Drainage Management for Aerotropolis and Mamre Road Precincts

Draft 7 June 2022

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Contents

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DRAFT Drainage Management for Aerotropolis and Mamre Road Precincts

When finalised, this document will identify the roles and expectations for drainage management in the initial precincts for the Aerotropolis and Mamre Road (the precincts).

Water on Country

Wianamatta, or 'Mother's Place' is a complex water system that travels from Dharawal Country in the south, through Dharug Country in the Aerotropolis, and links north to Darkinjung Country. It is made of an interconnected network of ephemeral creeks and resource rich, swampy Country, also known as wetlands.

Through impacts of colonisation and agricultural land use, these water systems have been fragmented and damaged. As the future of Aerotropolis changes, it is vital we commit to healing and revitalising water on Country.

Drainage in the Precincts

On the 25th of March 2022, the NSW (New South Wales) Government identified Sydney Water to "*undertake the planning, delivery and operation of major stormwater infrastructure for the precincts*". Under section 65 of the Sydney Water Act 1994 'stormwater drainage area' is defined and land areas are declared to enable Sydney Water to levy stormwater drainage area charges across catchments within the precincts.

The drainage networks in the precincts are to be managed in a collaborative partnership between Sydney Water, Penrith, and Liverpool Cities. Waterways and drainage lines in the precincts are key to recognising Country, providing amenity and recreation outcomes, ensuring health and public safety, as well as achieving ecological waterway health goals.

Co-ordinated drainage management via the integrated water cycle management studies are in line with the NSW Government's draft Greater Sydney Water Strategy and the waterway health objectives and targets for the Wianamatta Catchment (Performance criteria for protecting and improving the blue grid in the Wianamatta-South Creek catchment: Water quality and flow related objectives for use as environmental standards in land use planning. NSW Department of Planning and Environment, Parramatta 2022).

Planning Mechanisms and Stormwater/Drainage Requirements

The following provides an overview of the legislative framework that applies to drainage infrastructure within the precincts as it relates to urban development and growth area planning.

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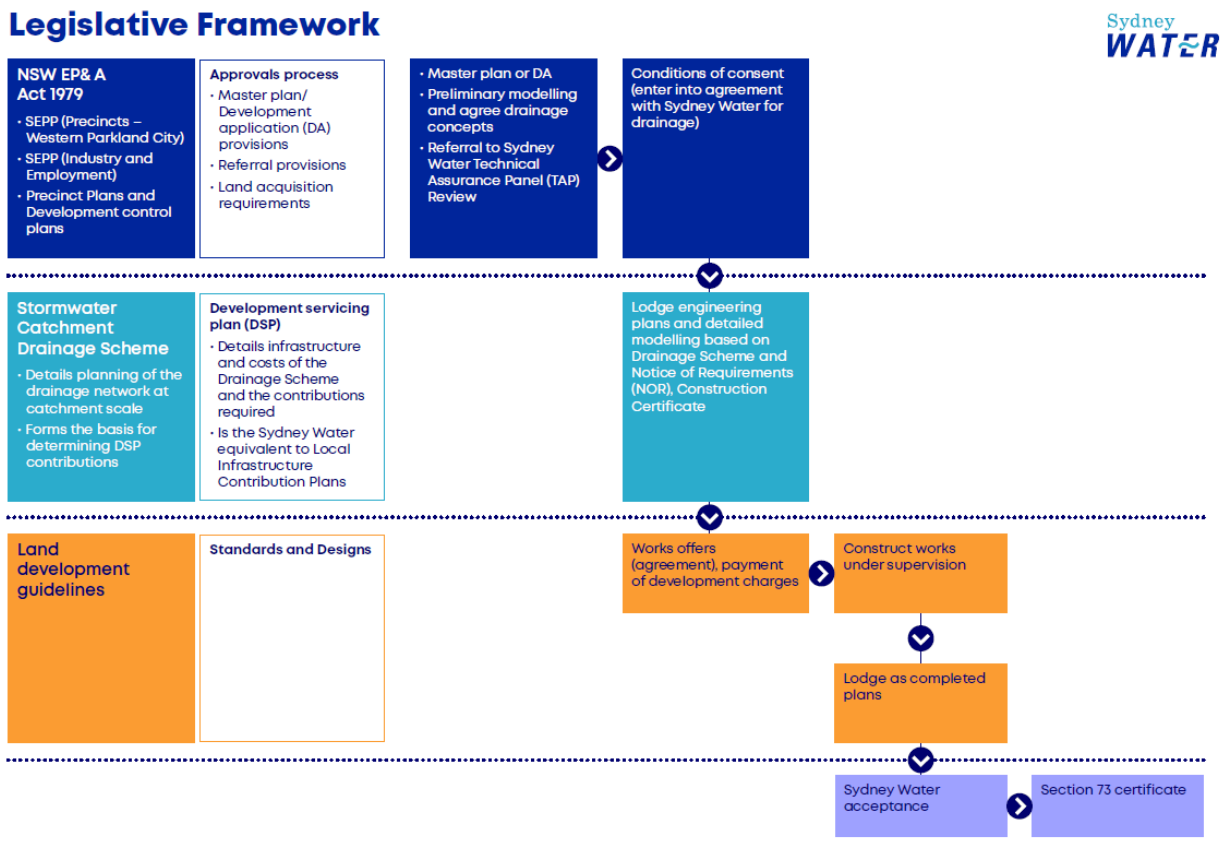

Figure 1 Legislative framework - planning hierarchy for stormwater drainage.

State Environmental Planning Policies

State Environmental Planning Policy (Precinct - Western Parklands City) 2021 (WPC SEPP)

The principle environmental planning instrument applying to the Aerotropolis precincts is the WPC SEPP.

The WPC SEPP includes a Land Reservation Acquisition Map which indicates the planned stormwater infrastructure in the initial precincts, including land to be acquired by Sydney Water for the delivery of this infrastructure, as the relevant acquisition authority.

This can be seen on the Land Reservation Acquisition Map (Figure 2).

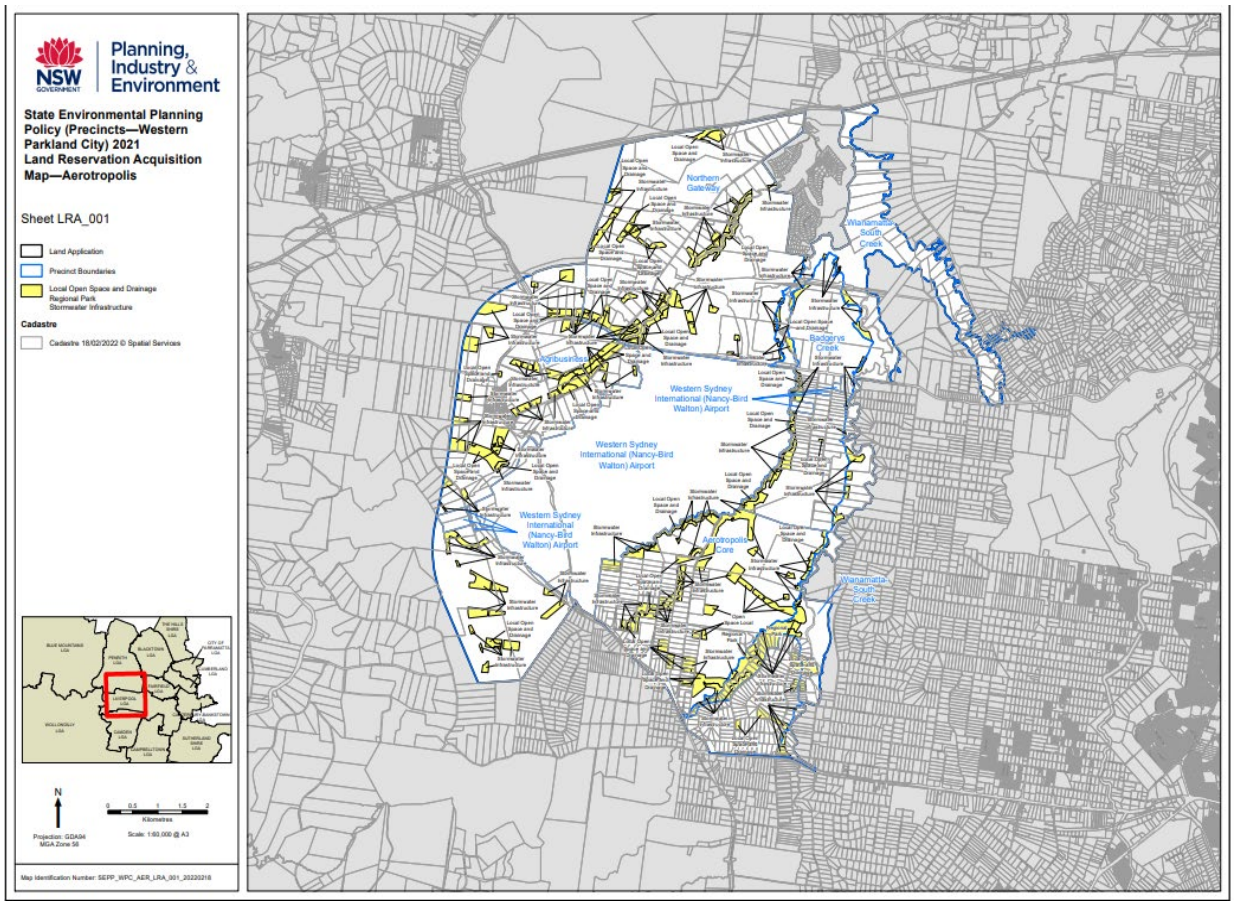

Figure 2 Land Reservation Acquisition Map - Aerotropolis. *Source: NSW Department of Planning and Environment.*

State Environmental Planning Policy (Industry and Employment) 2021 (Industry and Employment SEPP)

The Mamre Road Precinct is subject to a separate environmental planning instrument, the Industry and Employment SEPP. Whilst the principles for integrated water cycle management are established under this SEPP, it does not map stormwater infrastructure, nor nominate specific land for acquisition by Sydney Water.

