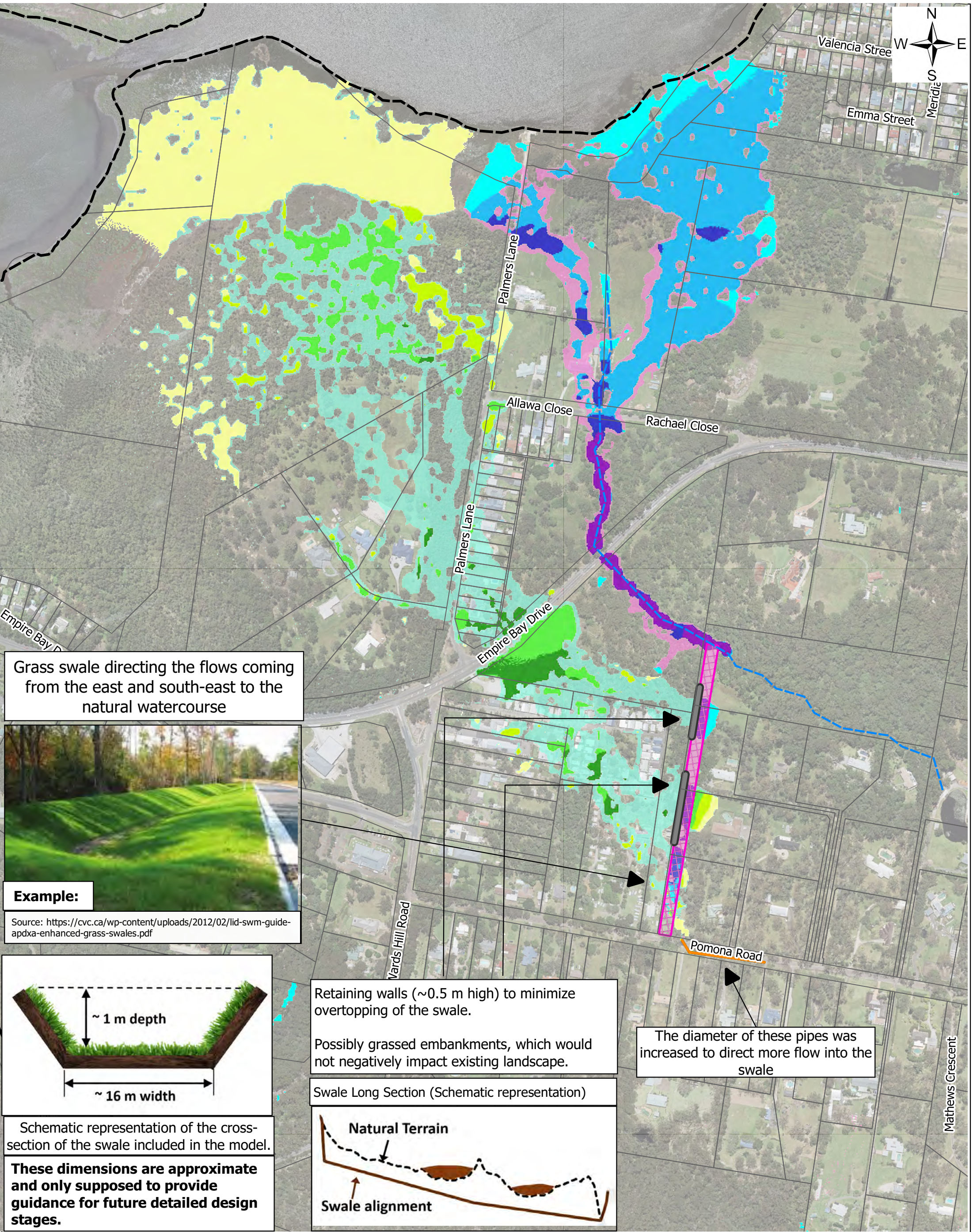


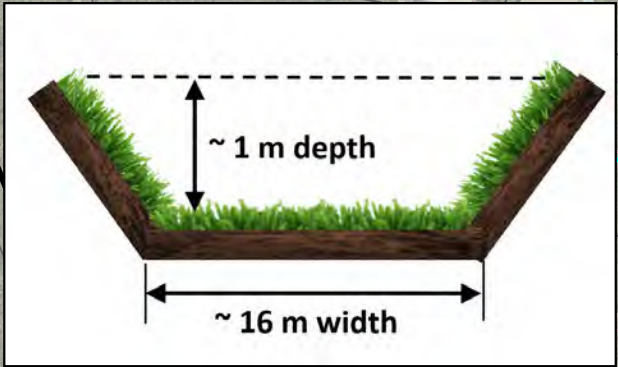


Grass swale directing the flows coming from the east and south-east to the natural watercourse



Example:

Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>



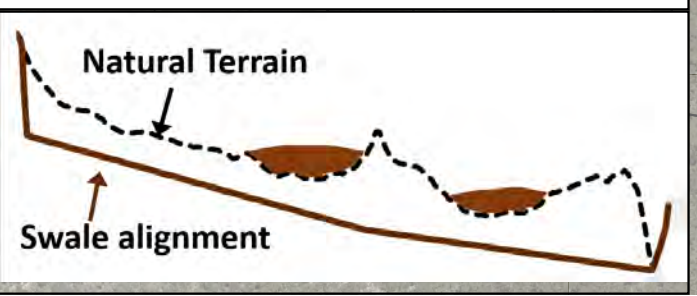
Schematic representation of the cross-section of the swale included in the model.

These dimensions are approximate and only supposed to provide guidance for future detailed design stages.

