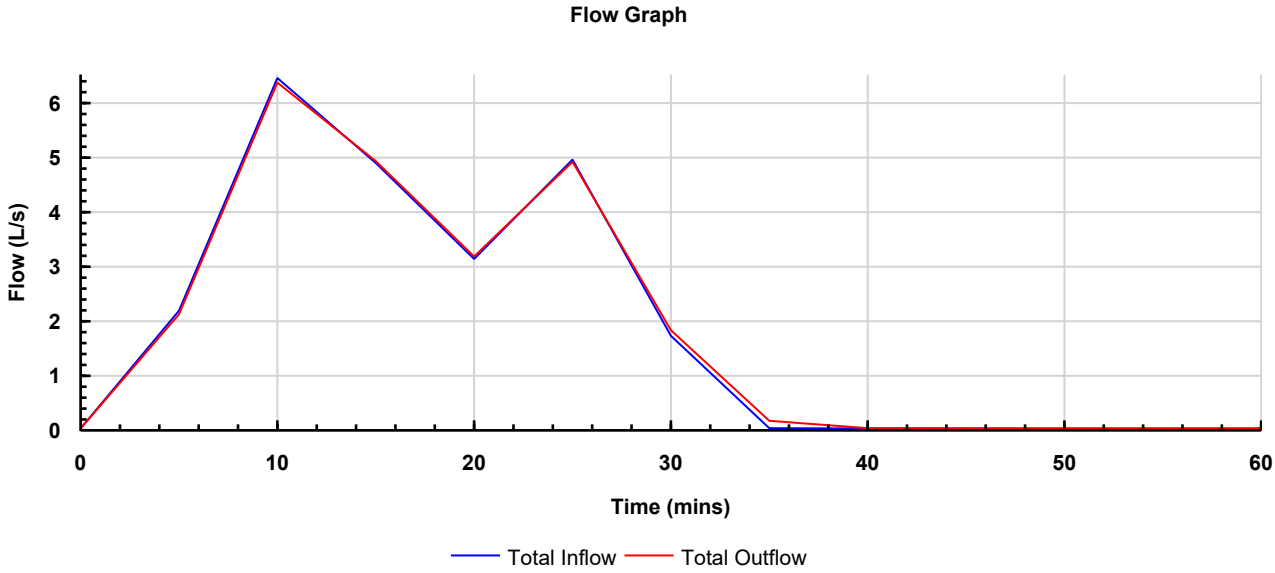
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

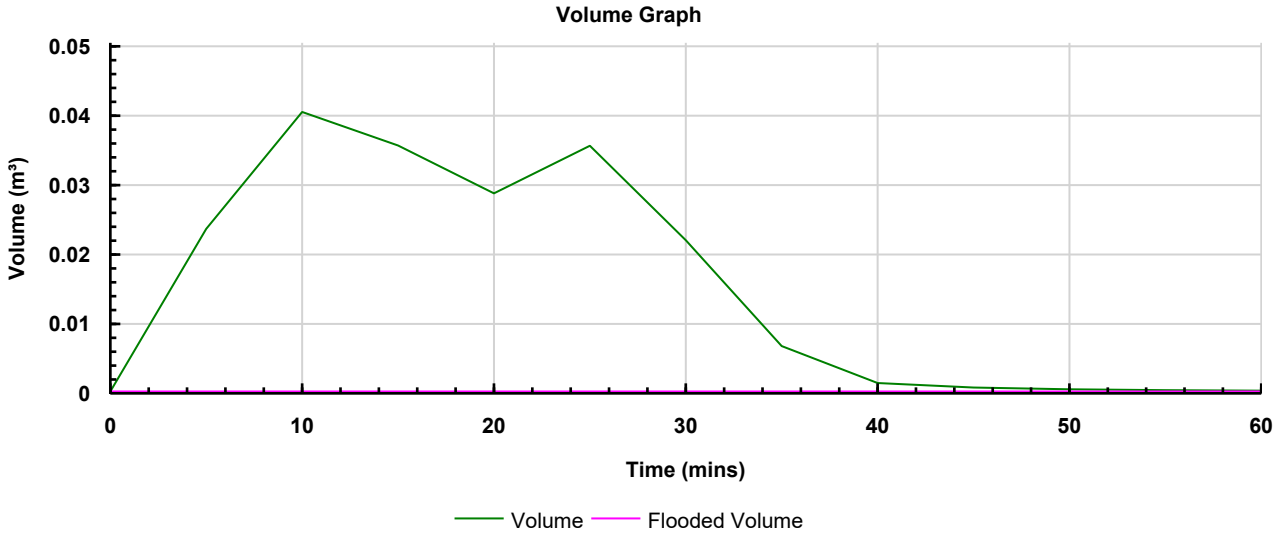


P5.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Manhole

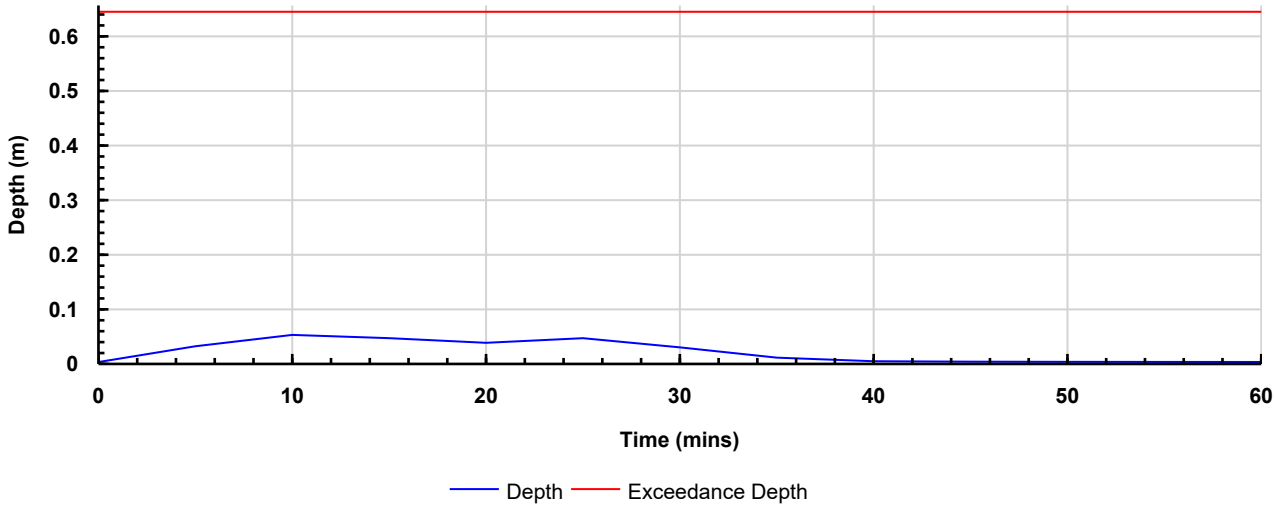
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.2	0.029	0.024	0.000	2.1
10	6.5	0.050	0.040	0.000	6.4
15	4.9	0.044	0.036	0.000	4.9
20	3.1	0.035	0.029	0.000	3.2
25	5.0	0.044	0.036	0.000	4.9
30	1.7	0.027	0.022	0.000	1.8
35	0.0	0.008	0.007	0.000	0.1
40	0.0	0.002	0.001	0.000	0.0
45	0.0	0.001	0.001	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

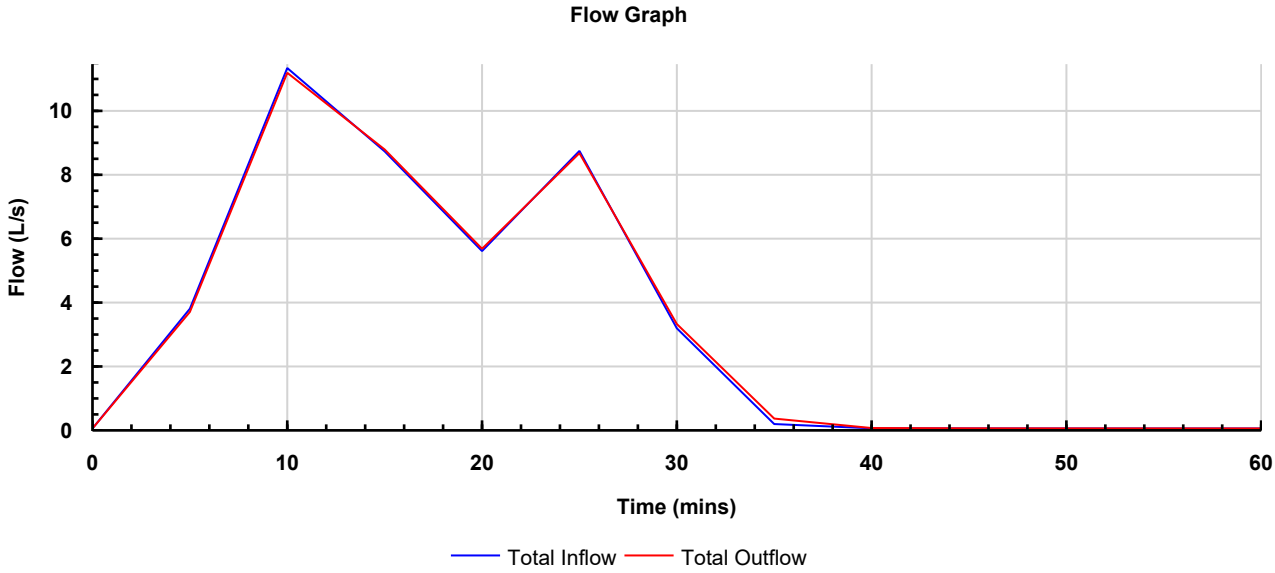
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

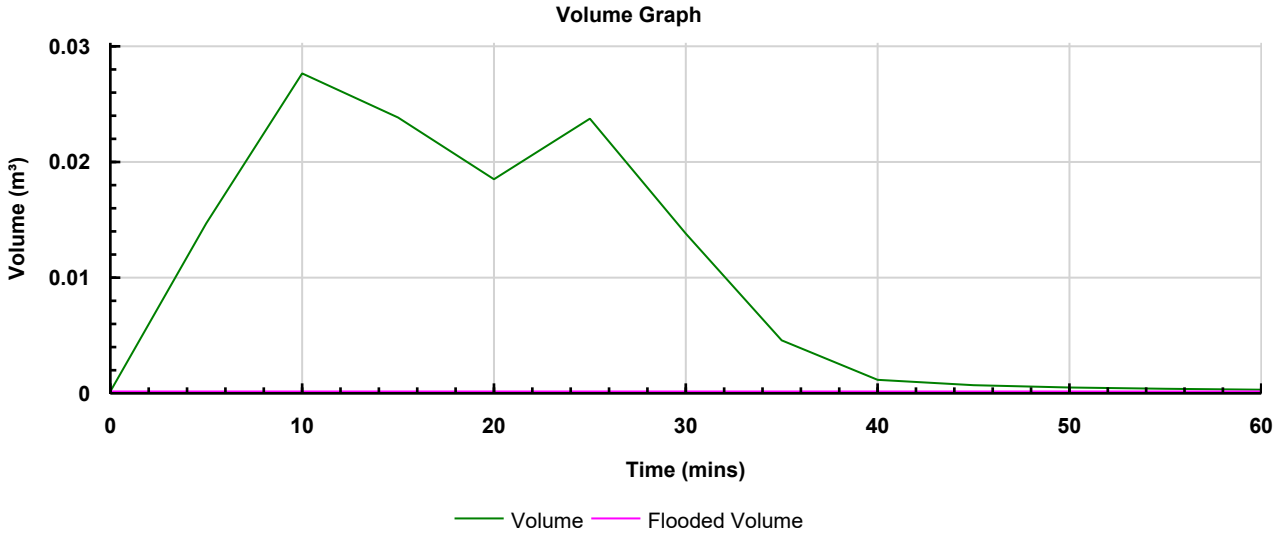


P6.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

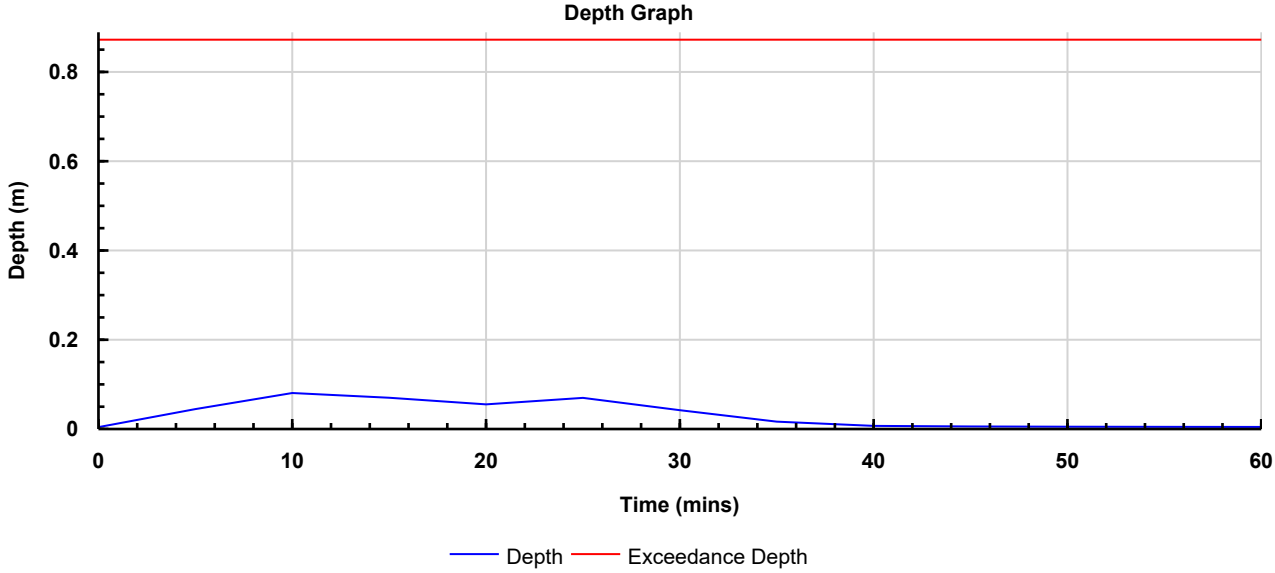
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	3.8	0.041	0.015	0.000	3.7
10	11.3	0.077	0.028	0.000	11.2
15	8.7	0.066	0.024	0.000	8.8
20	5.6	0.051	0.018	0.000	5.7
25	8.7	0.066	0.024	0.000	8.7
30	3.2	0.038	0.014	0.000	3.3
35	0.1	0.012	0.004	0.000	0.3
40	0.0	0.003	0.001	0.000	0.0
45	0.0	0.002	0.001	0.000	0.0
50	0.0	0.001	0.000	0.000	0.0
55	0.0	0.001	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

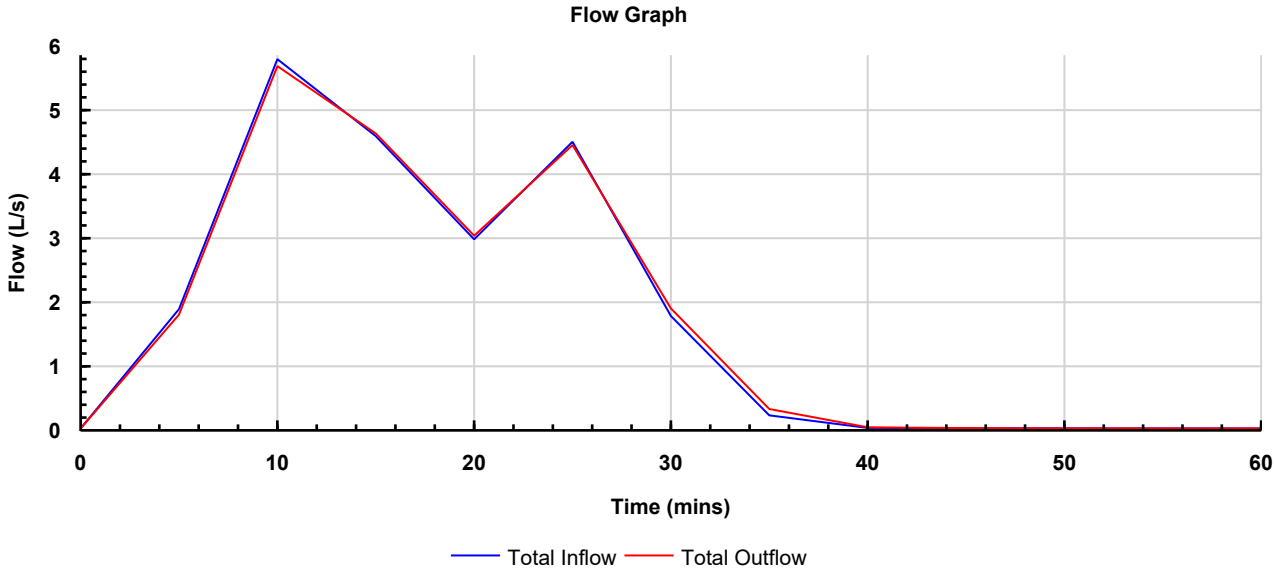
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

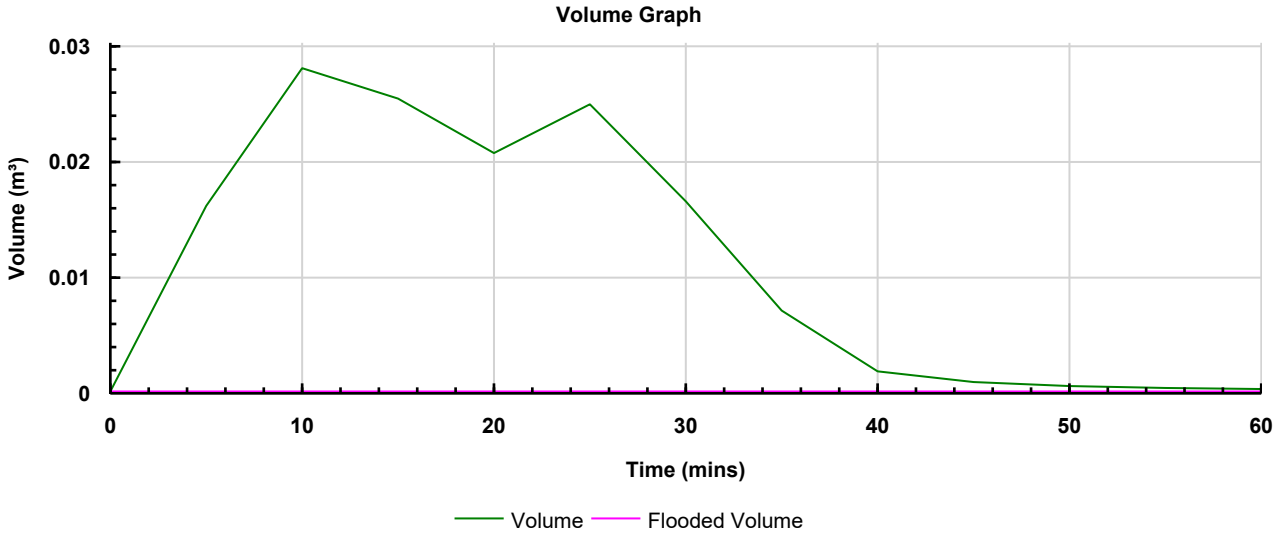


P8.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

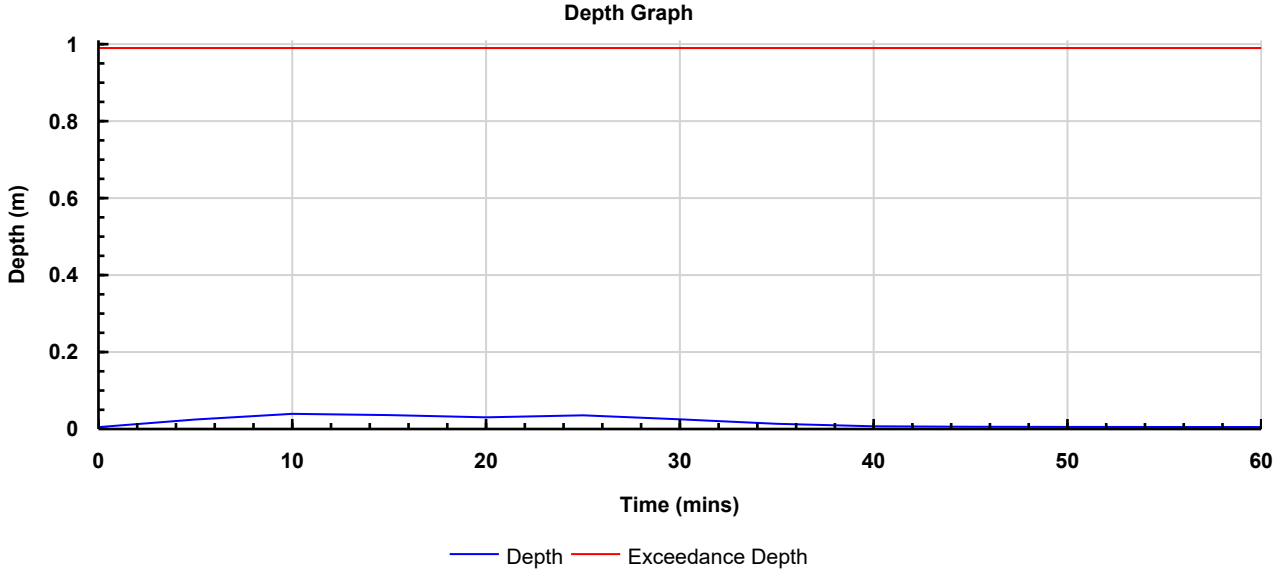
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	1.9	0.020	0.016	0.000	1.8
10	5.8	0.035	0.028	0.000	5.7
15	4.6	0.031	0.025	0.000	4.6
20	3.0	0.026	0.021	0.000	3.0
25	4.5	0.031	0.025	0.000	4.4
30	1.8	0.020	0.017	0.000	1.9
35	0.2	0.009	0.007	0.000	0.3
40	0.0	0.002	0.002	0.000	0.0
45	0.0	0.001	0.001	0.000	0.0
50	0.0	0.001	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

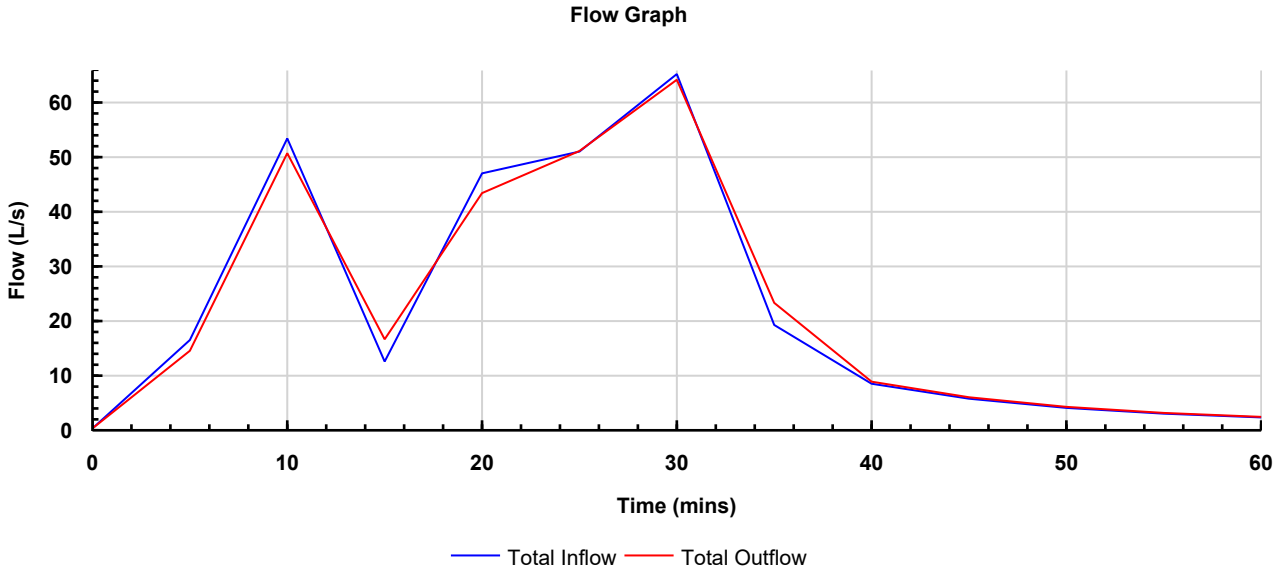
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

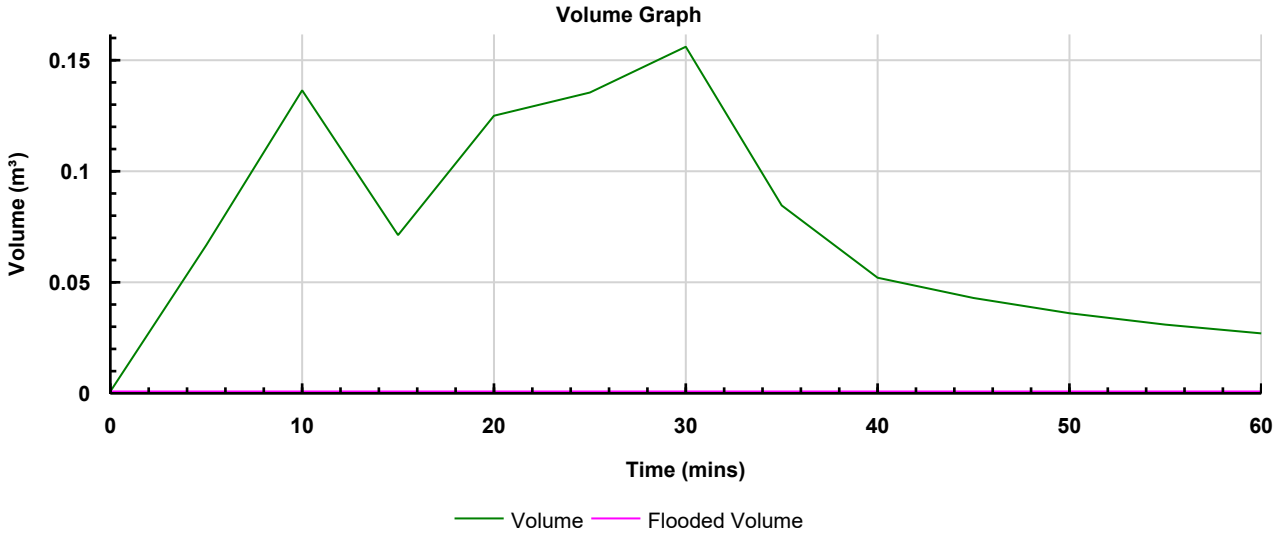


P3.05
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

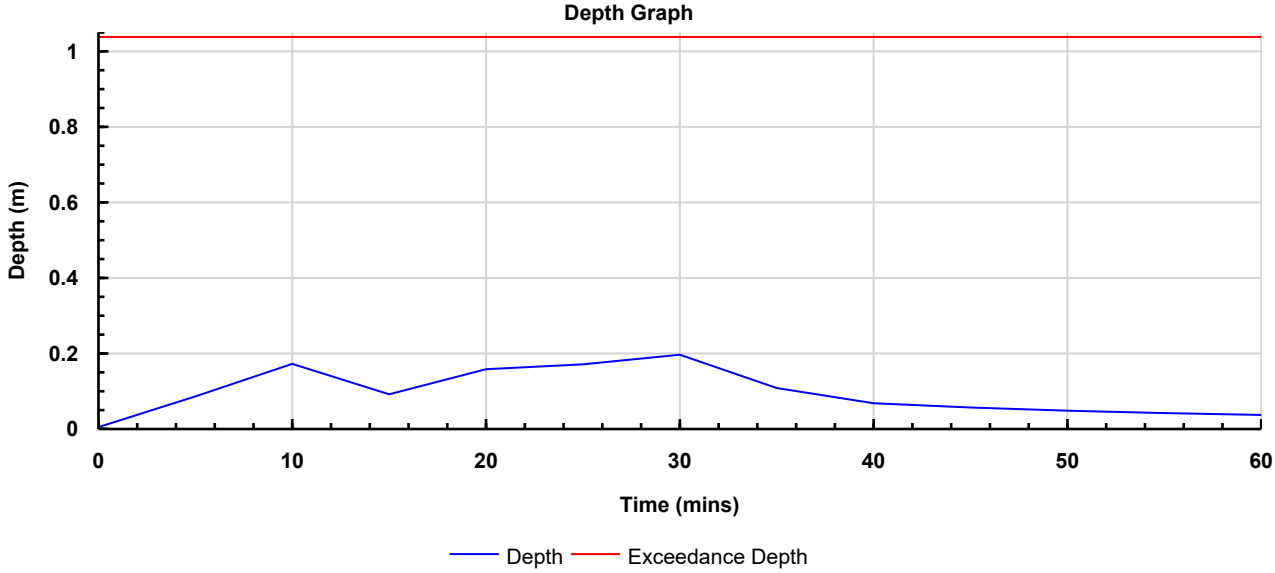
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	16.3	0.082	0.066	0.000	14.3
10	53.4	0.168	0.136	0.000	50.6
15	12.3	0.087	0.071	0.000	16.4
20	46.9	0.154	0.125	0.000	43.3
25	50.9	0.167	0.135	0.000	51.0
30	65.2	0.193	0.156	0.000	64.2
35	19.0	0.104	0.084	0.000	23.1
40	8.2	0.064	0.051	0.000	8.6
45	5.5	0.052	0.042	0.000	5.7
50	3.8	0.044	0.035	0.000	4.0
55	2.7	0.037	0.030	0.000	2.8
60	2.0	0.032	0.026	0.000	2.1

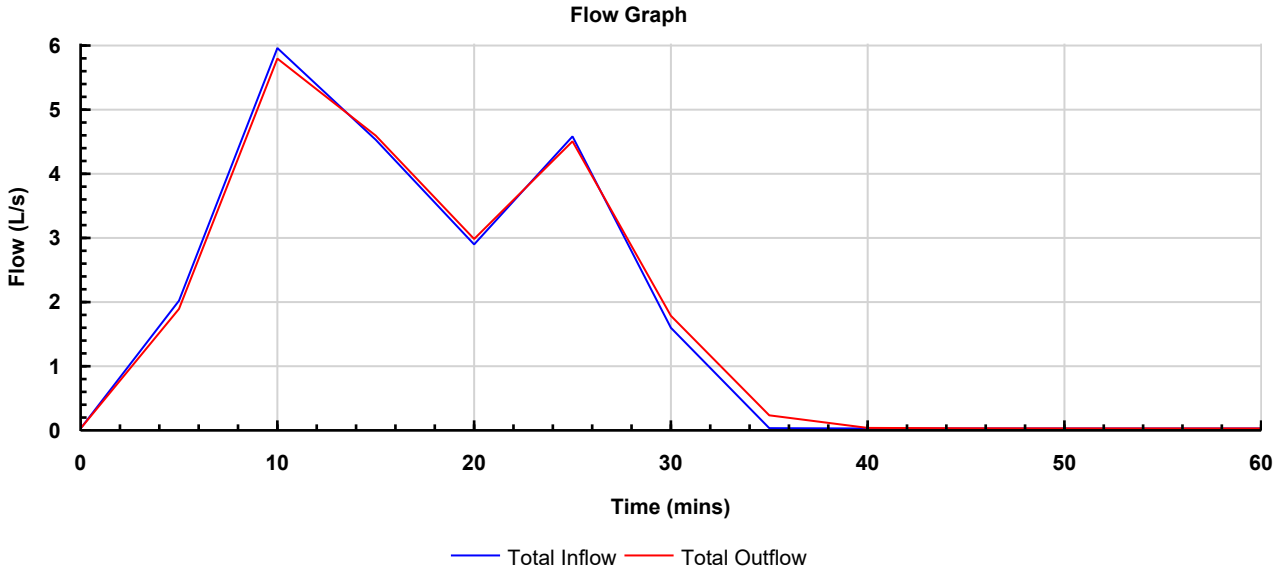
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

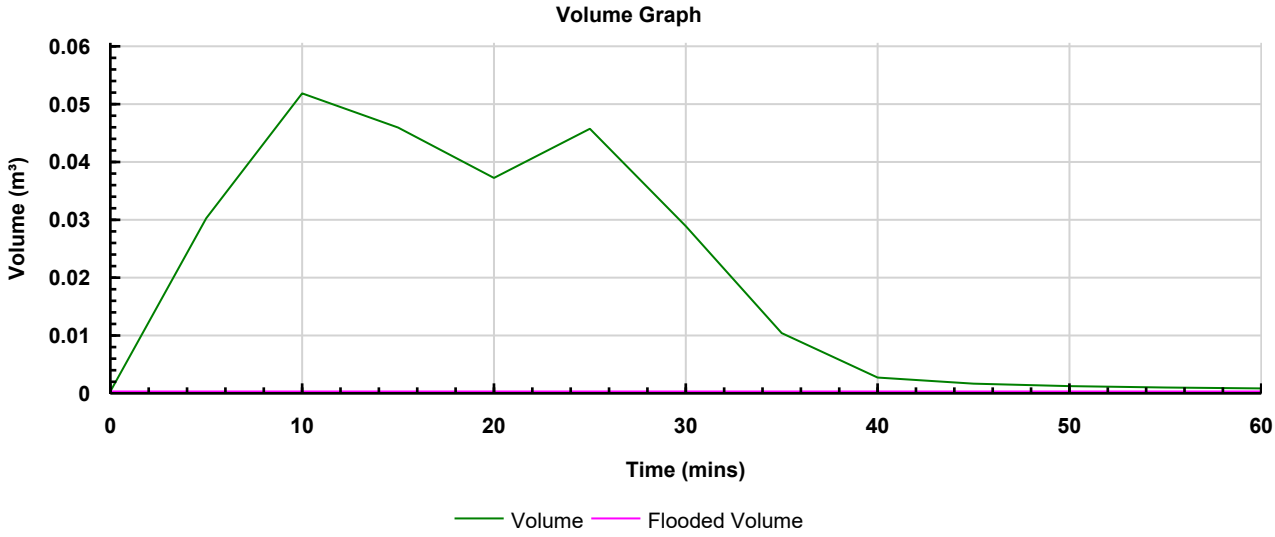


P8.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Manhole

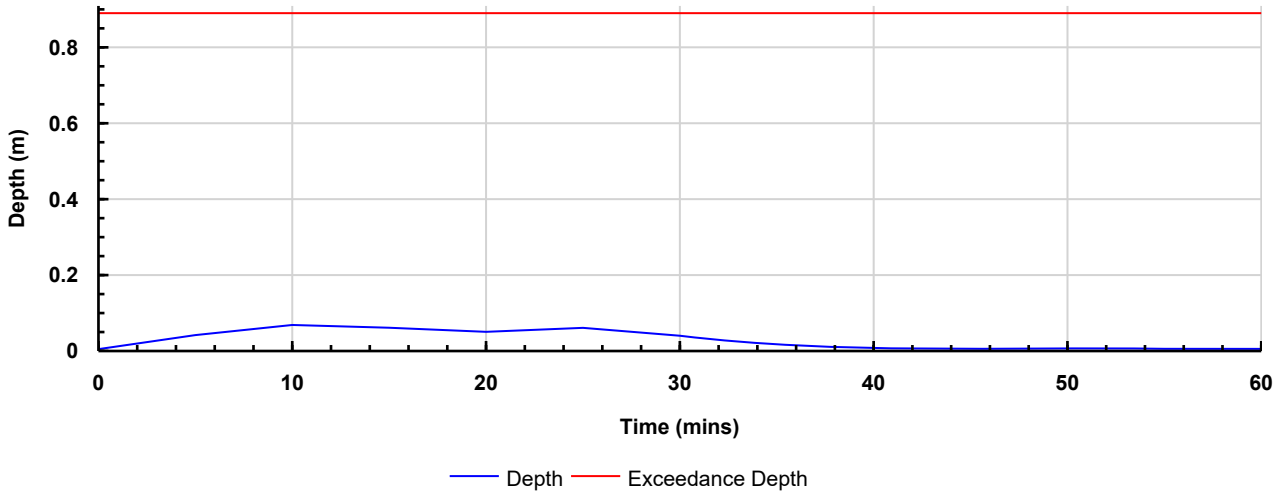
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.0	0.037	0.030	0.000	1.9
10	6.0	0.064	0.052	0.000	5.8
15	4.5	0.057	0.046	0.000	4.6
20	2.9	0.046	0.037	0.000	3.0
25	4.6	0.056	0.046	0.000	4.5
30	1.6	0.035	0.029	0.000	1.8
35	0.0	0.013	0.010	0.000	0.2
40	0.0	0.003	0.002	0.000	0.0
45	0.0	0.002	0.001	0.000	0.0
50	0.0	0.001	0.001	0.000	0.0
55	0.0	0.001	0.001	0.000	0.0
60	0.0	0.001	0.001	0.000	0.0

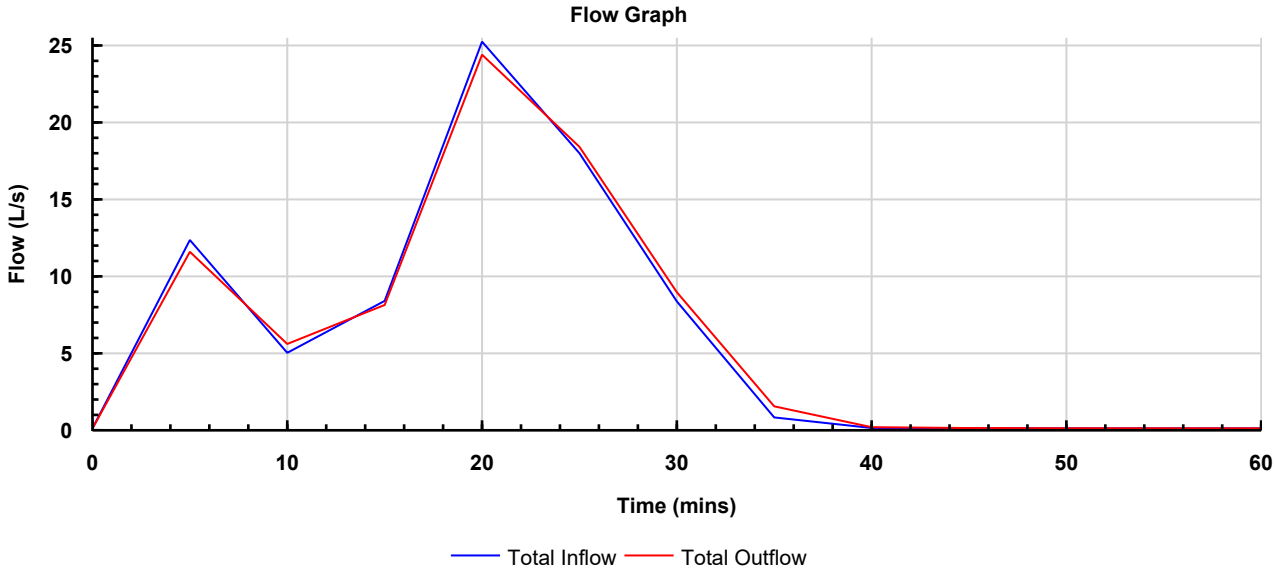
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

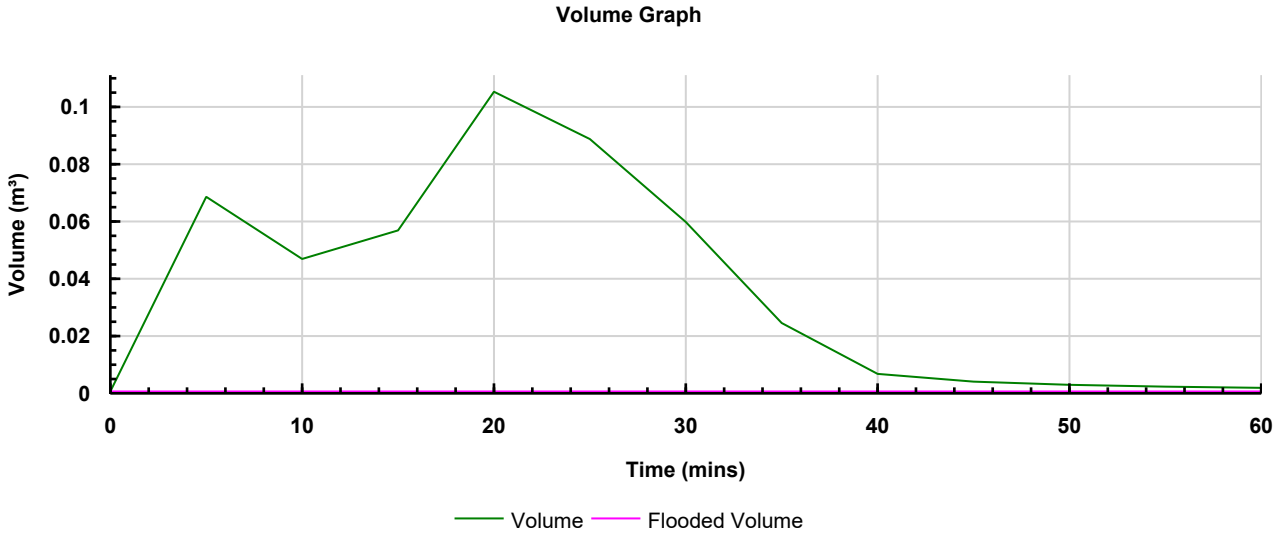


P5.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

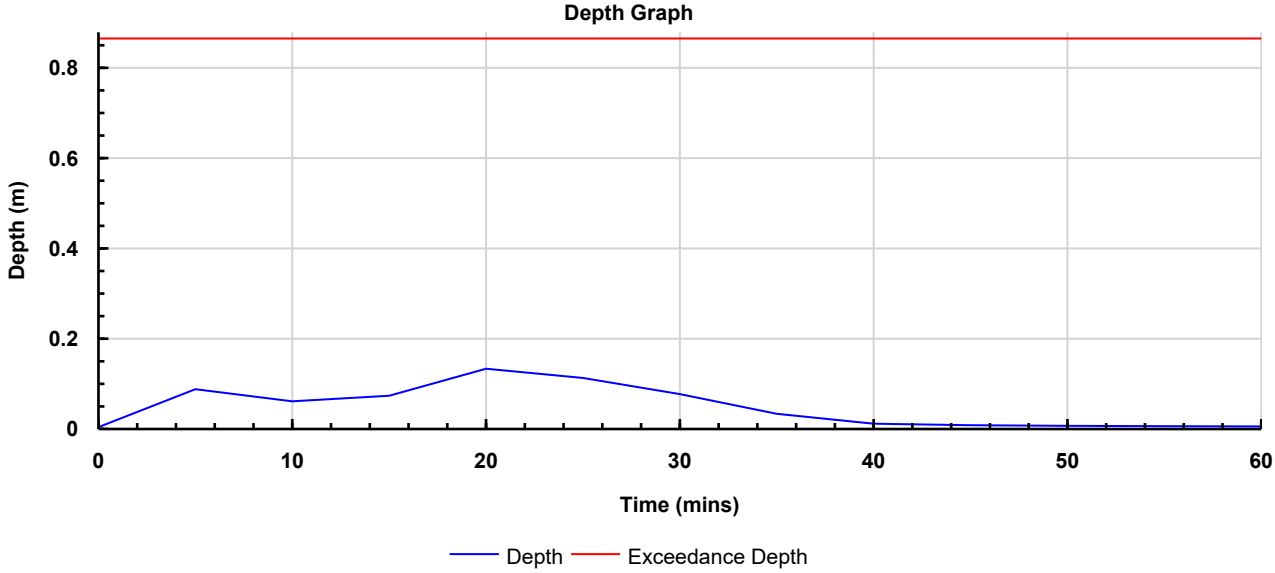
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	12.3	0.084	0.068	0.000	11.5
10	4.9	0.057	0.047	0.000	5.5
15	8.3	0.070	0.057	0.000	8.1
20	25.2	0.130	0.105	0.000	24.4
25	18.0	0.109	0.089	0.000	18.4
30	8.3	0.073	0.060	0.000	8.9
35	0.7	0.030	0.024	0.000	1.4
40	0.0	0.008	0.006	0.000	0.1
45	0.0	0.004	0.003	0.000	0.0
50	0.0	0.003	0.002	0.000	0.0
55	0.0	0.002	0.002	0.000	0.0
60	0.0	0.002	0.001	0.000	0.0

