

Advanced Works Manual For Water Supply and Wastewater Reticulation



FOREWORD

The Advanced Works Manual is designed to guide Developers and their appointed professionals through the process and procedures for delivering Water Corporation Reticulation assets.

The Advanced Works process is only available to pre – approved projects, which will generally be broad acre, multi staged subdivision developments. For all other developments the requirements of the Developers’ Manual will apply.



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Glossary of Terms

In this Manual the following words and expressions Shall have the following meanings.

Advanced Works Agreement	The formal legal document between the Developer and the Corporation with respect to fulfilling requirements for the provision of Reticulation assets.
Alignment	The line on which the pipes are laid and measured from the adjacent cadastral boundary.
As -constructed	The document on which details of the constructed works are recorded and submitted to the Corporation.
Asset Inspector	An officer of the Corporation responsible for assessing and or inspecting the works.
Beneficiary Lot	Lots that acquire water supply or wastewater service availability, as a result of an extension of the Reticulation, without the owner having paid, or been deemed to have paid, Headworks Contributions.
Certificate of Compliance	A document requiring the signature of a relevant party that certifies the aspect of works to which it relates.
Clearance to Work Permit	A permitting procedure to authorise a Contractor to conduct work on, or near a designated asset, other than where the personnel carrying out the work are being directly supervised by a person who has operational control of the asset.
Construction Engineer	The Engineer or Engineering Firm appointed by the Developer to manage the construction of the Works.
Concept Plan	The plan provided by the Design Engineer showing the key controls and parameters of the design, the planning considerations and the interaction with both existing and future assets. Developer
Contract	The agreement between the Developer and the Contractor for the execution of the works.
Contractor	A person or organisation bound to execute the works under a Contract.
Contract Price	The amount payable to the Contractor for the execution of a Contract.
Corporation	The statutory body corporate known as the Water Corporation, Western Australia.
Design Drawings	The drawings prepared by the Design Engineer, showing the proposed works.
Design Engineer	The Engineer or Engineering firm appointed by a Developer to prepare Design Drawings and documents for Submission to the Corporation.
Design Standard	The Corporation's Design Standard relevant to the works being undertaken.
Developer	The person or organisation that has entered into the Advanced Works Agreement with the Corporation to provide drainage, water or wastewater infrastructure.

Development Staging Plan	The plan showing the total land holding controlled by the Developer and the planned stages of development of the holding.
Easement	A defined area of land over which the Corporation has a right to enter for purposes defined by agreement or statute and subject to any conditions/restrictions implied therein. Such purposes can include for example, access, construction, maintenance and repair.
Engineer	A person qualified to be a Chartered Professional Engineer, and who has appropriate engineering experience.
Final Acceptance Certificate	A certificate issued by the Corporation at the end of the Warranty Period provided conditions have been met..
Final Inspection Clearance	A letter issued by the Asset Inspector confirming that the Works are acceptable.
Final Takeover Inspection	The Inspection by the Asset Inspector, with the Construction Engineer in attendance, prior to Takeover..
Inspection	Any activity undertaken to assess the condition of the works.
Land Development Agreement	The formal legal document between the Developer and the Corporation with respect to fulfilling the WAPC conditions for a designated area of subdivision (known as the Agreement Area).
Main Drain	An existing or proposed drain within the Metropolitan Area that is declared under legislation and controlled by the Corporation.
Main Sewer	A wastewater collection sewer to which direct property connections are not normally made.
Precalculated Cadastral Plan	A surveyor's precalculated cadastral plan of the proposed subdivision development.
Preliminaries to Works	The procedure which is necessary to address the Corporation's Statutory requirements under the <i>Water Agencies (Powers) Act 1984</i> for General and Major Works as setout in the External Approvals Manual.
Pre-takeover Inspection	The Inspection conducted by the Construction Engineer prior to booking a Final Takeover Inspection.
Region	An area of the State designated as a Region of the Water Corporation..
Regional Office	The principal office of that Region.
Reticulation	The pipelines and appurtenant works constructed to provide a water supply or wastewater service to a subdivision development.
Shall	A mandatory requirement.
Should	A requirement to be adopted unless circumstances justify a variation.
Specification	The document containing the technical clauses to be read in conjunction with the Design Drawings for the works.
Standard Drawings	Registered Corporation drawings
Submission	The compilation of drawings and documents presented to the Water Corporation.



Takeover	When the Corporation assumes ownership of the works and the Warranty Period commences.
Technical Manual	The Corporation's Technical Manual relevant to the works being undertaken as defined in Clause 0.
Warranty Period	The period commencing from Takeover.



1. Introduction

1.1 Scope

This Manual explains the administrative requirements for the provision of works that are covered by an Advanced Works Agreement (AWA), for the works to be incorporated into the Corporation's schemes and taken over by the Corporation, from the preliminary investigation stage to the final acceptance of works by the Corporation.

The scope of works covered by this Manual is restricted to water supply and wastewater Reticulation for projects that are pre-approved to be delivered through an Advanced Works Agreement.

A request to establish an Advanced Works Agreement Shall be made by the Developer and agreed to by the Corporation before design work commences. The Corporation reserves the right to deny access to the Advanced Works Agreement process at its discretion.

1.2 Technical and Other Manuals

This manual Should be read in conjunction with the Technical Manual or Design Standard relevant to the type of works being undertaken together with other appropriate Water Corporation manuals or standards as listed below:

- for water reticulation works the Water Reticulation Manual
- for wastewater reticulation works the Wastewater Manual Volume 1 and the Water Services Association of Australia Sewerage Code
- the External Approvals Manual (includes Preliminaries to Work)

Where this manual conflicts with another manual or standard this manual takes precedence..

1.3 Roles and Responsibilities

1.3.1 Developer

The Developer is the proponent of the works.

The Developer is responsible for:

- a) carrying out the requirements of the Advanced Works Agreement with the Corporation for these works
- b) appointing a Design Engineer, a Construction Engineer and a Contractor to carry out the works in accordance with this manual and the Technical Manuals and Design Standards.

1.3.2 Design Engineer

The role of the Design Engineer is to achieve a design for the works that is accepted by the Corporation.

