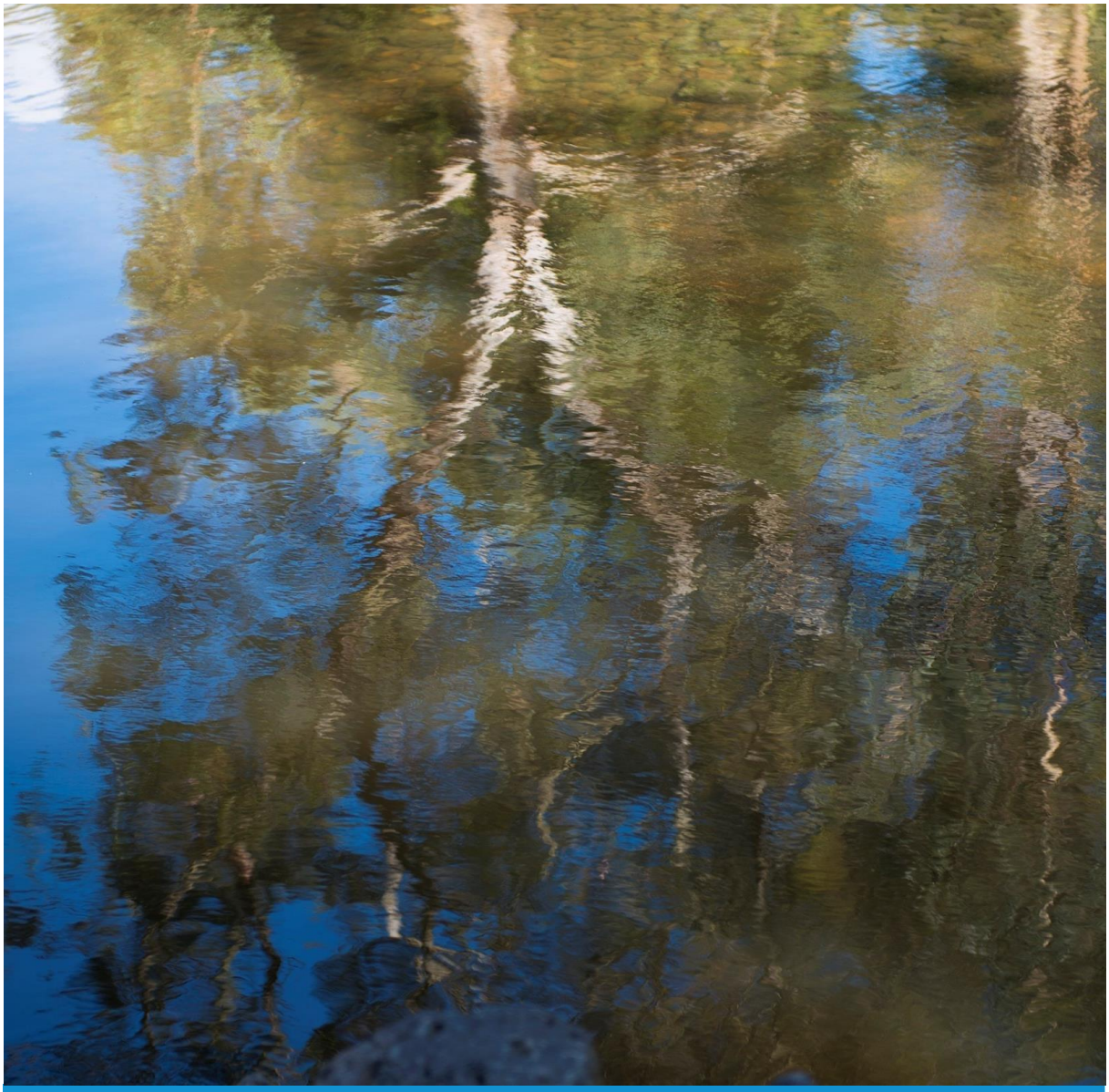

PART C:
DESIGN ACCEPTANCE PROCESS AND DEEMED TO COMPLY

C1. DESIGN ACCEPTANCE APPROACH

Melbourne Water and/ or council are the ultimate client for almost all waterways in Port Phillip and Westernport catchments. Once constructed, these waterways become Melbourne Water or council assets to own and maintain.

This part of the manual summarises the three stages in the design process, the steps involved in each stage, and how Melbourne Water review and provide feedback on the waterway design. It details what a designer can expect from the process. Part D of this manual provides the key technical design elements for each stage in the design process, and the standard that should be adhered to when providing material to Melbourne Water. The purpose of this alignment was to provide clarity and efficiency for Melbourne Water's land development customers working through the design process.

The waterway designer must ensure they meet the requirements of Melbourne Water through the design process in the same way they meet the requirements of the developer client for the subdivision/development adjacent to the waterway. Waterway designers therefore play a pivotal role in ensuring the waterway design interfaces with the surrounding development to the satisfaction of all parties.

Under Melbourne Water's Quality Assurance system (ISO 9001: Quality Management), developers, engineering consultants, sub-consultants and contractors have defined roles and responsibilities with respect to the delivery of Melbourne Water assets, such as waterways. Further information can be found on Melbourne Water's Planning and Building website[2]

The flow chart below (Figure 16) sets out the interactions between the design approach—undertaken by the waterway designer—and the steps in the design acceptance process. The waterway designer will work through three key design stages: concept, functional and detailed.

[2] http://www.melbournewater.com.au/Planning-and-building/land-development-process/policy/Pages/Quality-management.aspx

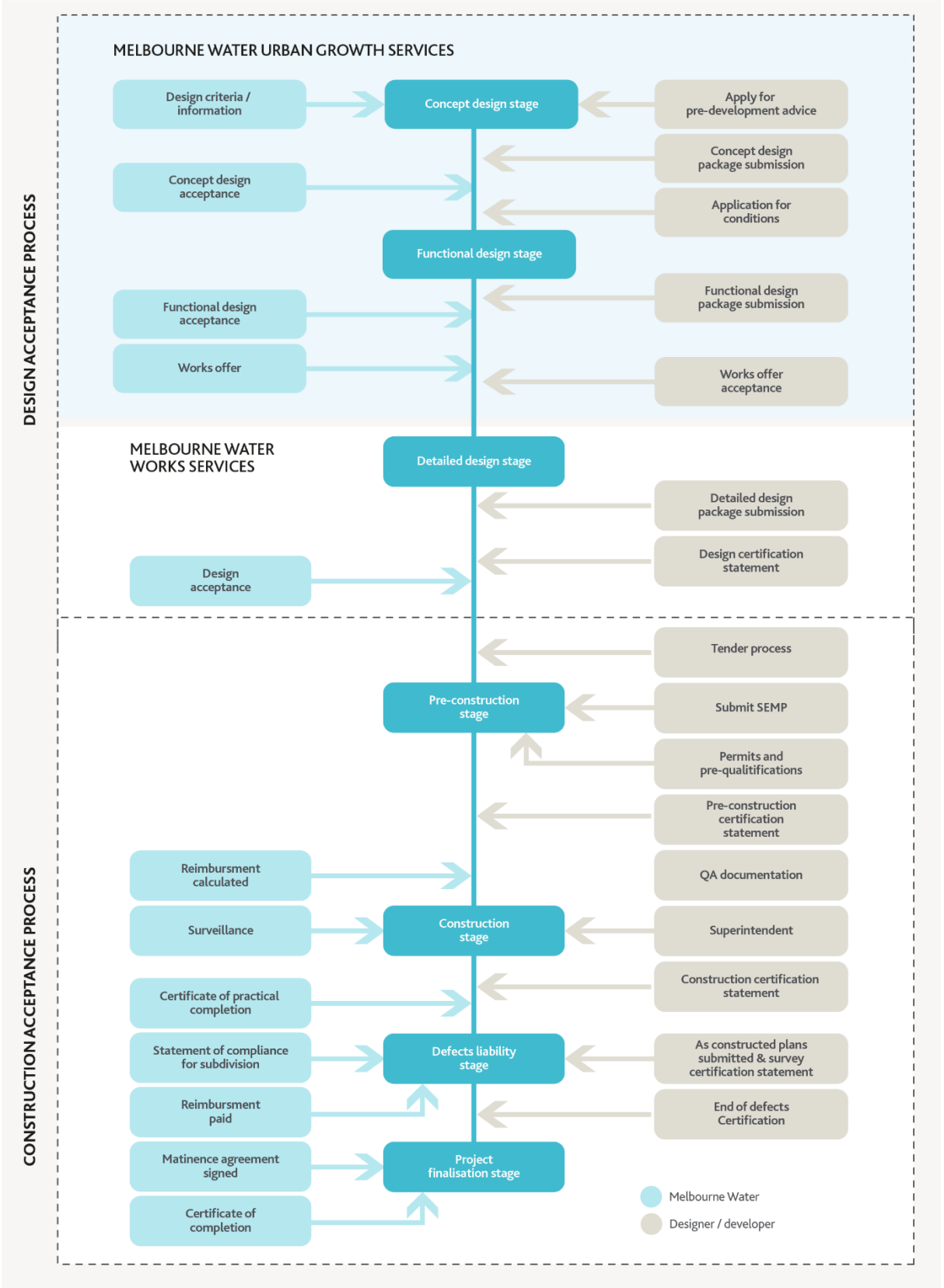

Figure 16 - *Overview of design acceptance process*

The developer/ consultant may choose to apply for the following approvals or consents in conjunction with the corresponding design acceptance (as a minimum) from Melbourne Water:

- An application for a Planning Permit should be accompanied by a Stormwater Management Strategy;
- An application for Certification of a Plan of Subdivision showing the creation of a Reserve and/or Easement over a constructed waterway/waterway corridor should be accompanied by an accepted functional design;
- An application for conditions (Works Offer) should be accompanied by an accepted functional design.

