

APPENDIX C

TUFLOW MODEL INPUTS & OUTPUTS

Survey and DEM Notes

The topographical survey triangulation provided by Rygate and Company Pty Ltd excluded a number of spot levels (necessary to define change in grade surface levels), the full definition of the kerbs and road pavement levels. The resulting existing surface triangulation (in the DEM provided by Rygate and Company Pty Ltd) was not representative of all the features surveyed. Typically, this presented itself as contours not corresponding to surveyed spot levels and no definition of the kerbs and gutters at the sides of roads.

Using 12d software, Hyder manually created three-dimensional strings and points based on levels in the Rygate and Company Pty Ltd survey to improve the definition of the existing surface in areas of particular importance (Darling Drive, Hay Street car park entrances, the plaza and Harbour Street adjacent to the Entertainment Centre and the area around Pier Street). The existing kerb types (mountable kerb, kerb and gutter, barrier kerb, dish gutter et cetera) were recorded during site visits and their principle dimensions taken. The kerbs modelled represent the idealised shape of the kerbs (i.e. based on standard kerb construction details). Variations in kerb heights have not been possible to model. This data can only be recorded by detailed topographical survey.

The three-dimensional points and strings were triangulated to create a more representative existing surface model. This surface was then used to supersede the Rygate and Company Pty Ltd triangulation in the location that they overlapped.

Build-up of the existing surface model

The existing surface model is made up from a number of datasets each with an increasing level of accuracy. Each dataset replaces data from the preceding dataset.

The first surface is the Lidar/ALS data provided by City of Sydney. This data set covers approximately 4x4km. This is replaced by the Lidar/ALS provided by Worley Parsons (and used in their flood modelling). In turn, this is replaced by the Rygate and Company topographical survey triangulation and then by the Hyder manually created survey.

Build-up of the proposed re-development surface model

The existing surface model was modified to include the surface representation of the SICEEP site development proposal.

CONDUIT LABEL	CONDUIT DIMENSION (m)	SYDNEY WATER CHANNEL	LOCATION	Q (m³/s) ¹	V (m/s) ²	STORM DURATION (MIN)
A	3.6 x 2.1	300	HAY STREET	31.6	4.2	60
B	3.1 x 2.0	30P	HAY STREET	11.3	2.0	60
C	Ø1.5	30P	PIER STREET	2.6	1.5	25
D	3.7 x 2.2	30P	PIER STREET	13.5	1.6	60
E	1.5 x 1.5	30P	TUMBALONG PARK	4.3	4.6	25
F	3.9 x 2.2	30P	IMAX THEATRE	10.1	1.4	60
G	3.1 x 2.2	30P	IMAX THEATRE	9.0	1.6	60
H	4.3 x 2.4	300	HAY STREET	21.7	2.1	60
I	3.0 x 2.4	300	DARLING DRIVE (CARPARK)	11.3	1.6	60
J	3.0 x 2.4	300	DARLING DRIVE (CARPARK)	11.4	1.6	60
K	3.0 x 2.4	300	PIER STREET	11.4	1.6	60
L	3.0 x 2.4	300	PIER STREET	11.4	1.6	60
M	3.0 x 2.4	300	COCKLE BAY OUTLET	11.5	1.6	60
N	3.0 x 2.4	300	COCKLE BAY OUTLET	11.4	1.6	60
O	3.1 x 1.6	30A2	DARLING DRIVE	10.1	2.1	25
P	2.1 x 1.8	30A2	DARLING DRIVE	9.3	2.5	25
Q	3.0 x 2.4	30A2	COCKLE BAY OUTLET	15.9	2.3	25
R	3.1 x 1.6	30A	DARLING DRIVE	3.6	0.8	25
S	Ø0.9	30A	DARLING DRIVE	1.8	2.9	25
T	Ø1.1	30A	DARLING DRIVE	2.4	2.8	25
U	3.5 x 1.6	30A	COCKLE BAY OUTLET	8.4	2.2	25
V	2.1 x 0.9	30B	DARLING DRIVE	3.1	1.6	25
W	Ø1.8	30B	DARLING DRIVE	4.0	1.6	25
X	2.1 x 0.9	30BA	DARLING DRIVE	3.9	2.0	25
Y	2.7 x 1.8	30B	HARBOURSIDE	8.8	1.9	25