The Design Engineer is responsible for carrying out that design.

The Design Engineer must be a registered holder of all current and relevant Technical Manuals, codes and Design Standards and be acceptable to the Corporation..



Construction Engineer

The Construction Engineer is responsible for managing and arranging the construction of the works to meet the requirements of the relevant Technical Manuals, codes and Design Standards and be acceptable to the Corporation.

Notification

The Developer Shall inform the Corporation in writing of the names of its Representative, Design Engineer and Construction Engineer.

2. Fees

The following fees are payable by the Developer to the Corporation on a Stage by Stage basis. Once established Fees will remain valid for the life of the Submission.

2.1.1 'Water Reticulation Planning' Fee – is a payment for water supply Reticulation planning which is based on 3.75% of the Water Corporation's estimate of the construction cost of the works. This fee is payable for all water supply Reticulation Submissions accepted, irrespective of whether the works proceed or not.

2.12 'Connection to Existing Works' Fee – is a payment for the Corporation to connect new infrastructure to the Corporation's existing system. These fees are dependent upon the type and size of connections and are payable prior to the connection being undertaken.

- For water supply works, in situations where an invoice has not already been received, the Construction Engineer Shall apply to the Submission Contact for a determination of the fee amount.
- (b) For wastewater works the Construction Engineer Shall apply to the Building Services in the Regional Office for a determination of the fee amount. For wastewater works the fee may include the installation and removal of an isolation device e.g. a plug.

3. Corporation Contacts

The Corporation Contacts are as shown below.

3.1 Submission Contact

Perth – Subdivision Works	Manager Land Servicing	Phone: 9420 2099
	Development Services Branch	Fax: 9420 3193
	Water Corporation	
	John Tonkin Water Centre	
	629 Newcastle Street, Leederville	
	PO Box 100 LEEDERVILLE WA 6902	



3.2 Inspections Contact

Perth	Inspection Services Perth Region 256 Bannister Road , Canning Vale PO Box 1525 Canning Vale Delivery Centre 6970	Phone: 9424 8462 Fax: 9424 8409
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3.3 As-Constructed Information Contact

Sewerage or Drainage – All Regions	Senior Spatial Analyst Spatial Information Management Group Water Corporation. Tel (08) 94202791 Fax (08) 94203112 E-Mail bill.spittles@watercorporation.com.au	Phone: 9420 2791 Fax: 9420 3112
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Water – All Regions	Spatial Data Team Leader Spatial Information Management Group Information Services Branch Water Corporation 629 Newcastle Street Leederville WA 6007 Tel: 9420 2069 Fax: 9420 3112 peter.jeffers@watercorporation.com.au	Phone: 9420 2069 Fax: 9420 3212
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4. Land Requirements

4.1 General

- 4.1.1 All Easements or reserves and land to be owned by the Corporation required for a Submission Shall be shown on the Concept Plan and the relevant Stage Design Drawings.
- 4.1.2 Where Easements or reserves outside of the Developer's land holding are required, written agreement in principle from the registered landowner to the arrangements proposed to acquire these Easements or reserves is required prior to a Concept Plan being accepted.
- 4.1.3 Where necessary the Corporation will require the Design Engineer to produce any documentation necessary to acquire land.
- 4.1.4 All land requirements Shall be completed to the Corporation's satisfaction prior to the Takeover of the works.



5. External Approvals

5.1 General

At an early stage in the preparation of a Submission the Design Engineer Shall give attention to the requirements for reference to external agencies as detailed in the Corporation's External Approval Manual [including the Corporation's (Statutory) requirements for Preliminaries to Works action as required by the Water Agencies (Powers) Act 1984].

- 5.1.1 Particular attention and early discussion needs to occur where a design proposal is adjacent to, within or crosses a reserve or asset under the control of either the Mains Roads Department (MRD), Public Transport Authority (PTA), Western Power or Telstra.
- 5.1.2 Prior to discussing a proposal with these bodies all alternatives Should first be considered and input on your design invited from the Corporation before any formal or informal approvals are sought.

5.2 Preliminaries to Works

The Design Engineer Shall determine the category of the works as described in Sections 86 to 97 of Water Agencies (Powers) Act 1984 and Shall satisfy the requirements of Guideline 1.2 of the Corporation's External Approval Manual.

Works are categorised in the Act as General, Major or Exempt. Major works are generally carried out by the Corporation and therefore not included in this manual. It is anticipated that most works will be General works and the remainder will be Exempt works.

