



# Maven Associates

Job Number  
168002

Sheet  
1

Rev  
A

Job Title            90-104 Felton Mathew Ave, St Johns  
Calc Title          Existing 100yr Overland Flowpath Section 1-1

Author  
JP

Date  
01/16/18

Checked  
BV

## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \qquad R = A/P$$

Where	Q =	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P =	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

#### Longitudinal slope

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S = **0.031** m/m

#### Section A Location

Depth =	0.23 m	Flow depth
Width =	0.00 m	
S =	0.031 m/m	
A =	4.2442 m <sup>2</sup>	
P =	40.9505 m	
R =	0.104	m
n =	0.020 ASPHALT	

Velocity (V)	1.936 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)	<b>8216</b> l/sec
VxA	

100 year peak discharge =	8100L/s Calculated runoff	<b>OK</b>
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\* Refer TP108 Modelling for Flow rates



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Job Title 90-104 Felton Mathew Ave, St Johns  
Calc Title Existing 100yr Overland Flowpath Section 2-2

Author  
JP

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01/16/18

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## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \quad R = A/P$$

Where	Q =	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P =	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

### **Longitudinal slope**

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S = **0.031** m/m

### **Section A Location**

Depth =	0.24 m	Flow depth
Width =	0.00 m	
S =	0.031 m/m	
A =	3.68 m <sup>2</sup>	
P =	29.1759 m	
R =	0.126	m
n =	0.020 ASHPHALT	

Velocity (V)	2.207 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)	<b>8120</b> l/sec
VxA	

100 year peak discharge =	8100L/s Calculated runoff	<b>OK</b>
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Job Title 90-104 Felton Mathew Ave, St Johns  
Calc Title Existing 100yr Overland Flowpath Section 3-3

Author  
JP

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01/16/18

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## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \quad R = A/P$$

Where	Q =	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P =	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

### **Longitudinal slope**

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S = **0.031** m/m

### **Section A Location**

Depth =	0.23 m	Flow depth
Width =	0.00 m	
S =	0.031 m/m	
A =	3.42 m <sup>2</sup>	
P =	24.2833 m	
R =	0.141	m
n =	0.020 ASHPHALT	

Velocity (V)	2.375 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)	<b>8123</b> l/sec
VxA	

100 year peak discharge =	8100L/s Calculated runoff	<b>OK</b>
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Job Title            90-104 Felton Mathew Ave, St Johns  
Calc Title          Existing 100yr Overland Flowpath Section 4-4

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## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \qquad R = A/P$$

Where	Q =	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P =	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

#### Longitudinal slope

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S = **0.031** m/m

#### Section A Location

Depth =	0.23 m	Flow depth
Width =	0.00 m	
S =	0.031 m/m	
A =	2.9132 m <sup>2</sup>	
P =	15.7317 m	
R =	0.185	m
n =	0.020 ASHPHALT	

Velocity (V)	2.851 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)            **8305** l/sec  
VxA

100 year peak discharge =            8100L/s Calculated runoff            **OK**

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## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \quad R = A/P$$

Where	Q =	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P =	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

#### Longitudinal slope

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S = **0.031** m/m

#### Section A Location

Depth=	0.23 m	Flow depth
Width=	0.00 m	
S=	0.031 m/m	
A=	3.169 m <sup>2</sup>	
P=	18.0437 m	
R=	0.176	m
n=	0.020 ASHPHALT	

Velocity (V)	2.752 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)	<b>8721</b> l/sec
VxA	

100 year peak discharge =	7540L/s Calculated runoff	<b>OK</b>
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Job Title 90-104 Felton Mathew Ave, St Johns  
Calc Title Proposed 100yr Overland Flowpath Section 2-2

Author  
JP

Date  
01/16/18

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## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \quad R = A/P$$

Where	Q =	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P =	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

### **Longitudinal slope**

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S = **0.031** m/m

### **Section A Location**

Depth=	0.23 m	Flow depth
Width=	0.00 m	
S=	0.031 m/m	
A=	3.2 m <sup>2</sup>	
P=	18.37 m	
R=	0.174	m
n=	0.020 ASHPHALT	

Velocity (V)	2.737 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)	<b>8758</b> l/sec
VxA	

100 year peak discharge =	8100L/s Calculated runoff	<b>OK</b>
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\* Refer TP108 Modelling for Flow rates



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## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \qquad R = A/P$$

Where	Q=	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P=	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

#### Longitudinal slope

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S= **0.031** m/m

#### Section A Location

Depth=	0.23 m	Flow depth	
Width=	0.00 m		
S=	0.031 m/m		
A=	2.7552 m <sup>2</sup>		
P=	14.176 m		
R=	0.194		m
n=	0.020 ASHPHALT		

Velocity (V)	2.944 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)	<b>8112</b> l/sec
VxA	

100 year peak discharge = 8100L/s Calculated runoff **OK**

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## Design Spreadsheet for Mannings Formula

### Calc 1: Capacity of Channel Flow (Q), Mannings formula

$$Q = \frac{(AR^{2/3}S^{1/2})}{n} \qquad R = A/P$$

Where	Q=	Channel Flow	l/s
	S =	Longitudinal Slope	m/m
	A =	Cross sectional area	m <sup>2</sup>
	P=	Wetted Perimeter	m
	R =	Hydraulic Radius	m
	n =	Mannings n	

#### Longitudinal slope

S =	RL(start)-RL(end) / L
RL(start)	24.75 m
RL(end)	22.9 m
L	60 m

Therefore S= **0.031** m/m

#### Section A Location

Depth=	0.23 m	Flow depth
Width=	0.00 m	
S=	0.031 m/m	
A=	2.7697 m <sup>2</sup>	
P=	14.2486 m	
R=	0.194	m
n=	0.020 ASHPHALT	

Velocity (V)	2.945 m/sec	< 0.6m/sec	<b>OK</b>
$R^{2/3} S^{1/2} / n$			

Channel Flow (Q)	<b>8155</b> l/sec
VxA	

100 year peak discharge =	8100L/s Calculated runoff	<b>OK</b>
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\* Refer TP108 Modelling for Flow rates