

Drainage Works and Maintenance Policy and Procedures

1. Purpose

The purpose of this document is to identify a Council policy and set of procedures for the maintenance of Council's drainage system.

2. Objectives

The objectives of the Policy are to:

- To provide a rational basis for ranking projects based on the limited amount of funding available in Council's capital works budget and drainage reserves.
- To limit Council's liability against potential claims based on priorities and limited resources.
- To efficiently allocate available funding and resources for the maintenance of existing drainage systems.
- To develop a priority for repairs.
- To minimise the ongoing maintenance problems by using effective repair treatments.
- To develop procedures for the reporting of information on flooding incidences and advice to residents.
- To develop a system for recording and reporting on the condition of Council's drainage systems.

3. Issues

The main concern with Council's existing drainage system is there are capacity deficiencies in the network that require significant funding to bring the network up to a design standard of 1 in 20 year storm events.

Analysis of the existing drainage system for both the Middle Harbour and Cowan Creek catchments have been carried out by consultants. Their findings have been presented in

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1.0	9/11/2004	New policy			
1.1	11/6/2013	Add. measure for rating/street sweeping change/prioritisation tables			

reports together with a ranking system for future capital works programs.

Whilst on site detention systems have been installed in new developments for the previous 10 years, this is not sufficient to cater for the existing deficiencies in the public drainage network.

Given that significant funding is required to bring the drainage system up to a design standard of 1 in 20 year storm events, future works need to be prioritised based on available funding in the capital works program and drainage reserve.

Council has collected information from residents on flooding reports since 1976. Some of this information has been investigated to determine whether it has been a capacity problem or a maintenance issue.

Council engaged two (2) consultants to undertake catchment analysis for the Middle Harbour and Cowan Creek catchments. The purpose of the analysis was to determine those areas which have the highest flooding impact on properties and public safety. The highest priority areas were then ranked against the ranking criteria as indicated in this policy. This information is then being compared with the reported data to determine the validity of the reported data.

Whilst the financial accounting standards require Councils to determine the condition of the existing drainage system, the condition rating does not assist in determining the capacity deficiencies and hence to repair or replace existing pipes that are deficient in capacity would not resolve any drainage issues.

4. Ranking Criteria

Following the catchment analysis, a number of factors needed to be taken into account when developing ranking criteria for all works identified from the catchment analysis and correlation with the reported flooding data.

The following criteria were established and weighted to assist in determining those projects of high importance and to assist in providing advice to residents on the relative priority of works:

i. Severity of the flooding problem (risk to Council)

This criterion uses the information from the catchment analysis and determines a score based on the flow rates, depth of flooding and the number of properties affected. This criterion was considered to be the most important and therefore given the highest weighting.

ii. Cost and effectiveness of the proposed solution

This relates to the cost of the proposed works based on a preliminary concept and design to determine the effectiveness and the benefits of the project. Some small cost projects can therefore have the highest benefit and be implemented relatively quickly and efficiently. Whereas, projects that have a high cost and have

construction difficulties would score lower. The weighting for this criterion ranges from high to medium.

iii. Relative sensitivity of area.

This criterion relates to the location of community facilities or properties taking into account the potential for property damage and the impact flooding would have on those properties.

iv. Other Factors

This relates to water quality, opportunities for incorporating other projects and obtaining external funding.

Attachment 1 is the proposed prioritisation scheme for stormwater projects.

5. DRAINAGE MAINTENANCE

Drainage maintenance is carried out on a programmed and reactive basis.

Sweeping of streets are undertaken by Contract which specify:

- Cleaning of kerbed roads to be monthly.
- Cleaning of un-kerbed road gutters to be every second month.
- Cleaning of footpath areas is to be twice per week for each precinct as nominated in the schedule with a minimum of three (3) days between each clean.

Roads are swept using the mechanical sweepers to reduce the amount of material and litter going into the drainage system.

Cleaning of gross pollutant traps is undertaken by contract on a six (6) monthly cycle.

Included in the appendix, is a list of known problem drainage sites. These sites require maintenance on a programmed cycle and are currently maintained three (3) times per year. Other sites are cleaned on request following resident complaints.

Procedure for regular drainage inspections.