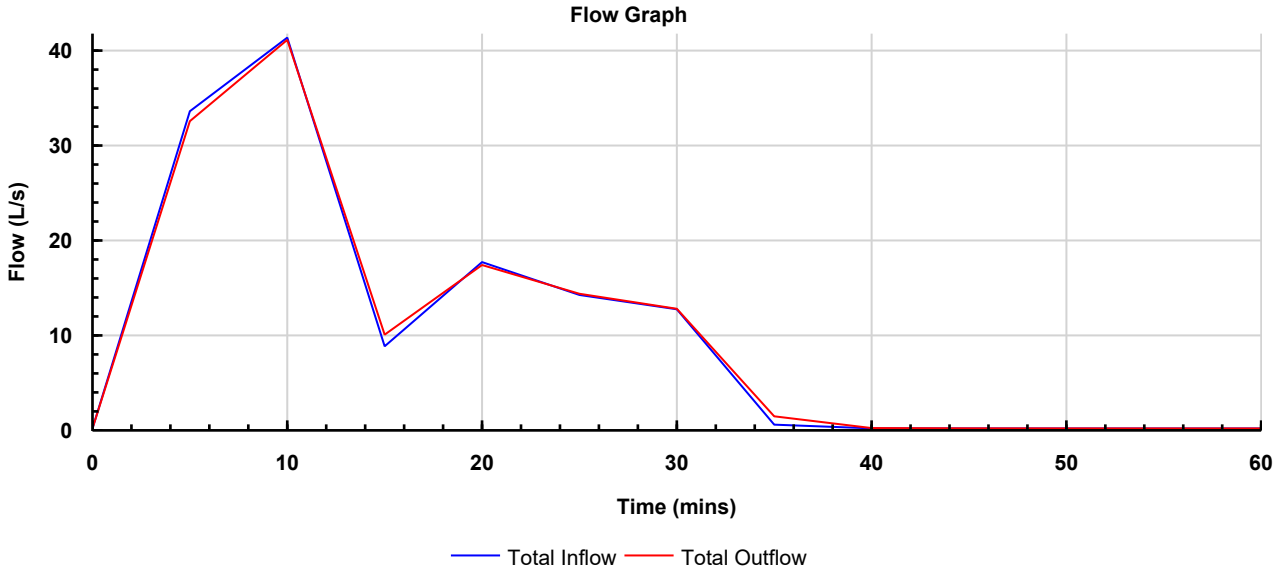
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

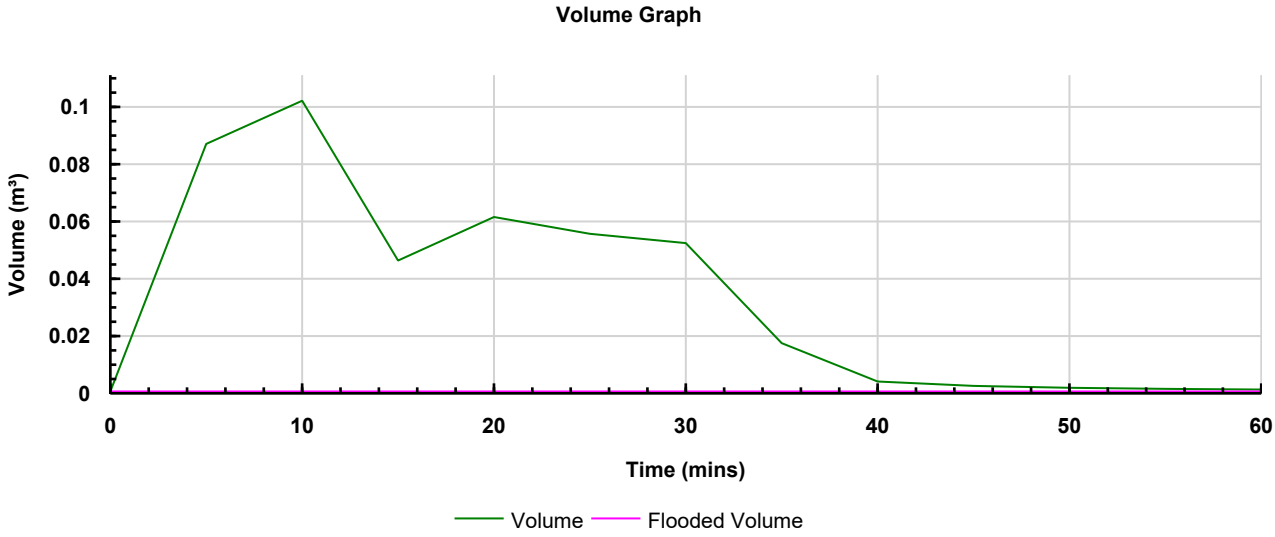


P6.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 5

Type : Manhole

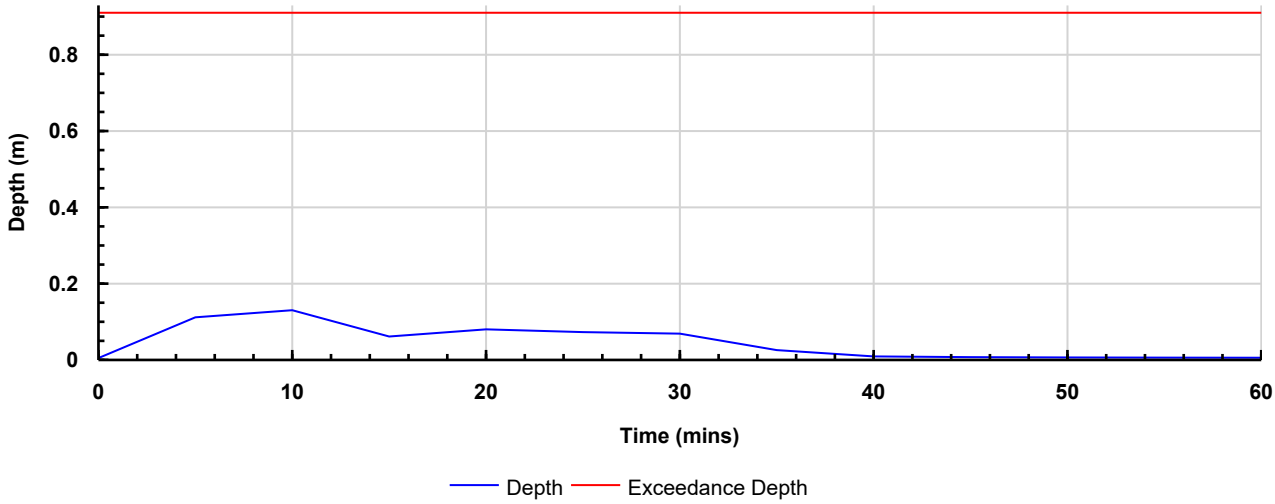
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	33.6	0.107	0.087	0.000	32.5
10	41.4	0.126	0.102	0.000	41.1
15	8.7	0.057	0.046	0.000	9.9
20	17.6	0.076	0.061	0.000	17.3
25	14.1	0.068	0.055	0.000	14.3
30	12.6	0.064	0.052	0.000	12.7
35	0.4	0.021	0.017	0.000	1.3
40	0.0	0.004	0.003	0.000	0.0
45	0.0	0.002	0.002	0.000	0.0
50	0.0	0.002	0.001	0.000	0.0
55	0.0	0.001	0.001	0.000	0.0
60	0.0	0.001	0.001	0.000	0.0

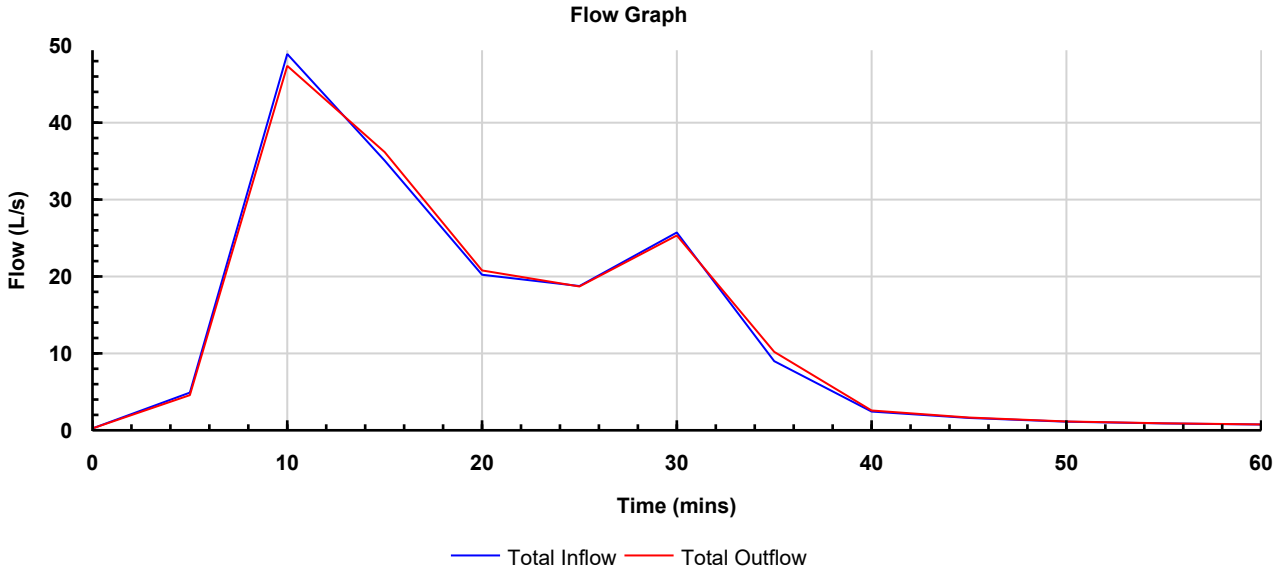
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

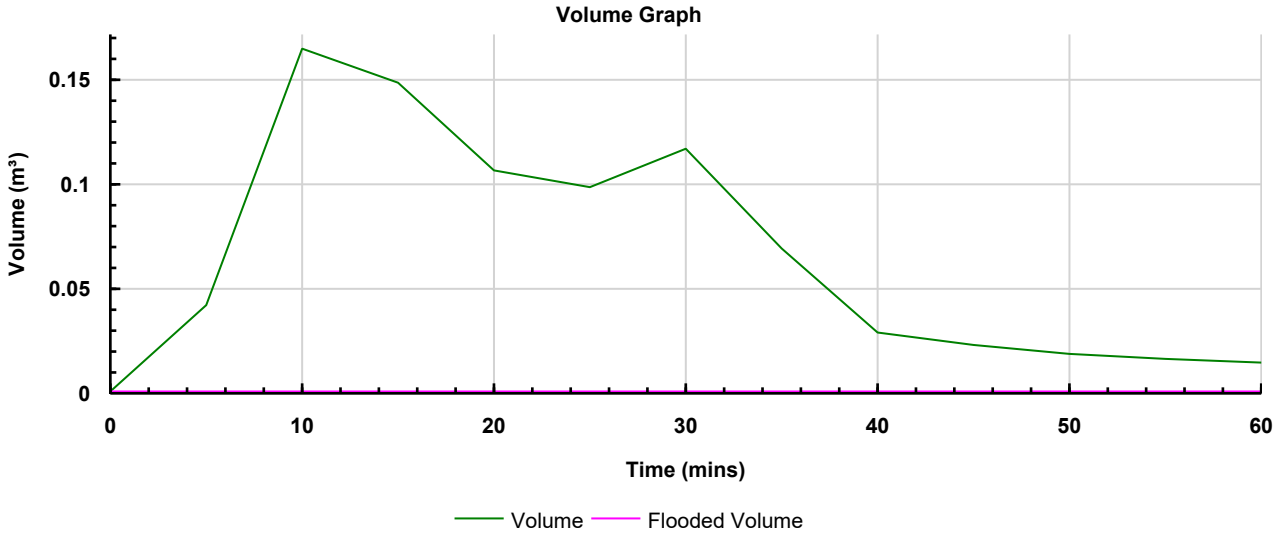


P2.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 1

Type : Manhole

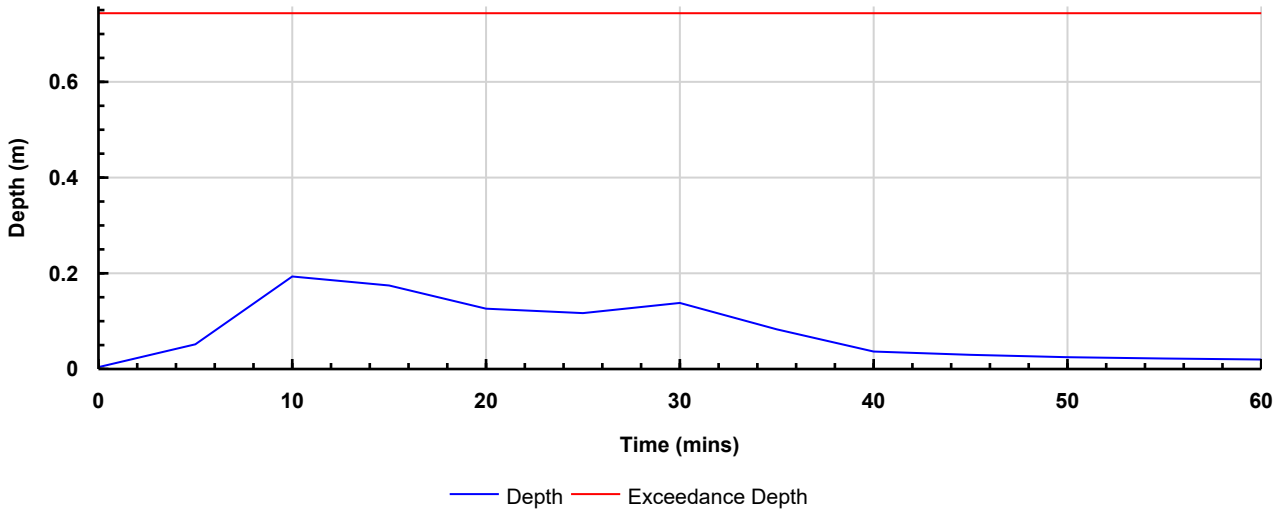
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	4.7	0.048	0.042	0.000	4.3
10	48.9	0.190	0.165	0.000	47.4
15	35.0	0.171	0.148	0.000	36.1
20	20.1	0.123	0.106	0.000	20.6
25	18.6	0.113	0.098	0.000	18.5
30	25.6	0.135	0.117	0.000	25.2
35	8.8	0.079	0.069	0.000	10.0
40	2.2	0.033	0.028	0.000	2.3
45	1.4	0.026	0.022	0.000	1.4
50	0.9	0.021	0.018	0.000	0.9
55	0.6	0.018	0.016	0.000	0.7
60	0.5	0.016	0.014	0.000	0.5

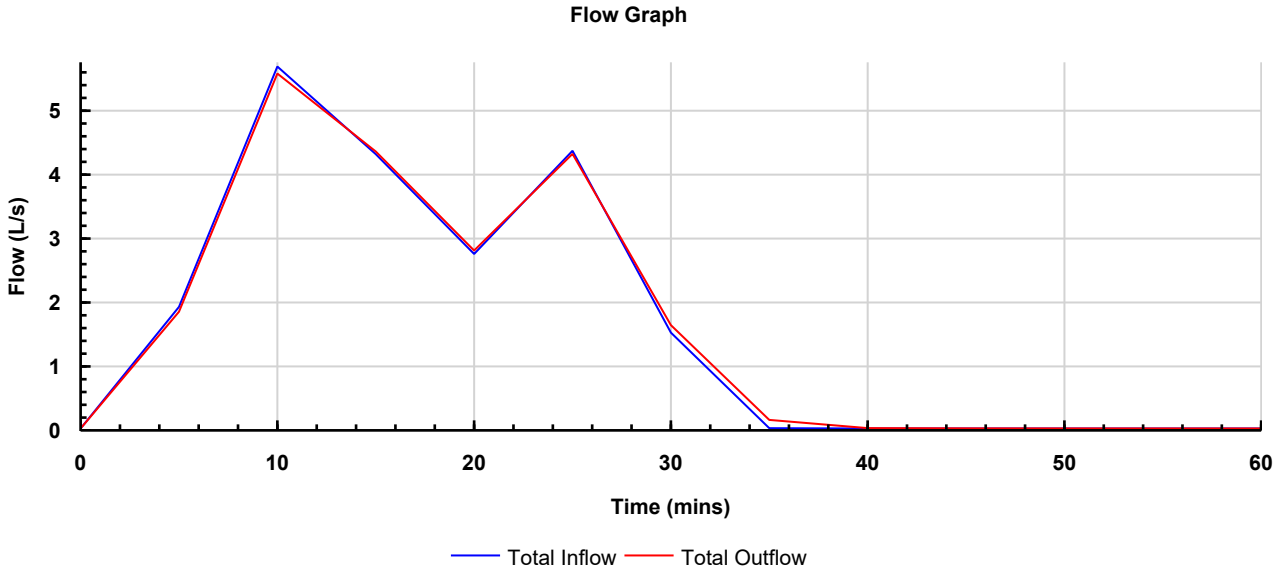
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

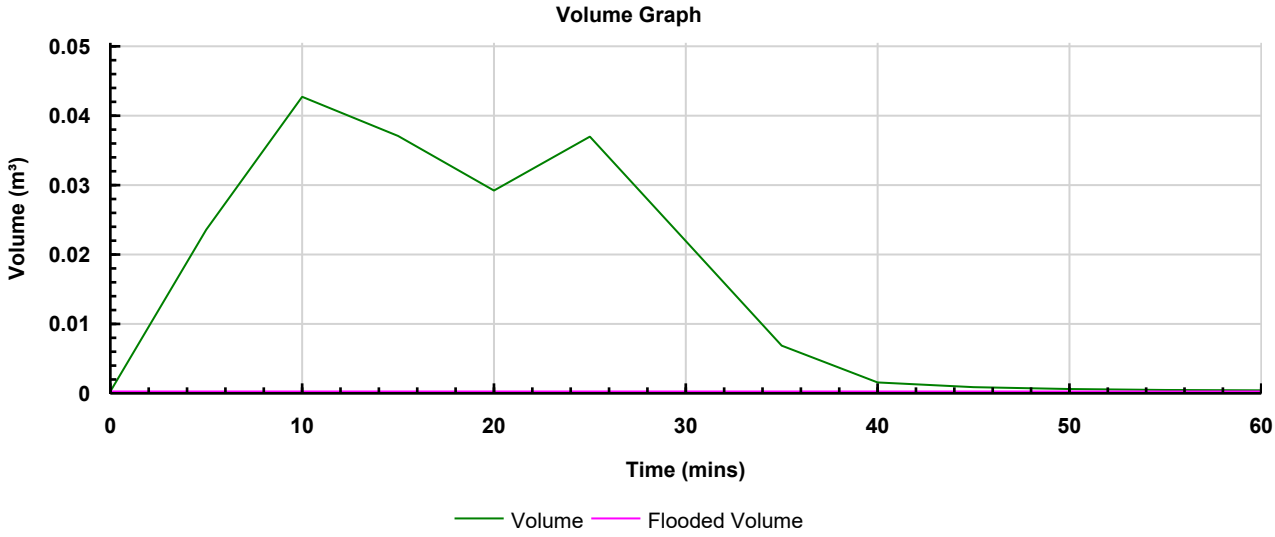


P6.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

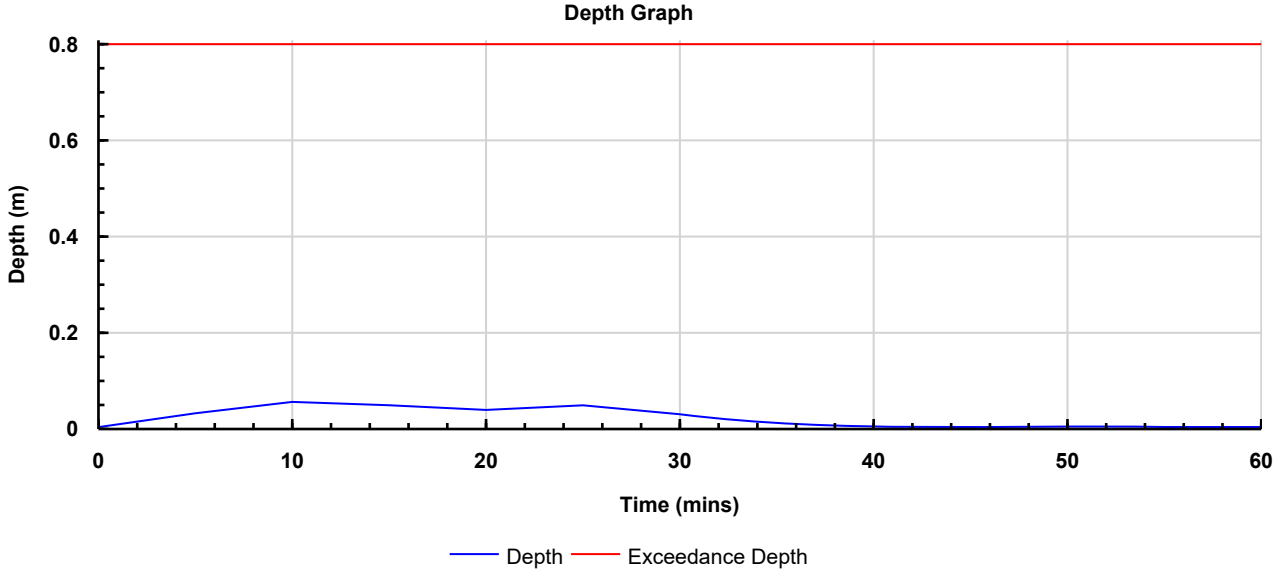
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	1.9	0.029	0.023	0.000	1.8
10	5.7	0.053	0.043	0.000	5.6
15	4.3	0.046	0.037	0.000	4.4
20	2.7	0.036	0.029	0.000	2.8
25	4.4	0.046	0.037	0.000	4.3
30	1.5	0.027	0.022	0.000	1.6
35	0.0	0.008	0.007	0.000	0.1
40	0.0	0.002	0.001	0.000	0.0
45	0.0	0.001	0.001	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

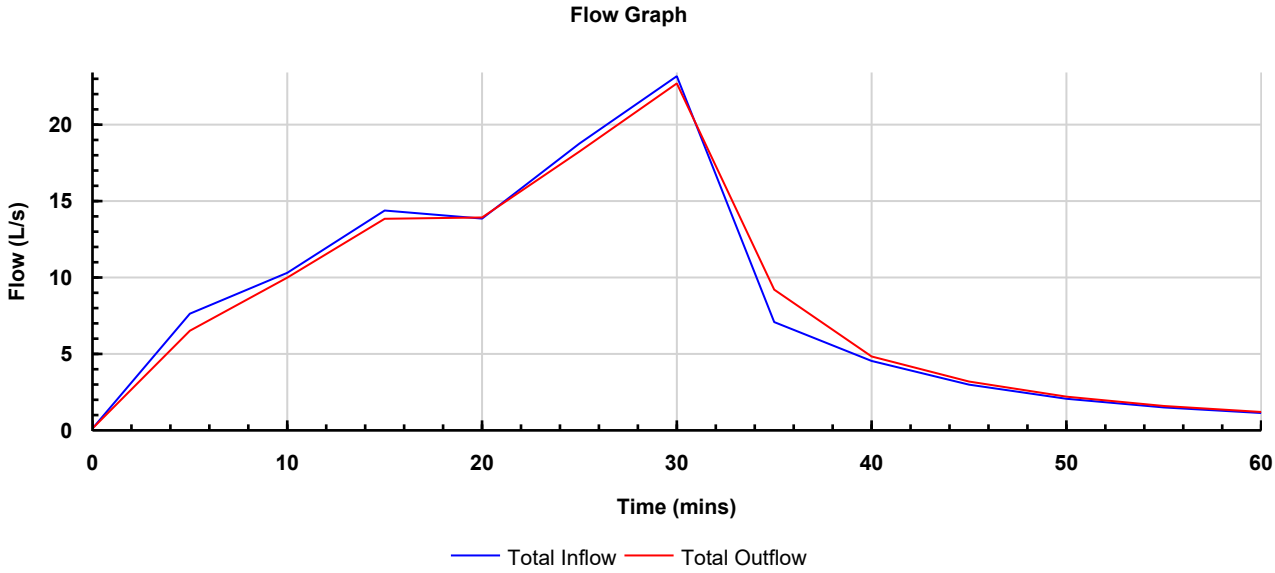
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

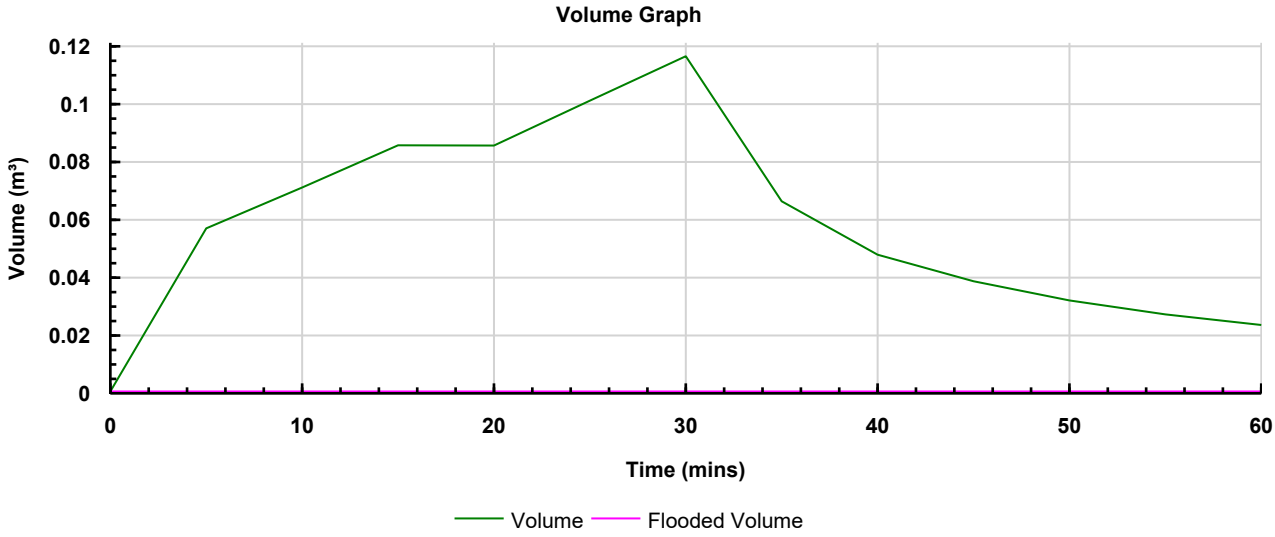


P4.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 9

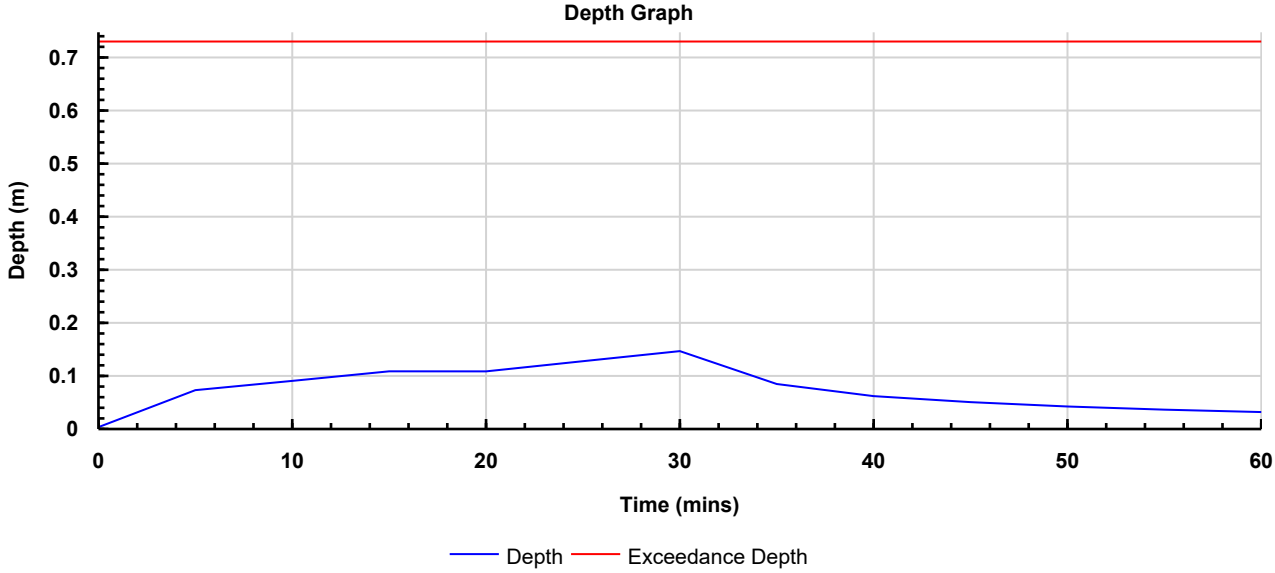
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	7.5	0.070	0.057	0.000	6.4
10	10.2	0.088	0.071	0.000	9.9
15	14.3	0.106	0.086	0.000	13.8
20	13.8	0.106	0.085	0.000	13.9
25	18.7	0.125	0.101	0.000	18.2
30	23.2	0.144	0.117	0.000	22.7
35	7.0	0.082	0.066	0.000	9.1
40	4.4	0.059	0.048	0.000	4.7
45	2.9	0.047	0.038	0.000	3.1
50	2.0	0.039	0.032	0.000	2.1
55	1.4	0.033	0.027	0.000	1.5
60	1.0	0.029	0.023	0.000	1.1

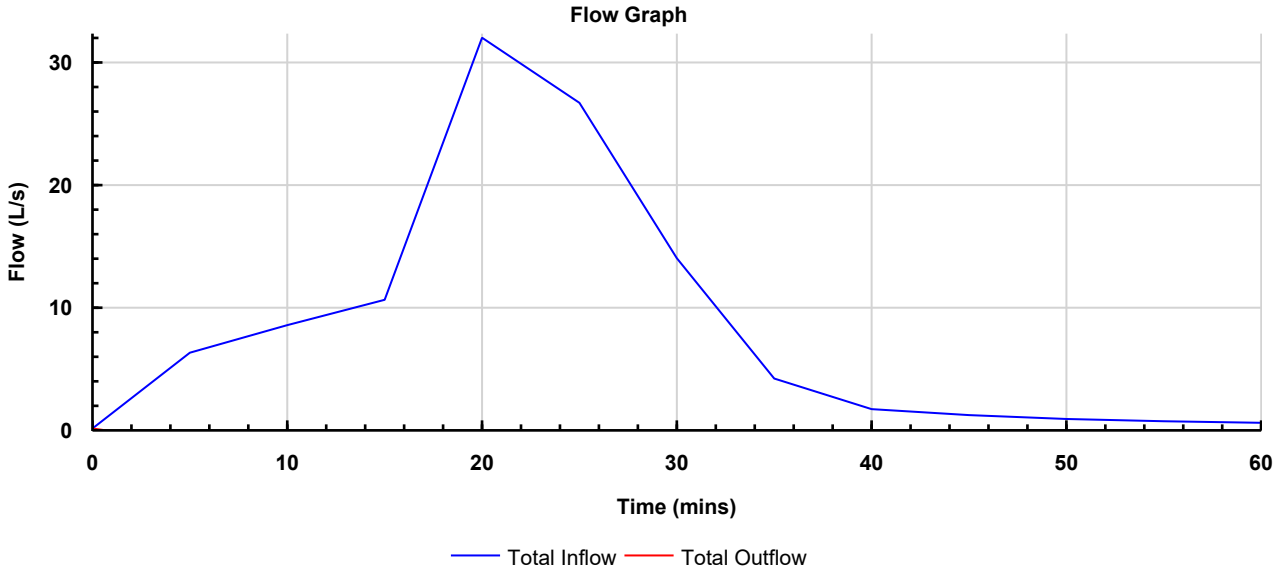
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

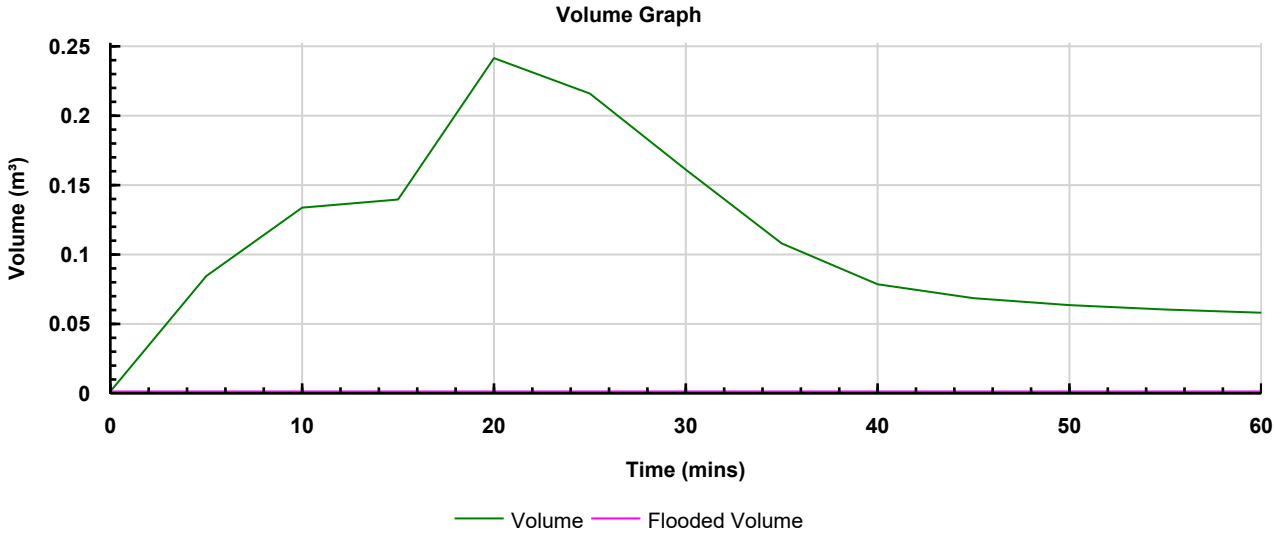


P3.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

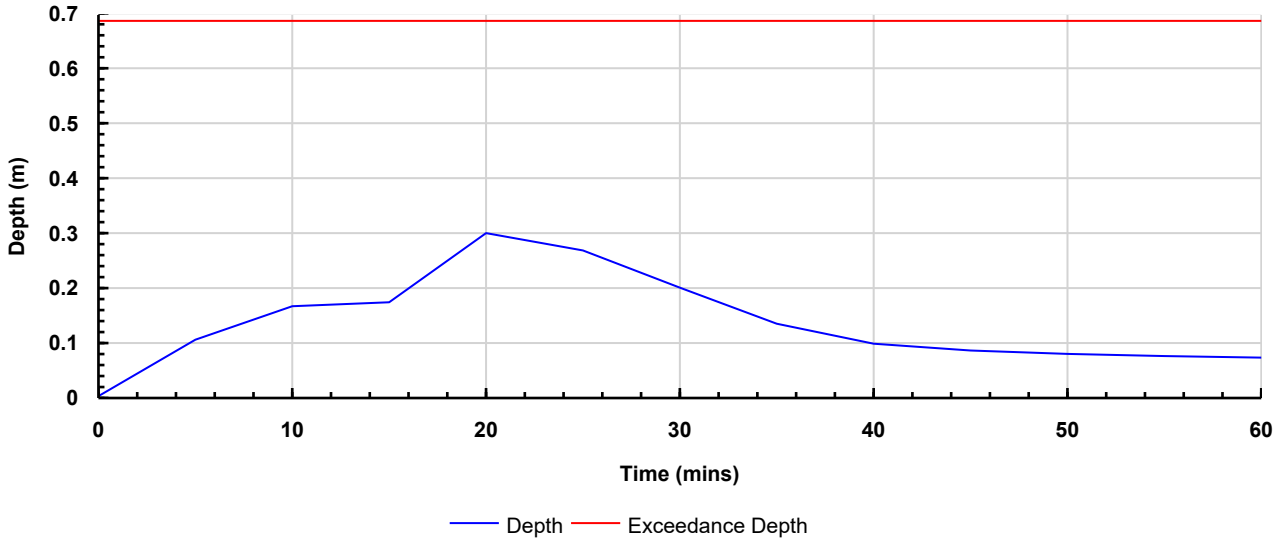
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	6.2	0.103	0.084	0.000	-1.1
10	8.5	0.164	0.133	0.000	-7.0
15	10.5	0.172	0.139	0.000	-7.7
20	32.0	0.298	0.241	0.000	-23.5
25	26.7	0.266	0.216	0.000	-20.9
30	14.0	0.198	0.161	0.000	-11.4
35	4.1	0.132	0.107	0.000	-4.1
40	1.6	0.096	0.078	0.000	-1.6
45	1.1	0.083	0.068	0.000	-1.1
50	0.8	0.077	0.063	0.000	-0.8
55	0.6	0.073	0.059	0.000	-0.6
60	0.5	0.070	0.057	0.000	-0.5

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

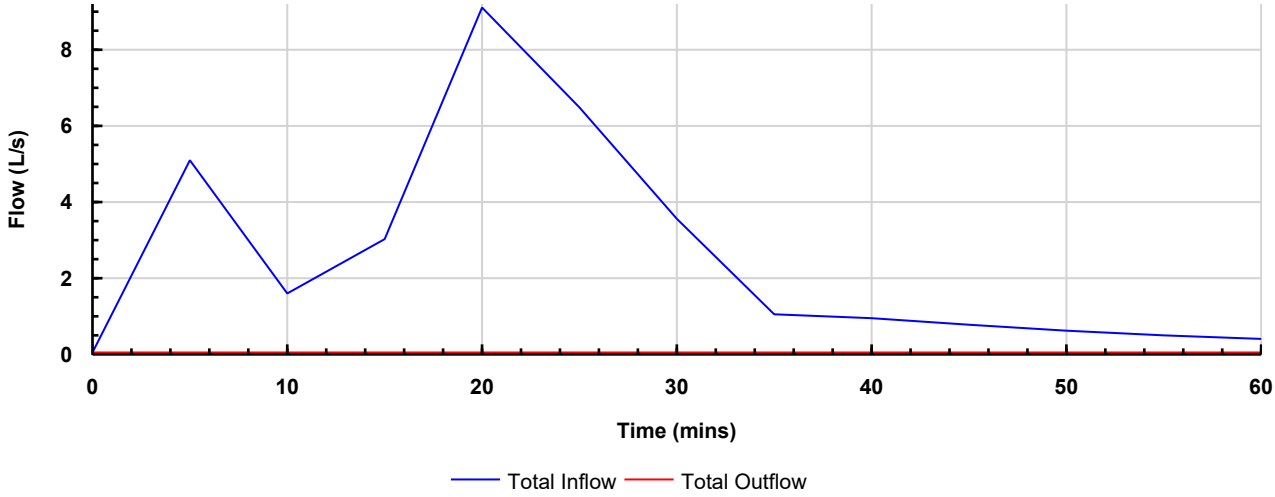


P3.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

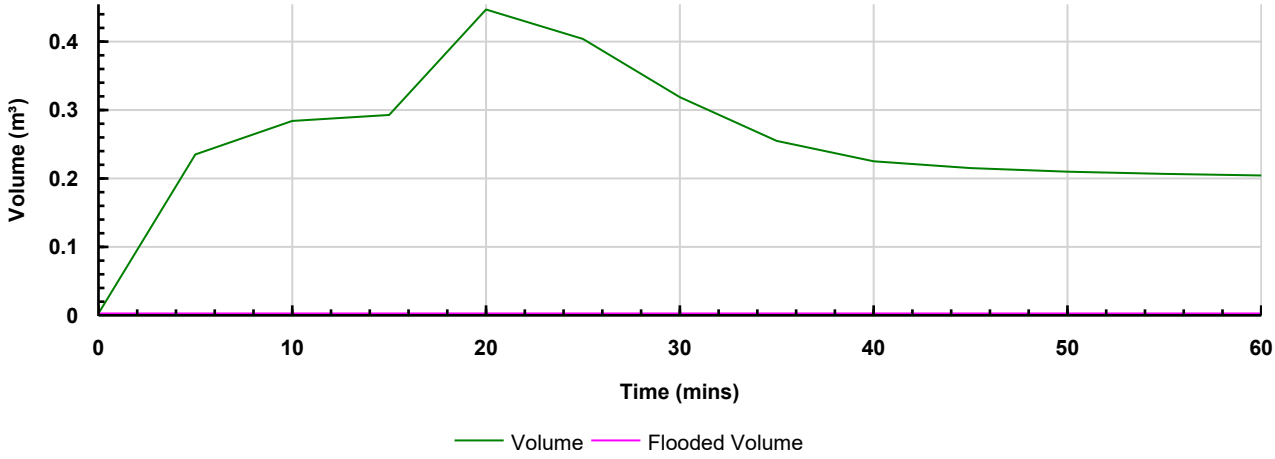
Type : Manhole

Graphs

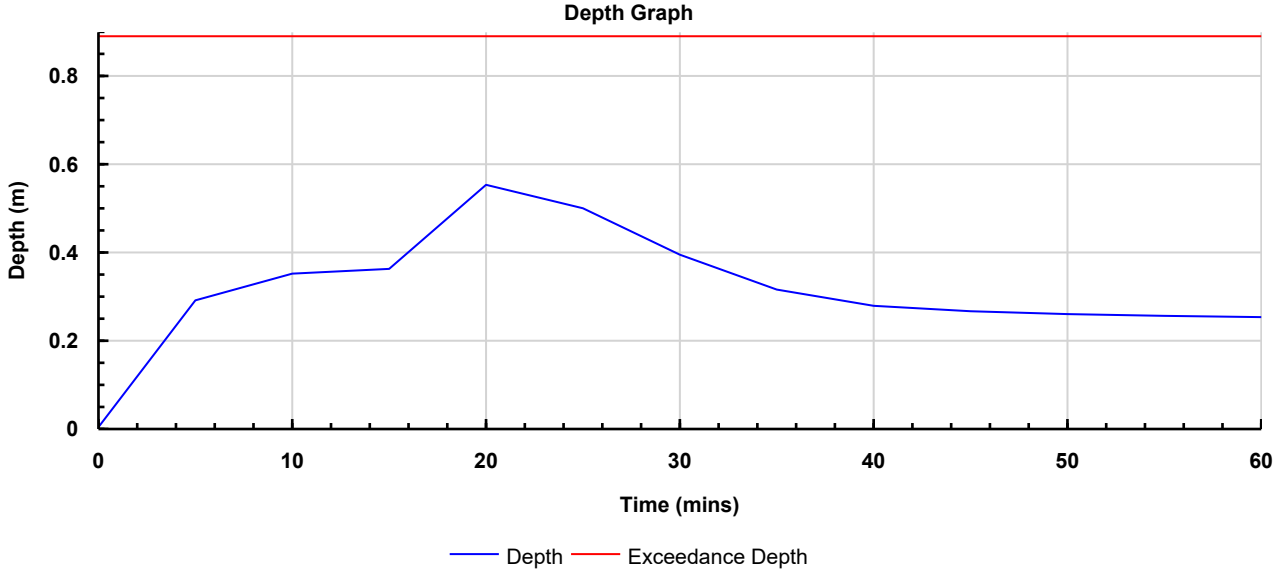
Flow Graph



Volume Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	5.1	0.289	0.234	0.000	-0.0
10	1.6	0.349	0.283	0.000	-0.0
15	3.0	0.360	0.292	0.000	-0.0
20	9.1	0.552	0.447	0.000	-0.0
25	6.5	0.498	0.404	0.000	-0.0
30	3.5	0.393	0.318	0.000	-0.0
35	1.0	0.313	0.254	0.000	-0.0
40	0.9	0.276	0.224	0.000	-0.0
45	0.7	0.264	0.214	0.000	-0.0
50	0.6	0.257	0.208	0.000	-0.0
55	0.5	0.253	0.205	0.000	-0.0
60	0.4	0.250	0.203	0.000	-0.0

