



# Appendix A

## Maps



## Map G101

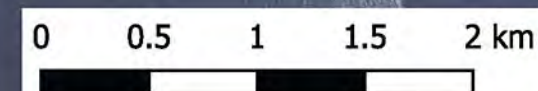
### Throsby, Styx and Cottage Creek Flood Study

#### Study Area

#### Legend

- Study Area
- Rail Line
- Roads
- Watercourses (Creeks, Channels, and Drains)

Scale : 1:35000@A3  
Date : 27 June 2023  
Revision : B  
Created by : JRF  
Coordinate System : GDA2020/  
MGA56





## Map G102

### Throsby, Styx and Cotage Creek Flood Study

#### Previous Study Locations

#### Legend

 Study Area

Assessment of Mayfield East Catchment

Newcastle International Hockey  
Stadium Flood Study

Broadmeadow Rezoning Workshop

Newcastle Knights Centre of  
Excellence Flood Impact Assessment

Honeysuckle Redevelopment  
Area Flood Study

Darby Plaza Flood Impact Assessment

Hunter Street Mall  
Streetscape Revitalisation

Wharf Road  
Drainage Study

Cooks Hill Drainage Study

Nesca Park Detention Basins -  
Dam Safety Assessment

0 0.5 1 1.5 2 km

Scale : 1:40000@A3  
Date : 29 June 2021  
Revision : A  
Created by : JRF  
Coordinate System : GDA2020/  
MGA56





## Map G103

### Throsby, Styx and Cotage Creek Flood Study

#### Future Development Areas

#### Legend

-  Study Area
-  Approximate  
Development Area

Broadmeadow

Wickham

Honeysuckle

Hunter Street Mall

0 0.5 1 1.5 2 km

Scale : 1:40000@A3  
Date : 08 August 2022  
Revision : B  
Created by : JMS  
Coordinate System : GDA2020/  
MGA56

**R h e l m**



## Map G105

### Throsby, Styx and Cottage Creek Flood Study

### Rainfall, Water Level and Streamflow Gauge Locations

#### Legend

Study Area

#### Gauge Owners and Types

- Hunter Water  
Rainfall - Pluvio
- Hunter Water  
Rainfall - Daily
- Hunter Water  
Rainfall - Streamflow
- Bureau of Meteorology  
Rainfall - Pluvio
- Bureau of Meteorology  
Rainfall - Daily
- University of Newcastle  
Rainfall - Pluvio
- Manly Hydraulics Lab  
Water Level
- Ports Authority NSW  
Water Level
- Gauges Received and used  
in Calibration/Validation
- Not Active during  
Calibration or Validation  
Events

Scale : 1:40000@A3

Date : 28 July 2022

Revision : B

Created by : JMS

Coordinate System : GDA2020/  
MGA56

0 0.5 1 1.5 2 km

Rhelm



## Map G106

### Throsby, Styx and Cottage Creek Flood Study

#### Digital Elevation Model - Existing Conditions

#### Legend

- Study Area
- Newcastle Port Authority Bathymetry
- Bathymetry from Throsby, Cottage and CBD Flood Study 10m Grid
- 1D Network Extents from Throsby, Cottage and CBD Flood Study

2021 LiDAR Elevation (m AHD)



Scale : 1:35000@A3  
Date : 3 July 2023  
Revision : B  
Created by : JRF  
Coordinate System : GDA2020/  
MGA56





## Map G107

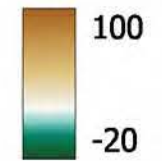
### Throsby, Styx and Cottage Creek Flood Study

#### Digital Elevation Model - 2007 Claibration

#### Legend

- Study Area
- Newcastle Port Authority Bathymetry
- Bathymetry from Throsby, Cottage and CBD Flood Study 10m Grid
- 1D Network Extents from Throsby, Cottage and CBD Flood Study
- Significant Development Since 2007

2021 LiDAR Elevation (m AHD)



Scale : 1:35000@A3  
Date : 3 July 2023  
Revision : B  
Created by : JRF  
Coordinate System : GDA2020/  
MGA56



**R h e l m**



## Map G108

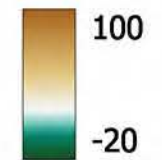
### Throsby, Styx and Cottage Creek Flood Study

#### Digital Elevation Model - 1988/90 Validation

##### Legend

- Study Area
- Newcastle Port Authority Bathymetry
- Bathymetry from Throsby, Cottage and CBD Flood Study 10m Grid
- 1D Network Extents from Throsby, Cottage and CBD Flood Study
- Significant Development Since 1988/90

LiDAR Elevation (m AHD)



Scale : 1:35000@A3  
Date : 3 July 2023  
Revision : B  
Created by : JRF  
Coordinate System : GDA2020/  
MGA56



## Surface [Manning's 'n' value]

- 1d Model
- Grass / Gravel [ $n=0.03$ ]
- Light Vegetation / Bare Earth [ $n=0.045$ ]
- Medium Vegetation [ $n=0.06$ ]
- Dense Vegetation [ $n=0.09$ ]
- Riparian Vegetation [ $n=0.10$ ]
- Roads / Railway / Open Concrete [ $n=0.02$ ]
- Buildings [ $n=1.00$ ]
- Urban (including buildings) [ $n=0.30$ ]
- Urban (excluding buildings) [ $n=0.1$ ]
- Open Water [ $n=0.022$ ]
- Concrete Channel [ $n=0.018$ ]



## Map G109

### Throsby, Styx and Cottage Creek Flood Study

### Hydraulic Model - Calibration

### 2D Surface Roughness

#### Legend

 Model Boundary

Scale : 1:32500@A3

Date : 7 July 2023

Revision : C

Created by : JRF

Coordinate System : GDA2020/  
MGA56





## Map G110

### Throsby, Styx and Cottage Creek Flood Study

#### Hydraulic Model

#### 2D Model Grid Size

#### Legend

-  Study Area
-  2d Model Boundary
-  4m Grid Areas
-  8m Grid Areas

Scale : 1:32500@A3  
Date : 5 August 2022  
Revision : A  
Created by : JMS  
Coordinate System : GDA2020/  
MGA56

0 0.5 1 1.5 2 km