Land required for stormwater infrastructure in the Mamre Road Precinct will be identified in Sydney Water's Stormwater Catchment Drainage Schemes which may be reflected in a subsequent amendment to the Industry and Employment SEPP, once finalised.

Precinct Plans

Western Sydney Aerotropolis Precinct Plan

This plan applies in accordance with the provisions of the WPC SEPP and provides the place-based objectives and requirements to guide development in a consistent and sustainable manner.

The Precinct Plan applies to five initial precincts; the Aerotropolis Core; Badgerys Creek; Wianamatta-South Creek; Northern Gateway and Agribusiness. Its provisions and objectives must be considered in the assessment of development applications and master plans by consent authorities which particularly reference the sustainable management of water.

Further detail is provided under section 4 Urban Structure, where the blue / green grid is identified as a key element of the precinct's future urban development. The delivery explanation of the blue / green grid is described under section 4.5.1 Total water cycle management which was developed in consultation with Sydney Water and is documented in the *Stormwater and Water Cycle Management Study (Sydney Water, 2021).* The objectives listed for this section specifically address the need for a regional stormwater network to be managed by Sydney Water. This includes the requirement that all development must demonstrate how it will address a regional stormwater approach and connect to the stormwater infrastructure shown in Figure 3 below.

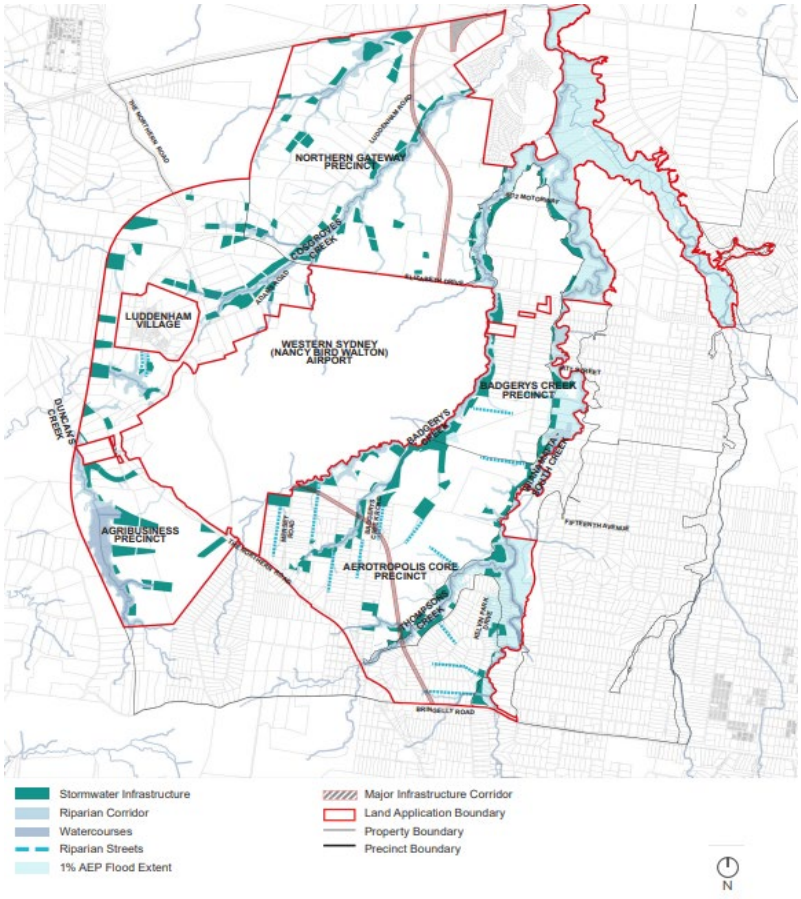

Figure 3 Western Sydney Aerotropolis Precinct Plan – Total water cycle management. *Source: NSW Department of Planning and Environment.*

Draft principles

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Draft Principles

Sydney Water's Operating Licence sets out what services can be delivered and how they are to be charged. For monopoly services, fees and charges are determined by IPART. IPART's determinations can set fixed fees or a methodology for setting charges. They can also specify associated procedural requirements associated with those charges.

Sydney Water's Development Servicing Plans (DSP) provide the details of infrastructure and costs of the Stormwater Catchment Drainage Scheme, and the contributions required to deliver these works. The method and process to estimate and levy these contributions is set in accordance with the most recent IPART determination - *Developer charges and backlog sewerage charges for metropolitan water agencies Sydney Water, Hunter Water and Central Coast Council, Final Determination, IPART October 2018*. This determination sets out how Sydney Water must develop, calculate, publicly exhibit, and register infrastructure contributions in a DSP before charging for connection to services. The determination methodology and process relate to all new connections to Sydney Water systems, not just trunk drainage.

The principles and objectives identified in the Department of Planning and Environment's Infrastructure Contributions Practice Note Review have formed the basis for Sydney Water's draft principles for Stormwater Catchment Drainage Schemes. These are outlined in figure 4 below.

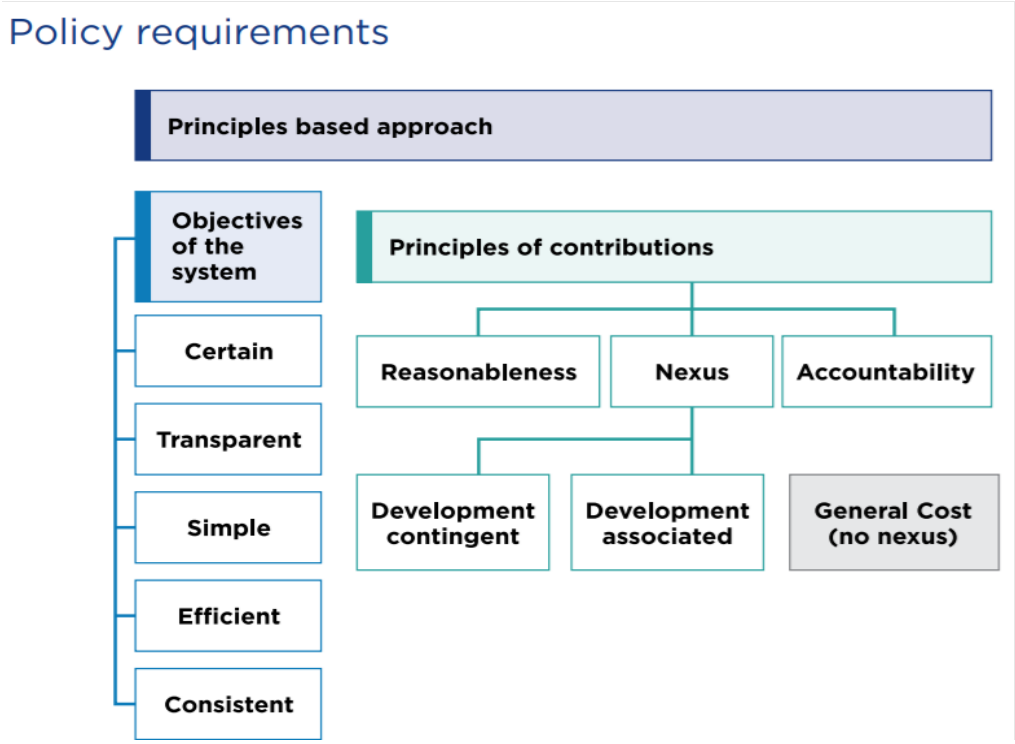

Figure 4 *NSW Government policy requirements for infrastructure contributions in NSW* (DPIE, 2021).

Sydney Water has considered several other stormwater specific sources to develop draft principles:

- Review of the essential works list, nexus, efficient design and benchmark costs for local infrastructure, Draft Report, IPART October 2021

- Draft Benchmarking Items and Costing Methodology - Benchmark Costs for Local Infrastructure prepared for IPART, Cardno, October 2021
- Principles for Provision of Waterway and Drainage Services for Urban Growth, Melbourne Water, 2005

In considering drainage within Integrated Water Cycle Management Strategies for the Aerotropolis and Mamre Road Precincts, Sydney Water has developed the following draft principles for discussion with stakeholders. The draft principles are designed to provide an integrated solution to drainage, waterway and stormwater quality works including:

- Adoption of an integrated catchment approach to stormwater management.
- User based pricing, full cost recovery and removal of cross subsidies that are not consistent with efficient and effective services.
- Environmental requirements based on the best available scientific information.
- Protection of waterway health and biodiversity values.
- Recognition, respect, and protection of cultural values along waterways.