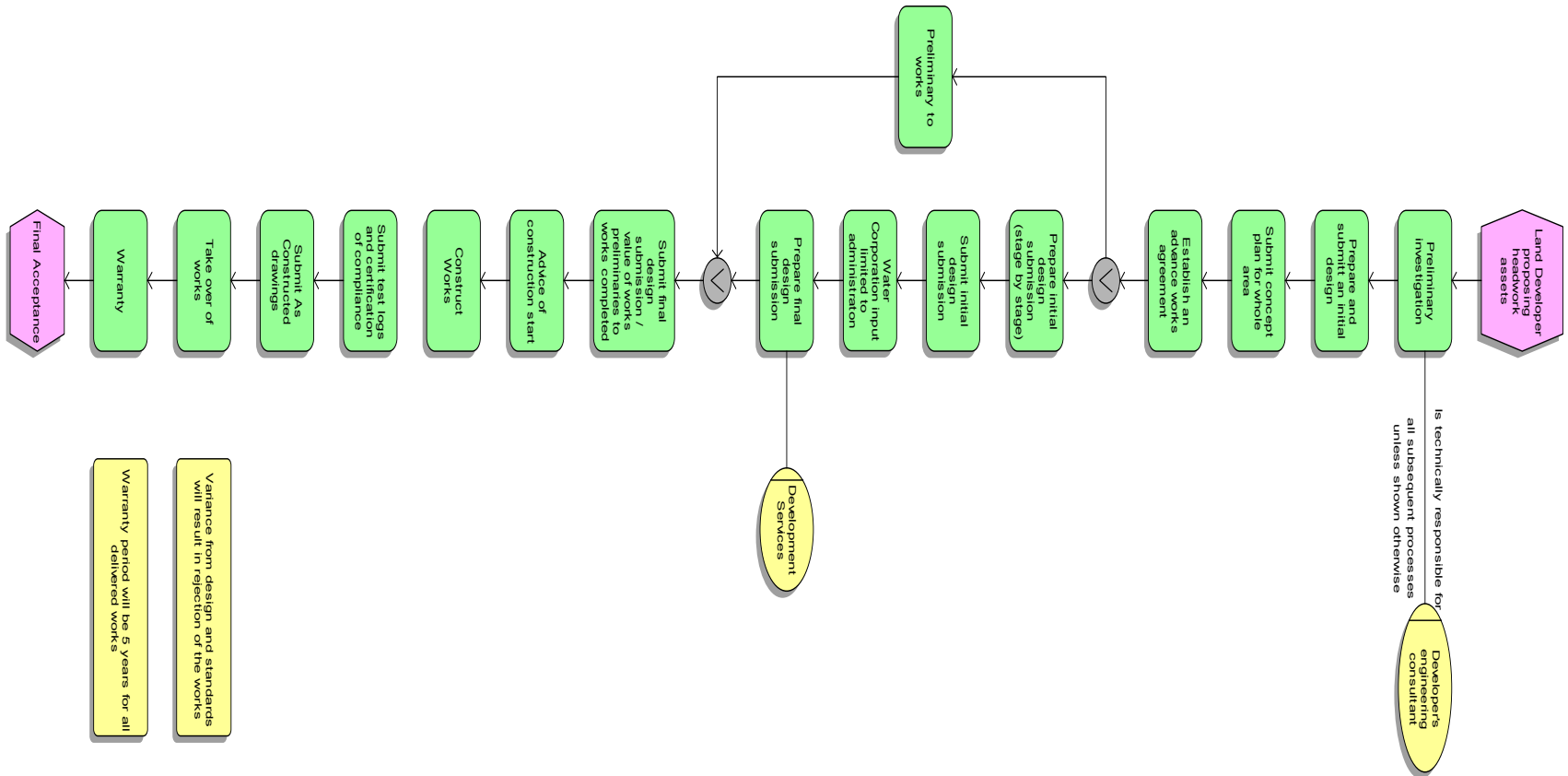
5.3 Objections

Objections to the proposed works that cannot be resolved by the Design Engineer Shall be referred to the Submission Contact All objections Shall be resolved prior to the acceptance of a Concept Plan.

5.4 Completion required for acceptance of Final Submission

Completion of all requirements of Preliminaries to Works, including full resolution of objections, is a mandatory condition for acceptance of the Concept Plan

6 Process





7. Preliminary Investigation

To ensure that the concept and capacity of the proposed works are compatible with the Corporation's overall planning requirements, the Design Engineer Shall discuss the broad planning concepts of the design with the Water Corporation Submission Contact. Where alternate technologies are proposed by the Developer the Corporation may impose additional requirements.

8. Planning Requirements

8.1 Concept

Prior to the establishment of an Advanced Works Agreement a Concept Plan for the area must be prepared by the Design Engineer for each service type (water and wastewater).

The Concept Plan for water supply Shall consider at a minimum:

- 8.1.1 The Concept Plan to be a scale of 1:2000
- 8.1.2 The routes and location of all Headworks Assets (Distribution / trunk mains booster stations, tanks etc)
- 8.1.3 The points of interconnection with both the existing network and the future network of other developments for both reticulation and distribution assets .
- 8.1.4 Water supply zone boundaries and their supply limits
- 8.1.5 Finished ground levels or contours.
- 8.1.6 The routes and sizes of all reticulation size mains
- 8.1.7 Valving Requirements for all mains

The Concept Plan for wastewater Shall consider at a minimum:

- 8.1.8 The Concept Plan to be a scale of 1:2000
- 8.1.9 The catchment control levels (cut and fill etc).and all finished ground levels or contours
- 8.1.10 The interconnection with both the existing network and the future network of other developments for both reticulation and distribution assets.
- 8.1.11 The route, location, size, inverts, grades of all Headworks, and/or outfall assets.
- 8.1.12 The routes of all reticulation assets.
 - For all control lines:
Main size, grade, inverts, depth of access chambers and flow
 - For all other lines:
Main size and inverts at the end of each line
- 8.1.14 The isolation of existing works strategy for the various stages of construction.
- 8.1.15. All other control points or features which may influence designs



8.2 Concept Plan Submission

- 8.2.1 Two (2) copies of the Concept Plan/s Shall be submitted to the Submissions Contact for review and comment.
- 8.2.2 Once the Corporation comments have been incorporated two (2) revised copies Shall be Submitted for acceptance.
- 8.3.3 The accepted Concept Plan/s will form the basis of an Advanced Works Agreement between the Developer and the Corporation.
- 8.2.4 Once a Concept Plan has been accepted and a variation is sought a written request, setting out the reasons for any change and a revised Concept Plan Shall be submitted to the Corporation for comment.

9. Advanced Works Agreement

Once a Concept Plan has been agreed the Corporation will prepare an Advanced Works Agreement, which Shall be executed before any works commence.

10. Design Requirements

10.1 Design Submissions

Designs for the works Shall be submitted by a Design Engineer.

10.2 Drawing Certification

Each drawing (and document) forming the Submission Shall be signed by an Engineer who has the authority to act on behalf of the Design Engineer making the Submission.

10.3 Design Responsibilities

Compliance with the Corporation's Technical Manuals and Design Standards and with statutory requirements Shall be the responsibility of the Design Engineer. Acceptance by the Corporation of a Submission Shall not relieve the Design Engineer of this responsibility or the responsibility for any discrepancies, errors or omissions in the Design Submission or for the adequacy of the design.

10.4 Drafting Standards

- 10.4.1 For all works, drafting Shall be in accordance with Australian Standard 1100, Part 101.
- 10.4.2 Drawings Shall be suitable for microfilming. A digital copy of the precalculated cadastral plan will expedite the incorporation of information into the Corporation's Facility Mapping System. The digital file to be in MGA94 coordinates.