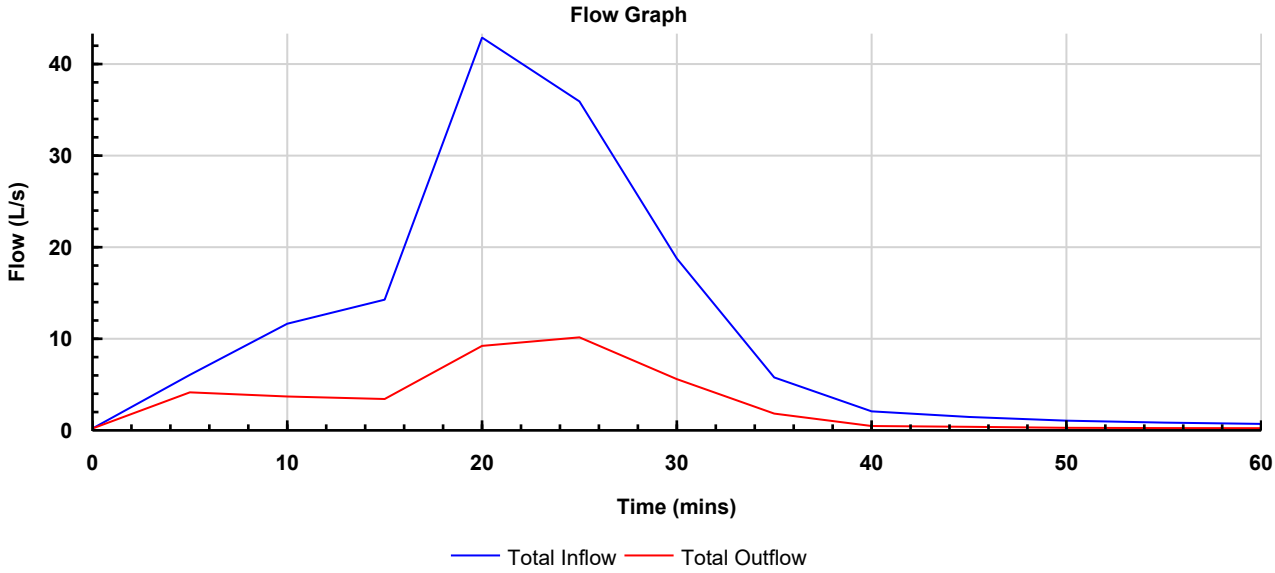
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

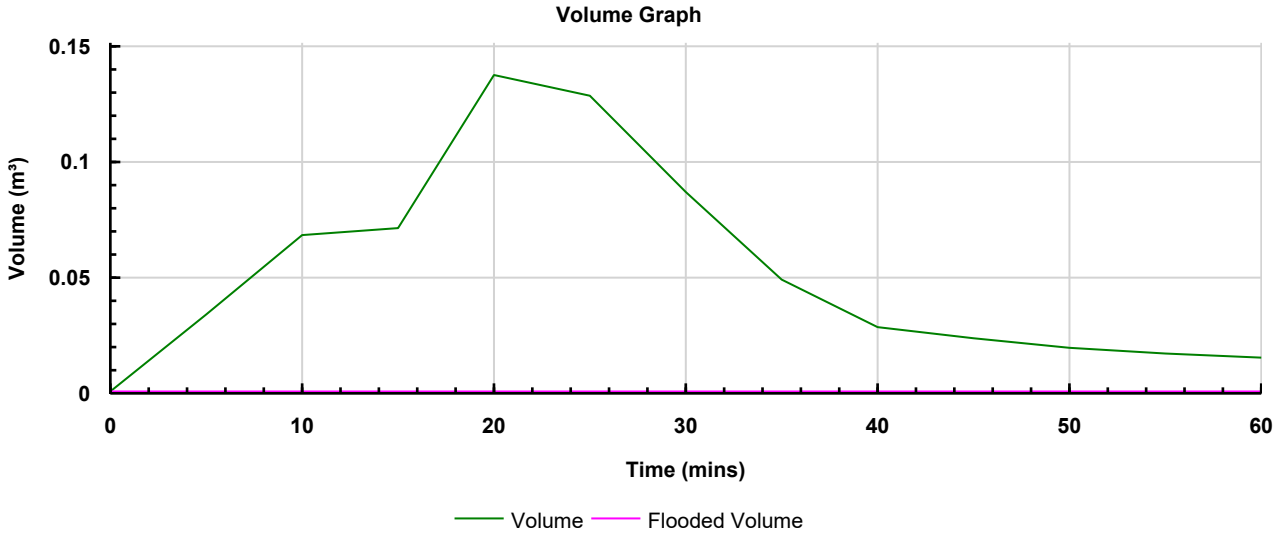


P2.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

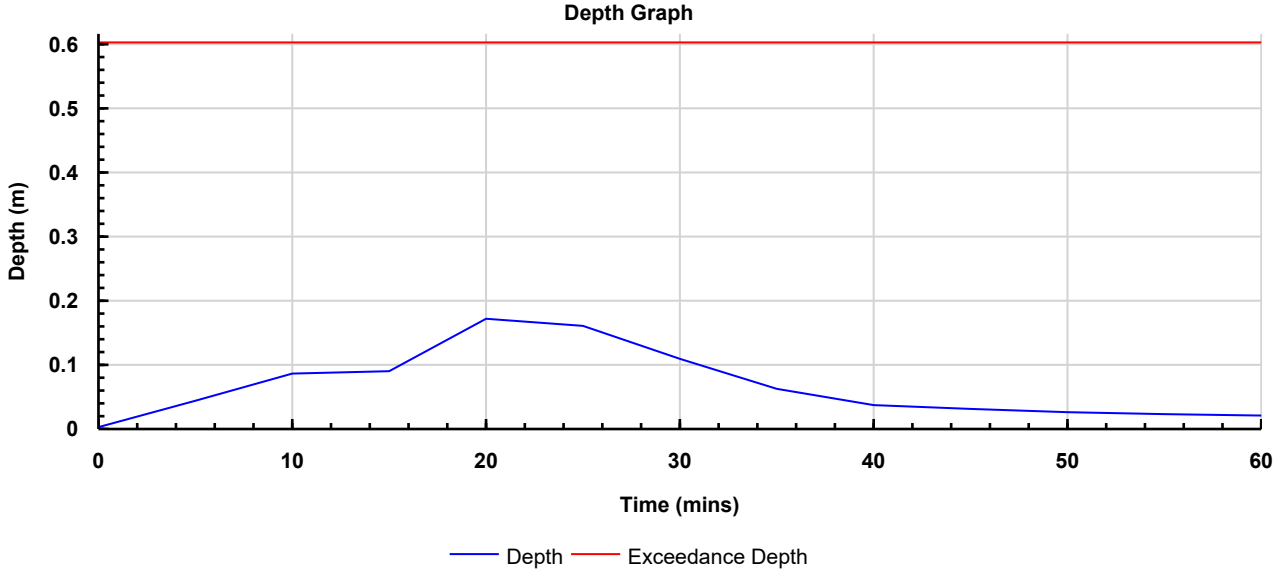
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	5.9	0.041	0.033	0.000	4.0
10	11.5	0.084	0.068	0.000	3.5
15	14.1	0.088	0.071	0.000	3.2
20	42.9	0.170	0.138	0.000	9.1
25	35.9	0.159	0.129	0.000	10.0
30	18.6	0.107	0.087	0.000	5.4
35	5.6	0.060	0.049	0.000	1.6
40	1.9	0.035	0.028	0.000	0.3
45	1.3	0.029	0.023	0.000	0.2
50	0.9	0.023	0.019	0.000	0.1
55	0.6	0.020	0.016	0.000	0.0
60	0.5	0.018	0.015	0.000	0.0

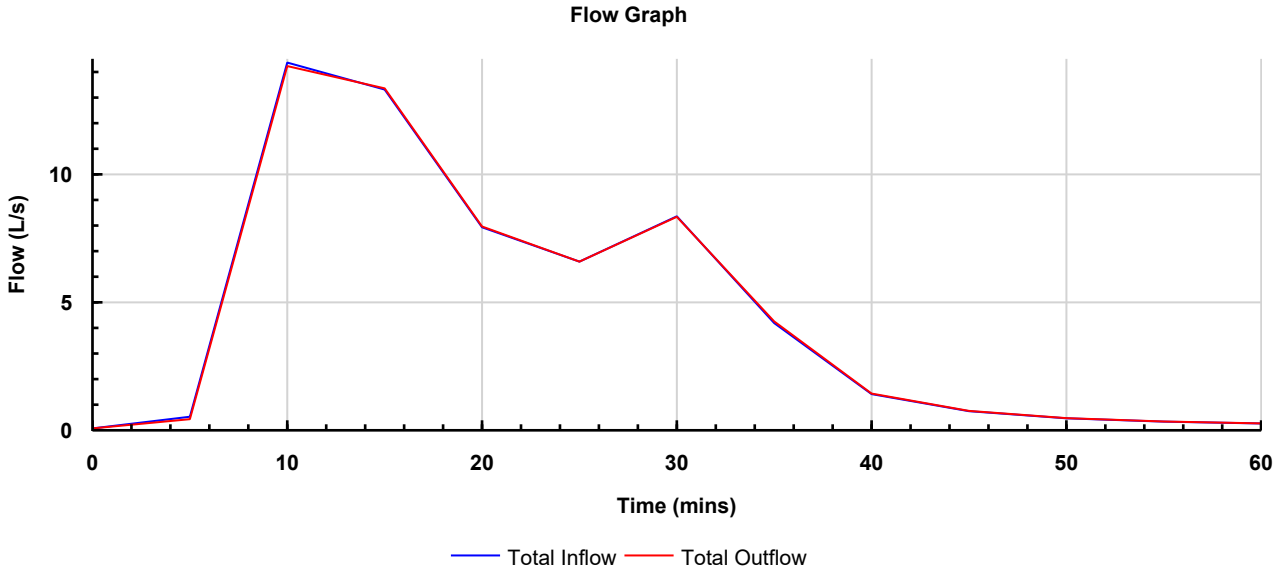
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

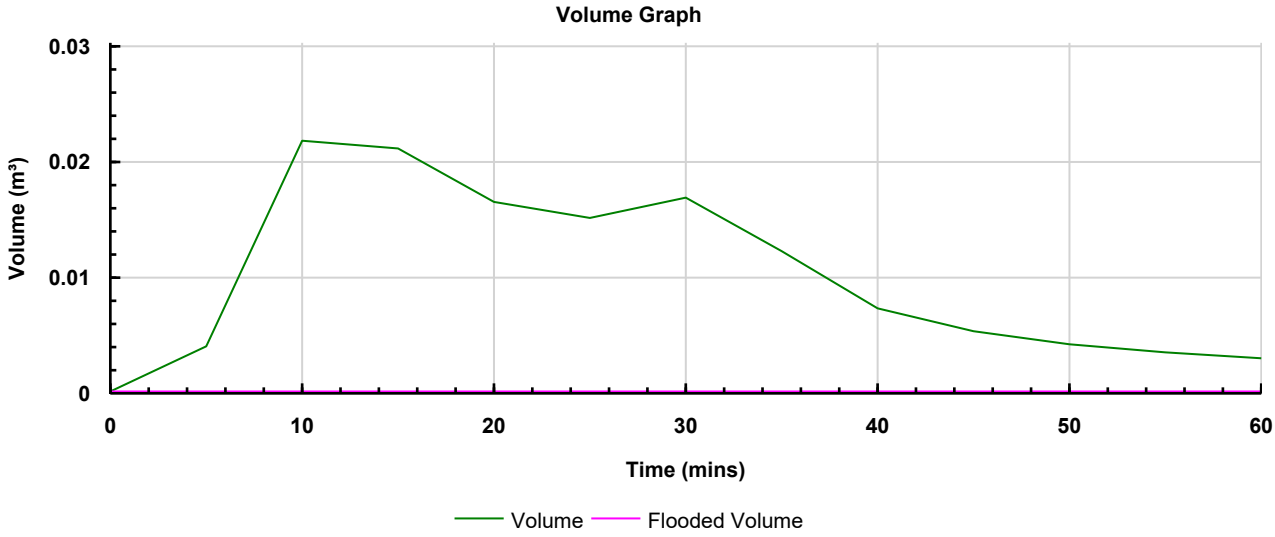


P12.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 1

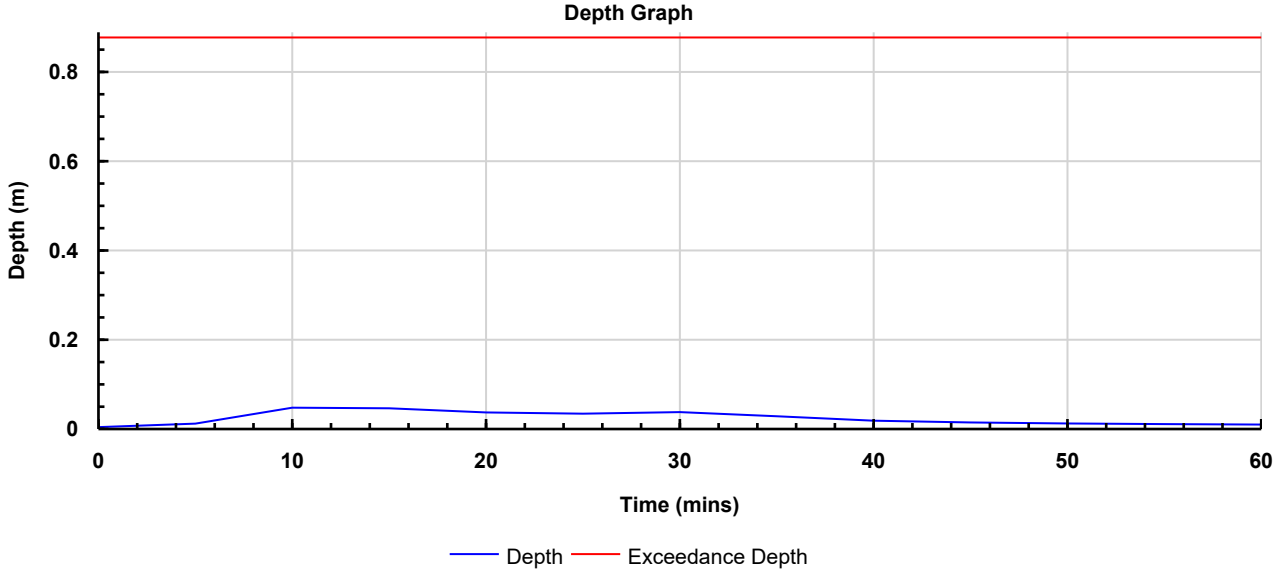
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.5	0.008	0.004	0.000	0.4
10	14.4	0.044	0.022	0.000	14.2
15	13.3	0.042	0.021	0.000	13.4
20	7.9	0.033	0.016	0.000	7.9
25	6.5	0.030	0.015	0.000	6.5
30	8.3	0.034	0.017	0.000	8.3
35	4.1	0.024	0.012	0.000	4.2
40	1.3	0.015	0.007	0.000	1.4
45	0.7	0.011	0.005	0.000	0.7
50	0.4	0.008	0.004	0.000	0.4
55	0.3	0.007	0.003	0.000	0.3
60	0.2	0.006	0.003	0.000	0.2

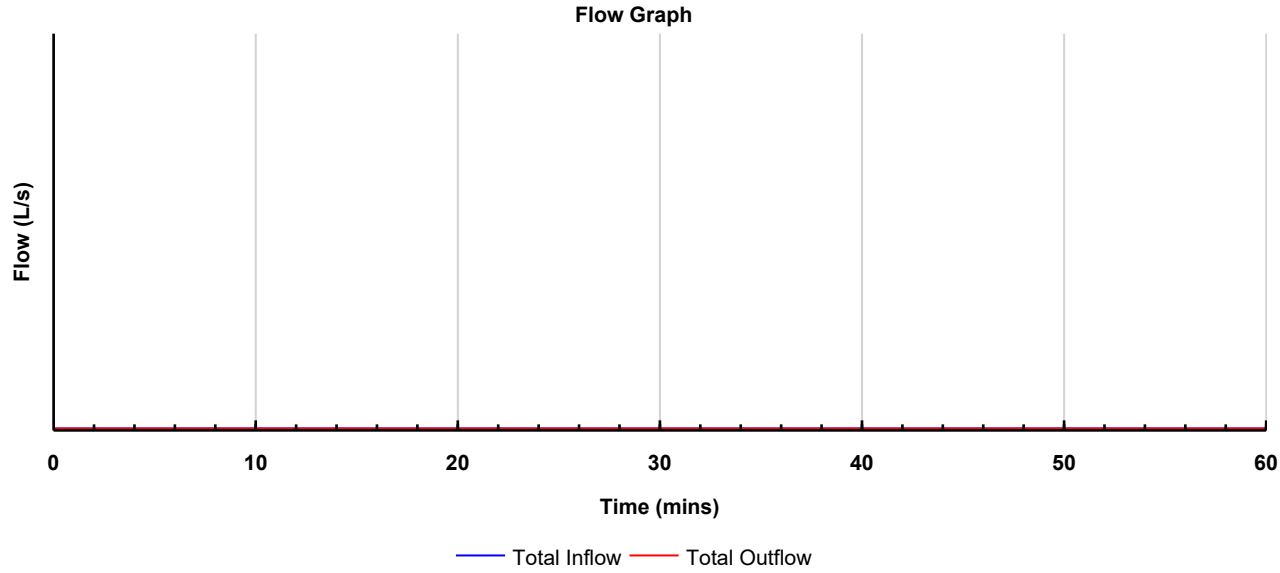
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

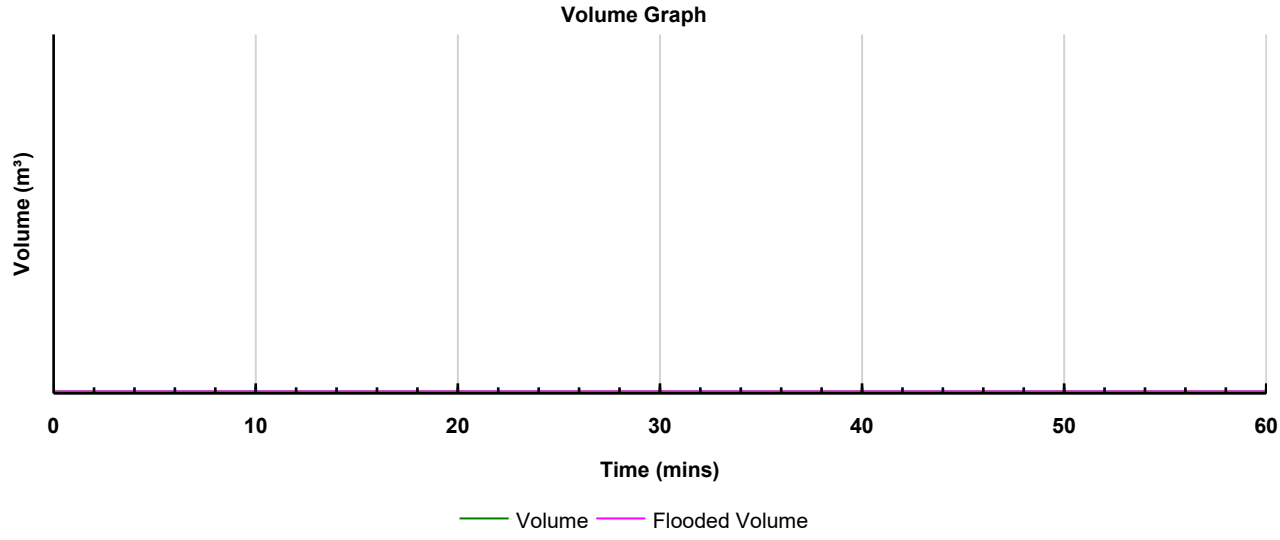


P6.00
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 1

Type : Manhole

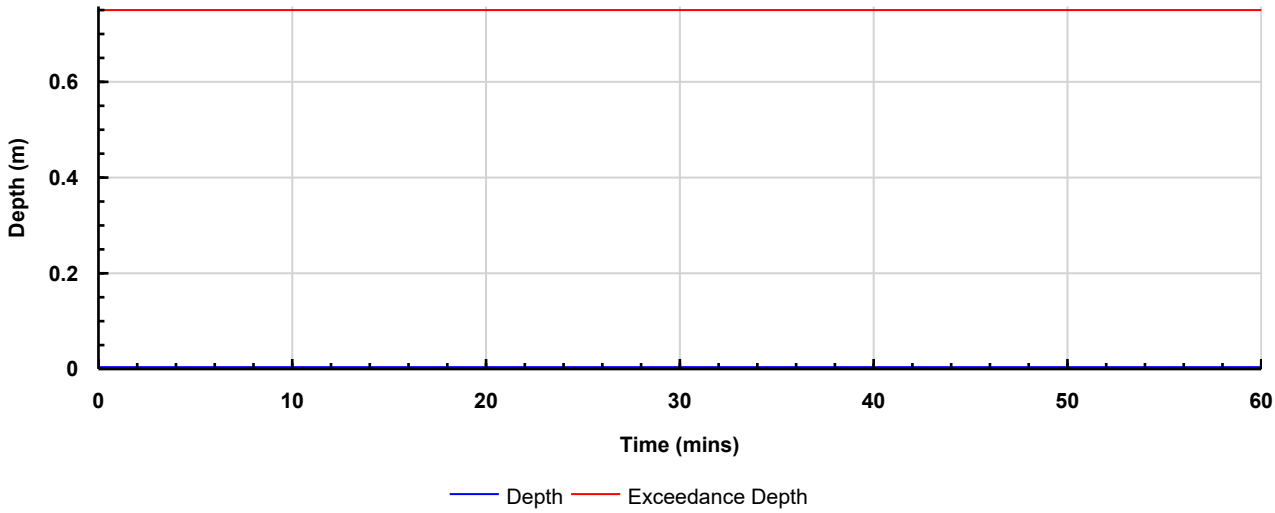
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.000	0.000	0.000	0.0
20	0.0	0.000	0.000	0.000	0.0
25	0.0	0.000	0.000	0.000	0.0
30	0.0	0.000	0.000	0.000	0.0
35	0.0	0.000	0.000	0.000	0.0
40	0.0	0.000	0.000	0.000	0.0
45	0.0	0.000	0.000	0.000	0.0
50	0.0	0.000	0.000	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

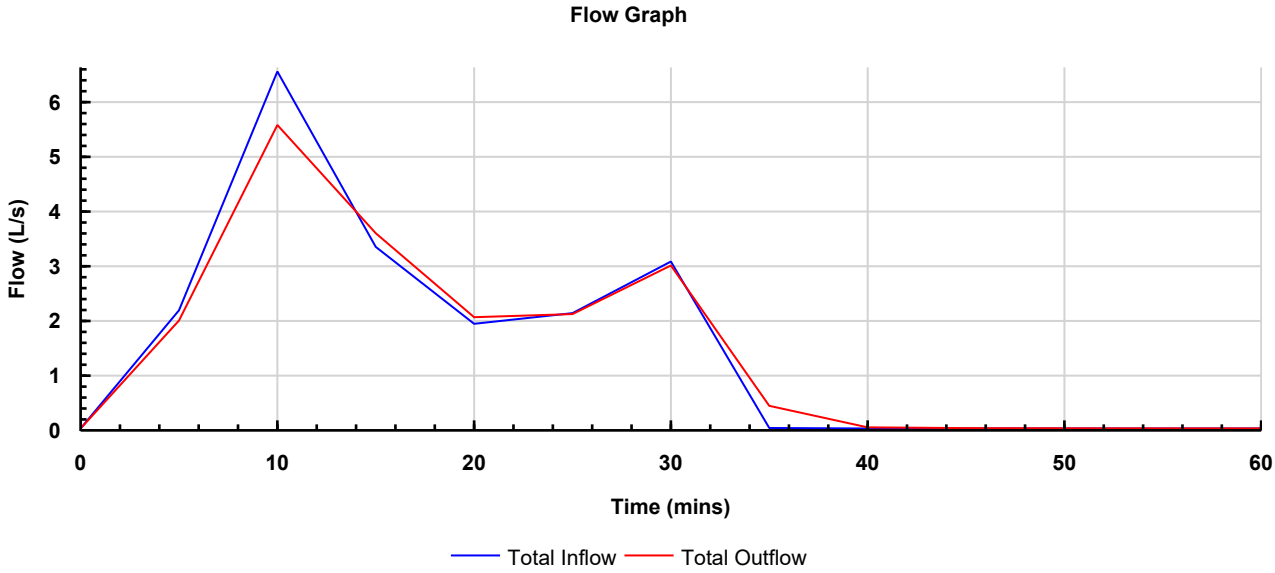
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

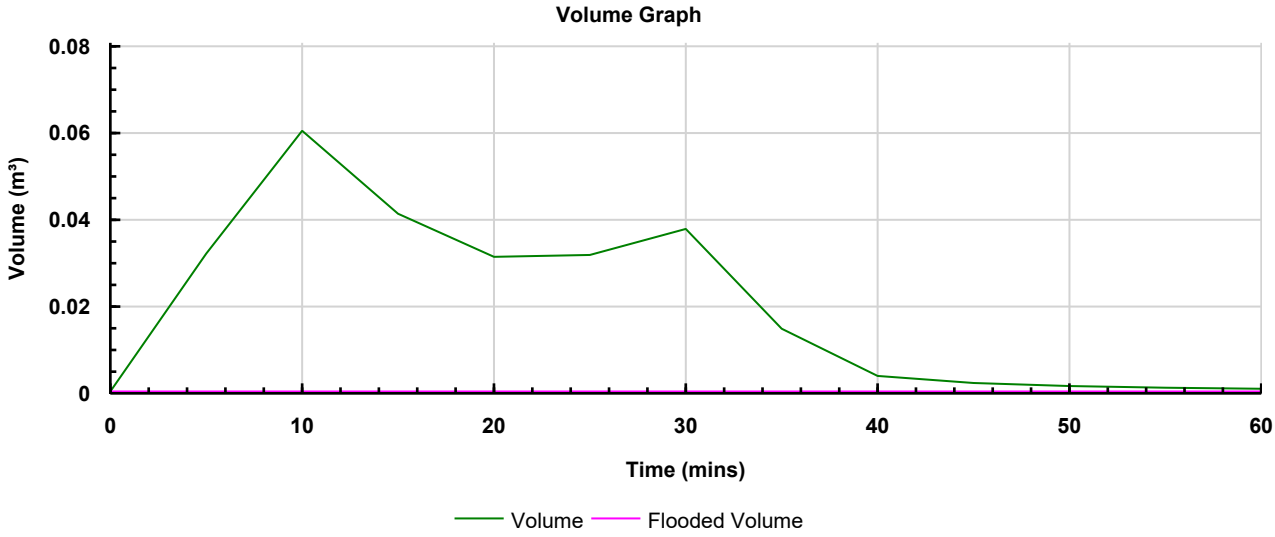


P2.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 1

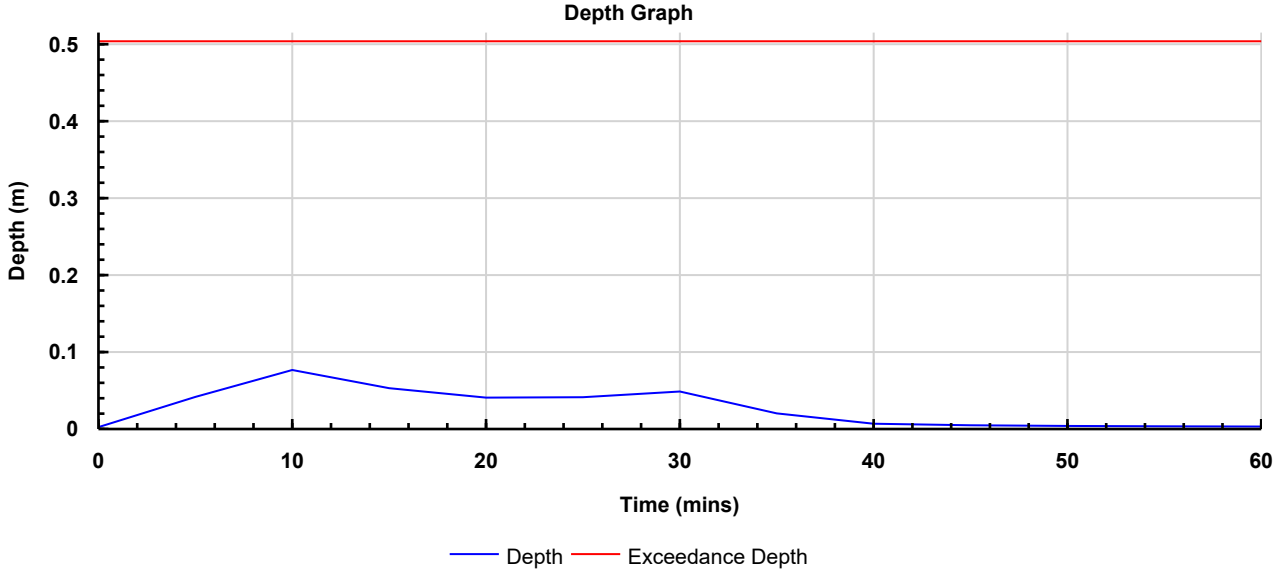
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.2	0.039	0.032	0.000	2.0
10	6.6	0.075	0.060	0.000	5.6
15	3.3	0.051	0.041	0.000	3.6
20	1.9	0.039	0.031	0.000	2.0
25	2.1	0.039	0.032	0.000	2.1
30	3.1	0.047	0.038	0.000	3.0
35	0.0	0.018	0.015	0.000	0.4
40	0.0	0.004	0.004	0.000	0.0
45	0.0	0.002	0.002	0.000	0.0
50	0.0	0.002	0.001	0.000	0.0
55	0.0	0.001	0.001	0.000	0.0
60	0.0	0.001	0.001	0.000	0.0

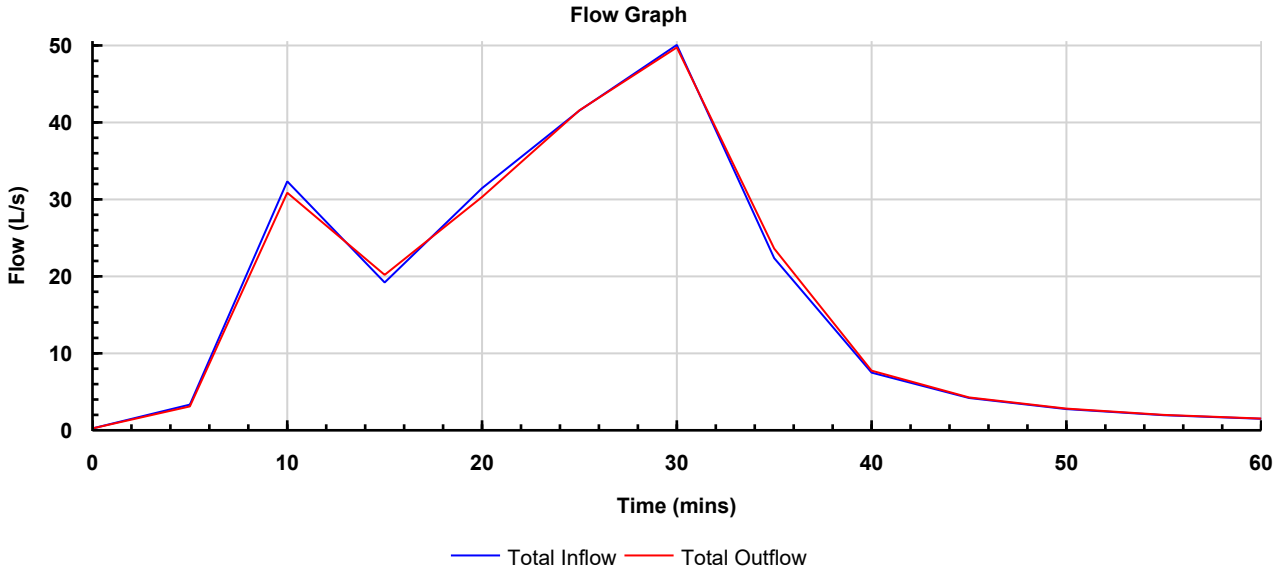
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

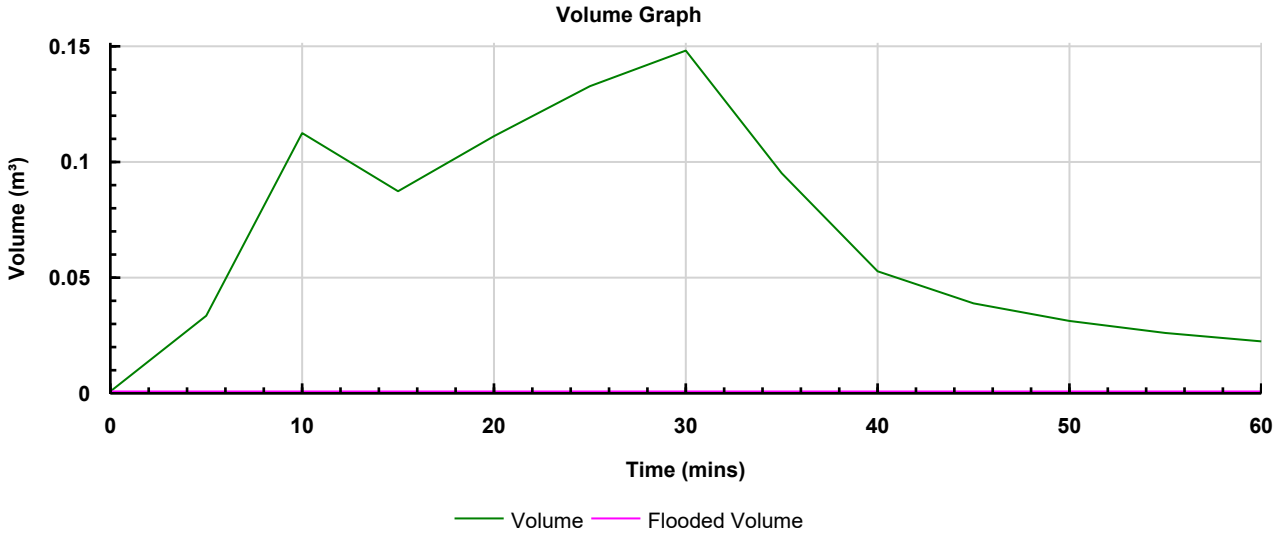


P2.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

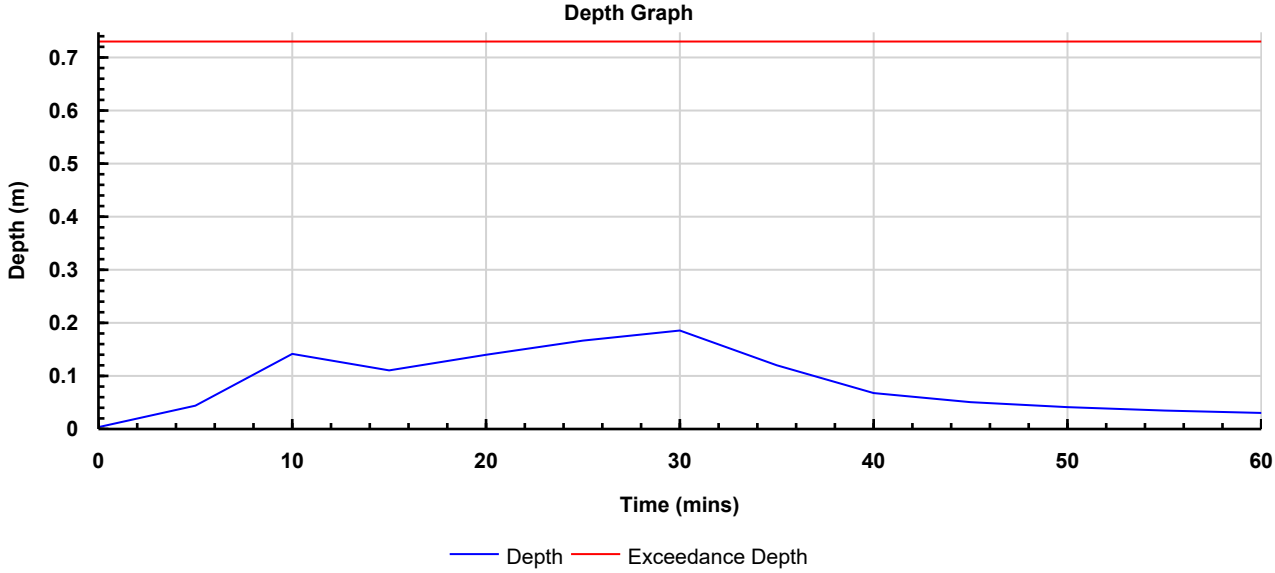
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	3.1	0.041	0.033	0.000	2.9
10	32.3	0.139	0.112	0.000	30.8
15	19.1	0.107	0.087	0.000	20.0
20	31.4	0.137	0.111	0.000	30.2
25	41.5	0.164	0.133	0.000	41.5
30	50.1	0.183	0.148	0.000	49.7
35	22.2	0.117	0.095	0.000	23.5
40	7.3	0.064	0.052	0.000	7.5
45	4.0	0.047	0.038	0.000	4.0
50	2.5	0.038	0.031	0.000	2.6
55	1.7	0.031	0.025	0.000	1.8
60	1.3	0.027	0.022	0.000	1.3

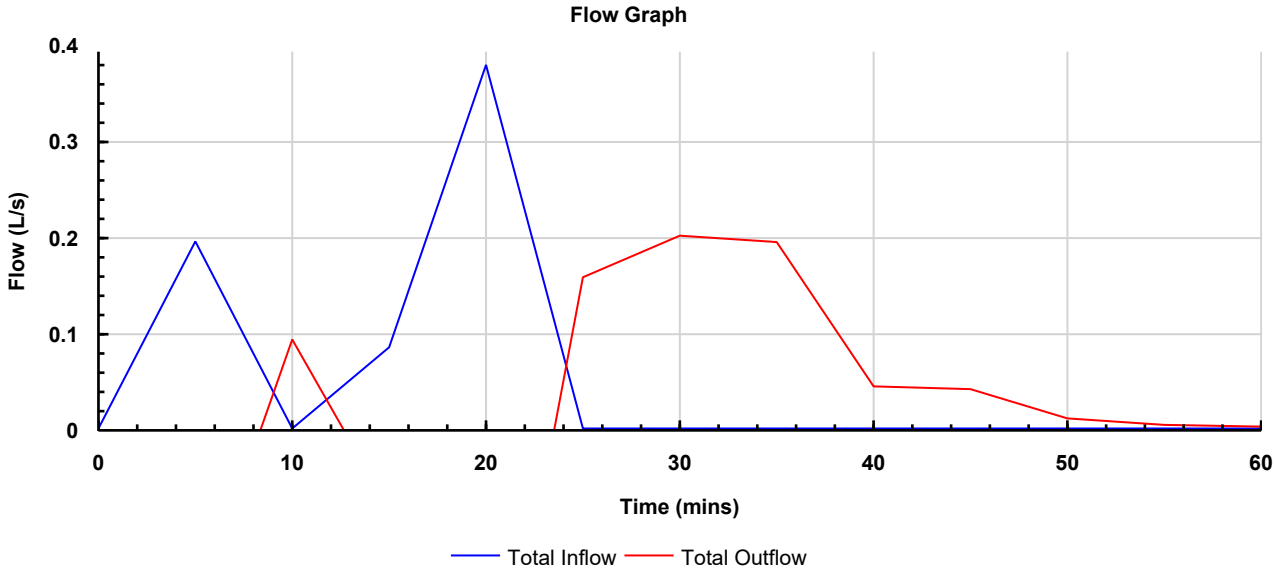
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

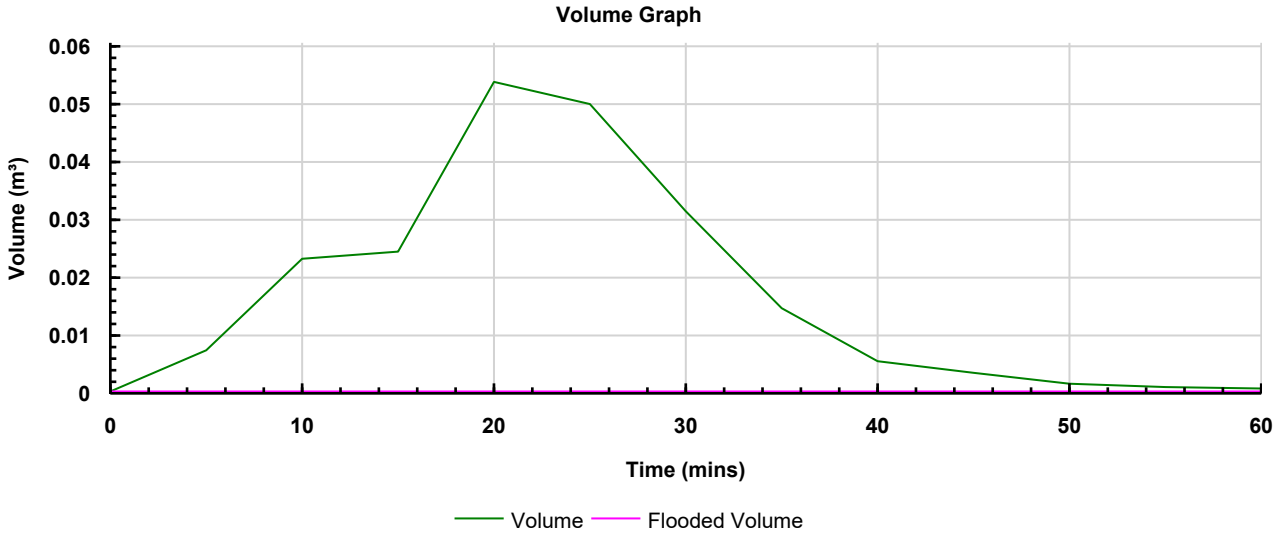


P10.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

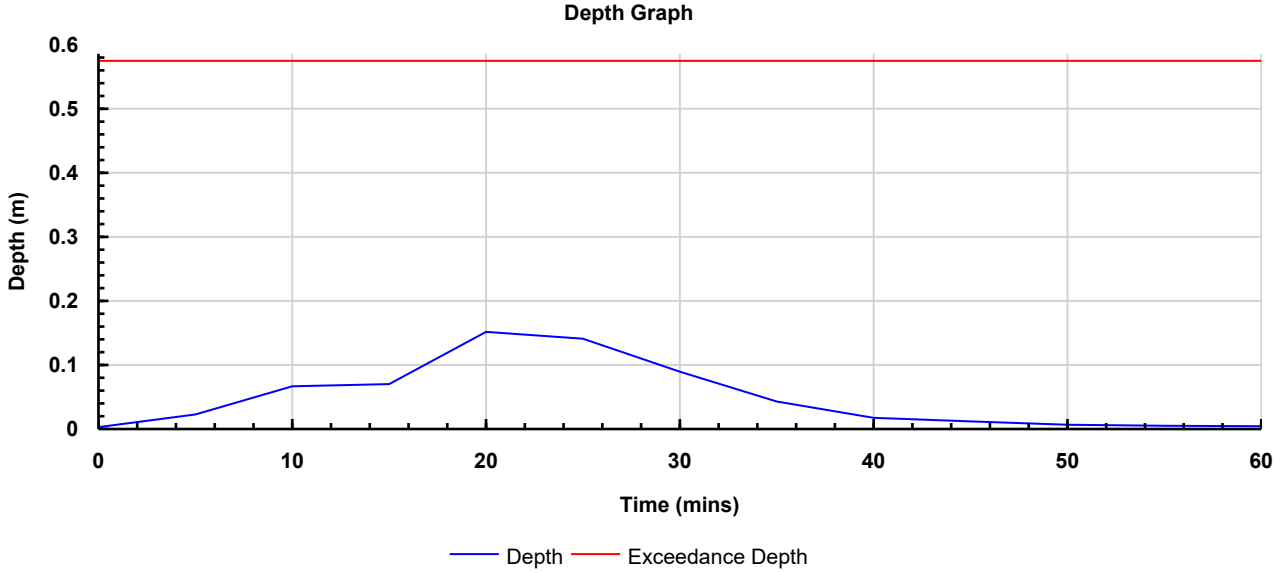
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.2	0.020	0.007	0.000	-0.2
10	0.0	0.064	0.023	0.000	0.1
15	0.1	0.068	0.024	0.000	-0.1
20	0.4	0.149	0.054	0.000	-0.4
25	0.0	0.139	0.050	0.000	0.2
30	0.0	0.087	0.031	0.000	0.2
35	0.0	0.040	0.014	0.000	0.2
40	0.0	0.015	0.005	0.000	0.0
45	0.0	0.009	0.003	0.000	0.0
50	0.0	0.004	0.001	0.000	0.0
55	0.0	0.002	0.001	0.000	0.0
60	0.0	0.001	0.001	0.000	0.0

