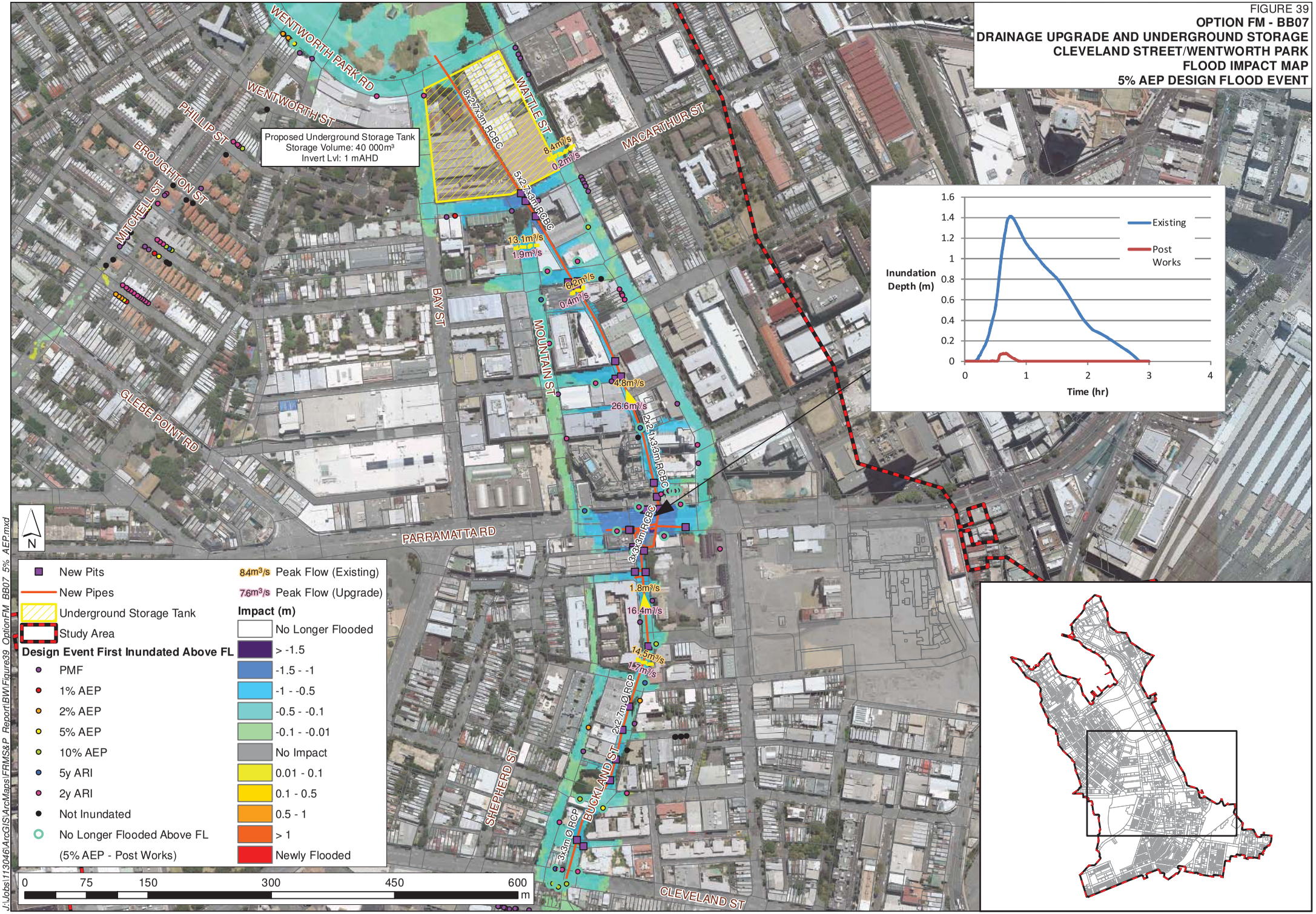
FIGURE 39

OPTION FM - BB07
DRAINAGE UPGRADE AND UNDERGROUND STORAGE
CLEVELAND STREET/WENTWORTH PARK
FLOOD IMPACT MAP
5% AEP DESIGN FLOOD EVENT



J:\Jobs\113046\ArcGIS\ArcMaps\FRMS&P Report\BW\Figure39 OptionFM BB07 5% AEP.mxd

Glossary of Terms

Appendix A

APPENDIX A: GLOSSARY

Taken from the Floodplain Development Manual (April 2005 edition)

acid sulfate soils	Are sediments which contain sulfidic mineral pyrite which may become extremely acid following disturbance or drainage as sulfur compounds react when exposed to oxygen to form sulfuric acid. More detailed explanation and definition can be found in the NSW Government Acid Sulfate Soil Manual published by Acid Sulfate Soil Management Advisory Committee.
Annual Exceedance Probability (AEP)	The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 500 m^3/s has an AEP of 5%, it means that there is a 5% chance (that is one-in-20 chance) of a 500 m^3/s or larger event occurring in any one year (see ARI).
Australian Height Datum (AHD)	A common national surface level datum approximately corresponding to mean sea level.
Average Annual Damage (AAD)	Depending on its size (or severity), each flood will cause a different amount of flood damage to a flood prone area. AAD is the average damage per year that would occur in a nominated development situation from flooding over a very long period of time.
Average Recurrence Interval (ARI)	The long term average number of years between the occurrence of a flood as big as, or larger than, the selected event. For example, floods with a discharge as great as, or greater than, the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.
caravan and moveable home parks	Caravans and moveable dwellings are being increasingly used for long-term and permanent accommodation purposes. Standards relating to their siting, design, construction and management can be found in the Regulations under the LG Act.
catchment	The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.
consent authority	The Council, government agency or person having the function to determine a development application for land use under the EP&A Act. The consent authority is most often the Council, however legislation or an EPI may specify a Minister or public authority (other than a Council), or the Director General of DIPNR, as having the function to determine an application.
design flood	A hypothetical flood representing a specific likelihood of occurrence (for example the 100 year ARI or 1% AEP flood). It is a probabilistic or statistical estimate, generally being based on some form of probability analysis of flood or rainfall data.
design rainfall	Used in the estimation of a flood or the design of a particular component or feature of a hydraulic structure. Design rainfall estimates are based on the intensity, frequency and duration of the storm bursts. The use of a design rainfall in the estimation of a flood does not imply that if such rainfall occurred at a given time, the estimated flood elevations would result.
development	Is defined in Part 4 of the Environmental Planning and Assessment Act (EP&A Act). **infill development:** refers to the development of vacant blocks of land that are

	generally surrounded by developed properties and is permissible under the current zoning of the land. Conditions such as minimum floor levels may be imposed on infill development. **new development:** refers to development of a completely different nature to that associated with the former land use. For example, the urban subdivision of an area previously used for rural purposes. New developments involve rezoning and typically require major extensions of existing urban services, such as roads, water supply, sewerage and electric power. **redevelopment:** refers to rebuilding in an area. For example, as urban areas age, it may become necessary to demolish and reconstruct buildings on a relatively large scale. Redevelopment generally does not require either rezoning or major extensions to urban services.
disaster plan (DISPLAN)	A step by step sequence of previously agreed roles, responsibilities, functions, actions and management arrangements for the conduct of a single or series of connected emergency operations, with the object of ensuring the coordinated response by all agencies having responsibilities and functions in emergencies.
discharge	The rate of flow of water measured in terms of volume per unit time, for example, cubic metres per second (m^3/s). Discharge is different from the speed or velocity of flow, which is a measure of how fast the water is moving for example, metres per second (m/s).
ecologically sustainable development (ESD)	Using, conserving and enhancing natural resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be maintained or increased. A more detailed definition is included in the Local Government Act 1993. The use of sustainability and sustainable in this manual relate to ESD.
effective warning time	The time available after receiving advice of an impending flood and before the floodwaters prevent appropriate flood response actions being undertaken. The effective warning time is typically used to move farm equipment, move stock, raise furniture, evacuate people and transport their possessions.
emergency management	A range of measures to manage risks to communities and the environment. In the flood context it may include measures to prevent, prepare for, respond to and recover from flooding.
flash flooding	Flooding which is sudden and unexpected. It is often caused by sudden local or nearby heavy rainfall. Often defined as flooding which peaks within six hours of the causative rain.
flood	Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami.
flood awareness	Flood awareness is an appreciation of the likely effects of flooding and a knowledge of the relevant flood warning, response and evacuation procedures.
flood education	Flood education seeks to provide information to raise awareness of the flood problem so as to enable individuals to understand how to manage themselves an their property in response to flood warnings and in a flood event. It invokes a state of flood readiness.
flood fringe areas	The remaining area of flood prone land after floodway and flood storage areas have been defined.

