



ASSET MANAGEMENT PLAN

North Sydney Council
Other Infrastructure Asset Class



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1.0 Executive Summary

This Asset Management Plan (AMP) covers the Other Infrastructure Asset Class as defined in Council's Asset Management Strategy, which includes Fences, Lighting, Marine Structures, Retaining Walls, and Seawalls. This Asset Management Plan outlines the required actions to maintain the current level of service in the most cost-effective manner while outlining associated risks within each of the asset classes. The scope and value of this Asset Class is shown in the Table below:

Table: Scope and Replacement Cost of Other Infrastructure Asset Class by Asset Category (\$2024)

Other Infrastructure Asset Class		
Asset Category	Scope	Replacement Cost (2024)
Fences	44.4km fences, 2,618 bollards	\$35,222,780
Lighting	1,874 assets	\$22,943,070
Marine Structures	44 assets	\$32,160,622
Retaining Walls	25km	\$95,950,616
Seawalls	4.9km	\$117,639,337
	TOTAL	\$303,916,424

All assets within the Other Infrastructure Class in North Sydney provide a vital service to the local community. Fences provide a protective barrier. Lighting provides safety at night. Marine Structures provide access to the foreshore. Retaining Walls provide structural support. Seawalls provide environmental protection of the foreshore.

The North Sydney LGA covers 10.5 square kilometres or 1049 hectares. Many of Council's assets in North Sydney were originally built from 1880 onwards. Further development and subdivisions increased significantly with the opening of the Sydney Harbour Bridge in 1932 and continued after World War 2. It was during this development period that much of the infrastructure in North Sydney was originally built. Therefore, North Sydney faces the continual challenge of maintaining a large portfolio of aging road infrastructure.

The Table below shows that the current cost to bring all Council's Other Infrastructure assets to a satisfactory standard is \$11.0M. This amount includes the cost to replace existing infrastructure currently in either poor or very poor condition (condition 4 or 5). This represents 3.6% of the Other Infrastructure network in terms of Replacement Cost. This means that 96.4% of this portfolio is in very good to fair condition (1 to 3).

The Table also shows that the total current Depreciation Expense is \$4.1M or 1.3% of the Total Replacement Cost of Council's assets. This assumes that all Council's assets are completely replaced every 74.2 years on average.

The Table shows that the 10-year Long Term Cost to bring all Council's infrastructure assets to a satisfactory standard as well as maintain the current standard is \$51.9M over 10 years or an average annual cost of \$5.2M. This includes the total Depreciation Expense over 10 years (maintaining the existing standard) and assumes that all condition 4 and 5 assets will be replaced over the next 10 years (bringing all assets to a satisfactory condition).

Table: Long Term Infrastructure Funding Required (\$2024)

Asset Category	Cost to bring to assets to satisfactory Cond. (4 + 5)	Total replacement cost	Depreciation Expense (2024)	Funding required over 10 years (Depreciation x 10 + Cond 4 + 5)	Average Annual Funding Required (2024)
Other Infrastructure / Fences	\$676,740	\$35,222,780	\$848,952	\$9,166,256	\$916,626
Other Infrastructure / Lighting	\$4,452,413	\$22,943,070	\$716,983	\$11,622,246	\$1,162,225
Other Infrastructure / Marine Structures	\$184,001	\$32,160,622	\$408,304	\$4,267,046	\$426,705
Other Infrastructure / Retaining Walls	\$3,956,730	\$95,950,616	\$1,059,706	\$14,553,785	\$1,455,379
Other Infrastructure / Seawalls	\$1,731,380	\$117,639,337	\$1,059,698	\$12,328,361	\$1,232,836
TOTAL	\$11,001,264	\$303,916,424	\$4,093,643	\$51,937,694	\$5,193,769

The allocation in the current forecast capital budget (as at 30 June 2024) is insufficient to continue providing existing services at current levels for the planning period.

The main service consequences of the current forecast capital budget are:

- Assets progressively deteriorating over time
- Increasing asset failures and potential closures
 - Service levels not fully meeting the needs of users
 - Increased capital costs due to cost escalation.

2.0 Asset Description

2.1 Asset Description – Fences

As shown in the Table below the Fences network mainly comprises of:

- Ordinance Fence = 28.4%
- Safety Fence - Steel Post & Cable = 18.1%

Fence Type	Quantity	Replacement Cost (2024)	% of the Network
Armco Guardrail	97	\$2,478,269	7.0%
Bicentennial Fence	4	\$2,199,246	6.2%
Boom Gate	1	\$13,757	0.0%
Collapsible	5	\$6,018	0.0%
Concrete Post and Chain Wire Fence	15	\$415,185	1.2%
Concrete Post and Rail Fence	62	\$520,690	1.5%
Concrete Road Barrier	5	\$119,801	0.3%
Decorative	560	\$618,342	1.8%

Fence Type	Quantity	Replacement Cost (2024)	% of the Network
Galvanised Post and Chain Wire Fence	111	\$2,372,713	6.7%
Galvanised Post and Rail Fence	119	\$920,505	2.6%
Gate Post	1	\$1,030	0.0%
Handrail Stainless Steel	77	\$281,265	0.8%
Handrail Steel	397	\$1,637,567	4.6%
Holding Rail	173	\$112,477	0.3%
Log Fence	44	\$38,254	0.1%
Ordinance Fence	978	\$10,020,764	28.4%
Other	20	\$68,168	0.2%
Pedestrian - Double	6	\$19,930	0.1%
Pedestrian - Single	74	\$65,518	0.2%
Picket Fence - Metal	102	\$564,903	1.6%
Picket Fence - Timber	36	\$283,457	0.8%
Removable	116	\$139,623	0.4%
RTA Pedestrian Fence	175	\$1,305,317	3.7%
Safety Fence - Galvanised Post & Rail on Concrete	20	\$2,275,239	6.5%
Safety Fence - Steel Post & Cable	35	\$6,378,106	18.1%
Special - Post and Rail Fence with Glass	1	\$20,472	0.1%
Special - Post and Rail Fence with Glass Panels	9	\$114,719	0.3%
Steel Post and Chain Fence	5	\$23,971	0.1%
Structural	1,772	\$1,956,610	5.6%
Timber Post and Chain Fence	2	\$14,453	0.0%
Timber Post and Rope	1	\$15,235	0.0%
Vehicle - Double	17	\$113,357	0.3%
Vehicle - Single	23	\$107,819	0.3%
Grand Total	5,063	\$35,222,780	100.0%

2.2 Asset Description – Lighting

As shown in the Table below the Lighting network mainly comprises of:

- Multi-function pole = 55.7%

Lighting Types	Quantity	Replacement Cost (2024)	% of the Network
4-unit battery pole green coated	5	\$26,018	0.1%
Awning Light - Elizabeth Plaza	8	\$21,102	0.1%
Banner Pole	33	\$249,838	1.1%
Bega Graphite finish 4.5 meters 100mm O/D straight pole with access door	2	\$19,553	0.1%
Bollard	68	\$353,039	1.5%
Brick Light	34	\$61,661	0.3%
Burton St Tunnel	1	\$233,088	1.0%
Bus Stop	58	\$70,943	0.3%
Cammeraygal PI Artwork	5	\$38,764	0.2%

Lighting Types	Quantity	Replacement Cost (2024)	% of the Network
Catenary Light - Elizabeth Plaza	1	\$150,247	0.7%
Decorative Fin Light - Brett Whiteley Place	2	\$20,253	0.1%
Decorative Seating Light - Brett Whiteley Place	11	\$63,080	0.3%
Down Light - Elizabeth Plaza	6	\$5,068	0.0%
Eclipse Light Pole	5	\$48,884	0.2%
Fairy Lights (multiple luminaires)	6	\$175,920	0.8%
Flexible Linear Led Strip Mounted with U Clips on Corten Walls	3	\$17,692	0.1%
Fountain Light - Brett Whiteley Place	3	\$163,409	0.7%
GM Poles 4.5M 90MM Pipe Pole Galvanised Steel	8	\$60,210	0.3%
GM Poles 5.0M 90MM Pipe Pole Galvanised Steel	16	\$158,960	0.7%
GM Poles PP-90-4.0 4M 90MM Pipe Pole c/w Marine Grade Powder Coat	19	\$185,757	0.8%
Handrail Light	13	\$12,732	0.1%
Handrail Light - Bob Gordon Reserve	35	\$32,933	0.1%
Handrail Light - Brett Whiteley Place/ Elizabeth Plaza	15	\$28,837	0.1%
Hexagonal Vic Pole Spaceship	76	\$743,030	3.2%
Inground Strip Light - Elizabeth Plaza	26	\$145,667	0.6%
Inground Strip Light - Grosvenor Lane	16	\$86,170	0.4%
Inground Uplight - Bradfield Plaza	42	\$91,326	0.4%
Inground Uplight - Brett Whiteley Place	22	\$47,837	0.2%
Inground Uplight Small	112	\$243,535	1.1%
Interpol Metal pole	49	\$479,059	2.1%
Lantern only special	2	\$8,797	0.0%
LED Recessed Linear LED Wall Grazer Mounted	5	\$29,487	0.1%
LED Spotlight with Glare Shield Mounted on Tapered Round Pole	1	\$9,777	0.0%
Memorial	4	\$52,776	0.2%
Metal Pole Ball	68	\$664,816	2.9%
Metal Pole Other	16	\$156,427	0.7%
Multi-Function Pole	312	\$12,769,782	55.7%
Pedestrian Ceiling Light	4	\$4,980	0.0%
Projector	7	\$92,358	0.4%
Shelter Light	5	\$5,494	0.0%
Shop Light - Elizabeth Plaza	3	\$7,913	0.0%
Sign Light	2	\$8,797	0.0%
Small Pedestrian Light	15	\$32,989	0.1%
Sportsfield	7	\$373,092	1.6%
Stair Light - Brett Whiteley Place	5	\$4,553	0.0%
Stair Light - Mitchell Street Plaza	10	\$31,394	0.1%
Stair Light only	9	\$8,196	0.0%
Straight Round 140mm Diameter Pole	10	\$97,767	0.4%
Tapered Octagonal Column	29	\$315,088	1.4%
Tapered Round Pole	28	\$259,928	1.1%
Taperline Pole Gooseneck Double	119	\$1,163,428	5.1%
Taperline Pole Gooseneck Single	41	\$400,845	1.7%