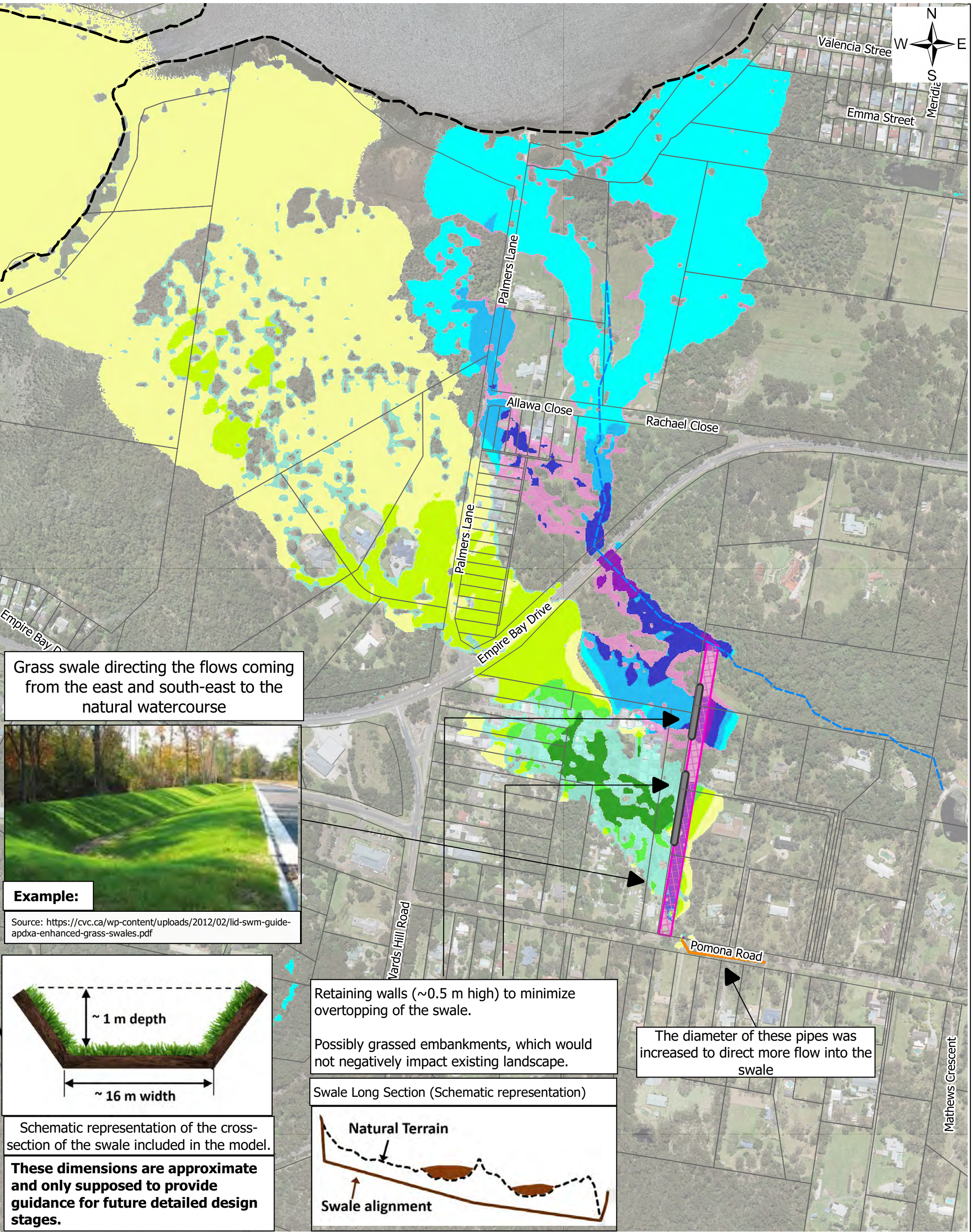
Retaining walls (~0.5 m high) to minimize overtopping of the swale.

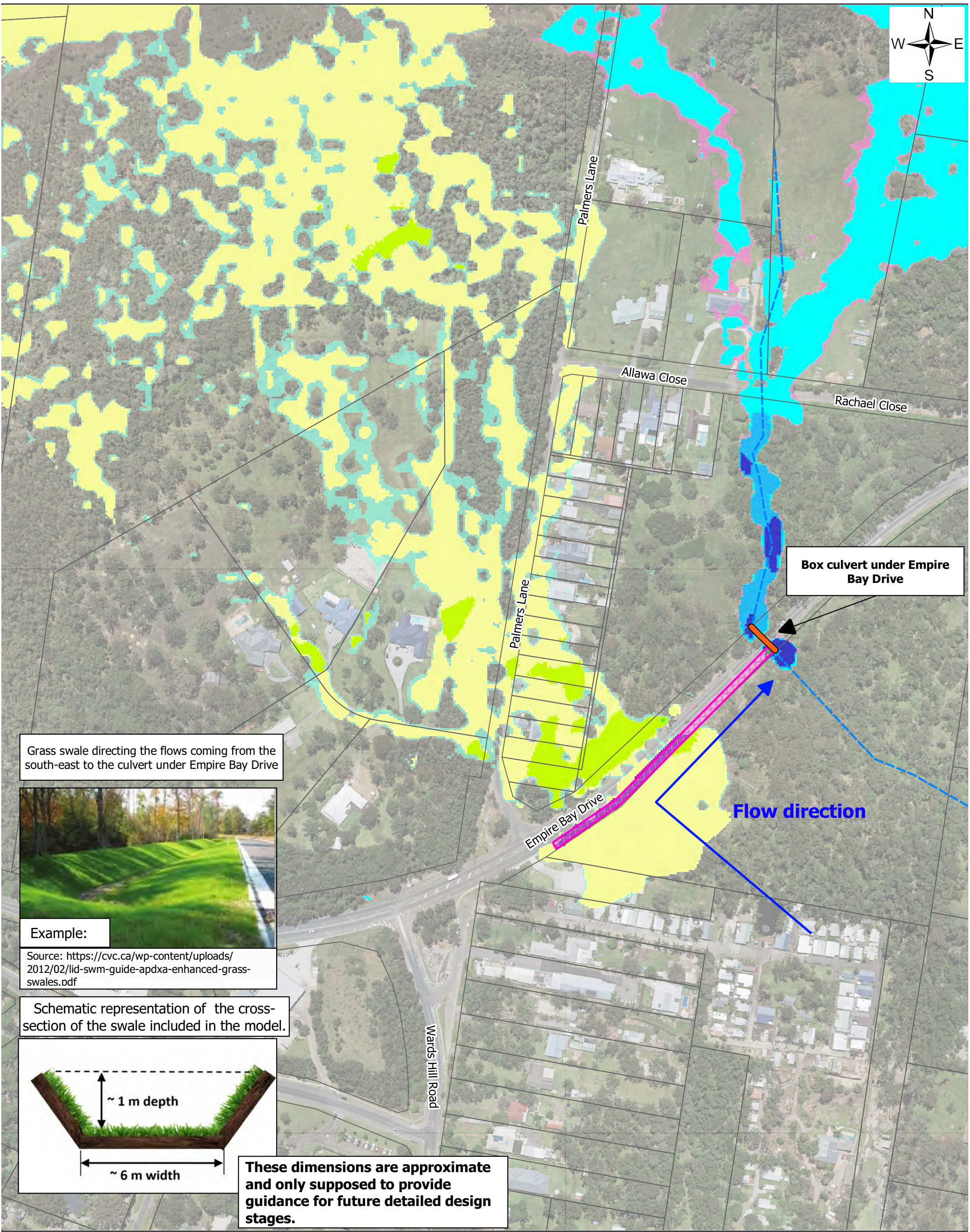
Possibly grassed embankments, which would not negatively impact existing landscape.