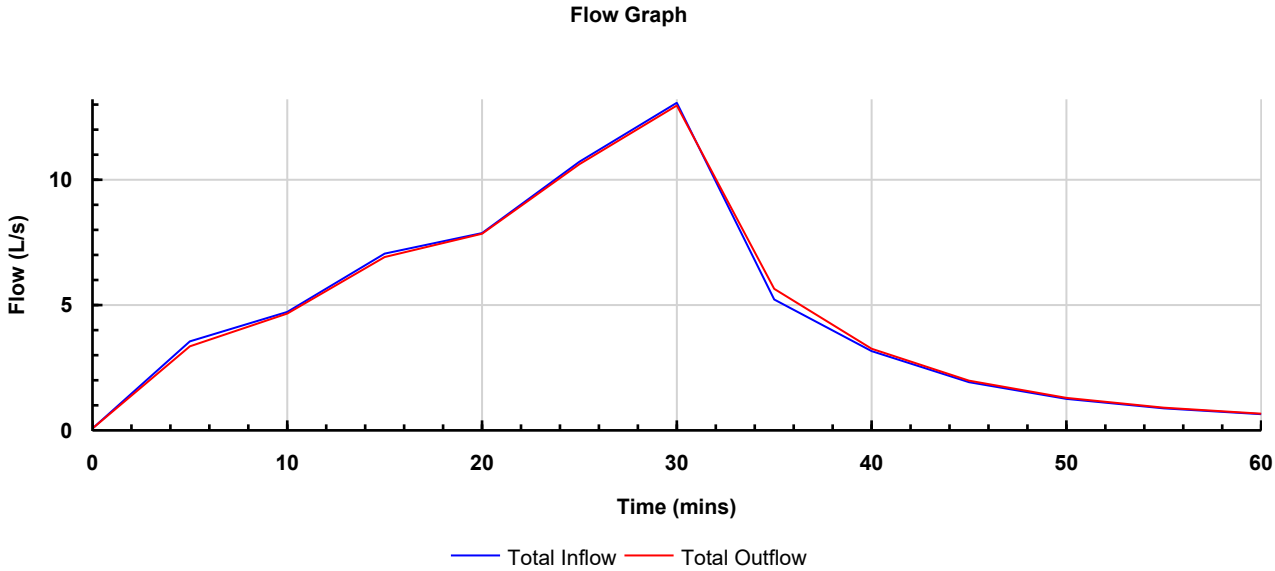
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

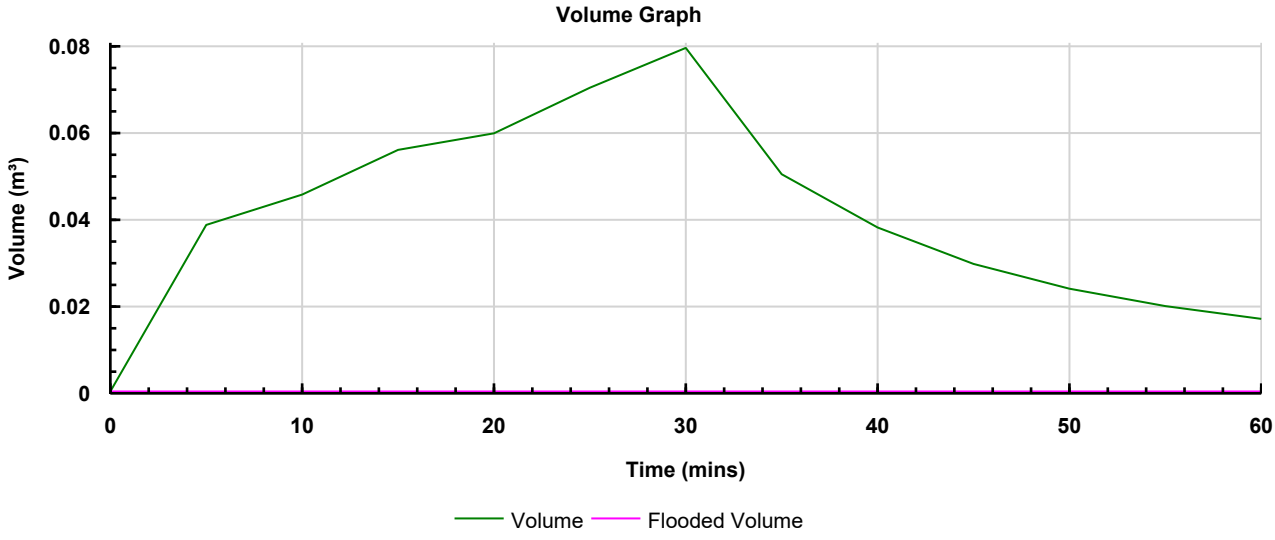


P4.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 9

Type : Manhole

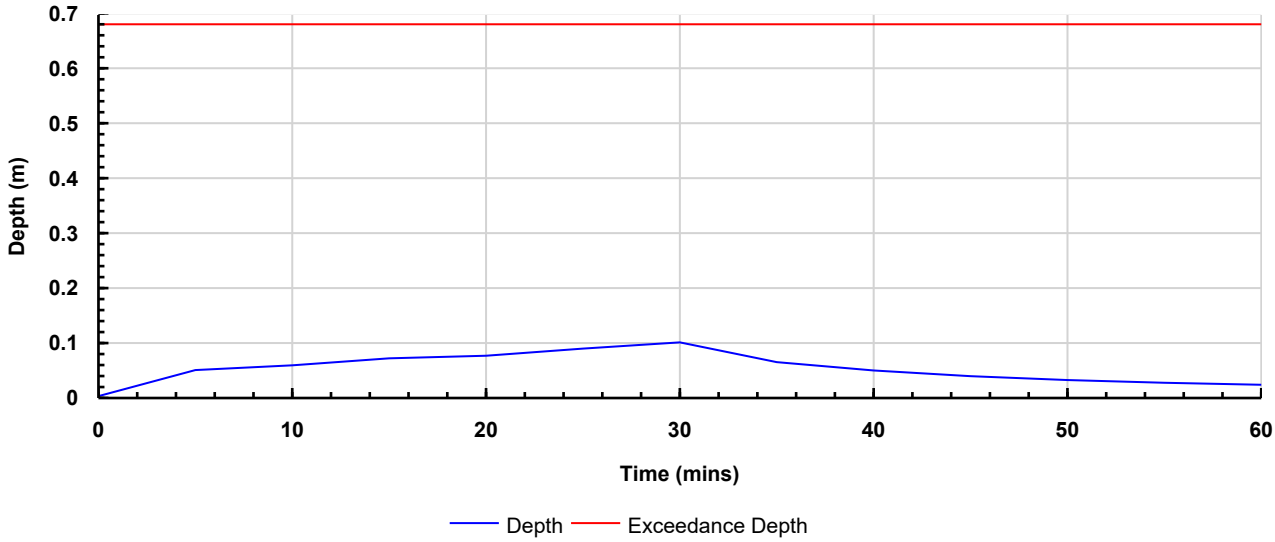
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	3.5	0.048	0.039	0.000	3.3
10	4.7	0.056	0.046	0.000	4.6
15	7.0	0.069	0.056	0.000	6.9
20	7.8	0.074	0.060	0.000	7.8
25	10.7	0.087	0.070	0.000	10.6
30	13.1	0.098	0.080	0.000	13.0
35	5.2	0.062	0.050	0.000	5.6
40	3.1	0.047	0.038	0.000	3.2
45	1.9	0.036	0.030	0.000	1.9
50	1.2	0.029	0.024	0.000	1.2
55	0.8	0.024	0.020	0.000	0.8
60	0.6	0.021	0.017	0.000	0.6

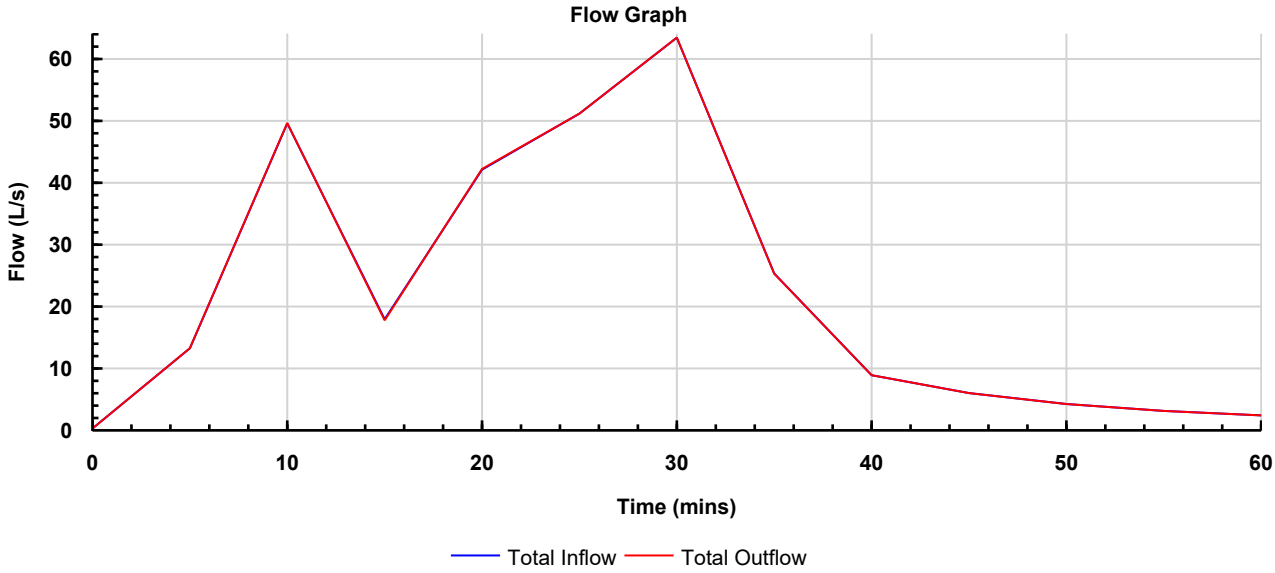
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

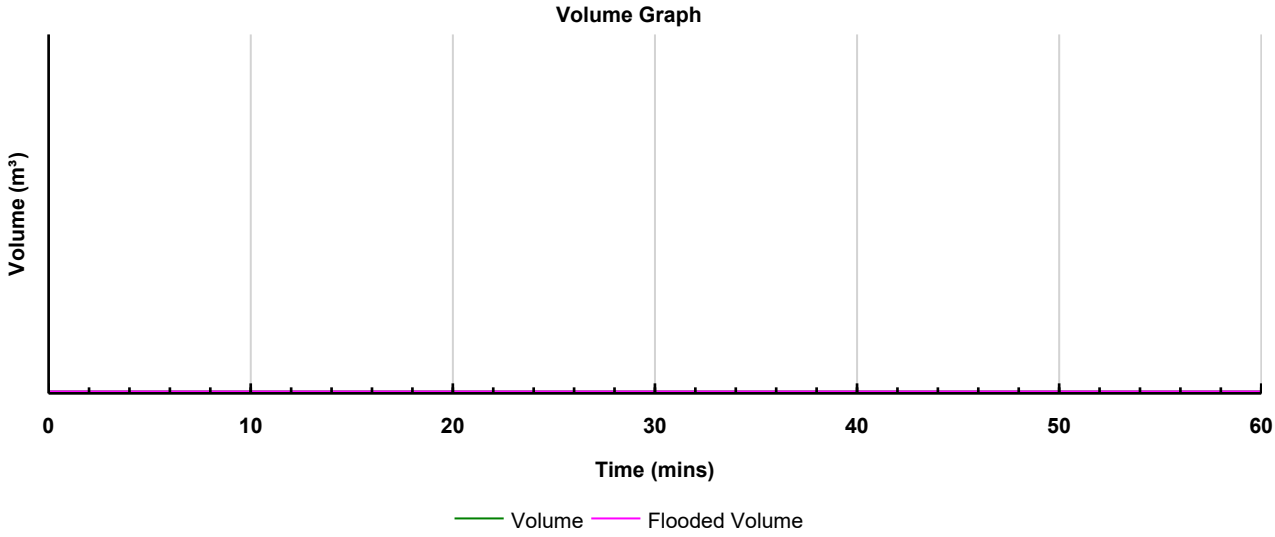


P3.07
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

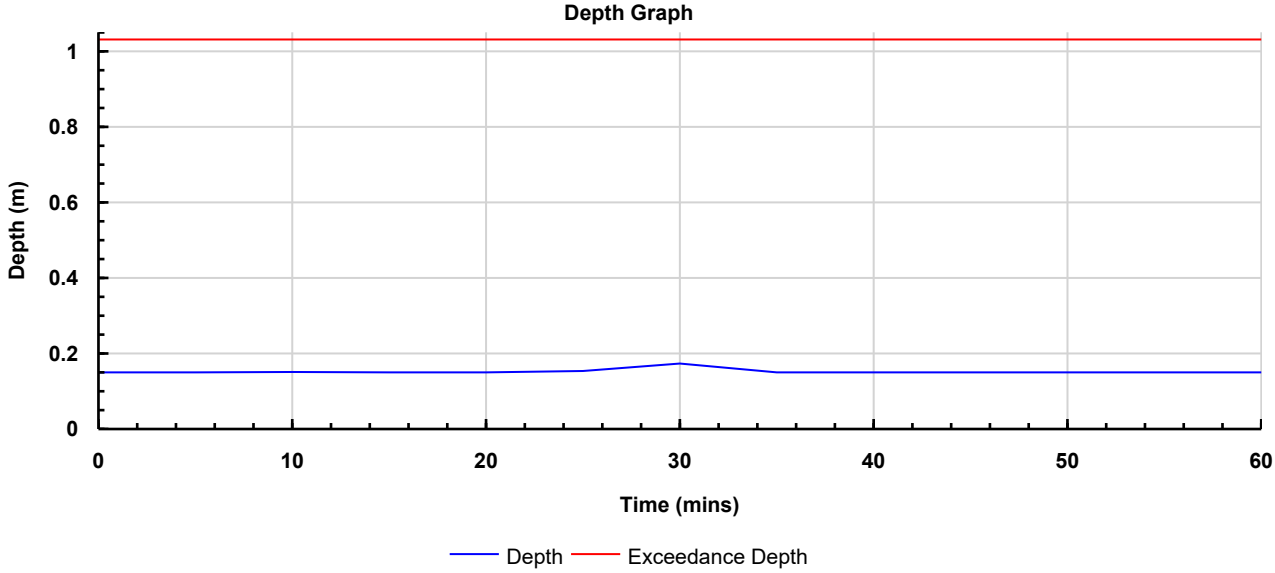
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.150	0.000	0.000	0.0
5	13.0	0.150	0.000	0.000	13.0
10	49.5	0.151	0.000	0.000	49.6
15	17.7	0.150	0.000	0.000	17.6
20	42.0	0.150	0.000	0.000	42.1
25	51.1	0.154	0.000	0.000	51.1
30	63.4	0.173	0.000	0.000	63.5
35	25.2	0.150	0.000	0.000	25.1
40	8.6	0.150	0.000	0.000	8.6
45	5.7	0.150	0.000	0.000	5.7
50	4.0	0.150	0.000	0.000	4.0
55	2.9	0.150	0.000	0.000	2.8
60	2.1	0.150	0.000	0.000	2.1

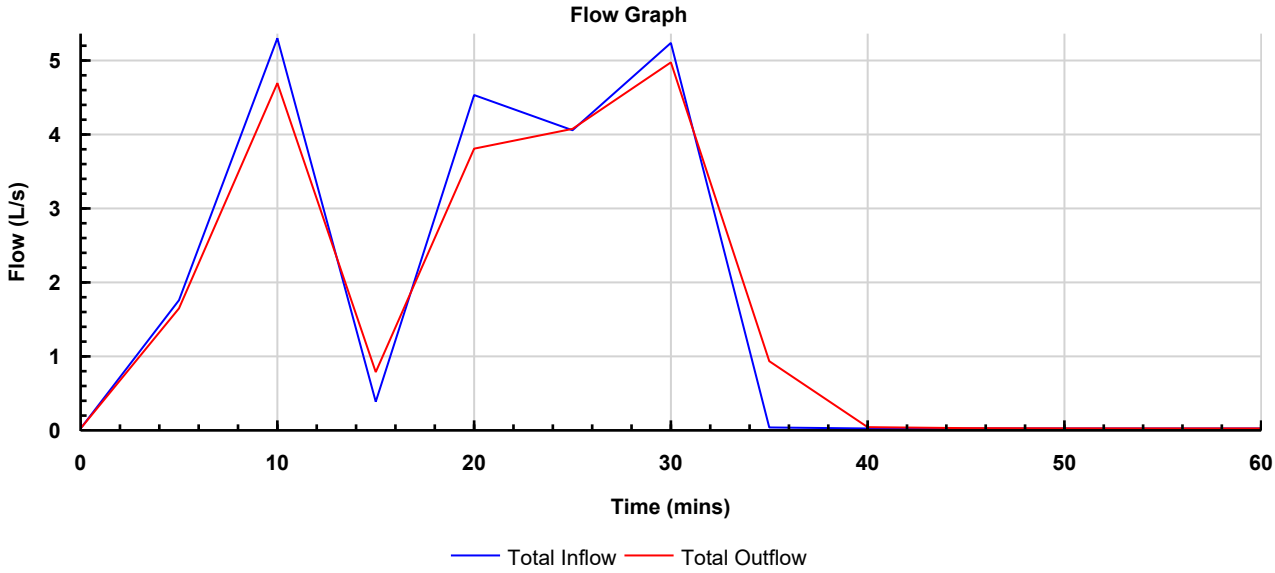
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

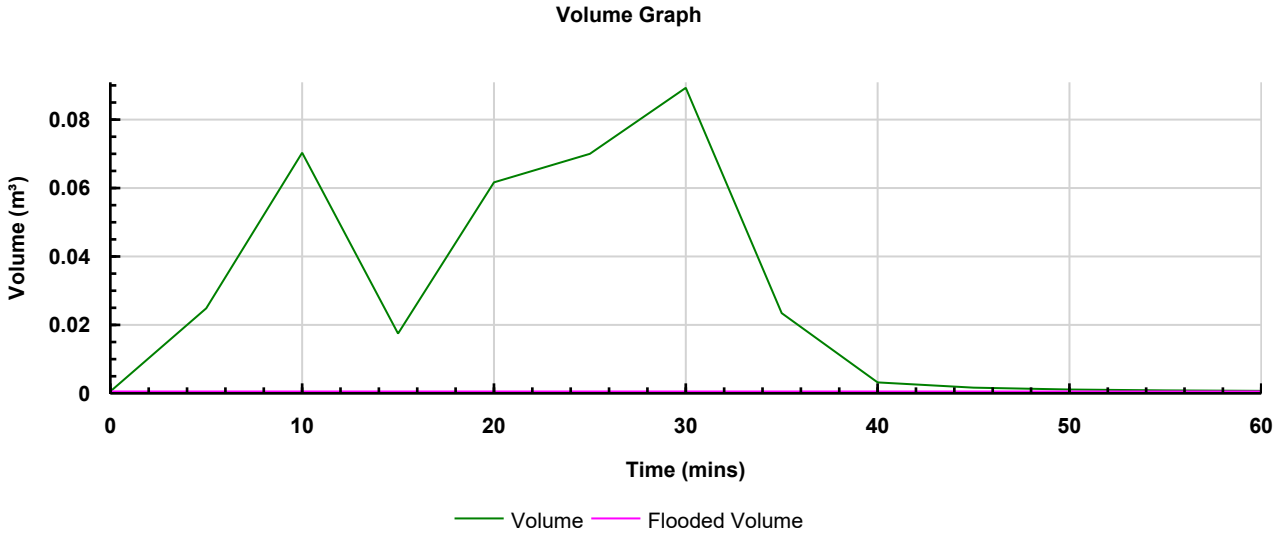


P3.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

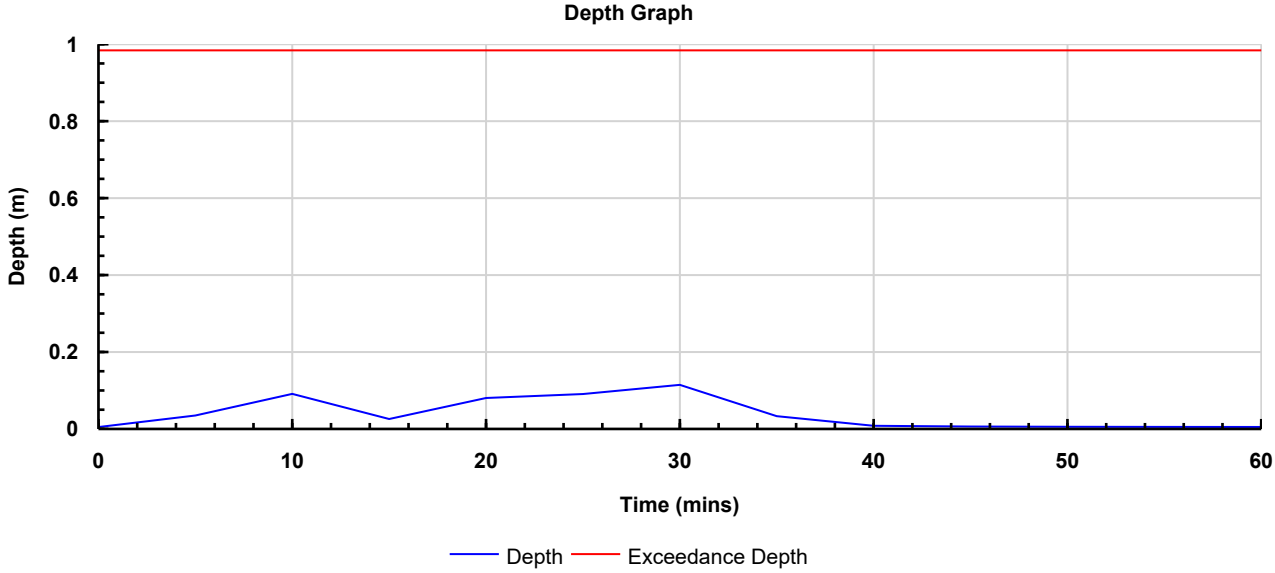
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	1.7	0.030	0.024	0.000	1.6
10	5.3	0.087	0.070	0.000	4.7
15	0.4	0.021	0.017	0.000	0.8
20	4.5	0.076	0.061	0.000	3.8
25	4.1	0.086	0.070	0.000	4.1
30	5.2	0.110	0.089	0.000	5.0
35	0.0	0.028	0.023	0.000	0.9
40	0.0	0.003	0.003	0.000	0.0
45	0.0	0.001	0.001	0.000	0.0
50	0.0	0.001	0.001	0.000	0.0
55	0.0	0.000	0.000	0.000	0.0
60	0.0	0.000	0.000	0.000	0.0

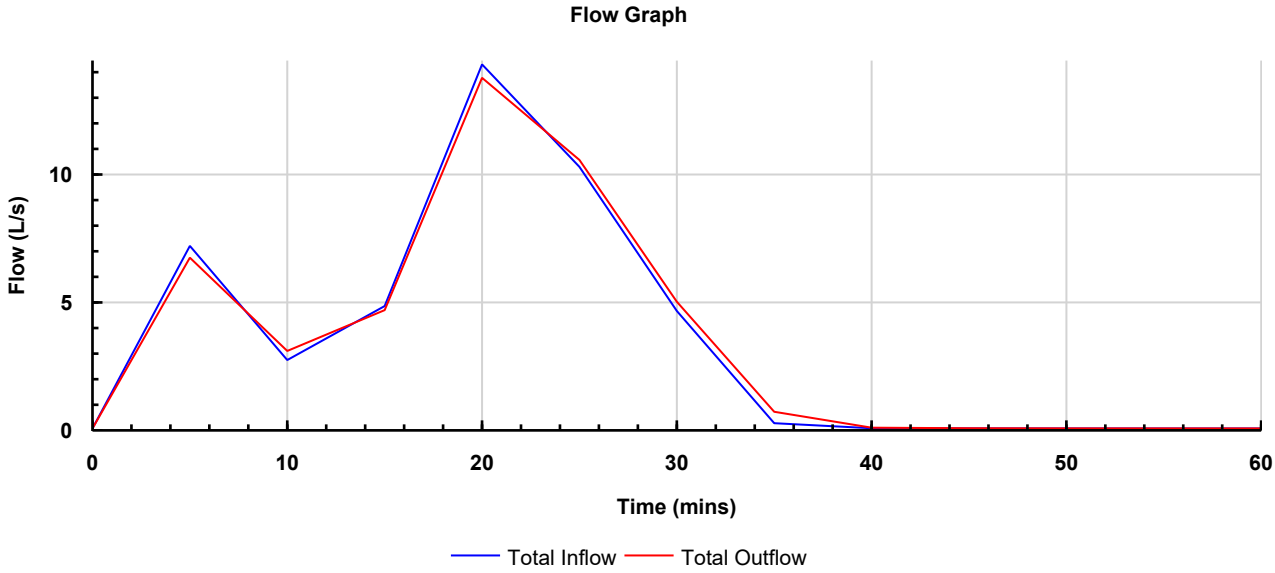
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

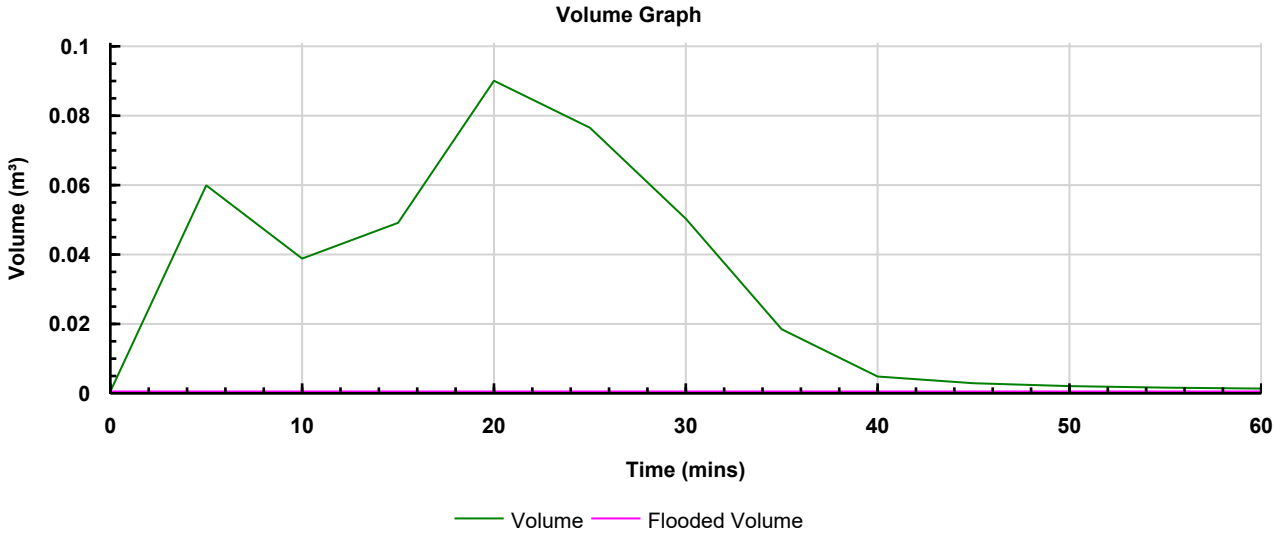


P9.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

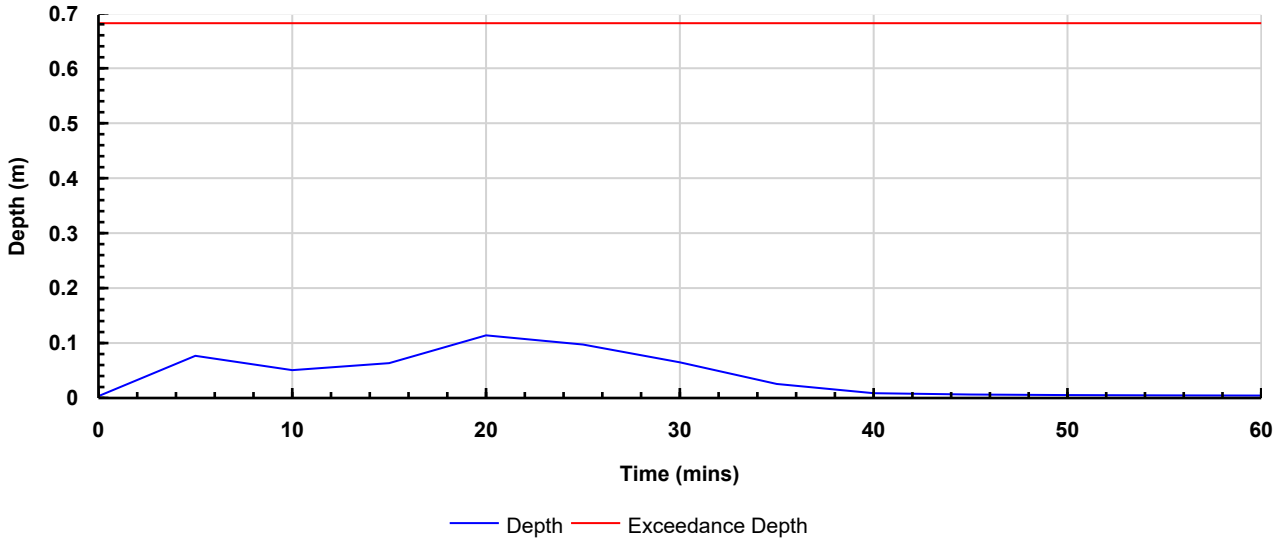
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	7.2	0.074	0.060	0.000	6.7
10	2.7	0.048	0.038	0.000	3.0
15	4.8	0.060	0.049	0.000	4.6
20	14.3	0.111	0.090	0.000	13.8
25	10.3	0.094	0.076	0.000	10.5
30	4.6	0.062	0.050	0.000	5.0
35	0.2	0.022	0.018	0.000	0.7
40	0.0	0.005	0.004	0.000	0.0
45	0.0	0.003	0.002	0.000	0.0
50	0.0	0.002	0.002	0.000	0.0
55	0.0	0.001	0.001	0.000	0.0
60	0.0	0.001	0.001	0.000	0.0

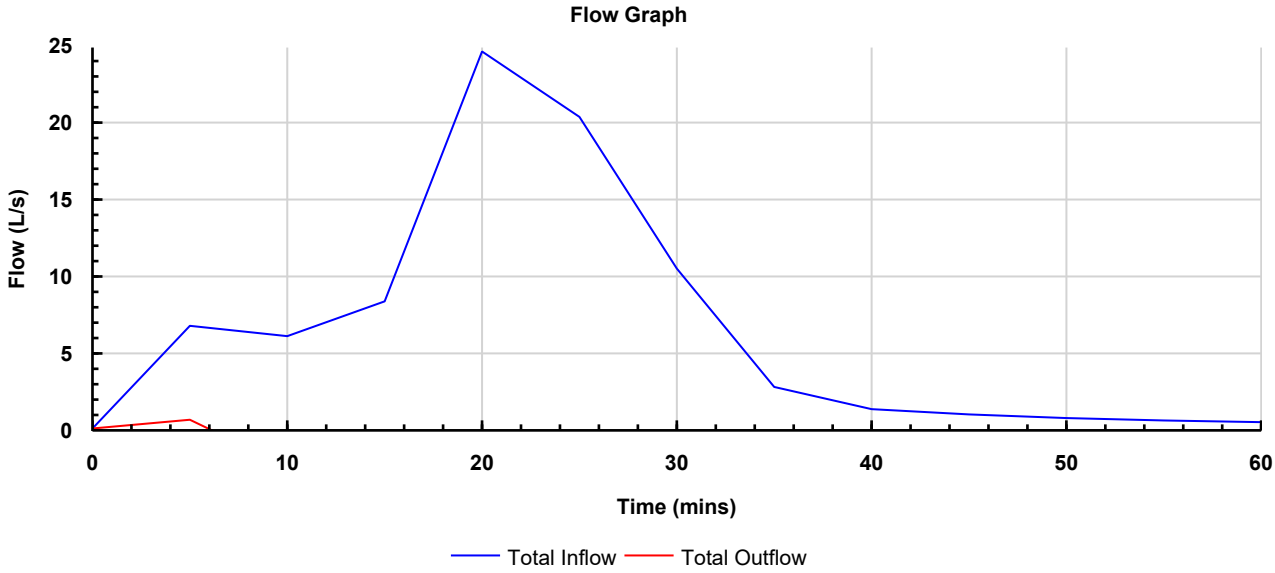
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

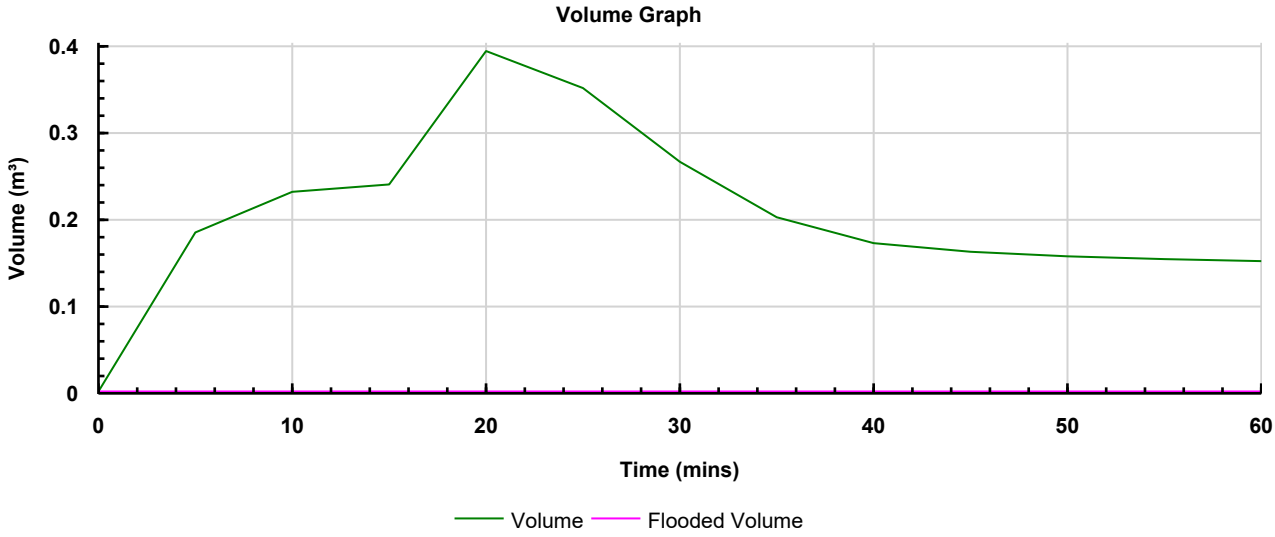


P3.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

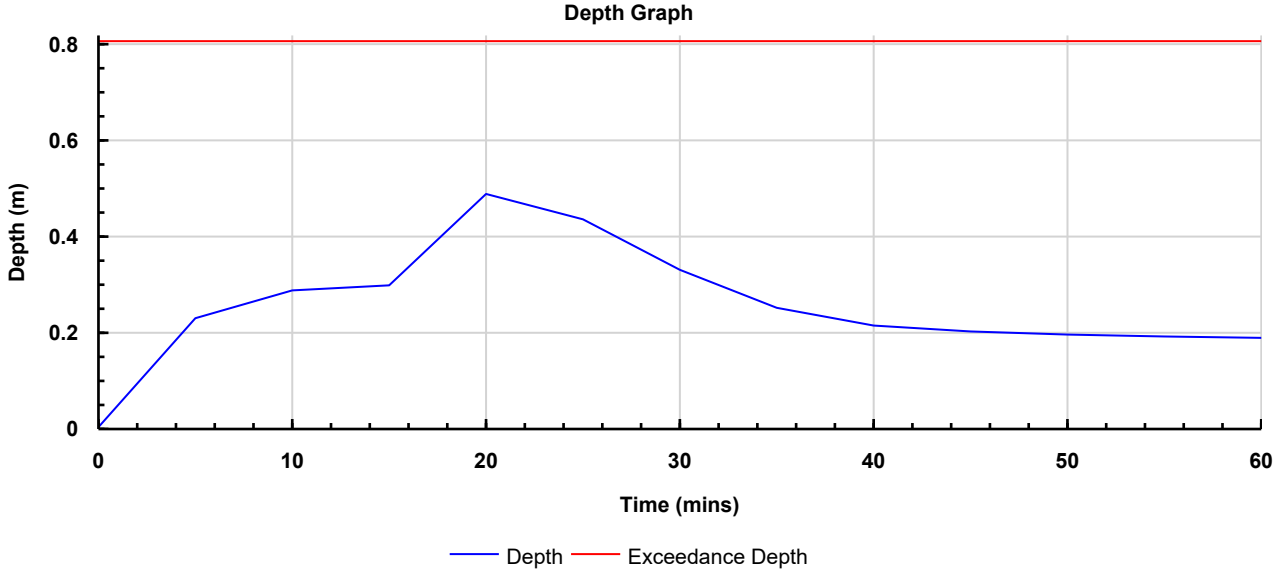
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	6.7	0.228	0.184	0.000	0.6
10	6.0	0.286	0.231	0.000	-2.5
15	8.3	0.296	0.240	0.000	-2.5
20	24.6	0.487	0.395	0.000	-7.3
25	20.3	0.434	0.352	0.000	-7.3
30	10.4	0.329	0.266	0.000	-4.3
35	2.7	0.249	0.202	0.000	-2.2
40	1.3	0.212	0.172	0.000	-1.2
45	0.9	0.200	0.162	0.000	-0.9
50	0.7	0.193	0.157	0.000	-0.7
55	0.5	0.189	0.153	0.000	-0.5
60	0.4	0.186	0.151	0.000	-0.4

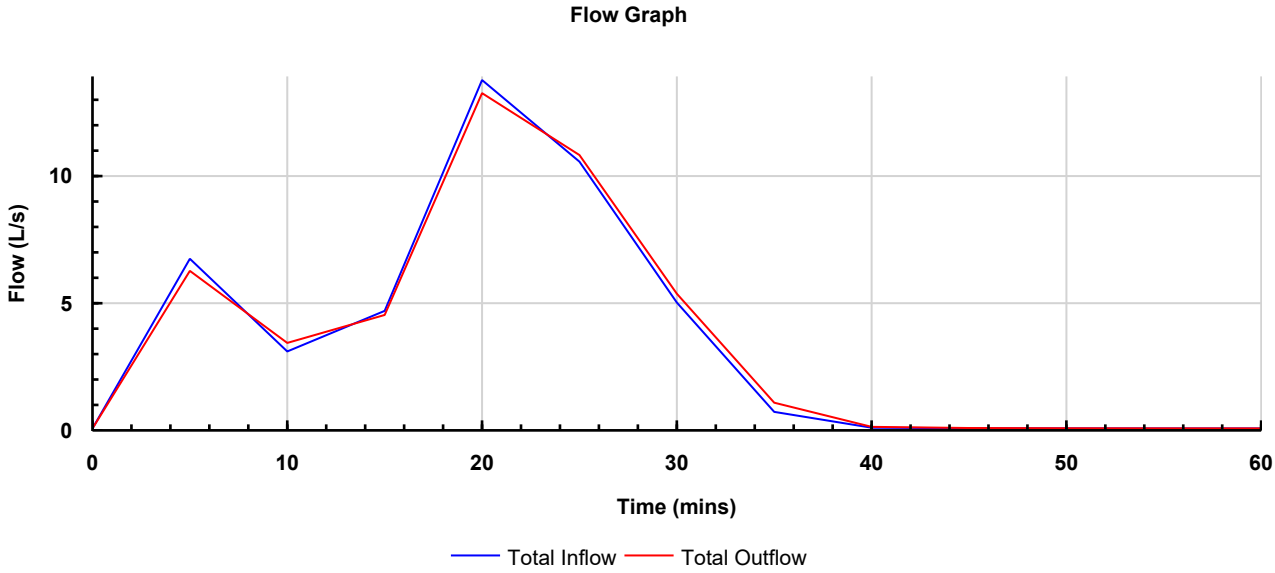
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

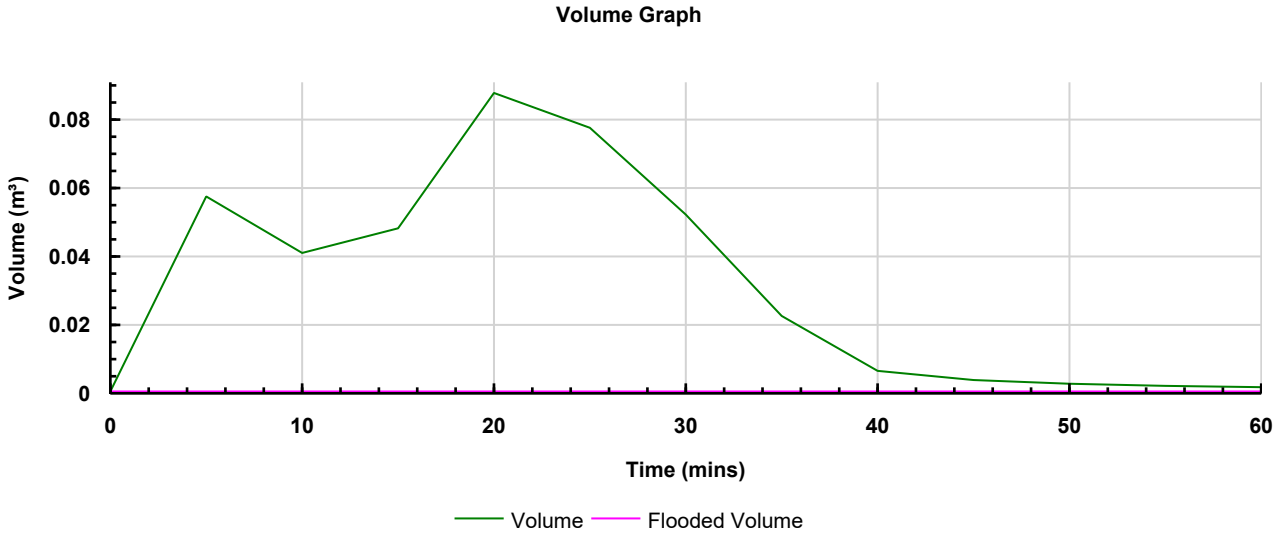


P9.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Manhole

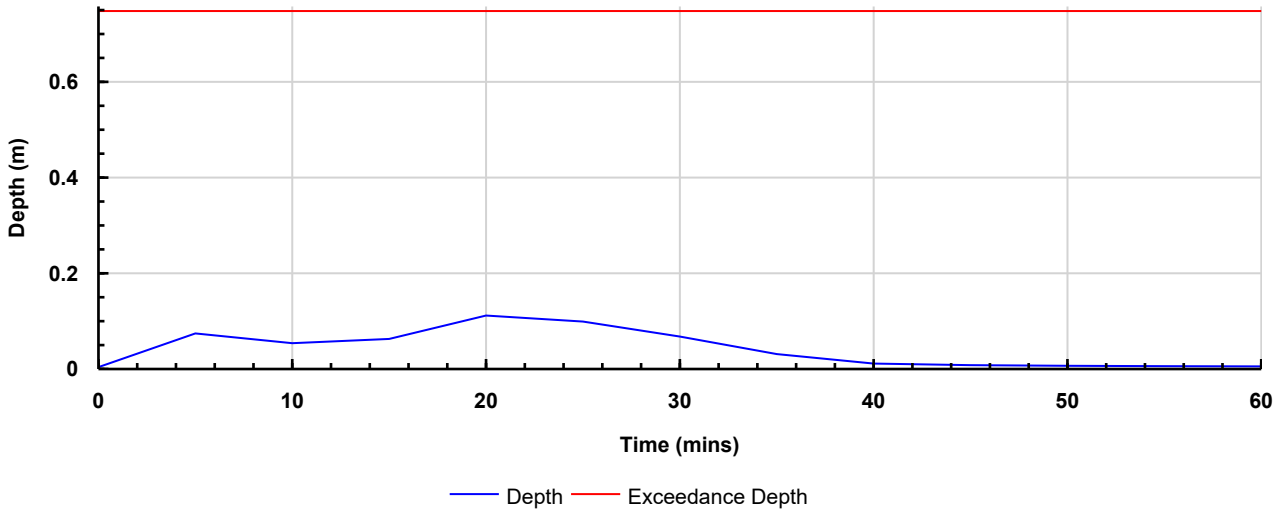
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	6.7	0.071	0.057	0.000	6.2
10	3.0	0.050	0.041	0.000	3.4
15	4.6	0.059	0.048	0.000	4.5
20	13.8	0.108	0.088	0.000	13.3
25	10.5	0.096	0.078	0.000	10.8
30	5.0	0.064	0.052	0.000	5.3
35	0.7	0.027	0.022	0.000	1.0
40	0.0	0.007	0.006	0.000	0.1
45	0.0	0.004	0.003	0.000	0.0
50	0.0	0.003	0.002	0.000	0.0
55	0.0	0.002	0.002	0.000	0.0
60	0.0	0.002	0.001	0.000	0.0