Completion of the following forms is a key administrative part of the design acceptance process under Melbourne Water's Quality Assurance program:

- Request for Scheme Servicing Advice
- Application for Conditions
- Acceptance of Conditions
- Design Certification
- Pre-Construction Certification
- Construction Certification
- As-Constructed Certification
- End of Defects Certification

Further assistance is provided to the consultant via a series of checklists, which can also be found on Melbourne Water's Planning and Building website.

C1.1 Design acceptance options

Melbourne Water has adopted two review/acceptance approaches for submitting waterway design proposals to Melbourne Water rather than attempting to define one set that applies to all situations. The two options are:

- Deemed to comply approach
- Alternative approach

After consultation with the development industry it is clear that developers and waterway designers want a clear understanding of Melbourne Water's requirements for waterways and request a prescriptive set of design criteria. It was decided that a Deemed to Comply design acceptance approach, with a prescriptive set of design criteria, would be most beneficial and useful for the industry to use. Melbourne Water also acknowledges that not all waterways and development sites are the same and it is difficult to have one set of prescriptive design criteria to suit all types and topography. As a result, an alternative design acceptance approach is available for designers, which allows developers and waterway designers to submit designs that do not entirely achieve all the design criteria but still achieves the required core outcomes.

Deemed to Comply approach

The Deemed to Comply approach requires designers to demonstrate compliance with a prescriptive set of design criteria. Deemed to Comply waterway designs have an estimated review (not acceptance) timeframe of a maximum of 28 calendar days per the Melbourne Water customer service charter.

Provided that designers demonstrate compliance with the design criteria they will have a high level of confidence that their designs will be accepted by Melbourne Water. The Deemed to Comply design criteria are included in the design checklists, provided on the Planning and Building website.

Alternative approach

The Alternative approach provides designers with the option of submitting an approach that differs from the prescriptive Deemed to Comply approach, but still delivers the required core outcomes for waterways. Part D provides a set of key design considerations and minimum standards when considering an appropriate waterway design and when the alternative design approach is sought.

If any of the Deemed to Comply criteria are not complied with, the design will be considered an Alternative approach.

The designer is responsible for providing Melbourne Water with evidence that the "Alternative approach" achieves equivalent or better performance than the "Deemed to Comply" approach.

The review timeframe for "Alternative approach" designs will be longer than Deemed to Comply designs. Designers should be aware that there is no certainty that their design will be accepted by Melbourne Water. This provides the opportunity for developers and their designers with tight time constraints and/or those that are risk averse to pursue the Deemed to Comply approach.

The review process for the Alternative approach will be the same as the Deemed to Comply approach, with a concept, functional and detailed design package required for each stage of the process. This ensures a transparent and consistent process for internal and external stakeholders. When an Alternative approach design is submitted, Melbourne Water's review involves input from various internal departments and expertise in waterway design and operation, including hydrology, hydraulics, ecology, constructability, and maintenance.

For unusual design applications, or where internal resources are not available, Melbourne Water may choose to seek expert opinion from independent peer reviewers about whether the information submitted demonstrates that Melbourne Water's core outcomes and design objectives will be achieved. Note: The cost associated with this will be borne by the developer not Melbourne Water.

C1.2 Working with Melbourne Water

Melbourne Water's Development Services team is the principal point of contact for all customers undertaking land development within catchments covered by Development Services Schemes.

To find out if your development is located within a Development Services Scheme, and for more information on working with Melbourne Water, please visit Melbourne Water's Planning and Building website.

The following diagram represents the structure of the Development Services team as it relates to the planning and delivery of key assets in Development Services Schemes.

STRATEGY DEVELOPMENT	**Catchment Strategies Team** • Implementation of Development Services Schemes • Review of Precinct Structure Plans • Assessment of catchment models including RORB, hydraulic models and MUSIC in greenfield areas
CONCEPT DESIGN	**Urban Growth Services Team** • Scheme servicing or feasibility advice • Review and assessment of Greenfield planning permit applications and subdivision applications • Review of surface water management strategies • Review of concept design package • Confirmation of wetland location and indicative footprint • Review of core outcomes associated with wetland proposal
FUNCTIONAL DESIGN	**Urban Growth Services Team and Developer Works Services Team** • Combined team review and assessment of functional design package • Preparation of internal business case for the delivery (timing and funding) of projects • Preparation of Non-Works and Works Offer • Review of MUSIC and flood models • Review of Certification of Plan of Subdivision and consent to the issue of a Statement of Compliance
DETAILED DESIGN	**Developer Works Services Team** • Assessment of detailed design packages • Issue design acceptance • Contractor tender assessment • Calculation of reimbursement for scheme works • Review of maintenance agreement
PRE-CONSTRUCTION AND CONSTRUCTION	**Developer Works Services Team** • Pre-constriction meeting onsite • Issue of permit to work • Surveillance of on-ground works • Issue certificate of practical completion
AS-CONSTRUCTED	**Developer Works Services Team** • Reimbursement paid • Maintenance agreements reviewed • Certificate of completion issued

Figure 17 – Development Planning team (high level structure)

C2. CONCEPT DESIGN STAGE

The concept design stage provides a chance to consider the opportunities and constraints of the subject site in relation to waterway design and construction, and to understand Melbourne Water's requirements and aspirations for the waterway that any design must address.

Providing a site responsive design that maximises the site's natural values and characteristics while balancing liveability outcomes for the future community is central to the concept stage. To achieve this Melbourne Water requires project proposals to have clear design objectives and a project Vision.

Design objectives establish the broad design priorities being sought for a project. Chapter A3 includes guidance for designs through the provision of design objectives for constructed waterways.

Design objectives should respond to the site's strengths as they have been identified through the context and site analysis. For example a site with biodiversity values may include a design objective such as *Protect and enhance habitat of the Baw Baw Frog* or if active transport is an important feature of the future adjoining urban development, a design objective might be *Provide a shared pedestrian and cycle pathway along the waterway that integrates with the broader neighbourhood active transport network.*

The vision will combine knowledge of the site (obtained from the context and site analysis) with expectations and aspirations for the future. It will articulate the priority elements of this future state and establish who it is for. The concept plan will be a reflection of the vision and design objectives and should include Melbourne Water's aspirations (i.e. Healthy Waterway Strategy) and the aspirations of other key agencies as outlined in key documents (i.e. PSPs).

The land developer and the local government authority may also have design specifications for the waterway and surrounding open space. The designer is tasked with the job of preparing a concept that meets each of these combined design objectives.

The concept design stage in this manual is concerned with the process of synthesising and identifying various options that could potentially meet the design objectives for the waterway. It does not just determine the layout but how the waterway will be incorporated into the landscape design and marry with the other design considerations associated with a development. A Development Services Scheme is a catchment masterplan and does not provide the necessary information required for a concept design of a waterway.

It is at the functional design stage where these options and ideas are tested to determine their feasibility. The outcome is the preferred design scenario. This underlines the **importance of iteration** during the evolution of the concept and functional design as different options are explored and refined.

Refer to Part D for more information on technical design elements to assist with this stage.

Concept design steps

The concept design stage consists of six steps (Figure 18).

Step 1
Submit request for Pre-Development Advice (feasibility)

The consultant submits the relevant form to Melbourne Water requesting pre-development advice. The form should include the following information:

- Catchment plan for the waterway clearly defining the property boundaries
- Overall estate plan (if available)
- Any baseline due diligence

It should be noted that this is not an application for conditions (i.e. the Works Offer), but a request for Pre-Development Advice.

Step 2
Receive Pre-Development Advice (feasibility)

Melbourne Water will provide the designer with advice regarding the scheme objectives and intent, including highlighting components (physical form, vegetation, etc.) of the waterway that need to be protected or modified, the waterway corridor width, design flows, identifying relevant plans and strategies, design parameters for Scheme infrastructure (such as outfall pipes), and any available background studies (flora, fauna, cultural heritage, etc.).

Step 3
Prepare initial concept design package

It is strongly recommended that the concept design package is jointly prepared by the landscape architect and waterway designer. The concept design package will clearly link to the overall development landscape masterplan (which is generally a permit requirement for a development). This is to ensure the waterway integrates with the greater development context, provides connections, and is responsive to the surrounding development. It is envisaged that once the concept package is developed for the waterway, a summary of this can be included in the development landscape masterplan (thus not duplicating work).