flood liable land	Is synonymous with flood prone land (i.e. land susceptible to flooding by the probable maximum flood (PMF) event). Note that the term flood liable land covers the whole of the floodplain, not just that part below the flood planning level (see flood planning area).
flood mitigation standard	The average recurrence interval of the flood, selected as part of the floodplain risk management process that forms the basis for physical works to modify the impacts of flooding.
floodplain	Area of land which is subject to inundation by floods up to and including the probable maximum flood event, that is, flood prone land.
floodplain risk management options	The measures that might be feasible for the management of a particular area of the floodplain. Preparation of a floodplain risk management plan requires a detailed evaluation of floodplain risk management options.
floodplain risk management plan	A management plan developed in accordance with the principles and guidelines in this manual. Usually includes both written and diagrammetic information describing how particular areas of flood prone land are to be used and managed to achieve defined objectives.
flood plan (local)	A sub-plan of a disaster plan that deals specifically with flooding. They can exist at State, Division and local levels. Local flood plans are prepared under the leadership of the State Emergency Service.
flood planning area	The area of land below the flood planning level and thus subject to flood related development controls. The concept of flood planning area generally supersedes the “flood liable land” concept in the 1986 Manual.
Flood Planning Levels (FPLs)	FPLs are the combinations of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans. FPLs supersede the “standard flood event” in the 1986 manual.
flood proofing	A combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding, to reduce or eliminate flood damages.
flood prone land	Is land susceptible to flooding by the Probable Maximum Flood (PMF) event. Flood prone land is synonymous with flood liable land.
flood readiness	Flood readiness is an ability to react within the effective warning time.
flood risk	Potential danger to personal safety and potential damage to property resulting from flooding. The degree of risk varies with circumstances across the full range of floods. Flood risk in this manual is divided into 3 types, existing, future and continuing risks. They are described below. **existing flood risk:** the risk a community is exposed to as a result of its location on the floodplain. **future flood risk:** the risk a community may be exposed to as a result of new development on the floodplain. **continuing flood risk:** the risk a community is exposed to after floodplain risk management measures have been implemented. For a town protected by levees, the continuing flood risk is the consequences of the levees being overtopped. For an area without any floodplain risk management measures, the continuing flood risk is simply the existence of its flood exposure.

flood storage areas	Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity, and loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. Hence, it is necessary to investigate a range of flood sizes before defining flood storage areas.
floodway areas	Those areas of the floodplain where a significant discharge of water occurs during floods. They are often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flows, or a significant increase in flood levels.
freeboard	Freeboard provides reasonable certainty that the risk exposure selected in deciding on a particular flood chosen as the basis for the FPL is actually provided. It is a factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc. Freeboard is included in the flood planning level.
habitable room	**in a residential situation:** a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom or workroom. **in an industrial or commercial situation:** an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood.
hazard	A source of potential harm or a situation with a potential to cause loss. In relation to this manual the hazard is flooding which has the potential to cause damage to the community. Definitions of high and low hazard categories are provided in the Manual.
hydraulics	Term given to the study of water flow in waterways; in particular, the evaluation of flow parameters such as water level and velocity.
hydrograph	A graph which shows how the discharge or stage/flood level at any particular location varies with time during a flood.
hydrology	Term given to the study of the rainfall and runoff process; in particular, the evaluation of peak flows, flow volumes and the derivation of hydrographs for a range of floods.
local overland flooding	Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.
local drainage	Are smaller scale problems in urban areas. They are outside the definition of major drainage in this glossary.
mainstream flooding	Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam.
major drainage	Councils have discretion in determining whether urban drainage problems are associated with major or local drainage. For the purpose of this manual major drainage involves: ▪ the floodplains of original watercourses (which may now be piped, channelised or diverted), or sloping areas where overland flows develop along alternative paths once system capacity is exceeded; and/or ▪ water depths generally in excess of 0.3 m (in the major system design storm as defined in the current version of Australian Rainfall and Runoff). These conditions may result in danger to personal safety and property damage to both premises and vehicles; and/or ▪ major overland flow paths through developed areas outside of defined drainage reserves; and/or

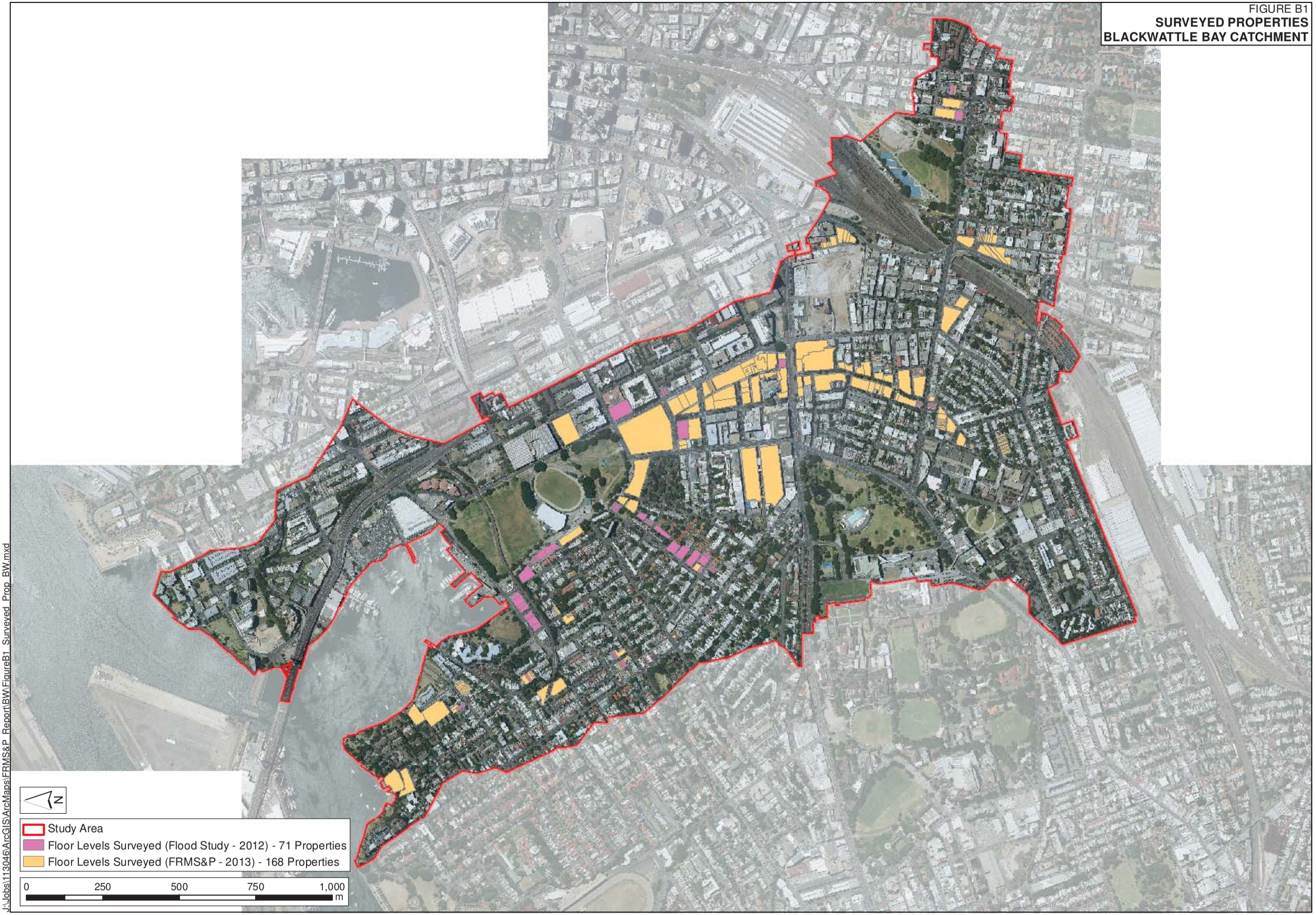
	▪ the potential to affect a number of buildings along the major flow path.
mathematical/computer models	The mathematical representation of the physical processes involved in runoff generation and stream flow. These models are often run on computers due to the complexity of the mathematical relationships between runoff, stream flow and the distribution of flows across the floodplain.
merit approach	The merit approach weighs social, economic, ecological and cultural impacts of land use options for different flood prone areas together with flood damage, hazard and behaviour implications, and environmental protection and well being of the State's rivers and floodplains. The merit approach operates at two levels. At the strategic level it allows for the consideration of social, economic, ecological, cultural and flooding issues to determine strategies for the management of future flood risk which are formulated into Council plans, policy and EPIs. At a site specific level, it involves consideration of the best way of conditioning development allowable under the floodplain risk management plan, local floodplain risk management policy and EPIs.
minor, moderate and major flooding	Both the State Emergency Service and the Bureau of Meteorology use the following definitions in flood warnings to give a general indication of the types of problems expected with a flood: **minor flooding:** causes inconvenience such as closing of minor roads and the submergence of low level bridges. The lower limit of this class of flooding on the reference gauge is the initial flood level at which landholders and townspeople begin to be flooded. **moderate flooding:** low-lying areas are inundated requiring removal of stock and/or evacuation of some houses. Main traffic routes may be covered. **major flooding:** appreciable urban areas are flooded and/or extensive rural areas are flooded. Properties, villages and towns can be isolated.
modification measures	Measures that modify either the flood, the property or the response to flooding. Examples are indicated in Table 2.1 with further discussion in the Manual.
peak discharge	The maximum discharge occurring during a flood event.
Probable Maximum Flood (PMF)	The PMF is the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation, and where applicable, snow melt, coupled with the worst flood producing catchment conditions. Generally, it is not physically or economically possible to provide complete protection against this event. The PMF defines the extent of flood prone land, that is, the floodplain. The extent, nature and potential consequences of flooding associated with a range of events rarer than the flood used for designing mitigation works and controlling development, up to and including the PMF event should be addressed in a floodplain risk management study.
Probable Maximum Precipitation (PMP)	The PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986). It is the primary input to PMF estimation.
probability	A statistical measure of the expected chance of flooding (see AEP).
risk	Chance of something happening that will have an impact. It is measured in terms of consequences and likelihood. In the context of the manual it is the likelihood of

	consequences arising from the interaction of floods, communities and the environment.
runoff	The amount of rainfall which actually ends up as streamflow, also known as rainfall excess.
stage	Equivalent to water level. Both are measured with reference to a specified datum.
stage hydrograph	A graph that shows how the water level at a particular location changes with time during a flood. It must be referenced to a particular datum.
survey plan	A plan prepared by a registered surveyor.
water surface profile	A graph showing the flood stage at any given location along a watercourse at a particular time.
wind fetch	The horizontal distance in the direction of wind over which wind waves are generated.