Lighting Types	Quantity	Replacement Cost (2024)	% of the Network
Totem Light Pole (Cluster)	7	\$103,700	0.5%
Under Awning Light - Recessed	53	\$211,577	0.9%
Under Awning Light - Surface Mount	299	\$1,193,615	5.2%
Under seat lighting - Miller Street Forecourt	6	\$35,384	0.2%
Vent Light only	9	\$19,793	0.1%
Vic Poles - 4.0m Tapered Base Octagonal	36	\$351,962	1.5%
Vic Poles - 4.6m Tapered Base Octagonal	23	\$224,864	1.0%
Vic Poles - 8.0m Road Light Pole	2	\$21,688	0.1%
VICPOLE Galvanised Steel	2	\$19,553	0.1%
Wall Mounted Light	21	\$200,148	0.9%
Wall mounted light - lane Parraween carpark	14	\$27,487	0.1%
Grand Total	1,874	\$22,943,070	100.0%

2.3 Asset Description – Marine Structures

As shown in the Table below the Marine Structures network mainly comprises of:

- Wharf/Jetty = 80.6%

Marine Structure Types	Quantity	Replacement Cost (2024)	% of the Network
Boardwalk	2	\$1,782,533	5.5%
Boardwalk/Bridge	1	\$420,068	1.3%
Boat Ramp	5	\$1,054,323	3.3%
Bridge	2	\$310,035	1.0%
Bridge/Boardwalk	1	\$73,042	0.2%
Decking	1	\$94,955	0.3%
Dinghy Storage	17	\$406,975	1.3%
Floating pontoon and access way	1	\$95,974	0.3%
Jetty	1	\$403,644	1.3%
Jetty/Wharf	1	\$798,085	2.5%
Kayak Storage	5	\$76,017	0.2%
Sandstone Jetty	1	\$136,219	0.4%
Shed	1	\$68,109	0.2%
Slipway	1	\$0	0.0%
Stairway and Jetty	1	\$145,951	0.5%
Tunks Park, Pontoon, Access & Jetty	1	\$382,013	1.2%
Wharf/Jetty	2	\$25,912,678	80.6%
Grand Total	44	\$32,160,622	100.0%

2.4 Asset Description – Retaining Walls

As shown in the Table below the Retaining Walls network mainly comprises of:

- Block Wall = 51.5%
- Stone Pitching - Mortar packed = 21.9%
- Reinforced Concrete = 14.0%

Retaining Wall Types	Quantity	Length (m)	Replacement Cost (2024)	% of the Network
Block Wall	433	12,756	\$49,380,389	51.5%
Block Wall - Quality facing	6	100	\$307,620	0.3%
Block Wall & Natural Rock	4	333	\$1,492,145	1.6%
Boulder	4	101	\$101,813	0.1%
Brick Wall	10	117	\$235,722	0.2%
Brick Wall - no mortar	1	12	\$734	0.0%
Brick Wall - rendered finish	1	2	\$3,221	0.0%
Crib Wall	3	122	\$482,699	0.5%
Crib Wall - Block wall each end	2	44	\$111,987	0.1%
Gabion Wall	2	28	\$415,028	0.4%
Gravity Block	13	559	\$1,564,549	1.6%
Interlocking brick	1	15	\$42,048	0.0%
Log Wall	3	31	\$15,641	0.0%
Mass Concrete	4	179	\$1,290,973	1.3%
Natural Sandstone Wall	7	229	\$776,930	0.8%
Reinforced Concrete	39	1,870	\$13,449,830	14.0%
Reinforced Concrete - Battered slope	3	24	\$35,517	0.0%
Reinforced Concrete - Rendered finish	2	93	\$468,965	0.5%
Reinforced Concrete - Sandstone capping	3	70	\$243,086	0.3%
Shot-crete to Natural rock	4	68	\$170,174	0.2%
Sleeper	13	128	\$27,312	0.0%
Sleeper - freestanding	1	7	\$2,591	0.0%
Stone Pitching - Battered slope	1	23	\$33,381	0.0%
Stone Pitching - Dry packed	66	1,041	\$1,650,057	1.7%
Stone Pitching - Mortar packed	308	6,432	\$21,021,402	21.9%
Stone Pitching - Mortar packed - Battered slope	2	92	\$178,578	0.2%
Stone Pitching - Mortar Packed - Composite	2	11	\$20,671	0.0%
Stone Pitching - Mortar Packed - Rendered Finish	7	247	\$921,589	1.0%
Unknown	9	361	\$1,505,962	1.6%
Grand Total	954	25,092	\$95,950,616	100.0%

2.5 Asset Description – Seawalls

As shown in the Table below the Seawalls network mainly comprises of:

- Sandstone and Concrete = 46.2%
- Sandstone = 42.3%

Seawall Types	Quantity	Replacement Cost (2024)	% of the Network
Concrete	6	\$3,361,092	2.9%
Concrete and Others	2	\$10,170,676	8.6%
Sandstone	23	\$49,772,696	42.3%
Sandstone and Concrete	11	\$54,334,872	46.2%
Grand Total	42	\$117,639,337	100.0%

3.0 Levels of Service

Technical service measures are linked to the activities and annual budgets covering:

- Operations – the regular activities to provide services (e.g. cleansing, inspections, etc).
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. footpath repair – patching, minor works),
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. footpath replacement and or footpath reconstruction),
- Upgrade – the activities to provide a higher level of service (e.g. widening a footpath or replacing an existing footpath with a different type as per Public Domain Style Manual).
- New - the activities to provide an additional level of service (e.g. constructing a footpath where none previously existed).

The Table below shows the technical levels of service expected to be provided for the Other Infrastructure Asset Class infrastructure assets. The ‘Desired’ position in the Table documents the position being recommended in this Asset Management Plan

Table: Other Infrastructure Asset Class – Technical Levels of Service

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance	Desired for Optimum Lifecycle Cost
Operations	Undertake network inspections to monitor condition	Network inspections to monitor condition	<ul style="list-style-type: none"> Fences (2023) Lighting (2023) Marine Structures (2023) Retaining Walls (2023) Seawalls (2023) 	Network inspected every 5 years
Maintenance	Reactive service Requests completed in a timely manner or made safe.	Respond to complaints.	Minor repairs undertaken in accordance with Maintenance Management System	Minor repairs undertaken in accordance with Maintenance Management Delivery System.
Renewal	Maintain existing assets to a satisfactory condition	Percentage of assets in ‘poor’ or ‘very poor’ (4, 5) Condition.	<ul style="list-style-type: none"> Fences (1.9%) Lighting (19.4%) Marine Structures 0.6% Retaining Walls (4.1%) Seawalls (1.5%) 	Improve
Upgrade	Assets meet the standard of the	Number of assets meet the standard	When assets are renewed, they are	When assets are renewed, they are

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance	Desired for Optimum Lifecycle Cost
	Public Domain Style Manual.	of the Public Domain Style Manual.	replaced with assets that meet the standard of the Public Domain Style Manual.	replaced with assets that meet the standard of the Public Domain Style Manual.
New	Satisfactory provision of assets.	New assets provided subject to needs, physical constraints, demand, and cost.	Provision of new assets assessed as required subject to needs, physical constraints, demand, and cost.	Provision of new assets assessed as required subject to needs, physical constraints, demand, and cost.

3.1 Future Demand

Drivers affecting demand for Fences, Lighting, Marine Structures, Retaining Walls, and Seawalls include things such as population change, regulation changes, new development, community expectations, public safety, technological changes, economic factors, climate change, and environmental factors. As North Sydney is a “brown field” site most capital projects are either renewal or upgrade to meet Public Domain Style Manual. Generally, no new assets are built. The provision of new assets is assessed as required subject to needs, physical constraints, demand, and cost. There is an anticipated population increase due to increasing medium to high density developments, rezoning of land by the State Government and demand for active transport. This will have significant implications on demand for these assets.

The number of Public Lighting assets is expected to increase into the future. This is due to the following factors:

- When several lights in an area require replacing, additional lights are often required to meet current standards.
- Replacing Ausgrid lights as part of CBD upgrades (note that whilst Ausgrid lights are owned by Ausgrid however they are funded by council).
- There are 124 Ausgrid “decorative” light poles. Ausgrid have a Policy of not replacing these assets and no longer store any parts. These will need to be replaced and owned by council.
- Assets constructed by Property developers

4.0 Asset Condition

4.1 Asset Condition – Fences

The condition of Council’s Fence network was surveyed in 2023 by Consultants, Rapid Map Services Pty Ltd in conjunction with Asset & Facilities Management Consulting Pty Ltd. The following condition criteria was used.

Table: Fences Condition Survey Criteria

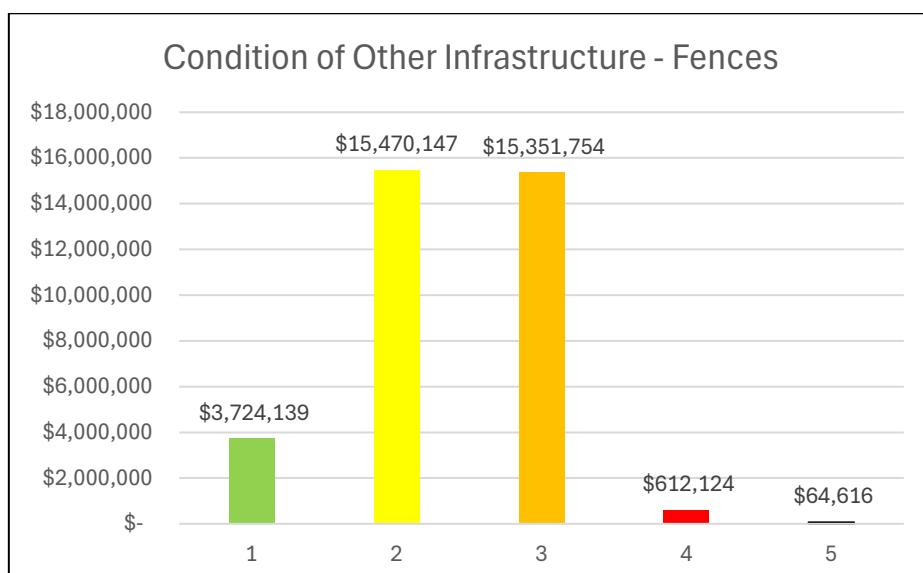
Grade	Condition	Description
1	Very Good	Sound fence or bollard designed to current standards and well maintained with no defects. No work required
2	Good	As grade 1 but not designed to current standards or showing minor wear, tear, and deterioration of surfaces e.g. rust – corrosion and weathering, but no undermining of fence / bollard structure. Needs to be reinspected in 2-3 years. Deterioration has no significant impact on stability and appearance of the fence / bollard. Only minor work required
3	Fair	Fence / bollard functionally sound, but appearance affected by minor defects e.g. loose straps, surface weathering, warping and or minor loss of stability, isolated undermining of fence / bollard foundations, but no overall loss of stability. Some deterioration beginning to be reflected in stability and appearance of fence / bollard. Some work required
4	Poor	Fence / bollard functioning but with problems due to significant defects e.g. damaged/ missing railings, loss of stability, undermining of foundations, severe corrosion and deformation and loss of support, likely to cause marked deterioration of stability and appearance likely within 1 year. Some replacement or rehabilitation needed within 1 year
5	Very Poor	Fence / bollard has serious problems and has failed or are about to fail in the near future, causing unacceptable stability, appearance and public safety hazard. Urgent replacement/ rehabilitation required

The Table below shows the Replacement Cost for each of the condition scores.