OVERLAND FLOW LABEL	LOCATION	Q (m³/s) ¹
1	HAY STREET	0.9
2	HARBOUR STREET	0.7
3	HAY STREET	0.0
4	QUAY STREET	0.8
5	DARLING DRIVE (SOUTH)	0.7
6	BETWEEN EC AND CAR PARK/THE BOULEVARD	0.1
7	HARBOUR STREET	0.2
8	LITTLE PIER STREET	0.0
9	HARBOUR STREET	0.1
10	CHINESE GARDENS	0.0
11	EC CAR PARK FLOW PATH	0.0
12	EC CAR PARK FLOW PATH	0.0
13	PIER STREET	0.0
14	PIER STREET	0.0
15	DARLING DRIVE	0.2
16	DARLING DRIVE (NORTH)	0.0
17	DARLING QUARTER	0.0

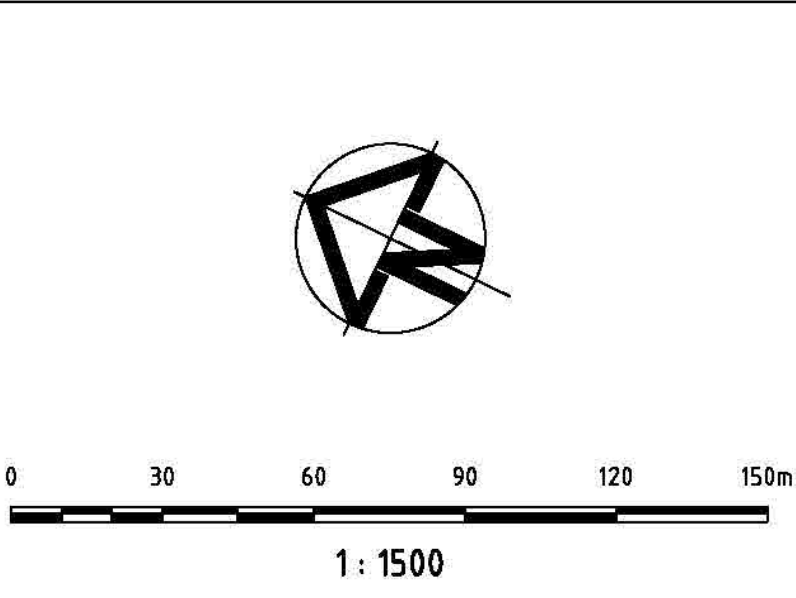
TABLE NOTES
¹ FLOW IS PEAK FOR MODELLED DESIGN CONDITION
² VELOCITY IS AT CORRESPONDING DESIGN FLOW

CO-INCIDENCE OF EVENTS	
STILL WATER LEVEL IN DARLING HARBOUR (mAHD)	CATCHMENT RUNOFF (YEAR ARI)
1.38	-
0.90	20



FLOOD MAPPING NOTES
LOCAL CATCHMENT FLOW AND FLOOD REGIMES AWAY FROM MAJOR OVERLAND FLOWPATHS ARE APPROXIMATE ONLY.
FLOOD LEVELS SHOWN ARE BASED ON THE ENVELOPE OF RESULTS FROM THE 25 AND 60 MINUTE STORM EVENT DURATIONS.
MODEL DETAILS ARE INCLUDED IN ACCOMPANYING REPORT.
EXISTING FLOOD RESULTS ARE ONLY REPRESENTATIVE OF THE DESIGN CONDITIONS IN ORDER TO ASSESS POTENTIAL DEVELOPMENT IMPACT. IN PARTICULAR, ALL OPEN STYLE GATES AND FENCES ACROSS OVERLAND FLOW PATHS ARE ASSUMED AS 0% BLOCKAGE.
TUFLOW (BUILD: 2011-09-AF-w64) MODEL FILE PATH: F:\AA004399\I-CAD\IC-CivilU-12D\data\F-Flooding\A-TUFLOW Results
DRAINS MODEL FILE PATH: F:\AA004399\I-CAD\IC-CivilU-Stormwater\A-DRAINS

DARLING HARBOUR LIVE



- NOTES:
- ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
 - ALL COORDINATES TO MGA. ALL LEVELS TO AHD.
 - THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATIONS AND DRAWINGS.
 - PRECINCT BOUNDARIES ARE INDICATIVE ONLY AND ARE SUBJECT TO CHANGE.

REV	DESCRIPTION	DATE
01	ISSUE FOR DEVELOPMENT APPLICATION	11/03/2013

CLIENT



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PROJECT
SICEEP
DARLING HARBOUR
PROJECT PRECINCT

DRAWING TITLE
20 YEAR ARI
EXISTING CONDITIONS
FLOOD DEPTH AND LEVEL CONTOURS

STATUS				
PRELIMINARY ONLY				
SCALE @ A1	DRAWN	DESIGNED	REVIEWED	APPROVED
1:1500	RD	CM	BC	JH
PROJECT NUMBER	DRAWING NUMBER		REV	
AA004399	WP-FL-0102		01	