Floor Level Database

Appendix B

FIGURE B1
SURVEYED PROPERTIES
BLACKWATTLE BAY CATCHMENT



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Floor Level Survey (undertaken in 2012 as part of Blackwattle Bay Flood Study)

								RESIDENTIAL BUILDING		NON-RESIDENTIAL BUILDING			
Parcel Tags as on Council Cadastre (GIS Tag)	Photo Name	Number of Buildings	Street Number	Street Name	Easting (m)	Northing (m)	Indicative Ground Level (mAHD)	Lowest Habitable Floor Level (m AHD)	Floor Construction Pier (P) Slab (S) Other (describe)	Type Commercial (C) Industrial (I) Public (P)	Name and Nature of Use/Business	Lowest Floor Level (mAHD)	Floor Construction Pier (P) Slab (S) Other (describe)
174627	1 Belvoir Street.jpg	1	1	Belvoir Street	334174.4	6248726.0	30.74	31.05	P				
175732	104-106 Buckingham Street.jpg	1	104 to 106	Buckingham Street	334224.3	6248684.3	31.70			C	Not known	31.78	S
182309	2 Pembroke Street.jpg	1	2	Pembroke Street	334165.4	6248647.7	30.46	31.42	P				
244124	208 Chalmers Street.jpg	1	204 to 214	Chalmers Street	334140.4	6248661.8	30.49			Com/Res	Chalmers Convenience Store	30.64	S
515871	Shop 1, 330 Wattle Street.jpg	1	Shop 1, 330	Wattle Street	333177.0	6249733.7	4.05			C	City Stationery (W C Penfolds) - Stationers	4.23	S
	Shop 2, 330 Wattle Street.jpg	1	Shop 2, 330	Wattle Street	333169.2	6249748.6	3.88			C	Li's Trading Pty Ltd - Catering equipment supplier	4.12	S
	Shop 3, 330 Wattle Street.jpg	1	Shop 3, 330	Wattle Street	333159.4	6249768.3	3.89			C	Insanely Great Software - Computer Programmers	4.15	S
	Shop 4, 330 Wattle Street.jpg	1	Shop 4, 330	Wattle Street	333154.0	6249780.0	3.86			C	Nightingales - Bridal Shop	4.18	S
515873	430 Wattle Street.jpg	1	430	Wattle Street	332238.1	6249627.8	4.78			C	Fantastic Gourmet - Fast food shop	5.02	S
515874	432 Wattle Street.jpg	1	432	Wattle Street	333239.7	6249624.0	4.69	5.01	P				
515875	434 Wattle Street.jpg	1	434	Wattle Street	333241.5	6249620.0	4.65	4.96	P				
515876	436 Wattle Street.jpg	1	436	Wattle Street	333243.3	6249616.0	4.65	4.97	P				
515877	438 Wattle Street.jpg	1	438	Wattle Street	333245.1	6249612.2	4.69	4.98	P				
519134	36 Talfourd Street.jpg	1	36	Talfourd Street	332351.4	6249754.3	15.91	17.31	P				
519135	38 Talfourd Street.jpg	1	38	Talfourd Street	332348.1	6249759.5	15.99	17.22	P				
519136	39 Talfourd Street.jpg	1	39	Talfourd Street	332379.7	6249781.9	13.11	16.29	P		NB: This level is Talfourd Street entry level - no access available to lower floor		
519137	40 Talfourd Street.jpg	1	40	Talfourd Street	332345.3	6249762.5	16.08	17.21	P				
519138	41 Talfourd Street.jpg	1	41	Talfourd Street	332377.4	6249785.2	13.29	16.29	P		NB: This level is Talfourd Street entry level - no access available to lower floor		
519139	42 Talfourd Street.jpg	1	42	Talfourd Street	332343.0	6249766.0	16.23	17.39	P				
519140	43 Talfourd Street.jpg	1	43	Talfourd Street	332375.3	6249788.1	13.46	16.58	P		NB: This level is Talfourd Street entry level - no access available to lower floor		
519142	45 Talfourd Street.jpg	1	45	Talfourd Street	332373.1	6249791.0	13.67	14.53	P				
519184	9 Phillip Street.jpg	1	9	Phillip Street	332819.6	6249667.7	5.72	6.02	P				
519186	11 Phillip Street.jpg	1	11	Phillip Street	332816.4	6249670.8	5.57	5.83	P				
519187	13 Phillip Street.jpg	1	13	Phillip Street	332813.8	6249673.1	5.56	5.85	P				
519189	15 Phillip Street.jpg	1	15	Phillip Street	332811.2	6249676.4	5.39	5.77	P				
519334	35 Campbell Street.jpg	1	35	Campbell Street	332707.2	6249479.1	13.05	13.18	P				
519335	36 Campbell Street.jpg	1	36	Campbell Street	332665.0	6249460.4	13.22	13.78	P				
519336	37 Campbell Street.jpg	1	37	Campbell Street	332704.3	6249481.6	13.02	13.18	P				
519337	38 Campbell Street.jpg	1	38	Campbell Street	332661.8	6249462.8	13.21	13.70	P				
519339	39 Campbell Street.jpg	1	39	Campbell Street	332701.6	6249483.9	12.99	13.20	P				
519340	40 Campbell Street.jpg	1	40	Campbell Street	332658.9	6249465.3	13.22	13.71	P				
519342	42 Campbell Street.jpg	1	42	Campbell Street	332655.7	6249467.7	13.28	13.72	P				
519344	44 Campbell Street.jpg	1	44	Campbell Street	332652.8	6249470.2	13.14	13.73	P				
520356	21-27 Wentworth Street.jpg	1	21 to 27	Wentworth Street	332833.7	6249695.3	3.34	4.59	S				
520908	23 Forsyth Street.jpg	1	23	Forsyth Street	332207.7	6250284.7	5.30	5.34	S				
520910	25 Forsyth Street.jpg	1	25	Forsyth Street	332212.0	6250287.5	5.15	5.34	S				
520964	2 Wentworth Park Road.jpg	1	2	Wentworth Park Road	332872.0	6249774.1	2.39	2.94	S				
520966	4 Wentworth Park Road.jpg	1	4	Wentworth Park Road	332868.9	6249777.4	2.39	3.05	S				
520967	6 Wentworth Park Road.jpg	1	6	Wentworth Park Road	332865.7	6249780.8	2.39	3.06	S				
520968	8 Wentworth Park Road.jpg	1	8	Wentworth Park Road	332862.1	6249784.0	2.39	3.08	S				
520969	10 Wentworth Park Road.jpg	1	10	Wentworth Park Road	332858.4	6249787.0	2.44	3.10	S				
520970	12 Wentworth Park Road.jpg	1	12	Wentworth Park Road	332855.1	6249789.3	2.44	3.11	S				
520989	48-64 Wentworth Park Road.jpg	1	48 to 64	Wentworth Park Road	332726.2	6249993.4	2.12	2.24	S				
520990	Unit 1, 66 Wentworth Park Road.jpg	1	Unit 1/66	Wentworth Park Road	332702.7	6250036.9	2.05	3.27	S				
	Unit 2, 66 Wentworth Park Road.jpg	1	Unit 2/66	Wentworth Park Road	332706.6	6250032.7	2.12	3.27	S				
	Unit 3, 66 Wentworth Park Road.jpg	1	Unit 3/66	Wentworth Park Road	332708.7	6250028.0	2.10	3.27	S				
	Unit 4, 66 Wentworth Park Road.jpg	1	Unit 4/66	Wentworth Park Road	332712.1	6250023.2	2.14	3.27	S				
	Unit 5, 66 Wentworth Park Road.jpg	1	Unit 5/66	Wentworth Park Road	332714.7	6250018.8	2.12	3.27	S				
520992	68 Wentworth Park Road.jpg	1	68	Wentworth Park Road	332694.0	6250038.1	2.02	3.12	P				
520993	70 Wentworth Park Road.jpg	1	70	Wentworth Park Road	332691.7	6250041.8	2.04	3.12	P				
520994	72 Wentworth Park Road.jpg	1	72	Wentworth Park Road	332688.9	6250045.2	2.06	3.11	P				
520995	74 Wentworth Park Road.jpg	1	74	Wentworth Park Road	332685.6	6250048.3	2.09	3.13	P				
520996	76 Wentworth Park Road.jpg	1	76	Wentworth Park Road	332682.8	6250051.8	2.17	3.11	P				
520997	78 Wentworth Park Road.jpg	1	78	Wentworth Park Road	332680.2	6250055.5	2.20	3.11	P				
520998	80-82 Wentworth Park Road.jpg	1	Unit 1/80-82	Wentworth Park Road	332665.1	6250068.4	2.18	3.12					
	80-82 Wentworth Park Road.jpg	1	Unit 2/80-82	Wentworth Park Road	332660.6	6250072.0	2.14	3.12	S				
	80-82 Wentworth Park Road.jpg	1	Unit 3/80-82	Wentworth Park Road	332656.1	6250076.2	2.14	3.12					
	80-82 Wentworth Park Road.jpg	1	Unit 4/80-82	Wentworth Park Road	332652.1	6250079.5	2.15	3.11	S				
	80-82 Wentworth Park Road.jpg	1	Unit 5/80-82	Wentworth Park Road	332648.1	6250083.3	2.15	3.11					
	80-82 Wentworth Park Road.jpg	1	Unit 6/80-82	Wentworth Park Road	332644.2	6250087.1	2.06	3.12	S				
	80-82 Wentworth Park Road.jpg	1	Unit 7/80-82	Wentworth Park Road	332640.9	6250090.5	2.06	3.13					
	80-82 Wentworth Park Road.jpg	1	Unit 8/80-82	Wentworth Park Road	332638.1	6250093.4	2.02	3.12	S				
	80-82 Wentworth Park Road.jpg	1	Unit 9/80-82	Wentworth Park Road	332635.8	6250095.9	2.02	3.12					