- A. Inspect and return to Group Co-ordinator Civil Maintenance with date inspection against each location.
- B. Ensure all material is removed from each site.
- C. Where watercourses are listed, the channel is to be inspected for a distance of at least 150 metres upstream or pipe inlets/culverts if the channel comes from a reserve. In other cases, the work should be to the next street upstream. Clearing will usually involve the removal of logs, fallen timber and other debris that could wash downstream during heavy rains and cause blockage of the inlets to culverts and pipes.

Refer to **Attachment 2** for list of identified locations.

ATTACHMENT 1

Table 1 - PROPOSED PRIORITISATION SCHEME FOR STORMWATER PROJECTS

CRITERIA	SCORING CRITERIA				IMPORTANCE WEIGHTING
1. Severity of the "Problem" (i.e. risk to Council)					
Severity	Adopted score = Highest score from the three columns				Critical (1.0)
	Score	5 year ARI Flow (m ³ /s)	Equivalent Properties Affected ¹	Depth of Flooding (1) (m)	
	1	<1.0	0	Na	
	2	1.0 to 2.0	0	Na	
	3	2.0 to 5.0	<1.0	>0.8	
	4	5.0 to 10.0	1.0 – 3.0	>1.0	
	5	>10.0	>3.0	>1.5	
2. Cost of Proposed Solution					
Overall Cost (refer to table 2)	Score	Factors			High (0.8)
	1	\$100,000 or more			
	5 to 1	Prorata : [5 - Estimated cost/\$100,000*4]			
3. Effectiveness of Proposed Solution					
Ease of Implementation	Score	Factors			Medium (0.4)
	1	Site on private land with no machinery access			
	2	Site on public land with no machinery access			
	3	Site on private land with good access			
	4	Site on major road with services likely to be in the locality			
5	Site on public land with easy machinery access				
4. Relative Sensitivity of Area of Flooding Impact (not scored)					
	Separate column for each factor (Y= present)				N/a
	Hospital/Nursing Home ; School ; Residential ; Commercial				
5. Other Factors (not scored)					
	Separate column for each factor (Y= present)				N/a
	Opportunity for water quality improvement as part of project				
	Additional benefits possible(eg sports field irrigation)				
	Opportunity for additional/outside funding for project.				

1. Equivalent Property = Dwellings with reported habitable flooding + reported garage flooding x 0.3 + reported garden flooding x 0.1

Table 2 – COSTING TABLE

Overall Cost = Estimated Cost + Contingency allowance		
Contingency allowance	Cost Multiplier	Level of technical analysis for preparation of cost estimate
	0.5	Desk top analysis
	0.7	Desk top analysis + site inspection
	1.0	Detailed investigation and design

Table 3 – COST BENEFIT RATIO

Ratio	CB Ratio = (Overall Cost/10,000) / 20yr ARI flow
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ATTACHMENT 2 – List of identified maintenance locations

STREET NAME	DESCRIPTION
Pymble Avenue	Clear pit outside No. 26.
St Andrews Drive	Clean inlets and culvert.
Womerah Street	a) Clear all pits in street b) Sag in vicinity of No. 13 pits
Terrigal Avenue	Clear all pits in street
Wambool Street	Open channel through Nos. 7 and 9.
19 Jersey Street and also opposite	Clear sag pit at 19 and 3 gully pits Opposite 19 clear debris on rollover kerb 20m each side of the pits.
Turrumurra Plaza	Clear silt pit/pond in reserve at rear of Plaza.
Catalpa Crescent	Clear all pits in street.
24 Duff Street	Clear pit.
Holmes Street	a) No. 64 clear debris arrestor b) Open Channel towards Duff St. c) Open channel in reserve.
The Comenarra Parkway	Clear drainage pits both sides of the road in the sag of the road between Howson Avenue and Hicks Avenue.
Kissing Point Road and Benning Avenue.	Clean drain inlet to pipeline.
Monteith Street	a) Clear all pits in street b) Open channel from culvert to Holmes Street.
Rothwell Road	From culvert near Montrose Street to Monteith Street.
Cooper Crescent	Creek between two pavements of road and upstream of culvert under Cooper Crescent.
Marshall Avenue	Clear all pits in street.
Ada Avenue	a) Clear all pits in street. b) Drop pit in the rear of No. 94.
8 Campbell Drive	Clear drainage pits both sides of the road and also check the pipe headwall for obstructions within 1 Campbell Drive.
61 Campbell Drive	Clear drainage pits both sides of the road.
The Glade Oval Tennis Courts	Ensure pipe under pathway to Koora Avenue is clear and remove all materials from creek for 50 metres upstream, which has the potential to block the pipe.
Lucinda Avenue	a) Inspect all pipes and pipelines within road reserve including pipe crossings from Campbell Drive to end. b) No. 145 – Check pit located between driveway and roadway. c) Clear watercourse of obstructions.
Borambil Street	Clear pit near entrance to Knox.