Swale Long Section (Schematic representation)



The diameter of these pipes was increased to direct more flow into the swale





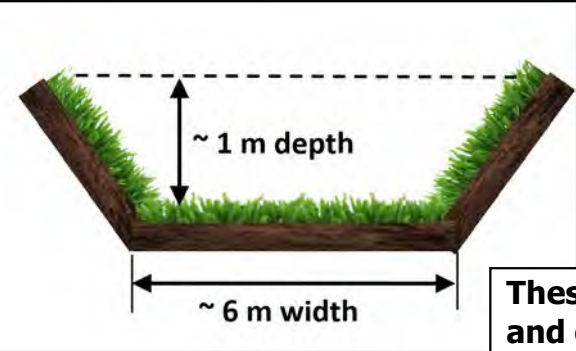
Grass swale directing the flows coming from the south-east to the culvert under Empire Bay Drive



Example:

Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>

Schematic representation of the cross-section of the swale included in the model.



These dimensions are approximate and only supposed to provide guidance for future detailed design stages.



Scale : 1:2500@A3
Date :02 June 2020
Revision : A
Created by : JS
Coordinate System : Map Grid of Australia 94



Legend

- Cadastre
- Swale
- Natural Watercourse
- Wet/Dry
- Was wet, now dry

Was dry, now wet

Depth Difference (m)