Table: Fences Condition Survey Results

Condition	Replacement Cost (2024)	% Condition (based on cost)
1 (Very Good)	\$3,724,139	10.6%
2 (Good)	\$15,470,147	43.9%
3 (Fair)	\$15,351,754	43.6%
4 (poor)	\$612,124	1.7%
5 (Very Poor)	\$64,616	0.2%
Total	\$35,222,780	100.0%

The Graph below shows the condition of Fence assets in terms of replacement cost.



4.2 Asset Condition – Lighting

The condition of Council's Lighting network was surveyed in 2023 by R J Mifsud Electrical in conjunction with a report prepared in 2018 by Gary Roberts & Associates Pty Ltd which prioritised the renewal of Lighting based on obsolescence. The following condition criteria was used.

Table: Lighting Condition Survey Criteria

Grade	Condition	General Meaning
1	Very Good	<p>Condition Well maintained with no defects. Pole is sound, straight and true. No evidence of corrosion or decay. Pole surface finish in good condition. Lantern is intact and securely fixed to pole. No evidence of water or insect ingress. Lens is clear and intact. No corrosion visible on luminaire. No work required.</p> <p>Pole Obsolescence The pole is suitable for use in contemporary lighting projects. This includes aesthetic and physical qualities including height, finish and utility access facilities etc.</p> <p>Luminaire attributes The performance and efficiency of the lighting fixture is generally in line with current technology trends and provides compliance with current or recent public lighting design standards.</p>
2	Good	<p>Condition The luminaires and supporting structures may show minor deterioration with some wear and tear typical of the age such as discolouration (fading) of the luminaire and hair line cracks in concrete around the support structure, but no concrete staining. Slight impact damage, but no loss of protective coating. Deterioration has no significant impact on strength, operation and appearance of the light. The luminaire internal reflective surfaces may show slight discolouration but are not excessive corrosion. Only minor work required. Luminaire has minor insect ingress that can be rectified with routine cleaning to manufacturers recommendations.</p> <p>Pole Obsolescence The pole is older than grade 1 but remains suitable for use in contemporary lighting projects pending onsite inspection and general agreement that the aesthetic is suitable for new projects.</p> <p>Luminaire attributes As grade 1 but the lighting fixture is older and may use obsolete or technology of lower efficiency. There may not be evidence of compliance with current or recent public lighting design standards.</p>
3	Fair	<p>Condition The luminaire is functionally sound, but the appearance is affected by minor defects i.e. slight impact damage; concrete cracks <2mm, loss of protective coating on fittings, minor chipping/ spalling of concrete. Poles have signs of light corrosion/decay especially at or just below ground level (May require further qualified inspection or testing). External deterioration is beginning to affect the strength, operation and appearance of the luminaire. The internal reflective surfaces of the luminaire may show signs of corrosion. Likely to require renewal within 6-10 years approx.</p> <p>Pole Obsolescence The pole is older than grade 2 and may not be suitable for use in contemporary lighting projects pending onsite inspection and general agreement that the aesthetic is suitable for new projects.</p> <p>Luminaire attributes As grade 2 but the lighting fixture uses obsolete or technology of lower efficiency. There is no evidence of compliance with current or past public lighting design standards.</p>
4	Poor	Condition

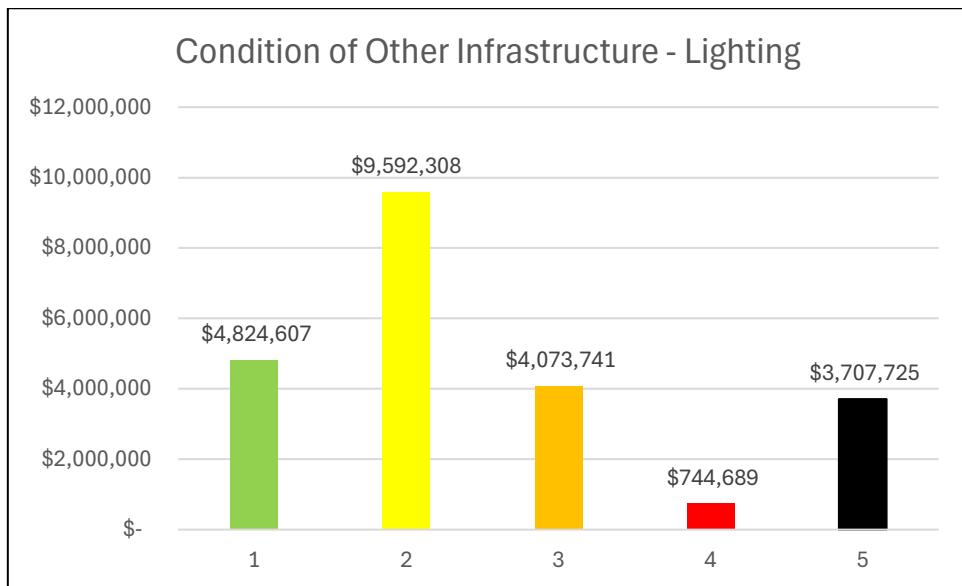
Grade	Condition	General Meaning
		<p>The luminaire functions but has significant defects e.g. structural cracks >2mm, concrete staining, impact damage, corrosion, instability of foundation; causing a marked deterioration in strength, stability, operation and appearance of the light within.</p> <p>Poles show signs of moderate corrosion/decay especially at or just below ground level (Will require further qualified inspection or testing).</p> <p>The luminaire has either insect or water ingress that can be rectified with replacement parts. The lens and/or reflector has deteriorated. Intermittent lamp failure may indicate lamp replacement is necessary.</p> <p>Likely to require renewal within 3-5 years.</p> <p>Pole Obsolescence</p> <p>The pole is not suitable for use in contemporary lighting projects.</p> <p>Luminaire attributes</p> <p>The lighting fixture uses obsolete technology of low efficiency. There is no evidence of compliance with current or past public lighting design standards.</p>
5	Very Poor	<p>Condition</p> <p>The luminaire has failed or is about to fail in the near future due to irreparable deterioration in strength, stability, operation and appearance.</p> <p>Poles have sustained impact damage or clear signs of corrosion/decay – especially at or just below ground level.</p> <p>The luminaire shows signs of damage due to water and insect ingress. The lens is yellowed or broken.</p> <p>The luminaire body and reflector are corroded.</p> <p>Priority renewal is required.</p> <p>Pole Obsolescence</p> <p>The pole is at the end of its life and should be replaced as a priority.</p> <p>Luminaire attributes</p> <p>The lighting fixture uses obsolete technology of low efficiency. There is no evidence of compliance with current or past public lighting design standards. The lumen output is diminished due to both internal and external aging.</p>

The Table below shows the Replacement Cost for each of the condition scores.

Table: Lighting Condition Survey Results

Condition	Replacement Cost (2024)	% Condition (based on cost)
1 (Very Good)	\$4,824,607	21.0%
2 (Good)	\$9,592,308	41.8%
3 (Fair)	\$4,073,741	17.8%
4 (poor)	\$744,689	3.2%
5 (Very Poor)	\$3,707,725	16.2%
Total	\$22,943,070	100.0%

The Graph below shows the condition of Lighting assets in terms of replacement cost.



4.3 Asset Condition – Marine Structures

The condition of Council's Marine Structures was surveyed in 2023 by Consultants, Manly Hydraulics Laboratory. The following condition criteria was used.

Table: Marine Structures Condition Survey Criteria

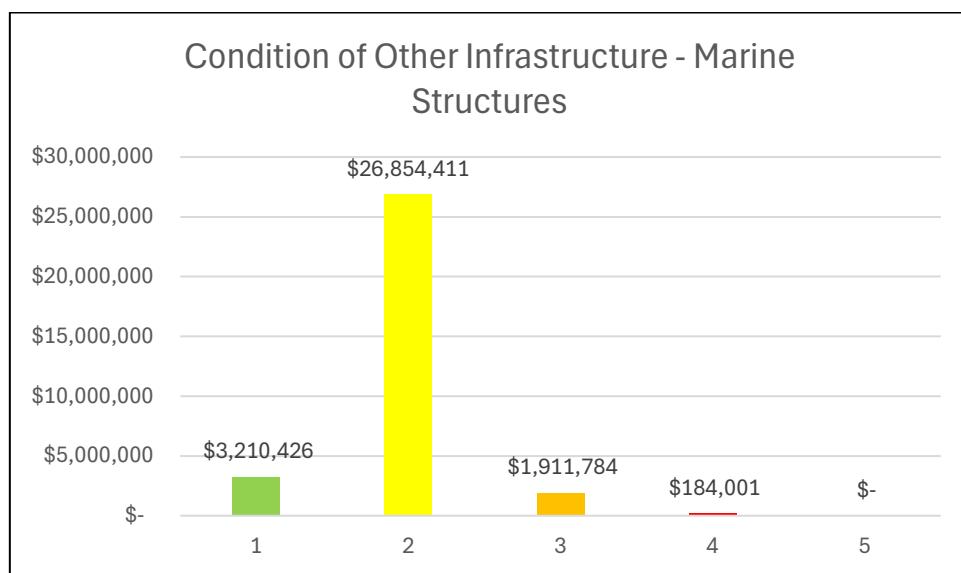
Grade	Condition	Description
1	Very good	Sound Physical condition. Asset likely to perform adequately without major work.
2	Good	Acceptable physical condition: minimal short-term failure risk but potential for deterioration in long-term (10 years plus). Only minor work required (if any).
3	Fair	Significant deterioration evident; failure unlikely within next 2 years but further deterioration likely and replacement likely within next 10 years. Work may be required but asset is still serviceable: minor components or isolated sections of the asset need replacement or repair now, but asset still functions safely at an adequate level of service.
4	Poor	Failure likely in short-term. Likely need to replace most or all of asset within 2 years. Substantial work required in short term, asset barely serviceable: no immediate risk to health or safety but works required within 2 years to ensure asset remains safe.
5	Very poor	Failed or failure imminent. Major work or replacement required urgently. Immediate need to replace most or all of asset. Health and safety hazards exist which present a possible risk to public safety, or asset cannot be serviced/operated without risk to users.