10.5 Standard Drawings

Standard Drawings are available in the Technical Manuals and Design Standards.

11. Initial Submission

The purpose of the initial Submission is for the Corporation to:

- Provide the administrative detail required for the Design Engineer to prepare a Final Submission





- ensure that the Preliminaries to Works have commenced.

An initial Submission will not be accepted prior to the acceptance of Concept Plan and the establishment of an Advanced Works Agreement

11.1 Requirements for the Initial Submission

General

The initial Submission Shall consist of:

- 11.1.1 Two copies of the Staging / Locality Plan which Shall show the Concept Plan area and all previous stages including references to the relevant Corporation Plan Set numbers
- 11.1.2 Two copies of the Design Drawings.
- 11.1.3 One copy of the surveyor's (holding a current Practising Certificate issued by the Land Surveyors Licensing Board) Precalculated Cadastral Plan.
- 11.1.4 A letter from the owners of land, other than the Developer, agreeing in principle to the granting of any Easement or reserve considered by the Corporation to be necessary for the works.
- 11.1.5 A list of the existing lots serviceable as a result of the works. The list Shall show the property address, owners name and mailing address and a short description of any improvement on the property. E.g. Residence, industrial units etc.

12. Details of Initial Submission

12.1 The Initial Design Checklist

The Initial Design Checklist for the initial engineering Submission Shall be in the following format and be specific to the relevant asset type :



Wastewater Reticulation Initial Design – Checklist

Concept Plan No: _____ **WAPC Ref No.** _____

Location and/or Stage Name: _____

Notes:

1. Applies to sewers 300 mm dia. and less (Perth Metropolitan Area only)
2. References the current version of the Developers Manual / AWA Manual and the relevant Design Standard.

This Checklist is to be used to undertake a review of an Initial Design Submission by the Design Engineer prior to lodging the submission with the Water Corporation. The Certification at the bottom of this Checklist is to be signed by an Engineer qualified and authorised to do so.

1	Planning Considerations	
1.1	The design complies with current Water Corporation planning	
1.2	The design complies with the current revision of the Advanced Works Agreement Concept Design.	
1.3	The design allows for all interconnecting flows (current and future)	
2	Drawing Format	
2.1	The drafting is to the appropriate standard	
2.2	The drawings contain all of the relevant Water Corporation referencing (ie: WAPC No,)	
2.3	Beneficiary lots have been identified and relevant details attached.	
2.4	All easements have been denoted.	
3	Design Criteria	
3.1	Without compromising the planning, the design meets the fundamental objectives of: <ol style="list-style-type: none"> a) minimising access chambers b) minimising sewer depths c) minimising sewer length d) maximising the locating sewers in public land 	
3.2	The design incorporates the most appropriate Access Chamber types and running traps where required.	
3.3	All lots served have sewer junctions at a location and depth suitable to correctly serve the lot/s and boundary traps where required.	
3.4	All fill requirements are denoted (ie: if design based on contours appropriate tolerances have been applied)	
3.5	All sewer grades are within acceptable tolerances	
3.6	All sewers terminate at the extremity of the land served unless future extension does not need to be catered for.	
3.7	Connections to existing works have been appropriately designed (ie: flow to flow where called for) and isolation from live works requirements have been considered and designed appropriately.	
3.8	The design applies standard alignments OR non-standard alignments have been approved by both the Water Corporation and other service providers.	
3.9	The design considers the proposed construction technique and/or constraints.	
3.10	For designs proposing a variation to the Design Standard a formal request has been made to the Water Corporation for approval.	
4	Influencing Factors	
4.1	The design makes appropriate allowance for existing or proposed physical features of influence ie: retaining walls, trees, other services, building etc.	
4.2	In the case of designs in existing established areas the route has been "walked".	
4.3	Where the design requires the approval of other parties (ie; DEC Clearing Permits, affected landowners, other service providers) a strategy to obtain these has been developed.	

I certify that this design has been reviewed and complies with Water Corporation requirements.

_____ / ____ / ____
Signature **Date**

Print Name and Firm



Water Supply Reticulation Initial Design – Checklist

Concept Plan No. _____ WAPC Ref No: _____

Location and/or Stage Name: _____

Notes:

3. Applies to water mains 250 mm dia. and less (Perth Metropolitan Area only)
4. References the current version of the Developers Manual and the relevant Design Standard.

This Checklist is to be used to undertake a review of an Initial Design Submission by the Design Engineer prior to lodging the submission with the Water Corporation. The Certification at the bottom of this Checklist is to be signed by an Engineer qualified and authorised to do so.

1	Planning Considerations	
1.1	The design complies with current Water Corporation planning	
1.2	The design complies with the current revision of the Advanced Works Agreement Concept Design.	
1.3	Where the design covers more than one water supply zone, the zoning boundary is accurately shown	
2	Drawing Format	
2.1	Where the design covers more than one water supply zone, the zoning boundary is accurately shown	
2.2	The drafting is to the appropriate standard	
2.3	The drawings contain all of the relevant Water Corporation referencing (ie: WAPC No,)	
2.4	Beneficiary lots have been identified and relevant details attached.	
2.5	All easements have been denoted.	
3	Design Criteria	
3.1	Without compromising the planning, the design meets the fundamental objectives of: e) minimising water main sizing f) efficient use of valves g) minimising bends h) efficient use of hydrants i) minimising long services j) maximising dual services k) minimising dead end mains	
3.2	The design incorporates valving that considers shutdown requirements and the number of properties impacted	
3.3	The design considers finished surface levels in relation to cover on mains.	
3.4	All water mains terminate at the extremity of the land served unless future extension does not need to be catered for.	
3.5	Connections to existing works have been appropriately designed	
3.6	The design applies standard alignments OR non-standard alignments have been approved by both the Water Corporation and other service providers.	
3.7	The design considers the proposed construction technique and/or constraints.	
3.8	For designs proposing a variation to the Design Standard a formal request has been made to the Water Corporation for approval.	
4	Influencing Factors	
4.1	The design makes appropriate allowance for existing or proposed physical features of influence ie: retaining walls, trees, other services, building etc.	
4.2	In the case of designs in existing established areas the route has been "walked".	
4.3	Where the design requires the approval of other parties (ie; DEC Clearing Permits, affected landowners, other service providers) a strategy to obtain these has been developed.	