- ≤ -0.2
- $-0.2 - -0.1$
- $-0.1 - -0.05$

Was dry, now wet

- $-0.05 - -0.01$
- $0.01 - 0.05$
- $0.05 - 0.1$
- $0.1 - 0.2$
- > 0.2

Map G215

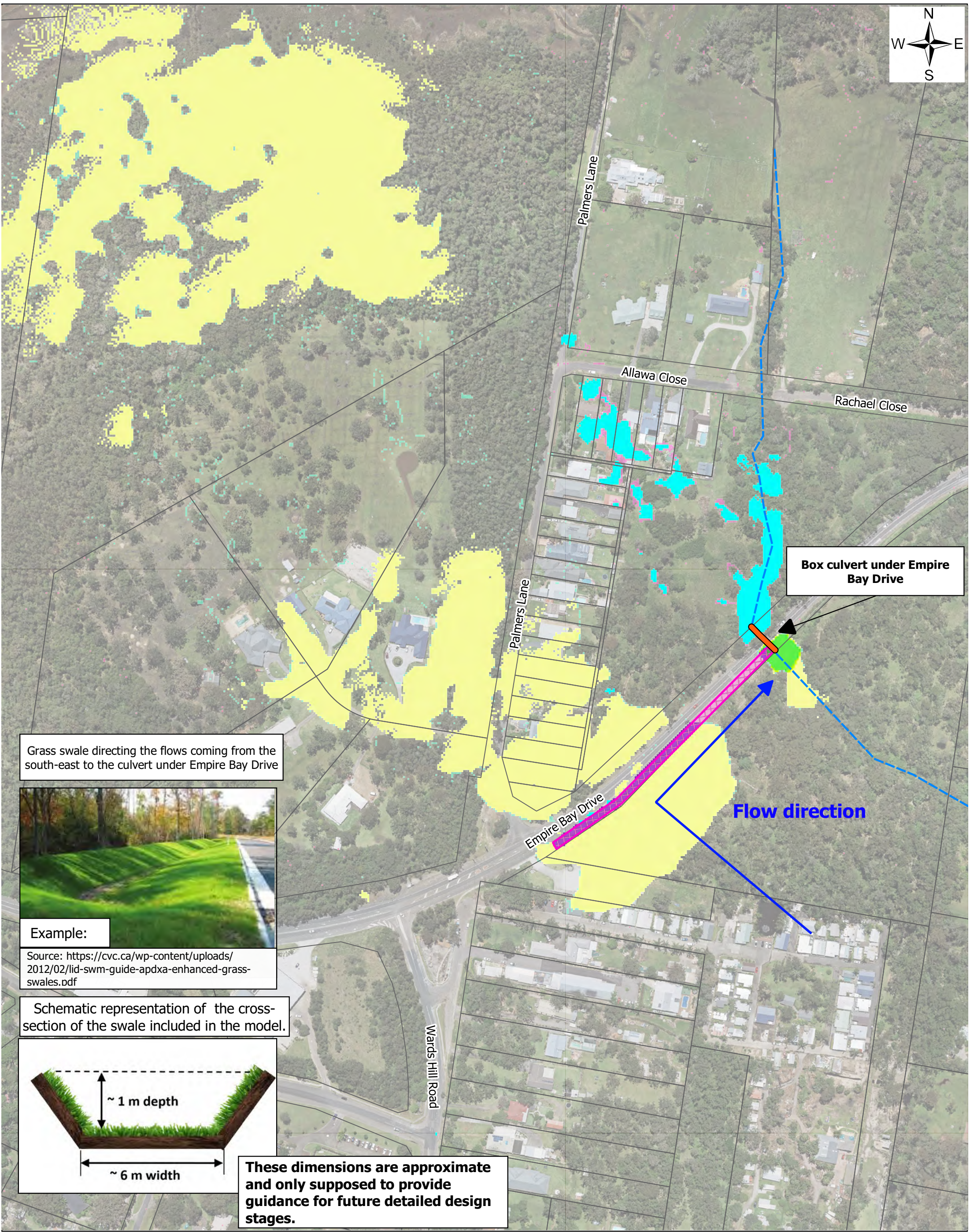
Flood Modification Options

FM EB7 Empire Bay Drive

Easement and drainage upgrades

20% AEP

Depth Difference (Option FM EB7 less Existing)

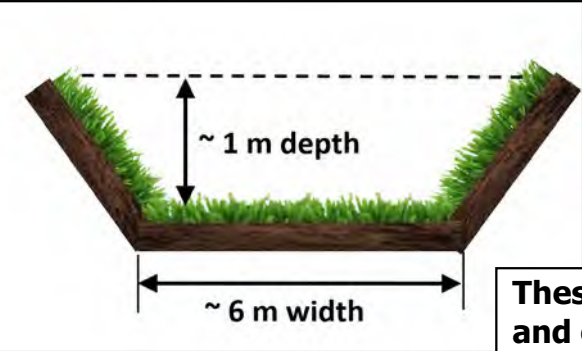


Grass swale directing the flows coming from the south-east to the culvert under Empire Bay Drive



Example:
Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>

Schematic representation of the cross-section of the swale included in the model.



These dimensions are approximate and only supposed to provide guidance for future detailed design stages.

Scale : 1:2500@A3
Date :02 June 2020
Revision : A
Created by : JS
Coordinate System : Map Grid of Australia 94

Legend

- Cadastre
- Swale
- Natural Watercourse
- Wet/Dry
- Was wet, now dry

Was dry, now wet

Depth Difference (m)

- ≤ -0.2
- $-0.2 - -0.1$
- $-0.1 - -0.05$
- $-0.05 - -0.01$
- $0.01 - 0.05$
- $0.05 - 0.1$
- $0.1 - 0.2$
- > 0.2

Map G216

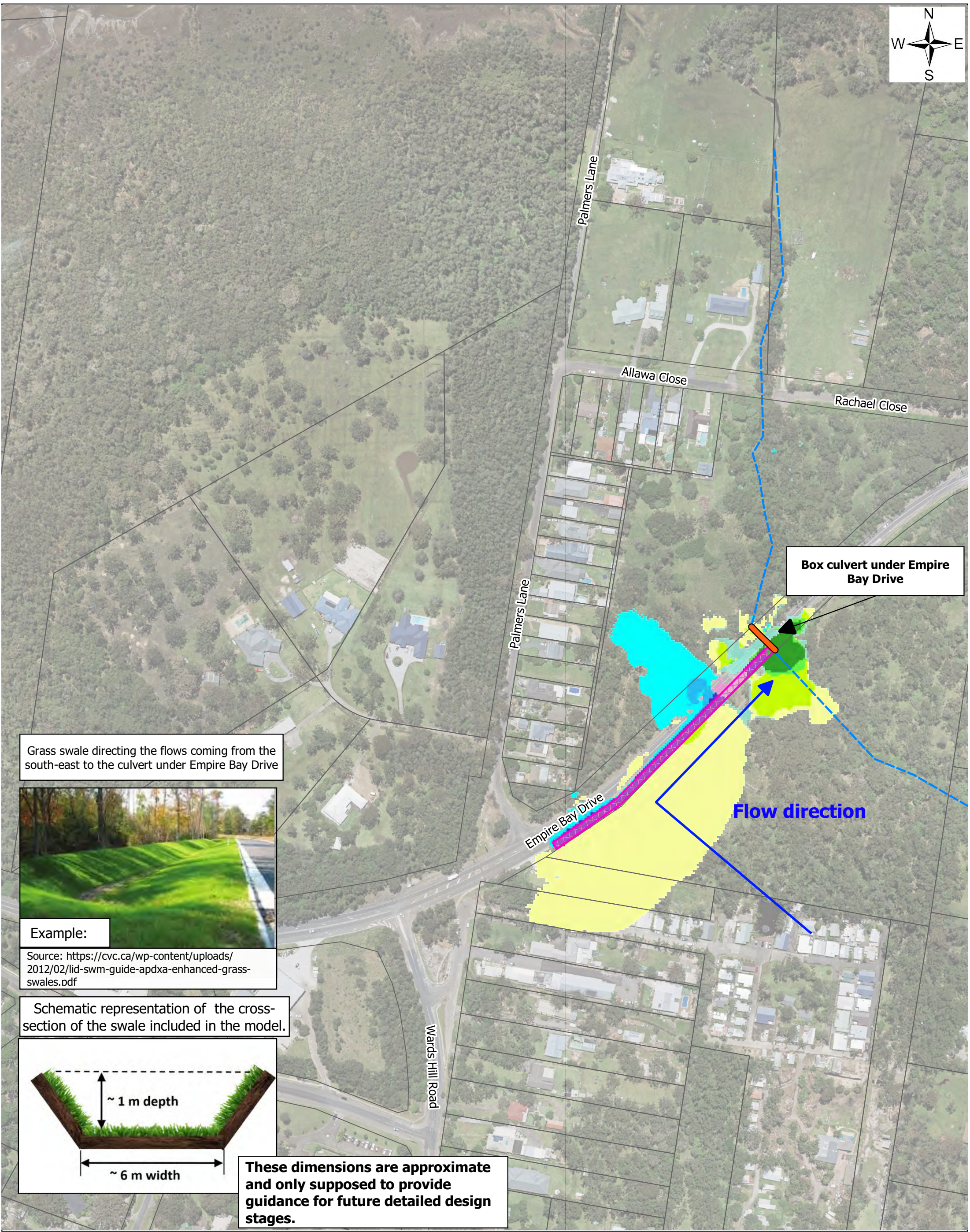
Flood Modification Options

FM EB7 Empire Bay Drive

Easement and drainage upgrades

1% AEP

Depth Difference (Option FM EB7 less Existing)