The Table below shows the Replacement Cost for each of the condition scores.

Table: Marine Structures Condition Survey Results

Condition	Replacement Cost (2024)	% Condition (based on cost)
1 (Very Good)	\$3,210,426	10.0%
2 (Good)	\$26,854,411	83.5%
3 (Fair)	\$1,911,784	5.9%
4 (poor)	\$184,001	0.6%
5 (Very Poor)	\$0	0.0%
Total	\$32,160,622	100.0%

The Graph below shows the condition of Marine Structures assets in terms of replacement cost.



4.4 Asset Condition – Retaining Walls

The condition of Council's Retaining Walls network was surveyed in 2023 by Consultants, Rapid Map Services Pty Ltd. The following condition criteria was used:

Table: Retaining Walls Condition Survey Criteria

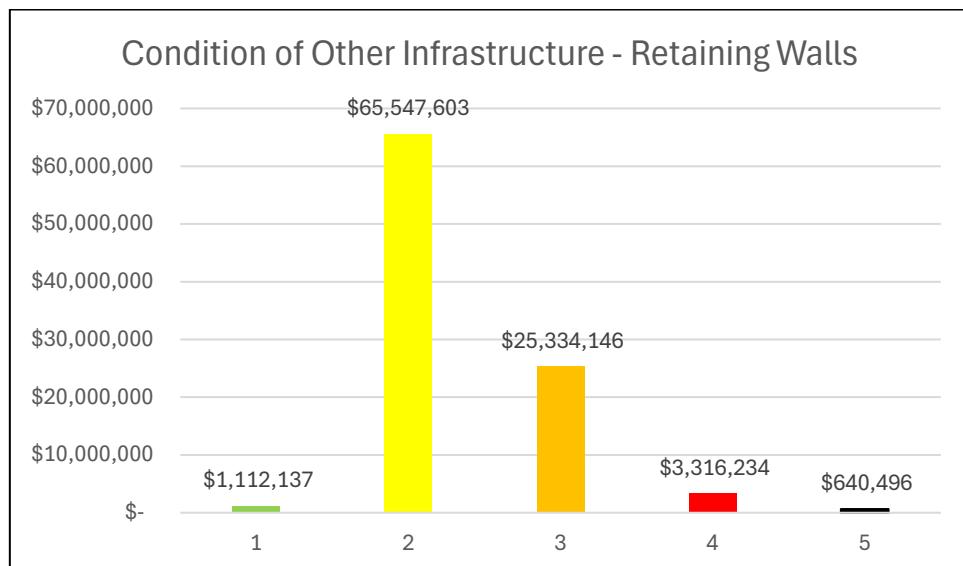
Grade	Condition	Description
0	Not inspected	Could not be accessed/inspected (e.g. vegetation growth, safety risk/hazard, access limitation).
1	Very Good	Wall overall looks relatively new and has no significant defects. Very minor wear, tear and deterioration to surfaces. Wall not in conditions 2, 3, 4 or 5. No work required.
2	Good	Wall with overall only minor defects (e.g. minor cracks, minor mortar loss, minor chipping, minor vegetation growth at joints, moderate weathering). Minor work is advised.
3	Fair	Wall is overall functionally sound but has visible defects (e.g. moderate cracks, moderate mortar loss, moderate chipping, moderate vegetation growth at joints, minor out of plane movement (bulging, tilting, bowing), minor loss of material). Some work is required.
4	Poor	Wall is overall mostly functioning but has significant visible defects that can be subject to rapid deterioration. (e.g. major cracks, major mortar loss, major chipping, moderate out of plane movement (bulging, tilting, bowing), moderate loss of material, partial failure of wall). Rehabilitation or replacement is recommended.
5	Very Poor	Wall overall has failed or is about to fail and has major defects (e.g. major cracks, major mortar loss, major chipping, major out of plane movement (bulging, tilting, bowing), significant loss of material and full or partial failure of wall). Urgent rectification works is recommended.

The Table below shows the Replacement Cost for each of the condition scores.

Table: Retaining Walls Condition Survey Results

Condition	Replacement Cost (2024)	% Condition (based on cost)
1 (Very Good)	\$1,112,137	1.2%
2 (Good)	\$65,547,603	68.3%
3 (Fair)	\$25,334,146	26.4%
4 (poor)	\$3,316,234	3.5%
5 (Very Poor)	\$640,496	0.7%
Total	\$95,950,616	100.0%

The Graph below shows the condition of Retaining Walls assets in terms of replacement cost.



4.5 Asset Condition – Seawalls

The condition of Council's Seawalls network was surveyed in 2023 by consultants, Royal HaskoningDVH Pty Ltd. The following condition criteria was used.

Table: Seawalls Condition Survey Criteria

Grade	Condition	Description
1	Very Good	Sound wall designed to current standards and well maintained with no defects. No work required
2	Good	As grade 1 but not designed to current standards or showing minor wear, tear and deterioration of surfaces e.g. minor mortar loss and weathering, but no undermining of foundation. Needs to be reinspected in 2- 3 years. Deterioration has no significant impact on stability and appearance of the wall. Only minor work required
3	Fair	Wall functionally sound, but appearance affected by minor defects e.g. cracks <2mm, surface weathering, chipping of stone and minor loss of mortar, isolated undermining of foundation, but no loss of stability. Some deterioration beginning to be reflected in stability and appearance of the wall. Some work required

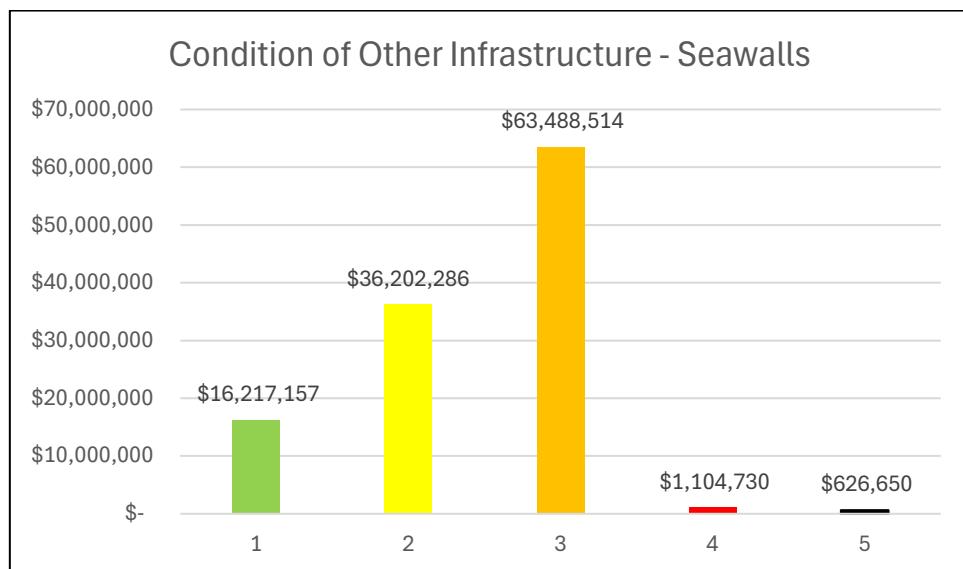
Grade	Condition	Description
4	Poor	Wall functioning but with problems due to significant defects e.g. cracks 2-10mm, mortar loss, loss of stone, undermining of foundations, deformation and loss of support, likely to cause marked deterioration of stability and appearance likely within 1 year. Some replacement or rehabilitation needed within 1 year
5	Very Poor	Wall has serious problems and has failed or are about to fail in the near future, causing unacceptable stability, appearance and is a Public Safety Hazard. Urgent replacement/ rehabilitation required

The Table below shows the Replacement Cost for each of the condition scores.

Table: Seawalls Condition Survey Results

Condition	Replacement Cost (2024)	% Condition (based on cost)
1 (Very Good)	\$16,217,157	13.8%
2 (Good)	\$36,202,286	30.8%
3 (Fair)	\$63,488,514	54.0%
4 (Poor)	\$1,104,730	0.9%
5 (Very Poor)	\$626,650	0.5%
Total	\$117,639,337	100.0%

The Graph below shows the condition of Seawalls assets in terms of replacement cost.



5.0 Financial Summary

5.1 Asset Valuation

The total Replacement Value of the Other Infrastructure Asset Class network is shown in the Table below as at 30 June 2024.

Table: Other Infrastructure Asset Class Valuation \$2024

Asset Category	Replacement Value (2024)	Accumulated Depreciation (2024)	Fair Value (2024)	Depreciation Expense (2024)
Fences	\$35,222,780	12,269,222	\$22,953,559	\$848,952
Lighting	\$22,943,070	8,472,343	\$14,470,727	\$716,983
Marine Structures	\$32,160,622	6,989,479	\$25,171,143	\$408,304
Retaining Walls	\$95,950,616	29,728,835	\$66,221,780	\$1,059,706
Seawalls	\$117,639,337	42,110,781	\$75,528,556	\$1,059,698
TOTAL	\$303,916,424	\$99,570,660	\$204,345,765	\$4,093,643

5.2 Funding Requirements

The Table below shows that the current cost to bring all Council's Other Infrastructure assets to a satisfactory standard is \$11.0M. This amount includes the cost to replace existing infrastructure currently in either poor or very poor condition (condition 4 or 5). This represents 3.6% of the Other Infrastructure network in terms of Replacement Cost. This means that 96.4% of this portfolio is in very good to fair condition (1 to 3).

The Table also shows that the total current Depreciation Expense is \$4.1M or 1.3% of the Total Replacement Cost of Council's assets. This assumes that all Council's assets are completely replaced every 74.2 years on average. This is a weighted average for the network as useful lives of the individual components varies.

The Table shows that the 10-year Long Term Cost to bring all Council's infrastructure assets to a satisfactory standard as well as maintain the current standard is \$51.9M over 10 years or an average annual cost of \$5.2M. This includes the total Depreciation Expense over 10 years (maintaining the existing standard) and assumes that all condition 4 and 5 assets will be replaced over the next 10 years (bringing all assets to a satisfactory condition).