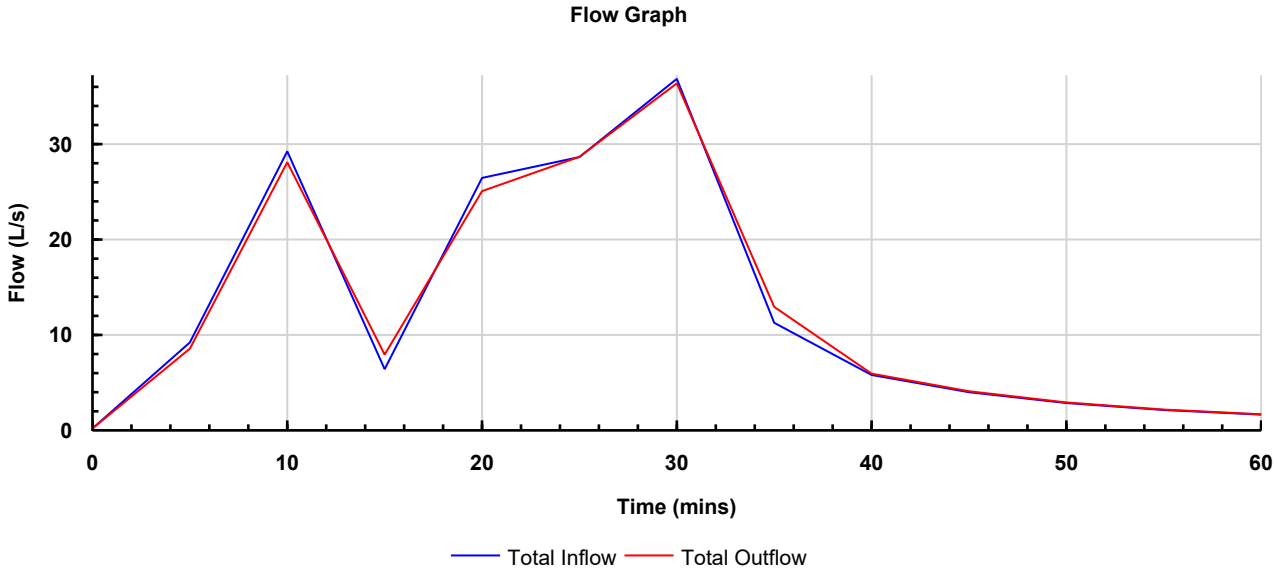
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

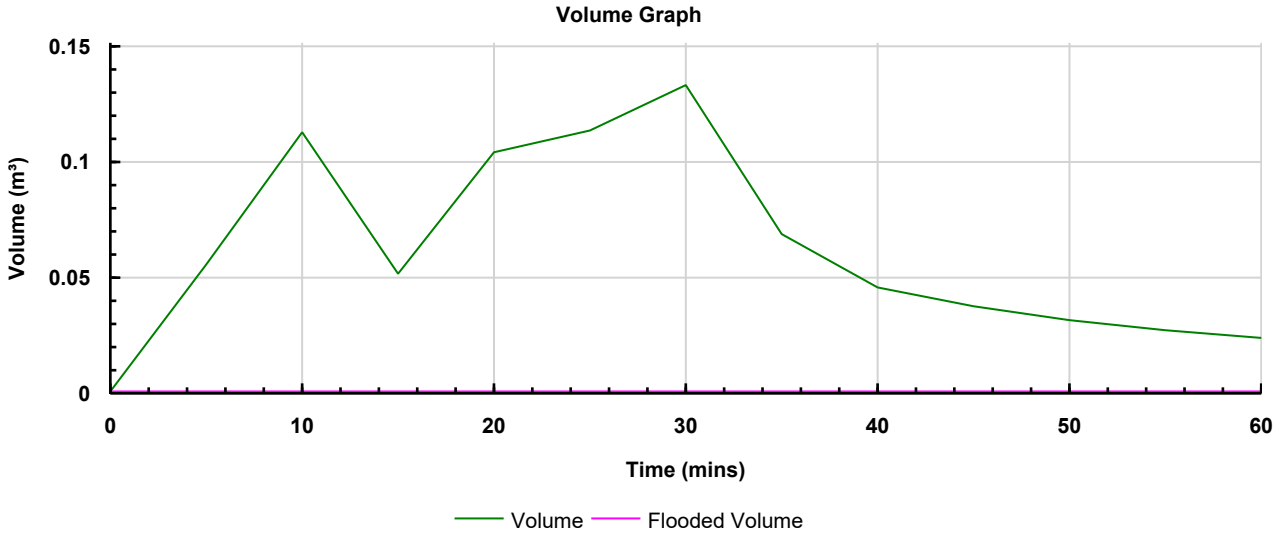


P3.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

Type : Manhole

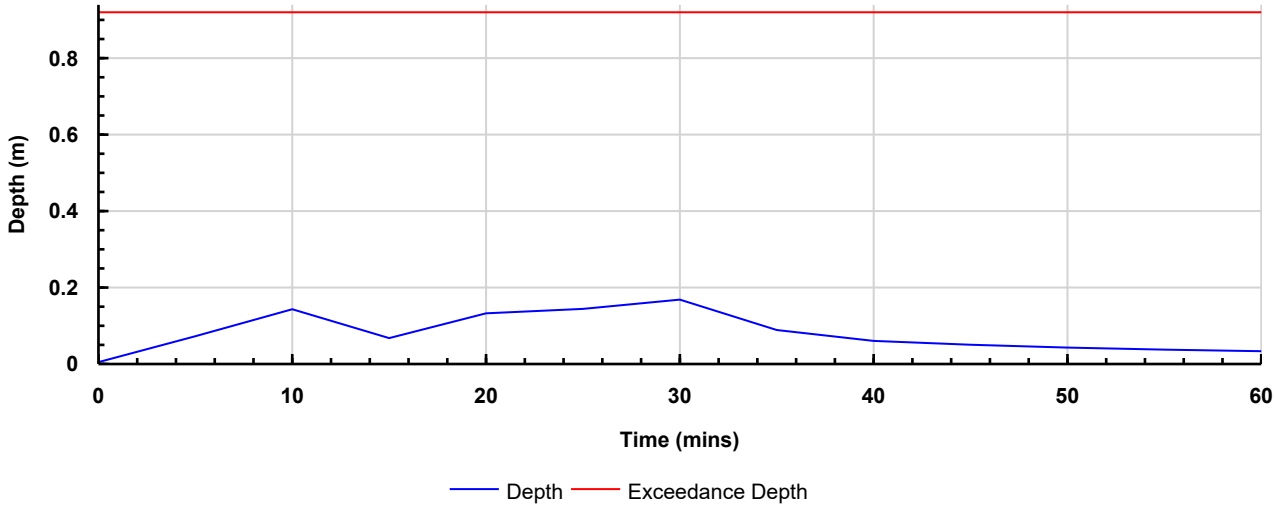
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	9.1	0.068	0.055	0.000	8.4
10	29.2	0.139	0.113	0.000	28.1
15	6.2	0.063	0.051	0.000	7.8
20	26.4	0.128	0.104	0.000	25.0
25	28.6	0.140	0.113	0.000	28.6
30	36.8	0.164	0.133	0.000	36.4
35	11.1	0.084	0.068	0.000	12.8
40	5.6	0.056	0.045	0.000	5.8
45	3.8	0.046	0.037	0.000	3.9
50	2.7	0.038	0.031	0.000	2.7
55	1.9	0.033	0.027	0.000	2.0
60	1.5	0.029	0.023	0.000	1.5

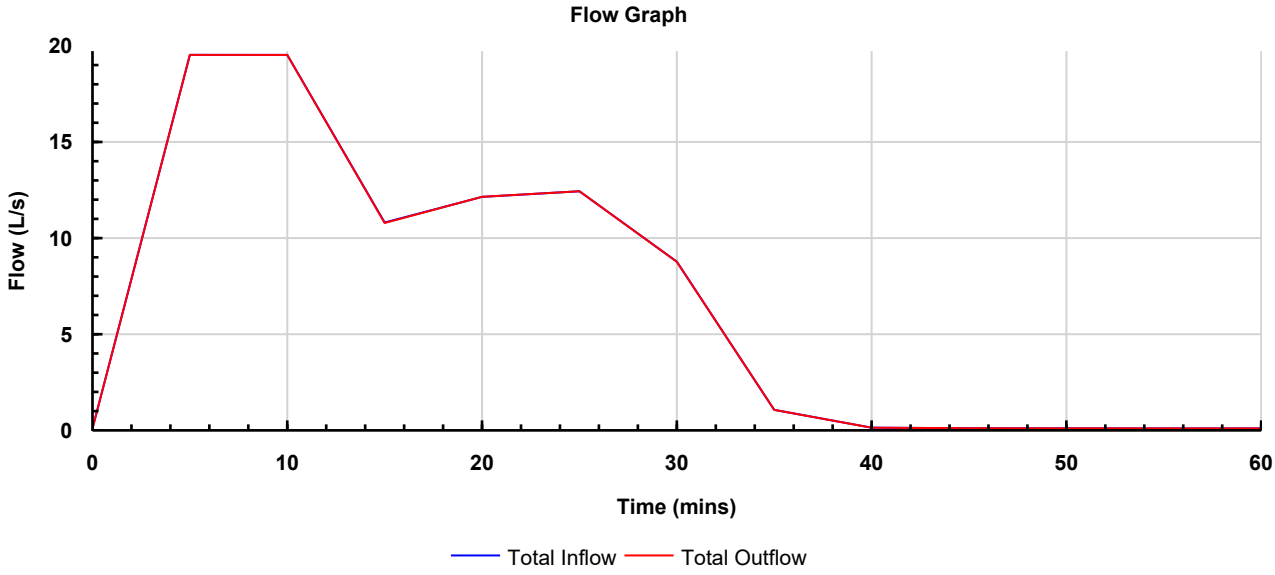
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

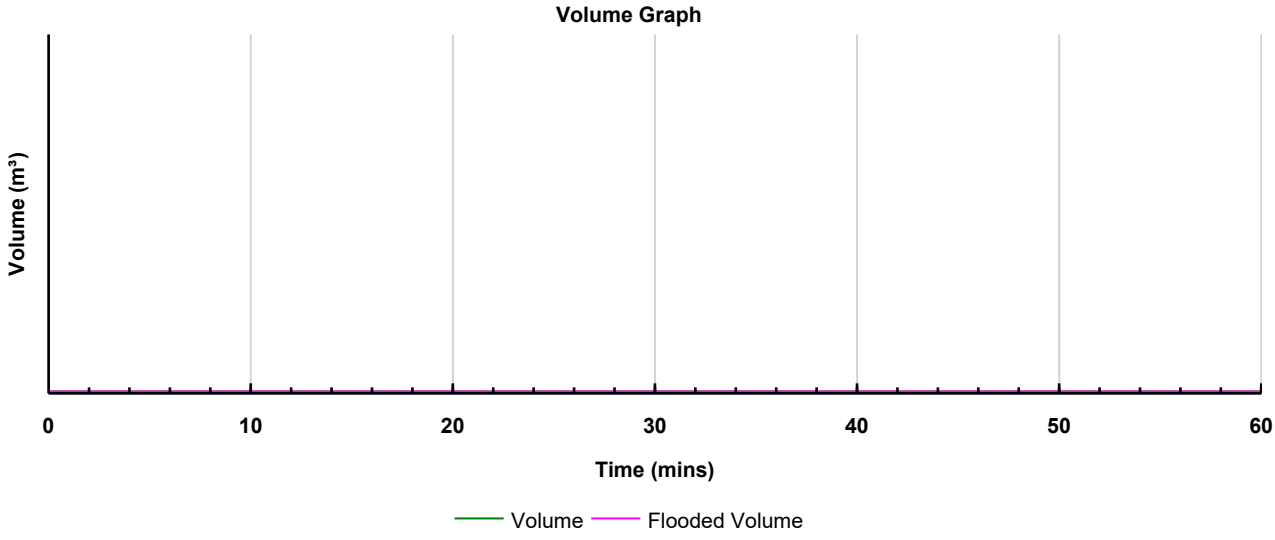


P6.04
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 1

Type : Manhole

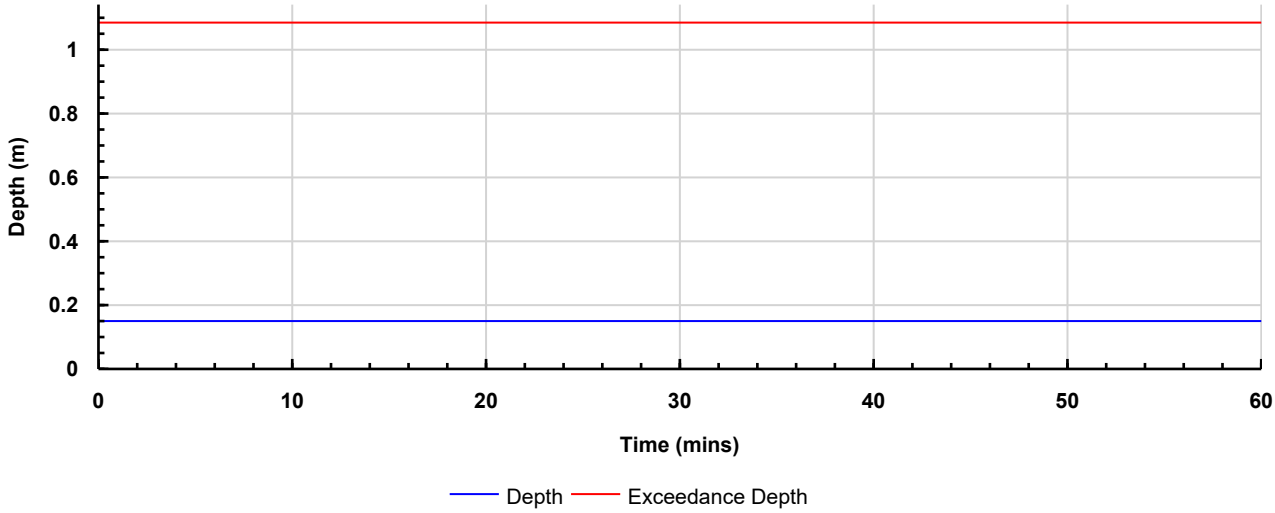
Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Depth Graph



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.150	0.000	0.000	0.0
5	19.5	0.150	0.000	0.000	19.5
10	19.5	0.150	0.000	0.000	19.5
15	10.8	0.150	0.000	0.000	10.7
20	12.1	0.150	0.000	0.000	12.1
25	12.4	0.150	0.000	0.000	12.4
30	8.7	0.150	0.000	0.000	8.7
35	1.0	0.150	0.000	0.000	1.0
40	0.0	0.150	0.000	0.000	0.0
45	0.0	0.150	0.000	0.000	0.0
50	0.0	0.150	0.000	0.000	0.0
55	0.0	0.150	0.000	0.000	0.0
60	0.0	0.150	0.000	0.000	0.0

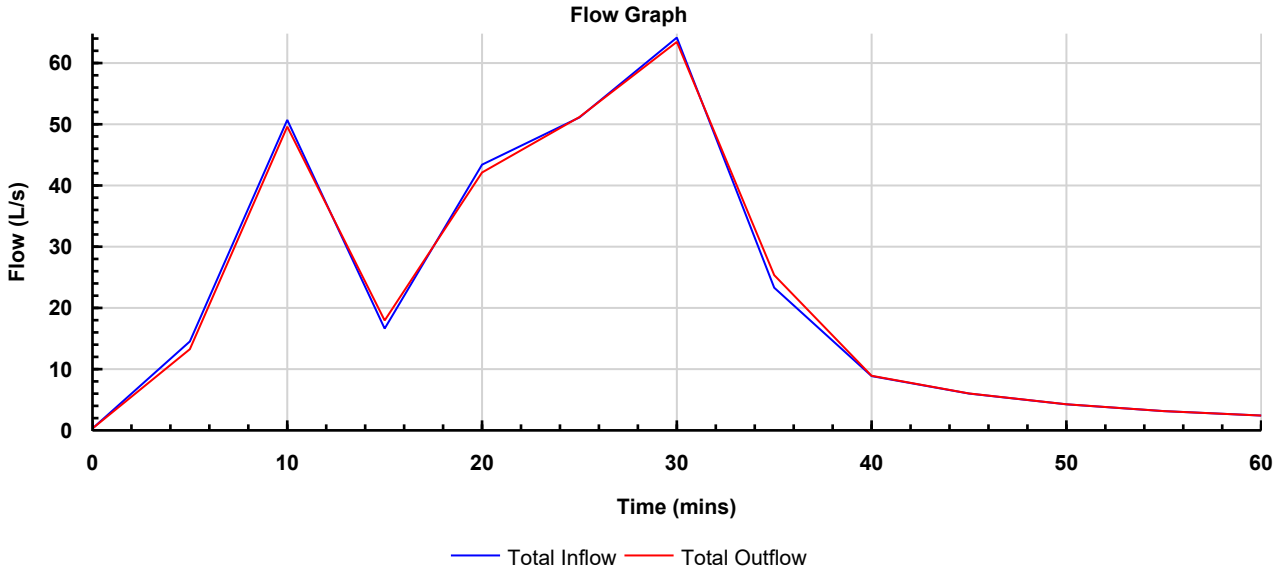
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

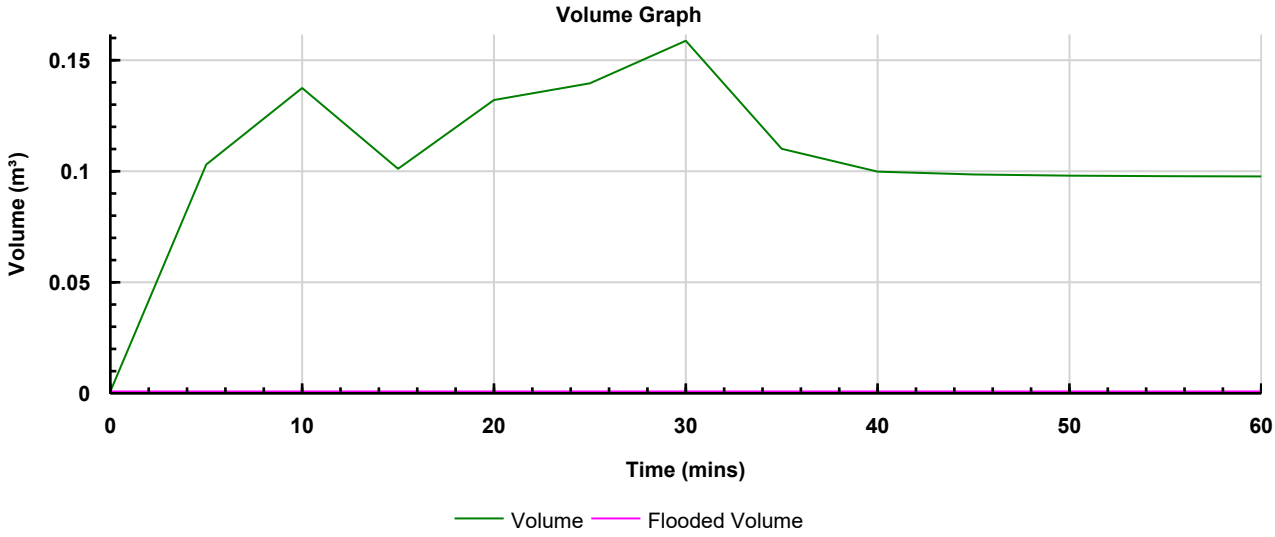


P3.06
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

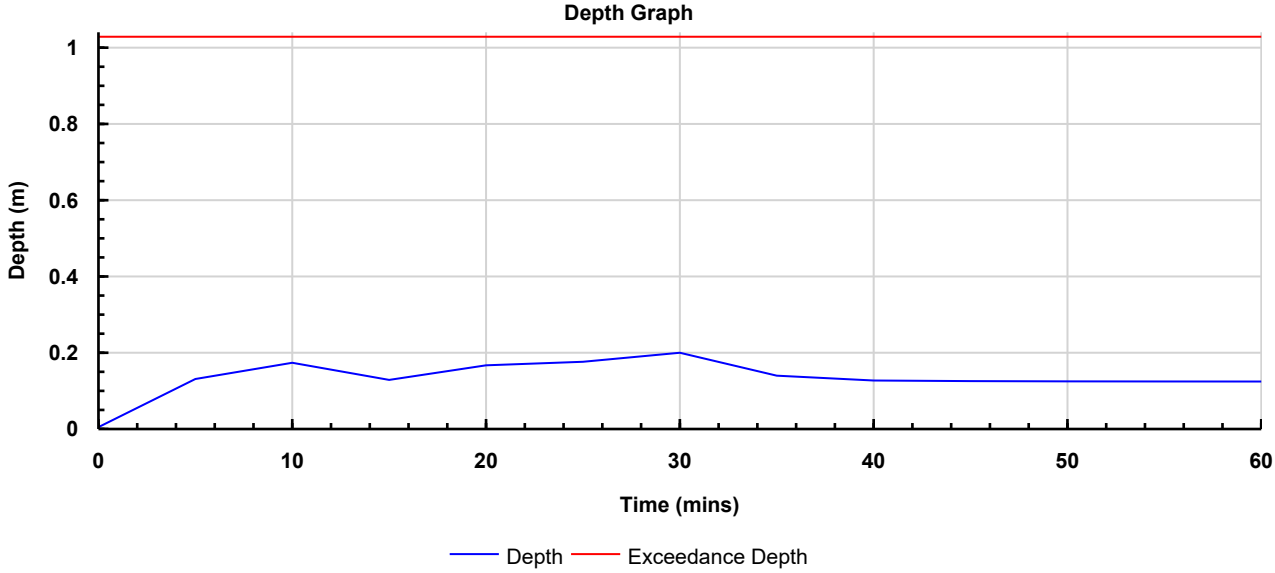
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	14.3	0.127	0.103	0.000	13.0
10	50.6	0.170	0.137	0.000	49.5
15	16.4	0.124	0.101	0.000	17.7
20	43.3	0.163	0.132	0.000	42.0
25	51.0	0.172	0.139	0.000	51.1
30	64.2	0.196	0.159	0.000	63.4
35	23.1	0.136	0.110	0.000	25.2
40	8.6	0.123	0.100	0.000	8.6
45	5.7	0.121	0.098	0.000	5.7
50	4.0	0.121	0.098	0.000	4.0
55	2.8	0.120	0.097	0.000	2.9
60	2.1	0.120	0.097	0.000	2.1

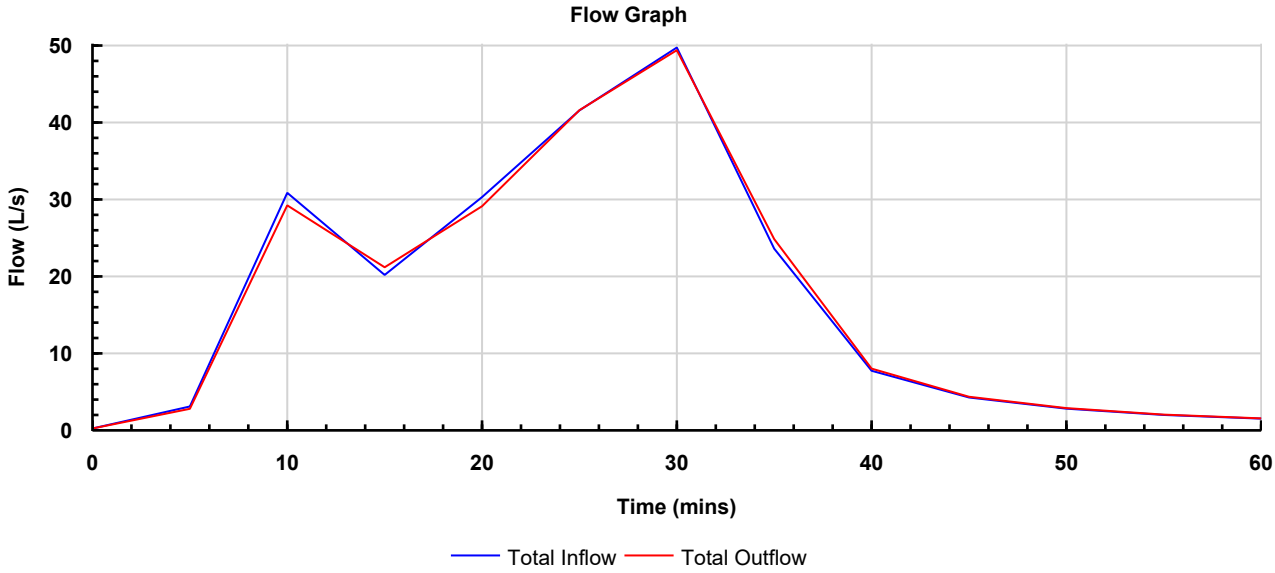
Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Junction Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

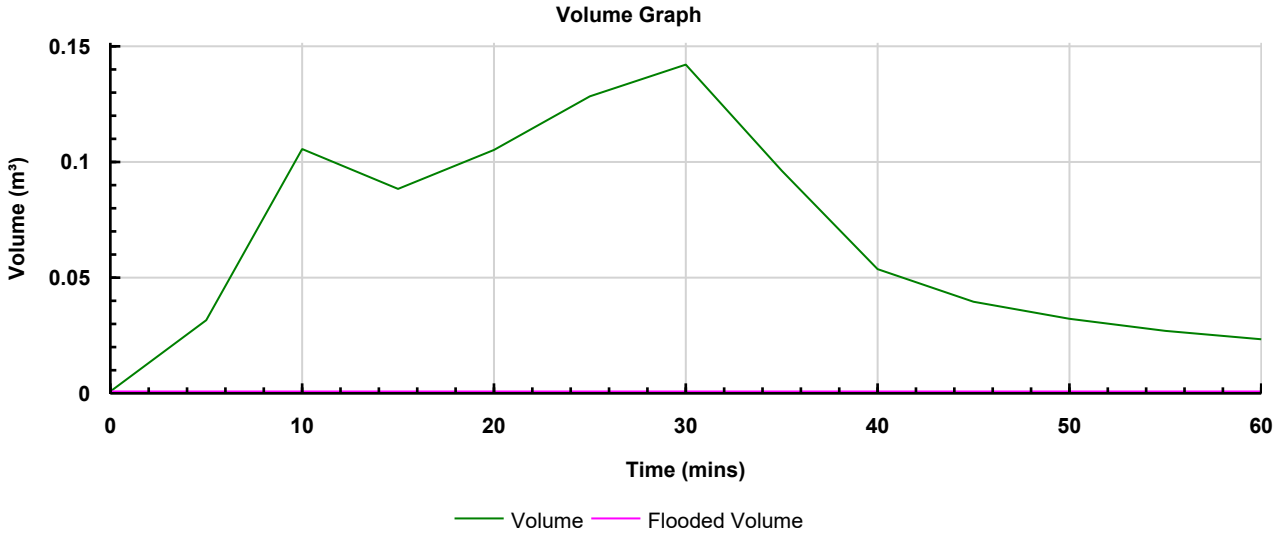


P2.05
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

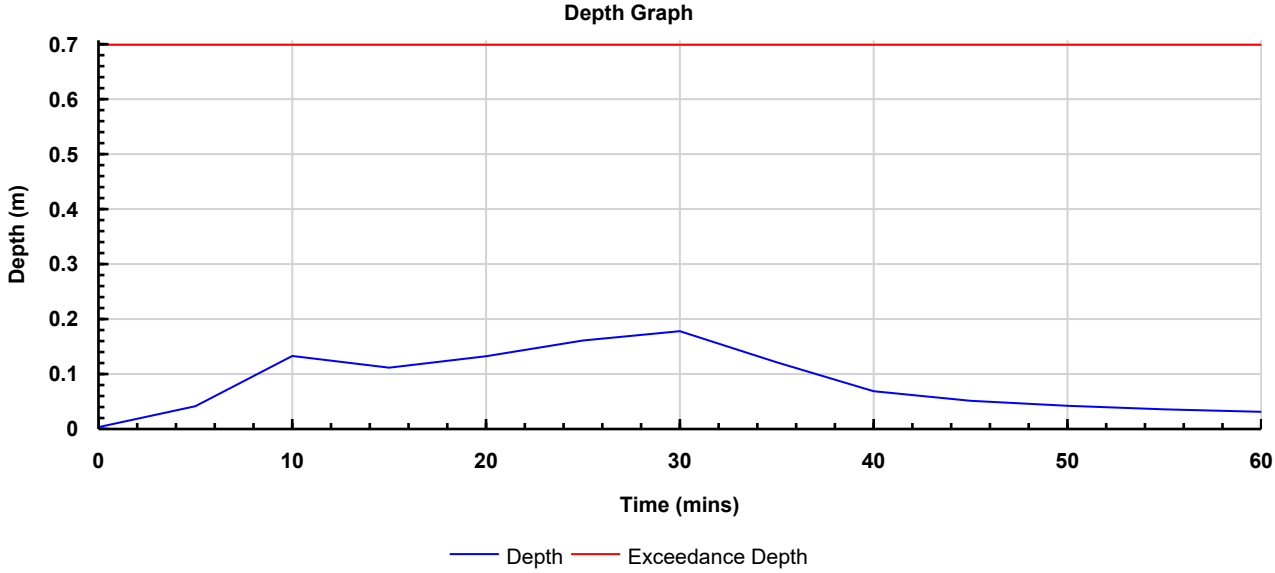
Type : Manhole

Graphs





Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		



Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Junction Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Tables

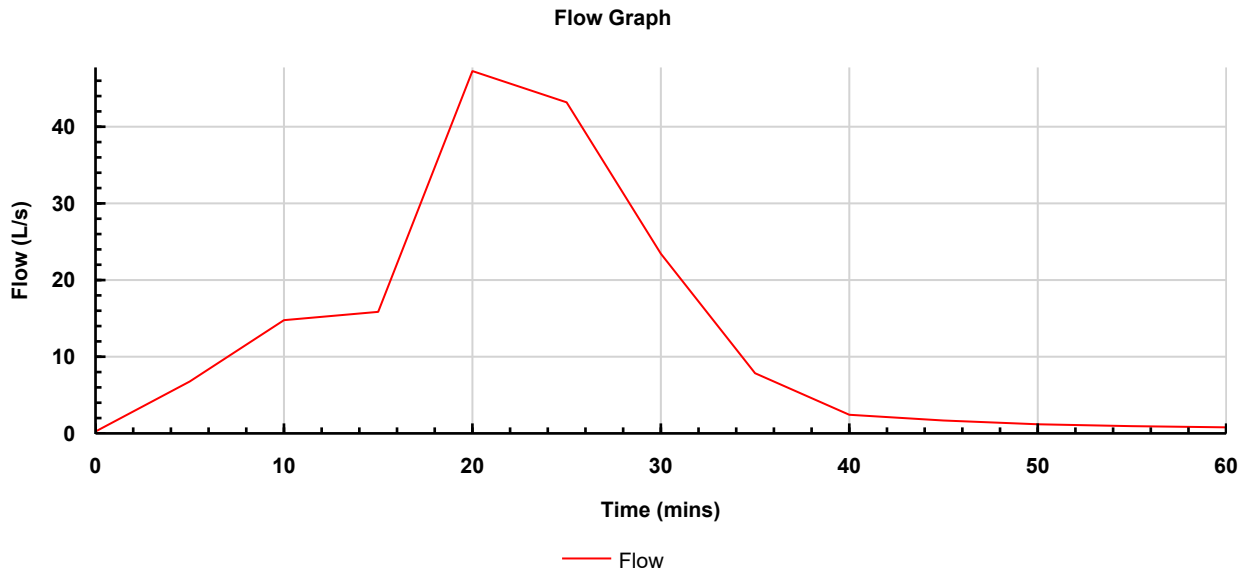
Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.9	0.038	0.031	0.000	2.6
10	30.8	0.130	0.105	0.000	29.1
15	20.0	0.109	0.088	0.000	21.0
20	30.2	0.130	0.105	0.000	29.0
25	41.5	0.158	0.128	0.000	41.6
30	49.7	0.175	0.142	0.000	49.4
35	23.5	0.118	0.096	0.000	24.7
40	7.5	0.066	0.053	0.000	7.8
45	4.0	0.048	0.039	0.000	4.1
50	2.6	0.039	0.032	0.000	2.7
55	1.8	0.033	0.026	0.000	1.8
60	1.3	0.028	0.023	0.000	1.3

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 2.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

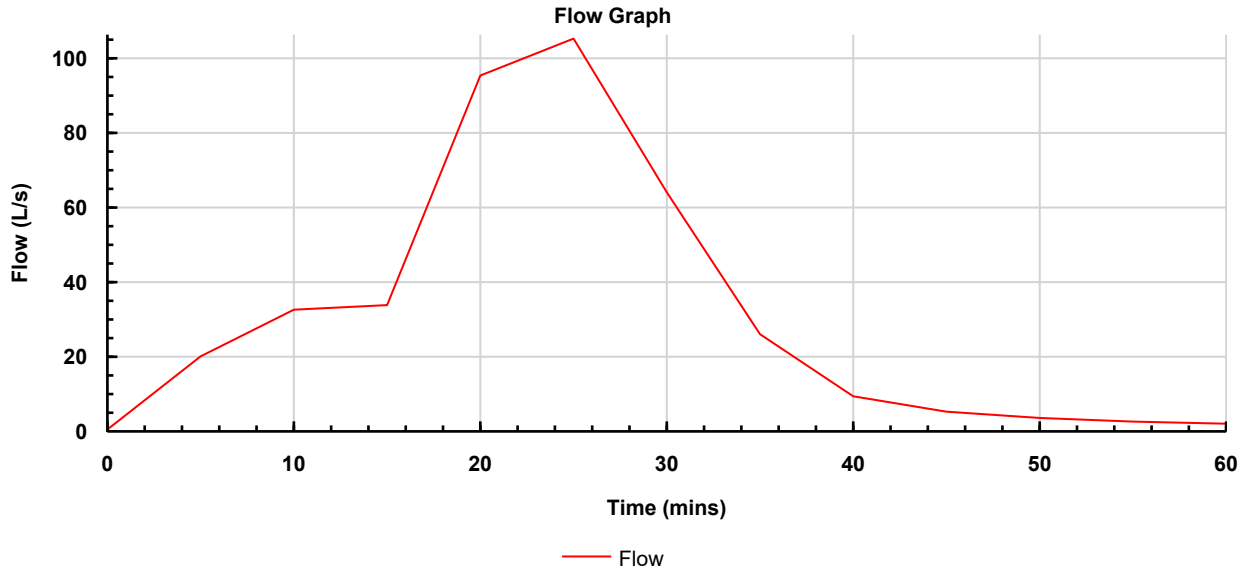
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.059	6.6
10	0.094	14.6
15	0.101	15.7
20	0.194	47.3
25	0.196	43.2
30	0.140	23.3
35	0.080	7.6
40	0.044	2.2
45	0.035	1.4
50	0.028	0.9
55	0.024	0.7
60	0.021	0.5

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 1.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

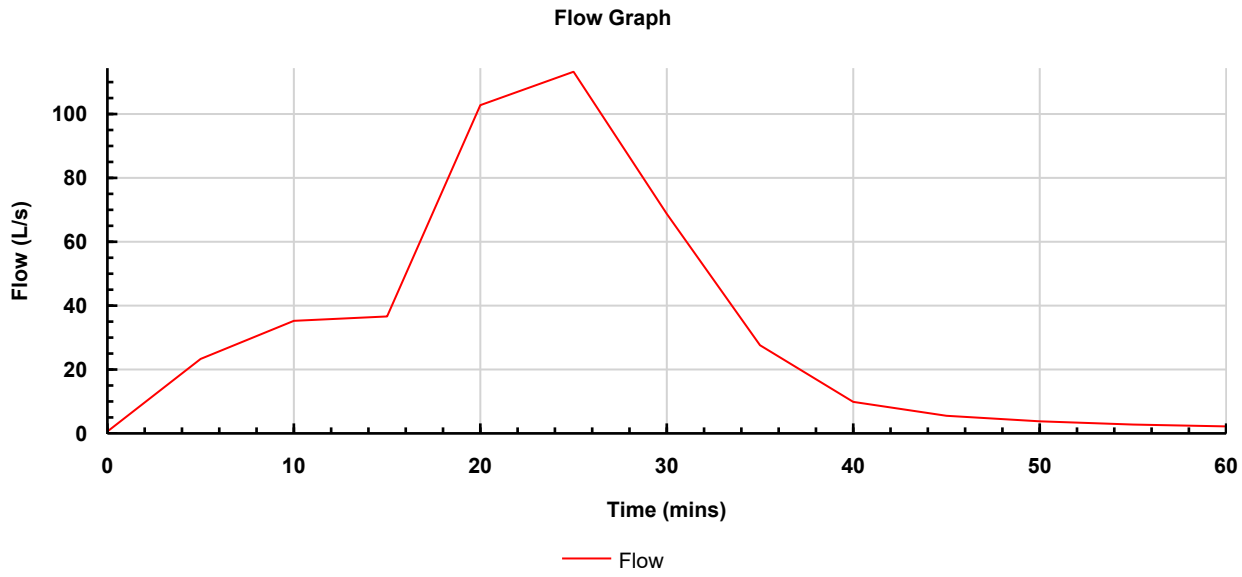
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.099	19.7
10	0.121	32.3
15	0.126	33.5
20	0.227	95.3
25	0.235	105.3
30	0.175	63.9
35	0.105	25.7
40	0.062	8.9
45	0.045	4.8
50	0.037	3.1
55	0.031	2.1
60	0.027	1.6

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 1.05
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

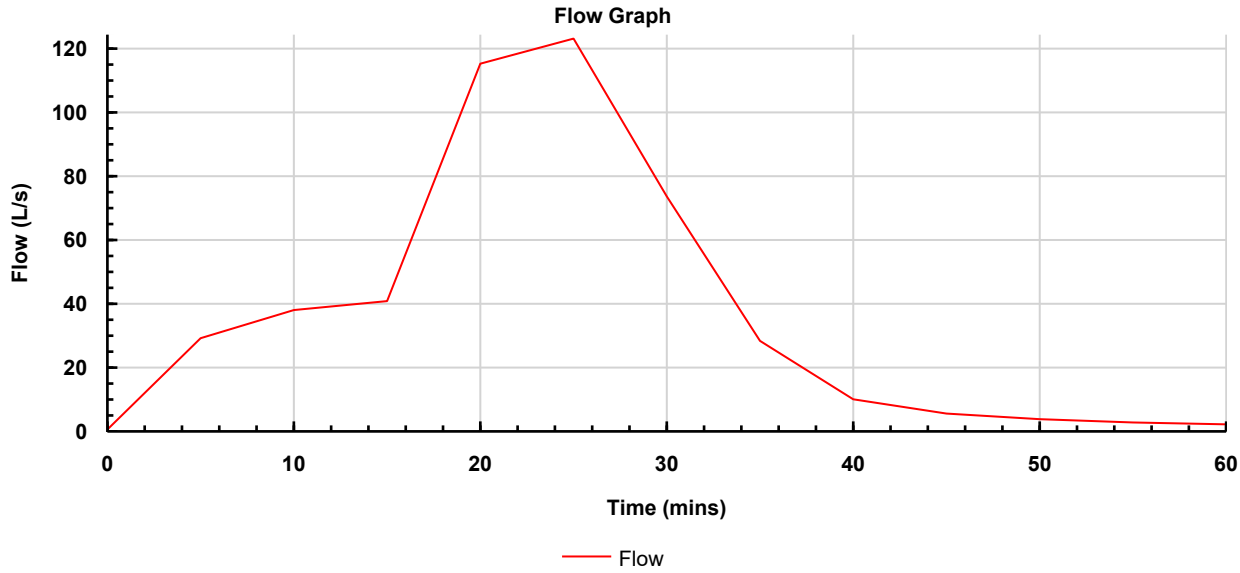
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.099	22.8
10	0.115	34.8
15	0.120	36.2
20	0.215	102.7
25	0.221	113.2
30	0.165	68.5
35	0.098	27.2
40	0.056	9.3
45	0.041	4.9
50	0.033	3.2
55	0.028	2.2
60	0.024	1.6

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 1.06
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

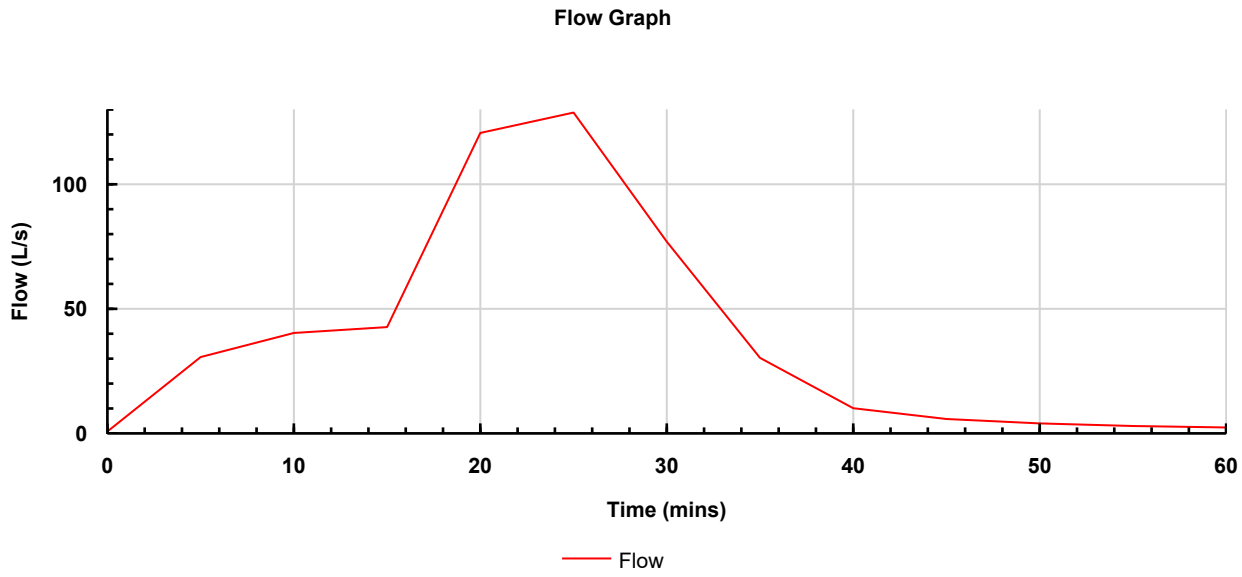
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.093	28.8
10	0.109	37.6
15	0.114	40.4
20	0.193	115.2
25	0.199	123.1
30	0.152	73.4
35	0.090	27.9
40	0.058	9.5
45	0.050	5.0
50	0.046	3.3
55	0.043	2.2
60	0.041	1.6

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 1.07
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

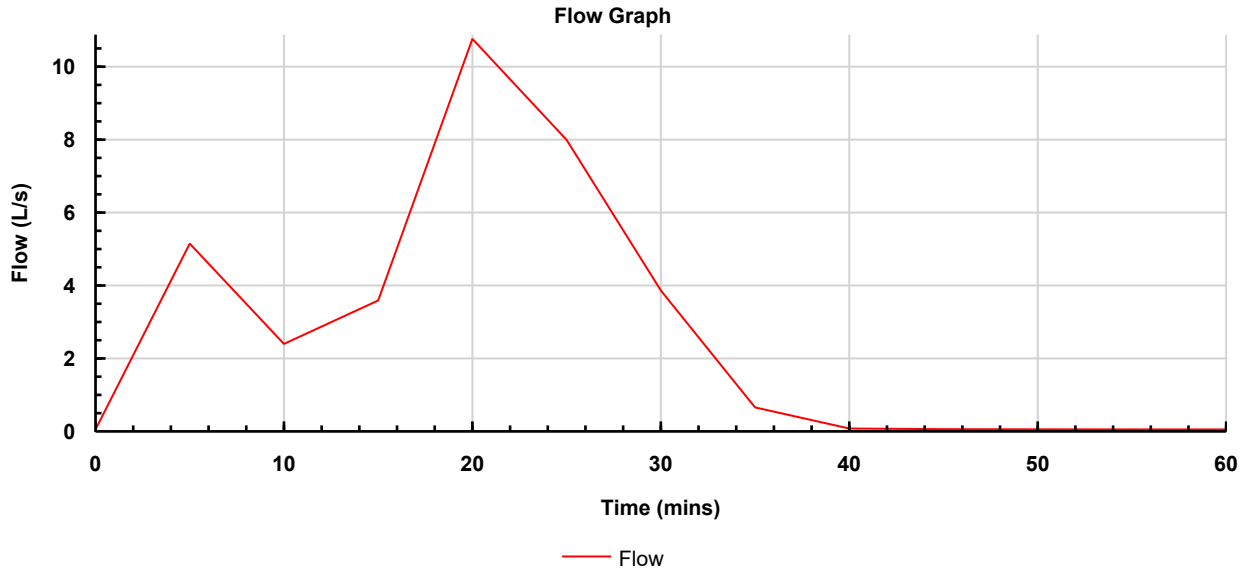
Time (mins)	Depth (m)	Flow (L/s)
0	0.075	0.0
5	0.121	30.1
10	0.131	39.8
15	0.133	42.2
20	0.171	120.6
25	0.176	128.8
30	0.150	76.7
35	0.120	29.7
40	0.108	9.4
45	0.106	5.0
50	0.105	3.3
55	0.105	2.2
60	0.105	1.6