								RESIDENTIAL BUILDING		NON-RESIDENTIAL BUILDING			
Parcel Tags as on Council Cadastre (GIS Tag)	Photo Name	Number of Buildings	Street Number	Street Name	Easting (m)	Northing (m)	Indicative Ground Level (mAHD)	Lowest Habitable Floor Level (m AHD)	Floor Construction Pier (P) Slab (S) Other (describe)	Type Commercial (C) Industrial (I) Public (P)	Name and Nature of Use/Business	Lowest Floor Level (mAHD)	Floor Construction Pier (P) Slab (S) Other (describe)
521613	2 Bridge Road.jpg	1	2	Bridge Road	332569.1	6250109.0	2.00			C	Kauri Foreshore Hotel - Pub	-0.02	S
521615	4 Bridge Road.jpg	1	4	Bridge Road	332554.4	6250097.8	1.99			C	Carnival & Party Warehouse - Party supplies retailer	2.45	S
521616	6 Bridge Road.jpg	1	6	Bridge Road	332538.7	6250087.1	2.02			C	Flat - Furniture supplier	2.20	S
521617	8 Bridge Road.jpg	1	8	Bridge Road	332529.3	6250080.8	2.02			C	Hello Happy Pty Ltd	2.29	S
521618	10 Bridge Road.jpg	1	10	Bridge Road	332507.8	6250065.4	2.07			C	Ruby Star Traders - Furniture retailer	2.35	S
521620	12 Bridge Road.jpg	1	12	Bridge Road	332501.0	6250060.9	1.98			I	Osmond Air Services - Air conditioning installers	2.44	S
521623	14-18 Bridge Road.jpg	1	14 to 18	Bridge Road	332488.5	6250052.4	2.03			C	BWS - Liquor retailer	3.09	S
521626	20 Bridge Road.jpg	1	20	Bridge Road	332470.9	6250039.4	2.38			C	Reece Plumbing - Plumbing supplies retailer	2.77	S
522343	38 Burton Street.jpg	1	38	Burton Street	332305.0	6250066.9	8.54	8.97	P				
525509	137 Broadway.jpg	1	137	Broadway	333343.8	6249232.1	5.68			C	Project 8 Café	5.28	S
	139 Broadway.jpg	1	139	Broadway	333338.8	6249232.3	5.68			C	Electric Monkeys	5.28	S
	141 Broadway.jpg	1	141	Broadway	333333.9	6249232.3	5.68			C	Chubby Girl's Bunz Shop - Bakery	5.28	S
	143 Broadway.jpg	1	143	Broadway	333329.1	6249232.1	5.18			C	Tattoo World	5.28	S
	145 Broadway.jpg	1	145	Broadway	333323.8	6249232.0	5.18			C	ICM Mobile Phone Access	5.28	S
526433	86 Cleveland Street.jpg	1	86	Cleveland Street	333195.5	6248790.3	11.42	11.74	P				
526435	88 & 90 Cleveland Street.jpg.jpg	1	88	Cleveland Street	333200.1	6248789.3	11.35	11.50	P				
526437	89 & 90 Cleveland Street.jpg.jpg	1	90	Cleveland Street	333204.5	6248787.8	11.29	11.52	P				
526444	97 Cleveland Street.jpg	1	97	Cleveland Street	333189.4	6248749.1	11.59	11.75	P				
526445	99 Cleveland Street.jpg	1	99	Cleveland Street	333193.8	6248746.8	11.44	11.55	P				
526446	101 Cleveland Street.jpg	1	101	Cleveland Street	333198.8	6248746.6	11.42			C	Thai Tha Hai - Restaurant	11.78	S & P
529443	9-15 MacArthur Street.jpg	1	9 to 15	MacArthur Street	333115.7	6249562.2	3.87	5.32	S				
614246	93 Glebe Street.jpg	1	93	Glebe Street	332733.3	6249540.5	11.26	11.39	S				
	95 Glebe Street.jpg	1	95	Glebe Street	332730.0	6249543.5	11.22	11.39	S				
	97 Glebe Street.jpg	1	97	Glebe Street	332725.3	6249545.0	11.02	11.44	S				
	99 Glebe Street.jpg	1	99	Glebe Street	332721.4	6249547.3	10.98	11.12	S				
	101 Glebe Street.jpg	1	101	Glebe Street	332717.6	6249550.0	10.87	11.14	S				
	103 Glebe Street.jpg	1	103	Glebe Street	332714.0	6249552.5	10.85	11.10	S				
	96 Mitchell Street.jpg	1	96	Mitchell Street	332708.1	6249579.7	9.46	9.90	S				
	98 Mitchell Street.jpg	1	98	Mitchell Street	332705.9	6249576.7	10.43	10.06	S				
	100 Mitchell Street.jpg	1	100	Mitchell Street	332703.4	6249574.1	10.43	10.32	S				
	102 Mitchell Street.jpg	1	102	Mitchell Street	332701.3	6249571.2	10.88	10.63	S				
	104 Mitchell Street.jpg	1	104	Mitchell Street	332699.4	6249567.8	10.88	10.96	S				
622676	12 Phillip Street.jpg	1	12	Phillip Street	332793.9	6249614.9	5.64	7.05	P				
	15 Broughton Street.jpg	1	15	Broughton Street	332769.4	6249613.3	8.06	8.58	P				
622677	24 Broughton Street.jpg	1	24	Broughton Street	332750.2	6249581.1	8.57	10.57	P				
	24a Broughton Street.jpg	1	24a	Broughton Street	332744.5	6249586.3	8.43	10.06	P				
	82 Mitchell Street.jpg	1	82	Mitchell Street	332731.0	6249605.1	8.82	9.37	P				
	84 Mitchell Street.jpg	1	84	Mitchell Street	332727.9	6249601.4	9.10	9.37	P				
	88 Mitchell Street.jpg	1	88	Mitchell Street	332721.4	6249593.0	9.30	9.72	P				
	92 Mitchell Street.jpg	1	92	Mitchell Street	332718.0	6249589.3	9.50	9.73	P				
622757	90 Glebe Street.jpg	1	90	Glebe Street	332720.3	6249507.0	11.31	12.24	P				
	92 Glebe Street.jpg	1	92	Glebe Street	332714.0	6249511.8	11.30	11.87	P				
	94 Glebe Street.jpg	1	94	Glebe Street	332707.6	6249516.9	10.97	11.49	P				
	96 Glebe Street.jpg	1	96	Glebe Street	332701.5	6249521.9	11.02	11.54	P				
	98 Glebe Street.jpg	1	98	Glebe Street	332695.1	6249526.1	11.12	11.62	P				
	100 Glebe Street.jpg	1	100	Glebe Street	332688.2	6249530.4	11.26	11.69	P				
	106a Mitchell Street.jpg	1	106a	Mitchell Street	332683.2	6249548.0	12.13	12.58	P				
	106 Mitchell Street.jpg	1	106	Mitchell Street	332681.1	6249542.3	12.43	12.57	P				
	108 Mitchell Street.jpg	1	108	Mitchell Street	332675.8	6249538.8	12.72	13.03	P				
	110 Mitchell Street.jpg	1	110	Mitchell Street	332673.2	6249535.8	12.86	13.04	P				
	112 Mitchell Street.jpg	1	112	Mitchell Street	332671.0	6249531.4	12.97	13.04	P				
623773	41 Campbell Street.jpg	1	41	Campbell Street	332693.9	6249480.7	13.00	13.20	P				
	43 Campbell Street.jpg	1	43	Campbell Street	332691.6	6249482.1	12.93	13.21	P				
	45 Campbell Street.jpg	1	45	Campbell Street	332688.9	6249484.2	12.94	13.20	P				
	47 Campbell Street.jpg	1	47	Campbell Street	332685.1	6249486.6	12.85	13.18	P				
	49 Campbell Street.jpg	1	49	Campbell Street	332681.6	6249489.3	12.94	13.15	P				
	51 Campbell Street.jpg	1	51	Campbell Street	332678.8	6249491.6	12.99	13.34	P				
	53 Campbell Street.jpg	1	53	Campbell Street	332675.9	6249494.0	12.98	13.22	P				
	55 Campbell Street.jpg	1	55	Campbell Street	332673.1	6249495.9	13.10	13.23	P				
623775	120 Mitchell Street.jpg	1	120	Mitchell Street	332655.0	6249504.8	13.09	14.59	P				