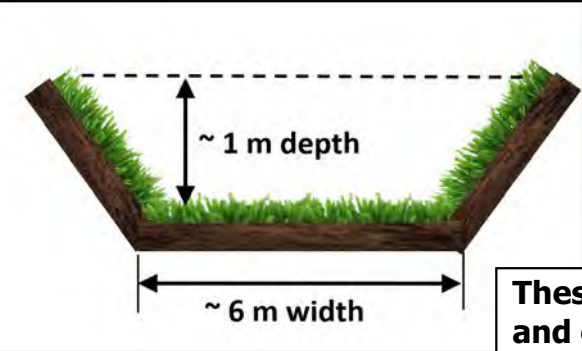


Grass swale directing the flows coming from the south-east to the culvert under Empire Bay Drive



Example:
Source: <https://cvc.ca/wp-content/uploads/2012/02/lid-swm-guide-apdxa-enhanced-grass-swales.pdf>

Schematic representation of the cross-section of the swale included in the model.



These dimensions are approximate and only supposed to provide guidance for future detailed design stages.

engineering | environmental | economics | engagement

Scale : 1:2500@A3
Date :02 June 2020
Revision : A
Created by : JS
Coordinate System : Map Grid of Australia 94

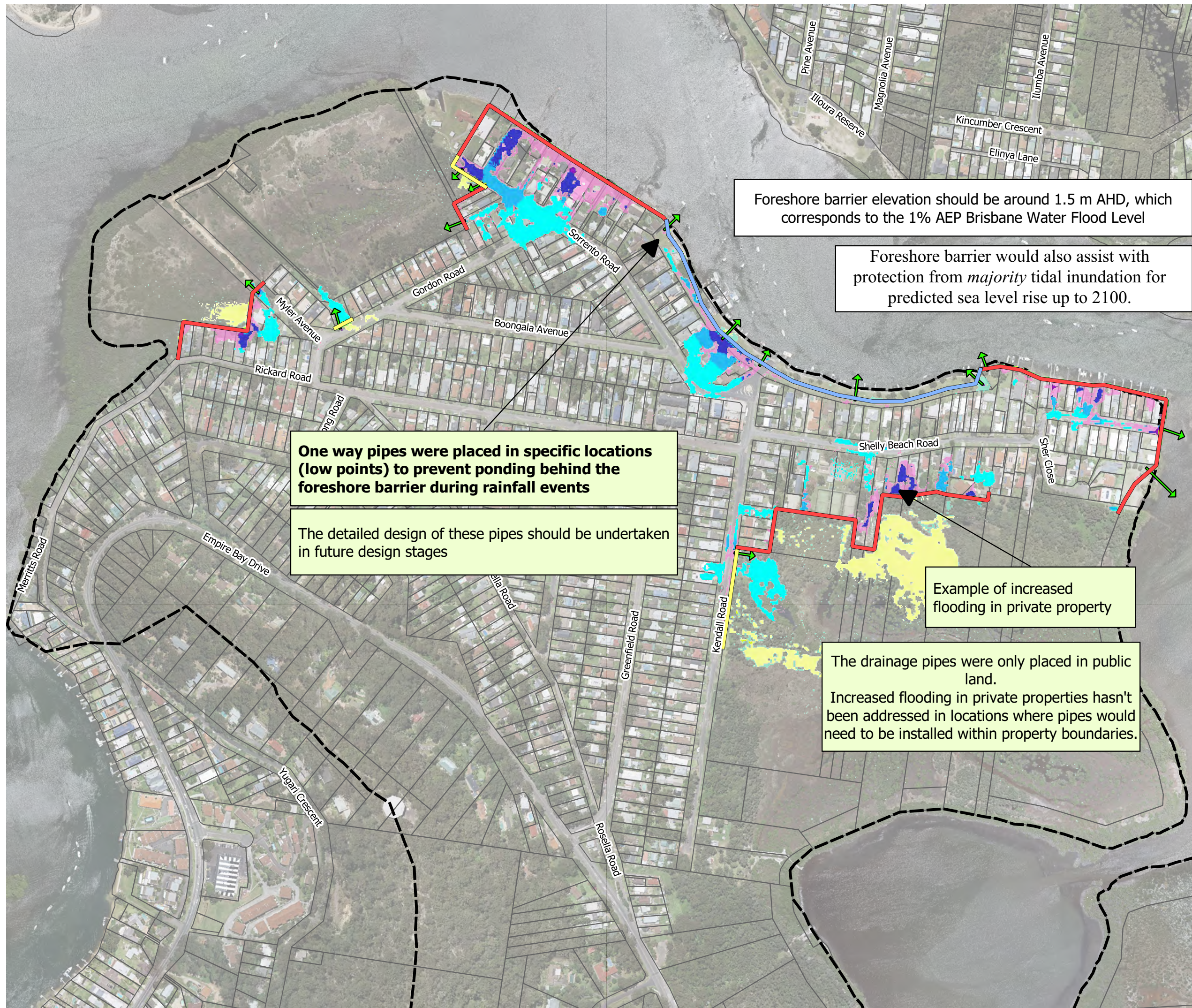
Legend

- Cadastre
- Swale
- Natural Watercourse
- Wet/Dry
- Was wet, now dry

Depth Difference (m)

- Was dry, now wet
- ≤ -0.2
- $-0.2 - -0.1$
- $-0.1 - -0.05$
- $-0.05 - -0.01$
- $0.01 - 0.05$
- $0.05 - 0.1$
- $0.1 - 0.2$
- > 0.2