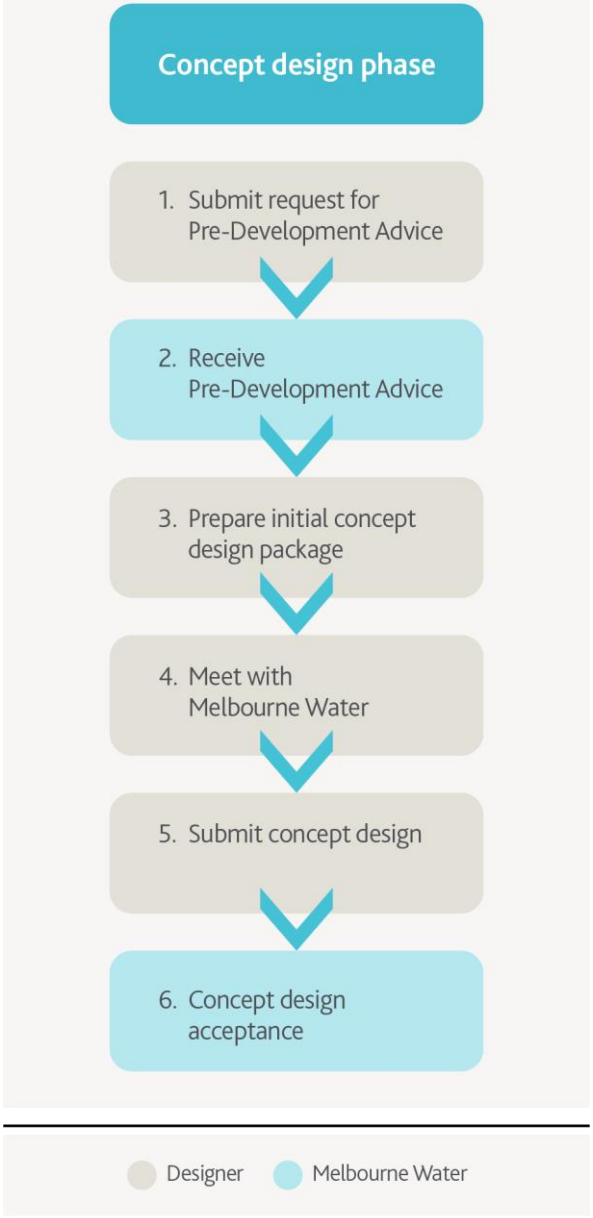

Figure 18 - *Steps in the concept design phase*

The designer's role is to:

- Co-ordinate the input from the design team;
- Assemble the design package; and
- Present it in the required format.

Tasks include:

1. Undertake context and site analysis (existing conditions)
2. Resolve issues from site analysis (opportunities and constraints)
3. Prepare site Vision and Design Objectives
4. Undertake a desktop soil assessment
5. Set the waterway type
6. Confirm the preliminary waterway corridor width
7. Set the preliminary waterway alignment
8. Establish preliminary maintenance requirements and delegation (MWC and Council)
9. Prepare a preliminary cost estimate
10. Prepare the concept design package

The above information should be used to produce a two-dimensional concept design plan that captures and articulates all the constraints, features and expectations associated with the waterway.

The initial concept design package should provide sufficient detail to demonstrate that the intent of the design specifications objectives and criteria and performance objectives provided required by Melbourne Water can be met, subject to further design (i.e. functional design). The package consists of a single report and concept design plans.

The concept design package includes:

- Context Plan
- Site location and background
- Opportunities and Constraints plan to inform the Design Response
- Project Vision and Design Objectives and demonstrate the planned connections within the broader open space network to and from the constructed waterway utilising a master planning approach
- Waterway type
- Description of the waterway corridor width, alignment and grade
- Any specific required outcomes for the waterway (e.g. specific habitats or recreational linkages, key species such as GGF)
- Landscape setting (from desktop study)
- Summary of the key opportunities and constraints for waterway design (including landscape and urban design opportunities)
- Where there is no road separation, cross sections and other information will need to be provided to show built form controls and performance measures to achieve a positive interface between public and private realm.
- Options, maintenance delegations and recommendations

The various elements contributing to a concept design plan are shown in Figure 19

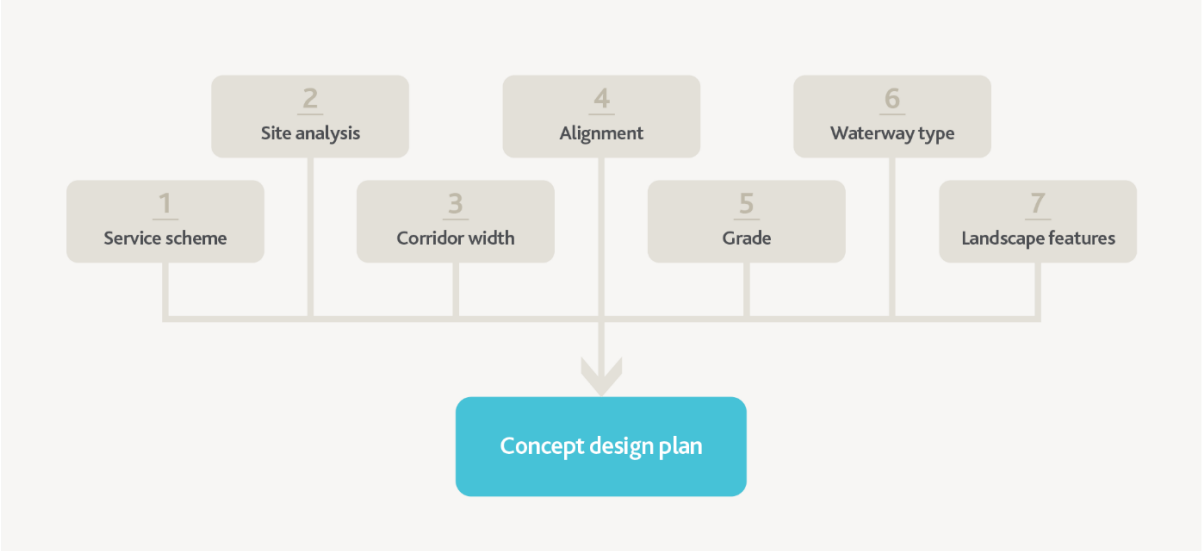

Figure 19 - Concept design plan elements

The plans to be included in the concept design package must include a layout plan and typical cross-section views of the proposed waterway and corridor features including as much detail as possible, such as:

- Land use plan including open space networks highlighted
- Indicative pedestrian and cycle networks and key connections between the waterway and adjoining urban development
- Existing waterway/channel location, size and shape
- Proposed road reserves
- Civil services (either existing or major proposed services)
- Proposed waterway corridor width and alignment
- Proposed low flow channel alignment (based on the waterway typology)
- Proposed maintenance access points, tracks and areas
- Indicative locations of proposed channel features (e.g. pools, riffles)
- Indicative locations of pathways, crossings and other social infrastructure
- Indicative pipe outfall/surcharge locations
- Indicative locations of proposed storm water quality treatment systems within the urban layout and/or waterway corridor based on the Stormwater Management Strategy for the development.
- Existing areas of flora, fauna, geomorphic and cultural heritage values
- Nodes at intervals within the corridor of the waterway that provide points of interest or places to gather; with sufficiently modified spatial layout
- An indicative cross-section for the waterway, based upon the consideration of future drainage connection invert levels and the nominated waterway corridor width. Indicate likely batter slopes, flood levels and vegetation plantings.

Important Note: Reports and plans are to be submitted in .PDF format and Reports are to be submitted in .doc or .docx format (to permit track changes). The package should be submitted in full as one package; not individually.

Step 4
Meet with Melbourne Water

The designer must submit the draft Concept Design package to Melbourne Water prior to the meeting via DevConnect.

The aim of this step is to seek feedback that the concept is generally to Melbourne Water's satisfaction and to give direction to the designer so that they can continue on the right track or make changes to design as required.

The designer then collates the feedback from Melbourne Water, relevant stakeholders, and incorporates this into the next iteration of the concept design.

Important note: Sometimes, it may be worthwhile submitting the revised draft concept design for further review and comment to check that the iteration adequately addresses the feedback, before making the final formal submission for acceptance.

Step 5
Submit concept design

Update the concept design as per the feedback from the previous Step and submit the concept design package to Melbourne Water for review and acceptance.

It is important that the designer highlights in their accompanying report:

- Any conflicts that arose from undertaking the iteration in attempting to address all parties' comments.
- How each comment has been addressed and what components of the design have changed accordingly.
- Any significant changes from the original concept design that may not otherwise be obvious to the reviewers.

Step 6
Concept design acceptance

Melbourne Water will provide concept design comments following receipt of the *completed* package.

- If the package is incomplete or is not to Melbourne Water's satisfaction, then there is no guarantee that the above review timeframes will be met.
- Melbourne Water does not accept any liability for delays caused by incomplete or inaccurate information submitted for review.

Melbourne Water's concept design acceptance will take the form of an 'in-principle acceptance subject to', with the 'subject to' being the further feasibility analysis that needs to be undertaken through the functional design phase.

Outcome of concept design stage

- At the end of the concept design phase three key parameters should have been generally agreed upon (subject to functional design):
- The design objectives (including landscape design outcomes) the concept design will aim to achieve.
- The waterway corridor width.
- The waterway type and corridor alignment.

There is an understanding between Melbourne Water and the developer at this stage that **nothing is 'locked-in'** and some changes to waterway reserve width and alignment, and possibly some of the objectives, may need to be made according to the results of the feasibility analysis undertaken during the functional design.

Note:
A concept design is a **great communication tool** that will assist in explaining the intent of the design response to Melbourne Water, Councils and other interested parties.