Floor Level Survey (undertaken in 2013 as part of Blackwattle Bay Floodplain Risk Management Study)

								RESIDENTIAL BUILDING		NON-RESIDENTIAL BUILDING				
Parcel Tags as on Council Cadastre (GIS Tag)	Photo Name	Number of Buildings	Street Number	Street Name	Easting (m)	Northing (m)	Indicative Ground Level (mAHD)	Lowest Habitable Floor Level (m AHD)	Floor Construction Pier (P) Slab (S) Other (describe)	Type Commercial (C) Industrial (I) Public (P)	Additional Comments	Name and Nature of Use/Business	Lowest Floor Level (mAHD)	Floor Construction Pier (P) Slab (S) Other (describe)
521707	137 Bridge Road		137	Bridge Roa	33292.3	6249747.7	17.05	16.95	S					
521711	143 Bridge Road		143	Bridge Roa	332375.9	6249736.3	17.71	18.25	S					
521713	145 Bridge Road		145	Bridge Roa	332372.8	6249734.0	18.03	18.48	S					
519141	44 Talfourd Street		44	Talfourd St	332351.9	6249776.3	16.23	17.39	S					
519143	46 Talfourd Street		46	Talfourd St	332349.4	6249779.8	16.33	17.89	S					
603543	79 Darling Street		79	Darling Str	332512.3	6249962.9	7.14	7.20	S					
603544	81 Darling Street		81	Darling Str	332509.1	6249967.8	6.75	6.81	S					
520182	1-21 Bay Street		1 to 21	Bay Street	332997.5	6249303.7				P	BROADWAY SHOPPING CENTRE CAR PARK		9.50	S
622429	10-16 Bay Street		10 to 16	Bay Street	333046.7	6249622.9	2.57	2.70	S					
637350	23-35 Bay Street		23 to 35	Bay Street	332994.3	6249319.2				P	BROADWAY SHOPPING CENTRE CAR PARK		9.60	S
529440	1-3 Macarthur Street		1 to 3	Macarthur	333060.7	6249573.3	4.32	5.01	S					
529441	5-7 Macarthur Street		5 to 7	Macarthur	333073.5	6249573.9	4.17	4.85	S					
604411	17-19 Macarthur Street		17 to 19	Macarthur	333189.1	6249601.2	3.84	5.11	S					
602436	385 Wattle Street		385	Wattle Stre	333233.5	6249562.3	4.37			C	Paint Supplies Store		4.42	S
532651	387-429 Wattle Street		387 to 429	Wattle Stre	333219.7	6249521.7	4.27			C	Petrol Station		4.40	S
532659	435 Wattle Street		435	Wattle Stre	333273.3	6249485.2	4.81	5.05	S					
532661	437 Wattle Street		437	Wattle Stre	333275.1	6249481.5	4.81	5.05	S					
532663	439 Wattle street		439	Wattle Stre	33276.9	6249477.9	4.81	5.05	S					
532665	441 Wattle street		441	Wattle Stre	333278.8	6249474.4	4.81	5.05	S					
532669			445 to 483	Wattle Street							NO HEIGHTS NEEDED AS BUILDING IS CONSTRUCTED			
630976	485-501 Wattle street		485 to 501	Wattle Stre	333344.3	6249344.9	6.08			I			6.55	S
631133	507 Wattle Street		507	Wattle Stre	333349.7	6249311.8	6.76	6.31						
630979	503 Wattle Street		503	Wattle Stre	333321.7	6249328.6	6.26	6.14						
532677	513 to 519 Wattle Street		513 to 519	Wattle Stre	333363.7	6249305.4	6.54	7.47						
525492	104-110 Broadway		104 to 110	Broadway	333373.9	6249193.1	8.17			P	Notre Dame University		9.13	S
525493	112-126 Broadway		112 to 126	Broadway	333328.4	6249190.3	8.11			C	Café		8.20	S
525494	128 Broadway		128	Broadway	333270.3	6249187.5	7.80			P	University		7.97	S
525500	129-135 Broadway		129 to 135	Broadway	333357.6	6249225.8	7.83			C	Restaurant		7.96	S
525515	142-152 Broadway		142 to 152	Broadway	333237.1	6249186.1	8.46			P	Carpark		8.48	S
533573	147-171 Broadway		147 to 171	Broadway	333245.1	6249220.5	7.42			C	Restaurant		7.54	S
606602	173-179 Broadway		173 to 179	Broadway	333230.3	6249219.1	8.46			C	Bakery		8.48	S
522674	2-14 Mountain Street		2 to 14	Mountain S	333174.2	6249511.6	4.27	4.40	S					
522678	16-20 Mountain Street		16 to 20	Mountain S	333180.8	6249473.2	4.50	4.68	S					
600502	22-36 Mountain Street		22 to 36	Mountain S	333233.1	6249563.7	4.52	4.52	S					
522690	38-44 Mountain Street		38 to 44	Mountain S	333198.8	6249350.1	5.73	5.92	S					
533570	52 Mountain Street		52	Mountain S	333284.5	6249310.8	7.28	7.55	S					
533554	46-52 Mountain Street		46 to 52	Mountain S	333201.2	6249332.5	6.04	6.29	S					
531302	13-15 Small Street		13 to 15	Small Stree	333198.0	6249359.8	5.15	5.73	S					
531301	11 Small Street		11	Small Stree	333232.5	6249369.7	5.09	5.29	S					
525704	4-12 Buckland Street		4 to 12	Buckland S	333310.0	6249108.0	8.33	9.47	S					
525725	19-21 Buckland Street		19 to 21	Buckland S	333290.0	6249166.0	7.79	8.23	S					
525732	23-35 Buckland Street		23 to 35	Buckland S	333296.0	6249080.0	8.33	9.60	S					
525707	14-16 Buckland Street		14 to 16	Buckland S	333316.0	6249046.0	9.00	9.13	S					
525708	18-20 Buckland Street		18 to 20	Buckland S	333307.0	6249017.0	9.32	9.59	S					
525737	57-75 Buckland Street		57 to 75	Buckland S	333280.0	6248981.0	9.61	10.06	S					
525733	30 Buckland Street		30	Buckland S	333297.0	6248985.0	9.69	9.99	S					
529083	34 Buckland Street		34	Buckland S	333289.5	6248954.7	10.16	10.60	S					
525743	83-85 Buckland Street		83 to 85	Buckland S	333265.5	6248924.3	10.07	10.17	S					
525736	36 Buckland Street		36	Buckland S	333281.1	6248925.1	10.29	12.44	S					
624757	28-32 Pine Street		28 to 32	Pine Street	333238.0	6248951.0	10.18	10.34	S					
530142	42-44 Pine Street		42 to 44	Pine Street	333229.0	6248922.0	10.39	10.86	S					
622428	62-64 Pine Street		62 to 64	Pine Street	333201.0	6248835.0	11.21	11.35	S					
522780	82-96 Myrtle Street		82 to 96	Myrtle Stre	333273.6	6248875.6	10.40	10.45	S					
522773	70-80 Myrtle Street		70 to 80	Myrtle Stre	333221.0	6248900.0	10.88			P	PARK		10.88	Grass
522764	61-63 Myrtle Street		61 to 63	Myrtle Stre	333222.0	6248867.0	11.16	11.22	S					
522768	65 Myrtle Street		65	Myrtle Stre	333252.0	6248855.0	11.09	11.22	S					
523502	5040 Paints Lane		5040	Paints Lan	333259.0	6248904.0	10.10				SUBSTATION			
526441	92-120 Cleveland Street		92 to 120	Cleveland	333222.0	6248777.0	11.36	11.47	S	R&C	Also Known As No.100 "Dolphin Square"			