The draft principles are designed to meet the IPART principles approach described earlier in a way that leads to positive social, economic, and environmental outcomes,

Sydney Water's draft principles for Stormwater Catchment Drainage Schemes within the precincts and ultimately DSP must be considered in the context of the following definitions.

Definitions

Stormwater Catchment Drainage Schemes (Drainage Schemes): details the level of planning of the drainage network within the declared stormwater drainage areas and is the basis for determining DSP contributions. It consists of functional designs for Sydney Water drainage assets, including pipelines, overland flow paths, retarding basins, waterways, wetlands, and gross pollution traps (GPT) and identification of land to be set aside for these purposes. It ensures that appropriate standards for flood protection and environmental performance are met, including protection and enhancement of waterway, biodiversity, and cultural values.

Development Servicing Plan (DSP): provides the details of infrastructure and costs of the Drainage Scheme and the contributions required. The method and process to estimate and levy these contributions are set in accordance with *Developer charges and backlog sewerage charges for metropolitan water agencies Sydney Water, Hunter Water and Central Coast Council,* Final Determination, IPART *October 2018*.

Declared Stormwater Drainage Area: this is the area where Sydney Water can charge customers a stormwater charge, and developers a contribution under the DSP. In the Aerotropolis area, the declared catchments are aligned to the precinct borders and were declared 18 March 2022 under the Sydney Water (Stormwater Drainage Areas) Order 2011. The maps can be viewed on the **NSW legislation website**.

State Environmental Planning Policy (SEPP): A SEPP is a statutory planning instrument made by the Minister for Planning and which can be issues-based or place-based. SEPPs may contain provisions for structure planning or precinct planning – a type of planning applied to a specific geographic areas, as well as core development controls, including requirements for integrated water cycle management.

Development Control Plan (DCP): provides detailed planning and design guidelines to support the planning controls in the relevant SEPP or local environmental plan.

Local Infrastructure Contributions (LIC): are developer contributions charged by councils for local infrastructure such as drainage, roads, open space and community facilities. Contributions may be applied as a charge per dwelling or per square metre of gross floor area or as a percentage levy of the capital cost of the proposed development. There is no overlap or duplication between LICs and Sydney Water DSP charges.

Proposed Western Parkland Stormwater Catchment Drainage Scheme Principles for the Aerotropolis and Mamre Road Precincts

Principle	Description/Comments	Application – 'how to'
1 There shall be no formal limit on the size of the stormwater catchment drainage scheme area. *Nexus, Simple* (Principle, Objective)	The appropriateness of size will vary from scheme to scheme and is governed by nexus between contributing properties and infrastructure provision and sufficient scale to maintain simplicity in administration (not too many schemes to administer) and stability in the charges (the larger the scheme, the more stable the charges). The scale of scheme area should be directly related to the drainage characteristics of the land as well as considering other engineering elements such as stormwater harvesting network requirements	Each scheme must have clear catchment boundaries, so their application to land is defined. This will be subject to the nature of the catchment and the spatial distribution of costs.
2 Stormwater catchment drainage schemes will be planned to service all land within the declared catchment and provide trunk drainage to service catchments greater than 15ha. *Accountability, Transparent*	Sydney Water will develop (with developers / landowners) Development Servicing Plans (DSP) to provide trunk drainage to service catchments greater than 15 ha. Council's will remain responsible for drainage infrastructure within catchments less than 15ha. The catchment boundary is the proposed interface between Sydney Water DSP funding and Council LIC (or other) funding of infrastructure.	Clear boundaries to drainage work between Council and Sydney Water should be agreed across both parties. Boundary of works and work requirements (standards) under Council responsibility should be documented. Works that Council require to be completed and funded as part of LIC should be clearly defined and will not be included in Sydney Water's DSP.
3 Stormwater catchment drainage schemes will be planned to recognise and celebrate water on Country. *Reasonableness, Transparent*	Sydney Water will prioritise traditional knowledge and values of water within drainage infrastructure planning.	Work with First Peoples Traditional Custodians to understand needs relating to access and cultural connections to water, and opportunities to care for and revitalise Country. This work will help to build a system wide approach that contributes to a site-based approach in principle 4.

Principle	Description/Comments	Application – 'how to'
4 Stormwater catchment drainage schemes will be planned to consider, respect, and protect cultural values, along trunk drainage and within waterways. *Reasonableness, Consistent*	Sydney Water will include protection and interpretation of cultural values within the stormwater catchment drainage schemes.	Work with First Peoples Traditional Custodians and Registered Aboriginal Parties to identify cultural values of Country as they relate to drainage systems/works within schemes to ensure they are respected and protected. Cultural values must be managed across design, construction, and maintenance stages so SW/developers can deliver appropriate works.
5 Stormwater catchment drainage schemes should propose infrastructure to service development that is efficient in terms of cost and performance. *Accountability, Efficient*	Scheme design should propose works that achieve the minimum standards and are efficient in terms of cost and performance, while protecting cultural, environmental, and other waterway values. Ensuring infrastructure is efficient is a central part of any precinct planning process. Efficient infrastructure not only reflects minimum applicable standards, but also meets community needs and provides value for money. Scheme costs include allowances for design, delivery management and scheme administration.	Clear standards for minimum compliance requirements for the scheme must be established. Scheme costs must reflect achieving minimum standards and form the basis of offered reimbursement for works (to developers). This may be moderated by actual costs to deliver compliance works. Enhancement works beyond compliance works undertaken by developers or another proponent (e.g. Councils) must not be funded by the scheme Funding of adjacent stormwater land or recreational improvement works, must not be in the scheme. These works may be delivered by a developer, but funding must be from a separate source.

Principle	Description/Comments	Application – 'how to'
6 Infrastructure benefits common to more than one stormwater catchment drainage scheme will have the cost apportioned. *Nexus, Transparent*	The cost of infrastructure servicing multiple schemes will be apportioned based on capacity share. This infrastructure may be sited in different locations but will be apportioned according to the benefits derived across each catchment. Recycled water capture system costs should be apportioned between schemes.	Where recycled water, drainage water collection and treatment are to be funded by the scheme, clarity on how costs are being apportioned must be provided. Where works serve multiple schemes cost apportionment must be shared as a proportion of drained catchments.
7 All landowners will receive an equivalent level of service. *Reasonableness, Consistent*	Owners of large lots will receive an equivalent level of service provided to smaller lots with appropriate drainage works based on engineering judgement.	As Sydney Water is only responsible for drainage infrastructure over 15ha, council is likely to be responsible for ensuring an equivalent level of service is provided across landowners. The adopted Level of Service which drainage schemes are operating within must be defined by DPE.
8 Infrastructure designed to accommodate run-off from non-developable land within the stormwater catchment drainage scheme boundary will be funded by Development Servicing Plan *Reasonableness, Transparent*	Non-developable land includes: – Existing reserves and conservation areas – Flood plains – Existing roads – Other land types not zoned for development.	Schemes must consider works required to service whole of catchment, with costs spread over the developed or developable area, only. Non developable land must be deducted from the catchment in the calculation and documented as areas not subject to drainage scheme charges.

Principle	Description/Comments	Application – 'how to'
9 Stormwater catchment drainage scheme infrastructure required to service existing urban land within the scheme will not be funded by the Development Servicing Plan. *General cost (no nexus), Consistent*	Sydney Water or the council will meet costs related to existing urban development based on area of responsibility. General costs arise regardless of whether any specific development proceeds which does not have a nexus to development.	Mapping out existing developed areas, regardless of their current level of required drainage management, should be undertaken to inform decision making. Apportioned costs to improve existing drainage will be funded by responsible authority's Sydney Water / Council. Infrastructure contributions should not be used to fund work to service existing developed areas to current standards. Existing development has already funded drainage service works and improvement to a new standard should be funded by the landowners through the rate base.[1]
10 Infrastructure to service existing and future development external to the stormwater catchment drainage scheme will not be funded by the Development Servicing Plan. *Nexus, Consistent*	Upstream modified existing or future flows, outside the scheme boundary, do not have a nexus to development and therefore are not funded by the scheme. Upsizing to cater for upstream modified flows should be funded as part of existing development or by the upstream DSP, as appropriate.	The cost of servicing upstream catchments should be determined and allocated to the upstream DSP.
11 Environmental works downstream of stormwater catchment drainage schemes will be funded where upstream development is the cause of the problem. *Nexus, Transparent*	The cost of environmental works downstream of a drainage scheme that has a nexus with the upstream drainage scheme, will be apportioned to the upstream scheme. Environmental improvement works of downstream waterways 'declared drainage areas', will be apportioned the impact of development not general improvement	The cost of servicing a catchment in downstream works must be determined and allocated to the appropriate scheme. General environmental improvement works of waterways must be determined and separated from the DSP.