C3. FUNCTIONAL DESIGN STAGE

The aim of the functional design stage is to test and evaluate the options identified in the concept stage, at a reach-scale, to ensure the proposed design meets the objectives for the waterway. The functional design is a *proof of concept* that provides confidence that the proposed waterway will function appropriately.

The proposed reach-scale design will:

- Meet free drainage outfall, public safety and flood protection requirements
- Be stable within the tolerable limits at a reach-scale
- Fit within the waterway corridor width
- Meet the objectives agreed to in concept design stage

Important note:

The Developer must work with Melbourne Water to arrive at a functional design that meets Melbourne Water's requirements *before* seeking Melbourne Water's consent to Certification of a Plan of Subdivision showing the creation of a Reserve and/or Easement over a constructed waterway/waterway corridor or subdivisional stages abutting or surrounding a proposed waterway corridor.

Functional design steps

The functional design stage consists of five steps (Figure 20)

Step 1
Prepare functional design package

The functional design package is prepared by the designer using the design elements and modelling detailed in Part D2. Tasks carried out to prepare the functional design package include:

1. Undertake geotechnical assessment and soil contamination investigation
2. Identify locations of non-waterway assets
3. Establish design flows
4. Set the waterway planform
5. Set the waterway cross section geometry
6. Develop the digital terrain model (DTM)
7. Estimate the hydraulic roughness
8. Specify hydraulic structures and interface elements
9. Develop the hydraulic model
10. Test the design for flooding, public safety and channel stability
11. Set the location of engineering and habitat features (as required by key species identified in the concept stage)
12. Incorporate geotechnical findings (e.g. clay, topsoil, rock etc)
13. Establish maintenance requirements and delegation
14. Revised cost estimate and proposed construction timeframe
15. Prepare the functional design package

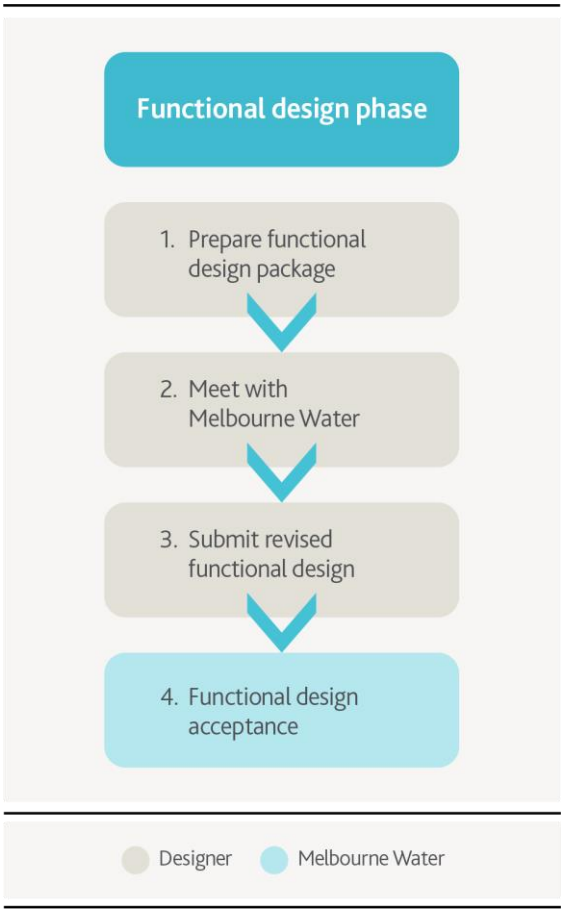

Figure 20 – *Steps for designer in the functional design phase*

Table 5 - Acceptable file formats for the functional design package

TASK	NOTES	FORMAT
Functional design checklist	Deemed to comply checklist	.pdf or .docx
Functional design report	Contents outlined in Part D	.pdf or .docx
Hydrological modelling summary	Approach, assumptions, input parameters and design flows	.pdf or .docx
Hydraulic modelling summary	Approach, assumptions and input parameters. Longitudinal profile of shear stress at each cross section showing comparable thresholds	.pdf or .docx
Cost estimate	Preliminary cost estimate according to the standard schedule of costs presented in Part D.	.pdf
Proposed construction timeframe	Preliminary construction timelines	.pdf or .docx
Functional design plans	Location of all interface elements, location of proposed features, long section, cross sections, landscape plans	.pdf
Constructed waterway strings	Boundary and design strings of constructed waterway for use in ArcMap/MapInfo	.shp or .tab (with associated files)
RORB hydrologic model	Catchment file, storm file, and data file Only if user defined: IFD file, pluviograph data, and temporal patterns	.cat, .stm, and .dat .map, .dat, and .pat
Catchment boundary strings	Delineated catchment boundary spatial data (for use in ArcMap/MapInfo)	.shp or .tab (with associated files)
HEC-RAS hydraulic model	HEC-RAS project file and associated plan file, geometry file and steady flow file	.prj (with associated .p*, .g* and .f*)
Geotechnical report	Report – findings to be summarised in functional design report	.pdf

Step 2
Meet with Melbourne Water

The designer must submit the draft functional design package to Melbourne Water prior to the meeting. The aim of this step is to:

- Seek feedback that the functional design is generally in accordance with the agreed design objectives, Melbourne Water's and the stakeholder/approval authority expectations.
- Give the designer an opportunity to demonstrate that the design will work, providing 'proof of concept'.
- Give certainty to the designer so that they can continue on the right track.

The designer then collates the feedback from Melbourne Water and the relevant stakeholders and authorities and incorporates this into an iteration of the functional design (if required).

Important note:
Submit the revised functional design for further review and comment. This provides an additional check that the iteration has correctly interpreted feedback before making the final, formal submission for acceptance.

Challenging and complex designs may require several iterations, therefore may need an allowance for multiple iterations and meetings with Melbourne Water and council to discuss and refine the design before submitting the package for formal acceptance.

Step 3
Submit revised functional design

Submit the functional design as per the feedback from the previous Step and update the functional design package for submission to Melbourne Water for formal review and acceptance.

It is important that the designer highlights in their accompanying report:

- any conflicts that arose from undertaking the iteration in attempting to address all parties' comments.
- how each comment has been addressed and what components of the design have changed accordingly.
- any significant changes from the original design objectives or the concept/functional design that may not otherwise be obvious to the reviewers.

Step 4
Functional design acceptance

Melbourne Water will provide functional design comments/acceptance following receipt of the *completed* package.

- If the package is incomplete or not to Melbourne Water satisfaction then there is no guarantee that the above review timeframes will be met.
- Melbourne Water does not accept any liability for delays caused by incomplete or inaccurate information submitted for our review.
- The review timeframe is contingent on the designer having followed the design acceptance process, including the submission of the draft package, attending meetings with Melbourne Water and stakeholders to discuss the design and the completion of any design iteration required to address comments to the satisfaction of the relevant parties, prior to submission of the final package for formal acceptance.

Important note:
Please refer to Planning and Building section of the Melbourne Water website for information on the functional design acceptance.

C4. DETAILED DESIGN STAGE

The aim of the final design stage is to finalise individual features within the waterway and produce detailed design documentation. This stage ensures the design of individual features meets specific requirements, and that the incorporation of the proposed features does not have an adverse impact on the function of the waterway. Design elements for the detailed design are covered in Part D3 of this manual.

Ultimately the aim of the detailed design stage is to document the design for construction. Key steps in this stage are gaining final design acceptance from Melbourne Water and the lodgement of design certification paperwork to Melbourne Water.

Completion of the detailed design stage will provide:

- Detailed civil design plans suitable for public tender (excluding set out).
- Detailed landscape plans suitable for public tender.
- Specifications suitable for public tender.
- Schedules suitable for public tender.
- Confirmation that construction and maintenance requirements can be met (MWC and Council).
- Addition of set-out information to the drawing set.
- Draft maintenance agreement

Detailed design steps

The detailed design stage consists of five steps (Figure 21).