STREET NAME	DESCRIPTION
7 Illoura Avenue in Illoura Lane	Clear pipe headwall opening to pit.
23 Illoura Avenue in Illoura Lane	Clear pipe headwall opening.
Drainage reserve – 3 Cleveland – rear of 15 Millewa Avenue	Clear dish drain and 300mm pipe headwall.
Wahroonga car park	Pit at rear of 20-22 Railway Avenue
Crescent Close	Clear all pits in street
Coonanbarra Road and Boundary Road	Clear silt pond
Water Street	No. 17 clear pits and gutters of leaves and debris. Removal all leaf material from nature strips. Inspect all other pits in street.
Billyard Avenue	Inspect pipe inlet at Mona Street intersection and creek upstream. Clear debris arrestor.
Burns Road	Grosvenor Street to Eastern Road.
Boundary Road Wahroonga	Clear pit at corner of Wyeena Close.
Kintore Street	Debris arrestor at rear Nos. 64/66.
Huon Street	Clear 5 metre deep pit at rear of public reserve adjacent to No. 14 Huon Street Wahroonga.
Finchley Place rear No. 10 and 12	Clean grated trench pit in road and silt pond in rear of properties.
Lovers Jump Creek (Burns Road)	Culvert inlet upstream of Burns Road. Do not enter No. 155.
Burns Road	Carry out a thorough inspection of the full length of Lovers Jump Creek upstream of Burns Road to identify and remove debris and any other matter which has the potential to be washed down the creek and lodge on No. 155 Burns Road and/or block the Burns Road culvert. (Note: Mrs Bullen to be present when this work is carried out within No. 155 Burns Road).
Du Faur Street	Inspect upstream pit (behind No. 12 in retention basin. Endure 300 mm pipe outlet from pit is clear).
Katina Street	Clear all pits in street.
The Chase Road	Culvert at Katina Street. Remove material at upstream end, particularly against central wall of culvert.
Corner of Rohini Street and Olive Lane	Clear open channel to pipe headwall.
Rawson Crescent	Outside No. 3 inspect pit in sag. Check all others pits/crossings in street.
Merrivale Lane	Inspect and clear all debris from pits in the vicinity of No. 111.
Rear of 66 Dalton Road.	Clear letterbox pit. Check open channel upstream of letterbox pit.
Leonora Avenue	Open all pits in cul-de-sac and along the pathway to Mawson

STREET NAME	DESCRIPTION
	Street to check for blockage or any other impediment to free flow of the system.
Roma Road, St Ives	Check Taylor Crossing at No. 28
Timbarra Road rear No. 60	Clean silt pond
16 Timbarra Road	Drain into reserve
Stanley Street	Outside No. 24 S.W.D. inlet
Cassandra Avenue	Check the pipe headwall and the drainage it in 10 Cassandra Avenue for blockage or any other impediment to free flow. Also check all road drainage pits from No. 10 through to Nos.
27 Stanley	Check low level footpath drainage for blockages frontage of 33, 31 and 27. In addition, check road drainage pits adjacent to 27 and 25.
17 Hunter Avenue	Open all pits along the frontage and check for blockages or any other impediment to free flow of the system.
Richard Road	Open channel towards Stanley Street
Lynbara Avenue	Open channel in reserve to pipeline from Richard Road.
Rosedale Road	Clear pit corner Mona Vale Road adjacent to War Memorial Park.
213 Mona Vale Road to Stanley Street	Check low level footpath drainage fro blockages or any other impediment to free flow of the system.
Bristol Avenue	Open channel upstream of pipeline.
Bolton Place	Open channel from culvert under Rosedale Road to large water main across gully.
Woodlands Avenue	No. 9 pits in sag.
Kulgoa Road	Clear pit/ponds in Richmond park – Opposite No. 2 Kulgoa Road.
Hope Street	a) Clear debris arrestor frontage 15A. b) Clear E.K.I. pits in sags particularly at 22. c) Clear pipe headwall rear property boundary at 18 and adjoining 23A Orana Avenue.
Fern Street	Debris at culvert and check channel upstream for full length of property No. 14.
12 King Edward St	Clear low level footpath pit. Locate at the end of the Agapanthus garden adjacent to the footpath and driveway.
Rosedale Road	Debris arrestor upstream of culvert in sag between Baldwin Street and Sage Street.
Between 17-19 Waugoola Street	Clear pollution filters. List type of material removed.
Rosedale Road Bridge	Clear all scuppers along each side of bridge.
End Edward Street	Clear pollution filters. List type of material removed.
Illeroy Avenue	Pipe inlet under road in adjacent drainage reserve.