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 7.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

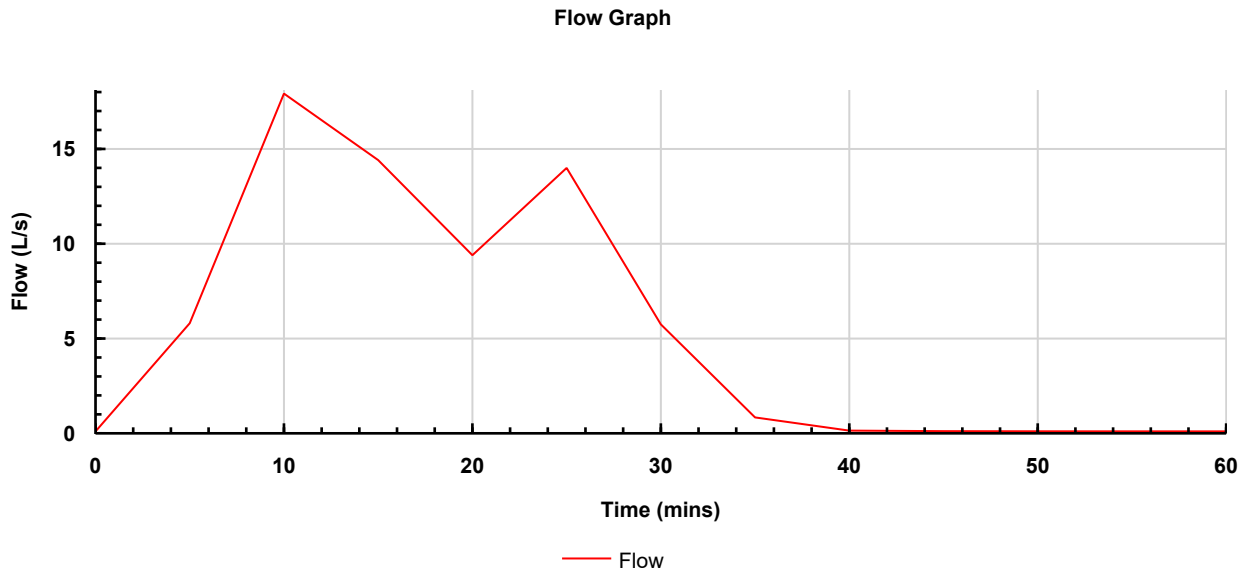
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.045	5.1
10	0.030	2.4
15	0.037	3.6
20	0.066	10.8
25	0.056	8.0
30	0.038	3.8
35	0.015	0.6
40	0.004	0.0
45	0.002	0.0
50	0.001	0.0
55	0.001	0.0
60	0.001	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 7.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

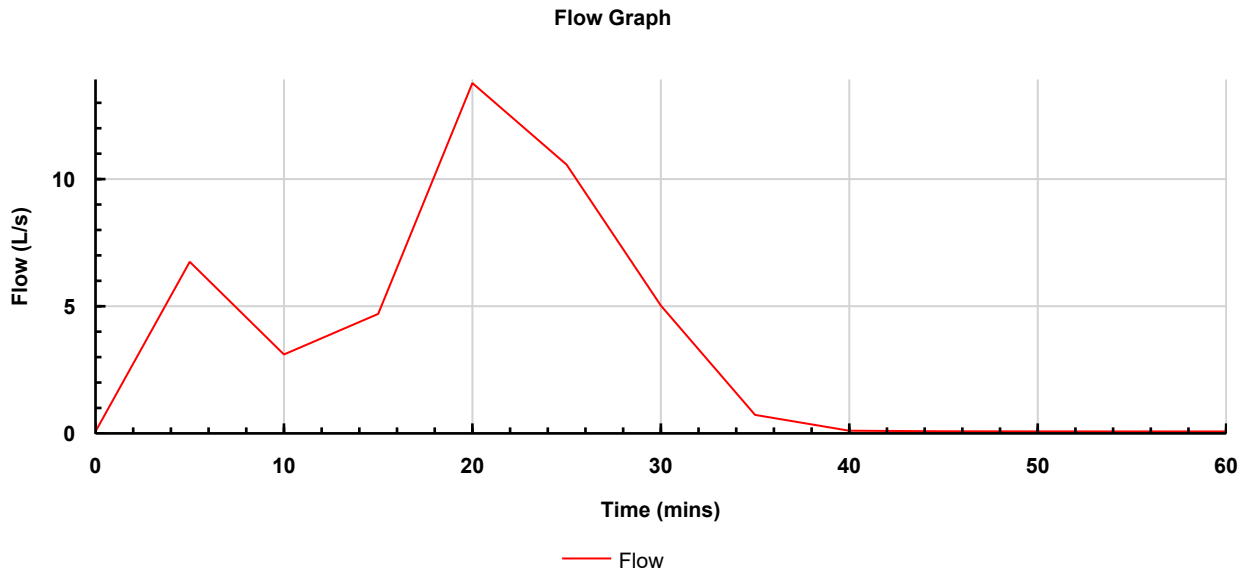
Time (mins)	Depth (m)	Flow (L/s)
0	0.075	0.0
5	0.094	5.7
10	0.108	17.9
15	0.105	14.4
20	0.099	9.3
25	0.104	14.0
30	0.094	5.7
35	0.082	0.7
40	0.077	0.0
45	0.076	0.0
50	0.076	0.0
55	0.075	0.0
60	0.075	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 9.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

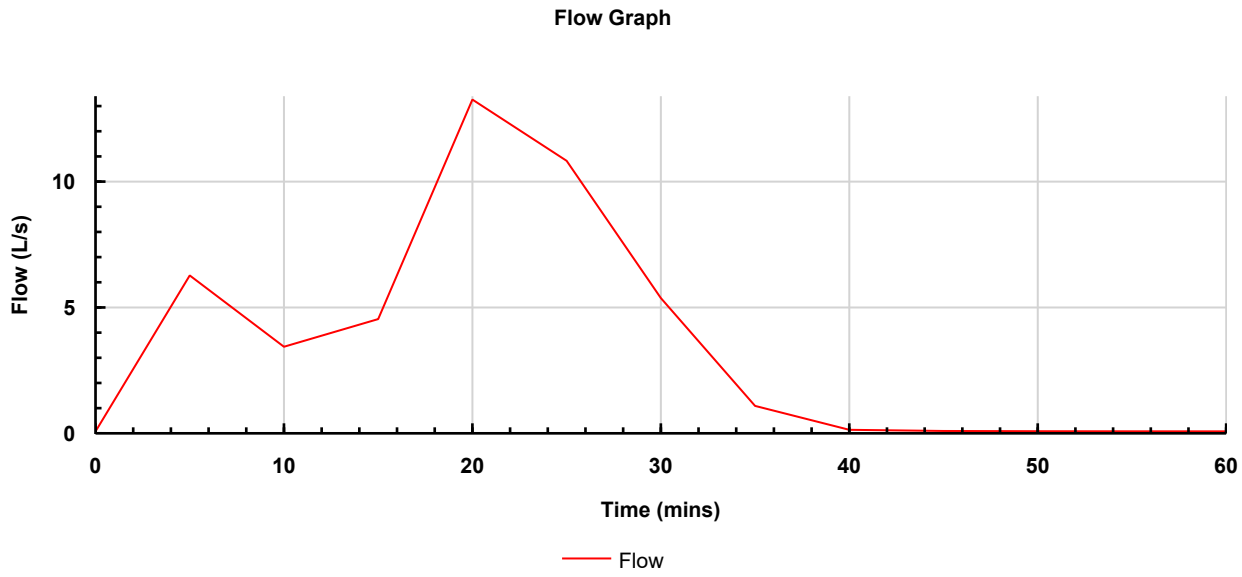
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.072	6.7
10	0.049	3.0
15	0.060	4.6
20	0.110	13.8
25	0.095	10.5
30	0.063	5.0
35	0.025	0.7
40	0.006	0.0
45	0.004	0.0
50	0.002	0.0
55	0.002	0.0
60	0.001	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 9.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

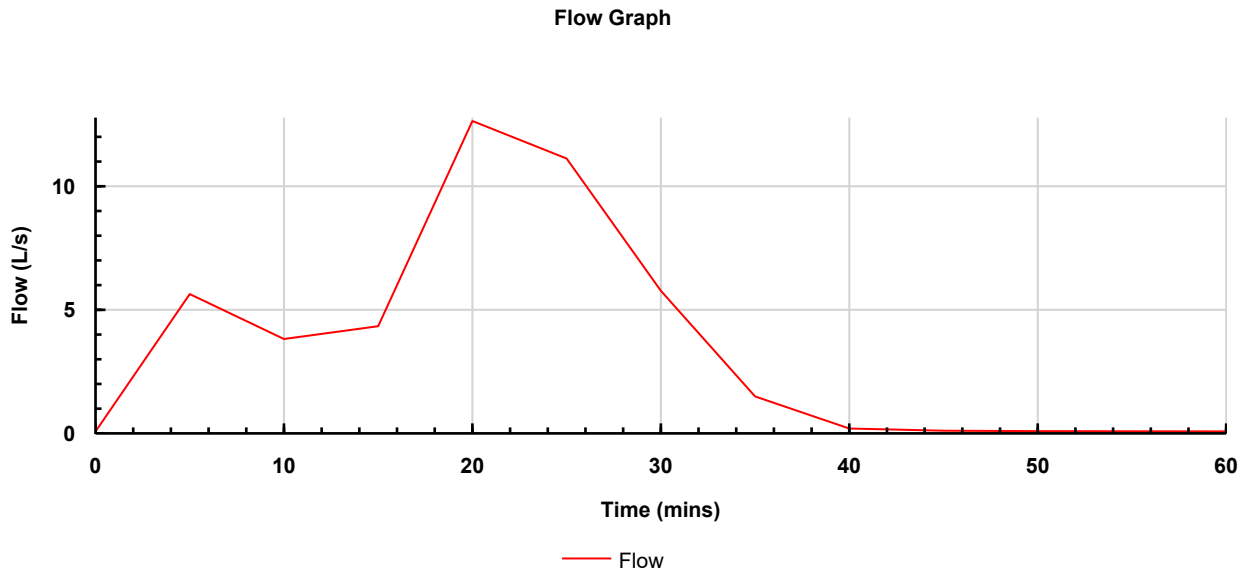
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.069	6.2
10	0.052	3.4
15	0.058	4.5
20	0.106	13.3
25	0.095	10.8
30	0.065	5.3
35	0.030	1.0
40	0.009	0.1
45	0.005	0.0
50	0.004	0.0
55	0.003	0.0
60	0.002	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 9.05
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

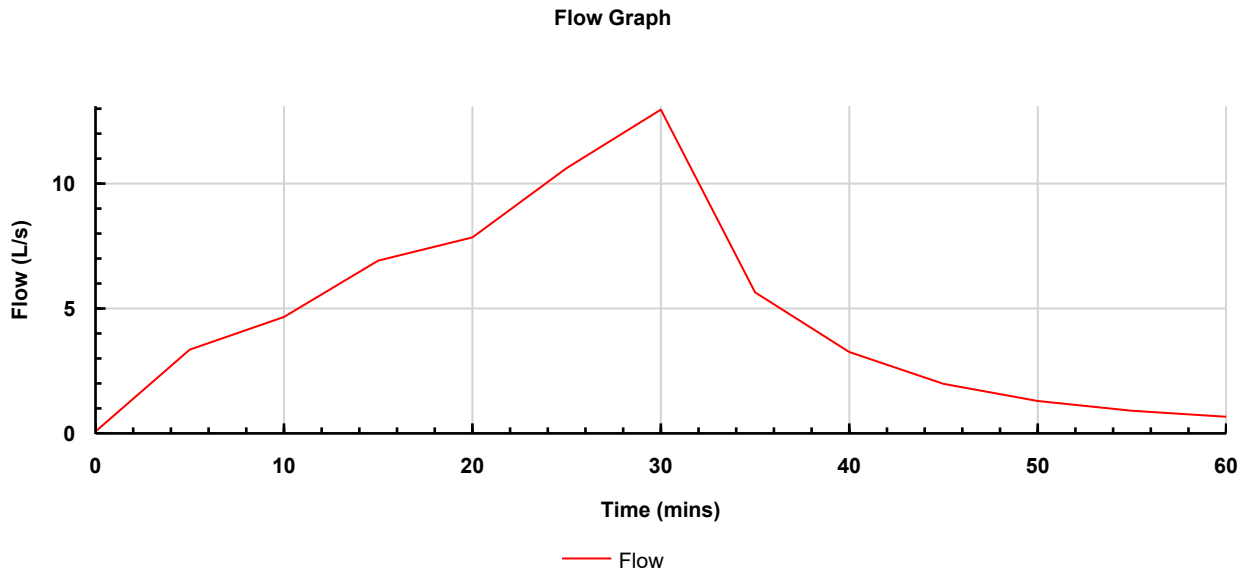
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.063	5.6
10	0.051	3.8
15	0.055	4.3
20	0.098	12.6
25	0.091	11.1
30	0.064	5.7
35	0.031	1.4
40	0.009	0.1
45	0.004	0.0
50	0.003	0.0
55	0.002	0.0
60	0.002	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 4.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 9

Type : Pipe

Graphs



Tables

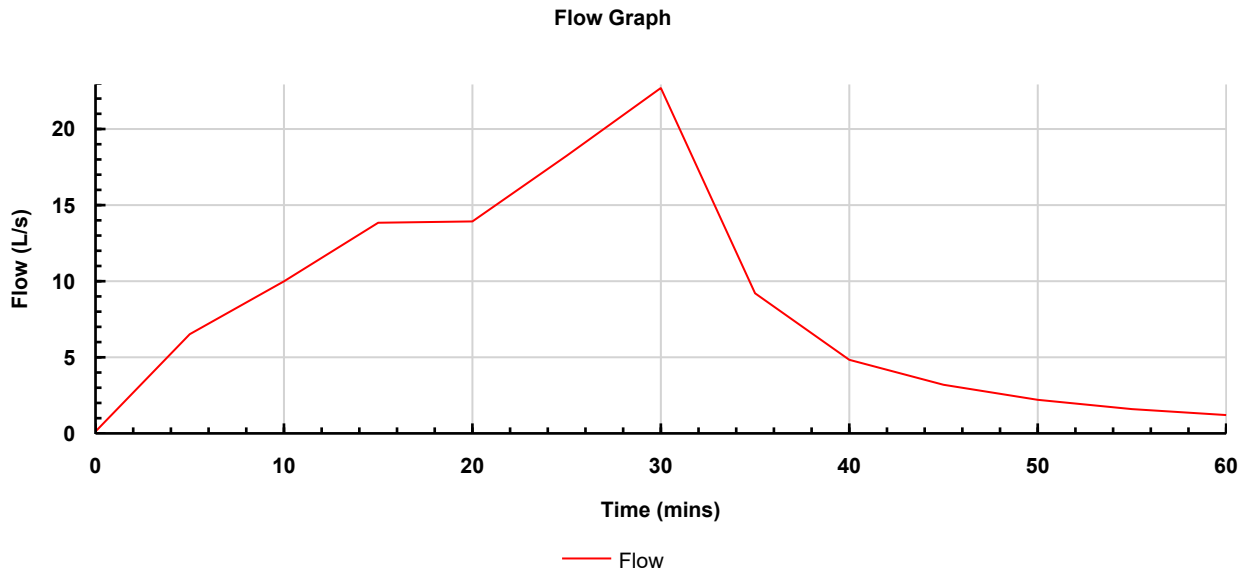
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.059	3.3
10	0.072	4.6
15	0.087	6.9
20	0.090	7.8
25	0.106	10.6
30	0.121	13.0
35	0.072	5.6
40	0.053	3.2
45	0.042	1.9
50	0.034	1.2
55	0.029	0.8
60	0.025	0.6

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 4.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 9

Type : Pipe

Graphs



Tables

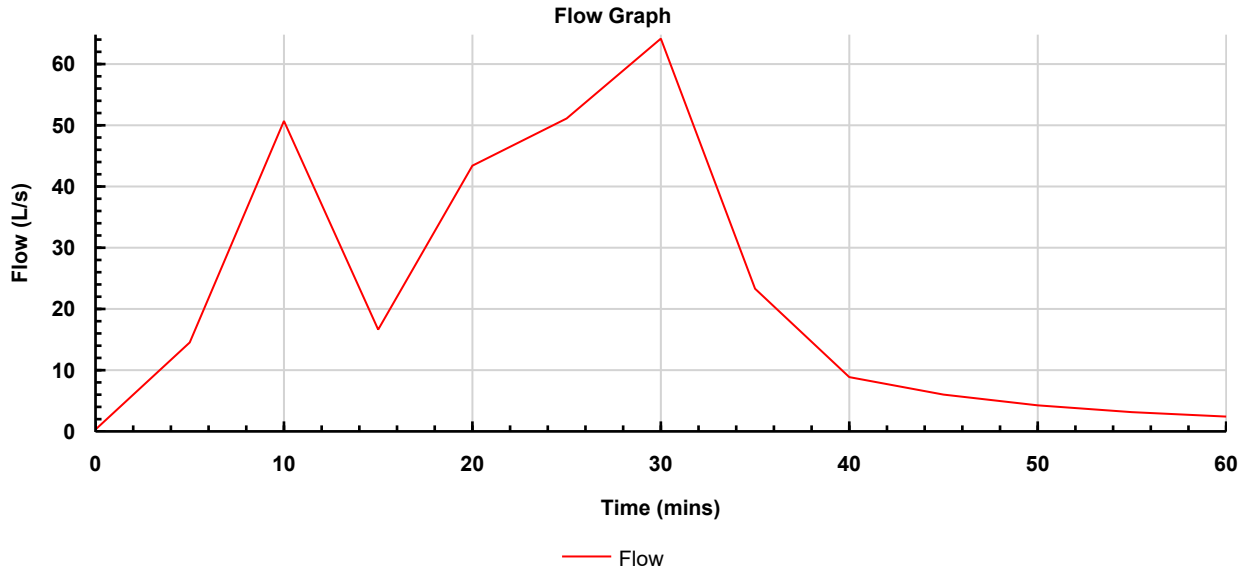
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.067	6.4
10	0.084	9.9
15	0.101	13.8
20	0.101	13.9
25	0.118	18.2
30	0.134	22.7
35	0.080	9.1
40	0.057	4.7
45	0.046	3.1
50	0.038	2.1
55	0.032	1.5
60	0.027	1.1

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.07
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

Type : Pipe

Graphs



Tables

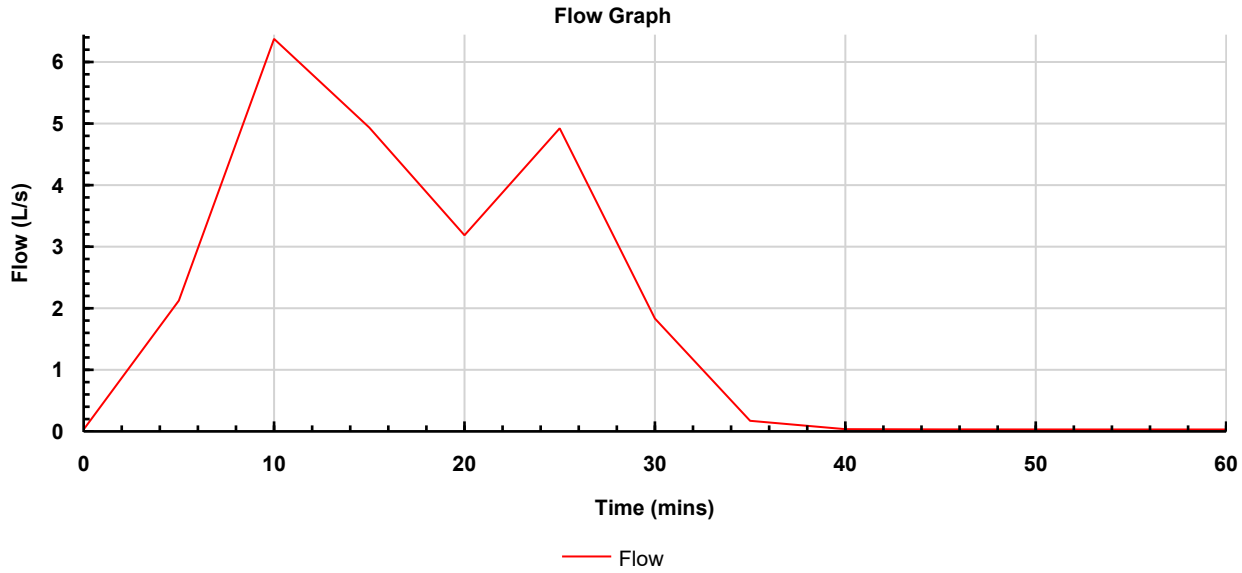
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.104	14.3
10	0.169	50.6
15	0.106	16.4
20	0.158	43.3
25	0.170	51.0
30	0.194	64.2
35	0.120	23.1
40	0.093	8.6
45	0.087	5.7
50	0.082	4.0
55	0.079	2.8
60	0.076	2.1

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 5.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

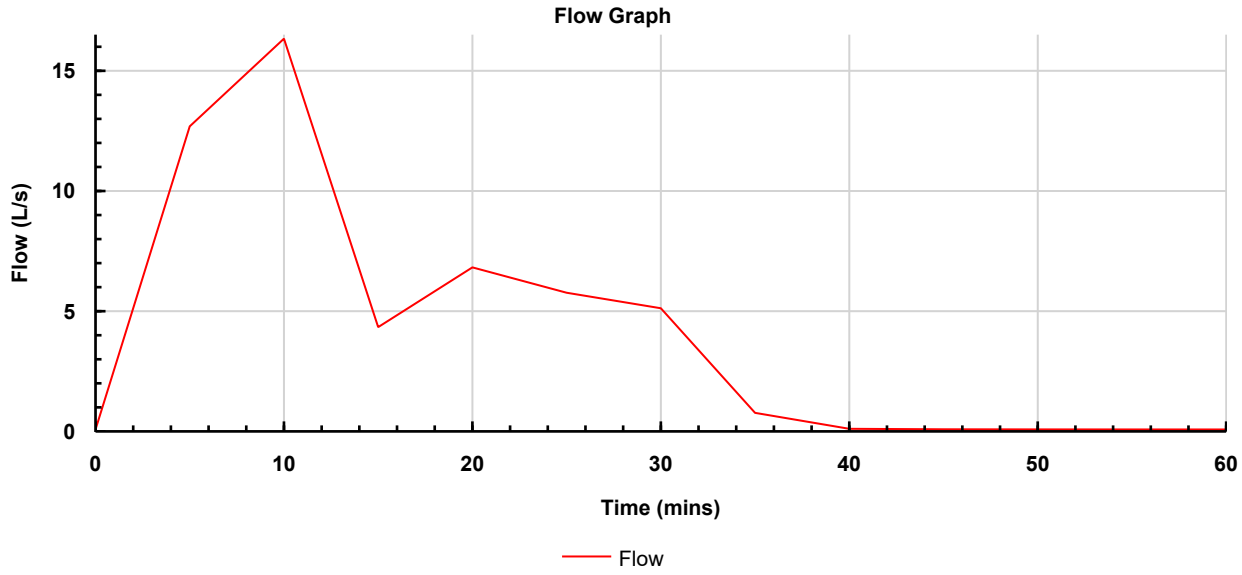
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.038	2.1
10	0.068	6.4
15	0.060	4.9
20	0.047	3.2
25	0.059	4.9
30	0.036	1.8
35	0.013	0.1
40	0.003	0.0
45	0.001	0.0
50	0.001	0.0
55	0.001	0.0
60	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 5.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 5

Type : Pipe

Graphs



Tables

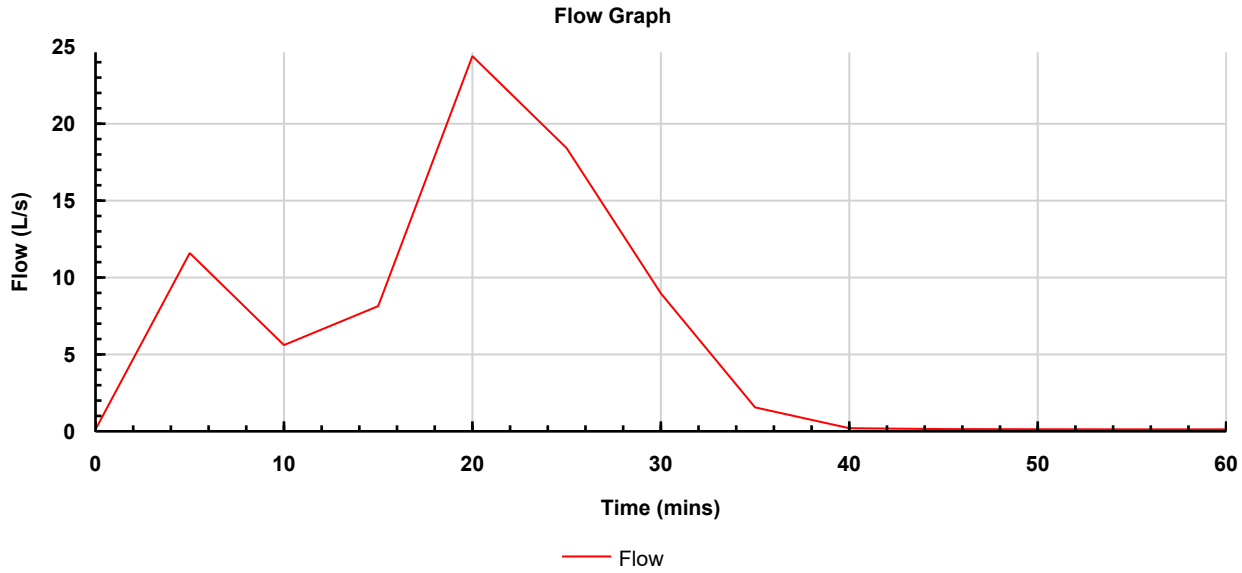
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.097	12.7
10	0.113	16.3
15	0.055	4.3
20	0.068	6.8
25	0.063	5.7
30	0.059	5.1
35	0.024	0.7
40	0.006	0.0
45	0.003	0.0
50	0.002	0.0
55	0.002	0.0
60	0.001	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 5.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

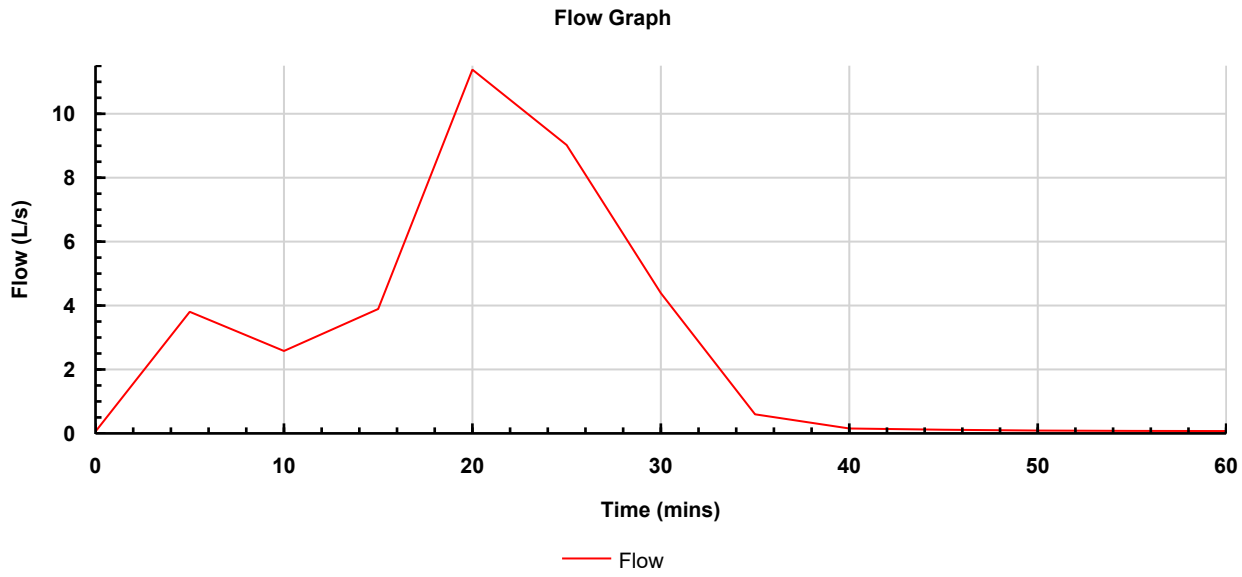
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.105	11.5
10	0.075	5.5
15	0.088	8.1
20	0.168	24.4
25	0.152	18.4
30	0.110	8.9
35	0.057	1.4
40	0.033	0.1
45	0.026	0.0
50	0.022	0.0
55	0.019	0.0
60	0.016	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 10.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

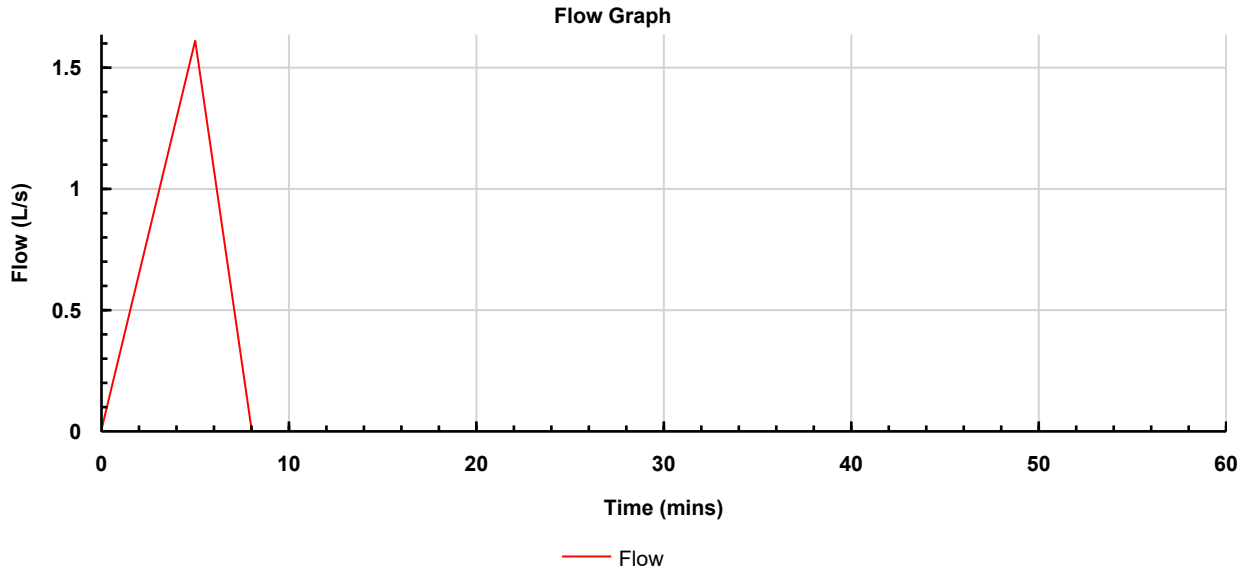
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.119	3.8
10	0.175	2.5
15	0.186	3.9
20	0.300	11.4
25	0.300	9.0
30	0.218	4.4
35	0.139	0.5
40	0.102	0.1
45	0.089	0.1
50	0.083	0.0
55	0.079	0.0
60	0.076	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.03
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 5

Type : Pipe

Graphs



Tables

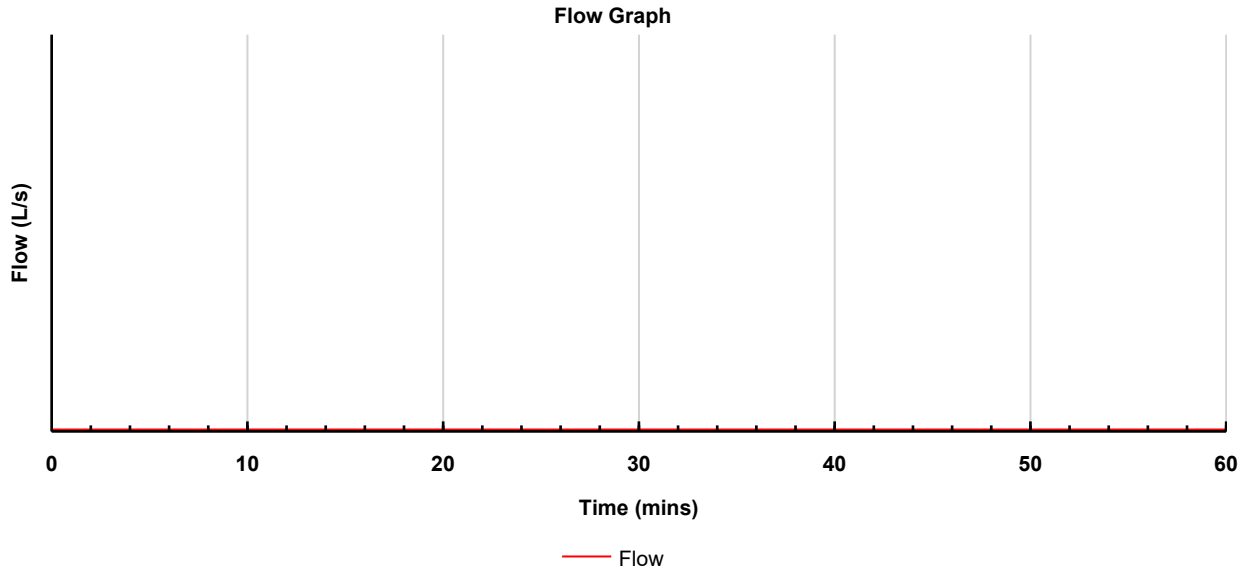
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.137	1.6
10	0.281	-1.1
15	0.304	-1.8
20	0.375	-4.7
25	0.375	-4.6
30	0.326	-2.8
35	0.267	-1.3
40	0.235	-0.8
45	0.224	-0.5
50	0.220	-0.4
55	0.217	-0.3
60	0.215	-0.3

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.04
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 1

Type : Pipe

Graphs



Tables

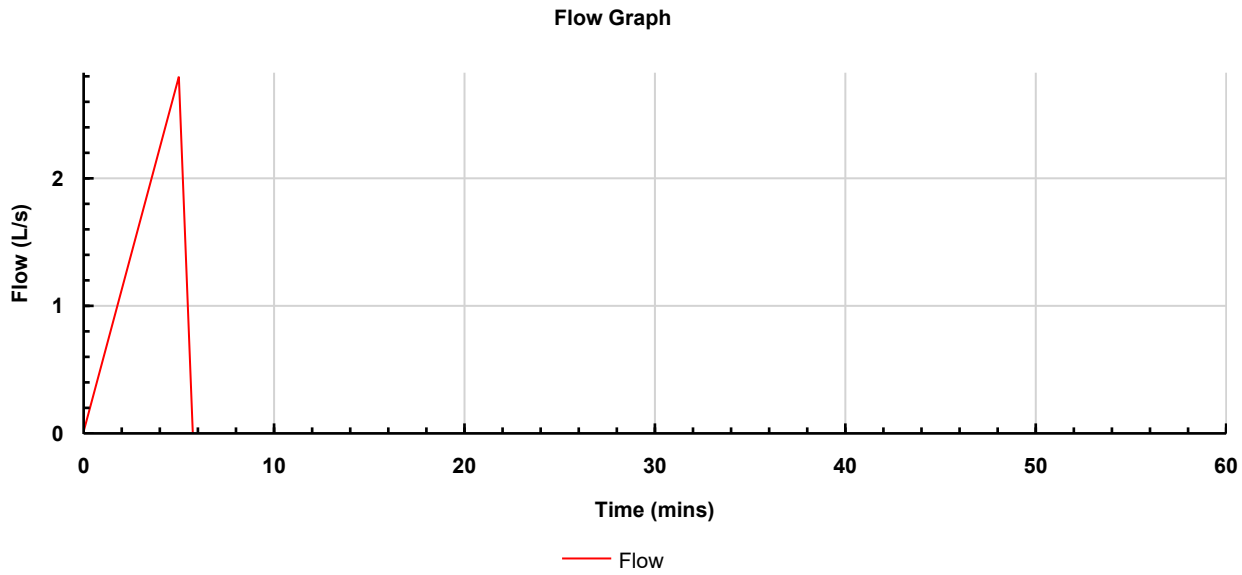
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.141	-0.0
10	0.203	-0.0
15	0.182	-0.0
20	0.179	-0.0
25	0.181	-0.0
30	0.172	-0.0
35	0.149	-0.0
40	0.133	-0.0
45	0.128	-0.0
50	0.126	-0.0
55	0.124	-0.0
60	0.123	-0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

Type : Pipe

Graphs



Tables

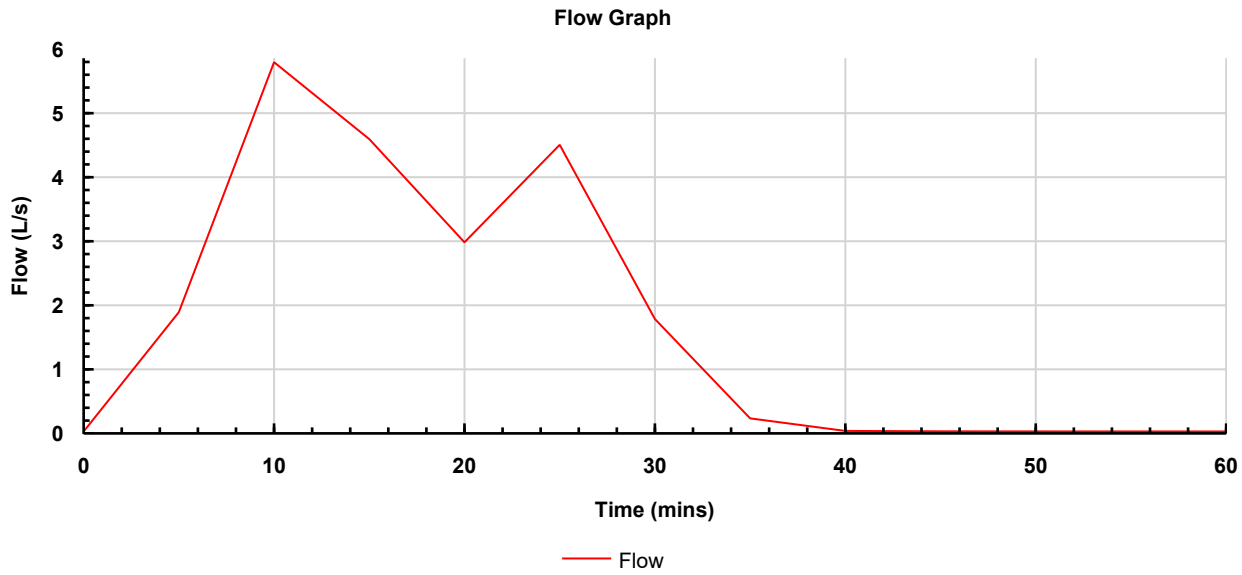
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.082	2.8
10	0.225	-16.4
15	0.220	-6.7
20	0.225	-13.3
25	0.225	-16.2
30	0.225	-19.8
35	0.216	-6.6
40	0.158	-1.8
45	0.144	-1.5
50	0.137	-0.9
55	0.132	-0.6
60	0.129	-0.5

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 8.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

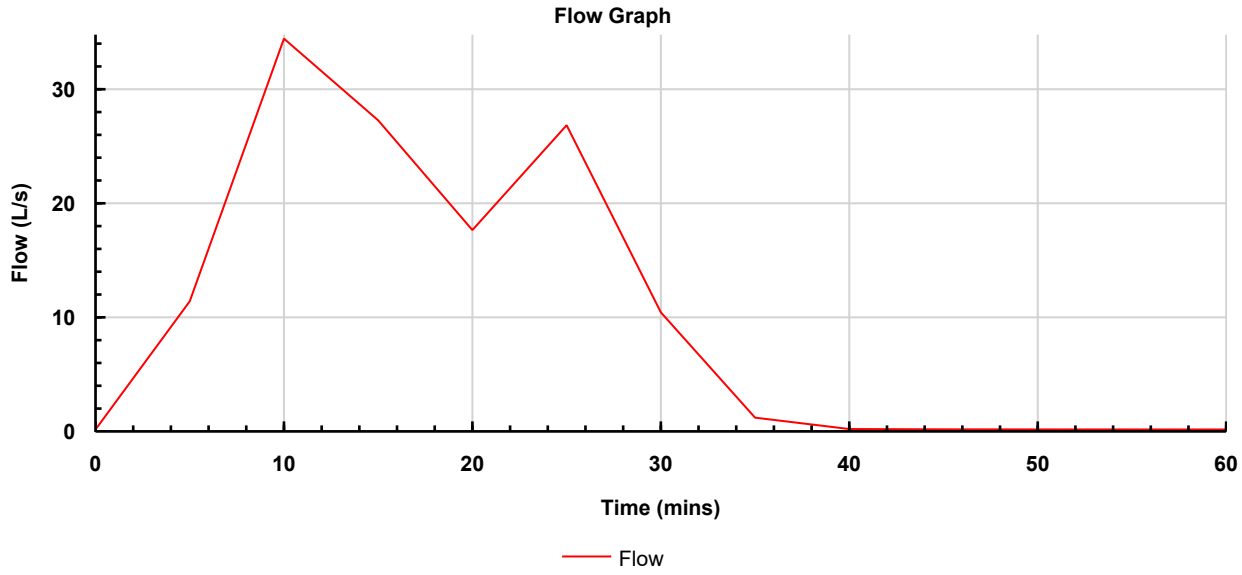
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.029	1.9
10	0.049	5.8
15	0.044	4.6
20	0.036	3.0
25	0.044	4.5
30	0.028	1.8
35	0.011	0.2
40	0.003	0.0
45	0.001	0.0
50	0.001	0.0
55	0.001	0.0
60	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 6.04
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

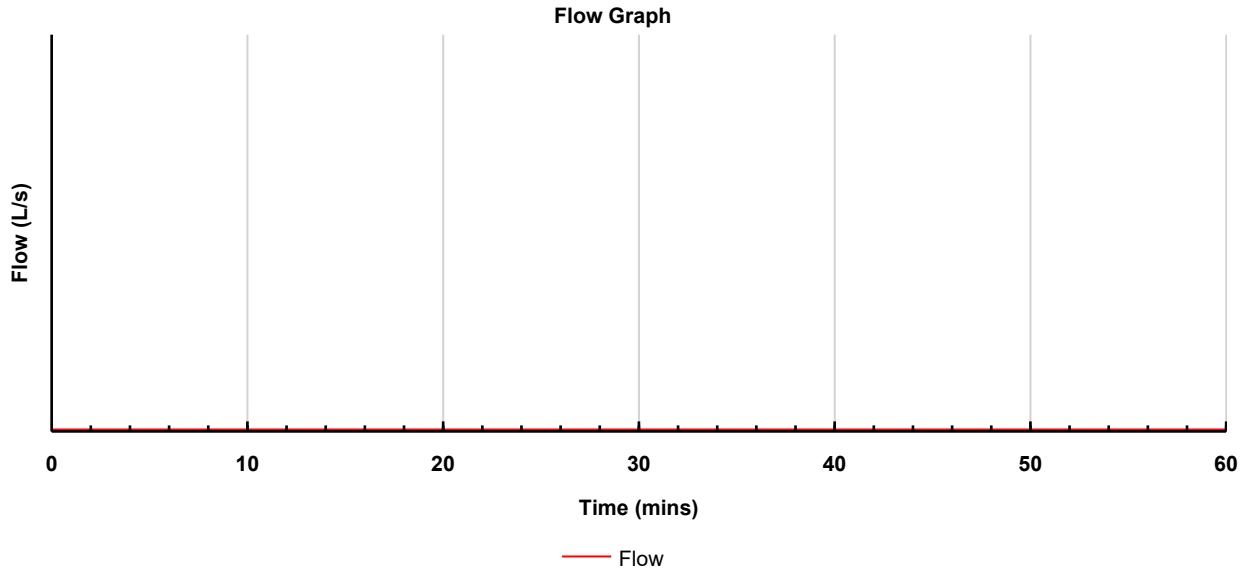
Time (mins)	Depth (m)	Flow (L/s)
0	0.075	0.0
5	0.105	11.3
10	0.131	34.4
15	0.123	27.2
20	0.113	17.6
25	0.123	26.8
30	0.104	10.3
35	0.084	1.0
40	0.077	0.0
45	0.076	0.0
50	0.076	0.0
55	0.076	0.0
60	0.075	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 6.01
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 1