Step 1
Finalise feature-scale design waterway elements

The feature-scale design elements are prepared by the consultant in accordance with the approach detailed in Part D3. Tasks carried out to prepare all information required as part of the detailed design package include:

1. Incorporate comments from the previous Stage
2. Confirm waterway features and locations
3. Size features (e.g. pools, rock work etc.)
4. Incorporate features into DTM
5. Update hydraulic model
6. Test design for flooding, stability and fish passage
7. Post-construction risk assessment
8. Revise maintenance schedule and budget

Step 2
Prepare detailed design package

The detailed design package is prepared by the designer. Tasks carried out to prepare all of the information required as part of the package include:

1. Prepare detailed design drawings (civil and landscape) suitable for public tender
2. Finalise the specifications
3. Finalise the maintenance plan and schedule
4. Finalise the cost estimate
5. Draft the Site Management Plan (to be finalised by appointed contractor)

Table 6 outlines the file formats and supplementary information requirements of the detailed design package

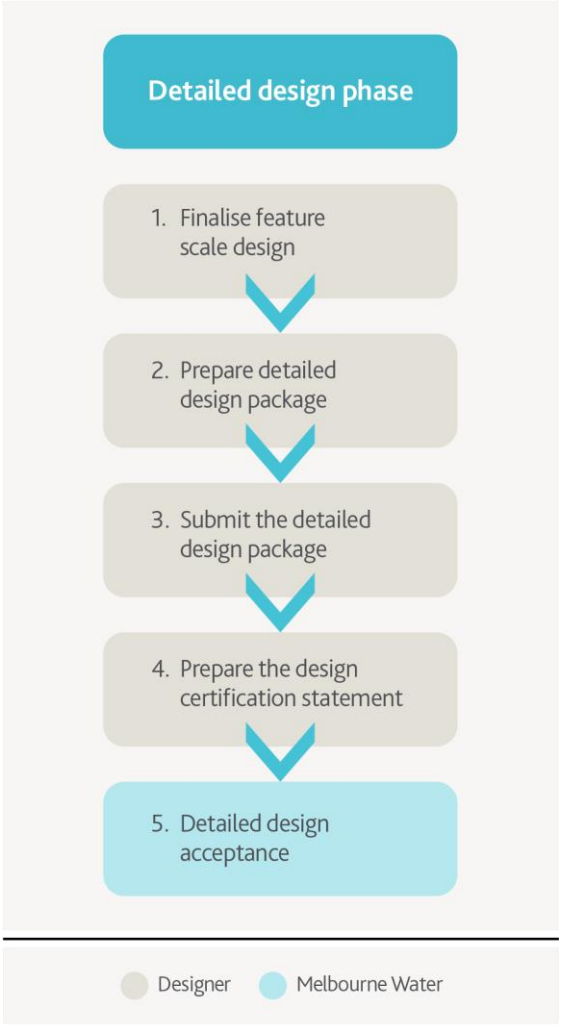

Figure 21 - *Steps in the detailed design phase*

Table 6 - Accepted file formats for the detailed design package

TASK	NOTES	FORMAT
Detailed design checklist	Deemed to comply checklist	.pdf or .docx
Detailed design report	Contents outlined in Part D	.pdf or .docx
Hydrological modelling summary	Approach, assumptions, input parameters and design flows	.pdf or .docx
Hydraulic modelling summary	Approach, assumptions and input parameters. Longitudinal profile of shear stress at each cross section showing comparable thresholds	.pdf or .docx
Detailed design plans	Location of all interface elements, location of proposed features, long section, cross sections, civil details, landscape plans, planting schedule, and landscape details	.pdf
Technical specification	Civil and landscape specifications for all design details, construction and establishment elements, Cultural Heritage Management Plan requirements	.pdf or .docx
Cost estimate	Final cost estimate according to the standard schedule of costs presented in Part D.	.pdf
Service alterations/ relocation approval	Written approval from service authorities for any service alterations/relocations.	.pdf or .docx
Operation and maintenance agreement	An asset operation plan and maintenance agreement.	.pdf or .docx
Draft Site Environmental Management Plan	Draft Site Environmental Management Plan	.pdf or .docx
Constructed waterway strings (output from DEM)	Boundary and design strings of constructed waterway for use in ArcMap/MapInfo	.shp or .tab (with associated files)
RORB hydrologic model	Catchment file, storm file, and data file Only if user defined: IFD file, pluviograph data, and temporal patterns	.cat, .stm, and .dat .map, .dat, and .pat
Catchment boundary strings	Delineated catchment boundary spatial data (for use in ArcMap/MapInfo)	.shp or .tab (with associated files)
HEC-RAS hydraulic model	HEC-RAS project file and associated plan file, geometry file and steady flow file	.prj (with associated .p*, .g* and .f*)
DEM/Terrain Model	DEM model and associated files	Grid as.txt

Important note:
Consultation with Melbourne Water will be required for any design changes that may be proposed/required during the preparation and/or review of the detailed design (civil or landscape) to ensure they will not have an adverse impact on waterway function.

Step 3
Submit the detailed design package

The designer must submit the Detailed Design package to Melbourne Water. Melbourne Water will review and provide comment on the detail design of a *completed* package. Melbourne Water may require some amendments prior to the finalisation of the detailed design and lodgement of design certification and package.

Important note:
If Melbourne Water has significant comments on the detailed design, a meeting will usually be required to discuss and resolve these comments prior to finalisation of the detailed design.

Step 4
Prepare the design certification statement

Once the design has been amended as per comments from Step 3 (if required), and the designer is confident that their design is acceptable, the Developer must submit the following documents to Melbourne Water:

- The Design Certification Statement.
- The finalised Detail Design package.

Step 5
Detailed design acceptance

Melbourne Water will provide detailed design comments/acceptance following receipt of the *completed* package.

- If the package is incomplete or not to Melbourne Water's satisfaction then there is no guarantee that the view timeframe will be met and timelines may be extended.
- Melbourne Water does not accept any liability for delays caused by incomplete or inaccurate information submitted for our review.
- The review timeframe is contingent on the designer having followed the design acceptance process, including the submission of the draft package, attending meetings with Melbourne Water and stakeholders to discuss the design and the completion of any design iteration required to address comments to the satisfaction of the relevant parties, prior to submission of the final package for formal acceptance.

C5. PRE-CONSTRUCTION STAGE

The objective of the pre-construction phase is to ensure that all stakeholders associated with the project are aware of their responsibilities, and that the contractor has all of the information relevant to the construction works. The pre-construction stage incorporates the tender process and the lodgement of pre-construction certification paperwork to Melbourne Water.

Pre-construction steps

The pre-construction stage consists of six steps (Figure 22).

Step 1
Tender process

The tender interview process should include design related questions so that the contractor's understanding of the project can be determined. It is recommended that the process include a site walk where the designer can communicate the design intent to the contractor and the field staff. The tender review process is to be conducted by the developer or their representative. Melbourne Water is not generally involved in the tender review process. Refer to Melbourne Water's Planning and Building website for further information.

Note: for tenders expected to be >$450k please follow the Victorian Government tendering process (Tenders Vic).

Important note:
When preparing the schedule of quantities that will form the basis of the tender documents, the developer's consultant is to itemise those components of the works that Melbourne Water is to pay for. This will allow for a prompt and accurate assessment of the value of Melbourne Water's reimbursement for the works.
Tendering of works

Reimbursements

Step 2
Submit SEMP

The designer, in consultation with the contractor, is to finalise and submit the Site Environmental Management Plan (SEMP) to Melbourne Water.

Step 3
Contractor assessment & reimbursement calculated

The actual reimbursement amount will be calculated and Melbourne Water will advise the Developer of the proposed reimbursement. An owner who is required to build Melbourne Water assets in conjunction with the development is reimbursed an amount towards the cost of the works by Melbourne Water.

Refer to Melbourne Water's land development policies on reimbursements for further information.

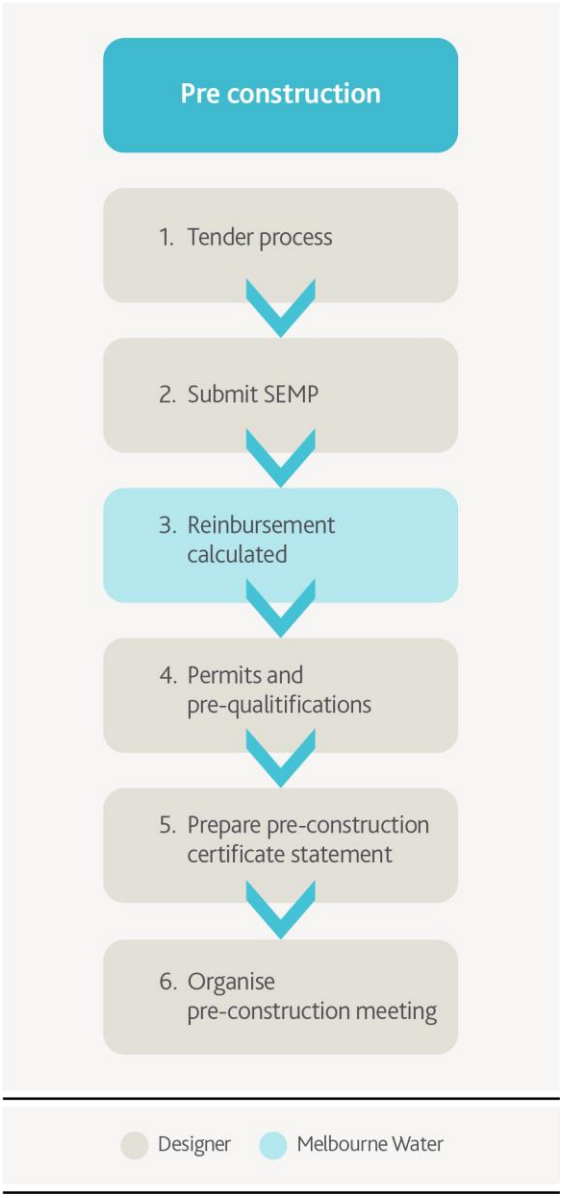

Figure 22 - *Steps in the pre-construction phase*

Step 4
Permits and pre-qualifications

Before works commence, the contactor is to obtain all permits and complete all pre-qualification processes:

- The contractor must obtain a Permit to Work for any projects that involve connections to an existing Melbourne Water asset including a waterway if required. The Permit to Work will be issued by the Project Surveillance Office at the Pre-commencement meeting. The contractor must have completed a Permit recipient training course in order to obtain a Permit to Work.
- While civil works are being carried out, the contractor must have someone on site that has obtained a Melbourne Water green card (i.e. attended the Site Environmental Awareness Training course).