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529093	29 Levey Street		29	Levey Stre	333338.5	6248940.7	11.35	11.76	S					
529095	31 Levey Street		31	Levey Stre	333342.3	6248940.9	11.36	11.76	S					
529098	33 Levey Street		33	Levey Stre	333345.8	6248941.2	11.45	11.76	S					
529100	35 Levey Street		35	Levey Stre	333349.5	6248941.5	11.47	11.77	S					
529102	37 Levey Street		37	Levey Stre	333353.2	6248941.8	11.56	12.11	S					
529104	39 Levey Street		39	Levey Stre	333357.1	6248942.1	11.64		S					
202399	188 Chalmers Street		188	Chalmers S	334132.0	6248700.0	30.24	30.10	S	C	Reece Bathroomsat Street Level &Residential Above		30.43	
175710	1-89 Buckingham Street		61 to 89	Buckingha	334196.0	6248699.0	31.57	32.06	S	C				
175722	91 Buckingham Street		91	Buckingha	334188.6	6248650.1	31.93	32.06	P					
175723	93 Buckingham Street		93	Buckingha	334187.9	6248645.8	32.08	32.39	P					
175733	108 Buckingham Street		108	Buckingha	334207.8	6248679.8	31.74	32.43	P					
175734	110 Buckingham Street		110	Buckingha	334207.1	6248675.5	31.74	32.43	P					
528878	4-8 Kelly Street		4 to 8	Kelly Stree	333105.6	6249498.9	4.76		S					
528881	25 Kelly Street		25	Kelly Stree	333226.5	6249494.5	4.14	6.10	S					
623775	118 Mitchell Street		118	Mitchell St	332660.1	6249523.5	13.55	14.12	S					
521900	17-31 Cowper Street		17 to 31	Cowper St	332879.8	6249710.0	2.33	3.34	S					
520965	A Wentworth Park Road		2A	Wentworth	332887.5	6249777.4	2.33	3.33	S					
520965	D Wentworth Park Road		2D	Wentworth	332898.4	6249767.9	2.45	3.32	S					
520984	4-46 Wentworth Park Road		40 to 46	Wentworth	332784.0	6249927.6	2.38		S	C	GLENMORE MEAT FACTORY		2.44	S
522344	40 Burton Street		40	Burton Stre	332310.4	6250081.6	9.70		S	I	SUBSTATION		9.92	
	38 Burton Street		38	Burton Stre	332314.3	6250075.7	8.51	8.92	S					
	36 Burton Street		36	Burton Stre	332319.0	6250069.0	7.74	9.37	S					
520951	80 Forsyth Street		80	Forsyth Str	332278.3	6250307.1	4.46	6.51	S					
520950	78 Forsyth Street		78	Forsyth Str	332274.1	6250303.5	4.64	6.83	S					
520949	76 Forsyth Street		76	Forsyth Str	332269.8	6250300.1	4.70	6.95	S					
520948	74 Forsyth Street		74	Forsyth Str	332265.1	6250295.9	5.04	6.75	S					
520947	72 Forsyth Street		72	Forsyth Str	332260.9	6250292.7	5.18	6.77	S					
520946	70 Forsyth Street		70	Forsyth Str	332257.7	6250290.2	5.29	6.72	S					
520945	68 Forsyth Street		68	Forsyth Str	332254.6	6250287.5	5.70	6.74	S					
520944	66 Forsyth Street		66	Forsyth Str	332250.9	6250284.8	5.97	7.75	S					
520943	64 Forsyth Street		64	Forsyth Str	332247.3	6250281.6	6.24	7.80	S					
520646	29-31 Cook Street		29 to 31	Cook Stree	332188.0	6250462.0	2.11	2.36	S		Level Ground floor Unit S.E Corner Property			
519070	18 Oxley Street		18	Oxley Stree	331943.0	6250482.0	11.74	3.14	S		Bottom Residentail Slab above Garage Levels			
521449	7-23 Stewart Street		7 to 23	Stewart Str	334981.0	6250476.0	11.74	9.02	S		Lowest Level Eastern Tower			
608938	14 Griffin Place		14	Griffin Plac	332224.0	6250370.0	2.76	3.20	S					
519208	2 Garran Lane		2	Garran Lar	332188.8	6250311.2	5.22	5.44						
519209	3A Garran Lane		3A	Garran Lar	332201.0	6250320.0	3.76	4.26			Level of Lower Dwelling of Former No.3 Garren Lane			
187364	55 Calder Road		55	Calder Roa	333041.0	6248520.0	17.36	18.43	P					
187362	53 Calder Road		53	Calder Roa	333042.0	6248520.0	17.32	17.89	P					
187360	51 Calder Road		51	Calder Roa	333046.1	6248521.2	17.71	18.30	S					
187358	49 Calder Road		49	Calder Roa	333047.2	6248521.5	17.68	18.11	S					
187356	47 Calder Road		47	Calder Roa	333053.9	6248523.7	17.67	18.11	S					
187354	45 Calder Road		45	Calder Roa	333054.9	6248524.0	17.70	18.19	S					
187352	43 Calder Road		43	Calder Roa	333061.2	6248526.0	17.77	18.60	S					
187350	41 Calder Road		41	Calder Roa	333064.4	6248527.3	17.77	18.56	S					
202235	39 Calder Road		39	Calder Roa	333066.2	6248528.0	17.87	18.56	S					
187346	37 Calder Road		37	Calder Roa	333070.0	6248530.0	17.52	18.17	P					
187344	35 Calder Road		35	Calder Roa	333073.0	6248531.0	17.44	18.21	P					
187342	33 Calder Road		33	Calder Roa	333076.0	6248532.0	17.44	18.21	P					
202234	31 Calder Road		31	Calder Roa	333080.0	6248533.0	17.49	18.23	P					
187338	29 Calder Road		29	Calder Roa	333083.0	6248535.0	17.49	18.23	P					
187336	27 Calder Road		27	Calder Roa	333088.0	6248536.0	17.45	18.19	P					
202233	25 Calder Road		25	Calder Roa	333090.0	6248537.0	17.45	18.19	P					
526407	61 Cleveland Street		61	Cleveland	333110.0	6248774.0	13.30	13.68	P					
526410	63 Cleveland Street		63	Cleveland	333115.0	6248772.0	13.12	13.48	P					
526412	65 Cleveland Street		65	Cleveland	333118.0	6248772.0	13.02	13.50	P					
526443	95 Cleveland Street		95	Cleveland	333187.0	6248763.0	11.68	11.86	P					
533601	57-163 Cleveland Street		157 to 163	Cleveland	333447.0	6248719.0	15.80				Corner Abercrombie &Cleveland(Building under Construction)			
194701	43-47 Vine Street		43 to 47	Vine Stree	333181.0	6248726.0	12.10	12.26	P	C				
194703	49-53 Vine Street		49 to 53	Vine Stree	333159.0	6248729.0	12.51	12.60	S	C				
194705	55 Vine Street		55	Vine Stree	333148.7	6248730.9	12.83	13.40	P					
194707	57 Vine Street		57	Vine Stree	333143.9	6248731.7	12.86	13.40	P					
202730	59 Vine Street		59	Vine Stree	333139.5	6248732.3	13.04	13.30	P					

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194712	63 Vine Street		63	Vine Stree	333127.0	6248734.0	13.20	13.38	P					
194713	65 Vine Street		65	Vine Stree	333124.0	6248735.0	13.12	13.45	P					
519440	12 Junction Street		12	Junction S	331763.0	6249192.0	14.32	11.76	S	C	Level Of Office at Rear of 3 Storey Building			
519440	12 Junction Street		12	Junction S	331762.0	6249178.0		10.88	S	C	Level Floor Old Building Rear of Site			
521860	1A Hegarty Street		1A	Hegarty St	331967.0	6249623.0	14.00	14.30	S		Bottom Floor of 3 Storey Brick Flats			
188501	16 Eveleigh Street		16	Eveleigh S	333549.1	6248647.6	18.28	18.28	S					
193153	13 Renwick Street		13	Renwick St	332986.9	6247555.6	26.48	26.96	S					
193154	15 Renwick Street		15	Renwick St	332974.6	6247553.2	26.43	26.97	S					
193155	17 Renwick Street		17	Renwick St	332968.5	6247552.0	26.36	26.97	S					
193156	19 Renwick Street		19	Renwick St	332962.3	6247550.8	26.40	26.99	S					
193157	21 Renwick Street		21	Renwick St	332956.6	6247549.7	26.40	26.99	S					
193158	23 Renwick Street		23	Renwick St	333728.3	6248579.0	26.35	26.99	S					
246249	25-27 Renwick Street		25 to 27	Renwick St	333728.0	6248576.8	26.35	26.47	S					
249952	29 Renwick Street		29	Renwick St	333726.9	6248569.0	26.29	26.56	S					
613353	35-37 Renwick Street		35 to 37	Renwick St	333724.0	6248549.7	26.51	26.72	S					
203082	32-134 Shepherd Street		132 to 134	Shepherd S	333064.0	6248657.0	14.47	14.60	S	P(COMMUNITY)				
183743	138 Shepherd Street		138	Shepherd S	333052.6	6248622.9	14.98	15.20	P	R				
183744	140 Shepherd Street		140	Shepherd S	333051.3	6248619.1	14.98	15.22	P	R				
202408	1-19 Regent Street		1 to 19	Regent Str	333724.1	6248648.0	28.22			C	Various Retail Stores		28.14	S
621684	21 Regent Street		21	Regent Str	336143.8	6248968.7	26.30			C	Various Retail Stores		26.95	S
518066	55-59 Regent Street		55 to 59	Regent Str	333772.0	6249050.0	17.81			C	Various Retail Stores		18.10	S
627845	60-65 Regent Street		60 to 65	Regent Str	333764.0	6249027.0	17.81			C	Various Retail Stores		17.81	S
515495	67-69 Regent Street		67 to 69	Regent Str	333757.0	6249020.0	17.94			C	Various Retail Stores		17.94	S
516920	71-75 Regent Street		71 to 75	Regent Str	333745.0	6249006.0	18.11			C	Various Retail Stores		19.16	S
518418	80 Broughton Street		80	Broughton	32498.2	6249935.8	6.75		S	P(COMMUNITY)	BROUGHTON ST CHILD CARE CENTRE		7.09	S
202206	12 Boundary Street		12	Boundary S	333135.0	6248876.0	13.06	13.06	P					
522340	32 Burton Street		32	Burton Stre	332326.8	6250060.1	6.69	8.38	S					
522341	34 Burton Street		34	Burton Stre	332324.8	6250063.4	7.37	8.82	S					
522022	27 Cardigan Street		27	Cardigan S	332508.5	6249942.3	7.53	7.61	S					
522023	29 Cardigan Street		29	Cardigan S	332500.1	6249936.4	7.01	7.18	S					
522024	31 Cardigan Street		31	Cardigan S	332501.1	6249937.1	7.01	7.18	S					
201521	36-38 George Street		36 to 38	George Str	333780.9	6248550.2	26.51			P	Carpark		26.73	S
514080	47-53 Jones Street		47 to 53	Jones Stre	333146.1	6249954.8	3.12			P	School		4.42	S
521045	42 Lombard Street		42	Lombard S	33261.6	6249961.2	19.41	20.60	S					
612303	1-73 Mount Vernon		1 to 73	Mount Vern	332197.0	6249431.0	24.85	25.17	P		Level Dwelling No.146 Corner St Johns Road and Mt Vernon Lane			
613427	2-8 Wentworth Street		2 to 8	Wentworth	332903.4	6249726.3	3.07	0.47						