I certify that this design has been reviewed and complies with Water Corporation requirements.

Signature

____/____/____
Date

Print Name and Firm



12.2 The Precalculated Cadastral Plan

The Precalculated Cadastral Plan Shall show:

- 12.2.1 Existing lot boundaries with dimensions, angles, lot numbers and street names.
- 12.2.2 Proposed lot and reserve boundaries with dimensions, angles, areas and lot numbers.
- 12.2.3 Proposed land use eg. Single residential, duplex, POS, school, multiple residential, industrial.
- 12.2.4 Scale and north point.

13. Review of Initial Submission

13.1 Acceptance

The Submission will be not generally be checked for conformity with the Corporation's overall planning requirements and the Accepted Concept Plan, however the Corporation reserves the right to run random audits for compliance purposes .

A marked up copy of the Initial Submission will be returned to the Design Engineer denoting the administrative details, such as Plan Numbers, Access Chamber Numbers, file numbers etc.

14. Final Submission

The Final Submission includes:

- the provision of final plans, incorporating references provided by the Corporation.
- the finalisation of Preliminaries to Works
- the Contract Price of the works.

and Shall be submitted not less than 5 working days prior to construction commencing.

14.1 Requirements of the Final Submission:

The final Submission Shall consist of the following documents:

- 14.1.1 6 Copies of the Design Drawings
- 14.1.2 An agreement in writing formalising the arrangements for the provision to the Corporation of any land, reserves or Easements required for the works
- 14.1.3 Advice in writing of the value of the works

15. Details of the Final Submission

15.1 The Submission Cover Sheet

- 15.1.1 The Submission Cover Sheet for the final design Submission Shall be in the following format:



**COVER SHEET
FOR A
FINAL DESIGN WITHIN AN ADVANCED WORKS AGREEMENT AREA**

Important information for Design Engineers:

The following specific details are required to be sent to the Water Corporation with the Final Submission of a design.

1. Please make sure that all information listed is included so that the Final Submission can be processed without delay.
2. Please verify the following information by signing on the bottom of the page.
3. Please include the signed original of this form with the Final Submission when forwarding to Water Corporation

1.	GENERAL	
	WAPC number: Stage Name/Number Service type (water, waste water, drainage)	
2	INITIAL DESIGN REVIEW	
	I confirm that this Submission conforms with the Initial Submission returned by the Water Corporation including required amendments	<input type="checkbox"/>
	OR	
	If any variations have been made, a description and reason for each variation is attached	<input type="checkbox"/>
	Where a variation to a Design Standard has been approved the relevant approval is attached	<input type="checkbox"/>
3.	DETAILS OF CONSTRUCTION ENGINEER	
	Name of Company: Address: Phone: Fax Email Project Manager: Qualified to carry out works	
		<input type="checkbox"/>
4.	DETAILS OF CONTRACT	
	Name of Contractor: Address: Phone: Fax: Email Project Manager: Contract Price (Excl GST): \$ Qualified to carry out works	
		<input type="checkbox"/>
5.	EXTERNAL APPROVALS	
	A statement is attached listing the authorities from which project approval has been obtained, including environmental clearances and copies of any conditions that have been imposed by those authorities on the construction or operation of the works.	<input type="checkbox"/>
	There are no unresolved objections arising from the Preliminaries to Works process for the proposed works.	<input type="checkbox"/>
6.	VERIFICATION OF CONTENT	
<p>Signature (Design Engineer) _____ Date _____</p>		



15.2 Design Drawings

Technical requirements for the Design Drawings are given in the Appropriate Technical Manuals and Design Standards. Drafting standards are specified in Clause 10.4

15.2.1 For all works the Design Drawings Shall comprise:

- (a) Six hard copies of the construction and staging drawings.
- (b) Two hard copies of the design data plan (wastewater only).

16. Acceptance of a Final Submission

The Submission and the responsibility for compliance with the Concept Plan and the relevant standards remains the responsibility of the Design Engineer.

17. Start Up Meeting Requirements (for Stage 1 of each AWA area)

17.1 General

17.1.1 Prior to the commencement of the works the Construction Engineer Shall contact the Inspections Contact and arrange for the assignment of an Asset Inspector. From this point forward arrangements are to be made directly with the assigned Asset Inspector.

17.1.2 Prior to the commencement of the works for Stage 1 the Construction Engineer Shall arrange and attend a "Start Up" meeting with the Asset Inspector. The Start Up meeting Shall be held at the site of the proposed works

17.1.3 The Construction Engineer Shall ensure that a record of the meeting is made. This record Shall detail the key information and agreements reached in relation to the entire project (entire project being the area covered by the relevant AWA)

17.1.4 The following matters Shall be addressed at the "Start Up" meeting:

- Indicative dates for the commencement and completion of each stage.
- Method of isolating the new works from the existing works during construction.
- Inspection Plan, detailing which parts of the works (including testing) the Asset Inspector will inspect, when these Inspections are proposed to take place and any requirements necessary to facilitate these Inspections.
- Nomination of additional staff who will access the site of the proposed works to carry out Inspections.
- Contact and reporting arrangements including signing of site Inspection reports.
- Arrangements for the protection of Water Corporation assets.
- Arrangements for the connection of new work to existing infrastructure.
- Arrangements for Inspection and testing processes.
- Milestone meetings at which joint attendance is required.
- Commissioning plan.

17.1.5 A copy of the meeting record Shall be forwarded to the Asset Inspector within 5 days of the Start Up meeting occurring.