Step 5
Prepare pre-construction certification statement

Before commencing construction, the Developer must submit the following documents to Melbourne Water:

- The Pre-Construction Certification List in the Construction Specifications section of Melbourne Water's website in accordance with Commencement of Works.
- Evidence that insurance requirements set out in the Insurance Conditions have been complied with.

Important note:
Melbourne Water must have at least two working weeks' notice of intention to start construction by submission of a Pre-Construction Certification Statement and Checklist.

You must give Melbourne Water at least two working days' notice from the start date if construction is going to be delayed. Melbourne Water also needs to know your new start date at least two working days before you begin.

Note: The manual does not cover the details of the construction components of the asset delivery process and the reader is encouraged to review this information as presented on Melbourne Water's Planning and Building website.

Step 6
Organise a pre-construction meeting

Once you have completed all the necessary pre-construction activities, you must organise a project pre-construction meeting with Melbourne Water to review your plan.

By this stage you should have:

- design acceptance
- lodged your pre-construction certification checklist and statement;
- lodged your site environmental management plan;
- had your reimbursement calculated;
- selected a contractor; and

  paid or lodged the necessary bonds if there is no reimbursement associated with the works

Important Note:
Consultation with the Melbourne Water Project Officer and Surveillance Officer **will be required** for any **design changes during construction** to ensure they will not have an adverse impact on waterway function.
Works must match the accepted design, unless Melbourne Water provides acceptance of any changes. If the contractor's works do not match the design or meet Melbourne Water's construction standards, the principal/developer may be asked to rectify them at their own cost.

During construction, the Melbourne Water Project Officer and Surveillance Officer will:

- visit your site to make sure the work complies with our standards;
- monitor your Site Environmental Management Plan, and amend the plan where necessary; and
- undertake water quality testing of some sites plus if necessary require modifications to the Site Environmental Management Plan and/or provide liaison and cooperation with the Environmental Protection Authority on serious pollution matters.

If unforeseen issues occur during construction that impact on and/or require a variation to the accepted design, it may be necessary to resubmit the new design to Melbourne Water for formal review and acceptance.

C6. AS-CONSTRUCTED AND ESTABLISHMENT STAGE

Submitting accurate documentation of what has been constructed to Melbourne Water is an essential part in (i) demonstrating that the construction process has met the intent of the design and (ii) in providing critical information to Melbourne Water for future use.

As-constructed and establishment steps

The as-constructed phase consists of seven steps (Figure 23)

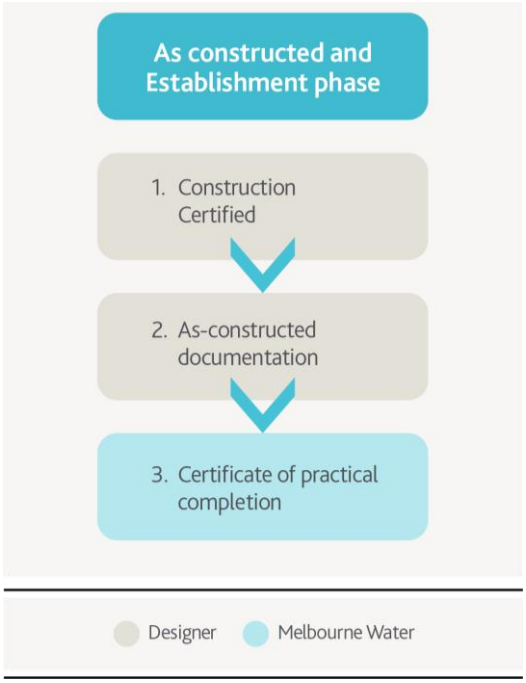

Figure 23 – Steps in the as-constructed phase

Step 1
Construction certification

At the end of construction, the designer must submit a Construction Certification Statement. Melbourne Water will consider the Works as completed when they have reviewed and accepted the Construction Certification Statement.

Check that you are ready to lodge your Construction Certification Statement by using the Construction Certification Checklist. See Melbourne Water's construction website for more details. Be sure to review all conditions in the Works Offer before submitting the Construction Certification Statement. If the works are not completed to Melbourne Water's satisfaction by the due date:

- The agreement may be terminated at the discretion of Melbourne Water;
- The developer must pay any reasonable additional costs incurred by Melbourne Water.

If the Agreement terminates, money paid by the Developer under the Agreement will be forfeited or refunded at the discretion of Melbourne Water. Melbourne Water will deduct any reasonable costs incurred, before determining any refund amount.

Melbourne Water will not accept the Construction Certification Statement if it has reason to believe that there are discrepancies between the works as certified and as constructed. As-constructed feature surveys should be undertaken by the consultant/owner to validate the construction/design process and be 're-input' into DEM and hydraulic models. Rather than compare isolated cross-sections the constructed DEM should be compared to the design DEM. The results should be provided to Melbourne Water.

Step 2
As-constructed documentation

All *As-constructed* documentation (plans, survey and flood mapping results) must be submitted to Melbourne Water. When the documentation is ready, submit the 'as-constructed' plans and complete the following forms:

- As-constructed Survey Certification Checklist
- Submission of digital data

Of significance for constructed waterways, this information must include:

- As-constructed drawings (plan layout, cross sections and long section) in electronic format (.PDF and MapInfo or AutoCAD) of the constructed waterway clearly showing:
- 1% AEP flood levels
- 1% AEP flood extents.
- 10% AEP flood levels and extents
- Low flow channel design flow flood levels and extents
- As-constructed survey data showing finished surface levels and other feature information in accordance with the specifications.
- Any other information required by and in accordance with the specifications on the checklist.
- An as constructed summary report completed by the designer that highlights that the design meets or does not meet the design intent, including the as-constructed hydraulic modelling results.

Important Note:
If the *As-constructed* survey is significantly different from the *for-construction* plans, hydraulic modelling should be re-run to generate as-constructed flood levels and extents using the as-constructed survey.
The creation and submission of accurate as-constructed flood mapping data to Melbourne Water is critical in that it facilitates:

- Melbourne Water's ability to demarcate new lots as being flood free via an automated system that relies on electronic flood mapping data to provide responses to requests for Information Statements issued by Water Retailers to future home owners;
- The Owner's ability to demonstrate that they have achieved sufficient freeboard from the 1% AEP flood levels in the constructed waterway in order to satisfy this requirement as part of receiving Melbourne Water's Consent to Statement of Compliance.

Step 3
Certificate of Practical Completion

Following receipt of the Construction Certification Statement and supporting information, and providing there are no discrepancies between the condition of the works as certified and as constructed, Melbourne Water will:

- issue the Certificate of Practical Completion;
- pay the reimbursement, less the amount held until the defects liability period finishes.

Step 4
Submit End of Defects Liability Period Statement

The defects liability period starts on the date of the Certificate of Practical Completion. The Developer must submit an End of Defects Liability Period Certification Statement at the end of the defects liability period.

The defects liability period differs depending on the asset. The following periods apply and take effect from when the Certificate of Practical Completion is issued:

- pipes and structures – three (3) months
- earthwork and rockwork – twelve (12) months
- plantings – three (3) month establishment period and twenty-four (24) month maintenance period (27 months total)

The Developer's nominated representative must certify that all works still comply with the Construction Certification Statement and that the construction of the development's roads and other services is complete.

Use the End of Defects Liability Period Certification Checklist to make sure that all the necessary steps are completed, and then submit the End of Defects Liability Period Certification Statement.

- End of Defects Liability Period Certification Checklist
- End of Defects liability Period Certification Statement

Once Melbourne Water has accepted your End of Defects Liability Period Certification Statement, Melbourne Water will organise for the remainder of the reimbursement to be paid and provide a Certificate of Completion provided the asset is defect free.

Melbourne Water will not accept the End of Defects Liability Period Certification Statement if it has reason to believe that there are discrepancies between the condition of the Works as certified and as existing.

Step 5
Certificate of Completion

A Certificate of Completion will be issued by Melbourne Water when all the requirements of the agreement have been satisfied. The requirements (if applicable), include:

1. The Certificate of Practical Completion issued by Melbourne Water
2. All contributions have been paid
3. All other money required by Melbourne Water has been paid
4. Downstream outfall works have been certified complete or the Developer has made alternative arrangements which are acceptable to Melbourne Water
5. Any other information, notices or documents required by Melbourne Water have been provided
6. The defects liability period has ended to the satisfaction of Melbourne Water
7. An endorsed maintenance agreement is in place (if required).

Step 6
Final reimbursement

Melbourne Water reimburses for works after the issue of a Certificate of Practical Completion and a Certificate of Completion as per the schedule outlined in the works offer and Melbourne Water's Planning and Building website:

- Reimbursements – Planning and Building website

C7. DEEMED TO COMPLY

C7.1 Introduction

This section presents an overview of the design criteria that need to be met to satisfy the Deemed to Comply assessment pathway. Please refer to Section C1.1 for more information on the Deemed to Comply approach and the Alternative Approach as part of the design acceptance process. Clear links between the design criteria and core outcomes are illustrated, assisting the designer to check that their design is meeting Melbourne Water's requirements.

These design criteria are expanded upon in this part of the manual and are also included in the relevant sections of Part D as part of the technical design elements. The Deemed to Comply conditions are also included in the design checklists available on Melbourne Water's Planning and Building website.