Map G217
Flood Modification Options
FM EB7 Empire Bay Drive
Easement and drainage
upgrades
PMF
Depth Difference (Option FM
EB7 less Existing)



Map G218
Flood Modification
Options
FM EB4 Foreshore
barrier around Empire
Bay

1% AEP - Depth
Difference (FM EB4
less Existing)

Legend

- Cadastre
- One way pipes through foreshore barrier
- EB_Levee_FMDT4_V01
- Shared Path
- Roadside Berm
- Retaining Wall
- Wet/Dry
 - Was wet, now dry
 - Was dry, now wet
- Depth Difference (m)
 - ≤ -0.2
 - $-0.2 - -0.1$
 - $-0.1 - -0.05$
 - $-0.05 - -0.01$
 - $0.01 - 0.05$
 - $0.05 - 0.1$
 - $0.1 - 0.2$
 - > 0.2



0 75 150 225 m

Scale : 1:7500@A3
Date : 2 June 2020
Revision : A
Created by : JS
Coordinate System : Map of Grid
Australia 94



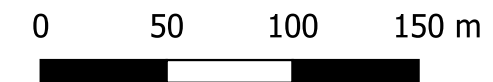


Map G219
FM EB5 Drainage
easement from Myrtle
Road to Kendall Road
20% AEP

Depth Difference
(FM EB5 less Existing)

Legend

- Cadastre
- Swale
- Wet/Dry
 - Was wet, now dry
 - Was dry, now wet
- Depth Difference (m)
 - ≤ -0.2
 - $-0.2 - -0.1$
 - $-0.1 - -0.05$
 - $-0.05 - -0.01$
 - $0.01 - 0.05$
 - $0.05 - 0.1$
 - $0.1 - 0.2$
 - > 0.2



Scale : 1:3000@A3
Date : 02 June 2020
Revision : A
Created by : JS
Coordinate System : Map of Grid
Australia 94



Easement directing flows coming from the south to wetland area

The easement could convey flows via a channel, overland flow (with minor flows in underground pipes), or a large underground culvert. The composition of the easement design will determine if, and how many voluntary property purchases would be required.

The location of the easement could also be modified slightly to accomodate voluntary purchase options

If the easement were to be a full property (or even two) wide, this would provide a significant green corridor for the community, which could incorporate shared pathways, parkland, landscaping, as well as a 'natural channel'

Examples of drainage easement:



Source: [https://stormwater.pca.state.mn.us/index.php?title=Dry_swale_\(grass_swale\)_combined](https://stormwater.pca.state.mn.us/index.php?title=Dry_swale_(grass_swale)_combined)



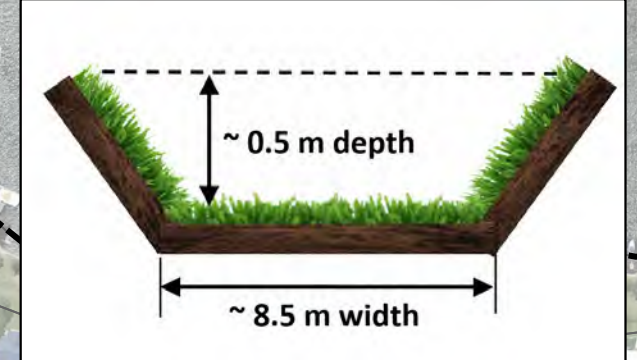
Source: https://www.westsuffolk.gov.uk/planning/Planning_Policies/upload/Adopted-Masterplan-LOWRES.pdf



Source: <https://www.pinterest.com.au/>

Schematic representation of the cross-section of the swale included in the model.

These dimensions are approximate and only supposed to provide guidance for future detailed design stages.



Culverts would be constructed under roads

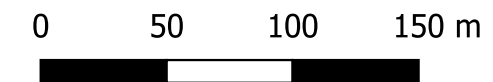


Map G220
FM EB5 Drainage
easement from Myrtle
Road to Kendall Road
1% AEP

Depth Difference
(FM EB5 less Existing)

Legend

- Cadastre
- Swale
- Wet/Dry
 - Was wet, now dry
 - Was dry, now wet
- Depth Difference (m)
 - ≤ -0.2
 - $-0.2 - -0.1$
 - $-0.1 - -0.05$
 - $-0.05 - -0.01$
 - $0.01 - 0.05$
 - $0.05 - 0.1$
 - $0.1 - 0.2$
 - > 0.2



Scale : 1:3000@A3
Date : 02 June 2020
Revision : A
Created by : JS
Coordinate System : Map of Grid
Australia 94



Easement directing flows coming from the south to wetland area

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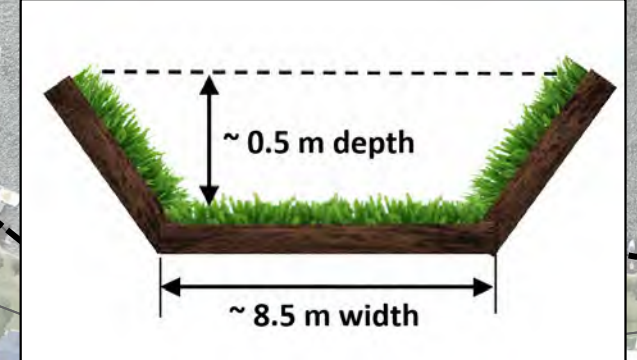
Source: https://www.westsuffolk.gov.uk/planning/Planning_Policies/upload/Adopted-Masterplan-LOWRES.pdf



Source: <https://www.pinterest.com.au/>

Schematic representation of the cross-section of the swale included in the model.