STREET NAME	DESCRIPTION
Wattle Street	Open channels upstream of culvert.
Jindalee Place	Clear silt pond at end of street.
11 Springdale Road	Check low level footpath drainage and street drainage adjacent to 9 and 11 Springdale Road for obstructions.
Stanhope Road	Nos. 17 and 14. All kerb and footpath pits and pipeline through No. 15 to Killara Avenue.
Tryon Road	To Howard Street.
7 Gerald Avenue	Check street drainage pits adjacent to 7 Gerald Avenue and the drainage pit at the rear boundary for obstructions.
Sydney Road	Clear pit cnr Woodlands Road.
Namoi Place	Clear silt pit/ponds in Reserve below No. 10.
Cnr Archbold Road and Roseville Avenue – Little Digger Park	Clear trash rack. Check volume %C.D.S. unit.
Archbold Road and No. 89 Roseville Avenue	Clear open channel (Moores Creek).
7 Allard Avenue	Two drop pits at rear of property.
Duntroon Avenue	Clear low level footpath drain on southern side from Moore Avenue to No. 7. Flush pipe under drives No. 7 and 9.
Maclaurin parade	Clear all pits in vicinity of intersection, particularly uphill of Pockley Avenue.
2/7 Nola Road	Clear drainage pit at end of open channel under suspended concrete driveway.
Sixth Mile Lane	Ensure gutter is free of silt and debris build up in sag adjacent to the property "Marlowe".
Bromborough Road	Clear all pits in street.
Carpark rear 4 Bent Street outside double gates and garage door off Woodford Lane.	Clear open drain pipe crossing and drainage pit.
Coronga Crescent	Clear all pits in street.
39 Primula Street	Clear all pits in street.
Polding Road	Open channel upstream of culvert.
Cocupara Avenue	Open channel upstream of culvert.
Blaxland Road	Clean "gross pollutant trap" at pipe outlet adjacent to 1 Blaxland.
Ellsmore Avenue	Clear all pits in street
Grassmere Road	Clear all pits in street
Buckingham Road	a) Clear all pits in street b) Taylor crossings and pits

STREET NAME	DESCRIPTION
Norfolk Street	Clear pit outside 2 Mildura Street
Warwick Street	Clear all pits in street
Maitland Street	Clear all pits in street
Ridgeland Avenue	Clear all pits in street
Highbridge Road	Clear all pits in street
St Johns Avenue rear No. 126	Clean 2 silt ponds
Doyle Place rear No. 7	Clean silt pond
Boundary of 12 Vale Street and 67 Dumaresq Street Gordon	Clear debris arrestor
Prince of Wales Drive	Clear pipe cage outlet of obstructions adjacent Pymble Bowling Club and the rear of Norman Griffith Oval.
Yanko Road	Inspect the sag pit adjacent to the driveway of No. 108 and remove any debris. Also check outlet of twin 450 dia. pipes in creek and remove any material that may cause obstruction.
Phillip Mall	Clear footpath drainage system above shop 20. Ensure the path above the surface drain is clear of silt and debris build up.
Warrabri Place, West Pymble	Clear all pits in the vicinity of No. 17.
Doncaster Avenue	Clear inlet to twin pipes under road between Coventry Place and Wyomee Avenue.
Wallalong Crescent	Silt pit/pond opposite Diana Avenue.
Hillary Street	Clear silt pit/pond along channel at rear 22 and 19. Also pit at frontage 19-22.
Ryde Road	Inspect all pits and pipelines on approach to De Burgh's Bridge. Clear as necessary (see attached sketch).
No. 31 Pearson Avenue	Clear open channel at No. 31.
Benning Avenue	Clear debris arrestor.