Please refer to the right-side column in the tables provided in this part for the various stages of design that relate to the Deemed to Comply criteria:

- Concept design deemed to comply checklist
- Functional design deemed to comply checklist
- Detailed design deemed to comply checklist

Where applicable, crosslinks have been provided to Melbourne Water standard drawings relevant to specific Deemed to Comply design criteria to assist with detailed design documentation.

C7.2 Deemed to Comply criteria

General

GN1	Designer must request for Pre-development Advice. The application should include the following information: • Catchment plan for the waterway clearly defining the property boundaries • Overall estate plan (if available) • Any baseline due diligence and topographic survey information	Concept
GN2	The waterway designer must acquire the Healthy Waterways Visions for Vegetation (Species and Quality) for the site.	Concept
GN3	The following site specific investigations have been completed: • Feature survey • Geotechnical assessment • Cultural heritage assessment • Flora and fauna assessment	Concept Functional
GN4	Obtain the minimum waterway corridor width from the approved site Stormwater Management Strategy (SWMS), the Precinct Structure Plan (PSP) and/or the Development Services Schemes (DSS) (if applicable). Undertake design to confirm this minimum	Concept

	specified corridor width is sufficient to meet the waterway design objectives.	
GN5	The waterway designer and landscape architect must prepare a concept package which includes a Vision with supporting Design Objectives for the site. Utilising the findings from the site specific investigations the designer must establish a Vision for the site that considers the existing features of the site in the context of the adjoining urban development, the future community who will be living near to and using the waterway and the broader strategic goals and aspirations for the waterway. The plans should consider: • Pedestrian and cycle connections along the waterway, and to the waterway from the adjoining urban development • Connections/ bridges across the waterway • Landmarks or other nodes that will support wayfinding along the waterway • Seating or unique character areas informing local sense of place • Key view lines to be protected • Other features that support the experience of users	Concept
GN6	Designer to establish whether the site is within a Growling Grass Frog (GGF) strategic area. The Growling Grass Frog Crossing Design Standards should be followed in the site falls in a GGF conservation area to meet the design criteria required. This applies to other protected fauna area (e.g. golden sun moth or legless lizard).	Concept
GN7	The waterway corridor alignment incorporates the existing low point at the upstream and downstream property boundary extents. Otherwise written agreement with the adjoining landowner/developer will be required for an alternative interface at the property boundary.	Concept

Waterway type

WT1	In areas with a natural longitudinal bed grade flatter than 1 in 800, a linear pool system waterway type should be selected	Concept Functional Detailed
WT2	Bedrock channels should be the selected waterway type should bed rock be located <1.5m below surface	Concept Functional Detailed

WT3	A compound waterway (i.e. a low flow channel within a high flow channel) should be selected for areas with natural longitudinal grades steeper than 1 in 800, and where bed rock is not located.	Concept Functional Detailed

Planform

P1	Waterway alignment to follow low point of the valley and through the landscape	Concept Functional Detailed
P2	Waterway alignment must integrate and consider upstream and downstream constraints and requirements to ensure it matches in with existing or proposed sections of waterway.	Concept Functional Detailed
P3	The developer and or their consultant is to negotiate with any downstream property owners with regard to outfall design and construction (temporary or permanent), not Melbourne Water. The developer must own and maintain any temporary outfalls until the permanent asset is constructed, not Melbourne Water.	Concept Functional Detailed
P4	Compound waterways must meet the following sinuosity criteria: • at least 1.05 (low sinuosity) • no greater than 1.25 (moderate sinuosity)	Functional Detailed
P5	For compound waterways the reach average meander wavelength should be around 10-14 times the low flow channel top width. To avoid the artificial appearance of a sequence of regular bends (i.e. non-uniform planform), the following break-down should be used as a guide for meander wavelength: • 50% at 10-14 times the low flow channel top width • 25% at 6-10 times the low flow channel top width • 25% at 14-20 times the low flow channel top width	Functional Detailed
P6	In compound waterways, bends should have a sharpness ratio of greater than 2 to 3. Bends in the range 2 to 3 represent the upper limit of the acceptable range. Bend sharpness less than 2 to 3, which include right-angled bends, are not acceptable; regardless of the waterway type. The waterway corridor reserve boundary may have a tighter angle (e.g. 90 degree bend) as long as the overall corridor is of sufficient width to transition the low and high flow channel around the bends in the corridor at an acceptable bend radius.	Functional Detailed
P7	To avoid significant increases in shear stress (and therefore the need for extensive rock work), bend sharpness ratio along a meander reach should desirably be greater than about 7. Therefore, the minimum desirable radius of curvature is about 20 metres for a low flow channel with a bottom width of 3 metres.	Functional Detailed

P8	Wholly straight waterways are not acceptable. Straight sections are permissible but the straight section of a high flow channel must not be greater than eight times the high flow channel top width and the straight sections of the low flow channel not greater than eight times the low flow channel top width.	Functional Detailed
P9	Diversity provided through physical form and alignment	Functional Detailed

Longitudinal grade

LG1	Design grades must be proposed within the acceptable 'stable' range, being flatter than 1 in 200 (dependant on shear stresses being within the acceptable thresholds). Rock chutes are likely to be required for longitudinal grades steeper than 1 in 200. The following chute grade are acceptable: • For longitudinal grades between 1 in 200 and 1 in 60: 1 in 20 rock chute (max) • For longitudinal grades between 1 in 60 and 1 in 40: 1 in 12 rock chute (max) • For longitudinal grades between 1 in 40 and 1 in 35: 1 in 10 rock chute (max) • For longitudinal grades steeper than 1 in 35: rock lined waterway Note: any fish passage requirements need to be established and if this cannot be met (i.e. chutes steeper than 1 in 20 are required) a discussion must take place with Melbourne Water.	Concept Functional Detailed
LG2	All graded rock chutes are to have a height no greater than 1.2m.	Functional Detailed
LG3	Compound channel waterways must have a maximum rock chute coverage of 25% of the waterway (from a plan view perspective)	Concept Functional Detailed

Modelling

MD1	Peak design flows must be estimated in accordance with methods in Australian Rainfall and Runoff 2019. RORB hydrologic modelling software should be used.	Concept Functional Detailed
MD2	A hydraulic model of the waterway with various flood events is developed using HEC-RAS or similar as approved by Melbourne Water. All geometry, flow constrictions, roughness values, and terrain inputs must be consistent with the design plans. Models are to be provided to Melbourne Water and model inputs and results documented in design reports.	Functional Detailed

MD3	Flood modelling should adopt hydraulic roughness coefficients (Manning's n) to represent the mature phase of the vegetation community that will be created in the waterway (conservative flood conveyance analysis) considering vegetation plantings take 2 years to establish.	Functional Detailed
MD4	The designer must select the appropriate hydraulic roughness to best represent the constructed waterway at various time scales – at ultimate and during establishment phase (for the relevant bed and bank materials/vegetation).	Functional Detailed

Cross section geometry

CS1	All constructed waterway types are required to safely convey the 1% AEP flow event	Functional Detailed
CS2	Compound waterway types must be sized such that the low flow channel has a bankfull capacity to convey flows somewhere in the range of a 4EY (minimum) to 1EY (maximum) event (3m minimum base)	Functional Detailed
CS3	Compound waterway types are required to have a high flow channel with sufficient capacity to convey the 1% AEP flow event	Functional Detailed
CS4	Compound waterway types are to have a high flow batter slope of typically 1V:5H to 1V:8H (no steeper than 1V:3H)	Functional Detailed
CS5	Minimum 300mm freeboard to be provided from 1% AEP flood level to top of high flow channel	Functional Detailed
CS6	Minimum 600mm freeboard to be provided from 1% AEP flood level to adjacent lot floor levels	Functional Detailed
CS7	Compound waterway types are to have a low flow channel batter slope of typically 1V:3H	Functional Detailed
CS8	Typically 1V:8H batter for waterways holding water at all times (e.g. linear pools type).	Functional Detailed
CS9	Compound waterway types are to have a low flow channel minimum base width of 3m. * Need to check that the low flow channel capacity is not >1EY given the minimum base width and depth requirements. If so discuss with Melbourne Water to get permission to have a reduction in base width.	Functional Detailed
CS10	Compound waterway types are to have a low flow channel minimum depth of 0.5m.	Functional Detailed

CS11	Low flow channel base to be flat (no 'U' shaped or V shaped)	Functional Detailed
CS12	Benches to have a 1 in 20 to 1 in 40 cross-fall grade towards low flow channel	Functional Detailed

Waterway stability

WS1	The designer must demonstrate that the shear stresses exerted on the waterway do not exceed the threshold shear stress for the boundary material or substrate. • Vegetated low flow channel shear stress threshold of 80 N/m2 (for the 1% AEP event thresholds should not be exceeded) • Vegetated high flow channel shear stress threshold of 45 N/m2	Functional Detailed
WS2	The applied (average) shear stress calculated by using Equation 1 (DuBoys 1879) or HEC-RAS needs to be factored up to estimate the maximum shear stresses occurring on the bed and sides of the cross section.	Functional Detailed
WS3	The applied shear stress at waterway bends has been "factored up" to determine maximum shear stress. Refer to Waterway Stability.	Functional Detailed
WS4	The designer must present tabulated shear stress values along the waterway length. The table should include the cross section chainage, the cross section average shear stress, and where applicable the multiplication factors. This should be done for the low flow channel and the high flow channel (maximum section distances 50m).	Functional Detailed