[1] IPART's 2018 New Connections Determination defines what development is included when calculating contributions

Principle	Description/Comments	Application – 'how to'
12 Sydney Water or the local council will meet the cost of improved flood protection for existing development. *General cost (no nexus), Consistent*	Sydney Water or the local council will meet the additional costs incurred in the scheme to increase the standard of drainage protection, water quality and waterway values for existing development, to the current accepted standard.	The scheme will be costed to achieve the current standard. In partially developed areas if standards change, which increases costs, the scheme charges must only cover the cost to achieve the new standard for future development. The already developed areas are regarded as existing development in accordance with principle 8.
13 Development Servicing Plans and associated stormwater catchment drainage schemes will be reviewed at least once every five years. *Accountability, Transparent*	DSP will be reviewed to ensure the contribution rate reflects the actual costs of servicing development. This is required of Sydney Water in accordance with their Operating Licence as they must levy charges according to IPART's pricing and infrastructure contributions determinations they are reviewed at least once every five years. Schemes will have engineering and environmental reviews at least once every five years, to ensure current standards are being met.	A program of regular technical review will be established as schemes develop and change, and as they are delivered over time. Sydney Water will engage with the development industry as part of each DSP review.
14 A robust consultation process will govern the creation of stormwater catchment drainage schemes. *Accountability, Transparent*	Sydney Water as part of the New Connections Determination requires consultation with industry, landowners, and other interested parties, and public exhibition prior to registering infrastructure contributions in Development Servicing Plans (DSPs)	The drainage scheme development process should include engagement with all landowners, Council, and other interested parties. Key issues relate to the location of major infrastructure assets within each scheme which will impact developable land and yield of various landowners.

Principle	Description/Comments	Application – 'how to'
15 Stormwater catchment drainage schemes will be adjusted for innovative works that benefit the scheme. *Reasonableness, Efficient*	Sydney Water will reward innovation by developers or proponents that financially benefit the scheme. The reward or reduction in scheme contribution will be based on the saving to the scheme; the overall financial benefit of the innovation, and benefit derived by the developer.	Where a developer creates a solution, which is more efficient than the scheme and achieves the required standards, the benefits should be shared with the developer. This benefit should consist of the proportion of savings divided over the external area serviced by the works.
16 Stormwater catchment drainage schemes will include property acquisition costs consistent with NSW Government standards and practices. *Reasonableness, Simple*	For a consistent and predictable approach to property acquisition for scheme pricing purposes Sydney Water will: – Include acquisition costs in schemes where the land is impacted by Sydney Water stormwater infrastructure. – Assess the property acquisition requirements on a site-by-site basis to determine suitable outcomes for all parties. - Value the land in line with the Australian Institute of Property valuations standards.	Sydney Water will comply with NSW Government Property acquisition standards and principles. Property valuations will be completed by a qualified, registered valuer and in line with the Australian Institute of Property's valuation standards. The basis on which land may be gifted to Sydney Water as the trunk stormwater authority must be clearly defined and captured in the standard development process. Additional land for other purposes (e.g. adjacent recreational land) is not to be funded by the DSP. This land may be purchased by Sydney Water but accounted for elsewhere through other funding mechanisms or through agreements with council for reimbursement.

Development Control Plans

Western Sydney Aerotropolis Development Control Plan – Phase 2 (Draft Phase 2 DCP)

The Draft Phase 2 DCP provides clear guidance on the expectations and requirements to deliver sustainable water infrastructure within the Aerotropolis. It outlines the objectives, performance outcomes (PO) and benchmarks required to implement the appropriate stormwater, Water Sensitive Urban Design (WSUD) and Integrated Water Management (IWM) solutions for urban development. It also requires that development acknowledge this is *'wet Country'* through the rehabilitation of naturalised waterways as areas of significant Aboriginal heritage, under section ***2.1 Starting with Country***.

The following details the key sections of the Draft Phase 2 DCP, expected to be finalised in June 2022, that have direct implementation requirements for Sydney Water as a stormwater authority managing trunk infrastructure.

Under section ***4.3 Stormwater Management and WSUD,*** PO7 states that:

> *'Development is designed to safely convey overland flows in accordance with Stormwater and Integrated Water Management Plan (Sydney Water 2021) and the safety standards included in Australian Rainfall and Runoff Guidelines 2019.'*

To deliver on PO7 the benchmark defines and details the required typology, design, and flow capacity that all **trunk drainage** should achieve.

The DCP also details the distinction between the relevant stormwater authority (regional and local infrastructure stormwater assets) and how they will be managed and maintained under section ***4.4 Management and Maintenance of Stormwater Infrastructure*** PO1 which states:

> '*Stormwater assets (including land and infrastructure) are managed and maintained by the relevant stormwater authority.*
>
> *Note: Regional Infrastructure stormwater assets:*
>
> *• Regional stormwater basins (mapped in the Integrated Water Management Plan)*
>
> *• Trunk drainage servicing catchments of 15ha and greater*
>
> *Local Infrastructure stormwater assets:*
>
> *• Stormwater basins not mapped in the Integrated Water Management Plan*
>
> *• Drainage servicing catchments less than 15ha*
>
> *• Street trees.'*

Mamre Road Development Control Plan (Mamre Rd DCP)

This DCP was adopted on Friday 19th November 2021 and provides planning controls for future industrial development in the Mamre Road Precinct including water cycle management, flooding, and riparian land controls.

The Mamre Road DCP also includes the Mamre Road Precinct Structure Plan (PSP) that applies in accordance with the provisions of the *Industry and Employment SEPP* and forms the basis for urban development within the Precinct by setting out the future urban structure. It details objectives and controls to facilitate co-ordinated development and requires development to be generally consistent with the PSP, including the environmental, open space and drainage networks as shown in Figure 5 below.

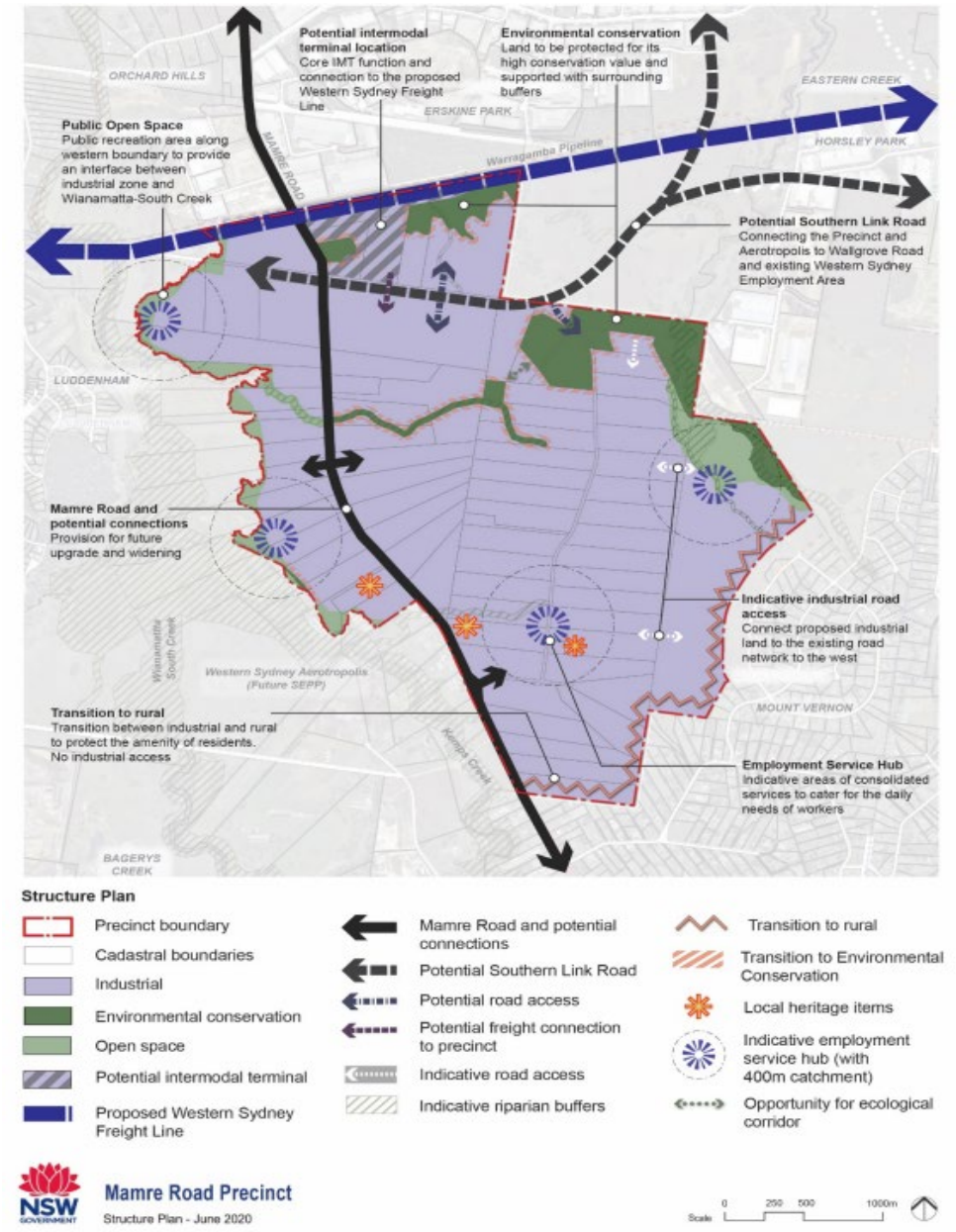

Figure 5 Mamre Rd PSP. *Source: NSW Department of Planning and Environment.*

The following details the key sections of the Mamre Rd DCP that have direct implementation requirements for Sydney Water and the role they will play in the delivery of water infrastructure as a stormwater authority alongside the consent authority.