Historically, Council has reported a 'cost to bring to satisfactory condition' that assumed those assets in 'poor' condition (category 4) were acceptable by the community. Council's recommendation is that assets in poor condition should be brought to a satisfactory condition, and therefore we have included these in our backlog estimates.

The Local Government Code of Accounting Practice outlines the requirements for both Council's financial statements and the special schedules. Under this Code, where Councils haven't developed an 'agreed' level of service, a standard of 'good' (category 2) should be used for the 'Estimated cost to bring to satisfactory condition'. This would mean including within our backlog figures category 3, 4 and 5 assets.

North Sydney Council has not undertaken the exercise with the community to determine the 'agreed level of service'. However, Council did not think it was reasonable to inflate the backlog to this extent. Instead, Council has opted to use the standard of 'satisfactory/fair' (category 3) as the condition to aspire to, rather than 'good' (category 2).

At a recent demographically selected workshop in 2024 (involving a group of residents, representative of the demographics of the North Sydney local government area), feedback suggested that infrastructure in a 'poor' or 'very poor' condition would not be acceptable to the community. Based on Council's review, it is recommended that all infrastructure currently classified as 'poor' or 'very poor' are required to be addressed.

Table: Long Term Infrastructure Funding Required (\$2024)

Asset Class / Category	Cost to bring to assets to satisfactory Cond. (4 + 5)	Total replacement cost	Depreciation Expense (2024)	Funding required over 10 years (Depreciation x 10 + Cond 4 + 5)	Average Annual Funding Required (2024)
Other Infrastructure / Fences	\$676,740	\$35,222,780	\$848,952	\$9,166,256	\$916,626
Other Infrastructure / Lighting	\$4,452,413	\$22,943,070	\$716,983	\$11,622,246	\$1,162,225
Other Infrastructure / Marine Structures	\$184,001	\$32,160,622	\$408,304	\$4,267,046	\$426,705
Other Infrastructure / Retaining Walls	\$3,956,730	\$95,950,616	\$1,059,706	\$14,553,785	\$1,455,379
Other Infrastructure / Seawalls	\$1,731,380	\$117,639,337	\$1,059,698	\$12,328,361	\$1,232,836
TOTAL	\$11,001,264	\$303,916,424	\$4,093,643	\$51,937,694	\$5,193,769

5.3 Useful Lives – Fences

The useful lives of all types of Fences assets were reviewed by iinsights Pty Ltd in 2023 and are shown in the following Table.

Feature	Fence Type	Useful Life
Bollard	Collapsible	35
Bollard	Decorative	35
Bollard	Other	35
Bollard	Removable	35
Bollard	Structural	35
Bollard	Holding Rail	35
Fence	Armco Guardrail	35
Fence	Bicentennial Fence	80
Fence	Boom Gate	30
Fence	Concrete Post and Chain Wire Fence	50
Fence	Concrete Post and Rail Fence	50
Fence	Concrete Road Barrier	50
Fence	Galvanised Post and Chain Wire Fence	50
Fence	Galvanised Post and Rail Fence	50
Fence	Handrail Stainless Steel	35
Fence	Handrail Steel	35
Fence	Ordinance Fence	35
Fence	Other	35
Fence	Picket Fence - Metal	35
Fence	RTA Pedestrian Fence	35
Fence	Safety Fence - Galvanised Post & Rail on Concrete	50

Feature	Fence Type	Useful Life
Fence	Safety Fence - Steel Post & Cable	50
Fence	Steel Post and Chain Fence	50
Fence	Timber Post and Chain Fence	50
Fence	Timber Post and Rope	35
Fence	Gate Post	35
Fence	Holding Rail	35
Fence	Log Fence	35
Fence	Pedestrian - Double	35
Fence	Pedestrian - Single	35
Fence	Special - Post and Rail Fence with Glass	35
Fence	Special - Post and Rail Fence with Glass Panels	35
Fence	Vehicle - Double	35
Fence	Vehicle - Single	35
Fence	Picket Fence - Timber	35
Fence	Barrier	35
Fence	Bicycle Barrier	35
Fence	Picket	35
Fence	Pillar	35
Fence	Pool Gate	30
Fence	Slide Rail	35
Fence	Structural	35
Fence	Unknown Post	35

5.4 Useful Lives – Lighting

The useful lives of all types of Lighting assets were reviewed by iinsights Pty Ltd in 2023 and are shown in the following Table. The Weighted Average Useful Life is 32.0 years.

Pole Type	Useful Life
4-unit battery pole green coated	35
Awning Light - Elizabeth Plaza	20
Banner Pole	35
Bega Graphite finish 4.5 meters 100mm O/D straight pole with access door	35
Bollard	20
Brick Light	20
Burton St Tunnel	35
Bus Stop	25
Cammeraygal Pl Artwork	20
Catenary Light - Elizabeth Plaza	20
Decorative Fin Light - Brett Whiteley Place	20
Decorative Seating Light - Brett Whiteley Place	20
Down Light - Elizabeth Plaza	20
Eclipse Light Pole	35
Fairy Lights (multiple luminaires)	20
Flexible Linear Led Strip Mounted with U-Clips on Corten Walls	20

Pole Type	Useful Life
Fountain Light - Brett Whiteley Place	20
GM Poles 4.5M 90MM Pipe Pole Galvanised Steel	35
GM Poles 5.0M 90MM Pipe Pole Galvanised Steel	35
GM Poles PP-90-4.0 4M 90MM Pipe Pole c/w Marine Grade Powder Coat	35
Handrail Light	20
Handrail Light - Bob Gordon Reserve	20
Handrail Light - Brett Whiteley Place/ Elizabeth Plaza	20
Hexagonal Vic Pole Spaceship	35
Inground Strip Light - Elizabeth Plaza	20
Inground Strip Light - Grosvenor Lane	20
Inground Uplight - Bradfield Plaza	20
Inground Uplight - Brett Whiteley Place	20
Inground Uplight Small	20
Interpol Metal pole	35
Lantern only special	35
LED Recessed Linear LED Wall Grazer Mounted	20
LED Spotlight with Glare Shield Mounted on Tapered Round Pole	35
Memorial	35
Metal Pole Ball	35
Metal Pole Other	35
Multi-Function Pole	35
Pedestrian Ceiling Light	20
Projector	20
Shelter Light	25
Shop Light - Elizabeth Plaza	20
Sign Light	20
Small Pedestrian Light	20
Sportsfield	35
Stair Light - Brett Whiteley Place	20
Stair Light - Mitchell Street Plaza	20
Stair Light only	20
Straight Round 140mm Diameter Pole	35
Tapered Octagonal Column	35
Tapered Round Pole	35
Taperline Pole Gooseneck Double	35
Taperline Pole Gooseneck Single	35
Totem Light Pole (Cluster)	35
Under Awning Light - Recessed	20
Under Awning Light - Surface Mount	20
Under seat lighting - Miller Street Forecourt	20
Vent Light only	20
Vic Poles - 4.0m Tapered Base Octagonal	35
Vic Poles - 4.6m Tapered Base Octagonal	35
Vic Poles - 8.0m Road Light Pole	35
VICPOLE Galvanised Steel	35

Pole Type	Useful Life
Wall Mounted Light	20
Wall mounted light - lane Parraween carpark	20

5.5 Useful Lives – Marine Structures

The useful lives of all types of Marine Structures assets were reviewed by iinsights Pty Ltd in 2023. They determined that the useful life of all marine structures is 50 years except for the concrete wharf at Wandakiah which was determined of having a useful life of 100 years.

5.6 Useful Lives – Retaining Walls

There are a wide variety of Retaining Wall types in North Sydney. Notes from the IPWEA 2017 Practice Note – “Useful Life of Infrastructure” are shown in the following Table. The useful lives of were reviewed by iinsights Pty Ltd in 2023 who determined that the useful lives of all types of retaining wall assets should be 90 years.

RETAINING WALLS - Notes from IPWEA 2017 Practice Note – “Useful Life of Infrastructure”						
Component	Low rates' description	High rates' description	Unit ID	Useful Lives (years)		
				Std	Low	High
Block Wall	150mm block, footing, no finish	250mm block, footing, no finish	m2	75	60	90
Brick Wall	100mm thick	200mm thick	m2	50	40	60
Retaining Walls (Concrete)	600mm maximum retaining, Grip block precast interlocking	7400mm maximum retaining, Grip block precast interlocking	m2	75	60	90
Retaining Walls (Timber)	1800mm maximum retaining, Timber crib	6300mm maximum retaining, Timber crib	m2	60	45	72

5.7 Useful Lives – Seawalls

The construction of seawalls in North Sydney was primarily undertaken by the State Government on Crown Land, before these assets were transferred to North Sydney Council for "Care, Control, and Management". Specific information on the construction dates is unknown as Council was not involved in their construction or recordkeeping.

Detailed aerial photography taken in 1943 is available through the State Government. This shows that 84% of seawalls existed in their current location in 1943. This information, whilst vague, at least provides evidence of the existence of seawalls at a point in time. It is interesting to note that about 40% of the sandstone seawalls that were in existence in 1943 have significant concrete sections within them. This suggests that major rehabilitation work was undertaken to stabilise these walls at some time unknown (prior to the 1980s). What is known is that, because of significant deterioration of these seawalls, North Sydney has undertaken major rehabilitation on many sections of nearly every single seawall under its care since the early 1990s onwards. This includes major rehabilitation on seawalls that were constructed after 1943. It is also clear that, if this action was not taken these seawalls would have fully collapsed into the harbour. In some instances due to the nature

of sudden failures some sections of seawalls have previously collapsed into the harbour before rehabilitation could be conducted. The seawall at McMahons Point fully collapsed which required full reconstruction in 2006.

The aggressive nature of the harbour environment affects the useful life of seawalls with waves constantly pounding against the sandstone wall founded on the harbour foreshore often on soil with weak bearing capacity. Both the volume, type, and size of harbour traffic also influence the useful life of seawalls including Ferries, Cruise Liners, commercial, and recreational craft. The river catamaran, with its unique wave frequency and amplitude, affects the life of seawalls. Also, under certain tides and conditions waves currently overtop at some seawall locations. This, combined with future sea level rise, will further increase the frequency waves currently overtop seawalls, reducing the remaining life and useful life of seawalls.

