

Torrens Catchment Water Management Board

First to Fifth Creeks Floodplain Mapping Project

Survey Report

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1. Introduction

This report has been prepared to provide a description of the survey that has been carried out as part of the First to Fifth Creeks Floodplain Mapping Project. The report outlines the extent of survey undertaken, the methods used, the results obtained and the expected level of accuracy of the data.

2. Survey Processes

2.1 Overview

Survey data collected for the First to Fifth Creeks Floodplain Mapping Project was used to generate a digital terrain model (DTM) of the area expected to be inundated by flooding of First, Second, Third, Fourth and Fifth Creeks. Data for preparation of the DTM was collected by two methods as follows:

- Photogrammetry
- Ground Survey

A description of the extent of data collected and the processes used is provided in the following Sections.

2.2 Photogrammetry

Data was collected using photogrammetric techniques over the area shown in Figure 2.1. Details of the photogrammetry process are provided below.

2.2.1 Aerial Photography

New photography was flown at a scale of 1:6,000. The flight lines used for the survey are overlaid on Figure 2.1. A total of 157 photographic frames were acquired during the flights. A GPS receiver mounted in the aircraft was used to capture the centres of each exposure. The GPS receiver logs position at 10 times per second, enabling the precise location of photo centres to be recorded. This data together with ground control points was used to control and triangulate the photography to the degree necessary to produce ground data to the required accuracy.

2.2.2 Photogrammetry

The aerial photography was scanned using a high resolution scanner to produce digital images used for the production of the initial DTM using Soft Photogrammetry (digital) techniques. After control and triangulation of the photography, points were generated over the Study Area on a 2.5 m grid. The data was edited using a manual process to remove points on roof tops and on vegetation. Break lines were manually acquired along water tables, tops of kerbs and along road crowns where necessary to accurately represent the shape of the road.

The process used for the generation of the photogrammetric data was such that individual points have a nominal ± 100 mm accuracy at the 90% confidence level and a nominal ± 150 mm accuracy at the 97% confidence level.

2.3 New Ground Survey

Following completion of the aerial photography, areas were identified in which the visibility of the ground was limited. Where these areas lay along creek lines, ground survey was undertaken to enable proper identification of the alignment, shape and invert of the channel. This ground survey was carried out by Allsurv Pty Ltd using RTK GPS equipment.

The areas surveyed using ground based techniques are shown in Figure 2.2 (in pink). In total, a length of approximately 18.5 km of channel was surveyed. Within these areas, breaklines were surveyed along the top of bank, bottom of bank and invert of the creek, together with additional pick up of any significant changes in surface grade outside the main channel.

Details of any culvert or bridge structures within these areas were also collected as part of the ground survey including upstream and downstream invert levels, opening dimensions and the profile of any overflow crest above the structure.

The survey was carried out to the AMG94 coordinate system, with levels to the Australian Height Datum (AHD).

A copy of the survey data is provided on the accompanying CD.

2.4 Existing Ground Survey

Where recent ground survey had been carried out, this was utilised in favour of undertaking new survey work. Survey for the following areas was sourced and utilised:

- Hazelwood Park (dated May 2003)
- Survey taken along First Creek within the City of Norwood, Payneham & St Peters (dated 1994)
- Survey of Richardson Park (dated 1994)
- Survey of Park 13, 14 and 15 (dated June 1996)

The extent of this existing survey is also shown in Figure 2.2 (in green). A copy of the data is provided on the accompanying CD.

Figure 2.1 Photogrammetry Extent

Figure 2.2 Ground Survey Extent

3. Survey Outputs

The data produced by the photogrammetry and ground survey was been integrated to produce a digital terrain model covering the area.

The DTM was then processed to produce the following survey products:

- A regular grid of levels across the Study Area (at 2.5 m centres)
- Break lines along tops and bottoms of kerbs, valley drains and road crowns where necessary to adequately define the surface shape.
- Contours at 0.5 m intervals across the plains and 1 m intervals across the Hills Face Escarpment (above 140 mAHD).

This data is provided on the attached CD in the following formats:

- Level Grid Data (x,y,z) coordinates in ASCII format
- Breaklines (x,y,z) coordinates in ASCII format
- Contours polylines in Autocad DWG, Micrstation DGN and DXF format.
The contour information has been separated into data for four subareas. These areas are shown in Figure 3.1.

The filenames of the data associated with these areas are listed below:

- Area 1 contours_ne.*
- Area 2 contours_e.*
- Area 3 contours_se.*
- Area 4 contours_w.*

Figure 3.1 Contour Data Sub Areas