Under section ***2.4 Integrated Water Cycle Management*** the DCP objectives reinforce the waterway objectives (flow and water quality) that have been established to protect waterways within the Wianamatta-South Creek catchment, in accordance with the *Western Parkland City District Plan* as well as *NSW Government Risk-based Framework for considering Waterway Health Outcomes in Strategic Land-use Planning Decisions* (2017). The DCP includes these flow and water quality objectives in Appendix D and directs users to the NSW Government technical notes, guidance documentation and modelling packages to assist in compliance.

The DCP objectives seek to ensure land use and development is integrated with water cycle management and transitions to regional water infrastructure to deliver holistic outcomes for waterways, amenity, and liveability. The planning controls detail how development must demonstrate compliance with specified stormwater quality and flow targets, through the provision of a Water Management Strategy that details any Water Sensitive Urban Design WSUD infrastructure proposed as part of the development.

WSUD infrastructure, such as naturalised trunk drainage paths, are considered acceptable solutions to the DCP controls, providing they are located within the indicative drainage paths shown below in Figure 6, and are in accordance with the listed controls under ***Trunk Drainage Infrastructure.***

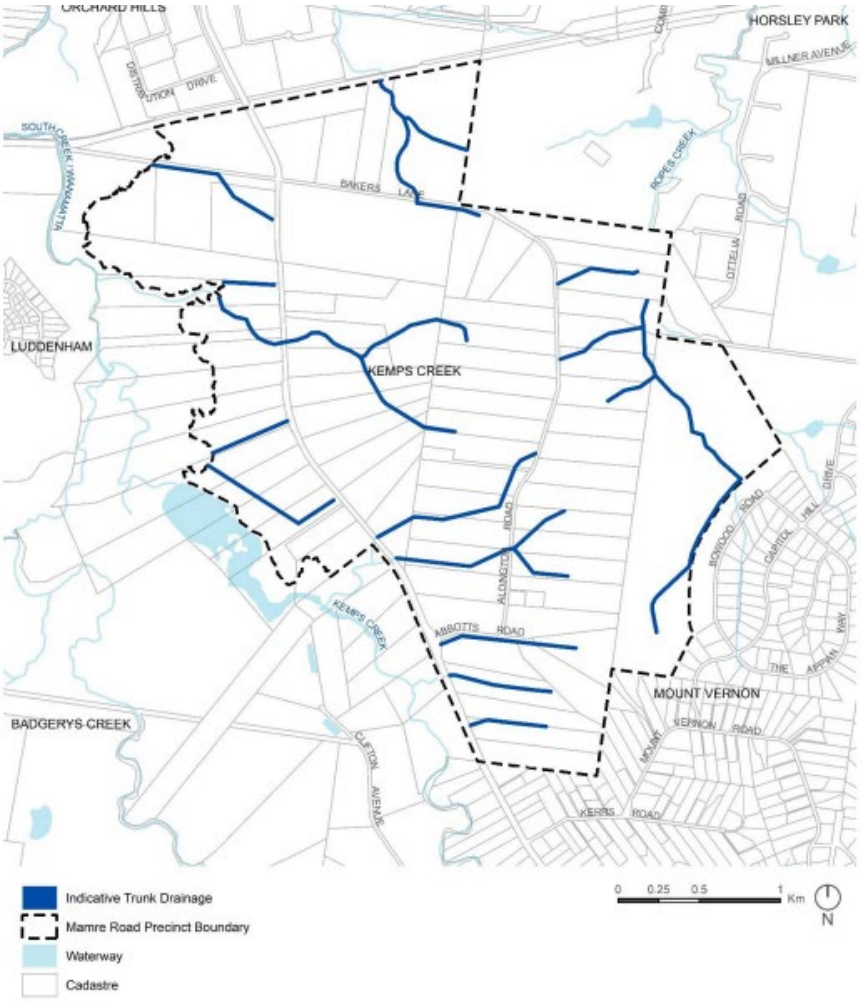

Figure 6 Mamre Rd DCP – Indicative trunk drainage paths. *Source: NSW Department of Planning and Environment.*

Potential planning amendments – Mamre Road

Following the exhibition and finalisation of this Draft Stormwater Catchment Scheme Plan, there is potential to implement amendments to relevant environmental planning instruments such as the Industry and Employment SEPP and Mamre Road DCP. Any proposed amendments would be subject to DPE standard public consultation and exhibition processes.

Level of Service

The Department of Planning and Environment (DPE) water group are currently reviewing Sydney Water's Level of Service in accordance with Sydney Water's Operating License. This is expected to include:

- Specification of drainage conveyance to government requirements
- Specification of Waterway Health requirements to government targets

A definition of Level of Service is expected to be included within this document when finalised.

The following diagram Figure 7 provides an indication of the management of stormwater drainage within the Aerotropolis precincts, by both local and regional stormwater authorities, reflecting the expected Level of Service.

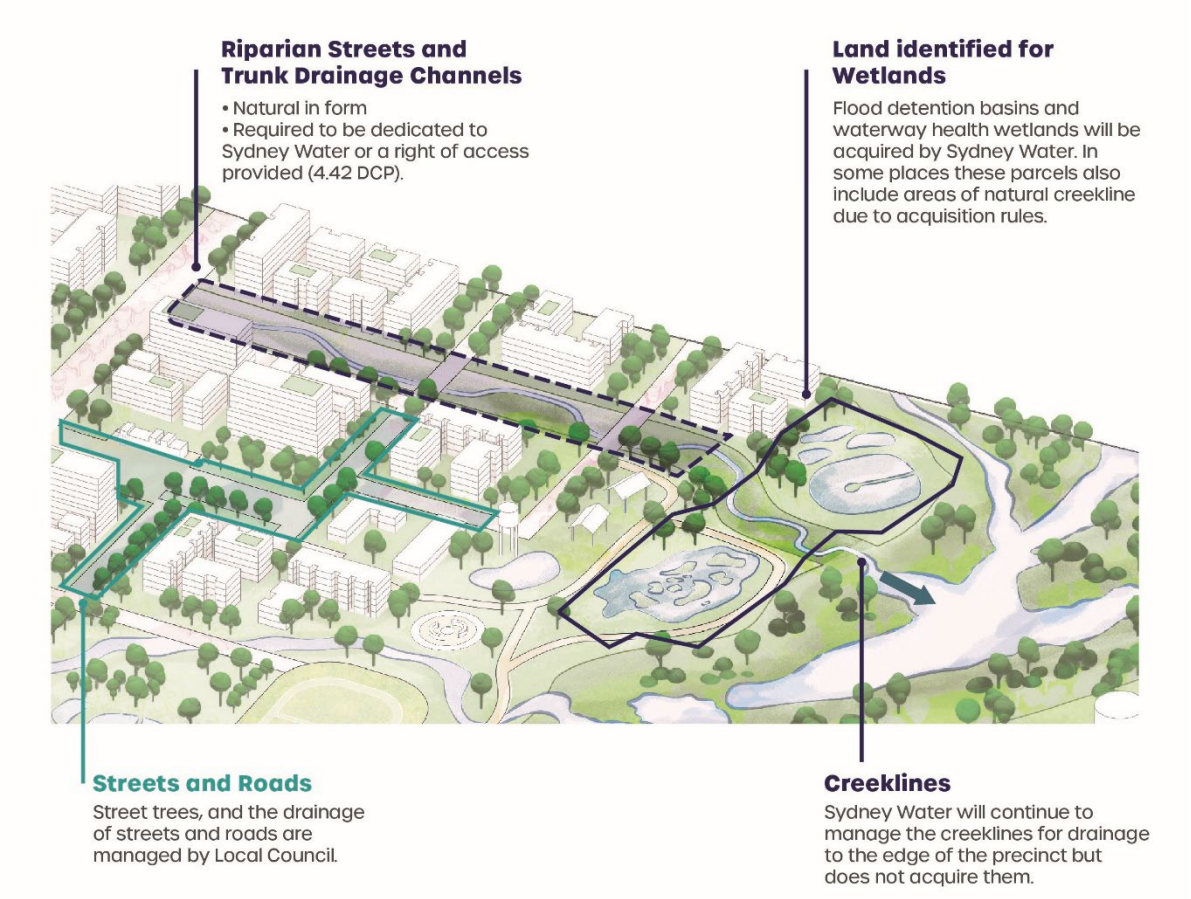

Figure 7 Indicative stormwater management for Aerotropolis and Mamre Rd precincts. *Source: Sydney Water.*

Proposed drainage management and delivery by asset

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Proposed Drainage Management and Delivery by Asset

The following table provides an indication of the anticipated delivery, management, and stormwater authority for drainage assets across the precincts.