Most of the original sandstone seawall blocks are still in place and most of these seawalls have been rehabilitated. Until further detailed research is completed a “long life, short life” approach has been adopted in accordance with accounting standards. Until further detailed research is completed, a short life of 80 years has been adopted which is the estimated period when major seawall rehabilitation is required. Major seawall rehabilitation may extend the life of seawalls by a further 40 years. Therefore, until further detailed research is completed a long life of 120 years has been adopted for seawalls.

6.0 Managing the Risks

Councils present budget levels (as at 30 June 2024) are insufficient to continue to manage risks in the medium term (4 years).

The main risk consequences are:

- Increase in trip hazards which may result in personal injury
- Fences and Bollards provide separation from steep drop offs, waterbodies, or hazardous areas. Failure of these assets may cause serious injury.
- Lighting poles suddenly failing and falling and causing property damage, injury, or death.
- Lighting Luminaires failing resulting in the area being poorly lit making the area unsafe for the public.
- Marine Structures - damage to infrastructure due to major storm events and large waves.
- Retaining Walls – Retaining Walls generally fail with very little warning. This usually occurs after heavy rainfall due to the increased water pressure behind the wall.
- Seawalls – seawalls generally fail with very little warning. Large voids can appear behind a seawall which may not be visible from the surface. This means that both seawalls and the backfill behind the seawall could collapse with little warning.

Council will endeavour to manage these risks within available funding by:

- Prioritising higher risk works within the planned budget where possible
- Re-allocating budgets from other sources if required and where possible
- Seeking emergency funding if required and where possible
- Partial or full closure where necessary

The Risk Matrix used to prioritise capital works for each Asset Category is shown in the Tables below.

Table: Risk Matrix – Fences

Risk Matrix - Fences					
Condition	Drop Height	0 to 1m	>1m to 2m	>2m to 3m	>3m
	Road Hierarchy	Lane	Local	Collector	Regional / State
	Park Hierarchy	Local	District	Regional	
	Slope below fence	Shallow	Medium	Steep	Vertical
	Score	1	2	3	4
Condition 1 – Very Good	1	L	L	L	L
Condition 2 - Good	2	L	L	L	M
Condition 3 – Fair	3	M	M	M	H
Condition 4 – Poor	4	H	H	H	VH
Condition 5 – Very Poor	5	H	VH	VH	VH

Table: Risk Matrix –Lighting

Risk Matrix - Lighting					
Condition	Footpath Hierarchy		All Other Areas	Medium Traffic	High Traffic
	Road Hierarchy	Lane	Local	Collector	Regional / State
	Park Hierarchy	Local	District	Regional	
	Score	1	2	3	4
Condition 1 – Very Good	1	L	L	L	L
Condition 2 - Good	2	L	L	L	M
Condition 3 – Fair	3	M	M	M	H
Condition 4 – Poor	4	H	H	H	VH
Condition 5 – Very Poor	5	H	VH	VH	VH

Table: Risk Matrix –Marine Structures

Risk Matrix - Marine Structures					
Condition	Relative Usage	Low	Medium	High	Very High
	Park Hierarchy	Local	District	Regional	
	Score	1	2	3	4
Condition 1 – Very Good	1	L	L	L	L
Condition 2 - Good	2	L	L	L	M
Condition 3 – Fair	3	M	M	M	H
Condition 4 – Poor	4	H	H	H	VH
Condition 5 – Very Poor	5	H	VH	VH	VH

Table: Risk Matrix – Retaining Walls

Risk Matrix - Retaining Walls					
Condition	Wall Height	0 to 1m	>1m to 2m	>2m to 3m	>3m
	Road Hierarchy	Lane	Local	Collector	Regional / State
	Footpath Hierarchy	All Other Areas	Medium Traffic	High Traffic	
	Park Hierarchy	Local	District	Regional	
	Score	1	2	3	4
Condition 1 – Very Good	1	L	L	L	L
Condition 2 - Good	2	L	L	L	M
Condition 3 – Fair	3	M	M	M	H
Condition 4 – Poor	4	H	H	H	VH
Condition 5 – Very Poor	5	H	VH	VH	VH

Table: Risk Matrix – Seawalls

Risk Matrix - Seawalls					
Condition	Seawall Height	0 to 1m	>1m to 2m	>2m to 3m	>3m
	Relative Usage	Low	Medium	High	Very High
	Park Hierarchy	Local	District	Regional	
	Score	1	2	3	4
	Condition 1 – Very Good	1	L	L	L
Condition 2 - Good	2	L	L	L	M
Condition 3 – Fair	3	M	M	M	H
Condition 4 – Poor	4	H	H	H	VH
Condition 5 – Very Poor	5	H	VH	VH	VH

6.1 Examples of Fence risks in the North Sydney LGA.



Examples of failed and failing Fences in the North Sydney LGA



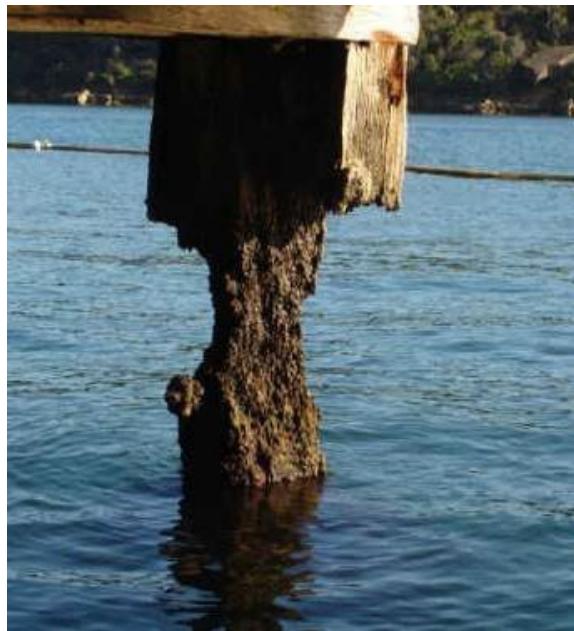
Examples of failed and failing Fences in the North Sydney LGA

6.2 Examples of Lighting risks in the North Sydney LGA.



Examples of Lights in poor condition in the North Sydney LGA

6.3 Examples of Marine Structure risks in the North Sydney LGA.



Examples of piles in very poor condition in the North Sydney LGA

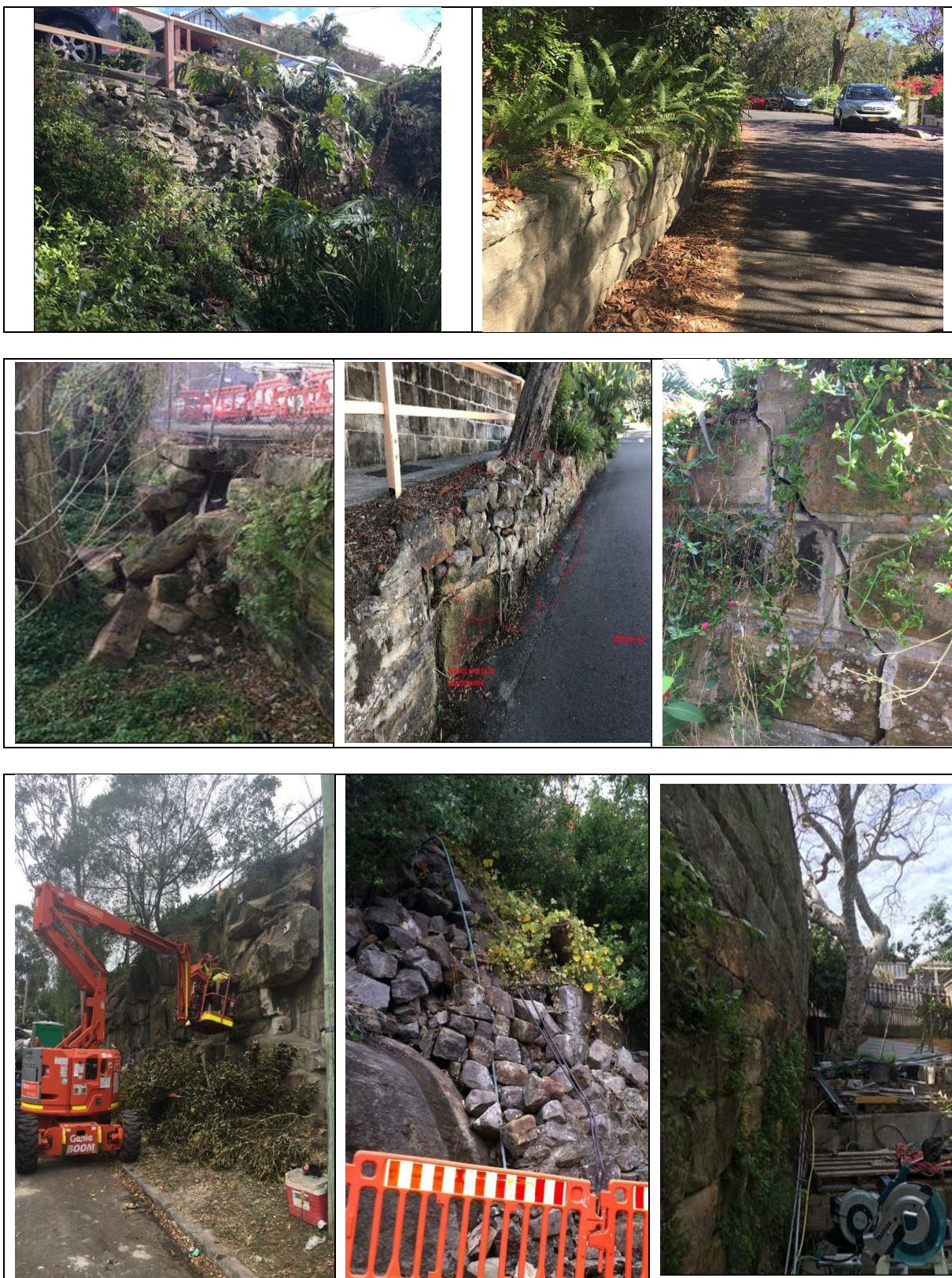


Evidence of marine worms in timber structure



Termites found in timber marine structure

6.4 Examples of Retaining Wall risks in the North Sydney LGA.



6.5 Examples of Seawall risks in the North Sydney LGA.



Examples of failed and failing seawalls in Bradfield Park



Examples of failed and failing seawalls in Sawmillers Reserve



Examples of failed and failing seawalls at McMahons Point

7.0 Funding and resourcing asset management

7.1 Funding sources

Council funds asset management from various sources including:

- Development Contributions (S7.11, S7.12 and S7.4)
- Internal and external restricted reserves (incl Stormwater Management Services Charge funds)
- Grants and contributions
- Working Capital
- General Revenue

7.2 Asset Maintenance

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again, e.g. trip hazard repair.