Community Consultation Appendix C

Blackwattle Bay Catchment Floodplain Risk Management Study and Plan

August 2013

CITY OF SYDNEY 2030

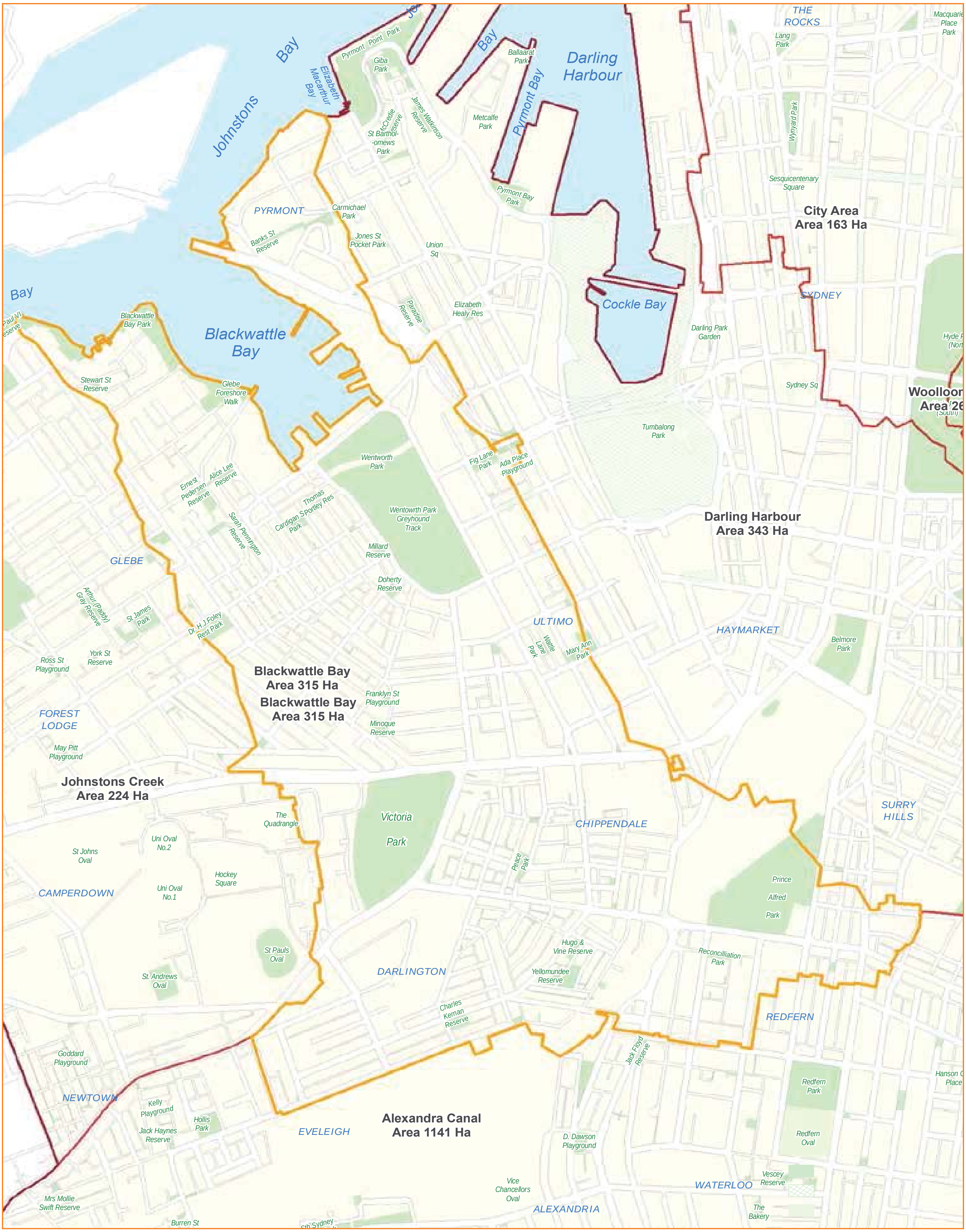
Sydney2030/Green/Global/Connected

The City of Sydney is preparing a Floodplain Risk Management Study and Plan for the Blackwattle Bay catchment area and we would like your help.

The study will tell us about the type of flood mitigation solutions feasible for the catchment and help us plan for and manage any flood risks.

Good management of flood risks can help reduce damage and improve social and economic opportunities.

city of villages



Johnstons Bay
Darling Harbour
Pyrmont Bay
Cockle Bay
Blackwattle Bay
PYRMONT
THE ROCKS
City Area
Area 163 Ha
SYDNEY
Woolloomooloo Area 26
Darling Harbour
Area 343 Ha
GLEBE
ULTIMO
HAYMARKET
FOREST LODGE
Blackwattle Bay
Area 315 Ha
Johnstons Creek
Area 224 Ha
CHIPPENDALE
SURRY HILLS
Victoria Park
CAMPERDOWN
DARLINGTON
REDFERN
NEWTOWN
EVELEIGH
Alexandra Canal
Area 1141 Ha
WATERLOO
ALEXANDRIA
Wentworth Park
Tumbalong Park
Prince Alfred Park
Redfern Park
Belmore Park
Sydney Sq
Darling Park Garden
Sesquicentenary Square

To access the questionnaire online visit

cityofsydney.nsw.gov.au

The City of Sydney has engaged WMAwater to assist with the preparation of the Blackwattle Bay Floodplain Risk Management Study and Plan.

The Blackwattle Bay Flood Study was completed by WMAwater in 2012, giving the City of Sydney a better understanding of the nature of flooding in your area. The next step in the NSW Government Flood Management Process is the preparation of a Floodplain Risk Management Study and Plan. The purpose of this study and plan is to identify and recommend appropriate actions to manage flood risks in theBlackwattle Bay area.

This brochure is an introduction to the Floodplain Risk Management Study and Plan and its objectives.

Stages of the NSW Government Flood Prone Land Policy

1. Formation of a Committee – complete
2. Data Collection – complete
3. Flood Study – complete
4. Floodplain Risk Management Study
5. Floodplain Risk Management Plan
6. Implementation of Plan.

For more information please contact:

WMAwater
Steve Gray
Phone 02 9299 2855
Fax: 02 9262 6208
mailto:gray@wmawater.com.au
gray@wmawater.com.au

Study area and flooding issues

The Blackwattle Bay study area includes parts of Glebe, Ultimo, Pyrmont, Chippendale and Darlington.

Much of the flooding in this catchment occurs due to natural depressions and low points. In the past, flooding has caused property damage and posed a hazard to people and property located near drainage areas. The Floodplain Risk Management Study and Plan currently being undertaken is to manage these flood risks.

Have your say

We want your comments about previous flood experiences and potential mitigation options.

The local knowledge of residents and business operators, including your personal experiences of flooding is a valuable source of information.

The information you provide in the accompanying questionnaire will help the City of Sydney determine how to manage the floods in your area.

For more information about this project, please contact the City of Sydney or WMAwater via the details provided.

Floodplain risk management options

The following list of floodplain risk management options are examples of the type of strategies that could be considered to minimise risk and reduce the impact of flooding in the catchment. These options will be investigated in more detail during the preparation of the Management Study and Plan. There are general categories of options.

Flood modification options.
Examples include:

- Construction of detention/retarding basins to reduce the peak flow downstream;
- Upgrading of drainage systems, upgrade of existing pipes or construction of new pipes; and
- Regrading of roads to provide better overland flowpaths.

Property modification options and planning control.
Examples include:

- Building and development controls,
- Flood-proofing measures, such as flood barriers.

Response modification options.
Examples include:

- Revision of the Local Disaster Plan;
- Public awareness and education – locality-based flooding information for residents;
- Public awareness and education – flooding information for schools;
- Flood depth markers at major (flood-affected) road crossings;
- Continuation of existing public awareness and education campaigns; and
- Data collection strategies for future floods.

Local Resident/Land Owner Survey

The City of Sydney is carrying out a Floodplain Risk Management Study and Plan for the Blackwattle Bay catchment. Please return your completed questionnaire in the reply-paid envelope by Monday 16 September 2013. Or complete the questionnaire online at cityofsydney.nsw.gov.au

1

Please provide the following details as we may contact you to discuss some of the information you have provided us.

Name: .....

Address: .....

Contact phone number:.....

Email: .....

2

What is the best way to contact you?

☐ Letter (post) ☐ Email ☐ Phone

3

How many people regularly live/work on this property?

.....

.....

.....