Drainage Element - Assets	Planning and requirements	Approval	Ownership	Funding source	Delivery	Ongoing Management
1. On site permeability outcomes Permeability of urban form is part of the landscape led design approach to the Aerotropolis area. To be incorporated into the development design.	Planning documents require that the development meet requirements set out in the DCP. These requirements are part of the total calculation of stormwater performance of the precincts.	DA Planners in Council/DPE Sydney Water in Notice of Requirements (NOR) and compliance with DPE technical guideline Building permits and planning permits TAP for a master planned development	Private	Private	Builder/ Developer Construction Certificate – private certifier	Private
2. Onsite detention Onsite detention (OSD) is to hold back stormflow to manage downstream flooding. OSD can be accommodated into development in various ways including tanks and landscape design.	Planned as part of development design. OSD requirements remain in place based on Council requirements.	DA Planners in Council/DPE Sydney Water in NOR and compliance with DPE technical guideline	Private	Private	Builder/ Developer built in compliance with the plumbing code. Construction Certificates (CC) and private certifier	Private
3. Stormwater pipes on lots Infrastructure transporting stormwater from development to the street system.	Required by DCP to be consistent with IWCM plan and Council requirements to minimise maintenance. Consistent with plumbing code and Council Engineering Specifications	DA Planners in Council/DPE Section 68 Sydney Water in Notice of Requirements and compliance with DPE technical guideline.	Private	Private	Builder/ Developer Construction Certificates (CC) and private certifier	Private

Drainage Element - Assets	Planning and requirements	Approval	Ownership	Funding source	Delivery	Ongoing Management
4. Stormwater GPT on lots Devices on the lot to remove litter closest to source.	Assumed in IWCM study as part of the treatment train to achieve the stormwater quality and flow targets. Required by DCP and in Stormwater Catchment Drainage Schemes (deemed to comply solution)	DA Planners in Council/DPE Sydney Water in Notice of Requirements (NOR) and compliance with EES tech guideline. Could be via a deemed to comply solution	Private	Private	Builder/ Developer	Private
5. Street guttering, road drainage pipes. Streets include gutters, kerb inlets, drains, pits, and pipe work associated with draining the roadway.	There is specific guidance in Council documentation including the Western Sydney Street Design guide and the Western Sydney Aerotropolis Urban Design and Landscape Plan (Precinct Plans) technical guideline.	Council S168 under the Roads Act	Council (part of road reserve) Transport NSW if State road.	Developer / LIC Works in Kind Agreement (developer offset from contribution)	Developer / Council In accordance with Council Engineering Specifications	Council
6. Street Trees and Pits Green streets with passively irrigated street trees shade urban areas and treat stormwater.	The Precinct Plans require green streets. Aero DCP specifies street trees at 15m intervals to create continuous canopy cover along both sides of streets. Tree pits to be passively irrigated. Street tree pits are part of the precinct calculation to meet the waterway health targets	Council/DPE Sydney Water in NOR and compliance with DPE technical guideline	Council or Transport NSW	Developer / LIC Works in Kind Agreement (developer offset from contribution)	Developer / Council In accordance with Council Engineering Specifications	Council
7. Stormwater pipe system 20% AEP < 15Ha catchment Stormwater pipe or channel assets delivering to the trunk drainage system.	Collaboratively planned by Council and Sydney Water – ongoing discussion required. Sydney Water develop a Stormwater Catchment Scheme Plan Designed by developers	Council/DPE in collaborate with Sydney Water.	Council	Developer /LIC Works in Kind Agreement (developer offset from contribution)	Developer / Council In accordance with Council Engineering Specifications	Council
8. Overland flow paths 1% AEP < 15ha Flow paths through urban areas when pipe system is overtopped.	Flow paths through urban areas when pipe system is overtopped. Can be collaboratively planned by Council and Sydney Water – ongoing discussion required. Designed by developer. Technical Standards – ARR 2019 and Council requirements.	Council/DPE	Council	Developer /LIC Works in Kind Agreement (developer offset from contribution)	Developer / Council In accordance with Council Engineering Specifications	Council

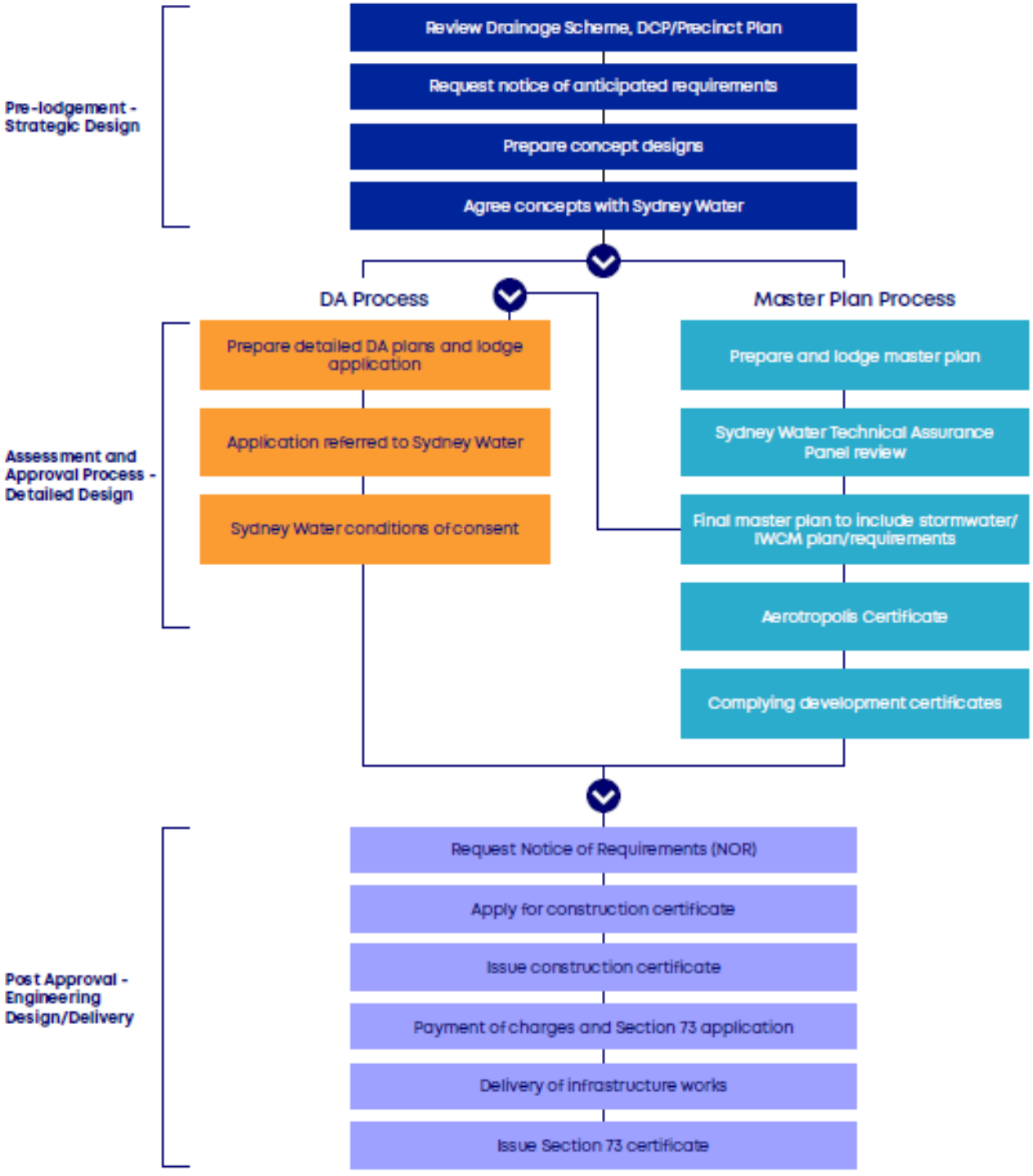
Drainage Element - Assets	Planning and requirements	Approval	Ownership	Funding source	Delivery	Ongoing Management
9. GPTs for greater than 15Ha GPTs can be required at the point the pipe system delivers to open drainage.	IWCM studies assumes GPTs before each wetland. Sydney Water's Stormwater Catchment Drainage Schemes will specify where this is needed.	Agreement with Council and Sydney Water	Sydney Water	Sydney Water DSP NOR Agreement (developer DSP offset)	Developer / Sydney Water In accordance with Sydney Water Engineering Specifications	Sydney Water
10. Naturalised Stormwater Open Channels >15Ha including "Riparian Streets" When the catchment being drained exceeds 15Ha drainage becomes open in a naturalised channel.	This is the commencement of the **trunk drainage** or the "*Regional Infrastructure Stormwater Assets*" as described in the Aerotropolis DCP. It has natural form and is sometimes the result of re-aligned small streams. This includes the "Riparian Streets" of the Aerotropolis (see Precinct Plans). Based on requirements of DCP specifications. Flood management requirements are specified in the DCPs. There needs to be consideration of: • Ensuring development is flood free • The open channel is to convey and contain the 1%AEP Design work undertaken by Sydney Water so that open channels contain the 1%AEP in the Stormwater Catchment Scheme Plans.	Identified in IWCM report and Precinct Plan. Some protections by NRAR regulations related to natural form. For Aerotropolis further alignments maybe needed at masterplan stage with approval from TAP.	Dedicated to Sydney Water or privately owned with easement to Sydney Water (as per DCP) unless identified in SEPP maps	Sydney Water DSP NOR Agreement (developer DSP offset)	Developer / Sydney Water In accordance with Sydney Water Engineering Specifications	Sydney Water
11. Detention basins in precinct For mitigating the increased flow effects due to development of region (in conjunction with the OSD)	Planned by Sydney Water to Council's specified approach (no regional detention basins proposed in Mamre Road) Drainage Scheme to detail drainage requirements as per DCP Development to be approved by DPE / Council	Council, DPE and Sydney Water to agreed Drainage Scheme	Sydney Water	Sydney Water DSP NOR Agreement (developer DSP offset)	Developer / Sydney Water In accordance with Sydney Water Engineering Specifications	Sydney Water
12. Waterway Health/ harvesting wetlands To meet the waterway health targets, stormwater is treated and stored in wetlands identified across the precincts.	Sydney Water has identified and planned wetlands as well as the land for acquisition including space for batters and maintenance access. Final system design is finalised in the Drainage Scheme. Mamre Road – identified in final Riparian, Flood and IWCM Plan. Aerotropolis Precincts – identified in Precinct Plans and SEPP.	Locations identified with DPE in Precinct Planning.	Sydney Water (see infrastructure layer in SEPP)	Sydney Water DSP NOR Agreement (developer DSP offset)	Developer / Sydney Water In accordance with Sydney Water Engineering Specifications	Sydney Water