In the long term, asset maintenance requirements are expected to increase due to changes in population demographics, community demand, and building and other standards, requiring capital renewal, upgrade or new assets.

7.3 Capital Works

Information from each asset management plan is used to inform the prioritisation of capital works commitments in Council's Delivery Program and Operational Plan for the Council term and financial year.

Allocation of funding for capital works is prioritised based on risk, condition assessments, resourcing, levels of service, and expected community outcomes from each asset management plan.

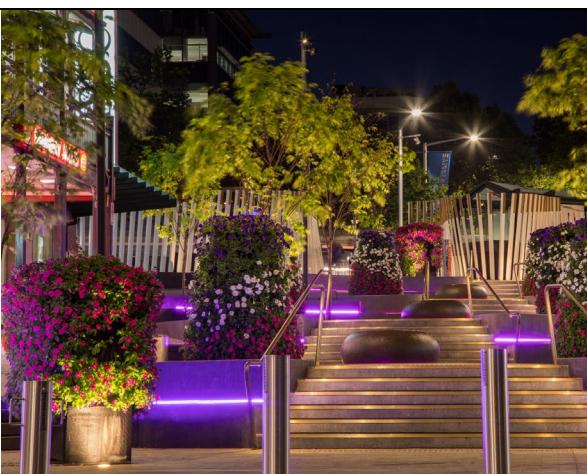
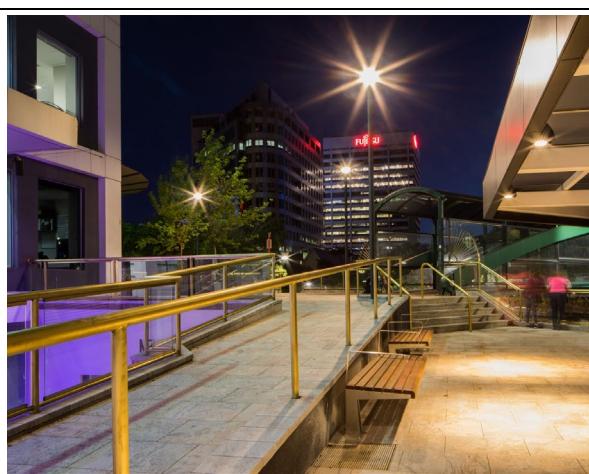
Draft capital works programs are developed on an annual basis through the Operational Plan and budget process and subject to public exhibition prior to adoption. Due to Council's limited financial position, these priorities are subject to change throughout the year in response to asset failure or risk.

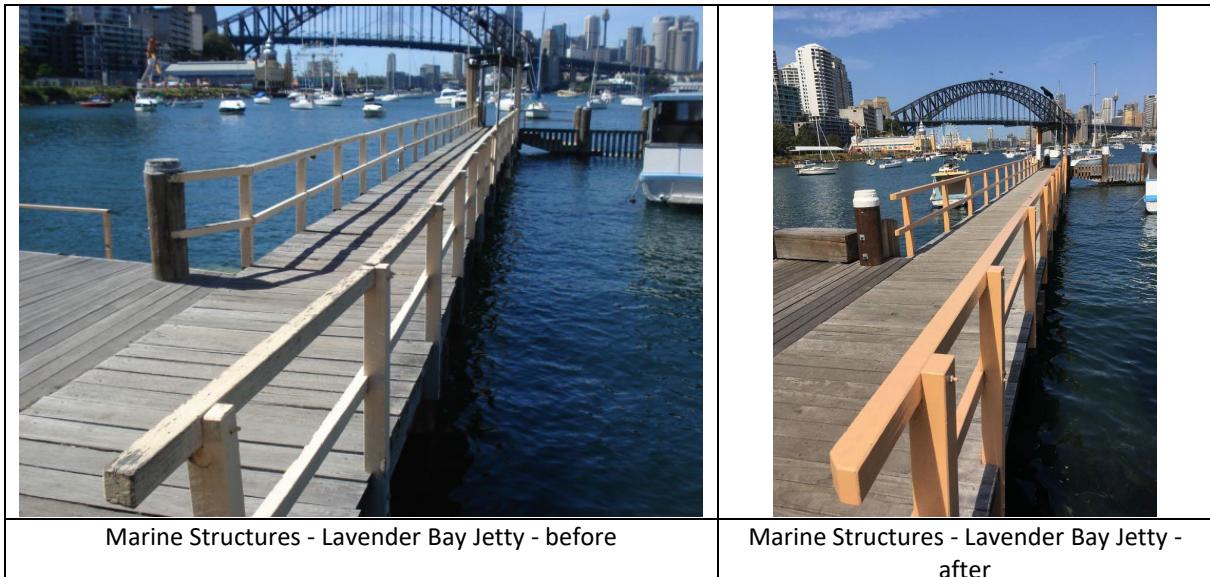
Copies of the adopted Delivery Program and Operational Plan can be found on Council's website.

7.4 Examples of completed Capital Works Projects

	
Fences - North Sydney Oval Picket Fence replacement	Fences - Young Street – Neutral Bay Road Closure – new Bollards

	
Fences - McDougall Street Kirribilli – Timber Ordinance Fence	Fences - Military Road Neutral Bay (After) – Decorative Safety Fence

	
Lighting – North Sydney Centre Upgrade	





Retaining Wall - Middlemiss Street, North Sydney



Retaining Wall - Alfred Street North



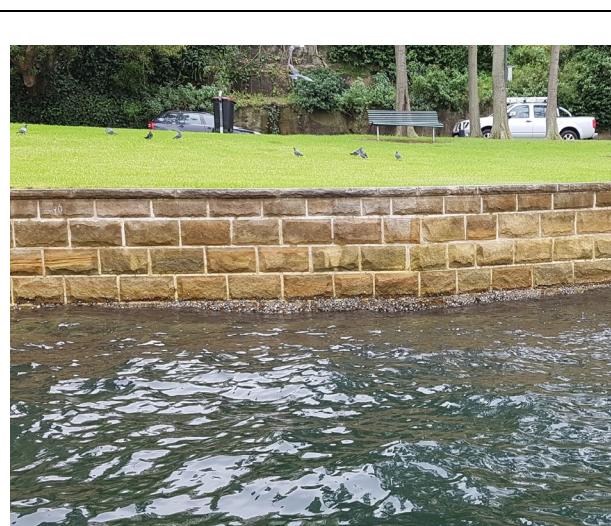
Seawall Grout Injection rehabilitation at Sawmillers Reserve -- before



Seawall Grout Injection rehabilitation at Sawmillers Reserve -- after



Seawall reconstruction at McMahons Point -- before



Seawall reconstruction at McMahons Point -- after

8.0 Monitoring and Improvement Program

A whole of organisation approach is essential for continuous asset management practices to continue to improve. Council's Asset Management Plans AMPs need to be based on accurate data and require detailed Valuations to be done on a periodic basis. Accurate Valuations in turn require detailed condition assessments of infrastructure assets. The following Improvement Plan summarises the areas for improvement within AMPs.

Table: Improvement Plan

Asset	Last Comprehensive Valuation (Year)	Comprehensive Valuation to be performed
Other infrastructure Fences, Lighting, Marine Structures, Retaining Walls, and Seawalls.	2023	No later than 2028
Community Consultation to determine and adopt Level of Service		No later than 2029

9.0 References

- 2023 Fences Data Collection & Condition Survey Audit by Consultants, Rapid Map Services Pty Ltd.
- 2018 Report from Gary Roberts & Associates Pty Ltd, "Prioritising the Upgrade of External Lighting Based on Technical Criteria".
- 2023 Lighting Data Collection & Condition Survey Audit by R J Mifsud Electrical.
- 2023 North Sydney Council Marine Structures Condition Audit by Consultants, Manly Hydraulics Laboratory.
- 2023 Retaining Wall Data Collection & Condition Survey Audit by Consultants, Rapid Map Services Pty Ltd.
- 2023 North Sydney Council Seawall Condition Audit by Consultants, Royal HaskoningDVH Pty Ltd.
- 2014, North Sydney Council Public Domain Style Manual
- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney,
- IPWEA, 2015, 2nd edition, 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2015, 3rd edition, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2012 LTFP Practice Note 6 PN Long Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney

10.0 Appendix A: Maintenance Management System - Fences

Inspection areas have been defined in accordance with their usage – high (**red**), medium (**blue**) or low (**white**)

Inspection frequencies are based on these areas as defined by the reference maps and the resources currently available to undertake the inspections. The results of inspections are downloaded into the MMDS database.

Red – 2 times per year

Blue – Once each year

White – Once every 2 years

There are 5 categories in which a defect may be placed.

Cat 5		Will be completed or made safe no later than 2 working days after allocation of defect to work crew. If made safe defect will then be re-categorised as Cat 4 or Cat 3.
Cat 4		Will be repaired no later than 10 working days after allocation of defect to work crew.
Cat 3		Will be repaired no later than 40 working days after allocation of defect to work crew.
Cat 2		Will be repaired no later than 160 working days after allocation of defect to work crew.
Cat 1		As new. Surface displaying no defects. May have aesthetic issues such as gum, stains, services mark-up, etc.

Intervention Matrix – Fences

DEFECT	SEVERITY	RISK ADJUSTED FOR PEDESTRIAN VOLUME AND AGE		
		WHITE	BLUE	RED
Minor defects only with faded paint or graffiti		LOW	LOW	LOW
Requires maintenance to return to acceptable level of service; typically, minor evidence of wood rot, unstable movement of posts; damaged chain wire mesh; presence of rust; loosened straps on timber fence	Slight	MEDIUM	HIGH	HIGH
Sections require replacement or significant renewal; evidence of wood rot; posts moving with ease	Moderate	HIGH	HIGH	VERY HIGH
Broken beyond repair; over 50% requires replacement; has missing sections; very unstable posts	Extreme	HIGH	VERY HIGH	VERY HIGH

NOTES:

1. Appearance defects (gum, stains, surface marks etc) are not safety issues. Response time TBA. Record in "Category" as "A".
2. **Red** areas are where failure is most disruptive and expensive to the community/users and/or high traffic (both pedestrian and vehicular) flows, e.g. retail/commercial areas; schools; hospitals; plazas.
3. **Blue** areas have medium traffic flows, e.g. streets leading to retail/commercial areas; schools; hospitals; plazas.