Features

F1	**Benches** Benches must not sit above the 10% AEP flood inundation level otherwise they will be too dry to perform the required habitat and ecological function.	Functional Detailed
F2	**Stormwater connections** The proposed design must integrate any drainage outfalls without causing unfavourable hydraulic conditions such as: • Inappropriate freefall from drainage outfalls or lack of rock armouring • Velocities greater than 1.5m/s (maximum) from drainage outfalls • Drowning of outfalls causing flows to be backed up and potentially flood the local drainage network upstream of the outfall The stormwater connection should be to a pool or direct to the low flow channel. There should be no bench at this point (i.e. the low flow channel is an extension of the high flow channel batter). Outfalls should also consider: • Configuration to facilitate access and maintenance requirements. • Protection, such as additional rock or vegetation, where flows are likely to cause scour due to increased turbulence or shear stress • Free draining	Functional Detailed
F3	**Rock chutes** • Rock chutes are to be designed using the CHUTE spread sheet. • Rock chutes, or rock riffles, must be designed to facilitate fish passage where required (1V:20H longitudinal grade). • D50 600mm is generally recommended as the upper limiting median rock size in any rock chute design (excluding toe and edge rock)	Functional Detailed
F4	**Fish passage** The default (deemed to comply) position is that fish passage is provided. This is achieved if a "drop cell culvert" (with a pool upstream and downstream) is provided at road crossings and rock chutes have a drop of less than 1.2m and chute grades are no steeper than 1 in 20.	Detailed

F5	**Crossings (bridges, culvert crossings)** Waterway crossing design details are set out in Melbourne Water's Constructing Waterway Crossings Guidelines. The guideline provides design criteria for single span and culvert crossings as well as pedestrian crossings. Design criteria include: • Minimum 5m abutment offsets from bank (for single span structures) • Shared pathways • Rock work configuration • Minimum safety criteria for culvert crossings • Pedestrian crossings should not adversely impact the functioning of nearby assets (e.g. road crossings) by increasing the flood height or flow velocity • There should be no crossings in the upstream or downstream general vicinity of critical culverts or bridges, except where the proposed crossing is above the 1% AEP flood level (this minimises potential impacts to critical culvert functions during flood events) • The underside of the pedestrian bridge should be set at least 600mm above the 1% AEP flood level • Rock armouring for scour protection is required under bridges and decks where vegetation cannot grow due to lack of sunlight • Crossings must be designed to facilitate fish or frog passage. This is achieved by providing a "wet drop cell culvert". • Box culvert crossing with a wet and dry cell culvert required for ecological purposes (fauna passage).	Functional Detailed
F6	Pools are to be located upstream and downstream of culvert crossings.	Detailed
F7	There must be a 1 in 20 rocked longitudinal bed grade transition from the waterway bed grade into the pool	Detailed
F8	Rock work should extend 400mm below the normal water level of the pool	Detailed
F9	Pool spacing approximately 20 – 30 times the low flow channel top width	Detailed
F10	Maximum pool width extends to the outer extent of the benches	Detailed
F11	Intermediate pools typically 600mm deep. Culvert pools typically 900mm deep below the "dry cell culverts".	Detailed
F12	Pool length is typically 3 to 4 times the maximum pool width	Detailed

Safety

S1	Floodway Safety Criteria for grassed floodways' in drainage reserves must be applied to the proposed waterway corridor. The safety criteria are appropriate for the safety of children. Full child safety is to be maintained to a depth of 0.4m on both banks wherever free access is available: For $d \leq 0.4$ m, $V \times d \leq 0.35$ m^2/s	Functional Detailed
S2	Fencing must be provide around steep grades and vertical drops (e.g. culverts, culverts)	Detailed

Vegetation

VG1	At least 200mm of topsoil must be provided in all planted areas accordance with Melbourne Waters Topsoil Specification.	Detailed
VG2	Topsoils used (in situ or imported) must comply with Melbourne Waters Topsoil Specification which is sub set of AS 4419 Soils for landscaping and garden use. Testing must be carried out by a NATA accredited laboratory. If required, amelioration to the topsoil must be undertaken to achieve compliance with Melbourne Waters Topsoil Specification.	Detailed
VG3	Minimum vegetation quality to be category 3 as per Healthy Waterways Visions.	Detailed
VG4	Vegetation diversity provided via a mixed palette of species	Detailed
VG5	Mulch located above the 1% AEP flood level	Detailed

Landscape design

LD1	Assets that are to be sited within the waterway corridor and are intended for public use (e.g. paths) must be located above the level of a 10% AEP flow event.	Functional Detailed
LD2	Boardwalks and viewing platforms must: • Sit above the 10% AEP flood level. • Not obstruct the capacity and hydraulic functioning of the waterway up to and including the 1% AEP flood level.	Functional Detailed

LD3	All boardwalks, piers, bridges and/or structurally treated edges installed and maintained by others are to meet Melbourne Waters below guideline requirements and also have heights and/or railings in accordance with relevant design codes and satisfy inundation and safety criteria. - Constructing waterway crossings guideline - Shared pathways guideline	Functional Detailed

Maintenance

MN1	Maintenance activities and responsibilities are documented in a schedule and indicated on a plan that will ultimately form part of the Maintenance Agreement.	Detailed
MN2	Access tracks for maintenance must be at least four (4) metres wide	Functional Detailed
MN3	Any grassed areas that Melbourne Water must maintain are to meet one of the below options. Councils batter grade requirements should be sought for areas they are to maintain as each council has a different requirement prior to construction: • 1 in 5 or flatter with a 3m run out area at the bottom of the slope is to be provided so MW can mow up and down if necessary. Run out area is to be a maximum grade of 1:12 and be clear of rocks, trees, fences etc. • Maximum grade of 1:12 to allow for safe grass cutting (horizontal and vertical cutting method). No run out area is required, area must be clear of rocks, trees, fences, drops etc. Note: For mowing around vegetation MW requires a 3m gap between vegetation to allow mower access. Overhanging vegetation can be an access issue. Slopes steeper than 1 in 5 to be densely vegetated.	Functional Detailed
MN4	Melbourne Water and council have the ability to safely access the waterway and its corridor to undertake the range of activities required to maintain the proposed structures and features that they will become responsible for via access tracks/roads.	Concept Functional Detailed
MN5	Removable bollards installed at the commencement of any vehicle access tracks into the waterway reserve	Detailed

Landscape contractor selection, plant supply, installation & maintenance

The landscape consultant must be engaged by the developer to supervise and approve the entire landscape construction process from the pre-commencement meeting through to achieving the end of defects period (a minimum of 27 months), ensuring the fellow requirements are met:

LC1	The landscape contractor awarded the waterway project is suitably qualified and experienced and has completed work on Melbourne Water waterways historically and the work is of a high quality.	Construction
LC2	The landscape contractor awarded the waterway project must be the contractor undertaking the plant installation. Melbourne Water will not accept sub-contracting to another contractor without written approval to ensure the sub-contractor is suitably qualified, experienced and has completed work of this nature previously.	Construction
LC3	The landscape contractor awarded the waterway project must be the contractor maintaining the planting once installed. Subcontracting of the maintenance activity must be approved by Melbourne Water in writing to ensure the sub-contractor is suitably qualified and experienced and has completed work of this nature previously.	Construction
LC4	The landscape contractor awarded the waterway project must order stock from an accredited nursery that grows plants to the specifications outlined within this manual (no wild stock or cutting up of planting clumps is to be installed).	Construction
LC5	Check the planting contractor's delivery docket to ensure the number of plants and format of plants ordered and delivered matches the landscape plan and requirements of this manual.	Construction
LC6	Audit the quality of stock delivered to site prior to the installation occurring accepting and/or rejecting any unacceptable stock that doesn't meet the requirements of this manual.	Construction
LC7	Ensure the contractor is undertaking regular weed runs (aquatic, ephemeral and terrestrial) of the site to ensure a weed seed bank doesn't develop.	Construction
LC8	Undertake random audits of the accredited nurseries they regularly source stock from to ensure the stock they are growing and supplying is of a high quality and meets the requirements of this manual.	Construction
LC9	Make Melbourne Water aware of any accredited nurseries growing and supplying poor quality stock that doesn't meet the requirements of this manual.	Construction

LC10	Make Melbourne Water aware of any landscape contractor not sourcing, installing and maintain planting to the requirements of this manual. See: Aquatic Plant Supply Standard Aquatic Plant Installation Standard Ephemeral & Terrestrial Plant Supply Standard Ephemeral & Terrestrial Plant Installation Standard Plant Selection and Provenance Standard	Construction
LC11	Make Melbourne Water aware of any topsoil installation that doesn't meet the requirements of Melbourne Waters topsoil specification whether installed by the civil or planting contractor.	Construction

Note:
Should Melbourne Water feel the quality or quantity of sourced plants delivered to and installed on site do not meet the requirements of this manual, we reserve the right to engage an independent auditor to assess and make a recommendation as to the quality of the landscape planting. Any required rectification works resulting from this audit would be at the expense of the developer, not Melbourne Water.