18. Pre-Start Advice (for Stages 2 onwards of each AWA area)

18.1 General

- 18.1.1 At least 5 days prior to construction commencement the Inspections Contact Shall be provided the following in writing;
- (a) The name of the Construction Engineer and contact details, Should they have changed from the Start Up meeting
 - (b) The name and contact details of the Contractor and or subContractors, Should they have changed from the Start Up meeting..
 - (c) The proposed date for commencement of work.
 - (d) Details of the proposed method of isolation of works.
- 18.1.2 The Inspections Contact will provide the Construction Engineer with a clearance to commence works, which may amend or augment matters agreed at the Start Up Meeting
- 18.1.3 Before construction commences the Construction Engineer Shall ensure:
- (a) That a clearance to commence construction has been obtained from the Inspections Contact.
 - (b) A Clearance to Works (CTW) Permit has been obtained, when required, from the Corporation (Customer Service Delivery).
 - (c) The Contractor employs personnel who have appropriate skills, and if required by the Corporation accreditation, for the performance of the tasks in which they are involved. Accreditations required Shall be as designated in the relevant Technical Manual or Design Standard,.

18.2 Notice of Proposed Works

- 18.2.1 Where property, other than that owned by the Developer, will be affected by construction of the proposed works, the Construction Engineer Shall ensure that written notice has been given to the occupiers of such property at least 10 days prior to commencement of work that will affect the property.

19. Construction Requirements

19.1 General

- 19.1.1 If a change of Contractor becomes necessary, the Construction Engineer Shall notify the Corporation of the new Contractor's name and contact information.
- 19.1.2 Any requirements of the Corporation regarding the Contractor's work Shall be directed to the Construction Engineer, not to the Contractor.
- 19.1.3 Work Shall be carried out in accordance with the requirements of the relevant Technical Manual or Design Standard, relevant Acts and By-laws and this manual.
- 19.1.4 The Construction Engineer Shall ensure that the Contractor is aware of, and agrees to comply with, the requirements of any authority in regard to the protection, diversion or relaying of any service affected by the works.
- 19.1.5 The Construction Engineer Shall ensure that the Contractor is conversant with Any agreement with any Authority such as the Department of Aboriginal Affairs or Department for Planning & Infrastructure into which the Design Engineer, the Developer or the Corporation may have entered for the works.

- 19.1.6 The Construction Engineer Shall ensure that the Contractor verifies by survey the location and level of the point of connection of the works to the existing system.

19.2 Protection of Corporation Assets

- 19.2.1 Corporation assets Shall not be disturbed without the approval of the appropriate Regional Office on each and every occasion.

OR

Excavation or construction work Shall not be carried out in close proximity to any existing Corporation asset until

- A joint Inspection of the asset has been carried out by the Corporation and the Construction Engineer to ascertain the condition of the asset; and
- The Asset Inspector has been given two working days notice of the intention to commence work.

- 19.2.2 The Construction Engineer Shall ensure that adequate measures are taken to protect the Corporation's assets from damage during construction of the works.

- 19.2.3 If any damage occurs to existing assets the Construction Engineer Shall immediately notify the Corporation. The Corporation will advise of what action Shall be taken, which may include any costs to make good the damage being charged to the Developer.

20. Isolation of New Works (Sewers Only)

The purpose of isolating non-commissioned sewers from live sewers is to provide a safe working environment for construction, testing and Inspection of the new work. Where the non-commissioned sewer system is not isolated from the live sewer, entry to and work within the new sewer system is subject to the provisions of Australian Standard AS2865, "Safe working in a confined space".

20.1 General

- 20.1.1 The Construction Engineer Shall make the necessary arrangements for the new works to be isolated from the live sewer prior to the commencement of construction and ensure that the isolation is maintained until the Final Inspection Clearance has been issued by the Asset Inspector (See Clause 0).
- 20.1.2 The new works Shall be either not connected (physical break) or Shall be physically isolated from the live sewer. A physical break is the preferred method and Should be used wherever practical.
- 20.1.3 Where a physical break is not practical, the Construction Engineer Shall apply to the Corporation (Building Services) to have the live sewer sealed off prior to construction and removed following the issue of the Final Inspection Clearance of the works.
- 20.1.4 The Water Corporation will notify the Construction Engineer in writing when the line has been isolated (seal installed and ready for testing) and again when the isolation has been removed.
- 20.1.5 Where the live sewer has been plugged (**150 or 225mm sewers**), the Construction Engineer Shall arrange for the plug to be tested to 50 kPa for one minute with no drop in pressure. The test Shall be conducted on the "upstream"



side of the plug prior to any entry by Corporation staff. The test Shall be logged in the Construction Engineer's Log of Inspections and Tests.

- 20.1.6 Where the live sewer has been sealed with a plastic membrane and brickwork (**Sewers 300mm and above**), the Construction Engineer Shall establish a testing schedule acceptable by Worksafe to ensure that the isolation is effective.

21. Inspection of Works During Construction

21.1 General

In general Inspections will not be undertaken by the Corporation during construction of the works, however the Corporation reserves the right to request an Inspection at anytime for the purposes of auditing compliance.

- 21.1.1 The Construction Engineer Shall make provision for access by Corporation Officers or representatives of the Corporation to inspect the works during construction when requested.
- 21.1.2 The Asset Inspector (including additional staff) Shall have access to the site at any time provided the Construction Engineer or Contractor is on site.
- 21.1.3 Inspections by the Corporation do not in any way relieve the Construction Engineer of the responsibility for ensuring that construction of the works is in accordance with the design documents and that it complies with the requirements of the Technical Manual or Design Standard.
- 21.1.4 The Construction Engineer Shall arrange for the provision of all personnel and equipment required any scheduled Inspection and testing.

21.2 Construction Engineer's Log of Inspections and Tests

- 21.2.1 The Construction Engineer Shall arrange and undertake inspection and testing of the works to ensure that the requirements of the Technical Manual or Design Standard are satisfied. The Construction Engineer Shall maintain a log of all Inspections and tests undertaken .. The log Shall record the following information:
- Inspections and/or tests witnessed by the Construction Engineer of the works, which were considered satisfactory. To this effect the Construction Engineer Shall sign the following statement on the Construction Engineer's log: "I am satisfied that the above Inspection and tests have been carried out."
 - Inspections and / or tests witnessed by the Construction Engineer of the works, which were considered unsatisfactory.
 - Any remedial action undertaken to the works as a result of an unsatisfactory Inspection prior to re-Inspection.
- 21.2.2 A copy of the Construction Engineer's Inspection log and test results Shall be submitted to the Asset Inspector prior to a Final Takeover Inspection being undertaken. The log Shall include but not be limited to the date, time, item tested, type of test, result of test and the name of the witness.