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Culverts would be constructed under roads

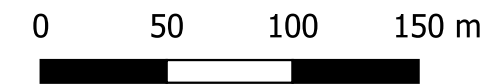


Map G221
FM EB5 Drainage
easement from Myrtle
Road to Kendall Road
PMF

Depth Difference
(FM EB5 less Existing)

Legend

- Cadastre
- Swale
- Wet/Dry
 - Was wet, now dry
 - Was dry, now wet
- Depth Difference (m)
 - ≤ -0.2
 - $-0.2 - -0.1$
 - $-0.1 - -0.05$
 - $-0.05 - -0.01$
 - $0.01 - 0.05$
 - $0.05 - 0.1$
 - $0.1 - 0.2$
 - > 0.2



Scale : 1:3000@A3
Date : 02 June 2020
Revision : A
Created by : JS
Coordinate System : Map of Grid
Australia 94



Easement directing flows coming from the south to wetland area

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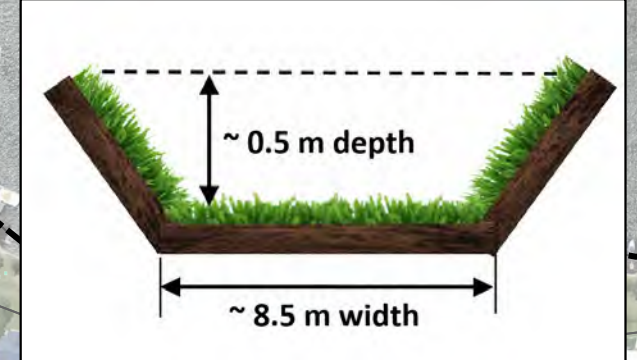
Source: https://www.westsuffolk.gov.uk/planning/Planning_Policies/upload/Adopted-Masterplan-LOWRES.pdf



Source: <https://www.pinterest.com.au/>

Schematic representation of the cross-section of the swale included in the model.

These dimensions are approximate and only supposed to provide guidance for future detailed design stages.



Culverts would be constructed under roads



Map G222
Emergency Response
Modification Options

EM01 Review of
Evacuation Centre
Locations

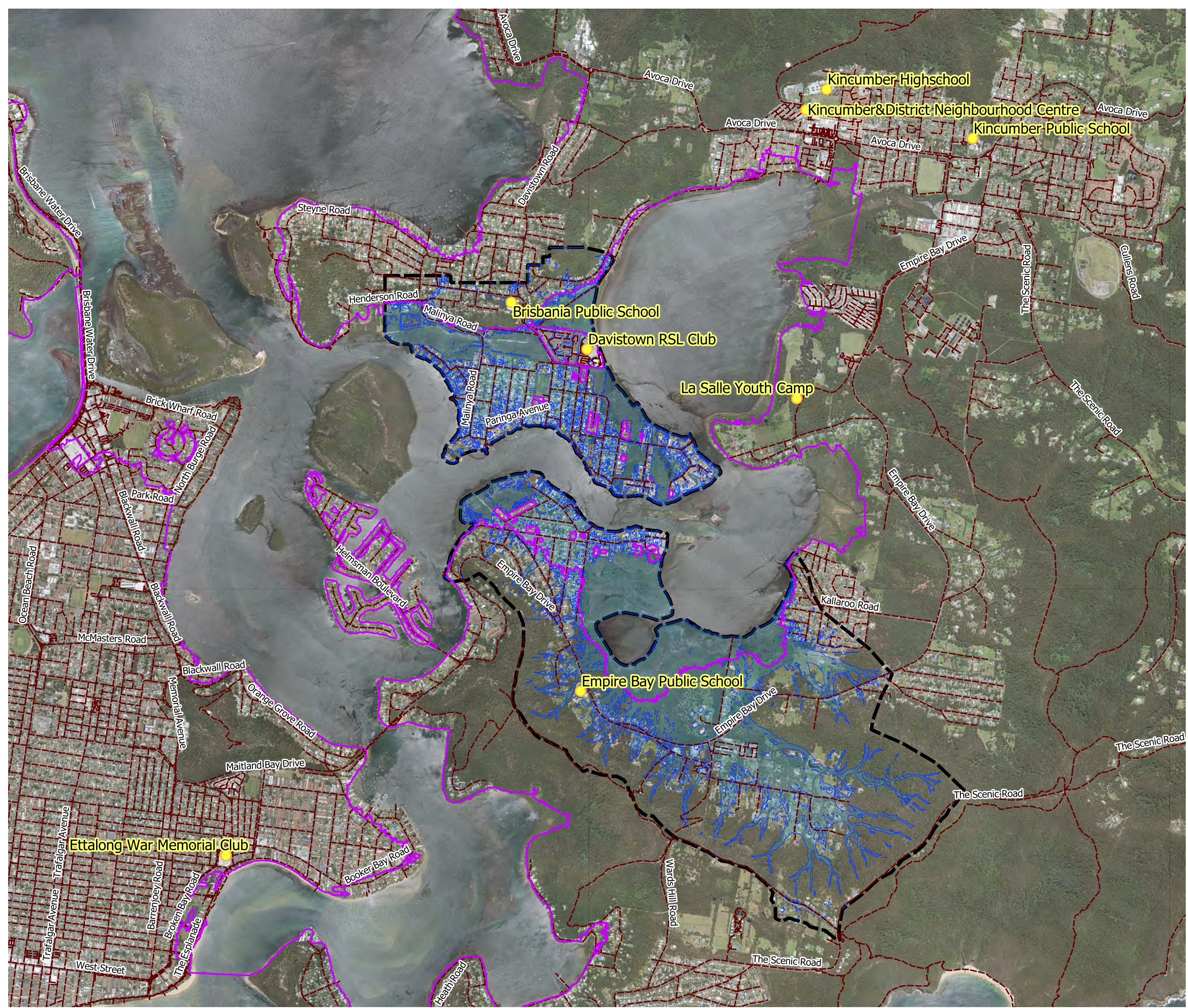
Davistown/Empire Bay

Legend

- Study Areas
- Cadastre
- Potential Evacuation Centre Locations
- Roadways
- PMF Brisbane Water Flood Extents
- PMF Catchment Flood Extents

0 250 500 750 m

Scale : 1:25,000@A3
Date : 02 June 2020
Revision : A
Created by : JS
Coordinate System : MGA 56