White areas have low traffic flows, e.g. residential street.

11.0 Appendix B: Maintenance Management System - Lighting

Inspection areas have been defined in accordance with the identified key factors of:

- Areas where failure is most disruptive and expensive to the community/users.
- Traffic (both vehicular and pedestrian) flows, e.g. pedestrian use areas; retail/commercial areas; schools and hospitals

Inspection frequencies are based on these areas as defined by the reference maps and the resources currently available to undertake the inspections.

Red – 2 times per year; **Blue** – Annual; **Other** – Once every 2 years;

The results of inspections will be downloaded into the MMDS database.

There are 5 categories in which a defect may be placed. Not all categories may be applicable to every inspection area and/or type of asset:

Cat 5		Will be made safe no later than 2 working days after allocation of defect to work crew. Defect may then be re-categorised as Cat 4 or Cat 3.
Cat 4		Will be repaired no later than 10 working days after allocation of defect to work crew.
Cat 3		Will be placed on Zone Maintenance Program. This program operates on an 8-week cycle, however, depending on workload and reactive maintenance requests, Cat 3 defects may miss a cycle or more before repairs are able to be undertaken.
Cat 2		Deferred maintenance. Defect may be repaired if close-by to Cat 4 or Cat 3 defect that is being repaired. Otherwise, will be re-inspected on next area inspection.
Cat 1		As new. Surface displaying no defects. May have aesthetic aspects such as gum, stains, services mark-up, etc.

Intervention Matrix

STREET LIGHTING	RED	BLUE	OTHER
NON-FUNCTIONING or STRUCTURALLY UNSOUND	28	24	21
DAMAGED BUT STILL FUNCTIONING	23	19	16
MINOR DAMAGE AND FUNCTIONING	20	16	13
FUNCTIONING – PAINT/DIRTY/BENT SHADE	18	14	11
AS NEW	10	6	3

Scoring example: 28 = High Use Area score 10 and Defect of Missing or Unstable score 18

Inspections of street lighting will include all the street lighting that the EPS Division is responsible for.

NORTH SYDNEY COUNCIL - GUIDE FOR STREET LIGHTING DEFECT RATING
AN EXPLANATION OF THE DEFECT INSPECTION SYSTEM

AREA OF INSPECTION		SCORE
RED	HIGH PEDESTRIAN TRAFFIC AREAS WITH SIGNIFICANT USAGE BY PEDESTRIANS OVER 50 YEARS OLD INSPECTIONS - 2 PER YEAR	10
BLUE	HIGH PEDESTRIAN TRAFFIC AREAS WITH MODERATE USAGE BY PEDESTRIANS OVER 50 YEARS OLD or MEDIUM PEDESTRIAN TRAFFIC AREAS WITH SIGNIFICANT USAGE BY PEDESTRIANS OVER 50 YEARS OLD INSPECTIONS - ANNUAL	6
WHITE	ALL OTHER AREAS IN LGA INCLUDING PARKS; RESERVES and PLAZAS INSPECTION - EVERY 2 YEARS	3
STREET LIGHTING TYPE		
MULTI FUNCTION POLE	LANEWAY/SHARED ZONE LIGHT POLE	
HERITAGE LIGHT POLE	LANEWAY/SHARED ZONE LIGHT WALL MOUNTED	
CIVIC LIGHT POLE	ILLUMINATED BOLLARD	
OCTAGAONAL LIGHT POLE	ILLUMINATED HAND RAIL	
UNDER AWNING LIGHTING	OTHER	
DEFECT		
NON-FUNCTIONAL, STRUCTURALLY UNSOUND - CORROSION, DAMAGED or UNSTABLE	18	
MAJOR SURFACE EXTERNAL CORROSION, DISCOLOURED LAMP SHADE	13	
MINOR SURACE EXTERNAL CORROSION	10	
FADED PAINT, BENT SHADE - STILL FULLY FUNCTIONAL OTHERWISE	8	
AS NEW	0	
HAZARD TYPE		
LIGHT OUT - BLOWN LAMP OR DAMAGE TO FITTING/POLE	BROKEN/DISCOLOURED - SECTION or PART DAMAGED	
MISSING - SECTION or PART NO LONGER IN ITS PLACE	BENT - NO LONGER AS INSTALLED VERTICAL POLE	
CORRODED - SHOWS OBVIOUS SIGNS OF CORROSION	FINISH - FADED; PEELING; DIRTY; GRAFFITI	
OTHER ASPECTS		
AREA HAS OBSTRUCTIONS DUE TO OVERHANGING TREE or VEGETATION	PRESENCE OF PARTICULAR ASPECT/S NOTED PRIOR TO DEPARTURE FROM PSID. REFERRED TO RELEVANT NSC SECTION VIA EMAIL	
AREA HAS GRASS and/or WEED GROWTH ENCROACHING ONTO ASSET		
AREA APPEARS TO HAVE BEEN AFFECTED BY NEARBY TREE ROOTS		

12.0 Appendix C: Maintenance Management System – Marine Structures

Inspection areas have been defined in accordance with the identified key factors of:

- Areas where failure is most disruptive and expensive to the community/users.
- Traffic (both vehicular and pedestrian) flows, e.g. pedestrian use areas; retail/commercial areas; schools and hospitals

Inspection frequencies are based on these areas as defined by the reference maps and the resources currently available to undertake the inspections.

Red – 2 times per year; **Blue** – Annual; **Other** – Once every 2 years;

The results of inspections will be downloaded into the MMDS database.

There are 5 categories in which a defect may be placed. Not all categories may be applicable to every inspection area and/or type of asset:

Cat 5		Will be made safe no later than 2 working days after allocation of defect to work crew. Defect may then be re-categorised as Cat 4 or Cat 3.
Cat 4		Will be repaired no later than 10 working days after allocation of defect to work crew.
Cat 3		Will be placed on Zone Maintenance Program. This program operates on an 8-week cycle, however, depending on workload and reactive maintenance requests, Cat 3 defects may miss a cycle or more before repairs are able to be undertaken.
Cat 2		Deferred maintenance. Defect may be repaired if close-by to Cat 4 or Cat 3 defect that is being repaired. Otherwise, will be re-inspected on next area inspection.
Cat 1		As new. Surface displaying no defects. May have aesthetic aspects such as gum, stains, services mark-up, etc.

Intervention Matrix

MARINE STRUCTURES	RED	BLUE	OTHER
MISSING or UNSTABLE	28	24	21
NOT FUNCTIONAL	23	19	16
DAMAGED BUT STILL FUNCTIONAL	20	16	13
FUNCTIONAL - PAINT/GRAFFITI/DIRTY	18	14	11
AS NEW	10	6	3

Scoring example: 28 = High Use Area score 10 and Defect of Missing or Unstable score 18

Inspections of marine structures will include all the marine structures that the EPS Division is responsible for. Inspections will involve the identification of **surface visible defects** only.

Expert structural assessments of each marine structure will be a separate element of the asset management regime.

NORTH SYDNEY COUNCIL - GUIDE FOR MARINE STRUCTURES DEFECT RATING
AN EXPLANATION OF THE DEFECT INSPECTION SYSTEM

SITE OF INSPECTION		SCORE
RED	MS001; MS002; MS003; MS006; MS007; MS008; MS009; MS010; MS011; MS012; MS013; MS014; MS016; MS021 and MS022 INSPECTIONS - 2 PER YEAR	10
BLUE	MS015; MS017; MS018 and MS024 INSPECTION - ANNUAL	6
WHITE	MS004; MS005; MS019; MS023 and MS025 INSPECTION - EVERY 2 YEARS	3

MARINE STRUCTURE TYPE

TIMBER DECKING - WHARF, JETTY or BOARDWALK	HANDRAIL - WHARF, JETTY or BOARDWALK
CONCRETE DECKING - WHARF, JETTY or BOARDWALK	PONTOON + GANGWAY
KERBING - WHARF or BOARDWALK	ACCESS LADDER or STAIRS
BOAT RAMP	PILES or OTHER VISIBLE STRUCTURAL MEMBERS *
LIGHTING - WHARF, JETTY or BOARDWALK	OTHER eg. SHELTER or SIGNAGE

* INSPECTION WILL BE UNDERTAKEN FROM DECK. PHOTOS TAKEN and IDENTIFIED DEFECTS WILL BE REFERRED TO MARINE STRUCTURE EXPERTS FOR ASSESSMENT + RECOMMENDATION

DEFECT - WHEN UNSURE REFER TO PHOTOS IN GUIDELINES FOR GUIDANCE

MISSING, DAMAGED AT A CRITICAL LOCATION or UNSTABLE	18
NON-FUNCTIONAL - THE DAMAGE IS SUCH THAT NO LONGER FIT FOR PURPOSE	13
RED/BLUE SITES - GAPS and/or RISE & FALL BETWEEN TIMBER DECK PLANKS GREATER THAN 10MM	13
WHITE SITES - GAPS and/or RISE & FALL BETWEEN TIMBER DECK PLANKS GREATER THAN 20MM	13
ALL SITES - GAPS, SETTLEMENT, RISE & FALL ON CONCRETE DECK SECTIONS GREATER THAN 10MM	13
FUNCTIONAL - THE DAMAGE IS SUCH THAT THE ASSET CAN STILL BE USED.	10
RED/BLUE SITES - GAPS and/or RISE & FALL BETWEEN TIMBER DECK PLANKS LESS THAN 10MM	10
WHITE SITES - GAPS and/or RISE & FALL BETWEEN TIMBER DECK PLANKS LESS THAN 20MM	10
ALL SITES - GAPS, SETTLEMENT, RISE & FALL ON CONCRETE DECK SECTIONS LESS THAN 10MM	10
FUNCTIONAL - THE DAMAGE IS FADED PAINT; GRAFFITI; PEELING PAINT; DIRTY; etc	8
AS NEW	0

HAZARD TYPE

MISSING - SECTION or PART NO LONGER IN ITS PLACE	BROKEN - SECTION DAMAGED, eg. HOLES, SPLITS, CRACKS
ROTTEN - TIMBER ROTTING/SPLIT; METAL RUSTING, etc.	BENT/SAGGING - NOT IN LINE/FLUSH (VERT or HORIZ)
LOOSE - ABLE TO BE MOVED WHEN IT SHOULDN'T BE	FINISH - FADED; PEELING; DIRTY; GRAFFITI
NECKING OF TIMBER PILE - DIAMETER < 300MM	