Drainage Element - Assets	Planning and requirements	Approval	Ownership	Funding source	Delivery	Ongoing Management
13. Community paths, public recreation infrastructure (directly adjacent to drainage assets)	Due to the multifunctional nature of wetlands and their location within and adjacent to open space and parkland areas, it is expected that pathways / cycleways etc. will cross drainage asset. These can be planned by Sydney Water or Council collaboratively – ongoing discussion required.		Council	Developer /LIC	Developer / Council / Sydney Water	Council
14. Stormwater extraction system and treatment Stormwater harvesting system	Sydney Water will design a stormwater extraction system to harvest stormwater from the wetlands and deliver to the development via the recycled water reticulation systems. Sydney Water will operate pump / pipe systems and manage storage levels.	NSW Health regarding treatment. DPE Water regarding extraction.	Sydney Water	Sydney Water DSP	Sydney Water WSAA standards	Sydney Water
15. Creek lines within Precincts (a declared drainage area). Natural creek lines	Creeks within the precincts are to remain in their natural form as much as possible. Sydney Water will manage creek lines to the edge of the precinct for drainage conveyance purposes.	NRAR waterfront land-controlled activity approvals.	Council where indicated as part of open space. Option of dedication to Sydney Water. Ownership for further discussion with DPE. Define purpose, function, and costs.	LIC / SIC or subject to acquisition.	Council / DPE	Sydney Water for drainage purposes (access arrangements required)
16. Waterbodies and land outside of declared drainage area (e.g. Wianamatta South Creek Precinct including South Creek, Ropes Creek, Lower Badgerys Creek and Thompsons Creek)	NSW Government has not yet identified governance arrangements for drainage and waterway management functions.		Private and others.	NIL		DPE Water to define.