21.3 Site Safety

- 21.3.1 Asset Inspectors will comply with the Contractor's site safety procedures while on site.

21.3.2 Asset Inspectors will not enter sites that they consider unsafe by Worksafe Standards.

21.3.3 Where safety issues relating to the Inspection cannot be resolved between the Construction Engineer and the Asset Inspector they Shall be referred to Worksafe for advice/resolution.

21.4 Pre-takeover Inspection

21.4.1 Prior to booking a Final Takeover Inspection the Construction Engineer Shall undertake a Pre-takeover Inspection.

21.4.2 A Pre-takeover Inspection Checklist Shall be completed by the Construction Engineer and provided to the Asset Inspector with all of the Test Logs prior to the Final Takeover Inspection.



Pre-takeover Inspection Checklist

Plan Set No: _____ **WAPC Ref No.** _____

Location and/or Stage Name: _____

This Checklist is to be used by the Construction Engineer to undertake Pre-takeover Inspection prior to booking a Final Takeover Inspection with the Water Corporation's Asset Inspector. The Certification at the bottom of this Checklist is to be signed by an Engineer qualified and authorised to do so.

1	Test and Inspection Logs / Certificates	
1.1	Test and Inspection Logs have been maintained, checked and signed for: (delete if not applicable) a) Pressure testing b) Ovality testing c) Lines sighted d) Spark testing e) Product specification (date of manufacture, supplier / brand) f) Bedding, jointing and installation of pipe work checked g) Anchor blocks in place and to specification h) Valve and hydrant supports are in place and to specification i) Denso tape and paste has been applied where required	
1.2	Compaction Certificates have been maintained, checked and signed.	
1.3	All testing equipment used has been recorded by Identification No. and current Calibration certification is provided.	
2	Water Supply Physical Inspection Items	
2.1	The following items have been physically inspected and verified: a) All water services are in place , correctly positioned, protected and to specification b) Denso tape and paste has been applied where required c) All valves and hydrants are in place and to specification d) All marker posts are in position and to specification	
3	Wastewater Physical Inspection Items	
3.1	The following items have been physically inspected and verified: a) Isolation is in place b) Access chambers (complete, clear , correct covers) c) Maintenance Shafts (complete, clear, correct covers) d) Property connection markers are in place	

I certify that the assets constructed meet all Water Corporation requirements.

Signature

___/___/___
Date

Print Name and Firm



21.5 Final Takeover Inspection

- 21.5.1 When the works have been completed for each stage of development, and the Construction Engineer has conducted a Pre-takeover Inspection, the Construction Engineer Shall arrange a Final Takeover Inspection with the Asset Inspector.
- 21.5.2 The Construction Engineer Shall provide no less than 2 working days notice of any request for a Final Takeover Inspection.
- 21.5.3 The Asset Inspector will inspect the works with the Construction Engineer in attendance.
- 21.5.4 Where the number and/or seriousness of non-conformances indicates that the Pre-takeover Inspection has been inadequate the Asset Inspector Shall terminate the Final Takeover Inspection and require the Construction Engineer to carry out further Inspection of the works before booking another Final Takeover Inspection. A fee may be charged to the Developer where a Pre-takeover Inspection is deemed to have been inadequate.
- 21.5.5 Where the works are deemed to be acceptable the Asset Inspector Shall arrange for a Final Inspection Clearance to be issued to the Construction Engineer.

22. Connection to Existing Assets

22.1 General

- 22.1.1 Connections or alterations required to the Corporation's existing infrastructure as a result of new works Shall be by prior arrangement with the Corporation. All such work Shall be at the Developer's expense.
- 22.1.2 The Construction Engineer Shall make the necessary arrangements for the payment of fees for the connection of the new works to the existing assets .
- 22.1.3 When the works are deemed to be acceptable, the Asset Inspector Shall initiate the connection of the works upon the request from the Construction Engineer.
- 22.1.4 Works will not be connected to existing assets until payment of all associated fees has been made and a Final Inspection Clearance has been issued.

23. Recording of As-constructed

23.1 General

- 23.1.1 The As-constructed Shall be certified "As-constructed", signed and dated by the Design Engineer ,the Construction Engineer and by the surveyor (who is eligible for membership of I.E.M.S.A. or I.S.A.) responsible for the survey. The As-constructed Shall be in accordance with the relevant Technical Manual, Design Standard or this Manual.

23.2 Submission Requirements of As-constructed Information

- 23.2.1 The completed and signed As-constructed Submission Shall be submitted to the As-constructed Submission Contact .



23.2.2 One copy of the As-constructed Submission Shall be submitted except where specified below .

23.3 As-constructed Information

Water Reticulation works

The As-constructed information Shall consist of:

23.3.1 The As -constructed plan in accordance with the typical information provided in

Water Corporation Design Standard 63.

23.3.2 A precalculated cadastral plan for areas which are not sewered, in electronic form whenever possible and particularly for large areas; otherwise a hard copy for small subdivisions.

Wastewater Reticulation works (the information / instruction below amends and / or supplements that contained in Wastewater Manual Volume 1)

23.3.3 The As -constructed plan in accordance with the typical information provided at Attachment 2 of this Manual.

23.3.4 All aspects of Section 6 of the Water Corporations Wastewater Manual Volume 1 must be complied with, other than the As-constructed plan mention at 23.3.3 replacing all references to Field Notes.

23.3.5 A precalculated cadastral plan, in electronic form whenever possible and particularly for large areas; otherwise a hard copy for small subdivisions.

23.3.6 A contour plan if earthworks have been carried out that has changed a contour by 0.5 metre or more.

24. Takeover of the Works

24.1 General

24.1.1 The Developer Shall remain fully responsible for the works until the date of written notification of Takeover from the Corporation.

24.2 Requirements for Takeover

Subject to connection to the existing system being available, Takeover is achieved when:

24.2.1 A Final Inspection Clearance has been issued by the Asset Inspector.

24.2.2 The Construction Engineer has certified that the works have been constructed in accordance with the documents accepted by the Corporation and the requirements of the Technical Manual or Design Standard.