4

How many of the permanent residents/workers are in age group below:

☐ 0–4 years ☐ 5–14 years ☐ 15–64 years ☐ 65+ years

5

What is the main language spoken at this address?

☐ English

☐ Other (please specify) .....

6

Is your property (please tick)

☐ Owner occupied ☐ Occupied by a tenant ☐ Business

☐ Other (please specify) .....

7

What type of structure is your property/business? (please tick)

☐ Freestanding house.....

☐ Apartment.....

☐ Dual occupancy.....

☐ Industrial.....

☐ Commercial.....

8

How long have you lived, worked at, and/or owned this property?

Years .....

Months .....

9

Have you ever experienced flooding since living and/or working in the Blackwattle Bay catchment? (please tick relevant boxes)

☐ Yes, floodwaters entered my house/business

☐ Yes, floodwaters entered my yard/surrounds of my business

☐ Yes, the road was flooded and I couldn't get to my car

☐ Yes, other parts of my neighbourhood were flooded

☐ No, I haven't experienced flooding

10

Do you have any materials or photos you can provide to evidence the flooding you experienced? If yes, when did this flood occur?

☐ No

☐ Yes – the flooding occurred on: .....

.....

11

As a local resident who may have witnessed flooding/drainage problems, you may have your own ideas about how to reduce flood risks. Which of the following management options would you prefer for the Blackwattle Bay catchment (1=least preferred, 5=most preferred)?

Proposed option	Preference
Stormwater harvesting, such as rainwater tanks — Suggested location/other comments:	1 2 3 4 5
Retarding or detention basins (these temporarily hold water and reduce peak flood flows) — Suggested location/other comments:	1 2 3 4 5
Improved flood flow paths — Suggested location/other comments:	1 2 3 4 5
Culvert/bridge enlarging — Suggested location/other comments:	1 2 3 4 5
Pit and pipe upgrades — Suggested location/other comments:	1 2 3 4 5
Levee banks or flood walls — Suggested location/other comments:	1 2 3 4 5
Strategic planning and flood related development controls — Suggested location/other comments:	1 2 3 4 5
Education of the community, providing greater awareness of potential hazards — Suggested location/other comments:	1 2 3 4 5
Flood forecasting, flood warnings, evacuation planning and emergency response measures — Suggested location/other comments:	1 2 3 4 5

Other (please specify any options you think are suitable):.....

.....

.....

.....

If you have any further comments that relate to the Blackwattle Bay Flood Management Study and Plan, please write them in the space below. Feel free to attach additional pages if necessary.

.....

.....

.....

Glossary

Culvert – a piped drain or covered channel that passes under a road or railroad.

Levee bank/flood wall – an embankment or wall, usually constructed from earth or concrete, built along the banks of a watercourse to help prevent overflow of its waters.

Retarding/detention basin – depression in the land surface that captures and holds stormwater runoff allowing it to slowly drain out of the basin into the adjoining natural drainage line or creek.

Stormwater harvesting – the collection, storage, treatment and use of stormwater run-off from urban areas.

Privacy notice: The information obtained from the survey will be used by staff from the City of Sydney Council and WMAwater only. The information supplied will remain completely confidential.

The Floodplain Risk Management Process

Flood Risk – What Is It?

Flooding occurs when land is inundated with water, often from a river, creek or the ocean. The flood risk of an area is a product of the severity of the flood threat (including its magnitude and likelihood) and the extent of human development in the area. For instance, a section of houses built adjacent to a creek that regularly floods will have a much higher flood risk than a single property in an elevated area.

▶ Properties affected by flooding

▶ Flooding on Sparkes St, Camperdown

Flood Risk - Where is it in NSW?

Flood risk in NSW is spread across the entire state, with nearly all local government areas affected in some form. The threat that flooding poses ranges from coastal inundation to the flooding of creeks and rivers, to surcharge of drainage systems in urban areas

Who has responsibility for managing flooding?

Generally speaking, Councils are responsible for carrying out the management process, with the NSW Government and SES providing assistance where necessary. Consultants with expertise in flooding are commonly engaged by the City to assist in each stage. Council's knowledge of its community, including their flood risk, is combined with a consultant's technical knowledge of flood behaviour and how to manage it, and both are guided by the NSW Government and the SES's policies, which ensures state-wide consistency.

How is flooding planned for?

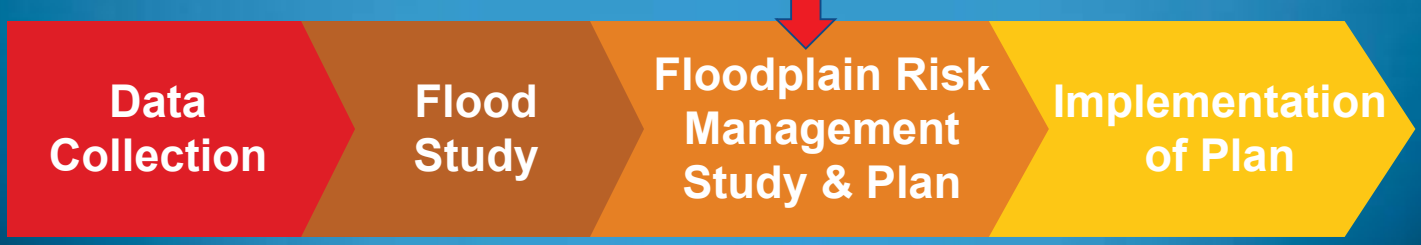
The flood risk in a particular area is managed through the NSW Government's Flood Prone Land Policy, which sets out a multiple stage process for managing flood risk. The process determines the flood behaviour in an area, assesses what impact a possible flood event will have on the area, and then produces a series of recommendations as to how to manage the flood risk. The stages are shown below.

How does the process work?

The process builds a complete picture of flooding in an area (both past and future) and then decides upon a strategy that will best manage the flood risk in the area. The process is cyclical. The last stage, implementing the chosen plan, is followed by a re-assessment of the flood behaviour, the management options, and so on. Flood threat is constantly changing, as uses evolve and the understanding of the lands hydrology grows. A better understanding of the possible impacts of climate change makes re-assessment of flood hydrology more important than ever.

WE ARE HERE

▶ The Floodplain Risk Management Process



Managing the Flood Risk – What Can Be Done?

The Three Types of Measure

The ideal approach to manage flood risk varies greatly between areas, and as such, many measures exist and are currently in use. The measures can be divided into three categories: **Property Modification**, **Response Modification** and **Flood Modification**. The suitability of a particular measure will depend on its benefit to the area, the cost of the measure, its negative impacts, and a range of other factors. A full description of each category is given in the Floodplain Development Manual

▶ **Examples of the three types of measure**

Property Modification Examples	Response Modification Examples	Flood Modification Examples
• House Raising • Flood Proofing • Zoning controls	• Warning System • Evacuation Plan • Education	• Drainage Upgrade • Detention Basins

Property Modification

Property modification measures refer to those that modify an existing property or place a control that limits future development. These measures include voluntary purchase of high risk properties, zoning controls in at-risk areas, house raising, flood proofing and flood access. The measures do not attempt to control the extent of the floodwaters, but rather act to lower the impact of the flood.

▶ **House raising is an example of property modification**

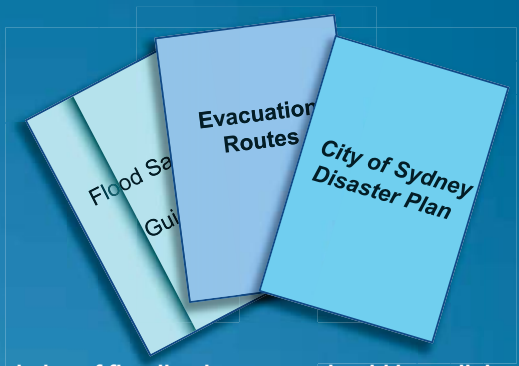
Property modification measures are only effective in some areas. For example, the cost of raising or purchasing a house must be balanced with the monetary benefit of that action. Similarly, house purchasing may be unpopular with landowners who value the location and intrinsic worth of their property.

▶ **Detention basin is an example of flood modification**

▶ **Designating floodways is an important zoning measure**

Response Modification

Response modification measures are those that increase the community's ability to react to floods when they occur. This typically relates to writing or amending plans used in emergency situation. Examples of plans that may be affected are those for flooding warning, the protection of an area, community education and readiness, the relief of evacuees and the post-flood recovery.



▶ **Knowledge of flooding in an area should be well documented**

While response modification measures will not alter the course of floodwaters, they have the advantage of generally being a cost-effective option. Plans such as those mentioned are typically easy to establish relative to other measures, and their benefits are immediate. A community that is well versed in the local flood risk, including their readiness, can minimize the impacts of a flood when it does occur.

Flood Modification

Flood modification measures aim to alter the behaviour of the floodwaters, be it their extent, velocity or height. These can be large scale projects, such as levees or seawalls around towns, or flood mitigation dams, or smaller modifications, such as altering the river channel, installation of sub-surface drainage, or local retarding basins. While they have the ability to re-route or diminish a river's flow, lowering the flood risk for large areas of land, modifying an area's hydrology can be both expensive and ecologically harmful. Furthermore, these structures may lead to a false sense of security, for example, that a levee or dam will protect an area indefinitely when in fact it will always fail once a large enough flood occurs.

Historical floods in Blackwattle Bay and Johnstons Creek catchments