Type : Pipe

Graphs



Tables

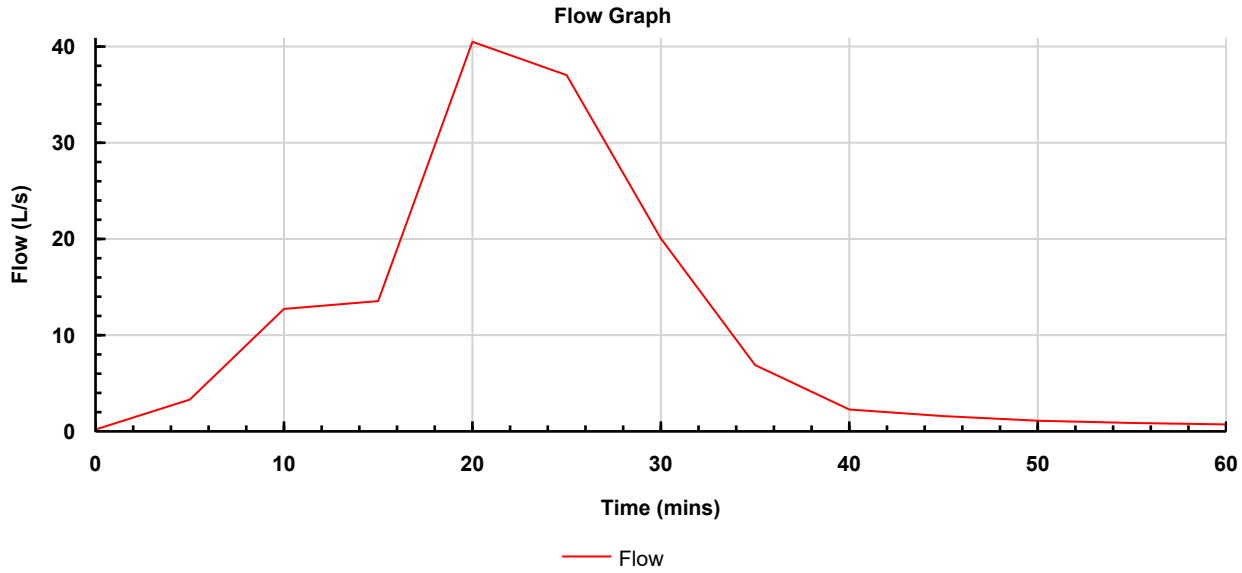
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.019	0.0
10	0.019	0.0
15	0.014	0.0
20	0.015	0.0
25	0.015	0.0
30	0.012	0.0
35	0.004	0.0
40	0.001	0.0
45	0.000	0.0
50	0.000	0.0
55	0.000	0.0
60	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 2.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

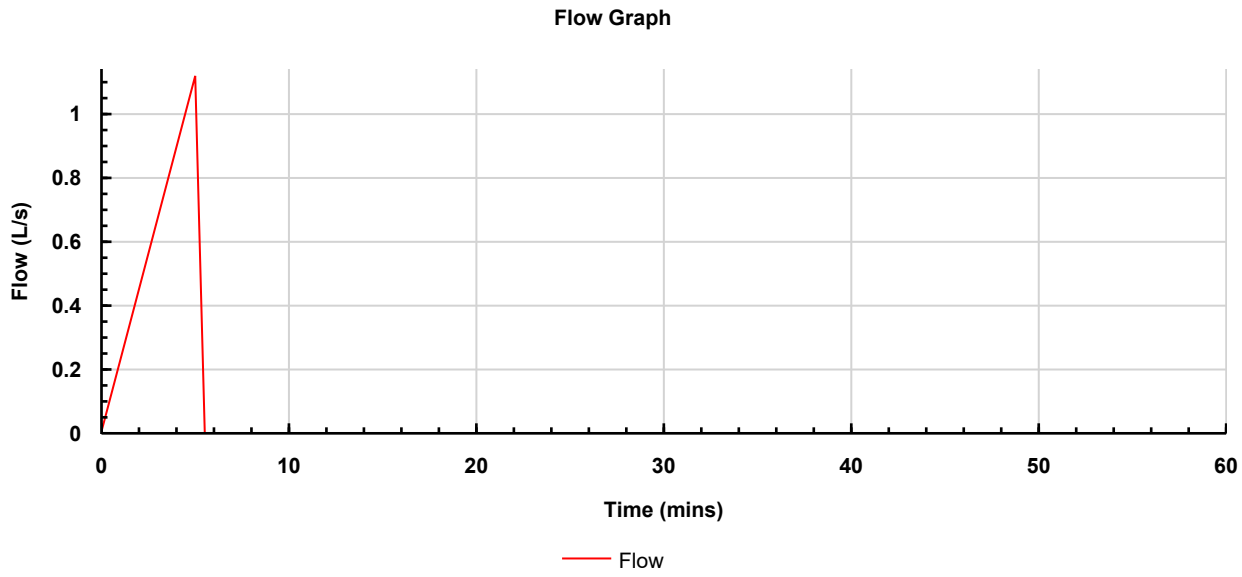
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.051	3.1
10	0.089	12.6
15	0.094	13.4
20	0.183	40.5
25	0.177	37.0
30	0.120	19.9
35	0.064	6.7
40	0.033	2.1
45	0.027	1.4
50	0.022	0.9
55	0.019	0.7
60	0.017	0.5

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.01
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

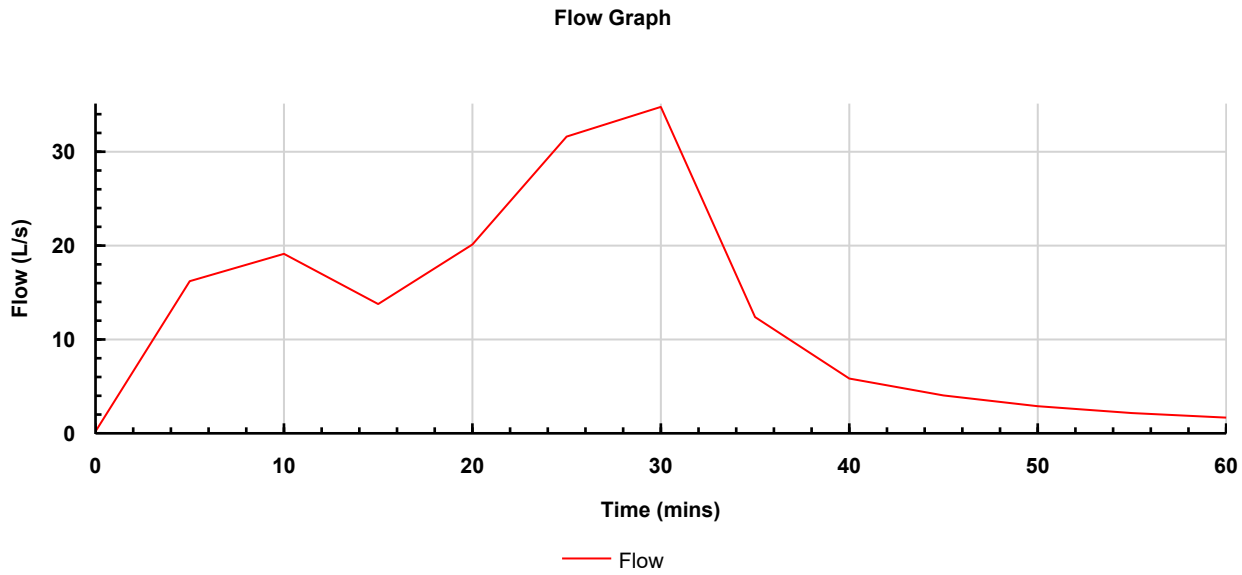
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.037	1.1
10	0.128	-9.9
15	0.120	-8.5
20	0.157	-15.4
25	0.169	-17.9
30	0.122	-8.8
35	0.078	-2.9
40	0.057	-1.3
45	0.049	-0.7
50	0.045	-0.5
55	0.043	-0.4
60	0.041	-0.3

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.06
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 3

Type : Pipe

Graphs



Tables

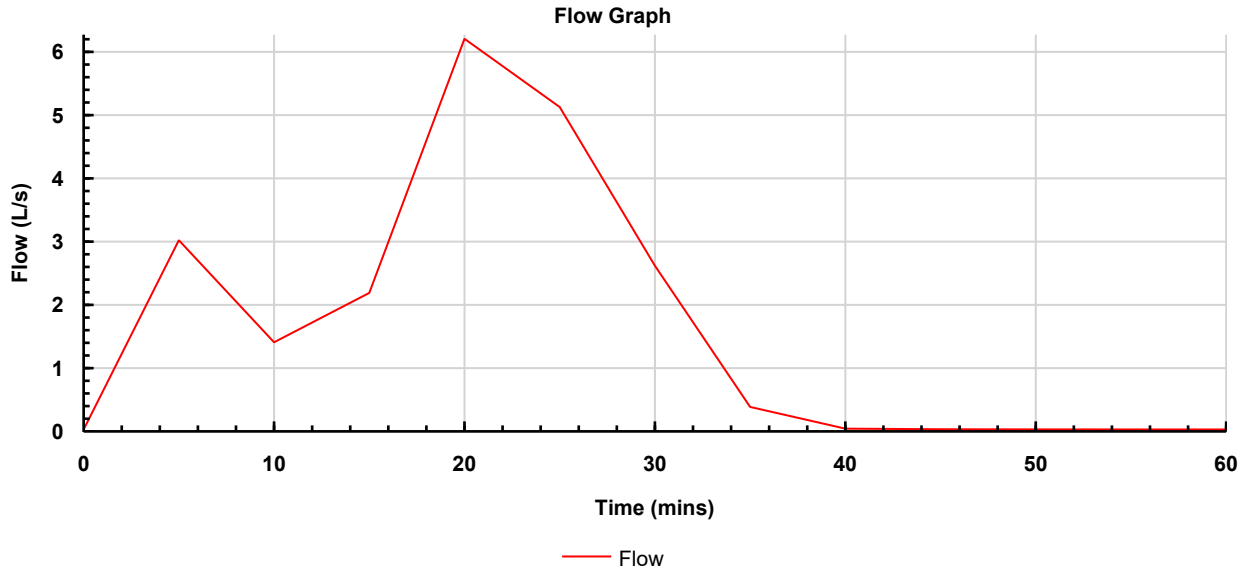
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.108	16.1
10	0.121	19.0
15	0.099	13.6
20	0.123	20.0
25	0.164	31.6
30	0.173	34.8
35	0.092	12.3
40	0.059	5.7
45	0.049	3.9
50	0.041	2.7
55	0.035	2.0
60	0.030	1.5

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.05
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

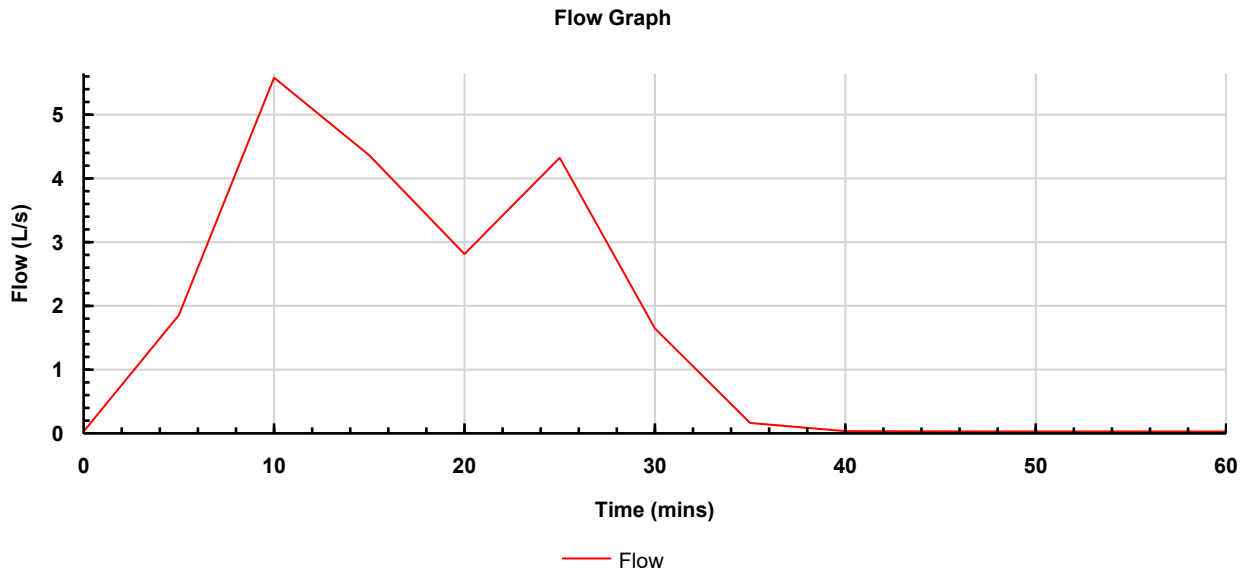
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.078	3.0
10	0.050	1.4
15	0.063	2.2
20	0.149	6.2
25	0.140	5.1
30	0.095	2.6
35	0.042	0.4
40	0.027	0.0
45	0.022	0.0
50	0.018	0.0
55	0.016	0.0
60	0.014	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 6.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

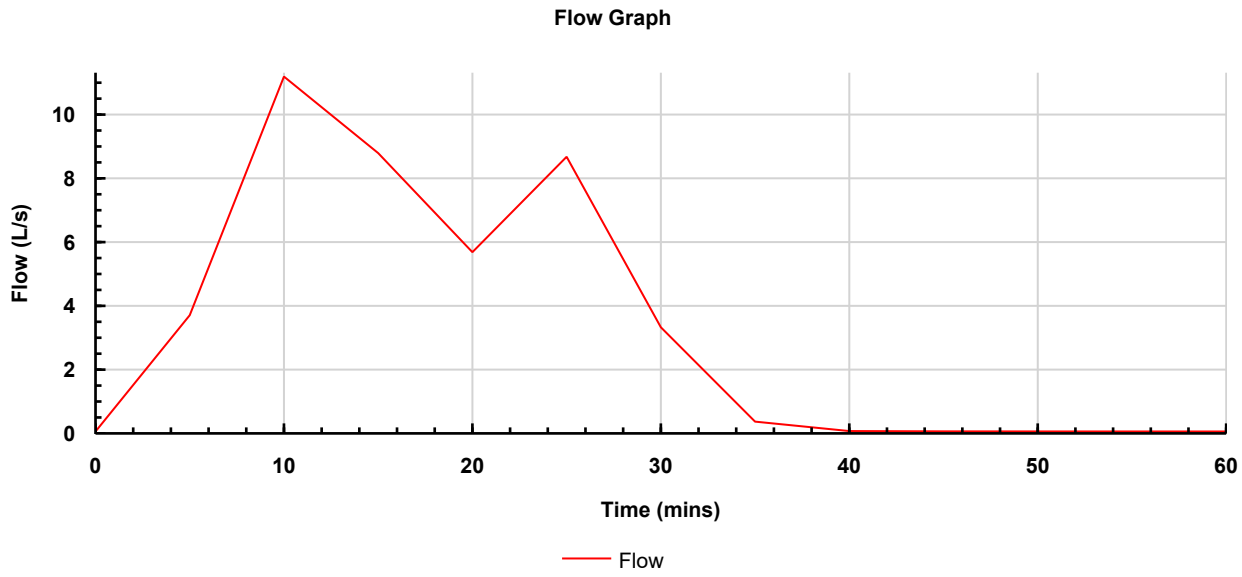
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.035	1.8
10	0.065	5.6
15	0.056	4.4
20	0.044	2.8
25	0.056	4.3
30	0.033	1.6
35	0.010	0.1
40	0.002	0.0
45	0.001	0.0
50	0.001	0.0
55	0.000	0.0
60	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 6.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

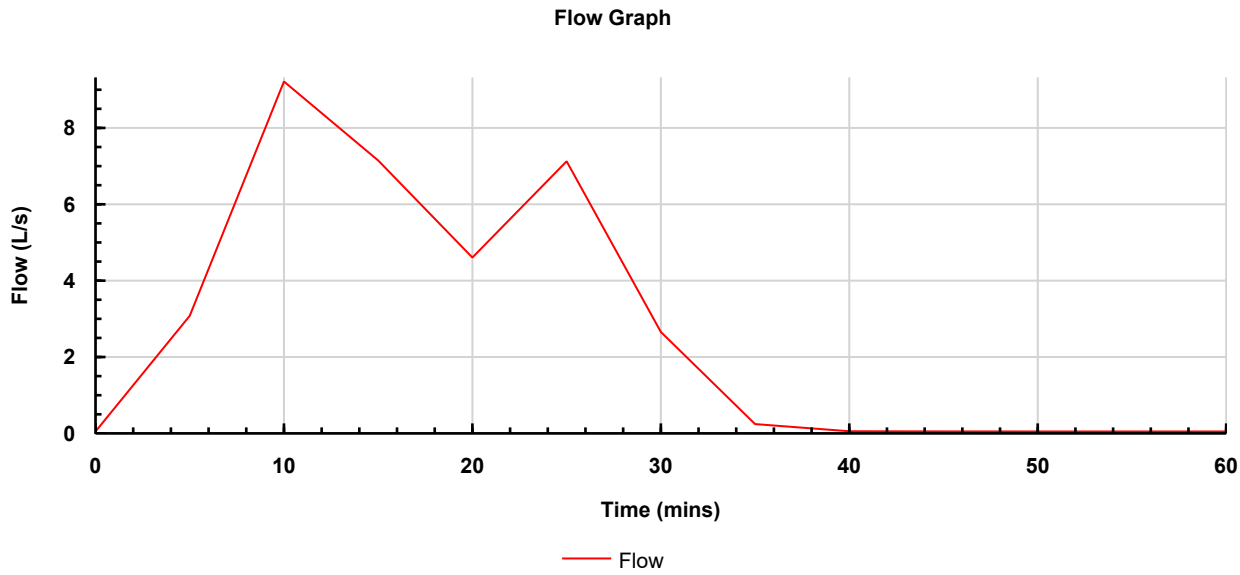
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.051	3.7
10	0.094	11.2
15	0.081	8.8
20	0.064	5.7
25	0.081	8.7
30	0.048	3.3
35	0.016	0.3
40	0.004	0.0
45	0.002	0.0
50	0.001	0.0
55	0.001	0.0
60	0.001	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 7.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

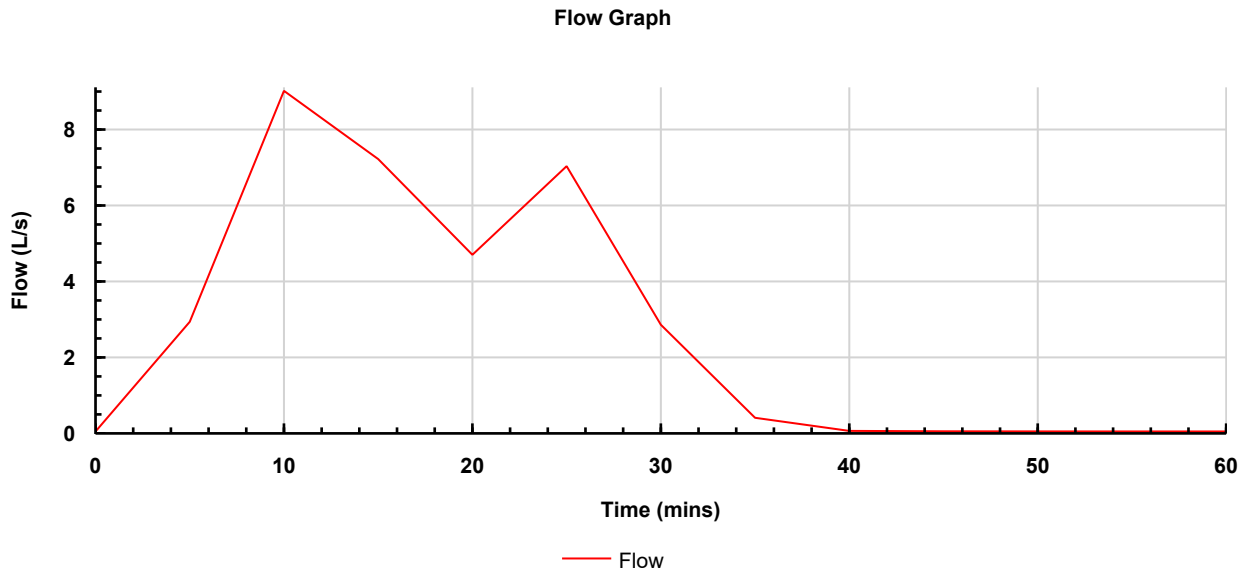
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.040	3.0
10	0.071	9.2
15	0.062	7.1
20	0.050	4.6
25	0.062	7.1
30	0.038	2.6
35	0.012	0.2
40	0.003	0.0
45	0.001	0.0
50	0.001	0.0
55	0.001	0.0
60	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 7.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

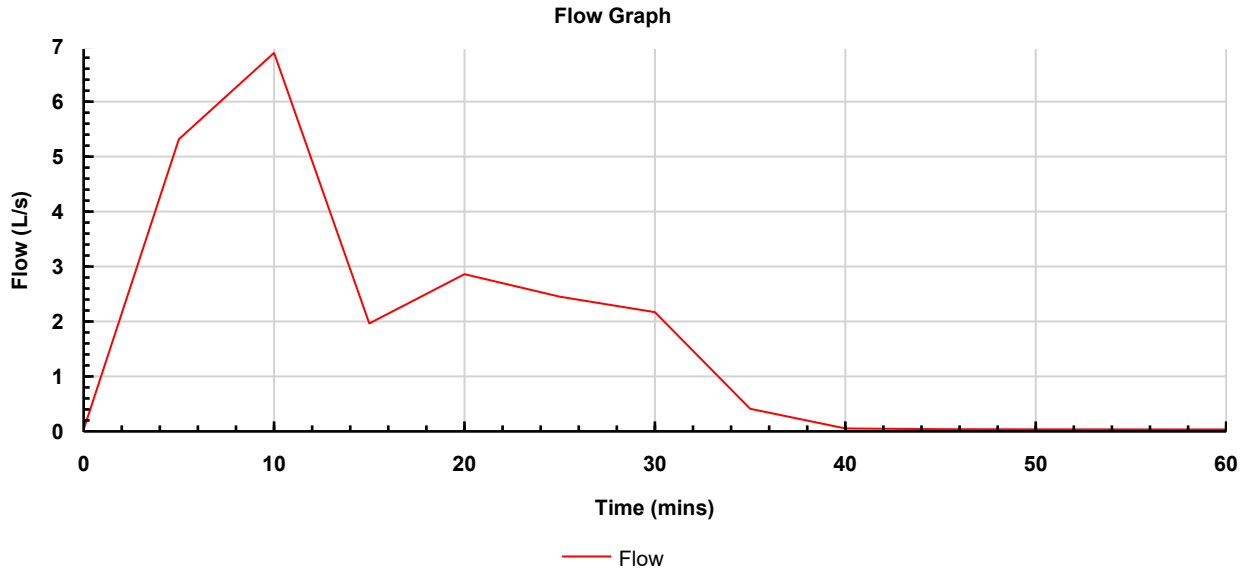
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.035	2.9
10	0.062	9.0
15	0.055	7.2
20	0.044	4.7
25	0.054	7.0
30	0.035	2.8
35	0.014	0.4
40	0.003	0.0
45	0.002	0.0
50	0.001	0.0
55	0.001	0.0
60	0.001	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 8.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 5

Type : Pipe

Graphs



Tables

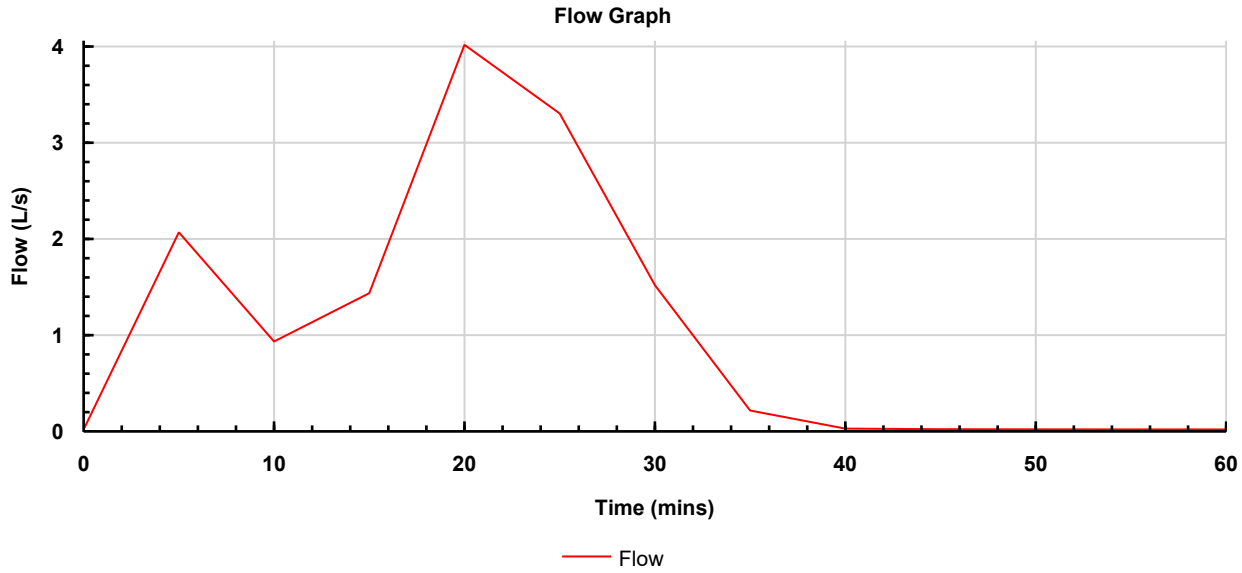
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.083	5.3
10	0.119	6.9
15	0.086	1.9
20	0.080	2.8
25	0.080	2.4
30	0.075	2.1
35	0.046	0.4
40	0.034	0.0
45	0.031	0.0
50	0.031	0.0
55	0.030	0.0
60	0.030	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 9.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

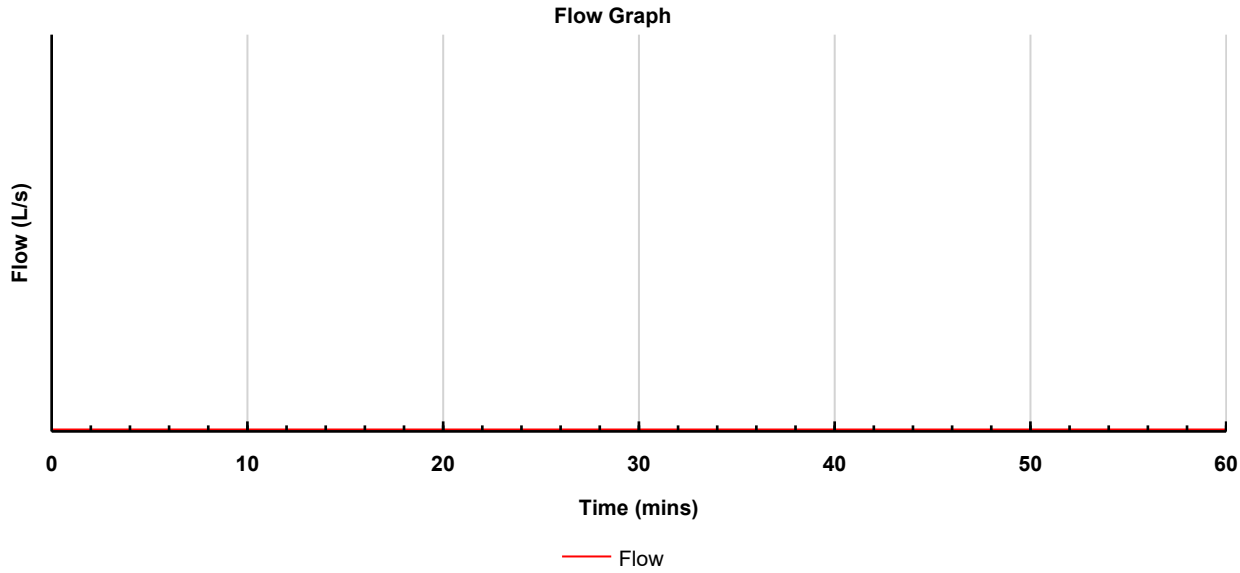
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.056	2.1
10	0.037	0.9
15	0.046	1.4
20	0.089	4.0
25	0.072	3.3
30	0.047	1.5
35	0.017	0.2
40	0.004	0.0
45	0.002	0.0
50	0.001	0.0
55	0.001	0.0
60	0.001	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 9.01
Critical Storm: ARR: 10 %: Increase Rainfall (%): +20: 30 mins: 1

Type : Pipe

Graphs



Tables

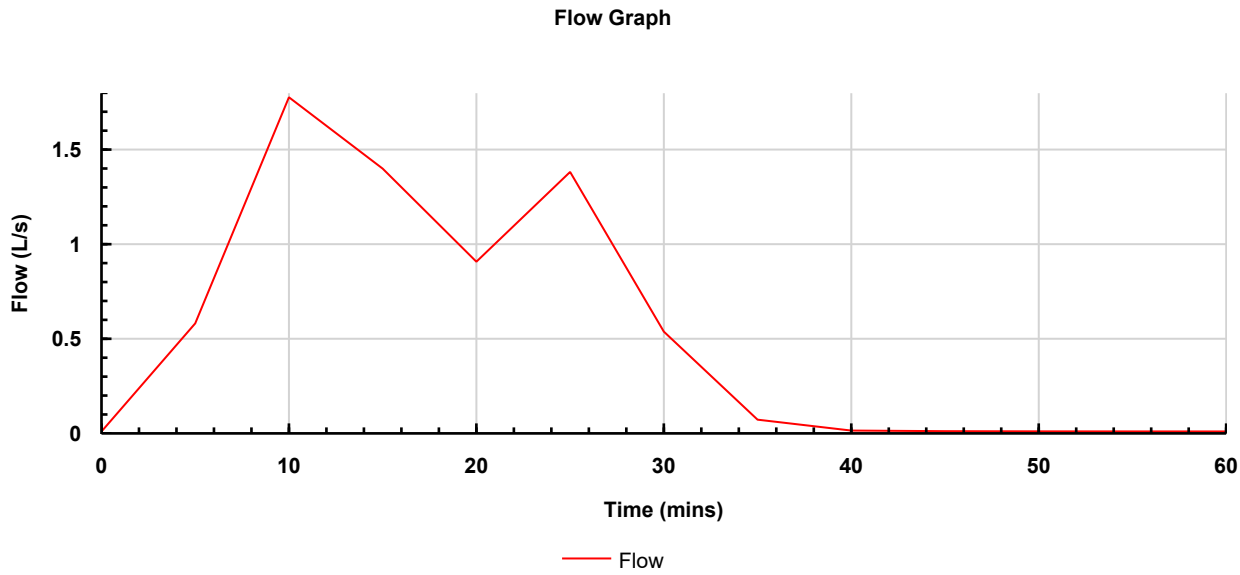
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.019	0.0
10	0.019	0.0
15	0.015	0.0
20	0.015	0.0
25	0.015	0.0
30	0.013	0.0
35	0.005	0.0
40	0.001	0.0
45	0.001	0.0
50	0.000	0.0
55	0.000	0.0
60	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 11.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

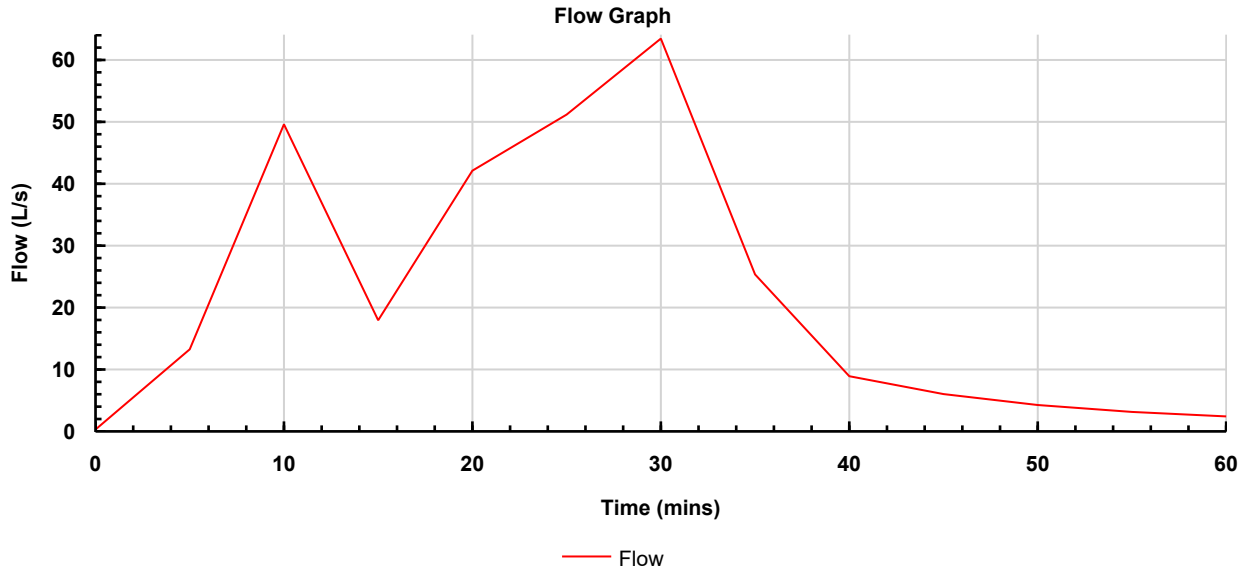
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.031	0.6
10	0.057	1.8
15	0.050	1.4
20	0.040	0.9
25	0.050	1.4
30	0.030	0.5
35	0.011	0.1
40	0.003	0.0
45	0.001	0.0
50	0.001	0.0
55	0.001	0.0
60	0.000	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 3.08
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

Type : Pipe

Graphs



Tables

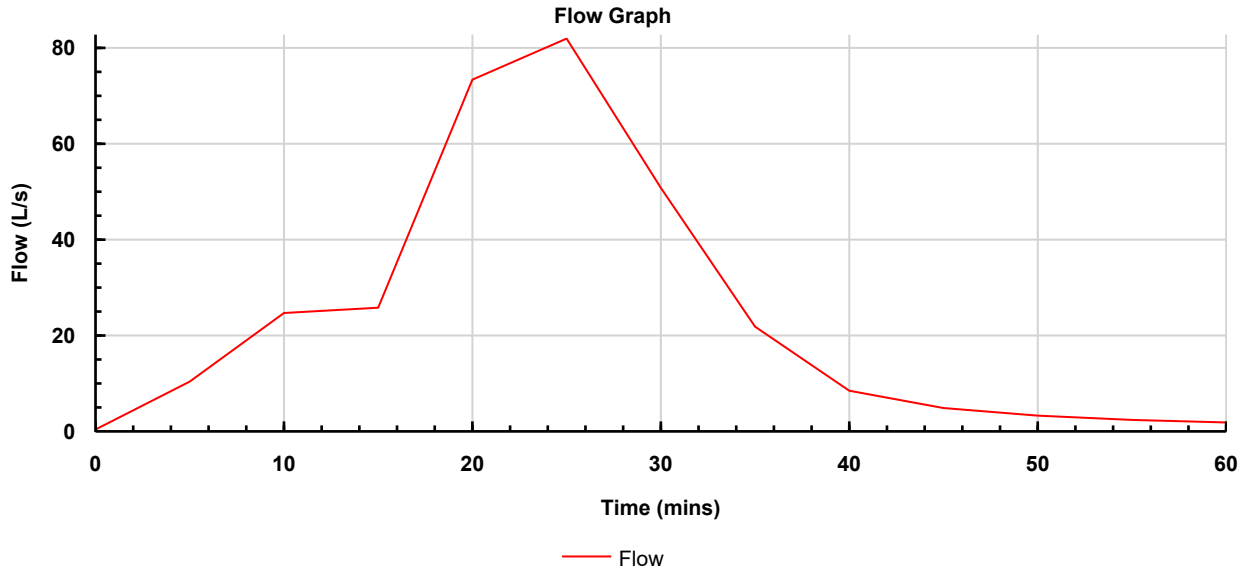
Time (mins)	Depth (m)	Flow (L/s)
0	0.075	0.0
5	0.138	13.0
10	0.160	49.5
15	0.137	17.7
20	0.156	42.0
25	0.163	51.1
30	0.185	63.4
35	0.143	25.2
40	0.136	8.6
45	0.136	5.7
50	0.135	4.0
55	0.135	2.9
60	0.135	2.1

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 1.03
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

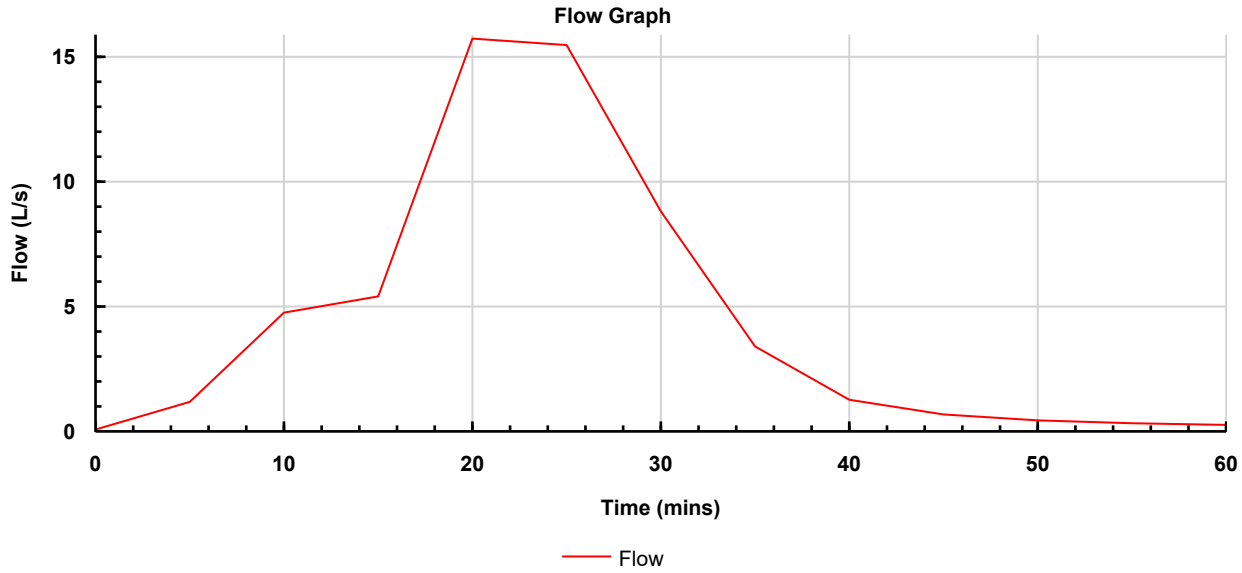
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.079	10.0
10	0.110	24.4
15	0.113	25.5
20	0.205	73.3
25	0.215	81.9
30	0.161	50.7
35	0.100	21.6
40	0.060	8.1
45	0.045	4.5
50	0.037	2.9
55	0.031	2.0
60	0.027	1.5

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 14.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 4

Type : Pipe

Graphs



Tables

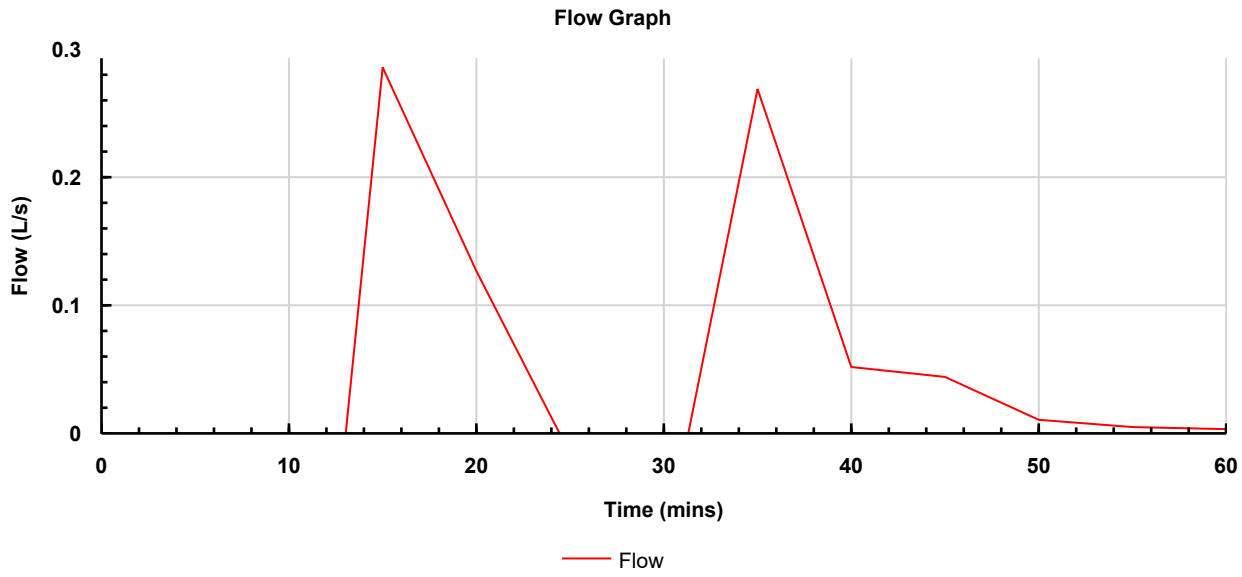
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.039	1.1
10	0.063	4.7
15	0.065	5.4
20	0.116	15.7
25	0.121	15.5
30	0.091	8.8
35	0.058	3.3
40	0.036	1.2
45	0.027	0.6
50	0.022	0.4
55	0.018	0.3
60	0.016	0.2

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 15.00
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 1

Type : Pipe

Graphs



Tables

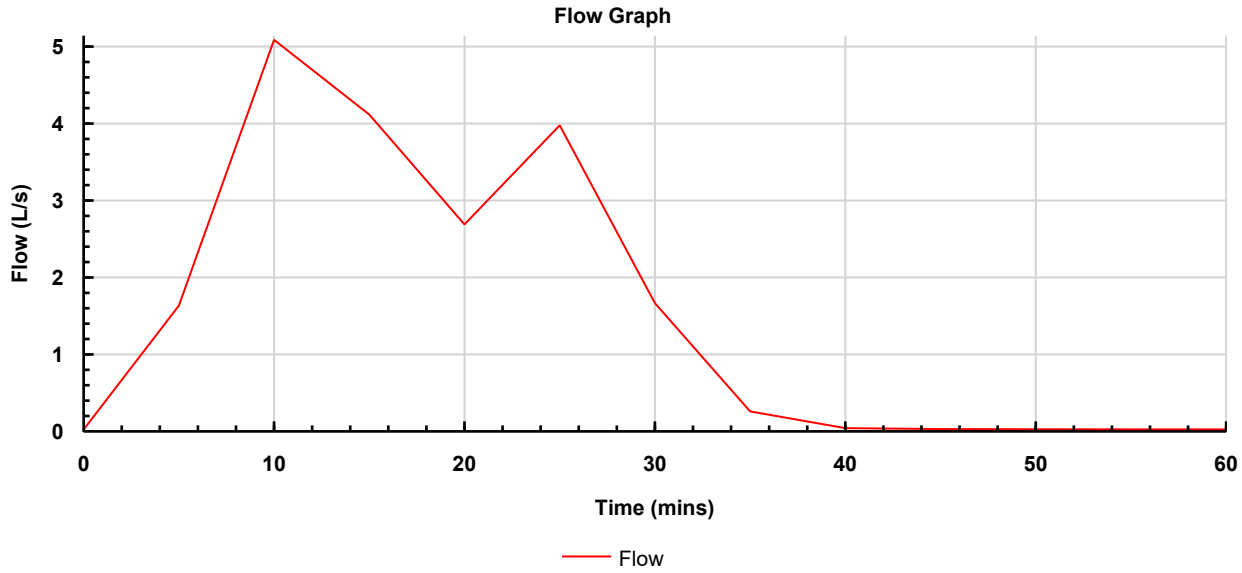
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.021	-0.2
10	0.160	-0.4
15	0.130	0.3
20	0.090	0.1
25	0.085	-0.0
30	0.104	-0.1
35	0.059	0.3
40	0.025	0.1
45	0.018	0.0
50	0.013	0.0
55	0.011	0.0
60	0.010	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Pipe 2.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 6