Map G223 Emergency Response Modification Options

EM03 Improve Empire Bay Road Flood Immunity

Legend

- Cadastre
- Study Area
- Sections of Empire Bay Drive Subjected to High Hazard (Greater than H2)
- Pits
- Pipes/Culverts
- PMF Hazard**
 - H1 - Generally safe for vehicles, people & buildings
 - H2 - Unsafe for small vehicles
 - H3 - Unsafe for vehicles, children and the elderly
 - H4 - Unsafe for vehicles and people
 - H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
 - H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure

150 0 150 300 m

Scale : 1:12000@A3

Date : 02 June 2020

Revision : B

Created by : JS

Coordinate System : Map Grid of
Australia 94





Map G230 Final Landform Davistown

Legend

— Contours (0.2m)

□ Cadastre

Terrain (m AHD)



100 0 100 200 m

Scale : 1:7000@A3
Date : 02 June 2020
Revision : A
Created by : JRF
Coordinate System : Map Grid of
Australia 94

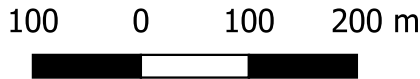




Map G231
Interim Landform
Scenario
Davistown

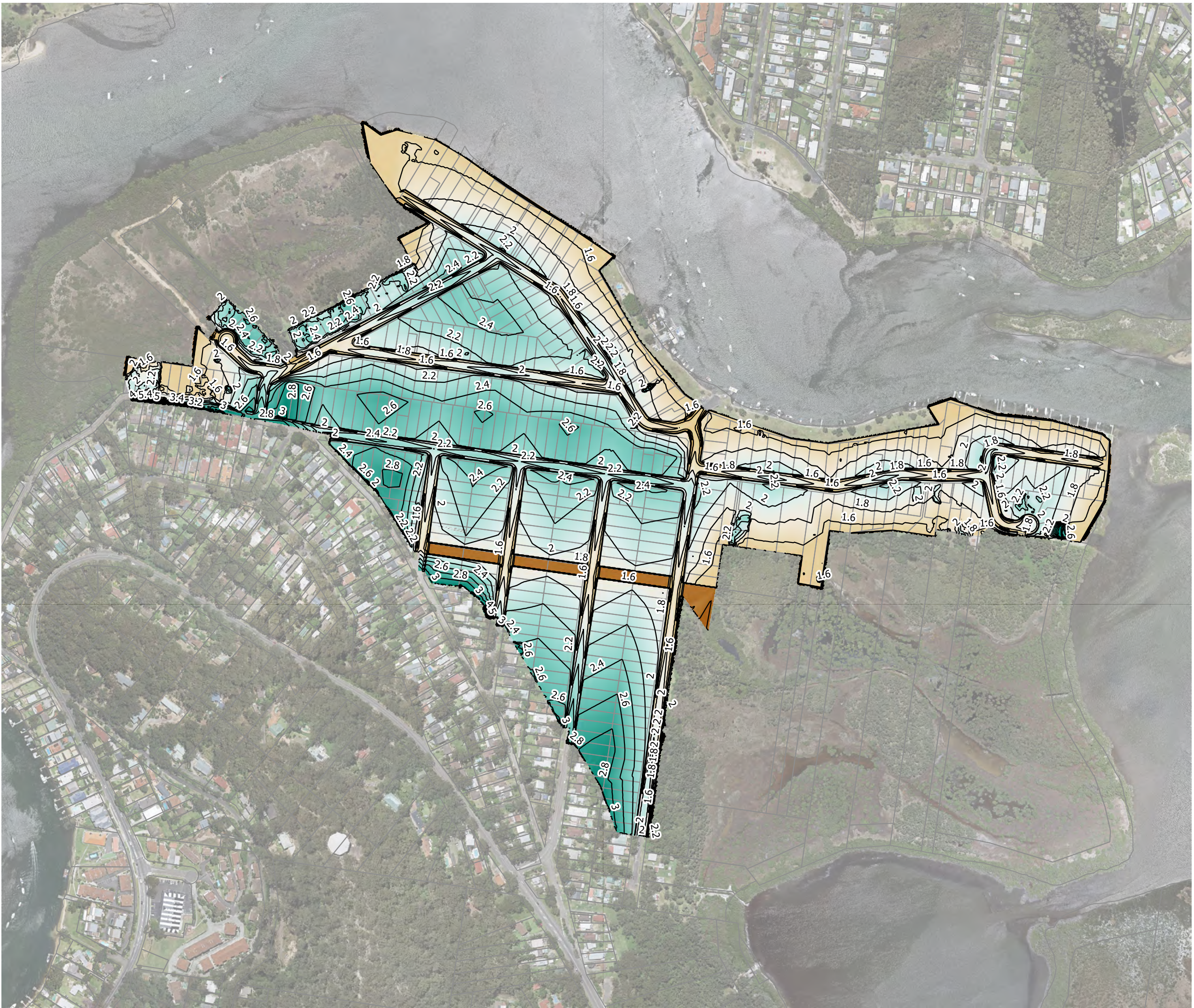
Legend

- Cadastre
- Proposed Levee at 1.5 m AHD
 - Berm
 - Retaining Wall
 - Shared Pathway
- Landform Raised
 - Roadways
 - Preperties



Scale : 1:7000@A3
Date : 02 June 2020
Revision : A
Created by : JRF
Coordinate System : Map Grid of Australia 94





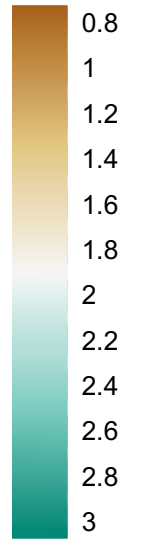
Map G232 Final Landform Empire Bay

Legend

— Contours (0.2m)

□ Cadastre

Terrain (m AHD)



50 0 50 100 150 200 m

Scale : 1:5000@A3
Date : 02 June 2020
Revision : A
Created by : JRF
Coordinate System : Map of Grid
Australia 94