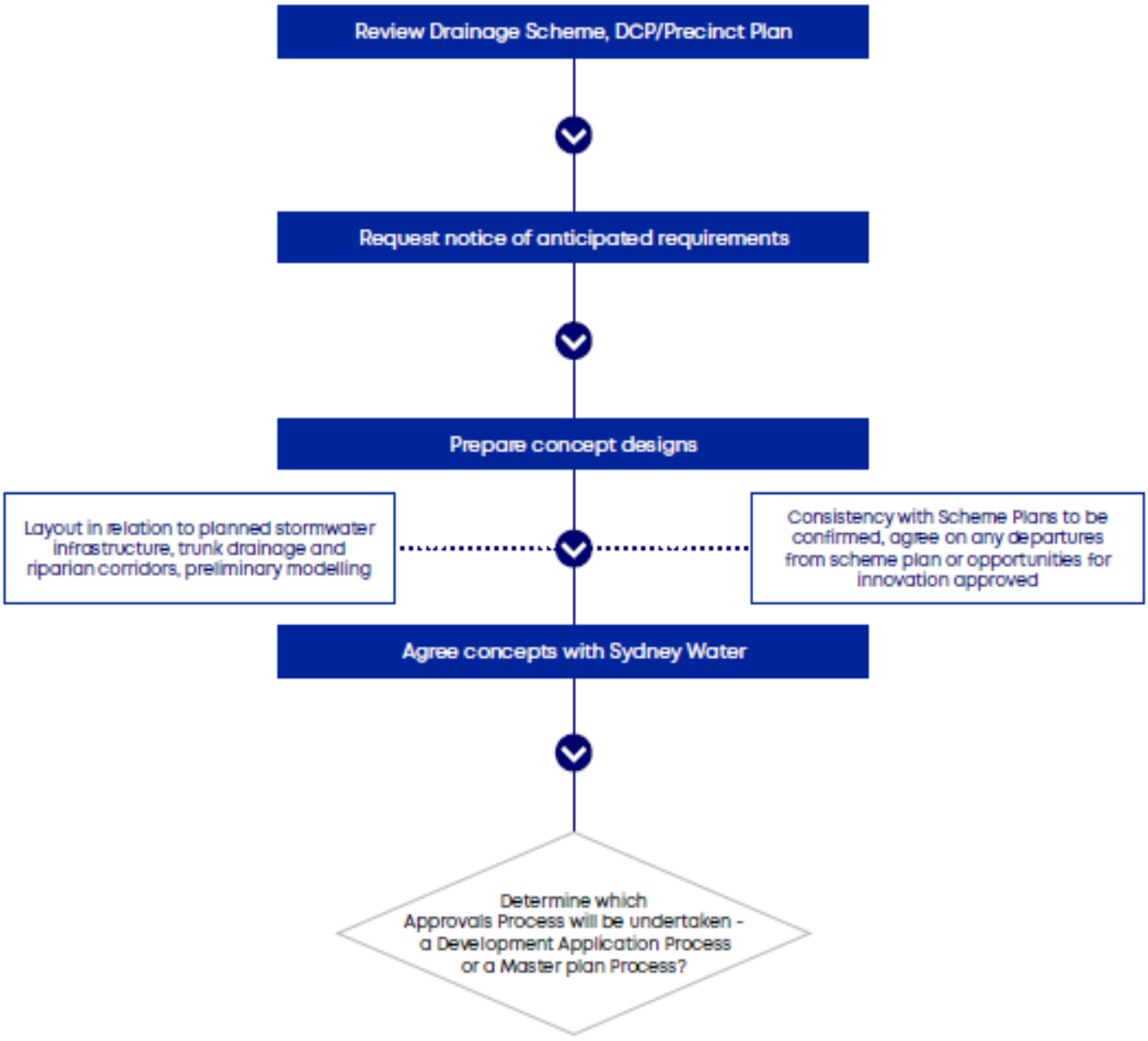
Proposed stormwater approvals process

Sydney WATER

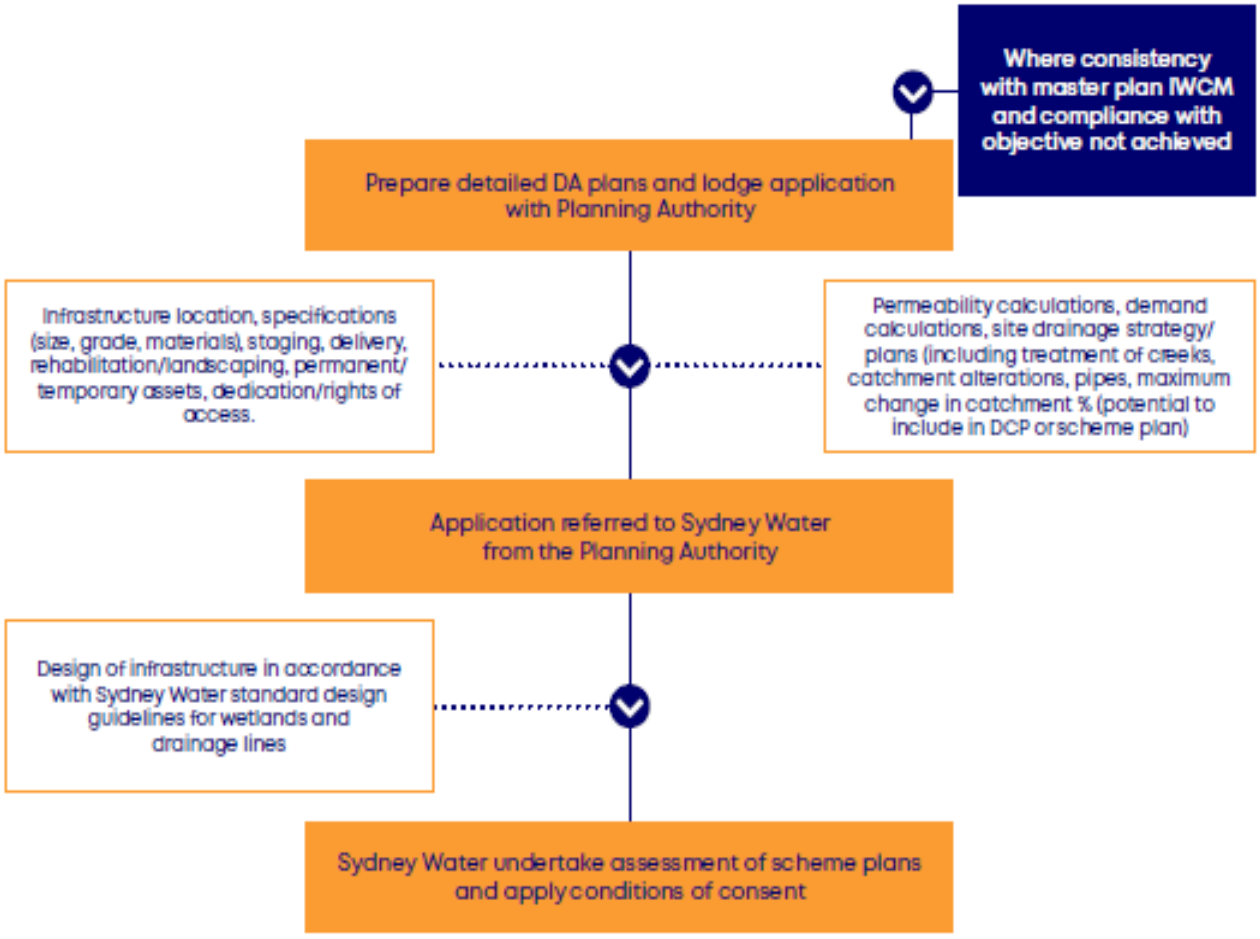
Stormwater Approvals Process



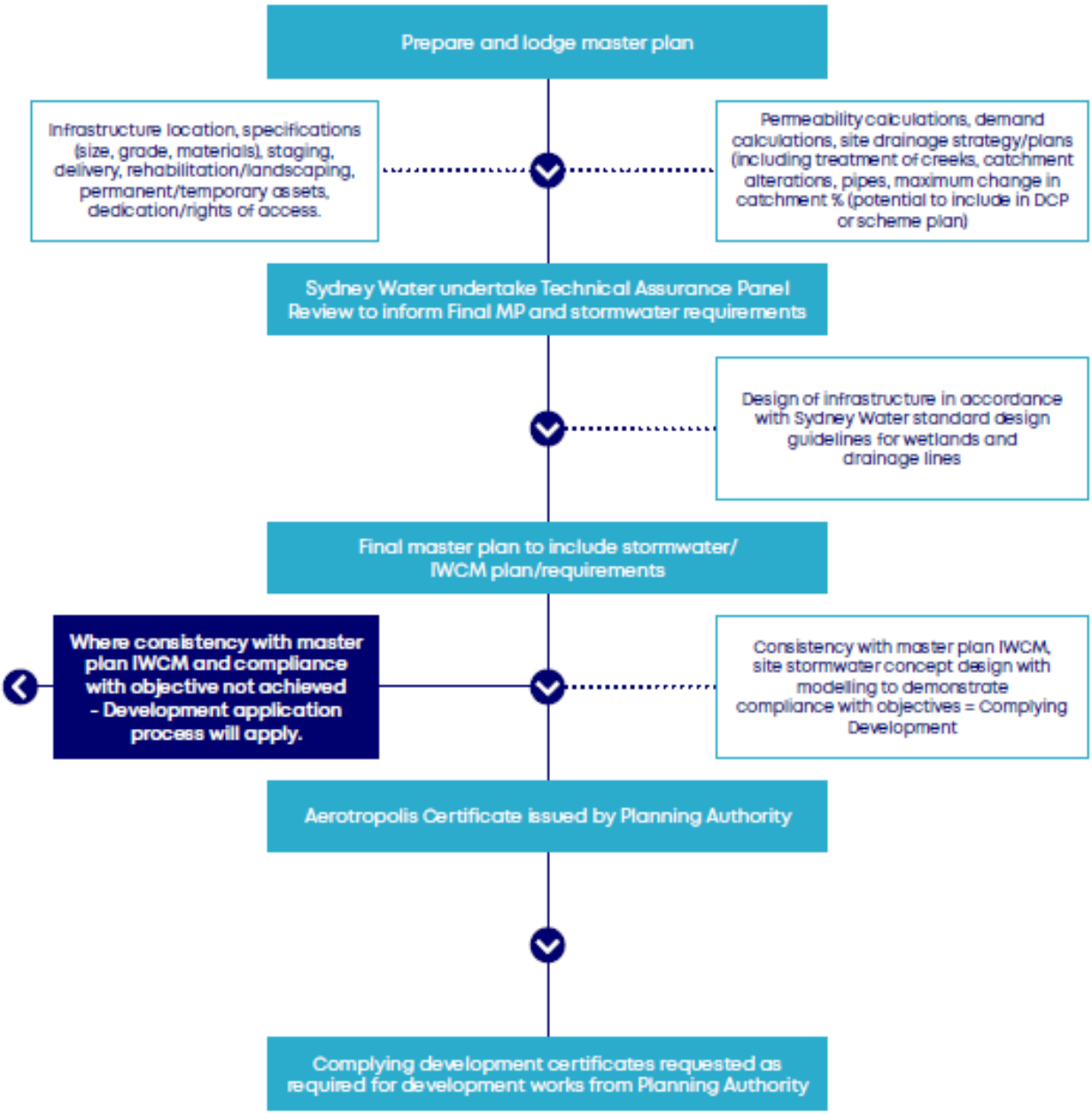
Pre-lodgement - Strategic Design



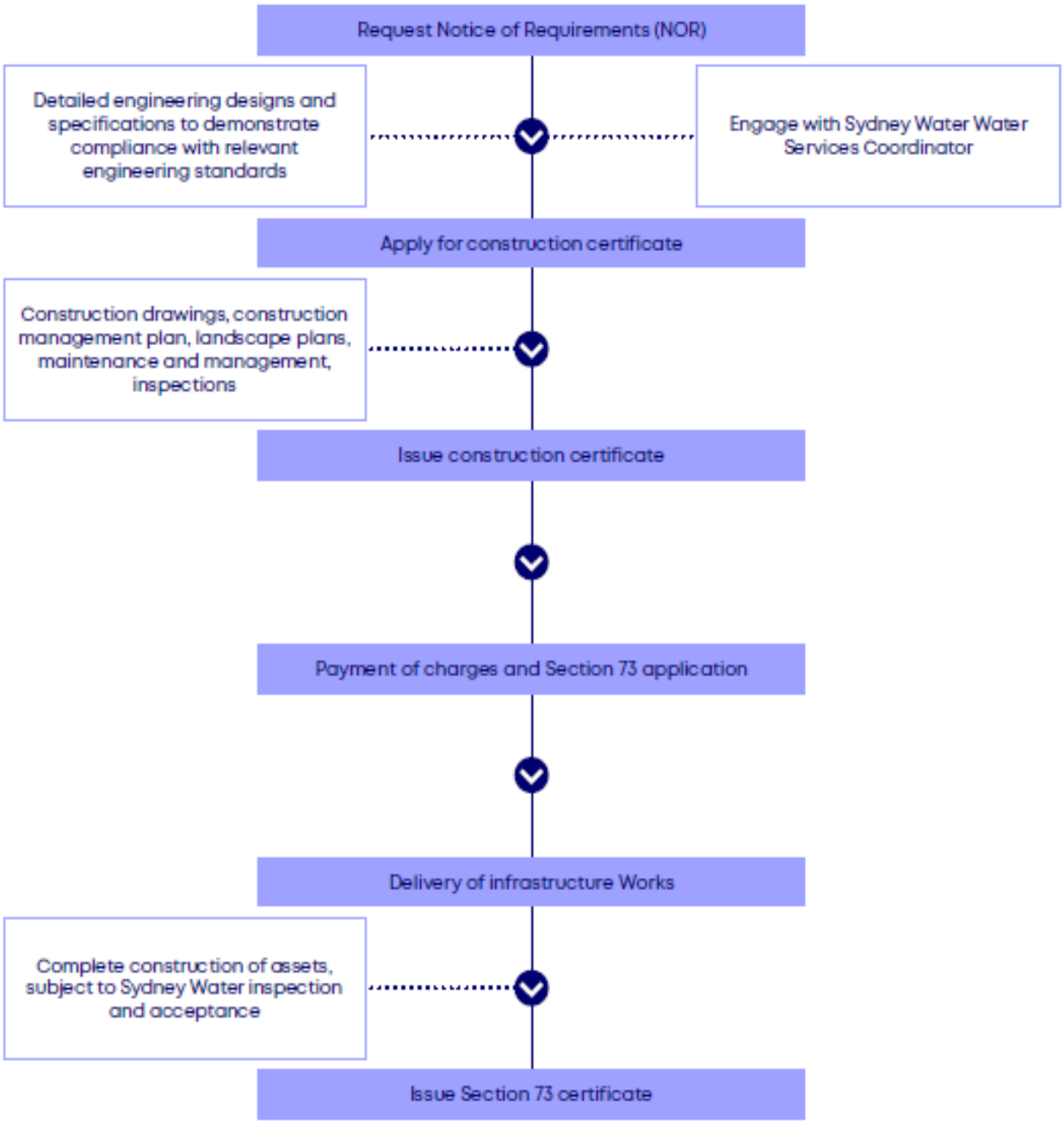
DA Process: Assessment and Approval Process - Detailed Design



Master Plan Process: Approvals - Detailed Design



Post Approval - Engineering Design/Delivery



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Sydney Water 2021 Stormwater and Water Cycle Management Study Aerotropolis Precincts

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