Type : Pipe

Graphs



Tables

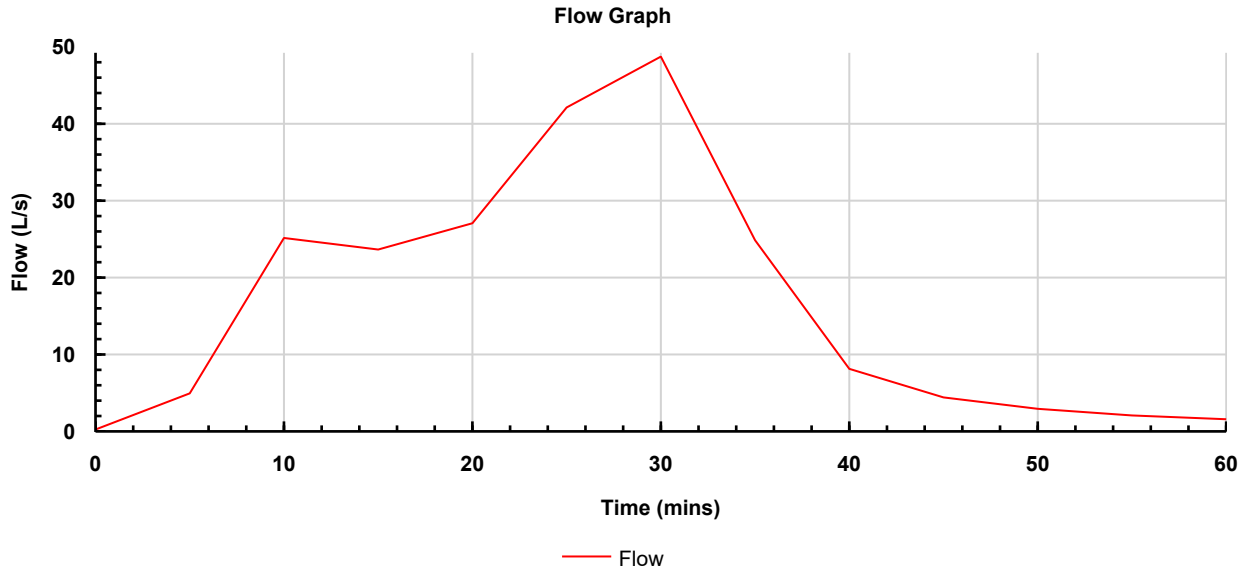
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.033	1.6
10	0.104	5.1
15	0.100	4.1
20	0.079	2.7
25	0.094	4.0
30	0.066	1.7
35	0.034	0.2
40	0.019	0.0
45	0.015	0.0
50	0.012	0.0
55	0.010	0.0
60	0.009	0.0

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

Pipe 1.02
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 3

Type : Pipe

Graphs



Tables

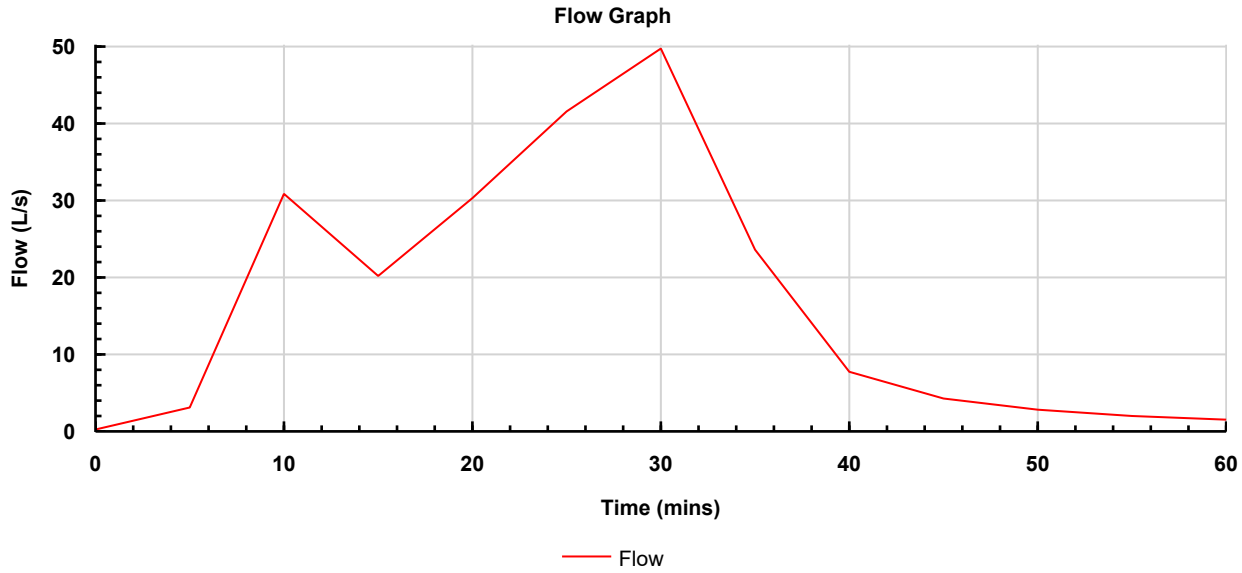
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.053	4.7
10	0.114	25.0
15	0.110	23.5
20	0.119	27.0
25	0.152	42.1
30	0.165	48.7
35	0.110	24.7
40	0.061	7.9
45	0.045	4.2
50	0.036	2.7
55	0.030	1.8
60	0.026	1.3

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by:	Checked by:	Approved By:
	M.B	H.S	J.L
Report Details:	WSP:		
Type: Connection Results Storm Phase: with cc 20%	Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 2.05
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

Type : Pipe

Graphs



Tables

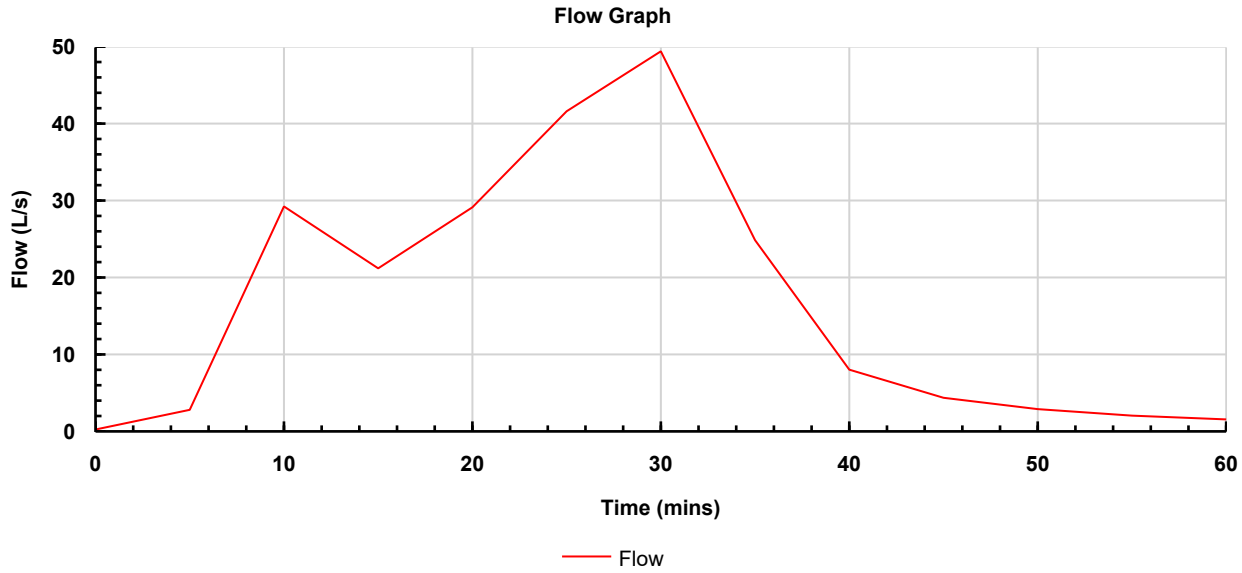
Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.039	2.9
10	0.134	30.8
15	0.108	20.0
20	0.133	30.2
25	0.161	41.5
30	0.179	49.7
35	0.118	23.5
40	0.065	7.5
45	0.048	4.0
50	0.038	2.6
55	0.032	1.8
60	0.027	1.3

Dickson shops:	Date:		
Dickson Shops and Streetscape Stormwater Upgrades Proposed Model Outputs	05/11/2024		
	Designed by: M.B	Checked by: H.S	Approved By: J.L
Report Details: Type: Connection Results Storm Phase: with cc 20%	WSP: Level 2, 121 Marcus Clarke Street Canberra, Australian Capital Territory ACT 2601, Australia		

PIPE 1.01
Critical Storm: ARR: 1 %: Increase Rainfall (%): +20: 30 mins: 10

Type : Pipe

Graphs



Tables

Time (mins)	Depth (m)	Flow (L/s)
0	0.000	0.0
5	0.034	2.6
10	0.120	29.1
15	0.103	21.0
20	0.120	29.0
25	0.148	41.6
30	0.164	49.4
35	0.112	24.7
40	0.062	7.8
45	0.045	4.1
50	0.037	2.7
55	0.031	1.8
60	0.026	1.3

Appendix B Flexible Pipe Loading Calculations

Project

Binder 3a,831

Name

Dickson Shops and Streetscape

Pipe details

Nominal Diameter

DN

225

mm

Type

StormPRO ®

Outside diameter
D_e 259 mm
Inside diameter
D_i 226 mm
Diameter at neutral axis of wall
D 238 mm
Initial 3-minute ring-bending modulus
E_b 1207 MPa
Long-term ring-bending modulus
E_{bL} 200 MPa
Poisson's ratio
μ 0.45
Initial 3-minute ring-bending stiffness
S_{DI} 8000 N/m/m
Long-term (2 year) ring-bending stiffness
S_{DL2} 1904 N/m/m
Long-term (50 year) ring-bending stiffness
S_{DL50} 1325 N/m/m

Site conditions

Binder 3a,832

User defined trench width

B

660

mm

(input only if trench width is wider than what the minimum is required)

Cover height

H 0.5 m

*For cover heights less than 0.5m please contact Vinidex

Water table height above pipe

H_w 0 m

Native soil type

Dense sand, dry

Embedment material description

Gravel - single size

Compaction requirement

90% dry density ratio (RD), 60% density index (ID)

Trench fill type

Loose granular materials

Trench width

B 660 mm

Embedment material modulus

E'_e 7 MPa

(subject to confirmation by geotechnical testing)

Native soil modulus

E'_n 15 MPa

(subject to confirmation by geotechnical testing)

Soil specific weight

γ 15 kN/m^3

Soil particle specific density

2.65

Design dead loads and live loads

Binder 3a 833

Design live load [2]

AS 5100 SM1600 Moving Load Single Lane

Construction load

Vertical design load (pressure at top of pipe) due to surface applied dead load

w_{gs} 0 kPa

Vertical design load (pressure at top of pipe) due to surface-applied live load

wq 174 kPa

Vertical design load (pressure at top of pipe) due to soil dead load [1]

wg 8 kPa

Effective combined soil modulus

Binder 3a 834

Ring-bending stiffness value for calculations [3]

50 years

B/D_e 2.5

E'_e/E'_n 0.5

Bedding constant

K 0.1

Design factor

Δf 0.8

Leonhardt correction factor

ζ 1.29

Effective combined soil modulus

E' 9.0 MPa

Binder 3a,835

Deflection prediction

Maximum allowable long-term vertical deflection	Δ_{yall}/D **7.5%**
Predicted long-term vertical deflection	Δ_y/D **3.2%**

Strain prediction

Shape factor	D_f **5.88**
Maximum allowable long-term ring-bending strain	ε_{ball} **4%**
Predicted long-term ring-bending strain	ε_b **1.7%**

Buckling stability

Minimum allowable design factor for buckling	F_{sall} **2.5**
Buckling pressure for $H>H_w$ (excluding vacuum pressure)	q_b **184** kPa
	q_{all1} **16** kPa
	q_{all2} **190** kPa
Allowable buckling pressure (greater of q_{all1} or q_{all2})	q_{all} **190** kPa
Actual design factor for buckling (excluding vacuum pressure)	F_s **2.6**

Binder 3a,836

Notes

1. Soil loading on the pipe is calculated based on the prism load and ignores the effects of soil friction within the fill above the pipe.
2. Design loads on buried flexible pipelines, due to construction and other equipment, should be determined as they can exceed the loads that apply following the construction phase. It is the designer's responsibility to check the type of equipment to be used during construction, particularly when the cover tends towards the minimum. Allowance should be made for increased impact effects due to adverse surface conditions. It may be necessary to increase the cover locally to reduce the working loads due to construction and other equipment
3. The 2-year value for the ring-bending stiffness of the pipe may be used to represent the design basis of 50-year deflection, ring-bending strain and buckling response.
4. The ring bending modulus values are based on the AASHTO LRFD Bridge Design Specifications for corrugated PP and PE pipe.

***Disclaimer**

The information contained in the guidelines is based on the Australian standard AS/NZS 2566.1 "Buried flexible pipelines. Part 1: Structural design". Vinidex is providing this information as a guide and this is provided in good faith to assist users in obtaining the best performance of Vinidex products. Vinidex makes efforts to align information in the tool with the Australian standard above, but does not take responsibility for the accuracy of the information or the results of using the guideline. The guidelines are provided to be a general guide in determining design of buried flexible pipelines but cannot include the complex details of the specific installation. Application of the information may involve engineering judgements which cannot correctly be made without detailed knowledge of all conditions pertaining to a specific installation. Responsibility lies solely with the user to ensure the applicability of the information in the context of those circumstances. It is recommended that advice be obtained from a consultant registered with the Institution of Engineers.No warranty (other than Statutory warranty) is expressed or implied as to the content of the information or results obtained by use thereof, and Vinidex Pty Limited will not be held liable for any costs or damages, direct or indirect, that might arise from use of the guidelines. These terms and conditions are governed by the laws of New South Wales.

Project

Binder 3a,837

Name

Dickson Shops and Streetscape

Pipe details

Nominal Diameter

DN

225

mm

Type

StormPRO ®

Outside diameter
D_e 259 mm
Inside diameter
D_i 226 mm
Diameter at neutral axis of wall
D 238 mm
Initial 3-minute ring-bending modulus
E_b 1207 MPa
Long-term ring-bending modulus
E_{bL} 200 MPa
Poisson's ratio
μ 0.45
Initial 3-minute ring-bending stiffness
S_{DI} 8000 N/m/m
Long-term (2 year) ring-bending stiffness
S_{DL2} 1904 N/m/m
Long-term (50 year) ring-bending stiffness
S_{DL50} 1325 N/m/m

Site conditions

Binder 3a,838

User defined trench width

B

660

mm

(input only if trench width is wider than what the minimum is required)

Cover height

H 0.5 m

*For cover heights less than 0.5m please contact Vinidex

Water table height above pipe

H_w 0 m

Native soil type

Dense sand, dry

Embedment material description

Gravel - graded

Compaction requirement

90% dry density ratio (RD), 60% density index (ID)

Trench fill type

Loose granular materials

Trench width

B 660 mm

Embedment material modulus

E'_e 7 MPa

(subject to confirmation by geotechnical testing)

Native soil modulus

E'_n 15 MPa

(subject to confirmation by geotechnical testing)

Soil specific weight

γ 15 kN/m^3

Soil particle specific density

2.65

Design dead loads and live loads

Binder 3a 839

Design live load [2]

AS 5100 SM1600 Moving Load Single Lane

Construction load

Vertical design load (pressure at top of pipe) due to surface applied dead load

w_{gs} 0 kPa

Vertical design load (pressure at top of pipe) due to surface-applied live load

wq 174 kPa

Vertical design load (pressure at top of pipe) due to soil dead load [1]

wg 8 kPa

Effective combined soil modulus

Binder 3a 840

Ring-bending stiffness value for calculations [3]

50 years

B/D_e 2.5

E'_e/E'_n 0.5

Bedding constant

K 0.1

Design factor

Δf 0.8

Leonhardt correction factor

ζ 1.29

Effective combined soil modulus

E' 9.0 MPa

Binder 3a,841

Deflection prediction

Maximum allowable long-term vertical deflection	Δ_{yall}/D **7.5%**
Predicted long-term vertical deflection	Δ_y/D **3.2%**

Strain prediction

Shape factor	D_f **5.88**
Maximum allowable long-term ring-bending strain	ε_{ball} **4%**
Predicted long-term ring-bending strain	ε_b **1.7%**

Buckling stability

Minimum allowable design factor for buckling	F_{sall} **2.5**
Buckling pressure for $H>H_w$ (excluding vacuum pressure)	q_b **184** kPa
	q_{all1} **16** kPa
	q_{all2} **190** kPa
Allowable buckling pressure (greater of q_{all1} or q_{all2})	q_{all} **190** kPa
Actual design factor for buckling (excluding vacuum pressure)	F_s **2.6**

Binder 3a,842

Notes

1. Soil loading on the pipe is calculated based on the prism load and ignores the effects of soil friction within the fill above the pipe.
2. Design loads on buried flexible pipelines, due to construction and other equipment, should be determined as they can exceed the loads that apply following the construction phase. It is the designer's responsibility to check the type of equipment to be used during construction, particularly when the cover tends towards the minimum. Allowance should be made for increased impact effects due to adverse surface conditions. It may be necessary to increase the cover locally to reduce the working loads due to construction and other equipment
3. The 2-year value for the ring-bending stiffness of the pipe may be used to represent the design basis of 50-year deflection, ring-bending strain and buckling response.
4. The ring bending modulus values are based on the AASHTO LRFD Bridge Design Specifications for corrugated PP and PE pipe.

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Project

Binder 3a,843

Name

Dickson Shops and Streetscape

Pipe details

Nominal Diameter

DN

225

mm

Type

StormPRO ®

Outside diameter
D_e 259 mm
Inside diameter
D_i 226 mm
Diameter at neutral axis of wall
D 238 mm
Initial 3-minute ring-bending modulus
E_b 1207 MPa
Long-term ring-bending modulus
E_{bL} 200 MPa
Poisson's ratio
μ 0.45
Initial 3-minute ring-bending stiffness
S_{DI} 8000 N/m/m
Long-term (2 year) ring-bending stiffness
S_{DL2} 1904 N/m/m
Long-term (50 year) ring-bending stiffness
S_{DL50} 1325 N/m/m

Site conditions

Binder 3a,844

User defined trench width

B

660

mm

(input only if trench width is wider than what the minimum is required)

Cover height

H 0.5 m

*For cover heights less than 0.5m please contact Vinidex

Water table height above pipe

H_w 0 m

Native soil type

Dense sand, dry

Embedment material description

Gravel - single size

Compaction requirement

100% dry density ratio (RD), 80% density index (ID)

Trench fill type

Loose granular materials

Trench width

B 660 mm

Embedment material modulus

E'_e 14 MPa

(subject to confirmation by geotechnical testing)

Native soil modulus

E'_n 15 MPa

(subject to confirmation by geotechnical testing)

Soil specific weight

γ 15 kN/m^3

Soil particle specific density

2.65

Design dead loads and live loads

Binder 3a 845

Design live load [2]

AS 5100 SM1600 Moving Load Single Lane

Construction load

Vertical design load (pressure at top of pipe) due to surface applied dead load

w_{gs} 0 kPa

Vertical design load (pressure at top of pipe) due to surface-applied live load

wq 174 kPa

Vertical design load (pressure at top of pipe) due to soil dead load [1]

wg 8 kPa

Effective combined soil modulus

Binder 3a 846

Ring-bending stiffness value for calculations [3]

50 years

B/D_e 2.5

E'_e/E'_n 0.9

Bedding constant

K 0.1

Design factor

Δf 0.8

Leonhardt correction factor

ζ 1.03

Effective combined soil modulus

E' 14.4 MPa

Binder 3a,847

Deflection prediction

Maximum allowable long-term vertical deflection	Δ_{yall}/D **7.5%**
Predicted long-term vertical deflection	Δ_y/D **2.0%**

Strain prediction

Shape factor	D_f **6.58**
Maximum allowable long-term ring-bending strain	ε_{ball} **4%**
Predicted long-term ring-bending strain	ε_b **1.2%**

Buckling stability

Minimum allowable design factor for buckling	F_{sall} **2.5**
Buckling pressure for $H>H_w$ (excluding vacuum pressure)	q_b **184** kPa
	q_{all1} **16** kPa
	q_{all2} **260** kPa
Allowable buckling pressure (greater of q_{all1} or q_{all2})	q_{all} **260** kPa
Actual design factor for buckling (excluding vacuum pressure)	F_s **3.5**

Binder 3a,848

Notes

1. Soil loading on the pipe is calculated based on the prism load and ignores the effects of soil friction within the fill above the pipe.
2. Design loads on buried flexible pipelines, due to construction and other equipment, should be determined as they can exceed the loads that apply following the construction phase. It is the designer's responsibility to check the type of equipment to be used during construction, particularly when the cover tends towards the minimum. Allowance should be made for increased impact effects due to adverse surface conditions. It may be necessary to increase the cover locally to reduce the working loads due to construction and other equipment
3. The 2-year value for the ring-bending stiffness of the pipe may be used to represent the design basis of 50-year deflection, ring-bending strain and buckling response.
4. The ring bending modulus values are based on the AASHTO LRFD Bridge Design Specifications for corrugated PP and PE pipe.

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Project

Binder 3a,849

Name

Dickson Shops and Streetscape

Pipe details

Nominal Diameter

DN

225

mm

Type

StormPRO ®

Outside diameter
D_e 259 mm
Inside diameter
D_i 226 mm
Diameter at neutral axis of wall
D 238 mm
Initial 3-minute ring-bending modulus
E_b 1207 MPa
Long-term ring-bending modulus
E_{bL} 200 MPa
Poisson's ratio
μ 0.45
Initial 3-minute ring-bending stiffness
S_{DI} 8000 N/m/m
Long-term (2 year) ring-bending stiffness
S_{DL2} 1904 N/m/m
Long-term (50 year) ring-bending stiffness
S_{DL50} 1325 N/m/m

Site conditions

Binder 3a,850

User defined trench width

B

660

mm

(input only if trench width is wider than what the minimum is required)

Cover height

H 0.5 m

*For cover heights less than 0.5m please contact Vinidex

Water table height above pipe

H_w 0 m

Native soil type

Dense sand, dry

Embedment material description

Gravel - graded

Compaction requirement

100% dry density ratio (RD), 80% density index (ID)

Trench fill type

Loose granular materials

Trench width

B 660 mm

Embedment material modulus

E'_e 20 MPa

(subject to confirmation by geotechnical testing)

Native soil modulus

E'_n 15 MPa

(subject to confirmation by geotechnical testing)

Soil specific weight

γ 15 kN/m^3

Soil particle specific density

2.65

Design dead loads and live loads

Binder 3a 851

Design live load [2]

AS 5100 SM1600 Moving Load Single Lane

Construction load

Vertical design load (pressure at top of pipe) due to surface applied dead load

w_{gs} 0 kPa

Vertical design load (pressure at top of pipe) due to surface-applied live load

wq 174 kPa

Vertical design load (pressure at top of pipe) due to soil dead load [1]

wg 8 kPa

Effective combined soil modulus

Binder 3a 852

Ring-bending stiffness value for calculations [3]

50 years

B/D_e 2.5

E'_e/E'_n 1.3

Bedding constant

K 0.1

Design factor

Δf 0.8

Leonhardt correction factor

ζ 0.88

Effective combined soil modulus

E' 17.6 MPa

Binder 3a,853

Deflection prediction

Maximum allowable long-term vertical deflection	Δ_{yall}/D **7.5%**
Predicted long-term vertical deflection	Δ_y/D **1.7%**

Strain prediction

Shape factor	D_f **6.86**
Maximum allowable long-term ring-bending strain	ε_{ball} **4%**
Predicted long-term ring-bending strain	ε_b **1.0%**

Buckling stability

Minimum allowable design factor for buckling	F_{sall} **2.5**
Buckling pressure for $H>H_w$ (excluding vacuum pressure)	q_b **184** kPa
	q_{all1} **16** kPa
	q_{all2} **297** kPa
Allowable buckling pressure (greater of q_{all1} or q_{all2})	q_{all} **297** kPa
Actual design factor for buckling (excluding vacuum pressure)	F_s **4**

Binder 3a,854

Notes

1. Soil loading on the pipe is calculated based on the prism load and ignores the effects of soil friction within the fill above the pipe.
2. Design loads on buried flexible pipelines, due to construction and other equipment, should be determined as they can exceed the loads that apply following the construction phase. It is the designer's responsibility to check the type of equipment to be used during construction, particularly when the cover tends towards the minimum. Allowance should be made for increased impact effects due to adverse surface conditions. It may be necessary to increase the cover locally to reduce the working loads due to construction and other equipment
3. The 2-year value for the ring-bending stiffness of the pipe may be used to represent the design basis of 50-year deflection, ring-bending strain and buckling response.
4. The ring bending modulus values are based on the AASHTO LRFD Bridge Design Specifications for corrugated PP and PE pipe.

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Project

Binder 3a,855

Name

Dickson Shops and Streetscape

Pipe details

Nominal Diameter

DN

225

mm

Type

StormPRO ®

Outside diameter
D_e 259 mm
Inside diameter
D_i 226 mm
Diameter at neutral axis of wall
D 238 mm
Initial 3-minute ring-bending modulus
E_b 1207 MPa
Long-term ring-bending modulus
E_{bL} 200 MPa
Poisson's ratio
μ 0.45
Initial 3-minute ring-bending stiffness
S_{DI} 8000 N/m/m
Long-term (2 year) ring-bending stiffness
S_{DL2} 1904 N/m/m
Long-term (50 year) ring-bending stiffness
S_{DL50} 1325 N/m/m

Site conditions

Binder 3a,856

User defined trench width

B

660

mm

(input only if trench width is wider than what the minimum is required)

Cover height

H 0.5 m

*For cover heights less than 0.5m please contact Vinidex

Water table height above pipe

H_w 0 m

Native soil type

Dense sand, dry

Embedment material description

Gravel - single size

Compaction requirement

100% dry density ratio (RD), 80% density index (ID)

Trench fill type

Loose granular materials

Trench width

B 660 mm

Embedment material modulus

E'_e 14 MPa

(subject to confirmation by geotechnical testing)

Native soil modulus

E'_n 15 MPa

(subject to confirmation by geotechnical testing)

Soil specific weight

γ 15 kN/m^3

Soil particle specific density

2.65

Design dead loads and live loads

Binder 3a 857

Design live load [2]

No vehicle loading

Construction load

Vertical design load (pressure at top of pipe) due to surface applied dead load

w_{gs} 0 kPa

Vertical design load (pressure at top of pipe) due to surface-applied live load

wq 0 kPa

Vertical design load (pressure at top of pipe) due to soil dead load [1]

wg 8 kPa

Effective combined soil modulus

Binder 3a 858

Ring-bending stiffness value for calculations [3]

50 years

B/D_e 2.5

E'_e/E'_n 0.9

Bedding constant

K 0.1

Design factor

Δf 0.8

Leonhardt correction factor

ζ 1.03

Effective combined soil modulus

E' 14.4 MPa

Binder 3a,859

Deflection prediction

Maximum allowable long-term vertical deflection	Δ_{yall}/D **7.5%**
Predicted long-term vertical deflection	Δ_y/D **0.1%**

Strain prediction

Shape factor	D_f **6.58**
Maximum allowable long-term ring-bending strain	ε_{ball} **4%**
Predicted long-term ring-bending strain	ε_b **0.0%**

Buckling stability

Minimum allowable design factor for buckling	F_{sall} **2.5**
Buckling pressure for $H>H_w$ (excluding vacuum pressure)	q_b **10** kPa
	q_{all1} **16** kPa
	q_{all2} **260** kPa
Allowable buckling pressure (greater of q_{all1} or q_{all2})	q_{all} **260** kPa
Actual design factor for buckling (excluding vacuum pressure)	F_s **65**

Binder 3a,860

Notes

1. Soil loading on the pipe is calculated based on the prism load and ignores the effects of soil friction within the fill above the pipe.
2. Design loads on buried flexible pipelines, due to construction and other equipment, should be determined as they can exceed the loads that apply following the construction phase. It is the designer's responsibility to check the type of equipment to be used during construction, particularly when the cover tends towards the minimum. Allowance should be made for increased impact effects due to adverse surface conditions. It may be necessary to increase the cover locally to reduce the working loads due to construction and other equipment
3. The 2-year value for the ring-bending stiffness of the pipe may be used to represent the design basis of 50-year deflection, ring-bending strain and buckling response.
4. The ring bending modulus values are based on the AASHTO LRFD Bridge Design Specifications for corrugated PP and PE pipe.

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Project

Binder 3a,861

Name

Dickson Shops and Streetscape

Pipe details

Nominal Diameter

DN

225

mm

Type

StormPRO ®

Outside diameter
D_e 259 mm
Inside diameter
D_i 226 mm
Diameter at neutral axis of wall
D 238 mm
Initial 3-minute ring-bending modulus
E_b 1207 MPa
Long-term ring-bending modulus
E_{bL} 200 MPa
Poisson's ratio
μ 0.45
Initial 3-minute ring-bending stiffness
S_{DI} 8000 N/m/m
Long-term (2 year) ring-bending stiffness
S_{DL2} 1904 N/m/m
Long-term (50 year) ring-bending stiffness
S_{DL50} 1325 N/m/m

Site conditions

Binder 3a,862

User defined trench width

B

660

mm

(input only if trench width is wider than what the minimum is required)

Cover height

H 0.5 m

*For cover heights less than 0.5m please contact Vinidex

Water table height above pipe

H_w 0 m

Native soil type

Dense sand, dry

Embedment material description

Gravel - graded

Compaction requirement

100% dry density ratio (RD), 80% density index (ID)

Trench fill type

Loose granular materials

Trench width

B 660 mm

Embedment material modulus

E'_e 20 MPa

(subject to confirmation by geotechnical testing)

Native soil modulus

E'_n 15 MPa

(subject to confirmation by geotechnical testing)

Soil specific weight

γ 15 kN/m^3

Soil particle specific density

2.65

Design dead loads and live loads

Binder 3a 863

Design live load [2]

No vehicle loading

Construction load

Vertical design load (pressure at top of pipe) due to surface applied dead load

w_{gs} 0 kPa

Vertical design load (pressure at top of pipe) due to surface-applied live load

wq 0 kPa

Vertical design load (pressure at top of pipe) due to soil dead load [1]

wg 8 kPa

Effective combined soil modulus

Binder 3a 864

Ring-bending stiffness value for calculations [3]

50 years

B/D_e 2.5

E'_e/E'_n 1.3

Bedding constant

K 0.1

Design factor

Δf 0.8

Leonhardt correction factor

ζ 0.88

Effective combined soil modulus

E' 17.6 MPa

Binder 3a,865

Deflection prediction

Maximum allowable long-term vertical deflection	Δ_{yall}/D **7.5%**
Predicted long-term vertical deflection	Δ_y/D **0.1%**

Strain prediction

Shape factor	D_f **6.86**
Maximum allowable long-term ring-bending strain	ε_{ball} **4%**
Predicted long-term ring-bending strain	ε_b **0.0%**

Buckling stability

Minimum allowable design factor for buckling	F_{sall} **2.5**
Buckling pressure for $H>H_w$ (excluding vacuum pressure)	q_b **10** kPa
	q_{all1} **16** kPa
	q_{all2} **297** kPa
Allowable buckling pressure (greater of q_{all1} or q_{all2})	q_{all} **297** kPa
Actual design factor for buckling (excluding vacuum pressure)	F_s **74.2**

Binder 3a,866

Notes

1. Soil loading on the pipe is calculated based on the prism load and ignores the effects of soil friction within the fill above the pipe.
2. Design loads on buried flexible pipelines, due to construction and other equipment, should be determined as they can exceed the loads that apply following the construction phase. It is the designer's responsibility to check the type of equipment to be used during construction, particularly when the cover tends towards the minimum. Allowance should be made for increased impact effects due to adverse surface conditions. It may be necessary to increase the cover locally to reduce the working loads due to construction and other equipment
3. The 2-year value for the ring-bending stiffness of the pipe may be used to represent the design basis of 50-year deflection, ring-bending strain and buckling response.
4. The ring bending modulus values are based on the AASHTO LRFD Bridge Design Specifications for corrugated PP and PE pipe.

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Appendix C Concrete Pipe Loading Calculations

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PIPE LOAD SUMMARY SHEET

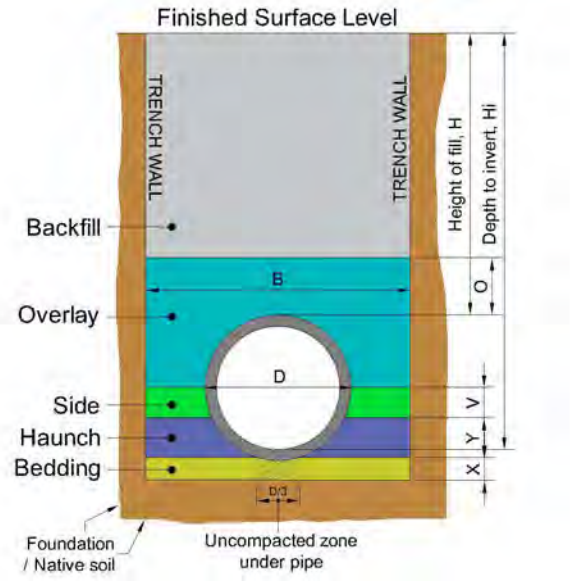
PIPECLASS3
Peace of mind for sustainable infrastructure

Date: 20-May-2025

Design of 375 dia. Class 4 RRJ drainage pipe

PROJECT DETAILS	
Job number:	PS208025
Client:	Oculus
Project:	Dickson Shops and Streetscape
Description:	RCP Pipe Loading Calculation
Designer:	WSP
Company:	Level 2, 121 Marcus Clarke Street Canberra, 2601

DESIGN PARAMETERS	
Installation Condition:	Trench
Pipe Nominal Diameter (mm):	375
Pipe External Diameter, D (mm):	445
Pipeline Orientation:	Both or skew
Soil Type:	clayey sand
Soil Density (kN/m³):	18
Soil Parameter Kμ:	0.15
Trench Width, B (m):	0.845
Height Of Fill, H (m):	0.2
Support Type:	HS2
Bedding Factor:	2.5
Excavation volume (solid) (m³/m)	0.630



In Service Load Cases/Combinations Considered (controlling load case/combination highlighted)

Load Description*	Fill Height (m)	Wg/2.5	Wq/1.5	Tc	Pipe Class
earth	0.4	1.5		1.5	2
W80(AS/NZS3725)	0.4	1.5	26.1	27.6	4
A160(AS/NZS3725)	0.4	1.5	26.1	27.6	4
M1600(AS/NZS3725)	0.4	1.5	19.6	21.1	3
S1600(AS/NZS3725)	0.4	1.5	11.5	13	2

All loads in kN/m. *Includes earth load at fill height shown.

Controlling Loads: earth + W80(AS/NZS3725)
Minimum Test Load: Tc = 1.5 + 26.1

Adopt 375 dia. Class 4 RRJ pipe (375/4 RRJ) in accordance with AS/NZS 4058:2007.

Design Notes:

1. In service live loads are considered as acting directly (no distribution) on the pipe (for cover < 0.4 m) in accordance with AS/NZS 3725:2007
2. A nominal wall thickness of 35 mm has been assumed.

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DETAILED LOAD CALCULATIONS

PIPECLASS3
Peace of mind for sustainable infrastructure

Date: 20-May-2025

Design of 375 dia. Class 4 RRJ drainage pipe

PROJECT DETAILS	
Job number:	PS208025
Client:	Oculus
Project:	Dickson Shops and Streetscape
Description:	RCP Pipe Loading Calculation
Designer:	WSP
Company:	Level 2, 121 Marcus Clarke Street Canberra, 2601

In Service Load Cases/Combinations Considered (controlling load case/combination highlighted)

Load Description*	Fill Height (m)	Wg/2.5	Wq/1.5	Tc	Pipe Class
earth	0.4	1.5		1.5	2
W80(AS/NZS3725)	0.4	1.5	26.1	27.6	4
A160(AS/NZS3725)	0.4	1.5	26.1	27.6	4
M1600(AS/NZS3725)	0.4	1.5	19.6	21.1	3
S1600(AS/NZS3725)	0.4	1.5	11.5	13	2

All loads in kN/m. *Includes earth load at fill height shown.

EARTH LOADS				
INSTALLATION CONDITION	Trench condition, vertical walls			
PIPE ORIENTATION	Both or skew			
TRENCH WIDTH	B	0.845	m	
Flexible pavement density		24.0	kN/m3	
Flexible pavement thickness		0.150	m	
Effective height of fill	He	0.400	m	
SPANGLER COEFFICIENT	Ct	0.441		Figure 6
WORKING LOAD DUE TO FILL	Wg	5.7	kN/m	Eqn 1
Positive Projection Check				
Settlement ratio	rs	1.000		Cl 6.3.6
Projection ratio	p	0.501		h/D
Plane of equal settlement height	He	0.400		
Modified Spangler coefficient	C'e	1.148		
Working load due to earth fill	Wg	3.7	kN/m	Eqn 2
Positive projection controls	Adopt Wg	3.7	kN/m	Cl 6.3.2

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Concrete Pipe Association of Australasia

DETAILED LOAD CALCULATIONS

Date: 20-May-2025

IN-SERVICE LIVE LOADS				
Vehicle	W80(AS/NZS3725)			
Footprint width at top of pipe	L1	1.080	m	AS/NZS3725
Footprint length at top of pipe	L2	0.780	m	
Footprint area	A	0.842	m²	
Load on footprint		80.000	kN	
Impact factor (dynamic load allowance)		1.34		Table C4
Live load pressure at top of pipe	q	127.255	kPa	Eqn 6
Minimum of L2 and D	S	0.445	m	Cl 6.5.3.4.1
Effective supporting length of pipe	Le	1.564	m	Figure 10
Working load due to live load	Wq	39.1	kN/m	Eqn 7

Vehicle	A160(AS/NZS3725)			
Footprint width at top of pipe	L1	1.080	m	AS/NZS3725
Footprint length at top of pipe	L2	0.780	m	
Footprint area	A	0.842	m²	
Load on footprint		80.000	kN	
Impact factor (dynamic load allowance)		1.34		Table C4
Live load pressure at top of pipe	q	127.255	kPa	Eqn 6
Minimum of L2 and D	S	0.445	m	Cl 6.5.3.4.1
Effective supporting length of pipe	Le	1.564	m	Figure 10
Working load due to live load	Wq	39.1	kN/m	Eqn 7

Vehicle	M1600(AS/NZS3725)			
Footprint width at top of pipe	L1	1.080	m	AS/NZS3725
Footprint length at top of pipe	L2	0.780	m	
Footprint area	A	0.842	m²	
Load on footprint		60.000	kN	
Impact factor (dynamic load allowance)		1.30		Table C4
Live load pressure at top of pipe	q	92.593	kPa	Eqn 6
Minimum of L2 and D	S	0.445	m	Cl 6.5.3.4.1
Effective supporting length of pipe	Le	1.564	m	Figure 10
Working load due to live load	Wq (wheel)	28.5	kN/m	Eqn 7
UDL footprint width at top of pipe	L1	3.490	m	
UDL footprint length at top of pipe	L2	1.000	m	
UDL footprint area	A	3.490	m²	
Load on UDL footprint		6.0	kN	
Impact factor (dynamic load allowance)		1.33		Table C4
UDL pressure at top of pipe	q	2.278	kPa	Eqn 6
Minimum of L2 and D for UDL	S	0.445	m	Cl 6.5.3.4.1
Effective supporting length of pipe for UDL	Le	3.974	m	Figure 10
Working load due to live load	Wq (UDL)	0.9	kN/m	Eqn 7
Total working load due to live load	Wq	29.3	kN/m	wheel + UDL

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DETAILED LOAD CALCULATIONS

Date: 20-May-2025

IN-SERVICE LIVE LOADS				
Vehicle	S1600(AS/NZS3725)			
Footprint width at top of pipe	L1	1.080	m	AS/NZS3725
Footprint length at top of pipe	L2	0.780	m	
Footprint area	A	0.842	m²	
Load on footprint		40.000	kN	
Impact factor (dynamic load allowance)		1.00		Table C4
Live load pressure at top of pipe	q	47.483	kPa	Eqn 6
Minimum of L2 and D	S	0.445	m	Cl 6.5.3.4.1
Effective supporting length of pipe	Le	1.564	m	Figure 10
Working load due to live load	Wq (wheel)	14.6	kN/m	Eqn 7
UDL footprint width at top of pipe	L1	3.490	m	
UDL footprint length at top of pipe	L2	1.000	m	
UDL footprint area	A	3.490	m²	
Load on UDL footprint		24.0	kN	
Impact factor (dynamic load allowance)		1.00		Table C4
UDL pressure at top of pipe	q	6.877	kPa	Eqn 6
Minimum of L2 and D for UDL	S	0.445	m	Cl 6.5.3.4.1
Effective supporting length of pipe for UDL	Le	3.974	m	Figure 10
Working load due to live load	Wq (UDL)	2.7	kN/m	Eqn 7
Total working load due to live load	Wq	17.3	kN/m	wheel + UDL

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Binder Bag 672

PIPE LOAD SUMMARY SHEET

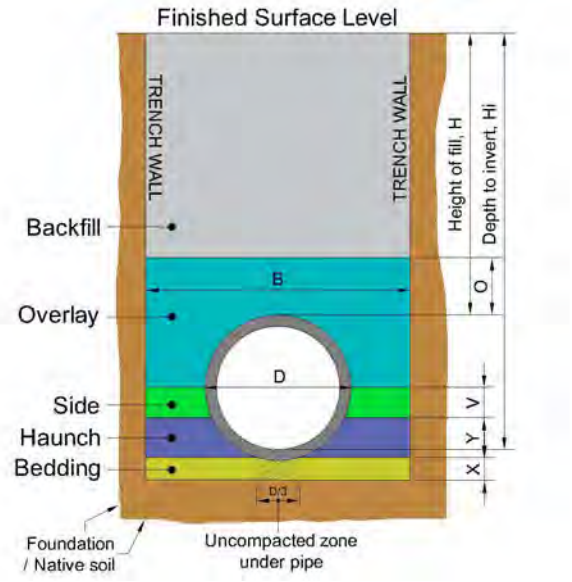
PIPECLASS3
Peace of mind for sustainable infrastructure

Date: 20-May-2025

Design of 450 dia. Class 10 RRJ drainage pipe

PROJECT DETAILS	
Job number:	PS208025
Client:	Oculus
Project:	Dickson Shops and Streetscape
Description:	RCP Pipe Loading Calculation
Designer:	WSP
Company:	Level 2, 121 Marcus Clarke Street Canberra, 2601

DESIGN PARAMETERS	
Installation Condition:	Trench
Pipe Nominal Diameter (mm):	450
Pipe External Diameter, D (mm):	534
Pipeline Orientation:	Both or skew
Soil Type:	clayey sand
Soil Density (kN/m³):	18
Soil Parameter Kμ:	0.15
Trench Width, B (m):	0.934
Height Of Fill, H (m):	0.15
Support Type:	HS2
Bedding Factor:	2.5
Excavation volume (solid) (m³/m)	0.730



In Service Load Cases/Combinations Considered (controlling load case/combination highlighted)

Load Description*	Fill Height (m)	Wg/2.5	Wq/1.5	Tc	Pipe Class
earth	0.35	1.5		1.5	2
W80(AS/NZS3725)	0.35	1.5	92.1	93.6	10
A160(AS/NZS3725)	0.35	1.5	92.1	93.6	10

All loads in kN/m. *Includes earth load at fill height shown.

Controlling Loads: earth + W80(AS/NZS3725)
Minimum Test Load: Tc = 1.5 + 92.1

Adopt 450 dia. Class 10 RRJ pipe (450/10 RRJ) in accordance with AS/NZS 4058:2007.

Design Notes:

1. In service live loads are considered as acting directly (no distribution) on the pipe (for cover < 0.4 m) in accordance with AS/NZS 3725:2007
2. A nominal wall thickness of 42 mm has been assumed.

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