24.2.3 The As-constructed information has been submitted to the As-constructed Contact and has been validated. The Corporation will validate the data within 10 working days of its Submission, if the information is correct.

24.2.4 The Construction Engineer has certified that restoration has been performed to the satisfaction of any affected property owner and authorities.

24.2.5 Any fees required have been paid.

24.2.6 All land requirements have been satisfied.

24.2.7 The Corporation has cleared the subdivision agreement requiring these works

24.2.8 The Corporation is satisfied that the terms of the Advanced Works Agreement have been satisfied and the Developer has provided a signed Certification of Compliance.

24.2.9 The Corporation has notified the Developer in writing that Takeover has been achieved.

24.3 Date of Takeover

The date of Takeover will be taken to be the date that all the requirements of the previous Clause have been completed.

25. Warranty Period

25.1 General

25.1.1 The Warranty Period Shall commence on the date of take-over.

25.1.2 The Warranty Period Shall be for 1 year.

25.1.3 During the Warranty Period, the Corporation Shall be responsible for operational maintenance of the works in accordance with normal practice.

25.2 Remedial Repairs during Warranty

25.2.1 During the Warranty Period the Developer Shall be responsible for ensuring that satisfactory remedial repairs arising from faulty design, workmanship or materials are carried out.

The cost of any consequential damage and claims resulting from such defects Shall be charged to the Developer.

25.2.2 During the Warranty Period, the Corporation may, at its discretion carry out remedial repairs where the fault affects the service to customers and/or public safety. The Corporation will notify the Developer of the work carried out as soon as practicable where the remedial repairs are attributable to the construction of the works. The cost of the remedial repairs Shall be charged to the Developer.

25.3 Remedial Repairs post Warranty

25.3.1 Where remedial works carried out by the Corporation are determined to be attributable to a design or construction error or omission the cost of the remedial works Shall be charged to the Developer.

25.3.2 Remedial works Shall include, but not be limited to, the absence of infrastructure components (ie: missing sewer junctions), incorrect installation (ie: inadequate bedding or compaction) and inadequate separation of any component of the works from other infrastructure (ie: inappropriate separation distance between water and electricity assets).



26. Final Acceptance Certificate

26.1 General

- 26.1.1 Prior to the end of the Warranty Period the Corporation will assess whether there are any defects. If so, the Asset Inspector will notify the Developer of the list of defects. Otherwise, the Asset Inspector will issue the Developer with the Final Acceptance Certificate at the end of the Warranty Period.
- 26.1.2 Providing that any defects identified in Clause 0 have been rectified to the satisfaction of the Corporation, a Final Acceptance Certificate Shall be issued by the Corporation.



27. Attachment 1: Clearance to Work Permit Guidelines

ASSETS LIKELY TO BE AFFECTED INCLUDE:

- Water mains (especially RC, AC, CI etc)
- Pressure mains
- Main Sewers
- Piped Water Corporation Main Drains
- Pump stations (pipework, pits, electrical cables, alarm lines etc)

REQUIREMENT FOR A PERMIT IS ESSENTIALLY A PRODUCT OF:

- Type of asset
- Proximity and depth of excavation in relation to an existing asset
- Soil conditions
- Construction method

CLEARANCE TO WORK PERMITS WILL BE REQUIRED WHERE:

1. Open excavating parallel to or crossing an existing water main, pressure main, Main Sewer or piped drain at an acute angle (less than 45°) where the integrity of the asset may be impacted by the Works. (e.g. within 2 metres of an asset and greater than 1 metre below the invert of an asset). **Note: there may be instances where this criteria is not appropriate and the designer must therefore consider the type of asset, proximity of the sewer, difference in invert levels and soil conditions. If any doubt exists the specific circumstances should be referred to the Region for assessment.**
2. Crossing under an existing asset where the clearance between the assets will be minimal (say <500mm).
3. Any crossing under a water main with a diameter greater than 200mm.
4. Excavating in or around pump station sites as buried assets and services are not necessarily in accordance with that shown on 'as-constructed' plans.
5. Any connection to an existing asset.
6. All Works in the vicinity of RC mains should be referred to the Region for special consideration.

Most failures have occurred as a result of the loss of support to RC or AC water mains and are preventable if a "cut and cap" is arranged at the appropriate time.

IF ANY DOUBT EXISTS THE DESIGNER / CONTRACTOR SHOULD REFER THE SPECIFIC CIRCUMSTANCES FOR ASSESSMENT BY THE REGION.



28. Attachment 2

**Request to Invoke The Performance Agreement Aspect of an
Advanced Works Agreement**

WAPC No/s: _____

Developer's (Applicant) Details

Name			
Address			
Suburb	Post Code:		
E-mail			
Phone Contact	Fax:		
ABN			

Project Manager Details

Name			
Address			
Suburb	Post Code:		
E-mail			
Phone Contact	Fax:		
ABN			

Agreement Number/s	
Stage Name	
Number of Lots	

Nominated Clearance Date (Note 2)

PROJECT DETAILS

Water Corporation Plan No
Value of Works (without GST)
Length of Main

	WATER SUPPLY Reticulation	WASTEWATER Reticulation

**PROJECT DETAILS
Only use for Connecting Link if applicable**

Water Corporation Plan No
Length of Main

	WATER SUPPLY Reticulation	WASTEWATER Reticulation

Planned Timetable for performance agreement events

Start Up meeting (Note 1)
If stage greater than 60 lots provide (A-C)
A) Pressure Test
B) Final Inspection
C) As Constructed provided

	WATER SUPPLY Reticulation Expected Date	WASTEWATER Reticulation Expected Date

Note 1 The startup meeting should be confirmed with the Asset Inspectors before submitting this request (Stage 1 of the Advanced Works Agreement only)

Note 2 Should the Performance Agreement occur after the startup meeting then the Developer is to nominate a subdivision clearance date as a basis for determining the Service Obligation date. The maximum period of the Performance Agreement will commence from the nominated clearance date and therefore no clearance of the subdivision will be issued before this date.



29 Attachment 3: Example Wastewater Reticulation As Constructed Plan

